



**Groundwater Sample Results,
Combined Level 2 and Level 4 Laboratory Report,
Electronic Data Deliverable, Data Validation Report,
and the Sample Location Report, SDG 320-23696-1**

*Naval Weapons Station Earle
Colts Neck, New Jersey*

July 2019

N60478.SF.001876
NWS EARLE
5090.3c

LABORATORY DATA PACKAGE, 320-23696-1, NWS EARLE, NJ
12/10/2016
TESTAMERICA LABORATORIES, INC

ANALYTICAL REPORT

Job Number: 320-23696-1

Job Description: Ensafe-NWS - Earle, NJ PFCs Groundwater

For:

Earth Toxics, Inc
PO BOX 3382
Logan, UT 84321

Attention: Mike Dryden



Approved for release.
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12/10/2016 11:29 AM

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The test results in this report relate only to the samples in this report and meet all requirements of NELAP, with any exceptions noted. Pursuant to NELAP, this report shall not be reproduced except in full, without the written approval of the laboratory. All questions regarding this report should be directed to the TestAmerica Denver Project Manager.

The Lab Certification ID# is 4025.

Reporting limits are adjusted for sample size used, dilutions and moisture content if applicable.

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Definitions/Glossary

Client: Earth Toxics, Inc
Project/Site: Ensafe-NWS - Earle, NJ PFCs Groundwater

TestAmerica Job ID: 320-23696-1

Qualifiers

LCMS

Qualifier	Qualifier Description
U	Undetected at the Limit of Detection.
J	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
D	The reported value is from a dilution.
M	Manual integrated compound.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, 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: Earth Toxics, Inc

Project: Ensafe-NWS - Earle, NJ PFCs Groundwater

Report Number: 320-23696-1

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 11/18/2016 9:50 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.7° C.

PFAS

Samples 46MW01 (320-23696-1), 46MW05 (320-23696-2), MCFSMWFM-01 (320-23696-3), MCFSMW-4 (320-23696-4), MCFSMW-2 (320-23696-5), MCFSMW5U-01 (320-23696-6), MCFSMW-16 (320-23696-7), DUP-111616 (320-23696-8) and FB111616 (320-23696-9) were analyzed for PFAs in accordance with 537 Modified. The samples were prepared on 11/23/2016 and analyzed on 12/03/2016 and 12/07/2016.

Due to the excessive amount of sediment in the sample bottles, the aqueous portion of these samples was decanted to new bottles prior to spiking and the extraction. 46MW01 (320-23696-1), MCFSMWFM-01 (320-23696-3), MCFSMWFM-01 (320-23696-3[MS]), MCFSMWFM-01 (320-23696-3[MSD]), MCFSMW-4 (320-23696-4), MCFSMW-2 (320-23696-5), MCFSMW5U-01 (320-23696-6), MCFSMW-16 (320-23696-7) and DUP-111616 (320-23696-8).

Due to high target analyte concentrations, samples 46MW05 (320-23696-2)[10X] and MCFSMW5U-01 (320-23696-6)[100X] required dilutions prior to analysis. The reporting limits have been adjusted accordingly. The samples were run at a dilution and both sets of data are reported.

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.

Perfluorononanoic acid (PFNA) failed the recovery criteria high for the MS/MSD of sample MCFSMWFM-01 (320-23696-3) in batch 320-141150. Due to the high concentrations of Perfluorooctanesulfonic acid (PFOS) and Perfluorononanoic acid (PFNA), the matrix spike / matrix spike duplicate (MS/MSD) could not be evaluated for accuracy and precision. The associated parent sample results have been flagged with a "J", in accordance with the DoD QSM.

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

Detection Summary

Client: Earth Toxics, Inc
 Project/Site: Ensafe-NWS - Earle, NJ PFCs Groundwater

TestAmerica Job ID: 320-23696-1

Client Sample ID: 46MW01

Lab Sample ID: 320-23696-1

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	7.1		3.8	2.9	1.2	ng/L	1		537 (Modified)	Total/NA

Client Sample ID: 46MW05

Lab Sample ID: 320-23696-2

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanesulfonic acid (PFBS)	57		2.4	1.9	0.88	ng/L	1		537 (Modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	21		2.4	1.9	0.77	ng/L	1		537 (Modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	430	J	2.4	1.9	0.84	ng/L	1		537 (Modified)	Total/NA
Perfluorononanoic acid (PFNA)	1.1	J	2.4	1.9	0.63	ng/L	1		537 (Modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	920	J	3.8	2.9	1.2	ng/L	1		537 (Modified)	Total/NA
Perfluorooctanoic acid (PFOA)	62		2.4	1.9	0.72	ng/L	1		537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	47	D	24	19	8.8	ng/L	10		537 (Modified)	Total/NA
Perfluoroheptanoic acid (PFHpA) - DL	21	J D	24	19	7.7	ng/L	10		537 (Modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	570	D	24	19	8.4	ng/L	10		537 (Modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	1000	D	38	29	12	ng/L	10		537 (Modified)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	61	D	24	19	7.2	ng/L	10		537 (Modified)	Total/NA

Client Sample ID: MCFSMWFM-01

Lab Sample ID: 320-23696-3

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanesulfonic acid (PFBS)	29		2.6	2.1	0.95	ng/L	1		537 (Modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	87		2.6	2.1	0.83	ng/L	1		537 (Modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	110	M	2.6	2.1	0.90	ng/L	1		537 (Modified)	Total/NA
Perfluorononanoic acid (PFNA)	380		2.6	2.1	0.68	ng/L	1		537 (Modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	200		4.1	3.1	1.3	ng/L	1		537 (Modified)	Total/NA
Perfluorooctanoic acid (PFOA)	85	M	2.6	2.1	0.78	ng/L	1		537 (Modified)	Total/NA

Client Sample ID: MCFSMW-4

Lab Sample ID: 320-23696-4

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanesulfonic acid (PFBS)	12	M	2.5	2.0	0.91	ng/L	1		537 (Modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	40		2.5	2.0	0.79	ng/L	1		537 (Modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	97	M	2.5	2.0	0.86	ng/L	1		537 (Modified)	Total/NA
Perfluorononanoic acid (PFNA)	15		2.5	2.0	0.64	ng/L	1		537 (Modified)	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Sacramento

Detection Summary

Client: Earth Toxics, Inc
 Project/Site: Ensafe-NWS - Earle, NJ PFCs Groundwater

TestAmerica Job ID: 320-23696-1

Client Sample ID: MCFSMW-4 (Continued)

Lab Sample ID: 320-23696-4

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	58	M	3.9	3.0	1.3	ng/L	1		537 (Modified)	Total/NA
Perfluorooctanoic acid (PFOA)	73	M	2.5	2.0	0.74	ng/L	1		537 (Modified)	Total/NA

Client Sample ID: MCFSMW-2

Lab Sample ID: 320-23696-5

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanesulfonic acid (PFBS)	23	M	2.5	2.0	0.93	ng/L	1		537 (Modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	29		2.5	2.0	0.81	ng/L	1		537 (Modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	220	M	2.5	2.0	0.88	ng/L	1		537 (Modified)	Total/NA
Perfluorononanoic acid (PFNA)	4.6	M	2.5	2.0	0.66	ng/L	1		537 (Modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	25	M	4.0	3.0	1.3	ng/L	1		537 (Modified)	Total/NA
Perfluorooctanoic acid (PFOA)	86		2.5	2.0	0.75	ng/L	1		537 (Modified)	Total/NA

Client Sample ID: MCFSMW5U-01

Lab Sample ID: 320-23696-6

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanesulfonic acid (PFBS)	160	M	2.5	2.0	0.91	ng/L	1		537 (Modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	41		2.5	2.0	0.79	ng/L	1		537 (Modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	700	J M	2.5	2.0	0.86	ng/L	1		537 (Modified)	Total/NA
Perfluorononanoic acid (PFNA)	11		2.5	2.0	0.65	ng/L	1		537 (Modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	2700	J	3.9	3.0	1.3	ng/L	1		537 (Modified)	Total/NA
Perfluorooctanoic acid (PFOA)	84	M	2.5	2.0	0.74	ng/L	1		537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	170	J D	250	200	91	ng/L	100		537 (Modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	1000	D	250	200	86	ng/L	100		537 (Modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	3900	D	390	300	130	ng/L	100		537 (Modified)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	100	J D	250	200	74	ng/L	100		537 (Modified)	Total/NA

Client Sample ID: MCFSMW-16

Lab Sample ID: 320-23696-7

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanesulfonic acid (PFBS)	37		2.6	2.1	0.95	ng/L	1		537 (Modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	50		2.6	2.1	0.83	ng/L	1		537 (Modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	340		2.6	2.1	0.90	ng/L	1		537 (Modified)	Total/NA
Perfluorononanoic acid (PFNA)	2.8		2.6	2.1	0.68	ng/L	1		537 (Modified)	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Sacramento

Detection Summary

Client: Earth Toxics, Inc
Project/Site: Ensafe-NWS - Earle, NJ PFCs Groundwater

TestAmerica Job ID: 320-23696-1

Client Sample ID: MCFSMW-16 (Continued)

Lab Sample ID: 320-23696-7

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	280		4.2	3.1	1.3	ng/L	1		537 (Modified)	Total/NA
Perfluorooctanoic acid (PFOA)	120	M	2.6	2.1	0.78	ng/L	1		537 (Modified)	Total/NA

Client Sample ID: DUP-111616

Lab Sample ID: 320-23696-8

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	5.7	M	3.9	2.9	1.2	ng/L	1		537 (Modified)	Total/NA

Client Sample ID: FB111616

Lab Sample ID: 320-23696-9

No Detections.

Client Sample Results

Client: Earth Toxics, Inc
 Project/Site: Ensafe-NWS - Earle, NJ PFCs Groundwater

TestAmerica Job ID: 320-23696-1

Client Sample ID: 46MW01

Lab Sample ID: 320-23696-1

Date Collected: 11/16/16 11:01

Matrix: Water

Date Received: 11/18/16 09:50

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	1.9	U	2.4	1.9	0.87	ng/L		12/03/16 20:56	1
Perfluoroheptanoic acid (PFHpA)	1.9	U	2.4	1.9	0.76	ng/L		12/03/16 20:56	1
Perfluorohexanesulfonic acid (PFHxS)	1.9	U	2.4	1.9	0.83	ng/L		12/03/16 20:56	1
Perfluorononanoic acid (PFNA)	1.9	U	2.4	1.9	0.62	ng/L		12/03/16 20:56	1
Perfluorooctanesulfonic acid (PFOS)	7.1		3.8	2.9	1.2	ng/L		12/03/16 20:56	1
Perfluorooctanoic acid (PFOA)	1.9	U	2.4	1.9	0.71	ng/L		12/03/16 20:56	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFOA	78		25 - 150	11/23/16 11:47	12/03/16 20:56	1
13C4 PFOS	109		25 - 150	11/23/16 11:47	12/03/16 20:56	1
13C4-PFHpA	90		25 - 150	11/23/16 11:47	12/03/16 20:56	1
13C5 PFNA	61		25 - 150	11/23/16 11:47	12/03/16 20:56	1
18O2 PFHxS	110		25 - 150	11/23/16 11:47	12/03/16 20:56	1

Client Sample Results

Client: Earth Toxics, Inc
 Project/Site: Ensafe-NWS - Earle, NJ PFCs Groundwater

TestAmerica Job ID: 320-23696-1

Client Sample ID: 46MW05

Lab Sample ID: 320-23696-2

Date Collected: 11/16/16 12:21

Matrix: Water

Date Received: 11/18/16 09:50

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	57		2.4	1.9	0.88	ng/L		12/03/16 21:03	1
Perfluoroheptanoic acid (PFHpA)	21		2.4	1.9	0.77	ng/L		12/03/16 21:03	1
Perfluorohexanesulfonic acid (PFHxS)	430	J	2.4	1.9	0.84	ng/L		12/03/16 21:03	1
Perfluorononanoic acid (PFNA)	1.1	J	2.4	1.9	0.63	ng/L		12/03/16 21:03	1
Perfluorooctanesulfonic acid (PFOS)	920	J	3.8	2.9	1.2	ng/L		12/03/16 21:03	1
Perfluorooctanoic acid (PFOA)	62		2.4	1.9	0.72	ng/L		12/03/16 21:03	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFOA	80		25 - 150	11/23/16 11:47	12/03/16 21:03	1
13C4 PFOS	91		25 - 150	11/23/16 11:47	12/03/16 21:03	1
13C4-PFHpA	70		25 - 150	11/23/16 11:47	12/03/16 21:03	1
13C5 PFNA	56		25 - 150	11/23/16 11:47	12/03/16 21:03	1
18O2 PFHxS	95		25 - 150	11/23/16 11:47	12/03/16 21:03	1

Method: 537 (Modified) - Perfluorinated Hydrocarbons - DL

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	47	D	24	19	8.8	ng/L		12/07/16 22:25	10
Perfluoroheptanoic acid (PFHpA)	21	J D	24	19	7.7	ng/L		12/07/16 22:25	10
Perfluorohexanesulfonic acid (PFHxS)	570	D	24	19	8.4	ng/L		12/07/16 22:25	10
Perfluorononanoic acid (PFNA)	19	U	24	19	6.3	ng/L		12/07/16 22:25	10
Perfluorooctanesulfonic acid (PFOS)	1000	D	38	29	12	ng/L		12/07/16 22:25	10
Perfluorooctanoic acid (PFOA)	61	D	24	19	7.2	ng/L		12/07/16 22:25	10

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFOA	98		25 - 150	11/23/16 11:47	12/07/16 22:25	10
13C4 PFOS	117		25 - 150	11/23/16 11:47	12/07/16 22:25	10
13C4-PFHpA	95		25 - 150	11/23/16 11:47	12/07/16 22:25	10
13C5 PFNA	76		25 - 150	11/23/16 11:47	12/07/16 22:25	10
18O2 PFHxS	122		25 - 150	11/23/16 11:47	12/07/16 22:25	10

Client Sample Results

Client: Earth Toxics, Inc
 Project/Site: Ensafe-NWS - Earle, NJ PFCs Groundwater

TestAmerica Job ID: 320-23696-1

Client Sample ID: MCFSMWFM-01

Lab Sample ID: 320-23696-3

Date Collected: 11/16/16 11:11

Matrix: Water

Date Received: 11/18/16 09:50

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	29		2.6	2.1	0.95	ng/L		12/07/16 22:40	1
Perfluoroheptanoic acid (PFHpA)	87		2.6	2.1	0.83	ng/L		12/07/16 22:40	1
Perfluorohexanesulfonic acid (PFHxS)	110	M	2.6	2.1	0.90	ng/L		12/07/16 22:40	1
Perfluorononanoic acid (PFNA)	380		2.6	2.1	0.68	ng/L		12/07/16 22:40	1
Perfluorooctanesulfonic acid (PFOS)	200		4.1	3.1	1.3	ng/L		12/07/16 22:40	1
Perfluorooctanoic acid (PFOA)	85	M	2.6	2.1	0.78	ng/L		12/07/16 22:40	1
Isotope Dilution	%Recovery	Qualifier	Limits		Prepared	Analyzed	Dil Fac		
13C4 PFOA	102		25 - 150		11/23/16 11:47	12/07/16 22:40	1		
13C4 PFOS	108		25 - 150		11/23/16 11:47	12/07/16 22:40	1		
13C4-PFHpA	108		25 - 150		11/23/16 11:47	12/07/16 22:40	1		
13C5 PFNA	73		25 - 150		11/23/16 11:47	12/07/16 22:40	1		
18O2 PFHxS	104		25 - 150		11/23/16 11:47	12/07/16 22:40	1		

Client Sample Results

Client: Earth Toxics, Inc
 Project/Site: Ensafe-NWS - Earle, NJ PFCs Groundwater

TestAmerica Job ID: 320-23696-1

Client Sample ID: MCFSMW-4

Lab Sample ID: 320-23696-4

Date Collected: 11/16/16 13:31

Matrix: Water

Date Received: 11/18/16 09:50

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	12	M	2.5	2.0	0.91	ng/L		12/03/16 21:11	1
Perfluoroheptanoic acid (PFHpA)	40		2.5	2.0	0.79	ng/L		12/03/16 21:11	1
Perfluorohexanesulfonic acid (PFHxS)	97	M	2.5	2.0	0.86	ng/L		12/03/16 21:11	1
Perfluorononanoic acid (PFNA)	15		2.5	2.0	0.64	ng/L		12/03/16 21:11	1
Perfluorooctanesulfonic acid (PFOS)	58	M	3.9	3.0	1.3	ng/L		12/03/16 21:11	1
Perfluorooctanoic acid (PFOA)	73	M	2.5	2.0	0.74	ng/L		12/03/16 21:11	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFOA	99		25 - 150	11/23/16 11:47	12/03/16 21:11	1
13C4 PFOS	108		25 - 150	11/23/16 11:47	12/03/16 21:11	1
13C4-PFHpA	93		25 - 150	11/23/16 11:47	12/03/16 21:11	1
13C5 PFNA	95		25 - 150	11/23/16 11:47	12/03/16 21:11	1
18O2 PFHxS	101		25 - 150	11/23/16 11:47	12/03/16 21:11	1

Client Sample Results

Client: Earth Toxics, Inc
 Project/Site: Ensafe-NWS - Earle, NJ PFCs Groundwater

TestAmerica Job ID: 320-23696-1

Client Sample ID: MCFSMW-2

Lab Sample ID: 320-23696-5

Date Collected: 11/16/16 14:21

Matrix: Water

Date Received: 11/18/16 09:50

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	23	M	2.5	2.0	0.93	ng/L		12/03/16 21:18	1
Perfluoroheptanoic acid (PFHpA)	29		2.5	2.0	0.81	ng/L		12/03/16 21:18	1
Perfluorohexanesulfonic acid (PFHxS)	220	M	2.5	2.0	0.88	ng/L		12/03/16 21:18	1
Perfluorononanoic acid (PFNA)	4.6	M	2.5	2.0	0.66	ng/L		12/03/16 21:18	1
Perfluorooctanesulfonic acid (PFOS)	25	M	4.0	3.0	1.3	ng/L		12/03/16 21:18	1
Perfluorooctanoic acid (PFOA)	86		2.5	2.0	0.75	ng/L		12/03/16 21:18	1
Isotope Dilution	%Recovery	Qualifier	Limits		Prepared		Analyzed	Dil Fac	
13C4 PFOA	92		25 - 150		11/23/16 11:47		12/03/16 21:18	1	
13C4 PFOS	113		25 - 150		11/23/16 11:47		12/03/16 21:18	1	
13C4-PFHpA	84		25 - 150		11/23/16 11:47		12/03/16 21:18	1	
13C5 PFNA	92		25 - 150		11/23/16 11:47		12/03/16 21:18	1	
18O2 PFHxS	95		25 - 150		11/23/16 11:47		12/03/16 21:18	1	

Client Sample Results

Client: Earth Toxics, Inc
 Project/Site: Ensafe-NWS - Earle, NJ PFCs Groundwater

TestAmerica Job ID: 320-23696-1

Client Sample ID: MCFSMW5U-01

Lab Sample ID: 320-23696-6

Date Collected: 11/16/16 15:01

Matrix: Water

Date Received: 11/18/16 09:50

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	160	M	2.5	2.0	0.91	ng/L		12/03/16 22:48	1
Perfluoroheptanoic acid (PFHpA)	41		2.5	2.0	0.79	ng/L		12/03/16 22:48	1
Perfluorohexanesulfonic acid (PFHxS)	700	J M	2.5	2.0	0.86	ng/L		12/03/16 22:48	1
Perfluorononanoic acid (PFNA)	11		2.5	2.0	0.65	ng/L		12/03/16 22:48	1
Perfluorooctanesulfonic acid (PFOS)	2700	J	3.9	3.0	1.3	ng/L		12/03/16 22:48	1
Perfluorooctanoic acid (PFOA)	84	M	2.5	2.0	0.74	ng/L		12/03/16 22:48	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFOA	102		25 - 150	11/23/16 11:47	12/03/16 22:48	1
13C4 PFOS	52		25 - 150	11/23/16 11:47	12/03/16 22:48	1
13C4-PFHpA	80		25 - 150	11/23/16 11:47	12/03/16 22:48	1
13C5 PFNA	46		25 - 150	11/23/16 11:47	12/03/16 22:48	1
18O2 PFHxS	82		25 - 150	11/23/16 11:47	12/03/16 22:48	1

Method: 537 (Modified) - Perfluorinated Hydrocarbons - DL

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	170	J D	250	200	91	ng/L		12/07/16 21:55	100
Perfluoroheptanoic acid (PFHpA)	200	U	250	200	79	ng/L		12/07/16 21:55	100
Perfluorohexanesulfonic acid (PFHxS)	1000	D	250	200	86	ng/L		12/07/16 21:55	100
Perfluorononanoic acid (PFNA)	200	U	250	200	65	ng/L		12/07/16 21:55	100
Perfluorooctanesulfonic acid (PFOS)	3900	D	390	300	130	ng/L		12/07/16 21:55	100
Perfluorooctanoic acid (PFOA)	100	J D	250	200	74	ng/L		12/07/16 21:55	100

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFOA	134		25 - 150	11/23/16 11:47	12/07/16 21:55	100
13C4 PFOS	124		25 - 150	11/23/16 11:47	12/07/16 21:55	100
13C4-PFHpA	133		25 - 150	11/23/16 11:47	12/07/16 21:55	100
13C5 PFNA	117		25 - 150	11/23/16 11:47	12/07/16 21:55	100
18O2 PFHxS	139		25 - 150	11/23/16 11:47	12/07/16 21:55	100

Client Sample Results

Client: Earth Toxics, Inc
 Project/Site: Ensafe-NWS - Earle, NJ PFCs Groundwater

TestAmerica Job ID: 320-23696-1

Client Sample ID: MCFSMW-16

Lab Sample ID: 320-23696-7

Date Collected: 11/16/16 16:06

Matrix: Water

Date Received: 11/18/16 09:50

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	37		2.6	2.1	0.95	ng/L		12/03/16 22:56	1
Perfluoroheptanoic acid (PFHpA)	50		2.6	2.1	0.83	ng/L		12/03/16 22:56	1
Perfluorohexanesulfonic acid (PFHxS)	340		2.6	2.1	0.90	ng/L		12/03/16 22:56	1
Perfluorononanoic acid (PFNA)	2.8		2.6	2.1	0.68	ng/L		12/03/16 22:56	1
Perfluorooctanesulfonic acid (PFOS)	280		4.2	3.1	1.3	ng/L		12/03/16 22:56	1
Perfluorooctanoic acid (PFOA)	120	M	2.6	2.1	0.78	ng/L		12/03/16 22:56	1
Isotope Dilution	%Recovery	Qualifier	Limits		Prepared	Analyzed	Dil Fac		
13C4 PFOA	70		25 - 150		11/23/16 11:47	12/03/16 22:56	1		
13C4 PFOS	101		25 - 150		11/23/16 11:47	12/03/16 22:56	1		
13C4-PFHpA	67		25 - 150		11/23/16 11:47	12/03/16 22:56	1		
13C5 PFNA	56		25 - 150		11/23/16 11:47	12/03/16 22:56	1		
18O2 PFHxS	97		25 - 150		11/23/16 11:47	12/03/16 22:56	1		

Client Sample Results

Client: Earth Toxics, Inc
 Project/Site: Ensafe-NWS - Earle, NJ PFCs Groundwater

TestAmerica Job ID: 320-23696-1

Client Sample ID: DUP-111616

Lab Sample ID: 320-23696-8

Date Collected: 11/16/16 11:01

Matrix: Water

Date Received: 11/18/16 09:50

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	1.9	U	2.4	1.9	0.89	ng/L		12/03/16 21:26	1
Perfluoroheptanoic acid (PFHpA)	1.9	U	2.4	1.9	0.78	ng/L		12/03/16 21:26	1
Perfluorohexanesulfonic acid (PFHxS)	1.9	U	2.4	1.9	0.85	ng/L		12/03/16 21:26	1
Perfluorononanoic acid (PFNA)	1.9	U	2.4	1.9	0.64	ng/L		12/03/16 21:26	1
Perfluorooctanesulfonic acid (PFOS)	5.7	M	3.9	2.9	1.2	ng/L		12/03/16 21:26	1
Perfluorooctanoic acid (PFOA)	1.9	U	2.4	1.9	0.73	ng/L		12/03/16 21:26	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFOA	77		25 - 150	11/23/16 11:47	12/03/16 21:26	1
13C4 PFOS	106		25 - 150	11/23/16 11:47	12/03/16 21:26	1
13C4-PFHpA	90		25 - 150	11/23/16 11:47	12/03/16 21:26	1
13C5 PFNA	70		25 - 150	11/23/16 11:47	12/03/16 21:26	1
18O2 PFHxS	103		25 - 150	11/23/16 11:47	12/03/16 21:26	1

Client Sample Results

Client: Earth Toxics, Inc
 Project/Site: Ensafe-NWS - Earle, NJ PFCs Groundwater

TestAmerica Job ID: 320-23696-1

Client Sample ID: FB111616

Lab Sample ID: 320-23696-9

Date Collected: 11/16/16 13:45

Matrix: Water

Date Received: 11/18/16 09:50

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	1.9	U	2.4	1.9	0.89	ng/L		12/03/16 21:33	1
Perfluoroheptanoic acid (PFHpA)	1.9	U	2.4	1.9	0.78	ng/L		12/03/16 21:33	1
Perfluorohexanesulfonic acid (PFHxS)	1.9	U	2.4	1.9	0.85	ng/L		12/03/16 21:33	1
Perfluorononanoic acid (PFNA)	1.9	U	2.4	1.9	0.64	ng/L		12/03/16 21:33	1
Perfluorooctanesulfonic acid (PFOS)	2.9	U	3.9	2.9	1.2	ng/L		12/03/16 21:33	1
Perfluorooctanoic acid (PFOA)	1.9	U	2.4	1.9	0.73	ng/L		12/03/16 21:33	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFOA	105		25 - 150	11/23/16 11:47	12/03/16 21:33	1
13C4 PFOS	96		25 - 150	11/23/16 11:47	12/03/16 21:33	1
13C4-PFHpA	106		25 - 150	11/23/16 11:47	12/03/16 21:33	1
13C5 PFNA	105		25 - 150	11/23/16 11:47	12/03/16 21:33	1
18O2 PFHxS	95		25 - 150	11/23/16 11:47	12/03/16 21:33	1

Default Detection Limits

Client: Earth Toxics, Inc
Project/Site: Ensafe-NWS - Earle, NJ PFCs Groundwater

TestAmerica Job ID: 320-23696-1

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Prep: 3535

Analyte	LOQ	DL	Units	Method
Perfluorobutanesulfonic acid (PFBS)	2.5	0.92	ng/L	537 (Modified)
Perfluoroheptanoic acid (PFHpA)	2.5	0.80	ng/L	537 (Modified)
Perfluorohexanesulfonic acid (PFHxS)	2.5	0.87	ng/L	537 (Modified)
Perfluorononanoic acid (PFNA)	2.5	0.65	ng/L	537 (Modified)
Perfluorooctanesulfonic acid (PFOS)	4.0	1.3	ng/L	537 (Modified)
Perfluorooctanoic acid (PFOA)	2.5	0.75	ng/L	537 (Modified)

Isotope Dilution Summary

Client: Earth Toxics, Inc
 Project/Site: Ensafe-NWS - Earle, NJ PFCs Groundwater

TestAmerica Job ID: 320-23696-1

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Isotope Dilution Recovery (Acceptance Limits)				
		³ C4 PFO/ (25-150)	³ C4 PFO/ (25-150)	³ C4-PFHp (25-150)	³ C5 PFN/ (25-150)	¹⁸ O2 PFHx (25-150)
320-23696-1	46MW01	78	109	90	61	110
320-23696-2	46MW05	80	91	70	56	95
320-23696-2 - DL	46MW05	98	117	95	76	122
320-23696-3	MCFSMWFM-01	102	108	108	73	104
320-23696-3 MS	MCFSMWFM-01	94	99	96	72	96
320-23696-3 MS - DL	MCFSMWFM-01	122	118	138	97	129
320-23696-3 MSD	MCFSMWFM-01	98	105	99	79	99
320-23696-3 MSD - DL	MCFSMWFM-01	142	131	146	116	138
320-23696-4	MCFSMW-4	99	108	93	95	101
320-23696-5	MCFSMW-2	92	113	84	92	95
320-23696-6	MCFSMW5U-01	102	52	80	46	82
320-23696-6 - DL	MCFSMW5U-01	134	124	133	117	139
320-23696-7	MCFSMW-16	70	101	67	56	97
320-23696-8	DUP-111616	77	106	90	70	103
320-23696-9	FB111616	105	96	106	105	95
LCS 320-139316/2-A	Lab Control Sample	120	111	120	119	115
MB 320-139316/1-A	Method Blank	112	105	113	113	107

Surrogate Legend

- 13C4 PFOA = 13C4 PFOA
- 13C4 PFOS = 13C4 PFOS
- 13C4-PFHpA = 13C4-PFHpA
- 13C5 PFNA = 13C5 PFNA
- 18O2 PFHxS = 18O2 PFHxS

QC Sample Results

Client: Earth Toxics, Inc
 Project/Site: Ensafe-NWS - Earle, NJ PFCs Groundwater

TestAmerica Job ID: 320-23696-1

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Lab Sample ID: MB 320-139316/1-A
Matrix: Water
Analysis Batch: 140675

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 139316

Analyte	MB	MB	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
	Result	Qualifier							
Perfluorobutanesulfonic acid (PFBS)	2.0	U	2.5	2.0	0.92	ng/L		12/03/16 19:33	1
Perfluoroheptanoic acid (PFHpA)	2.0	U	2.5	2.0	0.80	ng/L		12/03/16 19:33	1
Perfluorohexanesulfonic acid (PFHxS)	2.0	U	2.5	2.0	0.87	ng/L		12/03/16 19:33	1
Perfluorononanoic acid (PFNA)	2.0	U	2.5	2.0	0.65	ng/L		12/03/16 19:33	1
Perfluorooctanesulfonic acid (PFOS)	3.0	U	4.0	3.0	1.3	ng/L		12/03/16 19:33	1
Perfluorooctanoic acid (PFOA)	2.0	U	2.5	2.0	0.75	ng/L		12/03/16 19:33	1

Isotope Dilution	MB	MB	Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
13C4 PFOA	112		25 - 150	11/23/16 11:47	12/03/16 19:33	1
13C4 PFOS	105		25 - 150	11/23/16 11:47	12/03/16 19:33	1
13C4-PFHpA	113		25 - 150	11/23/16 11:47	12/03/16 19:33	1
13C5 PFNA	113		25 - 150	11/23/16 11:47	12/03/16 19:33	1
18O2 PFHxS	107		25 - 150	11/23/16 11:47	12/03/16 19:33	1

Lab Sample ID: LCS 320-139316/2-A
Matrix: Water
Analysis Batch: 140675

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 139316

Analyte	Spike Added	LCS	LCS	Unit	D	%Rec	Limits
		Result	Qualifier				
Perfluorobutanesulfonic acid (PFBS)	35.4	38.7		ng/L		109	50 - 150
Perfluoroheptanoic acid (PFHpA)	40.0	40.1		ng/L		100	60 - 140
Perfluorohexanesulfonic acid (PFHxS)	36.4	34.7		ng/L		95	60 - 140
Perfluorononanoic acid (PFNA)	40.0	39.8		ng/L		100	60 - 140
Perfluorooctanesulfonic acid (PFOS)	37.1	36.5		ng/L		98	60 - 140
Perfluorooctanoic acid (PFOA)	40.0	38.8		ng/L		97	60 - 140

Isotope Dilution	LCS	LCS	Limits
	%Recovery	Qualifier	
13C4 PFOA	120		25 - 150
13C4 PFOS	111		25 - 150
13C4-PFHpA	120		25 - 150
13C5 PFNA	119		25 - 150
18O2 PFHxS	115		25 - 150

Lab Sample ID: 320-23696-3 MS
Matrix: Water
Analysis Batch: 141150

Client Sample ID: MCFSMWFM-01
Prep Type: Total/NA
Prep Batch: 139316

Analyte	Sample Result	Sample Qualifier	Spike Added	MS	MS	Unit	D	%Rec	Limits
				Result	Qualifier				
Perfluorobutanesulfonic acid (PFBS)	29		36.7	58.8		ng/L		81	50 - 150
Perfluoroheptanoic acid (PFHpA)	87		41.5	131		ng/L		108	60 - 140
Perfluorohexanesulfonic acid (PFHxS)	110	M	37.8	147	M	ng/L		88	60 - 140
Perfluorononanoic acid (PFNA)	380		41.5	425	J 4	ng/L		104	60 - 140
Perfluorooctanesulfonic acid (PFOS)	200		38.5	236	4	ng/L		91	60 - 140
Perfluorooctanoic acid (PFOA)	85	M	41.5	126	M	ng/L		99	60 - 140

TestAmerica Sacramento

QC Sample Results

Client: Earth Toxics, Inc
 Project/Site: Ensafe-NWS - Earle, NJ PFCs Groundwater

TestAmerica Job ID: 320-23696-1

	<i>MS MS</i>	
<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>
13C4 PFOA	94	25 - 150
13C4 PFOS	99	25 - 150
13C4-PFHpA	96	25 - 150
13C5 PFNA	72	25 - 150
18O2 PFHxS	96	25 - 150

Lab Sample ID: 320-23696-3 MSD
Matrix: Water
Analysis Batch: 141150

Client Sample ID: MCFSMWFM-01
Prep Type: Total/NA
Prep Batch: 139316

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD		Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
				Result	Qualifier						
Perfluorobutanesulfonic acid (PFBS)	29		36.5	56.8		ng/L		76	50 - 150	3	30
Perfluoroheptanoic acid (PFHpA)	87		41.2	127		ng/L		98	60 - 140	4	30
Perfluorohexanesulfonic acid (PFHxS)	110	M	37.5	146	M	ng/L		86	60 - 140	1	30
Perfluorononanoic acid (PFNA)	380		41.2	420	J 4	ng/L		93	60 - 140	1	30
Perfluorooctanesulfonic acid (PFOS)	200		38.3	232	4	ng/L		80	60 - 140	2	30
Perfluorooctanoic acid (PFOA)	85	M	41.2	123	M	ng/L		91	60 - 140	3	30

	<i>MSD MSD</i>	
<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>
13C4 PFOA	98	25 - 150
13C4 PFOS	105	25 - 150
13C4-PFHpA	99	25 - 150
13C5 PFNA	79	25 - 150
18O2 PFHxS	99	25 - 150

Method: 537 (Modified) - Perfluorinated Hydrocarbons - DL

Lab Sample ID: 320-23696-3 MS
Matrix: Water
Analysis Batch: 141150

Client Sample ID: MCFSMWFM-01
Prep Type: Total/NA
Prep Batch: 139316

Analyte	Sample Result	Sample Qualifier	Spike Added	MS		Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
				Result	Qualifier						
Perfluorobutanesulfonic acid (PFBS) - DL	38	D	36.7	79.6	D	ng/L		114	50 - 150		
Perfluoroheptanoic acid (PFHpA) - DL	86	D	41.5	130	D	ng/L		107	60 - 140		
Perfluorohexanesulfonic acid (PFHxS) - DL	110	D	37.8	154	D	ng/L		104	60 - 140		
Perfluorononanoic acid (PFNA) - DL	410	D J	41.5	464	D 4	ng/L		142	60 - 140		
Perfluorooctanesulfonic acid (PFOS) - DL	190	D	38.5	225	D 4	ng/L		82	60 - 140		
Perfluorooctanoic acid (PFOA) - DL	89	D	41.5	136	D	ng/L		111	60 - 140		

	<i>MS MS</i>	
<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>
13C4 PFOA - DL	122	25 - 150
13C4 PFOS - DL	118	25 - 150
13C4-PFHpA - DL	138	25 - 150
13C5 PFNA - DL	97	25 - 150
18O2 PFHxS - DL	129	25 - 150

QC Sample Results

Client: Earth Toxics, Inc
 Project/Site: Ensafe-NWS - Earle, NJ PFCs Groundwater

TestAmerica Job ID: 320-23696-1

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

Lab Sample ID: 320-23696-3 MSD

Matrix: Water

Analysis Batch: 141150

Client Sample ID: MCFSMWFM-01

Prep Type: Total/NA

Prep Batch: 139316

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec.	Limits	RPD	Limit
	Result	Qualifier	Added	Result	Qualifier						RPD	
Perfluorobutanesulfonic acid (PFBS) - DL	38	D	36.5	77.9	D	ng/L		111		50 - 150	2	30
Perfluoroheptanoic acid (PFHpA) - DL	86	D	41.2	133	D	ng/L		115		60 - 140	2	30
Perfluorohexanesulfonic acid (PFHxS) - DL	110	D	37.5	151	D	ng/L		97		60 - 140	2	30
Perfluorononanoic acid (PFNA) - DL	410	D J	41.2	473	D 4	ng/L		164		60 - 140	2	30
Perfluorooctanesulfonic acid (PFOS) - DL	190	D	38.3	219	D 4	ng/L		67		60 - 140	3	30
Perfluorooctanoic acid (PFOA) - DL	89	D	41.2	129	D	ng/L		95		60 - 140	5	30
MSD MSD												
Isotope Dilution	%Recovery	Qualifier	Limits									
13C4 PFOA - DL	142		25 - 150									
13C4 PFOS - DL	131		25 - 150									
13C4-PFHpA - DL	146		25 - 150									
13C5 PFNA - DL	116		25 - 150									
18O2 PFHxS - DL	138		25 - 150									

QC Association Summary

Client: Earth Toxics, Inc
 Project/Site: Ensafe-NWS - Earle, NJ PFCs Groundwater

TestAmerica Job ID: 320-23696-1

LCMS

Prep Batch: 139316

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-23696-1	46MW01	Total/NA	Water	3535	
320-23696-2 - DL	46MW05	Total/NA	Water	3535	
320-23696-2	46MW05	Total/NA	Water	3535	
320-23696-3	MCFSMWFM-01	Total/NA	Water	3535	
320-23696-4	MCFSMW-4	Total/NA	Water	3535	
320-23696-5	MCFSMW-2	Total/NA	Water	3535	
320-23696-6	MCFSMW5U-01	Total/NA	Water	3535	
320-23696-6 - DL	MCFSMW5U-01	Total/NA	Water	3535	
320-23696-7	MCFSMW-16	Total/NA	Water	3535	
320-23696-8	DUP-111616	Total/NA	Water	3535	
320-23696-9	FB111616	Total/NA	Water	3535	
MB 320-139316/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-139316/2-A	Lab Control Sample	Total/NA	Water	3535	
320-23696-3 MS - DL	MCFSMWFM-01	Total/NA	Water	3535	
320-23696-3 MS	MCFSMWFM-01	Total/NA	Water	3535	
320-23696-3 MSD - DL	MCFSMWFM-01	Total/NA	Water	3535	
320-23696-3 MSD	MCFSMWFM-01	Total/NA	Water	3535	

Analysis Batch: 140675

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-23696-1	46MW01	Total/NA	Water	537 (Modified)	139316
320-23696-2	46MW05	Total/NA	Water	537 (Modified)	139316
320-23696-4	MCFSMW-4	Total/NA	Water	537 (Modified)	139316
320-23696-5	MCFSMW-2	Total/NA	Water	537 (Modified)	139316
320-23696-6	MCFSMW5U-01	Total/NA	Water	537 (Modified)	139316
320-23696-7	MCFSMW-16	Total/NA	Water	537 (Modified)	139316
320-23696-8	DUP-111616	Total/NA	Water	537 (Modified)	139316
320-23696-9	FB111616	Total/NA	Water	537 (Modified)	139316
MB 320-139316/1-A	Method Blank	Total/NA	Water	537 (Modified)	139316
LCS 320-139316/2-A	Lab Control Sample	Total/NA	Water	537 (Modified)	139316

Analysis Batch: 141150

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-23696-2 - DL	46MW05	Total/NA	Water	537 (Modified)	139316
320-23696-3	MCFSMWFM-01	Total/NA	Water	537 (Modified)	139316
320-23696-6 - DL	MCFSMW5U-01	Total/NA	Water	537 (Modified)	139316
320-23696-3 MS - DL	MCFSMWFM-01	Total/NA	Water	537 (Modified)	139316
320-23696-3 MS	MCFSMWFM-01	Total/NA	Water	537 (Modified)	139316
320-23696-3 MSD - DL	MCFSMWFM-01	Total/NA	Water	537 (Modified)	139316
320-23696-3 MSD	MCFSMWFM-01	Total/NA	Water	537 (Modified)	139316

Lab Chronicle

Client: Earth Toxics, Inc
Project/Site: Ensafe-NWS - Earle, NJ PFCs Groundwater

TestAmerica Job ID: 320-23696-1

Client Sample ID: 46MW01

Date Collected: 11/16/16 11:01

Date Received: 11/18/16 09:50

Lab Sample ID: 320-23696-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			524.6 mL	1.0 mL	139316	11/23/16 11:47	NS1	TAL SAC
Total/NA	Analysis	537 (Modified)		1			140675	12/03/16 20:56	SBC	TAL SAC
Instrument ID: A8_N										

Client Sample ID: 46MW05

Date Collected: 11/16/16 12:21

Date Received: 11/18/16 09:50

Lab Sample ID: 320-23696-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			520.2 mL	1.0 mL	139316	11/23/16 11:47	NS1	TAL SAC
Total/NA	Analysis	537 (Modified)		1			140675	12/03/16 21:03	SBC	TAL SAC
Instrument ID: A8_N										
Total/NA	Prep	3535	DL		520.2 mL	1.0 mL	139316	11/23/16 11:47	NS1	TAL SAC
Total/NA	Analysis	537 (Modified)	DL	10			141150	12/07/16 22:25	SBC	TAL SAC
Instrument ID: A8_N										

Client Sample ID: MCFSMWFM-01

Date Collected: 11/16/16 11:11

Date Received: 11/18/16 09:50

Lab Sample ID: 320-23696-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			482.4 mL	1.0 mL	139316	11/23/16 11:47	NS1	TAL SAC
Total/NA	Analysis	537 (Modified)		1			141150	12/07/16 22:40	SBC	TAL SAC
Instrument ID: A8_N										

Client Sample ID: MCFSMW-4

Date Collected: 11/16/16 13:31

Date Received: 11/18/16 09:50

Lab Sample ID: 320-23696-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			507 mL	1.0 mL	139316	11/23/16 11:47	NS1	TAL SAC
Total/NA	Analysis	537 (Modified)		1			140675	12/03/16 21:11	SBC	TAL SAC
Instrument ID: A8_N										

Client Sample ID: MCFSMW-2

Date Collected: 11/16/16 14:21

Date Received: 11/18/16 09:50

Lab Sample ID: 320-23696-5

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			496.1 mL	1.0 mL	139316	11/23/16 11:47	NS1	TAL SAC
Total/NA	Analysis	537 (Modified)		1			140675	12/03/16 21:18	SBC	TAL SAC
Instrument ID: A8_N										

TestAmerica Sacramento

Lab Chronicle

Client: Earth Toxics, Inc
 Project/Site: Ensafe-NWS - Earle, NJ PFCs Groundwater

TestAmerica Job ID: 320-23696-1

Client Sample ID: MCFSMW5U-01

Lab Sample ID: 320-23696-6

Date Collected: 11/16/16 15:01

Matrix: Water

Date Received: 11/18/16 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			506.9 mL	1.0 mL	139316	11/23/16 11:47	NS1	TAL SAC
Total/NA	Analysis	537 (Modified)		1			140675	12/03/16 22:48	SBC	TAL SAC
Instrument ID: A8_N										
Total/NA	Prep	3535	DL		506.9 mL	1.0 mL	139316	11/23/16 11:47	NS1	TAL SAC
Total/NA	Analysis	537 (Modified)	DL	100			141150	12/07/16 21:55	SBC	TAL SAC
Instrument ID: A8_N										

Client Sample ID: MCFSMW-16

Lab Sample ID: 320-23696-7

Date Collected: 11/16/16 16:06

Matrix: Water

Date Received: 11/18/16 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			481.1 mL	1.0 mL	139316	11/23/16 11:47	NS1	TAL SAC
Total/NA	Analysis	537 (Modified)		1			140675	12/03/16 22:56	SBC	TAL SAC
Instrument ID: A8_N										

Client Sample ID: DUP-111616

Lab Sample ID: 320-23696-8

Date Collected: 11/16/16 11:01

Matrix: Water

Date Received: 11/18/16 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			513.2 mL	1.0 mL	139316	11/23/16 11:47	NS1	TAL SAC
Total/NA	Analysis	537 (Modified)		1			140675	12/03/16 21:26	SBC	TAL SAC
Instrument ID: A8_N										

Client Sample ID: FB111616

Lab Sample ID: 320-23696-9

Date Collected: 11/16/16 13:45

Matrix: Water

Date Received: 11/18/16 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			514.5 mL	1.0 mL	139316	11/23/16 11:47	NS1	TAL SAC
Total/NA	Analysis	537 (Modified)		1			140675	12/03/16 21:33	SBC	TAL SAC
Instrument ID: A8_N										

Laboratory References:

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

Certification Summary

Client: Earth Toxics, Inc
Project/Site: Ensafe-NWS - Earle, NJ PFCs Groundwater

TestAmerica Job ID: 320-23696-1

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
New Jersey	NELAP	2	CA005	06-30-17

Laboratory: TestAmerica Denver

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
A2LA	DoD ELAP		2907.01	10-31-17
New Jersey	NELAP	2	CO004	06-30-17

Method Summary

Client: Earth Toxics, Inc
Project/Site: Ensafe-NWS - Earle, NJ PFCs Groundwater

TestAmerica Job ID: 320-23696-1

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: Earth Toxics, Inc
Project/Site: Ensafe-NWS - Earle, NJ PFCs Groundwater

TestAmerica Job ID: 320-23696-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-23696-1	46MW01	Water	11/16/16 11:01	11/18/16 09:50
320-23696-2	46MW05	Water	11/16/16 12:21	11/18/16 09:50
320-23696-3	MCFSMWFM-01	Water	11/16/16 11:11	11/18/16 09:50
320-23696-4	MCFSMW-4	Water	11/16/16 13:31	11/18/16 09:50
320-23696-5	MCFSMW-2	Water	11/16/16 14:21	11/18/16 09:50
320-23696-6	MCFSMW5U-01	Water	11/16/16 15:01	11/18/16 09:50
320-23696-7	MCFSMW-16	Water	11/16/16 16:06	11/18/16 09:50
320-23696-8	DUP-111616	Water	11/16/16 11:01	11/18/16 09:50
320-23696-9	FB111616	Water	11/16/16 13:45	11/18/16 09:50

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23696-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 140564

Lab Sample ID: IC 320-140564/4 Client Sample ID: _____

Date Analyzed: 12/03/16 13:48 Lab File ID: 03DEC2016A_004.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorononanoic acid (PFNA)	3.28	Incomplete Integration	chandrase nas	12/05/16 09:42
Perfluoroundecanoic acid (PFUnA)	3.97	Incomplete Integration	chandrase nas	12/05/16 09:42

Lab Sample ID: IC 320-140564/7 Client Sample ID: _____

Date Analyzed: 12/03/16 14:11 Lab File ID: 03DEC2016A_007.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	2.53	Baseline	chandrase nas	12/05/16 09:41
Perfluorooctanoic acid (PFOA)	2.89	Baseline	chandrase nas	12/05/16 09:41

Lab Sample ID: IC 320-140564/9 Client Sample ID: _____

Date Analyzed: 12/03/16 14:26 Lab File ID: 03DEC2016A_009.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorotridecanoic Acid (PFTriA)	4.50	Incomplete Integration	chandrase nas	12/05/16 09:44

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23696-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 140675

Lab Sample ID: CCV 320-140675/2 Client Sample ID: _____

Date Analyzed: 12/03/16 18:48 Lab File ID: 03DEC2016C_002.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	2.50	Baseline	chandrase nas	12/06/16 15:46

Lab Sample ID: CCV 320-140675/16 Client Sample ID: _____

Date Analyzed: 12/03/16 20:33 Lab File ID: 03DEC2016C_016.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	2.49	Baseline	chandrase nas	12/06/16 15:54
Perfluorooctanoic acid (PFOA)	2.83	Baseline	chandrase nas	12/06/16 15:54

Lab Sample ID: 320-23696-4 Client Sample ID: MCFSMW-4

Date Analyzed: 12/03/16 21:11 Lab File ID: 03DEC2016C_021.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	1.86	Baseline	chandrase nas	12/06/16 16:03
Perfluorohexanesulfonic acid (PFHxS)	2.47	Baseline	chandrase nas	12/06/16 16:03
Perfluorooctanoic acid (PFOA)	2.83	Baseline	chandrase nas	12/06/16 16:03
Perfluorooctanesulfonic acid (PFOS)	3.20	Baseline	chandrase nas	12/06/16 16:03

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23696-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 140675

Lab Sample ID: 320-23696-5 Client Sample ID: MCFSMW-2

Date Analyzed: 12/03/16 21:18 Lab File ID: 03DEC2016C_022.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	1.86	Baseline	chandrase nas	12/06/16 16:18
Perfluorohexanesulfonic acid (PFHxS)	2.48	Baseline	chandrase nas	12/06/16 16:18
Perfluorooctanesulfonic acid (PFOS)	3.08	Baseline	chandrase nas	12/06/16 16:18
Perfluorononanoic acid (PFNA)	3.20	Baseline	chandrase nas	12/06/16 16:18

Lab Sample ID: 320-23696-8 Client Sample ID: DUP-111616

Date Analyzed: 12/03/16 21:26 Lab File ID: 03DEC2016C_023.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	3.21	Baseline	chandrase nas	12/06/16 16:19

Lab Sample ID: CCV 320-140675/30 Client Sample ID: _____

Date Analyzed: 12/03/16 22:18 Lab File ID: 03DEC2016C_030.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	3.20	Baseline	chandrase nas	12/06/16 16:22

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23696-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 140675

Lab Sample ID: 320-23696-6 Client Sample ID: MCFSMW5U-01

Date Analyzed: 12/03/16 22:48 Lab File ID: 03DEC2016C_034.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	1.87	Incomplete Integration	chandrase nas	12/06/16 16:24
Perfluorohexanesulfonic acid (PFHxS)	2.48	Baseline	chandrase nas	12/06/16 16:24
Perfluorooctanoic acid (PFOA)	2.83	Baseline	chandrase nas	12/06/16 16:24

Lab Sample ID: 320-23696-7 Client Sample ID: MCFSMW-16

Date Analyzed: 12/03/16 22:56 Lab File ID: 03DEC2016C_035.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.83	Baseline	chandrase nas	12/06/16 16:25

Lab Sample ID: CCV 320-140675/37 Client Sample ID: _____

Date Analyzed: 12/03/16 23:11 Lab File ID: 03DEC2016C_037.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	2.48	Baseline	chandrase nas	12/06/16 16:26
Perfluorooctanesulfonic acid (PFOS)	3.19	Baseline	chandrase nas	12/06/16 16:26

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23696-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 141150

Lab Sample ID: 320-23696-3 Client Sample ID: MCFSMWFM-01

Date Analyzed: 12/07/16 22:40 Lab File ID: 07DEC2016C_011.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	2.46	Baseline	chandrase nas	12/08/16 09:14
Perfluorooctanoic acid (PFOA)	2.80	Baseline	chandrase nas	12/08/16 09:14

Lab Sample ID: 320-23696-3 MS Client Sample ID: MCFSMWFM-01 MS

Date Analyzed: 12/07/16 22:48 Lab File ID: 07DEC2016C_012.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	2.45	Baseline	chandrase nas	12/08/16 09:14
Perfluorooctanoic acid (PFOA)	2.80	Baseline	chandrase nas	12/08/16 09:14

Lab Sample ID: 320-23696-3 MSD Client Sample ID: MCFSMWFM-01 MSD

Date Analyzed: 12/07/16 22:55 Lab File ID: 07DEC2016C_013.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	2.45	Baseline	chandrase nas	12/08/16 09:15
Perfluorooctanoic acid (PFOA)	2.80	Baseline	chandrase nas	12/08/16 09:15

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-23696-1

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	1802 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)	1802 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_00021	12/28/16	08/03/16	MeOH/H2O, Lot 90285	5 mL	LCMPFCSU_00044	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
							1802 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_00057	25 uL
							Perfluorobutanesulfonic acid (PFBS)	0.442 ng/mL
							Perfluorodecanoic acid	0.5 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-23696-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorododecanoic acid	0.5 ng/mL
							Perfluorodecane Sulfonic acid	0.482 ng/mL
							Perfluoroheptanoic acid (PFHpA)	0.5 ng/mL
							Perfluoroheptanesulfonic Acid	0.476 ng/mL
							Perfluorohexanoic acid	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	0.5 ng/mL
							Perfluoropentanoic acid	0.5 ng/mL
							Perfluorotetradecanoic acid	0.5 ng/mL
							Perfluorotridecanoic acid	0.5 ng/mL
							Perfluoroundecanoic acid	0.5 ng/mL
.LCMPFCSU_00044	12/28/16	06/28/16	Methanol, Lot Baker 115935	50000 uL	LCM2PFHxDA_00006	1000 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00006	1000 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00006	1000 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00007	1000 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00010	1000 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00007	1000 uL	13C4 PFBA	1 ug/mL
					LCMPFDA_00010	1000 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00007	1000 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00011	1000 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00007	1000 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00007	1000 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00011	1000 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00015	1000 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00008	1000 uL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00006	01/07/21		Wellington Laboratories, Lot M2PFHxDA1112		(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00006	12/07/20		Wellington Laboratories, Lot M2PFTeDA1115		(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00006	05/22/20		Wellington Laboratories, Lot M4PFHpA0515		(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00007	05/22/20		Wellington Laboratories, Lot M5PFPeA0515		(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00010	12/22/17		Wellington Laboratories, Lot M8FOSA1215I		(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00007	05/24/21		Wellington Laboratories, Lot MPFBA0516		(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00010	08/19/20		Wellington Laboratories, Lot MPFDA0815		(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00007	04/08/21		Wellington Laboratories, Lot MPFDoA0416		(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00011	04/08/21		Wellington Laboratories, Lot MPFHxA0416		(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00007	10/23/20		Wellington Laboratories, Lot MPFHxS1015		(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00007	04/13/19		Wellington Laboratories, Lot MPFNA0414		(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00011	01/22/21		Wellington Laboratories, Lot MPFOA0116		(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00015	01/22/21		Wellington Laboratories, Lot MPFOS0116		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00008	10/31/19		Wellington Laboratories, Lot MPFUdA1014		(Purchased Reagent)		13C2 PFUnA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-23696-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LCPFCSP_00057	02/01/17	08/03/16	Methanol, Lot 090285	10000 uL	LCPFCSP_00056	1000 uL	Perfluorobutyric acid	0.1 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0884 ug/mL
							Perfluorodecanoic acid	0.1 ug/mL
							Perfluorododecanoic acid	0.1 ug/mL
							Perfluorodecane Sulfonic acid	0.0964 ug/mL
							Perfluoroheptanoic acid (PFHpA)	0.1 ug/mL
							Perfluoroheptanesulfonic Acid	0.0952 ug/mL
							Perfluorohexanoic acid	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	0.1 ug/mL
Perfluoropentanoic acid	0.1 ug/mL							
Perfluorotetradecanoic acid	0.1 ug/mL							
Perfluorotridecanoic acid	0.1 ug/mL							
Perfluoroundecanoic acid	0.1 ug/mL							
..LCPFCSP_00056	02/01/17	08/01/16	Methanol, Lot 090285	10000 uL	LCPFBA_00004	200 uL	Perfluorobutyric acid	1 ug/mL
					LCPFBS_00004	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00005	200 uL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00005	200 uL	Perfluorododecanoic acid	1 ug/mL
					LCPFDS_00005	200 uL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00005	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpS_00008	200 uL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00004	200 uL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00001	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00005	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00006	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00005	200 uL	Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS-br_00001	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00006	200 uL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00005	200 uL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00004	200 uL	Perfluorotetradecanoic acid	1 ug/mL
LCPFTrDA_00004	200 uL	Perfluorotridecanoic acid	1 ug/mL					
LCPFUdA_00004	200 uL	Perfluoroundecanoic acid	1 ug/mL					
...LCPFBA_00004	01/30/20	Wellington Laboratories, Lot PFBA0115			(Purchased Reagent)	Perfluorobutyric acid	50 ug/mL	
...LCPFBS_00004	10/09/19	Wellington Laboratories, Lot LPFBS1014			(Purchased Reagent)	Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL	

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-23696-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LCPFDA 00005	07/02/20		Wellington Laboratories, Lot PFDA0615		(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
...LCPFDoA 00005	01/30/20		Wellington Laboratories, Lot PFDoA0115		(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
...LCPFDS 00005	07/02/20		Wellington Laboratories, Lot LPFDS0615		(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
...LCPFHpA_00005	01/22/21		Wellington Laboratories, Lot PFHpA0116		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
...LCPFHpS 00008	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	50 ug/mL
...LCPFHxDA 00004	11/28/17		Wellington Laboratories, Lot PFHxDA0707		(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
...LCPFHxS-br_00001	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_00001	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	50 ug/mL
...LCPFPeA 00005	01/30/20		Wellington Laboratories, Lot PFPeA0115		(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
...LCPFTeDA 00004	12/09/20		Wellington Laboratories, Lot PFTeDA1215		(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
...LCPFTrDA 00004	12/10/18		Wellington Laboratories, Lot PFTrDA1213		(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
...LCPFUdA 00004	08/19/20		Wellington Laboratories, Lot PFUdA0815		(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC-L2_00022	12/28/16	08/03/16	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00044	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_00057	50 uL	Perfluorobutyric acid	1 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.884 ng/mL
							Perfluorodecanoic acid	1 ng/mL
							Perfluorododecanoic acid	1 ng/mL
							Perfluorodecane Sulfonic acid	0.964 ng/mL
							Perfluoroheptanoic acid (PFHpA)	1 ng/mL
							Perfluoroheptanesulfonic Acid	0.952 ng/mL
							Perfluorohexanoic acid	1 ng/mL
							Perfluorohexadecanoic acid	1 ng/mL
Perfluorohexanesulfonic acid (PFHxS)	0.91 ng/mL							
Perfluorononanoic acid (PFNA)	1 ng/mL							

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-23696-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration	
					Reagent ID	Volume Added			
							Perfluorooctanoic acid (PFOA)	1 ng/mL	
							Perfluorooctadecanoic acid	1 ng/mL	
							Perfluorooctanesulfonic acid (PFOS)	0.928 ng/mL	
							Perfluorooctane Sulfonamide	1 ng/mL	
							Perfluoropentanoic acid	1 ng/mL	
							Perfluorotetradecanoic acid	1 ng/mL	
							Perfluorotridecanoic acid	1 ng/mL	
							Perfluoroundecanoic acid	1 ng/mL	
.LCMPFCSU_00044	12/28/16	06/28/16	Methanol, Lot Baker 115935	50000 uL	LCM2PFHxDA_00006	1000 uL	13C2-PFHxDA	1 ug/mL	
					LCM2PFTeDA_00006	1000 uL	13C2-PFTeDA	1 ug/mL	
					LCM4PFHHPA_00006	1000 uL	13C4-PFHHPA	1 ug/mL	
					LCM5PFPEA_00007	1000 uL	13C5-PFPeA	1 ug/mL	
					LCM8FOSA_00010	1000 uL	13C8 FOSA	1 ug/mL	
					LCMPFBA_00007	1000 uL	13C4 PFBA	1 ug/mL	
					LCMPFDA_00010	1000 uL	13C2 PFDA	1 ug/mL	
					LCMPFDoA_00007	1000 uL	13C2 PFDoA	1 ug/mL	
					LCMPFHxA_00011	1000 uL	13C2 PFHxA	1 ug/mL	
					LCMPFHxS_00007	1000 uL	18O2 PFHxS	0.946 ug/mL	
					LCMPFNA_00007	1000 uL	13C5 PFNA	1 ug/mL	
					LCMPFOA_00011	1000 uL	13C4 PFOA	1 ug/mL	
					LCMPFOS_00015	1000 uL	13C4 PFOS	0.956 ug/mL	
					LCMPFUDa_00008	1000 uL	13C2 PFUnA	1 ug/mL	
..LCM2PFHxDA_00006	01/07/21		Wellington Laboratories, Lot M2PFHxDA1112				(Purchased Reagent)	13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00006	12/07/20		Wellington Laboratories, Lot M2PFTeDA1115				(Purchased Reagent)	13C2-PFTeDA	50 ug/mL
..LCM4PFHHPA_00006	05/22/20		Wellington Laboratories, Lot M4PFHHPA0515				(Purchased Reagent)	13C4-PFHHPA	50 ug/mL
..LCM5PFPEA_00007	05/22/20		Wellington Laboratories, Lot M5PFPeA0515				(Purchased Reagent)	13C5-PFPeA	50 ug/mL
..LCM8FOSA_00010	12/22/17		Wellington Laboratories, Lot M8FOSA1215I				(Purchased Reagent)	13C8 FOSA	50 ug/mL
..LCMPFBA_00007	05/24/21		Wellington Laboratories, Lot MPFBA0516				(Purchased Reagent)	13C4 PFBA	50 ug/mL
..LCMPFDA_00010	08/19/20		Wellington Laboratories, Lot MPFDA0815				(Purchased Reagent)	13C2 PFDA	50 ug/mL
..LCMPFDoA_00007	04/08/21		Wellington Laboratories, Lot MPFDoA0416				(Purchased Reagent)	13C2 PFDoA	50 ug/mL
..LCMPFHxA_00011	04/08/21		Wellington Laboratories, Lot MPFHxA0416				(Purchased Reagent)	13C2 PFHxA	50 ug/mL
..LCMPFHxS_00007	10/23/20		Wellington Laboratories, Lot MPFHxS1015				(Purchased Reagent)	18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00007	04/13/19		Wellington Laboratories, Lot MPFNA0414				(Purchased Reagent)	13C5 PFNA	50 ug/mL
..LCMPFOA_00011	01/22/21		Wellington Laboratories, Lot MPFOA0116				(Purchased Reagent)	13C4 PFOA	50 ug/mL
..LCMPFOS_00015	01/22/21		Wellington Laboratories, Lot MPFOS0116				(Purchased Reagent)	13C4 PFOS	47.8 ug/mL
..LCMPFUDa_00008	10/31/19		Wellington Laboratories, Lot MPFUDa1014				(Purchased Reagent)	13C2 PFUnA	50 ug/mL
.LCPFCSP_00057	02/01/17	08/03/16	Methanol, Lot 090285	10000 uL	LCPFCSP_00056	1000 uL	Perfluorobutyric acid	0.1 ug/mL	
							Perfluorobutanesulfonic acid (PFBS)	0.0884 ug/mL	
							Perfluorodecanoic acid	0.1 ug/mL	
							Perfluorododecanoic acid	0.1 ug/mL	
							Perfluorodecane Sulfonic acid	0.0964 ug/mL	
							Perfluoroheptanoic acid (PFHHPA)	0.1 ug/mL	
							Perfluoroheptanesulfonic Acid	0.0952 ug/mL	
							Perfluorohexanoic acid	0.1 ug/mL	

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-23696-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration	
					Reagent ID	Volume Added			
							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	0.1 ug/mL	
							Perfluoropentanoic acid	0.1 ug/mL	
							Perfluorotetradecanoic acid	0.1 ug/mL	
							Perfluorotridecanoic acid	0.1 ug/mL	
							Perfluoroundecanoic acid	0.1 ug/mL	
..LCPFCSP_00056	02/01/17	08/01/16	Methanol, Lot 090285	10000 uL	LCPFBA_00004	200 uL	Perfluorobutyric acid	1 ug/mL	
					LCPFBS_00004	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL	
					LCPFDA_00005	200 uL	Perfluorodecanoic acid	1 ug/mL	
					LCPFDoA_00005	200 uL	Perfluorododecanoic acid	1 ug/mL	
					LCPFDS_00005	200 uL	Perfluorodecane Sulfonic acid	0.964 ug/mL	
					LCPFHpA_00005	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL	
					LCPFHpS_00008	200 uL	Perfluoroheptanesulfonic Acid	0.952 ug/mL	
					LCPFHxA_00004	200 uL	Perfluorohexanoic acid	1 ug/mL	
					LCPFHxDA_00004	200 uL	Perfluorohexadecanoic acid	1 ug/mL	
					LCPFHxS-br_00001	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL	
					LCPFNA_00005	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL	
					LCPFOA_00006	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL	
					LCPFOA_00005	200 uL	Perfluorooctadecanoic acid	1 ug/mL	
					LCPFOS-br_00001	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL	
					LCPFOSA_00006	200 uL	Perfluorooctane Sulfonamide	1 ug/mL	
					LCPFPeA_00005	200 uL	Perfluoropentanoic acid	1 ug/mL	
					LCPFTeDA_00004	200 uL	Perfluorotetradecanoic acid	1 ug/mL	
					LCPFTrDA_00004	200 uL	Perfluorotridecanoic acid	1 ug/mL	
					LCPFUdA_00004	200 uL	Perfluoroundecanoic acid	1 ug/mL	
...LCPFBA_00004	01/30/20		Wellington Laboratories, Lot PFBA0115				(Purchased Reagent)	Perfluorobutyric acid	50 ug/mL
...LCPFBS_00004	10/09/19		Wellington Laboratories, Lot LPFBS1014				(Purchased Reagent)	Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
...LCPFDA_00005	07/02/20		Wellington Laboratories, Lot PFDA0615				(Purchased Reagent)	Perfluorodecanoic acid	50 ug/mL
...LCPFDoA_00005	01/30/20		Wellington Laboratories, Lot PFDoA0115				(Purchased Reagent)	Perfluorododecanoic acid	50 ug/mL
...LCPFDS_00005	07/02/20		Wellington Laboratories, Lot LPFDS0615				(Purchased Reagent)	Perfluorodecane Sulfonic acid	48.2 ug/mL
...LCPFHpA_00005	01/22/21		Wellington Laboratories, Lot PFHpA0116				(Purchased Reagent)	Perfluoroheptanoic acid (PFHpA)	50 ug/mL
...LCPFHpS_00008	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	50 ug/mL
...LCPFHxDA_00004	11/28/17		Wellington Laboratories, Lot PFHxDA0707				(Purchased Reagent)	Perfluorohexadecanoic acid	50 ug/mL
...LCPFHxS-br_00001	07/03/20		Wellington Laboratories, Lot brPFHxSK0615				(Purchased Reagent)	Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-23696-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...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_00001	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	50 ug/mL
...LCPFPeA 00005	01/30/20		Wellington Laboratories, Lot PFPeA0115		(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
...LCPFTeDA 00004	12/09/20		Wellington Laboratories, Lot PFTeDA1215		(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
...LCPFTrDA 00004	12/10/18		Wellington Laboratories, Lot PFTTrDA1213		(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
...LCPFUDA 00004	08/19/20		Wellington Laboratories, Lot PFUDA0815		(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC-L3_00019	12/28/16	08/03/16	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00044	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_00057	250 uL
					Perfluorobutanesulfonic acid (PFBS)	4.42 ng/mL		
					Perfluorodecanoic acid	5 ng/mL		
					Perfluorododecanoic acid	5 ng/mL		
					Perfluorodecane Sulfonic acid	4.82 ng/mL		
					Perfluoroheptanoic acid (PFHpA)	5 ng/mL		
					Perfluoroheptanesulfonic Acid	4.76 ng/mL		
					Perfluorohexanoic acid	5 ng/mL		
					Perfluorohexadecanoic acid	5 ng/mL		
					Perfluorohexanesulfonic acid (PFHxS)	4.55 ng/mL		
					Perfluorononanoic acid (PFNA)	5 ng/mL		
					Perfluorooctanoic acid (PFOA)	5 ng/mL		
					Perfluorooctadecanoic acid	5 ng/mL		
Perfluorooctanesulfonic acid (PFOS)	4.64 ng/mL							
Perfluorooctane Sulfonamide	5 ng/mL							
Perfluoropentanoic acid	5 ng/mL							
Perfluorotetradecanoic acid	5 ng/mL							
Perfluorotridecanoic acid	5 ng/mL							
Perfluoroundecanoic acid	5 ng/mL							

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-23696-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LCMPFCSU_00044	12/28/16	06/28/16	Methanol, Lot Baker 115935	50000 uL	LCM2PFHxDA_00006	1000 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00006	1000 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00006	1000 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00007	1000 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00010	1000 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00007	1000 uL	13C4 PFBA	1 ug/mL
					LCMPFDA_00010	1000 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00007	1000 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00011	1000 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00007	1000 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00007	1000 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00011	1000 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00015	1000 uL	13C4 PFOS	0.956 ug/mL
LCMPFUdA_00008	1000 uL	13C2 PFUnA	1 ug/mL					
..LCM2PFHxDA_00006	01/07/21	Wellington Laboratories, Lot M2PFHxDA1112		(Purchased Reagent)		13C2-PFHxDA	50 ug/mL	
..LCM2PFTeDA_00006	12/07/20	Wellington Laboratories, Lot M2PFTeDA1115		(Purchased Reagent)		13C2-PFTeDA	50 ug/mL	
..LCM4PFHPA_00006	05/22/20	Wellington Laboratories, Lot M4PFHxA0515		(Purchased Reagent)		13C4-PFHpA	50 ug/mL	
..LCM5PFPEA_00007	05/22/20	Wellington Laboratories, Lot M5PFPeA0515		(Purchased Reagent)		13C5-PFPeA	50 ug/mL	
..LCM8FOSA_00010	12/22/17	Wellington Laboratories, Lot M8FOSA1215I		(Purchased Reagent)		13C8 FOSA	50 ug/mL	
..LCMPFBA_00007	05/24/21	Wellington Laboratories, Lot MPFBA0516		(Purchased Reagent)		13C4 PFBA	50 ug/mL	
..LCMPFDA_00010	08/19/20	Wellington Laboratories, Lot MPFDA0815		(Purchased Reagent)		13C2 PFDA	50 ug/mL	
..LCMPFDoA_00007	04/08/21	Wellington Laboratories, Lot MPFDoA0416		(Purchased Reagent)		13C2 PFDoA	50 ug/mL	
..LCMPFHxA_00011	04/08/21	Wellington Laboratories, Lot MPFHxA0416		(Purchased Reagent)		13C2 PFHxA	50 ug/mL	
..LCMPFHxS_00007	10/23/20	Wellington Laboratories, Lot MPFHxS1015		(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL	
..LCMPFNA_00007	04/13/19	Wellington Laboratories, Lot MPFNA0414		(Purchased Reagent)		13C5 PFNA	50 ug/mL	
..LCMPFOA_00011	01/22/21	Wellington Laboratories, Lot MPFOA0116		(Purchased Reagent)		13C4 PFOA	50 ug/mL	
..LCMPFOS_00015	01/22/21	Wellington Laboratories, Lot MPFOS0116		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL	
..LCMPFUdA_00008	10/31/19	Wellington Laboratories, Lot MPFUdA1014		(Purchased Reagent)		13C2 PFUnA	50 ug/mL	
.LCPFCSP_00057	02/01/17	08/03/16	Methanol, Lot 090285	10000 uL	LCPFCSP_00056	1000 uL	Perfluorobutyric acid	0.1 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0884 ug/mL
							Perfluorodecanoic acid	0.1 ug/mL
							Perfluorododecanoic acid	0.1 ug/mL
							Perfluorodecane Sulfonic acid	0.0964 ug/mL
							Perfluoroheptanoic acid (PFHpA)	0.1 ug/mL
							Perfluoroheptanesulfonic Acid	0.0952 ug/mL
							Perfluorohexanoic acid	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	0.1 ug/mL							

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-23696-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluoropentanoic acid	0.1 ug/mL
							Perfluorotetradecanoic acid	0.1 ug/mL
							Perfluorotridecanoic acid	0.1 ug/mL
							Perfluoroundecanoic acid	0.1 ug/mL
..LCPFCSP_00056	02/01/17	08/01/16	Methanol, Lot 090285	10000 uL	LCPFBA 00004	200 uL	Perfluorobutyric acid	1 ug/mL
					LCPFBS_00004	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA 00005	200 uL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA 00005	200 uL	Perfluorododecanoic acid	1 ug/mL
					LCPFDS 00005	200 uL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00005	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpS 00008	200 uL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA 00004	200 uL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA 00004	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00001	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA 00005	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA 00006	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA 00005	200 uL	Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS-br_00001	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA 00006	200 uL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA 00005	200 uL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA 00004	200 uL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA 00004	200 uL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA 00004	200 uL	Perfluoroundecanoic acid	1 ug/mL
...LCPFBA 00004	01/30/20		Wellington Laboratories, Lot PFBA0115		(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
...LCPFBS_00004	10/09/19		Wellington Laboratories, Lot LFFBS1014		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
...LCPFDA 00005	07/02/20		Wellington Laboratories, Lot PFDA0615		(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
...LCPFDoA 00005	01/30/20		Wellington Laboratories, Lot PFDoA0115		(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
...LCPFDS 00005	07/02/20		Wellington Laboratories, Lot LFFDS0615		(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
...LCPFHpA_00005	01/22/21		Wellington Laboratories, Lot PFHpA0116		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
...LCPFHpS 00008	11/06/20		Wellington Laboratories, Lot LFFHpS1115		(Purchased Reagent)		Perfluoroheptanesulfonic Acid	47.6 ug/mL
...LCPFHxA 00004	12/22/20		Wellington Laboratories, Lot PFHxA1215		(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
...LCPFHxDA 00004	11/28/17		Wellington Laboratories, Lot PFHxDA0707		(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
...LCPFHxS-br_00001	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_00001	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	50 ug/mL
...LCPFPeA 00005	01/30/20		Wellington Laboratories, Lot PFPeA0115		(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
...LCPFTeDA 00004	12/09/20		Wellington Laboratories, Lot PFTeDA1215		(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
...LCPFTrDA 00004	12/10/18		Wellington Laboratories, Lot PFTrDA1213		(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-23696-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration		
					Reagent ID	Volume Added				
...LCPFuDA_00004	08/19/20		Wellington Laboratories, Lot PFUdA0815			(Purchased Reagent)	Perfluoroundecanoic acid	50 ug/mL		
LCPFCL-L4_00022	12/28/16	08/03/16	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00044	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		
					LCPFCSU_00056	100 uL	Perfluorobutyric acid	20 ng/mL		
							Perfluorobutanesulfonic acid (PFBS)	17.68 ng/mL		
							Perfluorodecanoic acid	20 ng/mL		
							Perfluorododecanoic acid	20 ng/mL		
							Perfluorodecane Sulfonic acid (PFHpA)	19.28 ng/mL		
							Perfluoroheptanoic acid	20 ng/mL		
							Perfluoroheptanesulfonic Acid	19.04 ng/mL		
							Perfluorohexanoic acid	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	20 ng/mL									
Perfluoropentanoic acid	20 ng/mL									
Perfluorotetradecanoic acid	20 ng/mL									
Perfluorotridecanoic acid	20 ng/mL									
Perfluoroundecanoic acid	20 ng/mL									
.LCMPFCSU_00044	12/28/16	06/28/16	Methanol, Lot Baker 115935	50000 uL	LCM2PFHxDA_00006	1000 uL	13C2-PFHxDA	1 ug/mL		
							LCM2PFTeDA_00006	1000 uL	13C2-PFTeDA	1 ug/mL
							LCM4PFHPA_00006	1000 uL	13C4-PFHpA	1 ug/mL
							LCM5PFPEA_00007	1000 uL	13C5-PFPeA	1 ug/mL
							LCM8FOSA_00010	1000 uL	13C8 FOSA	1 ug/mL
							LCMPFBA_00007	1000 uL	13C4 PFBA	1 ug/mL
							LCMPFDA_00010	1000 uL	13C2 PFDA	1 ug/mL
							LCMPFDoA_00007	1000 uL	13C2 PFDoA	1 ug/mL
							LCMPFHxA_00011	1000 uL	13C2 PFHxA	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-23696-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCMPFHxS 00007	1000 uL	1802 PFHxS	0.946 ug/mL
					LCMPFNA 00007	1000 uL	13C5 PFNA	1 ug/mL
					LCMPFOA 00011	1000 uL	13C4 PFOA	1 ug/mL
					LCMPFOS 00015	1000 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA 00008	1000 uL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA 00006	01/07/21		Wellington Laboratories, Lot M2PFHxDA1112		(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA 00006	12/07/20		Wellington Laboratories, Lot M2PFTeDA1115		(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA 00006	05/22/20		Wellington Laboratories, Lot M4PFHPA0515		(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA 00007	05/22/20		Wellington Laboratories, Lot M5PFPeA0515		(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA 00010	12/22/17		Wellington Laboratories, Lot M8FOSA1215I		(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA 00007	05/24/21		Wellington Laboratories, Lot MPFBA0516		(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA 00010	08/19/20		Wellington Laboratories, Lot MPFDA0815		(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA 00007	04/08/21		Wellington Laboratories, Lot MPFDoA0416		(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA 00011	04/08/21		Wellington Laboratories, Lot MPFHxA0416		(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS 00007	10/23/20		Wellington Laboratories, Lot MPFHxS1015		(Purchased Reagent)		1802 PFHxS	47.3 ug/mL
..LCMPFNA 00007	04/13/19		Wellington Laboratories, Lot MPFNA0414		(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA 00011	01/22/21		Wellington Laboratories, Lot MPFOA0116		(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS 00015	01/22/21		Wellington Laboratories, Lot MPFOS0116		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA 00008	10/31/19		Wellington Laboratories, Lot MPFUdA1014		(Purchased Reagent)		13C2 PFUnA	50 ug/mL
..LCPFCSP_00056	02/01/17	08/01/16	Methanol, Lot 090285	10000 uL	LCPFBA 00004	200 uL	Perfluorobutyric acid	1 ug/mL
					LCPFBS_00004	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA 00005	200 uL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA 00005	200 uL	Perfluorododecanoic acid	1 ug/mL
					LCPFDS 00005	200 uL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00005	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpS 00008	200 uL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA 00004	200 uL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA 00004	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00001	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA 00005	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA 00006	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA 00005	200 uL	Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS-br_00001	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA 00006	200 uL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA 00005	200 uL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA 00004	200 uL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA 00004	200 uL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA 00004	200 uL	Perfluoroundecanoic acid	1 ug/mL
..LCPFBA 00004	01/30/20		Wellington Laboratories, Lot PFBA0115		(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
..LCPFBS_00004	10/09/19		Wellington Laboratories, Lot LPFBS1014		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA 00005	07/02/20		Wellington Laboratories, Lot PFDA0615		(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
..LCPFDoA 00005	01/30/20		Wellington Laboratories, Lot PFDoA0115		(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
..LCPFDS 00005	07/02/20		Wellington Laboratories, Lot LPFDS0615		(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-23696-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFHpa_00005	01/22/21		Wellington Laboratories, Lot PFHpA0116		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHps 00008	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	50 ug/mL
..LCPFHxDA 00004	11/28/17		Wellington Laboratories, Lot PFHxDA0707		(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
..LCPFHxS-br_00001	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 PFOA0115		(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
..LCPFOS-br_00001	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	50 ug/mL
..LCPFPeA 00005	01/30/20		Wellington Laboratories, Lot PFPeA0115		(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFTeDA 00004	12/09/20		Wellington Laboratories, Lot PFTeDA1215		(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
..LCPFTrDA 00004	12/10/18		Wellington Laboratories, Lot PFTTrDA1213		(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
..LCPFUda_00004	08/19/20		Wellington Laboratories, Lot PFUda0815		(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC-L4_00023	02/01/17	09/30/16	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00045	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
							LCMPFCSP_00056	100 uL
Perfluoroheptanoic acid (PFHpA)	20 ng/mL							
Perfluorohexanesulfonic acid (PFHxS)	18.2 ng/mL							
Perfluorononanoic acid (PFNA)	20 ng/mL							
Perfluorooctanoic acid (PFOA)	20 ng/mL							
Perfluorooctanesulfonic acid (PFOS)	18.56 ng/mL							
.LCMPFCSU_00045	03/01/17	08/31/16	Methanol, Lot Baker 115935	50000 uL	LCM2PFHxDA_00006	1000 uL	13C2-PFHxDA	1 ug/mL
							LCM2PFTeDA_00006	1 ug/mL
							LCM4PFHPA_00006	1 ug/mL
							LCM5PFPEA_00007	1 ug/mL
							LCM8FOSA_00010	1 ug/mL
							LCMPFBA_00007	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-23696-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCMPFDA 00010	1000 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA 00007	1000 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA 00011	1000 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS 00007	1000 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA 00007	1000 uL	13C5 PFNA	1 ug/mL
					LCMPFOA 00011	1000 uL	13C4 PFOA	1 ug/mL
					LCMPFOS 00015	1000 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUDa 00008	1000 uL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA 00006	01/07/21		Wellington Laboratories, Lot M2PFHxDA1112		(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA 00006	12/07/20		Wellington Laboratories, Lot M2PFTeDA1115		(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA 00006	05/22/20		Wellington Laboratories, Lot M4PFHPa0515		(Purchased Reagent)		13C4-PFHPa	50 ug/mL
..LCM5PFPEA 00007	05/22/20		Wellington Laboratories, Lot M5PFPeA0515		(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA 00010	12/22/17		Wellington Laboratories, Lot M8FOSA1215I		(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA 00007	05/24/21		Wellington Laboratories, Lot MPFBA0516		(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA 00010	08/19/20		Wellington Laboratories, Lot MPFDA0815		(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA 00007	04/08/21		Wellington Laboratories, Lot MPFDoA0416		(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA 00011	04/08/21		Wellington Laboratories, Lot MPFHxA0416		(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS 00007	10/23/20		Wellington Laboratories, Lot MPFHxS1015		(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA 00007	04/13/19		Wellington Laboratories, Lot MPFNA0414		(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA 00011	01/22/21		Wellington Laboratories, Lot MPFOA0116		(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS 00015	01/22/21		Wellington Laboratories, Lot MPFOS0116		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUDa 00008	10/31/19		Wellington Laboratories, Lot MPFUDa1014		(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00056	02/01/17	08/01/16	Methanol, Lot 090285	10000 uL	LCPFBs_00004	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFHpa_00005	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHxS-br_00001	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA 00005	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA 00006	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFOS-br_00001	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
..LCPFBs_00004	10/09/19		Wellington Laboratories, Lot LPFBS1014		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFHpa_00005	01/22/21		Wellington Laboratories, Lot PFHpA0116		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHxS-br_00001	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
..LCPFOS-br_00001	10/14/20		Wellington Laboratories, Lot brPFOSK1015		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
LCPFC-L5_00020	12/28/16	08/03/16	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00044	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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-23696-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration		
					Reagent ID	Volume Added				
							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		
							LCPFCSU_00056	250 uL	Perfluorobutyric acid	50 ng/mL
									Perfluorobutanesulfonic acid (PFBS)	44.2 ng/mL
							Perfluorodecanoic acid	50 ng/mL		
							Perfluorododecanoic acid	50 ng/mL		
							Perfluorodecane Sulfonic acid	48.2 ng/mL		
							Perfluoroheptanoic acid (PFHpA)	50 ng/mL		
							Perfluoroheptanesulfonic Acid	47.6 ng/mL		
							Perfluoroheptanoic acid	50 ng/mL		
							Perfluoroheptadecanoic acid	50 ng/mL		
							Perfluoroheptanesulfonic acid (PFHxS)	45.5 ng/mL		
							Perfluorononanoic acid (PFNA)	50 ng/mL		
							Perfluorooctanoic acid (PFOA)	50 ng/mL		
		Perfluorooctadecanoic acid	50 ng/mL							
		Perfluorooctanesulfonic acid (PFOS)	46.4 ng/mL							
		Perfluorooctane Sulfonamide	50 ng/mL							
		Perfluoropentanoic acid	50 ng/mL							
		Perfluorotetradecanoic acid	50 ng/mL							
		Perfluorotridecanoic acid	50 ng/mL							
		Perfluoroundecanoic acid	50 ng/mL							
.LCMPFCSU_00044	12/28/16	06/28/16	Methanol, Lot Baker 115935	50000 uL	LCM2PFHxDA_00006	1000 uL	13C2-PFHxDA	1 ug/mL		
					LCM2PFTeDA_00006	1000 uL	13C2-PFTeDA	1 ug/mL		
					LCM4PFHPA_00006	1000 uL	13C4-PFHpA	1 ug/mL		
					LCM5PFPEA_00007	1000 uL	13C5-PFPeA	1 ug/mL		
					LCM8FOSA_00010	1000 uL	13C8 FOSA	1 ug/mL		
					LCMPFBA_00007	1000 uL	13C4 PFBA	1 ug/mL		
					LCMPFDA_00010	1000 uL	13C2 PFDA	1 ug/mL		
					LCMPFDoA_00007	1000 uL	13C2 PFDoA	1 ug/mL		
					LCMPFHxA_00011	1000 uL	13C2 PFHxA	1 ug/mL		
					LCMPFHxS_00007	1000 uL	18O2 PFHxS	0.946 ug/mL		
					LCMPFNA_00007	1000 uL	13C5 PFNA	1 ug/mL		
					LCMPFOA_00011	1000 uL	13C4 PFOA	1 ug/mL		
					LCMPFOS_00015	1000 uL	13C4 PFOS	0.956 ug/mL		
					LCMPFUdA_00008	1000 uL	13C2 PFUnA	1 ug/mL		
..LCM2PFHxDA_00006	01/07/21	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL		
..LCM2PFTeDA_00006	12/07/20	Wellington Laboratories, Lot M2PFTeDA1115			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL		

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-23696-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCM4PFHPA 00006	05/22/20		Wellington Laboratories, Lot M4PFHPA0515			(Purchased Reagent)	13C4-PFHPa	50 ug/mL
..LCM5PFPEA 00007	05/22/20		Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)	13C5-PFPeA	50 ug/mL
..LCM8FOSA 00010	12/22/17		Wellington Laboratories, Lot M8FOSA1215I			(Purchased Reagent)	13C8 FOSA	50 ug/mL
..LCMPFBA 00007	05/24/21		Wellington Laboratories, Lot MPFBA0516			(Purchased Reagent)	13C4 PFBA	50 ug/mL
..LCMPFDA 00010	08/19/20		Wellington Laboratories, Lot MPFDA0815			(Purchased Reagent)	13C2 PFDA	50 ug/mL
..LCMPFDoA 00007	04/08/21		Wellington Laboratories, Lot MPFDoA0416			(Purchased Reagent)	13C2 PFDoA	50 ug/mL
..LCMPFHxA 00011	04/08/21		Wellington Laboratories, Lot MPFHxA0416			(Purchased Reagent)	13C2 PFHxA	50 ug/mL
..LCMPFHxS 00007	10/23/20		Wellington Laboratories, Lot MPFHxS1015			(Purchased Reagent)	1802 PFHxS	47.3 ug/mL
..LCMPFNA 00007	04/13/19		Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)	13C5 PFNA	50 ug/mL
..LCMPFOA 00011	01/22/21		Wellington Laboratories, Lot MPFOA0116			(Purchased Reagent)	13C4 PFOA	50 ug/mL
..LCMPFOS 00015	01/22/21		Wellington Laboratories, Lot MPFOS0116			(Purchased Reagent)	13C4 PFOS	47.8 ug/mL
..LCMPFUDa 00008	10/31/19		Wellington Laboratories, Lot MPFUDa1014			(Purchased Reagent)	13C2 PFUnA	50 ug/mL
..LCPFCSP_00056	02/01/17	08/01/16	Methanol, Lot 090285	10000 uL	LCPFBA_00004	200 uL	Perfluorobutyric acid	1 ug/mL
					LCPFBS_00004	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA 00005	200 uL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA 00005	200 uL	Perfluorododecanoic acid	1 ug/mL
					LCPFDS 00005	200 uL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpa_00005	200 uL	Perfluoroheptanoic acid (PFHPa)	1 ug/mL
					LCPFHps 00008	200 uL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA 00004	200 uL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA 00004	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00001	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA 00005	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA 00006	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFOdA 00005	200 uL	Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS-br_00001	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA 00006	200 uL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA 00005	200 uL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA 00004	200 uL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTTrDA 00004	200 uL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA 00004	200 uL	Perfluoroundecanoic acid	1 ug/mL
..LCPFBA 00004	01/30/20		Wellington Laboratories, Lot PFBA0115			(Purchased Reagent)	Perfluorobutyric acid	50 ug/mL
..LCPFBS_00004	10/09/19		Wellington Laboratories, Lot LPFBS1014			(Purchased Reagent)	Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDoA 00005	07/02/20		Wellington Laboratories, Lot PFDA0615			(Purchased Reagent)	Perfluorodecanoic acid	50 ug/mL
..LCPFDoA 00005	01/30/20		Wellington Laboratories, Lot PFDa0115			(Purchased Reagent)	Perfluorododecanoic acid	50 ug/mL
..LCPFDS 00005	07/02/20		Wellington Laboratories, Lot LPFDS0615			(Purchased Reagent)	Perfluorodecane Sulfonic acid	48.2 ug/mL
..LCPFHpa_00005	01/22/21		Wellington Laboratories, Lot PFHPa0116			(Purchased Reagent)	Perfluoroheptanoic acid (PFHPa)	50 ug/mL
..LCPFHps 00008	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	50 ug/mL
..LCPFHxDA 00004	11/28/17		Wellington Laboratories, Lot PFHxDA0707			(Purchased Reagent)	Perfluorohexadecanoic acid	50 ug/mL
..LCPFHxS-br_00001	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.: 320-23696-1

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_00001	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	50 ug/mL
..LCPFPeA 00005	01/30/20		Wellington Laboratories, Lot PFPeA0115		(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFTeDA 00004	12/09/20		Wellington Laboratories, Lot PFTeDA1215		(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
..LCPFTrDA 00004	12/10/18		Wellington Laboratories, Lot PFTrDA1213		(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
..LCPFUdA 00004	08/19/20		Wellington Laboratories, Lot PFUdA0815		(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC-L6_00019	12/28/16	08/03/16	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00044	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_00056	1000 uL	Perfluorobutyric acid	200 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	176.8 ng/mL
							Perfluorodecanoic acid	200 ng/mL
							Perfluorododecanoic acid	200 ng/mL
							Perfluorodecane Sulfonic acid (PFHpA)	192.8 ng/mL
							Perfluoroheptanoic acid	200 ng/mL
							Perfluoroheptanesulfonic Acid	190.4 ng/mL
							Perfluorohexanoic acid	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	200 ng/mL							
Perfluoropentanoic acid	200 ng/mL							
Perfluorotetradecanoic acid	200 ng/mL							
Perfluorotridecanoic acid	200 ng/mL							
Perfluoroundecanoic acid	200 ng/mL							
..LCMPFCSU_00044	12/28/16	06/28/16	Methanol, Lot Baker 115935	50000 uL	LCM2PFHxDA_00006	1000 uL	13C2-PFHxDA	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-23696-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCM2PFTeDA_00006	1000 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00006	1000 uL	13C4-PFHpa	1 ug/mL
					LCM5PFPEA_00007	1000 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00010	1000 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00007	1000 uL	13C4 PFBA	1 ug/mL
					LCMPFDA_00010	1000 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00007	1000 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00011	1000 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00007	1000 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00007	1000 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00011	1000 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00015	1000 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00008	1000 uL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00006	01/07/21		Wellington Laboratories, Lot M2PFHxDA1112		(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00006	12/07/20		Wellington Laboratories, Lot M2PFTeDA1115		(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00006	05/22/20		Wellington Laboratories, Lot M4PFHpA0515		(Purchased Reagent)		13C4-PFHpa	50 ug/mL
..LCM5PFPEA_00007	05/22/20		Wellington Laboratories, Lot M5PFPeA0515		(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00010	12/22/17		Wellington Laboratories, Lot M8FOSA1215I		(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00007	05/24/21		Wellington Laboratories, Lot MPFBA0516		(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00010	08/19/20		Wellington Laboratories, Lot MPFDA0815		(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00007	04/08/21		Wellington Laboratories, Lot MPFDoA0416		(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00011	04/08/21		Wellington Laboratories, Lot MPFHxA0416		(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00007	10/23/20		Wellington Laboratories, Lot MPFHxS1015		(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00007	04/13/19		Wellington Laboratories, Lot MPFNA0414		(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00011	01/22/21		Wellington Laboratories, Lot MPFOA0116		(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00015	01/22/21		Wellington Laboratories, Lot MPFOS0116		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00008	10/31/19		Wellington Laboratories, Lot MPFUdA1014		(Purchased Reagent)		13C2 PFUnA	50 ug/mL
..LCPFCSP_00056	02/01/17	08/01/16	Methanol, Lot 090285	10000 uL	LCPFBA_00004	200 uL	Perfluorobutyric acid	1 ug/mL
					LCPFBS_00004	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00005	200 uL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00005	200 uL	Perfluorododecanoic acid	1 ug/mL
					LCPFDS_00005	200 uL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpa_00005	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpS_00008	200 uL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00004	200 uL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00001	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00005	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00006	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00005	200 uL	Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS-br_00001	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00006	200 uL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00005	200 uL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00004	200 uL	Perfluorotetradecanoic acid	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-23696-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFTrDA_00004	200 uL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00004	200 uL	Perfluoroundecanoic acid	1 ug/mL
..LCPFBA_00004	01/30/20		Wellington Laboratories, Lot PFBA0115		(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
..LCPFBS_00004	10/09/19		Wellington Laboratories, Lot LPFBS1014		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00005	07/02/20		Wellington Laboratories, Lot PFDA0615		(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
..LCPFDoA_00005	01/30/20		Wellington Laboratories, Lot PFDoA0115		(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
..LCPFDS_00005	07/02/20		Wellington Laboratories, Lot LPFDS0615		(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
..LCPFHpA_00005	01/22/21		Wellington Laboratories, Lot PFHpA0116		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpS_00008	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	50 ug/mL
..LCPFHxDA_00004	11/28/17		Wellington Laboratories, Lot PFHxDA0707		(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
..LCPFHxS-br_00001	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_00001	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	50 ug/mL
..LCPFPeA_00005	01/30/20		Wellington Laboratories, Lot PFPeA0115		(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFTeDA_00004	12/09/20		Wellington Laboratories, Lot PFTeDA1215		(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
..LCPFTrDA_00004	12/10/18		Wellington Laboratories, Lot PFTrDA1213		(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
..LCPFUdA_00004	08/19/20		Wellington Laboratories, Lot PFUdA0815		(Purchased Reagent)		Perfluoroundecanoic acid	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
							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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-23696-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCG-NEtFOSA-M_00001	03/10/19		WELLINGTON, Lot dNetFOSA0314M		LCM2-8:2FTS_00001	200 uL	M2-8:2FTS	0.958 ug/mL
..LCd-NMeFOSA-M_00001	01/28/19		WELLINGTON, Lot dNMeFOSA0114M		(Purchased Reagent)		d-N-EtFOSA-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-octanesulfo namide	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-octanesulfo namide	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-octanesulfo namide	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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-23696-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration		
					Reagent ID	Volume Added				
					LCPFC2SP_00014	50 uL	d5-NEtFOSAA	50 ng/mL		
							M2-6:2FTS	47.5 ng/mL		
							M2-8:2FTS	47.9 ng/mL		
							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-octanesulfo namide	1 ng/mL		
							N-ethyl perfluorooctane sulfonamidoacetic acid	1 ng/mL		
							MeFOSA	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		
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.0958 ug/mL		
							N-ethylperfluoro-1-octanesulfo namide	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-octanesulfo namide	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-23696-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					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
LCPPFC2-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
					LCPPFC2SP_00014	250 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.9 ng/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	4.74 ng/mL
							N-ethylperfluoro-1-octanesulfonamide	5 ng/mL
							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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-23696-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration		
					Reagent ID	Volume Added				
.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-octanesulfo namide	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-octanesulfo namide	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-octanesulfo namide	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		

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-23696-1

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)	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	
					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	

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-23696-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration		
					Reagent ID	Volume Added				
							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-octanesulfo namide	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		
					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-octanesulfo namide	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.: 320-23696-1

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-octanesulfo namide	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
					LCPFC2SP_00013	1000 uL	M2-8:2FTS	47.9 ng/mL
							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-octanesulfo namide	200 ng/mL
							N-ethyl 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
..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-octanesulfo namide	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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-23696-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration		
					Reagent ID	Volume Added				
					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-octanesulfoamide	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		
							1802 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
									Perfluoroheptanoic acid (PFHpA)	50 ng/mL
									Perfluorohexanesulfonic acid (PFHxS)	47.25 ng/mL
Perfluorononanoic acid (PFNA)	50 ng/mL									
Perfluorooctanesulfonic acid (PFOS)	47.75 ng/mL									
Perfluorooctanoic acid (PFOA)	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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-23696-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCMPFHxS_00008	1000 uL	1802 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 M4PFHpaA0516		(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)		1802 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
..LCPFACMXB_00007	11/06/20		Wellington Laboratories, Lot PFACMXB1115		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1.77 ug/mL
							Perfluoroheptanoic acid (PFHpA)	2 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	1.89 ug/mL
							Perfluorononanoic acid (PFNA)	2 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	1.91 ug/mL
							Perfluorooctanoic acid (PFOA)	2 ug/mL
LCPFCSP_00070	05/15/17	11/15/16	Methanol, Lot 090285	10000 uL	LCPFBA_00005	100 uL	Perfluorobutyric acid	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	0.5 ug/mL
					LCPFDoA_00005	100 uL	Perfluorododecanoic acid	0.5 ug/mL
					LCPFDS_00006	100 uL	Perfluorodecane Sulfonate	0.482 ug/mL
							Perfluorodecane Sulfonic acid	0.482 ug/mL
					LCPFHpa_00005	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_00004	100 uL	Perfluorohexanoic acid	0.5 ug/mL
					LCPFHxDA_00006	100 uL	Perfluorohexadecanoic acid	0.5 ug/mL
					LCPFHxS-br_00002	100 uL	Perfluorohexane Sulfonate	0.455 ug/mL
							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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-23696-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					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	0.5 ug/mL
					LCPFPeA 00005	100 uL	Perfluoropentanoic acid	0.5 ug/mL
					LCPFTeDA 00004	100 uL	Perfluorotetradecanoic acid	0.5 ug/mL
					LCPFTrDA 00004	100 uL	Perfluorotridecanoic acid	0.5 ug/mL
					LCPFUDa 00005	100 uL	Perfluoroundecanoic acid	0.5 ug/mL
.LCPFBA 00005	05/27/21		Wellington Laboratories, Lot PFBA0516		(Purchased Reagent)		Perfluorobutyric acid	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	50 ug/mL
.LCPFDaA 00005	01/30/20		Wellington Laboratories, Lot PFDoA0115		(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
.LCPFDS_00006	05/24/21		Wellington Laboratories, Lot LPFDS0516		(Purchased Reagent)		Perfluorodecane Sulfonate	48.2 ug/mL
							Perfluorodecane Sulfonic acid	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)		Perfluoroheptane Sulfonate	47.6 ug/mL
							Perfluoroheptanesulfonic Acid	47.6 ug/mL
.LCPFHxA 00004	12/22/20		Wellington Laboratories, Lot PFHxA1215		(Purchased Reagent)		Perfluorohexanoic acid	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 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	50 ug/mL
.LCPFPeA 00005	01/30/20		Wellington Laboratories, Lot PFPeA0115		(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
.LCPFTeDA 00004	12/09/20		Wellington Laboratories, Lot PFTeDA1215		(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
.LCPFTrDA 00004	12/10/18		Wellington Laboratories, Lot PFTrDA1213		(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
.LCPFUDa 00005	08/19/20		Wellington Laboratories, Lot PFUDa0815		(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL

Reagent

LC6:2FTS_00001

r: 7hclis ev
S: 7h2015sw

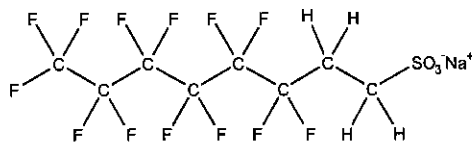


WELLINGTON LABORATORIES

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

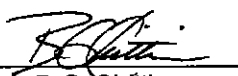
DOCUMENTATION/ DATA ATTACHED:

- 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: 
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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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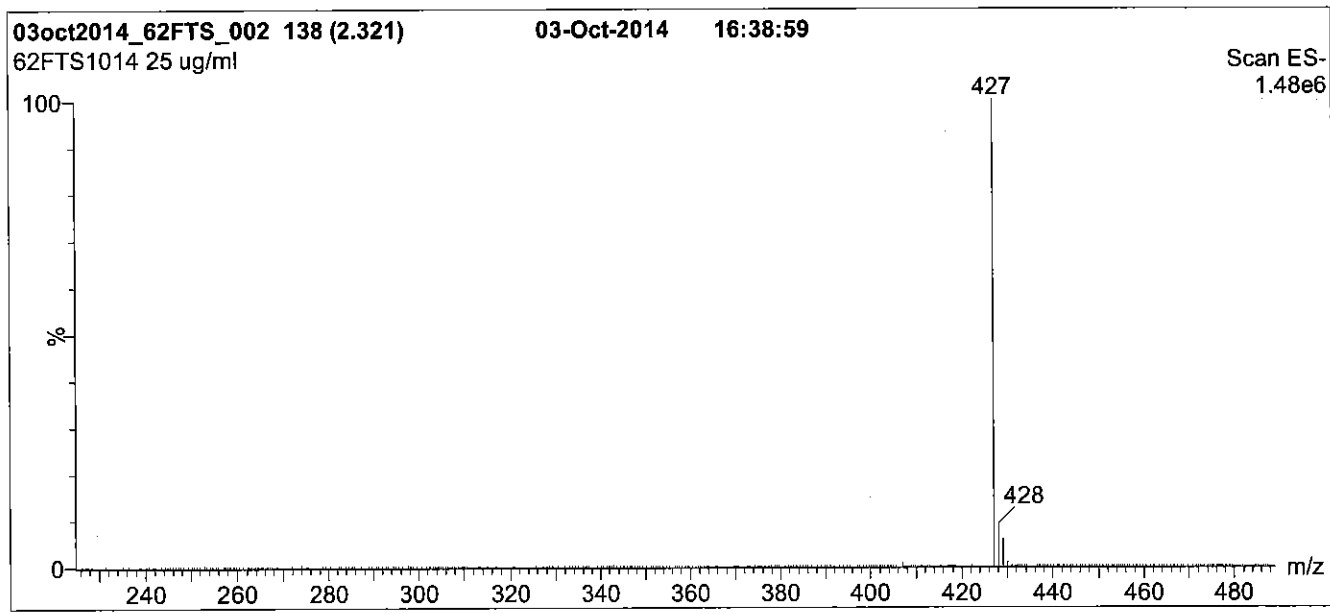
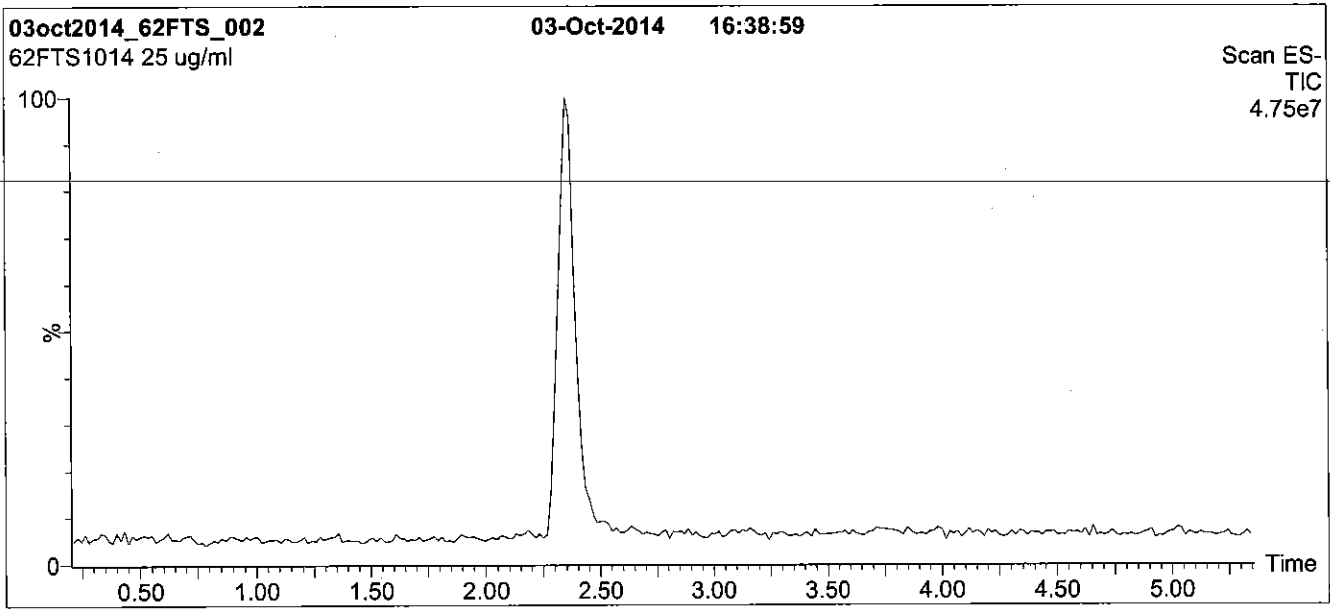
QUALITY MANAGEMENT:

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).



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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

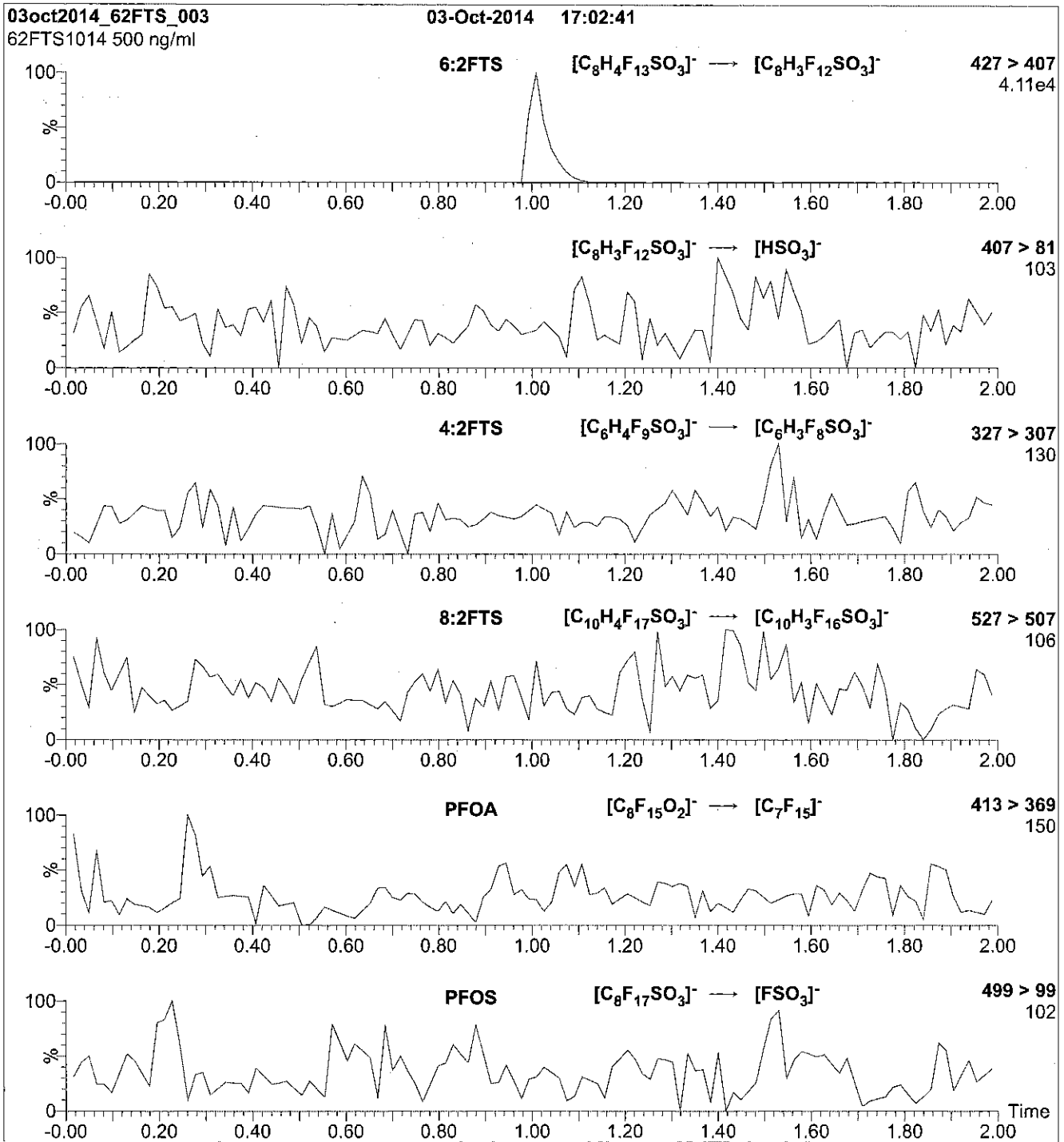
Column: Acquity UPLC BEH Shield RP₁₈, 1.7 μ m, 2.1 x 100 mm
Mobile phase: Gradient
 Start: 55% (80:20 MeOH:ACN) / 45% H₂O (both with 10 mM NH₄OAc buffer)
 Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.
 Time: 10 min

Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)
Source: Electrospray (negative)
 Capillary Voltage (kV) = 3.00
 Cone Voltage (V) = 30.00
 Cone Gas Flow (l/hr) = 50
 Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LC6:2FTS_00002

R: 8/23/16 SBC



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

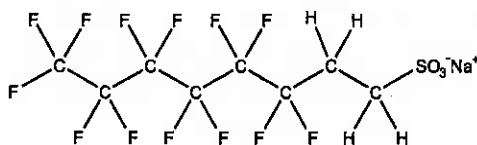


WELLINGTON LABORATORIES

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: C₈H₄F₁₃SO₃Na **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:

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, \dots, x_n on which it depends is:

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LIMITED WARRANTY:

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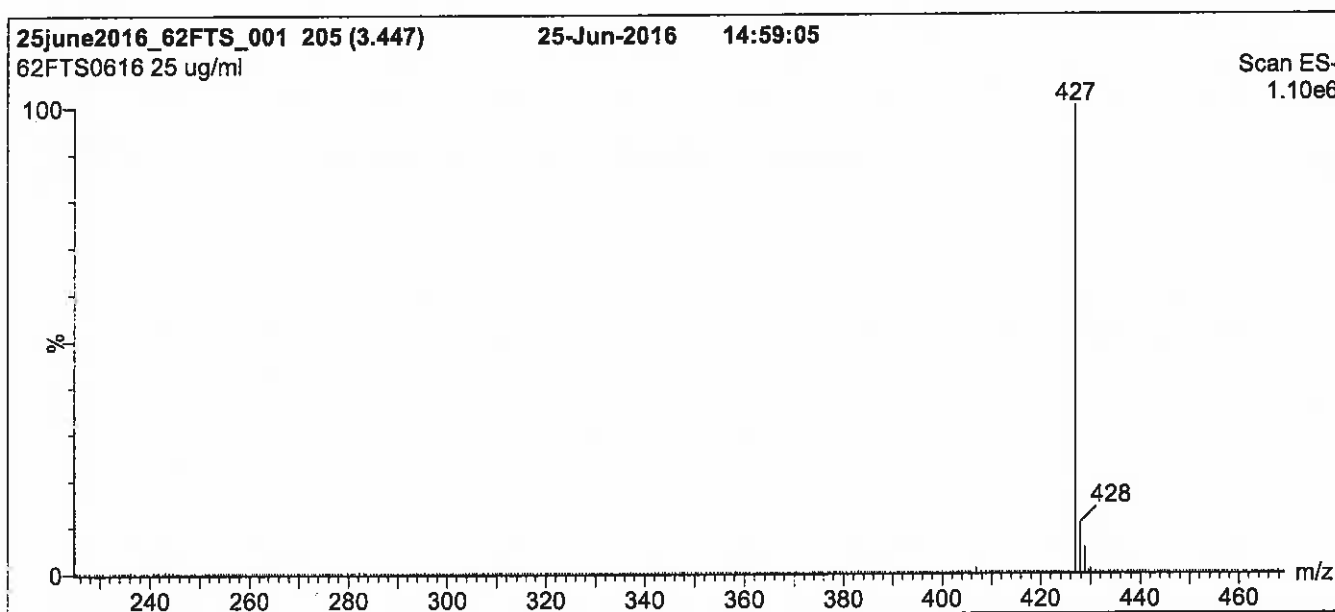
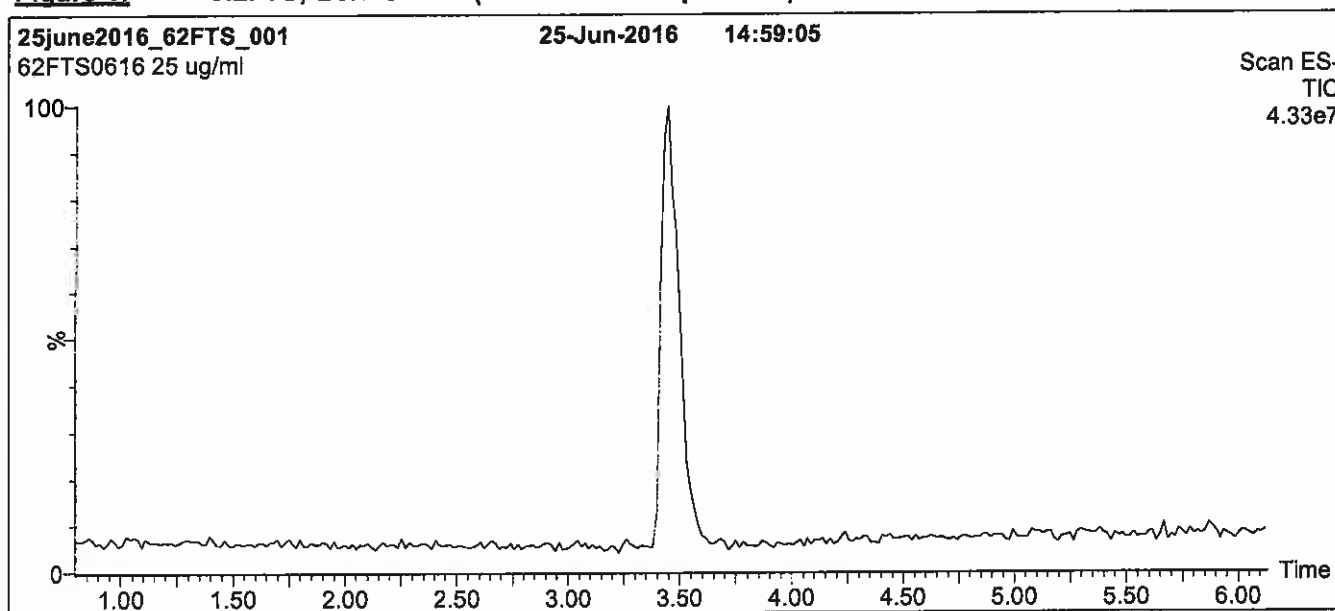
QUALITY MANAGEMENT:

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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 RP₁₈
 1.7 μ m, 2.1 x 100 mm

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

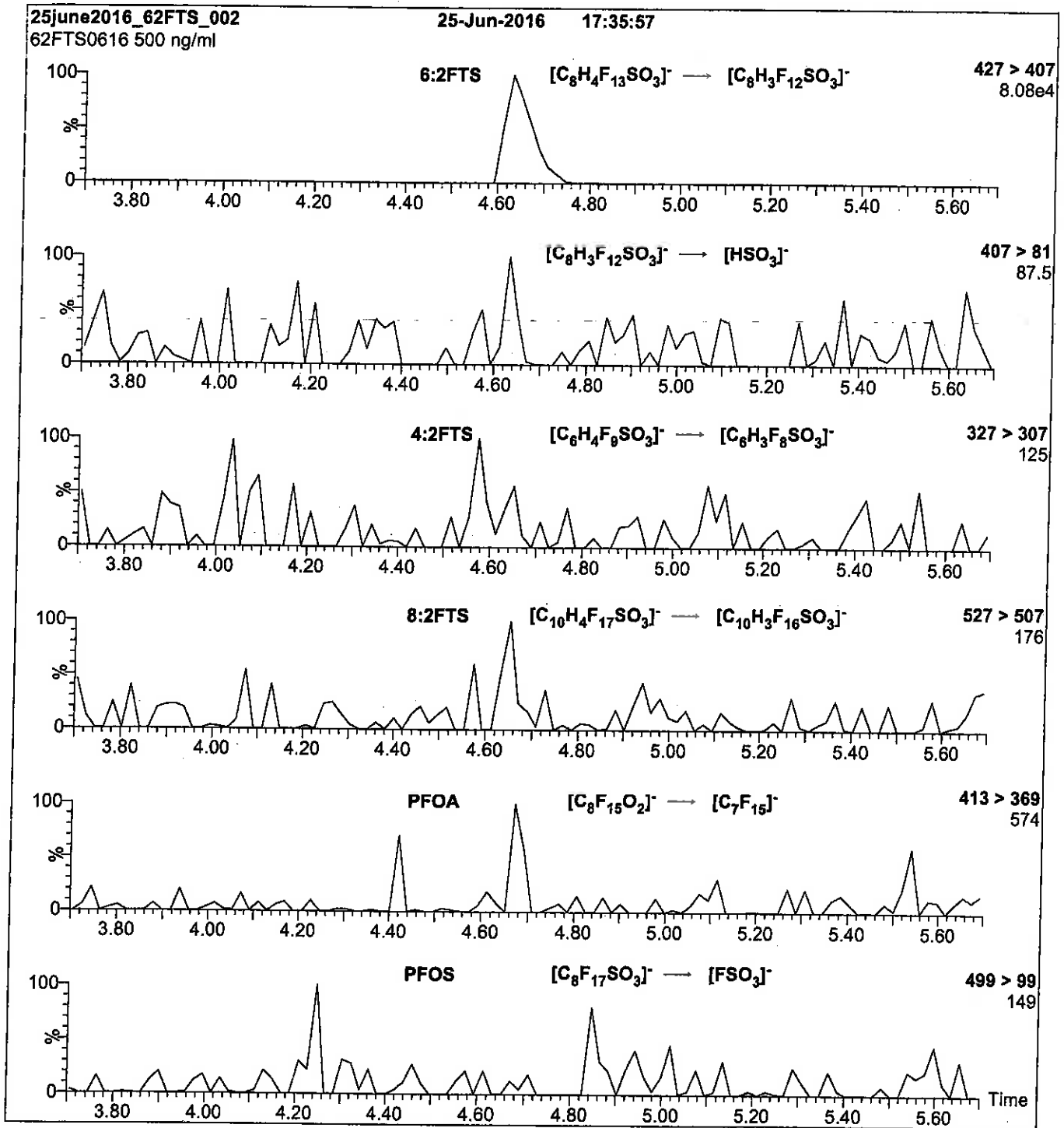
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LC8 : 2FTS _ 00001

r: 7/16/15 sv
s: 7/22/15 sv

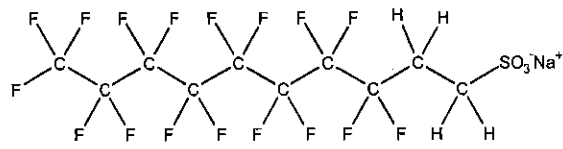


WELLINGTON LABORATORIES

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: C₁₀H₄F₁₇SO₃Na **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

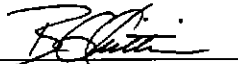
DOCUMENTATION/ DATA ATTACHED:

- 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: 
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

INTENDED USE:

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HAZARDS:

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HOMOGENEITY:

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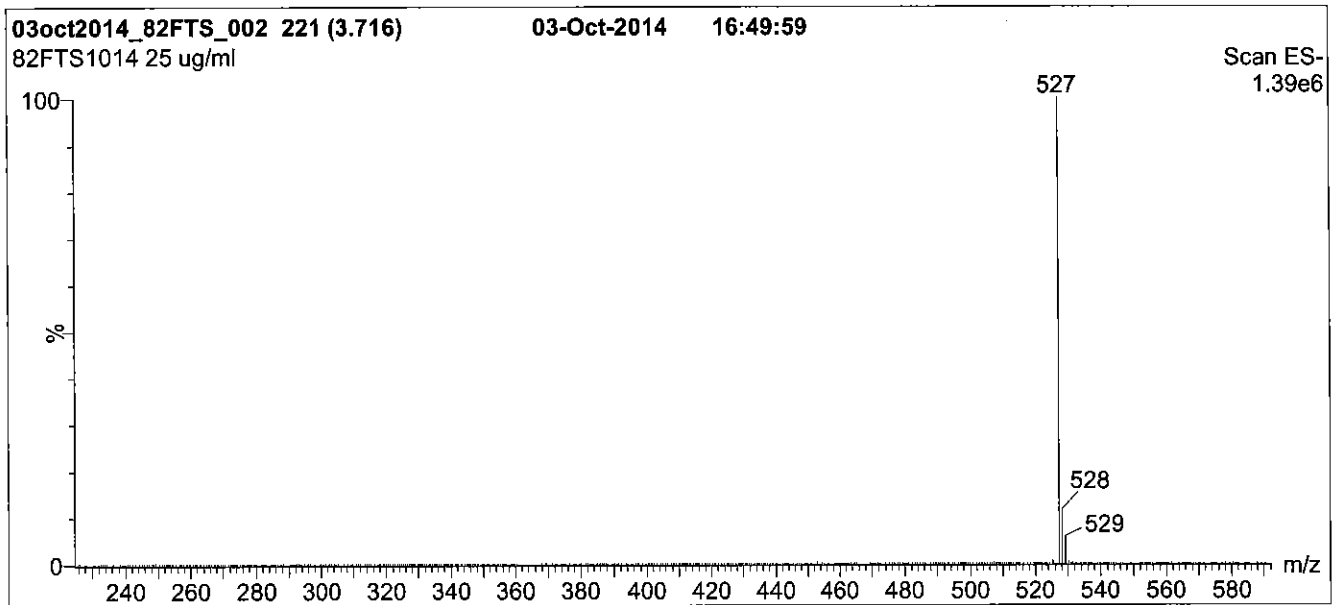
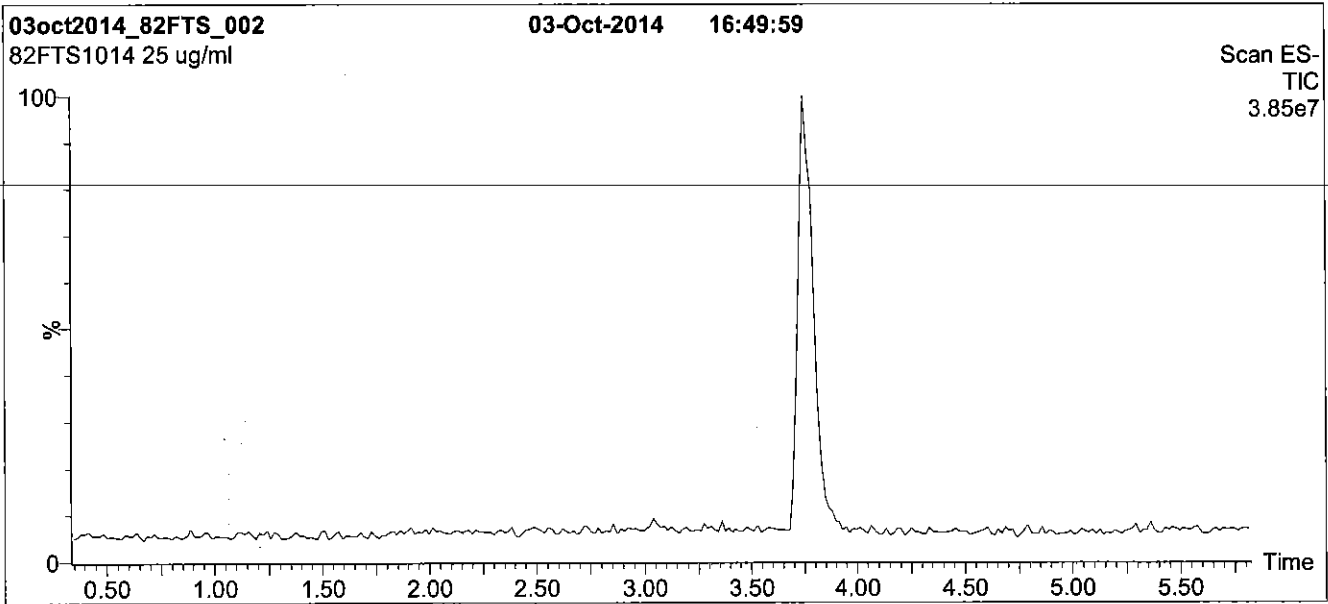
QUALITY MANAGEMENT:

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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 RP₁₈
1.7 μ m, 2.1 x 100 mm

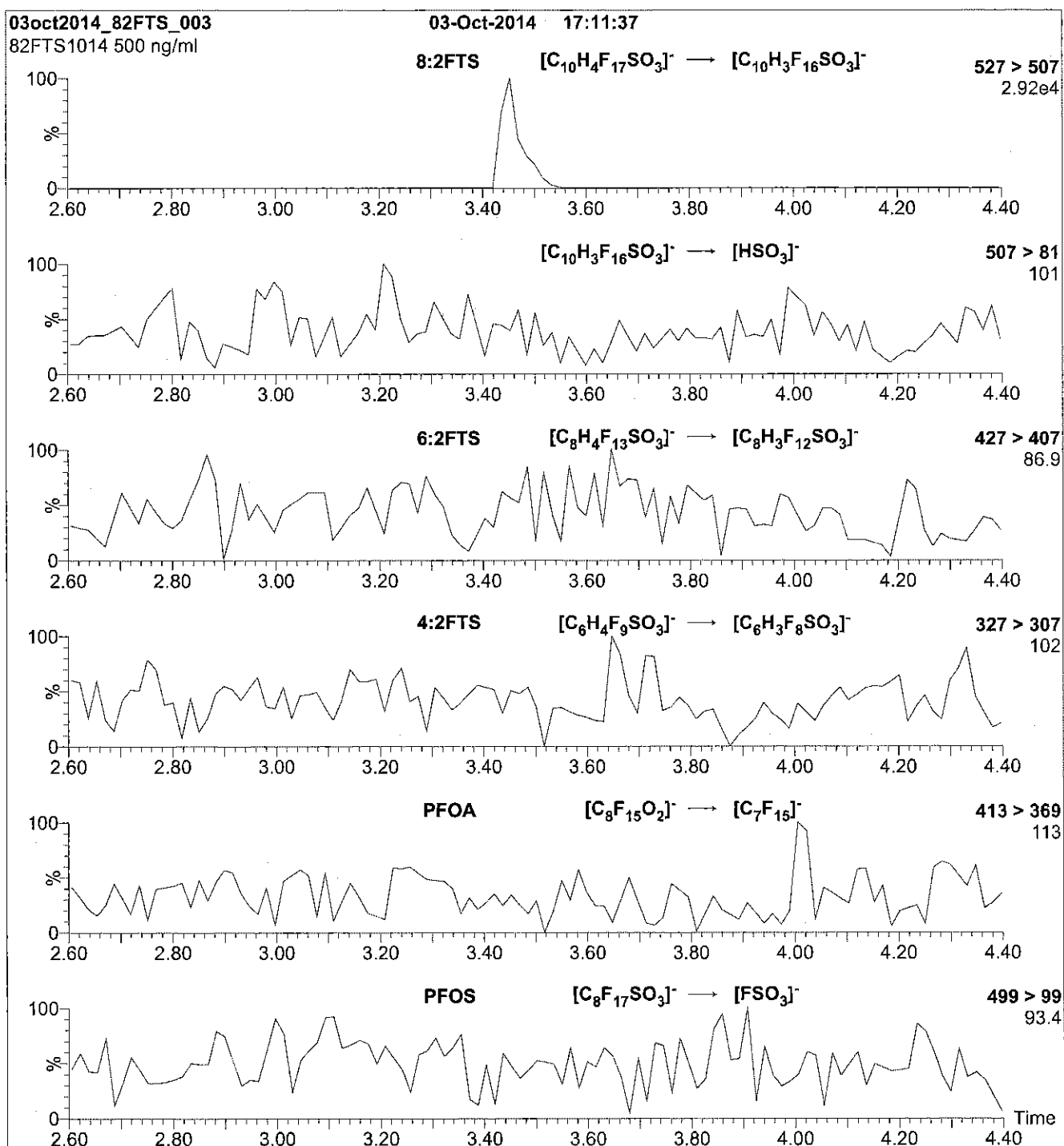
Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min.
Return to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)
Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 30.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/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 Prod: SBC
8:2FTS

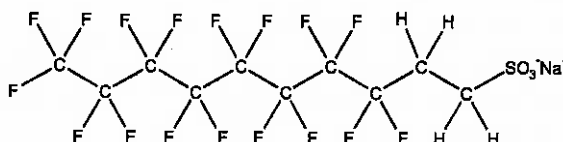


WELLINGTON LABORATORIES

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: C₁₀H₄F₁₇SO₃Na **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) 10/23/2015
EXPIRY DATE: (mm/dd/yyyy) 10/23/2020
RECOMMENDED STORAGE: Refrigerate ampoule

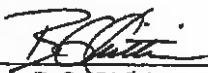
DOCUMENTATION/ DATA ATTACHED:

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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: 
B.G. Chittim **Date:** 10/27/2015
(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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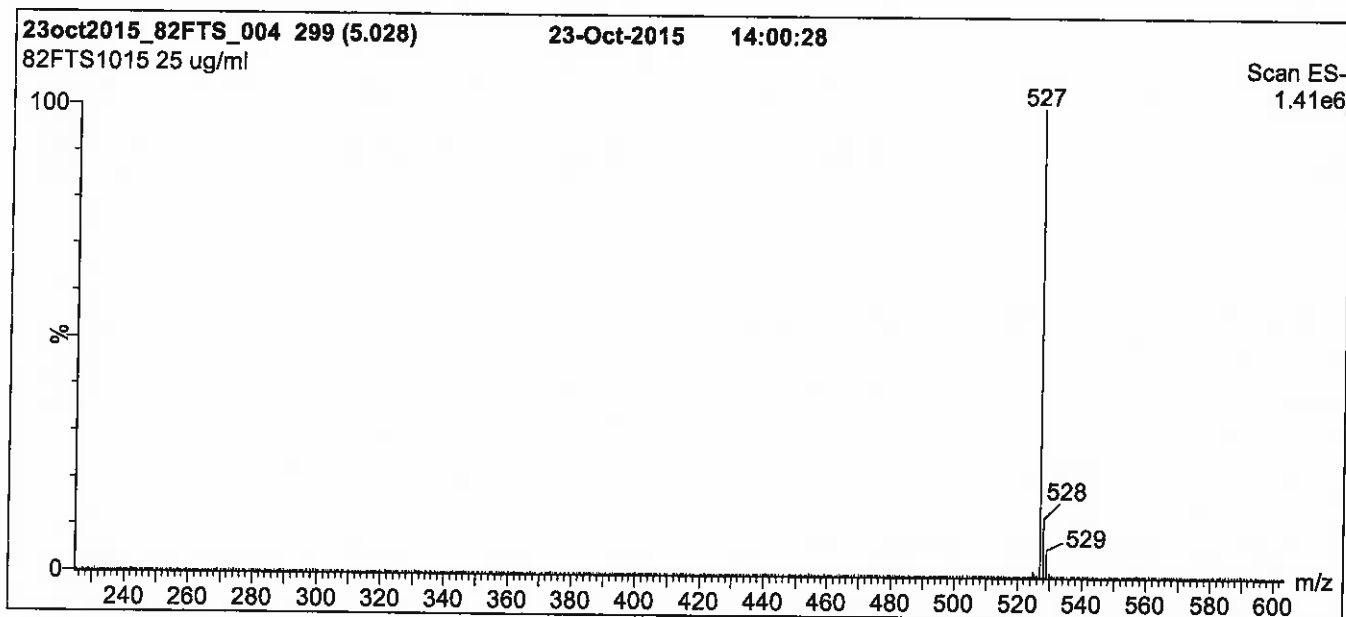
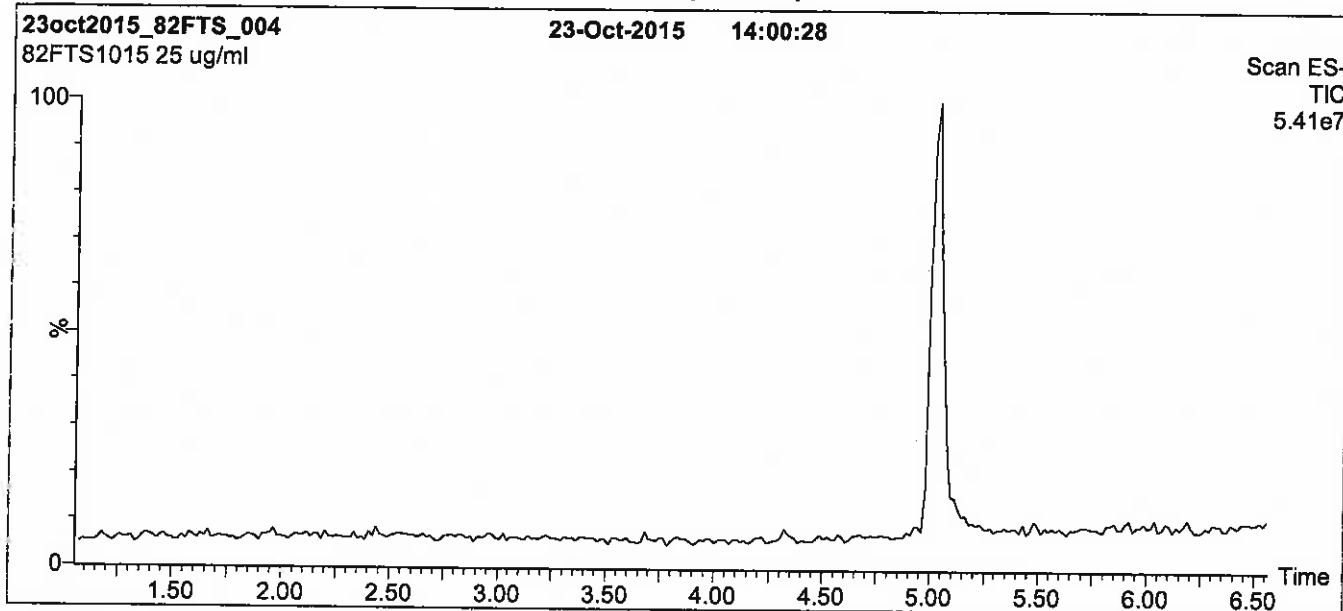
QUALITY MANAGEMENT:

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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 RP₁₈
1.7 μ m, 2.1 x 100 mm

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

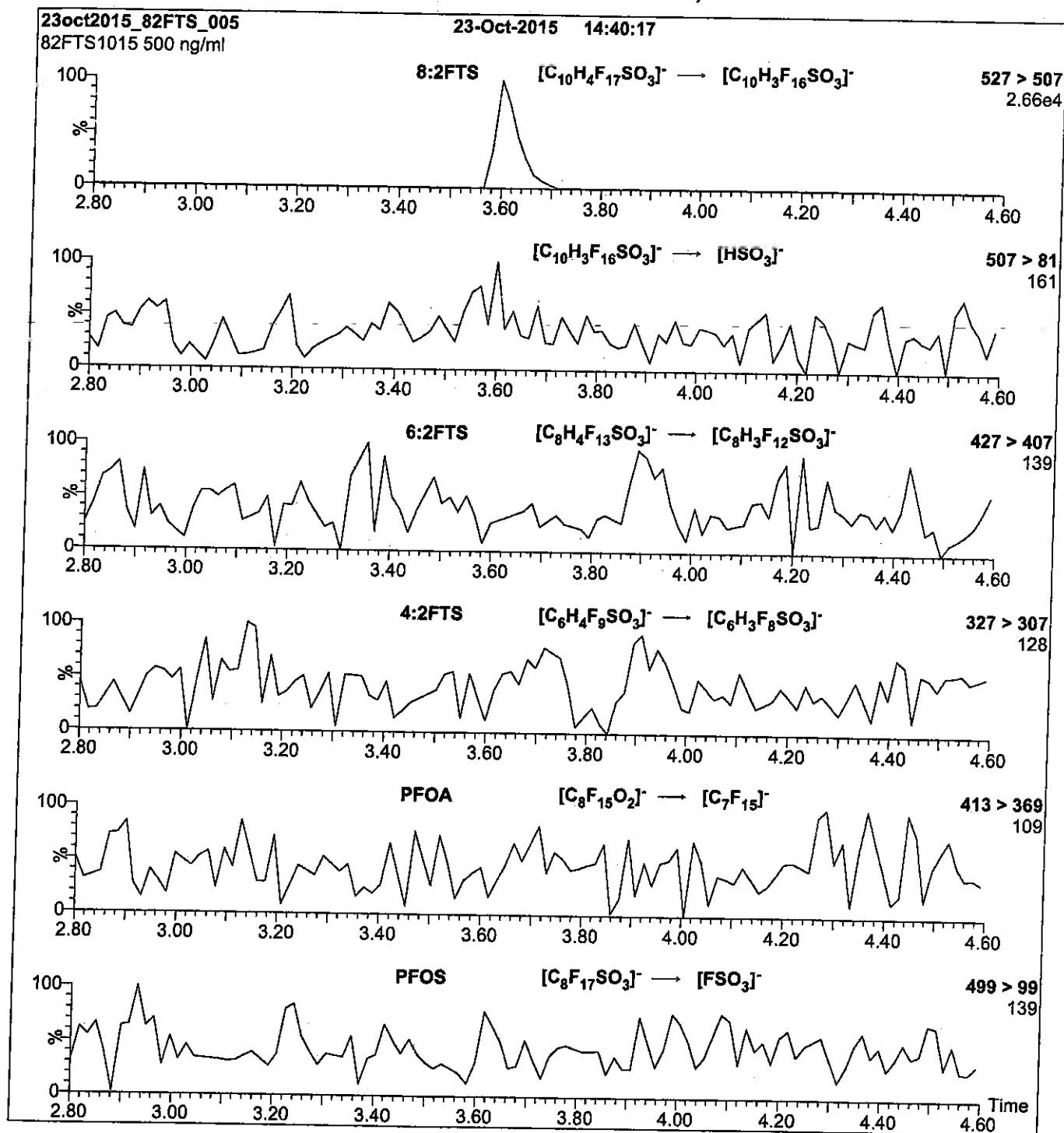
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

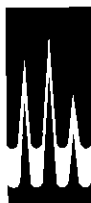
MS Parameters

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

Reagent

LCd-NEtFOSA-M_00001

C: 7/16/15 8/



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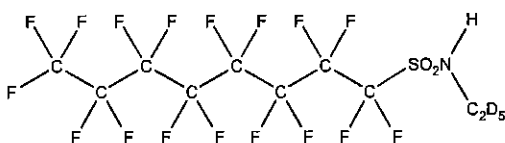
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: d-N-EtFOSA-M
COMPOUND: N-ethyl-d₅-perfluoro-1-octanesulfonamide

LOT NUMBER: dNEtFOSA0314M

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: C₁₀D₅HF₁₇NO₂S
CONCENTRATION: 50 ± 2.5 µg/ml
CHEMICAL PURITY: >98%
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

MOLECULAR WEIGHT: 532.23
SOLVENT(S): Methanol
ISOTOPIC PURITY: ≥98% ²H₅

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:

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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, \dots, x_n on which it depends is:

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

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

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LIMITED WARRANTY:

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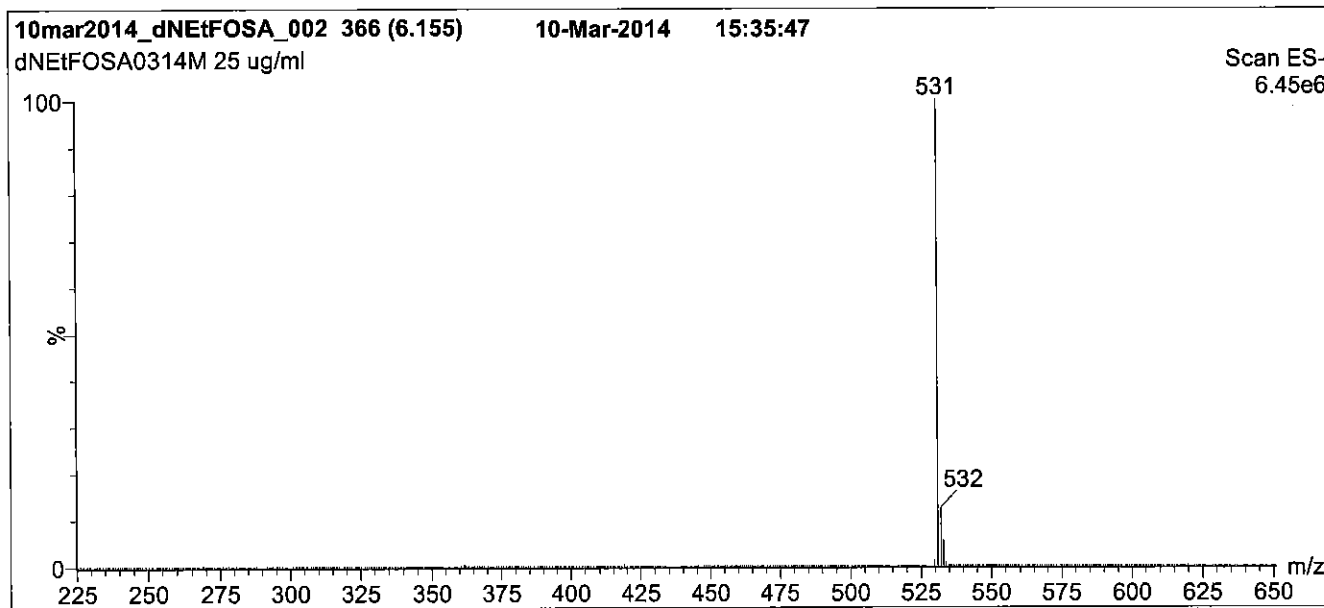
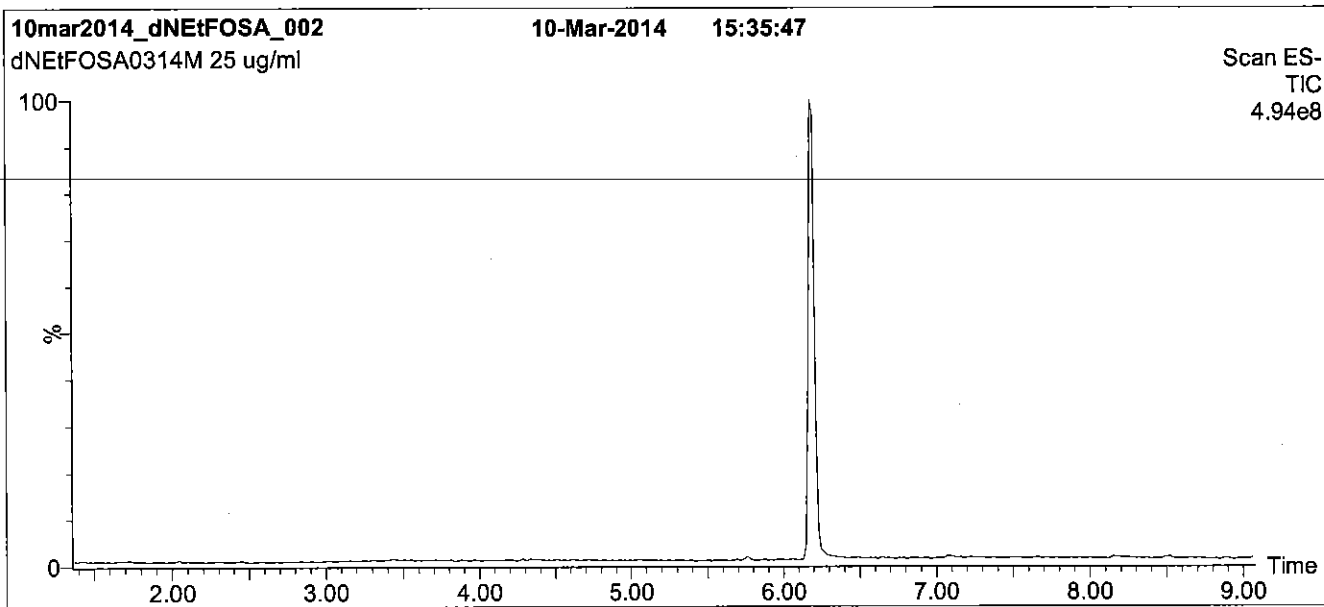
QUALITY MANAGEMENT:

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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 RP₁₈
 1.7 μ m, 2.1 x 100 mm

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

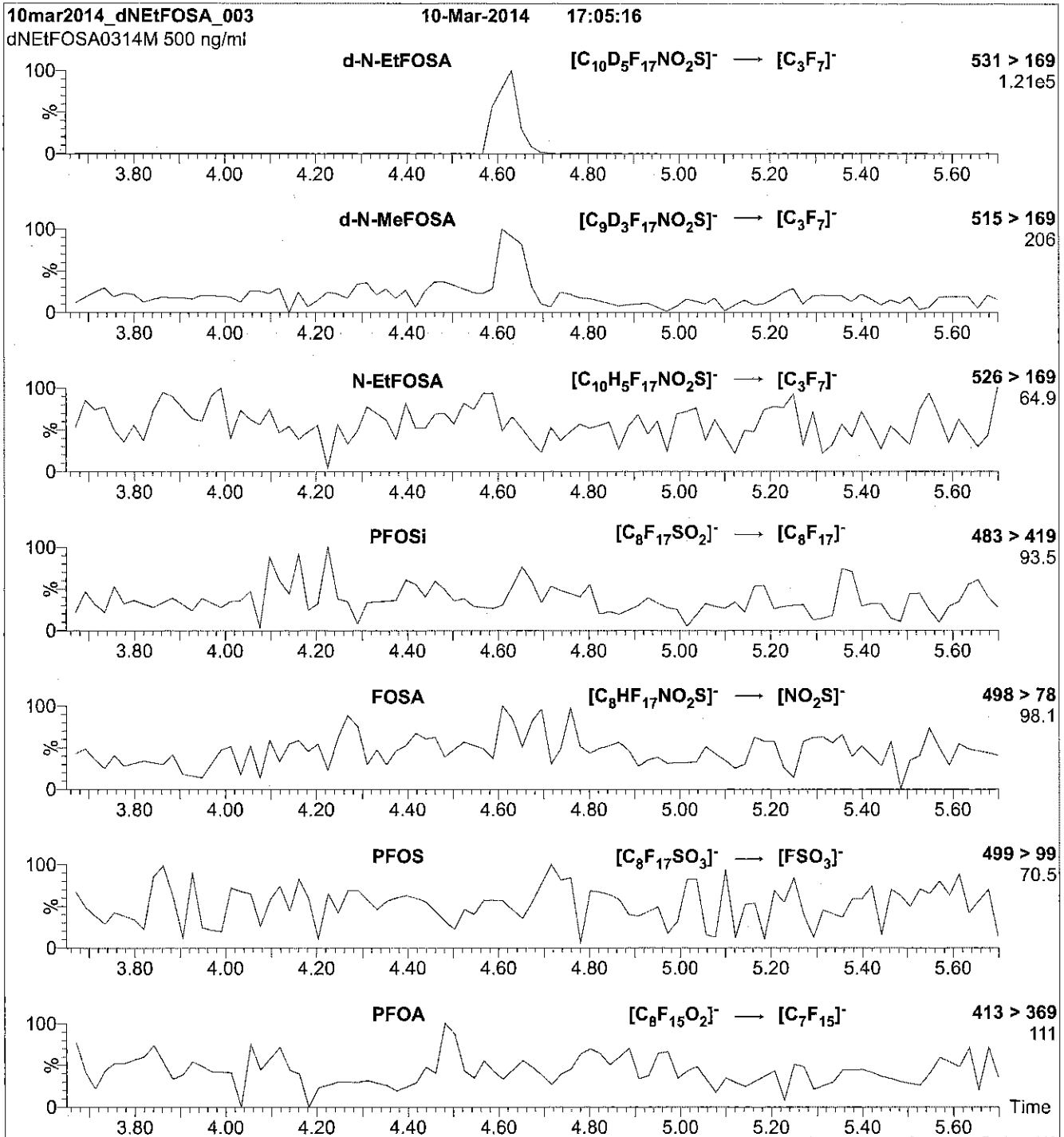
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 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 μ l (500 ng/ml d-N-EtFOSA-M)

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCd-NEtFOSA-M_00002

R-7/6/16 CAW



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

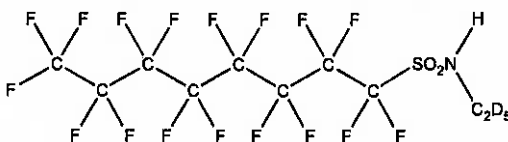


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CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: d-N-EtFOSA-M **LOT NUMBER:** dNEtFOSA0314M
COMPOUND: N-ethyl-d₅-perfluoro-1-octanesulfonamide

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: C₁₀D₅HF₁₇NO₂S **MOLECULAR WEIGHT:** 532.23
CONCENTRATION: 50 ± 2.5 µg/ml **SOLVENT(S):** Methanol
CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥98% ²H₅
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

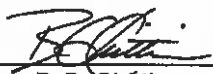
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ADDITIONAL INFORMATION:

- See page 2 for further details.

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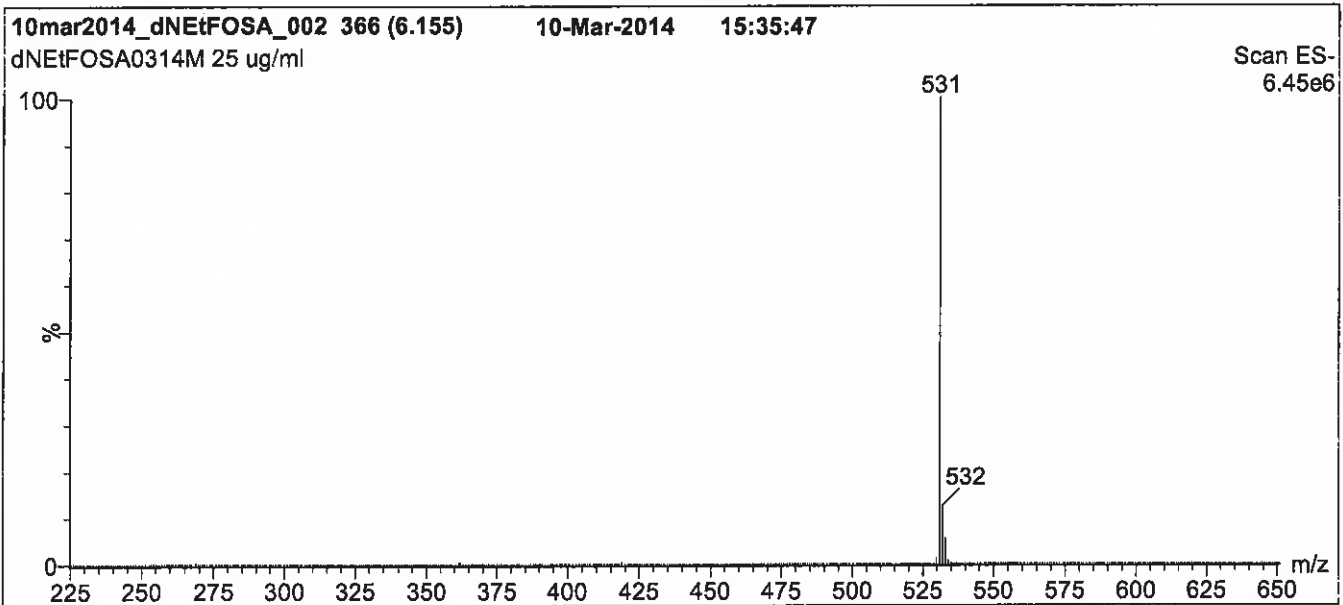
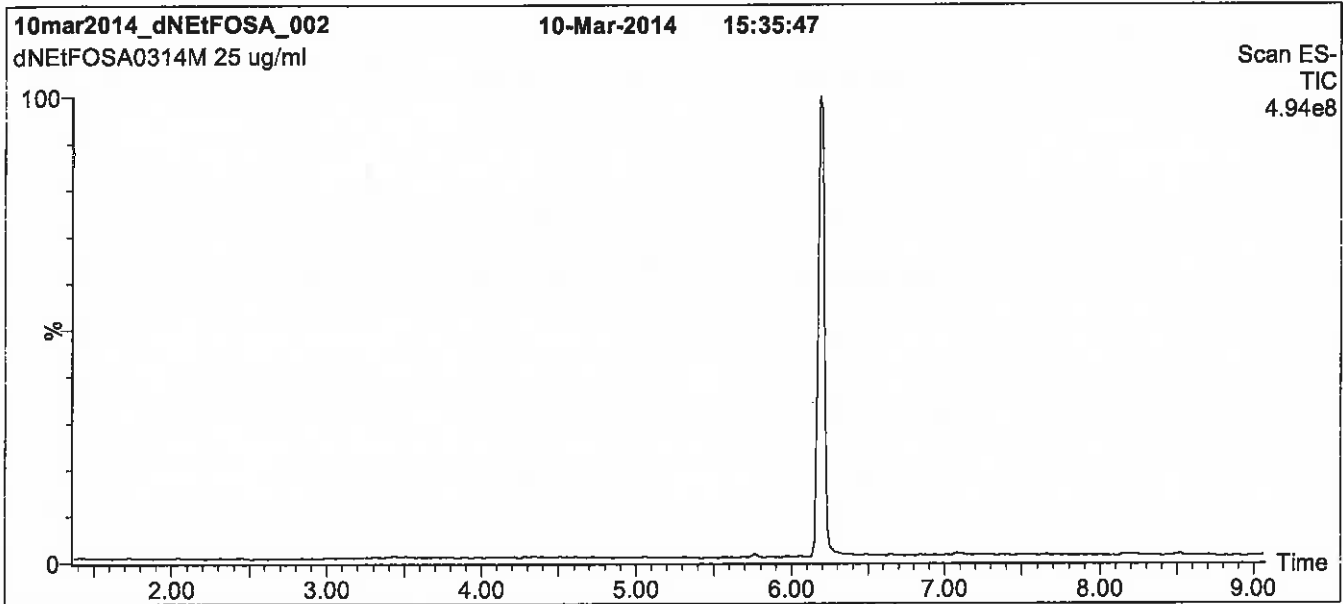
QUALITY MANAGEMENT:

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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 RP₁₈
 1.7 μ m, 2.1 x 100 mm

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

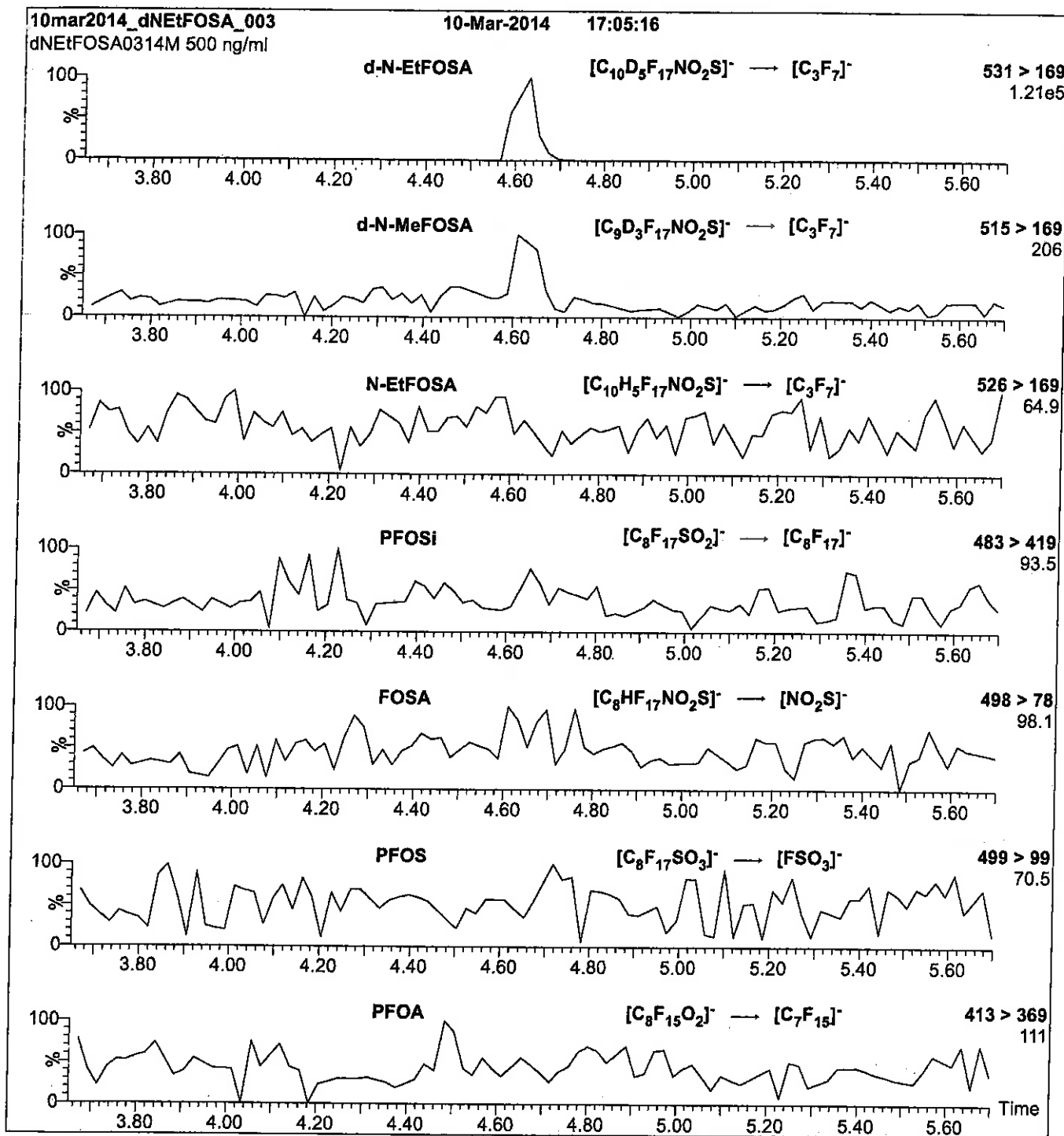
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 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 μ l (500 ng/ml d-N-EtFOSA-M)

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCd-NMeFOSA-M_00001

r: 7/16/15 SKW



WELLINGTON LABORATORIES

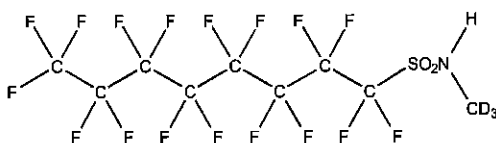
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: d-N-MeFOSA-M
COMPOUND: N-methyl-d₃-perfluoro-1-octanesulfonamide

LOT NUMBER: dNMeFOSA0114M

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: C₉D₃HF₁₇NO₂S
CONCENTRATION: 50 ± 2.5 µg/ml
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 01/28/2014
EXPIRY DATE: (mm/dd/yyyy) 01/28/2019
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

MOLECULAR WEIGHT: 516.19
SOLVENT(S): Methanol
ISOTOPIC PURITY: ≥98% ²H₃

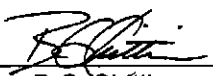
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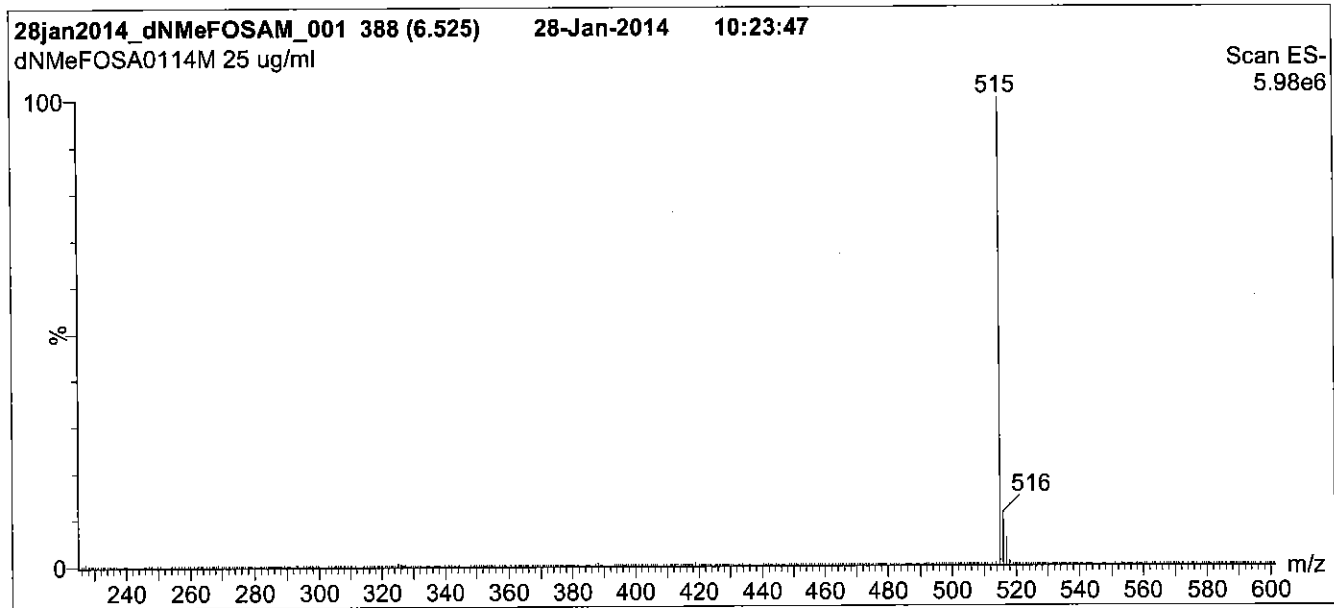
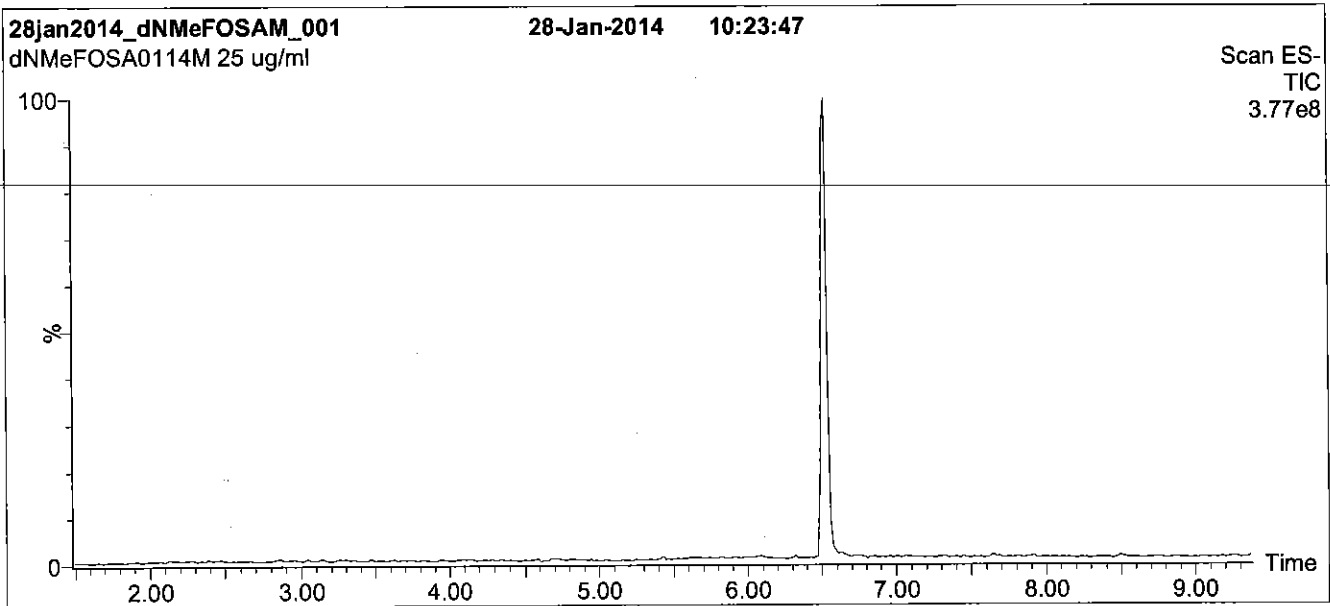
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Figure 1: d-N-MeFOSA-M; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
 Start: 50% H₂O / 50% (80:20 MeOH:ACN)
 (both with 10mM NH₄OAc 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

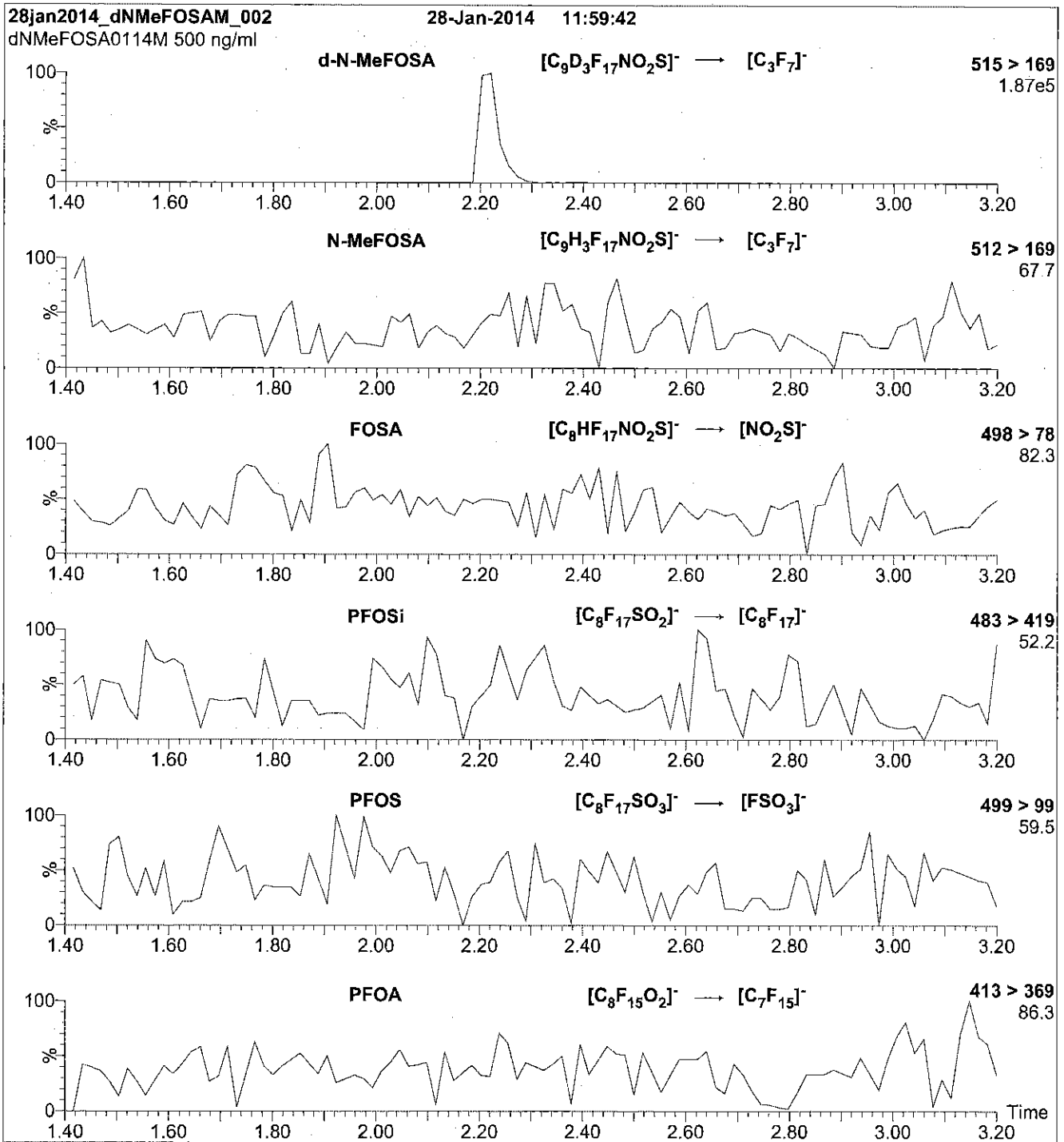
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

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

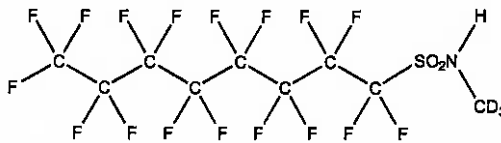
Reagent

LCd-NMeFOSA-M_00002

**WELLINGTON
LABORATORIES****CERTIFICATE OF ANALYSIS
DOCUMENTATION**

PRODUCT CODE: d-N-MeFOSA-M **LOT NUMBER:** dNMeFOSA0616M
COMPOUND: N-methyl-d₃-perfluoro-1-octanesulfonamide

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: C₉D₃HF₁₇NO₂S **MOLECULAR WEIGHT:** 516.19
CONCENTRATION: 50 ± 2.5 µg/ml **SOLVENT(S):** Methanol
CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥98% ²H₃
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:

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

ADDITIONAL INFORMATION:

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Certified By: _____

B.G. Chittim

Date: 06/16/2016

(mm/dd/yyyy)

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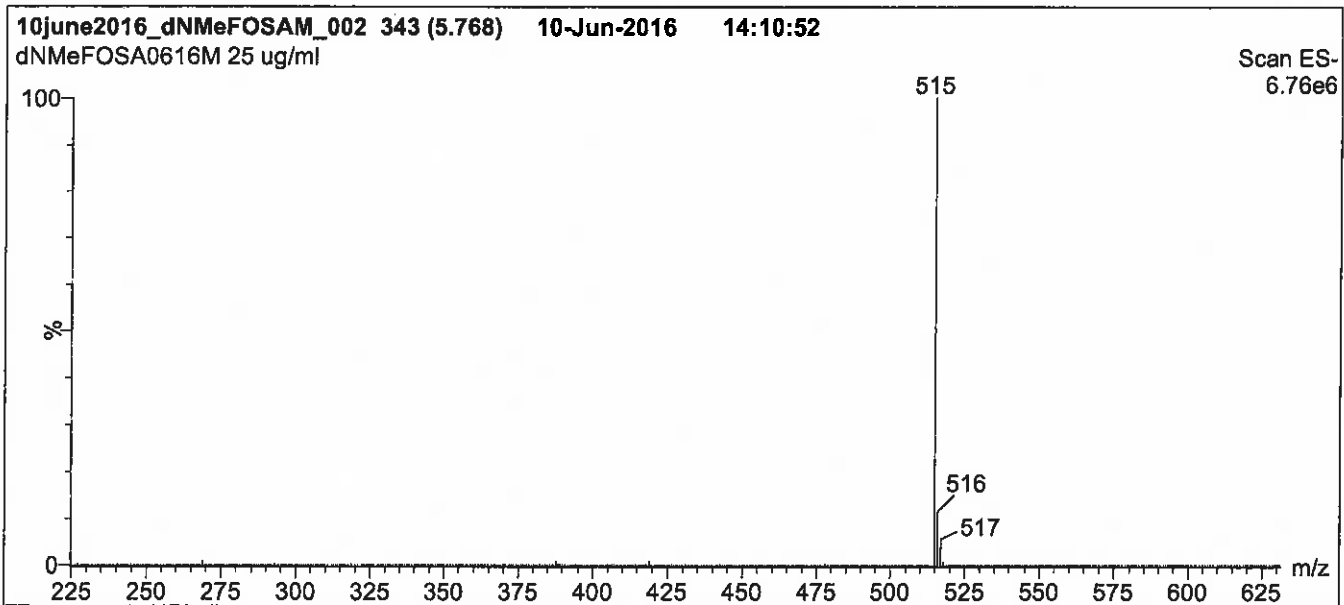
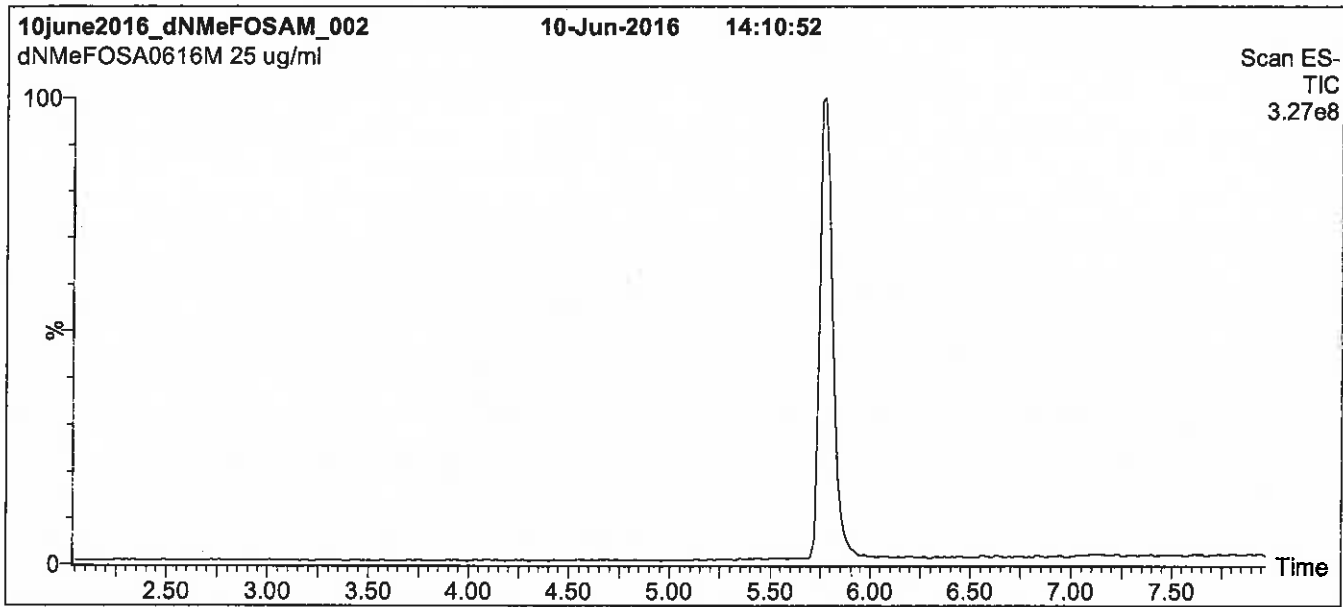
QUALITY MANAGEMENT:

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).



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: 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 RP₁₈
 1.7 μ m, 2.1 x 100 mm

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

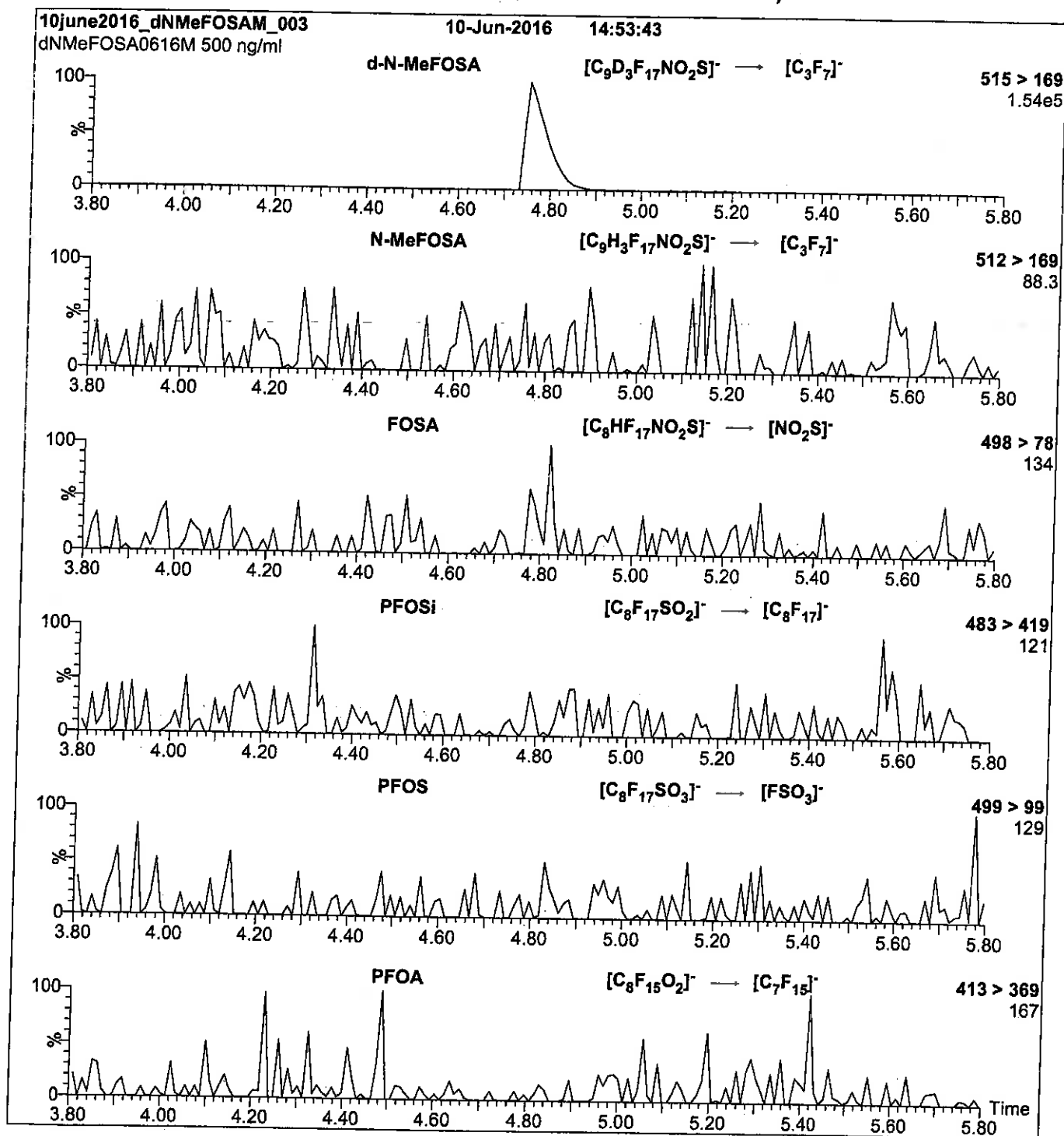
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
 Capillary Voltage (kV) = 2.50
 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 μ l (500 ng/ml d-N-MeFOSA-M)

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCd3-NMeFOSAA_00001

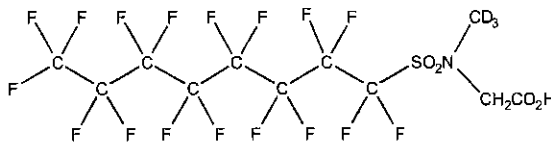


WELLINGTON LABORATORIES

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: C₁₁D₃H₃F₁₇NO₄S
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 574.23
SOLVENT(S): Methanol
 Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 01/31/2013
EXPIRY DATE: (mm/dd/yyyy) 01/31/2018
RECOMMENDED STORAGE: Refrigerate ampoule

ISOTOPIC PURITY: ≥98% ²H₃

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:

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:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

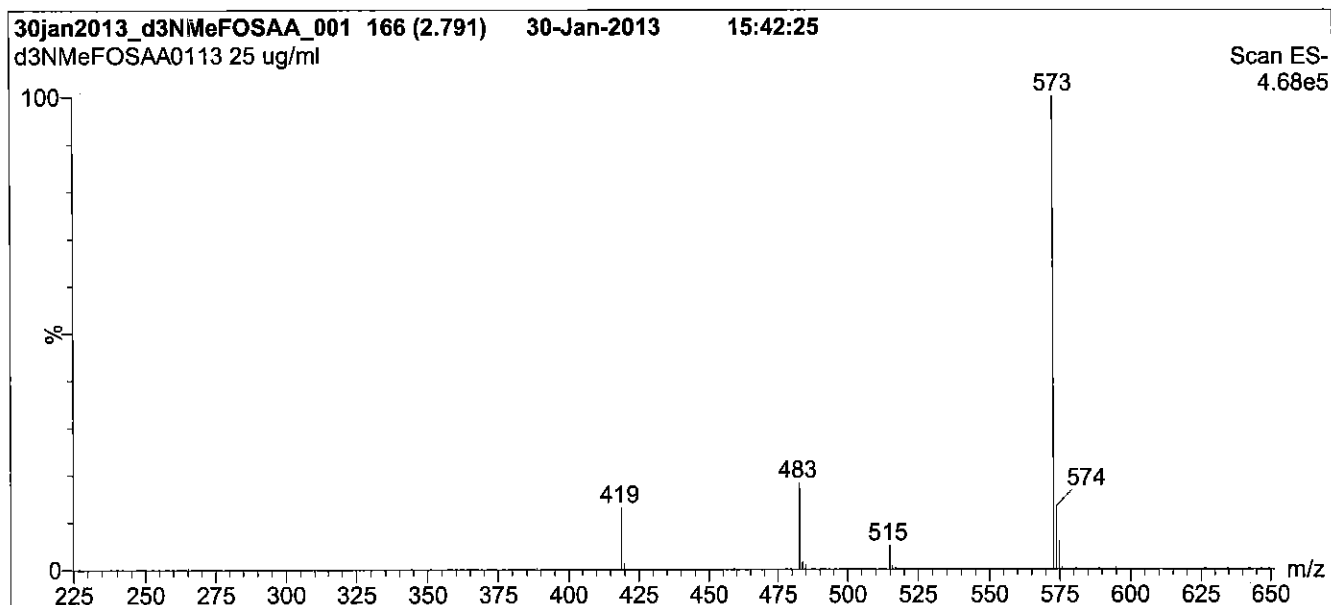
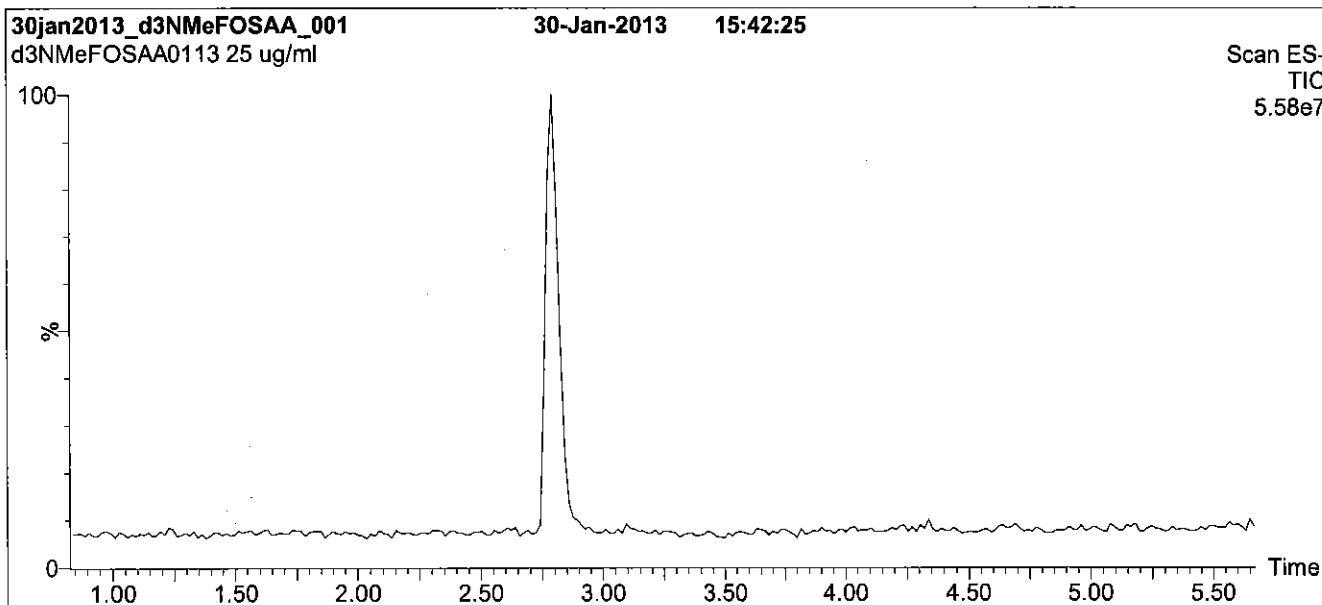
QUALITY MANAGEMENT:

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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 RP₁₈
 1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
 Start: 65% (80:20 MeOH:ACN) / 35% H₂O
 (both with 10 mM NH₄OAc buffer)
 Ramp to 90% organic over 7 min and hold for 1.5 min
 before returning to initial conditions in 0.5 min.
 Time: 10 min

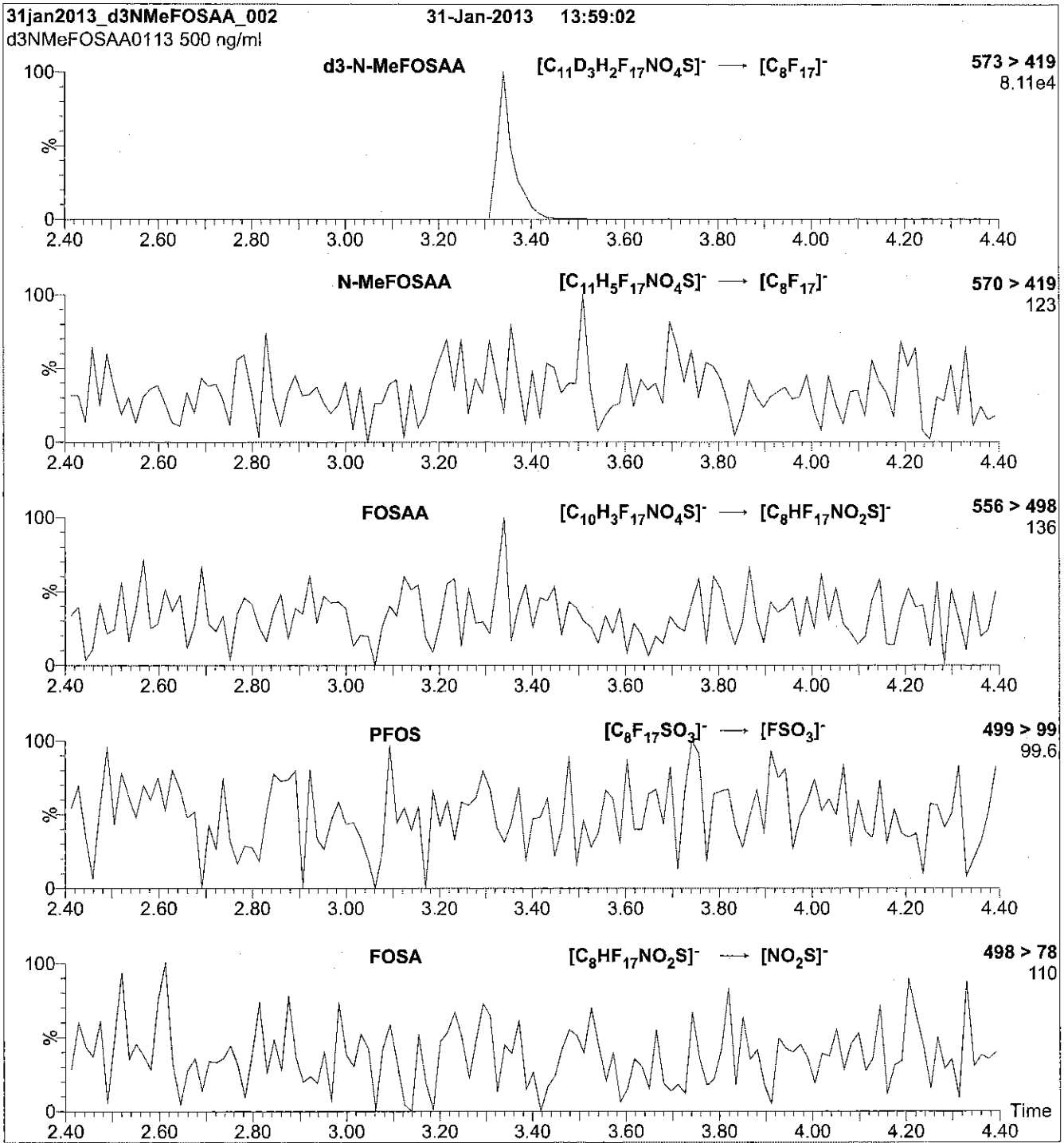
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCd3-NMeFOSAA_00002

R: 7/6/16 CBW



671572

ID: LCd3-NMeFOSAA_00002

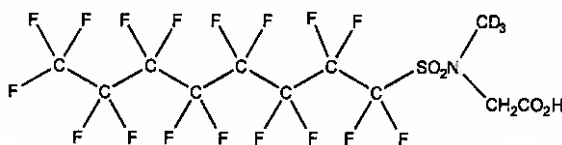
Exp: 01/2021 Prpd: CBW

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: C₁₁D₃H₃F₁₇NO₄S **MOLECULAR WEIGHT:** 574.23
CONCENTRATION: 50 ± 2.5 µg/ml **SOLVENT(S):** Methanol
Water (<1%)
CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥98% ²H₃
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: 01/25/2016

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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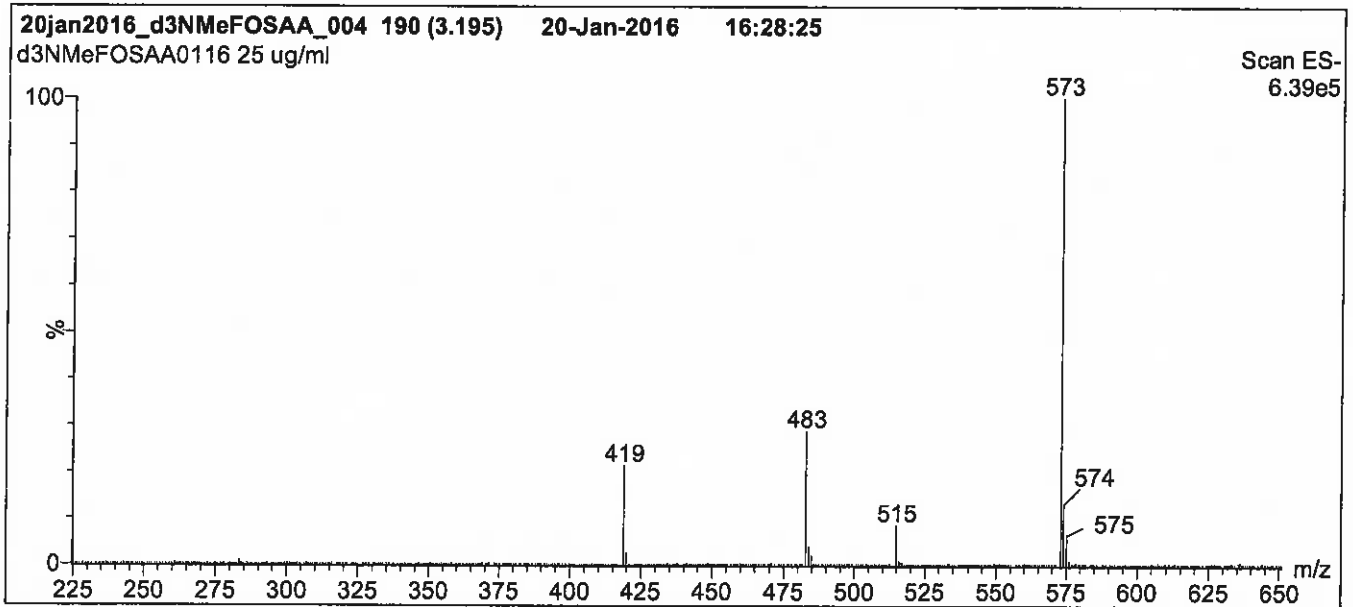
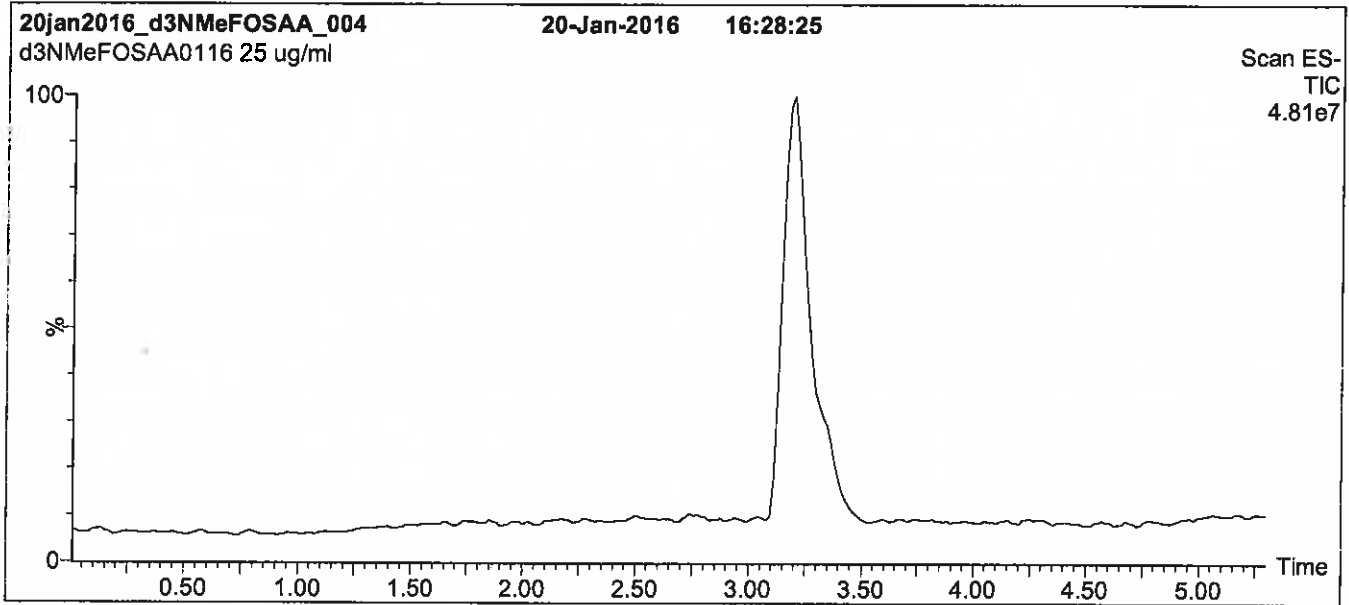
QUALITY MANAGEMENT:

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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 RP₁₈
 1.7 μ m, 2.1 x 100 mm

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

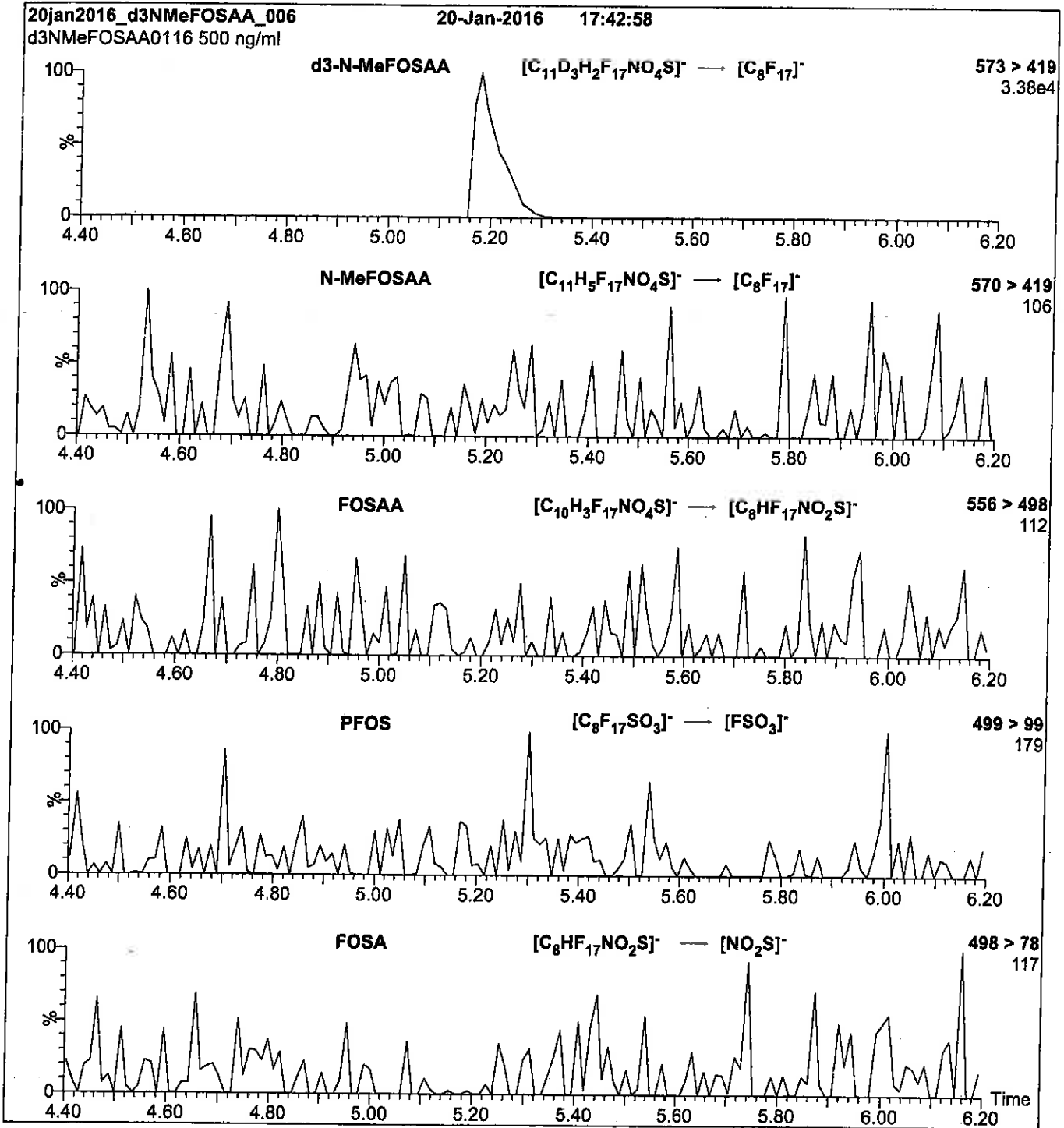
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCd5-NEtFOSAA_00001

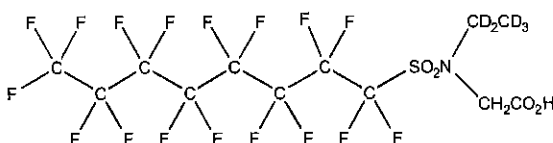


WELLINGTON LABORATORIES

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: C₁₂D₅H₃F₁₇NO₄S
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 590.27
SOLVENT(S): Methanol
 Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 05/08/2015
EXPIRY DATE: (mm/dd/yyyy) 05/08/2020
RECOMMENDED STORAGE: Refrigerate ampoule

ISOTOPIC PURITY: ≥98% ²H₅

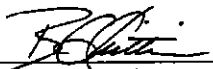
DOCUMENTATION/ DATA ATTACHED:

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

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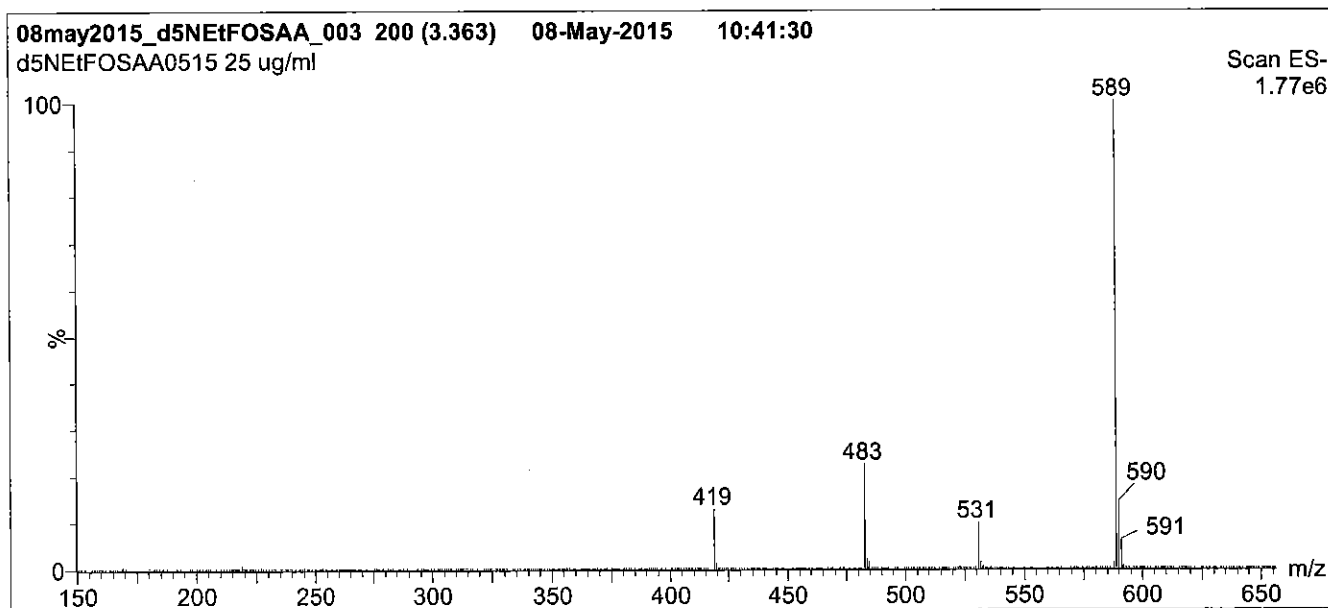
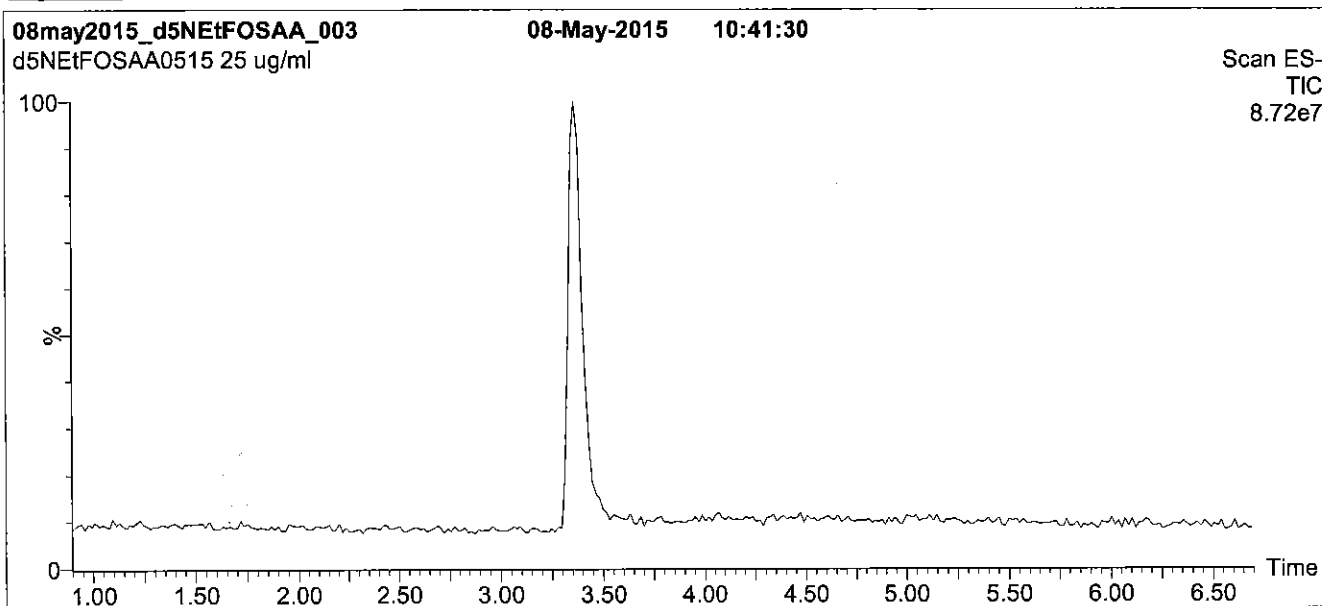
QUALITY MANAGEMENT:

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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 RP₁₈
 1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
 Start: 65% (80:20 MeOH:ACN) / 35% H₂O
 (both with 10 mM NH₄OAc buffer)
 Ramp to 90% organic over 7 min and hold for 2 min
 before returning to initial conditions in 0.5 min.
 Time: 10 min

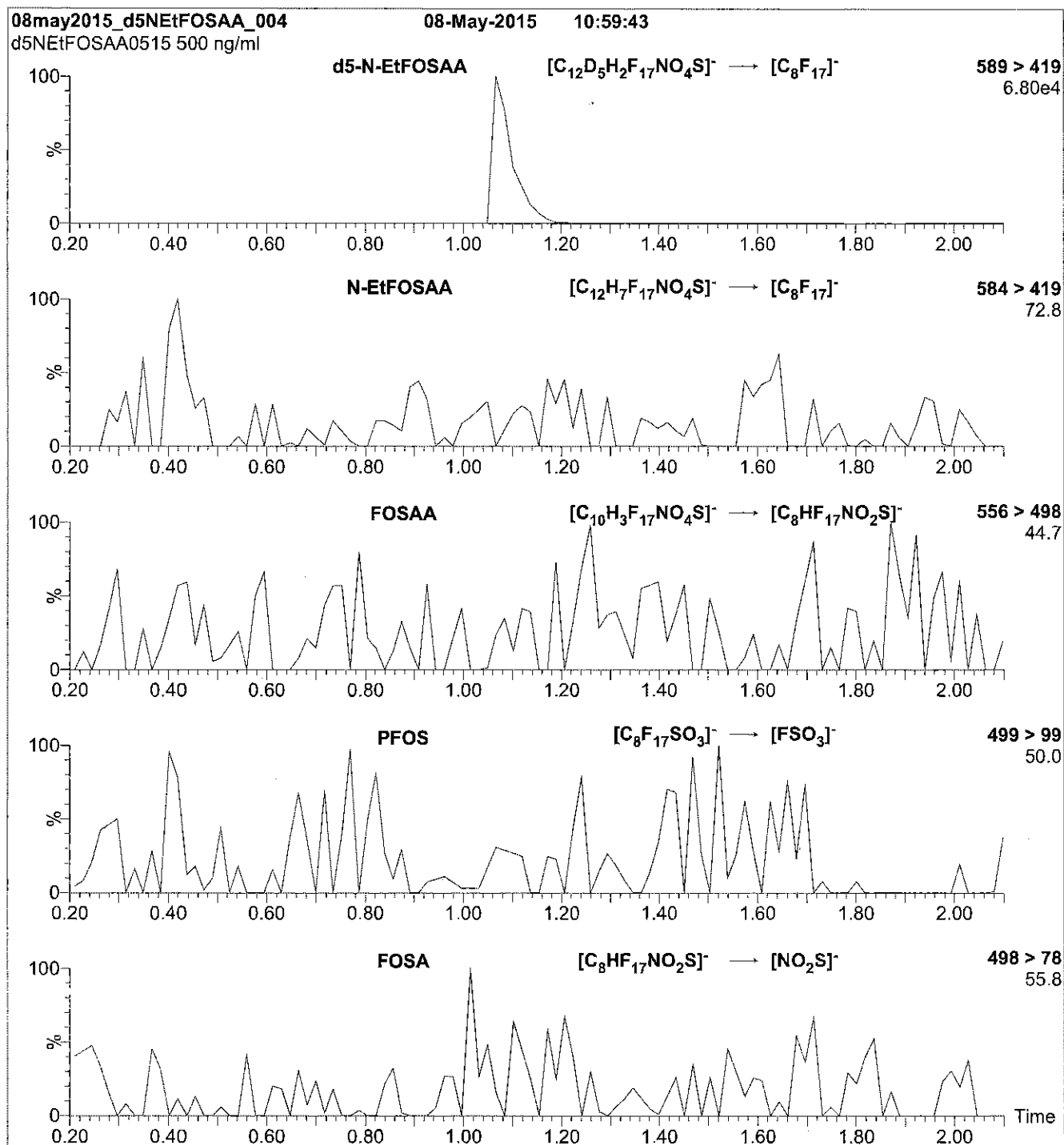
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/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 Prep: CBW
d5-N-EtFOSAA

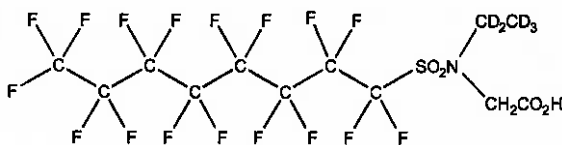


WELLINGTON LABORATORIES

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: C₁₂D₅H₃F₁₇NO₄S

CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 590.27

SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%

ISOTOPIC PURITY: ≥98% ²H₆

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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: 
B.G. Chittim

Date: 12/07/2015
(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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HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

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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.

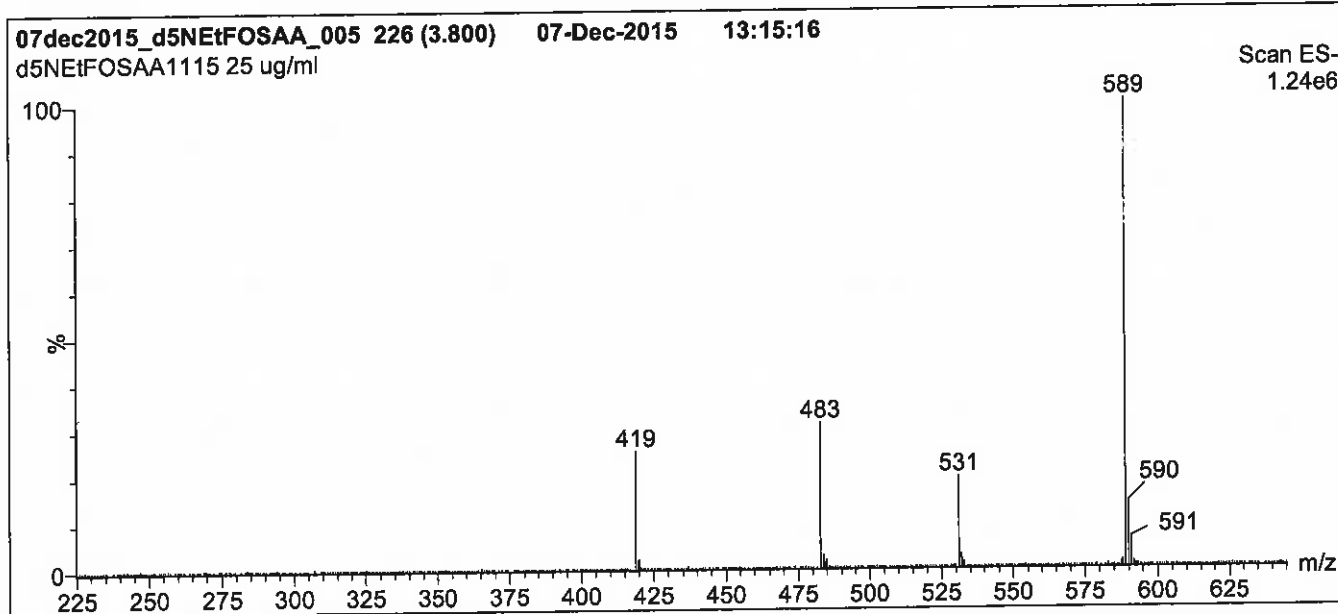
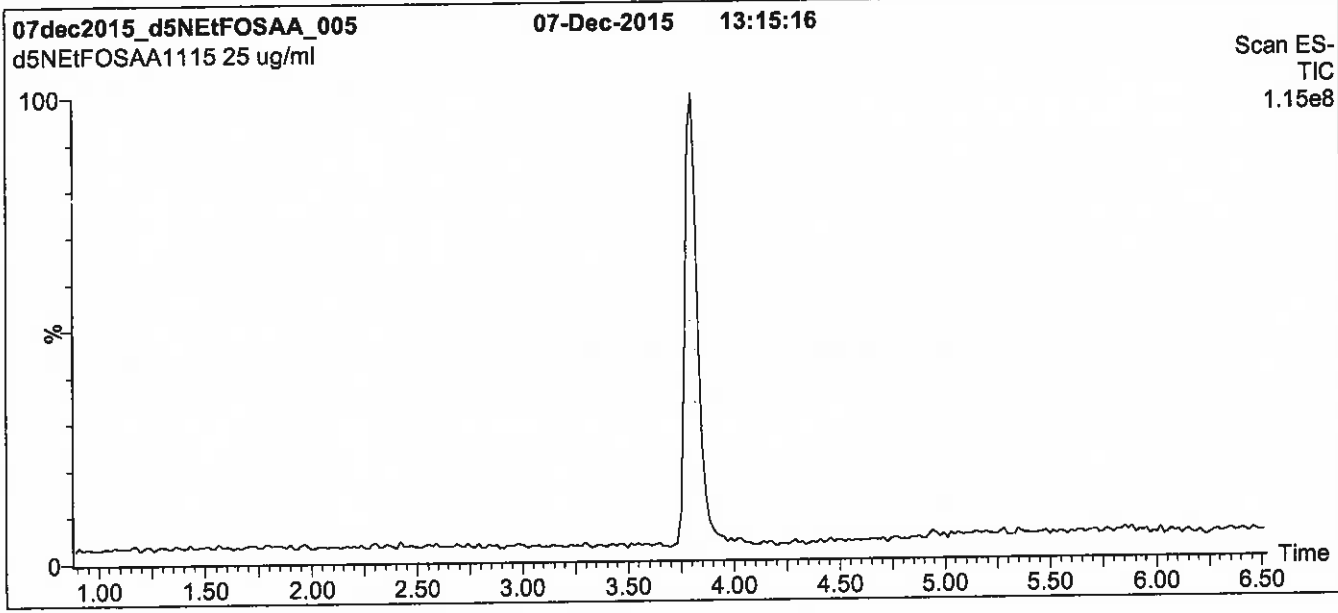
QUALITY MANAGEMENT:

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).



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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 RP₁₈
 1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
 Start: 65% (80:20 MeOH:ACN) / 35% H₂O
 (both with 10 mM NH₄OAc buffer)
 Ramp to 90% organic over 7 min and hold for 2 min.
 before returning to initial conditions in 0.5 min.
 Time: 10 min

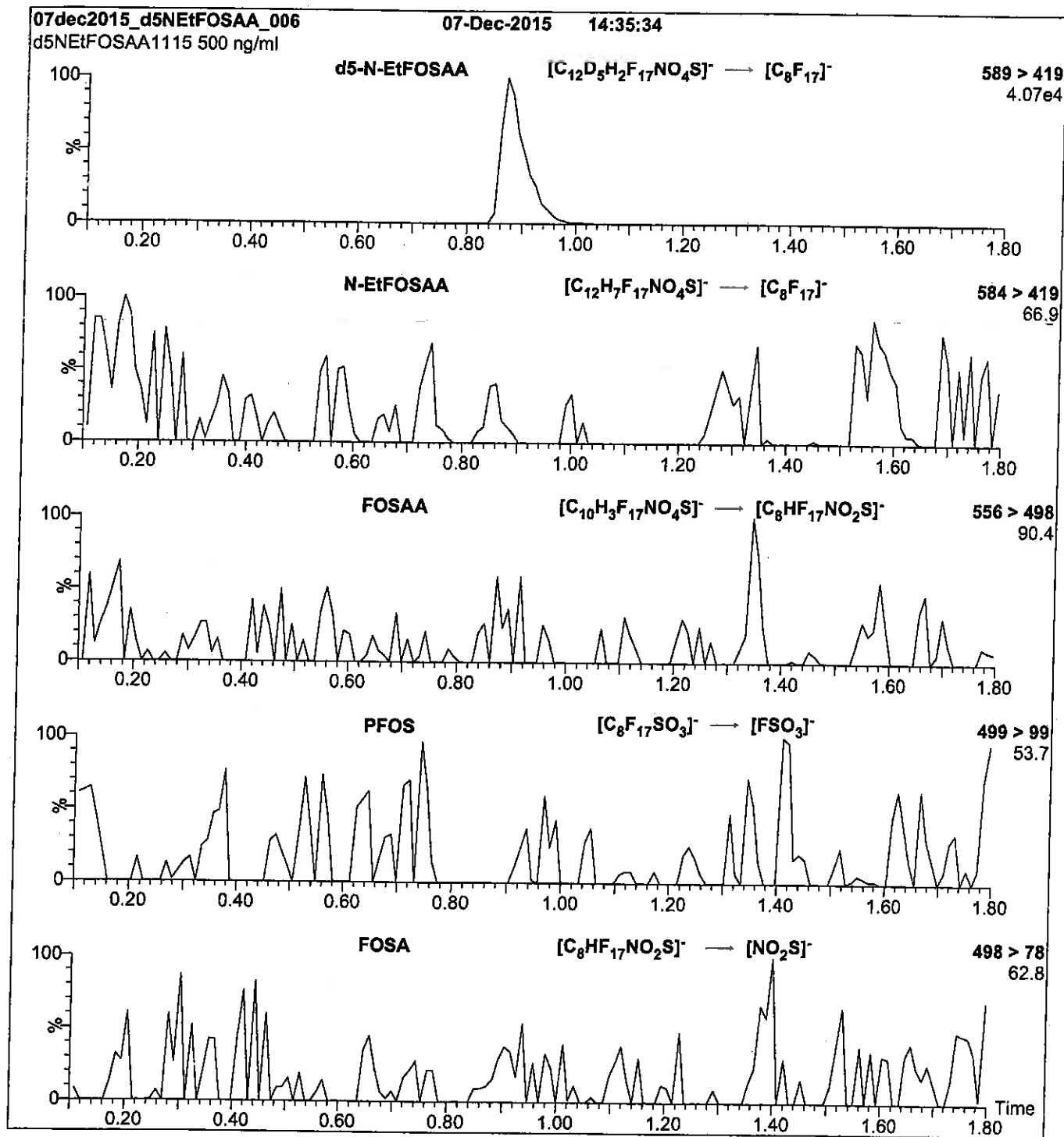
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCM2-6:FTS_00001

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

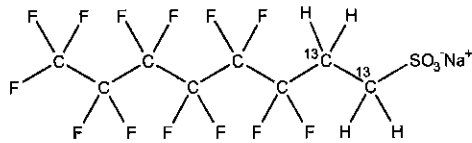


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2-6:2FTS **LOT NUMBER:** M262FTS0714
COMPOUND: Sodium 1H,1H,2H,2H-perfluoro-[1,2-¹³C₂]octane sulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₂¹²C₆H₄F₁₃SO₃Na **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% ¹³C
LAST TESTED: (mm/dd/yyyy) 07/15/2014 (1,2-¹³C₂)
EXPIRY DATE: (mm/dd/yyyy) 07/15/2017
RECOMMENDED STORAGE: Refrigerate ampoule

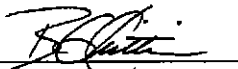
DOCUMENTATION/ DATA ATTACHED:

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

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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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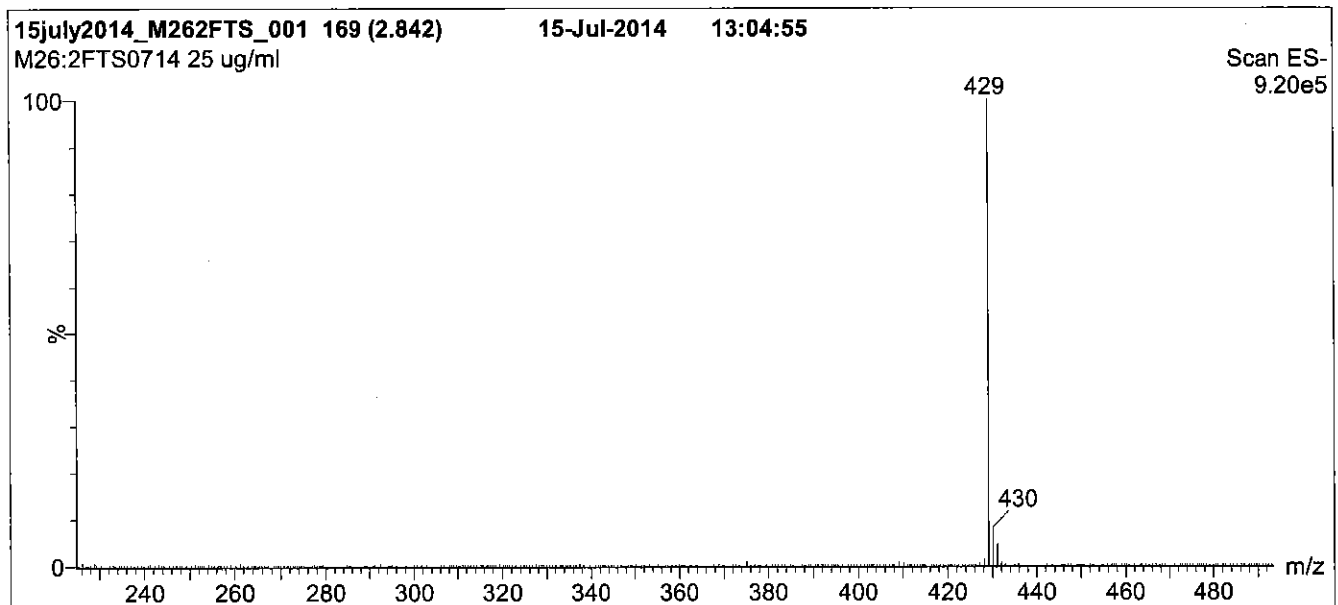
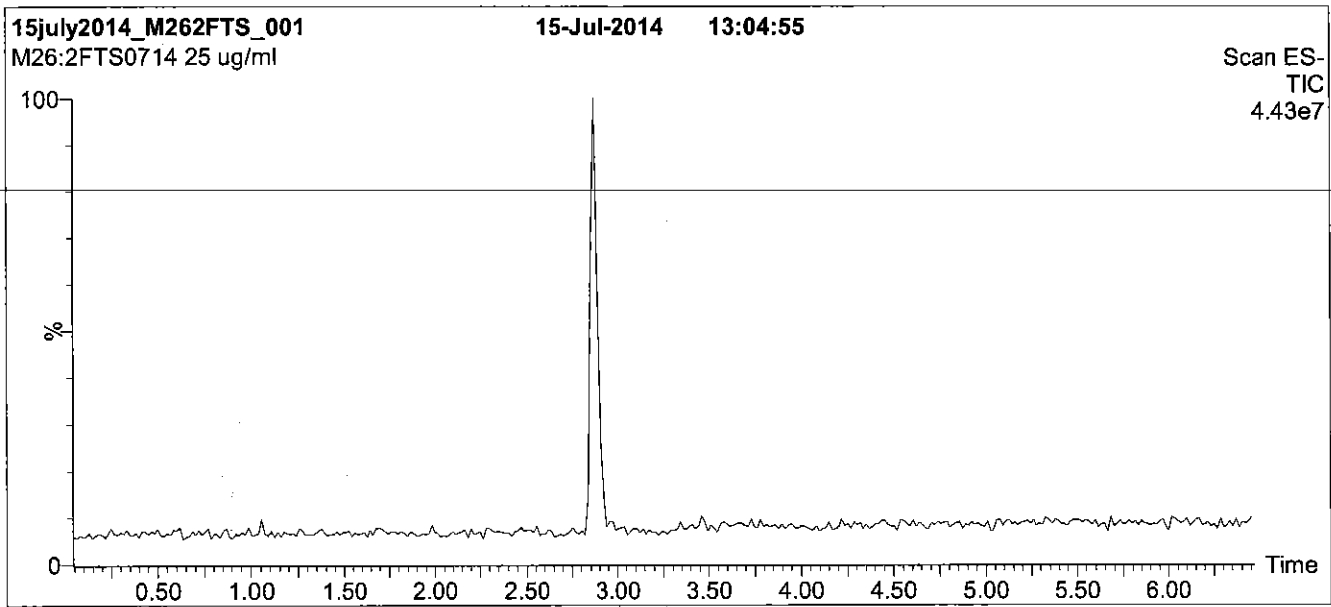
QUALITY MANAGEMENT:

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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 RP₁₈
1.7 μ m, 2.1 x 100 mm

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

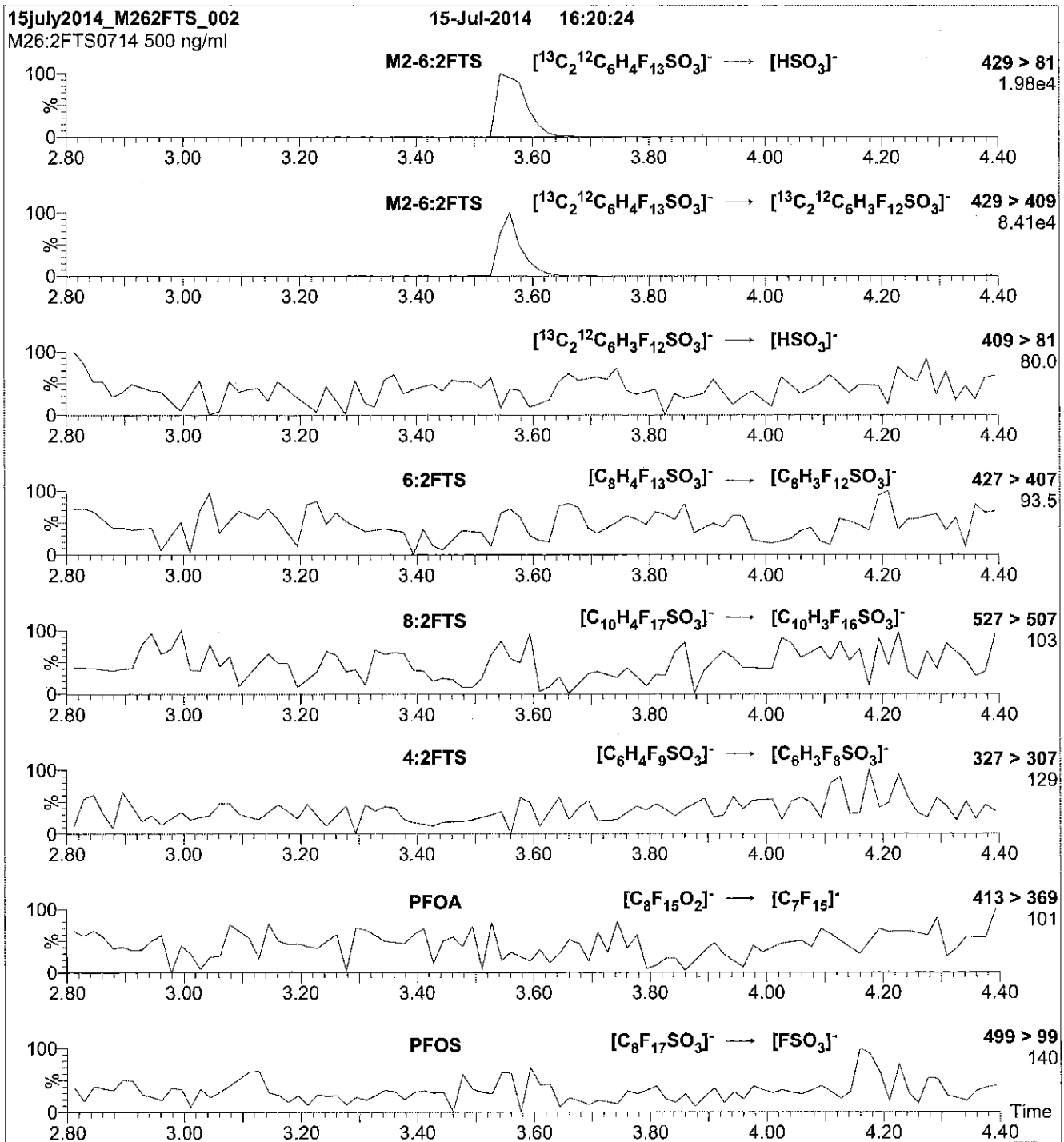
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 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 $\mu\text{l}/\text{min}$

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:F2S_00002
Exp: 01/08/21 Prod: CSW
M2-6:2F2S

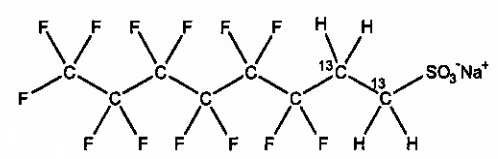


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2-6:2F2S **LOT NUMBER:** M262F2S0116
COMPOUND: Sodium 1H,1H,2H,2H-perfluoro-[1,2-¹³C₂]octane sulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₂¹²C₆H₄F₁₃SO₃Na **MOLECULAR WEIGHT:** 452.13
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt) **SOLVENT(S):** Methanol
47.5 ± 2.4 µg/ml (M2-6:2F2S anion)
CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99% ¹³C
LAST TESTED: (mm/dd/yyyy) 01/08/2016 (1,2-¹³C₂)
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 6:2F2S contains 4.22% of ³⁴S (due to natural isotopic abundance) therefore both native 6:2F2S and M2-6:2F2S 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 M2-6:2F2S during quantitative analysis as it will be free of any native contribution (see Figure 2).

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Certified By: 
B.G. Chittim **Date:** 01/11/2016
(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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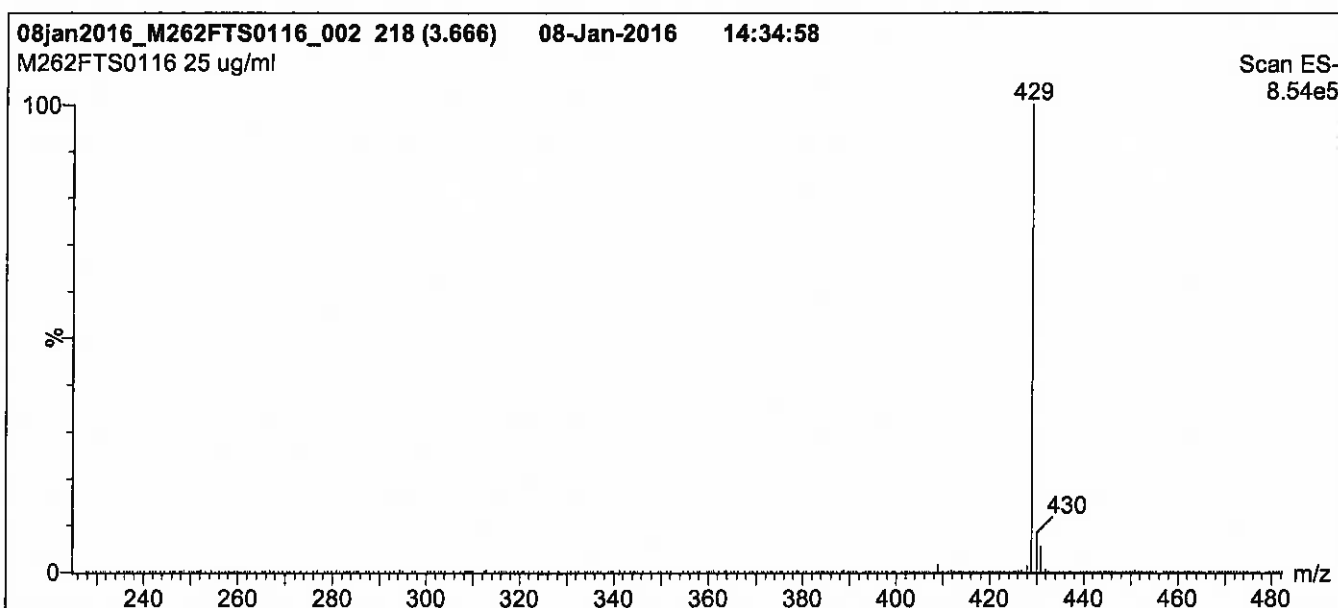
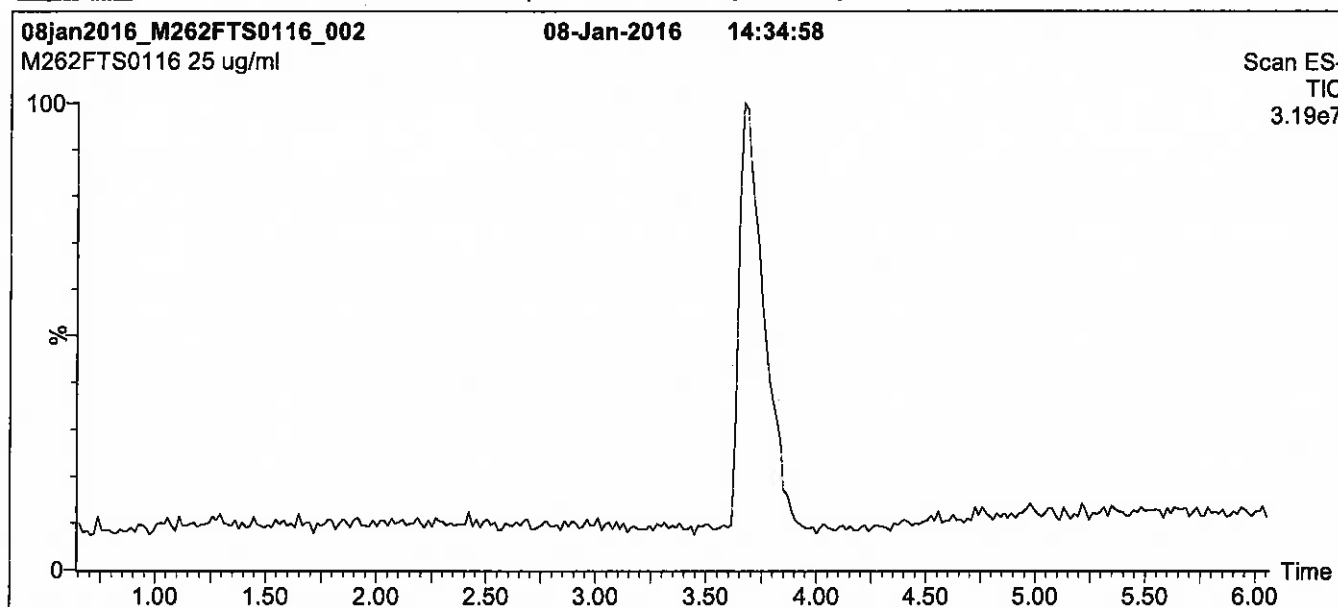
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Figure 1: M2-6:2FTS; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

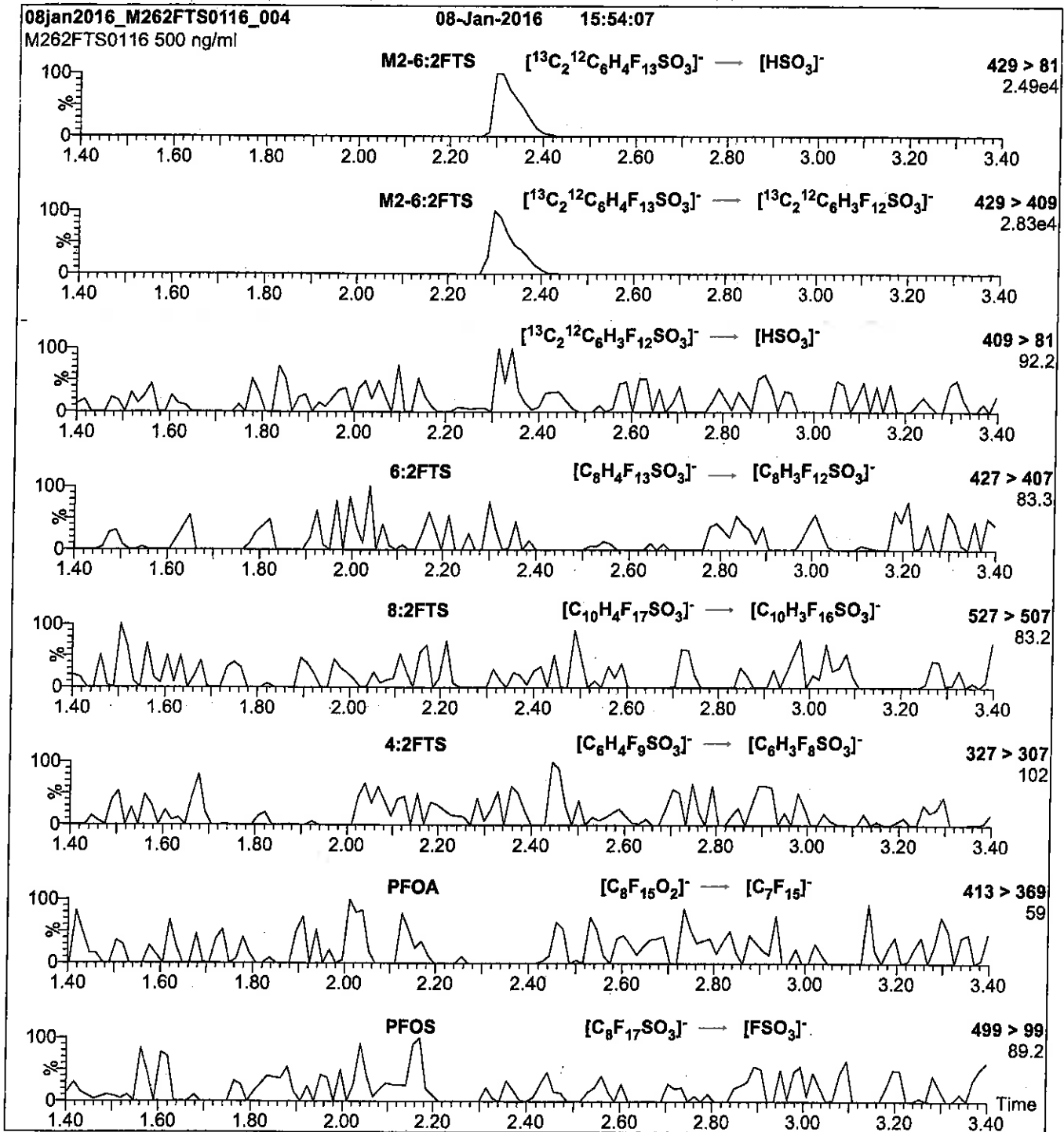
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

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

MS Parameters

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

Reagent

LCM2-8:2FTS_00001

r: 7/16/15 ✓
s: 7/22/15 STV

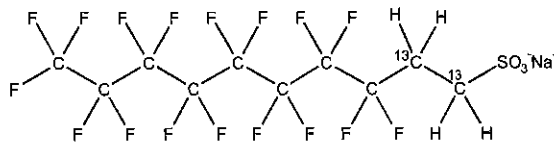


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2-8:2FTS **LOT NUMBER:** M282FTS0414
COMPOUND: Sodium 1H,1H,2H,2H-perfluoro-[1,2-¹³C₂]decane sulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₂¹²C₈H₄F₁₇SO₃Na **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% ¹³C
LAST TESTED: (mm/dd/yyyy) 04/13/2014 (1,2-¹³C₂)
EXPIRY DATE: (mm/dd/yyyy) 04/13/2017
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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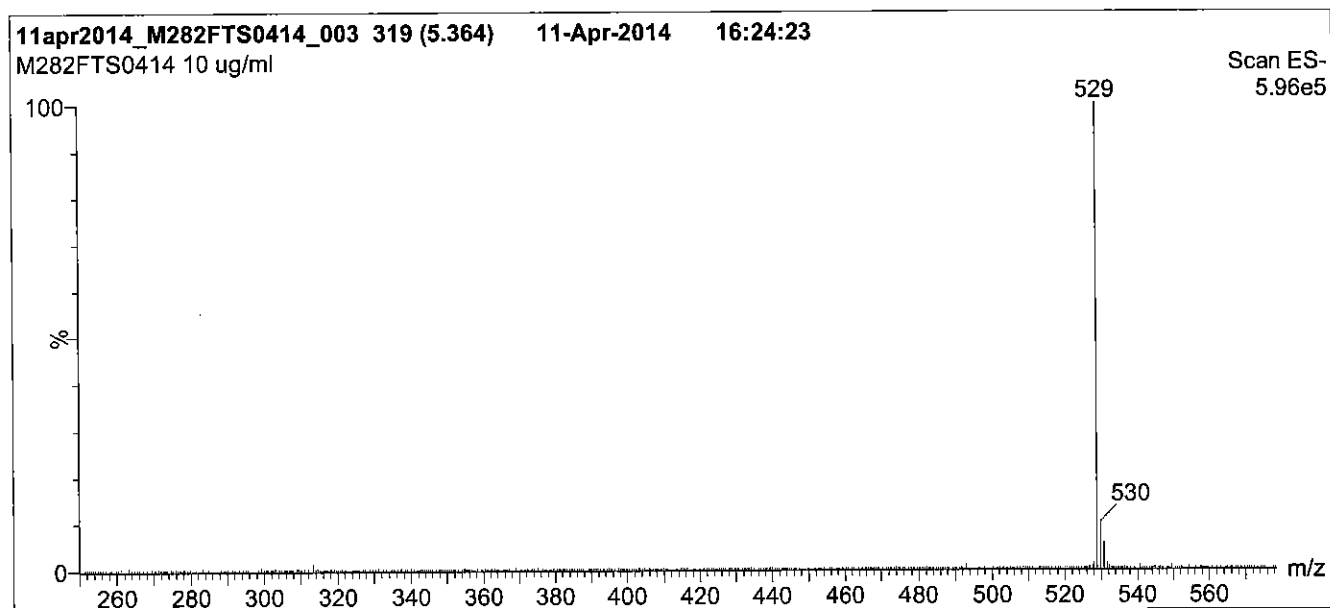
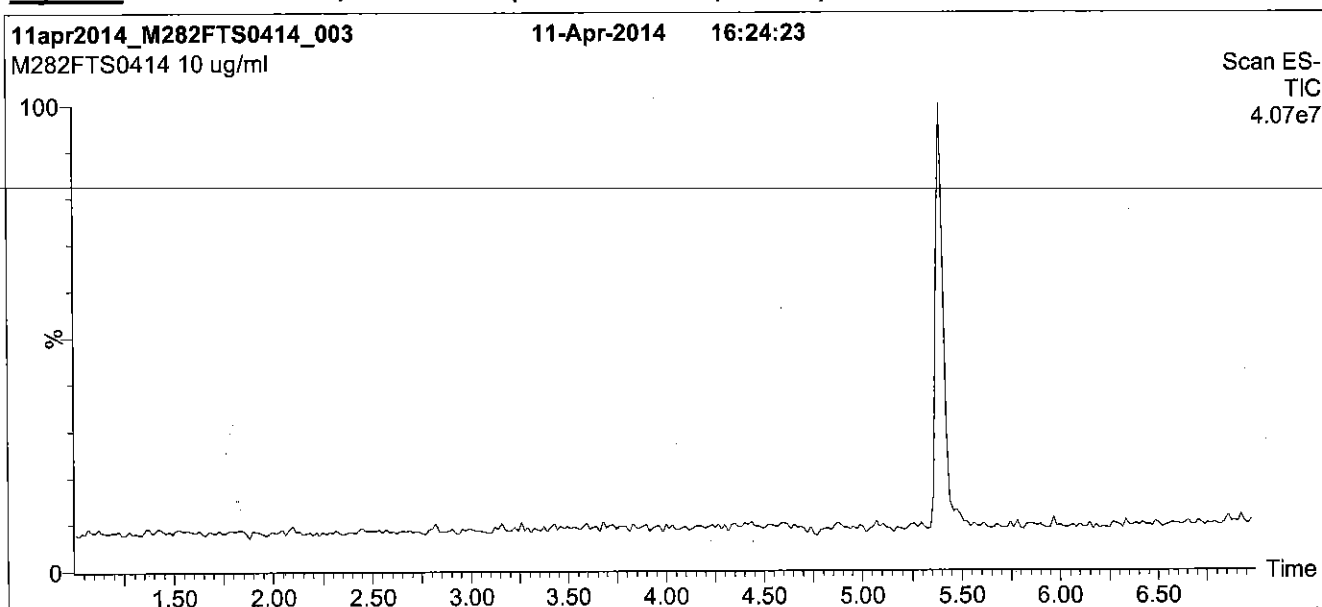
QUALITY MANAGEMENT:

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



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

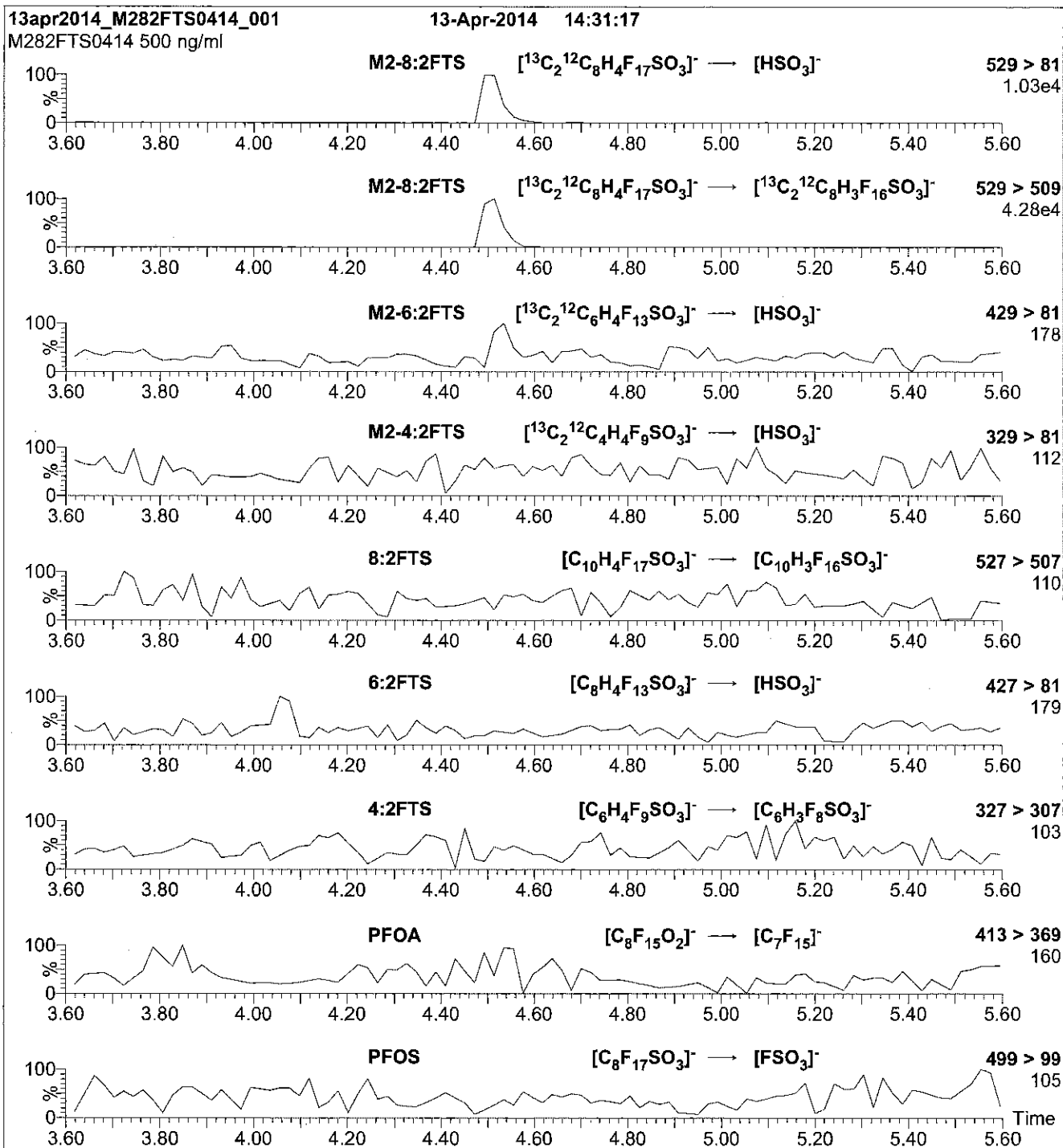
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (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 $\mu\text{l}/\text{min}$

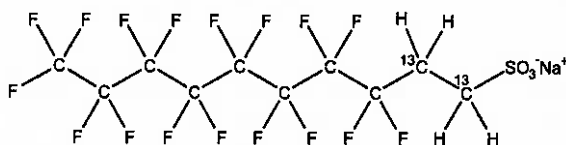
MS Parameters

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

Reagent

LCM2-8:2FTS_00002

R: 7/6/16 CBW

671602
ID: LCM2-8:2FTS_00002
Exp: 01/08/21 Prod: 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-[1,2-¹³C₂]decane sulfonate**STRUCTURE:** **CAS #:** Not available

MOLECULAR FORMULA:	¹³ C ₂ ¹² C ₈ H ₄ F ₁₇ SO ₃ Na	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)	ISOTOPIC PURITY:	≥99% ¹³ C
CHEMICAL PURITY:	>98%		(1,2- 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 ³⁴S (due to natural isotopic abundance) therefore both native 8:2FTS and M2-8:2FTS will produce signals in the m/z 529 to m/z 509 channel during SRM analysis. We recommend using the m/z 529 to m/z 81 transition to monitor for M2-8:2FTS during quantitative analysis as it will be free of any native contribution (see Figure 2).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim
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:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

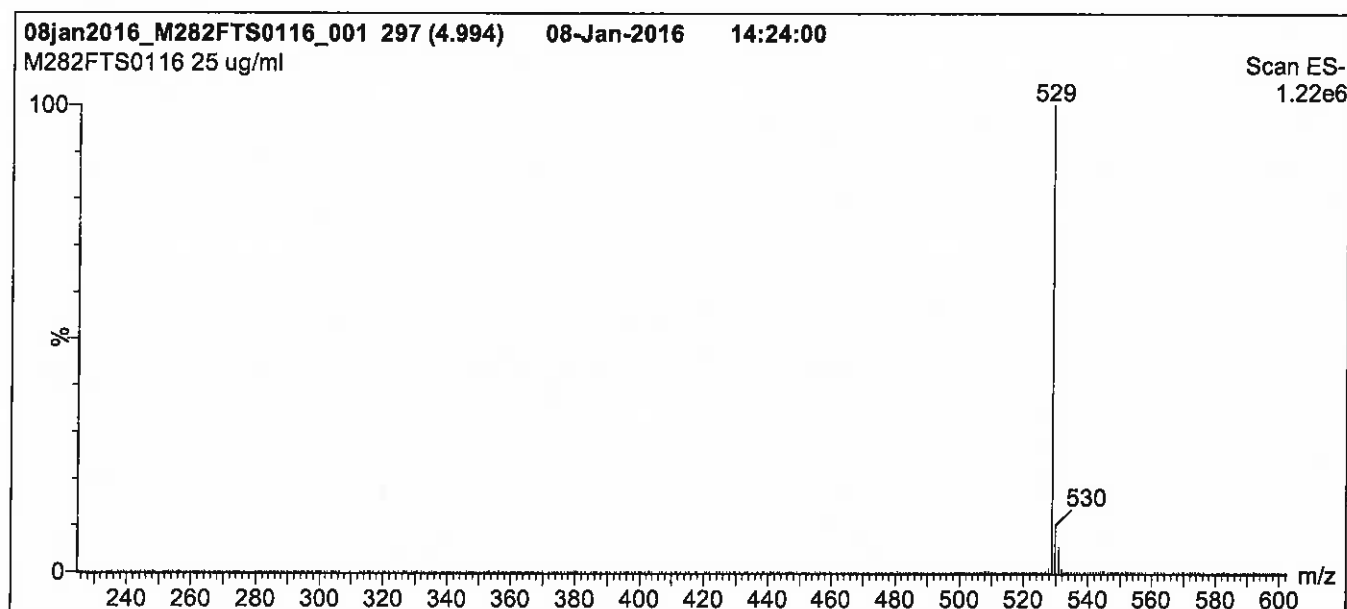
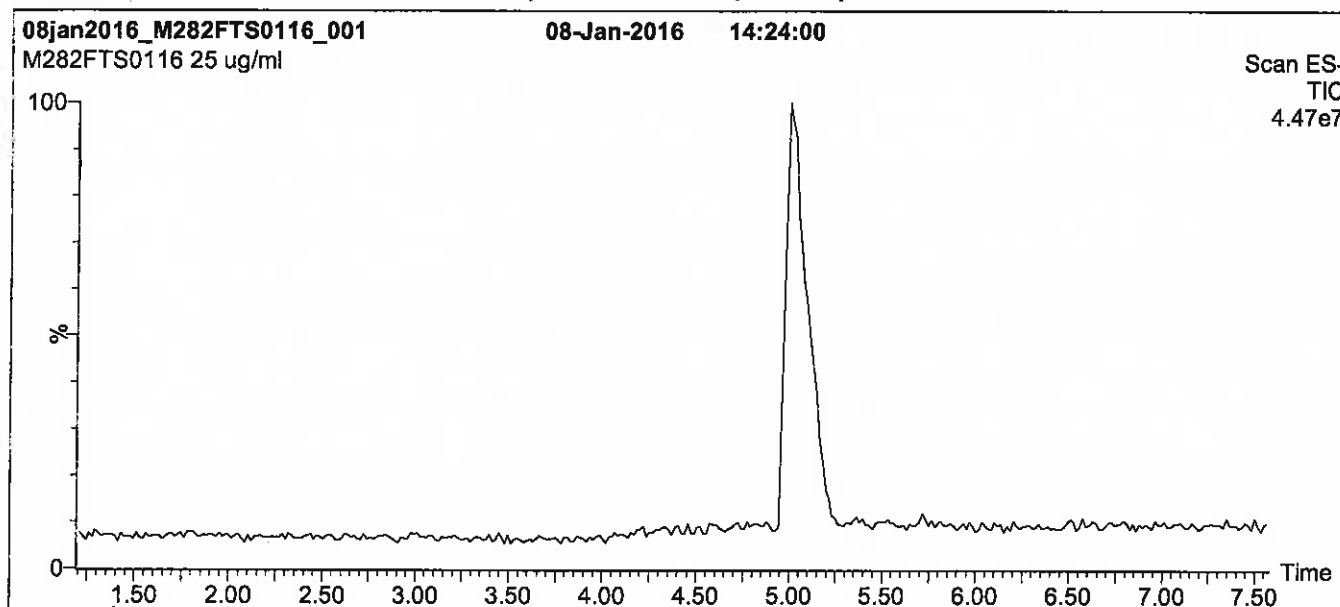
QUALITY MANAGEMENT:

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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 RP₁₈
1.7 μ m, 2.1 x 100 mm

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

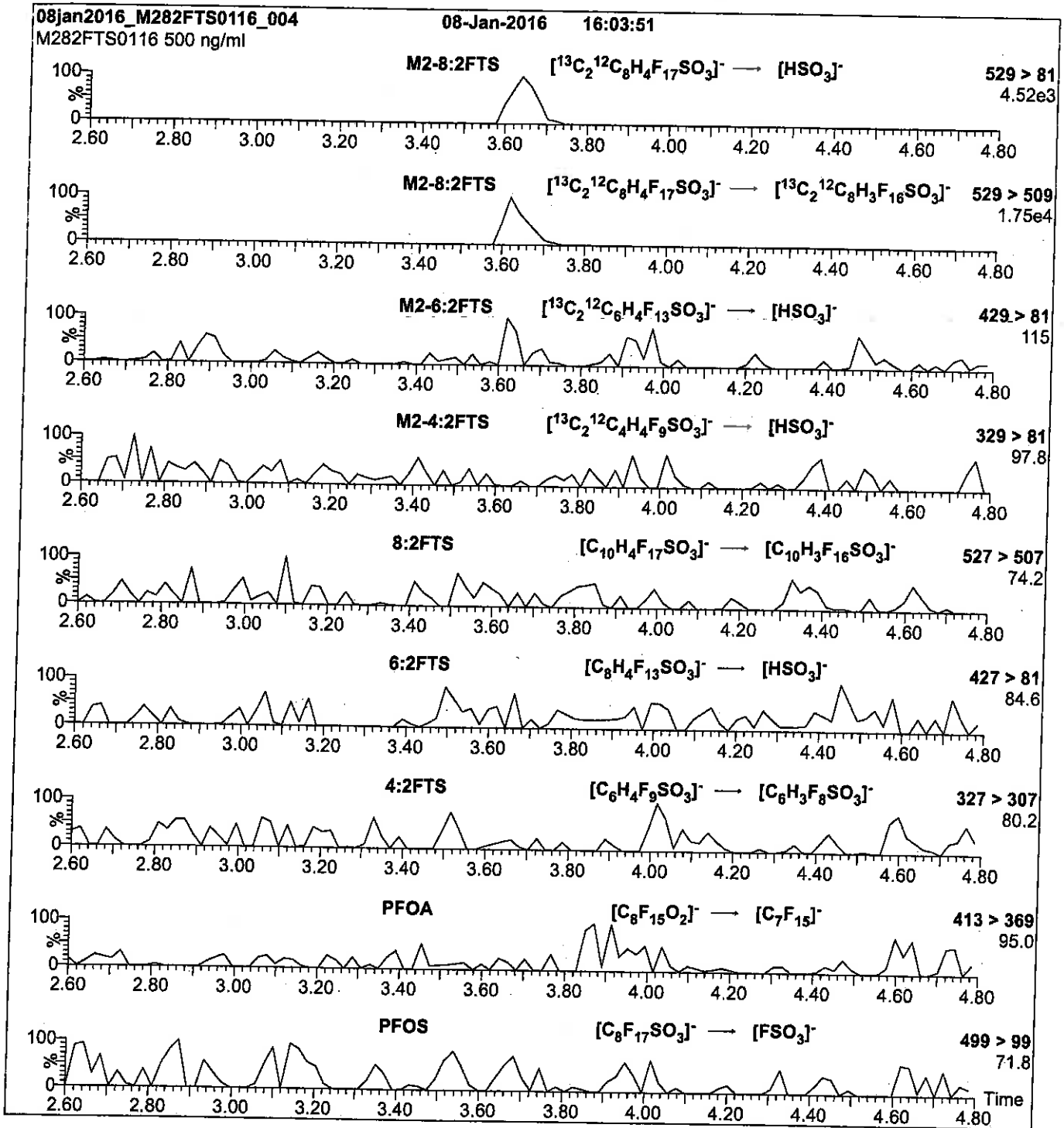
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

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

MS Parameters

Collision Gas (mbar) = $3.20\text{e-}3$
Collision Energy (eV) = 30

Reagent

LCM2PFHxDA_00008

R: SBC 9/22/16

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

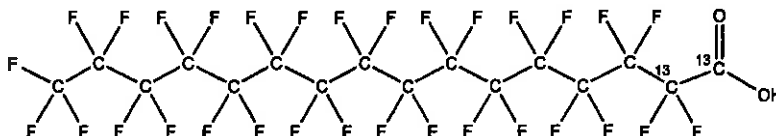


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2PFHxDA **LOT NUMBER:** M2PFHxDA1112
COMPOUND: Perfluoro-n-[1,2-¹³C₂]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- 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)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.3% of native perfluoro-n-hexadecanoic acid.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:  **Date:** 01/11/2016
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:

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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, \dots, x_n on which it depends is:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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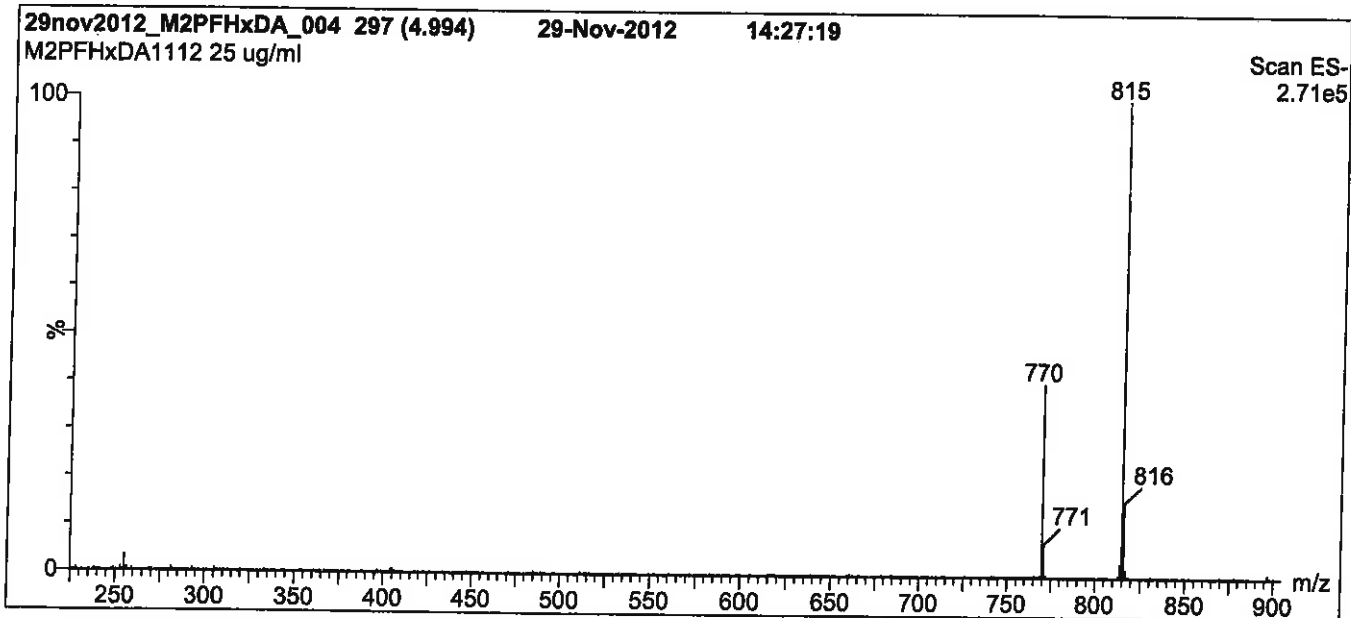
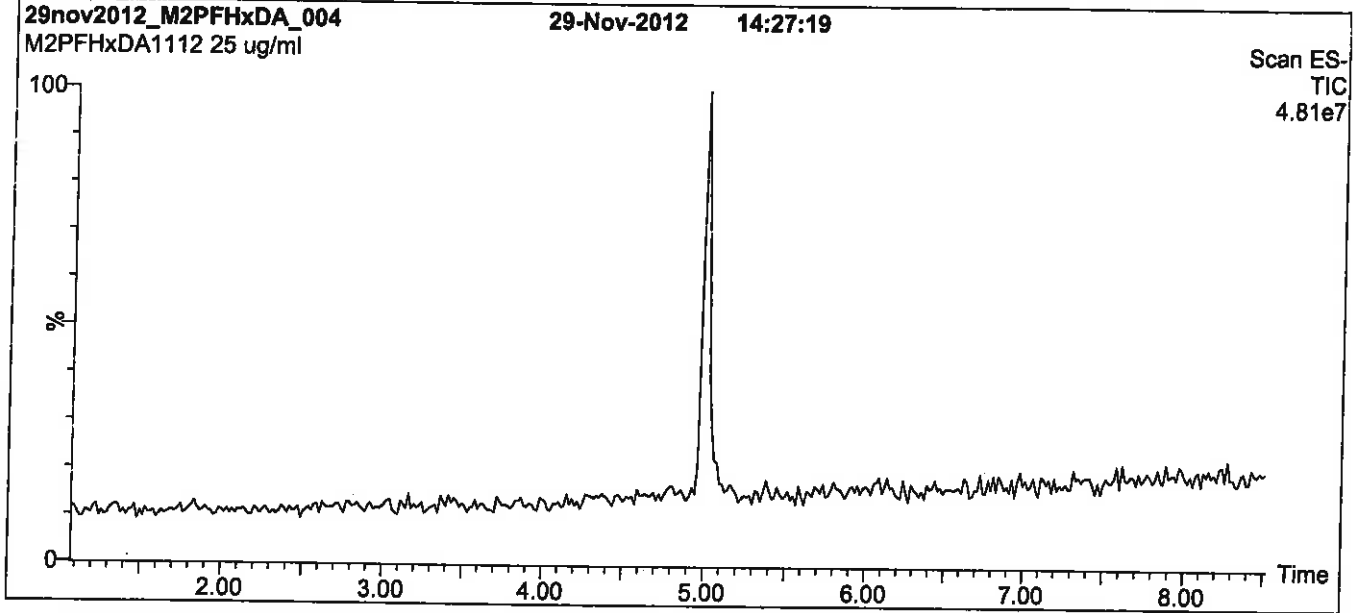
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
 Start: 60% (80:20 MeOH:ACN) / 40% H₂O
 (both with 10 mM NH₄OAc 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

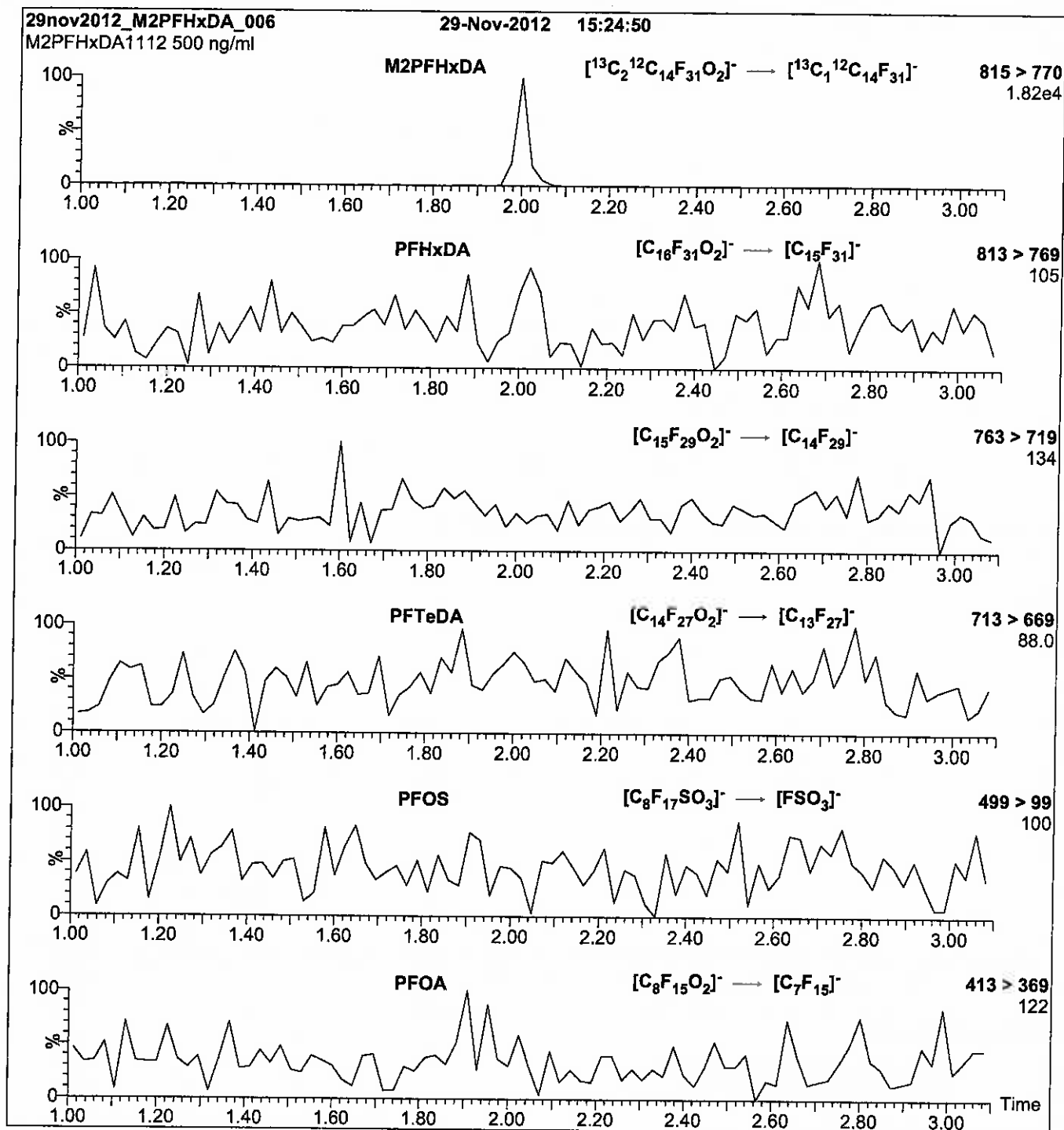
Flow: 300 μ l/min

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 $\mu\text{l}/\text{min}$

MS Parameters

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

Reagent

LCM2PFTeDA_00007

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

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

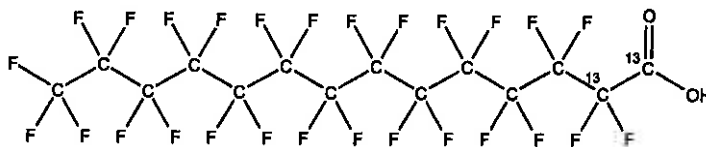


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2PFTeDA **LOT NUMBER:** M2PFTeDA1115
COMPOUND: Perfluoro-n-[1,2-¹³C₂]tetradecanoic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₂¹²C₁₂HF₂₇O₂ **MOLECULAR WEIGHT:** 716.10
CONCENTRATION: 50 ± 2.5 µg/ml **SOLVENT(S):** Methanol
Water (<1%)
CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99% ¹³C
(1,2-¹³C₂)
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
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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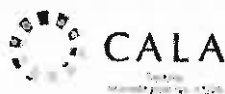
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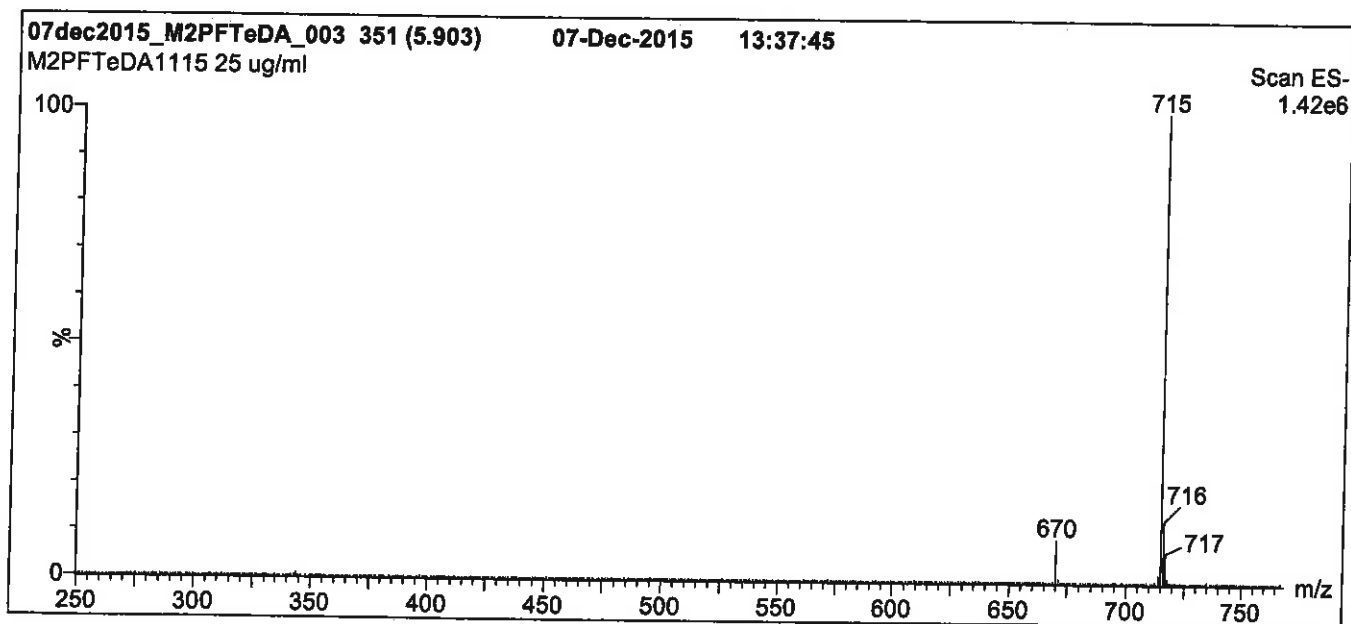
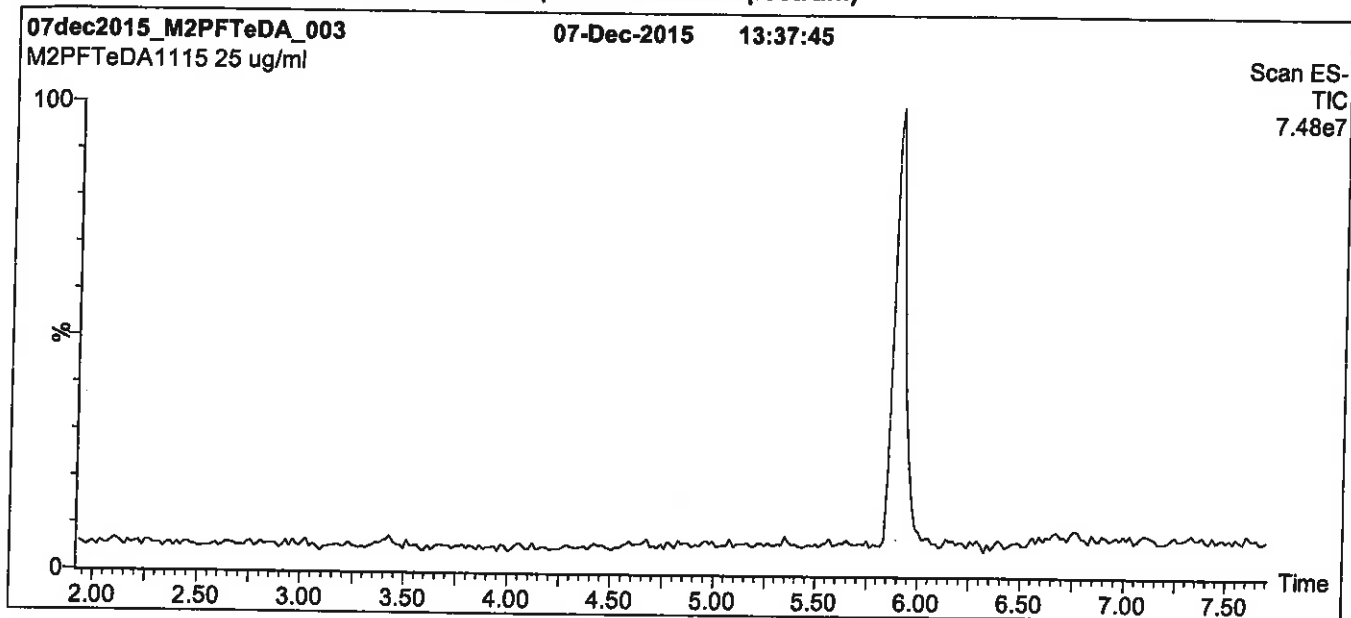
QUALITY MANAGEMENT:

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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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

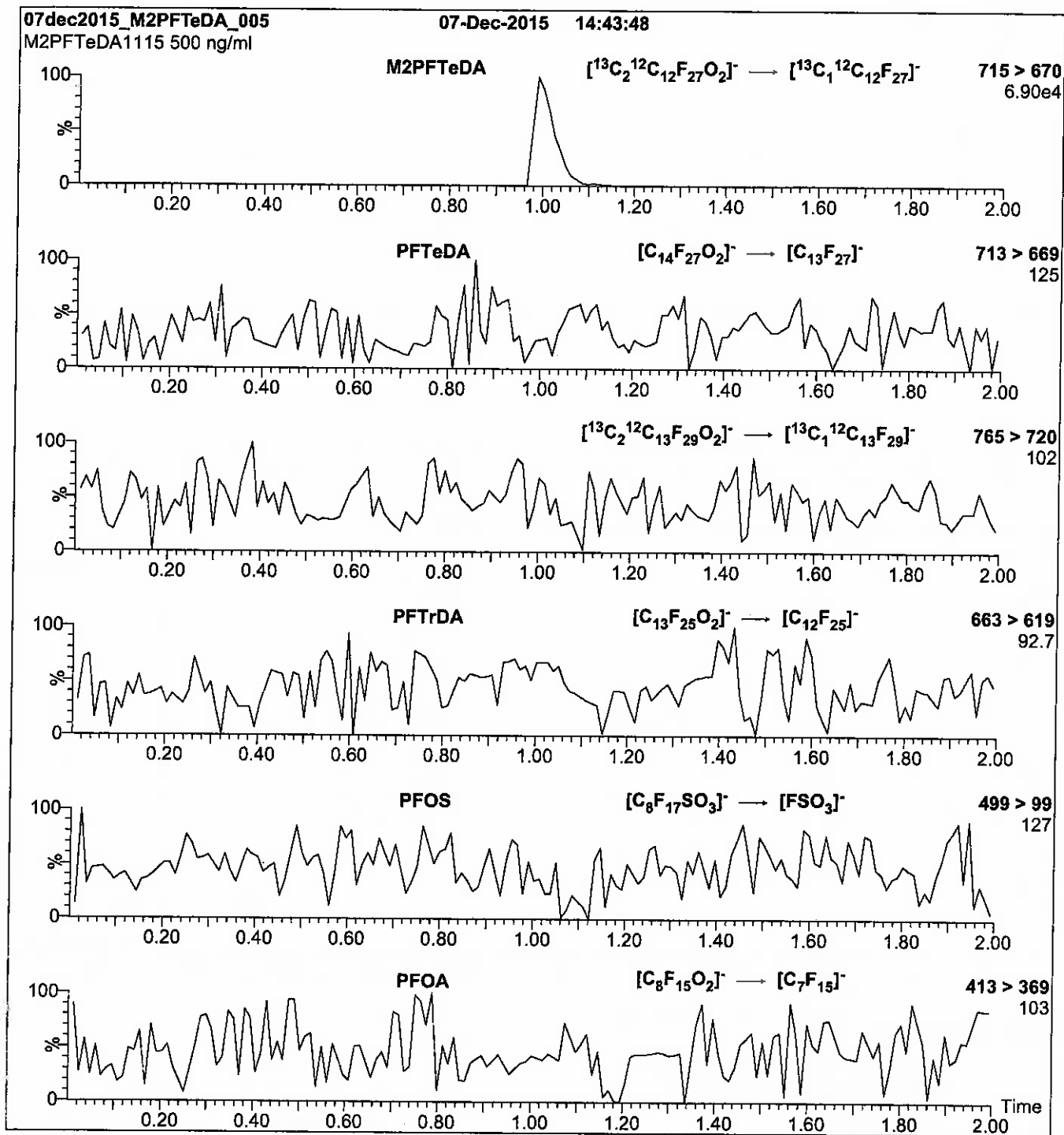
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (250 - 1250 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 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 $\mu\text{l}/\text{min}$

MS Parameters

Collision Gas (mbar) = $3.28\text{e-}3$
Collision Energy (eV) = 14

Reagent

LCM4PFHPA_00007

f: SBC a/22/16

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



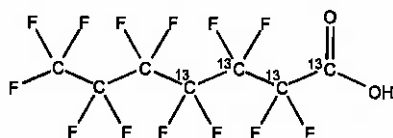
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

Scanned 10/14/16 SK

PRODUCT CODE: M4PFHpA **LOT NUMBER:** M4PFHpA0516
COMPOUND: Perfluoro-n-[1,2,3,4-¹³C₄]heptanoic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₄¹²C₃HF₁₃O₂
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 368.03
SOLVENT(S): Methanol
Water (<1%)
ISOTOPIC PURITY: ≥99%¹³C
(1,2,3,4-¹³C₄)

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:** 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:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

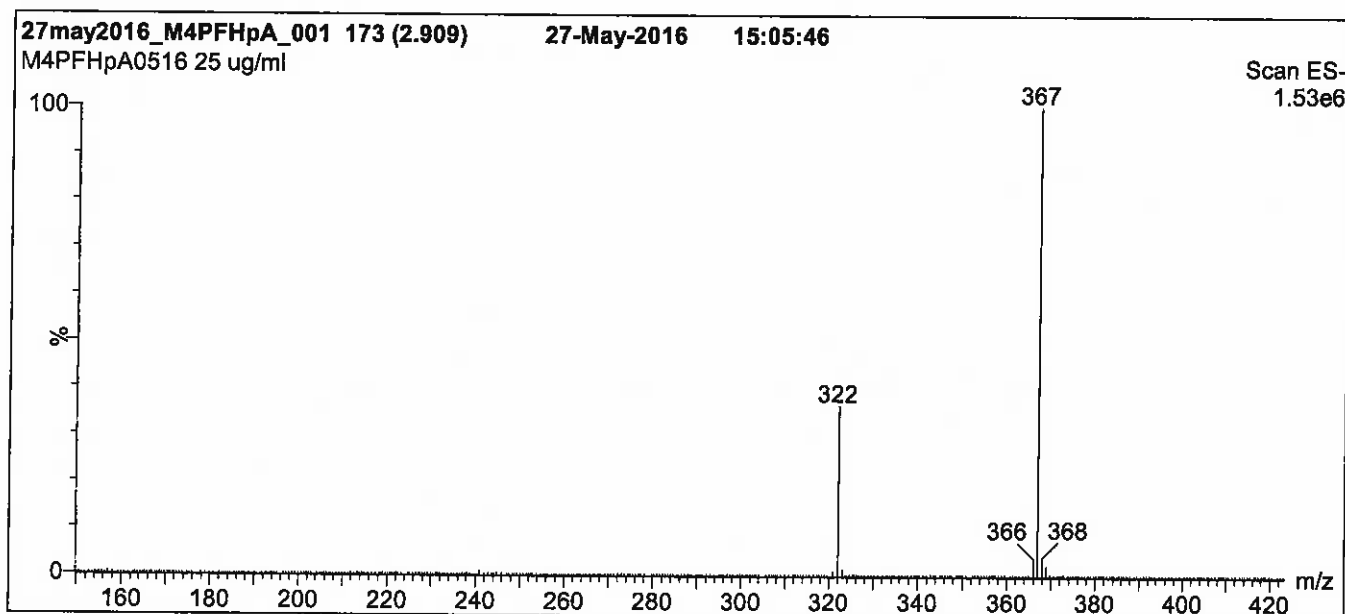
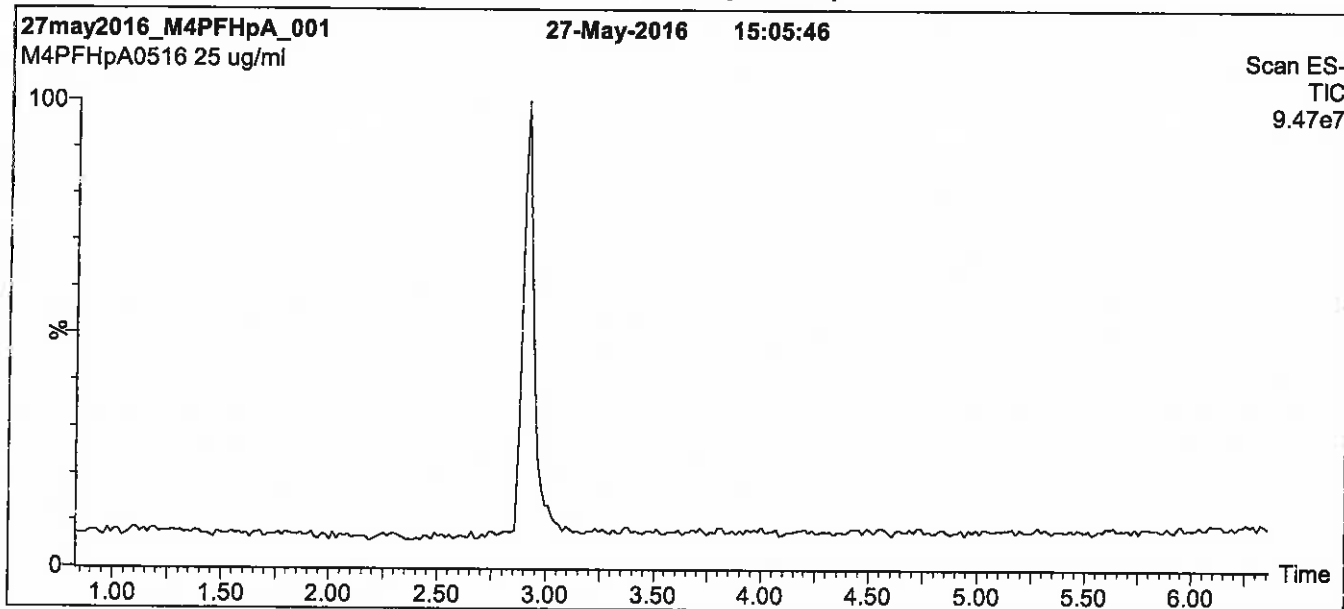
QUALITY MANAGEMENT:

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



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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 RP₁₈
1.7 μ m, 2.1 x 100 mm

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

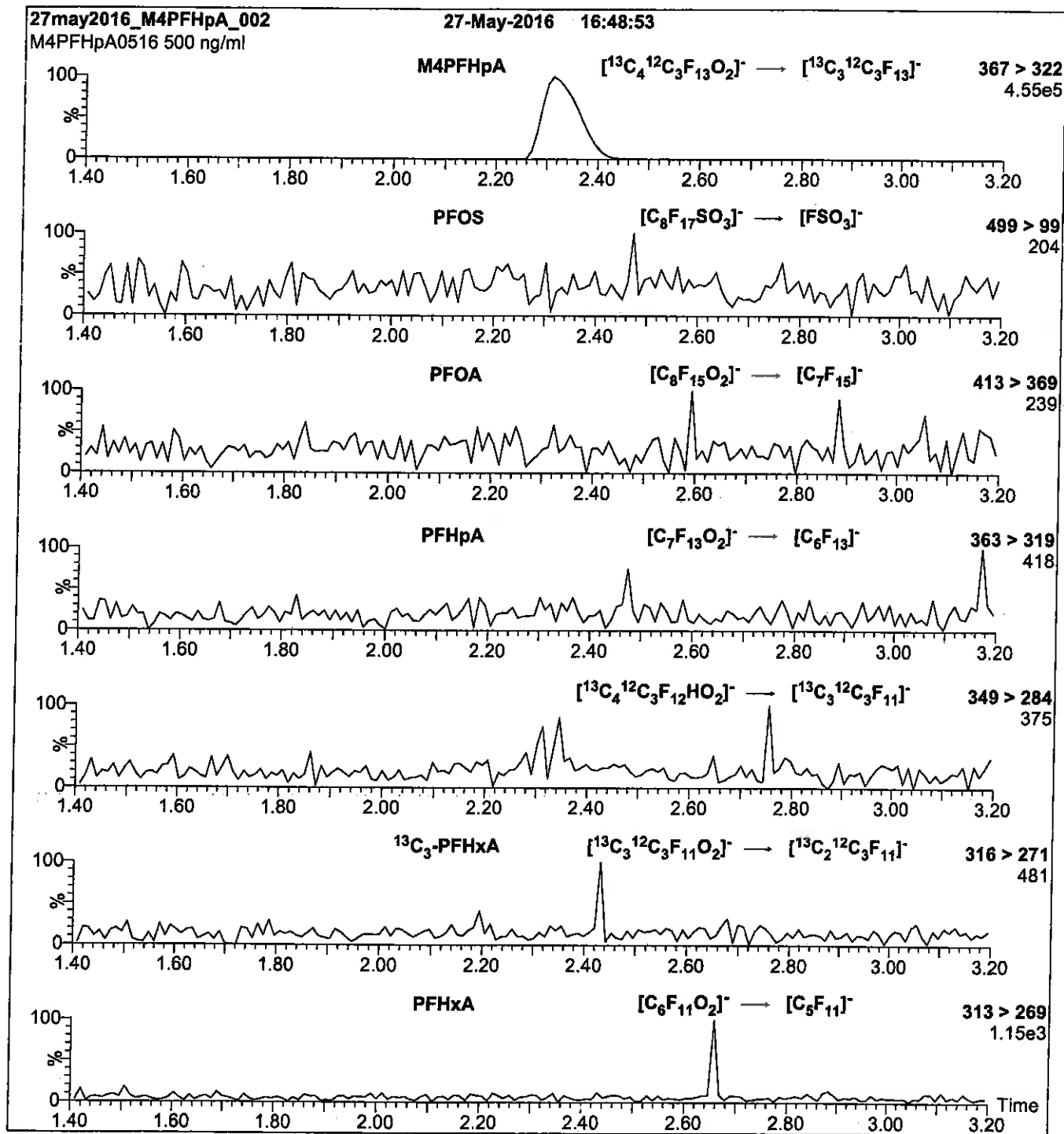
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

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

MS Parameters

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

Reagent

LCM5PFPEA_00008

R: 8BC 9/22/16



739590

ID: LCM5PFPEA_00008

Exp: 05/22/20 Prpt: SAC

¹³C₅-Perfluoropentanoic a



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CERTIFICATE OF ANALYSIS
DOCUMENTATION

Scanned 10/14/16 SR

PRODUCT CODE:

M5PFPeA

LOT NUMBER:

M5PFPeA0515

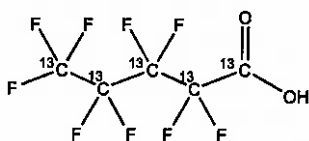
COMPOUND:

Perfluoro-n-[¹³C₅]pentanoic acid

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

¹³C₅HF₉O₂

MOLECULAR WEIGHT:

269.01

CONCENTRATION:

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

≥99% ¹³C

LAST TESTED: (mm/dd/yyyy)

05/22/2015

(¹³C₅)

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)

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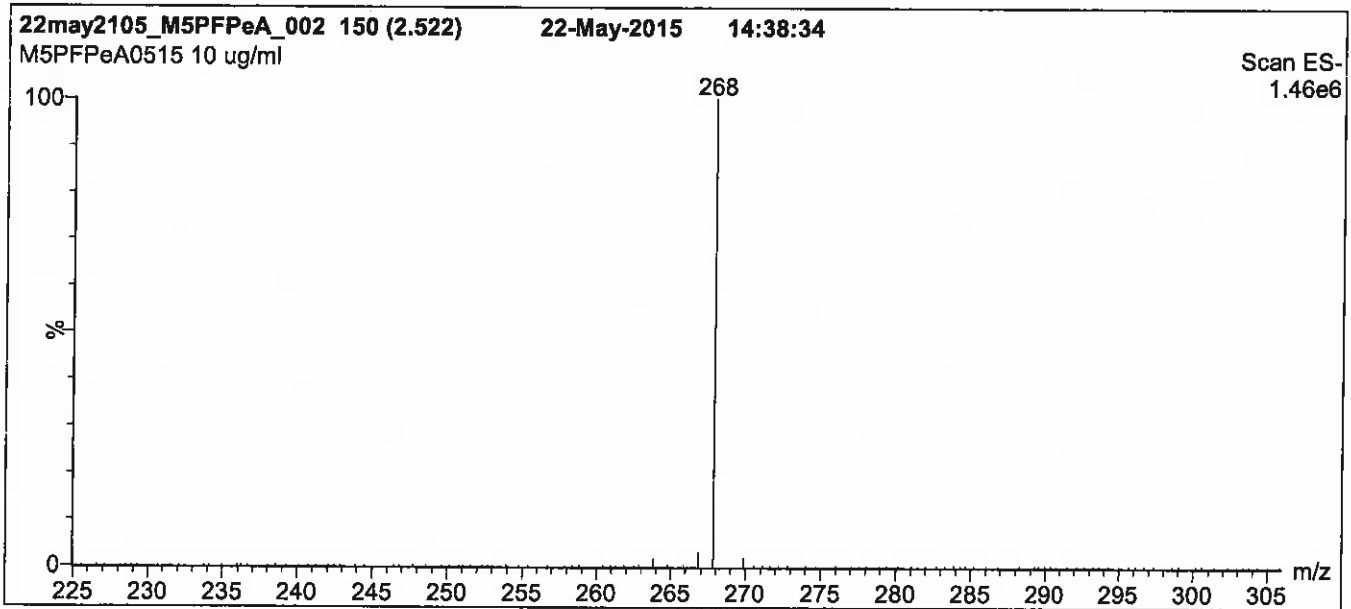
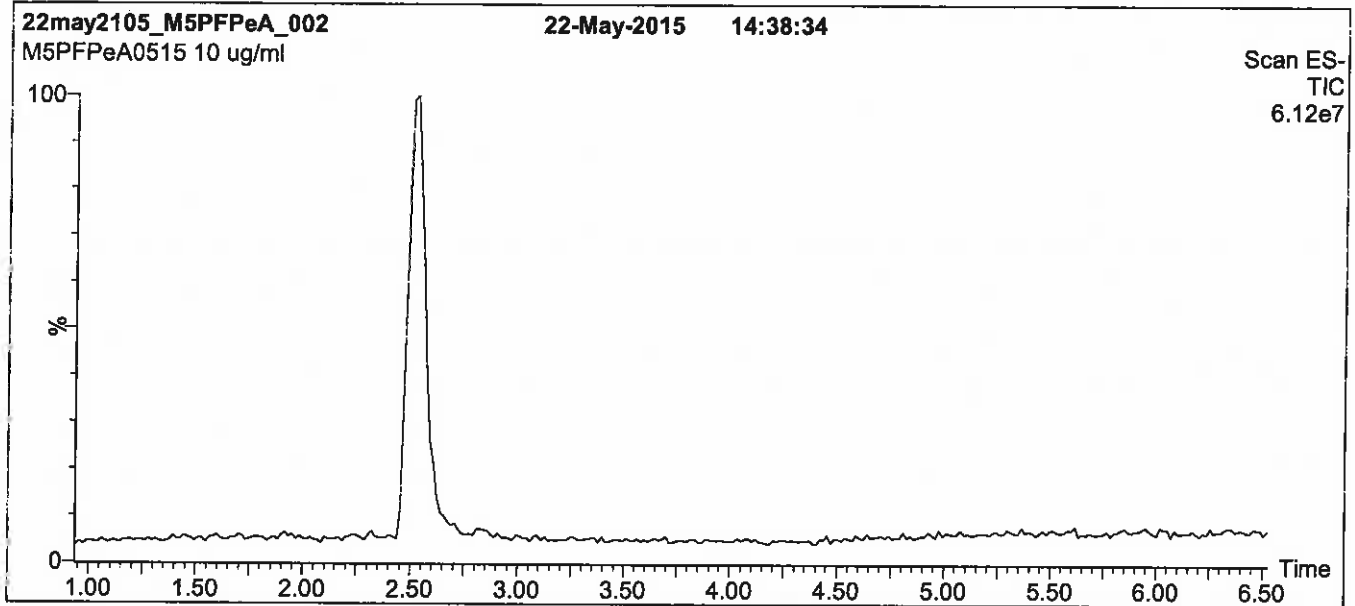
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

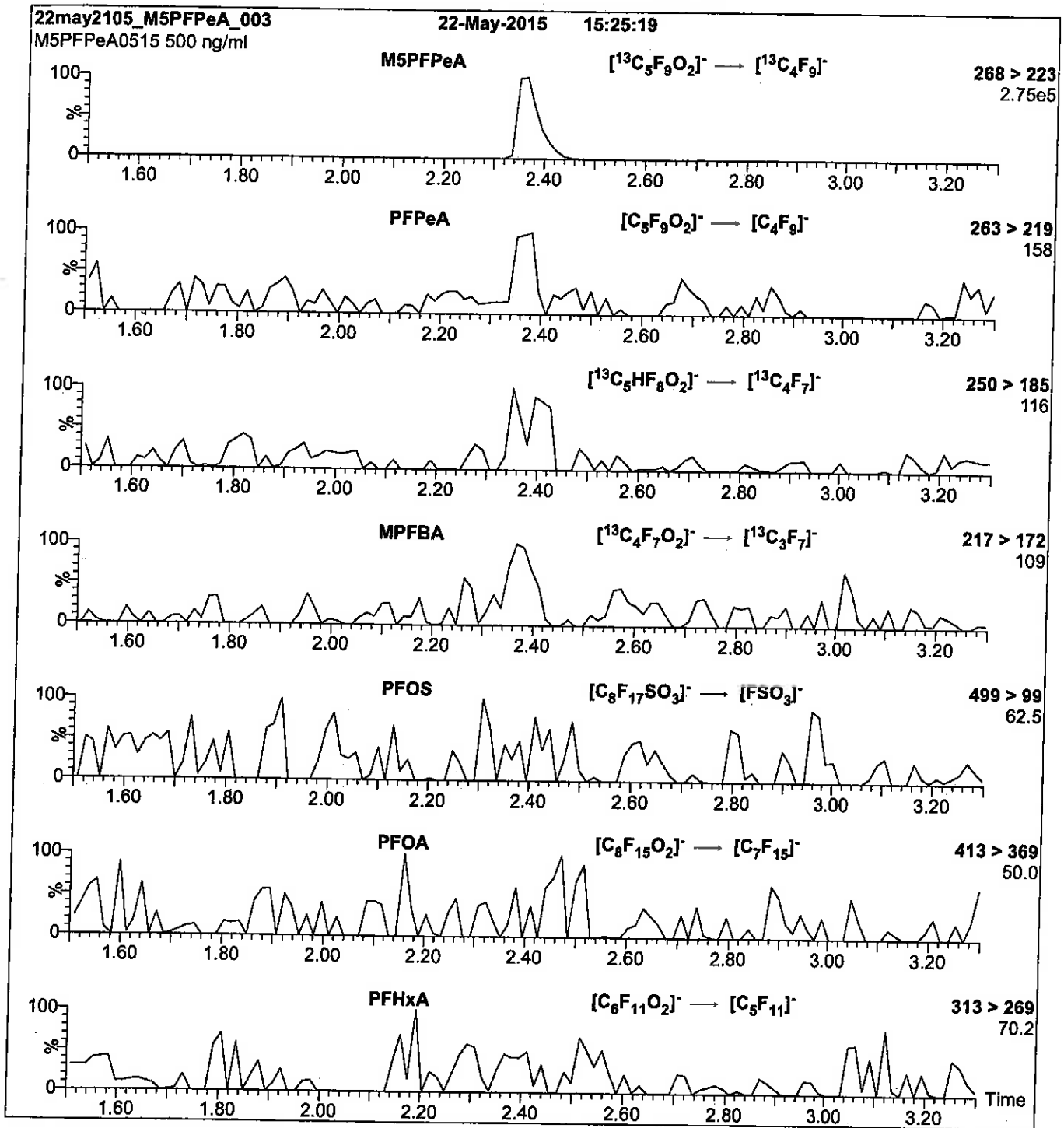
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

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

MS Parameters

Collision Gas (mbar) = $3.35\text{e-}3$
 Collision Energy (eV) = 9

Reagent

LCM8FOSA_00011

R: SBC
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9/22/16



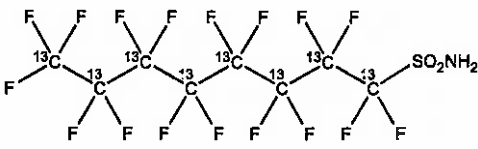
739615
ID: LCM8FOSA_00011
Exp: 12/22/17 Prod: SBC
13C8-Perfluorooctanesulfo



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M8FOSA-I **LOT NUMBER:** M8FOSA1215I
COMPOUND: Perfluoro-1-[¹³C]₈octanesulfonamide
STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₈H₂F₁₇NO₂S **MOLECULAR WEIGHT:** 507.09
CONCENTRATION: 50 ± 2.5 µg/ml **SOLVENT(S):** Isopropanol
CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99% ¹³C
LAST TESTED: (mm/dd/yyyy) 12/22/2015 (¹³C₈)
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:  **Date:** 01/14/2016
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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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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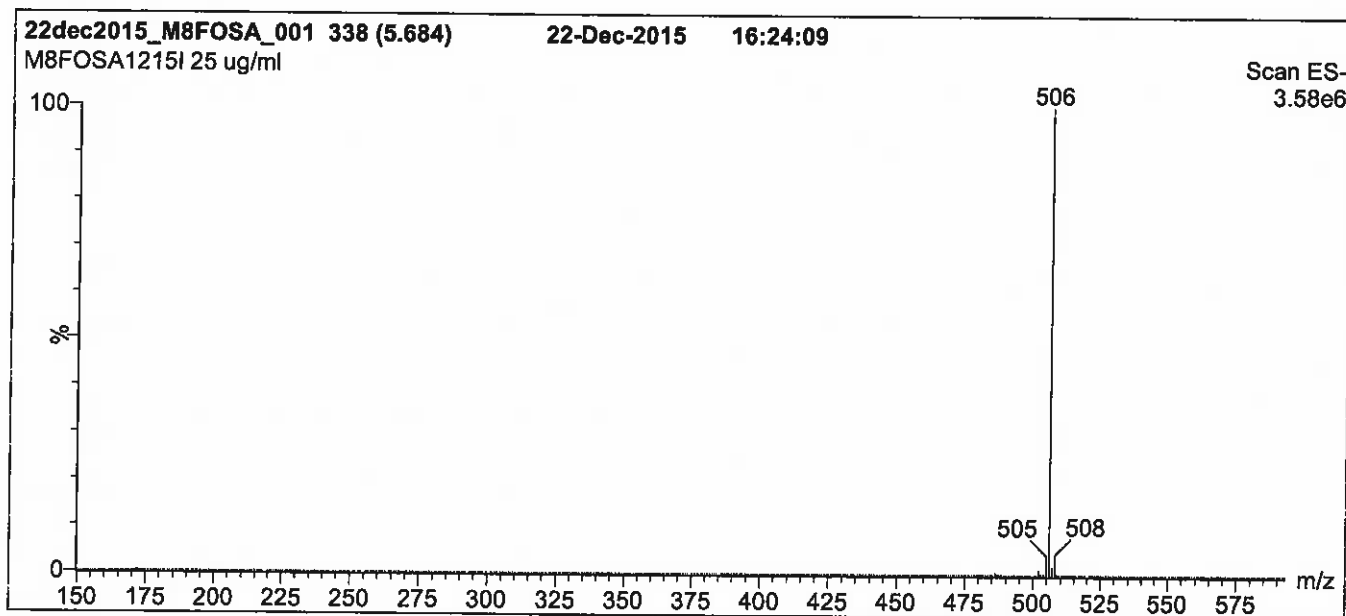
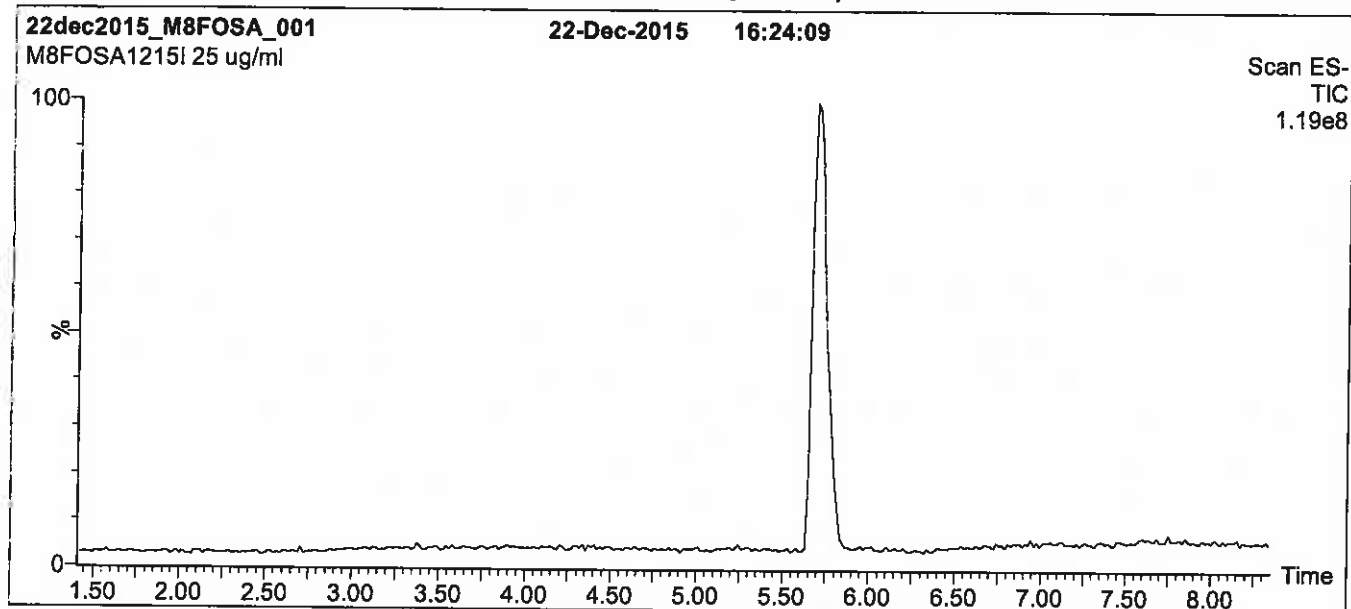
QUALITY MANAGEMENT:

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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 RP₁₈
1.7 μ m, 2.1 x 100 mm

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

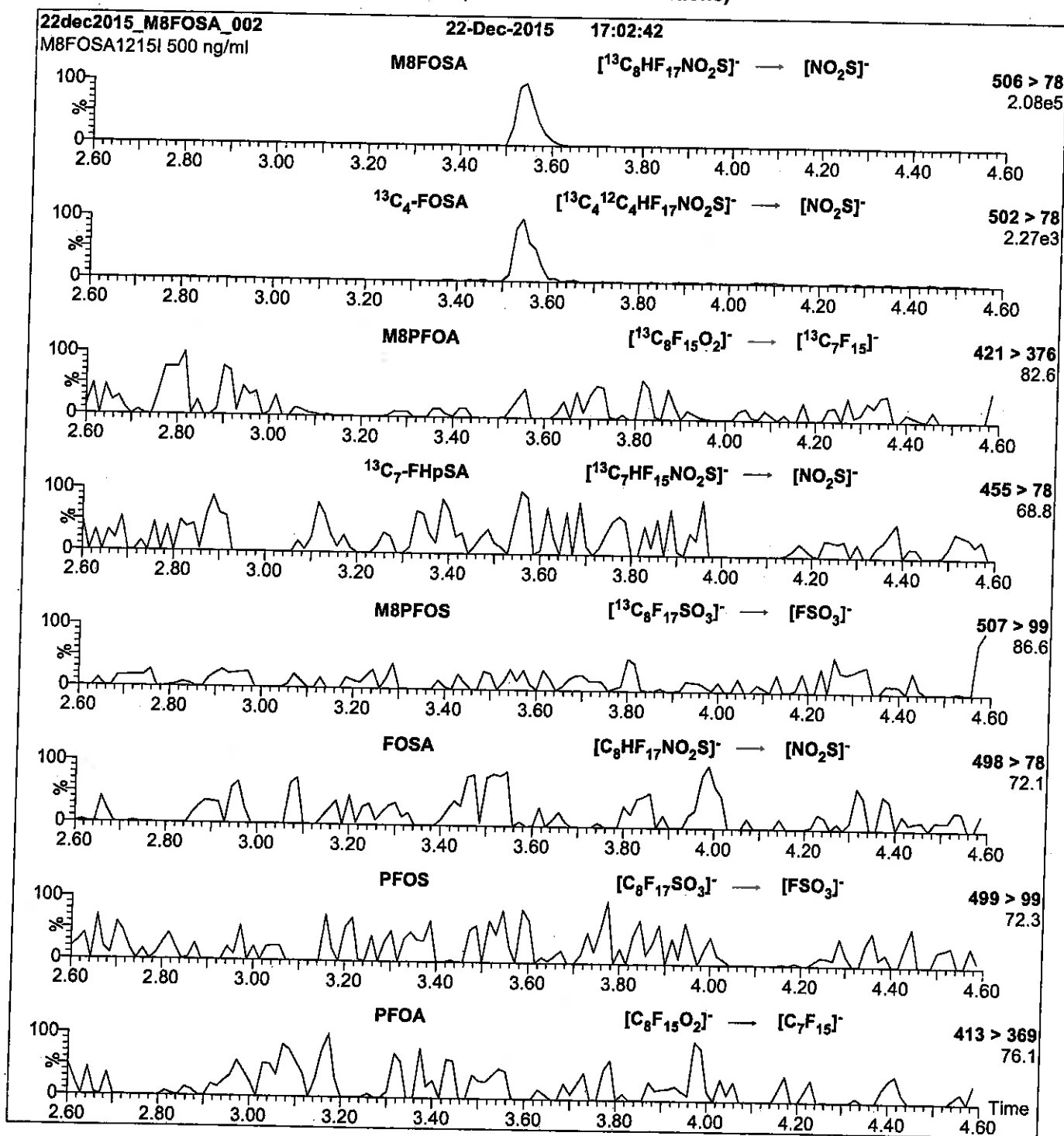
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

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

MS Parameters

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

Reagent

LCMPFBA_00008

R: 8BC 9/22/16



739593

ID: LCMFBA_00008

Exp: 05/24/21 Prep: SEC

¹³C4-Perfluorobutanoic ac



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

Scanned 10/14/16 SP

PRODUCT CODE:

MPFBA

LOT NUMBER:

MPFBA0516

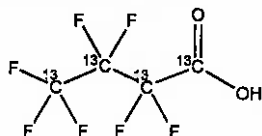
COMPOUND:

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

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

¹³C₄HF₈O₂

MOLECULAR WEIGHT:

218.01

CONCENTRATION:

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

≥99%¹³C

LAST TESTED: (mm/dd/yyyy)

05/24/2016

(1,2,3,4-¹³C₄)

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)

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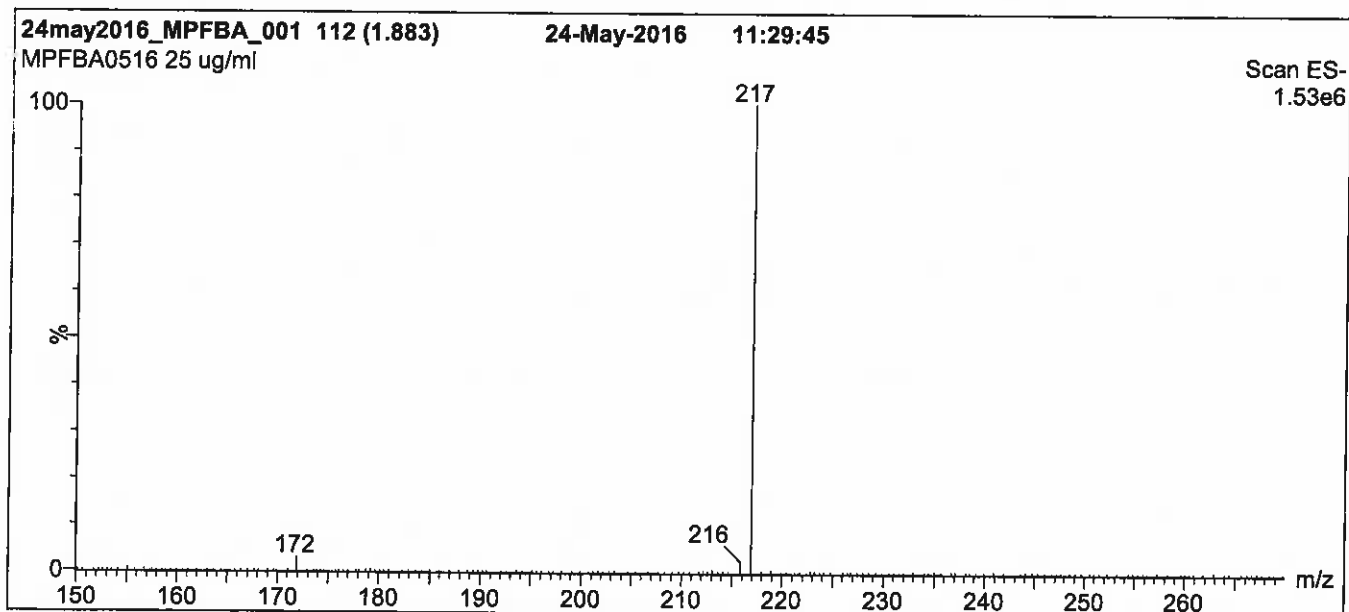
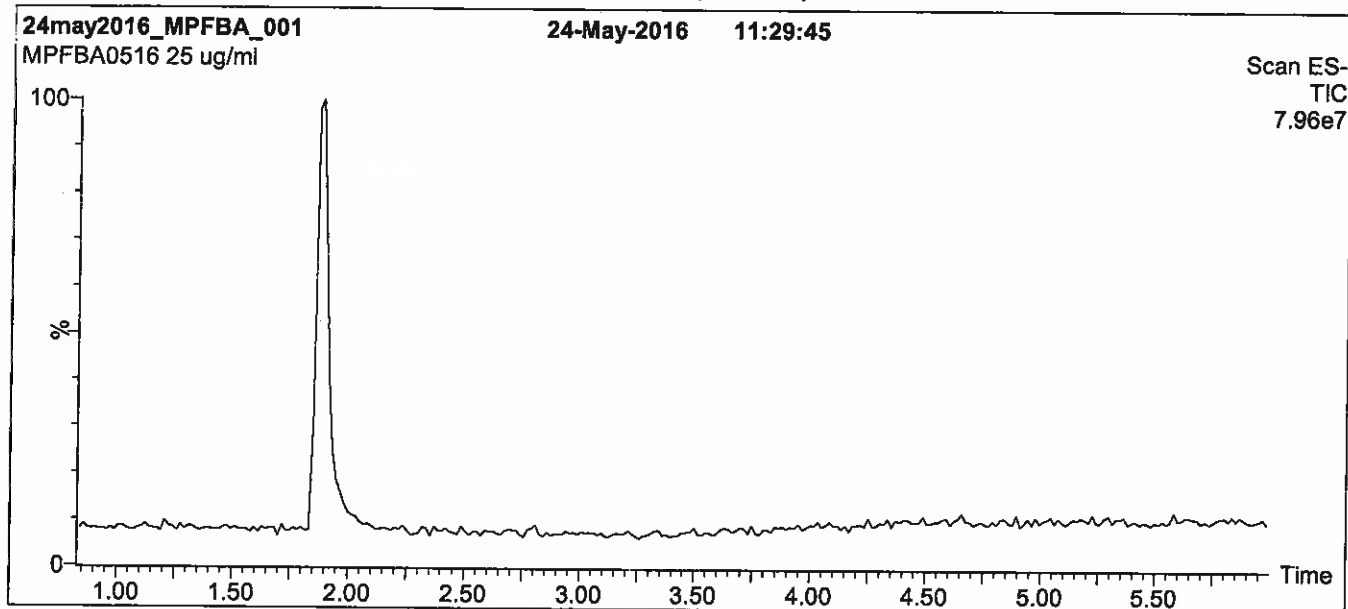
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For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

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



Conditions for Figure 1:

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

Chromatographic Conditions

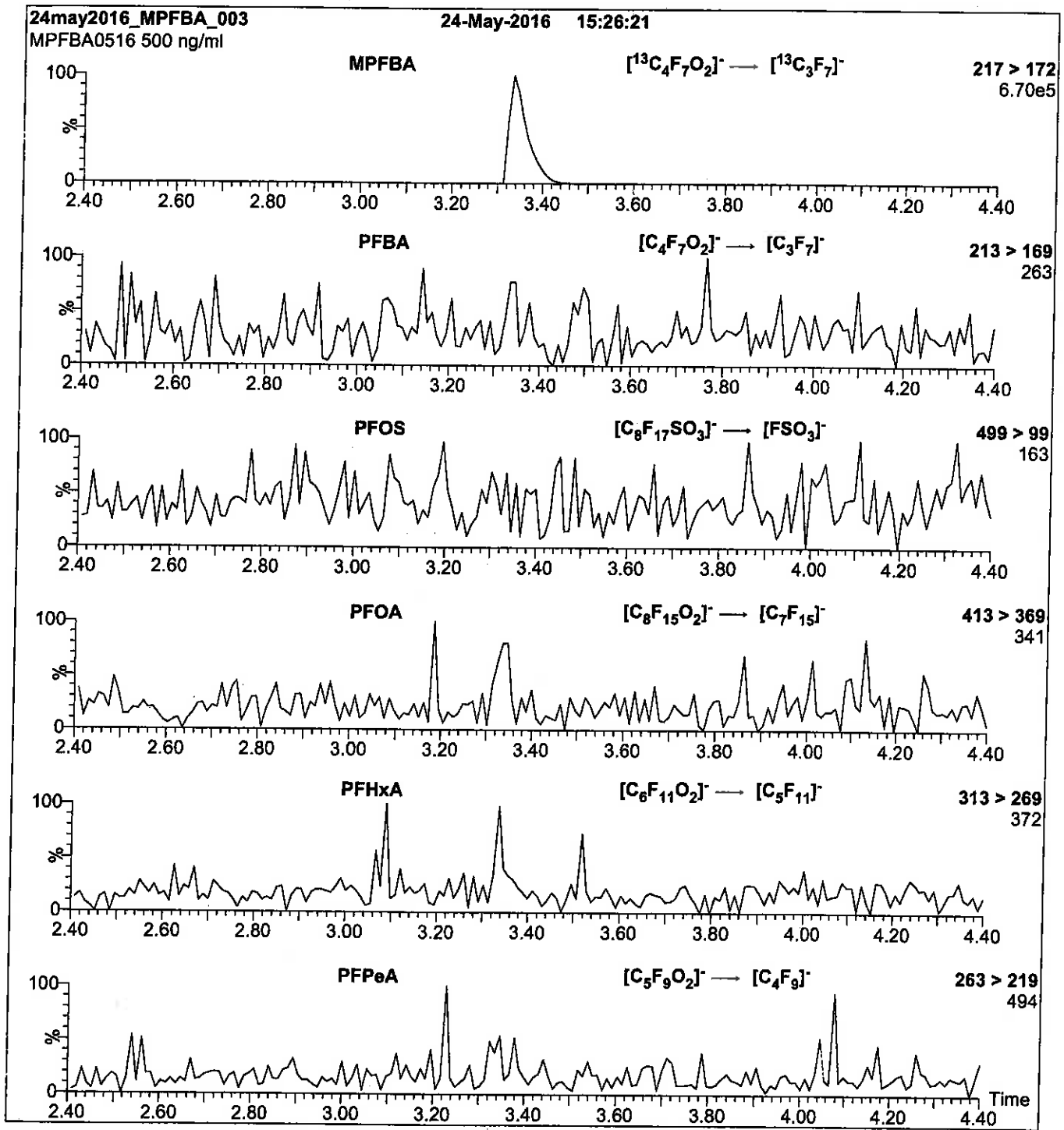
Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm
Mobile phase: Gradient
Start: 30% (80:20 MeOH:ACN) / 70% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)
Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 10.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

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

MS Parameters

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

Reagent

LCMPFDA_00011

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

739609
ID: LCMFDA_00011
Exp: 08/19/20 Prep: SBC
13C2-Perfluorodecanoic a

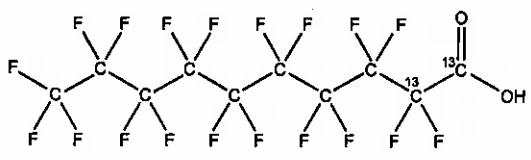


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFDA **LOT NUMBER:** MPFDA0815
COMPOUND: Perfluoro-n-[1,2-¹³C₂]decanoic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₂¹²C₈HF₁₈O₂ **MOLECULAR WEIGHT:** 516.07
CONCENTRATION: 50 ± 2.5 µg/ml **SOLVENT(S):** Methanol
Water (<1%)
CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99% ¹³C
(1,2-¹³C₂)
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 ¹³C₁-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
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

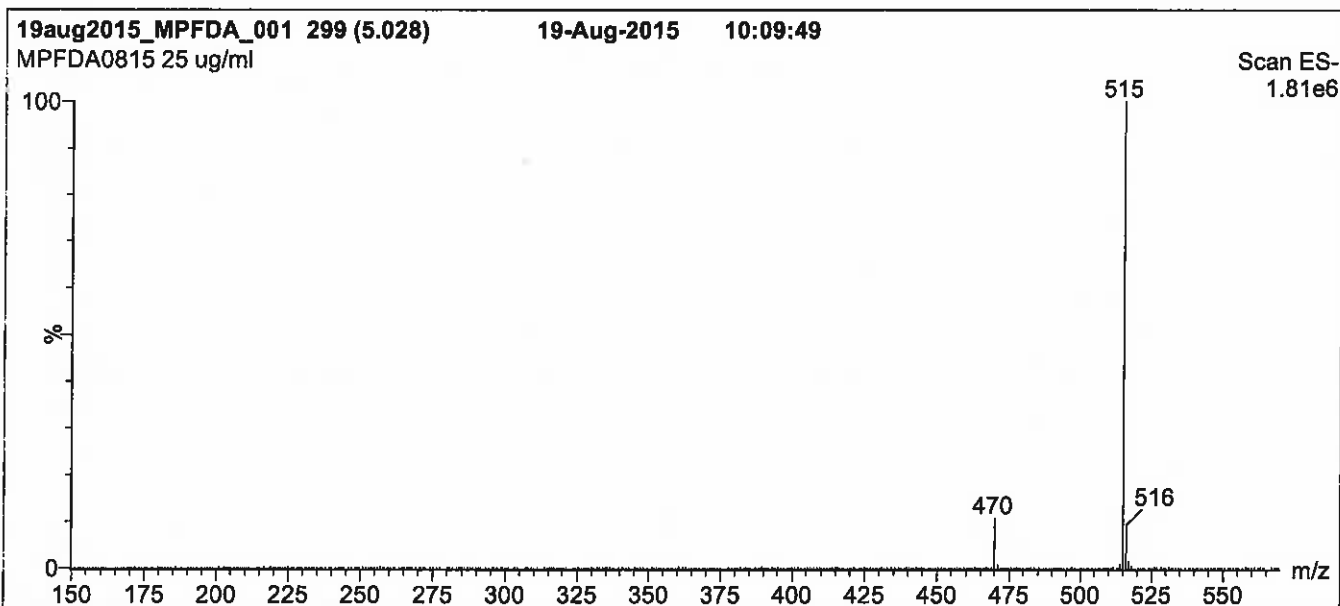
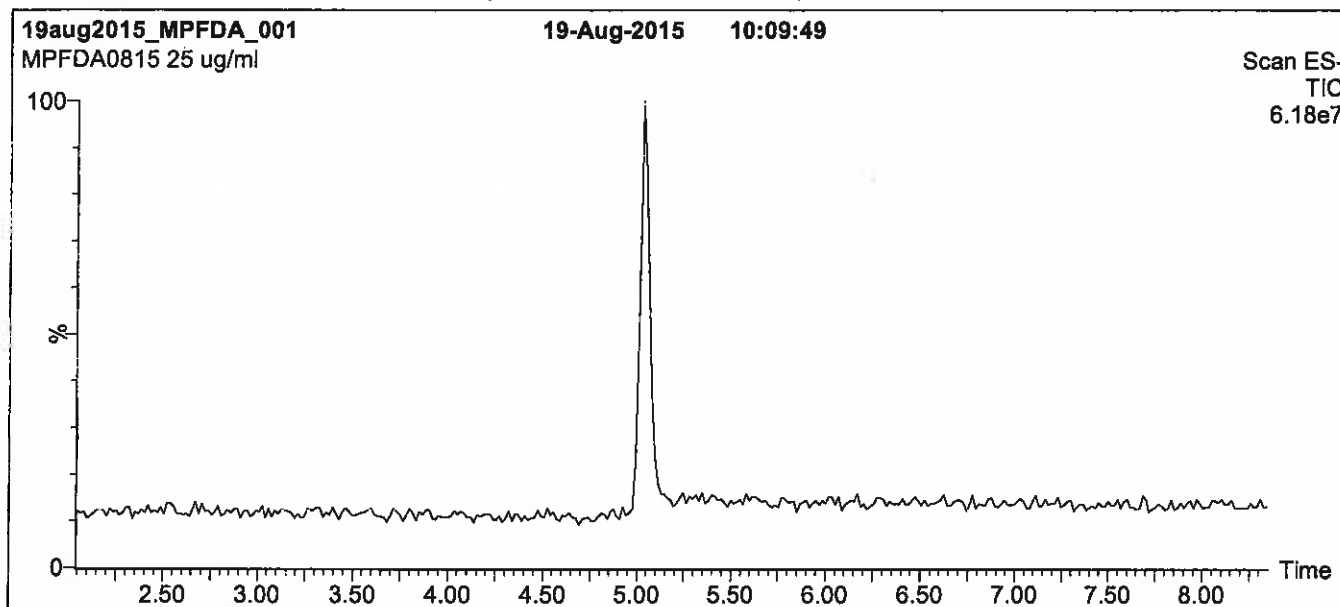
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

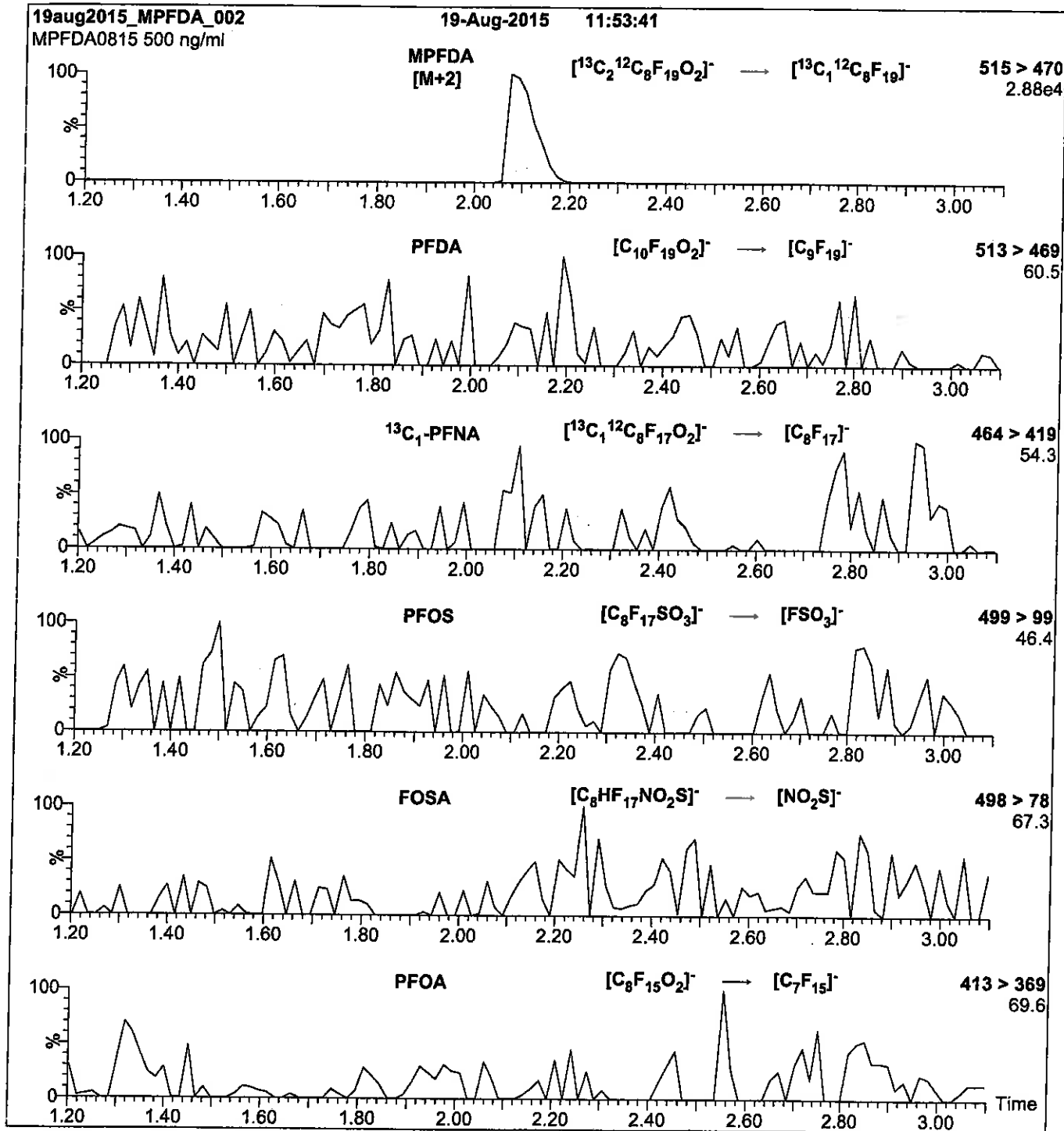
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
 Capillary Voltage (kV) = 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 μ l (500 ng/ml MPFDA)

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCMPFD_oA_00008

R: 882 9/22/16



739598
ID: LCMFDoA_00008
Exp: 04/08/21 Prod: SBC
13C2-Perfluorododecanoic



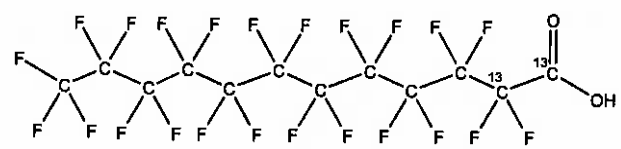
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

Scanned 10/14/16 SR

PRODUCT CODE: MPFDoA **LOT NUMBER:** MPFDoA0416
COMPOUND: Perfluoro-n-[1,2-¹³C₂]dodecanoic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₂¹²C₁₀HF₂₃O₂ **MOLECULAR WEIGHT:** 616.08
CONCENTRATION: 50 ± 2.5 µg/ml **SOLVENT(S):** Methanol
CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99% ¹³C
LAST TESTED: (mm/dd/yyyy) 04/08/2016 (1,2-¹³C₂)
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:

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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:

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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, \dots, x_n on which it depends is:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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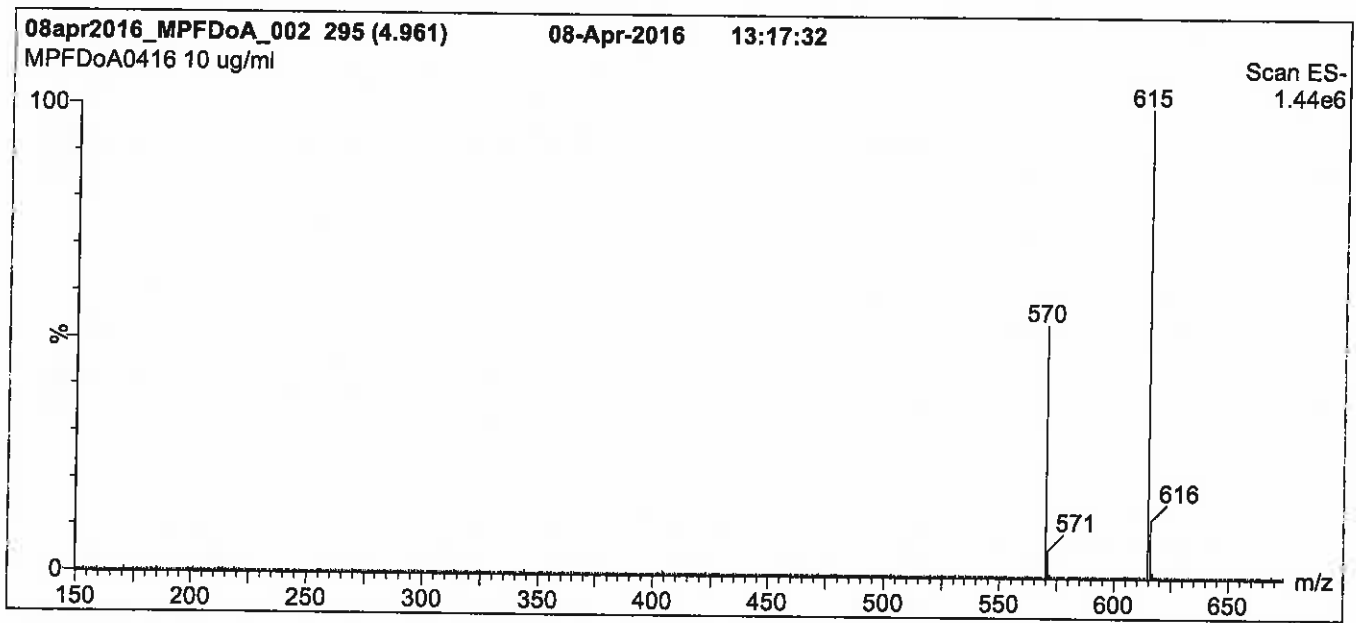
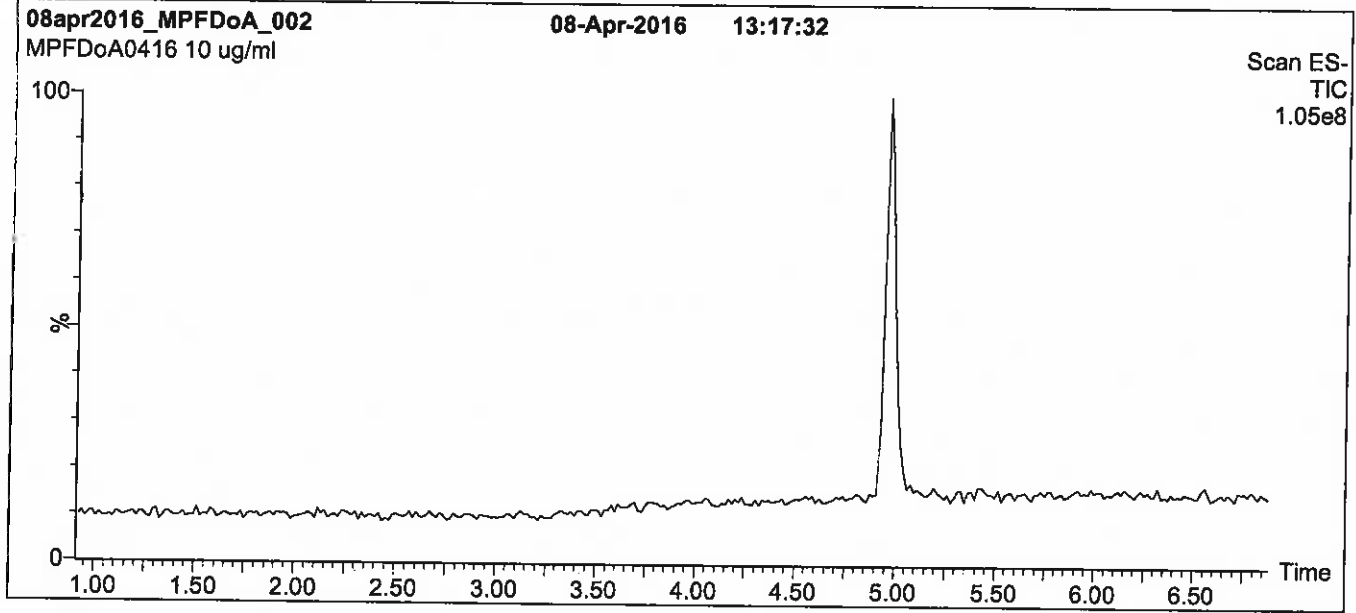
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Figure 1: MPFDoA; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

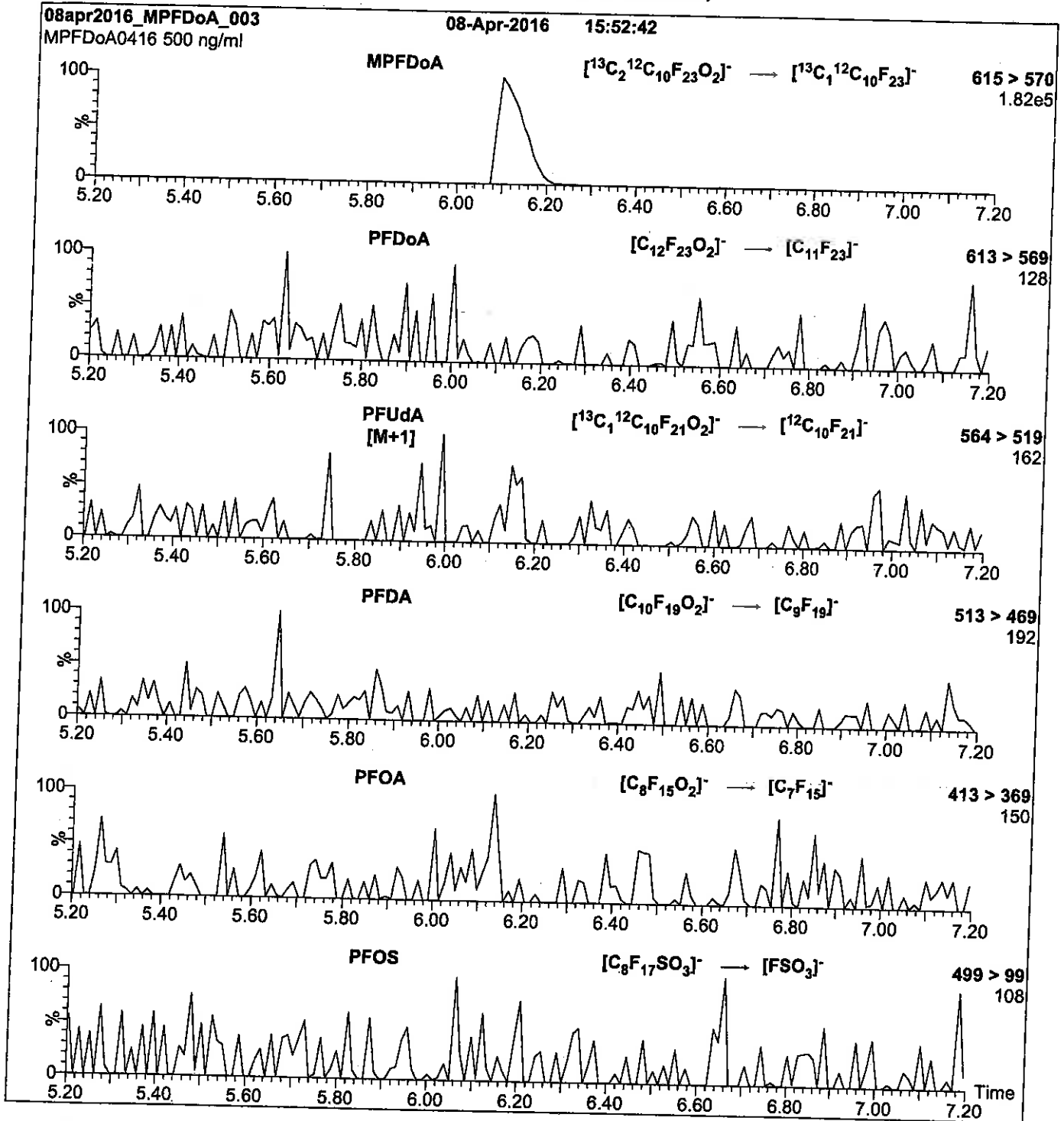
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (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 $\mu\text{l}/\text{min}$

MS Parameters

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

Reagent

LCMPFHxA_00012

Scanned 10/11/16 R: SBC 9/22/16

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



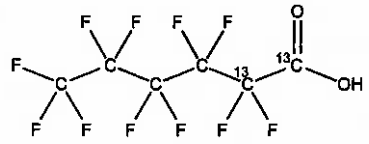
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

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

LOT NUMBER: MPFHxA0416

STRUCTURE: **CAS #:** Not available



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

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

CHEMICAL PURITY: >98%

ISOTOPIC PURITY: ≥99%¹³C
(1,2-¹³C₂)

LAST TESTED: (mm/dd/yyyy) 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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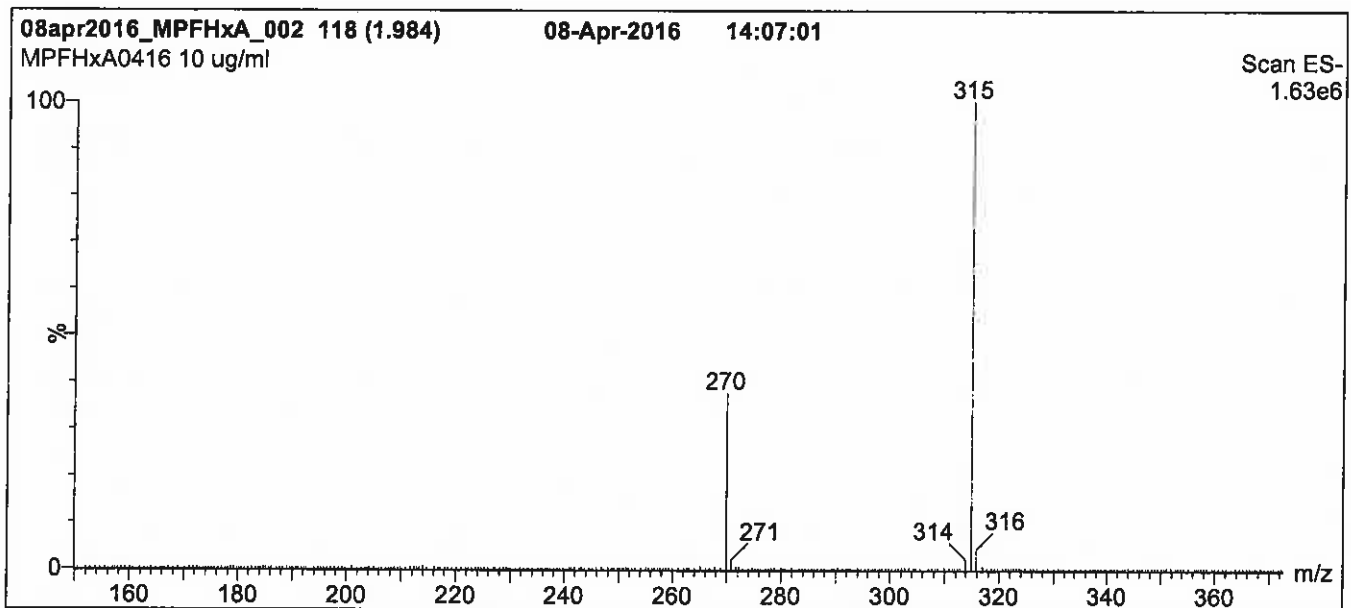
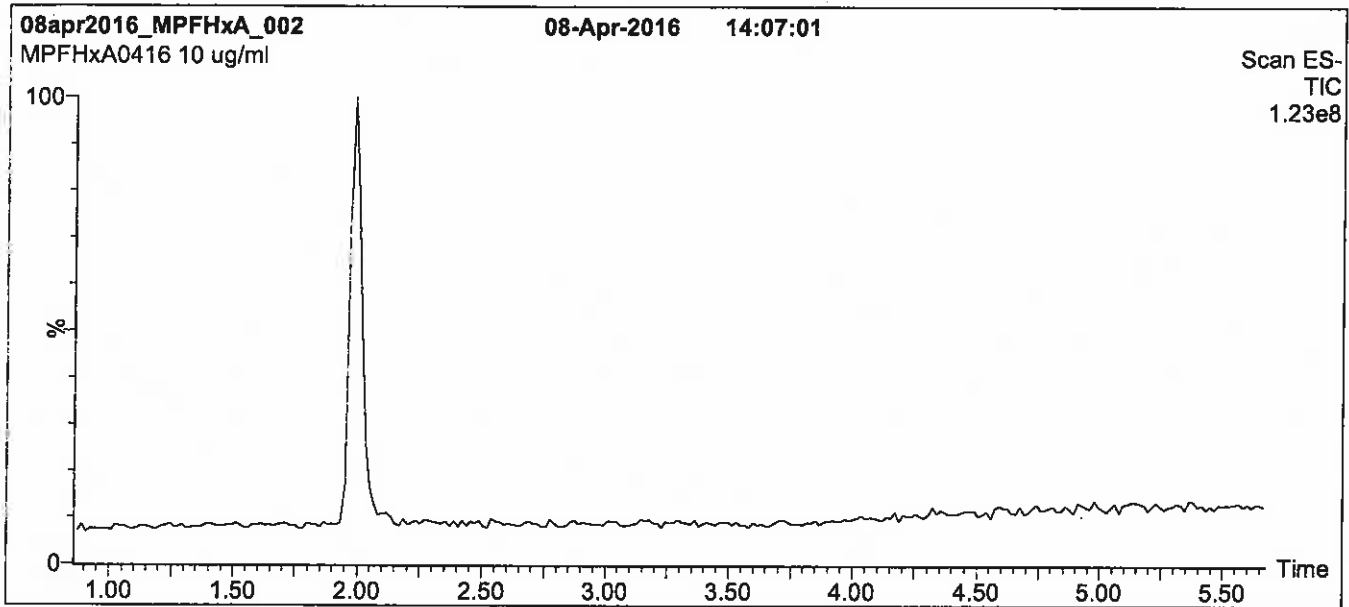
QUALITY MANAGEMENT:

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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 RP₁₈
 1.7 μ m, 2.1 x 100 mm

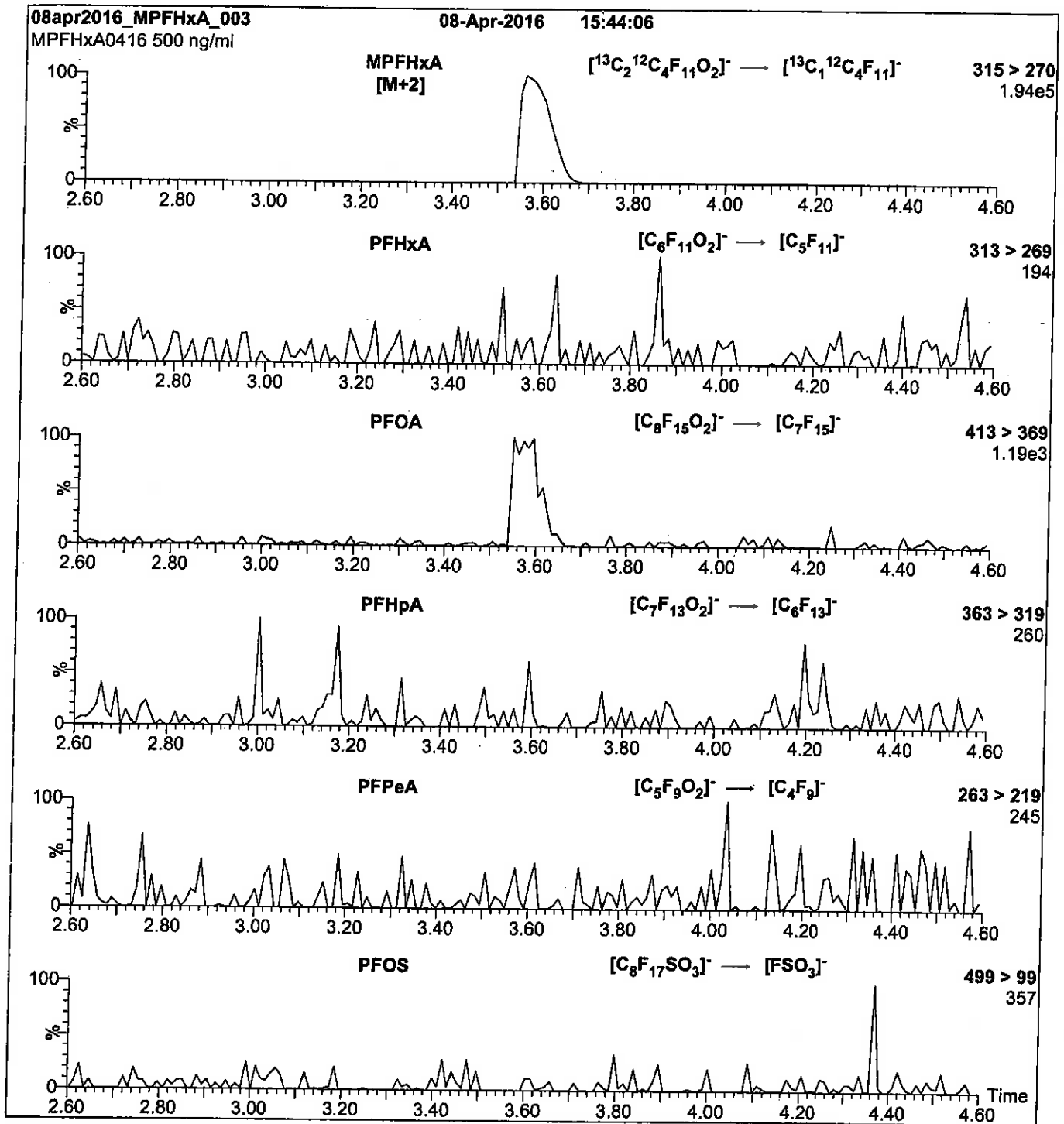
Mobile phase: Gradient
 Start: 50% (80:20 MeOH:ACN) / 50% H₂O
 (both with 10 mM NH₄OAc buffer)
 Ramp to 90% organic over 7.5 min and hold for 1.5 min
 before returning to initial conditions over 0.5 min.
 Time: 10 min

Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (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 $\mu\text{l}/\text{min}$

MS Parameters

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

Reagent

LCMPFHXS_00008

R: 800 9/22/16



739601

ID: LCMPFHxS_00008

Exp: 10/23/20 Prod: SBC

18O2-Perfluorohexanesulfo



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

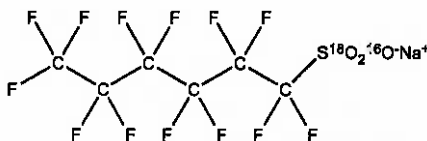
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PRODUCT CODE: MPFHxS
COMPOUND: Sodium perfluoro-1-hexane[¹⁸O₂]sulfonate

LOT NUMBER: MPFHxS1015

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: C₆F₁₃S¹⁸O₂¹⁶ONa
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt)
47.3 ± 2.4 µg/ml (MPFHxS anion)
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

MOLECULAR WEIGHT: 426.10
SOLVENT(S): Methanol
ISOTOPIC PURITY: >94% (¹⁸O₂)

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- The response factor for MPFHxS (C₆F₁₃S¹⁸O₂¹⁶O) has been observed to be up to 10% lower than for PFHxS (C₆F₁₃S¹⁶O₃) when both compounds are injected together. This difference may vary between instruments.
- Due to the isotopic purity of the starting material (¹⁸O₂ >94%), MPFHxS contains ~ 0.3% of PFHxS. This value agrees with the theoretical percent relative abundance that is expected based on the stated isotopic purity.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 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

INTENDED USE:

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HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

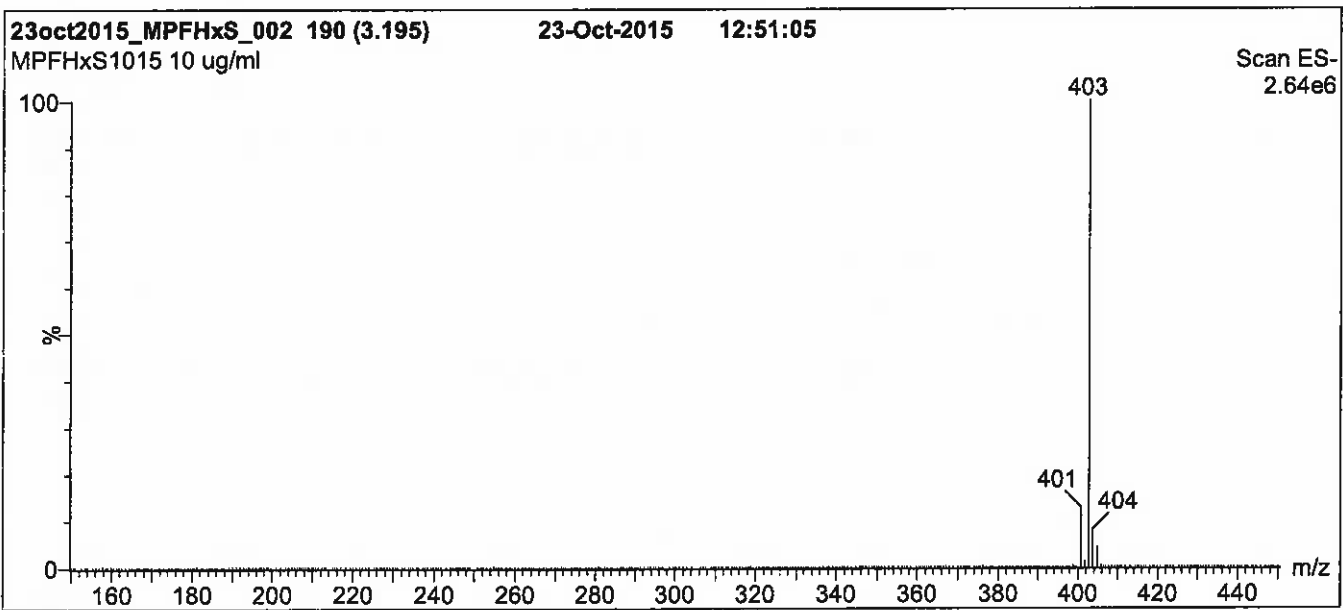
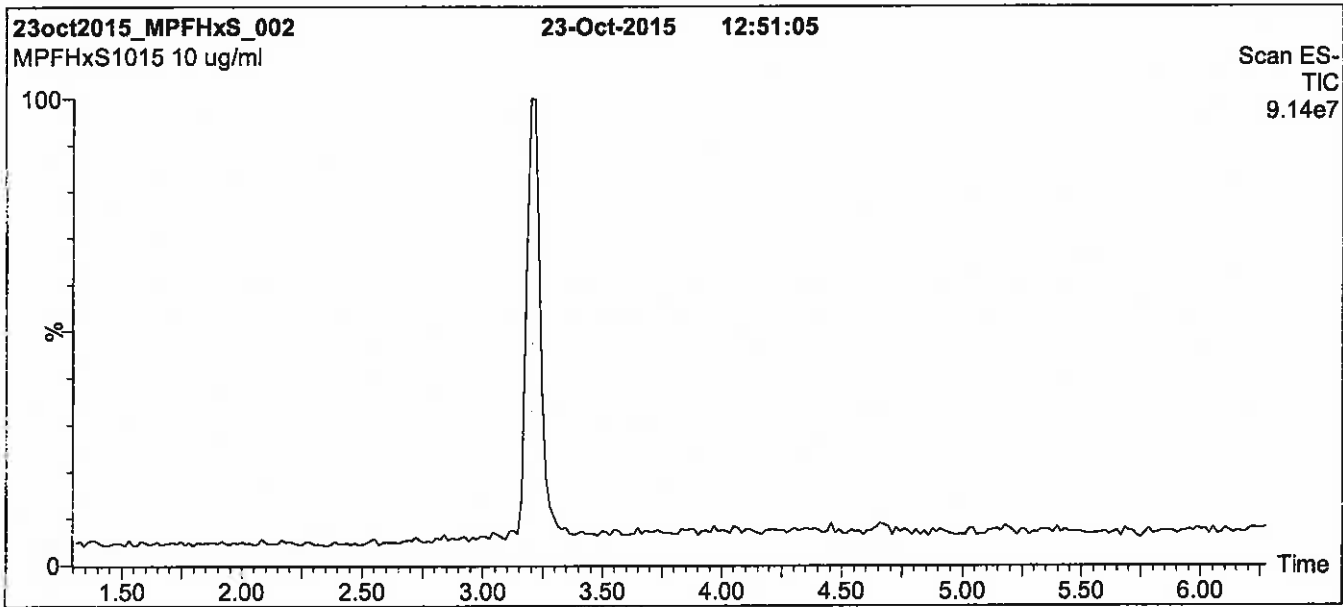
QUALITY MANAGEMENT:

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



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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 RP₁₈
 1.7 μ m, 2.1 x 100 mm

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

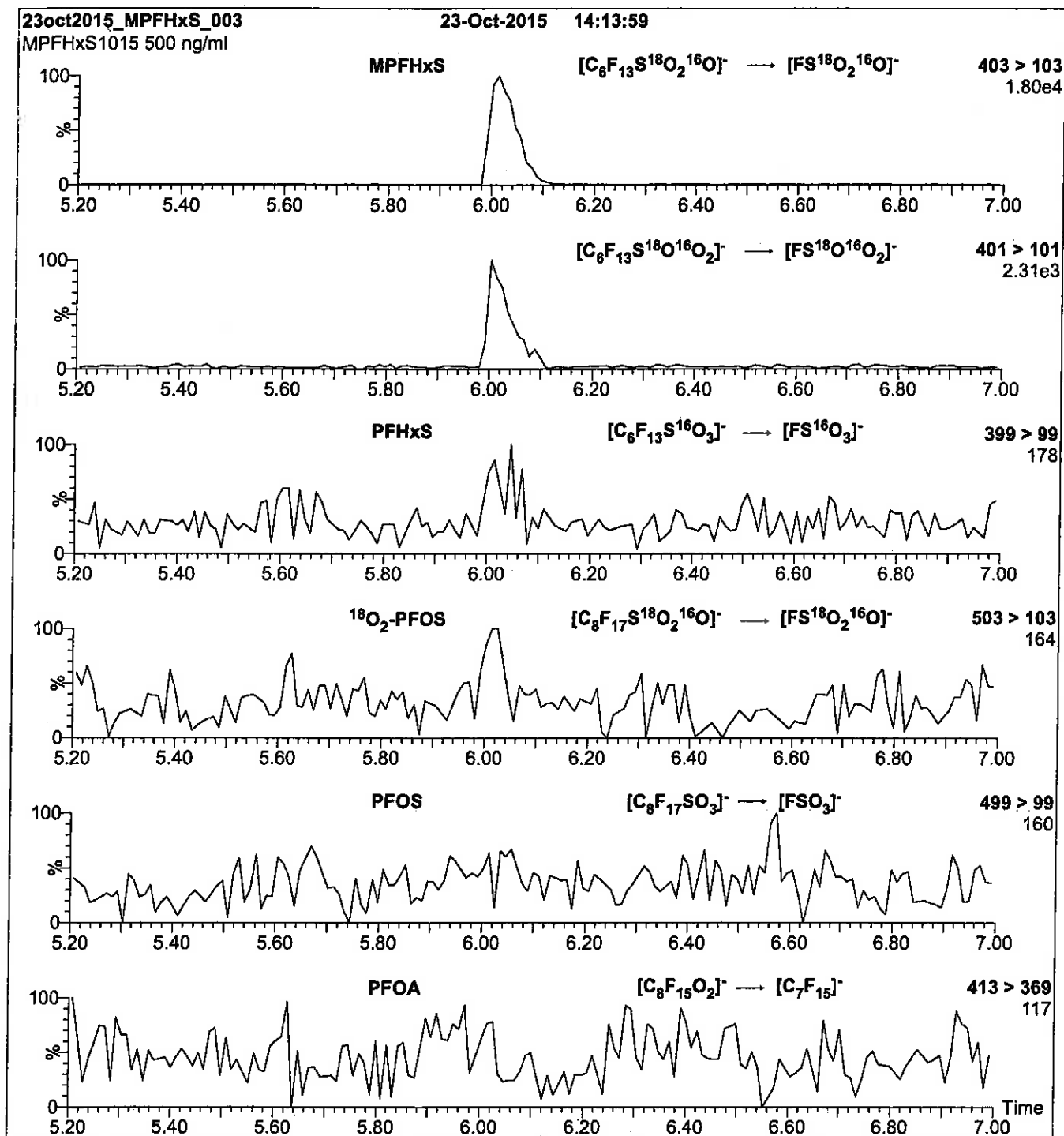
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
 Capillary Voltage (kV) = 3.00
 Cone Voltage (V) = 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 μ l (500 ng/ml MPFHxS)

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCMPFNA_00008

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



739637
ID: LCM:PFNA_00008
Exp: 04/13/19 Pppl: SBC
13C5-Perfluoronanoic aci

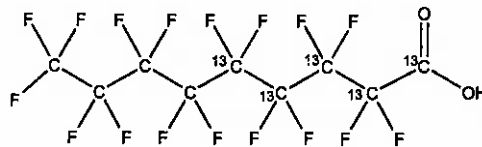


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFNA **LOT NUMBER:** MPFNA0414
COMPOUND: Perfluoro-n-[1,2,3,4,5-¹³C₅]nonanoic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₅¹²C₄HF₁₇O₂ **MOLECULAR WEIGHT:** 469.04
CONCENTRATION: 50 ± 2.5 µg/ml **SOLVENT(S):** Methanol
Water (<1%)
CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99%¹³C
(1,2,3,4,5-¹³C₅)
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:

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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, \dots, x_n on which it depends is:

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

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

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

TRACEABILITY:

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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.

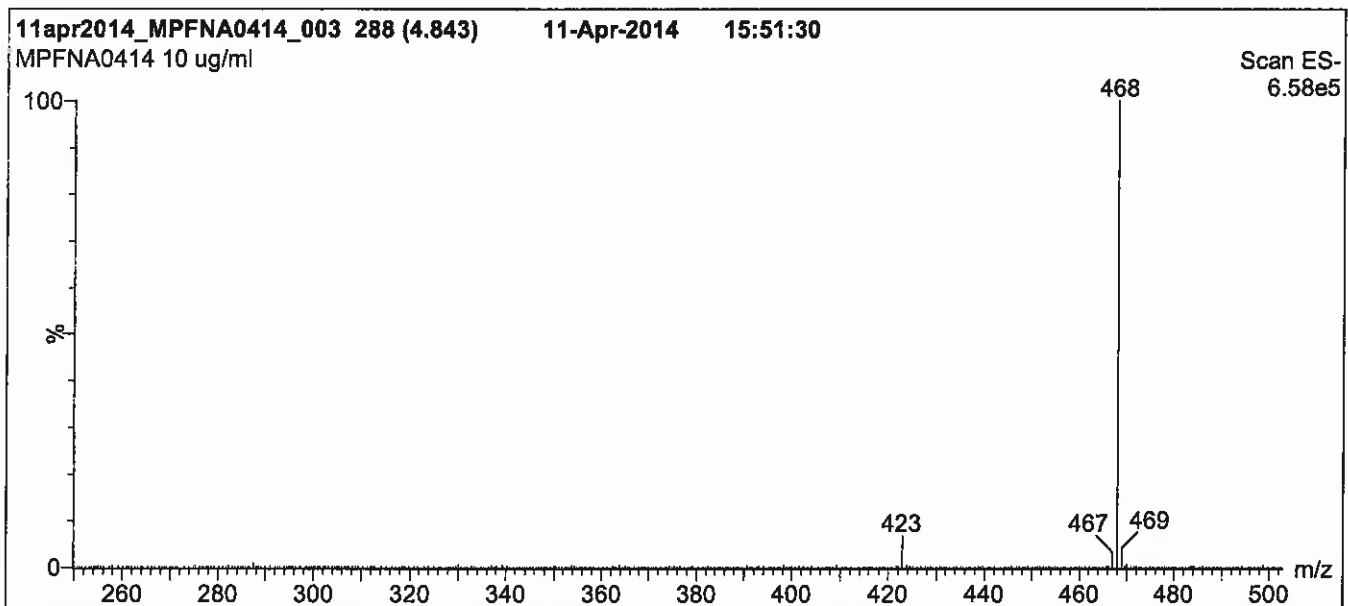
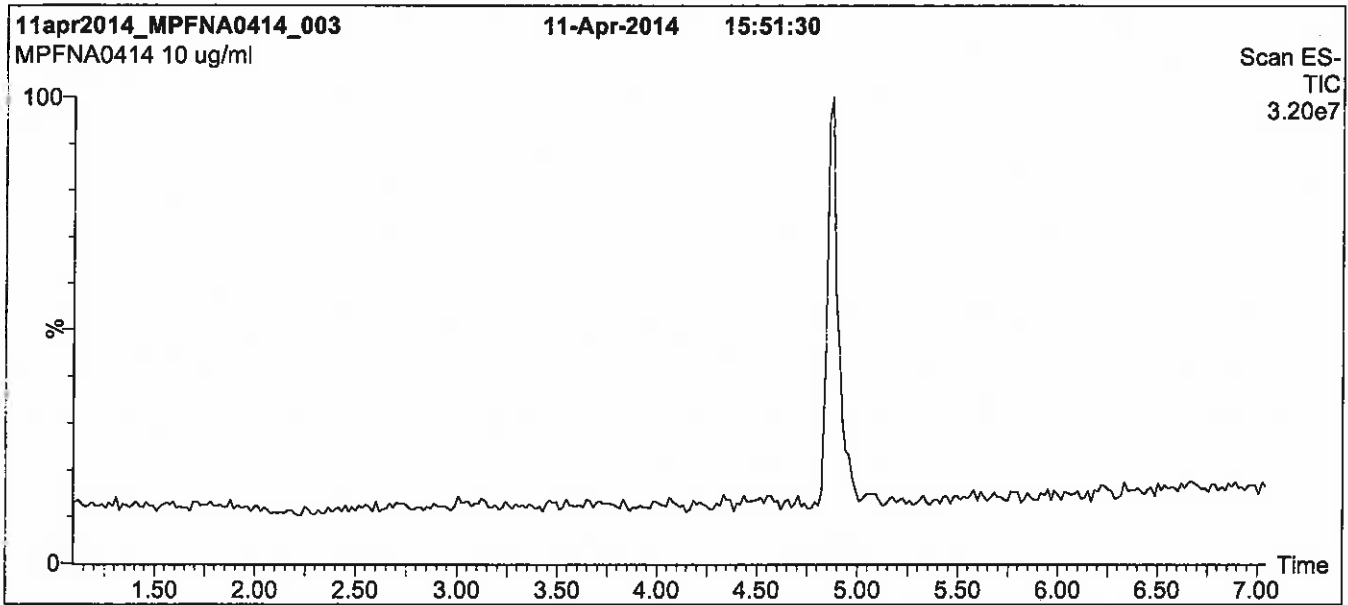
QUALITY MANAGEMENT:

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).



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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 RP₁₈
 1.7 μ m, 2.1 x 100 mm

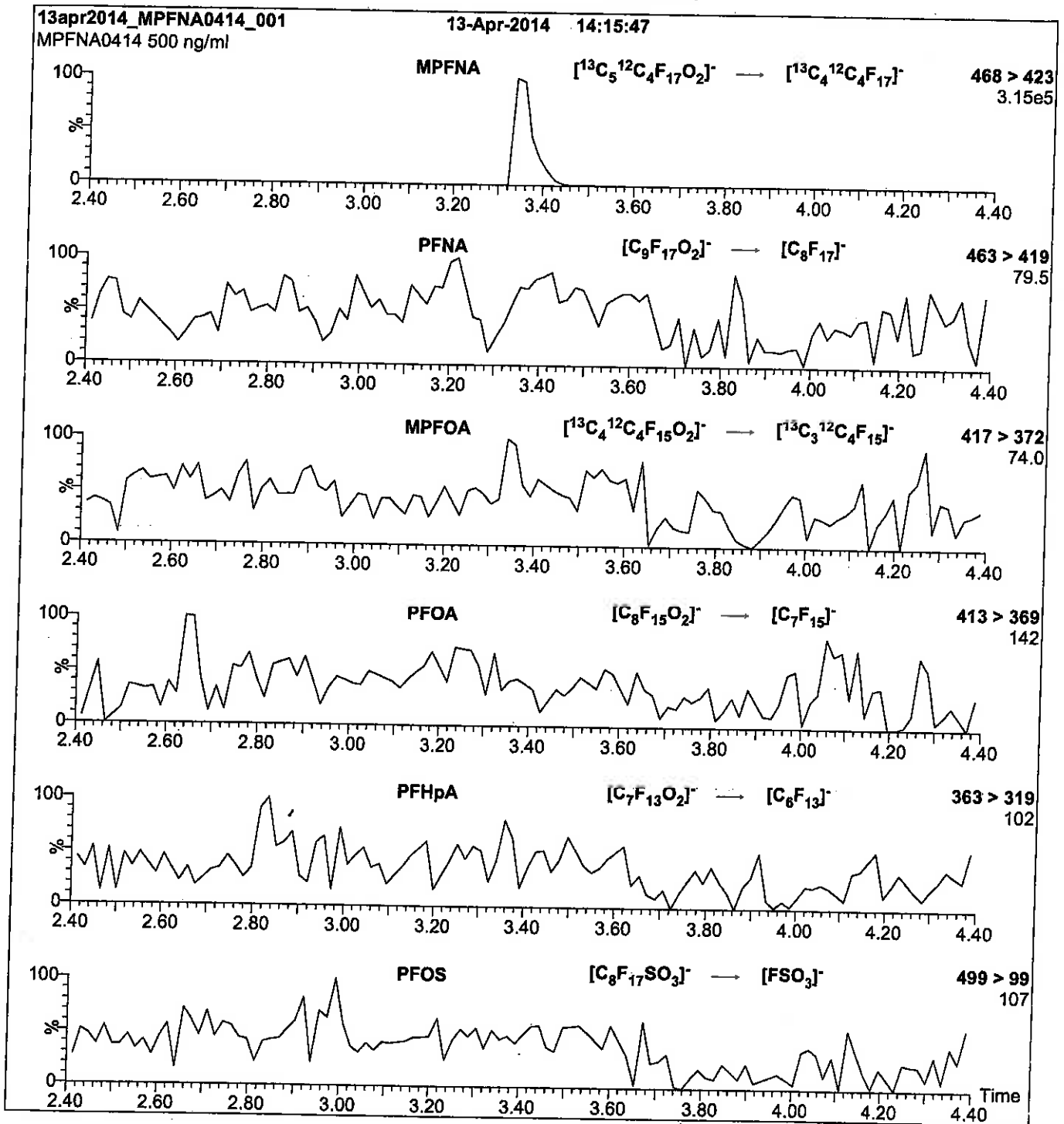
Mobile phase: Gradient
 Start: 50% (80:20 MeOH:ACN) / 50% H₂O
 (both with 10 mM NH₄OAc buffer)
 Ramp to 90% organic over 7 min and hold for 2 min
 before returning to initial conditions in 0.5 min.
 Time: 10 min

Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (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 $\mu\text{l}/\text{min}$

MS Parameters

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

Reagent

LCMPFOA_00012

R: SBC 9/22/16



738683
ID: LCMFOA_00012
Exp: 01/22/21 Prep: SBC
13C4-Perfluorooctanoic ac

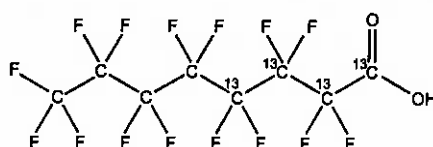


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFOA **LOT NUMBER:** MPFOA0116
COMPOUND: Perfluoro-n-[1,2,3,4-¹³C₄]octanoic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₄¹²C₄HF₁₅O₂ **MOLECULAR WEIGHT:** 418.04
CONCENTRATION: 50 ± 2.5 µg/ml **SOLVENT(S):** Methanol
Water (<1%)
CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99% ¹³C
(1,2,3,4-¹³C₄)
LAST TESTED: (mm/dd/yyyy) 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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HAZARDS:

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LIMITED WARRANTY:

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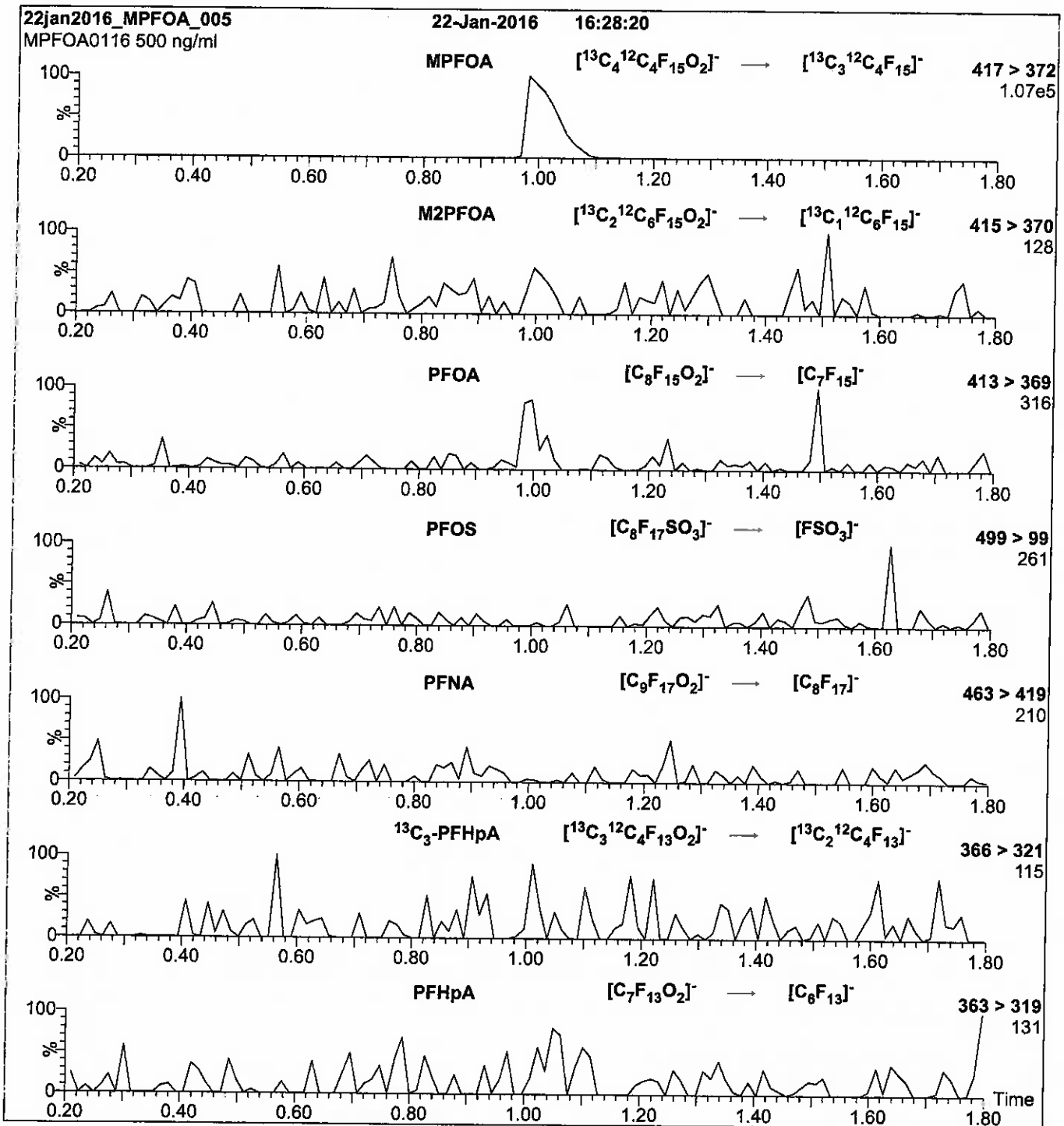
QUALITY MANAGEMENT:

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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)

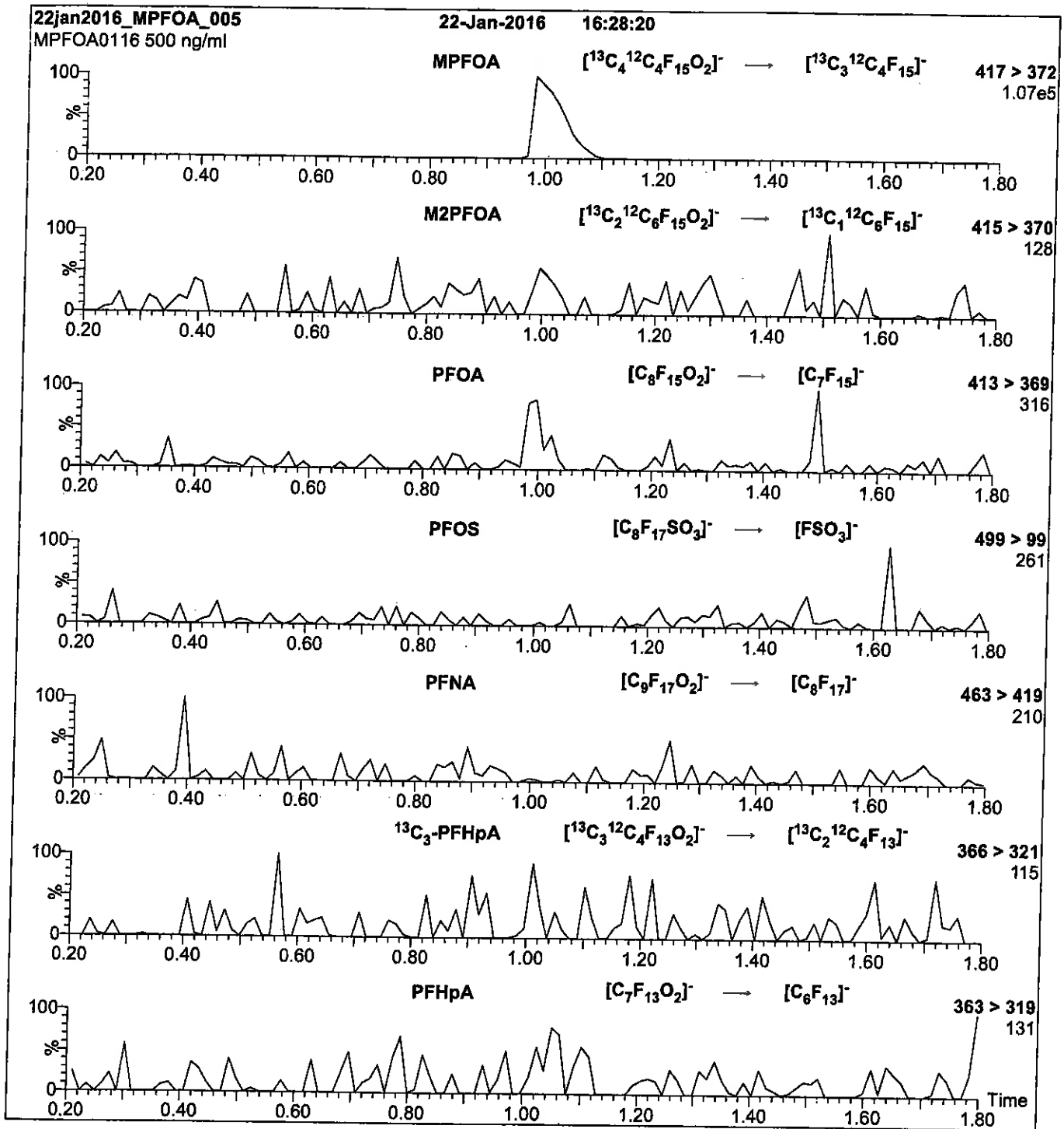
Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

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

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)

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

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

MS Parameters

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

Reagent

LCMPFOS_00017

R: 9/9/16 802

728309
ID: LCMPPFOS_00017
Exp: 08/03/21 Prpd: SBC
13C4-Perfluorooctanesulfo

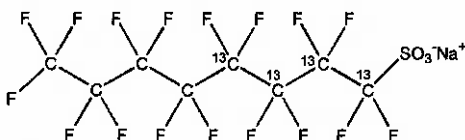


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFOS **LOT NUMBER:** MPFOS0816
COMPOUND: Sodium perfluoro-1-[1,2,3,4-¹³C₄]octanesulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	¹³ C ₄ ¹² C ₄ F ₁₇ SO ₃ Na	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- 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-[1,2,3-¹³C₃]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

INTENDED USE:

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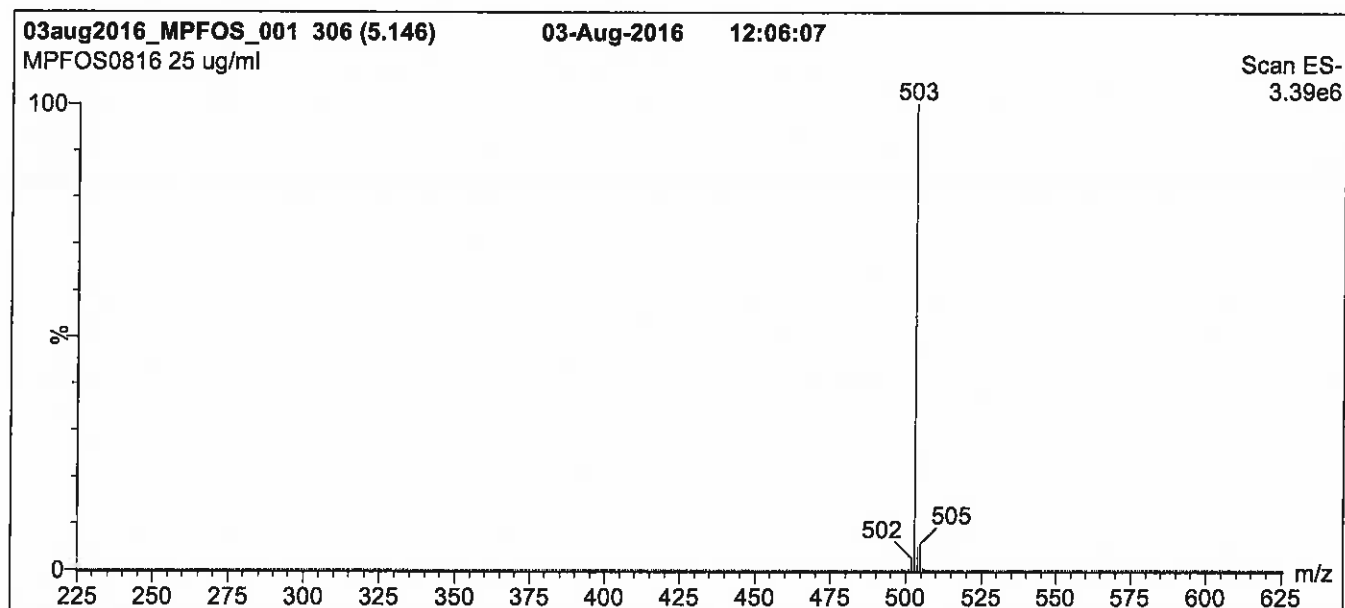
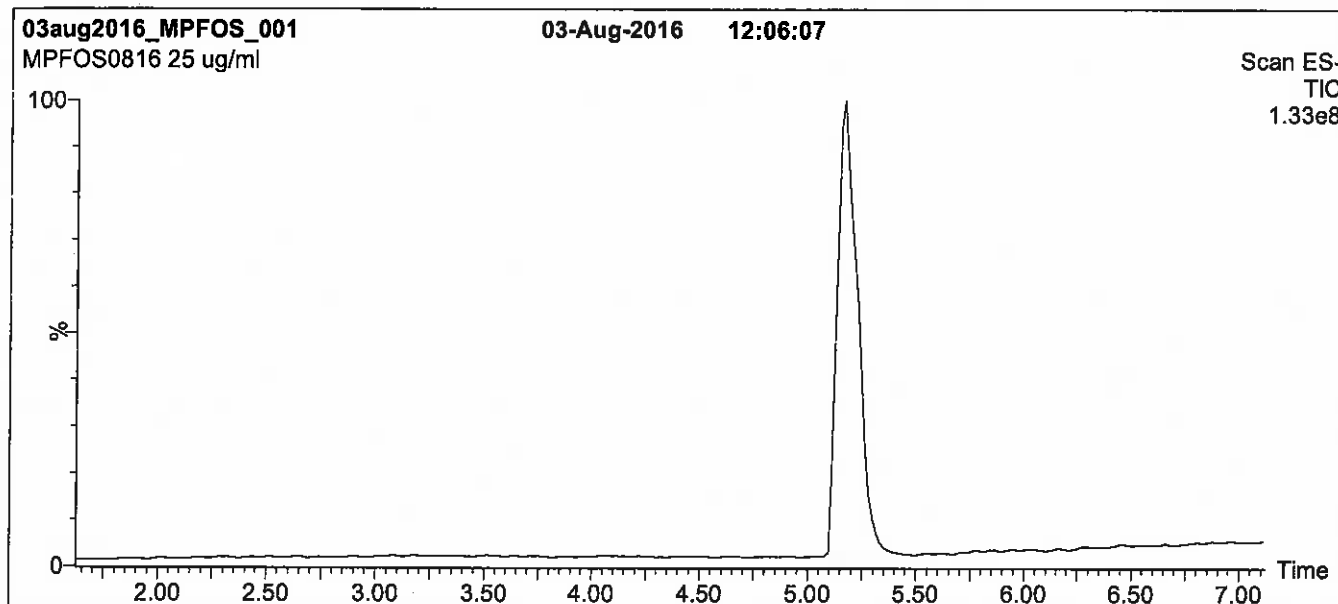
QUALITY MANAGEMENT:

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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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 45% (80:20 MeOH:ACN) / 55% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

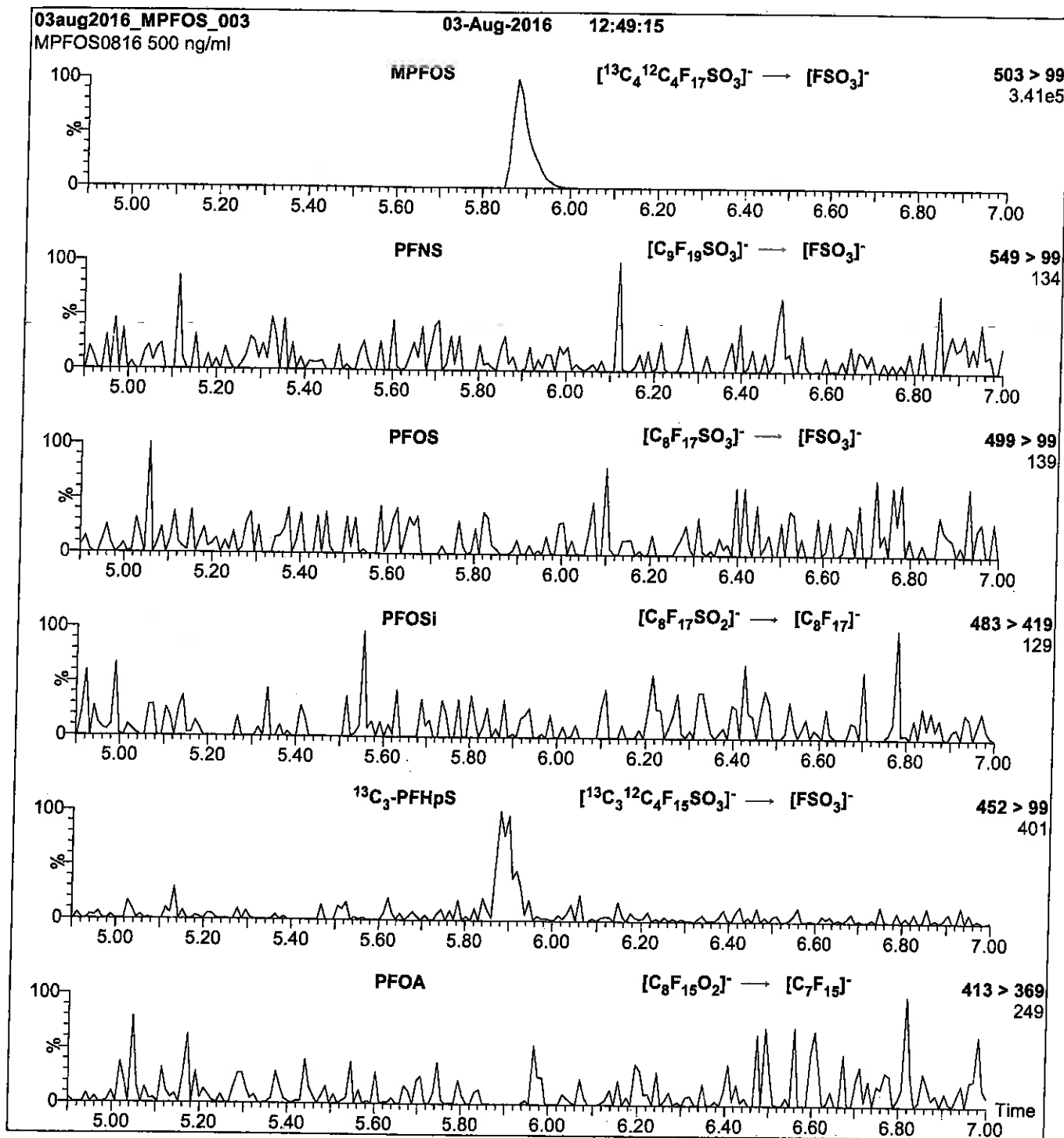
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 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 $\mu\text{l}/\text{min}$

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 Prod: SBC
13C2-Perfluoroundecanoic

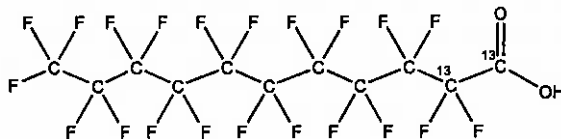


**WELLINGTON
LABORATORIES**

**CERTIFICATE OF ANALYSIS
DOCUMENTATION**

Scanned 10/14/16 SK

PRODUCT CODE: MPFUdA **LOT NUMBER:** MPFUdA0216
COMPOUND: Perfluoro-n-[1,2-¹³C₂]undecanoic acid
STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₂¹²C₉HF₂₁O₂ **MOLECULAR WEIGHT:** 566.08
CONCENTRATION: 50 ± 2.5 µg/ml **SOLVENT(S):** Methanol
Water (<1%)
CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99% ¹³C
(1,2-¹³C₂)
LAST TESTED: (mm/dd/yyyy) 02/12/2016
EXPIRY DATE: (mm/dd/yyyy) 02/12/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Presence of 1-¹³C₁-PFUdA (~1%; see Figure 2), 2-¹³C₁-PFUdA (~1%), and PFUdA (~0.2%; see Figure 2) are due to the isotopic purity of the ¹³C-precursor.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: 
B.G. Chittim **Date:** 02/24/2016
(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

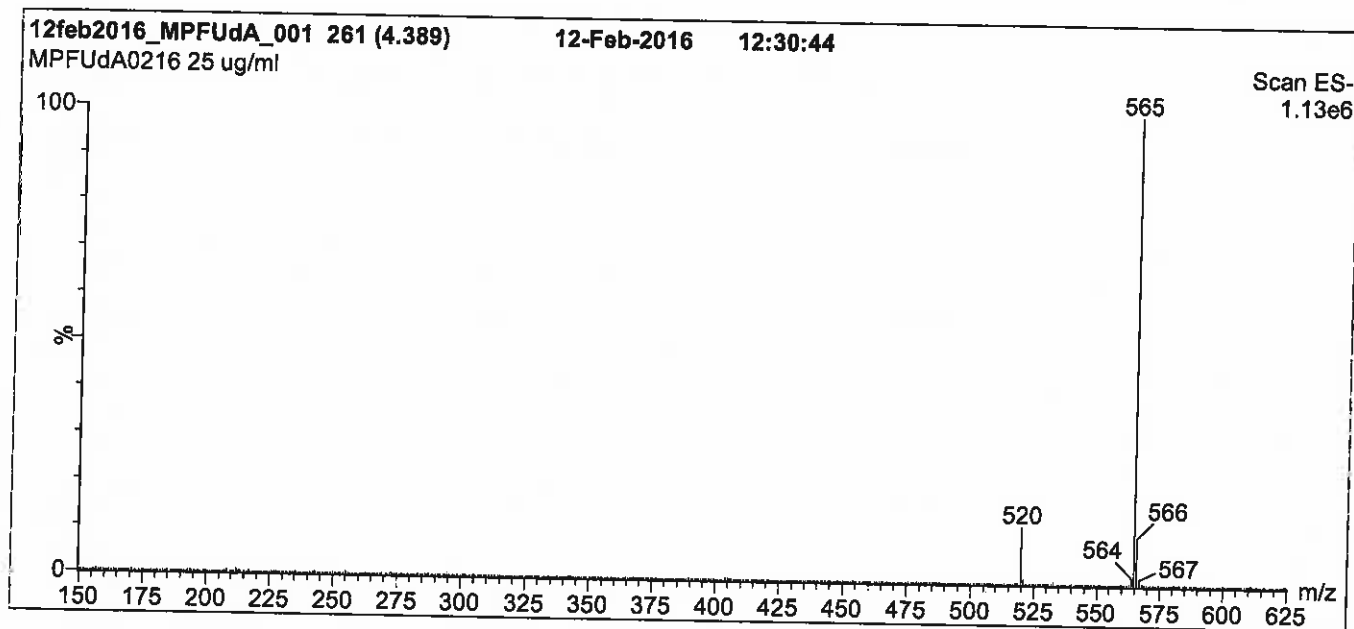
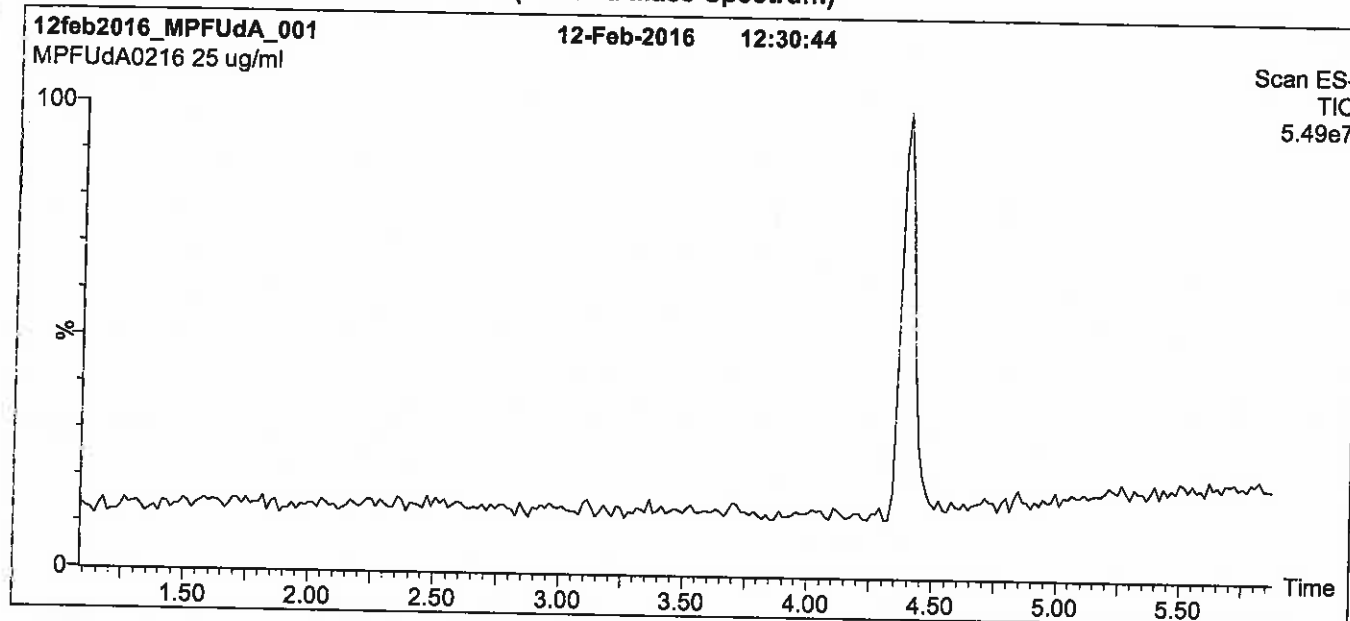
QUALITY MANAGEMENT:

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



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

Figure 1: 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 RP₁₈
 1.7 μ m, 2.1 x 100 mm

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

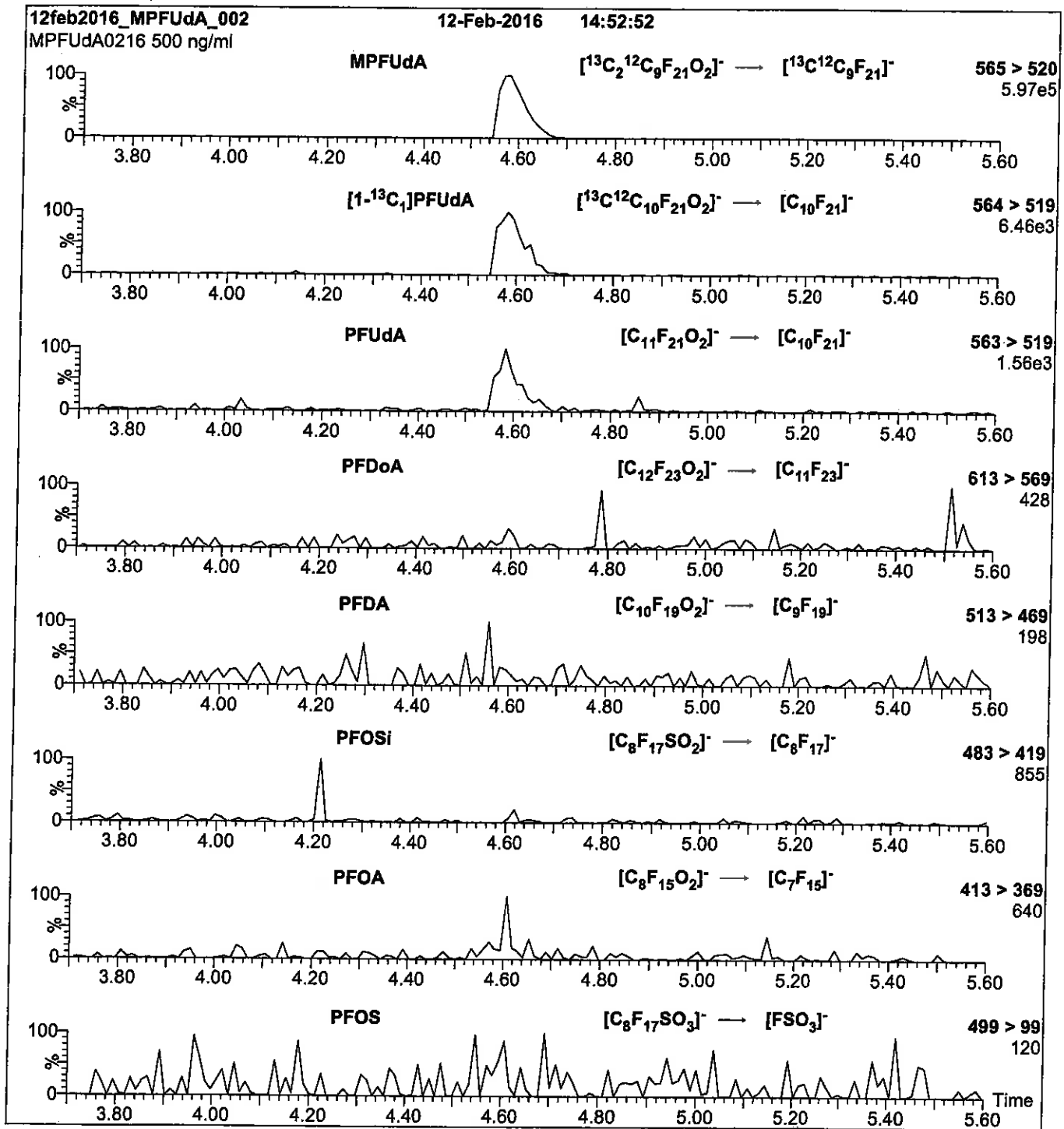
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (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 $\mu\text{l}/\text{min}$

MS Parameters

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

Reagent

LCN-EtFOSA-M_00002

P: 7/16/15 SW



WELLINGTON LABORATORIES

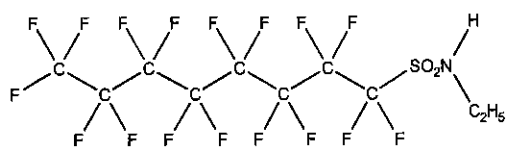
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: N-EtFOSA-M
COMPOUND: N-ethylperfluoro-1-octanesulfonamide

LOT NUMBER: NEtFOSA0714M

STRUCTURE:

CAS #: 4151-50-2



MOLECULAR FORMULA: C₁₀H₆F₁₇NO₂S
CONCENTRATION: 50 ± 2.5 µg/ml
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

MOLECULAR WEIGHT: 527.20
SOLVENT(S): Methanol


DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: 
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:

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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:

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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:

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.

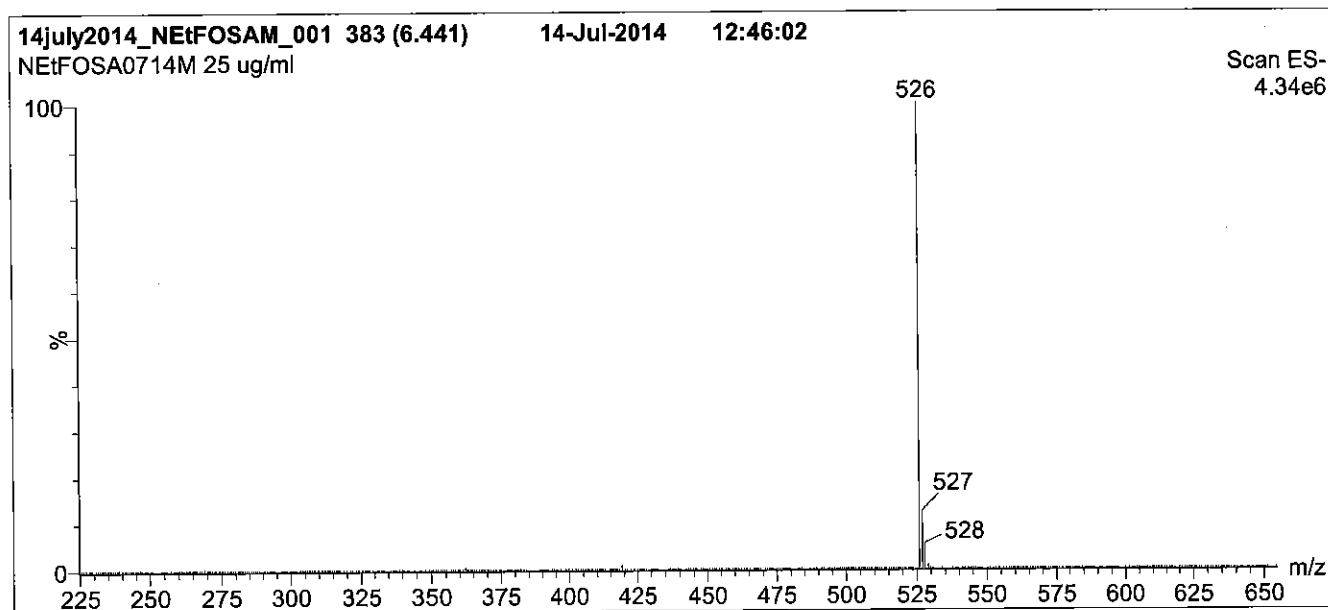
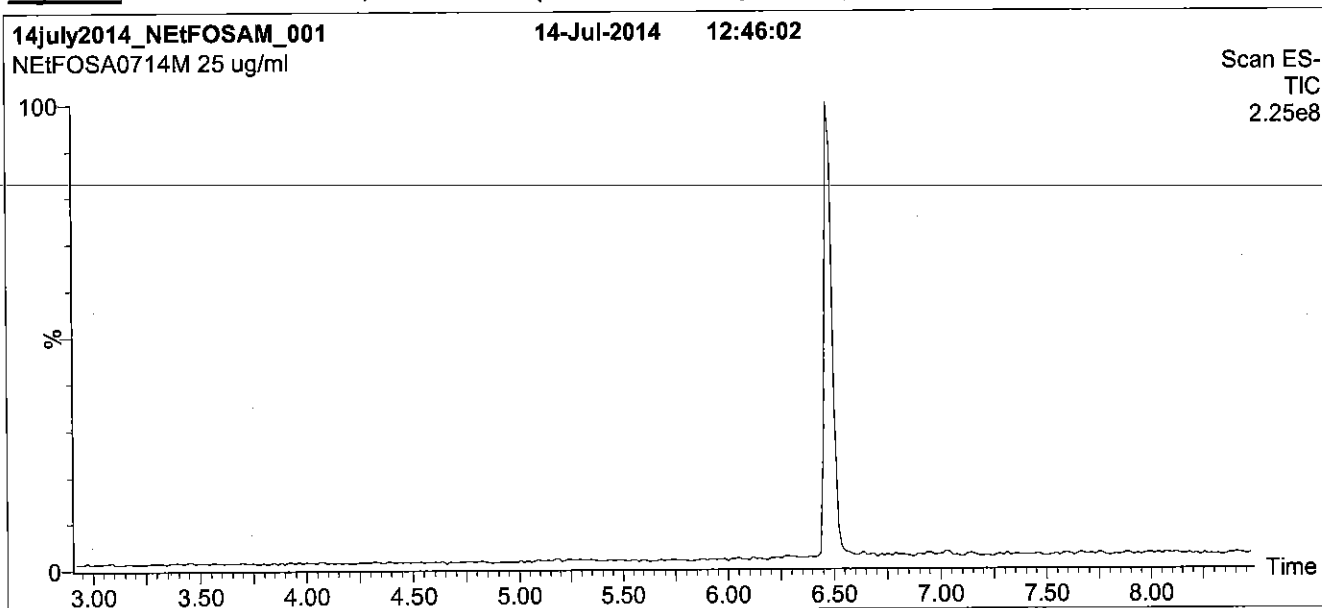
QUALITY MANAGEMENT:

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).



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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 RP₁₈
1.7 μ m, 2.1 x 100 mm

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

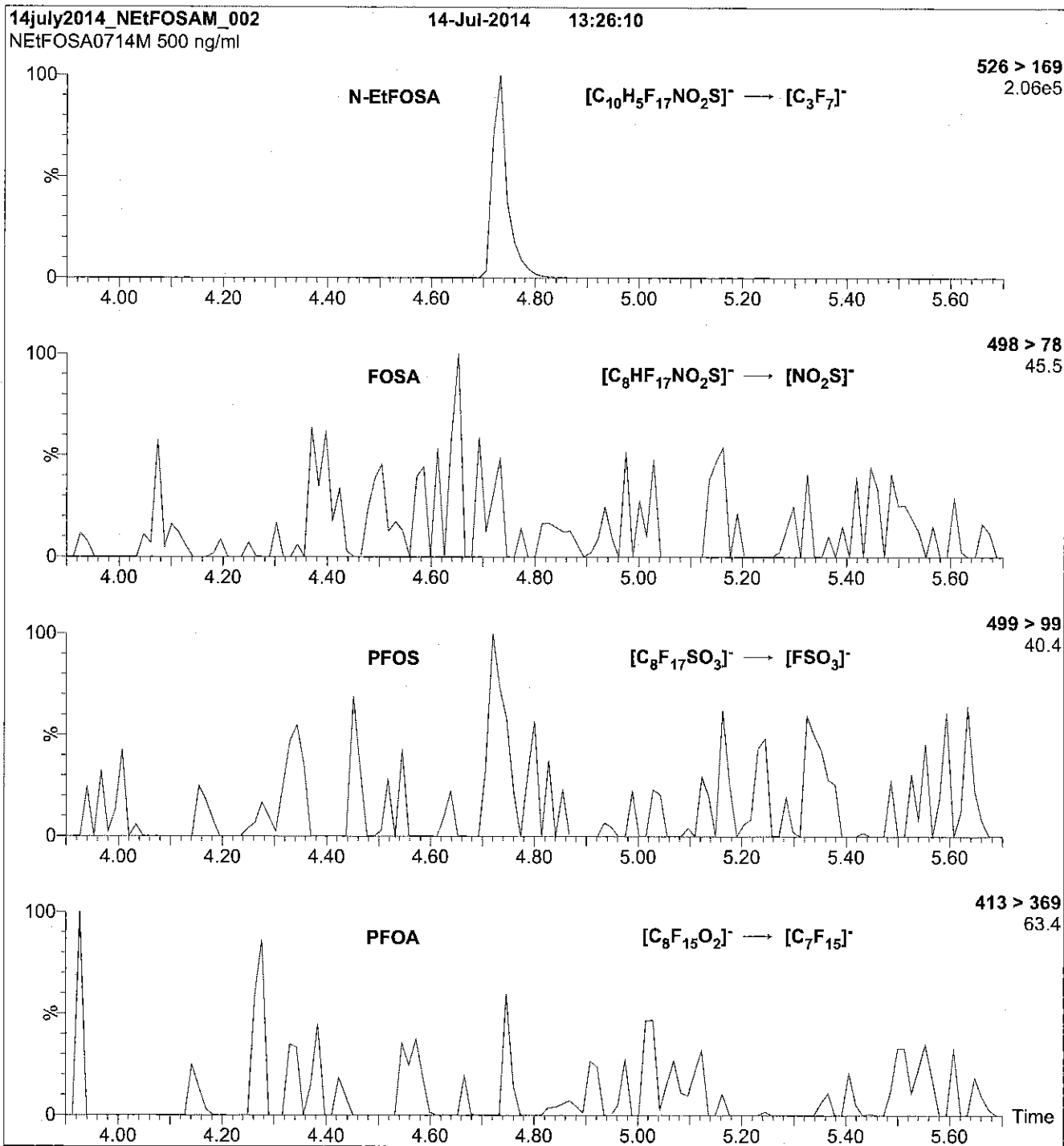
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 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 μ l (500 ng/ml N-EtFOSA-M)

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCN-EtFOSA-M_00003

R: 8/23/16 SBC



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

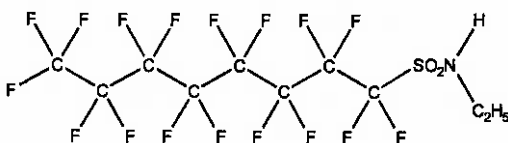


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CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: N-EtFOSA-M **LOT NUMBER:** NEtFOSA0516M
COMPOUND: N-ethylperfluoro-1-octanesulfonamide

STRUCTURE: **CAS #:** 4151-50-2



MOLECULAR FORMULA: C₁₀H₈F₁₇NO₂S **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

INTENDED USE:

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SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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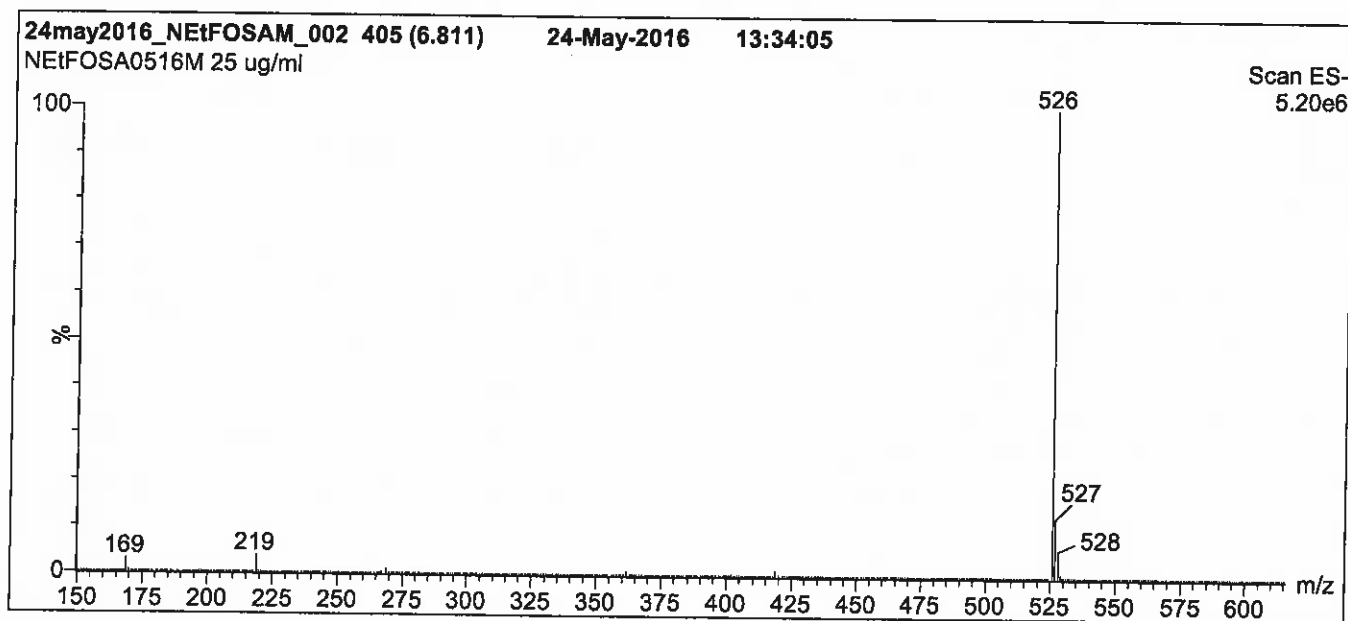
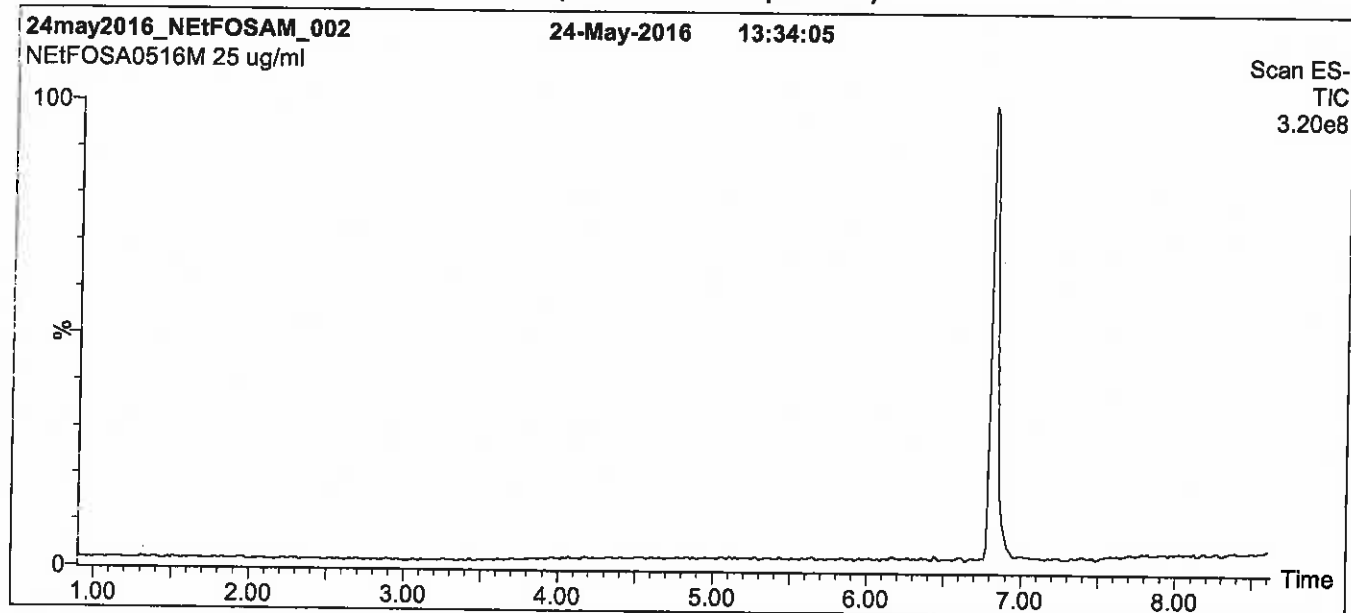
QUALITY MANAGEMENT:

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Figure 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 RP₁₈
 1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
 Start: 45% H₂O / 55% (80:20 MeOH:ACN)
 (both with 10 mM NH₄OAc buffer)
 Ramp to 90% organic over 7.5 min and hold for 1.5
 min before returning to initial conditions in 0.5 min.
 Time: 10 min

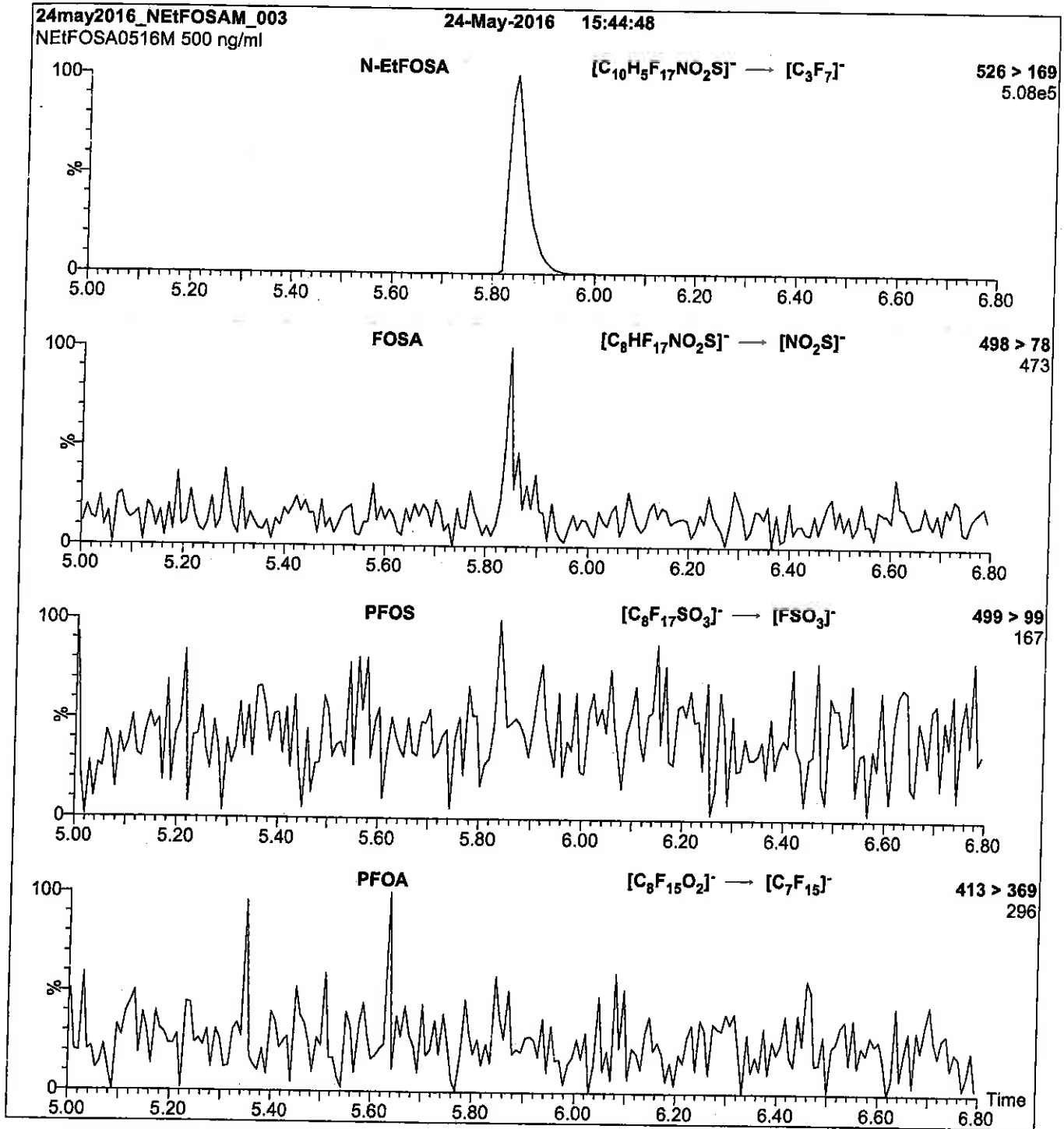
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
 Capillary Voltage (kV) = 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 μ l (500 ng/ml N-EtFOSA-M)

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

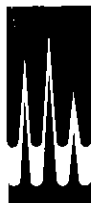
Flow: 300 μ l/min

MS Parameters

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

Reagent

LCN-ETFOSAA_00001

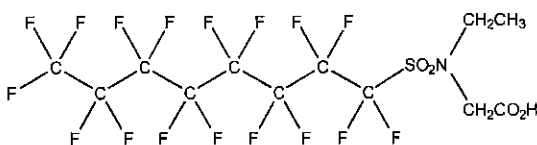


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: N-EtFOSAA **LOT NUMBER:** NEtFOSAA0113
COMPOUND: N-ethylperfluoro-1-octanesulfonamidoacetic acid

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



MOLECULAR FORMULA: C₁₂H₈F₁₇NO₄S **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:

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HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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

LIMITED WARRANTY:

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

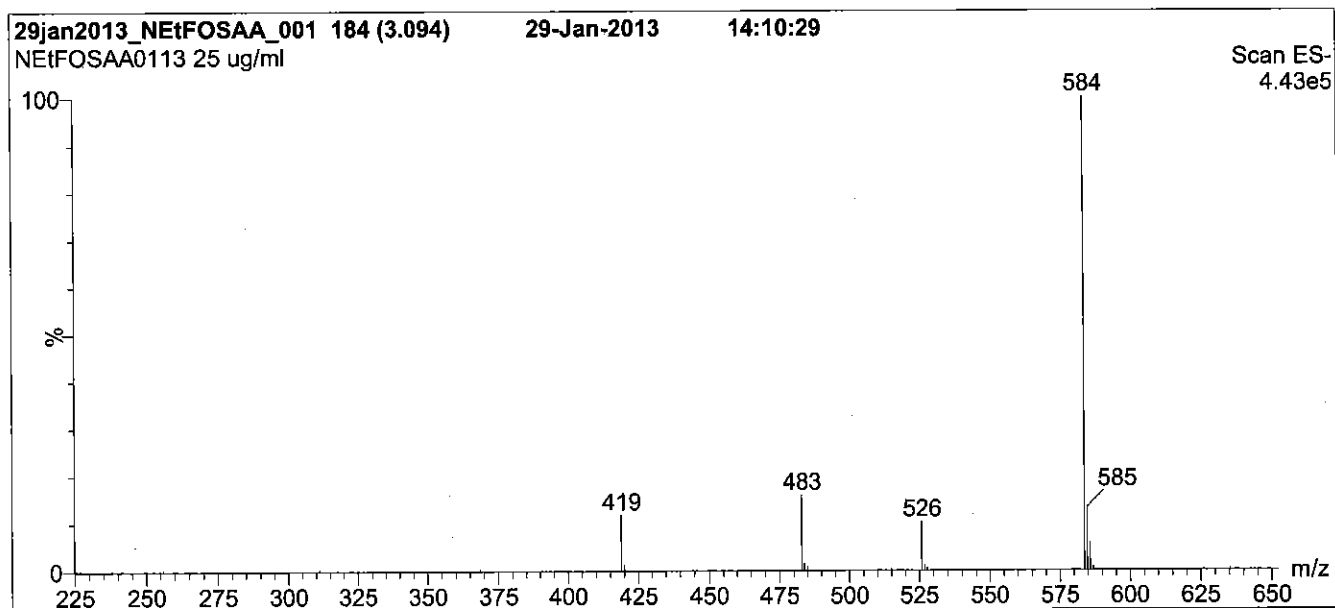
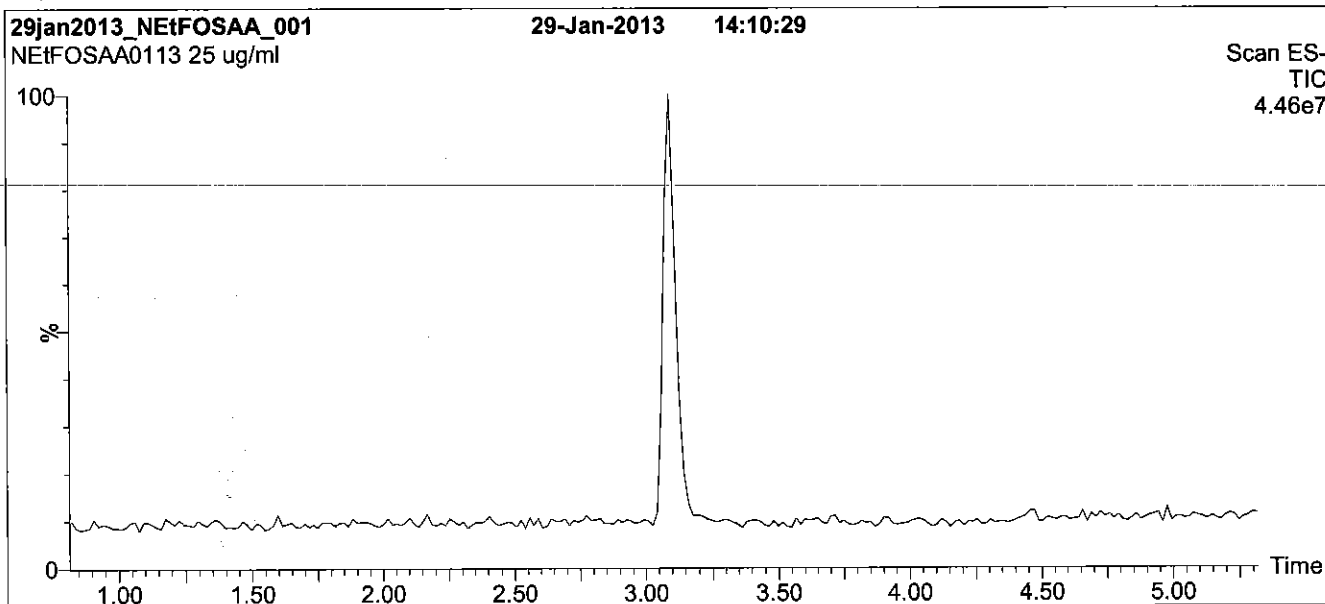
QUALITY MANAGEMENT:

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



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
 Start: 65% (80:20 MeOH:ACN) / 35% H₂O
 (both with 10 mM NH₄OAc buffer)
 Ramp to 90% organic over 7 min and hold for 1.5 min
 before returning to initial conditions in 0.5 min.
 Time: 10 min

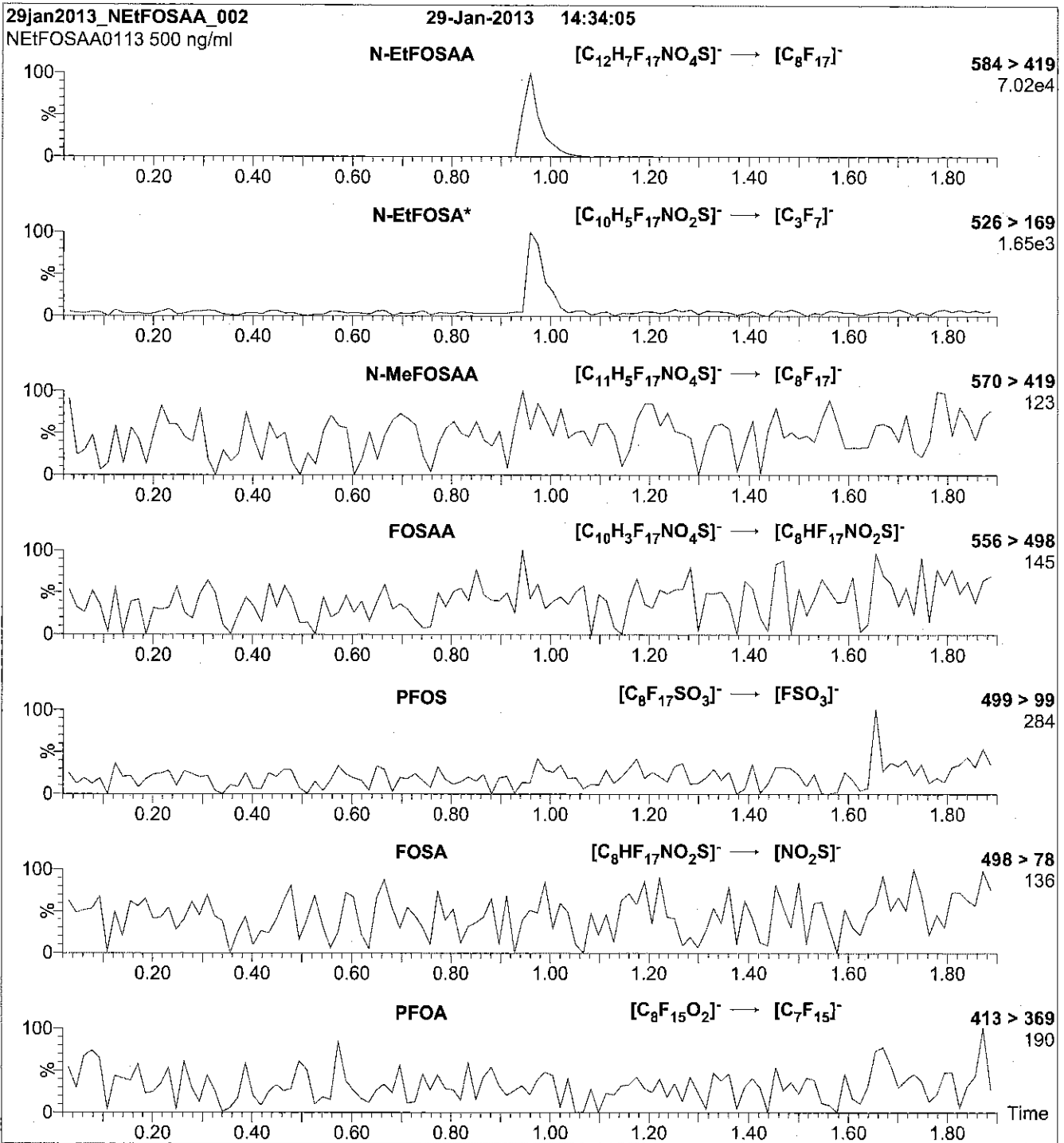
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

Figure 2: 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 μ l (500 ng/ml N-EtFOSAA)

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCN-ETFOSAA_00002

R: 8/23/16 SBC



715561
ID: LCN-EiFOSAA_00002
Exp: 01/2021 Pp# 98C
N-EiFOSAA

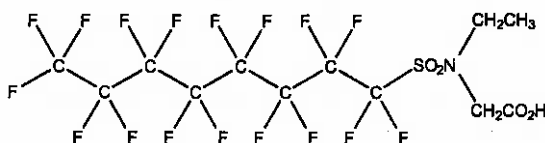


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CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: N-EtFOSAA **LOT NUMBER:** NEiFOSAA0116
COMPOUND: N-ethylperfluoro-1-octanesulfonamidoacetic acid

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



MOLECULAR FORMULA: C₁₂H₈F₁₇NO₄S **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)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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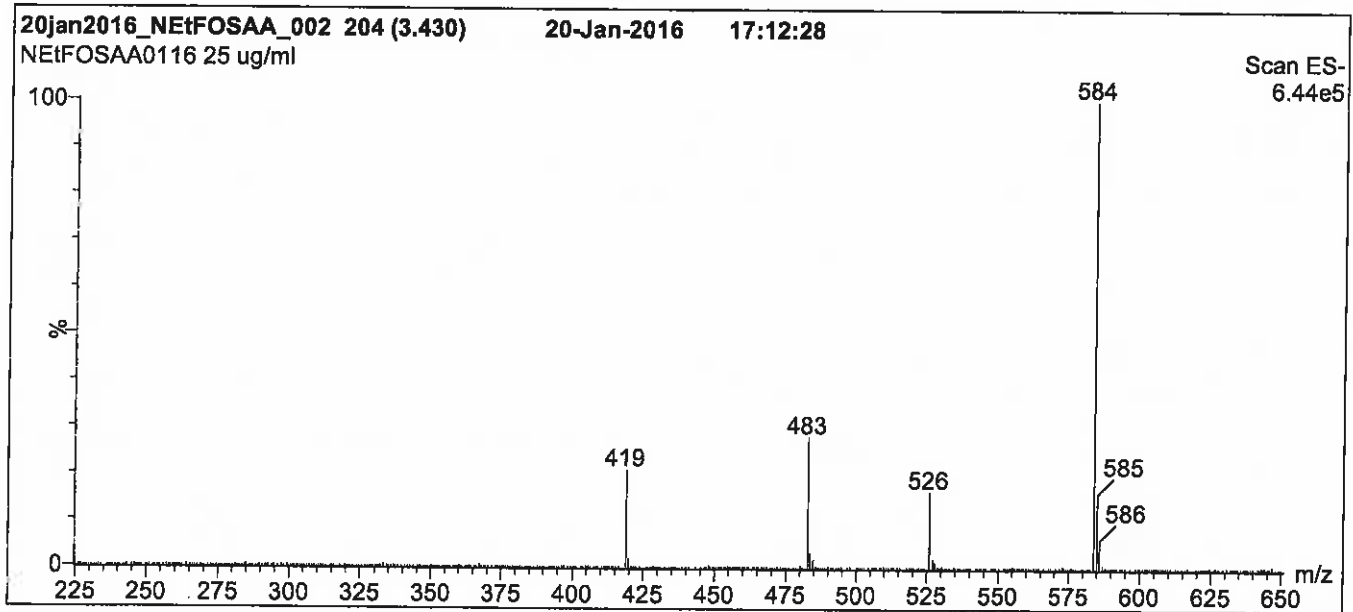
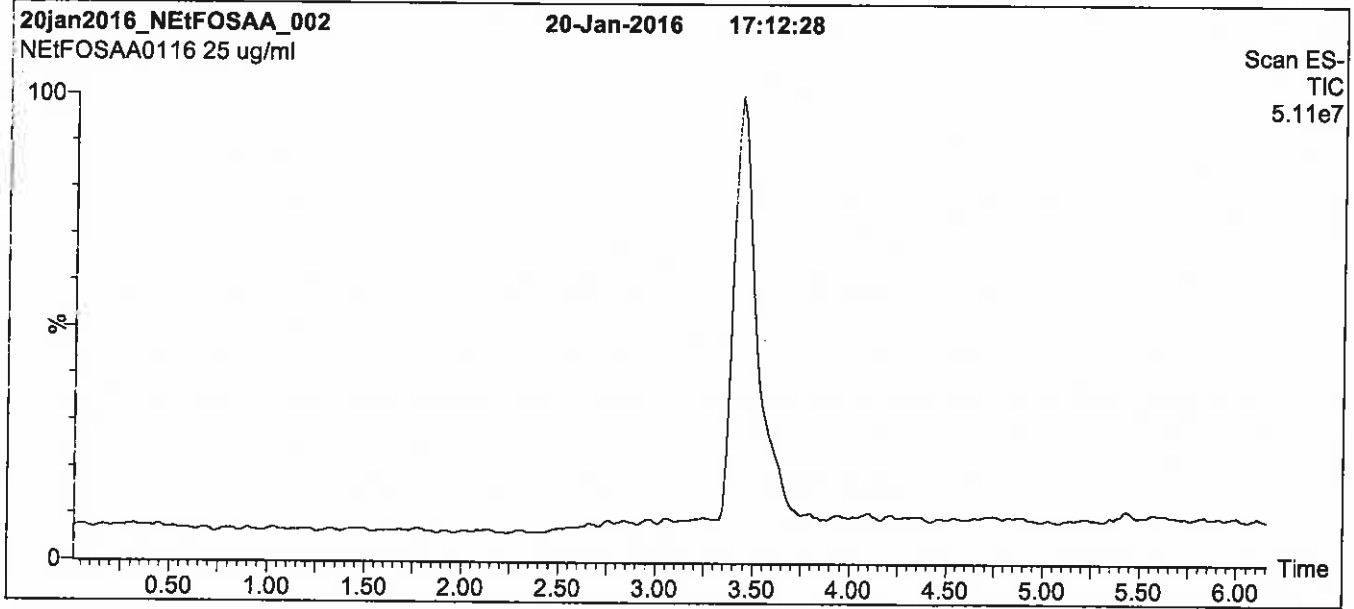
QUALITY MANAGEMENT:

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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 RP₁₈
 1.7 μ m, 2.1 x 100 mm

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

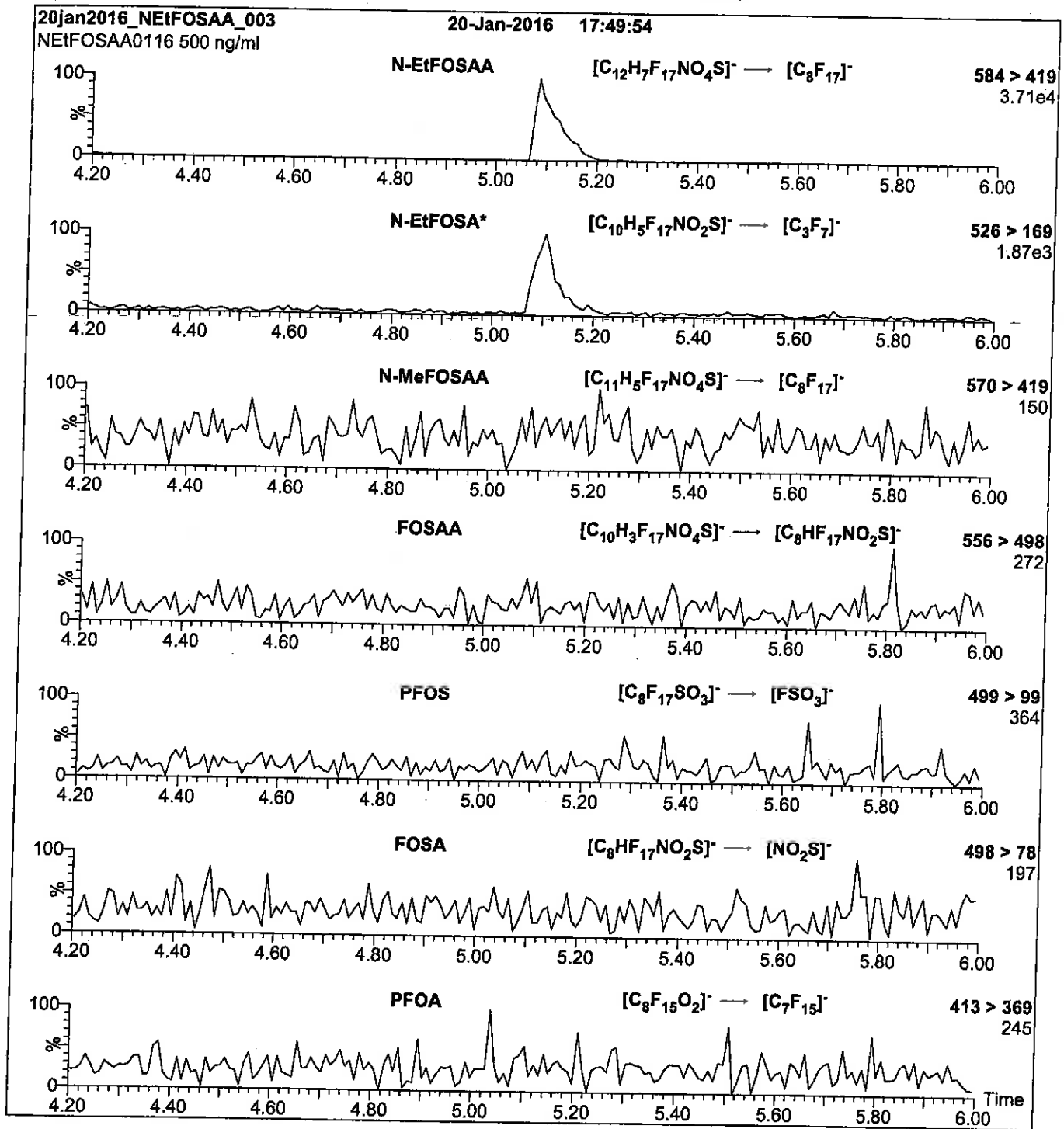
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

Figure 2: 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 μ l (500 ng/ml N-EtFOSAA)

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCN-MeFOSA-M_00001

R: 7/16/15 SPW



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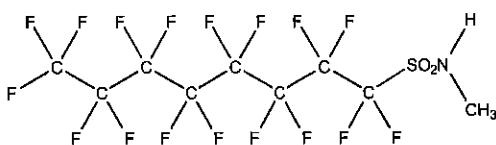
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: N-MeFOSA-M
COMPOUND: N-methylperfluoro-1-octanesulfonamide

LOT NUMBER: NMeFOSA0714M

STRUCTURE:

CAS #: 31506-32-8



MOLECULAR FORMULA: C₉H₄F₁₇NO₂S
CONCENTRATION: 50 ± 2.5 µg/ml
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

MOLECULAR WEIGHT: 513.17
SOLVENT(S): Methanol

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

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:

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HAZARDS:

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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, \dots, x_n on which it depends is:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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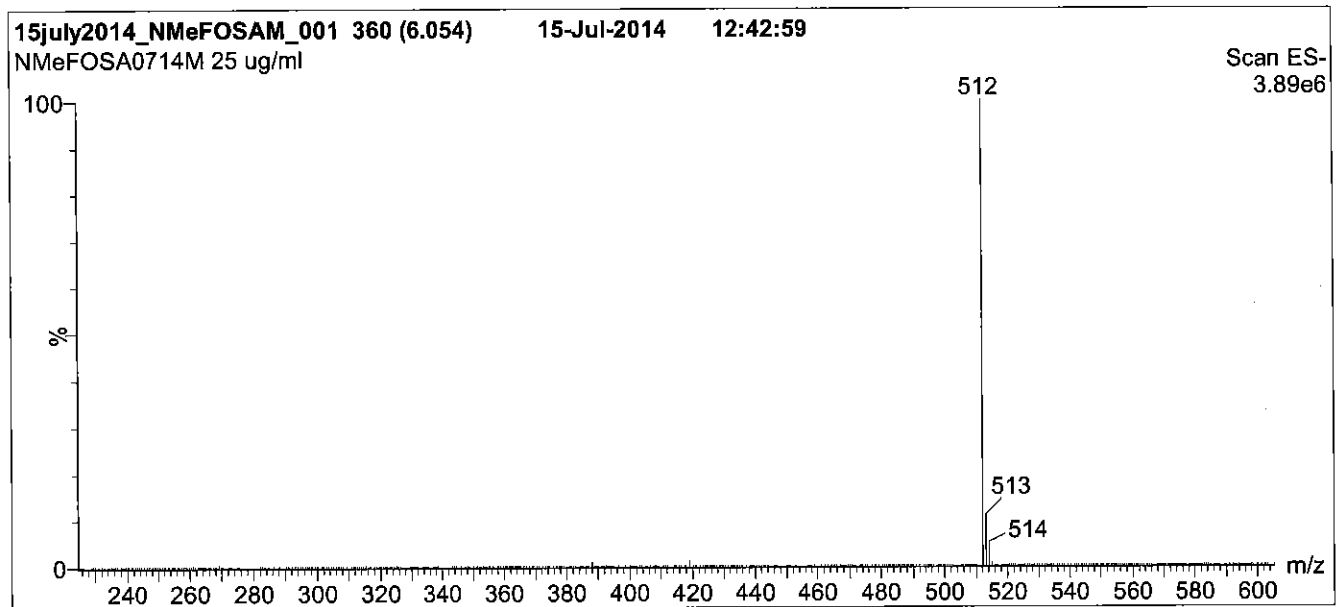
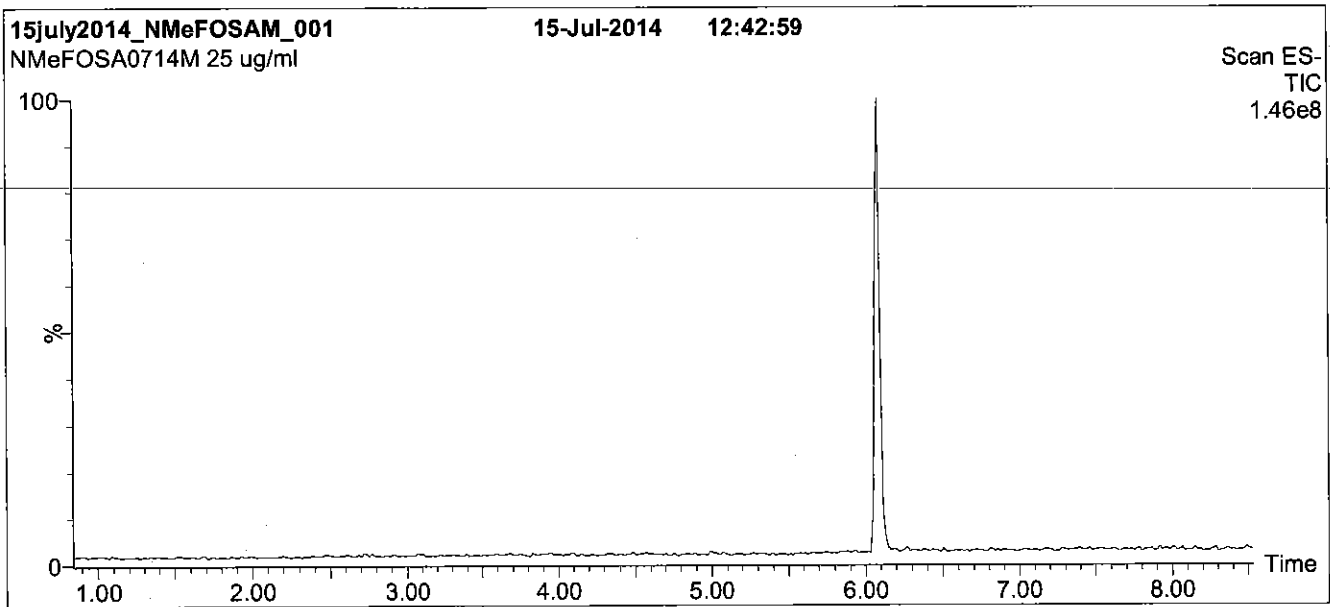
QUALITY MANAGEMENT:

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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 RP₁₈
1.7 μ m, 2.1 x 100 mm

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

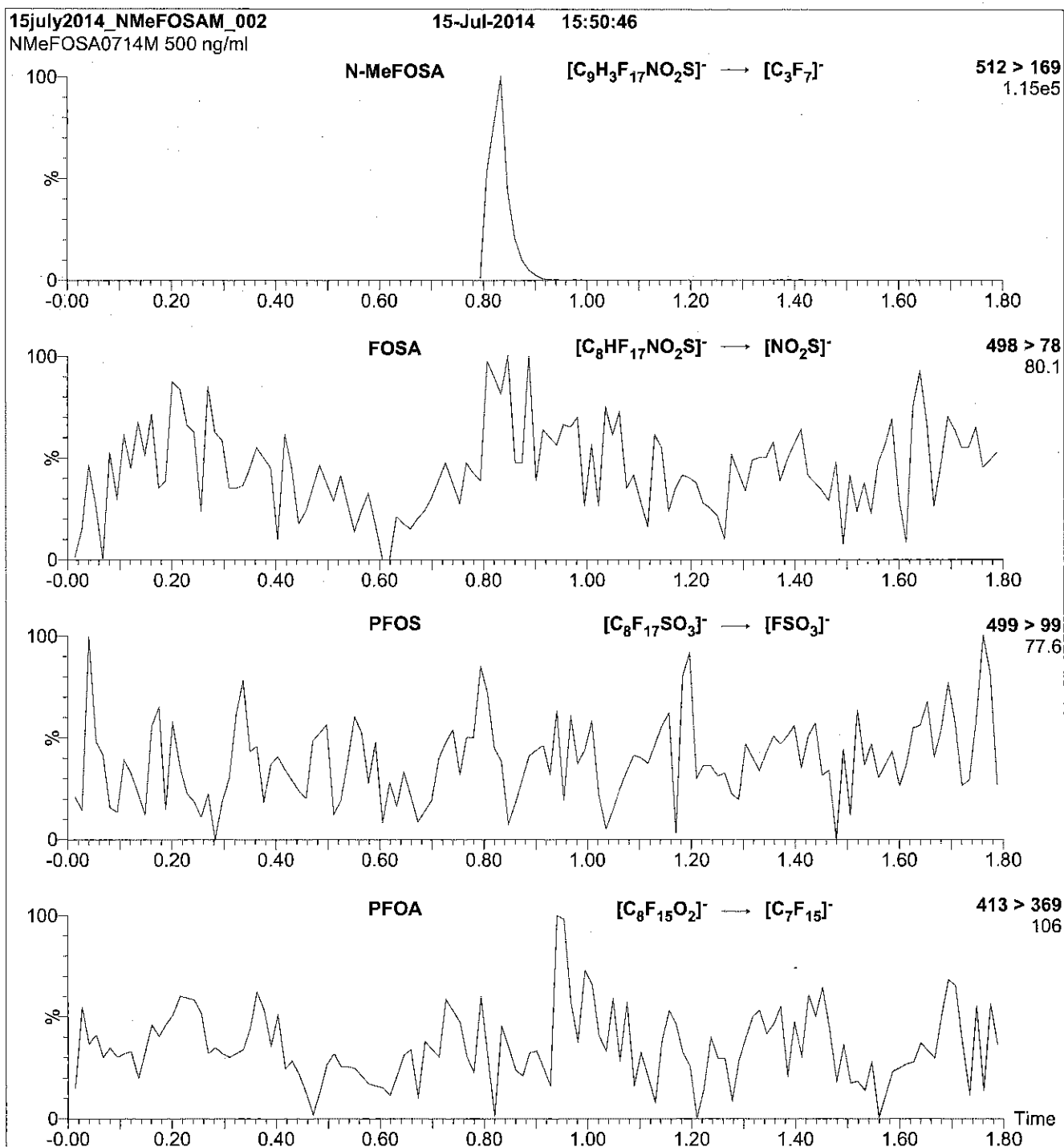
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 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 μ l (500 ng/ml N-MeFOSA-M)

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCN-MeFOSA-M_00002

R: 8/23/16 SBC



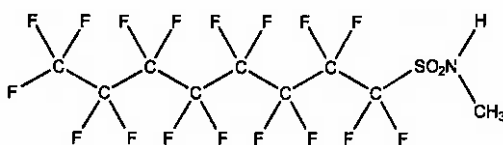
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ID: LCN-MeFOSA-M_00002
Exp: 05/24/21 Pppl: SBC
N-MeFOSA-M



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: C₉H₄F₁₇NO₂S **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

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: 05/26/2016
(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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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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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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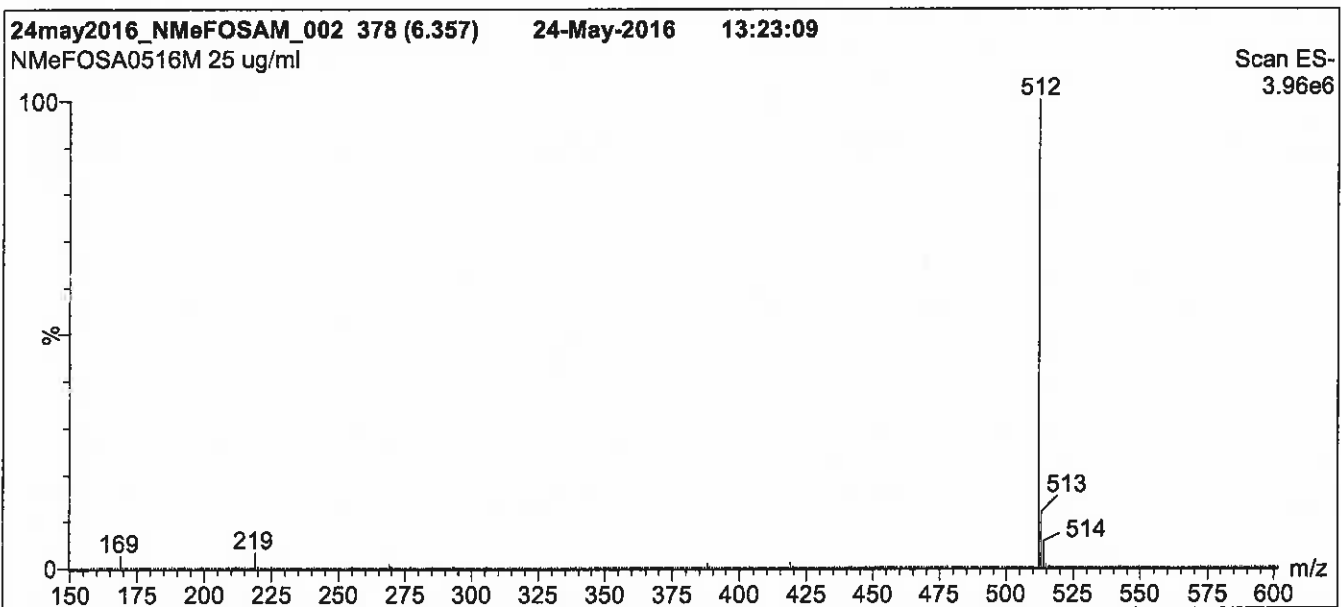
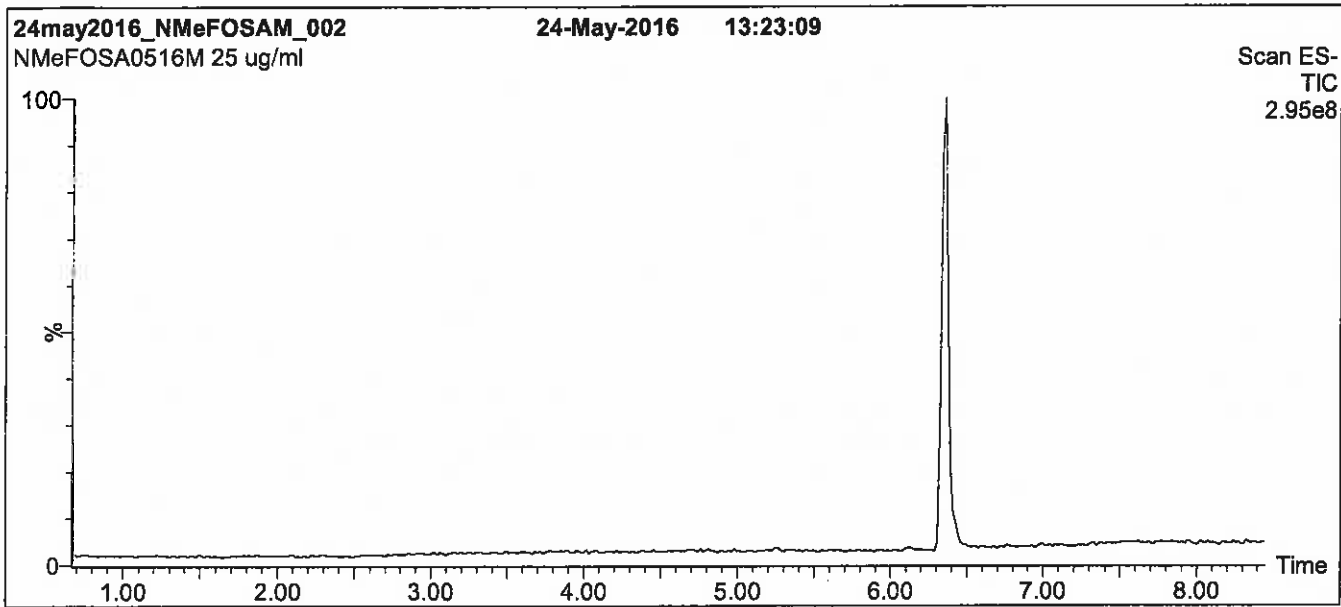
QUALITY MANAGEMENT:

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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 RP₁₈
 1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
 Start: 45% H₂O / 55% (80:20 MeOH:ACN)
 (both with 10 mM NH₄OAc buffer)
 Ramp to 90% organic over 7.5 min and hold for
 1.5 min before returning to initial conditions in 0.5 min.
 Time: 10 min

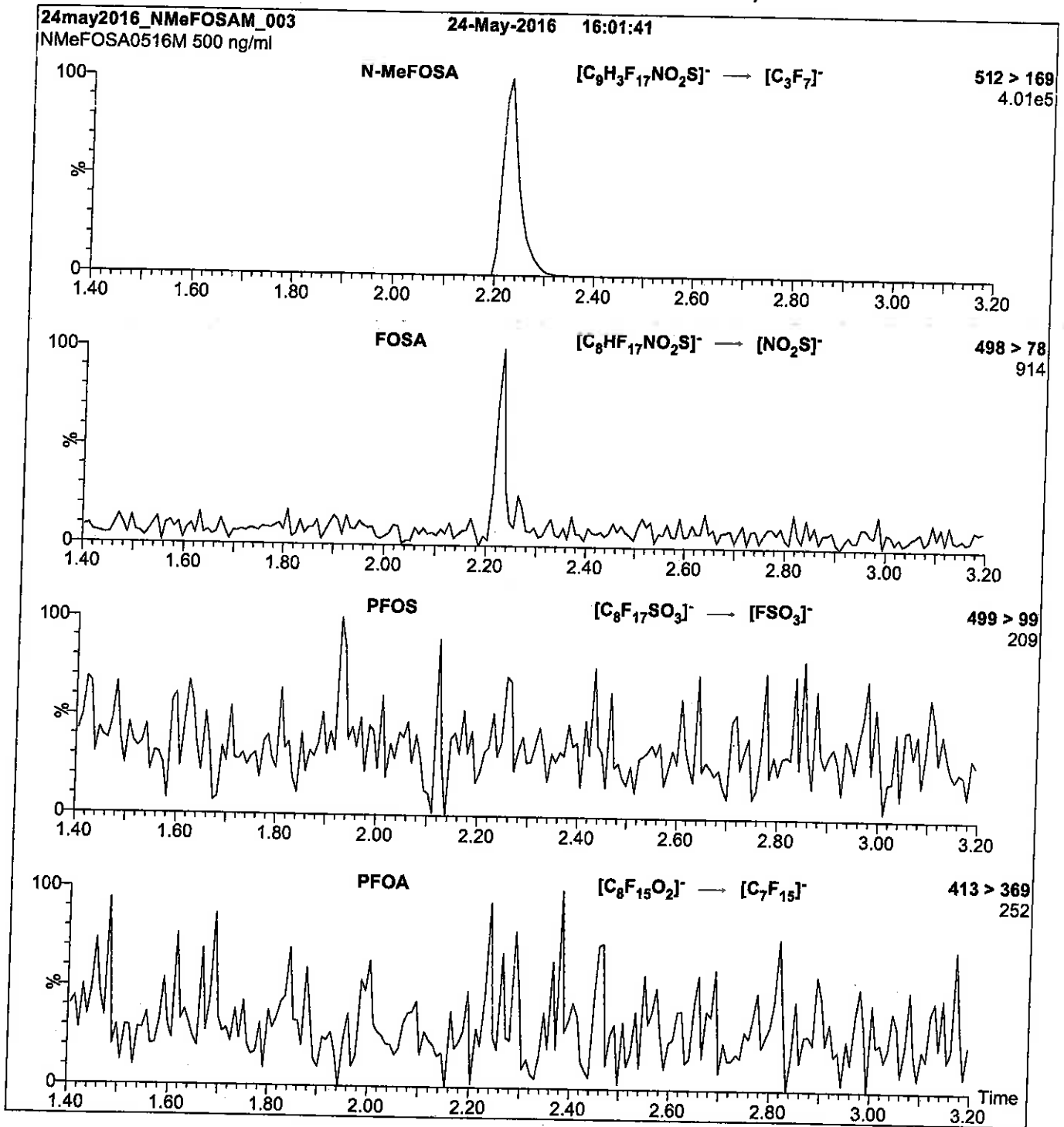
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
 Capillary Voltage (kV) = 2.50
 Cone Voltage (V) = 40.00
 Core 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 μ l (500 ng/ml N-MeFOSA-M)

MS Parameters

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

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

Flow: 300 μ l/min

Reagent

LCN-MeFOSAA_00001

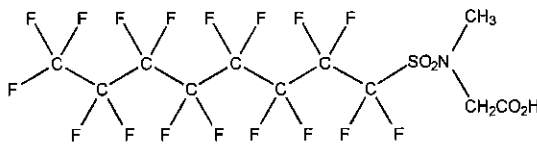


WELLINGTON
LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: N-MeFOSAA **LOT NUMBER:** NMeFOSAA1214
COMPOUND: N-methylperfluoro-1-octanesulfonamidoacetic acid

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



MOLECULAR FORMULA: C₁₁H₆F₁₇NO₄S **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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SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

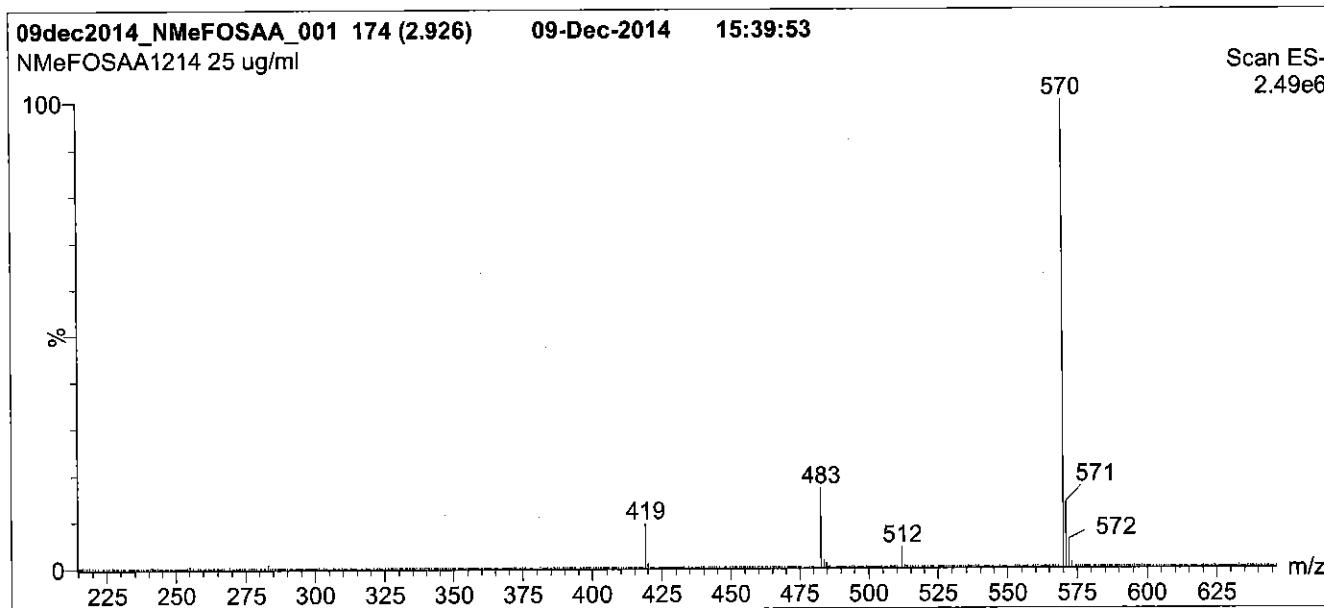
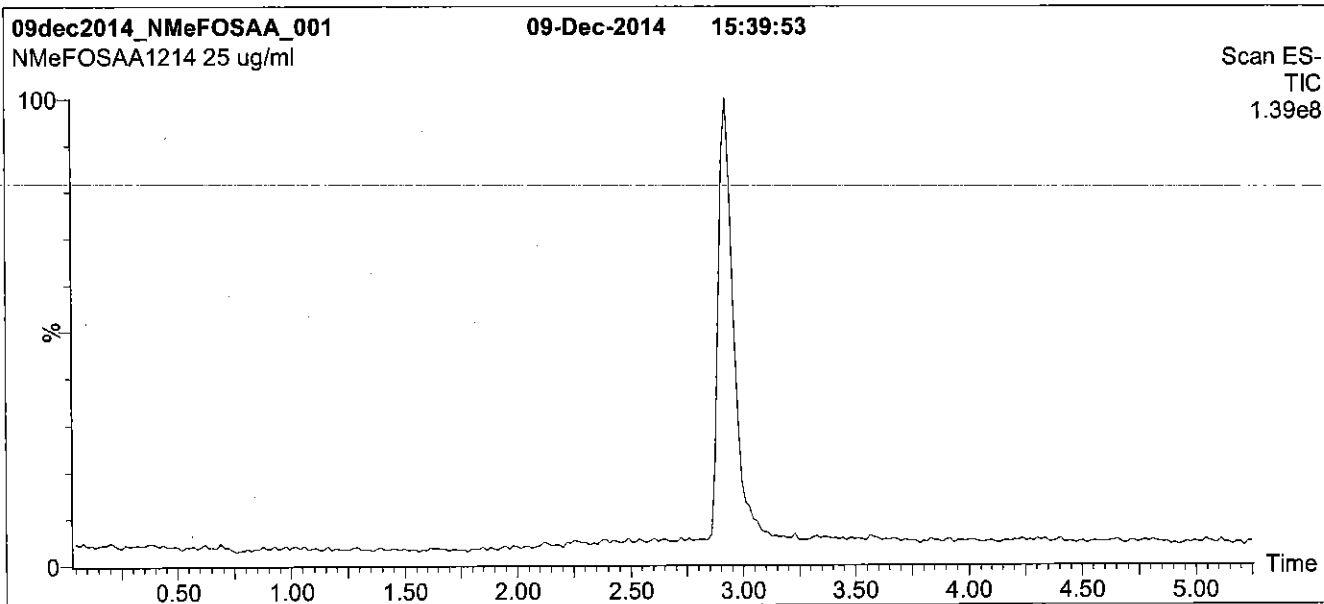
QUALITY MANAGEMENT:

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



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
 Start: 65% (80:20 MeOH:ACN) / 35% H₂O
 (both with 10 mM NH₄OAc buffer)
 Ramp to 90% organic over 7 min and hold for 1.5 min
 before returning to initial conditions in 0.5 min.
 Time: 10 min

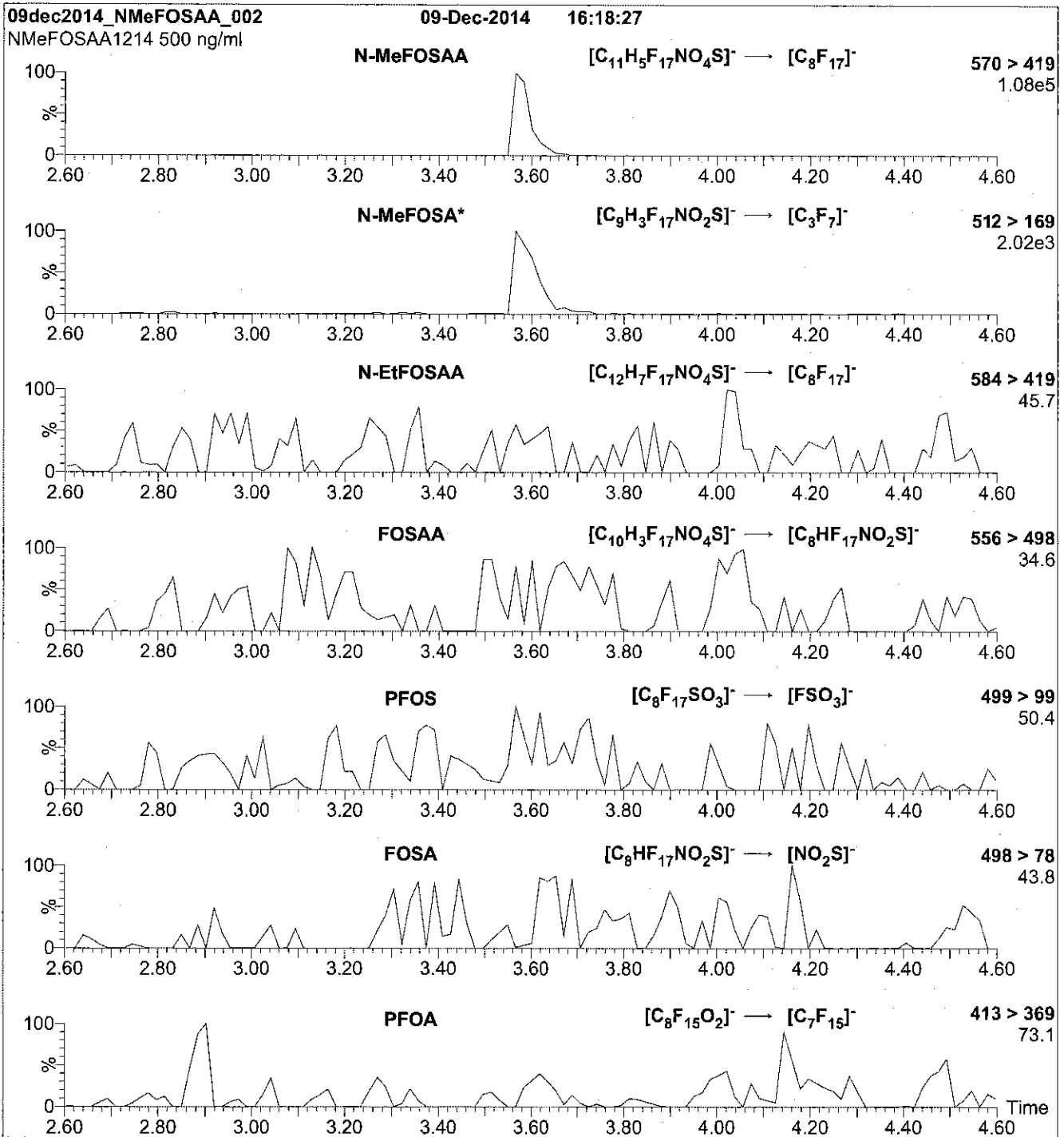
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (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 μ l (500 ng/ml N-MeFOSAA)

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCN-MeFOSAA_00003

R: 8/23/16 JAE

715562
ID: LCN-MeFOSAA_00003
Exp: 01/20/21 Prod. SEC
N-MeFOSAA

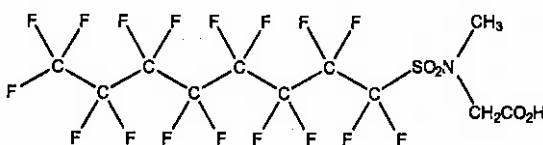


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: N-MeFOSAA **LOT NUMBER:** NMeFOSAA0116
COMPOUND: N-methylperfluoro-1-octanesulfonamidoacetic acid

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



MOLECULAR FORMULA: C₁₁H₈F₁₇NO₄S **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

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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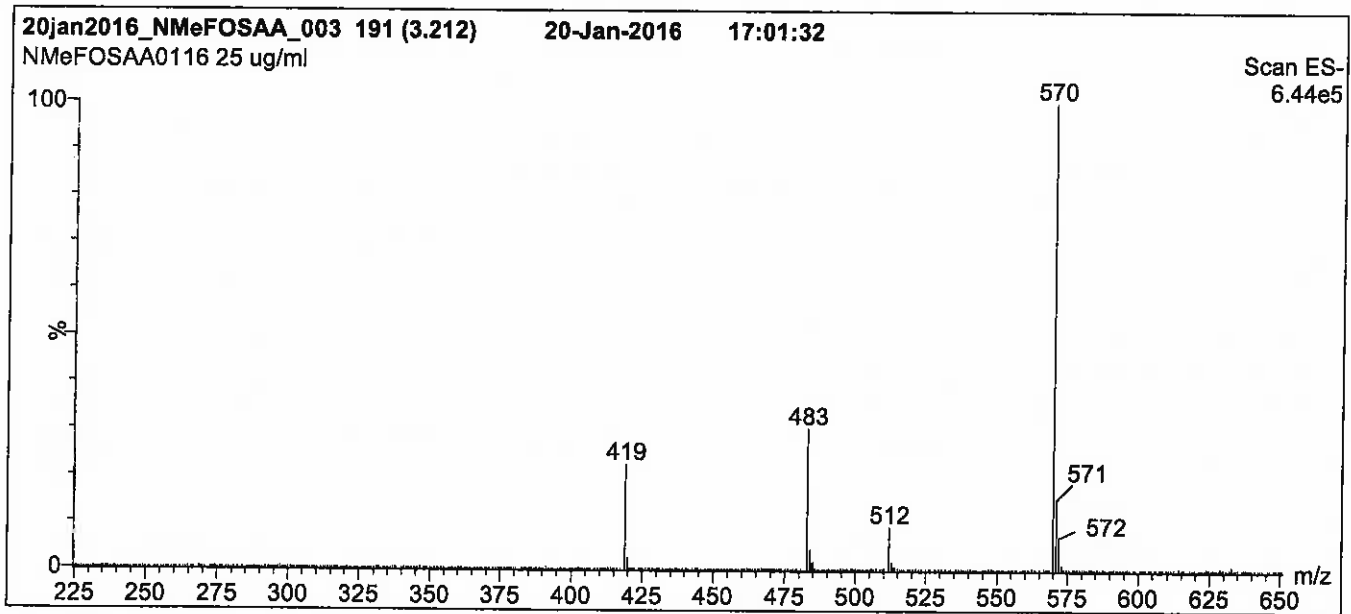
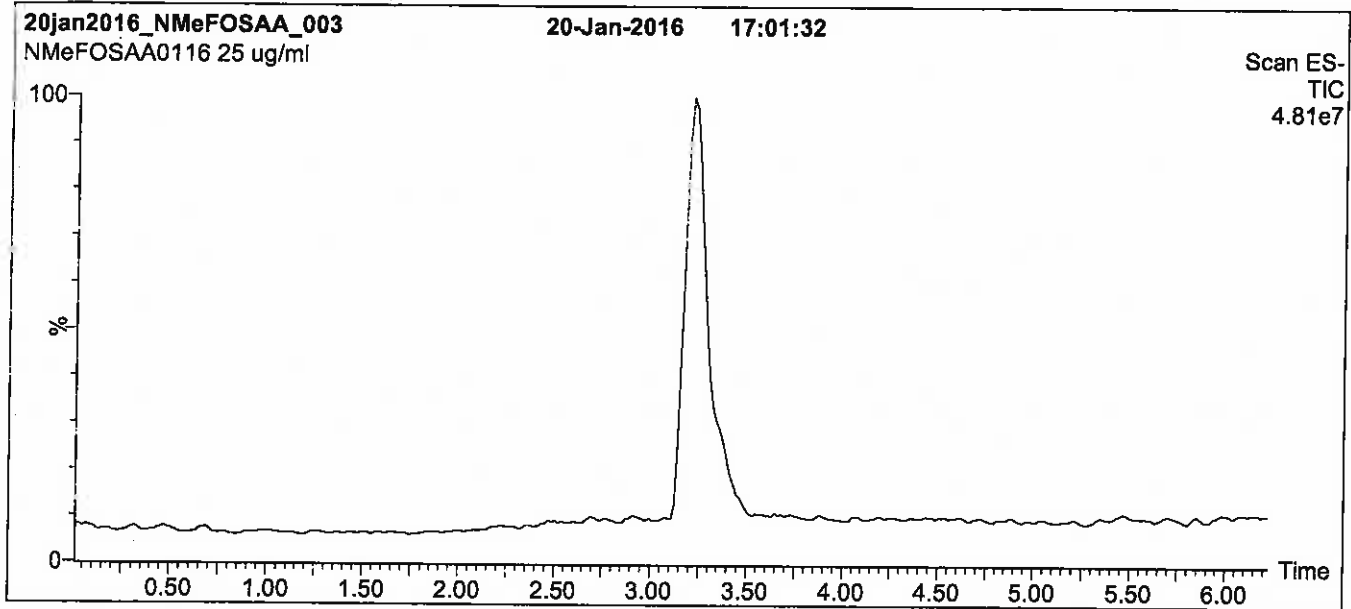
QUALITY MANAGEMENT:

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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 RP₁₈
 1.7 μ m, 2.1 x 100 mm

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

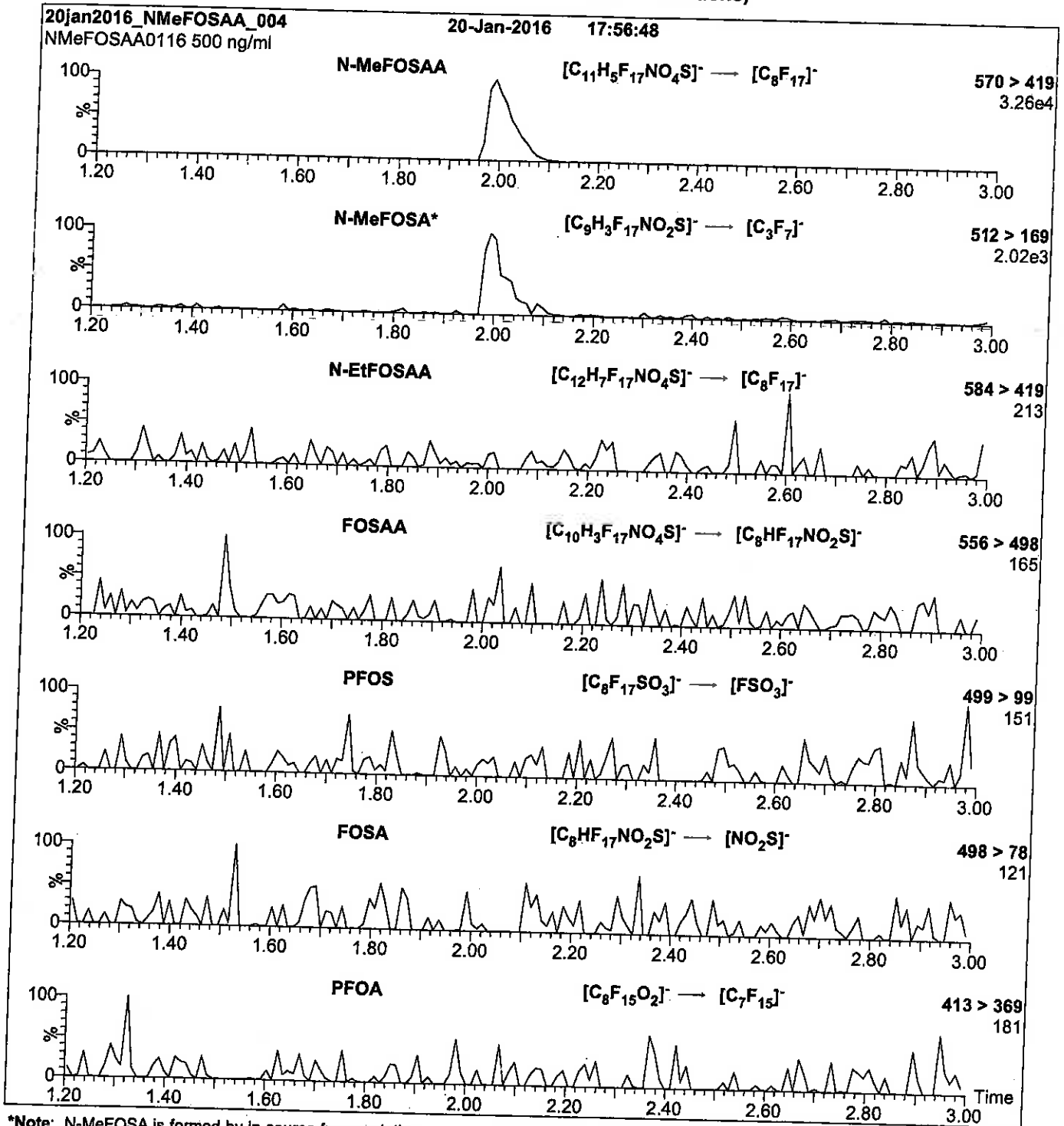
MS Parameters

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

Flow: 300 μ l/min

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 μ l (500 ng/ml N-MeFOSAA)

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCPFACMXB_00007



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 (C₄-C₁₄, C₁₆, and C₁₈) and four native perfluoroalkylsulfonates (C₄, C₆, C₈ and C₁₀). 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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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UNCERTAINTY:

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TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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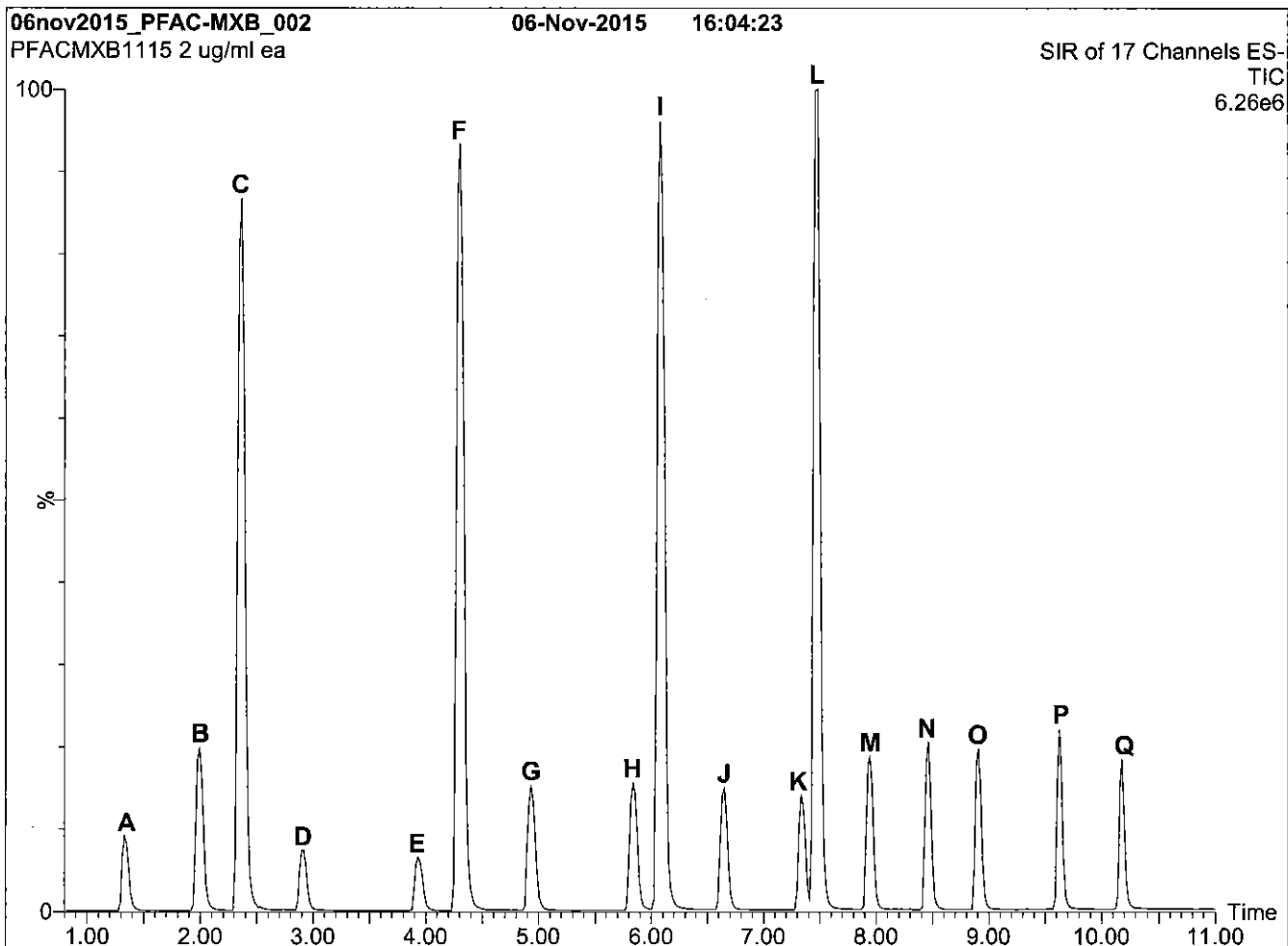
Table A: PFAC-MXB; Components and Concentrations (ng/ml, ± 5% in Methanol / Water (<1%))

Name	Abbreviation	Concentration (ng/ml)		Peak Assignment in Figure 1
		as the salt	as the anion	
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. Crittitt

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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% H₂O / 45% (80:20 MeOH:ACN)
(both with 10 mM NH₄OAc 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 μ l/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)

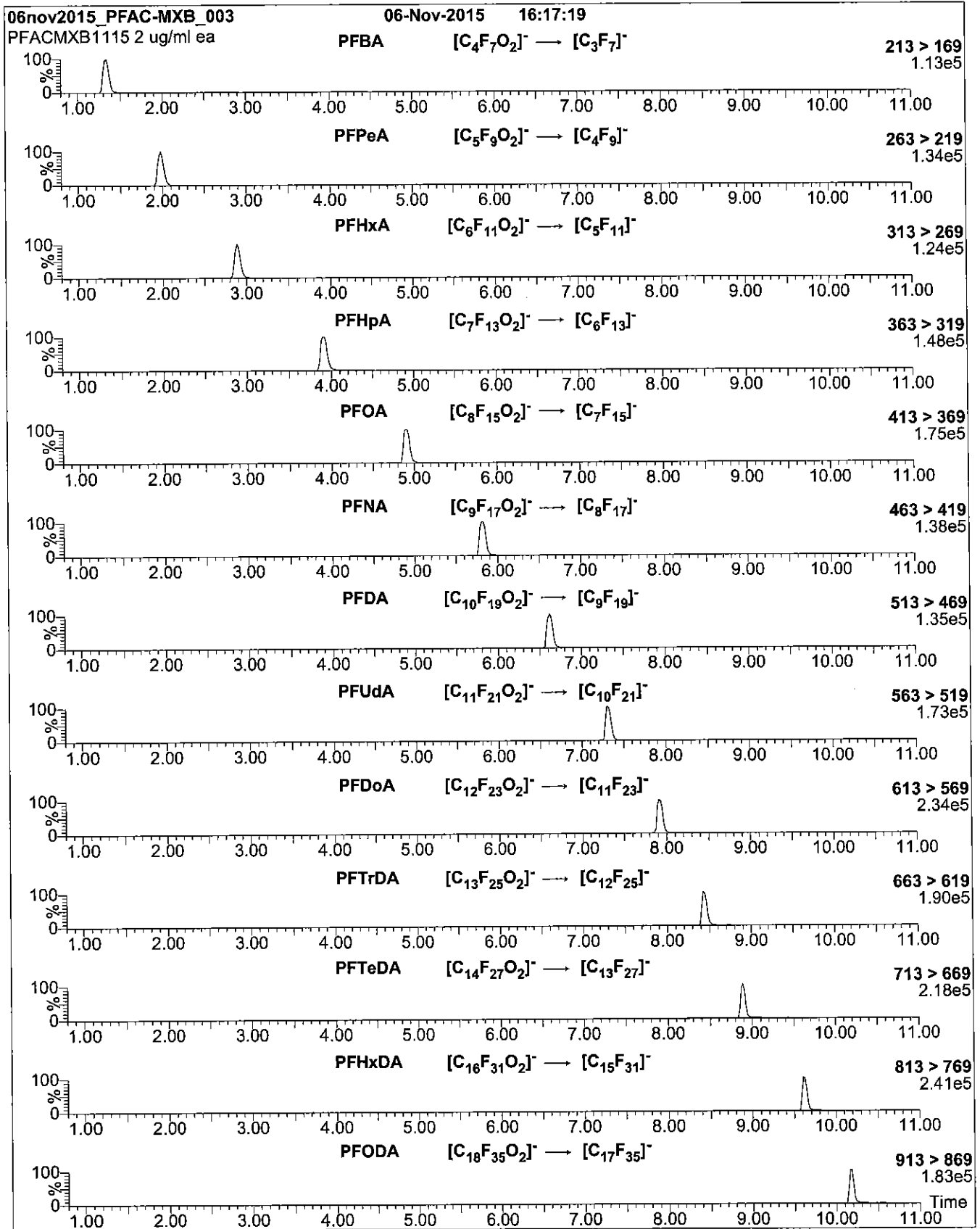
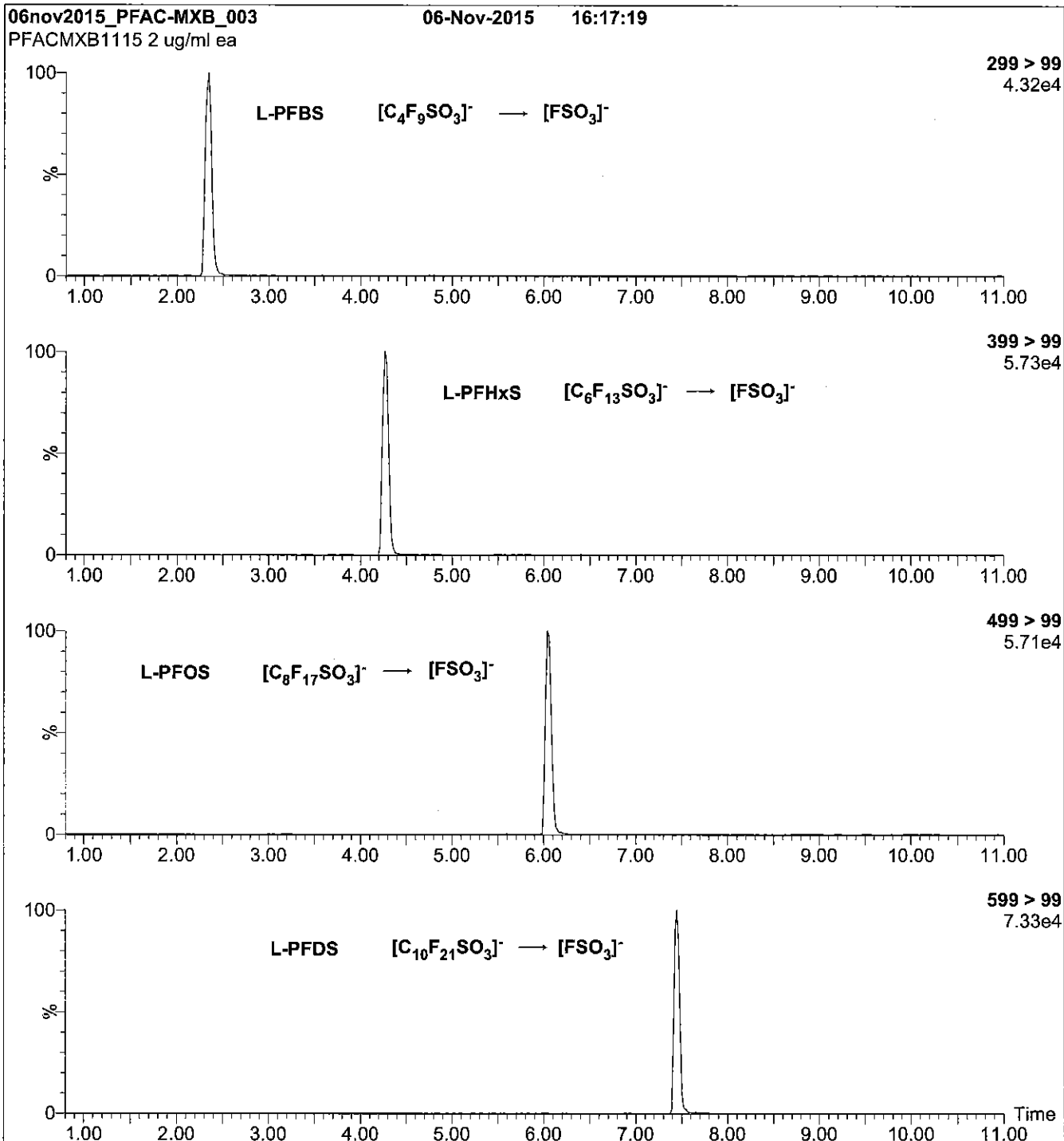


Figure 3: PFAC-MXB; LC/MS/MS Data (Selected MRM Transitions)



Conditions for Figures 2 and 3:

Injection: on-column (PFAC-MXB)
 Mobile phase: Same as Figure 1
 Flow: 300 μ /min

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

Reagent

LCPFBA_00004



R: 2125/16 CBW

587895

ID: LCPFBA_00004

Exp: 01/30/20 Prep: CBW

PF-n-butanoic acid

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

PFBA

LOT NUMBER:

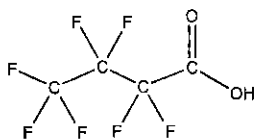
PFBA0115

COMPOUND:

Perfluoro-n-butanoic acid

STRUCTURE:**CAS #:**

375-22-4

**MOLECULAR FORMULA:** $C_4HF_7O_2$ **MOLECULAR WEIGHT:**

214.04

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

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

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)

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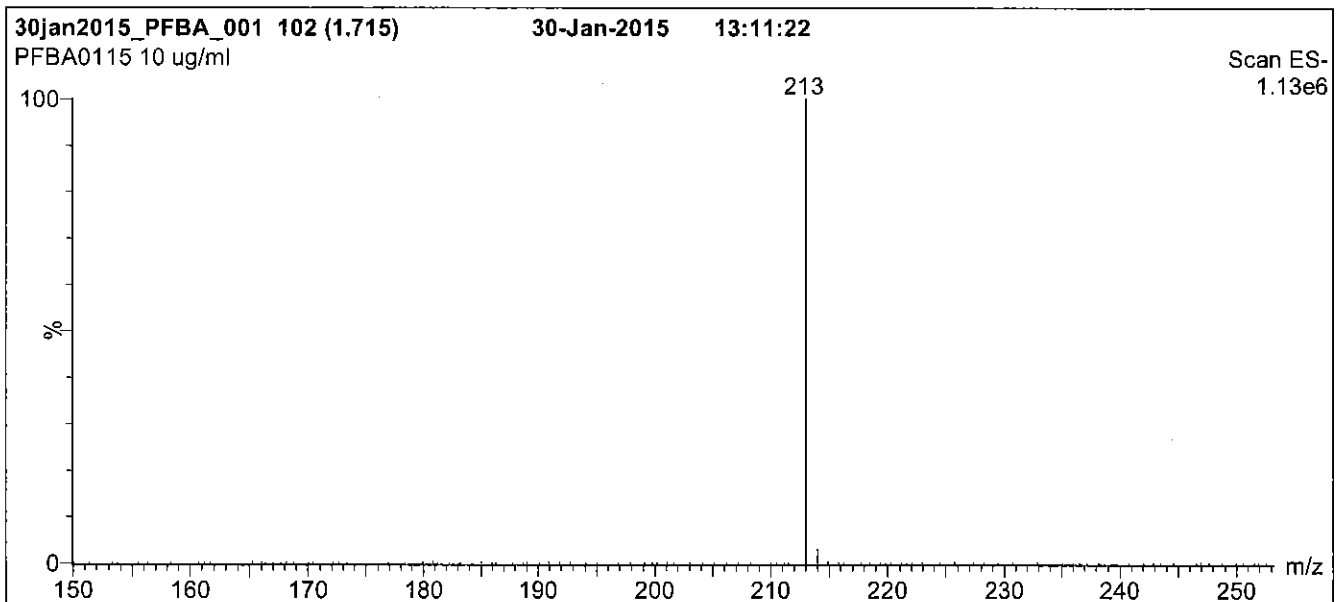
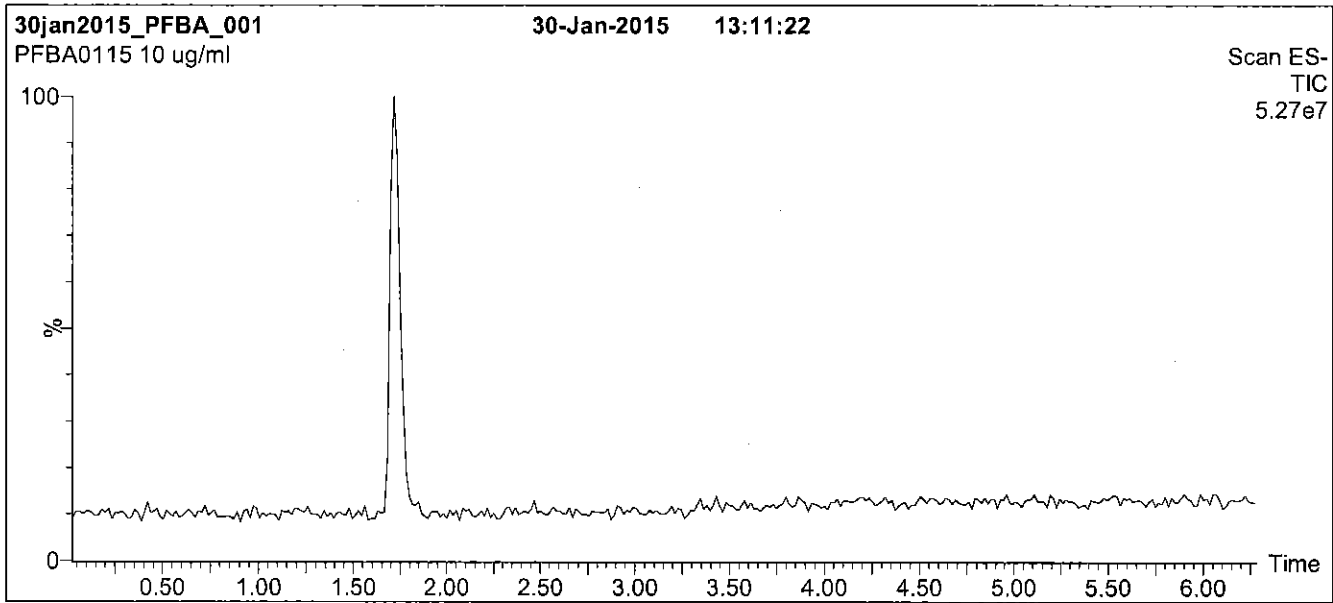
QUALITY MANAGEMENT:

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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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 30% (80:20 MeOH:ACN) / 70% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1 min
before returning to initial conditions in 0.5 min.
Time: 10 min

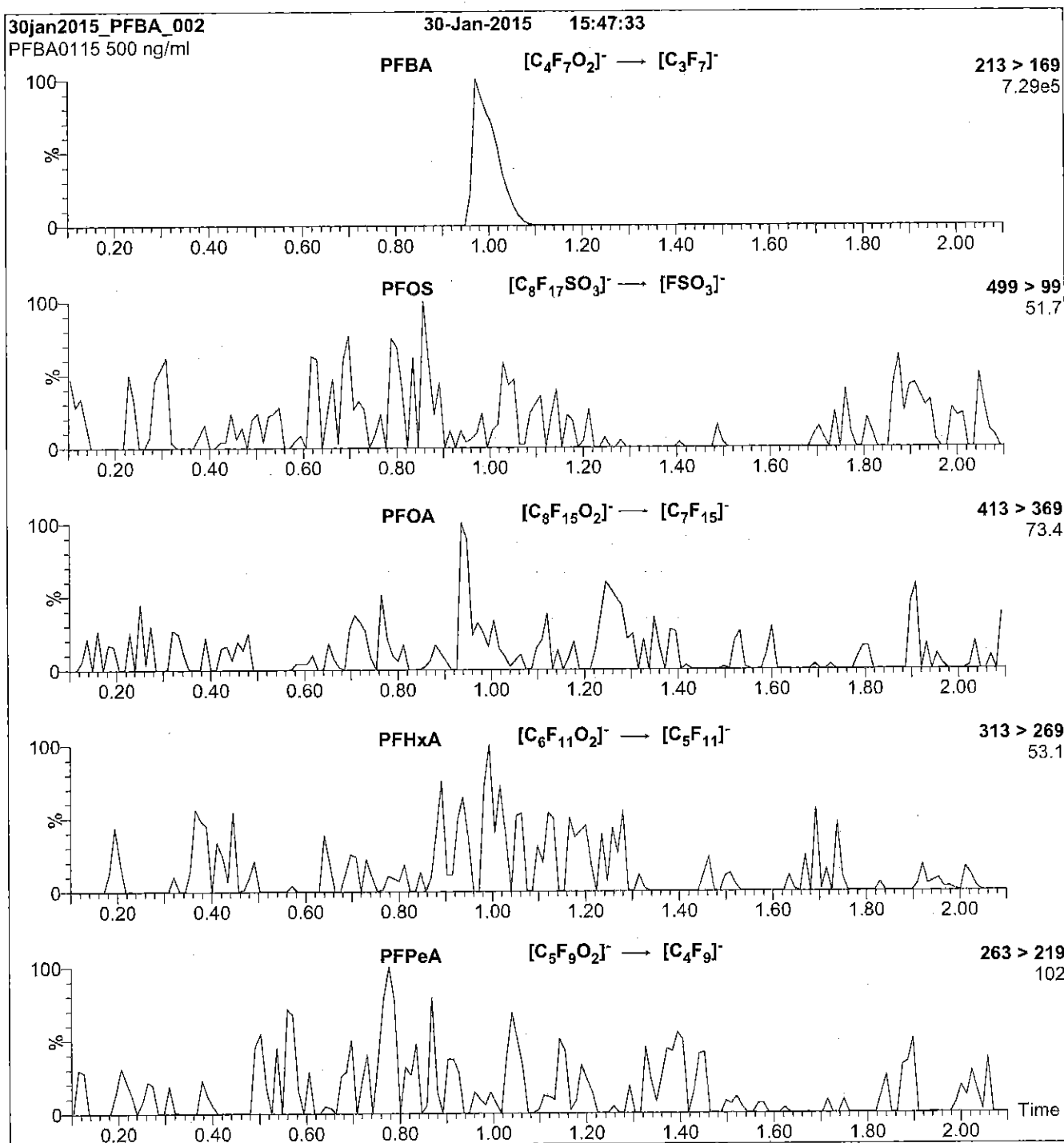
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 8.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
 Collision Energy (eV) = 10

Reagent

LCPFBA_00005

Scanned
10/16/14

R: SBC 9/13/16



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



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

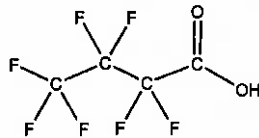


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFBA
COMPOUND: Perfluoro-n-butanolic acid
LOT NUMBER: PFBA0516

STRUCTURE:
CAS #: 375-22-4



MOLECULAR FORMULA: $C_4HF_7O_2$
CONCENTRATION: $50 \pm 2.5 \mu\text{g/ml}$
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:

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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.

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, \dots, x_n on which it depends is:

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

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

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

TRACEABILITY:

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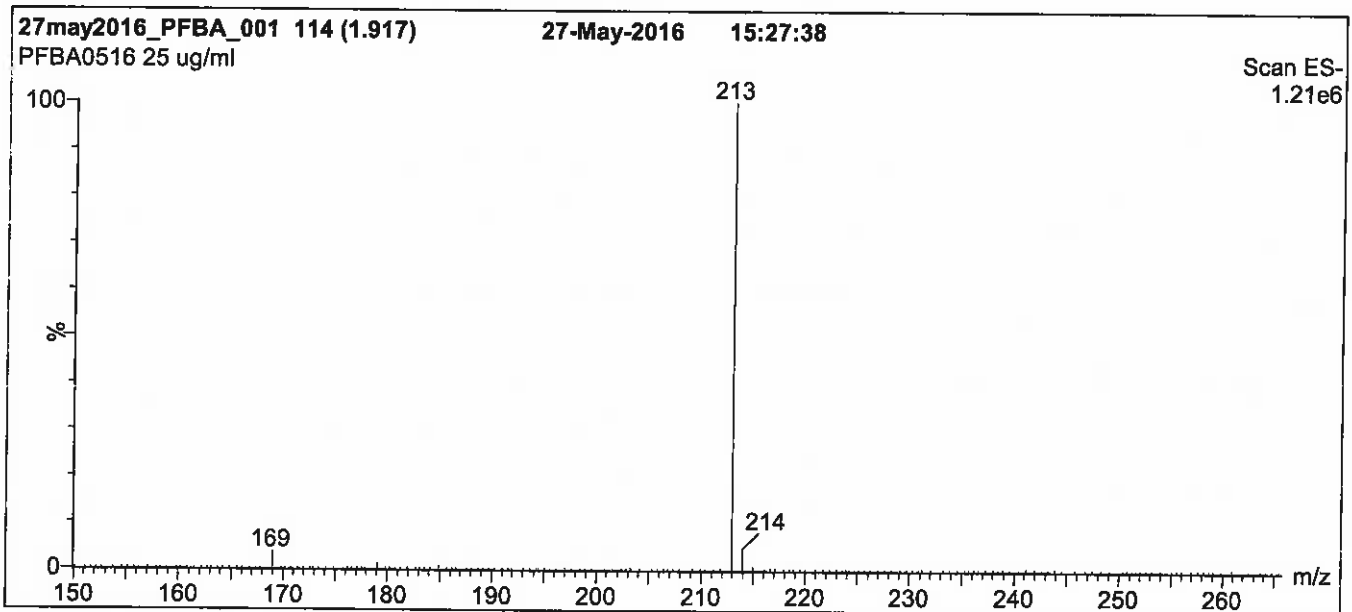
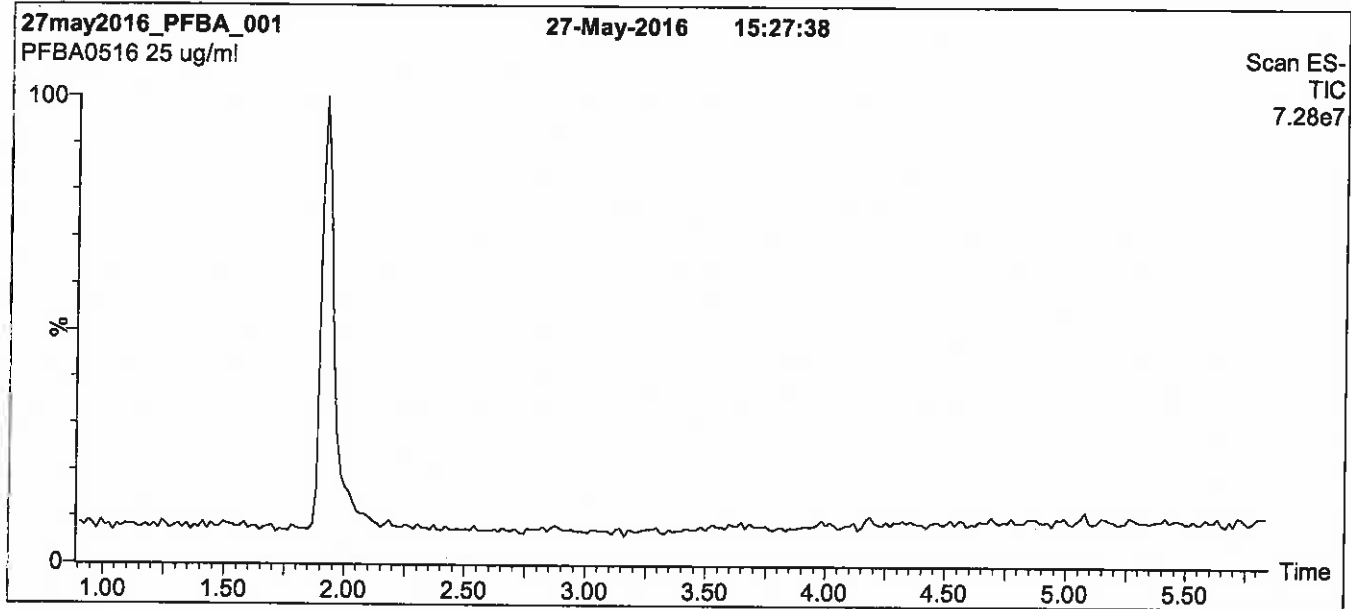
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Figure 1: PFBA; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

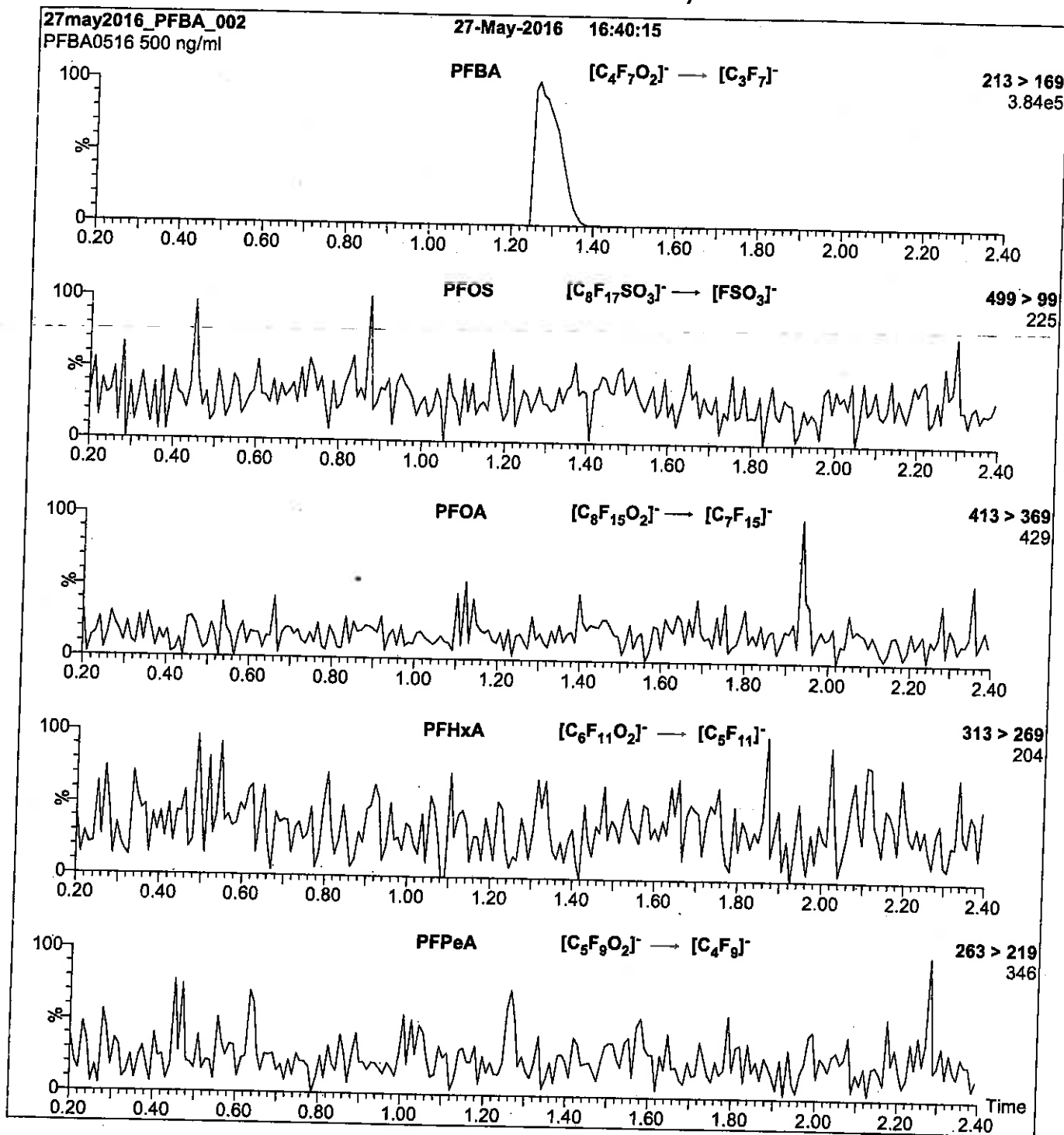
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCPFBS_00004



Rec. 3/29/16 JRB ✓

605236

ID: LCPFBS_00004

Exp: 10/09/19 Prpd: CBW

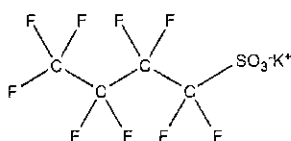
PF-1-butanesulfonate K sa



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: L-PFBS **LOT NUMBER:** LPFBS1014
COMPOUND: Potassium perfluoro-1-butanesulfonate
STRUCTURE: **CAS #:** 29420-49-3



MOLECULAR FORMULA: C₄F₉SO₃K **MOLECULAR WEIGHT:** 338.19
CONCENTRATION: 50.0 ± 2.5 µg/ml (K salt) **SOLVENT(S):** Methanol
44.2 ± 2.2 µg/ml (PFBS anion)
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 10/09/2014
EXPIRY DATE: (mm/dd/yyyy) 10/09/2019
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

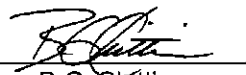
DOCUMENTATION/ DATA ATTACHED:

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:** 04/02/2015
(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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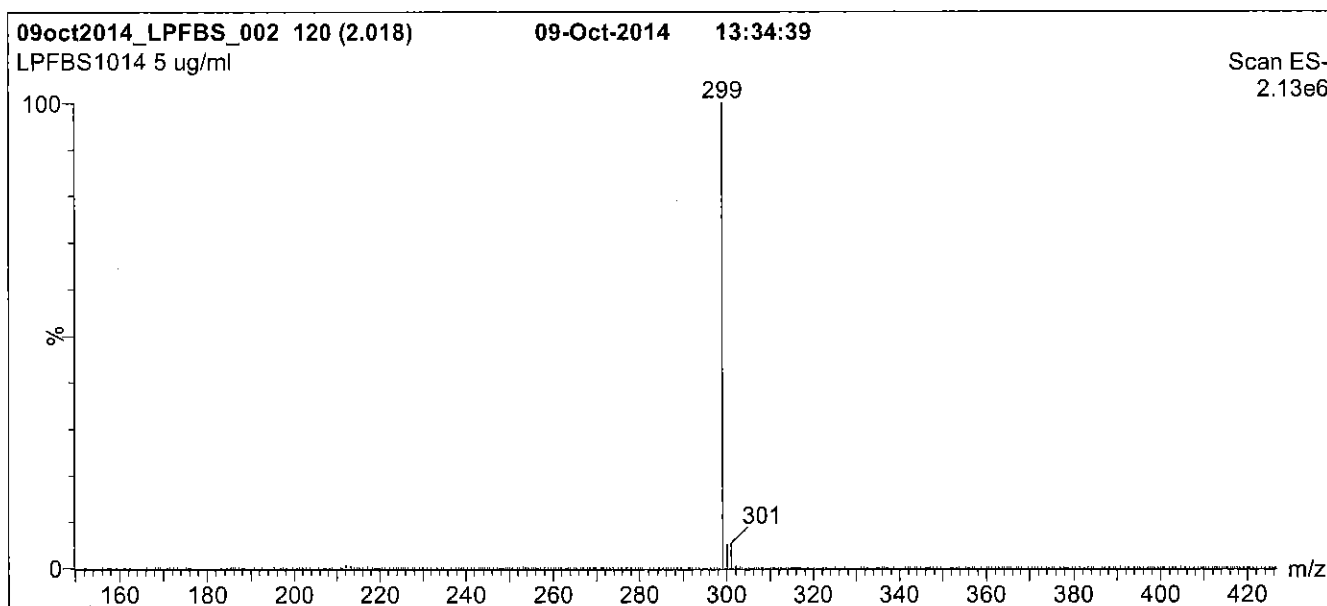
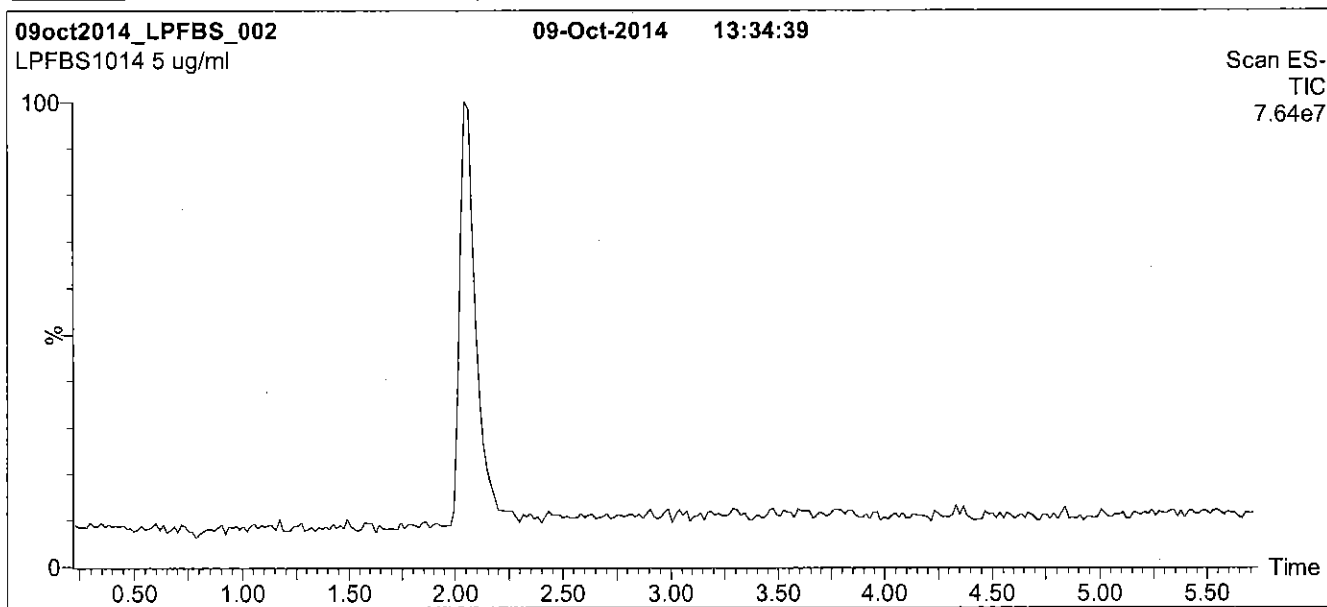
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Figure 1: L-PFBS; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

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

Chromatographic Conditions

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

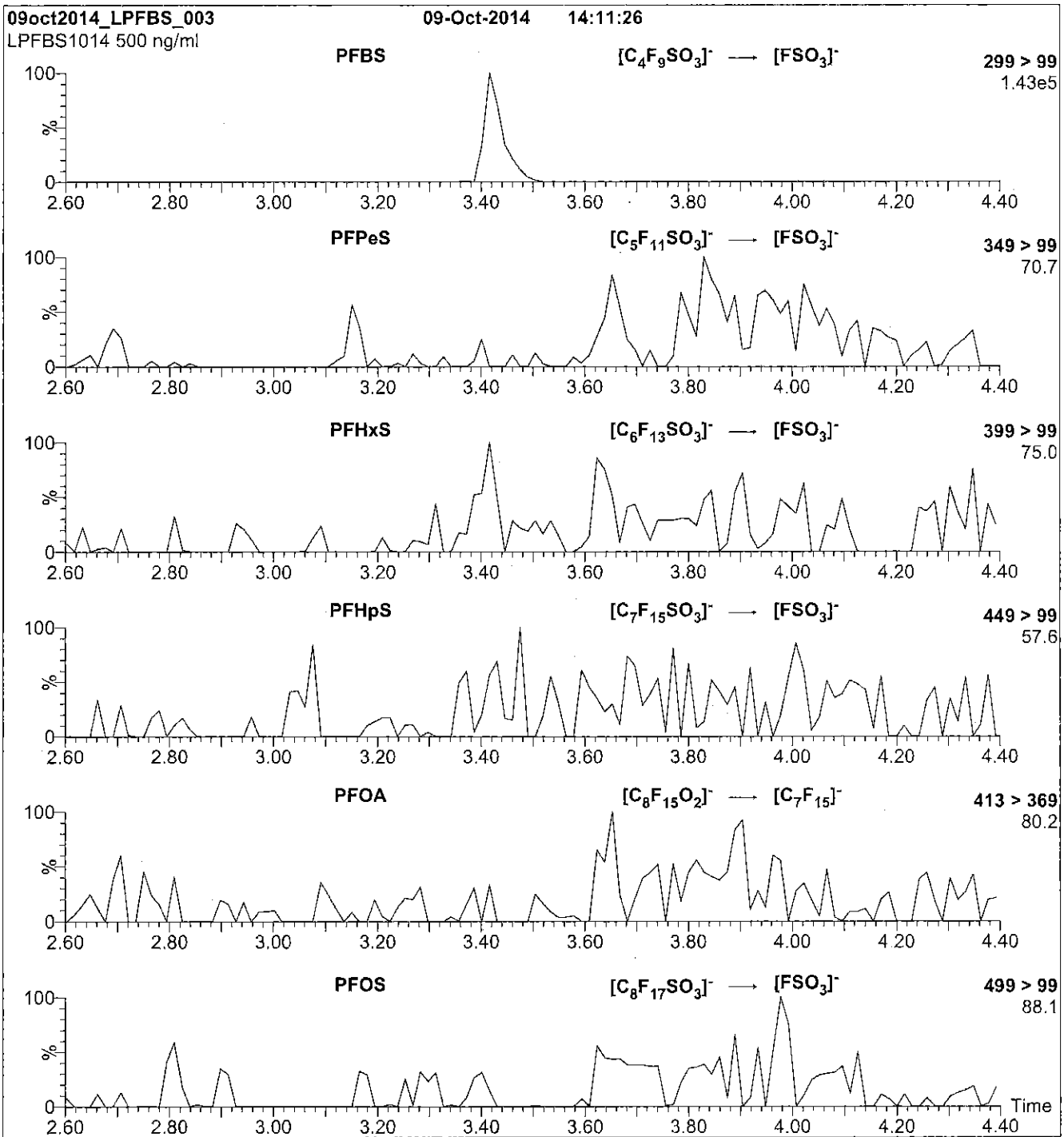
Mobile phase: Gradient
 Start: 40% (80:20 MeOH:ACN) / 60% H₂O
 (both with 10 mM NH₄OAc buffer)
 Ramp to 90% organic over 7 min and hold for 1.5 min
 before returning to initial conditions in 0.5 min.
 Time: 10 min

Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)
 Source: Electrospray (negative)
 Capillary Voltage (kV) = 2.00
 Cone Voltage (V) = 40.00
 Cone Gas Flow (l/hr) = 50
 Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCPFBS_00005

R: 9/9/16 gbe



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

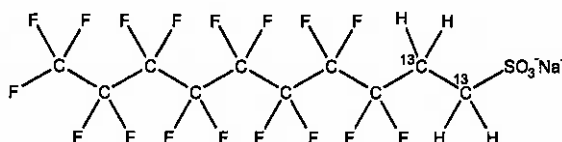


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2-8:2FTS **LOT NUMBER:** M282FTS0116
COMPOUND: Sodium 1H,1H,2H,2H-perfluoro-[1,2-¹³C₂]decane sulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	¹³ C ₂ ¹² C ₈ H ₄ F ₁₇ SO ₃ Na	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)	ISOTOPIC PURITY:	≥99% ¹³ C
CHEMICAL PURITY:	>98%		(1,2- 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 ³⁴S (due to natural isotopic abundance) therefore both native 8:2FTS and M2-8:2FTS will produce signals in the m/z 529 to m/z 509 channel during SRM analysis. We recommend using the m/z 529 to m/z 81 transition to monitor for M2-8:2FTS during quantitative analysis as it will be free of any native contribution (see Figure 2).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: 
B.G. Chittim **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

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EXPIRY DATE / PERIOD OF VALIDITY:

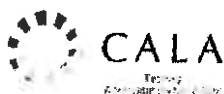
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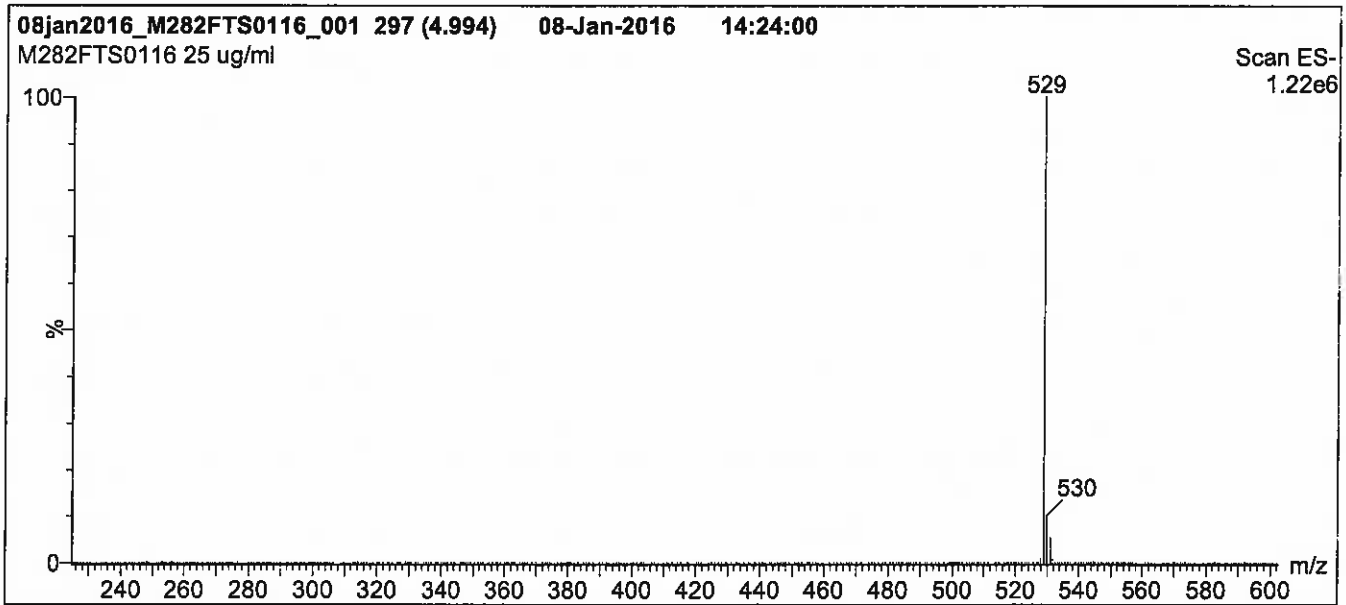
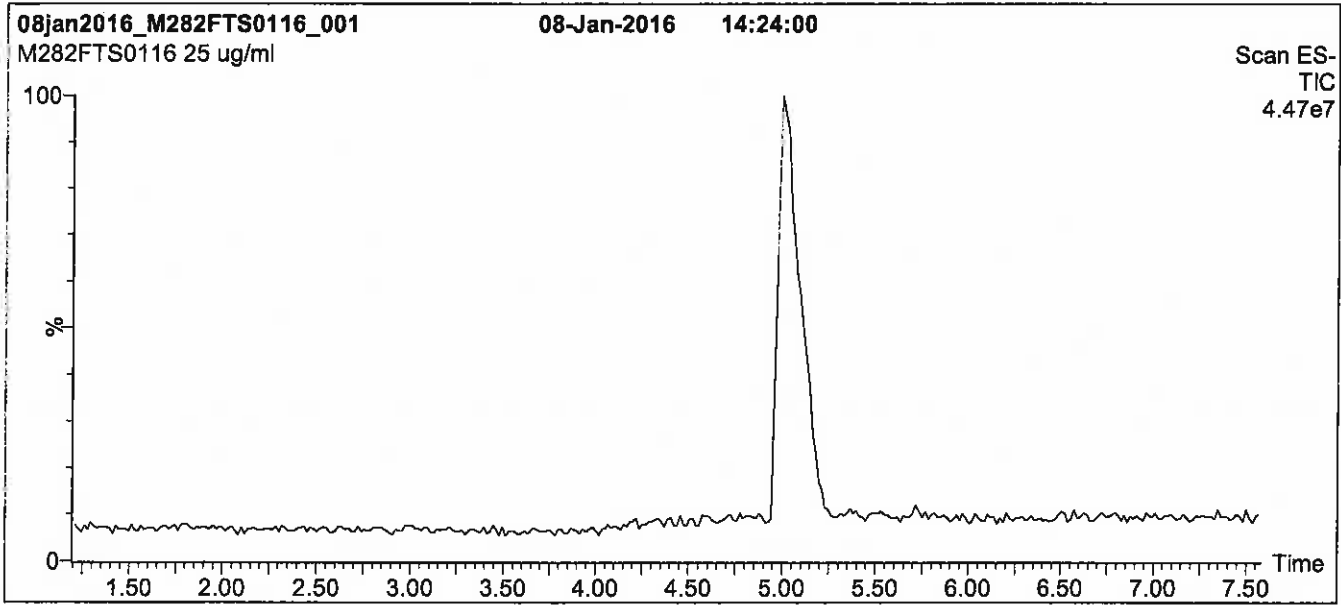
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Figure 1: M2-8:2FTS; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

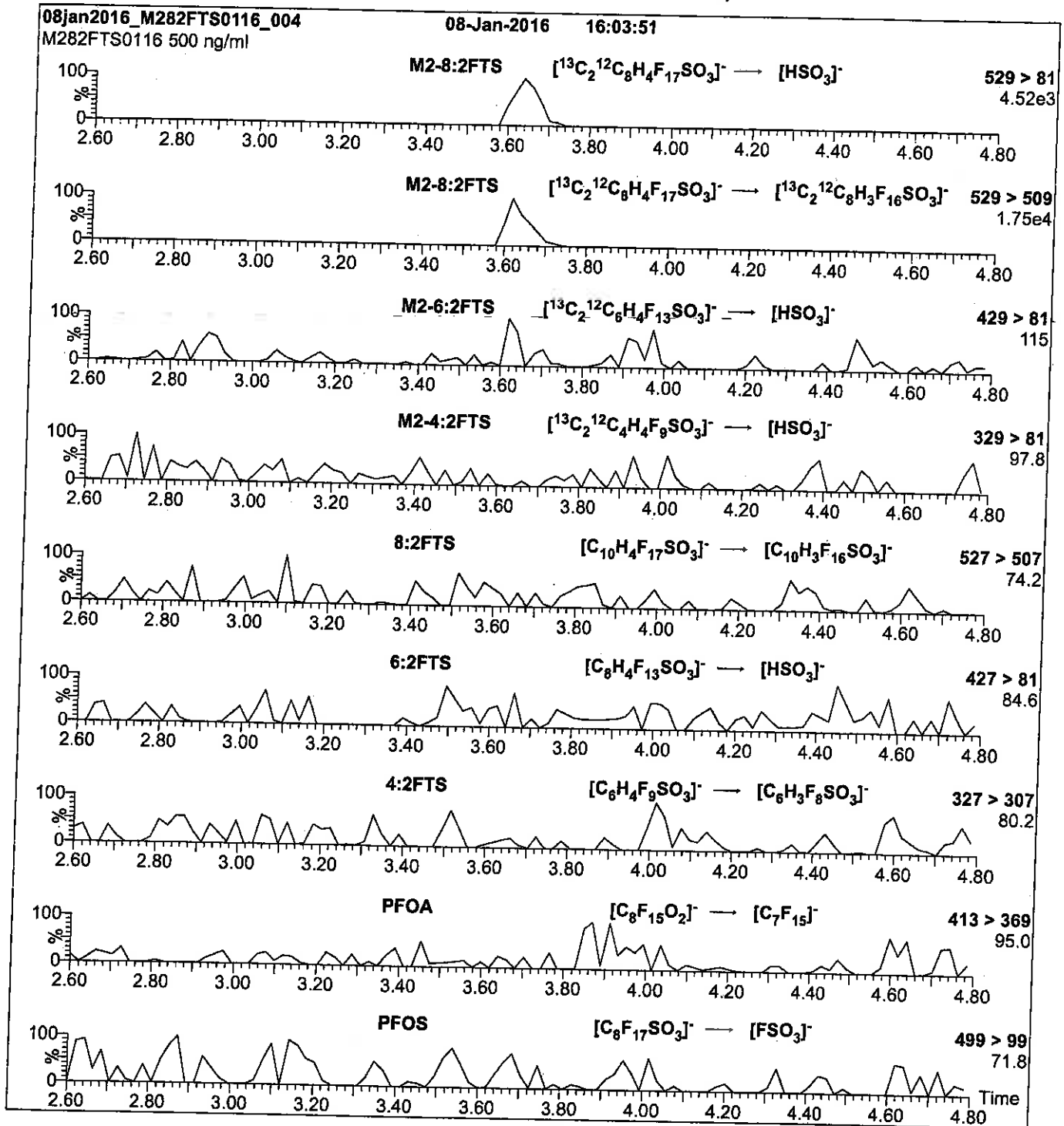
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

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

MS Parameters

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

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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 $\pm 5\%$ (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

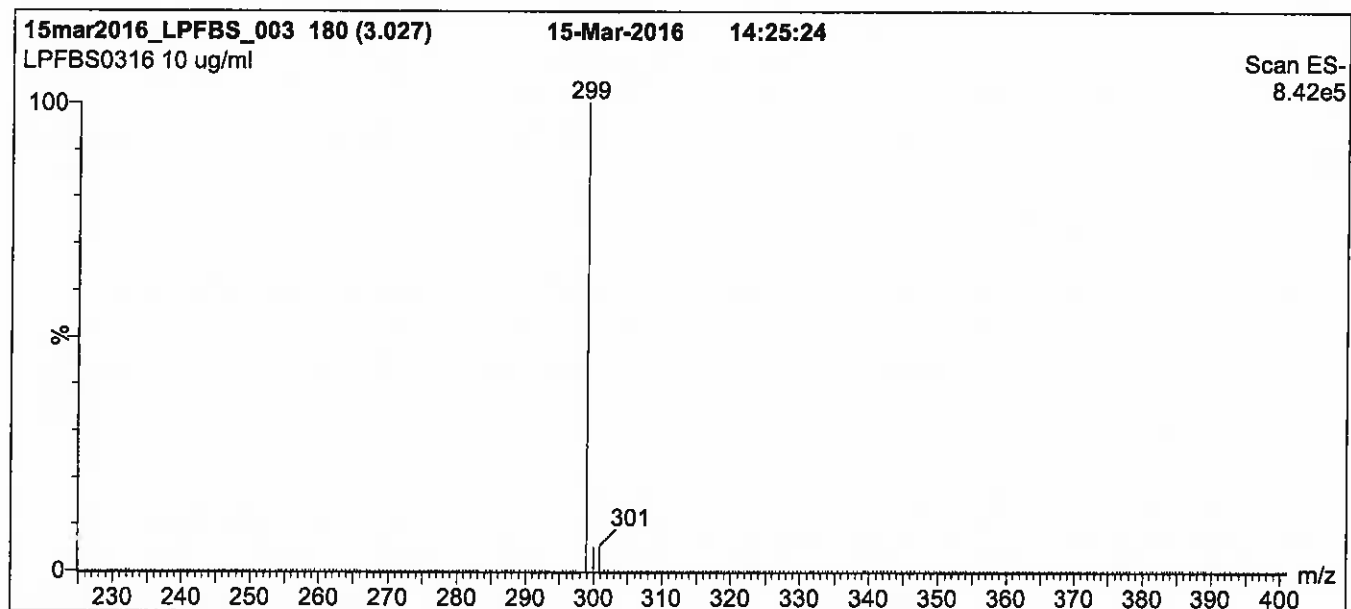
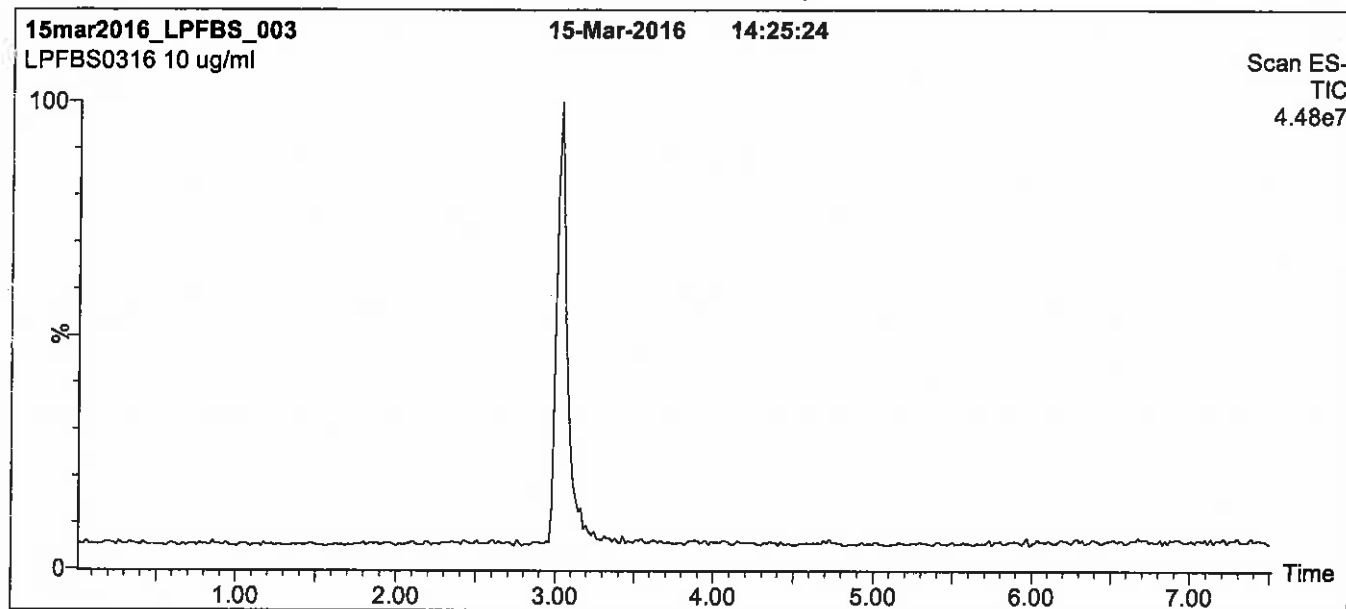
QUALITY MANAGEMENT:

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



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

Figure 1: L-PFBS; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

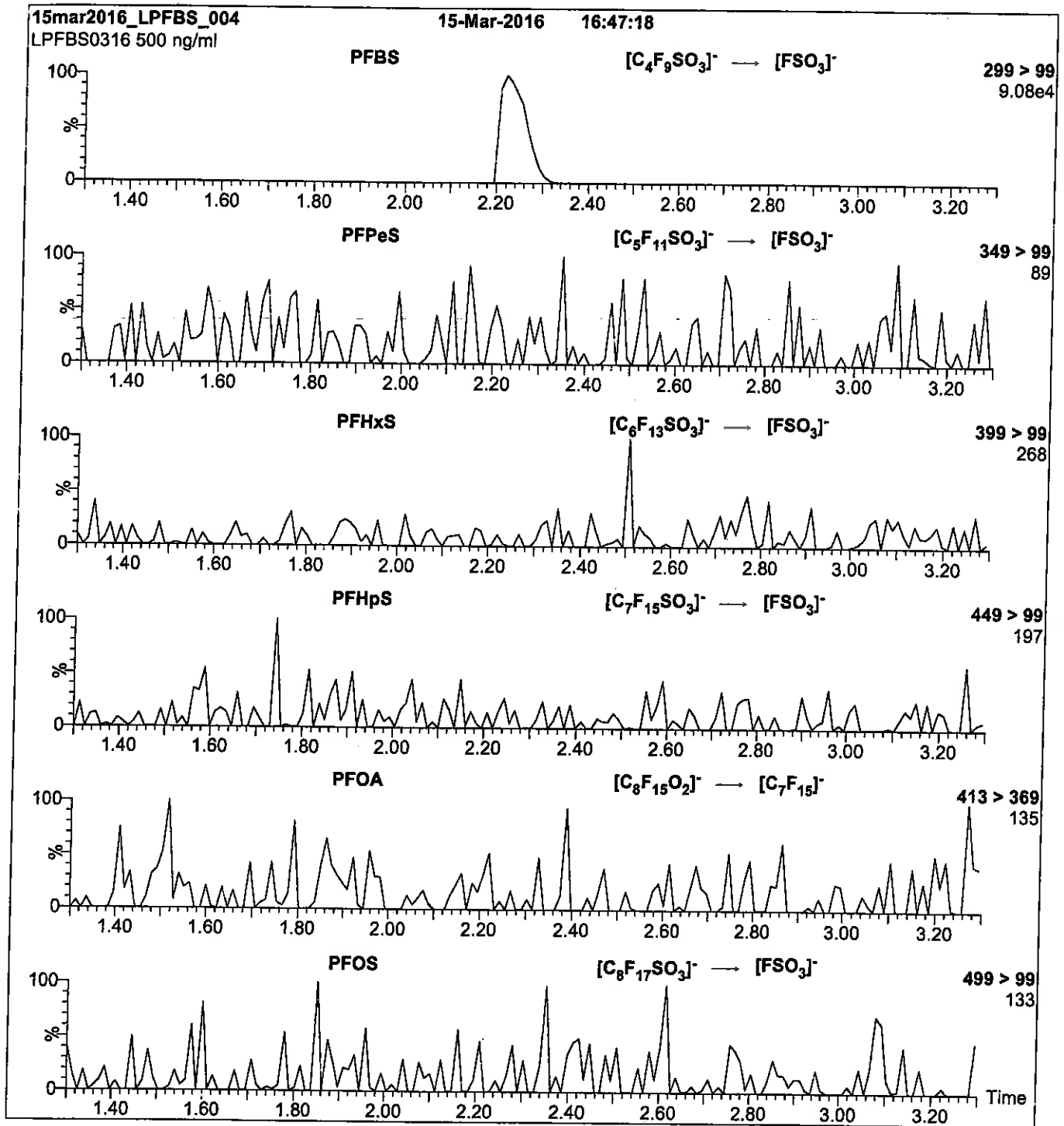
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 40.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCPFDA_00005

R: 7/16/16 CBW



671576
ID: LCPFDA_00305
Exp: 07/02/20 Pipd: CBW
PF-n-decanoic acid



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFDA

LOT NUMBER:

PFDA0615

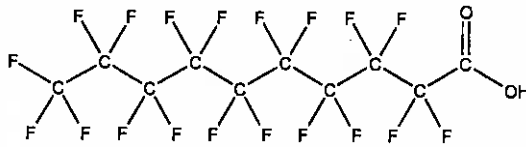
COMPOUND:

Perfluoro-n-decanoic acid

STRUCTURE:

CAS #:

335-76-2



MOLECULAR FORMULA:

C₁₀H₁₉F₁₉O₂

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:

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

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LIMITED WARRANTY:

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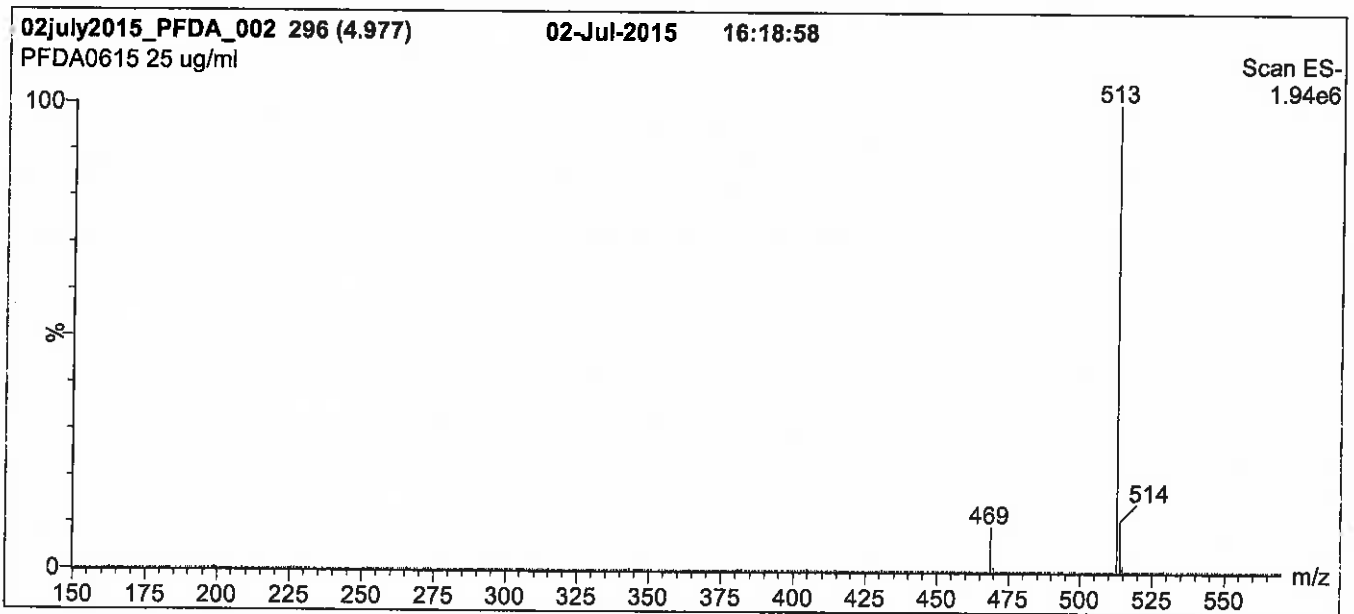
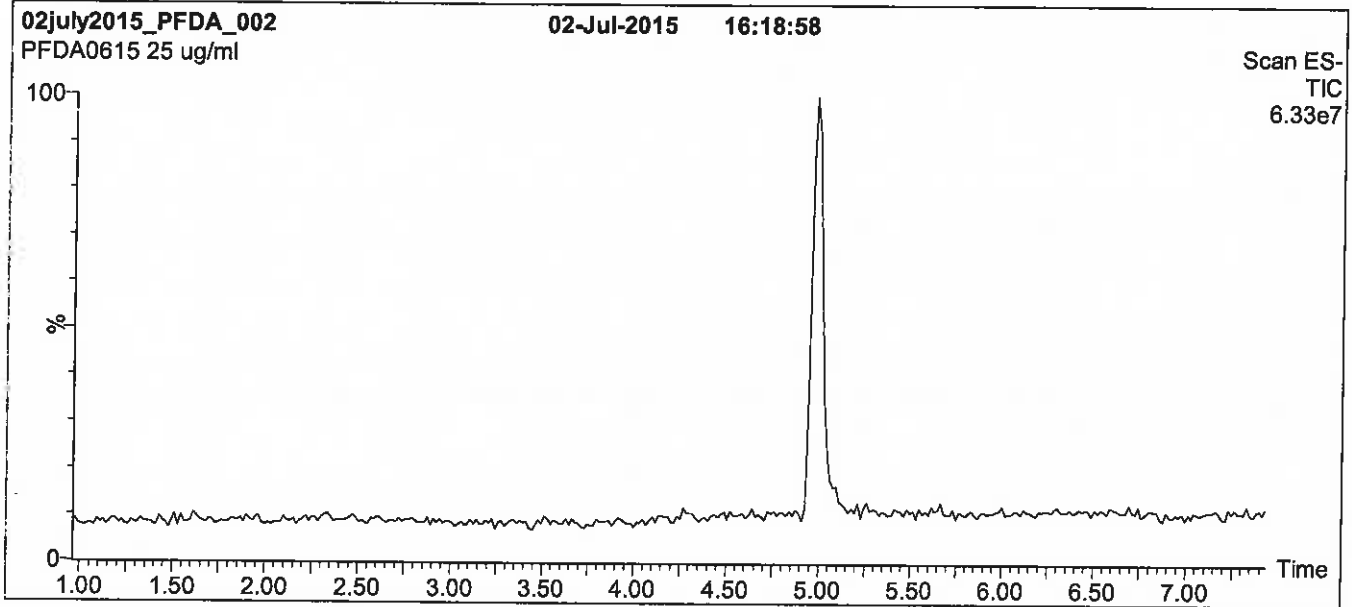
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

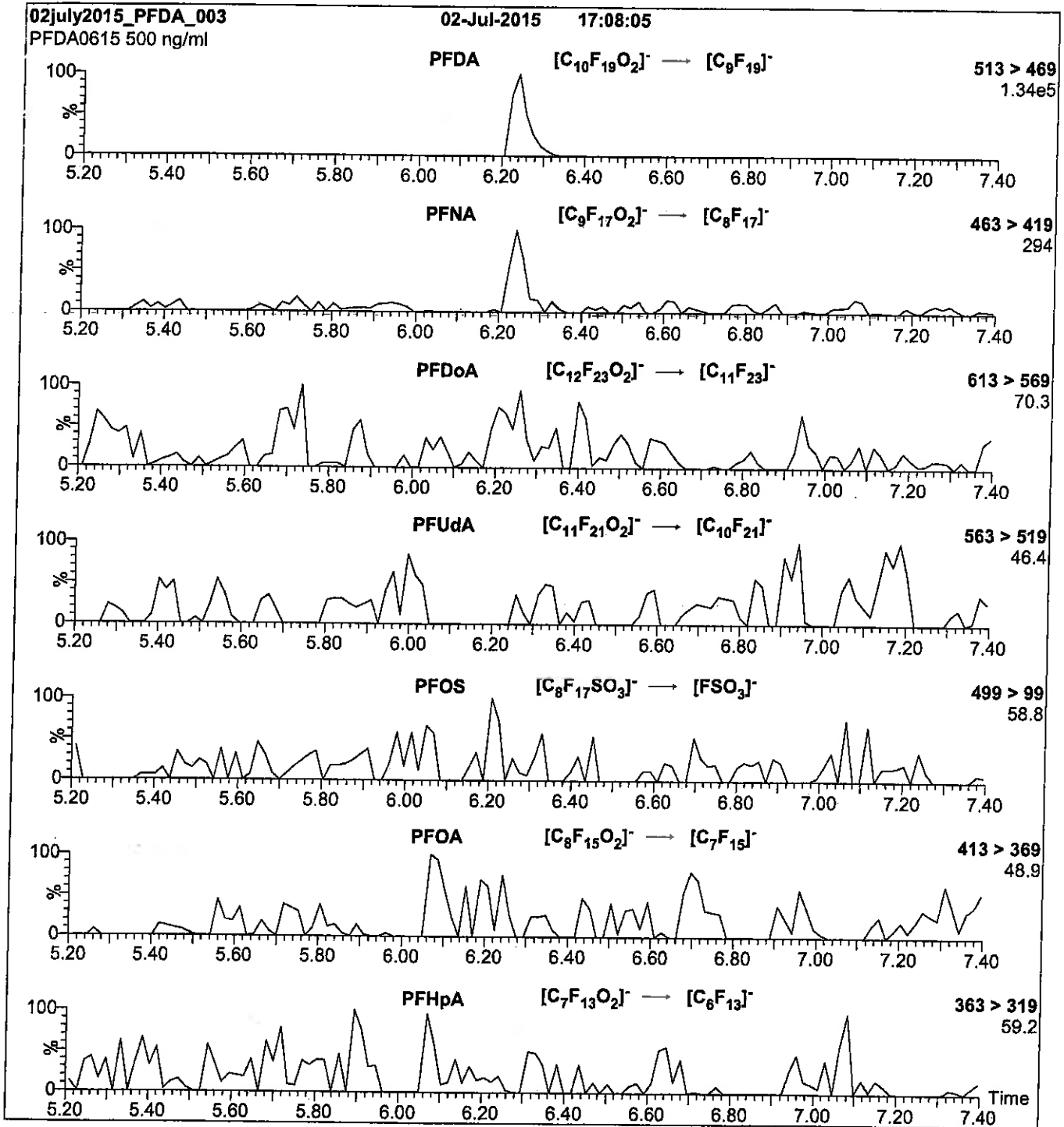
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 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 μ l (500 ng/ml PFDA)

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCPFDoA_00005

R: 7/6/16 car

671601
ID: LCPFD0A_00005
Exp: 01/30/20 Pripd: CBW
PF-n-dodecanoic acid

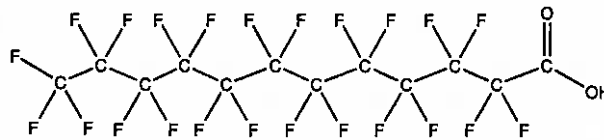


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFD0A **LOT NUMBER:** PFD0A0115
COMPOUND: Perfluoro-n-dodecanoic acid

STRUCTURE: **CAS #:** 307-55-1



MOLECULAR FORMULA:	C ₁₂ H 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:

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:

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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:

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

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

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TRACEABILITY:

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LIMITED WARRANTY:

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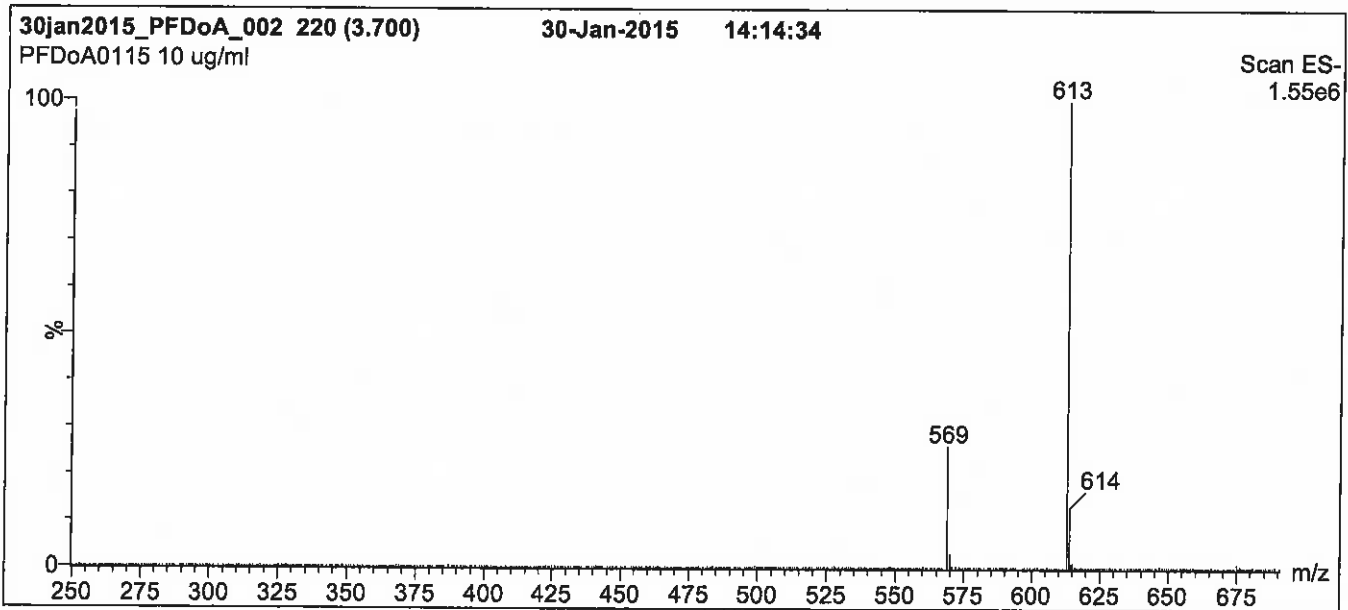
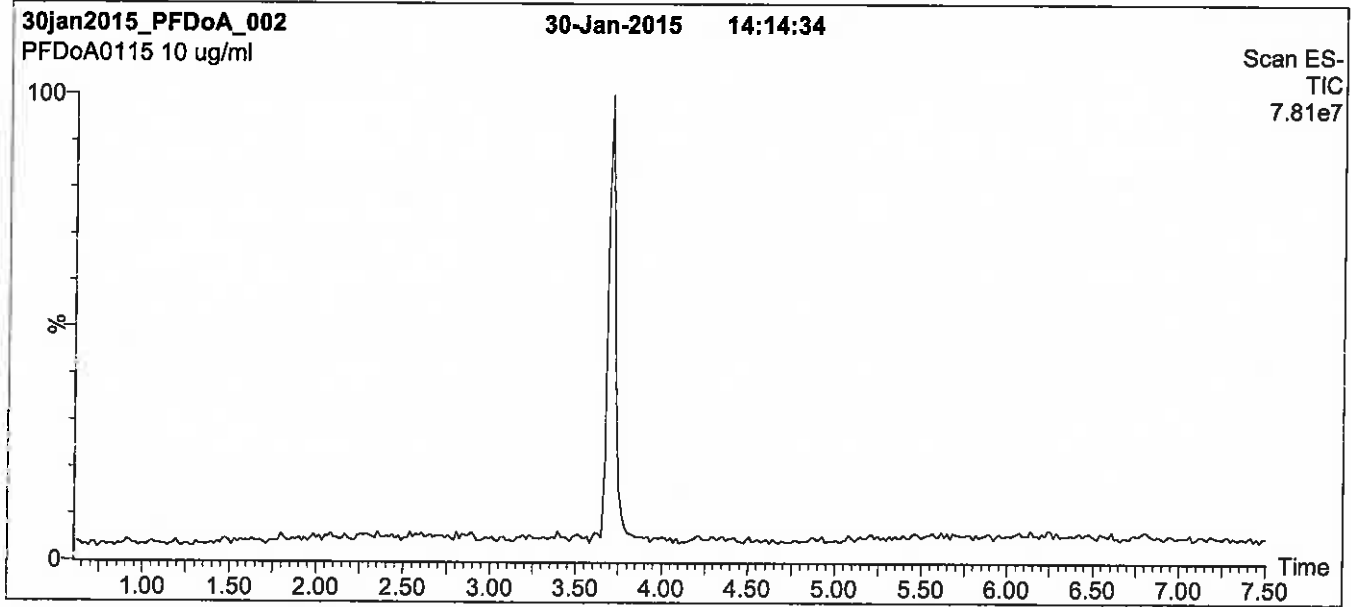
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

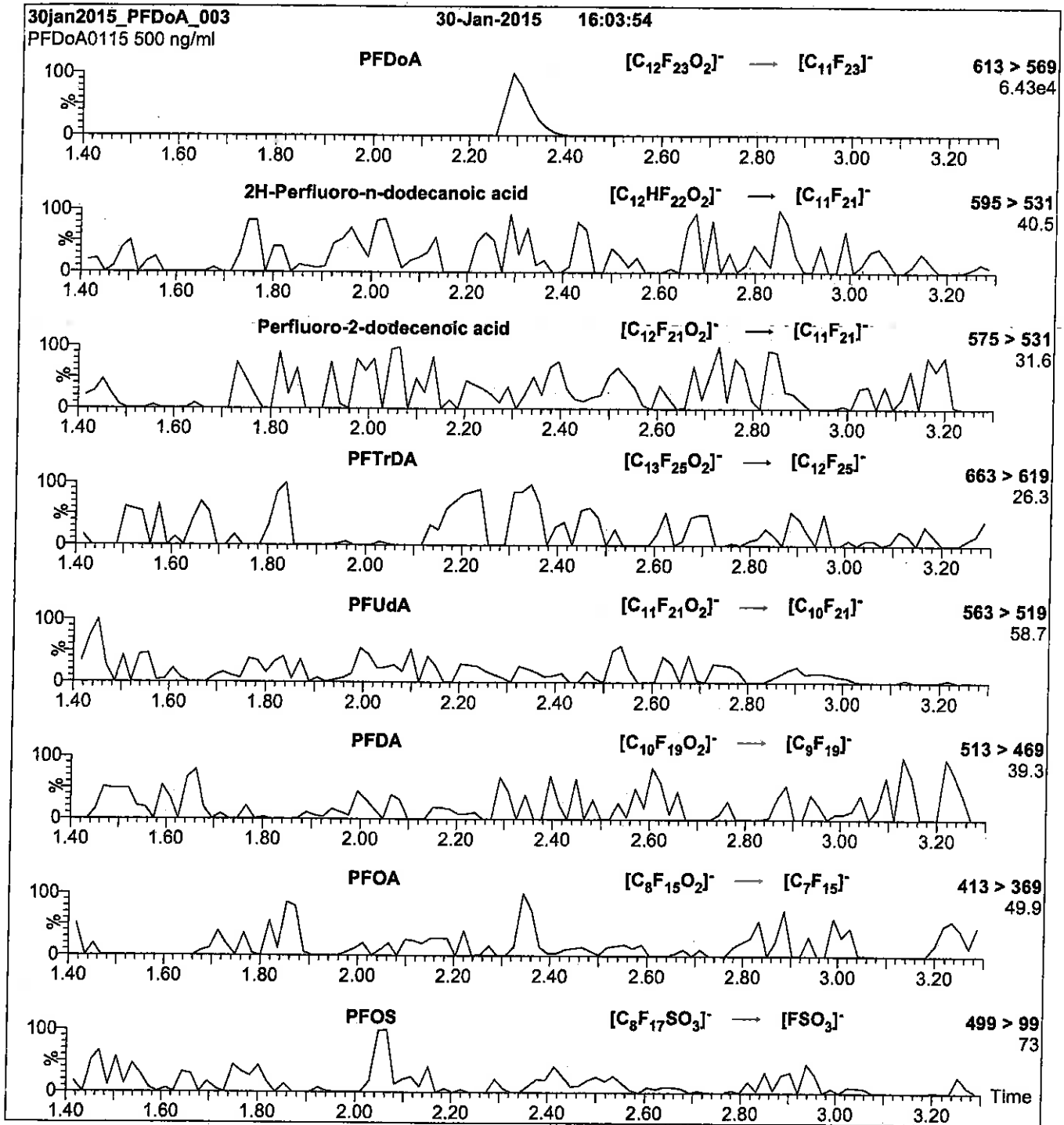
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (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 μ l (500 ng/ml PFDoA)

MS Parameters

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

Collision Gas (mbar) = 3.28e-3
 Collision Energy (eV) = 13

Flow: 300 μ l/min

Reagent

LCPFDS_00005



605240
 ID: LCPFDS_00005
 Exp: 07/02/20 Prep: CBW
 PF-1-decanesulfonate sodi

Rec. 3/29/16 JRB

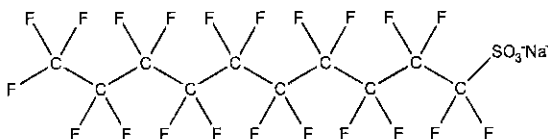


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 LABORATORIES

CERTIFICATE OF ANALYSIS
 DOCUMENTATION

PRODUCT CODE: L-PFDS **LOT NUMBER:** LPFDS0615
COMPOUND: Sodium perfluoro-1-decanesulfonate

STRUCTURE: **CAS #:** 2806-15-7



MOLECULAR FORMULA: C₁₀F₂₁SO₃Na **MOLECULAR WEIGHT:** 622.13
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt) **SOLVENT(S):** Methanol
 48.2 ± 2.4 µg/ml (PFDS anion)
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

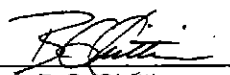
DOCUMENTATION/ DATA ATTACHED:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: 
 B.G. Chittim **Date:** 12/07/2015
 (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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HOMOGENEITY:

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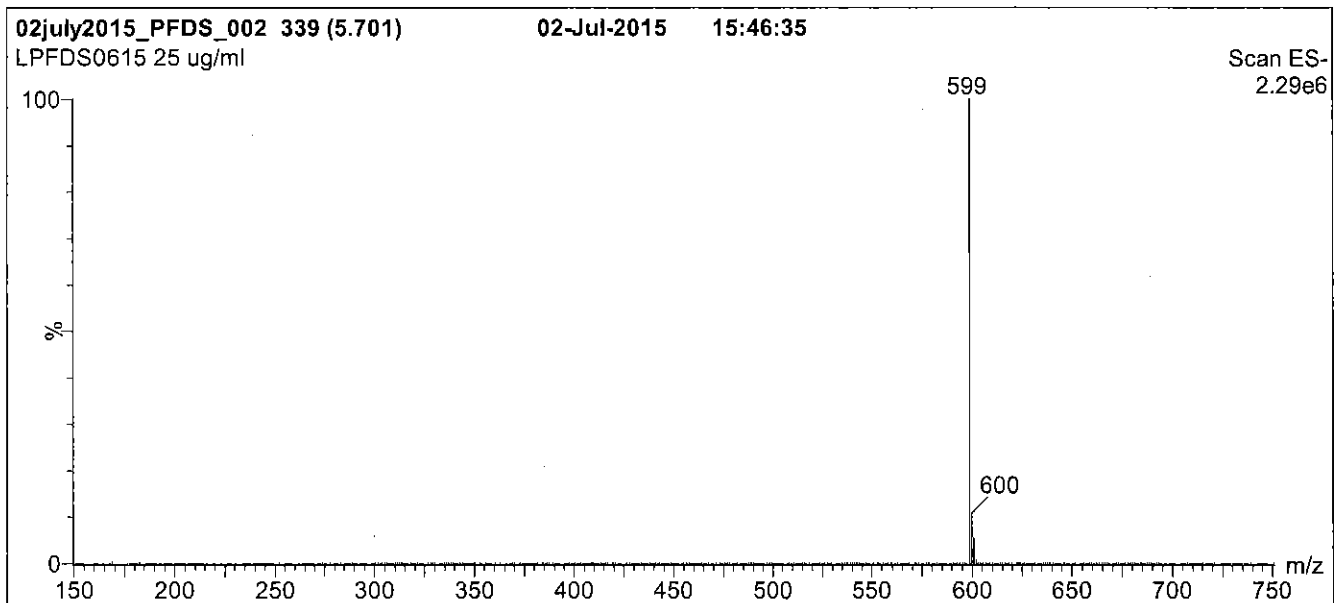
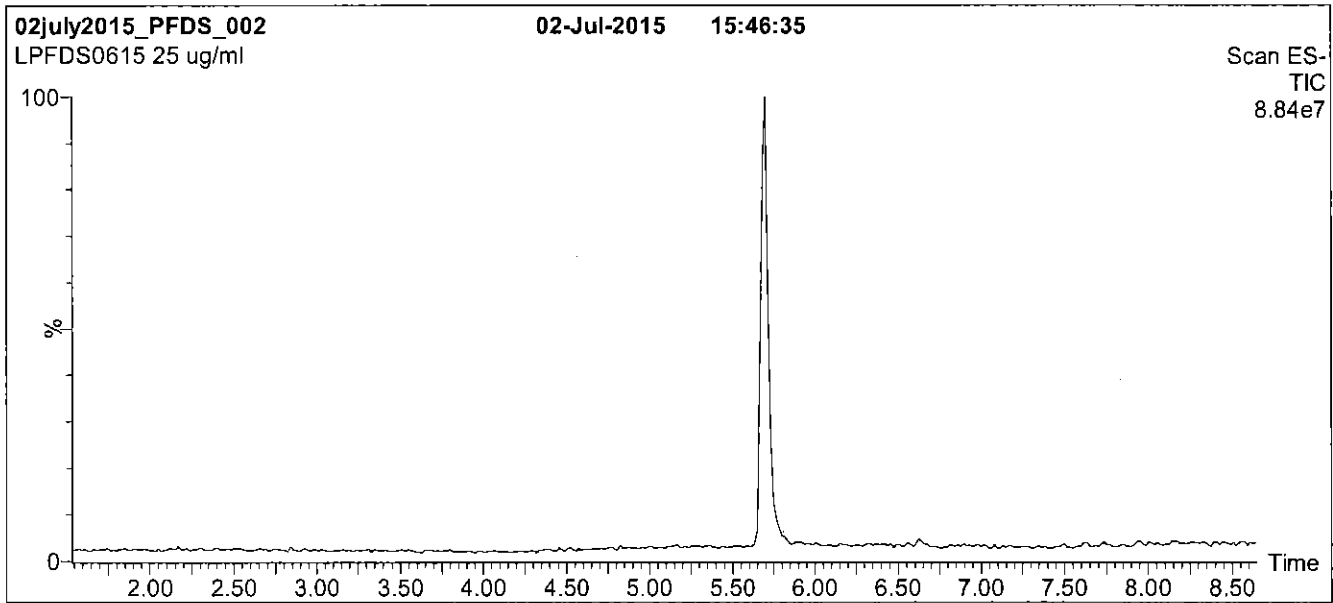
QUALITY MANAGEMENT:

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Figure 1: L-PFDS; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

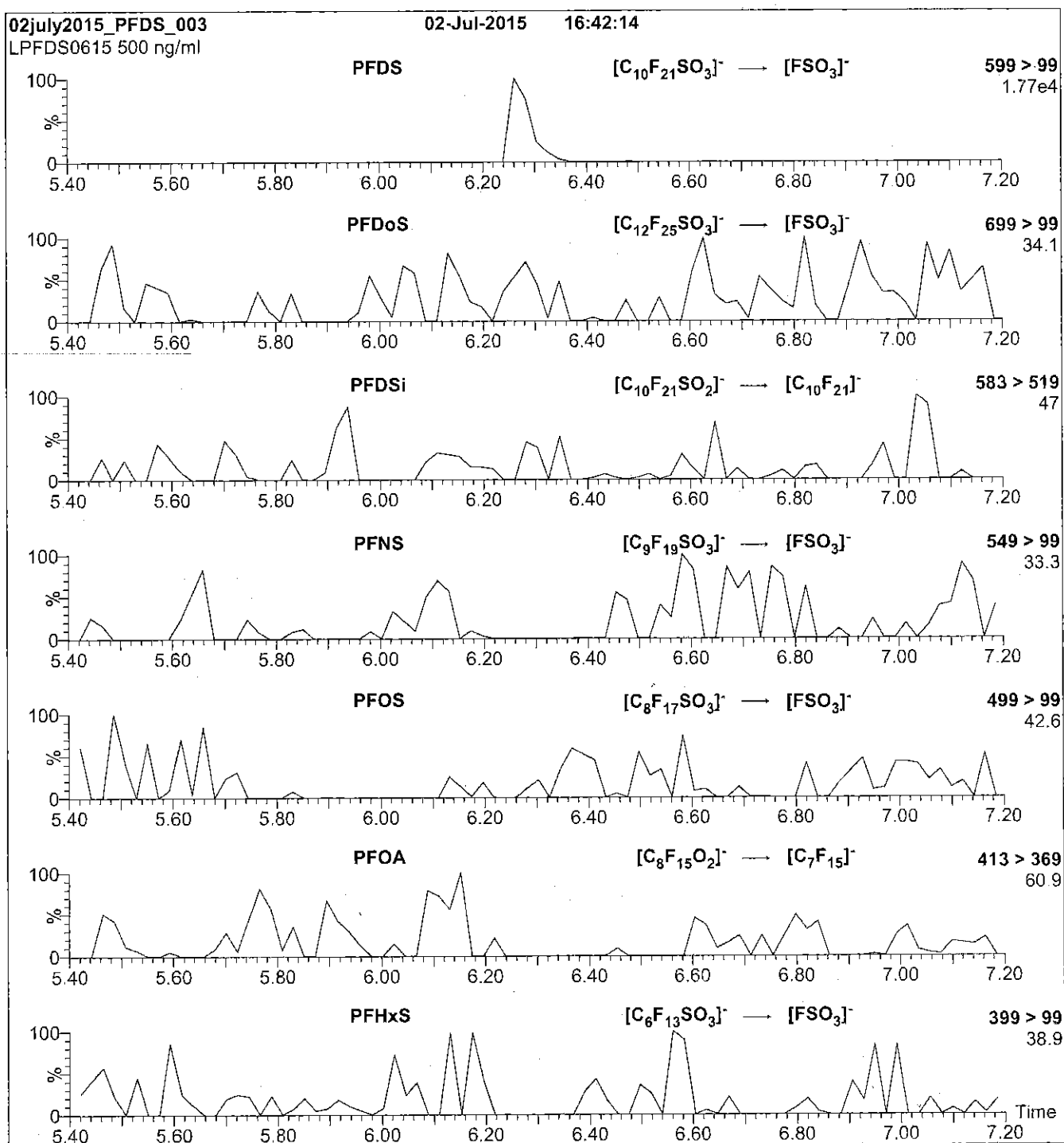
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.54e-3
Collision Energy (eV) = 50

Reagent

LCPFHpA_00005



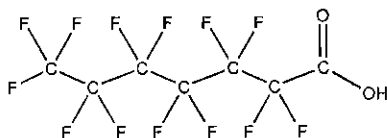
609639

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:** C₇HF₁₃O₂
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, \dots, x_n on which it depends is:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

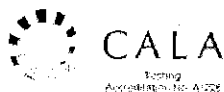
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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

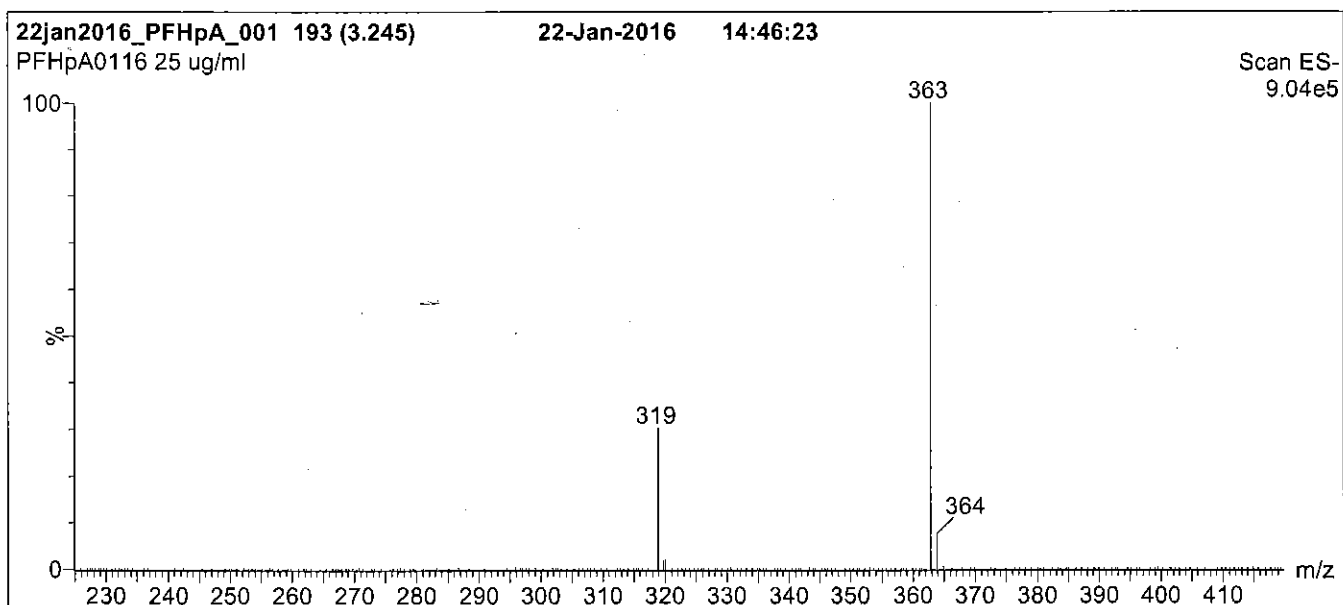
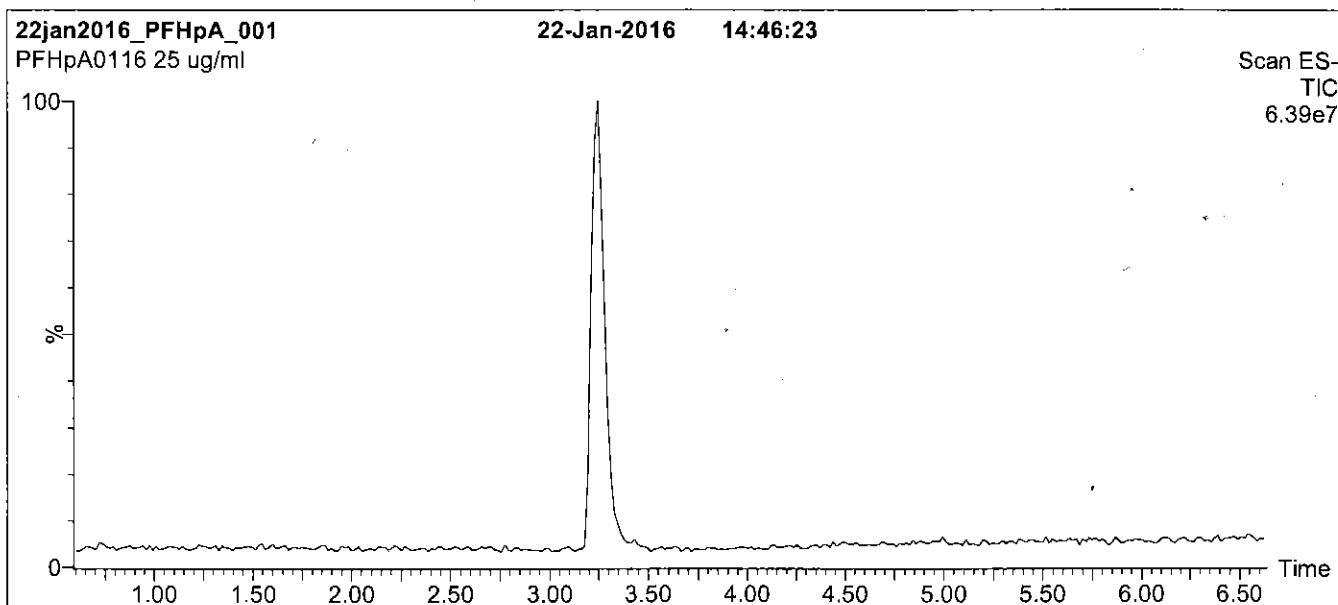
QUALITY MANAGEMENT:

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



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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 RP₁₈
1.7 μ m, 2.1 x 100 mm

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

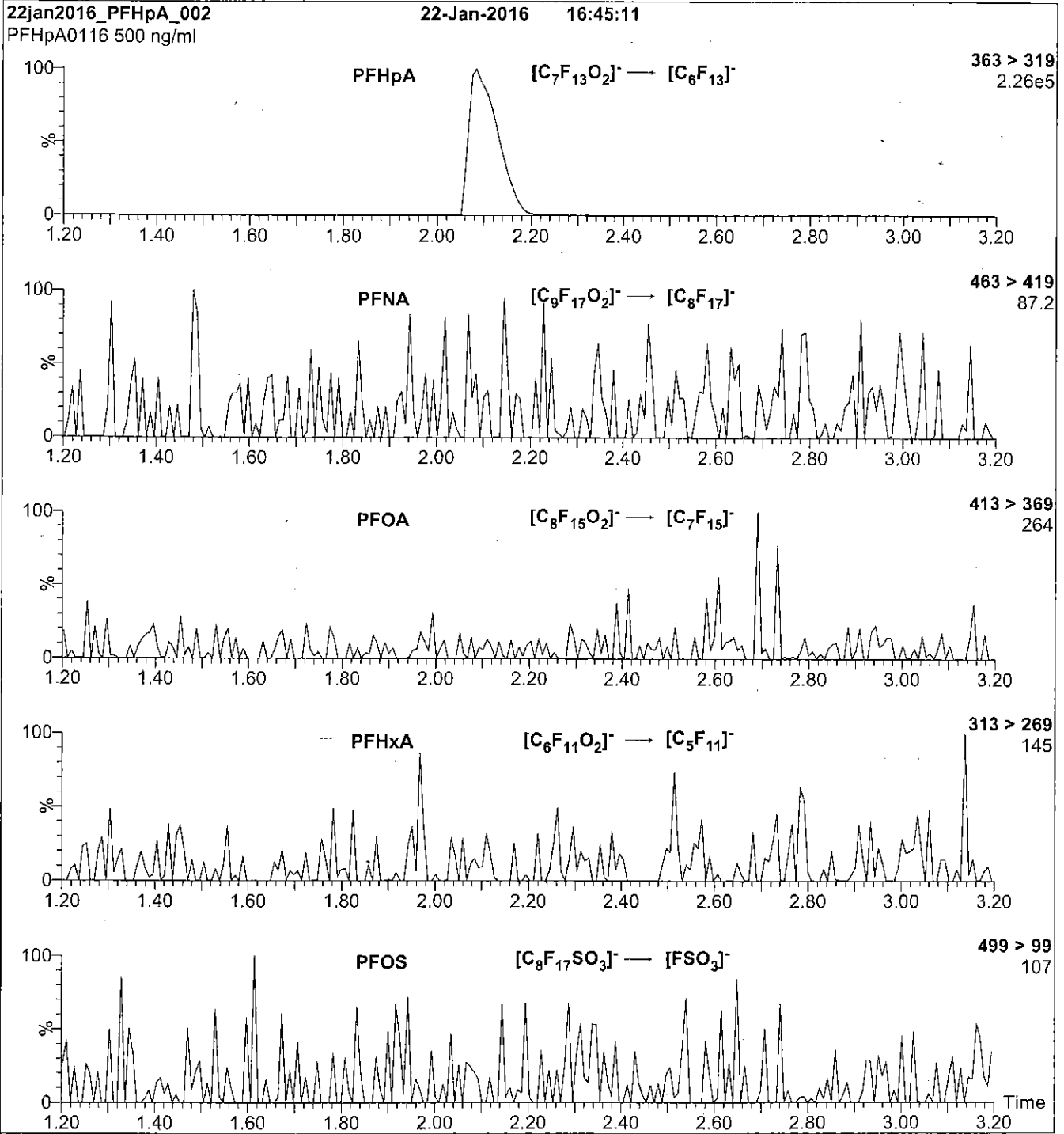
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCPFHpS_00008



627751
 ID: LCPFHPS_00008
 Exp: 11/06/20 Ppt: CBW
 PFHpS at 47.6ug/mL

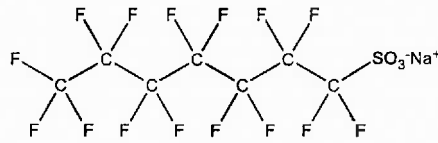
R: 5/10/16 CBW



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CERTIFICATE OF ANALYSIS
 DOCUMENTATION

PRODUCT CODE: L-PFHpS **LOT NUMBER:** LPFHpS1115
COMPOUND: Sodium perfluoro-1-heptanesulfonate
STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: C₇F₁₅SO₃Na **MOLECULAR WEIGHT:** 472.10
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt) **SOLVENT(S):** Methanol
 47.6 ± 2.4 µg/ml (PFHpS anion)
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 (C₈F₁₃SO₃Na) and ~ 0.2% of L-PFOS (C₈F₁₇SO₃Na).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: **Date:** 11/09/2015
 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:

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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:

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.

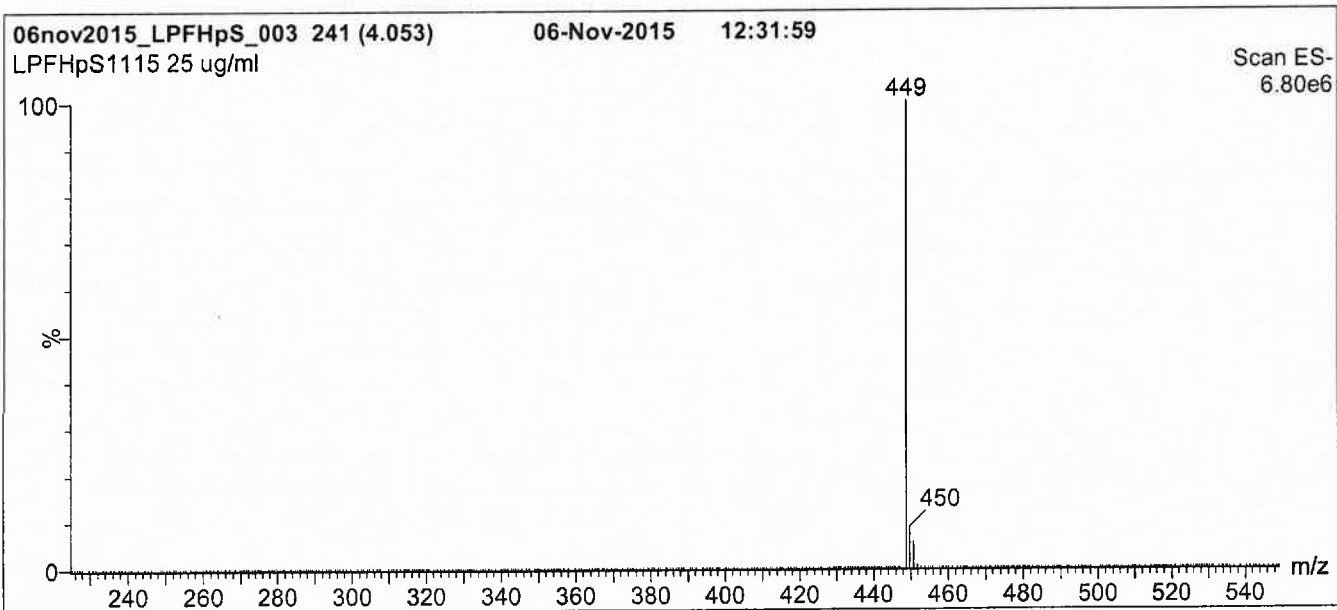
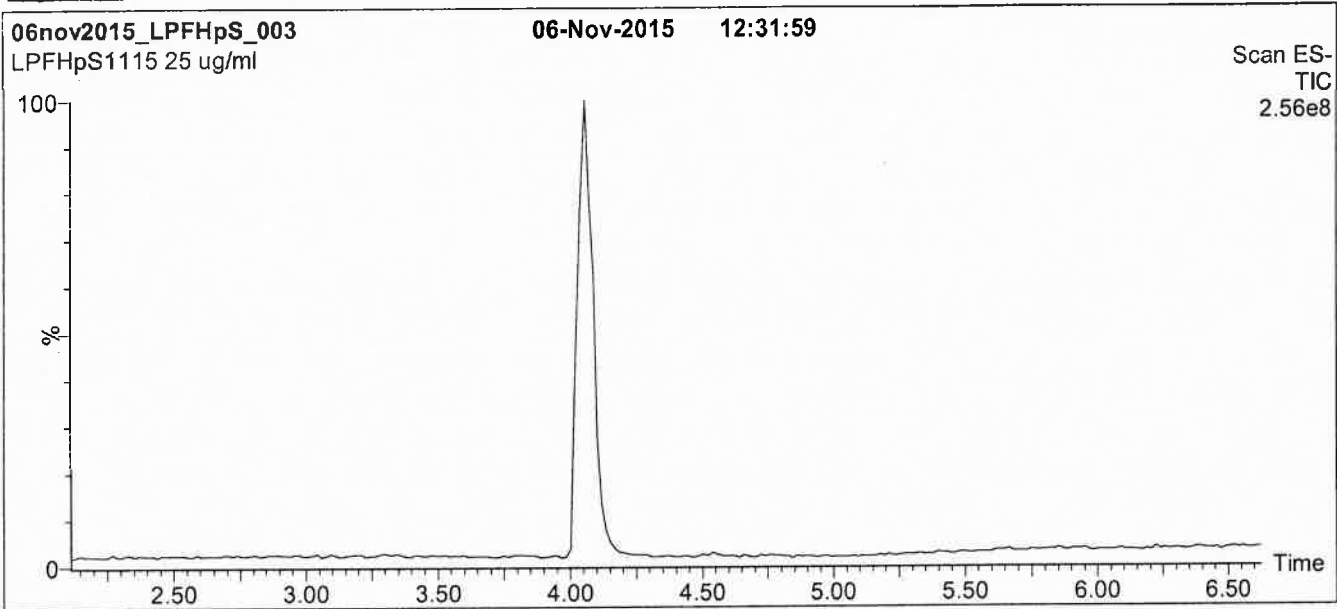
QUALITY MANAGEMENT:

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).



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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 RP₁₈
 1.7 μm, 2.1 x 100 mm

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

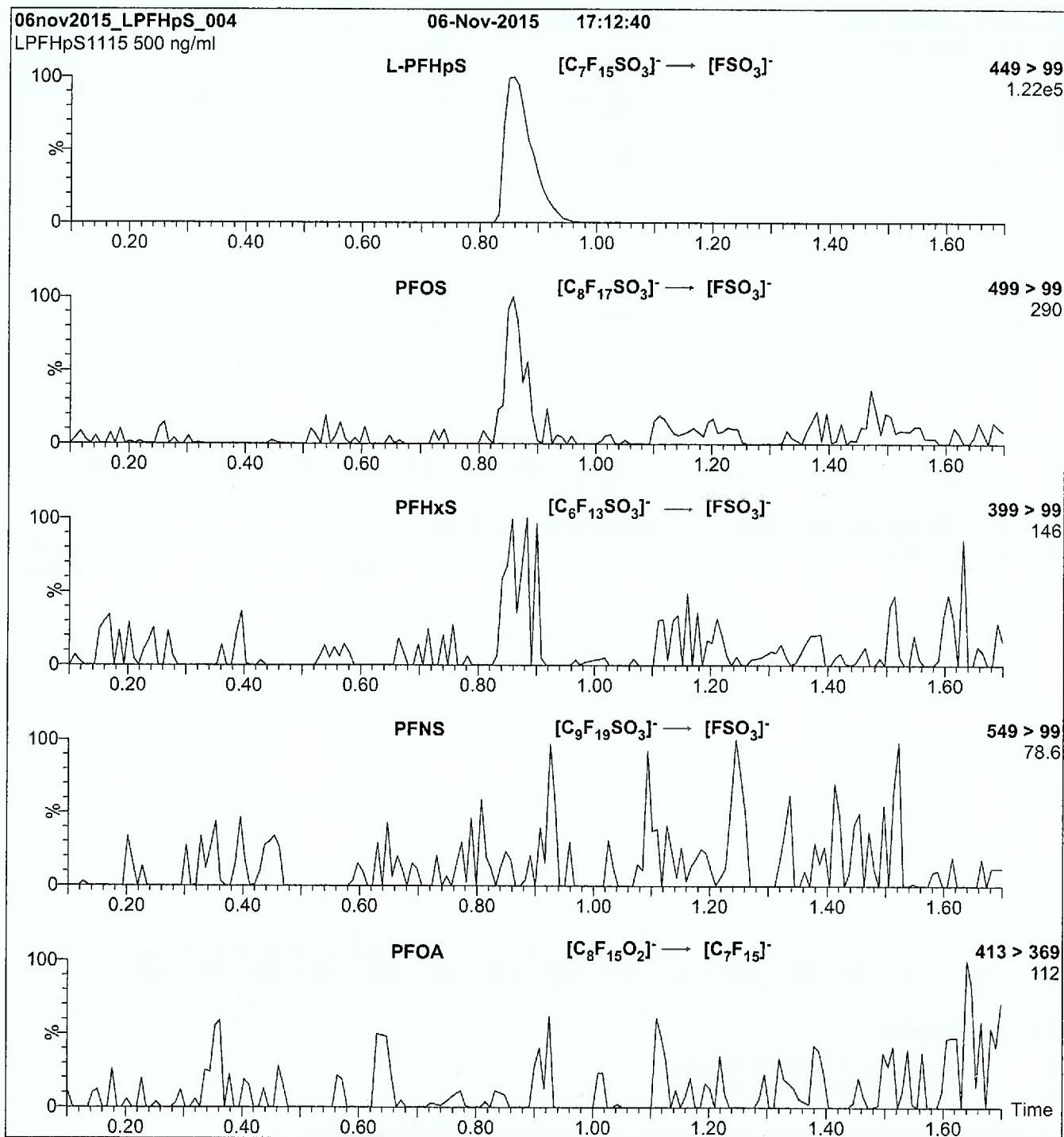
Flow: 300 μl/min

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 μ l (500 ng/ml L-PFHpS)

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

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
 Collision Energy (eV) = 35

Reagent

LCPFHps_00009

Scanned
10/14/16 SP
R: 8BC 9/13/16



730635
ID: LCPFHpS_00009
Exp: 11/06/20 Prpd: SBC
PFHpS at 47.6ug/ml



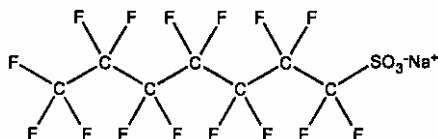
730639
ID: LCPFHpS_00010
Exp: 11/06/20 Prpd: SBC
PFHpS at 47.6ug/ml



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: L-PFHpS **LOT NUMBER:** LPFHpS1115
COMPOUND: Sodium perfluoro-1-heptanesulfonate
STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: C₇F₁₅SO₃Na **MOLECULAR WEIGHT:** 472.10
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt) **SOLVENT(S):** Methanol
47.6 ± 2.4 µg/ml (PFHpS anion)
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 (C₆F₁₃SO₃Na) and ~ 0.2% of L-PFOS (C₈F₁₇SO₃Na).

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:

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

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TRACEABILITY:

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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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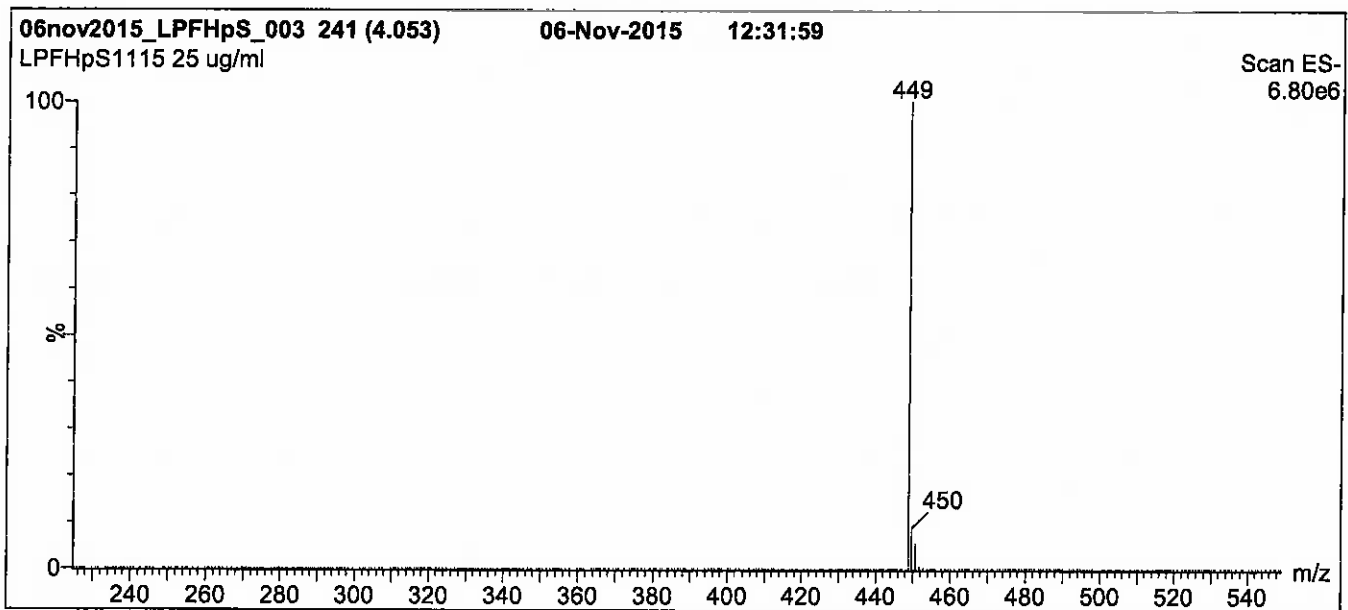
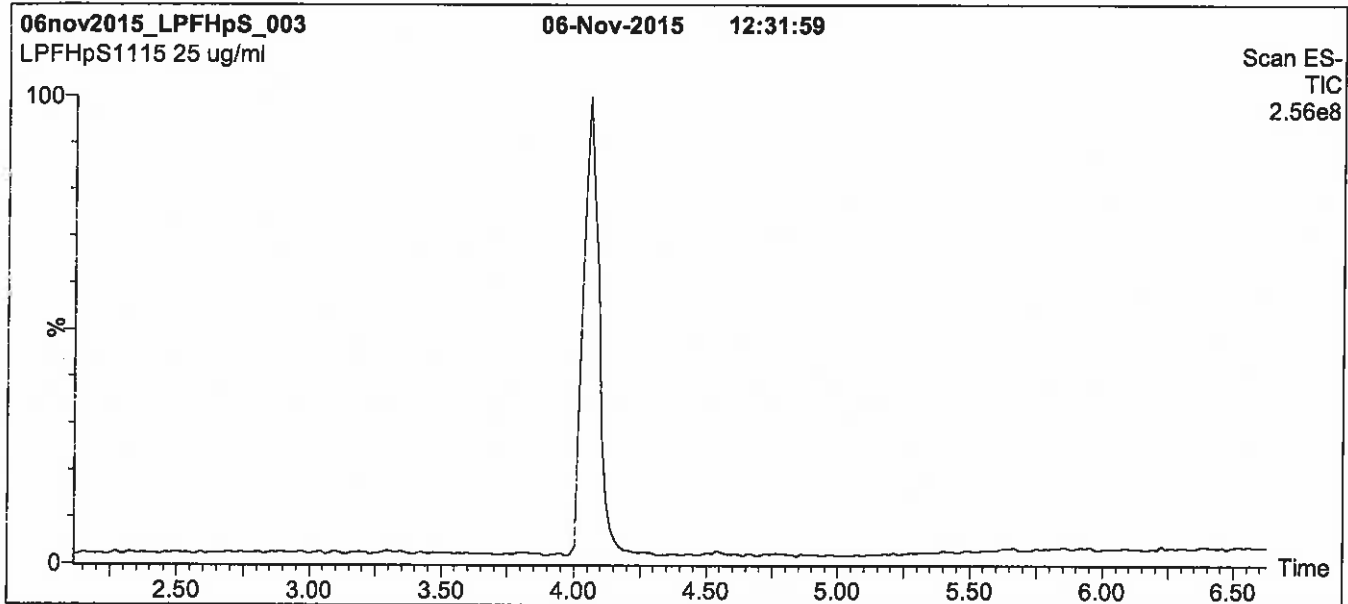
QUALITY MANAGEMENT:

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).



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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 RP₁₈
1.7 μ m, 2.1 x 100 mm

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

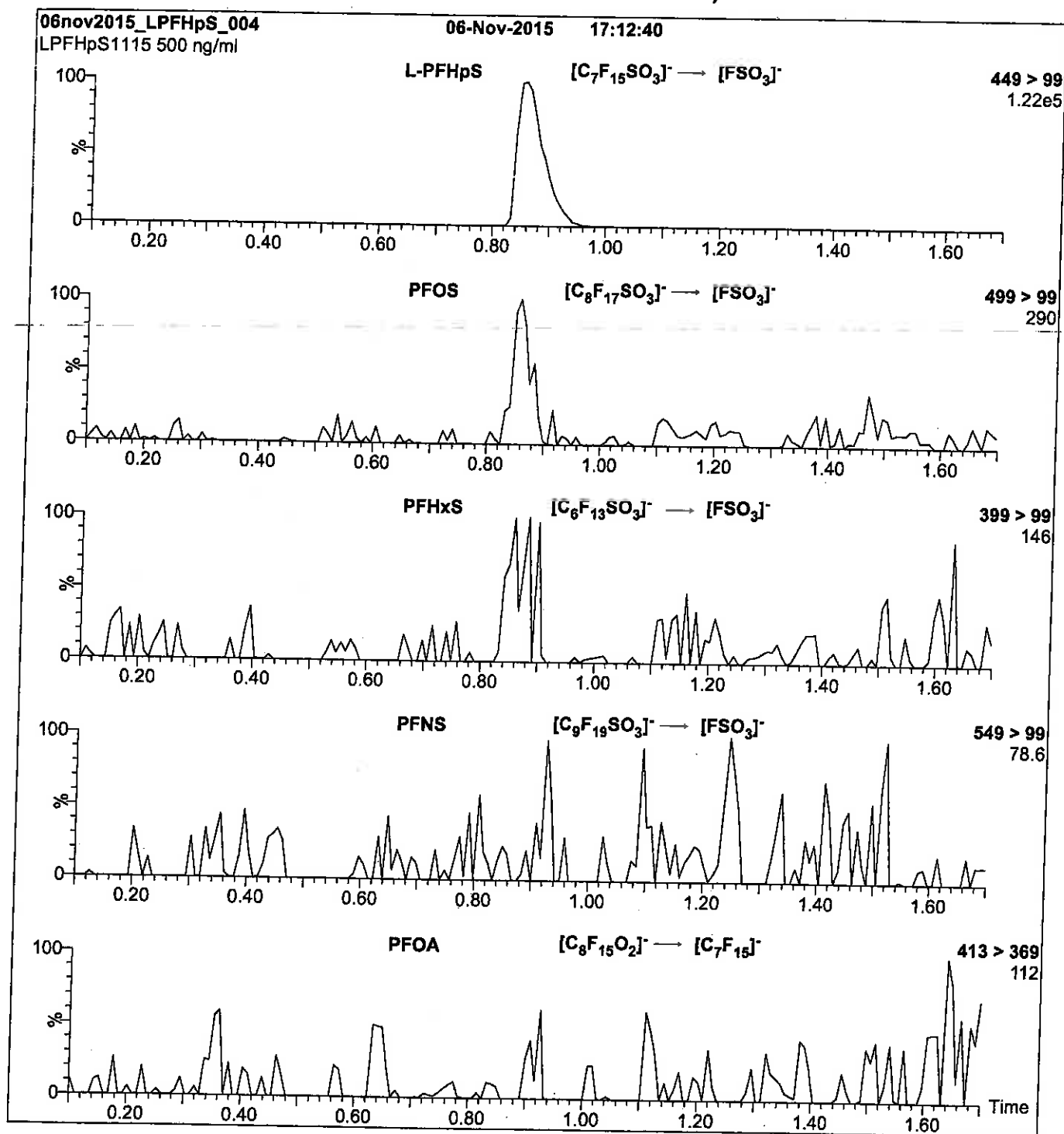
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 60.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
 Collision Energy (eV) = 35

Reagent

LCPFHxA_00004



609702
 ID: LCPFHxA_00004
 Exp: 12/22/20 Prod: CBW
 PF-n-hexanoic acid

R: 4/7/16 CBW



WELLINGTON
 LABORATORIES

CERTIFICATE OF ANALYSIS
 DOCUMENTATION

PRODUCT CODE:

PFHxA

LOT NUMBER:

PFHxA1215

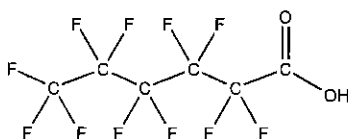
COMPOUND:

Perfluoro-n-hexanoic acid

STRUCTURE:

CAS #:

307-24-4



MOLECULAR FORMULA:

C₆H₁₁F₁₁O₂

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. Crittitt

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:

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

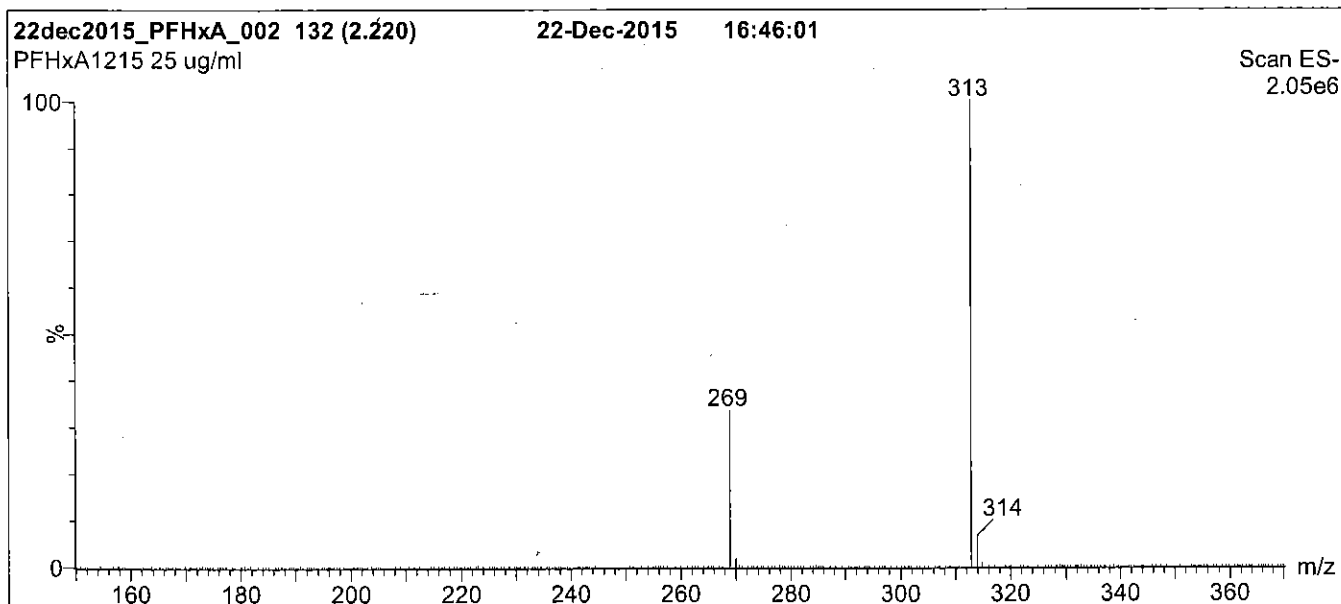
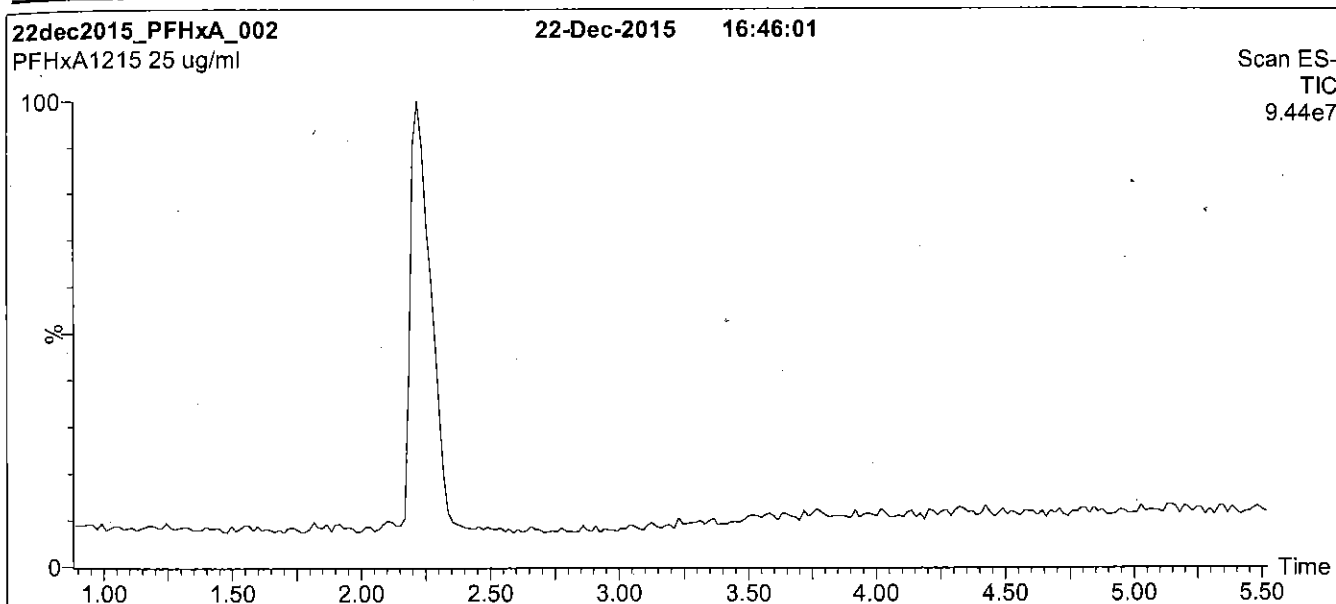
QUALITY MANAGEMENT:

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



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

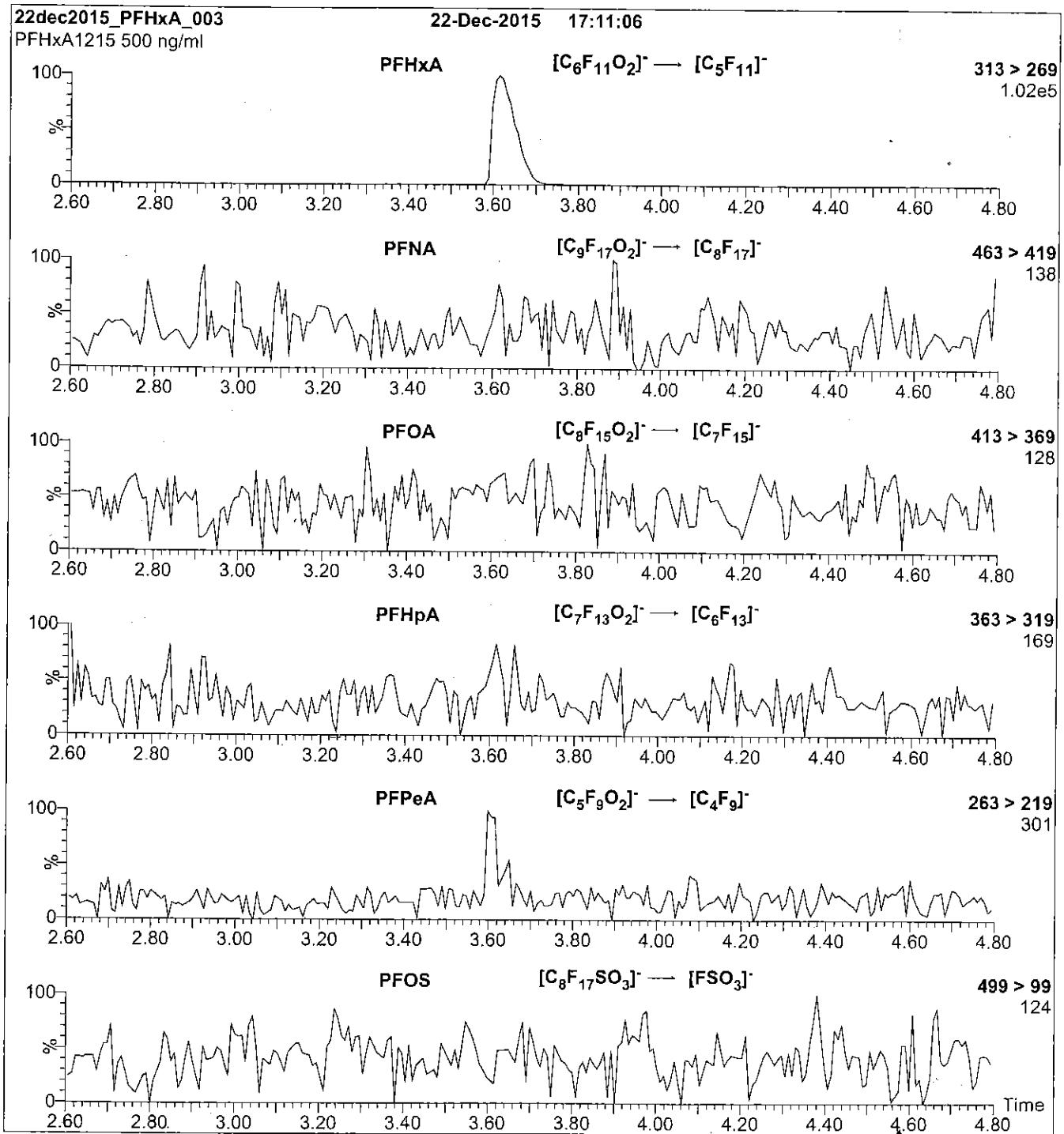
Mobile phase: Gradient
 Start: 50% (80:20 MeOH:ACN) / 50% H₂O
 (both with 10 mM NH₄OAc buffer)
 Ramp to 90% organic over 7 min and hold for 2 min
 before returning to initial conditions in 0.5 min.
 Time: 10 min

Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (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 μ l (500 ng/ml PFHxA)

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

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
 Collision Energy (eV) = 10

Reagent

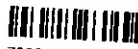
LCPFHxDA_00006

R: SBC 9/13/16

Scanned 10/14/16



WELLINGTON LABORATORIES



730630
ID: LCPFHxDA_00006
Exp: 05/25/21 Prod: SBC
PFHxDA stock 50ug/mL

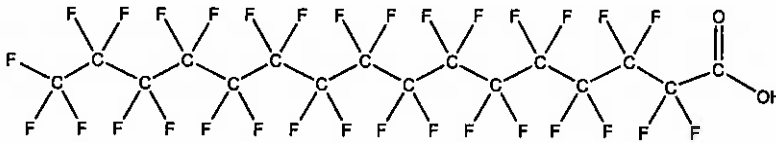


730631
ID: LCPFHxDA_00007
Exp: 05/25/21 Prod: SBC
PFHxDA stock 50ug/mL

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFHxDA **LOT NUMBER:** PFHxDA0516
COMPOUND: Perfluoro-n-hexadecanoic acid

STRUCTURE: **CAS #:** 67905-19-5



MOLECULAR FORMULA: C₁₆H₃₁O₂ **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:

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.

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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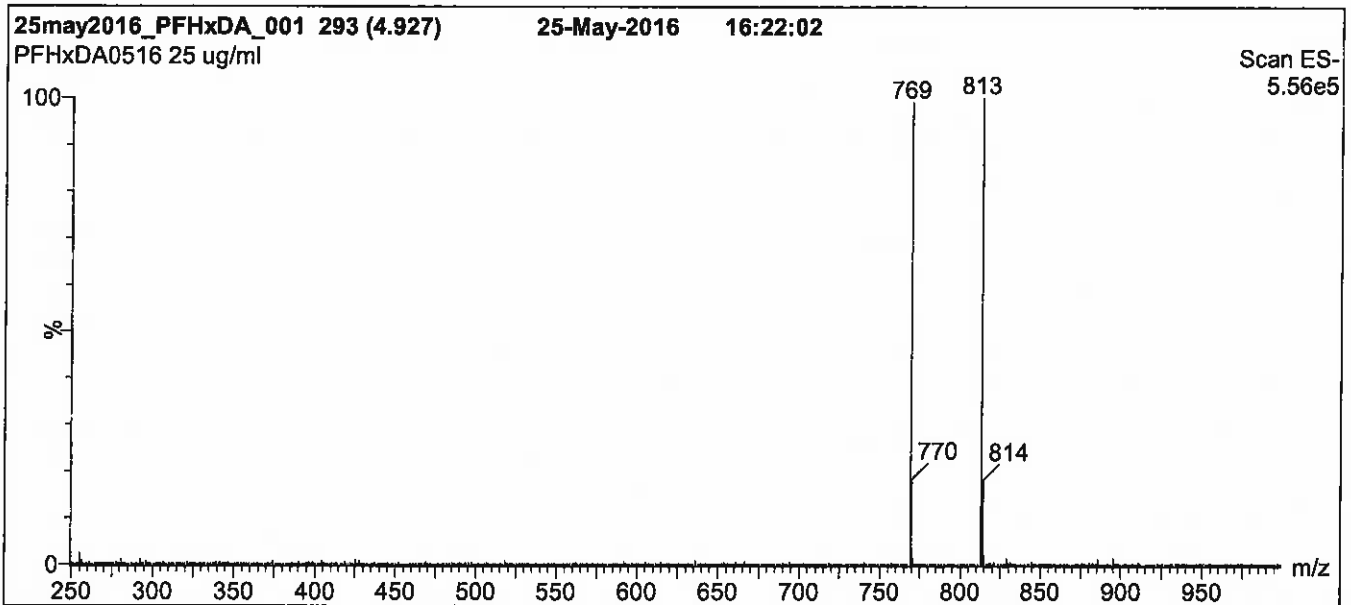
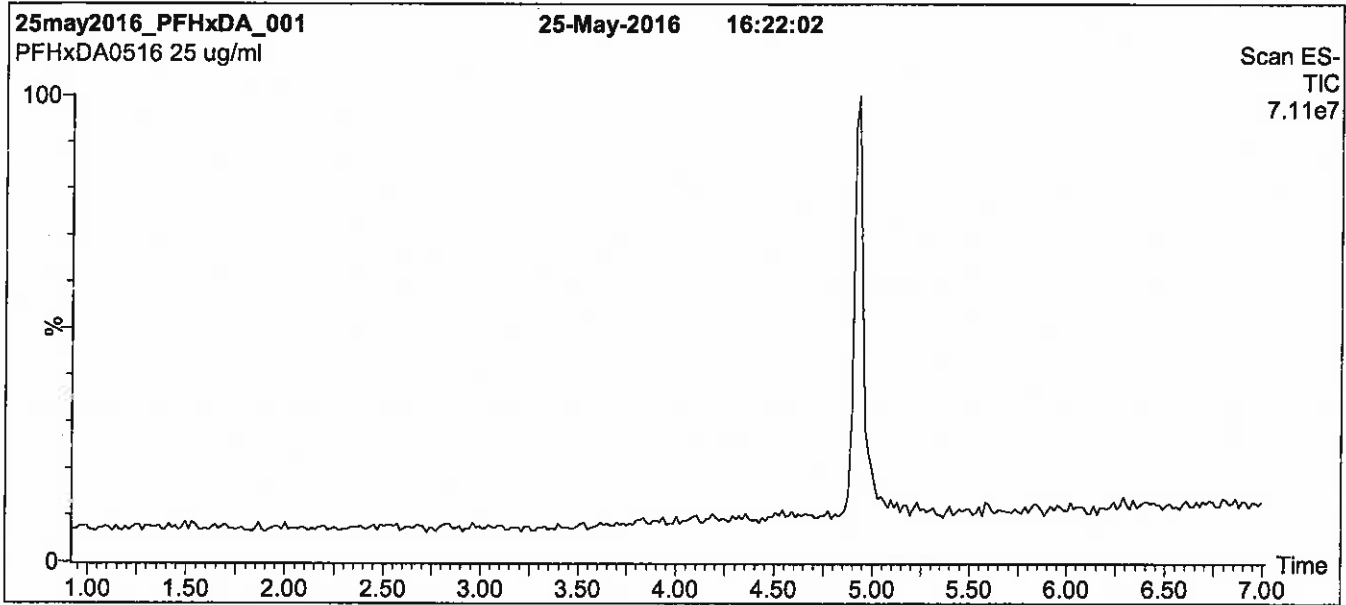
QUALITY MANAGEMENT:

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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 RP₁₈
1.7 μ m, 2.1 x 100 mm

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

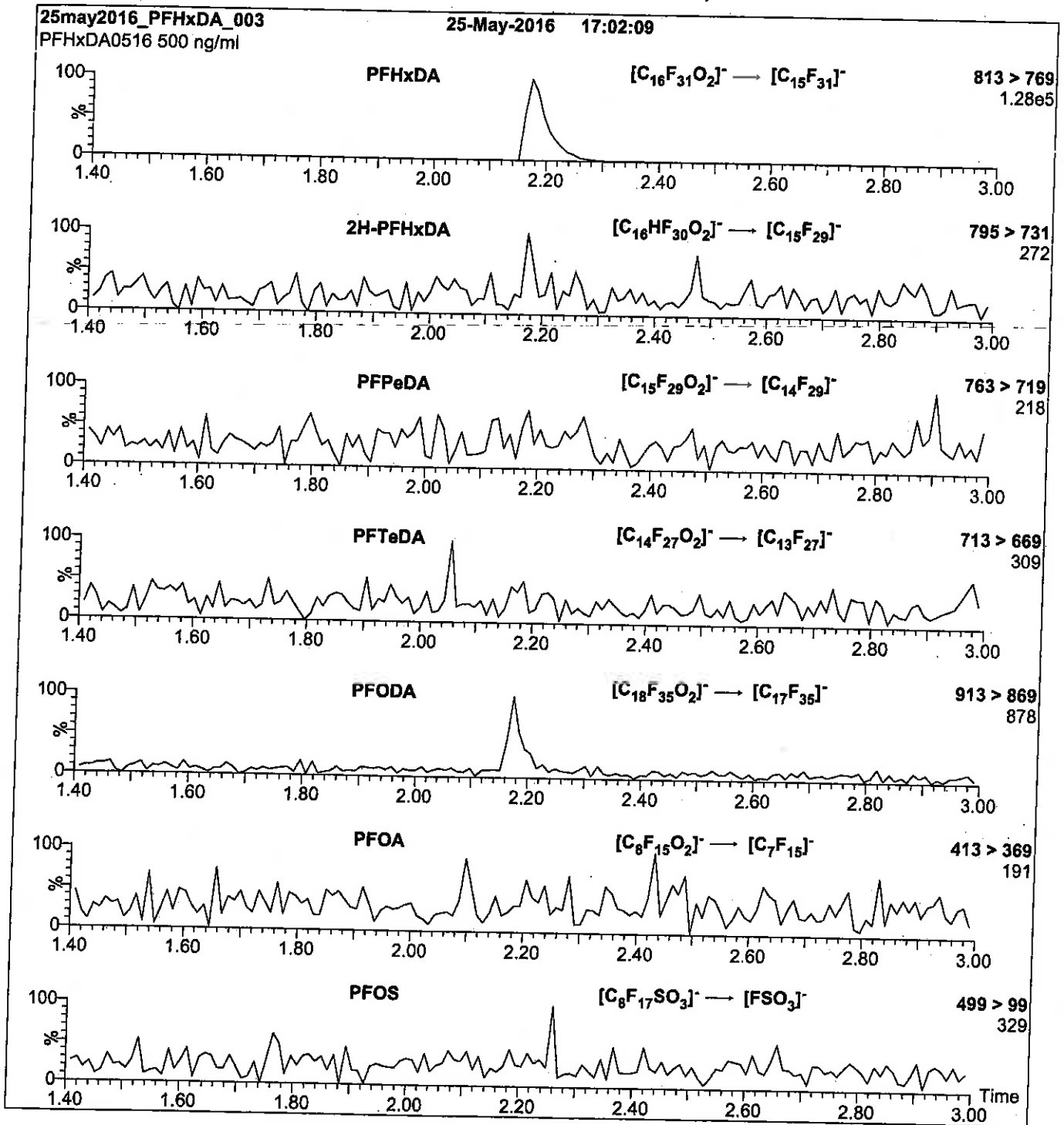
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (250 - 1250 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.66e-3
 Collision Energy (eV) = 15

Reagent

LCPFHxS-br_00001



PS 12/9/15 SW

566007
ID: LCPFHxS-br_00001
Exp: 07/03/20 Pppl: CBW
Potassium Perfluorohexane



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

br-PFHxSK

Potassium Perfluorohexanesulfonate Solution/Mixture of Linear and Branched Isomers

<u>PRODUCT CODE:</u>	br-PFHxSK
<u>LOT NUMBER:</u>	brPFHxSK0615
<u>CONCENTRATION:</u>	50.0 ± 2.5 µg/ml (total potassium salt) 45.5 ± 2.3 µg/ml (total PFHxS anion)
<u>SOLVENT(S):</u>	Methanol
<u>DATE PREPARED:</u> (mm/dd/yyyy)	06/29/2015
<u>LAST TESTED:</u> (mm/dd/yyyy)	07/03/2015
<u>EXPIRY DATE:</u> (mm/dd/yyyy)	07/03/2020
<u>RECOMMENDED STORAGE:</u>	Store ampoule in a cool, dark place

DESCRIPTION:

The chemical purity has been determined to be ≥98% perfluorohexanesulfonate linear and branched isomers. The full name, structure and percent composition for each of the identified isomeric components are given in Table A.

DOCUMENTATION/ DATA ATTACHED:

- Table A: Isomeric Components and Percent Composition by ¹⁹F-NMR
- Figure 1: LC/MS Data (TIC and Mass Spectrum)
- Figure 2: LC/MS Data
- Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.5% of perfluoro-1-pentanesulfonate and ~ 0.2% of perfluoro-1-octanesulfonate.
- CAS#: 3871-99-6 (for linear isomer; potassium salt).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

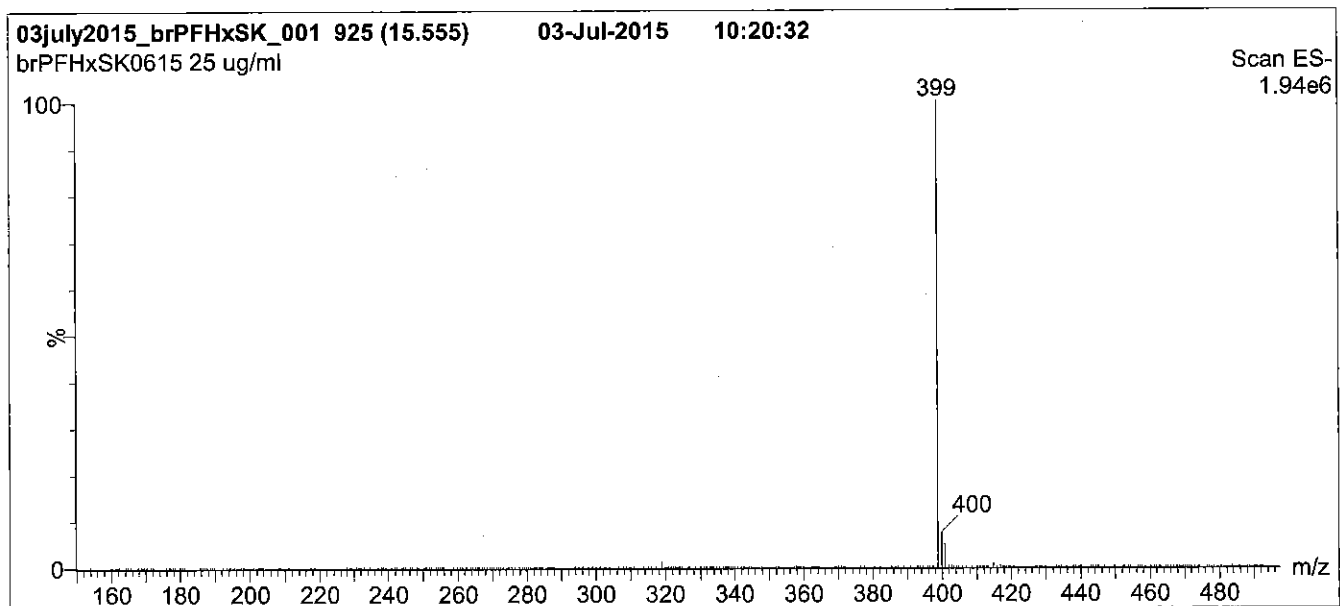
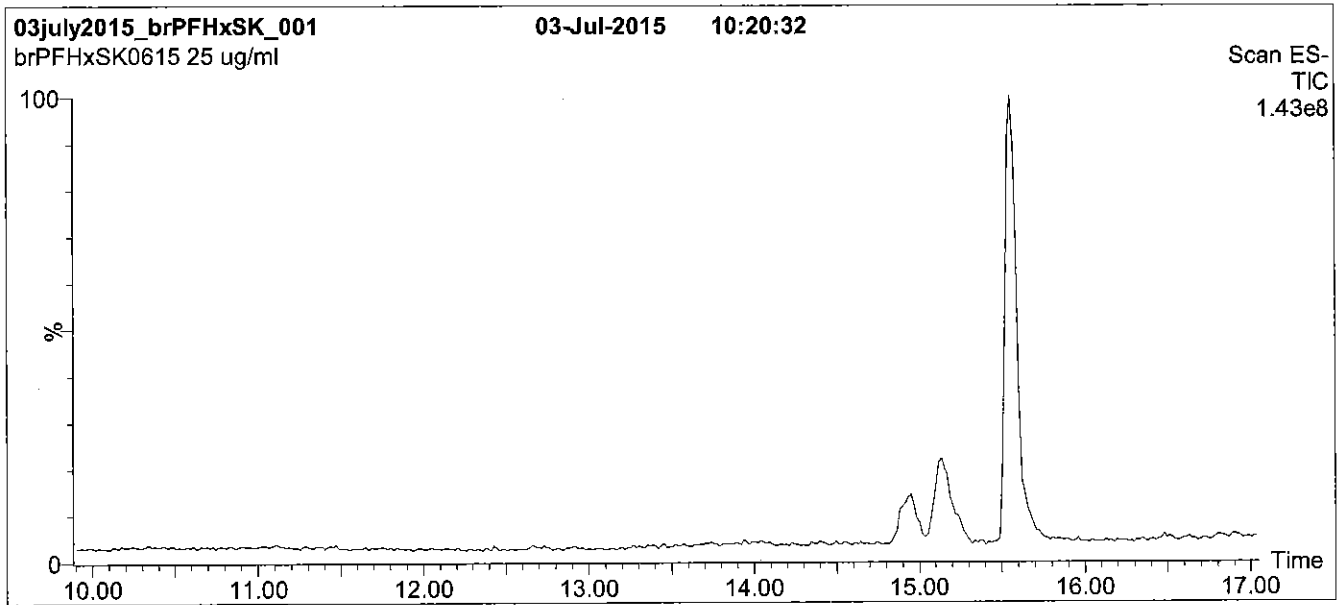
Isomer	Name	Structure	Percent Composition by ¹⁹ F-NMR
1	Potassium perfluoro-1-hexanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ ⁻ K ⁺	81.1
2	Potassium 1-trifluoromethylperfluoropentanesulfonate**	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ ⁻ K ⁺ CF ₃	2.9
3	Potassium 2-trifluoromethylperfluoropentanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ ⁻ K ⁺ CF ₃	1.4
4	Potassium 3-trifluoromethylperfluoropentanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ ⁻ K ⁺ CF ₃	5.0
5	Potassium 4-trifluoromethylperfluoropentanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ ⁻ K ⁺ CF ₃	8.9
6	Potassium 3,3-di(trifluoromethyl)perfluorobutanesulfonate	CF ₃ CF ₃ CCF ₂ CF ₂ SO ₃ ⁻ K ⁺ CF ₃	0.2
7	Other Unidentified Isomers		0.5

* Percent of total perfluorohexanesulfonate isomers only.
 ** Systematic Name: 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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 20% (80:20 MeOH:ACN) / 80% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 50% organic over 14 min. Ramp to
90% organic over 3 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 20 min

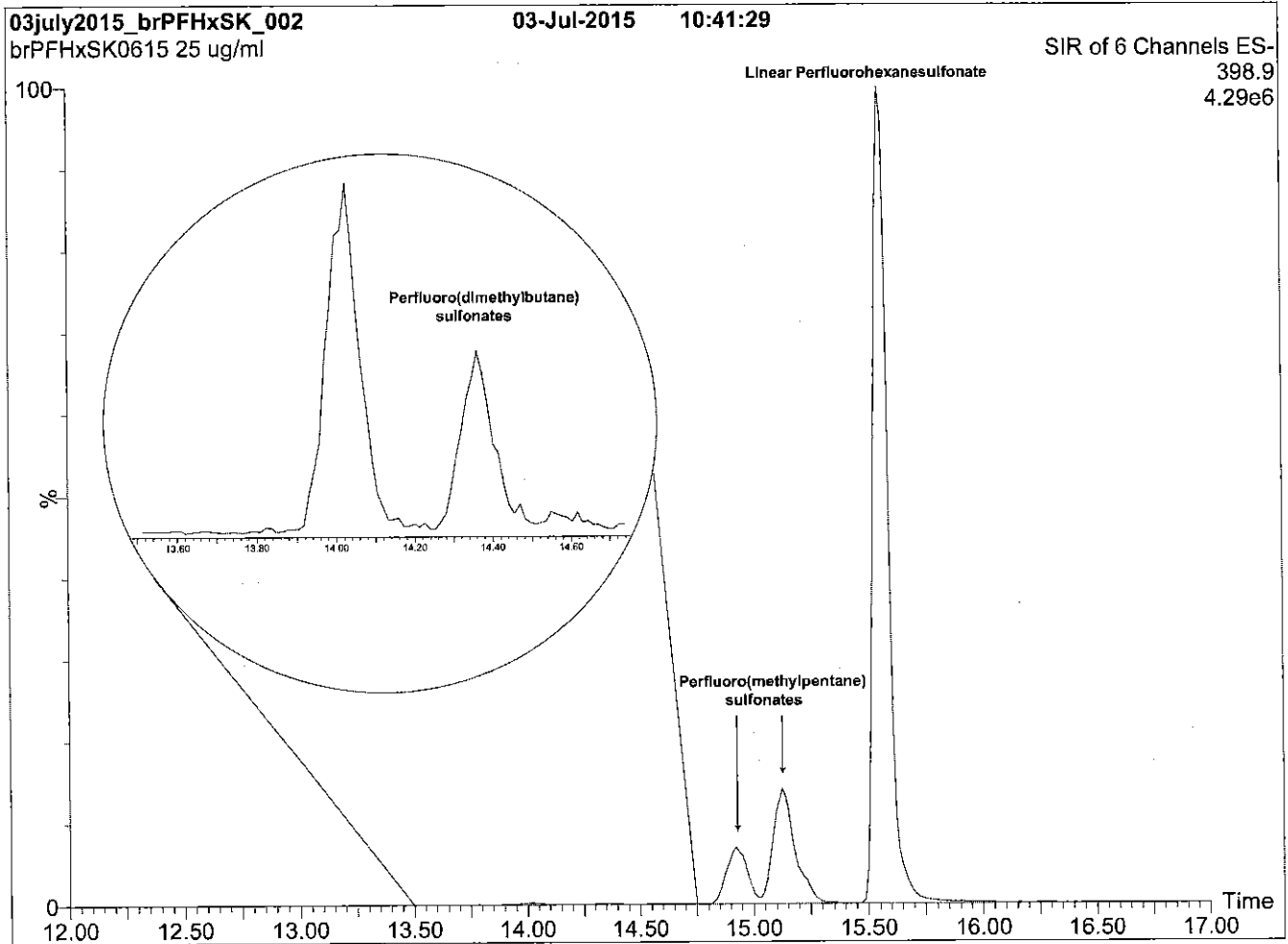
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (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 RP₁₈
1.7 μm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 20% (80:20 MeOH:ACN) / 80% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 50% organic over 14 min. Ramp to
90% organic over 3 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 20 min

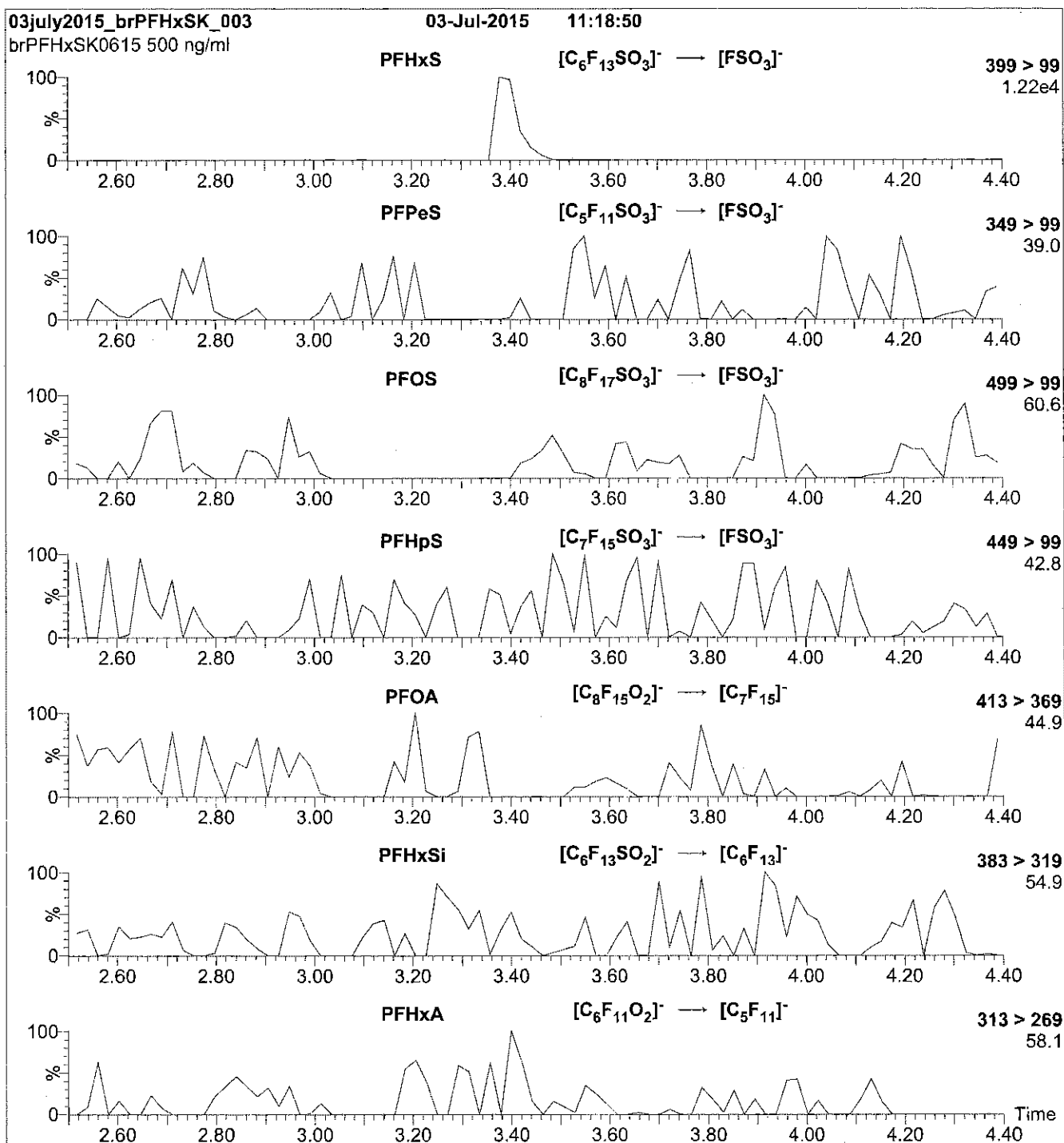
Flow: 300 μl/min

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 μ l (500 ng/ml br-PFHxSK)

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCPFHxS-br_00002

SBC
R: 9/13/16



730513
ID: LCPFHxS-br_00002
Exp: 07/03/20 Ppfd: SBC
Potassium Perfluorohexane



730514
ID: LCPFHxS-br_00003
Exp: 07/03/20 Ppfd: 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 ¹⁹F-NMR
Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS Data
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.5% of perfluoro-1-pentanesulfonate and ~ 0.2% of perfluoro-1-octanesulfonate.
- CAS#: 3871-99-6 (for linear isomer; potassium salt).

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

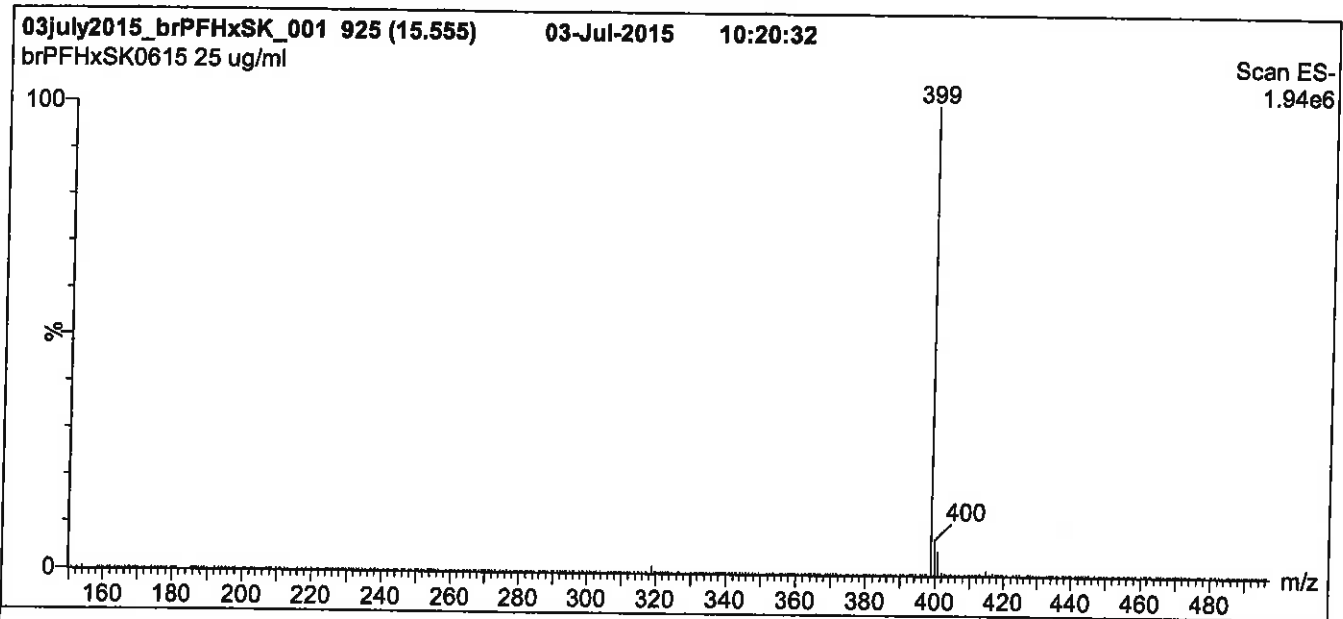
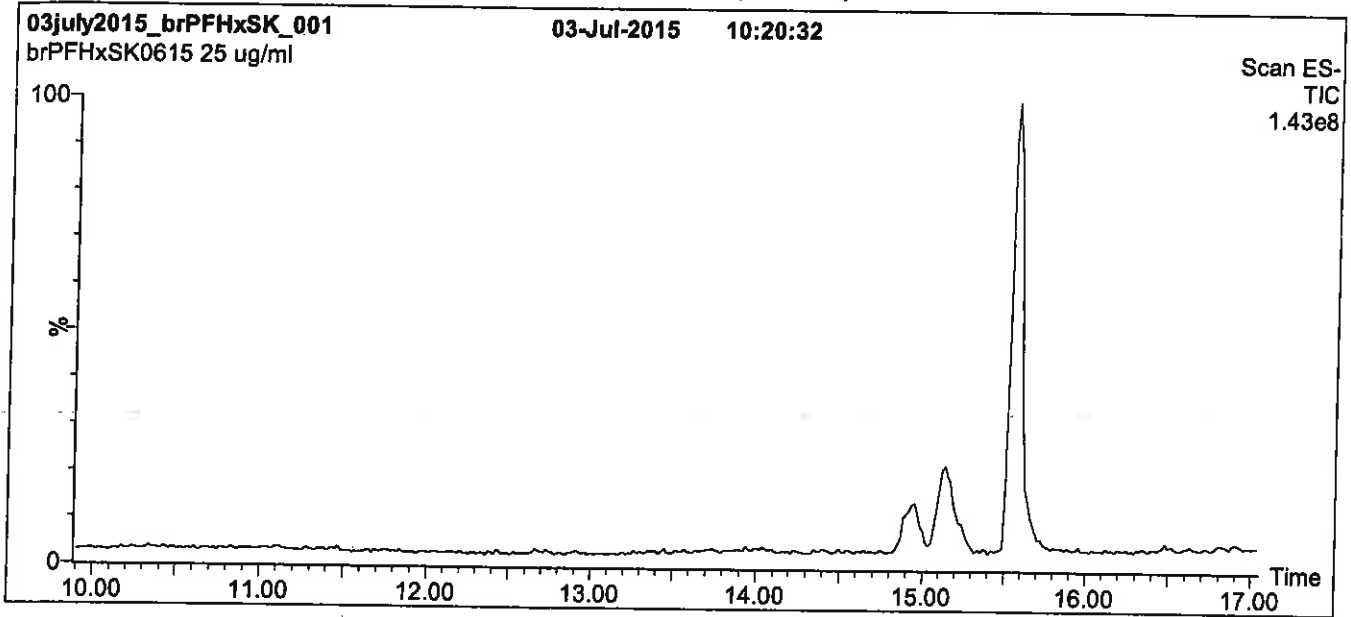
Isomer	Name	Structure	Percent Composition by ¹⁹ F-NMR
1	Potassium perfluoro-1-hexanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ ⁻ K ⁺	81.1
2	Potassium 1-trifluoromethylperfluoropentanesulfonate**	$\begin{array}{c} \text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+ \\ \\ \text{CF}_3 \end{array}$	2.9
3	Potassium 2-trifluoromethylperfluoropentanesulfonate	$\begin{array}{c} \text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+ \\ \\ \text{CF}_3 \end{array}$	1.4
4	Potassium 3-trifluoromethylperfluoropentanesulfonate	$\begin{array}{c} \text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+ \\ \\ \text{CF}_3 \end{array}$	5.0
5	Potassium 4-trifluoromethylperfluoropentanesulfonate	$\begin{array}{c} \text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+ \\ \\ \text{CF}_3 \end{array}$	8.9
6	Potassium 3,3-di(trifluoromethyl)perfluorobutanesulfonate	$\begin{array}{c} \text{CF}_3 \\ \\ \text{CF}_3\text{CCF}_2\text{CF}_2\text{SO}_3^-\text{K}^+ \\ \\ \text{CF}_3 \end{array}$	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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 20% (80:20 MeOH:ACN) / 80% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 50% organic over 14 min. Ramp to
90% organic over 3 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 20 min

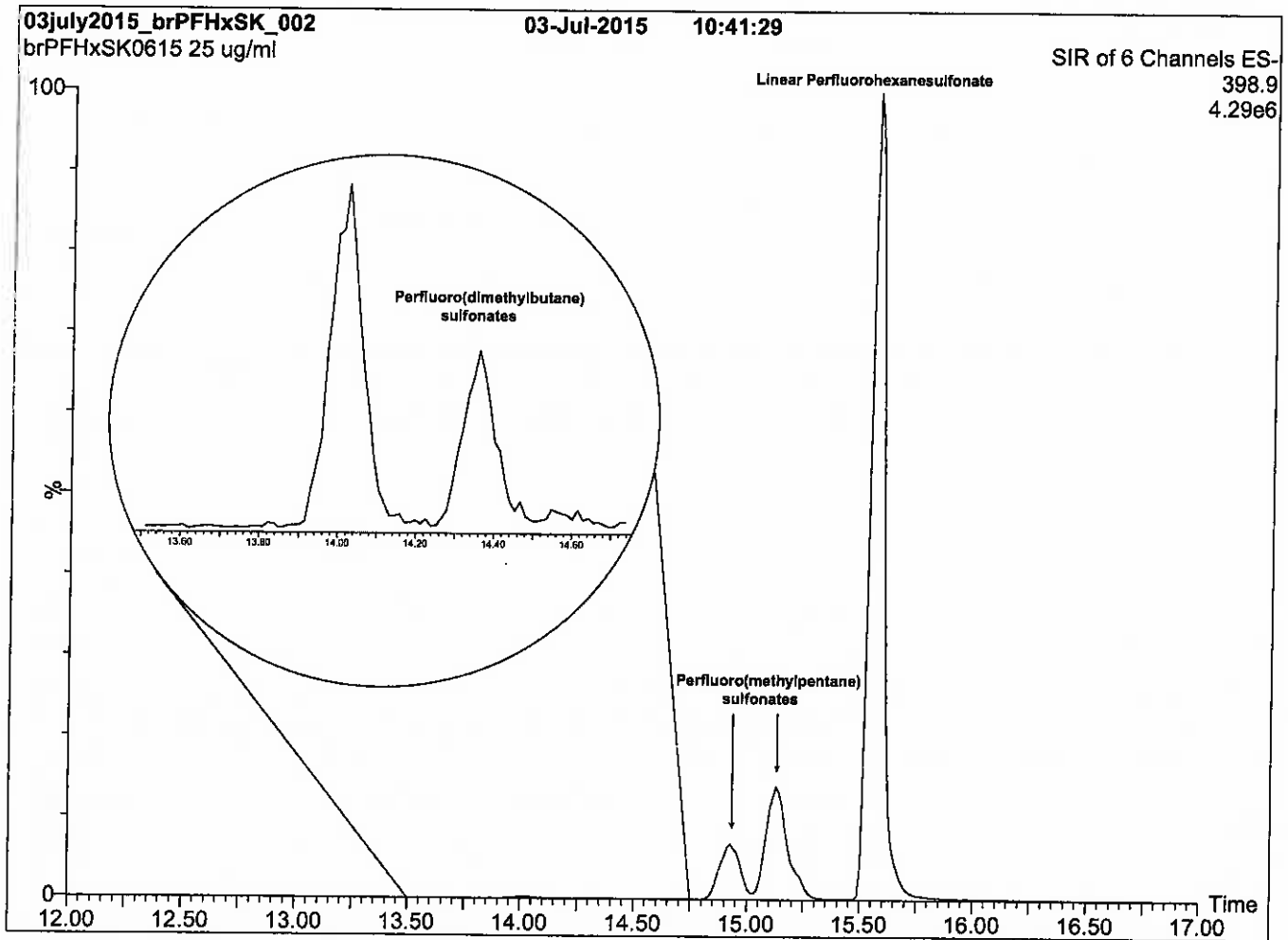
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (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 RP₁₈
1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
Start: 20% (80:20 MeOH:ACN) / 80% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 50% organic over 14 min. Ramp to
90% organic over 3 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 20 min

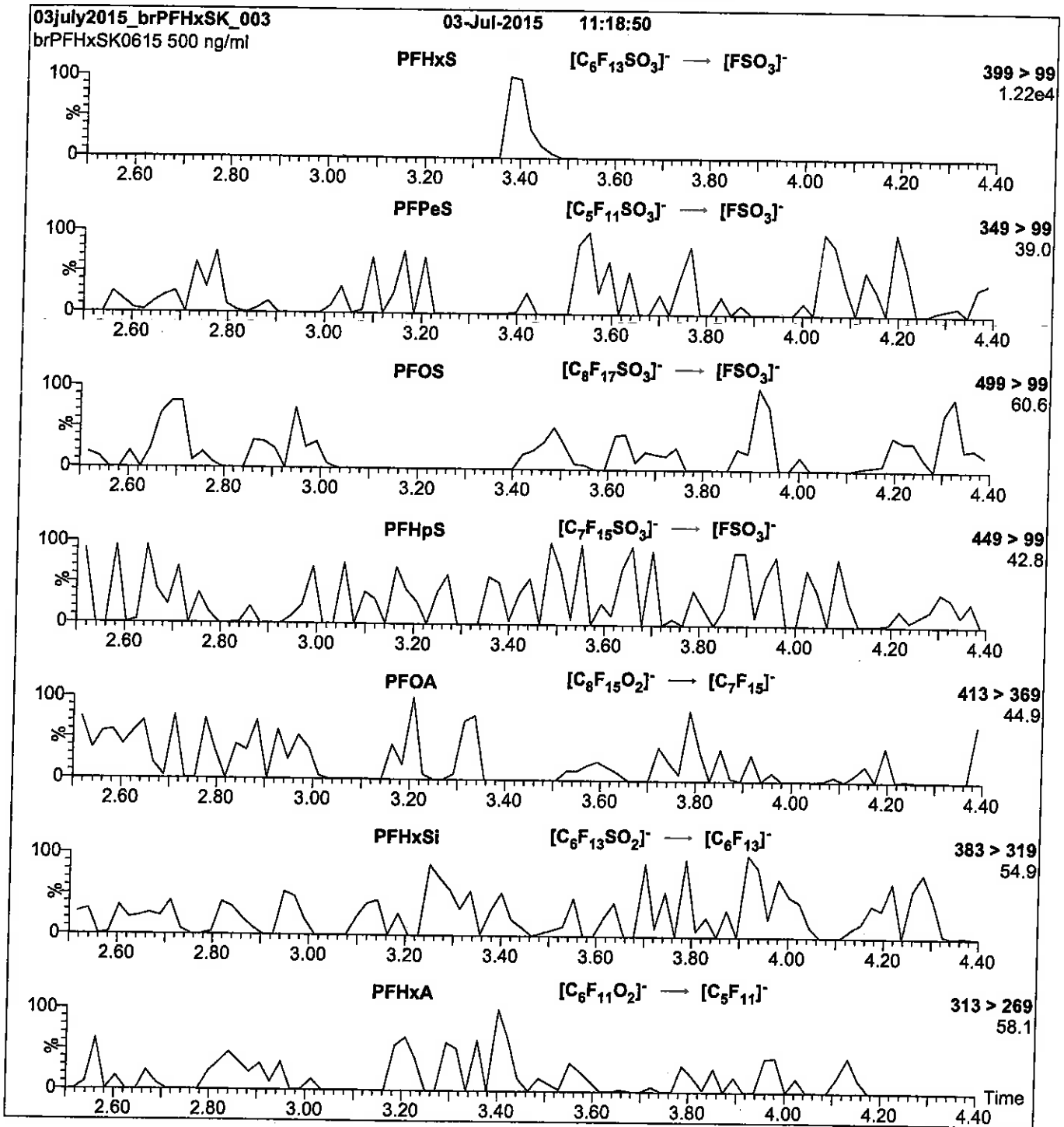
Flow: 300 μ l/min

MS Parameters

Experiment: SIR (6 channels)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 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 μ l (500 ng/ml br-PFHxSK)

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCPFNA_00005



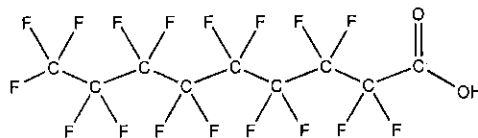
R: 4/7/16 CBW

609703

ID: LCPFNA_00005

Exp: 10/23/20 Prod: CBW

PF-n-nonanoic acid

**WELLINGTON**
LABORATORIES**CERTIFICATE OF ANALYSIS**
DOCUMENTATION**PRODUCT CODE:** PFNA
COMPOUND: Perfluoro-n-nonanoic acid**LOT NUMBER:** PFNA1015**STRUCTURE:****CAS #:** 375-95-1**MOLECULAR FORMULA:** C₉H_{F₁₇}O₂
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:

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, \dots, x_n on which it depends is:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

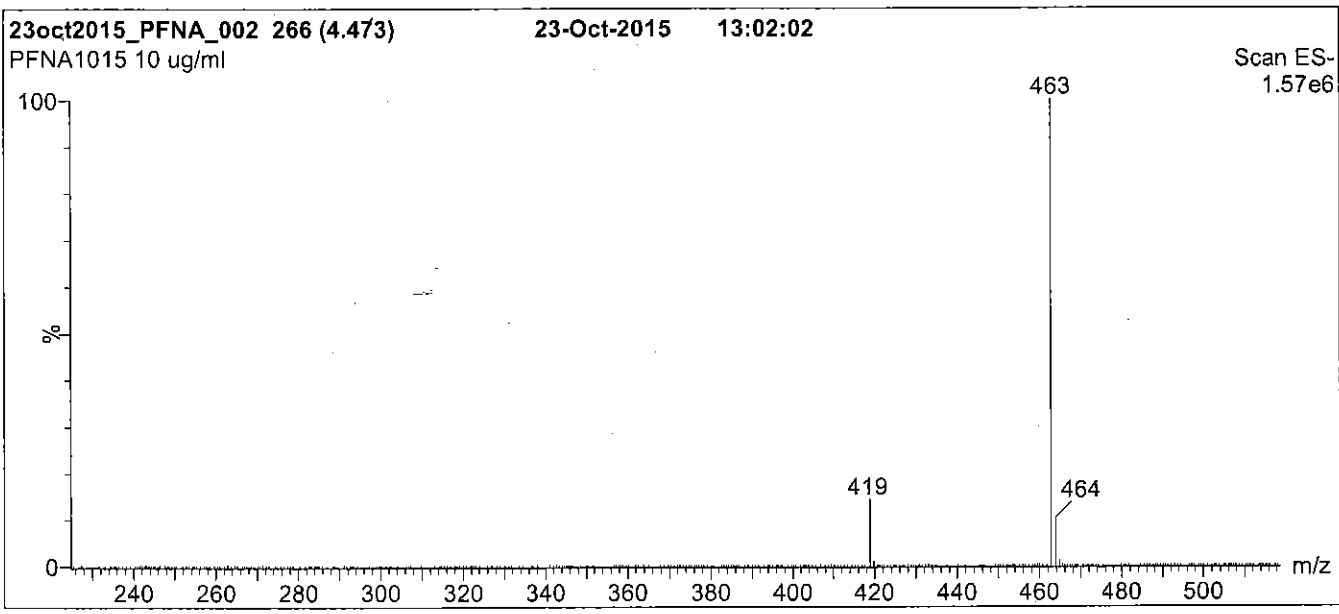
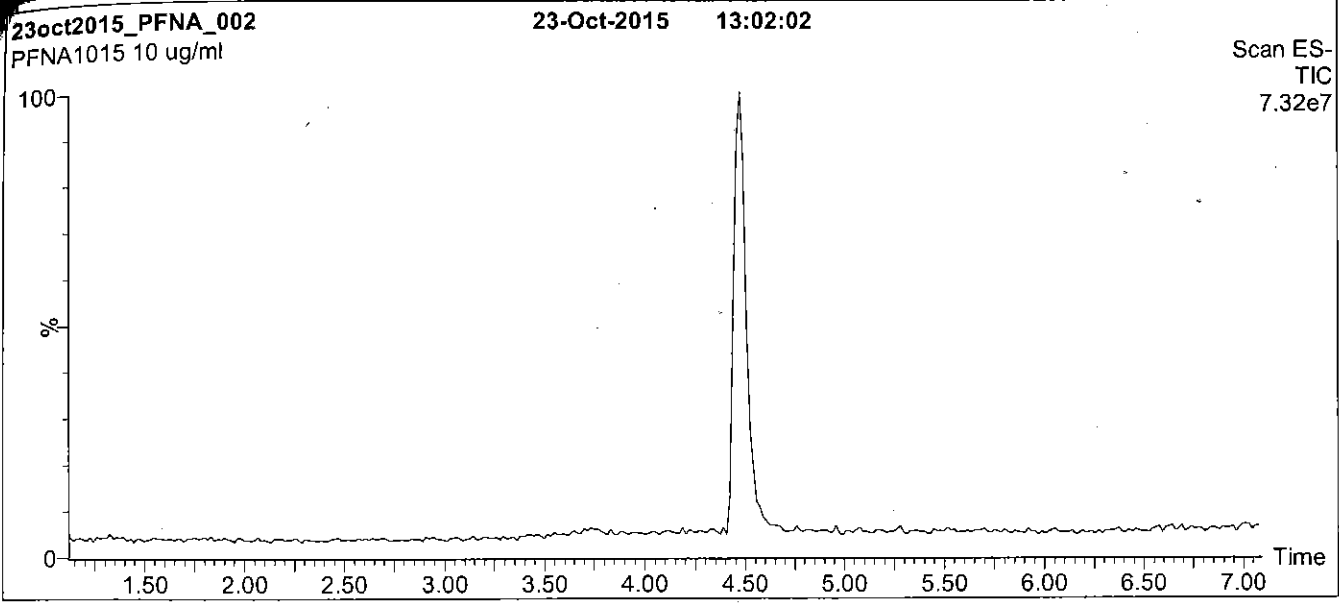
QUALITY MANAGEMENT:

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



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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 RP₁₈
 1.7 μ m, 2.1 x 100 mm

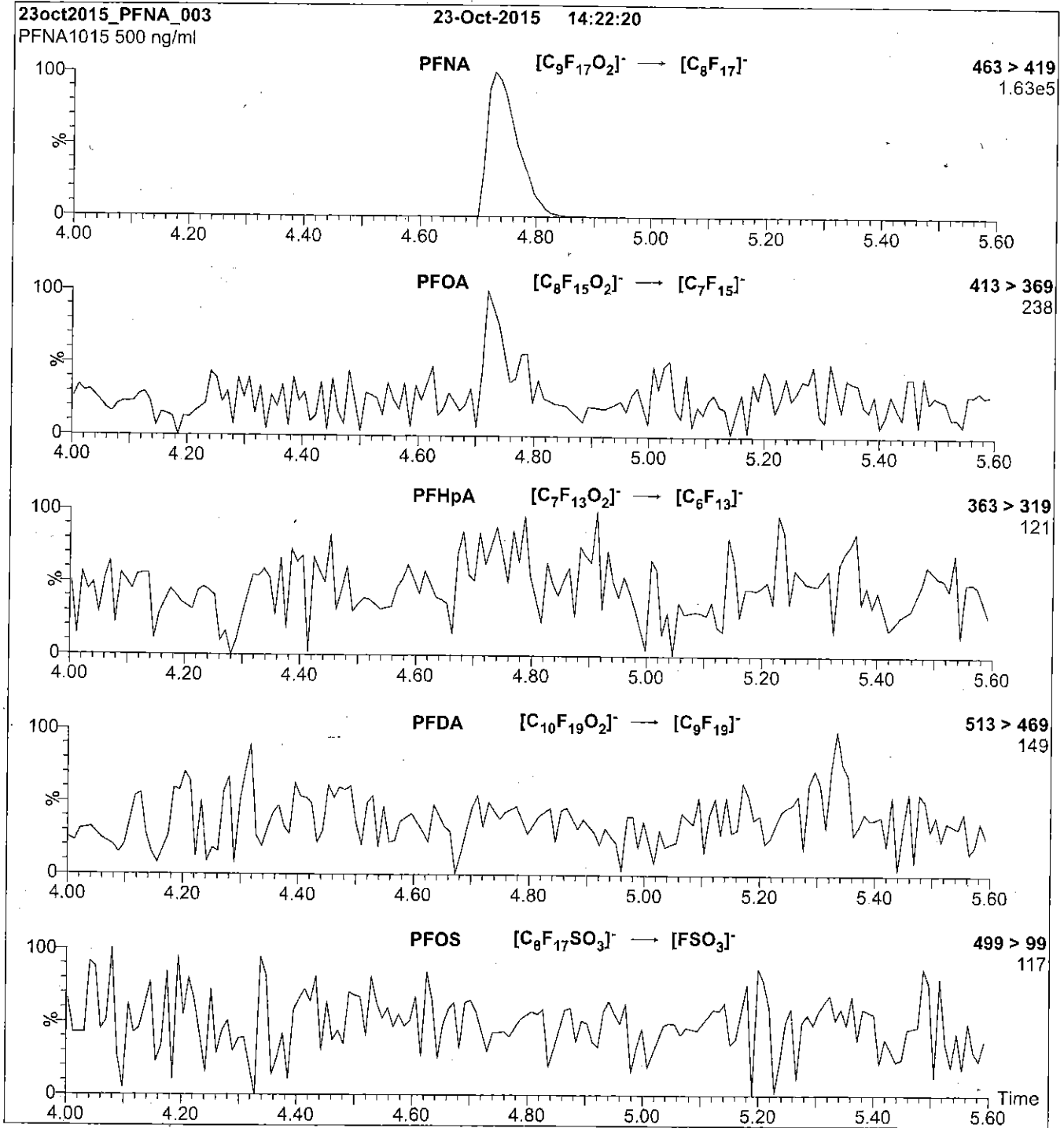
Mobile phase: Gradient
 Start: 50% (80:20 MeOH:ACN) / 50% H₂O
 (both with 10 mM NH₄OAc buffer)
 Ramp to 90% organic over 7 min and hold for 2 min
 before returning to initial conditions in 0.5 min.
 Time: 10 min

Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)
 Source: Electrospray (negative)
 Capillary Voltage (kV) = 2.00
 Cone Voltage (V) = 15.00
 Cone Gas Flow (l/hr) = 50
 Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCPFOA_00006

R-7/6/16 CBW

671577
ID: LCPFOA_00006
Exp: 11/06/20 Prod: CBW
PF-n-octanoic acid

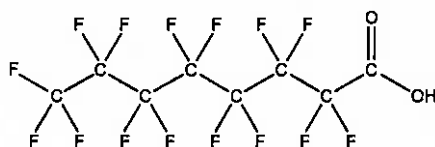


WELLINGTON LABORATORIES

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: $50 \pm 2.5 \mu\text{g/ml}$ **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:  **Date:** 11/11/2015
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, \dots, x_n on which it depends is:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

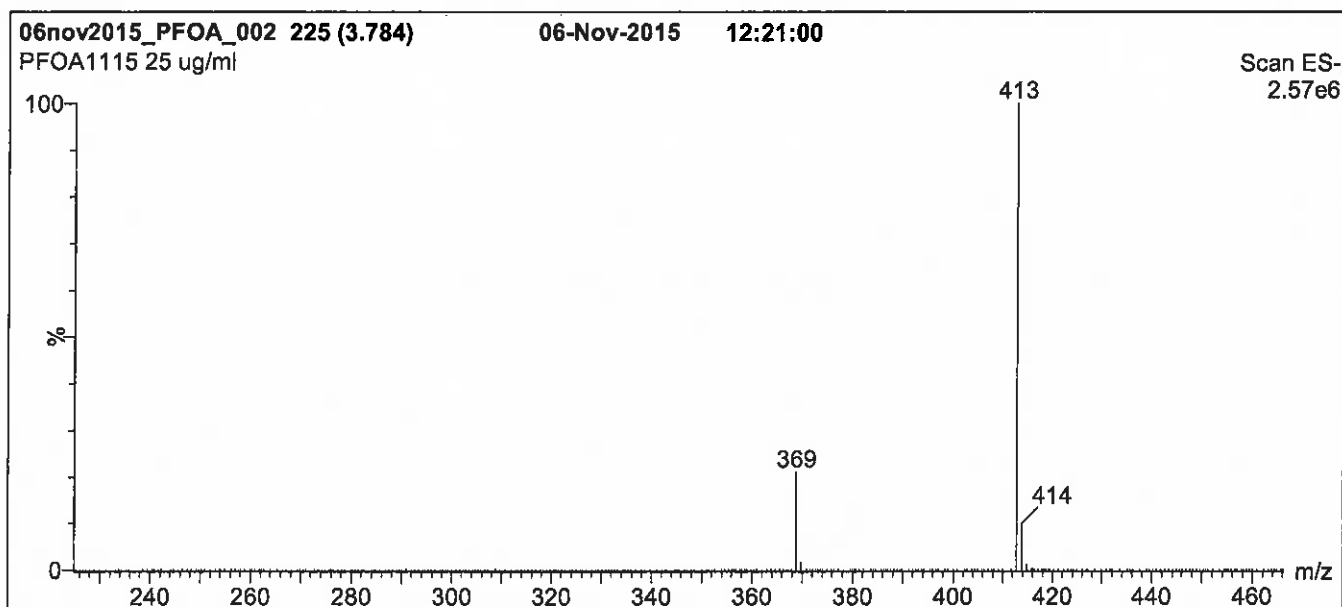
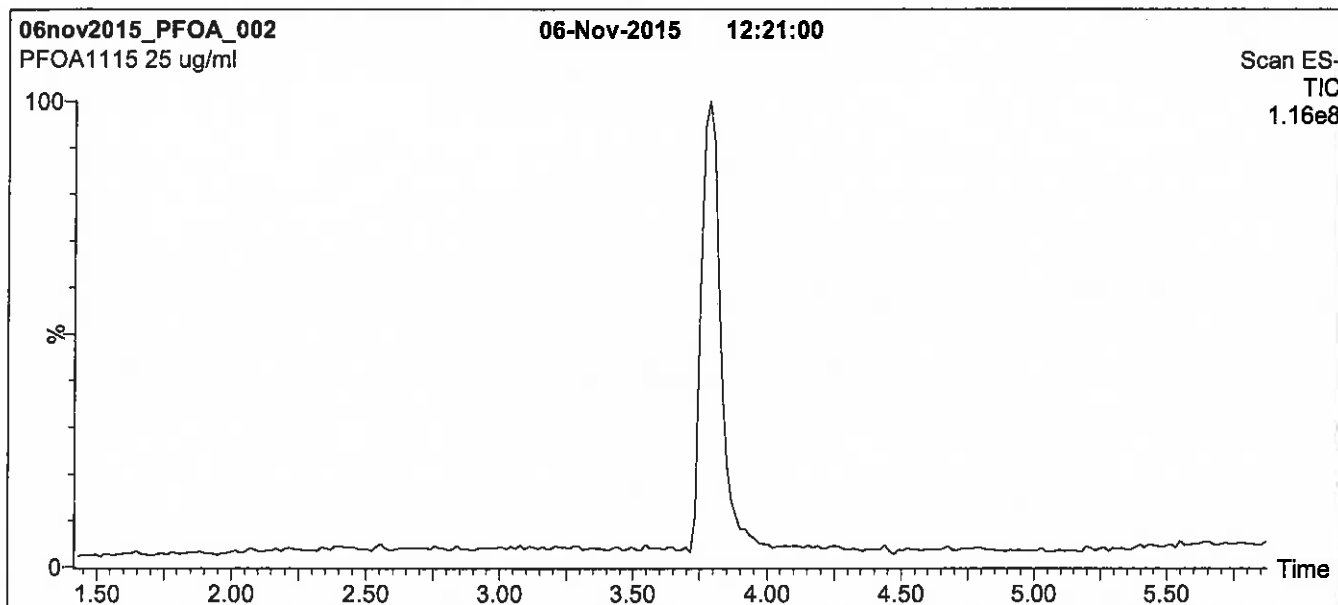
QUALITY MANAGEMENT:

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



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

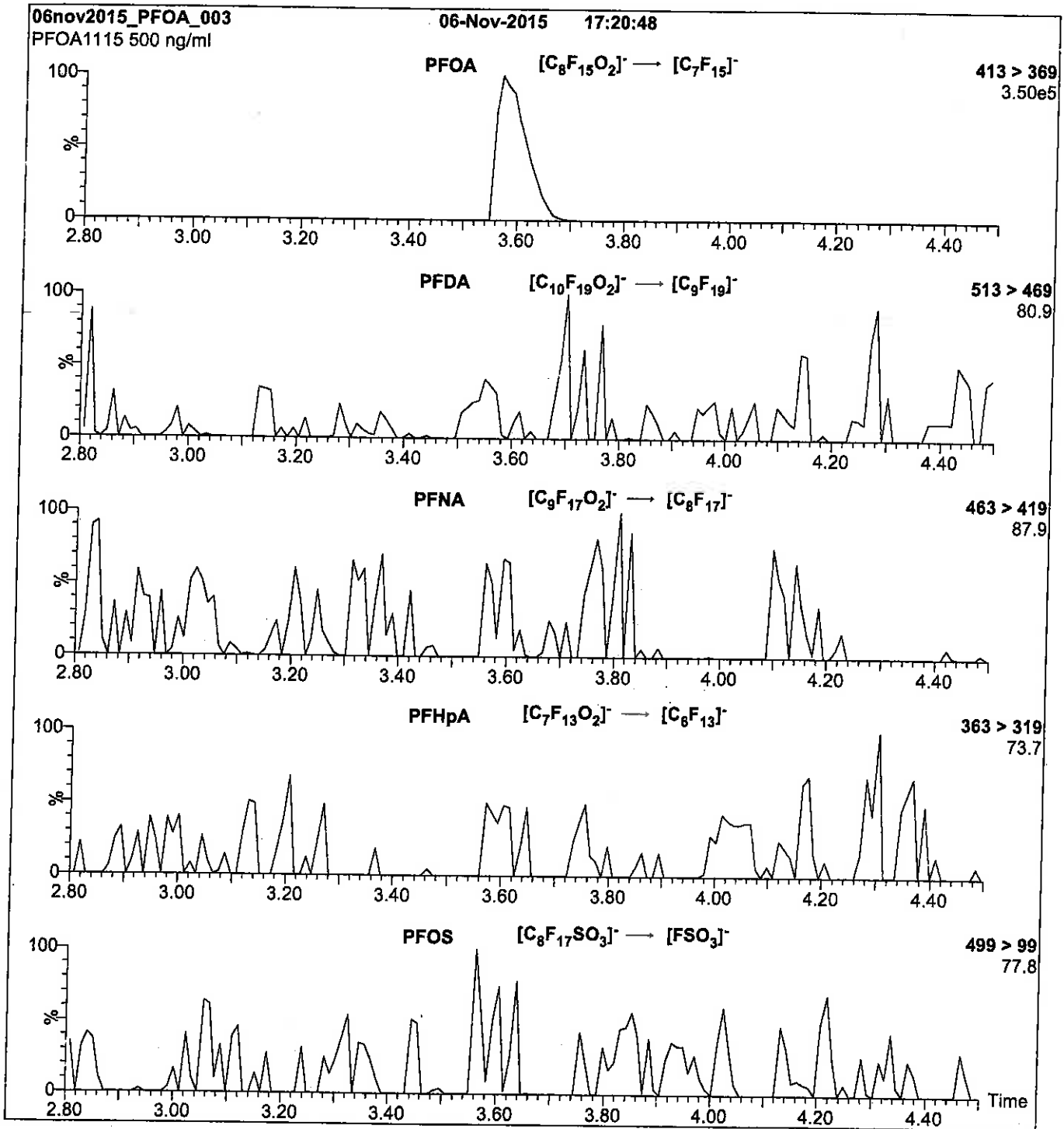
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

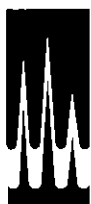
Collision Gas (mbar) = 3.17e-3
Collision Energy (eV) = 10

Reagent

LCPFODA_00005

605234
ID: LC PFODA_00005
Exp: 01/30/20 Prod: CBW
PFODA stock 50ug/ml

Rec. 3/20/16 JRB

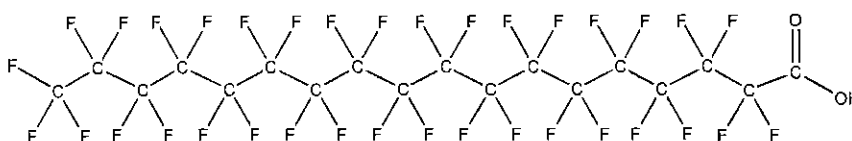


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFODA **LOT NUMBER:** PFODA0115
COMPOUND: Perfluoro-n-octadecanoic acid

STRUCTURE: **CAS #:** 16517-11-6



MOLECULAR FORMULA: $C_{18}H_{35}O_2$ **MOLECULAR WEIGHT:** 914.14
CONCENTRATION: $50 \pm 2.5 \mu\text{g/ml}$ **SOLVENT(S):** Methanol
Water (<1%)
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 01/30/2015
EXPIRY DATE: (mm/dd/yyyy) 01/30/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

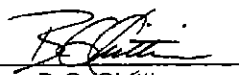
DOCUMENTATION/ DATA ATTACHED:

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

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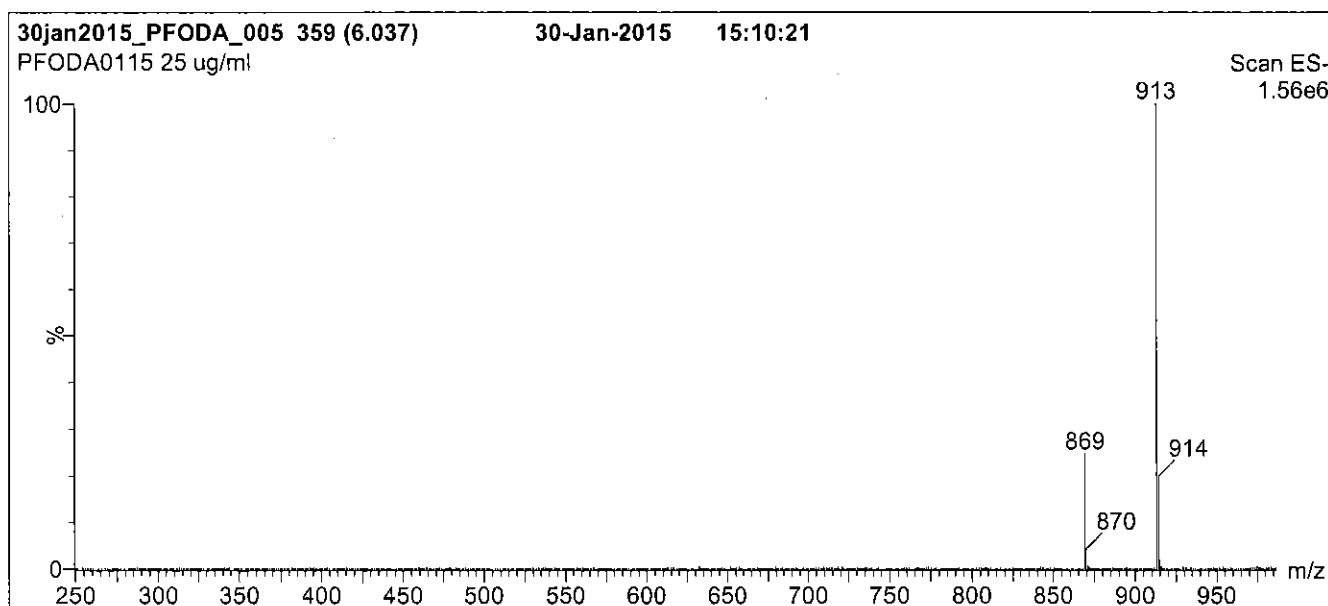
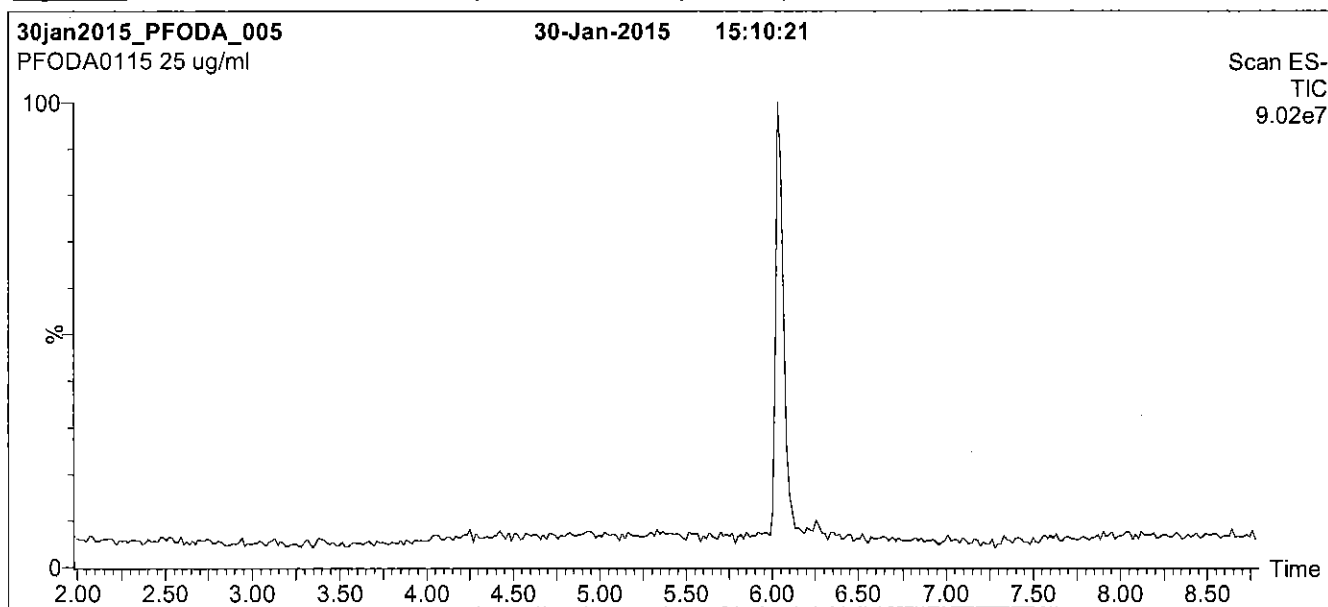
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

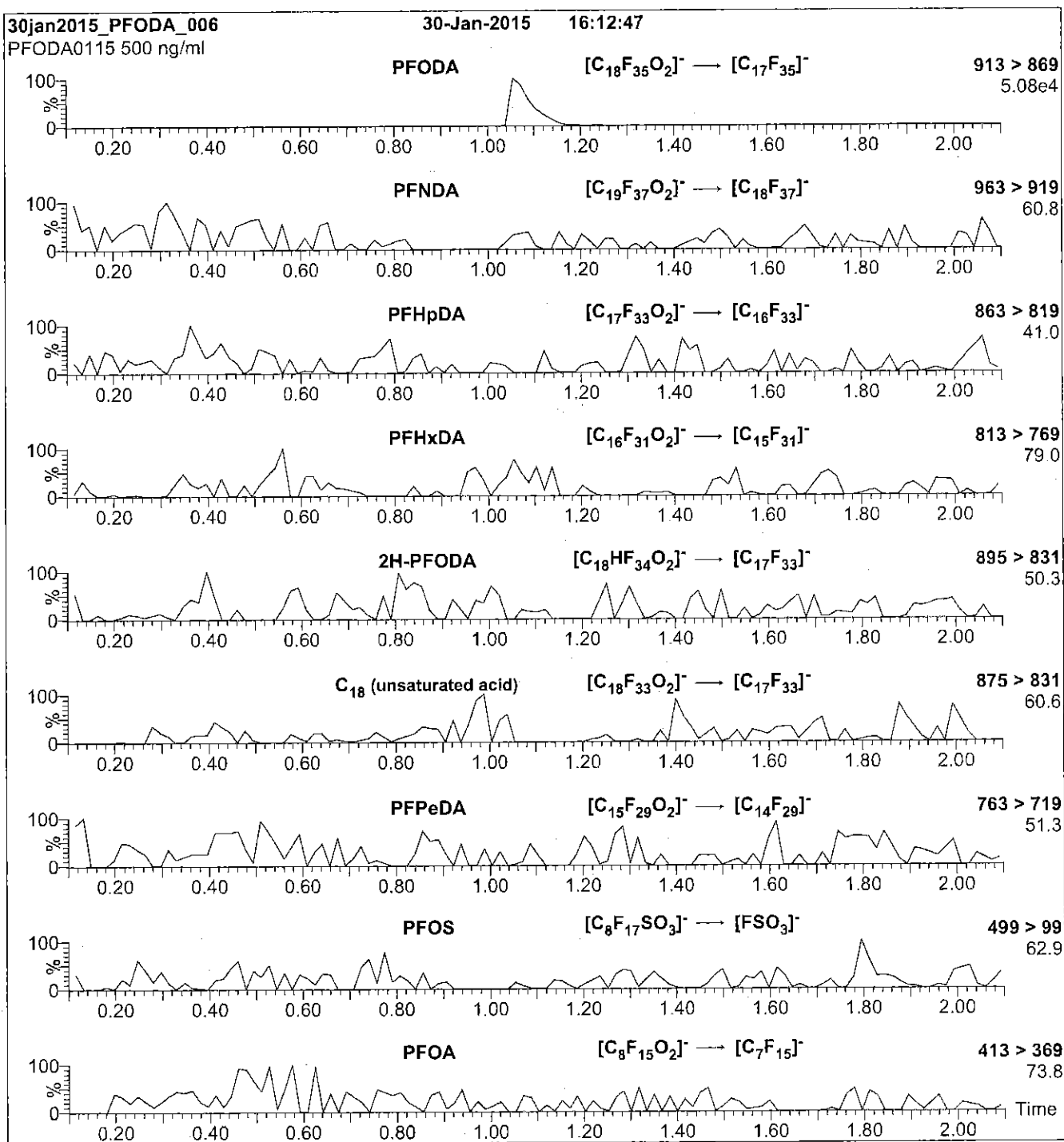
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (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% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 15

Reagent

LCPFOS-br_00001



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 ¹⁹F-NMR
Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS Data (SIR)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- A 5-point calibration curve was generated using linear PFOS (potassium salt) and mass-labelled PFOS as an internal standard to enable quantitation of br-PFOSK using isotopic dilution.
- CAS#: 2795-39-3 (for linear isomer; potassium salt).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

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




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

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

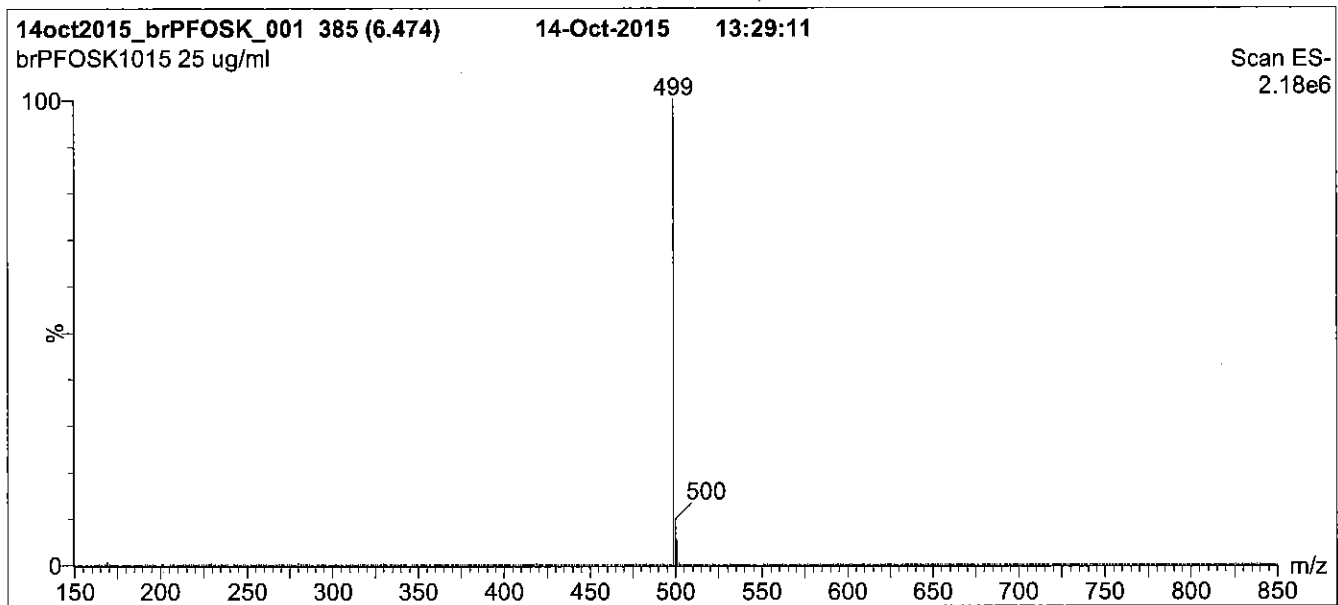
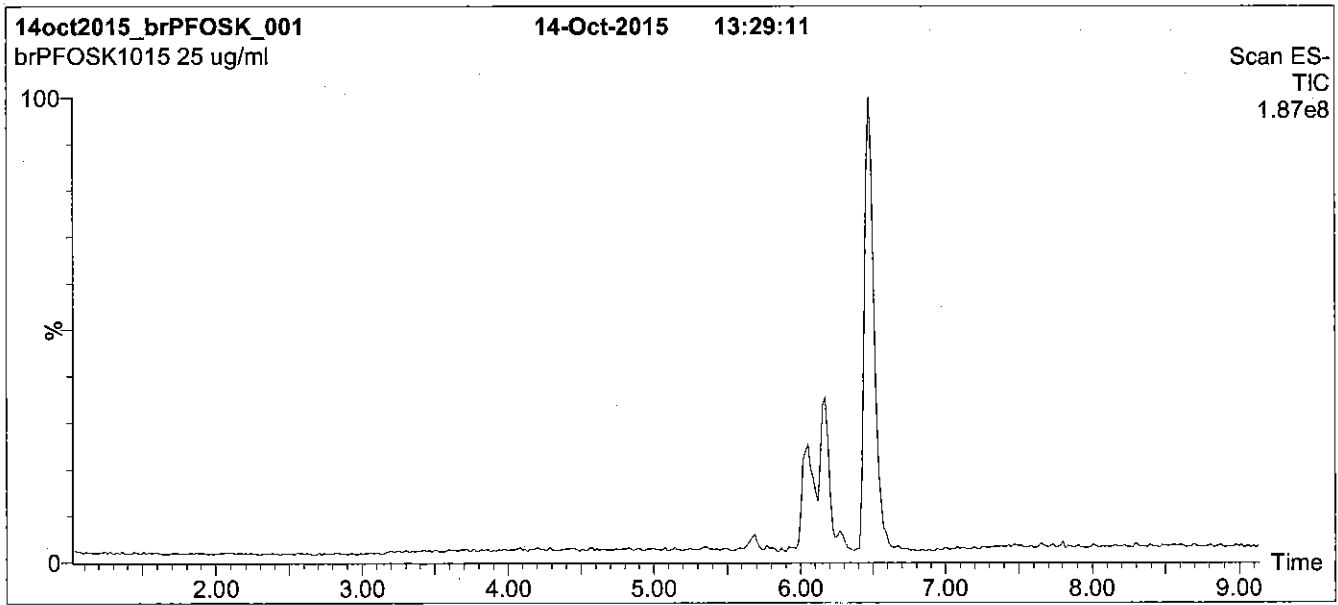
Isomer	Name	Structure	Percent Composition by ¹⁹ F-NMR
1	Potassium perfluoro-1-octanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ K ⁺	78.8
2	Potassium 1-trifluoromethylperfluoroheptanesulfonate**	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ CF(SO ₃)K ⁺ CF ₃	1.2
3	Potassium 2-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF(SO ₃)CF ₂ K ⁺ CF ₃	0.6
4	Potassium 3-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF(SO ₃)CF ₂ CF ₂ K ⁺ CF ₃	1.9
5	Potassium 4-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF ₂ CF(SO ₃)CF ₂ CF ₂ CF ₂ K ⁺ CF ₃	2.2
6	Potassium 5-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF(SO ₃)CF ₂ CF ₂ CF ₂ CF ₂ K ⁺ CF ₃	4.5
7	Potassium 6-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF(SO ₃)CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ K ⁺ CF ₃	10.0
8	Potassium 5,5-di(trifluoromethyl)perfluorohexanesulfonate	CF ₃ -C(CF ₃) ₂ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ K ⁺ CF ₃	0.2
9	Potassium 4,4-di(trifluoromethyl)perfluorohexanesulfonate	CF ₃ CF ₂ -C(CF ₃) ₂ -CF ₂ CF ₂ CF ₂ SO ₃ K ⁺ CF ₃	0.03
10	Potassium 4,5-di(trifluoromethyl)perfluorohexanesulfonate	CF ₃ -CF(CF ₃)-CF(CF ₃)-CF ₂ CF ₂ CF ₂ SO ₃ K ⁺ CF ₃ CF ₃	0.4
11	Potassium 3,5-di(trifluoromethyl)perfluorohexanesulfonate	CF ₃ -CF(CF ₃)-CF ₂ -CF(CF ₃)-CF ₂ CF ₂ SO ₃ K ⁺ CF ₃ CF ₃	0.07

* Percent of total perfluorooctanesulfonate isomers only. Isomers are labelled in Figure 2.
 ** Systematic Name: Potassium perfluorooctane-2-sulfonate.

Certified By: 
 B.G. Chittim

Date: 10/15/2015
(mm/dd/yyyy)

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 45% (80:20 MeOH:ACN) / 55% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 12 min and hold for 2 min.
Return to initial conditions over 0.5 min.
Time: 16 min

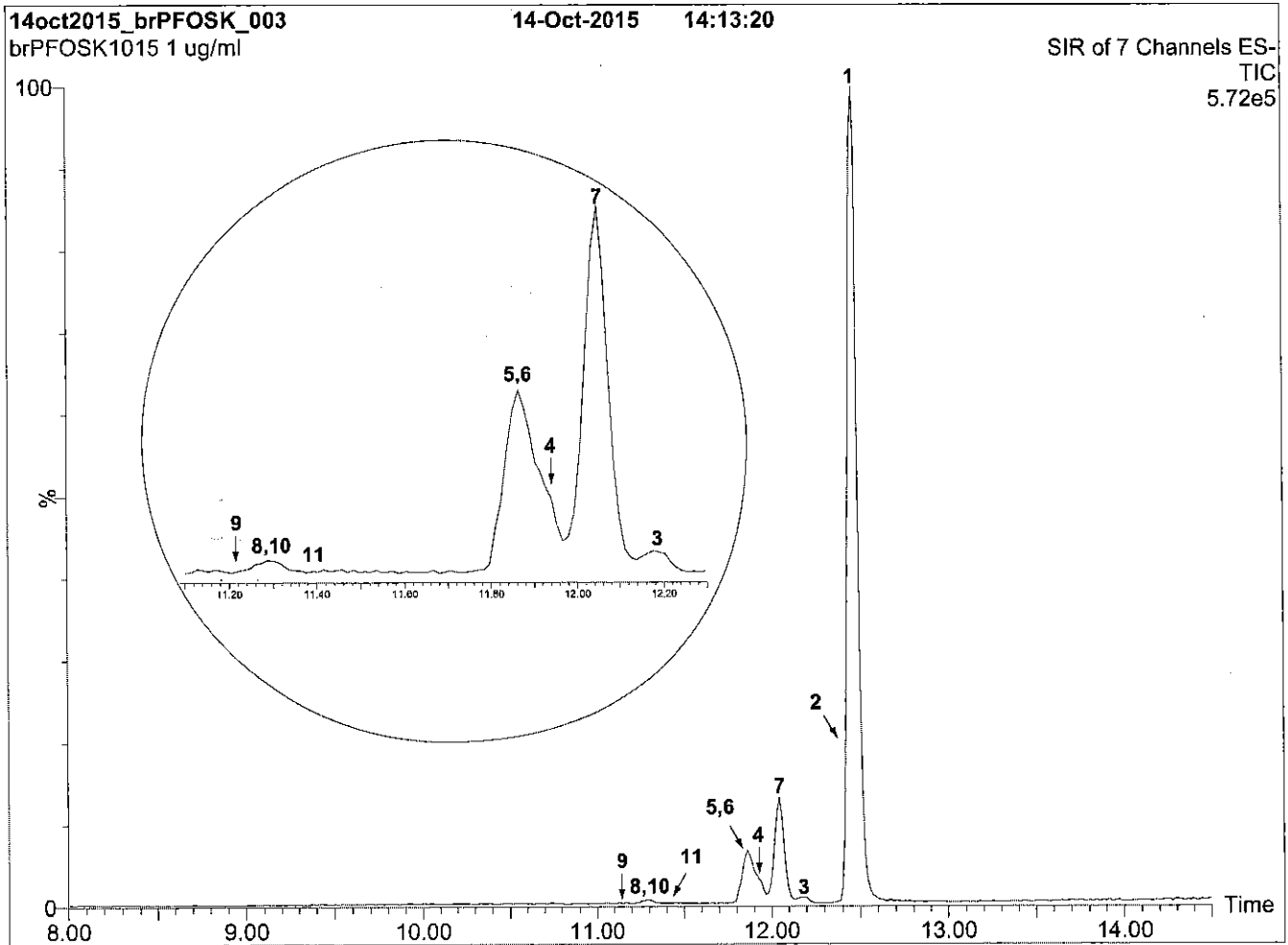
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (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

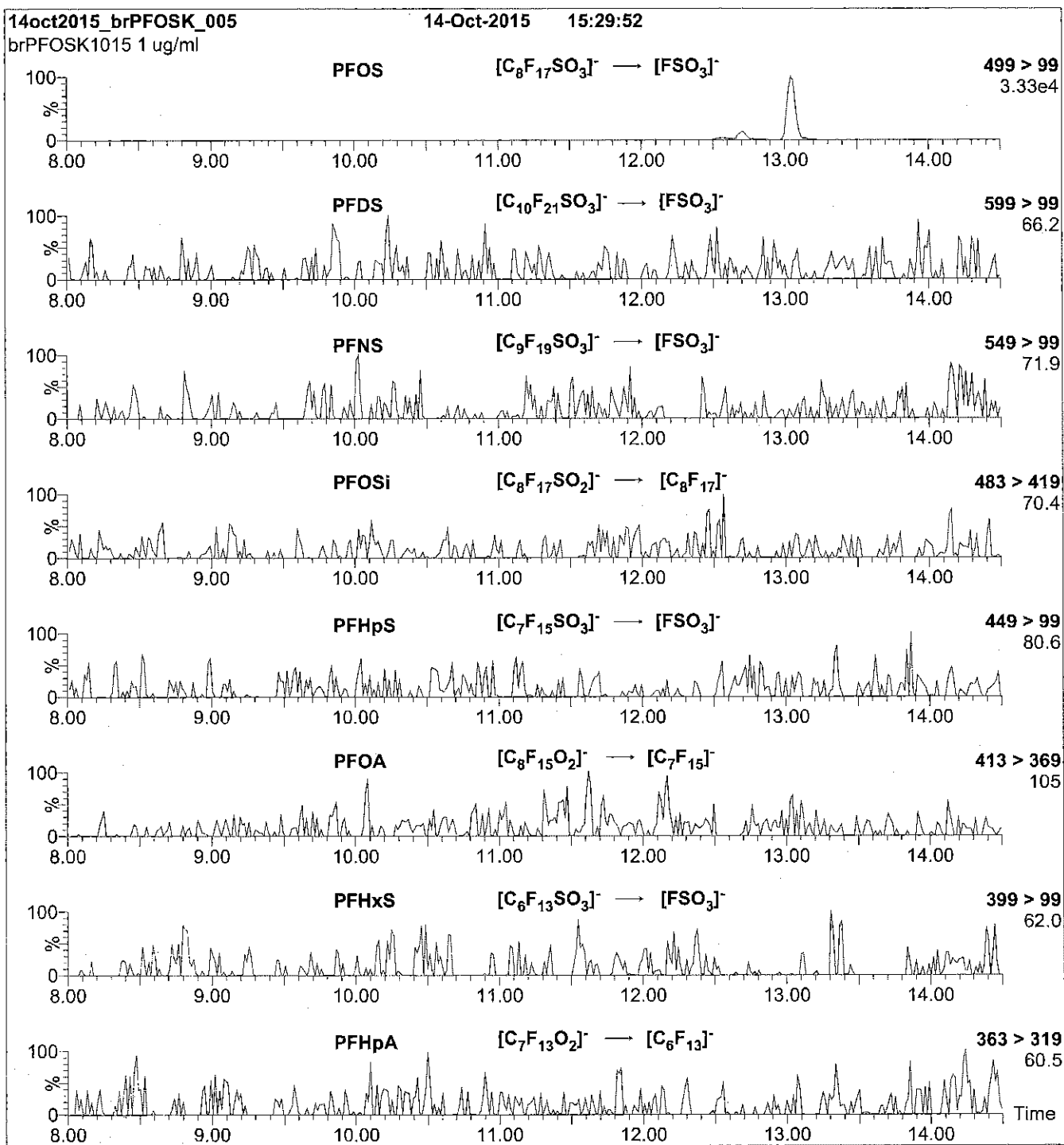
Chromatographic Conditions:

Column: Acquity UPLC BEH Shield RP₁₈ (1.7 μ m, 2.1 x 100 mm)
Injection: 1.0 μ g/ml of br-PFOSK
Mobile Phase: Gradient
45% (80:20 MeOH:ACN) / 55% H₂O (both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 15 min and hold for 3 min.
Return to initial conditions over 1 min.
Time: 20 min
Flow: 300 μ l/min

MS Conditions:

SIR (ES)
Source = 110 °C
Desolvation = 325 °C
Cone Voltage = 60V

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



Conditions for Figure 3:

Injection: On-column
Mobile phase: Same as Figure 2
Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.06e-3
Collision Energy (eV) = 11-50 (variable)

Reagent

LCPFOS-br_00002

Scanned
10/14/16 SR

R: SBC 9/13/16



730515
ID: LCPFOS-br_00002
Exp: 10/14/20 Prpt: SBC
Potassium Perfluorooctane



730516
ID: LCPFOS-br_00003
Exp: 10/14/20 Prpt: 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 ¹⁹F-NMR
Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS Data (SIR)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- A 5-point calibration curve was generated using linear PFOS (potassium salt) and mass-labelled PFOS as an internal standard to enable quantitation of br-PFOSK using isotopic dilution.
- CAS#: 2795-39-3 (for linear isomer; potassium salt).

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

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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.

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

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



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

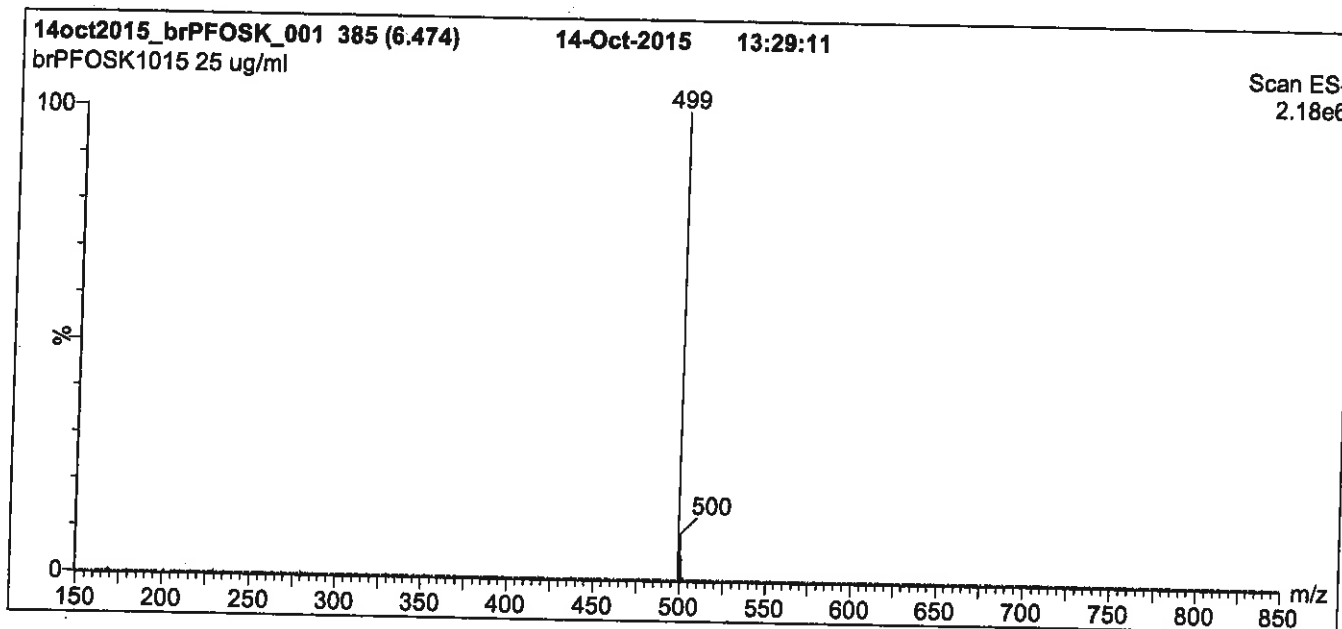
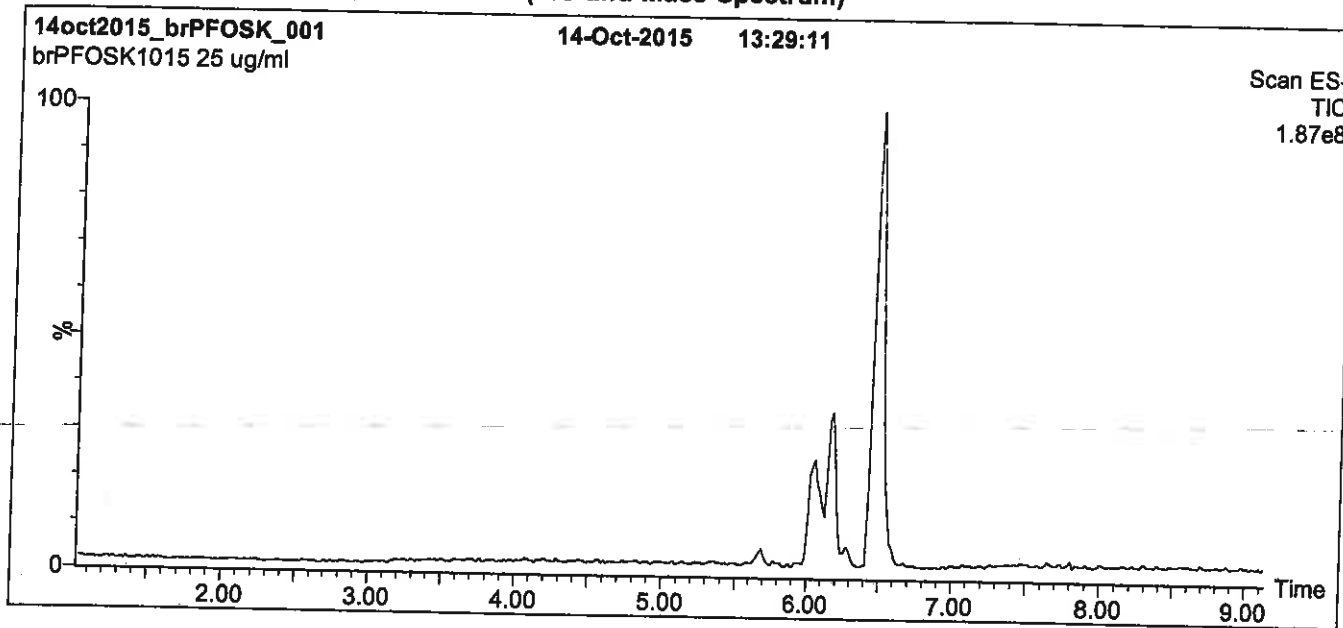
Isomer	Name	Structure	Percent Composition by ¹⁹ F-NMR
1	Potassium perfluoro-1-octanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ K ⁺	78.8
2	Potassium 1-trifluoromethylperfluoroheptanesulfonate**	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ CF(SO ₃)K ⁺ CF ₃	1.2
3	Potassium 2-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF(CF ₃)SO ₃ K ⁺ CF ₃	0.6
4	Potassium 3-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF(CF ₃)CF ₂ SO ₃ K ⁺ CF ₃	1.9
5	Potassium 4-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF ₂ CF(CF ₃)CF ₂ CF ₂ SO ₃ K ⁺ CF ₃	2.2
6	Potassium 5-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF(CF ₃)CF ₂ CF ₂ CF ₂ SO ₃ K ⁺ CF ₃	4.5
7	Potassium 6-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF(CF ₃)CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ K ⁺ CF ₃	10.0
8	Potassium 5,5-di(trifluoromethyl)perfluorohexanesulfonate	CF ₃ CF ₃ -C-CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ K ⁺ CF ₃	0.2
9	Potassium 4,4-di(trifluoromethyl)perfluorohexanesulfonate	CF ₃ CF ₃ -C-CF ₂ CF ₂ CF ₂ SO ₃ K ⁺ CF ₃	0.03
10	Potassium 4,5-di(trifluoromethyl)perfluorohexanesulfonate	CF ₃ -CF(CF ₃)-CF(CF ₃)-CF ₂ CF ₂ CF ₂ SO ₃ K ⁺ CF ₃ CF ₃	0.4
11	Potassium 3,5-di(trifluoromethyl)perfluorohexanesulfonate	CF ₃ -CF(CF ₃)-CF ₂ -CF(CF ₃)-CF ₂ CF ₂ SO ₃ K ⁺ CF ₃ CF ₃	0.07

* Percent of total perfluorooctanesulfonate isomers only. Isomers are labelled in Figure 2.
 ** Systematic Name: Potassium perfluorooctane-2-sulfonate.

Certified By: 
 B.G. Chittim

Date: 10/15/2015
(mm/dd/yyyy)

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 45% (80:20 MeOH:ACN) / 55% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 12 min and hold for 2 min.
Return to initial conditions over 0.5 min.
Time: 16 min

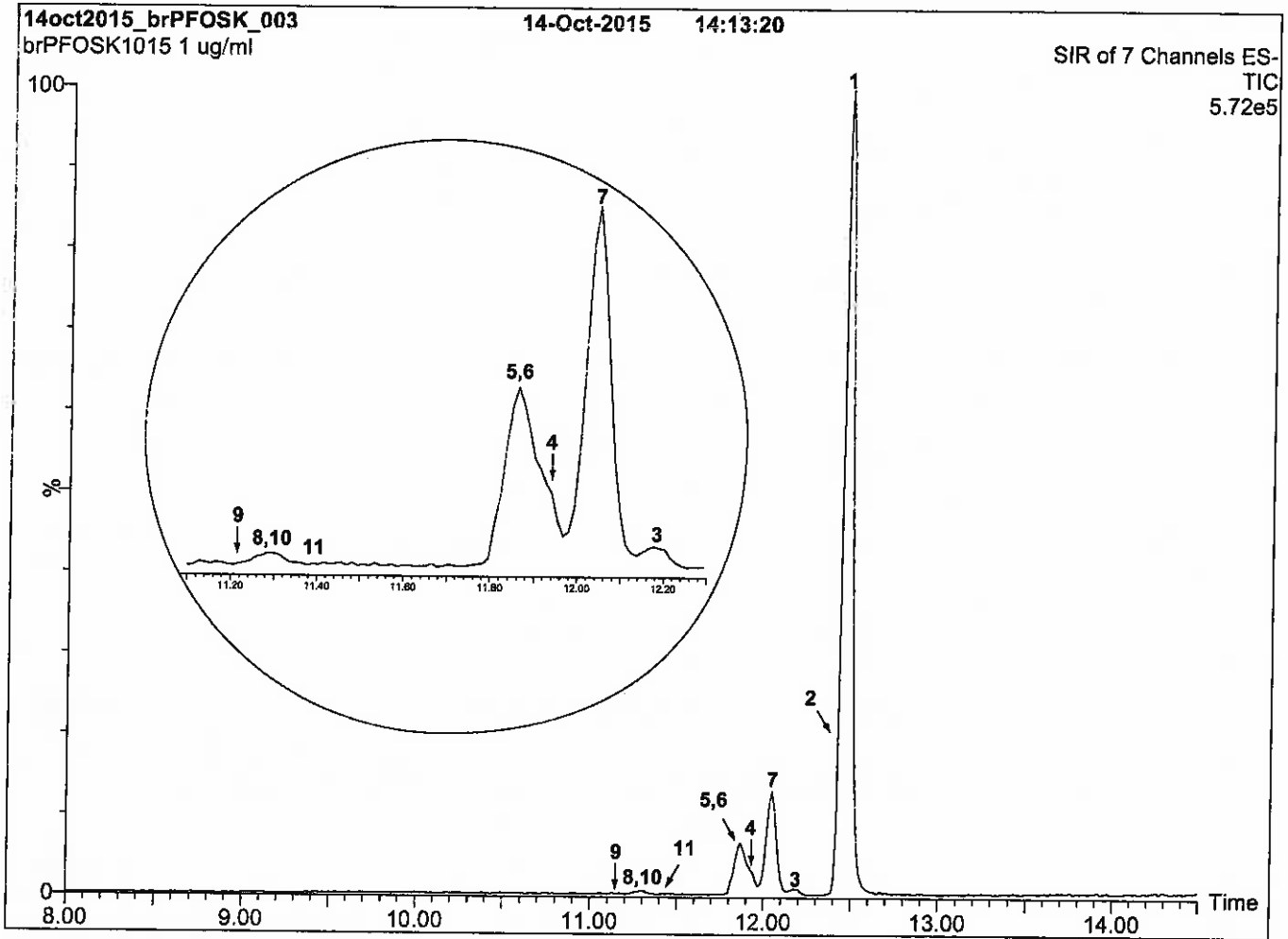
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (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

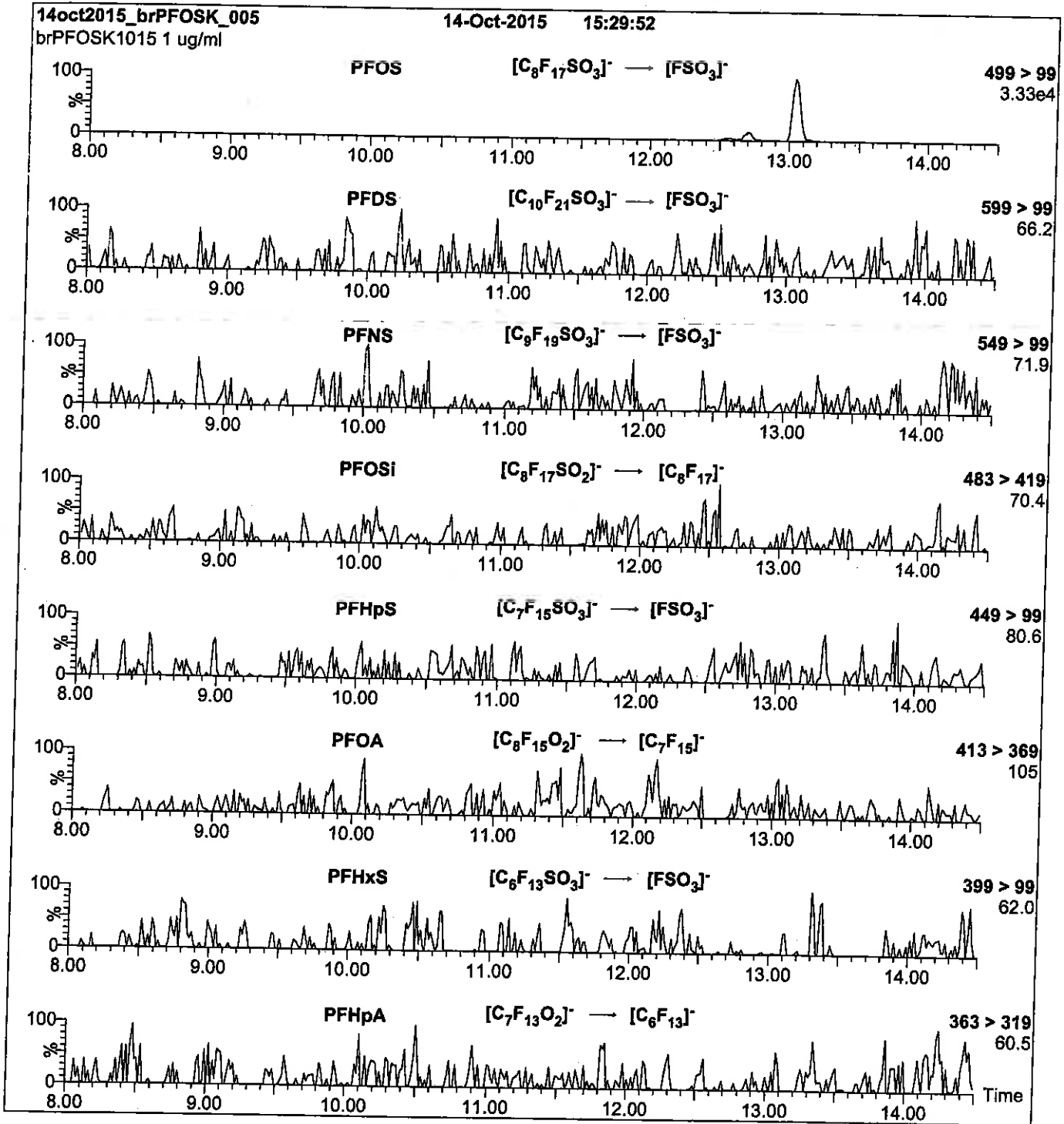
Chromatographic Conditions:

Column: Acquity UPLC BEH Shield RP₁₈ (1.7 μ m, 2.1 x 100 mm)
Injection: 1.0 μ g/ml of br-PFOSK
Mobile Phase: Gradient
45% (80:20 MeOH:ACN) / 55% H₂O (both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 15 min and hold for 3 min.
Return to initial conditions over 1 min.
Time: 20 min
Flow: 300 μ l/min

MS Conditions:

SIR (ES)
Source = 110 °C
Desolvation = 325 °C
Cone Voltage = 60V

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



Conditions for Figure 3:

Injection: On-column

Mobile phase: Same as Figure 2

Flow: 300 μ /min

MS Parameters

Collision Gas (mbar) = 3.06e-3

Collision Energy (eV) = 11-50 (variable)

Reagent

LCPFOSA_00006

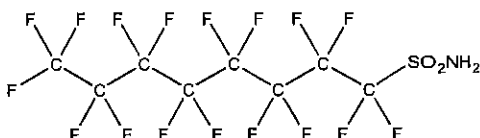


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: FOSA-I **LOT NUMBER:** FOSA0815I
COMPOUND: Perfluoro-1-octanesulfonamide

STRUCTURE: **CAS #:** 754-91-6



MOLECULAR FORMULA: C₈H₂F₁₇NO₂S **MOLECULAR WEIGHT:** 499.14
CONCENTRATION: 50 ± 2.5 µg/ml **SOLVENT(S):** Isopropanol
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 09/02/2015
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

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LIMITED WARRANTY:

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

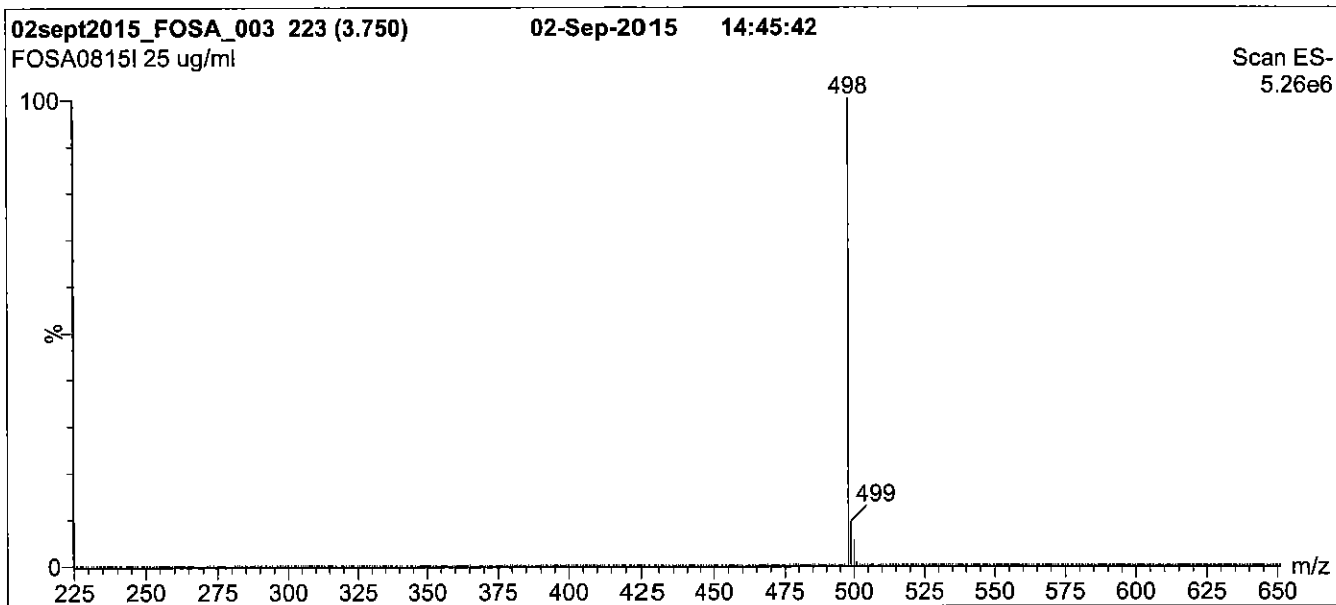
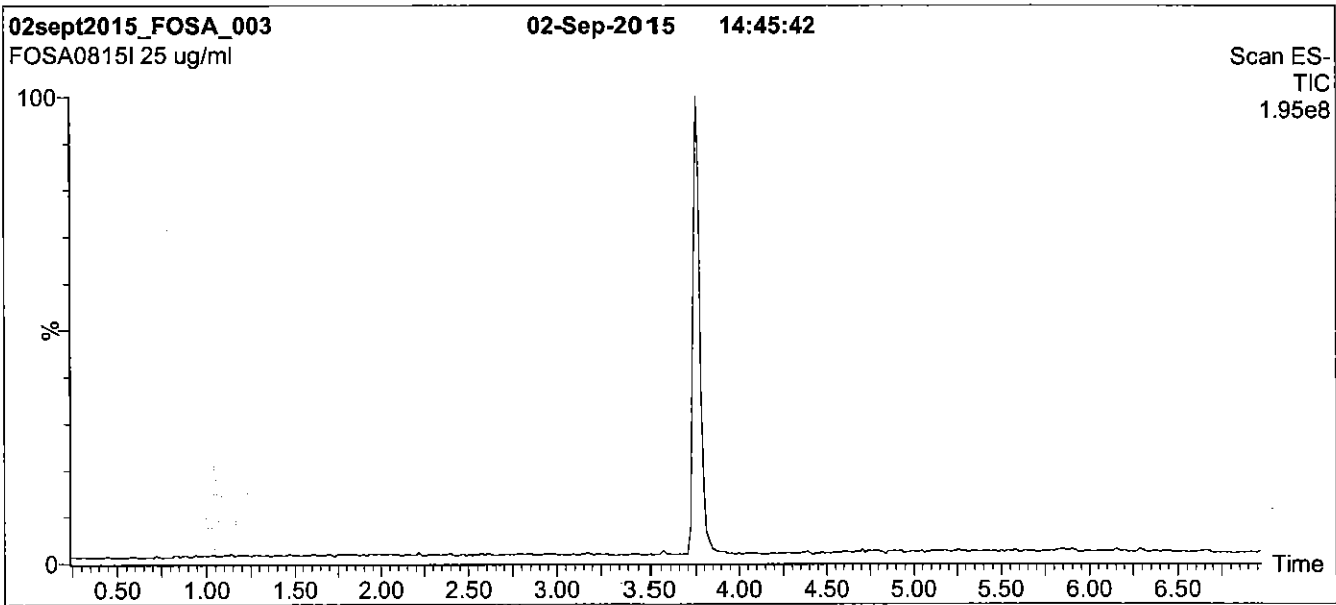
QUALITY MANAGEMENT:

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



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{1a}
1.7 μ m, 2.1 x 100 mm

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

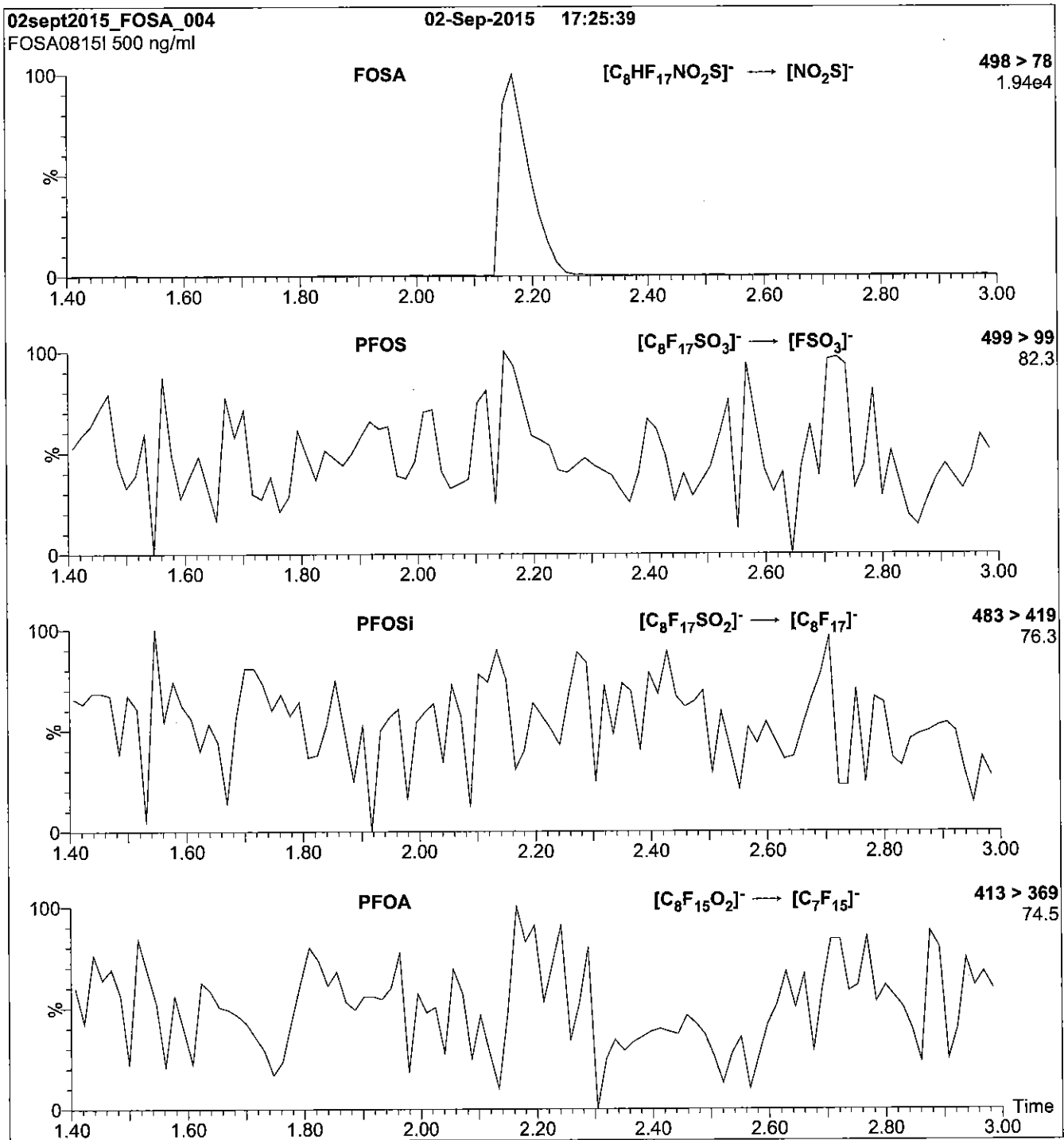
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

Injection: Direct loop injection
10 μ l (500 ng/ml FOSA-I)

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCFPeA_00005

R: 7/6/16 CBW

671579
ID: LCPFPeA_00005
Exp: 01/30/20 Prod: CBW
PF-n-pentanoic acid



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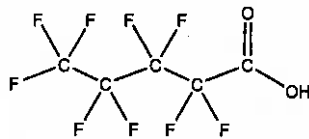
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFPeA
COMPOUND: Perfluoro-n-pentanoic acid

LOT NUMBER: PFPeA0115

STRUCTURE:

CAS #: 2706-90-3



MOLECULAR FORMULA: $C_5H_9F_9O_2$
CONCENTRATION: $50 \pm 2.5 \mu\text{g/ml}$

MOLECULAR WEIGHT: 264.05
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
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

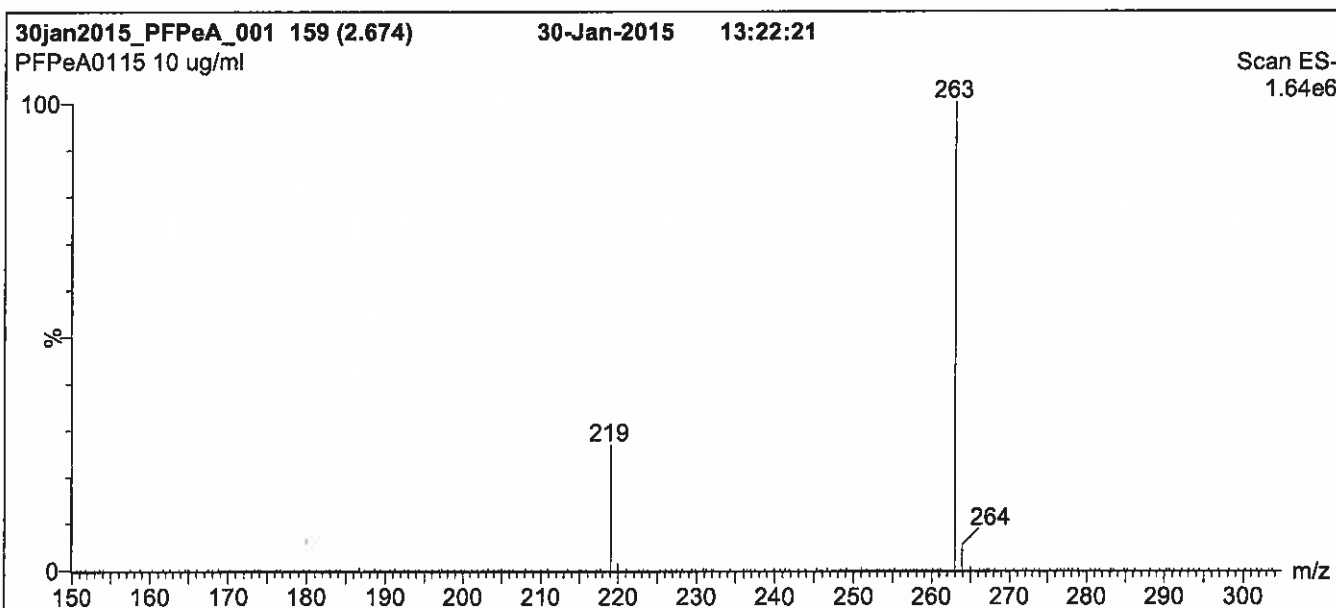
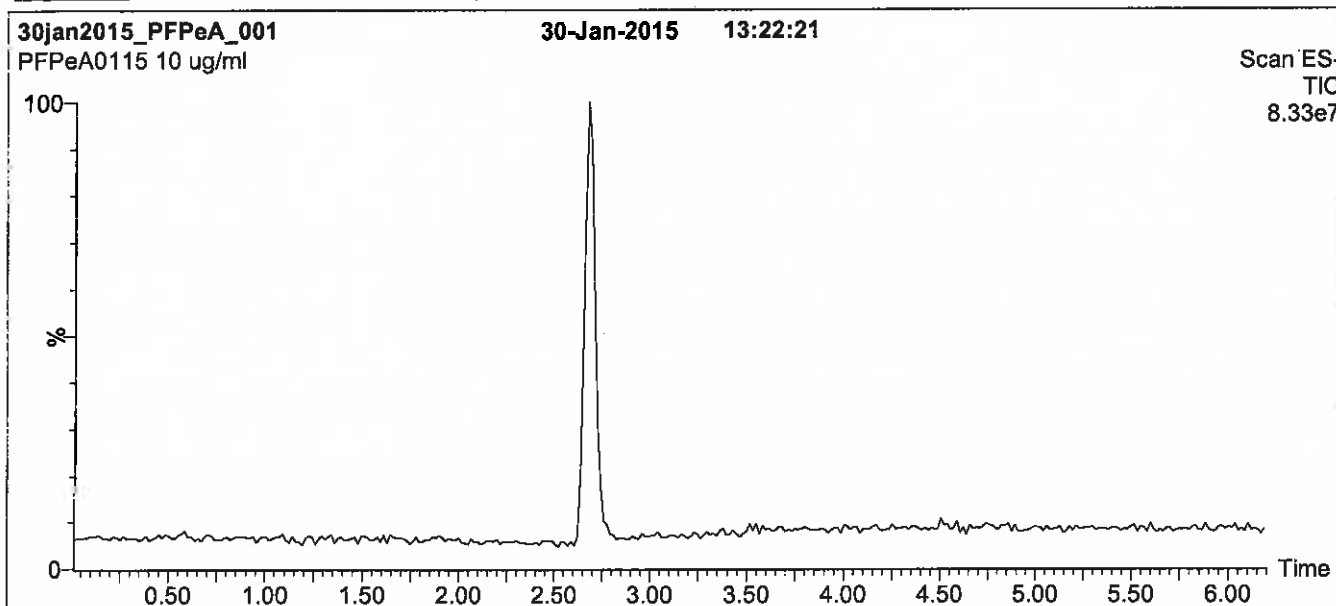
QUALITY MANAGEMENT:

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



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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 RP₁₈
 1.7 μ m, 2.1 x 100 mm

Mobile phase: Gradient
 Start: 30% (80:20 MeOH:ACN) / 70% H₂O
 (both with 10 mM NH₄OAc buffer)
 Ramp to 90% organic over 7.5 min and hold for 1 min
 before returning to initial conditions in 0.5 min.
 Time: 10 min

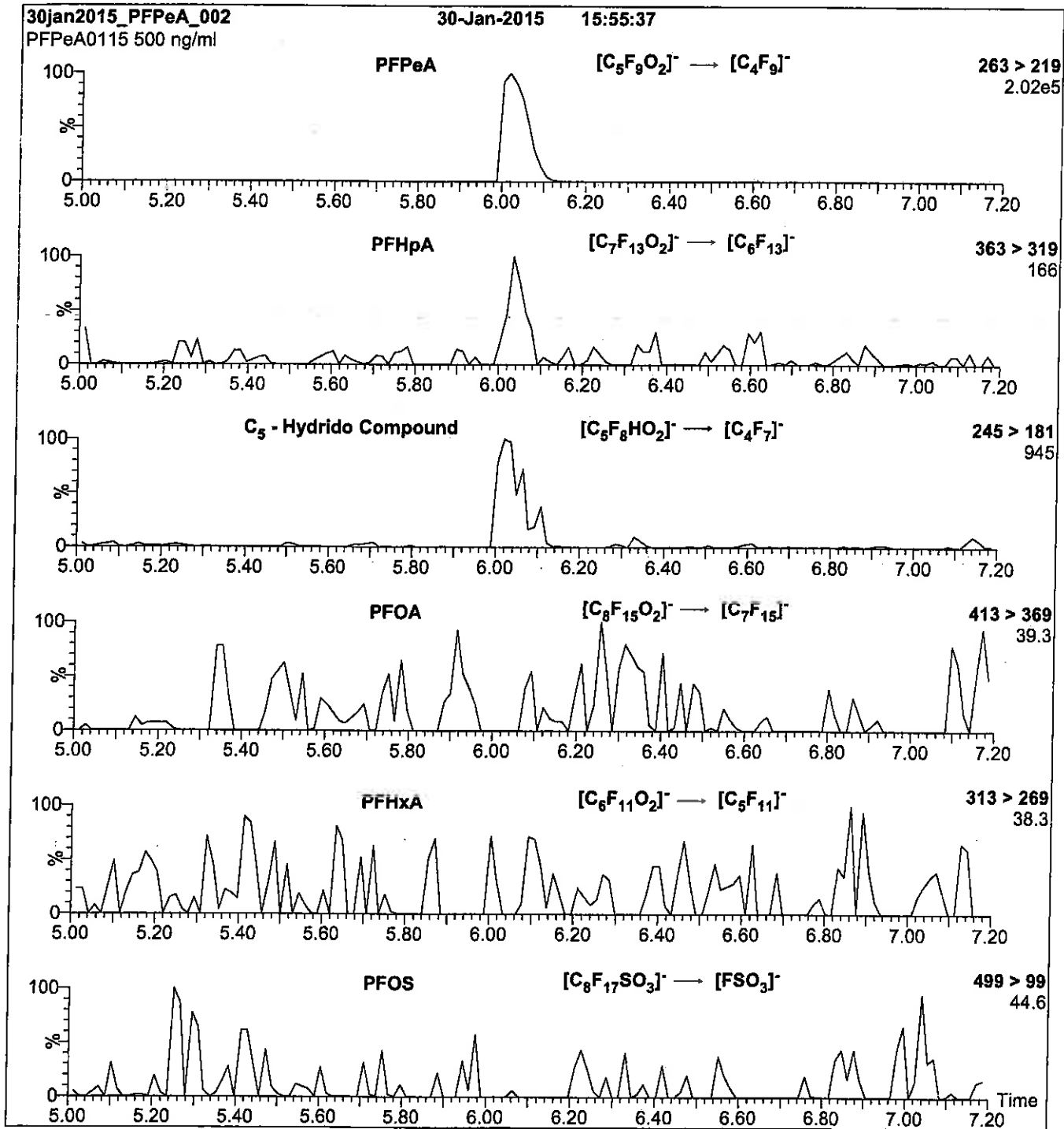
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCPFTeDA_00004



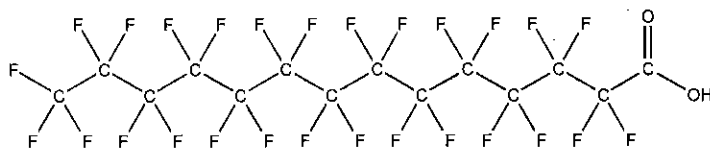
R: 4/7/16 CBW

609636

ID: LCPFTeDA_00004

Exp: 12/09/20 Pripd: CBW

PF-n-tetradecanoic acid

**WELLINGTON**
LABORATORIES**CERTIFICATE OF ANALYSIS**
DOCUMENTATION**PRODUCT CODE:** PFTeDA **LOT NUMBER:** PFTeDA1215
COMPOUND: Perfluoro-n-tetradecanoic acid**STRUCTURE:** **CAS #:** 376-06-7

MOLECULAR FORMULA:	$C_{14}H_{27}O_2$	MOLECULAR WEIGHT:	714.11
CONCENTRATION:	$50 \pm 2.5 \mu\text{g/ml}$	SOLVENT(S):	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	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 ($C_{12}H_{23}O_2$) and ~ 0.2% of PFPeDA ($C_{15}H_{29}O_2$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim
Date: 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:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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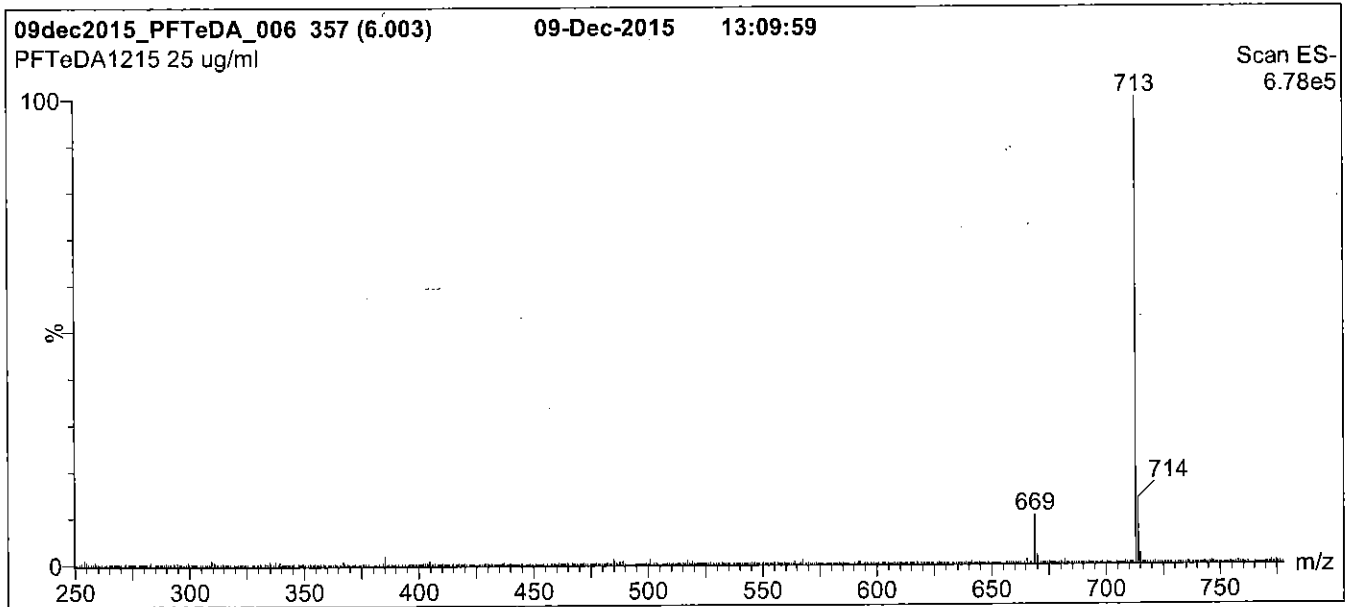
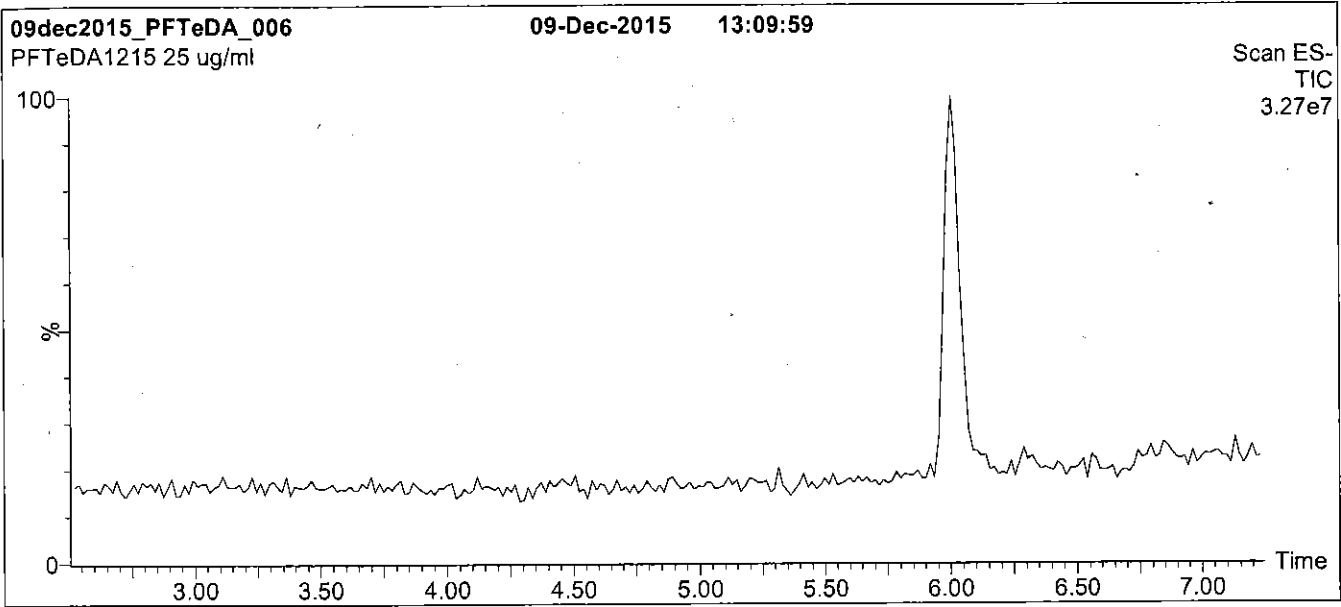
QUALITY MANAGEMENT:

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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 RP₁₈
1.7 µm, 2.1 x 100 mm

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

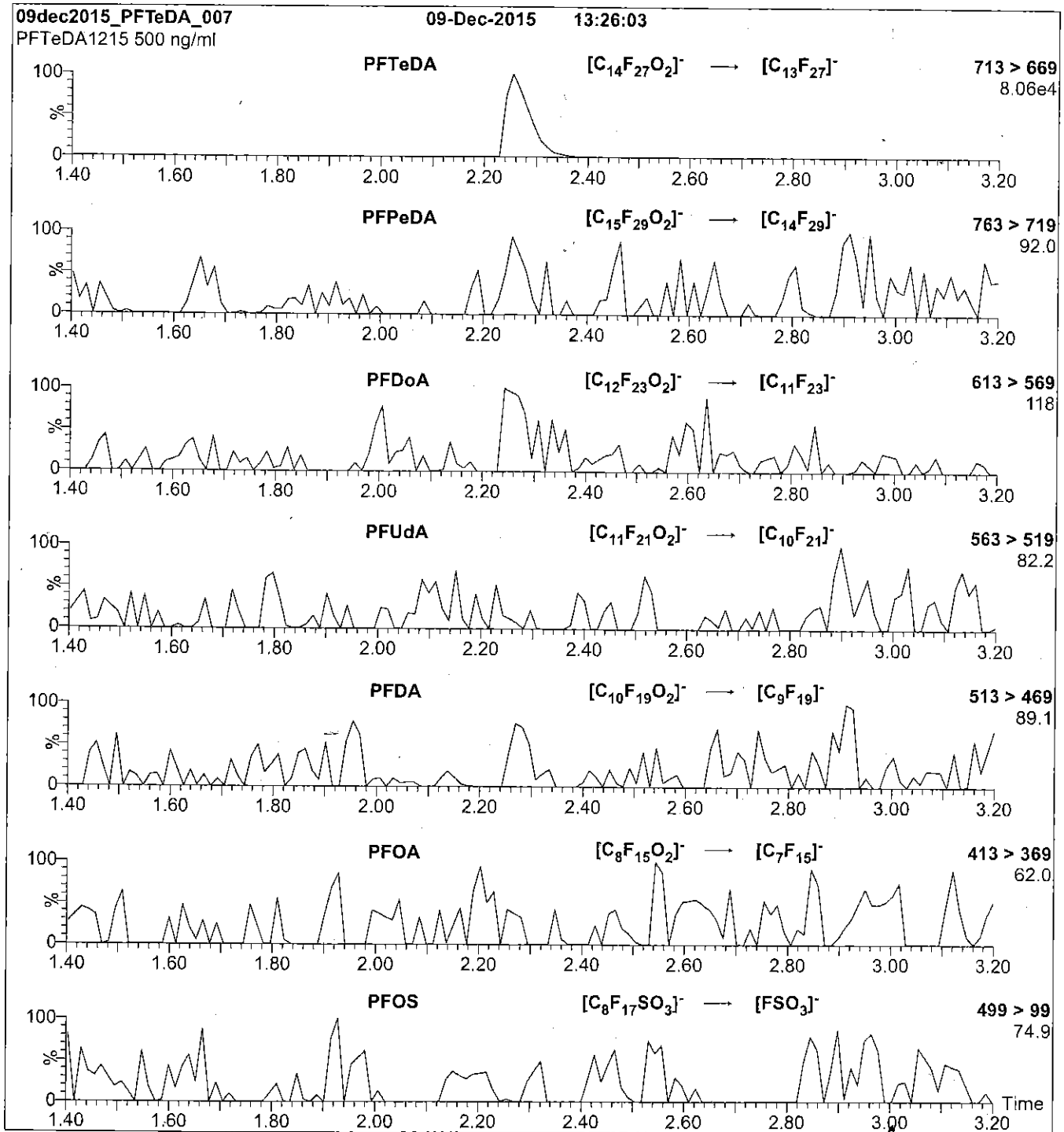
Flow: 300 µl/min

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 μ l (500 ng/ml PFTeDA)

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

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 14

Reagent

LCPFT_rDA_00004



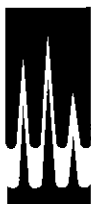
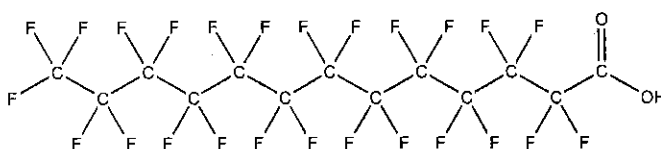
R: 4/7/16 CBW

609697

ID: LCPFTrDA_00004

Exp: 12/10/18 Ppjd: CBW

PF-n-tridecanoic acid

**WELLINGTON**
LABORATORIES**CERTIFICATE OF ANALYSIS**
DOCUMENTATION**PRODUCT CODE:** PFTTrDA **LOT NUMBER:** PFTTrDA1213
COMPOUND: Perfluoro-n-tridecanoic acid**STRUCTURE:** **CAS #:** 72629-94-8

MOLECULAR FORMULA:	$C_{13}H_1F_{25}O_2$	MOLECULAR WEIGHT:	664.11
CONCENTRATION:	$50 \pm 2.5 \mu\text{g/ml}$	SOLVENT(S):	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	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 ($C_{11}H_9F_{21}O_2$); ~ 0.4% of PFDaA ($C_{12}H_7F_{23}O_2$), and ~ 0.1% of PFTeDA ($C_{14}H_5F_{27}O_2$).

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
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:

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.

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TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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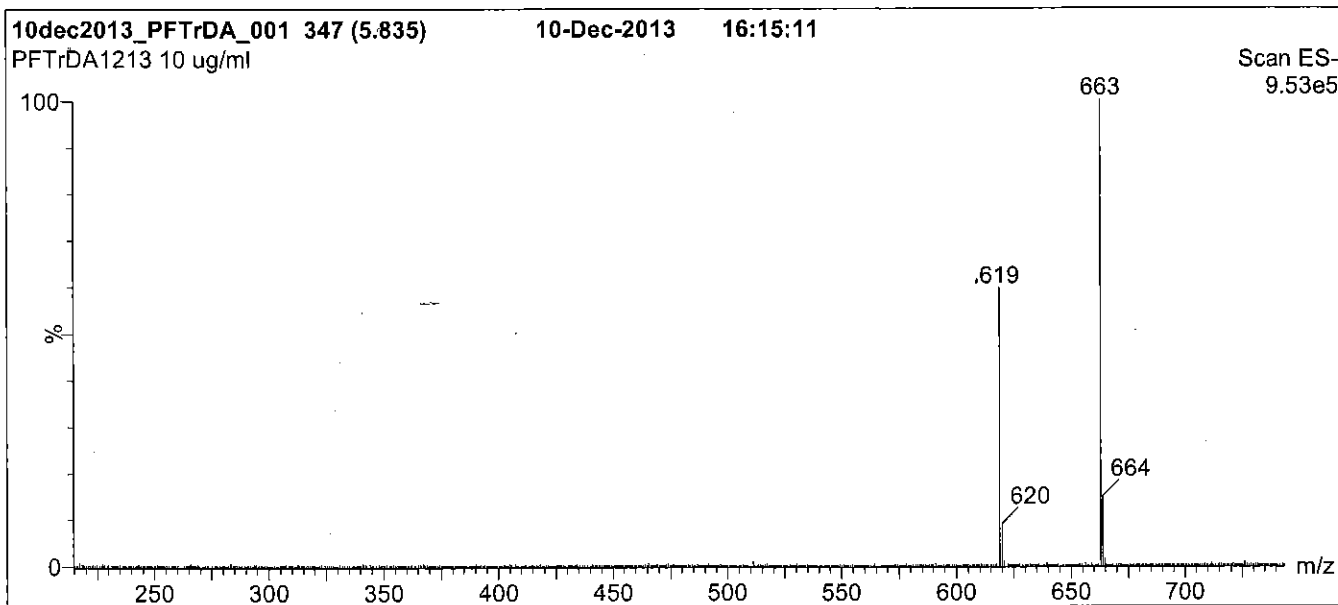
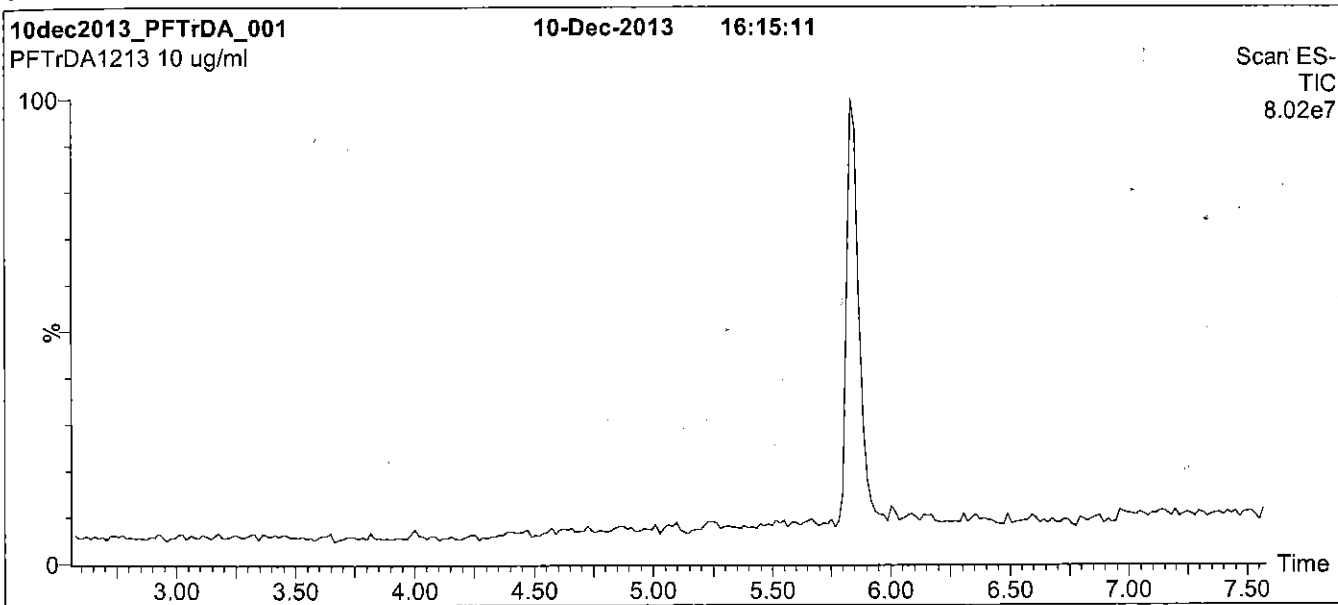
QUALITY MANAGEMENT:

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Figure 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 RP₁₈
 1.7 μ m, 2.1 x 100 mm

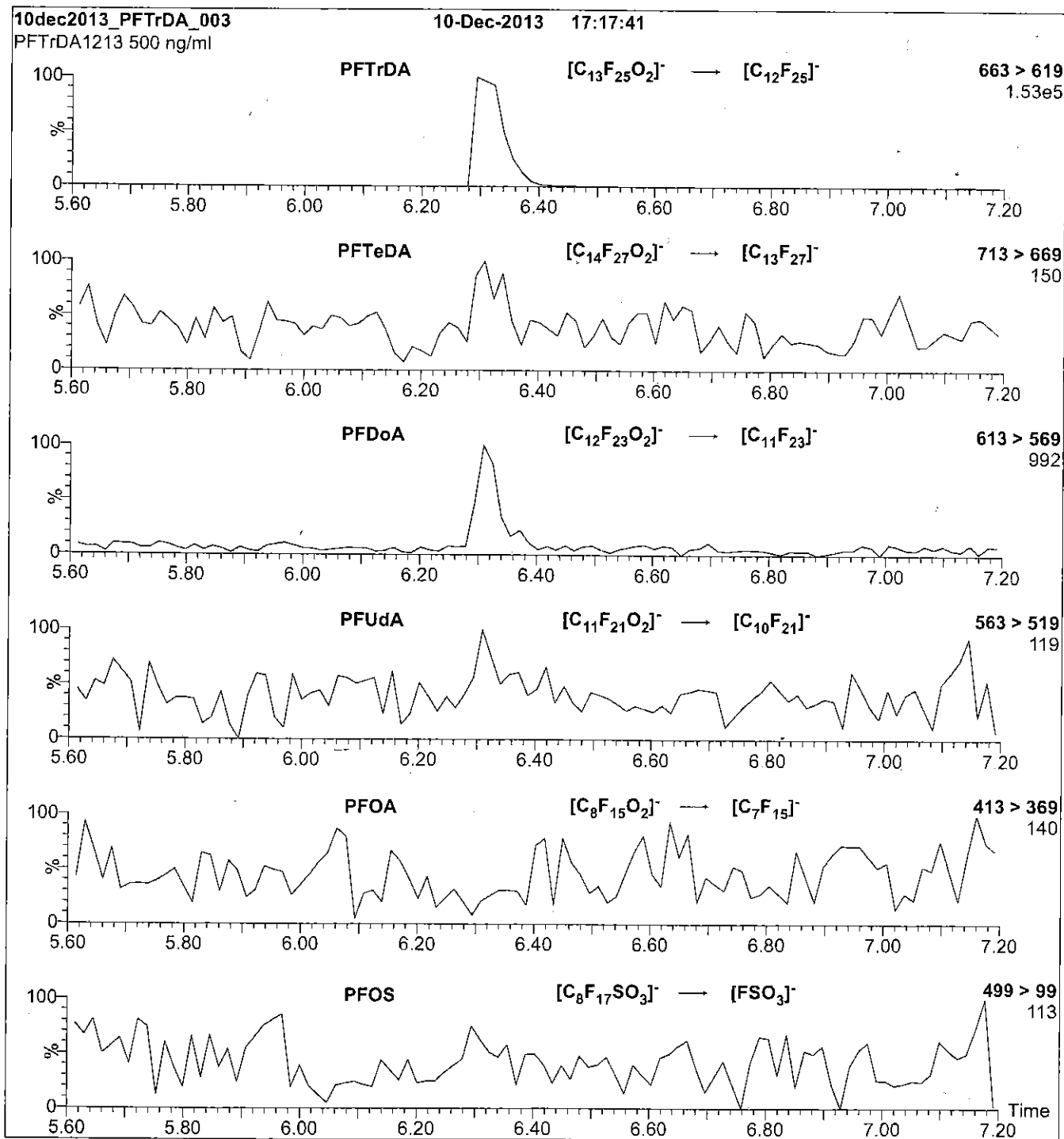
Mobile phase: Gradient
 Start: 60% (80:20 MeOH:ACN) / 40% H₂O
 (both with 10 mM NH₄OAc buffer)
 Ramp to 90% organic over 7 min and hold for 1.5 min
 before returning to initial conditions in 0.5 min.
 Time: 10 min

Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (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 μ l (500 ng/ml PFTrDA)

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

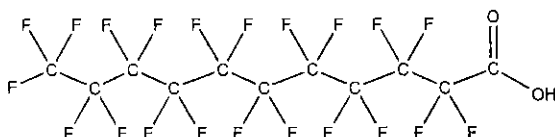
LCPFUdA_00004



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFUdA **LOT NUMBER:** PFUdA0815
COMPOUND: Perfluoro-n-undecanoic acid
STRUCTURE: **CAS #:** 2058-94-8



MOLECULAR FORMULA: C₁₁H_{F₂₁}O₂ **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

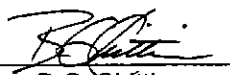
DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:  Date: 08/21/2015
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, \dots, x_n on which it depends is:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

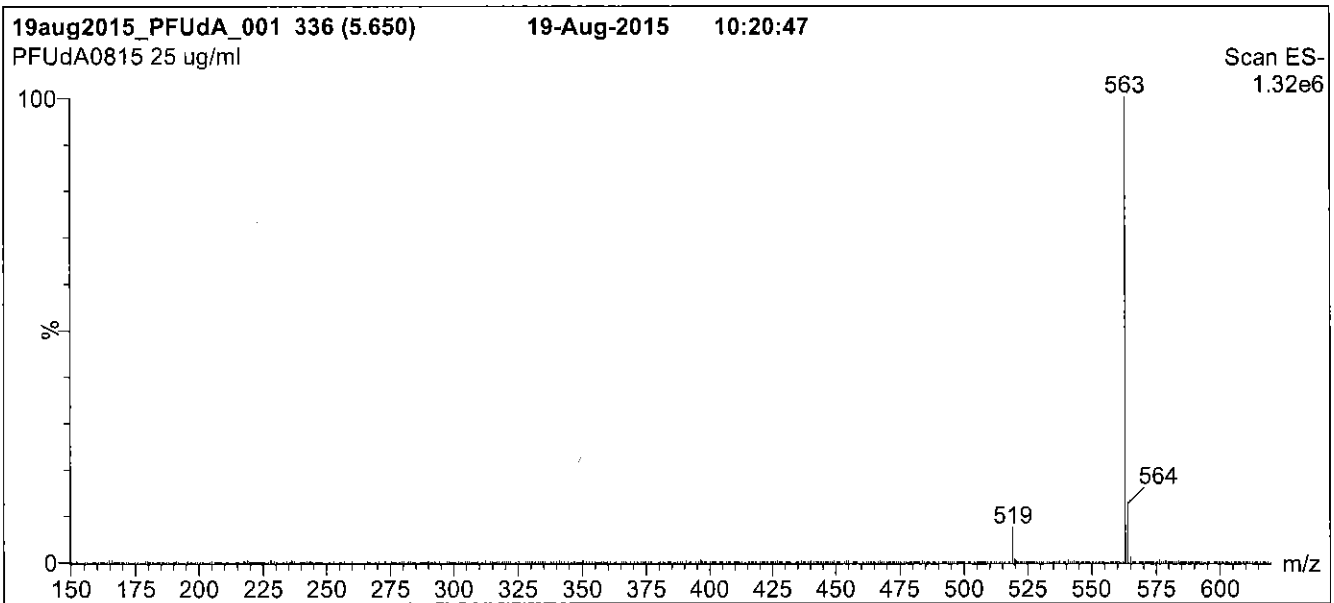
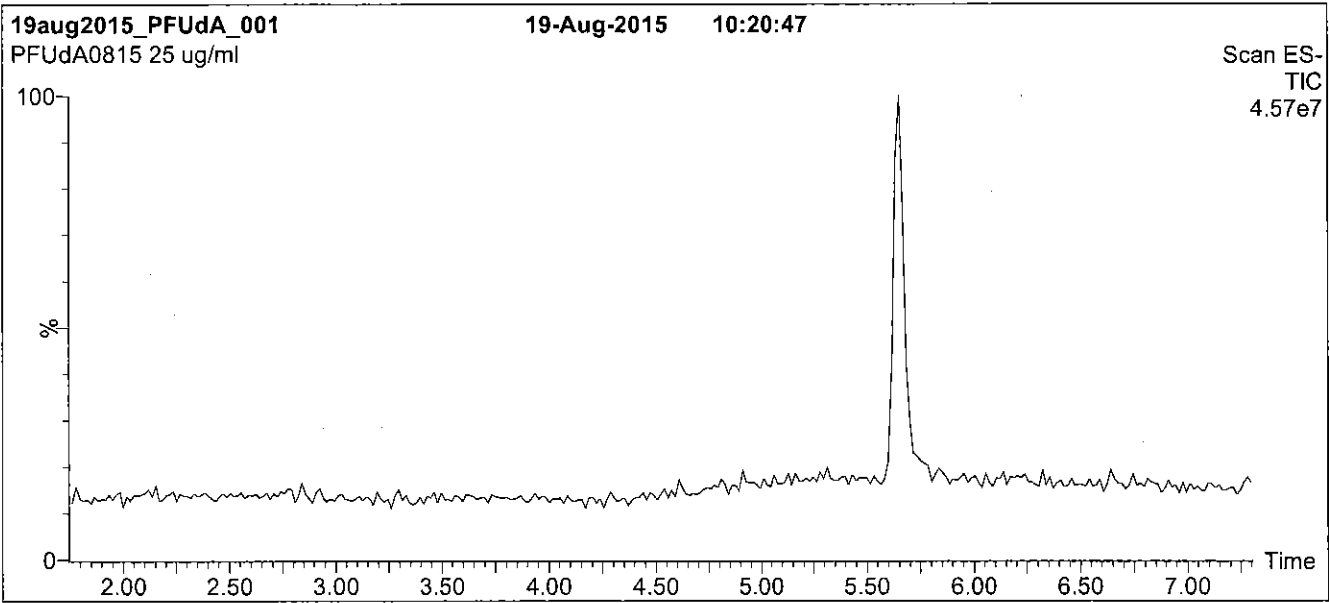
QUALITY MANAGEMENT:

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



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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

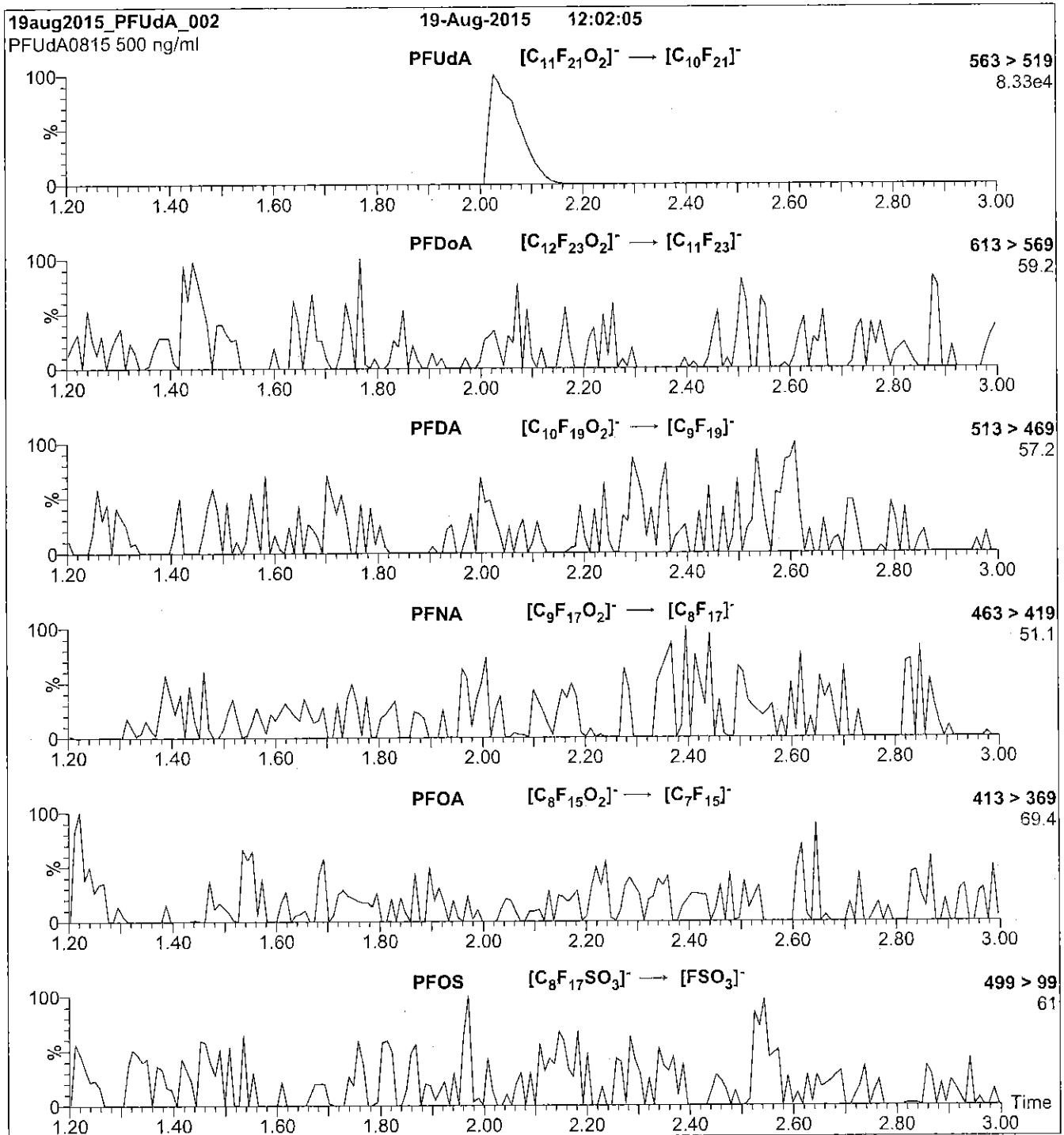
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
 Capillary Voltage (kV) = 3.00
 Cone Voltage (V) = 15.00
 Cone Gas Flow (l/hr) = 65
 Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
 Collision Energy (eV) = 11

Reagent

LCPFUdA_00005

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



730535
ID: LCPFUdA_00005
Exp: 08/19/20 Prj: SBC
PF-n-undecanoic acid



730536
ID: LCPFUdA_00006
Exp: 08/19/20 Prj: SBC
PF-n-undecanoic acid

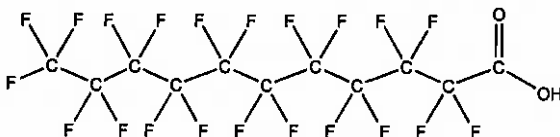


WELLINGTON LABORATORIES

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

- 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.

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

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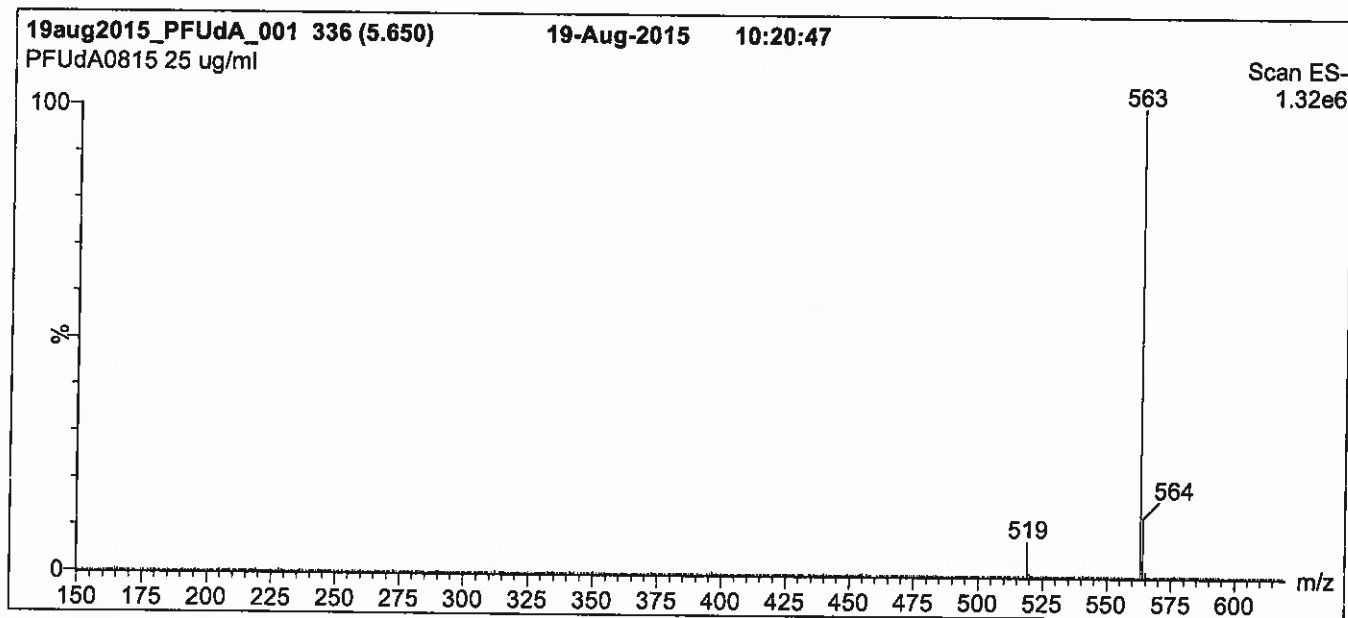
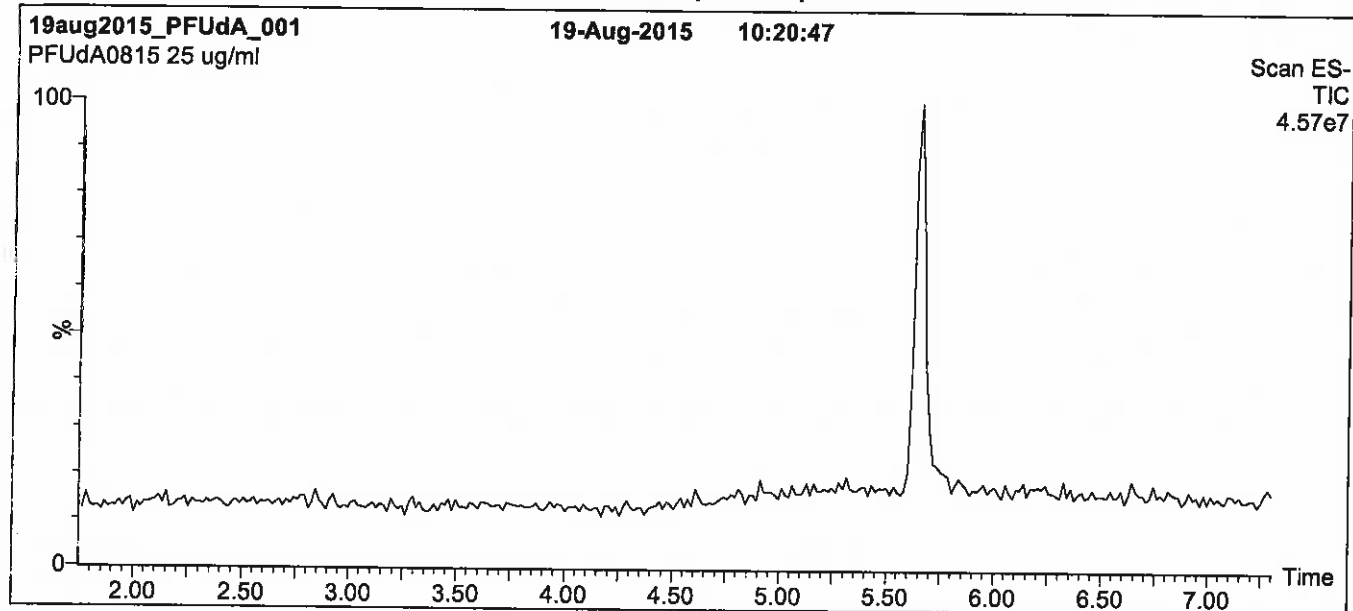
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Figure 1: PFUdA; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

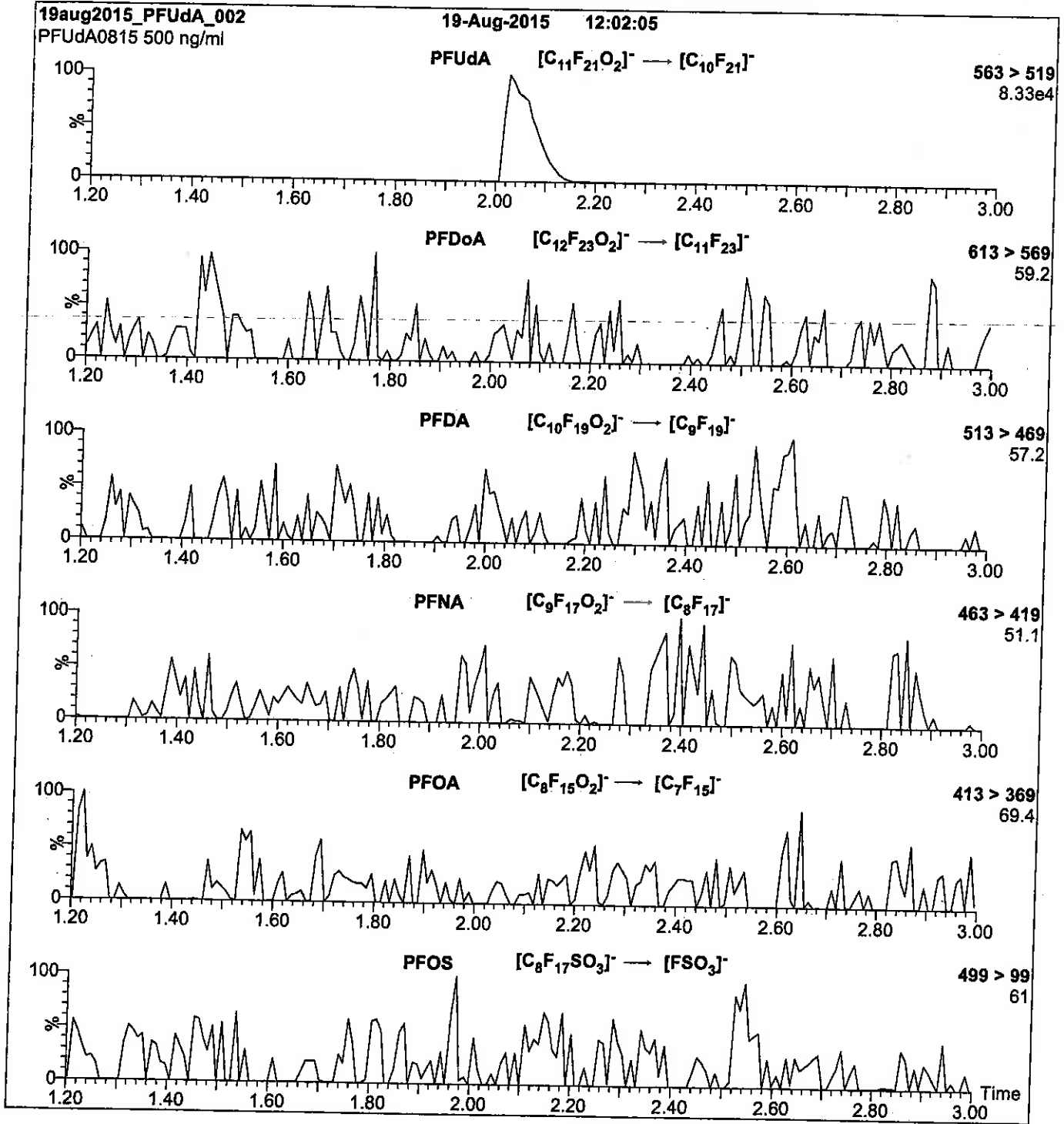
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 65
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = 3.31e-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.: 320-23696-1

SDG No.: _____

Matrix: Water

Level: Low

GC Column (1): Acquity ID: 2.1 (mm)

Client Sample ID	Lab Sample ID	13CHpA #	PFHxS #	PFOA #	PFOS #	PFNA #
46MW01	320-23696-1	90	110	78	109	61
46MW05	320-23696-2	70	95	80	91	56
46MW05 DL	320-23696-2 DL	95	122	98	117	76
MCFSMWFM-01	320-23696-3	108	104	102	108	73
MCFSMW-4	320-23696-4	93	101	99	108	95
MCFSMW-2	320-23696-5	84	95	92	113	92
MCFSMW5U-01	320-23696-6	80	82	102	52	46
MCFSMW5U-01 DL	320-23696-6 DL	133	139	134	124	117
MCFSMW-16	320-23696-7	67	97	70	101	56
DUP-111616	320-23696-8	90	103	77	106	70
FB111616	320-23696-9	106	95	105	96	105
	MB 320-139316/1-A	113	107	112	105	113
	LCS 320-139316/2-A	120	115	120	111	119
MCFSMWFM-01 MS	320-23696-3 MS	96	96	94	99	72
MCFSMWFM-01 MS DL	320-23696-3 MS DL	138	129	122	118	97
MCFSMWFM-01 MSD	320-23696-3 MSD	99	99	98	105	79
MCFSMWFM-01 MSD DL	320-23696-3 MSD DL	146	138	142	131	116

QC LIMITS

13CHpA = 13C4-PFHpA
 PFHxS = 1802 PFHxS
 PFOA = 13C4 PFOA
 PFOS = 13C4 PFOS
 PFNA = 13C5 PFNA

25-150
 25-150
 25-150
 25-150
 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.: 320-23696-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 03DEC2016C_009.d
 Lab ID: LCS 320-139316/2-A Client ID: _____

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
13C4 PFOA	100	120	120	25-150	
13C4 PFOS	95.6	106	111	25-150	
13C4-PFHpA	100	120	120	25-150	
13C5 PFNA	100	119	119	25-150	
18O2 PFHxS	94.6	108	115	25-150	
Perfluorobutanesulfonic acid (PFBS)	35.4	38.7	109	50-150	
Perfluoroheptanoic acid (PFHpA)	40.0	40.1	100	60-140	
Perfluorohexanesulfonic acid (PFHxS)	36.4	34.7	95	60-140	
Perfluorononanoic acid (PFNA)	40.0	39.8	100	60-140	
Perfluorooctanesulfonic acid (PFOS)	37.1	36.5	98	60-140	
Perfluorooctanoic acid (PFOA)	40.0	38.8	97	60-140	

Column to be used to flag recovery and RPD values
 FORM III 537 (Modified)

FORM III
LCMS MATRIX SPIKE RECOVERY

Lab Name: TestAmerica Sacramento

Job No.: 320-23696-1

SDG No.: _____

Matrix: Water Level: Low

Lab File ID: 07DEC2016C_012.d

Lab ID: 320-23696-3 MS

Client ID: MCFSMWFM-01 MS

COMPOUND	SPIKE ADDED (ng/L)	SAMPLE CONCENTRATION (ng/L)	MS CONCENTRATION (ng/L)	MS % REC	QC LIMITS REC	#
13C4 PFOA	104	110	97.2	94	25-150	
13C4 PFOS	99.3	110	98.2	99	25-150	
13C4-PFHpA	104	110	100	96	25-150	
13C5 PFNA	104	76	74.3	72	25-150	
18O2 PFHxS	98.2	100	93.9	96	25-150	
Perfluorobutanesulfonic acid (PFBS)	36.7	29	58.8	81	50-150	
Perfluoroheptanoic acid (PFHpA)	41.5	87	131	108	60-140	
Perfluorohexanesulfonic acid (PFHxS)	37.8	110	147	88	60-140	M
Perfluorononanoic acid (PFNA)	41.5	380	425	104	60-140	J 4
Perfluorooctanesulfonic acid (PFOS)	38.5	200	236	91	60-140	4
Perfluorooctanoic acid (PFOA)	41.5	85	126	99	60-140	M

Column to be used to flag recovery and RPD values

FORM III 537 (Modified)

FORM III
LCMS MATRIX SPIKE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-23696-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 07DEC2016C_007.d
 Lab ID: 320-23696-3 MS DL Client ID: MCFSMWFM-01 MS DL

COMPOUND	SPIKE ADDED (ng/L)	SAMPLE CONCENTRATION (ng/L)	MS CONCENTRATION (ng/L)	MS % REC	QC LIMITS REC	#
13C4 PFOA	104	140	127	122	25-150	
13C4 PFOS	99.3	130	117	118	25-150	
13C4-PFHpA	104	150	143	138	25-150	
13C5 PFNA	104	100	101	97	25-150	
18O2 PFHxS	98.2	130	127	129	25-150	
Perfluorobutanesulfonic acid (PFBS)	36.7	38	79.6	114	50-150	D
Perfluoroheptanoic acid (PFHpA)	41.5	86	130	107	60-140	D
Perfluorohexanesulfonic acid (PFHxS)	37.8	110	154	104	60-140	D
Perfluorononanoic acid (PFNA)	41.5	410	464	142	60-140	D 4
Perfluorooctanesulfonic acid (PFOS)	38.5	190	225	82	60-140	D 4
Perfluorooctanoic acid (PFOA)	41.5	89	136	111	60-140	D

Column to be used to flag recovery and RPD values
 FORM III 537 (Modified)

FORM III
LCMS MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-23696-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 07DEC2016C_013.d
 Lab ID: 320-23696-3 MSD Client ID: MCFSMWFM-01 MSD

COMPOUND	SPIKE ADDED (ng/L)	MSD CONCENTRATION (ng/L)	MSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
13C4 PFOA	103	101	98			25-150	
13C4 PFOS	98.6	103	105			25-150	
13C4-PFHpA	103	103	99			25-150	
13C5 PFNA	103	81.7	79			25-150	
18O2 PFHxS	97.5	96.9	99			25-150	
Perfluorobutanesulfonic acid (PFBS)	36.5	56.8	76	3	30	50-150	
Perfluoroheptanoic acid (PFHpA)	41.2	127	98	4	30	60-140	
Perfluorohexanesulfonic acid (PFHxS)	37.5	146	86	1	30	60-140	M
Perfluorononanoic acid (PFNA)	41.2	420	93	1	30	60-140	J 4
Perfluorooctanesulfonic acid (PFOS)	38.3	232	80	2	30	60-140	4
Perfluorooctanoic acid (PFOA)	41.2	123	91	3	30	60-140	M

Column to be used to flag recovery and RPD values
 FORM III 537 (Modified)

FORM III
LCMS MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento

Job No.: 320-23696-1

SDG No.: _____

Matrix: Water Level: Low

Lab File ID: 07DEC2016C_008.d

Lab ID: 320-23696-3 MSD DL

Client ID: MCFSMWFM-01 MSD DL

COMPOUND	SPIKE ADDED (ng/L)	MSD CONCENTRATION (ng/L)	MSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
13C4 PFOA	103	146	142			25-150	
13C4 PFOS	98.6	129	131			25-150	
13C4-PFHpA	103	150	146			25-150	
13C5 PFNA	103	120	116			25-150	
18O2 PFHxS	97.5	135	138			25-150	
Perfluorobutanesulfonic acid (PFBS)	36.5	77.9	111	2	30	50-150	D
Perfluoroheptanoic acid (PFHpA)	41.2	133	115	2	30	60-140	D
Perfluorohexanesulfonic acid (PFHxS)	37.5	151	97	2	30	60-140	D
Perfluorononanoic acid (PFNA)	41.2	473	164	2	30	60-140	D 4
Perfluorooctanesulfonic acid (PFOS)	38.3	219	67	3	30	60-140	D 4
Perfluorooctanoic acid (PFOA)	41.2	129	95	5	30	60-140	D

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.: 320-23696-1
 SDG No.: _____
 Lab File ID: 03DEC2016C_008.d Lab Sample ID: MB 320-139316/1-A
 Matrix: Water Date Extracted: 11/23/2016 11:47
 Instrument ID: A8_N Date Analyzed: 12/03/2016 19:33
 Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-139316/2-A	03DEC2016C_009.d	12/03/2016 19:41
46MW01	320-23696-1	03DEC2016C_019.d	12/03/2016 20:56
46MW05	320-23696-2	03DEC2016C_020.d	12/03/2016 21:03
MCFSMW-4	320-23696-4	03DEC2016C_021.d	12/03/2016 21:11
MCFSMW-2	320-23696-5	03DEC2016C_022.d	12/03/2016 21:18
DUP-111616	320-23696-8	03DEC2016C_023.d	12/03/2016 21:26
FB111616	320-23696-9	03DEC2016C_024.d	12/03/2016 21:33
MCFSMW5U-01	320-23696-6	03DEC2016C_034.d	12/03/2016 22:48
MCFSMW-16	320-23696-7	03DEC2016C_035.d	12/03/2016 22:56
MCFSMW5U-01 DL	320-23696-6 DL	07DEC2016C_005.d	12/07/2016 21:55
MCFSMWFM-01 MS DL	320-23696-3 MS DL	07DEC2016C_007.d	12/07/2016 22:10
MCFSMWFM-01 MSD DL	320-23696-3 MSD DL	07DEC2016C_008.d	12/07/2016 22:18
46MW05 DL	320-23696-2 DL	07DEC2016C_009.d	12/07/2016 22:25
MCFSMWFM-01	320-23696-3	07DEC2016C_011.d	12/07/2016 22:40
MCFSMWFM-01 MS	320-23696-3 MS	07DEC2016C_012.d	12/07/2016 22:48
MCFSMWFM-01 MSD	320-23696-3 MSD	07DEC2016C_013.d	12/07/2016 22:55

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23696-1
 SDG No.: _____
 Client Sample ID: 46MW01 Lab Sample ID: 320-23696-1
 Matrix: Water Lab File ID: 03DEC2016C_019.d
 Analysis Method: 537 (Modified) Date Collected: 11/16/2016 11:01
 Extraction Method: 3535 Date Extracted: 11/23/2016 11:47
 Sample wt/vol: 524.6(mL) Date Analyzed: 12/03/2016 20:56
 Con. Extract Vol.: 1.0(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 140675 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.9	U	2.4	1.9	0.87
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.9	U	2.4	1.9	0.76
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.9	U	2.4	1.9	0.83
375-95-1	Perfluorononanoic acid (PFNA)	1.9	U	2.4	1.9	0.62
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	7.1		3.8	2.9	1.2
335-67-1	Perfluorooctanoic acid (PFOA)	1.9	U	2.4	1.9	0.71

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	78		25-150
STL00991	13C4 PFOS	109		25-150
STL01892	13C4-PFHpA	90		25-150
STL00995	13C5 PFNA	61		25-150
STL00994	18O2 PFHxS	110		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b\03DEC2016C_019.d
 Lims ID: 320-23696-A-1-A
 Client ID: 46MW01
 Sample Type: Client
 Inject. Date: 03-Dec-2016 20:56:16 ALS Bottle#: 20 Worklist Smp#: 19
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-23696-A-1-A
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: A8-PC\A8 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 06-Dec-2016 15:55:35 Calib Date: 03-Dec-2016 15:33:40
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d
 Column 1 : Det: EXP1
 Process Host: XAWRK027

First Level Reviewer: chandrasenas Date: 06-Dec-2016 15:56:16

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.858	1.877	-0.019	1.000	25395	0.0463				
298.90 > 99.00	1.858	1.877	-0.019	1.000	14443		1.76(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.127	2.129	-0.002		10264181	43.2		86.4	551592	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.458	2.466	-0.008	1.000	23773	0.1241			105	
D 11 13C4-PFHpA										
367.00 > 322.00	2.466	2.473	-0.007		9322680	44.9		89.9	384417	
D 10 18O2 PFHxS										
403.00 > 84.00	2.489	2.481	0.008		16254052	52.0		110	625969	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.474	2.496	-0.022	1.000	141369	0.3748				
D 14 13C4 PFOA										
417.00 > 372.00	2.829	2.836	-0.007		8569502	39.1		78.2	450095	
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.198	3.215	-0.017	1.000	1076422	3.72			305292	
499.00 > 99.00	3.198	3.215	-0.017	1.000	256389		4.20(0.90-1.10)		14731	
D 17 13C4 PFOS										
503.00 > 80.00	3.198	3.215	-0.017		12759516	51.9		109	364021	
D 19 13C5 PFNA										
468.00 > 423.00	3.207	3.215	-0.008		5096479	30.6		61.3	300211	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b\03DEC2016C_019.d

Injection Date: 03-Dec-2016 20:56:16

Instrument ID: A8_N

Lims ID: 320-23696-A-1-A

Lab Sample ID: 320-23696-1

Client ID: 46MW01

Operator ID: A8-PC\A8

ALS Bottle#: 20

Worklist Smp#: 19

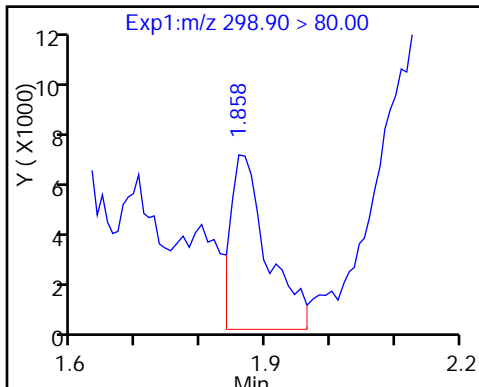
Injection Vol: 2.0 ul

Dil. Factor: 1.0000

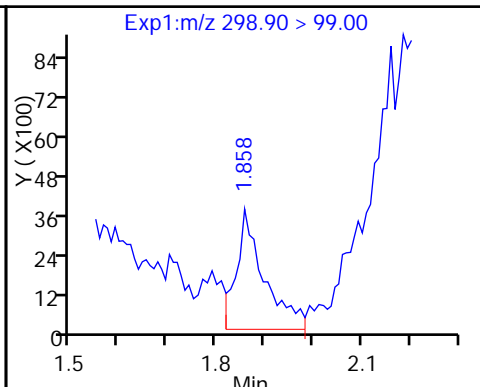
Method: A8_N

Limit Group: LC PFC_DOD ICAL

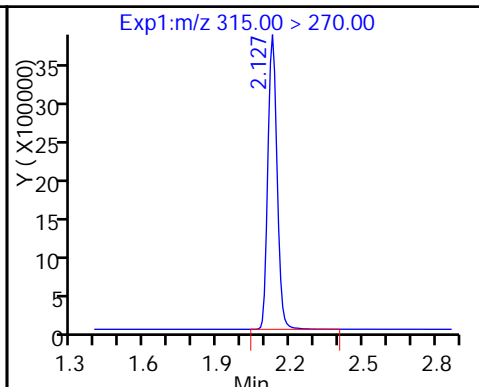
5 Perfluorobutanesulfonic acid



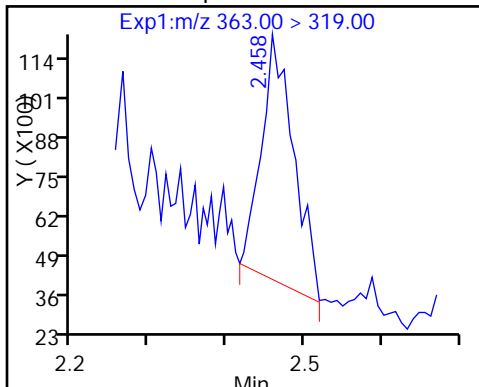
5 Perfluorobutanesulfonic acid



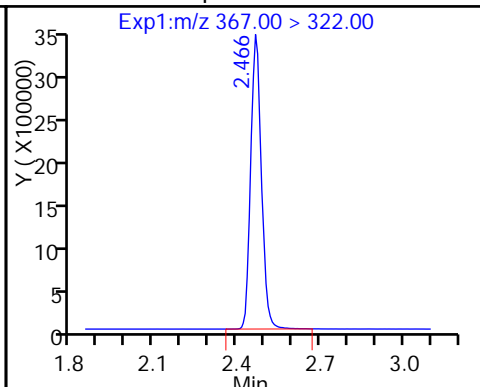
D 6 13C2 PFHxA



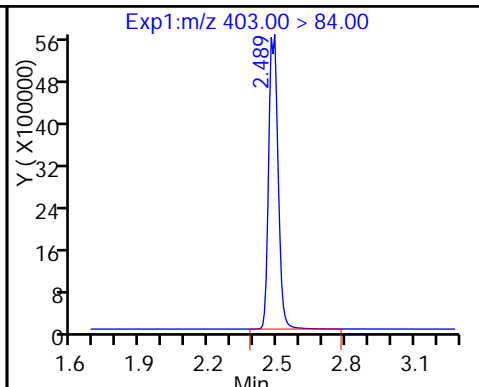
12 Perfluoroheptanoic acid



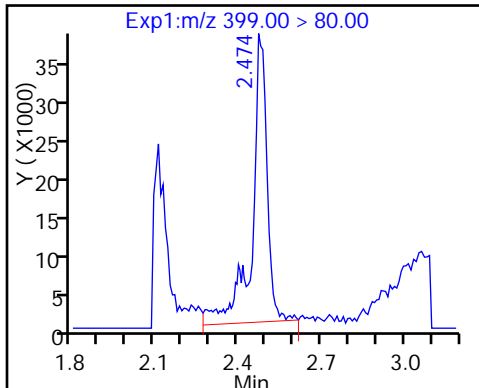
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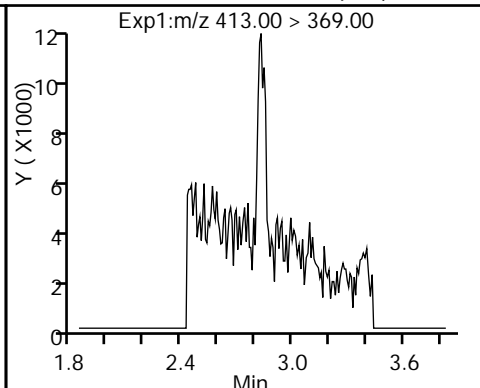
D 10 18O2 PFHxS



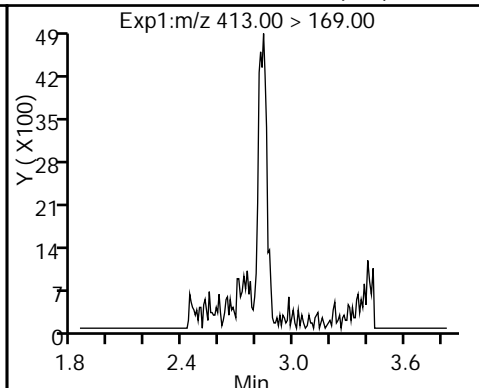
9 Perfluorohexanesulfonic acid



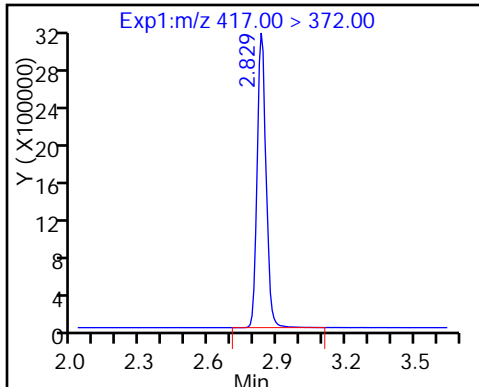
15 Perfluorooctanoic acid (ND)



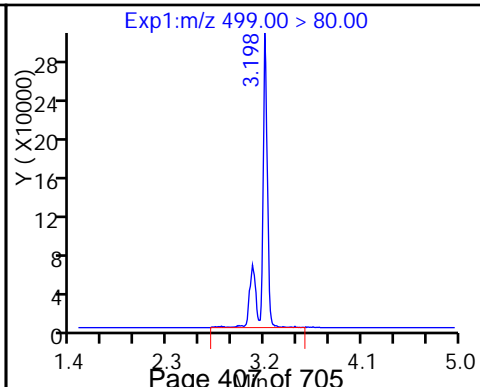
15 Perfluorooctanoic acid (ND)



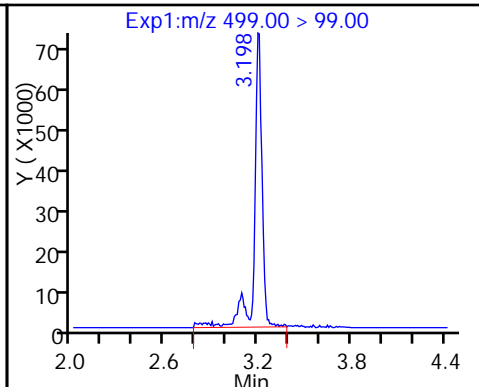
D 14 13C4 PFOA



18 Perfluorooctane sulfonic acid



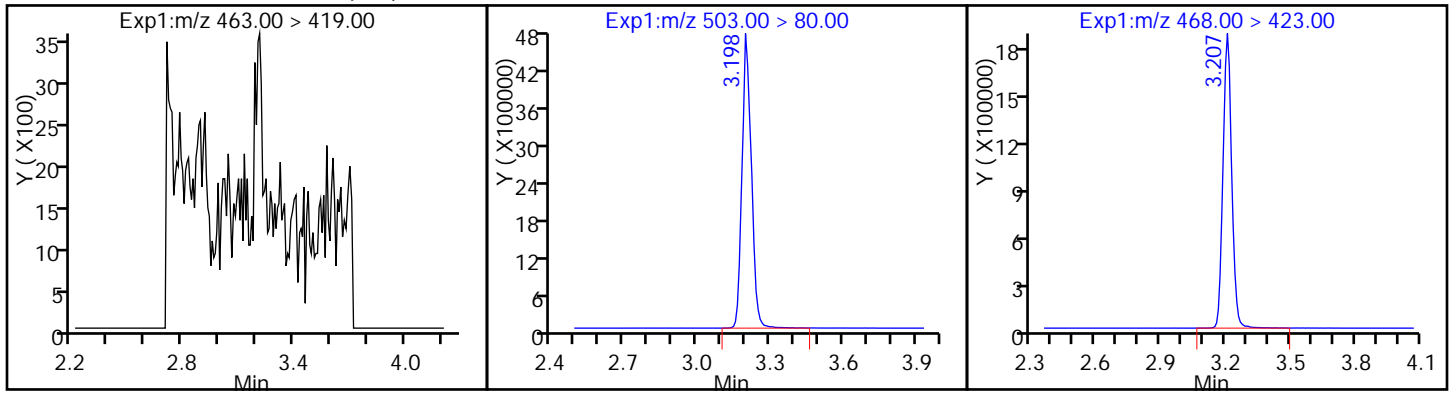
18 Perfluorooctane sulfonic acid



20 Perfluorononanoic acid (ND)

D 17 13C4 PFOS

D 19 13C5 PFNA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23696-1
 SDG No.: _____
 Client Sample ID: 46MW05 Lab Sample ID: 320-23696-2
 Matrix: Water Lab File ID: 03DEC2016C_020.d
 Analysis Method: 537 (Modified) Date Collected: 11/16/2016 12:21
 Extraction Method: 3535 Date Extracted: 11/23/2016 11:47
 Sample wt/vol: 520.2 (mL) Date Analyzed: 12/03/2016 21:03
 Con. Extract Vol.: 1.0 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: Acquity ID: 2.1 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 140675 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	57		2.4	1.9	0.88
375-85-9	Perfluoroheptanoic acid (PFHpA)	21		2.4	1.9	0.77
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	430	J	2.4	1.9	0.84
375-95-1	Perfluorononanoic acid (PFNA)	1.1	J	2.4	1.9	0.63
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	920	J	3.8	2.9	1.2
335-67-1	Perfluorooctanoic acid (PFOA)	62		2.4	1.9	0.72

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	80		25-150
STL00991	13C4 PFOS	91		25-150
STL01892	13C4-PFHpA	70		25-150
STL00995	13C5 PFNA	56		25-150
STL00994	18O2 PFHxS	95		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b\03DEC2016C_020.d
 Lims ID: 320-23696-A-2-A
 Client ID: 46MW05
 Sample Type: Client
 Inject. Date: 03-Dec-2016 21:03:47 ALS Bottle#: 21 Worklist Smp#: 20
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-23696-A-2-A
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: A8-PC\A8 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 06-Dec-2016 15:55:35 Calib Date: 03-Dec-2016 15:33:40
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d
 Column 1 : Det: EXP1
 Process Host: XAWRK027

First Level Reviewer: chandrasenas Date: 06-Dec-2016 15:56:56

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.868	1.877	-0.009	1.000	14169861	29.9				
298.90 > 99.00	1.868	1.877	-0.009	1.000	6238056		2.27(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.128	2.129	-0.001		8821078	37.1		74.3	828151	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.457	2.466	-0.009	1.000	1647144	11.0			6937	
D 11 13C4-PFHpA										
367.00 > 322.00	2.465	2.473	-0.008		7280898	35.1		70.2	444480	
D 10 18O2 PFHxS										
403.00 > 84.00	2.480	2.481	-0.001		14054590	45.0		95.1	1497936	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.480	2.496	-0.016	1.000	72227872	221.5				E
15 Perfluorooctanoic acid										
413.00 > 369.00	2.828	2.836	-0.008	1.000	6007956	32.0			95426	
413.00 > 169.00	2.828	2.836	-0.008	1.000	3904151		1.54(0.90-1.10)		234826	
D 14 13C4 PFOA										
417.00 > 372.00	2.828	2.836	-0.008		8758090	39.9		79.9	632362	
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.205	3.215	-0.010	1.000	116316863	476.2			752000	E
499.00 > 99.00	3.196	3.215	-0.019	0.997	25004813		4.65(0.90-1.10)		516467	
20 Perfluorononanoic acid										
463.00 > 419.00	3.196	3.215	-0.019	1.000	54906	0.5906			414	
D 17 13C4 PFOS										
503.00 > 80.00	3.205	3.215	-0.010		10757911	43.7		91.5	182825	
D 19 13C5 PFNA										
468.00 > 423.00	3.205	3.215	-0.010		4665812	28.0		56.1	1493252	

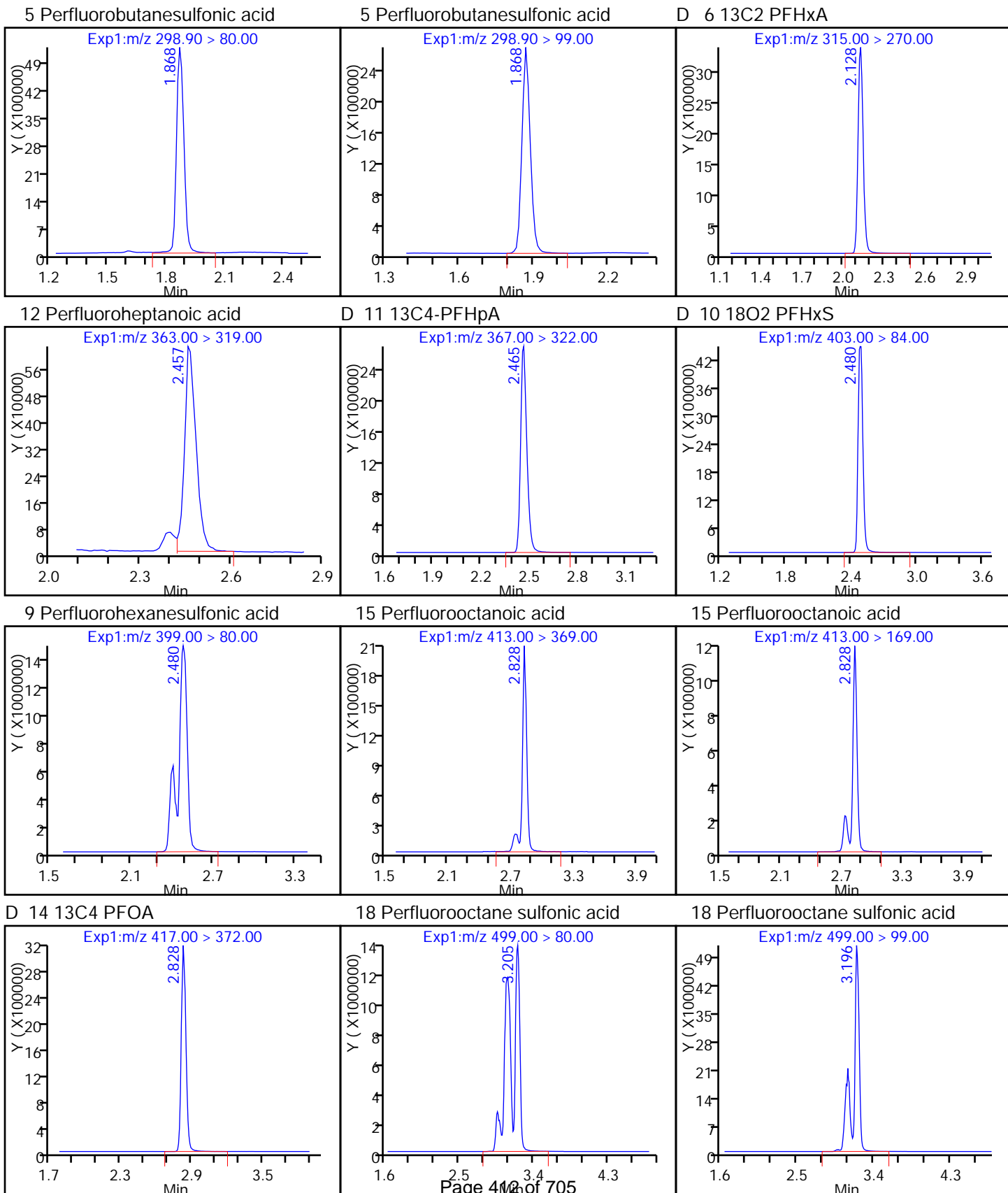
[QC Flag Legend](#)

Processing Flags

E - Exceeded Maximum Amount

TestAmerica Sacramento

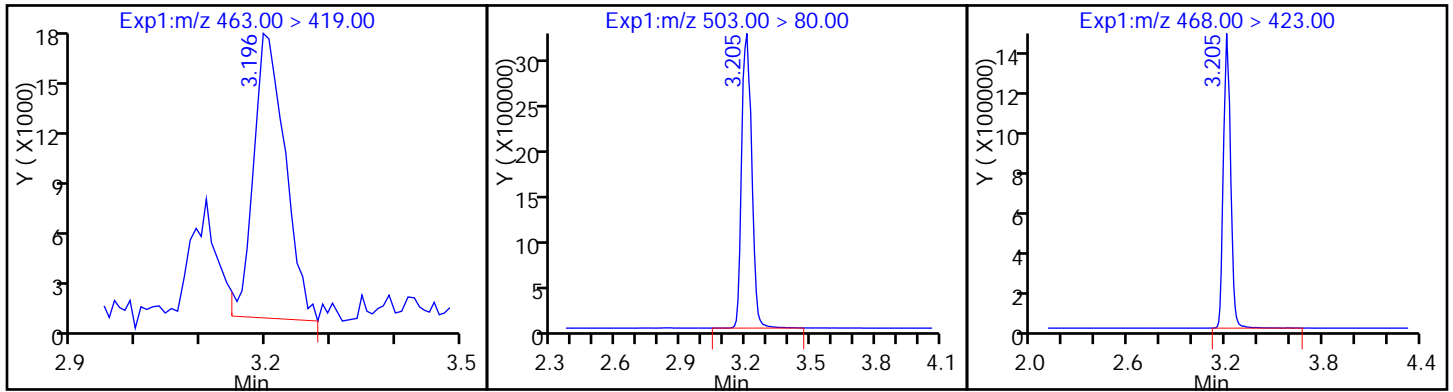
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Injection Date: 03-Dec-2016 21:03:47 Instrument ID: A8_N
Lims ID: 320-23696-A-2-A Lab Sample ID: 320-23696-2
Client ID: 46MW05
Operator ID: A8-PC\A8 ALS Bottle#: 21 Worklist Smp#: 20
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL



20 Perfluorononanoic acid

D 17 13C4 PFOS

D 19 13C5 PFNA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23696-1
 SDG No.: _____
 Client Sample ID: 46MW05 DL Lab Sample ID: 320-23696-2 DL
 Matrix: Water Lab File ID: 07DEC2016C_009.d
 Analysis Method: 537 (Modified) Date Collected: 11/16/2016 12:21
 Extraction Method: 3535 Date Extracted: 11/23/2016 11:47
 Sample wt/vol: 520.2 (mL) Date Analyzed: 12/07/2016 22:25
 Con. Extract Vol.: 1.0 (mL) Dilution Factor: 10
 Injection Volume: 2 (uL) GC Column: Acquity ID: 2.1 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 141150 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	<i>Perfluorobutanesulfonic acid (PFBS)</i>	47	D	24	19	8.8
375-85-9	<i>Perfluoroheptanoic acid (PFHpA)</i>	21	J D	24	19	7.7
355-46-4	<i>Perfluorohexanesulfonic acid (PFHxS)</i>	570	D	24	19	8.4
375-95-1	<i>Perfluorononanoic acid (PFNA)</i>	19	U	24	19	6.3
1763-23-1	<i>Perfluorooctanesulfonic acid (PFOS)</i>	1000	D	38	29	12
335-67-1	<i>Perfluorooctanoic acid (PFOA)</i>	61	D	24	19	7.2

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	98		25-150
STL00991	13C4 PFOS	117		25-150
STL01892	13C4-PFHpA	95		25-150
STL00995	13C5 PFNA	76		25-150
STL00994	18O2 PFHxS	122		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161208-37624.b\07DEC2016C_009.d
 Lims ID: 320-23696-A-2-A
 Client ID: 46MW05
 Sample Type: Client
 Inject. Date: 07-Dec-2016 22:25:50 ALS Bottle#: 44 Worklist Smp#: 9
 Injection Vol: 2.0 ul Dil. Factor: 10.0000
 Sample Info: 320-23696-a-2-a 10X
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: A8-PC\A8 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20161208-37624.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 08-Dec-2016 09:15:43 Calib Date: 03-Dec-2016 15:33:40
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d
 Column 1 : Det: EXP1
 Process Host: XAWRK027

First Level Reviewer: chandrasenas Date: 08-Dec-2016 09:16:07

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.848	1.858	-0.010	1.000	1496025	2.46				
298.90 > 99.00	1.848	1.858	-0.010	1.000	622389		2.40(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.102	2.109	-0.007		1047886	4.41		8.8	135321	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.422	2.372	0.050	1.000	12369772	29.6				
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.438	2.438	0.0	1.000	222810	1.10			1859	
D 11 13C4-PFHpA										
367.00 > 322.00	2.438	2.438	0.0		982220	4.74		9.5	87742	
D 10 18O2 PFHxS										
403.00 > 84.00	2.456	2.455	0.001		1799543	5.76		12.2	218392	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.805	2.796	0.009	1.000	737859	3.19			13193	
413.00 > 169.00	2.797	2.796	0.001	0.997	466716		1.58(0.90-1.10)		21265	
D 14 13C4 PFOA										
417.00 > 372.00	2.797	2.804	-0.007		1077683	4.92		9.8	99471	
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.165	3.147	0.018	1.000	16410597	52.6			764781	
499.00 > 99.00	3.065	3.147	-0.082	0.968	3025790		5.42(0.90-1.10)		42906	
D 17 13C4 PFOS										
503.00 > 80.00	3.165	3.163	0.002		1374677	5.59		11.7	101399	
D 19 13C5 PFNA										
468.00 > 423.00	3.165	3.171	-0.006		635352	3.82		7.6	73771	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161208-37624.b\07DEC2016C_009.d

Injection Date: 07-Dec-2016 22:25:50

Instrument ID: A8_N

Lims ID: 320-23696-A-2-A

Lab Sample ID: 320-23696-2

Client ID: 46MW05

Operator ID: A8-PC\A8

ALS Bottle#: 44

Worklist Smp#: 9

Injection Vol: 2.0 ul

Dil. Factor: 10.0000

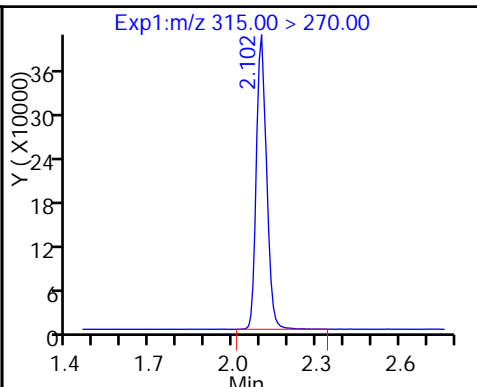
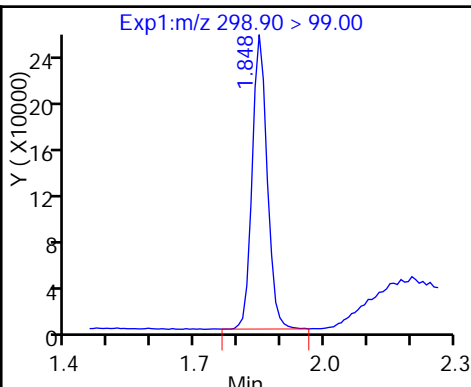
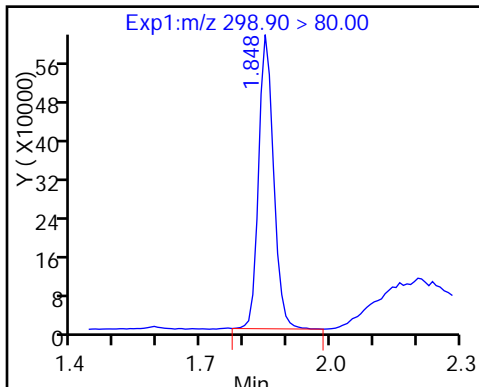
Method: A8_N

Limit Group: LC PFC_DOD ICAL

5 Perfluorobutanesulfonic acid

5 Perfluorobutanesulfonic acid

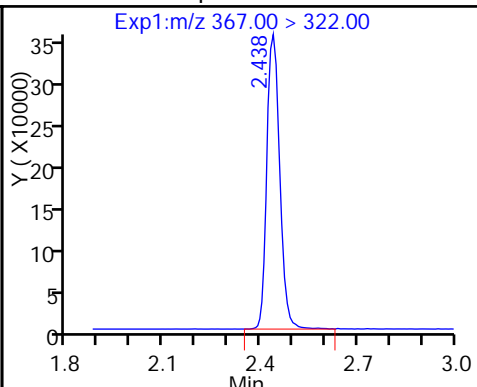
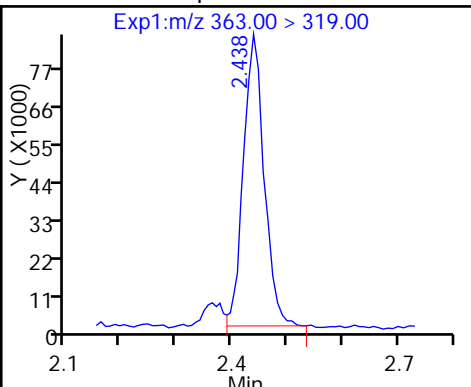
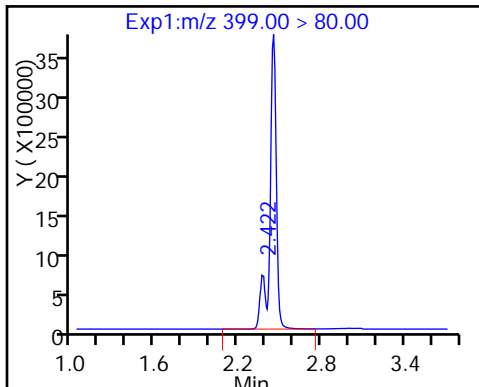
D 6 13C2 PFHxA



9 Perfluorohexanesulfonic acid

12 Perfluoroheptanoic acid

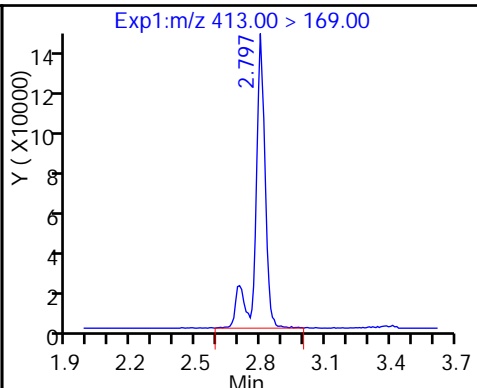
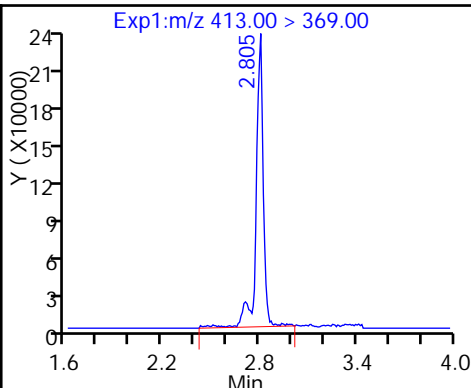
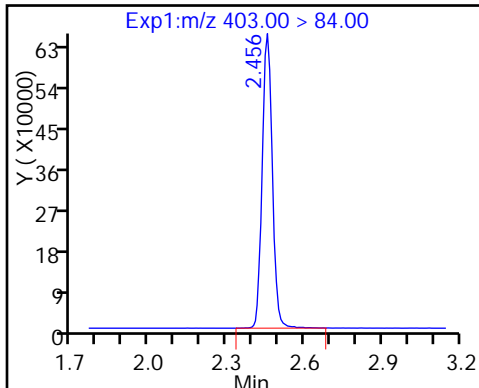
D 11 13C4-PFHpA



D 10 18O2 PFHxS

15 Perfluorooctanoic acid

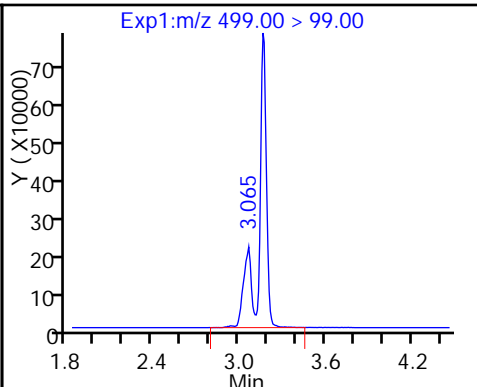
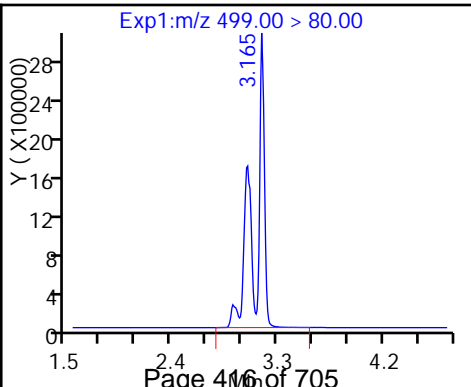
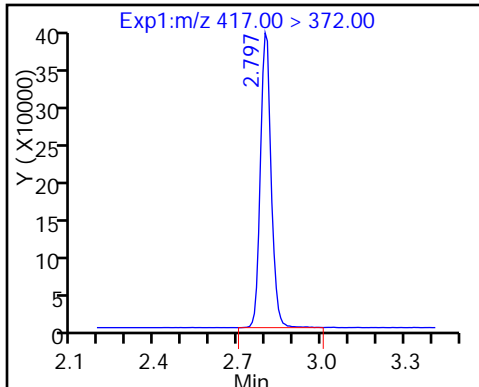
15 Perfluorooctanoic acid



D 14 13C4 PFOA

18 Perfluorooctane sulfonic acid

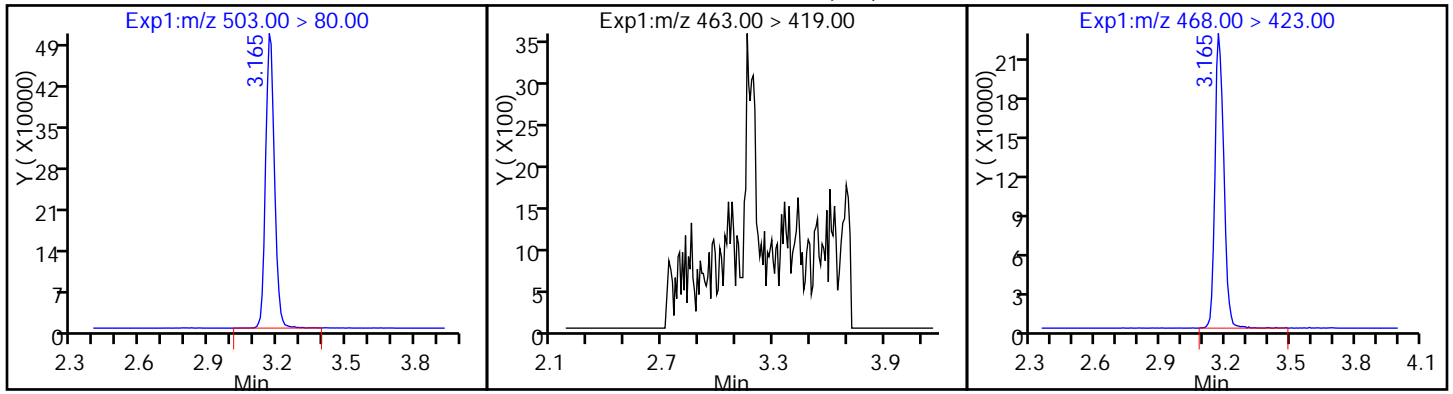
18 Perfluorooctane sulfonic acid



D 17 13C4 PFOS

20 Perfluorononanoic acid (ND)

D 19 13C5 PFNA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23696-1
 SDG No.: _____
 Client Sample ID: MCFSMWFM-01 Lab Sample ID: 320-23696-3
 Matrix: Water Lab File ID: 07DEC2016C_011.d
 Analysis Method: 537 (Modified) Date Collected: 11/16/2016 11:11
 Extraction Method: 3535 Date Extracted: 11/23/2016 11:47
 Sample wt/vol: 482.4 (mL) Date Analyzed: 12/07/2016 22:40
 Con. Extract Vol.: 1.0 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: Acquity ID: 2.1 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 141150 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	29		2.6	2.1	0.95
375-85-9	Perfluoroheptanoic acid (PFHpA)	87		2.6	2.1	0.83
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	110	M	2.6	2.1	0.90
375-95-1	Perfluorononanoic acid (PFNA)	380		2.6	2.1	0.68
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	200		4.1	3.1	1.3
335-67-1	Perfluorooctanoic acid (PFOA)	85	M	2.6	2.1	0.78

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	102		25-150
STL00991	13C4 PFOS	108		25-150
STL01892	13C4-PFHpA	108		25-150
STL00995	13C5 PFNA	73		25-150
STL00994	18O2 PFHxS	104		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161208-37624.b\07DEC2016C_011.d
 Lims ID: 320-23696-A-3-A
 Client ID: MCFSMWFM-01
 Sample Type: Client
 Inject. Date: 07-Dec-2016 22:40:49 ALS Bottle#: 46 Worklist Smp#: 11
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-23696-a-3-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: A8-PC\A8 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20161208-37624.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 08-Dec-2016 09:14:10 Calib Date: 03-Dec-2016 15:33:40
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d
 Column 1 : Det: EXP1
 Process Host: XAWRK027

First Level Reviewer: chandrasenas Date: 08-Dec-2016 09:14:10

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	1.542	-0.008	3645352	10.9		21.7	387895	
1 Perfluorobutyric acid	212.90 > 169.00	1.534	1.542	-0.008	1694178	26.6			2145	
D 4 13C5-PFPeA	267.90 > 223.00	1.810	1.820	-0.010	7095496	26.8		53.6	86431	
3 Perfluoropentanoic acid	262.90 > 219.00	1.810	1.820	-0.010	10968259	76.2			3062	
5 Perfluorobutanesulfonic acid	298.90 > 80.00	1.848	1.858	-0.010	7285534	14.0				
	298.90 > 99.00	1.848	1.858	-0.010	3088348		2.36(0.00-0.00)			
7 Perfluorohexanoic acid	313.00 > 269.00	2.093	2.100	-0.007	19953939	100.4			50367	
D 6 13C2 PFHxA	315.00 > 270.00	2.093	2.109	-0.016	10421408	43.9		87.8	476443	
9 Perfluorohexanesulfonic acid	399.00 > 80.00	2.456	2.372	0.084	19588399	54.8				M
										M
12 Perfluoroheptanoic acid	363.00 > 319.00	2.433	2.438	-0.005	9606093	41.8			31156	
D 11 13C4-PFHpA	367.00 > 322.00	2.440	2.438	0.002	11192970	54.0		108	770468	
D 10 18O2 PFHxS	403.00 > 84.00	2.456	2.455	0.001	15407770	49.3		104	799619	
48 Sodium 1H,1H,2H,2H-perfluorooctane	427.00 > 407.00	2.769	2.774	-0.005	27095538	NR				
D 47 M2-6:2FTS	429.00 > 409.00	2.769	2.774	-0.005	1648328	15.6		0.0		

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.801	2.796	0.005	1.000	9874592	41.1			46095	M
413.00 > 169.00	2.801	2.796	0.005	1.000	6310796		1.56(0.90-1.10)		285484	
D 14 13C4 PFOA										
417.00 > 372.00	2.801	2.804	-0.003		11217344	51.2		102	452552	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.809	2.804	0.005	1.000	685104	2.19				
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.060	3.147	-0.087	1.000	27974143	97.0			599805	
499.00 > 99.00	3.170	3.147	0.023	1.036	5895258		4.75(0.90-1.10)		802637	
D 17 13C4 PFOS										
503.00 > 80.00	3.170	3.163	0.007		12702656	51.6		108	218100	
20 Perfluorononanoic acid										
463.00 > 419.00	3.170	3.171	-0.001	1.000	22223268	184.0			93782	
D 19 13C5 PFNA										
468.00 > 423.00	3.170	3.171	-0.001		6061910	36.4		72.9	219409	
D 21 13C8 FOSA										
506.00 > 78.00	3.507	3.503	0.004		369453	0.9184		1.8	35535	
D 42 M2-8:2FTS										
529.00 > 509.00	3.515	3.520	-0.005		15396	0.1585		0.0		
43 Sodium 1H,1H,2H,2H-perfluorooctane										
527.00 > 507.00	3.515	3.520	-0.005	1.000	266489	NR				
24 Perfluorodecanoic acid										
513.00 > 469.00	3.532	3.528	0.004	1.000	265300	2.99			3212	
D 23 13C2 PFDA										
515.00 > 470.00	3.532	3.528	0.004		4624707	29.3		58.6	212934	
D 45 d3-NMeFOSAA										
573.00 > 419.00	3.678	3.683	-0.005		2910	0.0401		0.0		
44 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.582	3.693	-0.111	0.974	471	NR				
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.834	3.839	-0.005	1.000	1181	0.006947				
D 46 d5-NEtFOSAA										
589.00 > 419.00	3.851	3.847	0.004		6506	0.0817		0.0		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.860	3.857	0.003	1.000	145766	2.31			2861	
D 27 13C2 PFUnA										
565.00 > 520.00	3.860	3.857	0.003		2959571	24.9		49.8	269519	
D 52 d-N-MeFOSA-M										
515.00 > 169.00	3.851	3.997	-0.146		744	0.007079		0.0		
54 MeFOSA										
512.00 > 169.00	3.974	4.007	-0.033	1.000	639	NR				
D 30 13C2 PFDaA										
615.00 > 570.00	4.155	4.154	0.001		2737142	24.4		48.8	127820	
D 51 d-N-EtFOSA-M										
531.00 > 169.00	4.190	4.192	-0.002		488	0.004921		0.0		

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.662	4.652	0.010	1.000	22092	0.2177			198	
713.00 > 169.00	4.662	4.652	0.010	1.000	3071		7.19(0.00-0.00)		1139	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.662	4.652	0.010		7600804	32.9		65.8	932801	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.079	5.068	0.011		1552708	12.0		23.9	82328	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.079	5.079	0.0	1.000	20643	-0.3746			67.9	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.306	5.428	-0.122	1.000	2906	0.0535			14.5	

QC Flag Legend

Processing Flags

NR - Missing Quant Standard

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161208-37624.b\07DEC2016C_011.d

Injection Date: 07-Dec-2016 22:40:49

Instrument ID: A8_N

Lims ID: 320-23696-A-3-A

Lab Sample ID:

Client ID: MCFSMWFM-01

Operator ID: A8-PC\A8

ALS Bottle#: 46

Worklist Smp#: 11

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

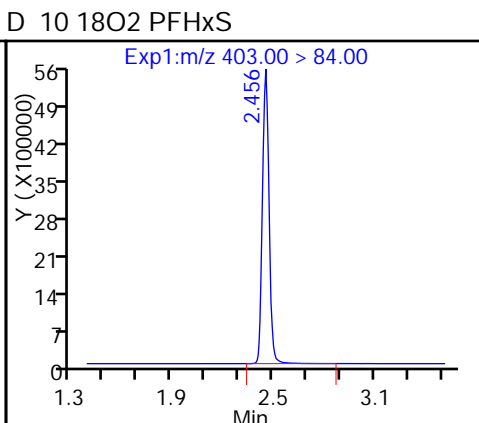
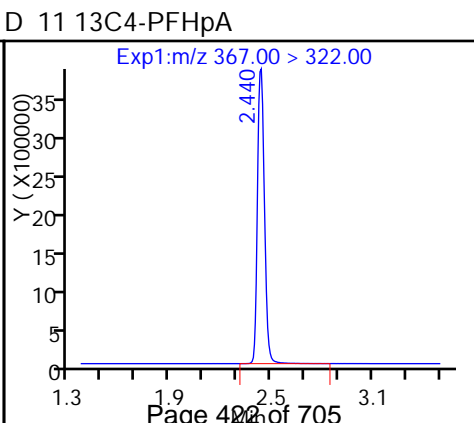
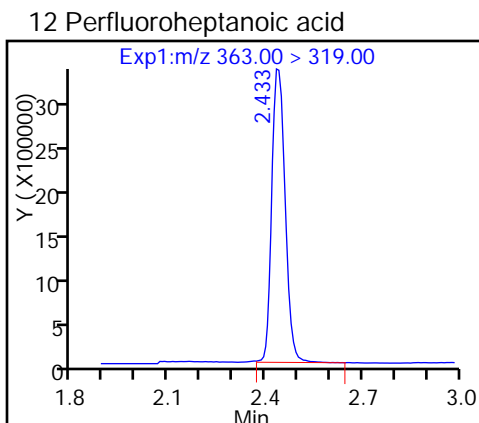
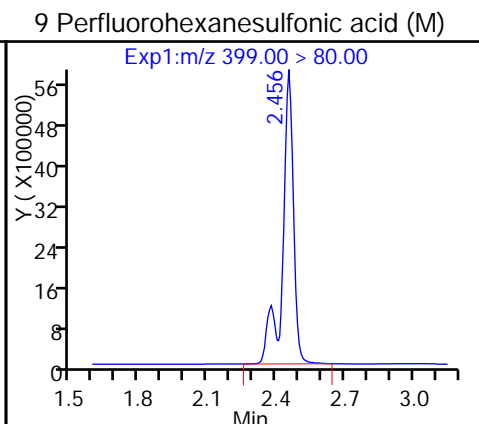
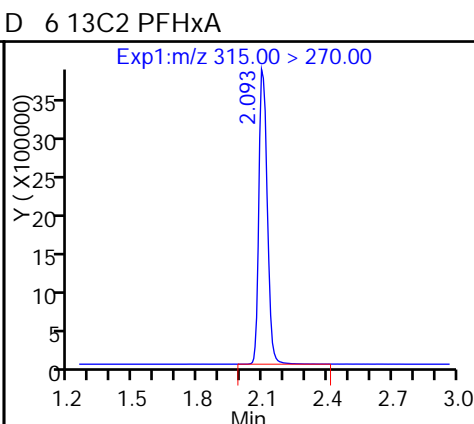
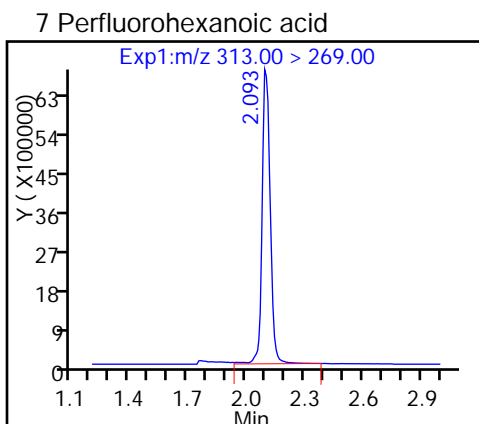
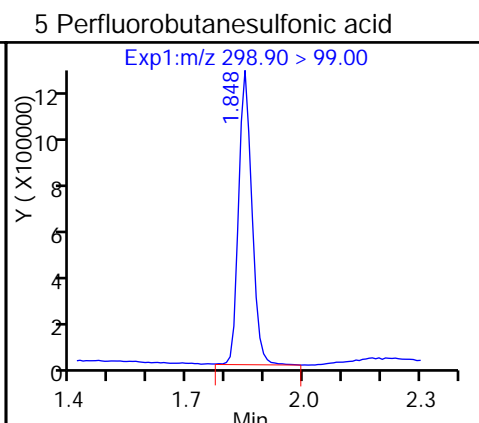
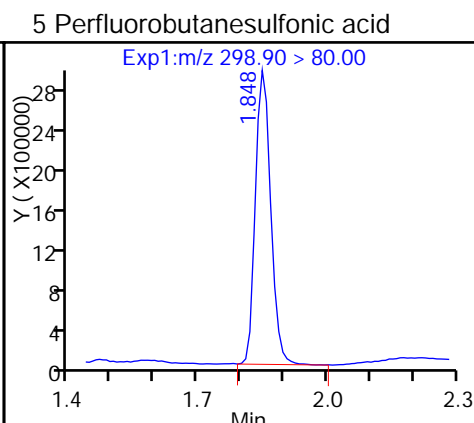
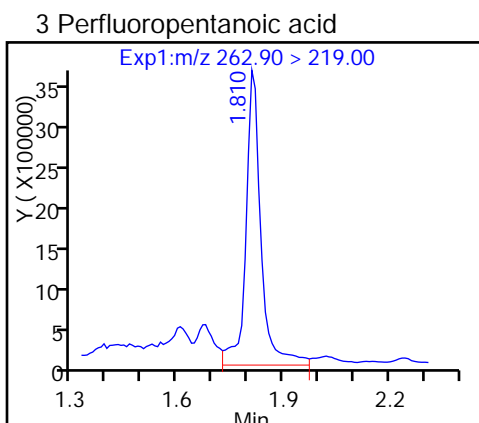
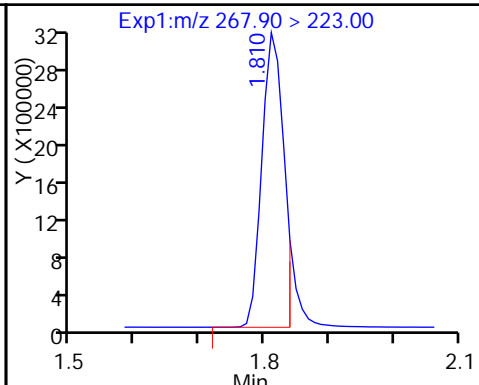
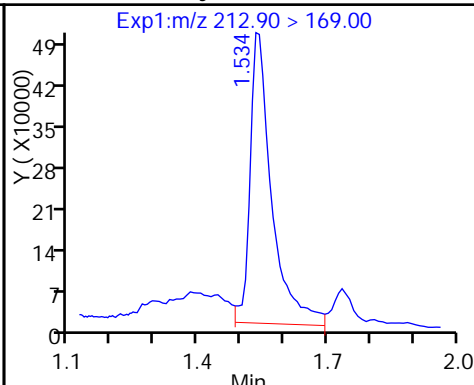
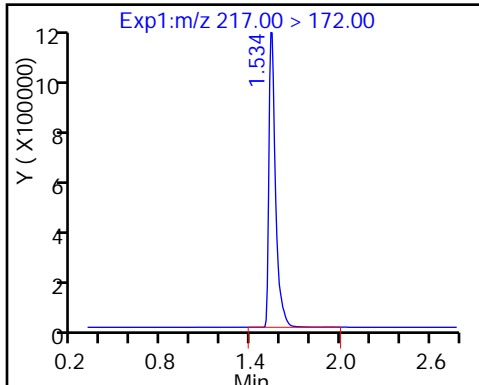
Method: A8_N

Limit Group: LC PFC_DOD ICAL

D 2 13C4 PFBA

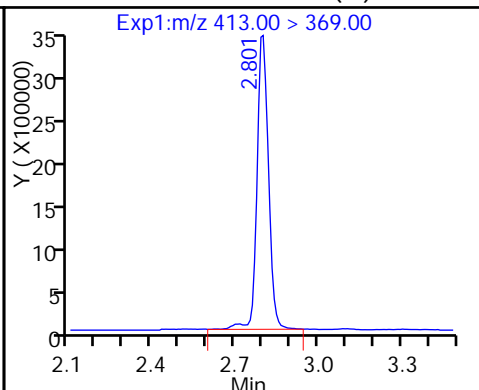
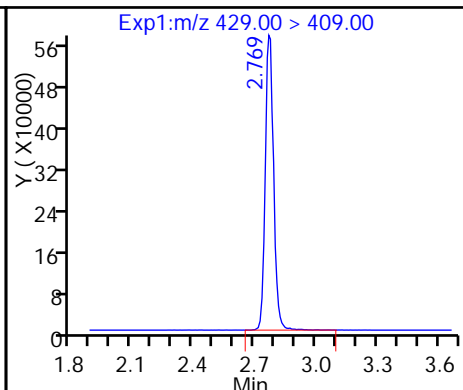
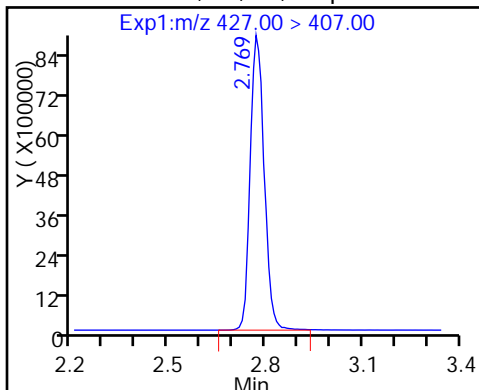
1 Perfluorobutyric acid

D 4 13C5-PFPeA



48 Sodium 1H,1H,2H,2H-perfluorooctanoate

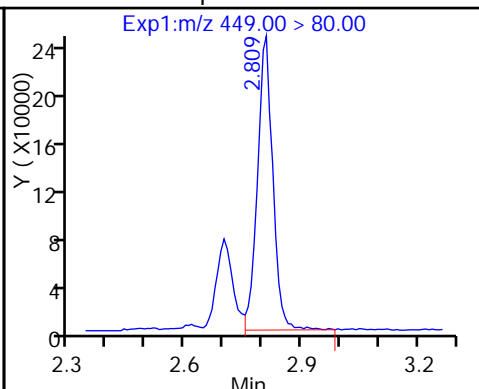
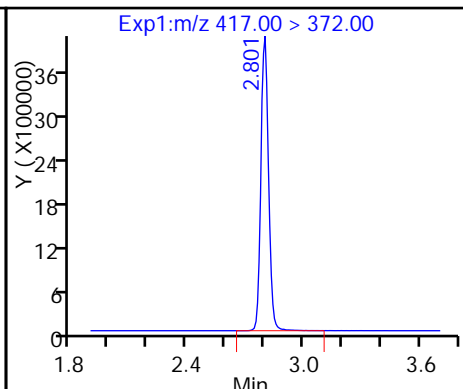
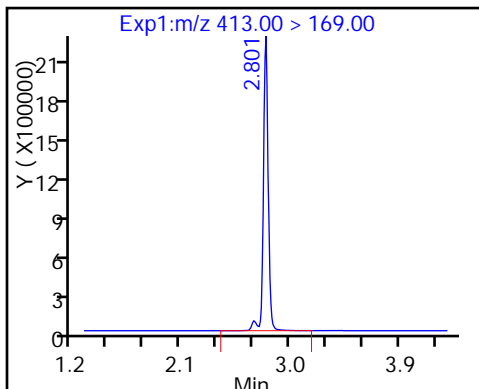
15 Perfluorooctanoic acid (M)



15 Perfluorooctanoic acid

D 14 13C4 PFOA

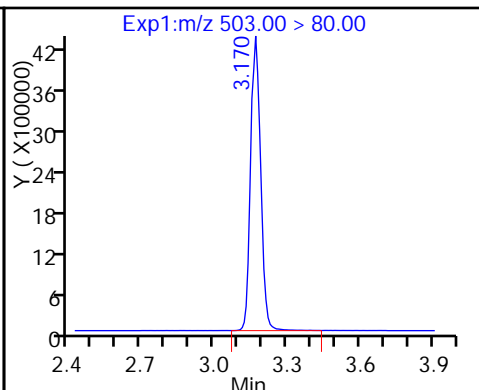
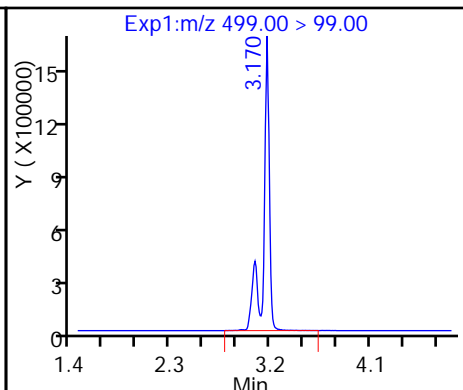
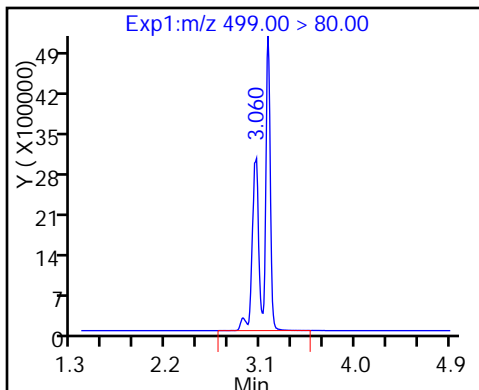
13 Perfluoroheptanesulfonic Acid



18 Perfluorooctane sulfonic acid

18 Perfluorooctane sulfonic acid

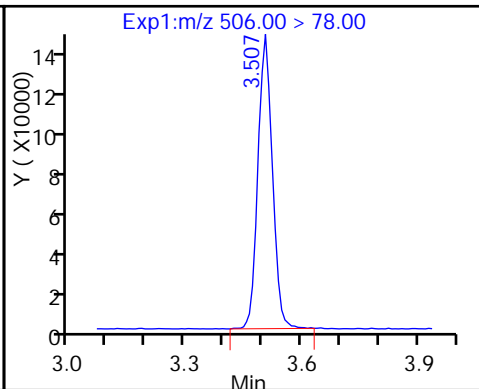
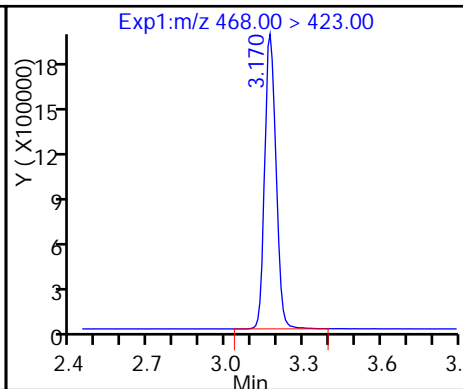
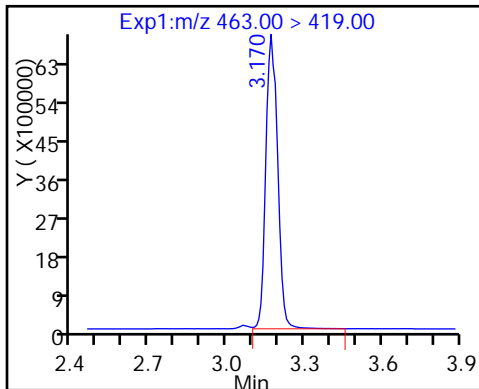
D 17 13C4 PFOS



20 Perfluorononanoic acid

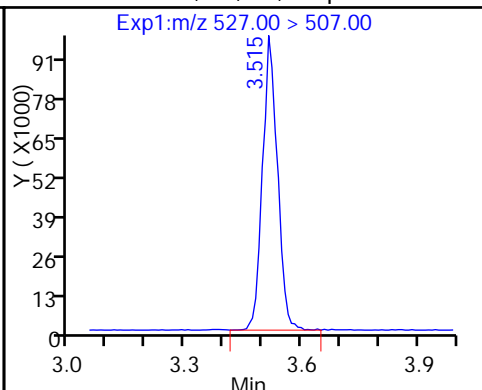
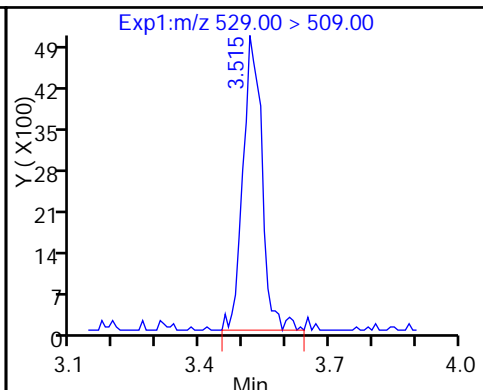
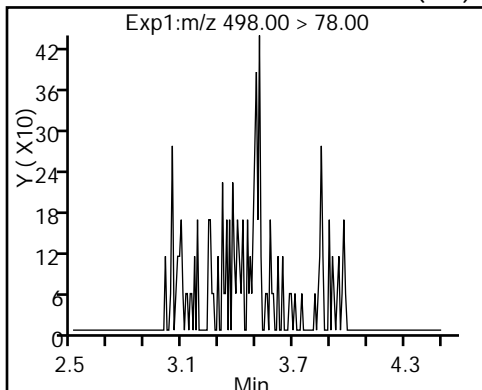
D 19 13C5 PFNA

D 21 13C8 FOSA



22 Perfluorooctane Sulfonamide (ND) D 42 M2-8:2FTS

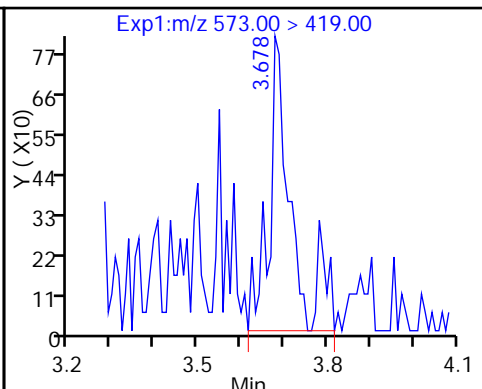
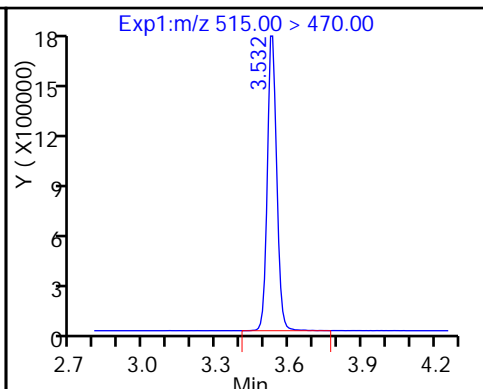
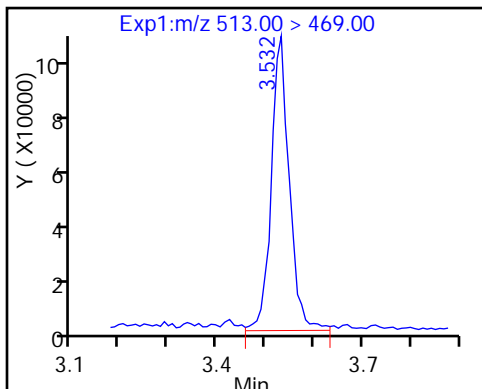
43 Sodium 1H,1H,2H,2H-perfluorooctane



24 Perfluorodecanoic acid

D 23 13C2 PFDA

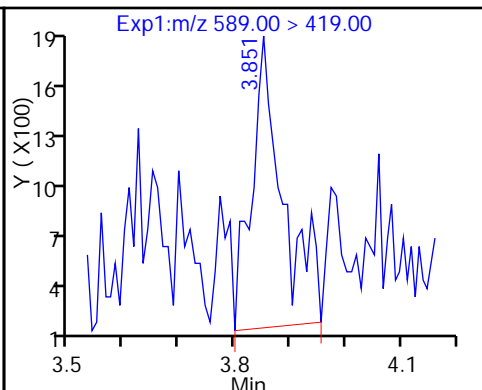
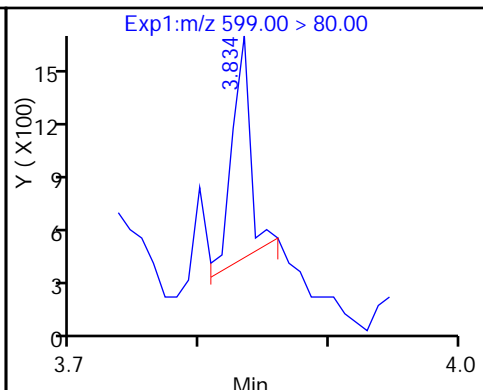
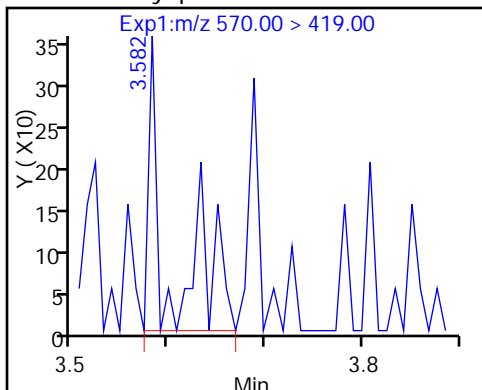
D 45 d3-NMeFOSAA



44 N-methyl perfluorooctane sulfonamid

26 Perfluorodecane Sulfonic acid

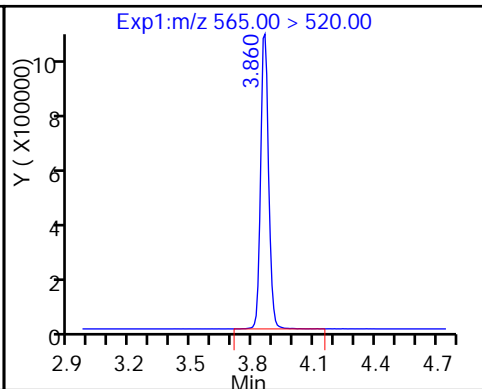
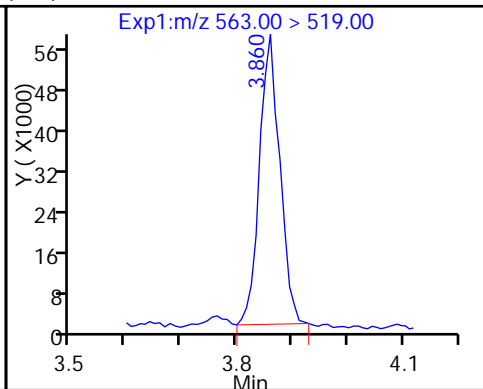
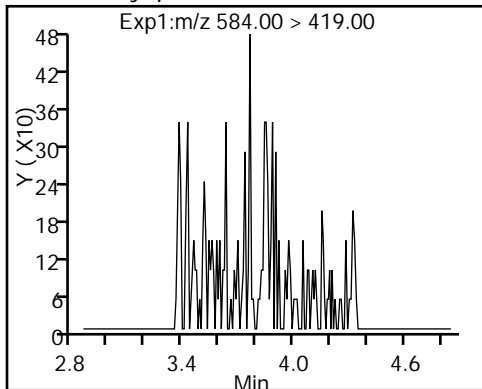
D 46 d5-NEtFOSAA



49 N-ethyl perfluorooctane sulfonamid (ND)

27 Perfluoroundecanoic acid

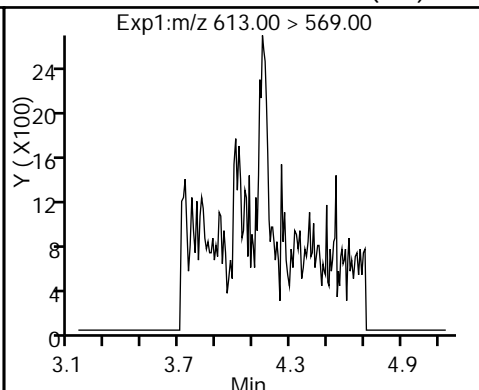
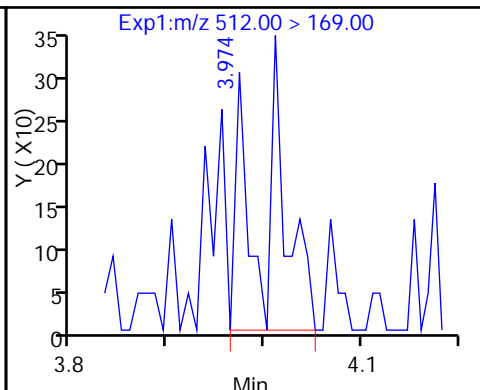
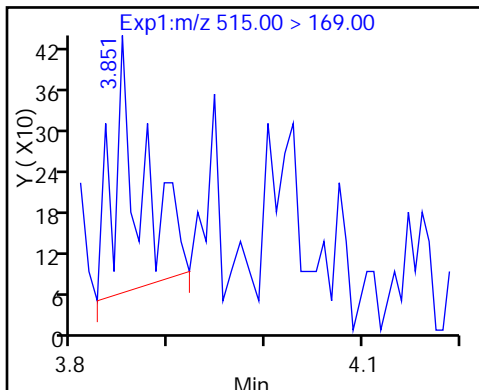
D 27 13C2 PFUnA



D 52 d-N-MeFOSA-M

54 MeFOSA

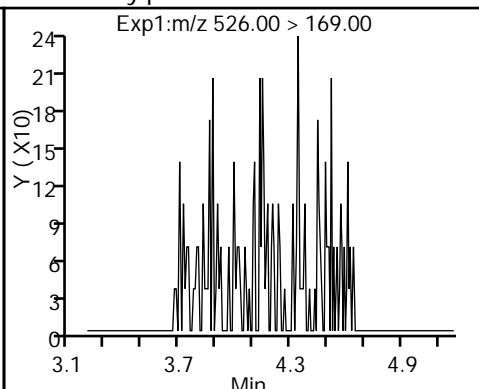
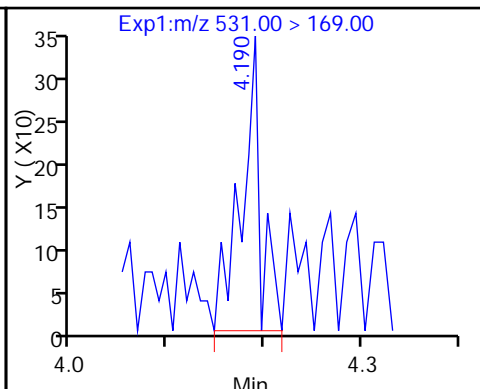
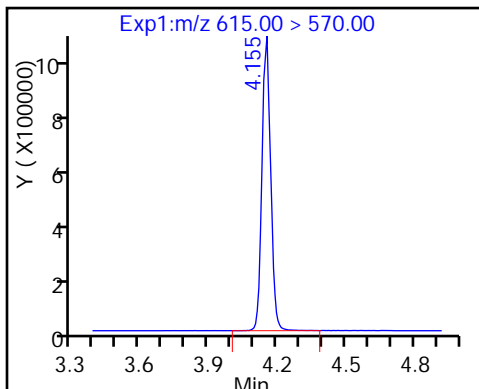
29 Perfluorododecanoic acid (ND)



D 30 13C2 PFDaA

D 51 d-N-EtFOSA-M

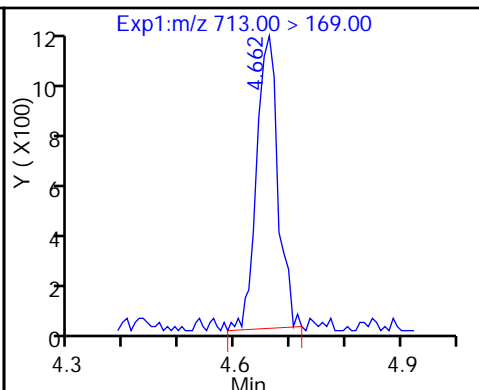
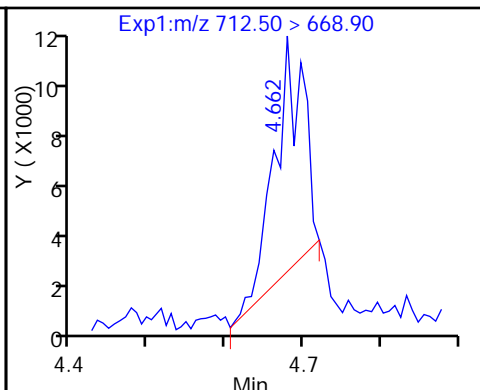
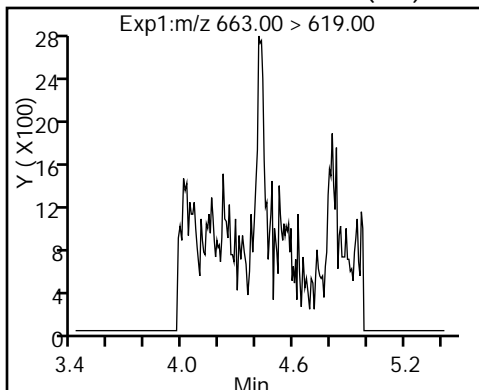
53 N-ethylperfluoro-1-octanesulfonami (ND)



31 Perfluorotridecanoic acid (ND)

33 Perfluorotetradecanoic acid

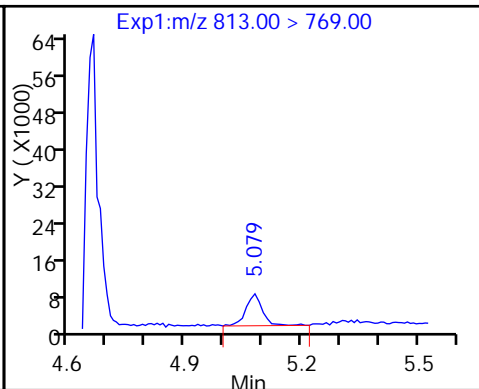
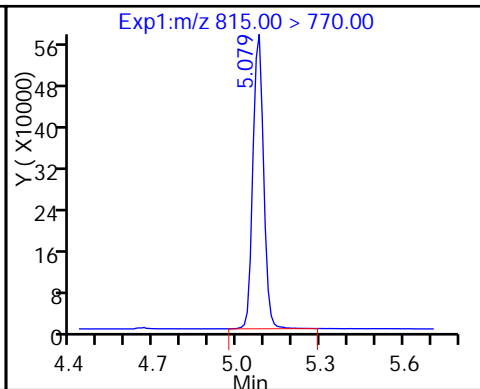
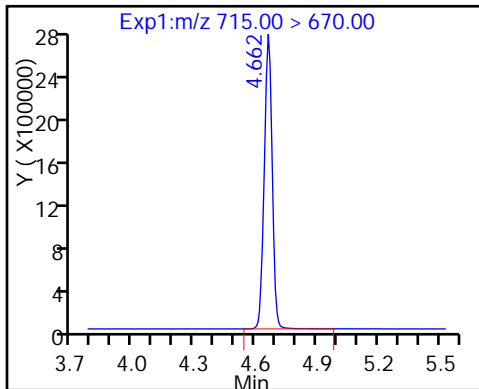
33 Perfluorotetradecanoic acid



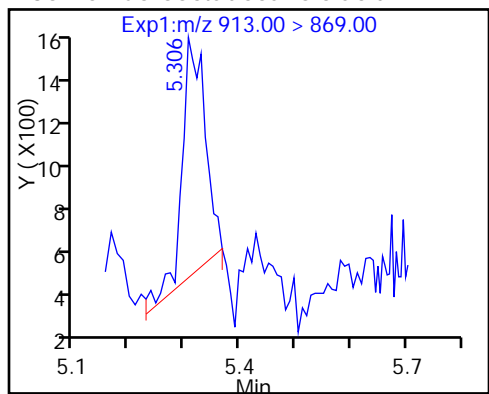
D 32 13C2-PFTeDA

D 34 13C2-PFHxDA

35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



TestAmerica Sacramento

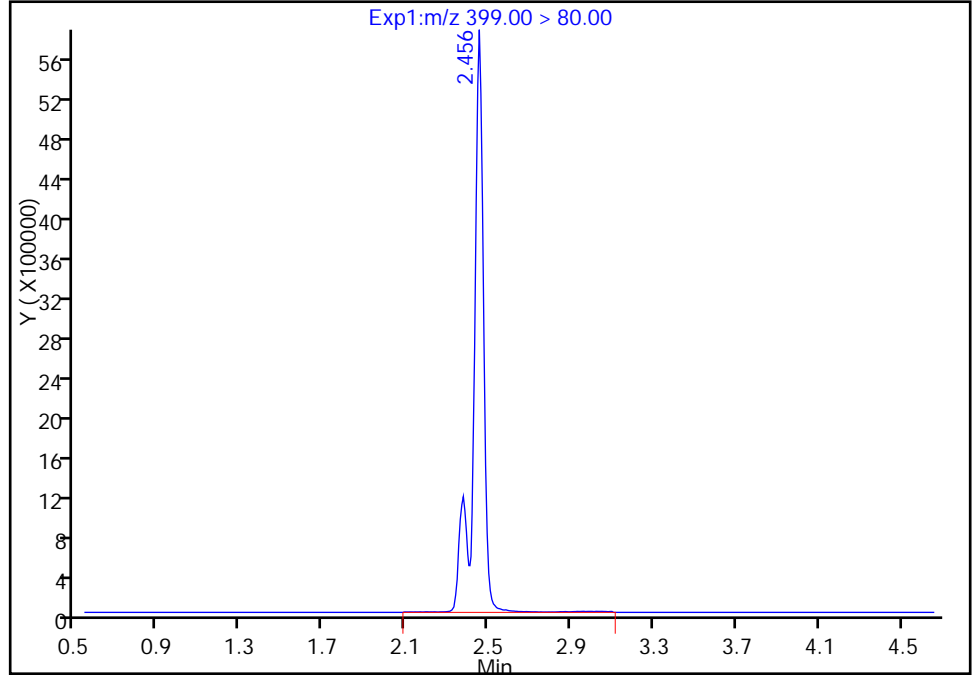
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Injection Date: 07-Dec-2016 22:40:49 Instrument ID: A8_N
Lims ID: 320-23696-A-3-A Lab Sample ID:
Client ID: MCFSMWFM-01
Operator ID: A8-PC\A8 ALS Bottle#: 46 Worklist Smp#: 11
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

9 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

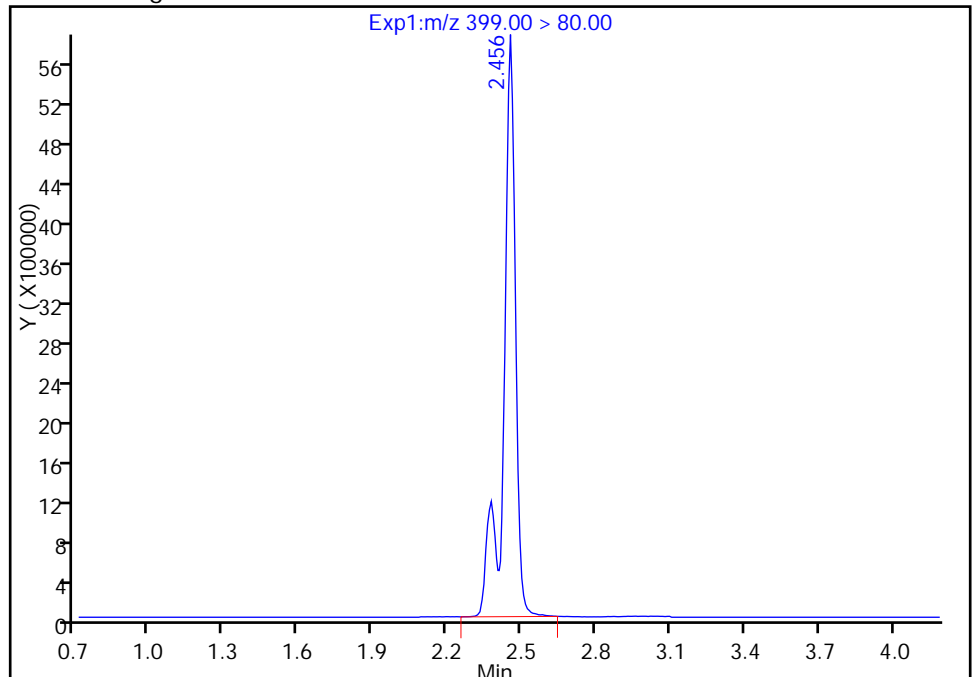
RT: 2.46
Area: 19972878
Amount: 55.863220
Amount Units: ng/ml

Processing Integration Results



RT: 2.46
Area: 19588399
Amount: 54.787849
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 08-Dec-2016 09:14:10

Audit Action: Manually Integrated

Audit Reason: Baseline

TestAmerica Sacramento

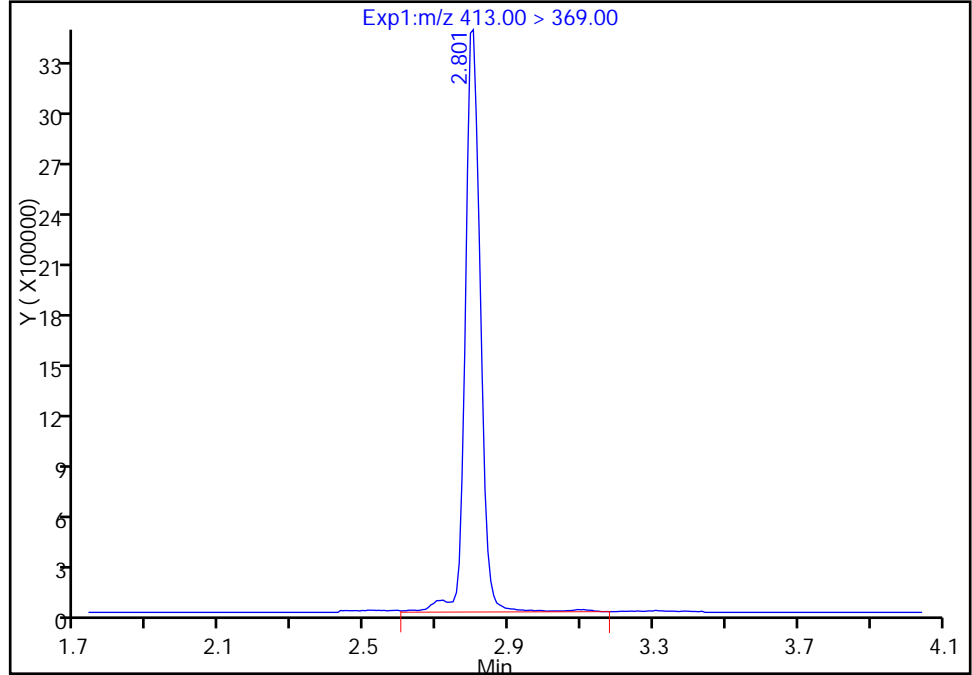
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161208-37624.b\07DEC2016C_011.d
Injection Date: 07-Dec-2016 22:40:49 Instrument ID: A8_N
Lims ID: 320-23696-A-3-A Lab Sample ID:
Client ID: MCFSMWFM-01
Operator ID: A8-PC\A8 ALS Bottle#: 46 Worklist Smp#: 11
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

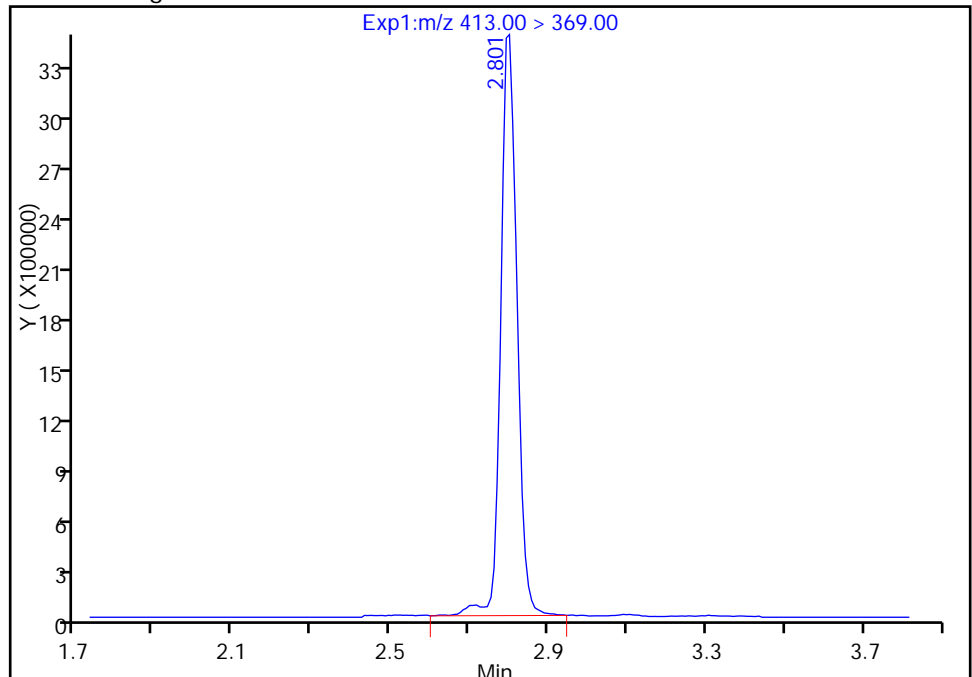
RT: 2.80
Area: 10120393
Amount: 42.083995
Amount Units: ng/ml

Processing Integration Results



RT: 2.80
Area: 9874592
Amount: 41.061871
Amount Units: ng/ml

Manual Integration Results



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23696-1
 SDG No.: _____
 Client Sample ID: MCFSMW-4 Lab Sample ID: 320-23696-4
 Matrix: Water Lab File ID: 03DEC2016C_021.d
 Analysis Method: 537 (Modified) Date Collected: 11/16/2016 13:31
 Extraction Method: 3535 Date Extracted: 11/23/2016 11:47
 Sample wt/vol: 507(mL) Date Analyzed: 12/03/2016 21:11
 Con. Extract Vol.: 1.0(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 140675 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	12	M	2.5	2.0	0.91
375-85-9	Perfluoroheptanoic acid (PFHpA)	40		2.5	2.0	0.79
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	97	M	2.5	2.0	0.86
375-95-1	Perfluorononanoic acid (PFNA)	15		2.5	2.0	0.64
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	58	M	3.9	3.0	1.3
335-67-1	Perfluorooctanoic acid (PFOA)	73	M	2.5	2.0	0.74

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	99		25-150
STL00991	13C4 PFOS	108		25-150
STL01892	13C4-PFHpA	93		25-150
STL00995	13C5 PFNA	95		25-150
STL00994	18O2 PFHxS	101		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b\03DEC2016C_021.d
 Lims ID: 320-23696-A-4-A
 Client ID: MCFSMW-4
 Sample Type: Client
 Inject. Date: 03-Dec-2016 21:11:17 ALS Bottle#: 22 Worklist Smp#: 21
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-23696-A-4-A
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: A8-PC\A8 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 06-Dec-2016 16:03:31 Calib Date: 03-Dec-2016 15:33:40
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d
 Column 1 : Det: EXP1
 Process Host: XAWRK027

First Level Reviewer: chandrasenas Date: 06-Dec-2016 16:03:31

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.858	1.877	-0.019	1.000	3077989	6.12				M
298.90 > 99.00	1.858	1.877	-0.019	1.000	1353100		2.27(0.00-0.00)			M
D 6 13C2 PFHxA										
315.00 > 270.00	2.117	2.129	-0.012		9314236	39.2		78.4	489258	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.463	2.466	-0.003	1.000	3990542	20.2			8077	
D 11 13C4-PFHpA										
367.00 > 322.00	2.463	2.473	-0.010		9596712	46.3		92.5	383939	
D 10 18O2 PFHxS										
403.00 > 84.00	2.472	2.481	-0.009		14899907	47.7		101	1118564	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.472	2.496	-0.024	1.000	16936888	49.0				M
15 Perfluorooctanoic acid										
413.00 > 369.00	2.827	2.836	-0.009	1.000	8604840	37.1			27754	M
413.00 > 169.00	2.819	2.836	-0.017	0.997	5969758		1.44(0.90-1.10)		163094	
D 14 13C4 PFOA										
417.00 > 372.00	2.819	2.836	-0.017		10822381	49.4		98.7	617656	
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.196	3.215	-0.019	1.000	8454956	29.3			21289	M
499.00 > 99.00	3.196	3.215	-0.019	1.000	1864397		4.53(0.90-1.10)		86649	
20 Perfluorononanoic acid										
463.00 > 419.00	3.204	3.215	-0.011	1.000	1172991	7.41			6140	
D 17 13C4 PFOS										
503.00 > 80.00	3.196	3.215	-0.019		12695148	51.6		108	51950	
D 19 13C5 PFNA										
468.00 > 423.00	3.204	3.215	-0.011		7944018	47.7		95.5	434018	

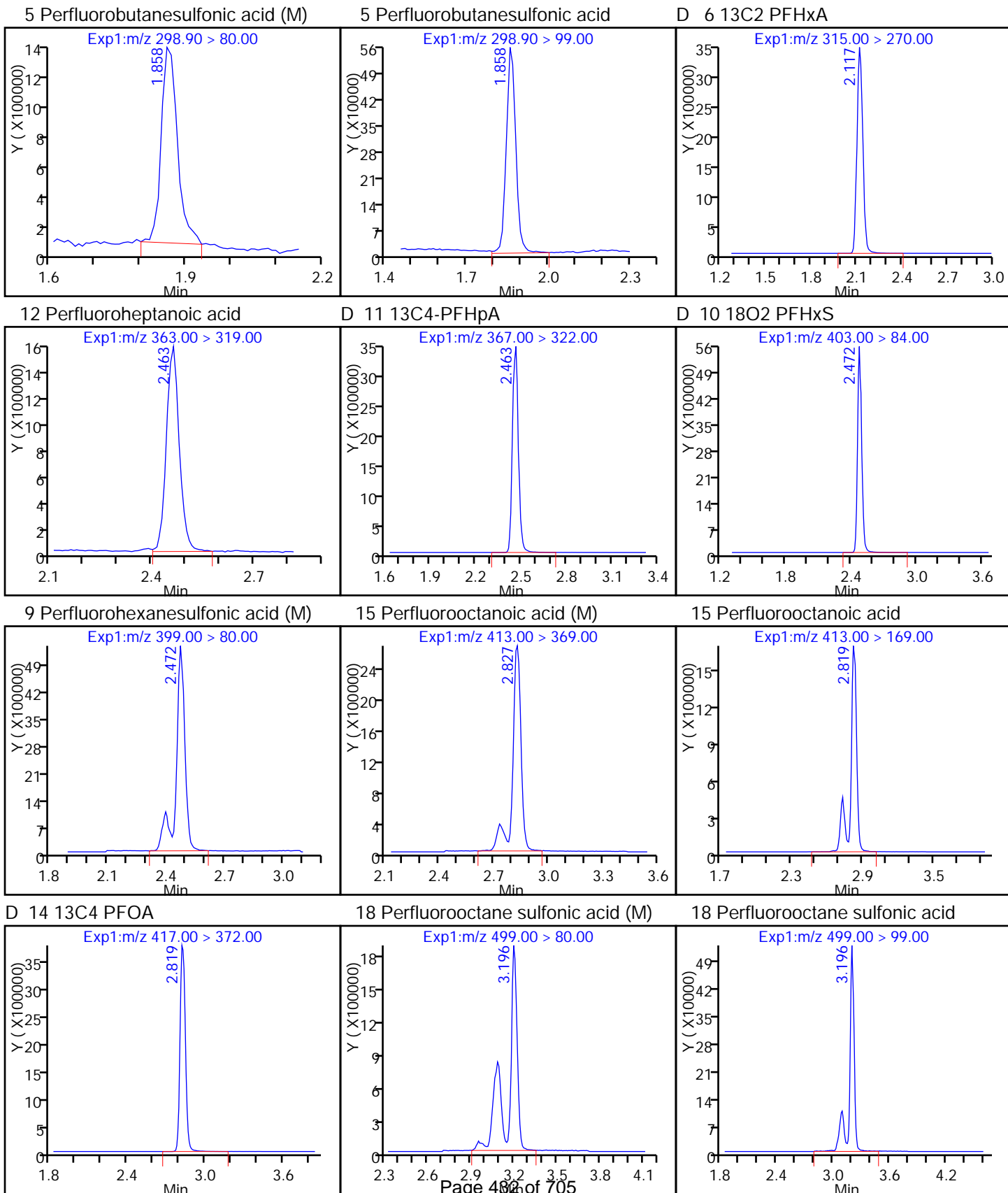
QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica Sacramento

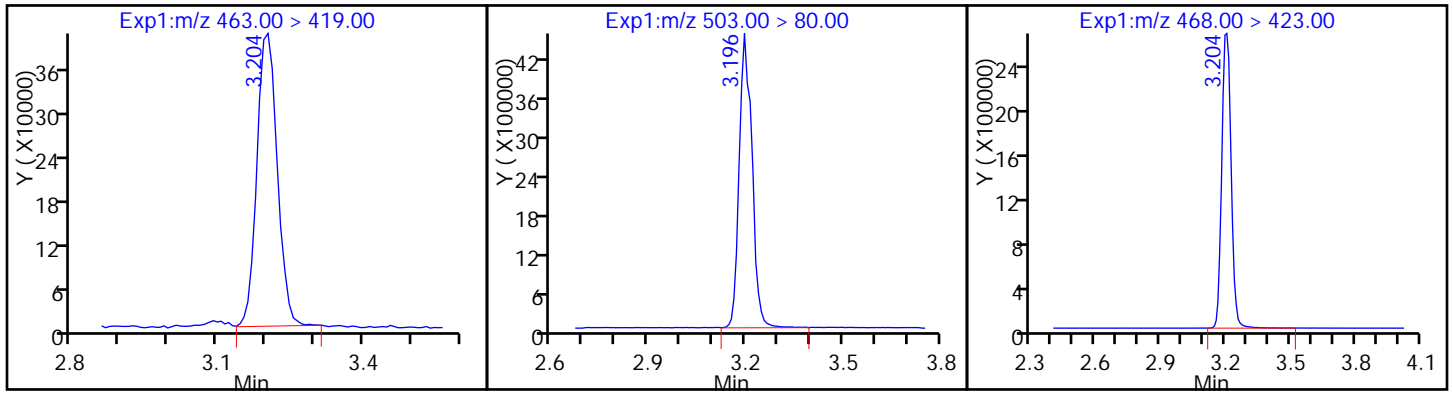
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b\03DEC2016C_021.d
Injection Date: 03-Dec-2016 21:11:17 Instrument ID: A8_N
Lims ID: 320-23696-A-4-A Lab Sample ID: 320-23696-4
Client ID: MCFSMW-4
Operator ID: A8-PC\A8 ALS Bottle#: 22 Worklist Smp#: 21
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL



20 Perfluorononanoic acid

D 17 13C4 PFOS

D 19 13C5 PFNA



TestAmerica Sacramento

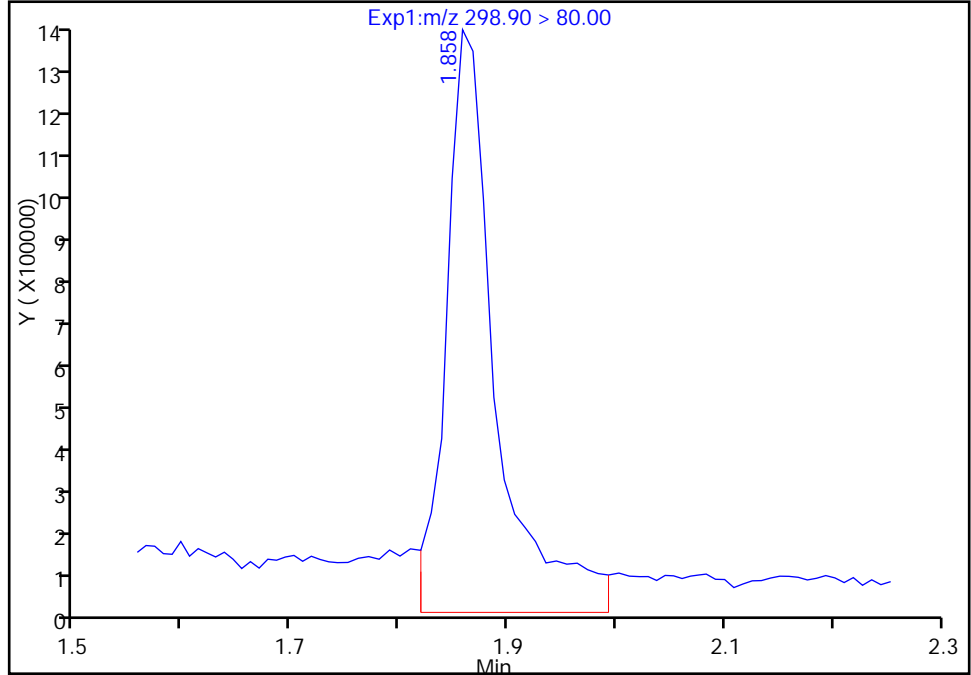
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b\03DEC2016C_021.d
Injection Date: 03-Dec-2016 21:11:17 Instrument ID: A8_N
Lims ID: 320-23696-A-4-A Lab Sample ID: 320-23696-4
Client ID: MCFSMW-4
Operator ID: A8-PC\A8 ALS Bottle#: 22 Worklist Smp#: 21
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 1

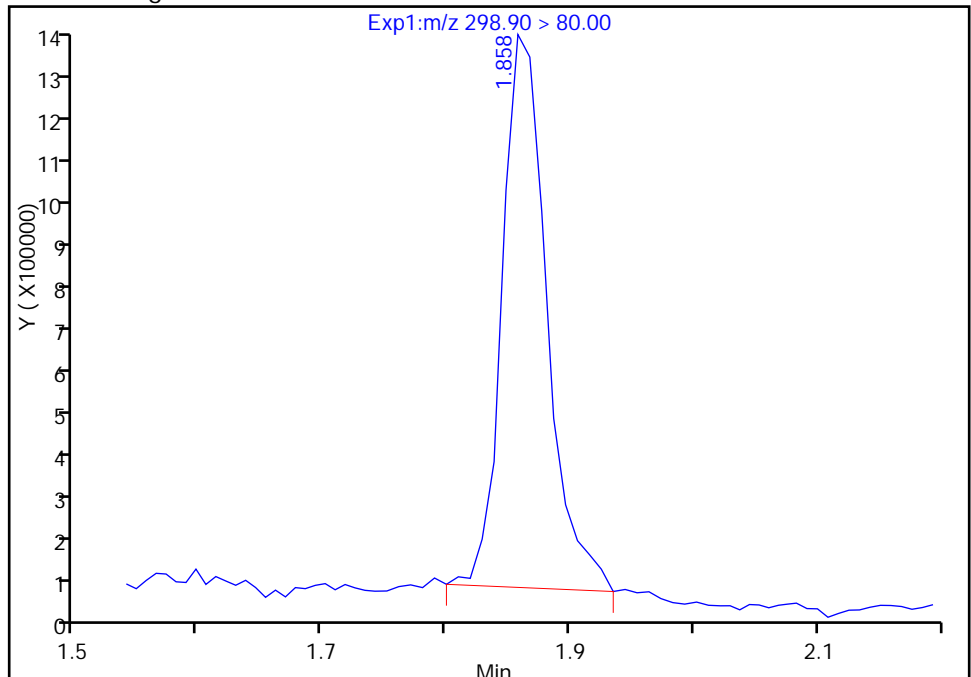
RT: 1.86
Area: 4268575
Amount: 8.490214
Amount Units: ng/ml

Processing Integration Results



RT: 1.86
Area: 3077989
Amount: 6.122133
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

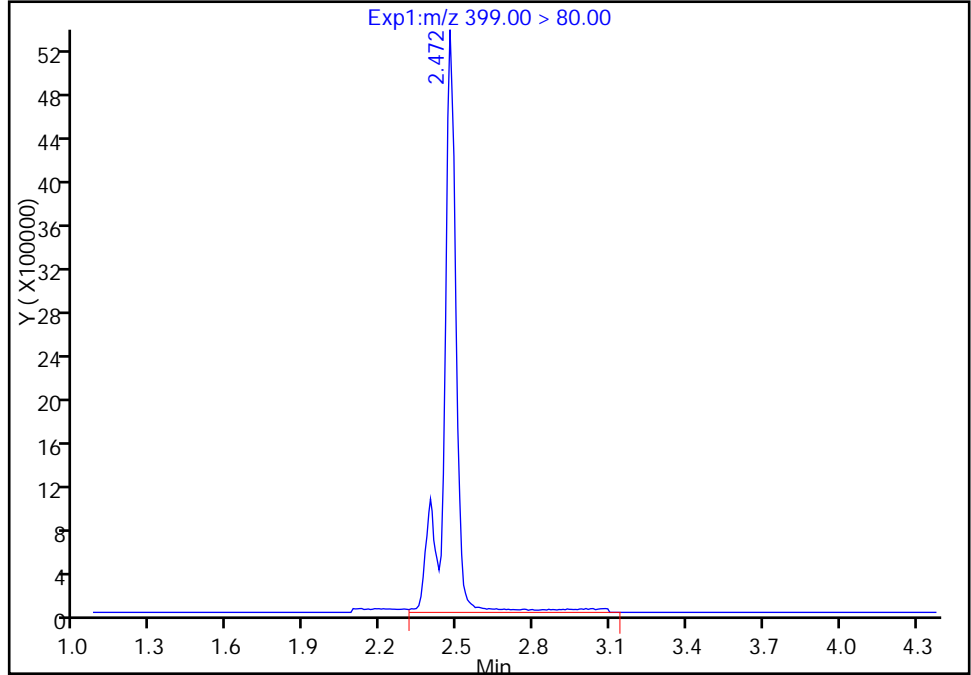
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b\03DEC2016C_021.d
Injection Date: 03-Dec-2016 21:11:17 Instrument ID: A8_N
Lims ID: 320-23696-A-4-A Lab Sample ID: 320-23696-4
Client ID: MCFSMW-4
Operator ID: A8-PC\A8 ALS Bottle#: 22 Worklist Smp#: 21
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

9 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

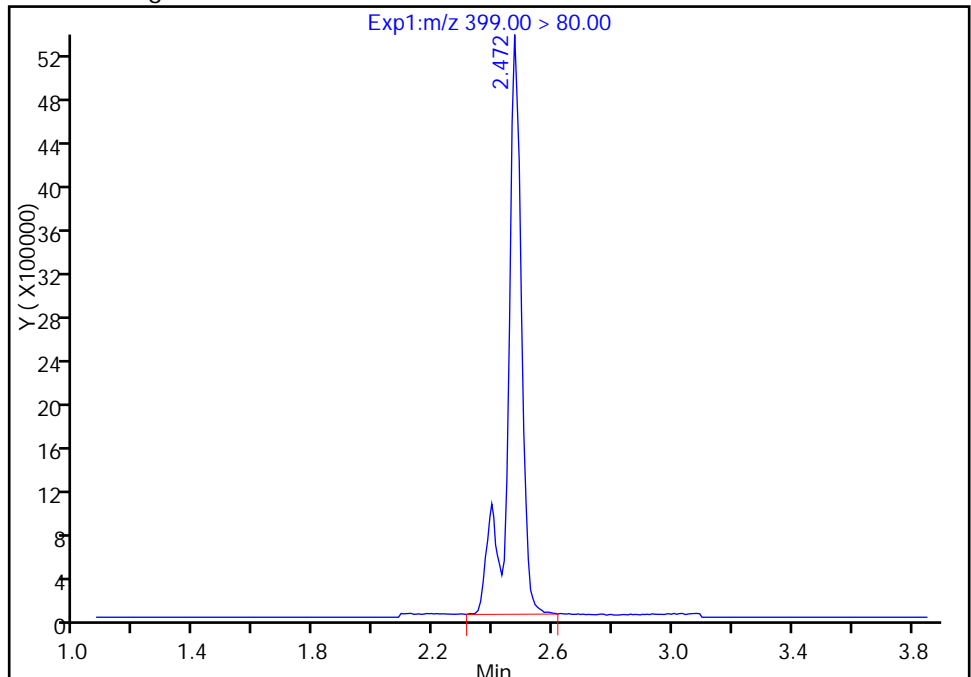
RT: 2.47
Area: 18216646
Amount: 52.687787
Amount Units: ng/ml

Processing Integration Results



RT: 2.47
Area: 16936888
Amount: 48.986359
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 06-Dec-2016 16:03:31
Audit Action: Manually Integrated

Audit Reason: Baseline

TestAmerica Sacramento

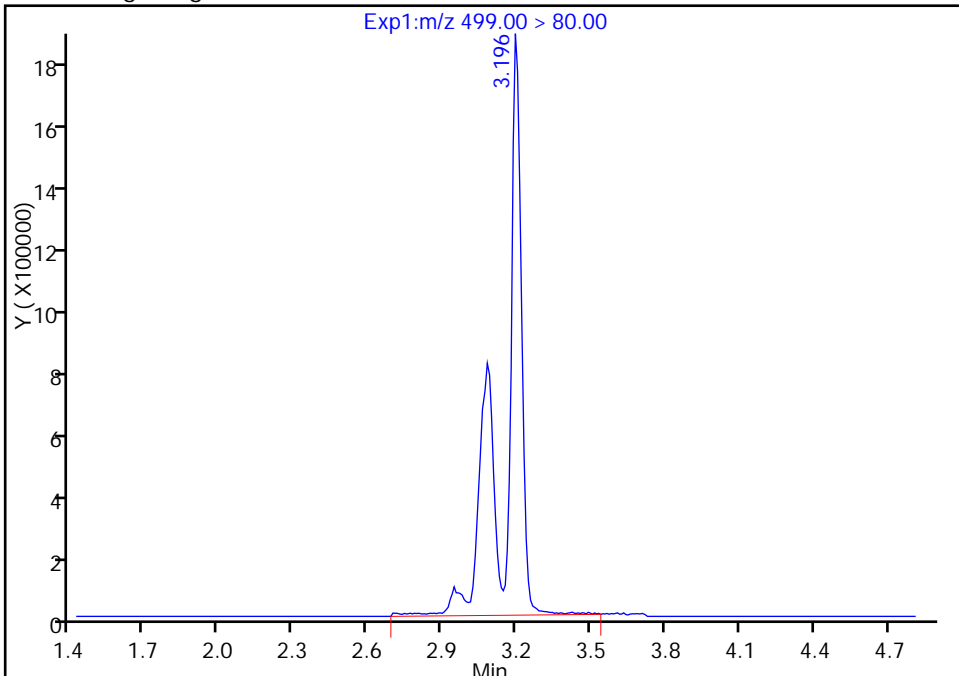
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Injection Date: 03-Dec-2016 21:11:17 Instrument ID: A8_N
Lims ID: 320-23696-A-4-A Lab Sample ID: 320-23696-4
Client ID: MCFSMW-4
Operator ID: A8-PC\A8 ALS Bottle#: 22 Worklist Smp#: 21
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

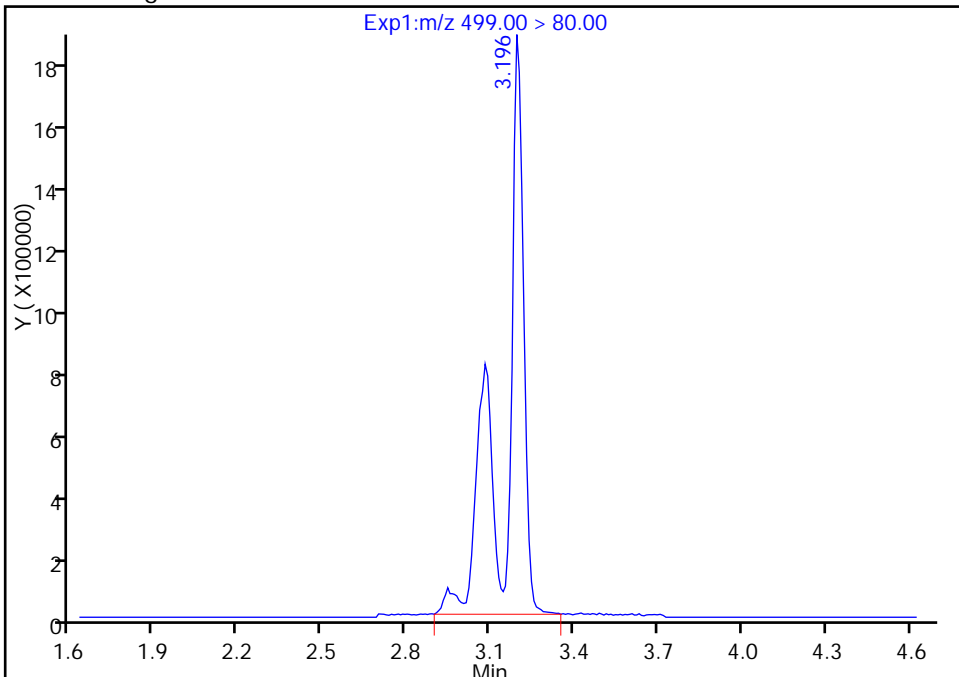
RT: 3.20
Area: 8771669
Amount: 30.433574
Amount Units: ng/ml

Processing Integration Results



RT: 3.20
Area: 8454956
Amount: 29.334729
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

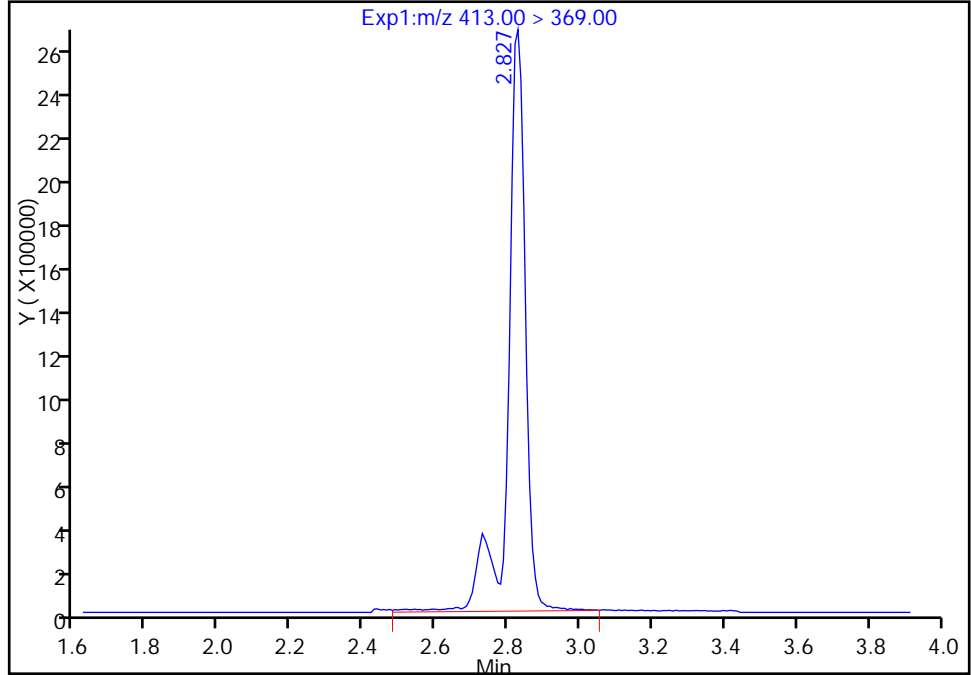
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Injection Date: 03-Dec-2016 21:11:17 Instrument ID: A8_N
Lims ID: 320-23696-A-4-A Lab Sample ID: 320-23696-4
Client ID: MCFSMW-4
Operator ID: A8-PC\A8 ALS Bottle#: 22 Worklist Smp#: 21
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

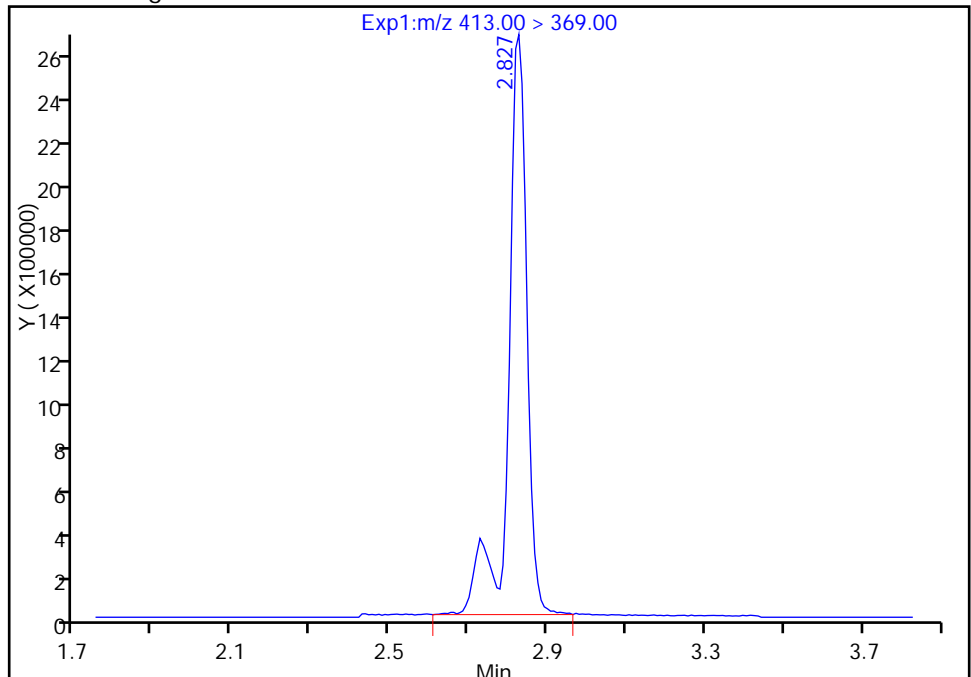
RT: 2.83
Area: 8852889
Amount: 38.156789
Amount Units: ng/ml

Processing Integration Results



RT: 2.83
Area: 8604840
Amount: 37.087674
Amount Units: ng/ml

Manual Integration Results



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23696-1
 SDG No.: _____
 Client Sample ID: MCFSMW-2 Lab Sample ID: 320-23696-5
 Matrix: Water Lab File ID: 03DEC2016C_022.d
 Analysis Method: 537 (Modified) Date Collected: 11/16/2016 14:21
 Extraction Method: 3535 Date Extracted: 11/23/2016 11:47
 Sample wt/vol: 496.1 (mL) Date Analyzed: 12/03/2016 21:18
 Con. Extract Vol.: 1.0 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: Acquity ID: 2.1 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 140675 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	23	M	2.5	2.0	0.93
375-85-9	Perfluoroheptanoic acid (PFHpA)	29		2.5	2.0	0.81
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	220	M	2.5	2.0	0.88
375-95-1	Perfluorononanoic acid (PFNA)	4.6	M	2.5	2.0	0.66
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	25	M	4.0	3.0	1.3
335-67-1	Perfluorooctanoic acid (PFOA)	86		2.5	2.0	0.75

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	92		25-150
STL00991	13C4 PFOS	113		25-150
STL01892	13C4-PFHpA	84		25-150
STL00995	13C5 PFNA	92		25-150
STL00994	18O2 PFHxS	95		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b\03DEC2016C_022.d
 Lims ID: 320-23696-A-5-A
 Client ID: MCFSMW-2
 Sample Type: Client
 Inject. Date: 03-Dec-2016 21:18:48 ALS Bottle#: 23 Worklist Smp#: 22
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-23696-A-5-A
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: A8-PC\A8 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 06-Dec-2016 16:18:58 Calib Date: 03-Dec-2016 15:33:40
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d
 Column 1 : Det: EXP1
 Process Host: XAWRK027

First Level Reviewer: chandrasenas Date: 06-Dec-2016 16:18:58

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										M
298.90 > 80.00	1.858	1.877	-0.019	1.000	5306230	11.2				M
298.90 > 99.00	1.858	1.877	-0.019	1.000	2066823		2.57(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.121	2.129	-0.008		9034956	38.0		76.1	488379	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.456	2.466	-0.010	1.000	2573416	14.3			5374	
D 11 13C4-PFHpA										
367.00 > 322.00	2.456	2.473	-0.017		8744872	42.2		84.3	815232	
D 10 18O2 PFHxS										
403.00 > 84.00	2.474	2.481	-0.007		14041541	45.0		95.0	846342	
9 Perfluorohexanesulfonic acid										M
399.00 > 80.00	2.483	2.496	-0.014	1.000	36189467	111.1				M
15 Perfluorooctanoic acid										
413.00 > 369.00	2.818	2.836	-0.018	1.000	9210738	42.6			55671	
413.00 > 169.00	2.818	2.836	-0.018	1.000	6045444		1.52(0.90-1.10)		174367	
D 14 13C4 PFOA										
417.00 > 372.00	2.826	2.836	-0.010		10085689	46.0		92.0	716782	
18 Perfluorooctane sulfonic acid										M
499.00 > 80.00	3.081	3.215	-0.134	1.000	3818944	12.6			11315	M
499.00 > 99.00	3.195	3.215	-0.020	1.037	668305		5.71(0.90-1.10)		15870	M
20 Perfluorononanoic acid										M
463.00 > 419.00	3.195	3.215	-0.020	1.000	350261	2.29			2238	M
D 17 13C4 PFOS										
503.00 > 80.00	3.195	3.215	-0.020		13300849	54.1		113	93059	
D 19 13C5 PFNA										
468.00 > 423.00	3.195	3.215	-0.020		7664552	46.1		92.1	258410	

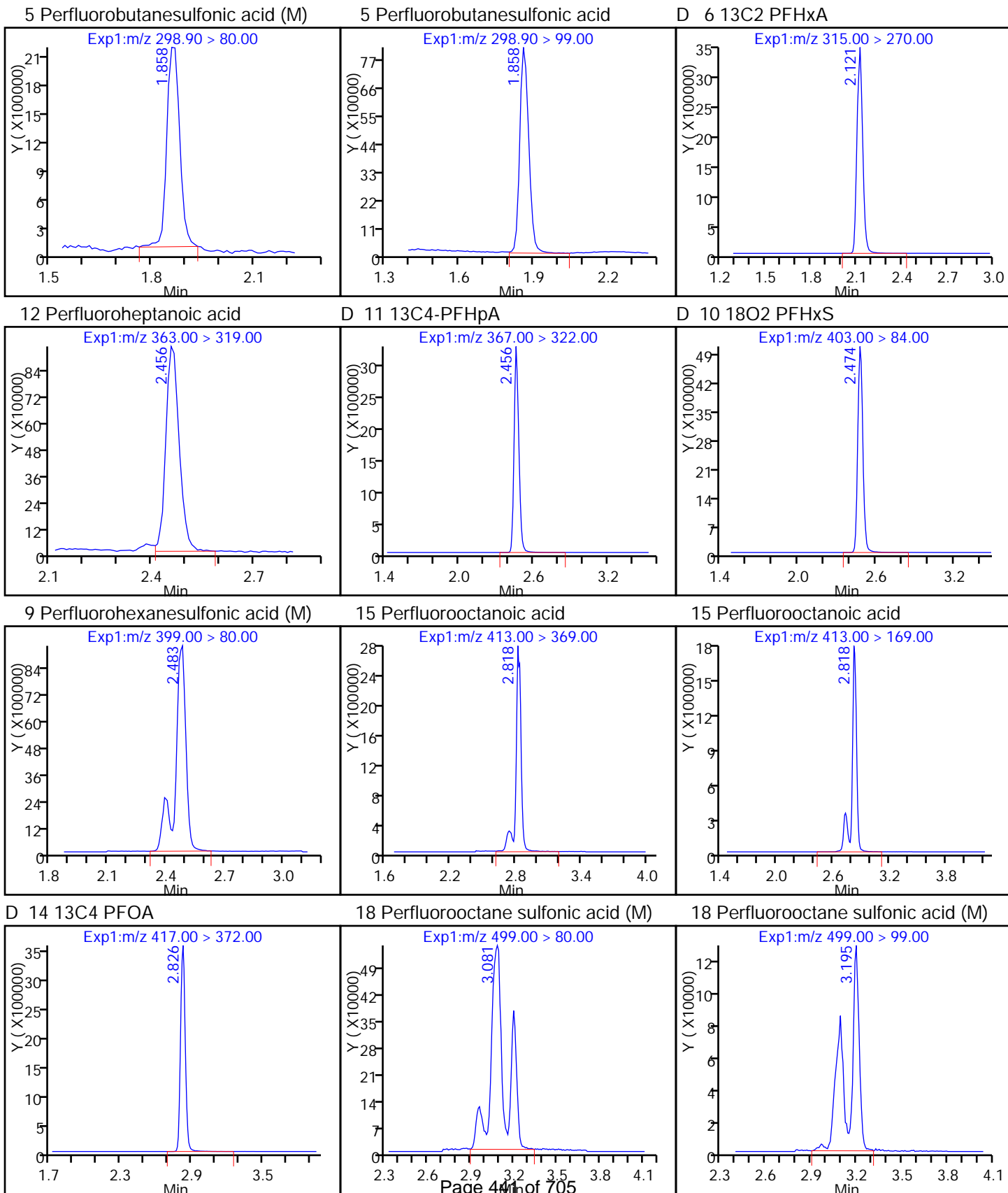
QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica Sacramento

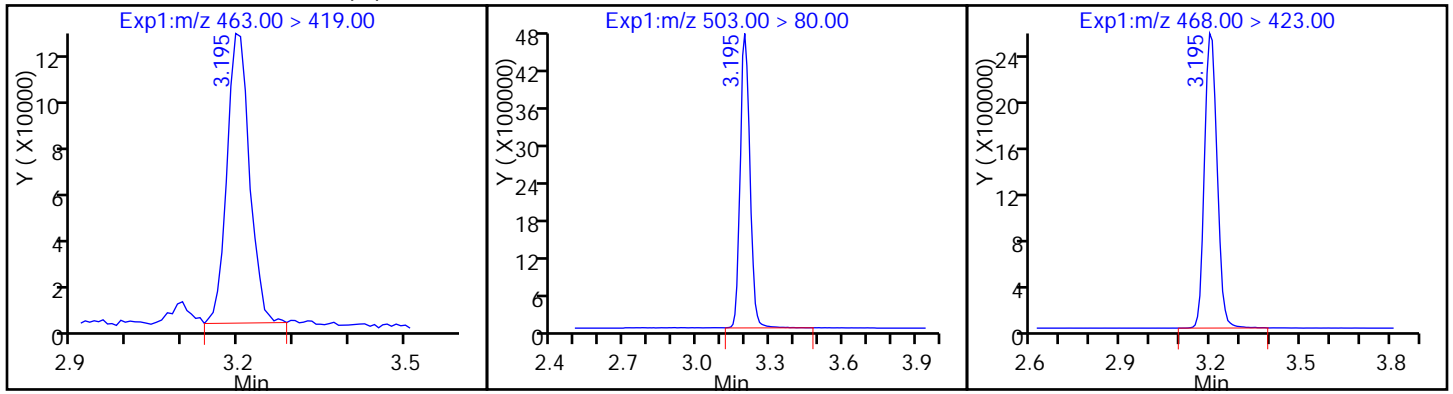
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b\03DEC2016C_022.d
Injection Date: 03-Dec-2016 21:18:48 Instrument ID: A8_N
Lims ID: 320-23696-A-5-A Lab Sample ID: 320-23696-5
Client ID: MCFSMW-2
Operator ID: A8-PC\A8 ALS Bottle#: 23 Worklist Smp#: 22
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL



20 Perfluorononanoic acid (M)

D 17 13C4 PFOS

D 19 13C5 PFNA



TestAmerica Sacramento

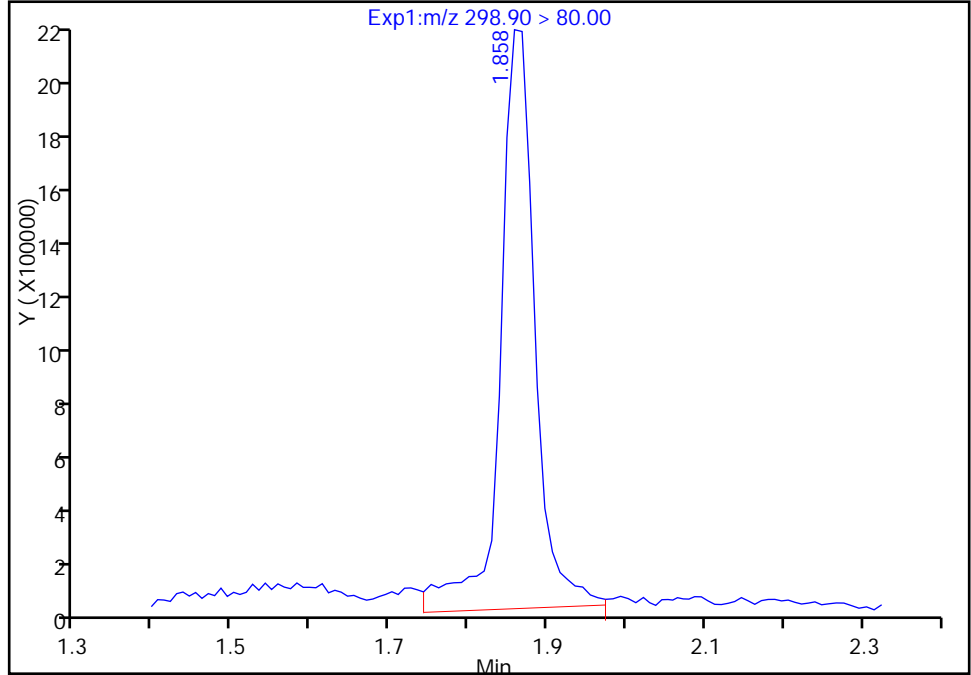
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b\03DEC2016C_022.d
Injection Date: 03-Dec-2016 21:18:48 Instrument ID: A8_N
Lims ID: 320-23696-A-5-A Lab Sample ID: 320-23696-5
Client ID: MCFSMW-2
Operator ID: A8-PC\A8 ALS Bottle#: 23 Worklist Smp#: 22
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 1

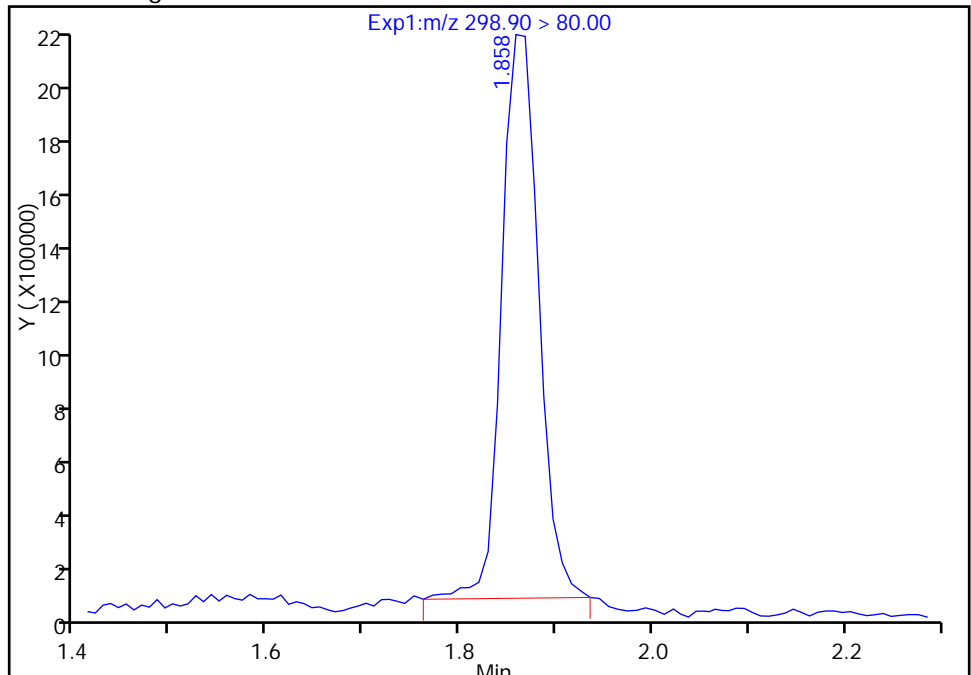
RT: 1.86
Area: 6324168
Amount: 13.347745
Amount Units: ng/ml

Processing Integration Results



RT: 1.86
Area: 5306230
Amount: 11.199292
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

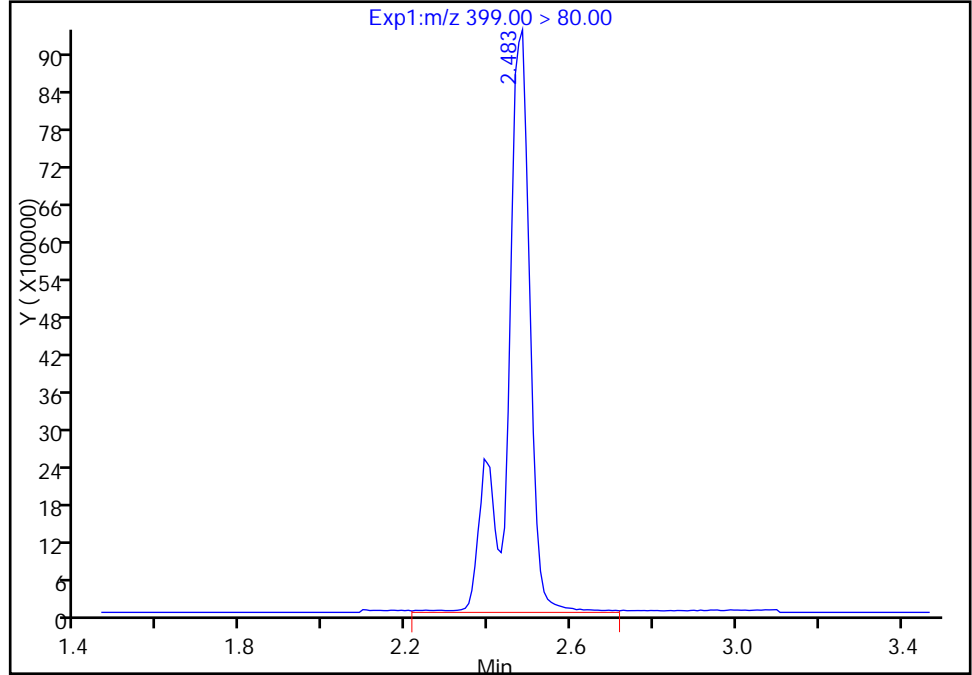
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b\03DEC2016C_022.d
Injection Date: 03-Dec-2016 21:18:48 Instrument ID: A8_N
Lims ID: 320-23696-A-5-A Lab Sample ID: 320-23696-5
Client ID: MCFSMW-2
Operator ID: A8-PC\A8 ALS Bottle#: 23 Worklist Smp#: 22
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

9 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

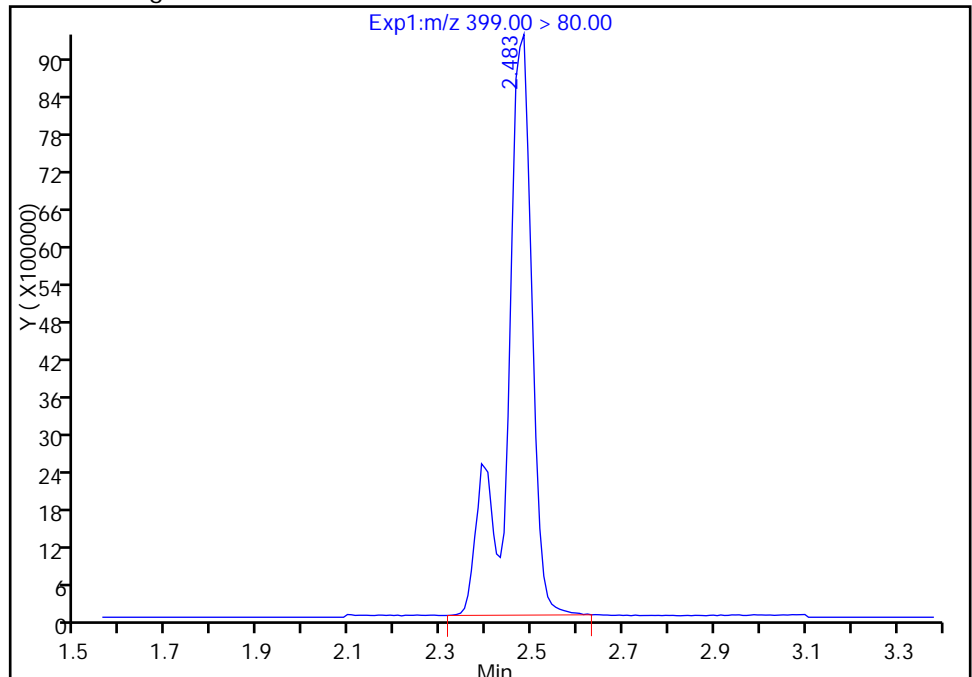
RT: 2.48
Area: 37194985
Amount: 114.1549
Amount Units: ng/ml

Processing Integration Results



RT: 2.48
Area: 36189467
Amount: 111.0689
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

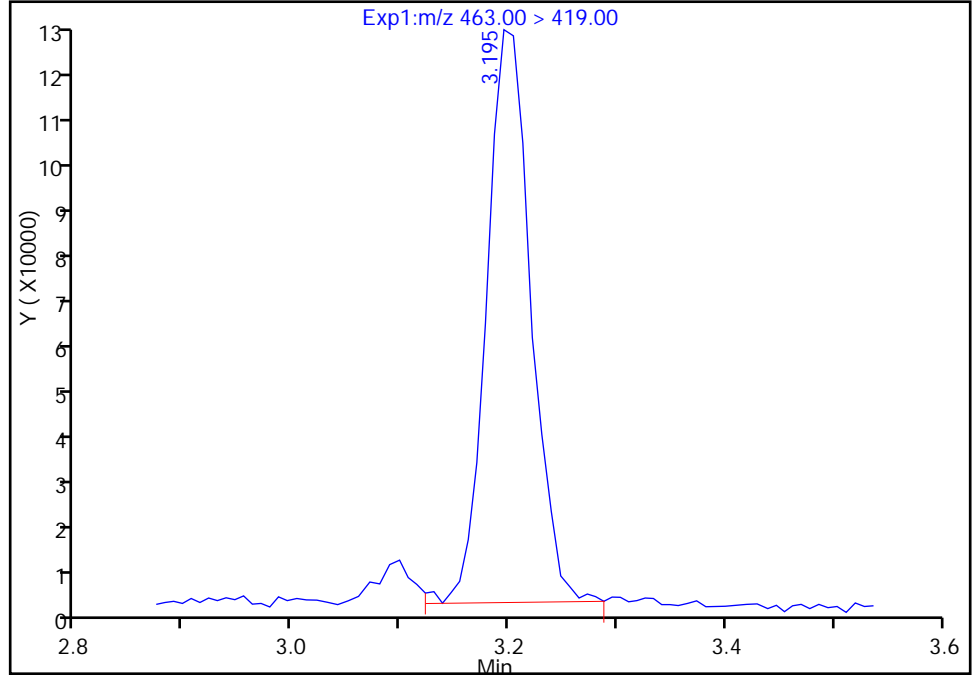
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b\03DEC2016C_022.d
Injection Date: 03-Dec-2016 21:18:48 Instrument ID: A8_N
Lims ID: 320-23696-A-5-A Lab Sample ID: 320-23696-5
Client ID: MCFSMW-2
Operator ID: A8-PC\A8 ALS Bottle#: 23 Worklist Smp#: 22
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

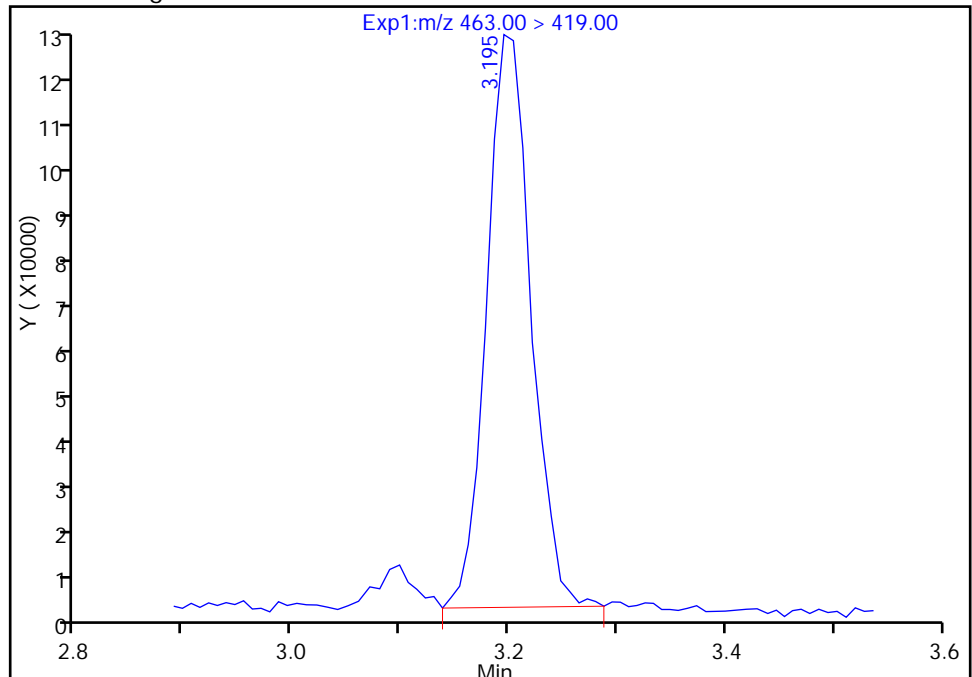
RT: 3.20
Area: 352114
Amount: 2.305508
Amount Units: ng/ml

Processing Integration Results



RT: 3.20
Area: 350261
Amount: 2.293375
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

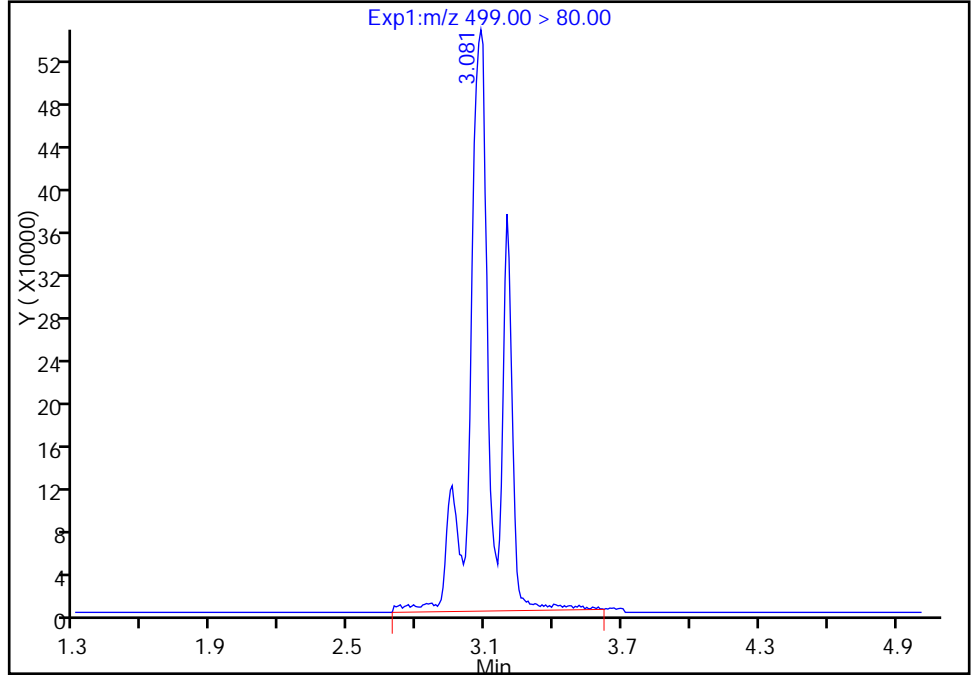
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b\03DEC2016C_022.d
Injection Date: 03-Dec-2016 21:18:48 Instrument ID: A8_N
Lims ID: 320-23696-A-5-A Lab Sample ID: 320-23696-5
Client ID: MCFSMW-2
Operator ID: A8-PC\A8 ALS Bottle#: 23 Worklist Smp#: 22
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

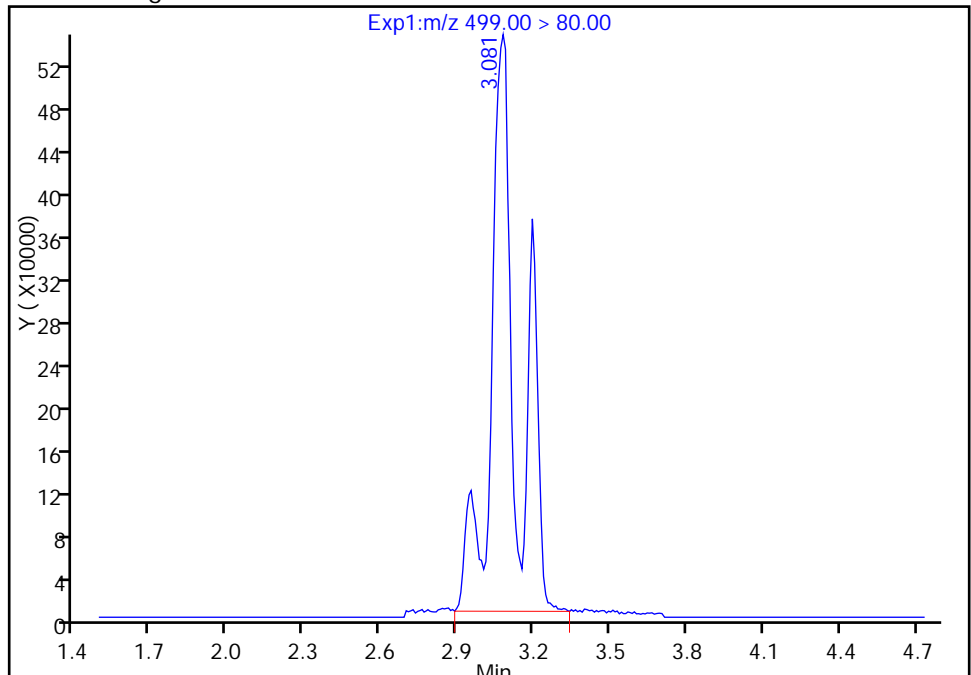
RT: 3.08
Area: 4056162
Amount: 13.432116
Amount Units: ng/ml

Processing Integration Results



RT: 3.08
Area: 3818944
Amount: 12.646560
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

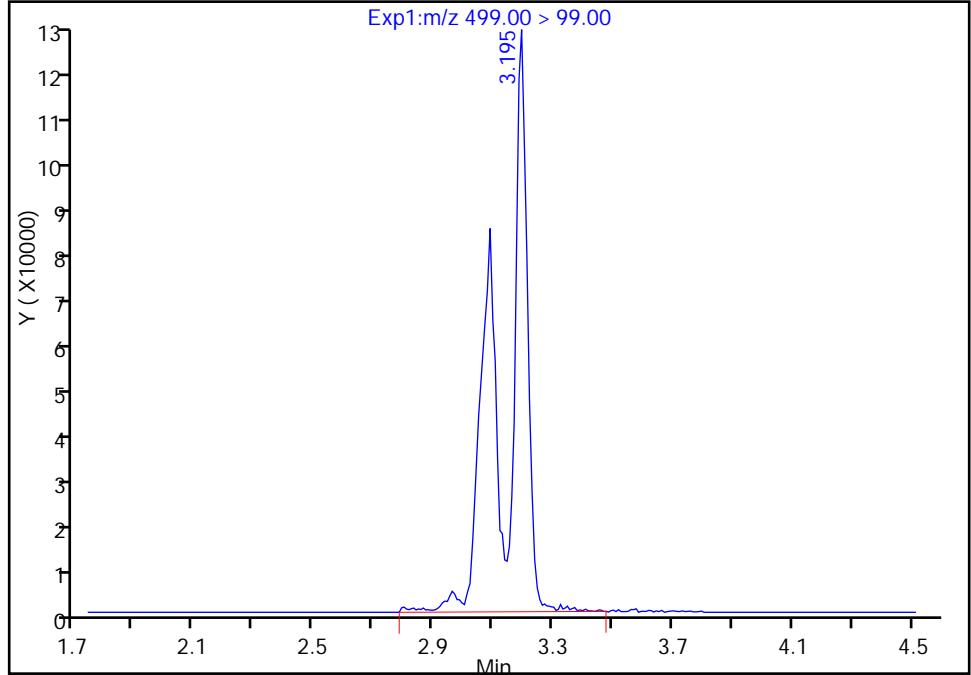
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b\03DEC2016C_022.d
Injection Date: 03-Dec-2016 21:18:48 Instrument ID: A8_N
Lims ID: 320-23696-A-5-A Lab Sample ID: 320-23696-5
Client ID: MCFSMW-2
Operator ID: A8-PC\A8 ALS Bottle#: 23 Worklist Smp#: 22
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

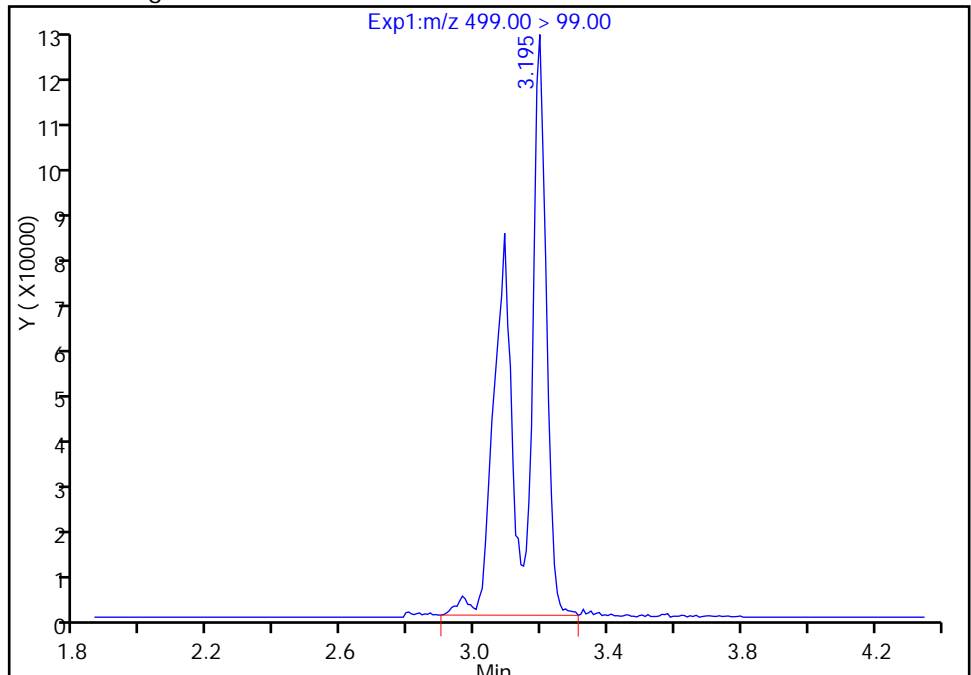
RT: 3.20
Area: 685590
Amount: 13.432116
Amount Units: ng/ml

Processing Integration Results



RT: 3.20
Area: 668305
Amount: 12.646560
Amount Units: ng/ml

Manual Integration Results



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23696-1
 SDG No.: _____
 Client Sample ID: MCFSMW5U-01 Lab Sample ID: 320-23696-6
 Matrix: Water Lab File ID: 03DEC2016C_034.d
 Analysis Method: 537 (Modified) Date Collected: 11/16/2016 15:01
 Extraction Method: 3535 Date Extracted: 11/23/2016 11:47
 Sample wt/vol: 506.9(mL) Date Analyzed: 12/03/2016 22:48
 Con. Extract Vol.: 1.0(mL) Dilution Factor: 1
 Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 140675 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	160	M	2.5	2.0	0.91
375-85-9	Perfluoroheptanoic acid (PFHpA)	41		2.5	2.0	0.79
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	700	J M	2.5	2.0	0.86
375-95-1	Perfluorononanoic acid (PFNA)	11		2.5	2.0	0.65
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2700	J	3.9	3.0	1.3
335-67-1	Perfluorooctanoic acid (PFOA)	84	M	2.5	2.0	0.74

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	102		25-150
STL00991	13C4 PFOS	52		25-150
STL01892	13C4-PFHpA	80		25-150
STL00995	13C5 PFNA	46		25-150
STL00994	18O2 PFHxS	82		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b\03DEC2016C_034.d
 Lims ID: 320-23696-A-6-A
 Client ID: MCFSMW5U-01
 Sample Type: Client
 Inject. Date: 03-Dec-2016 22:48:45 ALS Bottle#: 31 Worklist Smp#: 34
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-23696-A-6-A
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: A8-PC\A8 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 06-Dec-2016 16:24:39 Calib Date: 03-Dec-2016 15:33:40
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d
 Column 1 : Det: EXP1
 Process Host: XAWRK027

First Level Reviewer: chandrasenas Date: 06-Dec-2016 16:24:39

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.867	1.877	-0.010	1.000	33610992	82.0				M
298.90 > 99.00	1.867	1.877	-0.010	1.000	16985319		1.98(0.00-0.00)			M
D 6 13C2 PFHxA										
315.00 > 270.00	2.125	2.129	-0.004		9476149	39.9		79.8	671319	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.462	2.466	-0.004	1.000	3521327	20.7			10234	
D 11 13C4-PFHpA										
367.00 > 322.00	2.462	2.473	-0.011		8268969	39.9		79.7	364113	
D 10 18O2 PFHxS										
403.00 > 84.00	2.477	2.481	-0.004		12147057	38.9		82.2	787870	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.477	2.496	-0.019	1.000	99509067	353.0				EM
15 Perfluorooctanoic acid										
413.00 > 369.00	2.831	2.836	-0.005	1.000	10229901	42.5			95697	M
413.00 > 169.00	2.831	2.836	-0.005	1.000	6757652		1.51(0.90-1.10)		258180	
D 14 13C4 PFOA										
417.00 > 372.00	2.831	2.836	-0.005		11228258	51.2		102	654329	
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.183	3.215	-0.032	1.000	190266604	1380.7			392020	E
499.00 > 99.00	3.201	3.215	-0.014	1.005	65172913		2.92(0.90-1.10)		0.0	
20 Perfluorononanoic acid										
463.00 > 419.00	3.201	3.215	-0.014	1.000	435421	5.74			888	
D 17 13C4 PFOS										
503.00 > 80.00	3.201	3.215	-0.014		6069884	24.7		51.6	91912	
D 19 13C5 PFNA										
468.00 > 423.00	3.210	3.215	-0.005		3806210	22.9		45.7	138420	

QC Flag Legend

Processing Flags

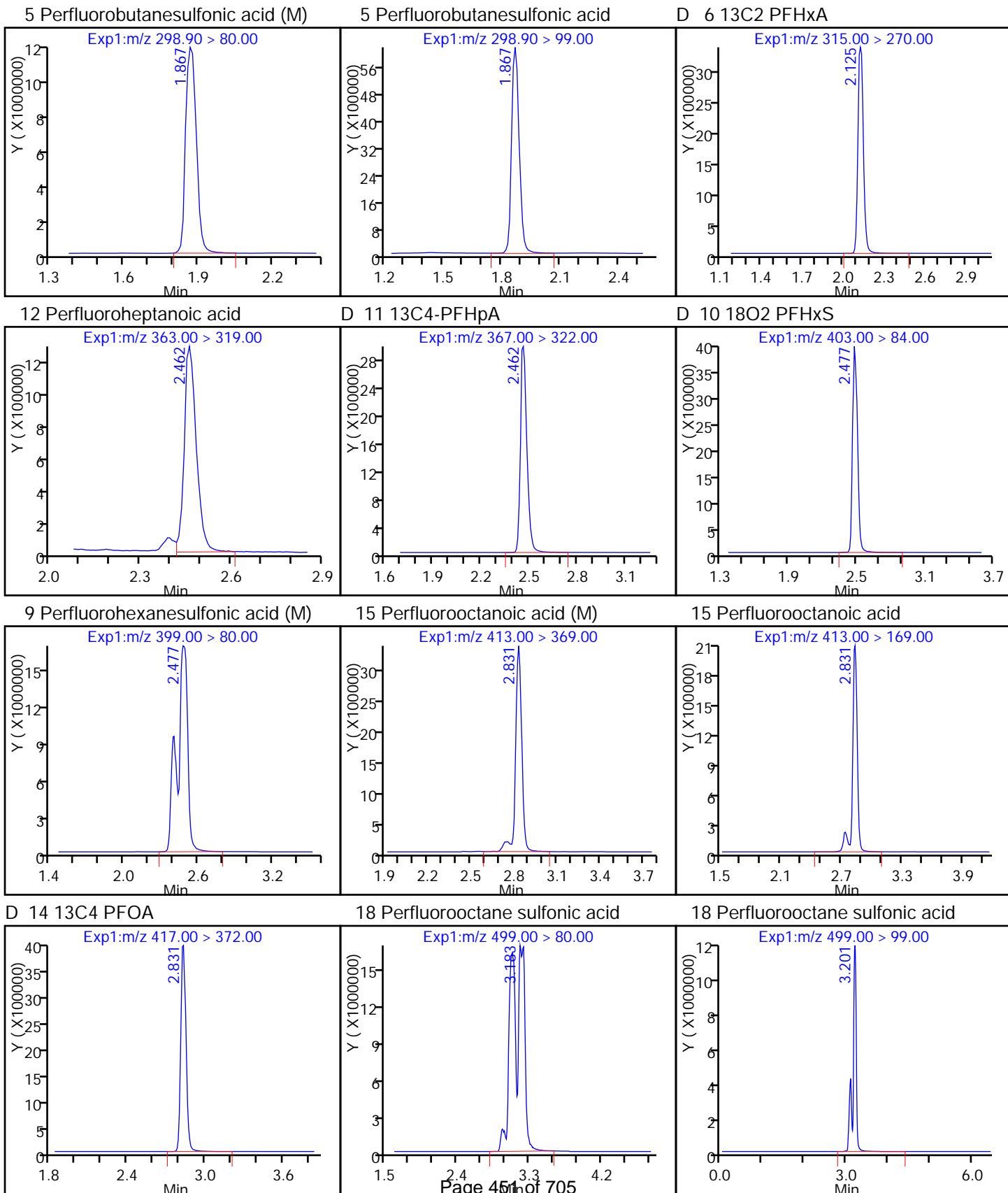
E - Exceeded Maximum Amount

Review Flags

M - Manually Integrated

TestAmerica Sacramento

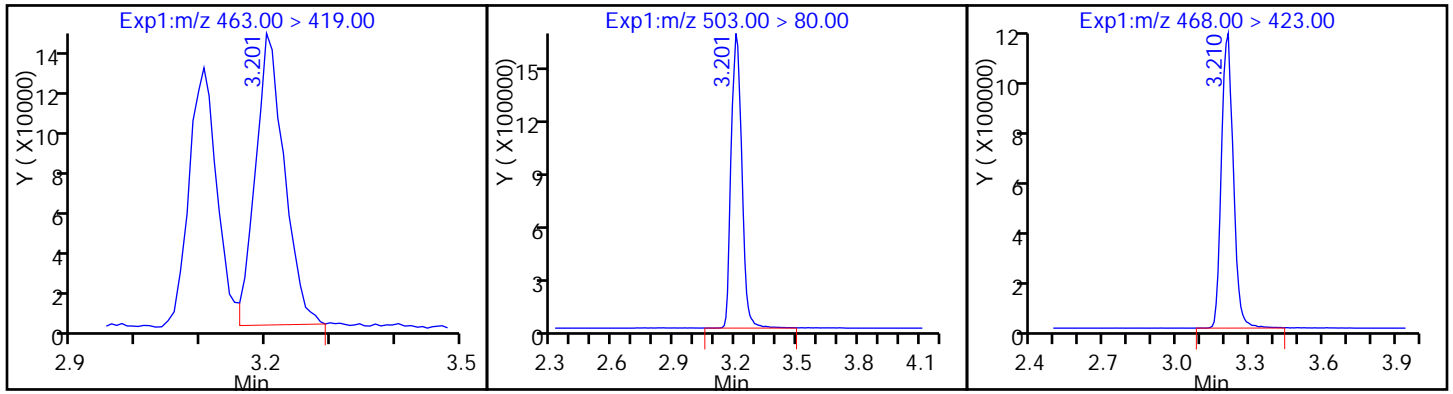
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b\03DEC2016C_034.d
Injection Date: 03-Dec-2016 22:48:45 Instrument ID: A8_N
Lims ID: 320-23696-A-6-A Lab Sample ID: 320-23696-6
Client ID: MCFSMW5U-01
Operator ID: A8-PC\A8 ALS Bottle#: 31 Worklist Smp#: 34
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL



20 Perfluorononanoic acid

D 17 13C4 PFOS

D 19 13C5 PFNA



TestAmerica Sacramento

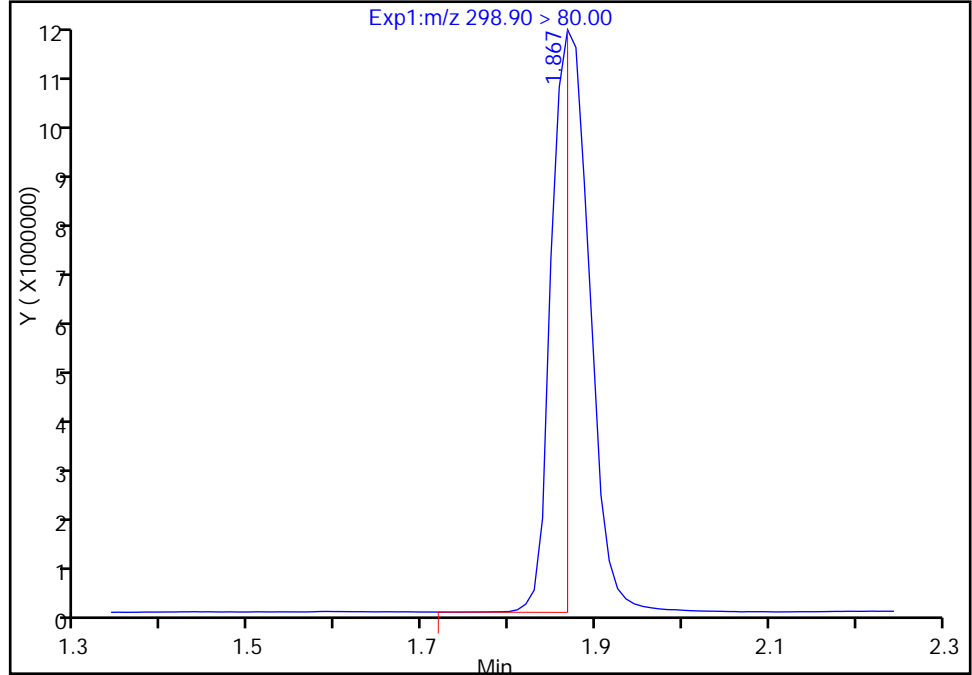
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Injection Date: 03-Dec-2016 22:48:45 Instrument ID: A8_N
Lims ID: 320-23696-A-6-A Lab Sample ID: 320-23696-6
Client ID: MCFSMW5U-01
Operator ID: A8-PC\A8 ALS Bottle#: 31 Worklist Smp#: 34
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 1

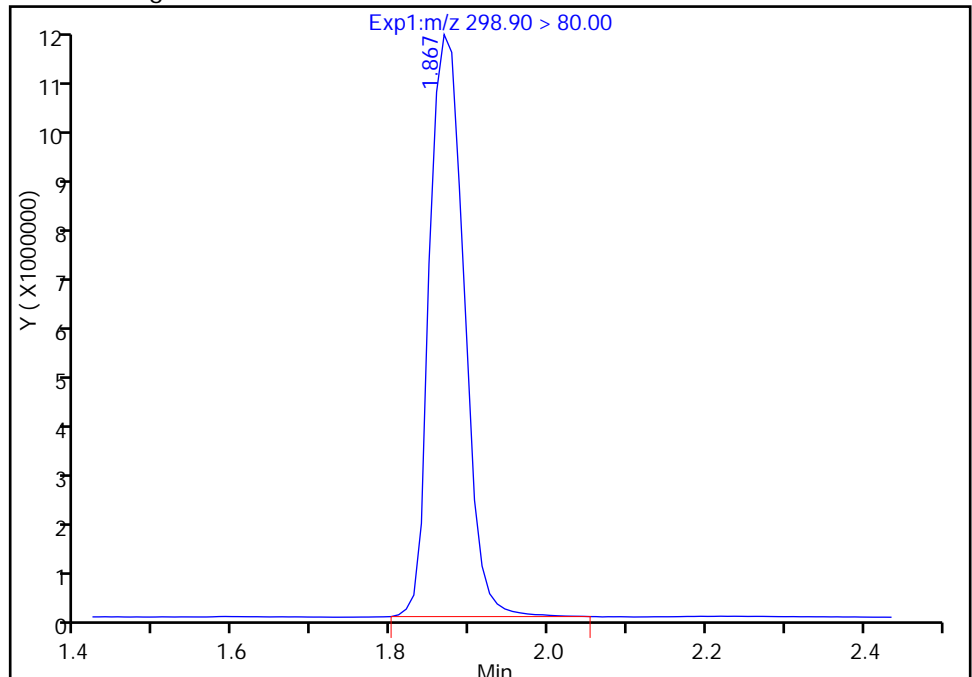
RT: 1.87
Area: 14175484
Amount: 34.584866
Amount Units: ng/ml

Processing Integration Results



RT: 1.87
Area: 33610992
Amount: 82.002959
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

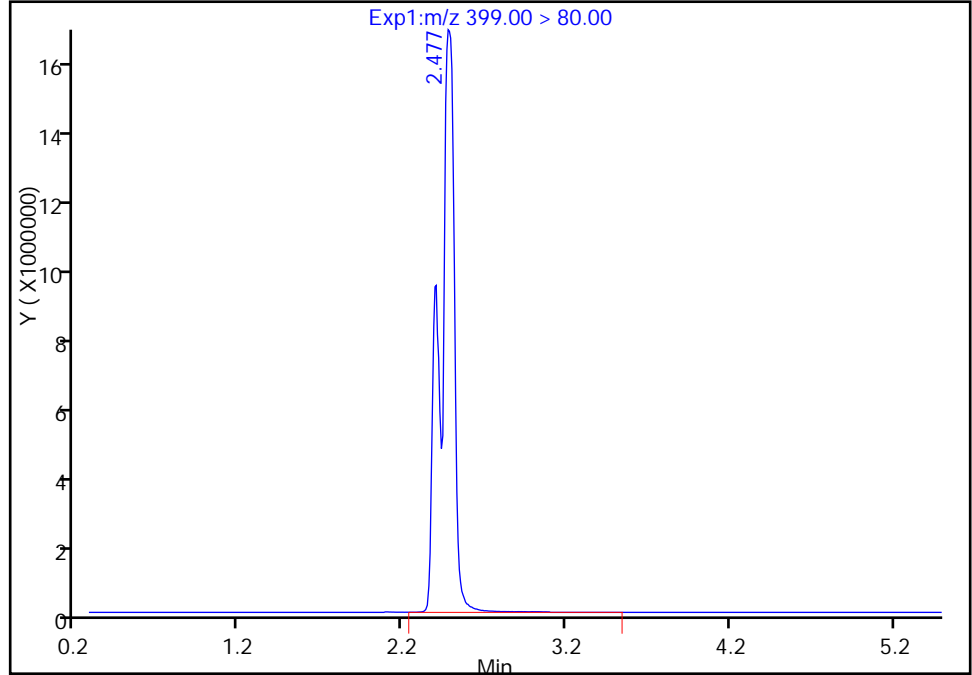
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b\03DEC2016C_034.d
Injection Date: 03-Dec-2016 22:48:45 Instrument ID: A8_N
Lims ID: 320-23696-A-6-A Lab Sample ID: 320-23696-6
Client ID: MCFSMW5U-01
Operator ID: A8-PC\A8 ALS Bottle#: 31 Worklist Smp#: 34
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

9 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

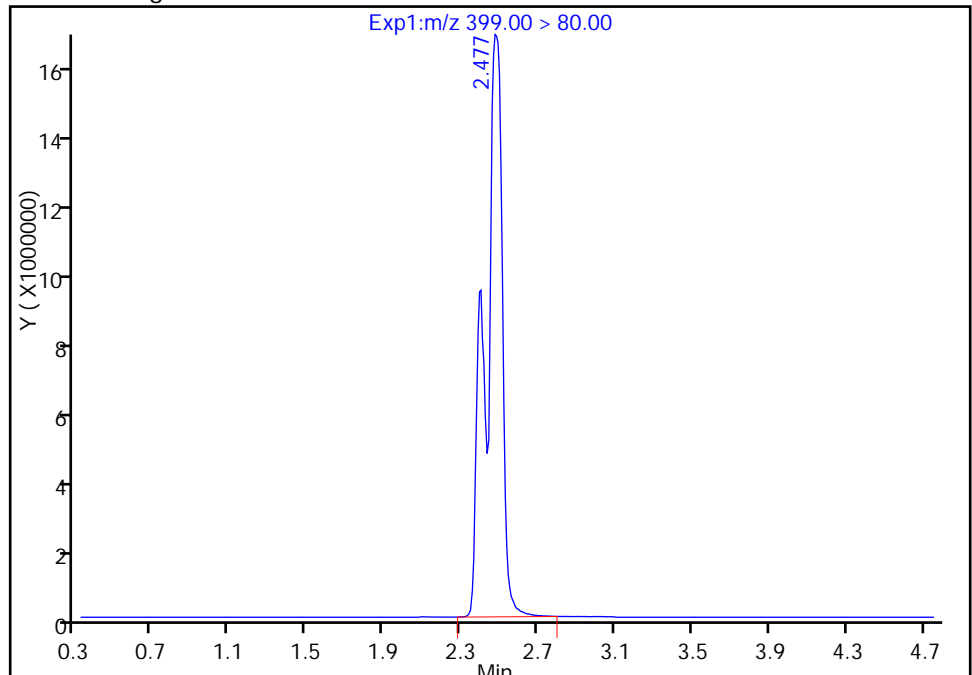
RT: 2.48
Area: 100261499
Amount: 355.7036
Amount Units: ng/ml

Processing Integration Results



RT: 2.48
Area: 99509067
Amount: 353.0341
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

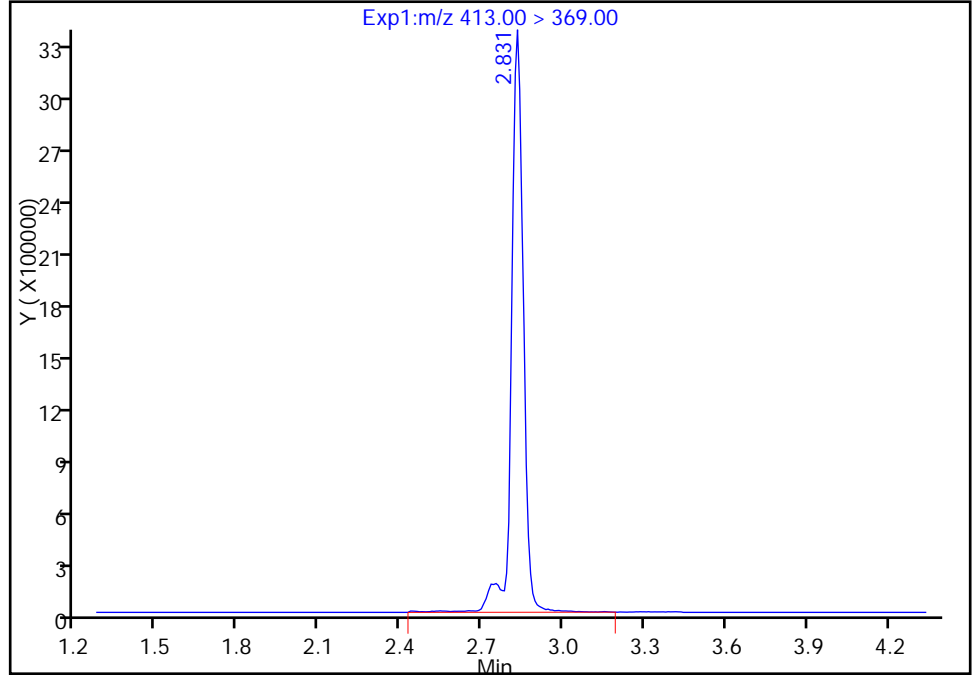
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b\03DEC2016C_034.d
Injection Date: 03-Dec-2016 22:48:45 Instrument ID: A8_N
Lims ID: 320-23696-A-6-A Lab Sample ID: 320-23696-6
Client ID: MCFSMW5U-01
Operator ID: A8-PC\A8 ALS Bottle#: 31 Worklist Smp#: 34
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

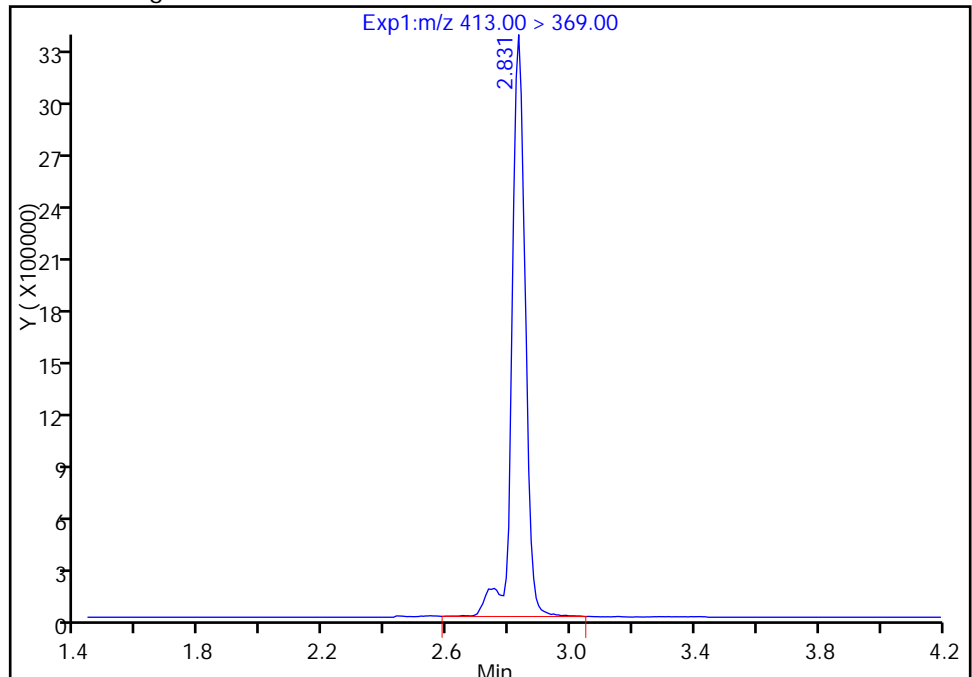
RT: 2.83
Area: 10402341
Amount: 43.214383
Amount Units: ng/ml

Processing Integration Results



RT: 2.83
Area: 10229901
Amount: 42.498017
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 06-Dec-2016 16:24:39
Audit Action: Manually Integrated

Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23696-1
 SDG No.: _____
 Client Sample ID: MCFSMW5U-01 DL Lab Sample ID: 320-23696-6 DL
 Matrix: Water Lab File ID: 07DEC2016C_005.d
 Analysis Method: 537 (Modified) Date Collected: 11/16/2016 15:01
 Extraction Method: 3535 Date Extracted: 11/23/2016 11:47
 Sample wt/vol: 506.9(mL) Date Analyzed: 12/07/2016 21:55
 Con. Extract Vol.: 1.0(mL) Dilution Factor: 100
 Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 141150 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	<i>Perfluorobutanesulfonic acid (PFBS)</i>	170	J D	250	200	91
375-85-9	<i>Perfluoroheptanoic acid (PFHpA)</i>	200	U	250	200	79
355-46-4	<i>Perfluorohexanesulfonic acid (PFHxS)</i>	1000	D	250	200	86
375-95-1	<i>Perfluorononanoic acid (PFNA)</i>	200	U	250	200	65
1763-23-1	<i>Perfluorooctanesulfonic acid (PFOS)</i>	3900	D	390	300	130
335-67-1	<i>Perfluorooctanoic acid (PFOA)</i>	100	J D	250	200	74

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	134		25-150
STL00991	13C4 PFOS	124		25-150
STL01892	13C4-PFHpA	133		25-150
STL00995	13C5 PFNA	117		25-150
STL00994	18O2 PFHxS	139		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

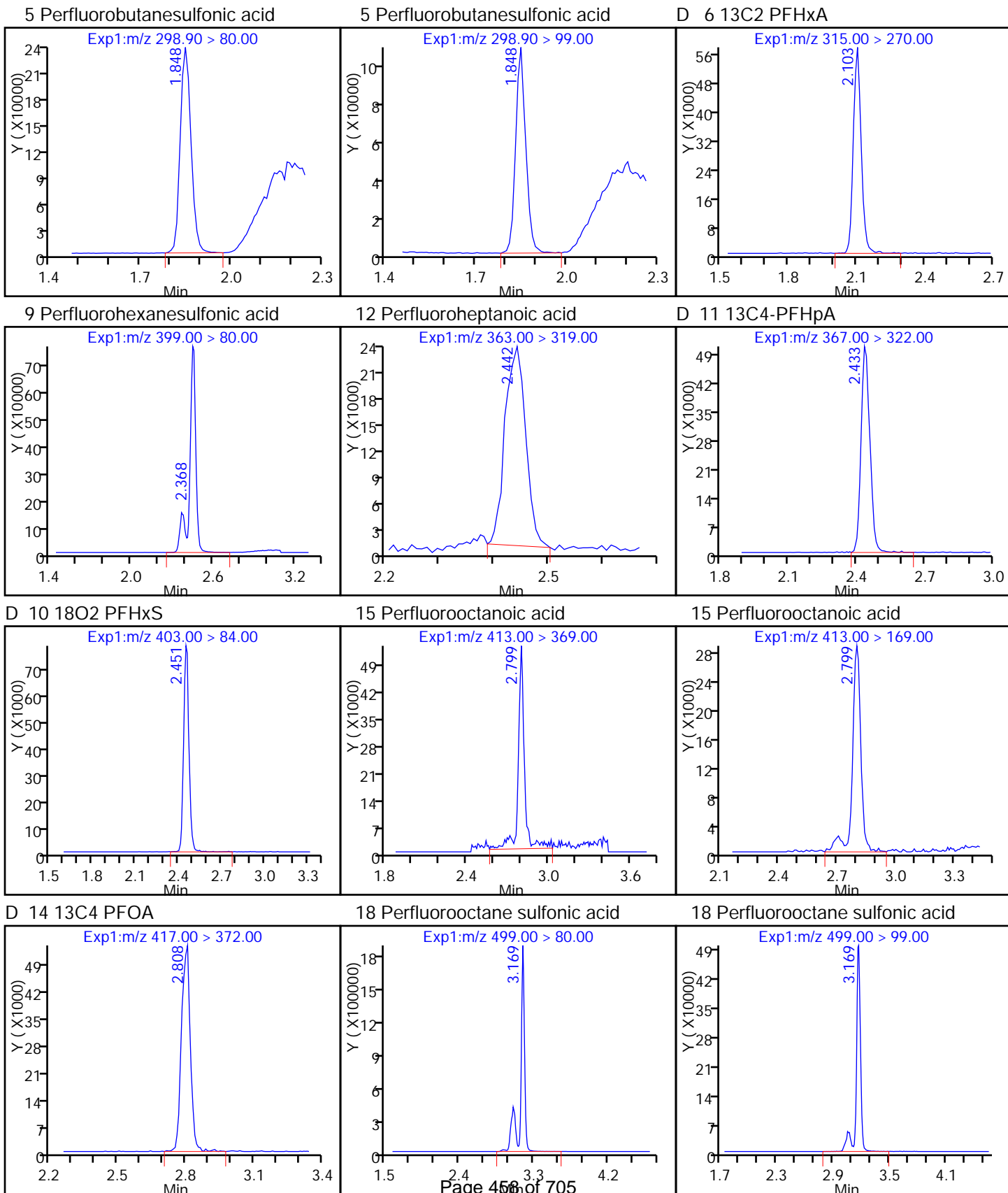
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161208-37624.b\07DEC2016C_005.d
 Lims ID: 320-23696-A-6-A
 Client ID: MCFSMW5U-01
 Sample Type: Client
 Inject. Date: 07-Dec-2016 21:55:49 ALS Bottle#: 40 Worklist Smp#: 5
 Injection Vol: 2.0 ul Dil. Factor: 100.0000
 Sample Info: 320-23696-a-6-a 100X
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: A8-PC\A8 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20161208-37624.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 08-Dec-2016 09:12:21 Calib Date: 03-Dec-2016 15:33:40
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d
 Column 1 : Det: EXP1
 Process Host: XAWRK027

First Level Reviewer: chandrasenas Date: 08-Dec-2016 09:13:01

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.848	1.858	-0.010	1.000	595903	0.8573				
298.90 > 99.00	1.848	1.858	-0.010	1.000	247597		2.41(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.103	2.109	-0.006		140614	0.5921		1.2	19113	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.368	2.372	-0.004	1.000	2460153	5.15				
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.442	2.438	0.004	1.000	58654	0.2066			539	
D 11 13C4-PFHpA										
367.00 > 322.00	2.433	2.438	-0.005		138229	0.6664		1.3	25219	
D 10 18O2 PFHxS										
403.00 > 84.00	2.451	2.455	-0.004		205994	0.6595		1.4	78598	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.799	2.796	0.003	1.000	166270	0.5279			2014	
413.00 > 169.00	2.799	2.796	0.003	1.000	88933		1.87(0.90-1.10)		4127	
D 14 13C4 PFOA										
417.00 > 372.00	2.808	2.804	0.004		146924	0.6701		1.3	26714	
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.169	3.147	0.022	1.000	6511062	19.7			1880228	
499.00 > 99.00	3.169	3.147	0.022	1.000	1548515		4.20(0.90-1.10)		98340	
D 17 13C4 PFOS										
503.00 > 80.00	3.169	3.163	0.006		145805	0.5927		1.2	19739	
20 Perfluorononanoic acid										
463.00 > 419.00	3.161	3.171	-0.010	1.000	10944	0.0565			132	
D 19 13C5 PFNA										
468.00 > 423.00	3.169	3.171	-0.002		97173	0.5839		1.2	17668	

TestAmerica Sacramento

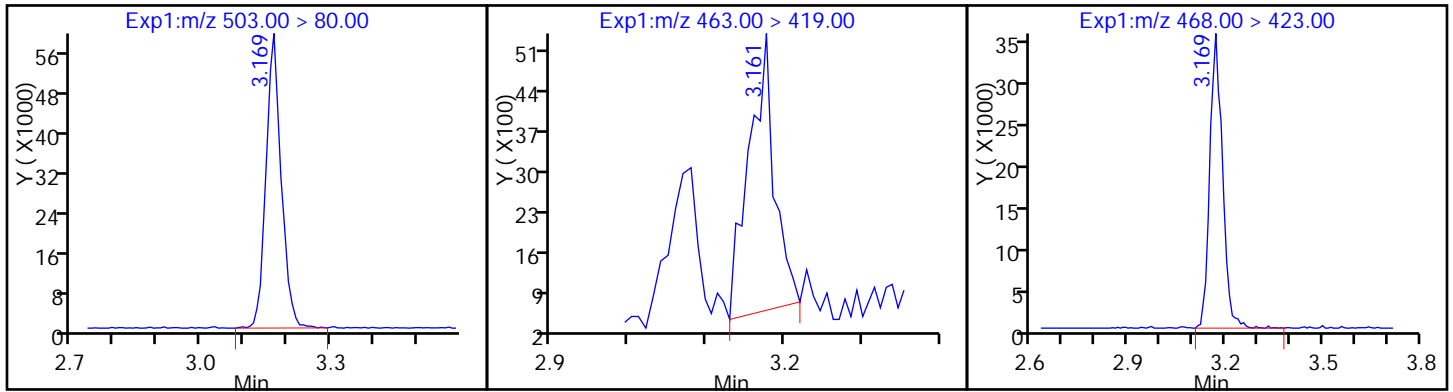
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161208-37624.b\07DEC2016C_005.d
Injection Date: 07-Dec-2016 21:55:49 Instrument ID: A8_N
Lims ID: 320-23696-A-6-A Lab Sample ID: 320-23696-6
Client ID: MCFSMW5U-01
Operator ID: A8-PC\A8 ALS Bottle#: 40 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 100.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL



D 17 13C4 PFOS

20 Perfluorononanoic acid

D 19 13C5 PFNA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23696-1
 SDG No.: _____
 Client Sample ID: MCFSMW-16 Lab Sample ID: 320-23696-7
 Matrix: Water Lab File ID: 03DEC2016C_035.d
 Analysis Method: 537 (Modified) Date Collected: 11/16/2016 16:06
 Extraction Method: 3535 Date Extracted: 11/23/2016 11:47
 Sample wt/vol: 481.1 (mL) Date Analyzed: 12/03/2016 22:56
 Con. Extract Vol.: 1.0 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: Acquity ID: 2.1 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 140675 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	37		2.6	2.1	0.95
375-85-9	Perfluoroheptanoic acid (PFHpA)	50		2.6	2.1	0.83
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	340		2.6	2.1	0.90
375-95-1	Perfluorononanoic acid (PFNA)	2.8		2.6	2.1	0.68
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	280		4.2	3.1	1.3
335-67-1	Perfluorooctanoic acid (PFOA)	120	M	2.6	2.1	0.78

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	70		25-150
STL00991	13C4 PFOS	101		25-150
STL01892	13C4-PFHpA	67		25-150
STL00995	13C5 PFNA	56		25-150
STL00994	18O2 PFHxS	97		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b\03DEC2016C_035.d
 Lims ID: 320-23696-A-7-A
 Client ID: MCFSMW-16
 Sample Type: Client
 Inject. Date: 03-Dec-2016 22:56:15 ALS Bottle#: 32 Worklist Smp#: 35
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-23696-A-7-A
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: A8-PC\A8 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 06-Dec-2016 16:25:22 Calib Date: 03-Dec-2016 15:33:40
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d
 Column 1 : Det: EXP1
 Process Host: XAWRK027

First Level Reviewer: chandrasenas Date: 06-Dec-2016 16:25:22

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.868	1.877	-0.009	1.000	8640779	17.9				
298.90 > 99.00	1.858	1.877	-0.019	0.995	3447136		2.51(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.117	2.129	-0.012		7256625	30.6		61.1	886408	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.463	2.466	-0.003	1.000	3433664	23.9			8586	
D 11 13C4-PFHpA										
367.00 > 322.00	2.463	2.473	-0.010		6992561	33.7		67.4	510517	
D 10 18O2 PFHxS										
403.00 > 84.00	2.478	2.481	-0.003		14278441	45.7		96.6	1574595	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.478	2.496	-0.018	1.000	54385787	164.1				
15 Perfluorooctanoic acid										
413.00 > 369.00	2.825	2.836	-0.011	1.000	9316370	56.9			40136	M
413.00 > 169.00	2.825	2.836	-0.011	1.000	6754104		1.38(0.90-1.10)		217347	
D 14 13C4 PFOA										
417.00 > 372.00	2.825	2.836	-0.011		7639974	34.8		69.7	400562	
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.194	3.215	-0.021	1.000	36895669	136.5			1235507	
499.00 > 99.00	3.194	3.215	-0.021	1.000	9202335		4.01(0.90-1.10)		0.0	
20 Perfluorononanoic acid										
463.00 > 419.00	3.194	3.215	-0.021	1.000	123028	1.33			857	
D 17 13C4 PFOS										
503.00 > 80.00	3.194	3.215	-0.021		11908404	48.4		101	163412	
D 19 13C5 PFNA										
468.00 > 423.00	3.203	3.215	-0.012		4648182	27.9		55.9	214802	

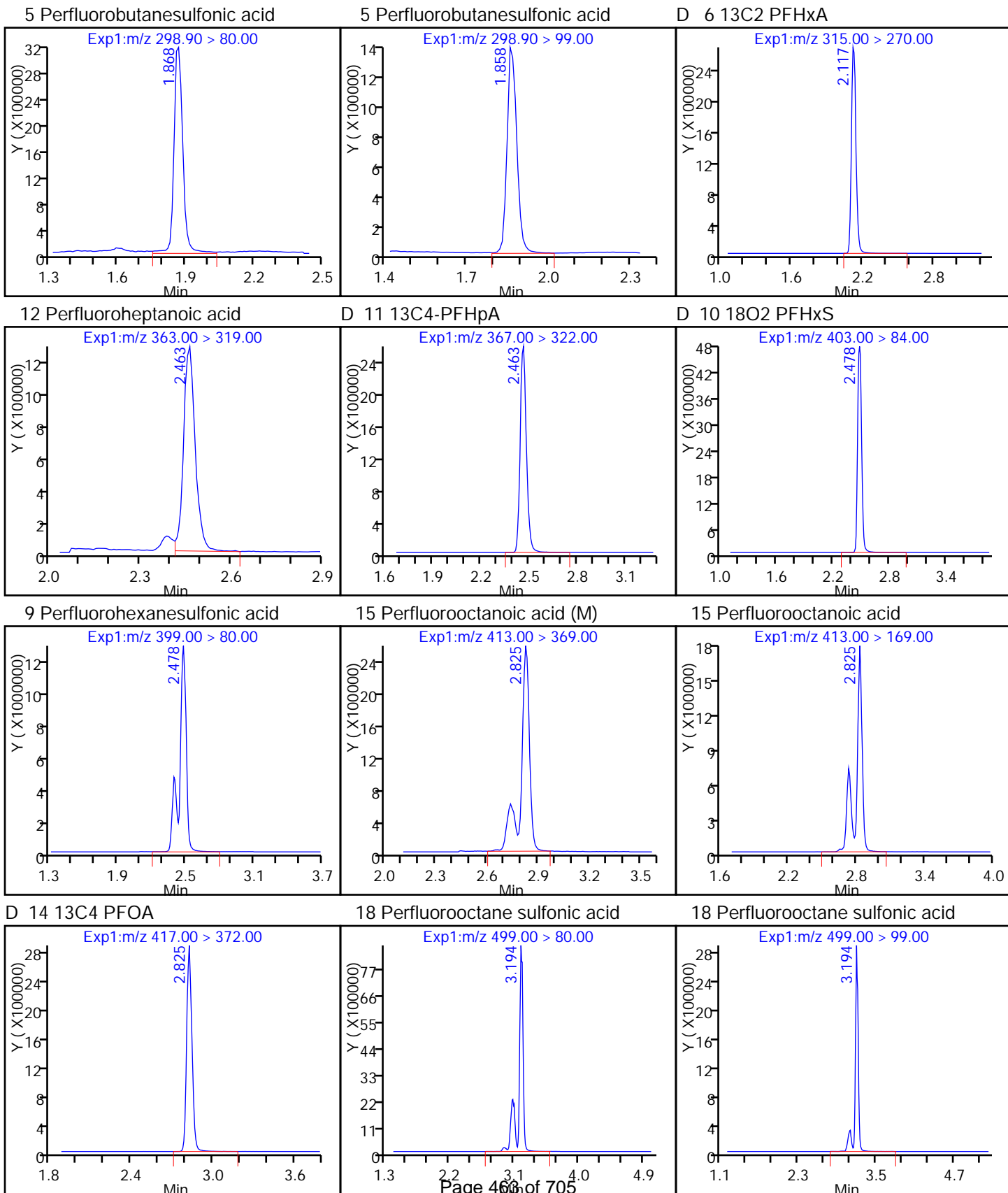
QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica Sacramento

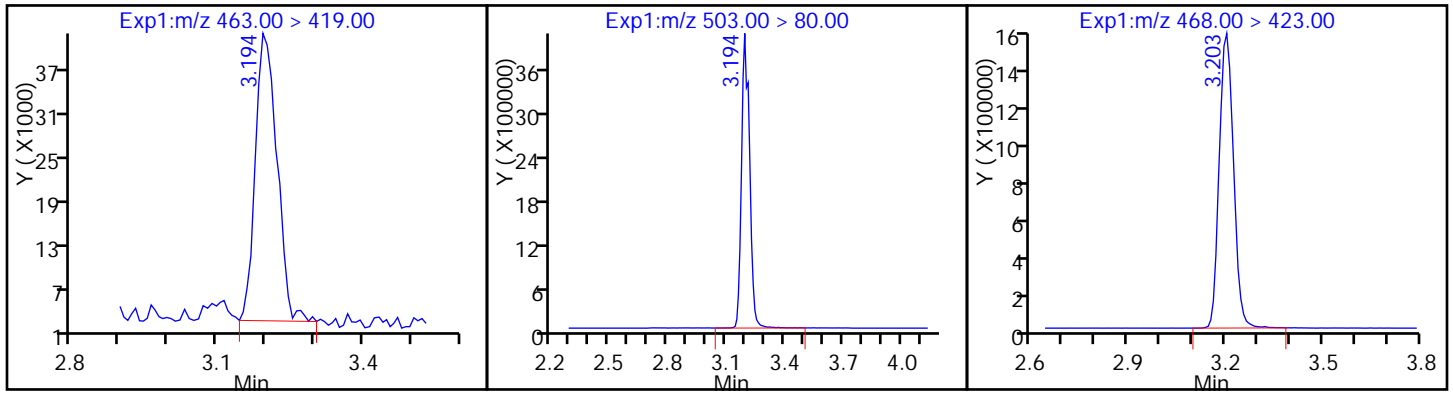
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b\03DEC2016C_035.d
Injection Date: 03-Dec-2016 22:56:15 Instrument ID: A8_N
Lims ID: 320-23696-A-7-A Lab Sample ID: 320-23696-7
Client ID: MCFSMW-16
Operator ID: A8-PC\A8 ALS Bottle#: 32 Worklist Smp#: 35
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL



20 Perfluorononanoic acid

D 17 13C4 PFOS

D 19 13C5 PFNA



TestAmerica Sacramento

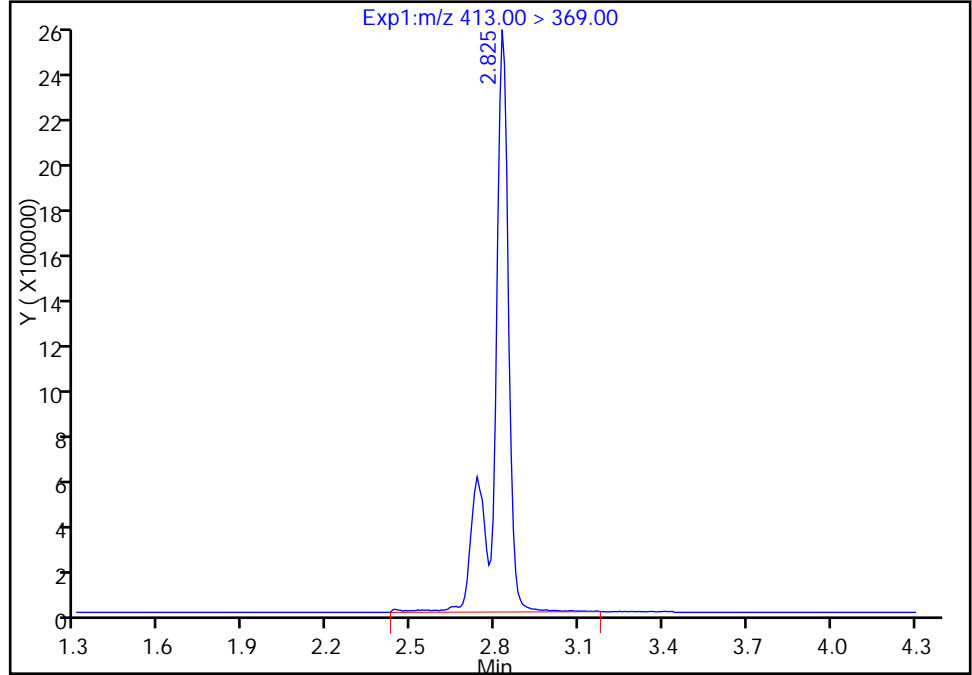
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Injection Date: 03-Dec-2016 22:56:15 Instrument ID: A8_N
Lims ID: 320-23696-A-7-A Lab Sample ID: 320-23696-7
Client ID: MCFSMW-16
Operator ID: A8-PC\A8 ALS Bottle#: 32 Worklist Smp#: 35
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

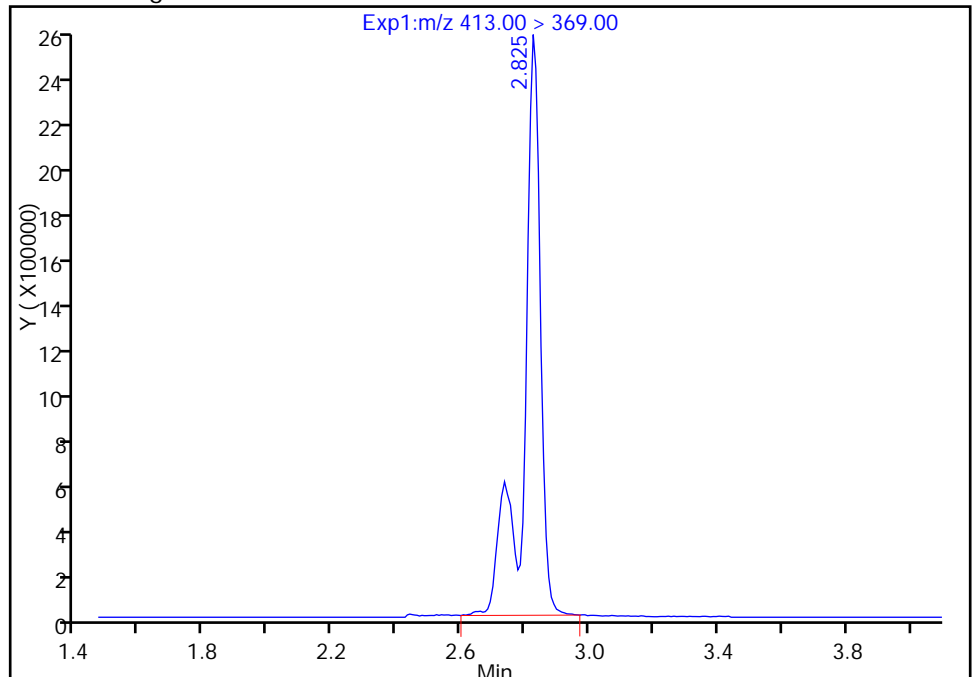
RT: 2.83
Area: 9611401
Amount: 58.681936
Amount Units: ng/ml

Processing Integration Results



RT: 2.83
Area: 9316370
Amount: 56.880639
Amount Units: ng/ml

Manual Integration Results



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23696-1
 SDG No.: _____
 Client Sample ID: DUP-111616 Lab Sample ID: 320-23696-8
 Matrix: Water Lab File ID: 03DEC2016C_023.d
 Analysis Method: 537 (Modified) Date Collected: 11/16/2016 11:01
 Extraction Method: 3535 Date Extracted: 11/23/2016 11:47
 Sample wt/vol: 513.2 (mL) Date Analyzed: 12/03/2016 21:26
 Con. Extract Vol.: 1.0 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: Acquity ID: 2.1 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 140675 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.9	U	2.4	1.9	0.89
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.9	U	2.4	1.9	0.78
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.9	U	2.4	1.9	0.85
375-95-1	Perfluorononanoic acid (PFNA)	1.9	U	2.4	1.9	0.64
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	5.7	M	3.9	2.9	1.2
335-67-1	Perfluorooctanoic acid (PFOA)	1.9	U	2.4	1.9	0.73

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	77		25-150
STL00991	13C4 PFOS	106		25-150
STL01892	13C4-PFHpA	90		25-150
STL00995	13C5 PFNA	70		25-150
STL00994	18O2 PFHxS	103		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b\03DEC2016C_023.d
 Lims ID: 320-23696-A-8-A
 Client ID: DUP-111616
 Sample Type: Client
 Inject. Date: 03-Dec-2016 21:26:18 ALS Bottle#: 24 Worklist Smp#: 23
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-23696-A-8-A
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: A8-PC\A8 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 06-Dec-2016 16:19:26 Calib Date: 03-Dec-2016 15:33:40
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d
 Column 1 : Det: EXP1
 Process Host: XAWRK027

First Level Reviewer: chandrasenas Date: 06-Dec-2016 16:19:26

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.868	1.877	-0.009	1.000	8916	0.0174				
298.90 > 99.00	1.858	1.877	-0.019	0.995	4414		2.02(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.128	2.129	-0.001		9369932	39.5		78.9	491775	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.459	2.466	-0.007	1.000	18631	0.0968			90.9	
D 11 13C4-PFHpA										
367.00 > 322.00	2.466	2.473	-0.007		9370534	45.2		90.4	492804	
D 10 18O2 PFHxS										
403.00 > 84.00	2.481	2.481	0.0		15161185	48.5		103	697154	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.489	2.496	-0.007	1.000	133636	0.3799				
D 14 13C4 PFOA										
417.00 > 372.00	2.830	2.836	-0.006		8412356	38.4		76.7	760905	
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.207	3.215	-0.008	1.000	831567	2.93			33818	M
499.00 > 99.00	3.207	3.215	-0.008	1.000	211067		3.94(0.90-1.10)		10106	
20 Perfluorononanoic acid										
463.00 > 419.00	3.225	3.215	0.010	1.000	4407	0.0379			35.8	
D 17 13C4 PFOS										
503.00 > 80.00	3.207	3.215	-0.008		12487511	50.8		106	366430	
D 19 13C5 PFNA										
468.00 > 423.00	3.207	3.215	-0.008		5829655	35.0		70.1	401298	

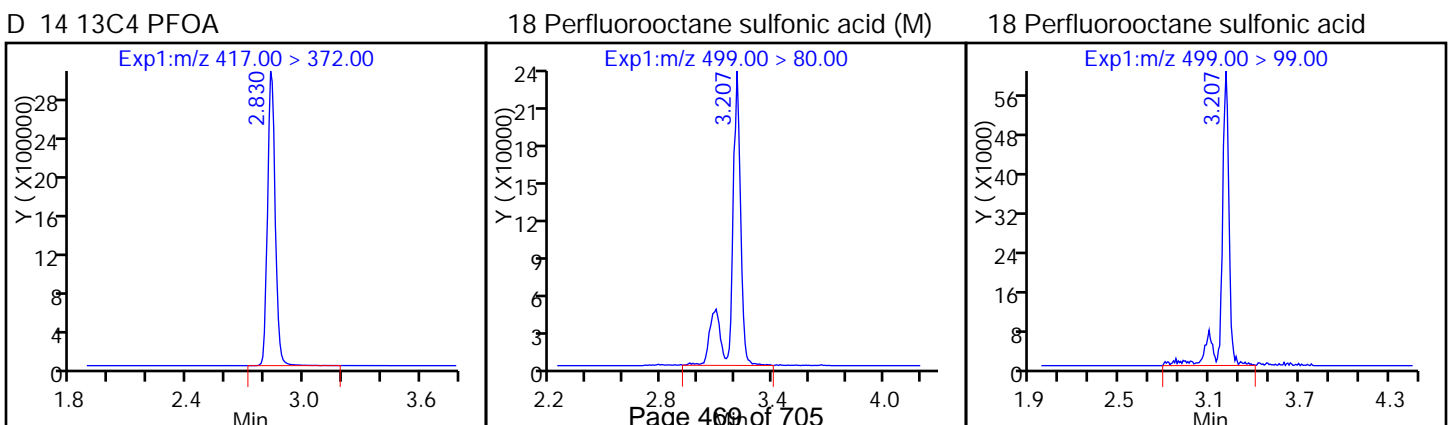
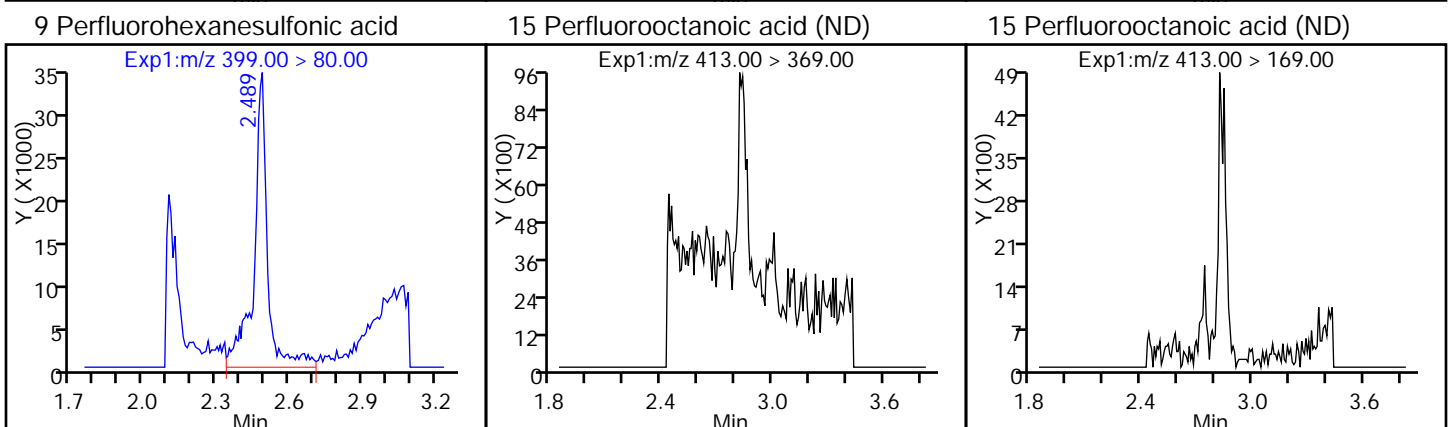
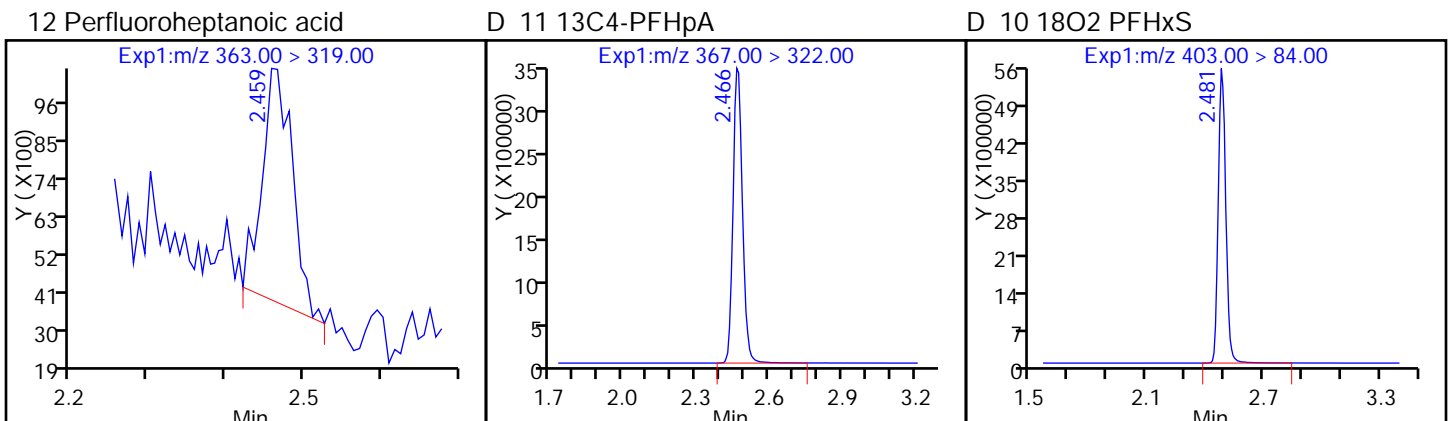
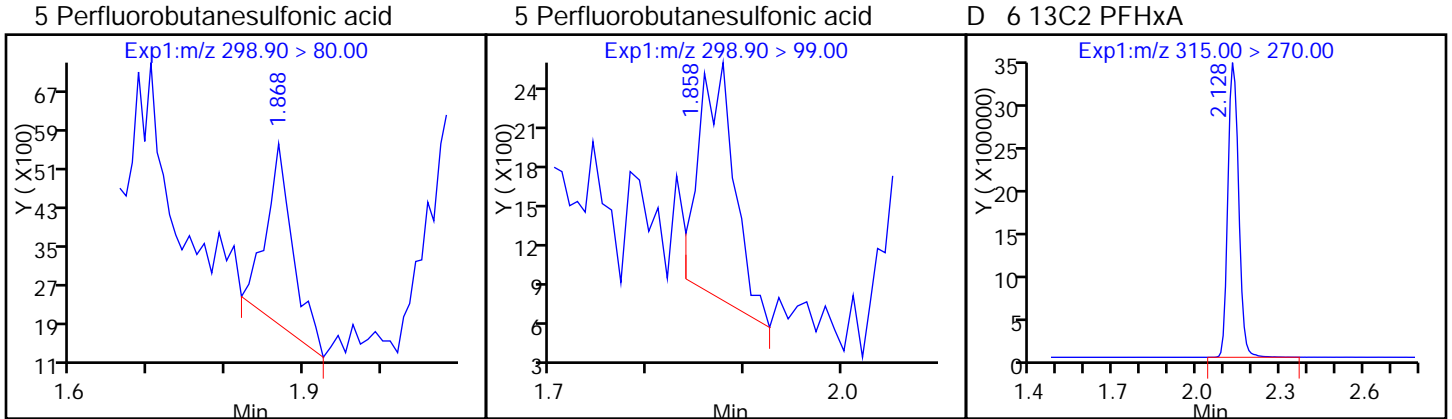
QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica Sacramento

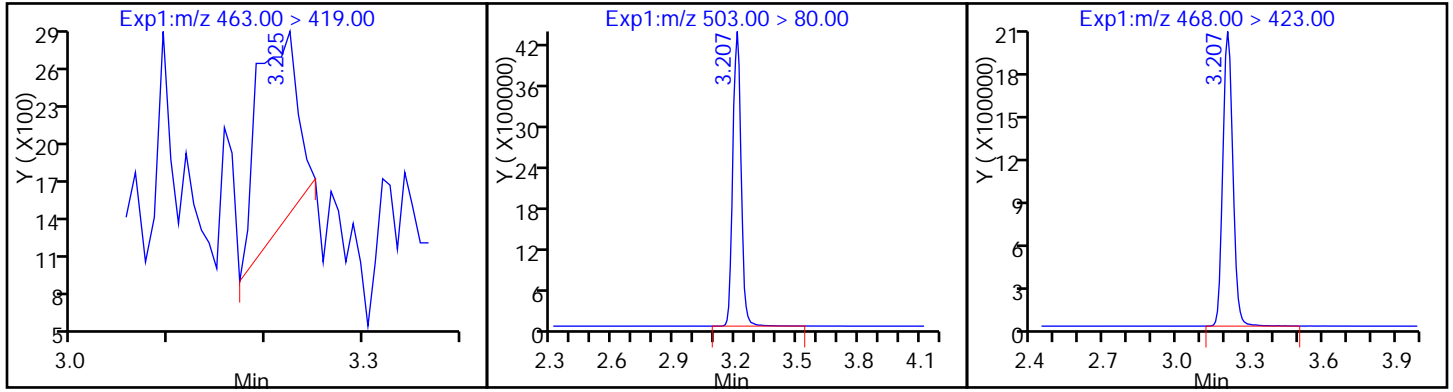
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Injection Date: 03-Dec-2016 21:26:18 Instrument ID: A8_N
Lims ID: 320-23696-A-8-A Lab Sample ID: 320-23696-8
Client ID: DUP-111616
Operator ID: A8-PC\A8 ALS Bottle#: 24 Worklist Smp#: 23
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL



20 Perfluorononanoic acid

D 17 13C4 PFOS

D 19 13C5 PFNA



TestAmerica Sacramento

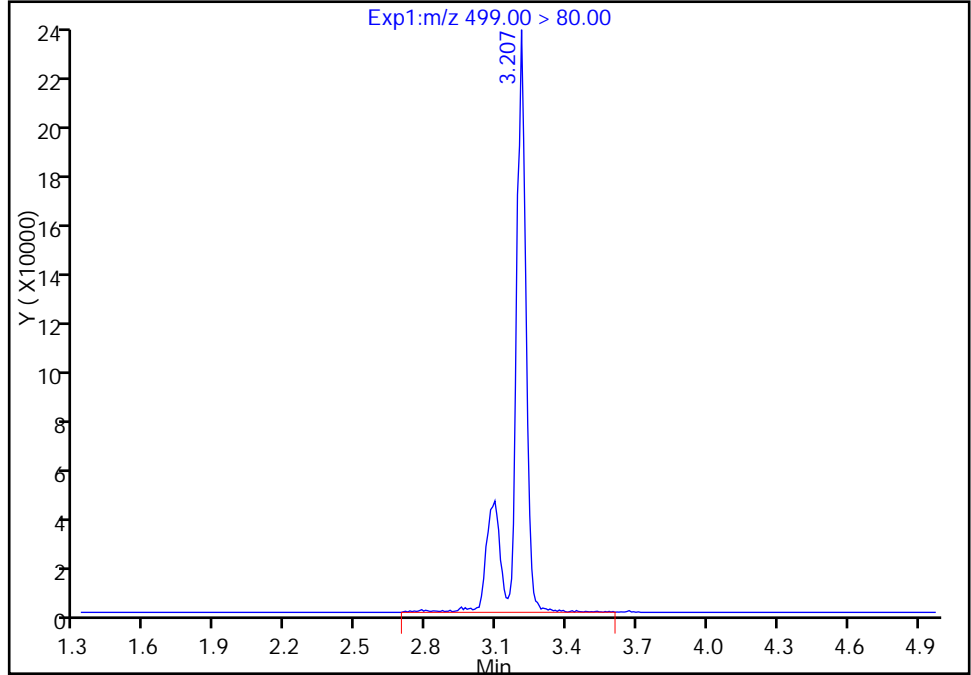
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Injection Date: 03-Dec-2016 21:26:18 Instrument ID: A8_N
Lims ID: 320-23696-A-8-A Lab Sample ID: 320-23696-8
Client ID: DUP-111616
Operator ID: A8-PC\A8 ALS Bottle#: 24 Worklist Smp#: 23
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

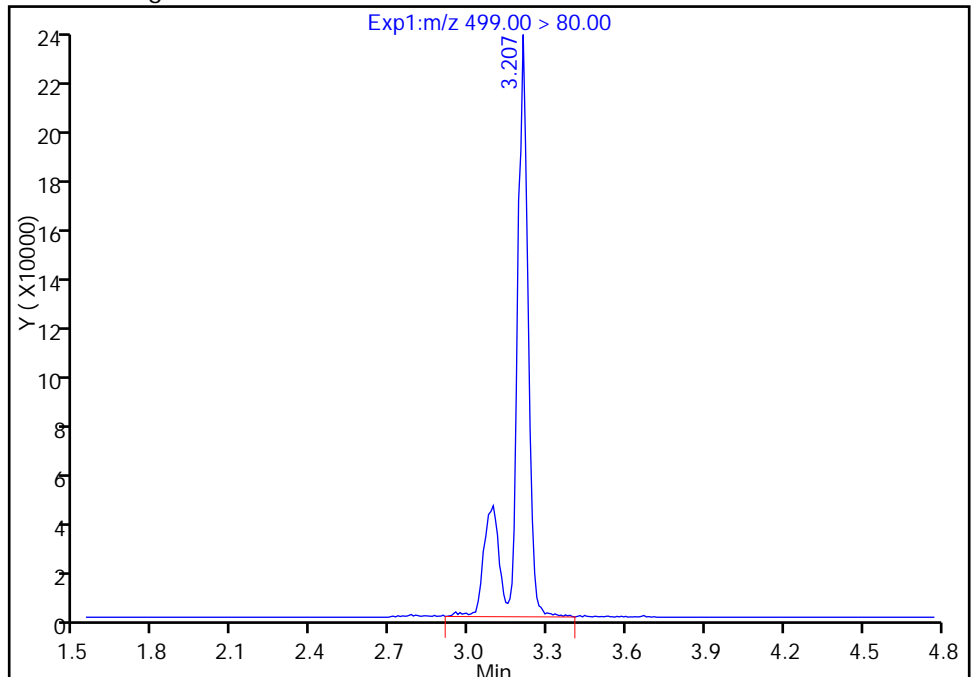
RT: 3.21
Area: 846470
Amount: 2.985686
Amount Units: ng/ml

Processing Integration Results



RT: 3.21
Area: 831567
Amount: 2.933120
Amount Units: ng/ml

Manual Integration Results



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23696-1
 SDG No.: _____
 Client Sample ID: FB111616 Lab Sample ID: 320-23696-9
 Matrix: Water Lab File ID: 03DEC2016C_024.d
 Analysis Method: 537 (Modified) Date Collected: 11/16/2016 13:45
 Extraction Method: 3535 Date Extracted: 11/23/2016 11:47
 Sample wt/vol: 514.5 (mL) Date Analyzed: 12/03/2016 21:33
 Con. Extract Vol.: 1.0 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: Acquity ID: 2.1 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 140675 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.9	U	2.4	1.9	0.89
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.9	U	2.4	1.9	0.78
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.9	U	2.4	1.9	0.85
375-95-1	Perfluorononanoic acid (PFNA)	1.9	U	2.4	1.9	0.64
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.9	U	3.9	2.9	1.2
335-67-1	Perfluorooctanoic acid (PFOA)	1.9	U	2.4	1.9	0.73

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	105		25-150
STL00991	13C4 PFOS	96		25-150
STL01892	13C4-PFHpA	106		25-150
STL00995	13C5 PFNA	105		25-150
STL00994	18O2 PFHxS	95		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

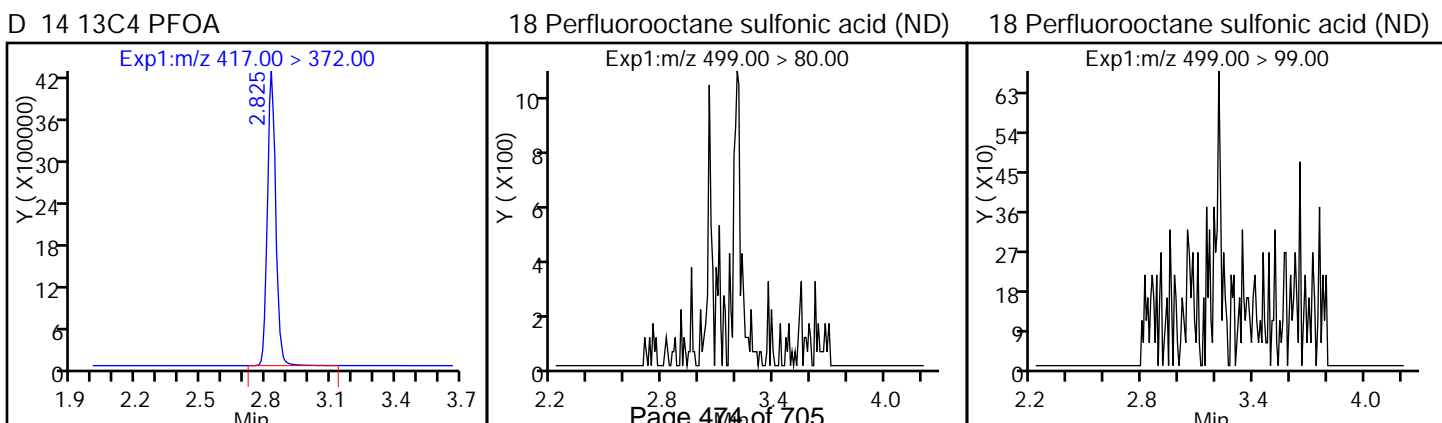
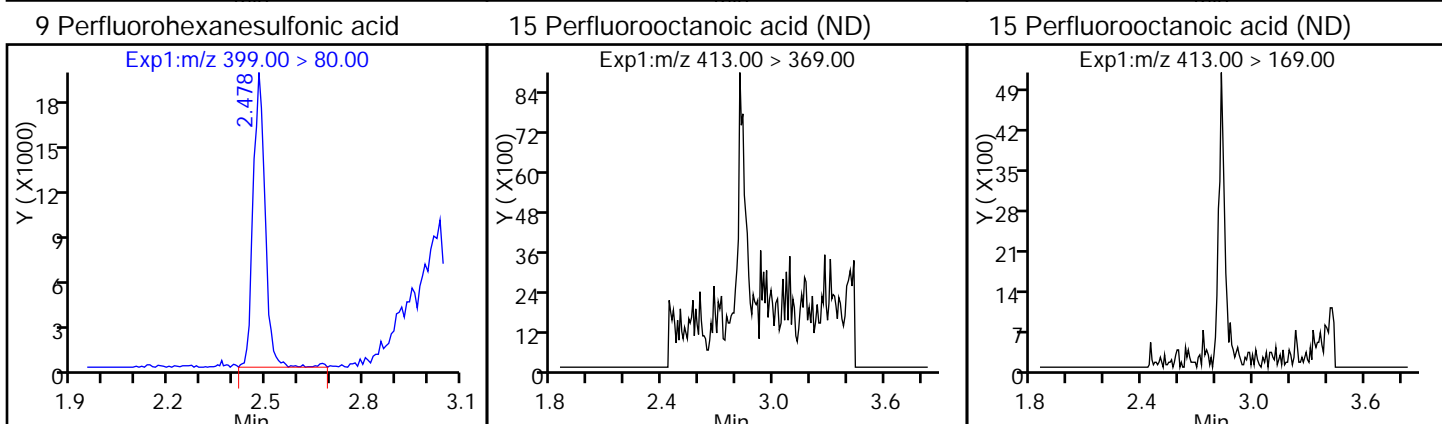
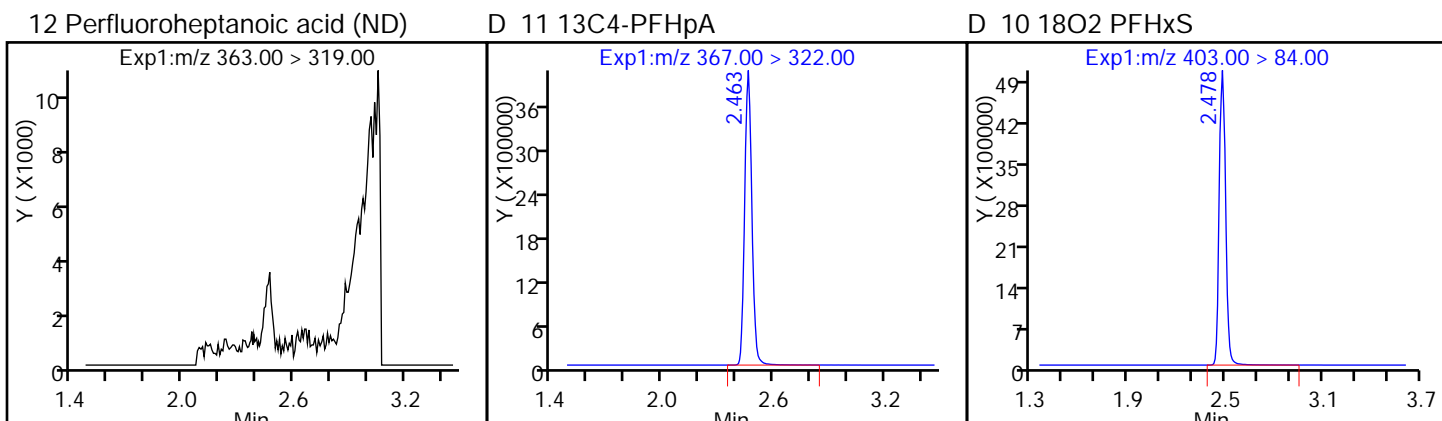
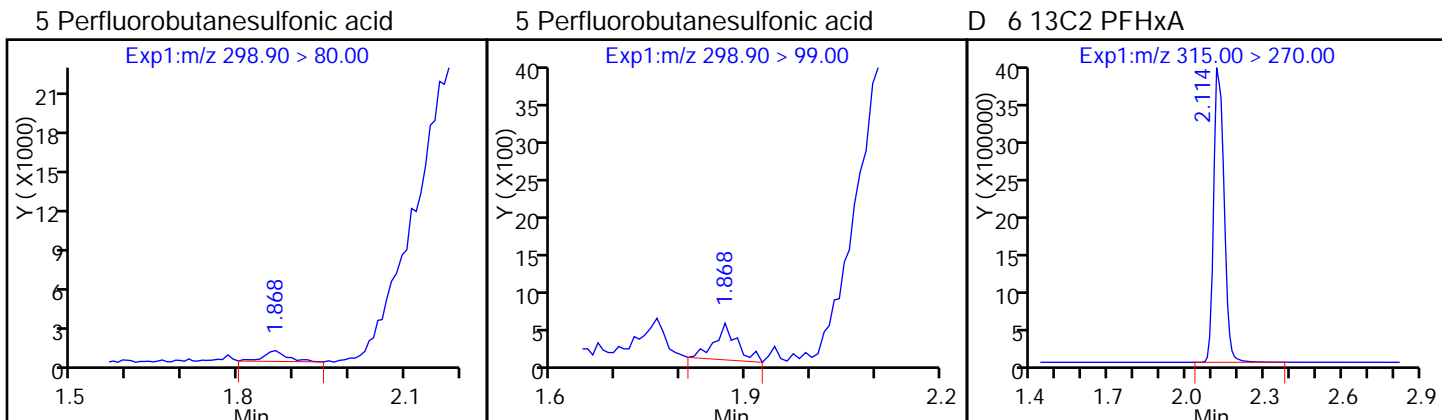
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b\03DEC2016C_024.d
 Lims ID: 320-23696-A-9-A
 Client ID: FB111616
 Sample Type: Client
 Inject. Date: 03-Dec-2016 21:33:50 ALS Bottle#: 25 Worklist Smp#: 24
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-23696-A-9-A
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: A8-PC\A8 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 06-Dec-2016 16:19:26 Calib Date: 03-Dec-2016 15:33:40
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d
 Column 1 : Det: EXP1
 Process Host: XAWRK027

First Level Reviewer: chandrasenas Date: 06-Dec-2016 16:20:00

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.868	1.877	-0.009	1.000	2365	0.004970				
298.90 > 99.00	1.868	1.877	-0.009	1.000	1166		2.03(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.114	2.129	-0.015		11094071	46.7		93.4	439257	
D 11 13C4-PFHpA										
367.00 > 322.00	2.463	2.473	-0.010		11017101	53.1		106	807640	
D 10 18O2 PFHxS										
403.00 > 84.00	2.478	2.481	-0.003		14101140	45.1		95.4	5040084	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.478	2.496	-0.018	1.000	50159	0.1533				
D 14 13C4 PFOA										
417.00 > 372.00	2.825	2.836	-0.011		11558783	52.7		105	611457	
D 17 13C4 PFOS										
503.00 > 80.00	3.194	3.215	-0.021		11329047	46.1		96.3	806413	
D 19 13C5 PFNA										
468.00 > 423.00	3.203	3.215	-0.012		8744479	52.5		105	995355	

TestAmerica Sacramento

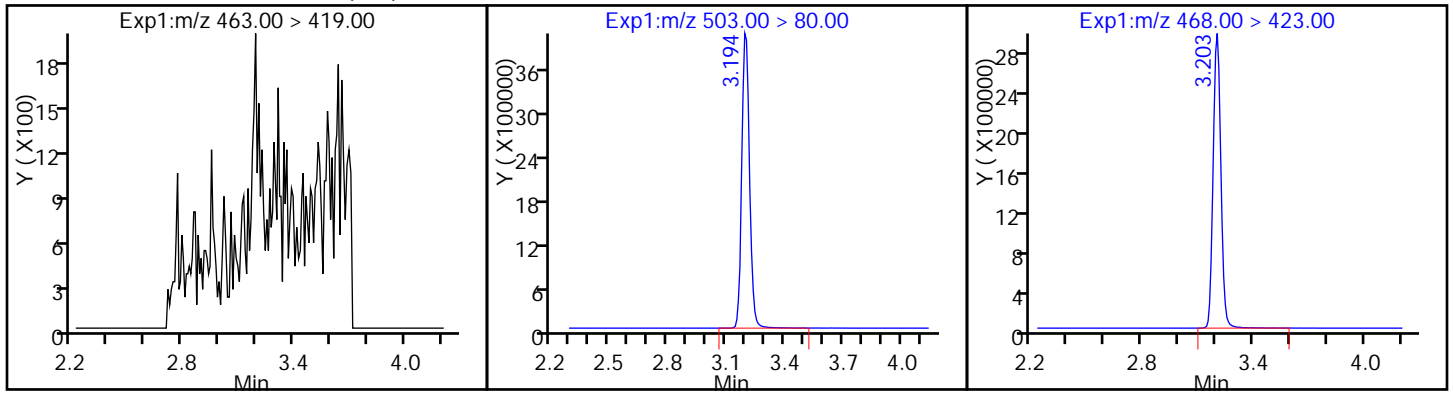
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Injection Date: 03-Dec-2016 21:33:50 Instrument ID: A8_N
Lims ID: 320-23696-A-9-A Lab Sample ID: 320-23696-9
Client ID: FB111616
Operator ID: A8-PC\A8 ALS Bottle#: 25 Worklist Smp#: 24
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL



20 Perfluorononanoic acid (ND)

D 17 13C4 PFOS

D 19 13C5 PFNA



FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23696-1 Analy Batch No.: 140564

SDG No.: _____

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/03/2016 13:48 Calibration End Date: 12/03/2016 15:33 Calibration ID: 26875

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-140564/4	03DEC2016A_004.d
Level 2	IC 320-140564/13	03DEC2016A_013.d
Level 3	IC 320-140564/5	03DEC2016A_005.d
Level 4	IC 320-140564/14	03DEC2016A_014.d
Level 5	IC 320-140564/6	03DEC2016A_006.d
Level 6	IC 320-140564/15	03DEC2016A_015.d
Level 7	IC 320-140564/7	03DEC2016A_007.d
Level 8	IC 320-140564/16	03DEC2016A_016.d
Level 9	IC 320-140564/8	03DEC2016A_008.d
Level 10	IC 320-140564/17	03DEC2016A_017.d
Level 11	IC 320-140564/9	03DEC2016A_009.d
Level 12	IC 320-140564/18	03DEC2016A_018.d

ANALYTE	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7	LVL 8	LVL 9	LVL 10	RT WINDOW	AVG RT
	LVL 11	LVL 12										
Perfluorobutanoic acid (PFBA)	1.582 1.574		1.574		1.574		1.582		1.574		1.327 - 1.827	1.577
Perfluoropentanoic acid (PFPeA)	1.868 1.858		1.858		1.858		1.868		1.858		1.611 - 2.111	1.861
Perfluorobutanesulfonic acid (PFBS)	1.906 1.896		1.897		1.897		1.907		1.897		1.720 - 2.080	1.900
Perfluorohexanoic acid (PFHxA)	2.170 2.157		2.164		2.163		2.171		2.160		1.914 - 2.414	2.164
Perfluoroheptanoic acid (PFHpA)	2.521 2.501		2.512		2.516		2.512		2.510		2.262 - 2.762	2.512
Perfluorohexanesulfonic acid (PFHxS)	++++ 2.526		2.535		2.531		2.527		2.525		2.281 - 2.781	2.529
6:2FTS		++++ 2.838		2.830		2.838		2.840		2.830	2.586 - 3.086	2.835
Perfluorooctanoic acid (PFOA)	++++ 2.868		2.894		2.880		2.894		2.884		2.637 - 3.137	2.884
Perfluoroheptanesulfonic Acid (PFHpS)	2.902 2.884		2.886		2.888		2.886		2.884		2.638 - 3.138	2.888
Perfluorooctanesulfonic acid (PFOS)	++++ 3.249		3.259		3.255		3.259		3.257		3.008 - 3.508	3.256
Perfluorononanoic acid (PFNA)	3.275 3.249		3.268		3.263		3.267		3.257		3.013 - 3.513	3.263
Perfluorooctane Sulfonamide (FOSA)	3.581 3.571		3.573		3.576		3.573		3.570		3.324 - 3.824	3.574
8:2FTS		3.601 3.589		3.579		3.588		3.592		3.579	3.338 - 3.838	3.588
Perfluorodecanoic acid (PFDA)	3.632 3.613		3.632		3.618		3.623		3.620		3.373 - 3.873	3.623

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23696-1 Analy Batch No.: 140564

SDG No.: _____

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/03/2016 13:48 Calibration End Date: 12/03/2016 15:33 Calibration ID: 26875

ANALYTE	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7	LVL 8	LVL 9	LVL 10	RT WINDOW	AVG RT
	LVL 11	LVL 12										
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)		3.774 3.752		3.760		3.760		3.756		3.750	3.509 - 4.009	3.759
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)		3.931 3.927		3.935		3.926		3.931		3.925	3.679 - 4.179	3.929
Perfluorodecanesulfonic acid (PFDS)	3.945 3.921		3.944		3.938		3.939		3.928		3.686 - 4.186	3.936
Perfluoroundecanoic acid (PFUnA)	3.971 3.947		3.953		3.956		3.956		3.946		3.705 - 4.205	3.955
MeFOSA		4.063 4.061		4.051		4.051		4.063		4.051	3.807 - 4.307	4.057
N-EtFOSA-M		4.253 4.249		4.239		4.240		4.244		4.245	3.995 - 4.495	4.245
Perfluorododecanoic acid (PFDoA)	4.261 4.236		4.254		4.253		4.253		4.242		4.000 - 4.500	4.250
Perfluorotridecanoic Acid (PFTriA)	4.535 4.501		4.515		4.521		4.524		4.510		4.268 - 4.768	4.518
Perfluorotetradecanoic acid (PFTeA)	4.778 4.746		4.770		4.761		4.764		4.750		4.511 - 5.011	4.762
Perfluoro-n-hexadecanoic acid (PFHxDA)	5.208 5.160		5.196		5.191		5.187		5.177		4.936 - 5.436	5.187
Perfluoro-n-octadecanoic acid (PFODA)	5.584 5.536		5.565		5.561		5.563		5.547		5.309 - 5.809	5.559
13C4 PFBA	1.582 1.565		1.574		1.574		1.574		1.574		1.324 - 1.824	1.574
13C5-PFPeA	1.868 1.858		1.858		1.858		1.868		1.858		1.611 - 2.111	1.861
13C2 PFHxA	2.179 2.157		2.164		2.163		2.162		2.160		1.914 - 2.414	2.164
13C4-PFHpA	2.521 2.501		2.512		2.508		2.512		2.510		2.261 - 2.761	2.511
18O2 PFHxS	2.544 2.518		2.535		2.531		2.535		2.525		2.281 - 2.781	2.531
M2-6:2FTS		2.840 2.838		2.830		2.838		2.840		2.830	2.586 - 3.086	2.836
13C4 PFOA	2.886 2.868		2.886		2.880		2.886		2.876		2.630 - 3.130	2.880
13C4 PFOS	3.267 3.249		3.259		3.263		3.259		3.257		3.009 - 3.509	3.259
13C5 PFNA	3.275 3.249		3.268		3.263		3.267		3.257		3.013 - 3.513	3.263
13C8 FOSA	3.581 3.562		3.565		3.576		3.573		3.570		3.321 - 3.821	3.571
M2-8:2FTS		3.601 3.589		3.579		3.596		3.592		3.587	3.341 - 3.841	3.591

FORM VI
 LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
 RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23696-1 Analy Batch No.: 140564

SDG No.: _____

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/03/2016 13:48 Calibration End Date: 12/03/2016 15:33 Calibration ID: 26875

ANALYTE	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7	LVL 8	LVL 9	LVL 10	RT WINDOW	AVG RT
	LVL 11	LVL 12										
13C2 PFDA	3.640 3.621		3.624		3.627		3.623		3.620		3.376 - 3.876	3.626
d3-NMeFOSAA		3.765 3.752		3.760		3.751		3.756		3.750	3.506 - 4.006	3.756
d5-NEtFOSAA		3.931 3.919		3.918		3.918		3.931		3.917	3.672 - 4.172	3.922
13C2 PFUnA	3.971 3.947		3.961		3.956		3.965		3.946		3.708 - 4.208	3.958
d-N-MeFOSA-M		4.054 4.052		4.051		4.051		4.055		4.042	3.801 - 4.301	4.051
d-N-EtFOSA-M		4.244 4.239		4.231		4.240		4.244		4.236	3.989 - 4.489	4.239
13C2 PFDoA	4.261 4.236		4.262		4.253		4.253		4.242		4.001 - 4.501	4.251
13C2-PFTeDA	4.778 4.738		4.762		4.761		4.764		4.750		4.509 - 5.009	4.759
13C2-PFHxDA	5.208 5.171		5.196		5.180		5.187		5.177		4.936 - 5.436	5.187

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-23696-1 Analy Batch No.: 140564

SDG No.: _____

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/03/2016 13:48 Calibration End Date: 12/03/2016 15:33 Calibration ID: 26875

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-140564/4	03DEC2016A_004.d
Level 2	IC 320-140564/13	03DEC2016A_013.d
Level 3	IC 320-140564/5	03DEC2016A_005.d
Level 4	IC 320-140564/14	03DEC2016A_014.d
Level 5	IC 320-140564/6	03DEC2016A_006.d
Level 6	IC 320-140564/15	03DEC2016A_015.d
Level 7	IC 320-140564/7	03DEC2016A_007.d
Level 8	IC 320-140564/16	03DEC2016A_016.d
Level 9	IC 320-140564/8	03DEC2016A_008.d
Level 10	IC 320-140564/17	03DEC2016A_017.d
Level 11	IC 320-140564/9	03DEC2016A_009.d
Level 12	IC 320-140564/18	03DEC2016A_018.d

ANALYTE	CF				CURVE TYPE	COEFFICIENT			#	MIN CF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1	LVL 2	LVL 3	LVL 4		B	M1	M2								
	LVL 5	LVL 6	LVL 7	LVL 8												
13C4 PFBA	310185 395986 320580		331347 365089 291784		Ave		335828.500			11.4		50.0				
13C5-PFPeA	254875 312687 249553		258388 288538 223232		Ave		264545.467			11.9		50.0				
13C2 PFHxA	230194 279196 219710		235263 254328 206225		Ave		237485.877			10.9		50.0				
13C4-PFHpA	200488 249965 193077		209795 229496 161658		Ave		207413.233			14.7		50.0				
18O2 PFHxS	293993 367326 302399		309858 340372 260105		Ave		312342.301			12.0		50.0				
M2-6:2FTS		91389 101069 97657		86632 132540 123901	Ave		105531.519			17.5		50.0				
13C4 PFOA	219399 265152 198189		227804 241383 163620		Ave		219257.923			16.1		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.: 320-23696-1 Analy Batch No.: 140564

SDG No.: _____

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/03/2016 13:48 Calibration End Date: 12/03/2016 15:33 Calibration ID: 26875

ANALYTE	CF				CURVE TYPE	COEFFICIENT			#	MIN CF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1	LVL 2	LVL 3	LVL 4		B	M1	M2								
	LVL 5	LVL 6	LVL 7	LVL 8												
LVL 9	LVL 10	LVL 11	LVL 12													
13C4 PFOS	228339		232908		Ave		246009.066			12.7		50.0				
	292548		275934													
	236006		210320													
13C5 PFNA	162836		167249		Ave		166415.157			14.2		50.0				
	202161		178407													
	157087		130751													
13C8 FOSA	382785		396984		Ave		402279.103			11.3		50.0				
	462525		446533													
	385863		338985													
M2-8:2FTS		89009		81776	Ave		97142.4774			15.9		50.0				
		92918		112285												
		86527		120341												
13C2 PFDA	153345		157229		Ave		157817.020			12.7		50.0				
	184278		175727													
	148117		128207													
d3-NMeFOSAA		66435		67366	Ave		72529.4733			12.4		50.0				
		73365		86475												
		62459		79076												
d5-NEtFOSAA		76443		76375	Ave		79657.5967			10.3		50.0				
		81901		93004												
		68389		81834												
13C2 PFUnA	116625		121719		Ave		118762.217			14.6		50.0				
	141738		129709													
	112505		90276													
d-N-MeFOSA-M		93925		97701	Ave		105101.257			10.8		50.0				
		110531		123254												
		95888		109309												
d-N-EtFOSA-M		87118		94000	Ave		99165.2500			9.9		50.0				
		101086		114956												
		93356		104475												
13C2 PFDoA	107060		108978		Ave		112083.837			11.2		50.0				
	131990		121360													
	106770		96346													
13C2-PFTEdA	220709		228021		Ave		231173.483			12.4		50.0				
	269763		257560													
	220622		190365													
13C2-PFHxDA	122044		129673		Ave		129725.210			12.9		50.0				
	151839		147280													
	117867		109649													

Note: The m1 coefficient is the same as Ave CF for an Ave curve type.

CURVE EVALUATION

Lab Name: TestAmerica SacramentoJob No.: 320-23696-1Analy Batch No.: 140564

SDG No.: _____

Instrument ID: A8_NGC Column: Acquity ID: 2.1 (mm)Heated Purge: (Y/N) NCalibration Start Date: 12/03/2016 13:48Calibration End Date: 12/03/2016 15:33Calibration ID: 26875

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
	LVL 6 LVL 11	LVL 7 LVL 12	LVL 8	LVL 9	LVL 10												
Perfluorobutanoic acid (PFBA)	285568 214032	350423	286663	280973	351800	AveID	0.8740				8.8		35.0				
Perfluoropentanoic acid (PFPeA)	300210 177640	305783	267561	251941	316000	AveID	1.0148				12.2		35.0				
Perfluorobutanesulfonic acid (PFBS)	504086 300541	615867	490253	486734	626278	AveID	1.5960				14.4		50.0				
Perfluorohexanoic acid (PFHxA)	235776 165590	261205	221801	208409	271706	AveID	0.9531				8.6		35.0				
Perfluoroheptanoic acid (PFHpA)	221302 150068	245911	215700	198314	250864	AveID	1.0271				5.9		35.0				
Perfluorohexanesulfonic acid (PFHxS)	++++ 259457	382897	373893	318646	405919	AveID	1.0976				7.2		35.0				
6:2FTS	74414 95077	++++	114411	73191	96558	AveID	0.8401				11.7		35.0				
Perfluorooctanoic acid (PFOA)	++++ 154270	264619	266474	208682	291075	AveID	1.0719				7.8		35.0				
Perfluoroheptanesulfonic Acid (PFHpS)	288964 206923	350751	264304	290052	344790	AveID	1.1771				9.2		50.0				
Perfluorooctanesulfonic acid (PFOS)	++++ 232098	303437	248775	257626	311027	AveID	1.0852				1.7		35.0				
Perfluorononanoic acid (PFNA)	173474 124497	190216	158219	153501	196312	AveID	0.9963				5.5		35.0				
Perfluorooctane Sulfonamide (FOSA)	370100 253291	455589	375193	365380	452435	AveID	0.9341				10.2		35.0				

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

CURVE EVALUATION

Lab Name: TestAmerica SacramentoJob No.: 320-23696-1Analy Batch No.: 140564

SDG No.: _____

Instrument ID: A8_NGC Column: Acquity ID: 2.1(mm)Heated Purge: (Y/N) NCalibration Start Date: 12/03/2016 13:48Calibration End Date: 12/03/2016 15:33Calibration ID: 26875

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
	LVL 6	LVL 7	LVL 8	LVL 9	LVL 10												
8:2FTS	68103	78395 87944	105918	66735	89333	AveID	0.8560			14.0	35.0						
Perfluorodecanoic acid (PFDA)	156640 117857	171719	147102	143186	173721	AveID	0.9605			3.8	35.0						
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	52006	47238 67834	82772	53845	69682	AveID	0.8583			18.3	35.0						
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	53051	50866 65238	81472	49948	65231	AveID	0.7657			17.0	35.0						
Perfluorodecanesulfonic acid (PFDS)	142463 129604	184058	155987	152444	180118	AveID	0.6398			3.9	50.0						
Perfluoroundecanoic acid (PFUnA)	154250 89091	133679	130643	111061	140855	AveID	1.0657			12.2	35.0						
MeFOSA	71380	74884 88180	109492	72155	93127	AveID	0.8080			14.0	35.0						
N-EtFOSA-M	73063	72158 91173	110071	72107	94707	AveID	0.8605			12.9	35.0						
Perfluorododecanoic acid (PFDoA)	106404 88867	120759	100943	100016	121390	AveID	0.9490			3.8	35.0						
Perfluorotridecanoic Acid (PFTriA)	106898 87470	118653	100348	100682	125535	AveID	0.9498			3.6	50.0						
Perfluorotetradecanoic acid (PFTeA)	219098 152968	234056	215694	192030	235101	AveID	1.8536			8.9	50.0						
Perfluoro-n-hexadecanoic acid (PFHxDA)	254818 94562	143517	184956	107642	153296	L1ID	0.7490	0.9930					0.9980		0.9900		
Perfluoro-n-octadecanoic acid (PFODA)	100080 89220	110258	119152	114581	134794	AveID	0.9929			8.1	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.: 320-23696-1 Analy Batch No.: 140564

SDG No.: _____

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/03/2016 13:48 Calibration End Date: 12/03/2016 15:33 Calibration ID: 26875

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-140564/4	03DEC2016A_004.d
Level 2	IC 320-140564/13	03DEC2016A_013.d
Level 3	IC 320-140564/5	03DEC2016A_005.d
Level 4	IC 320-140564/14	03DEC2016A_014.d
Level 5	IC 320-140564/6	03DEC2016A_006.d
Level 6	IC 320-140564/15	03DEC2016A_015.d
Level 7	IC 320-140564/7	03DEC2016A_007.d
Level 8	IC 320-140564/16	03DEC2016A_016.d
Level 9	IC 320-140564/8	03DEC2016A_008.d
Level 10	IC 320-140564/17	03DEC2016A_017.d
Level 11	IC 320-140564/9	03DEC2016A_009.d
Level 12	IC 320-140564/18	03DEC2016A_018.d

ANALYTE	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
		LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5
		LVL 6	LVL 7	LVL 8	LVL 9	LVL 10	LVL 6	LVL 7	LVL 8	LVL 9	LVL 10
13C4 PFBA	Ave	15509259	18254473	16567343	16029004	19799279	50.0	50.0	50.0	50.0	50.0
		14589192					50.0				
13C5-PFPeA	Ave	12743752	14426922	12919402	12477636	15634346	50.0	50.0	50.0	50.0	50.0
		11161582					50.0				
13C2 PFHxA	Ave	11509685	12716423	11763139	10985481	13959775	50.0	50.0	50.0	50.0	50.0
		10311260					50.0				
13C4-PFHpA	Ave	10024418	11474824	10489748	9653835	12498264	50.0	50.0	50.0	50.0	50.0
		8082881					50.0				
1802 PFHxS	Ave	13905891	16099619	14656306	14303487	17374498	47.3	47.3	47.3	47.3	47.3
		12302944					47.3				
M2-6:2FTS	Ave	4800798	4340981	6295656	4115043	4638709	47.5	47.5	47.5	47.5	47.5
		5885296					47.5	47.5			
13C4 PFOA	Ave	10969960	12069172	11390215	9909434	13257596	50.0	50.0	50.0	50.0	50.0
		8181000					50.0				
13C4 PFOS	Ave	10914613	13189624	11132983	11281105	13983781	47.8	47.8	47.8	47.8	47.8
		10053294					47.8				

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-23696-1 Analy Batch No.: 140564

SDG No.: _____

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/03/2016 13:48 Calibration End Date: 12/03/2016 15:33 Calibration ID: 26875

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	8141793 6537549	8920352	8362456	7854327	10108070	50.0 50.0	50.0	50.0	50.0	50.0
13C8 FOSA	Ave	19139237 16949269	22326638	19849207	19293148	23126232	50.0 50.0	50.0	50.0	50.0	50.0
M2-8:2FTS	Ave	4450751 4263521	5764339	5378444	3917070	4144623	47.9 47.9	47.9	47.9	47.9	47.9
13C2 PFDA	Ave	7667226 6410340	8786342	7861453	7405870	9213875	50.0 50.0	50.0	50.0	50.0	50.0
d3-NMeFOSAA	Ave	3668263 3953776	3321758	4323749	3368323	3122973	50.0 50.0	50.0	50.0	50.0	50.0
d5-NEtFOSAA	Ave	4095032 4091711	3822164	4650188	3818745	3419439	50.0 50.0	50.0	50.0	50.0	50.0
13C2 PFUnA	Ave	5831263 4513820	6485474	6085968	5625237	7086903	50.0 50.0	50.0	50.0	50.0	50.0
d-N-MeFOSA-M	Ave	5526561 5465444	4696243	6162693	4885054	4794382	50.0 50.0	50.0	50.0	50.0	50.0
d-N-EtFOSA-M	Ave	5054297 5223764	4355916	5747792	4699997	4667809	50.0 50.0	50.0	50.0	50.0	50.0
13C2 PFDoA	Ave	5353024 4817286	6067987	5448882	5338479	6599493	50.0 50.0	50.0	50.0	50.0	50.0
13C2-PFTeDA	Ave	11035471 9518260	12877999	11401035	11031119	13488161	50.0 50.0	50.0	50.0	50.0	50.0
13C2-PFHxDA	Ave	6102203 5482429	7363997	6483658	5893329	7591947	50.0 50.0	50.0	50.0	50.0	50.0

Curve Type Legend:

Ave = Average

RESPONSE AND CONCENTRATION

Lab Name: TestAmerica SacramentoJob No.: 320-23696-1Analy Batch No.: 140564

SDG No.: _____

Instrument ID: A8_NGC Column: Acquity ID: 2.1(mm)Heated Purge: (Y/N) NCalibration Start Date: 12/03/2016 13:48Calibration End Date: 12/03/2016 15:33Calibration ID: 26875

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-140564/4	03DEC2016A_004.d
Level 2	IC 320-140564/13	03DEC2016A_013.d
Level 3	IC 320-140564/5	03DEC2016A_005.d
Level 4	IC 320-140564/14	03DEC2016A_014.d
Level 5	IC 320-140564/6	03DEC2016A_006.d
Level 6	IC 320-140564/15	03DEC2016A_015.d
Level 7	IC 320-140564/7	03DEC2016A_007.d
Level 8	IC 320-140564/16	03DEC2016A_016.d
Level 9	IC 320-140564/8	03DEC2016A_008.d
Level 10	IC 320-140564/17	03DEC2016A_017.d
Level 11	IC 320-140564/9	03DEC2016A_009.d
Level 12	IC 320-140564/18	03DEC2016A_018.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5
			LVL 6	LVL 7	LVL 8	LVL 9	LVL 10	LVL 6	LVL 7	LVL 8	LVL 9	LVL 10
Perfluorobutanoic acid (PFBA)		AveID	142784	7008467	286663	14048645	1758998	0.500	20.0	1.00	50.0	5.00
			42806432					200				
Perfluoropentanoic acid (PFPeA)		AveID	150105	6115663	267561	12597041	1580002	0.500	20.0	1.00	50.0	5.00
			35527936					200				
Perfluorobutanesulfonic acid (PFBS)		AveID	222806	10888534	433384	21513660	2768149	0.442	17.7	0.884	44.2	4.42
			53135654					177				
Perfluorohexanoic acid (PFHxA)		AveID	117888	5224102	221801	10420431	1358530	0.500	20.0	1.00	50.0	5.00
			33117925					200				
Perfluoroheptanoic acid (PFHpA)		AveID	110651	4918226	215700	9915679	1254320	0.500	20.0	1.00	50.0	5.00
			30013620					200				
Perfluorohexanesulfonic acid (PFHxS)		AveID	++++	6968734	340243	14498414	1846932	++++	18.2	0.910	45.5	4.55
			47221104					182				
6:2FTS		AveID	352721	++++	2169230	69385	4576863	4.74	++++	19.0	0.948	47.4
			18026595	190								
Perfluorooctanoic acid (PFOA)		AveID	++++	5292388	266474	10434085	1455373	++++	20.0	1.00	50.0	5.00
			30853962					200				

FORM VI

RESPONSE AND CONCENTRATION

Lab Name: TestAmerica SacramentoJob No.: 320-23696-1Analy Batch No.: 140564

SDG No.: _____

Instrument ID: A8_NGC Column: AcquityID: 2.1(mm)Heated Purge: (Y/N) NCalibration Start Date: 12/03/2016 13:48Calibration End Date: 12/03/2016 15:33Calibration ID: 26875

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5
			LVL 6	LVL 7	LVL 8	LVL 9	LVL 10	LVL 6	LVL 7	LVL 8	LVL 9	LVL 10
Perfluoroheptanesulfonic Acid (PFHpS)		AveID	137547 39398056	6678298	251617	13806464	1641199	0.476 190	19.0	0.952	47.6	4.76
Perfluorooctanesulfonic acid (PFOS)		AveID	++++ 43077470	5631788	230863	11953842	1443163	++++ 186	18.6	0.928	46.4	4.64
Perfluorononanoic acid (PFNA)		AveID	86737 24899337	3804327	158219	7675034	981559	0.500 200	20.0	1.00	50.0	5.00
Perfluorooctane Sulfonamide (FOSA)		AveID	185050 50658186	9111782	375193	18269014	2262174	0.500 200	20.0	1.00	50.0	5.00
8:2FTS		AveID	326213	37551 16850029	2029390	63932	4279048	4.79	0.479 192	19.2	0.958	47.9
Perfluorodecanoic acid (PFDA)		AveID	78320 23571490	3434382	147102	7159278	868604	0.500 200	20.0	1.00	50.0	5.00
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)		AveID	260030	23619 13566790	1655435	53845	3484088	5.00	0.500 200	20.0	1.00	50.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)		AveID	265257	25433 13047697	1629443	49948	3261537	5.00	0.500 200	20.0	1.00	50.0
Perfluorodecanesulfonic acid (PFDS)		AveID	68667 24987612	3548629	150371	7347809	868168	0.482 193	19.3	0.964	48.2	4.82
Perfluoroundecanoic acid (PFUnA)		AveID	77125 17818228	2673576	130643	5553051	704273	0.500 200	20.0	1.00	50.0	5.00
MeFOSA		AveID	356898	37442 17635948	2189848	72155	4656344	5.00	0.500 200	20.0	1.00	50.0
N-EtFOSA-M		AveID	365313	36079 18234509	2201423	72107	4735360	5.00	0.500 200	20.0	1.00	50.0
Perfluorododecanoic acid (PFDoA)		AveID	53202 17773370	2415187	100943	5000795	606951	0.500 200	20.0	1.00	50.0	5.00

RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-23696-1 Analy Batch No.: 140564

SDG No.: _____

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) NCalibration Start Date: 12/03/2016 13:48 Calibration End Date: 12/03/2016 15:33 Calibration ID: 26875

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5
			LVL 6	LVL 7	LVL 8	LVL 9	LVL 10	LVL 6	LVL 7	LVL 8	LVL 9	LVL 10
			LVL 11	LVL 12	LVL 8	LVL 9	LVL 10	LVL 11	LVL 12	LVL 8	LVL 9	LVL 10
Perfluorotridecanoic Acid (PFTriA)		AveID	53449	2373060	100348	5034109	627673	0.500	20.0	1.00	50.0	5.00
			17494025					200				
Perfluorotetradecanoic acid (PFTeA)		AveID	109549	4681126	215694	9601518	1175506	0.500	20.0	1.00	50.0	5.00
			30593527					200				
Perfluoro-n-hexadecanoic acid (PFHxDA)		L1ID	127409	2870345	184956	5382109	766480	0.500	20.0	1.00	50.0	5.00
			18912385					200				
Perfluoro-n-octadecanoic acid (PFODA)		AveID	50040	2205153	119152	5729058	673971	0.500	20.0	1.00	50.0	5.00
			17844066					200				

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\20161205-37491.b\03DEC2016A_004.d
 Lims ID: IC L1
 Client ID:
 Sample Type: IC Calib Level: 1
 Inject. Date: 03-Dec-2016 13:48:41 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*sub3
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 05-Dec-2016 10:24:05 Calib Date: 03-Dec-2016 15:33:40
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d
 Column 1 : Det: EXP1
 Process Host: XAWRK020

First Level Reviewer: chandrasenas Date: 05-Dec-2016 09:42:37

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	1.582	1.574	0.008	15509259	46.2		92.4	1670611	
1 Perfluorobutyric acid	212.90 > 169.00	1.582	1.577	0.005	142784	0.5267		105	902	
3 Perfluoropentanoic acid	262.90 > 219.00	1.868	1.861	0.007	150105	0.5803		116	1311	
D 4 13C5-PFPeA	267.90 > 223.00	1.868	1.861	0.007	12743752	48.2		96.3	785537	
5 Perfluorobutanesulfonic acid	298.90 > 80.00	1.906	1.900	0.006	222806	0.4748		107		
	298.90 > 99.00	1.906	1.900	0.006	90815		2.45(0.00-0.00)	107		
7 Perfluorohexanoic acid	313.00 > 269.00	2.170	2.164	0.006	117888	0.5373		107	2866	
D 6 13C2 PFHxA	315.00 > 270.00	2.179	2.164	0.015	11509685	48.5		96.9	1035144	
D 11 13C4-PFHpA	367.00 > 322.00	2.521	2.511	0.010	10024418	48.3		96.7	941002	
12 Perfluoroheptanoic acid	363.00 > 319.00	2.521	2.512	0.009	110651	0.5374		107	1512	
9 Perfluorohexanesulfonic acid	399.00 > 80.00	2.544	2.531	0.013	195583	0.6061		133		
D 10 18O2 PFHxS	403.00 > 84.00	2.544	2.531	0.013	13905891	44.5		94.1	1599849	
D 14 13C4 PFOA	417.00 > 372.00	2.886	2.880	0.006	10969960	50.0		100	702523	

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	2.902	2.887	0.015	1.000	176658	0.7512		150	2006	
413.00 > 169.00	2.902	2.887	0.015	1.000	83124		2.13(0.90-1.10)	150	4894	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.902	2.888	0.014	1.000	137547	0.5117		108		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.267	3.258	0.009	1.000	118203	0.4770		103	15866	
499.00 > 99.00	3.250	3.258	-0.008	0.995	0		0.00(0.90-1.10)	103		
D 17 13C4 PFOS										
503.00 > 80.00	3.267	3.259	0.008		10914613	44.4		92.8	963774	
D 19 13C5 PFNA										
468.00 > 423.00	3.275	3.263	0.012		8141793	48.9		97.8	521938	
20 Perfluorononanoic acid										
463.00 > 419.00	3.275	3.263	0.012	1.000	86737	0.5346		107	1741	M
D 21 13C8 FOSA										
506.00 > 78.00	3.581	3.571	0.010		19139237	47.6		95.2	555083	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.581	3.574	0.007	1.000	185050	0.5175		104	16767	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.632	3.623	0.009	1.000	78320	0.5318		106	2431	
D 23 13C2 PFDA										
515.00 > 470.00	3.640	3.626	0.014		7667226	48.6		97.2	219644	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.945	3.936	0.009	1.000	68667	0.4701		97.5		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.971	3.955	0.016	1.000	77125	0.6205		124	2113	M
D 27 13C2 PFUnA										
565.00 > 520.00	3.971	3.958	0.013		5831263	49.1		98.2	341809	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.261	4.250	0.011	1.000	53202	0.5236		105	752	
D 30 13C2 PFDaA										
615.00 > 570.00	4.261	4.251	0.010		5353024	47.8		95.5	191441	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.535	4.518	0.017	1.000	53449	0.5256		105	91.0	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.778	4.759	0.019		11035471	47.7		95.5	488569	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.778	4.761	0.017	1.000	109549	0.5520		110	60.5	
713.00 > 169.00	4.770	4.761	0.009	0.998	20451		5.36(0.00-0.00)	110	3502	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.208	5.186	0.022		6102203	47.0		94.1	113568	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.208	5.186	0.022	1.000	127409	0.4441		88.8	179	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.584	5.559	0.025	1.000	50040	0.4708		94.2	82.2	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LCPFC-L1_00021

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_004.d

Injection Date: 03-Dec-2016 13:48:41

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

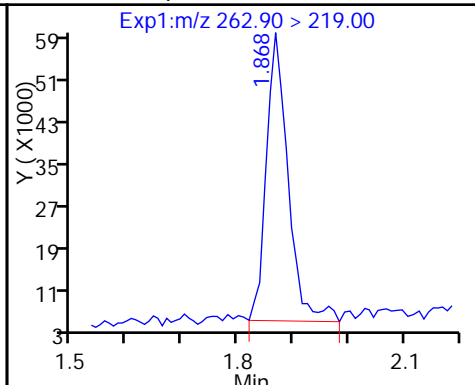
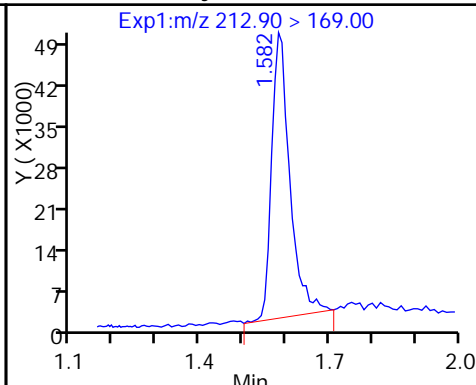
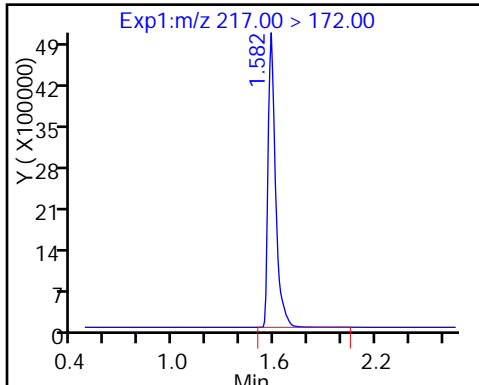
Method: A8_N

Limit Group: LC PFC_DOD ICAL

D 2 13C4 PFBA

1 Perfluorobutyric acid

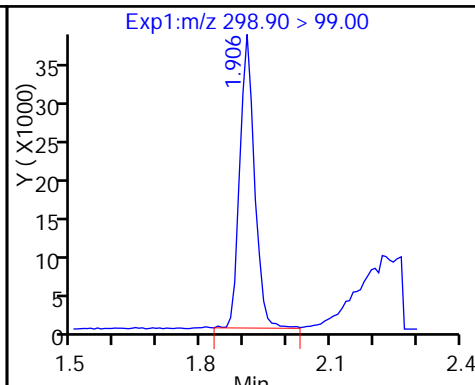
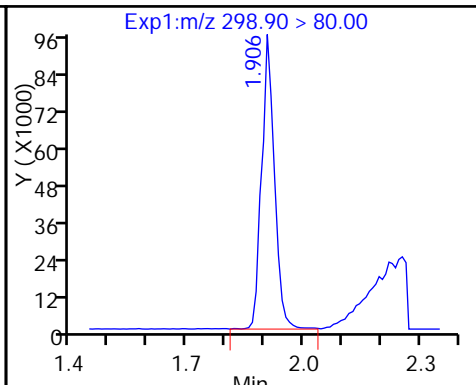
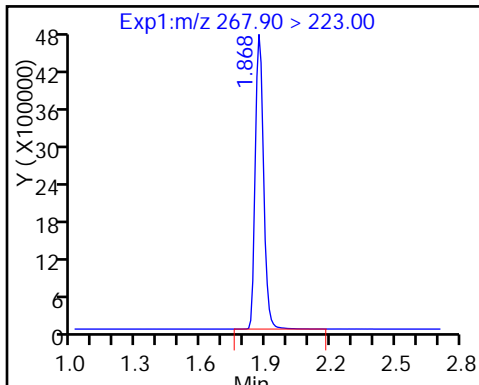
3 Perfluoropentanoic acid



D 4 13C5-PFPeA

5 Perfluorobutanesulfonic acid

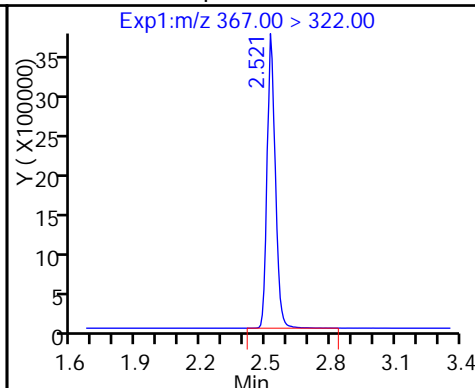
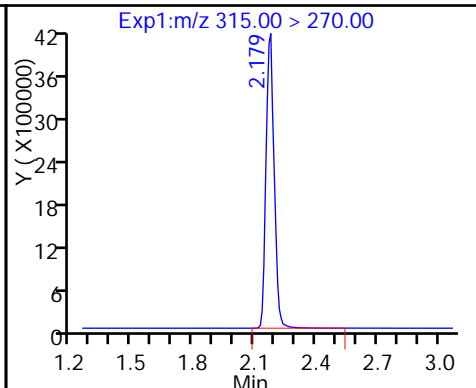
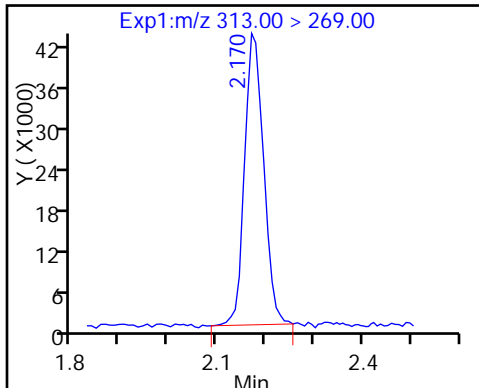
5 Perfluorobutanesulfonic acid



7 Perfluorohexanoic acid

D 6 13C2 PFHxA

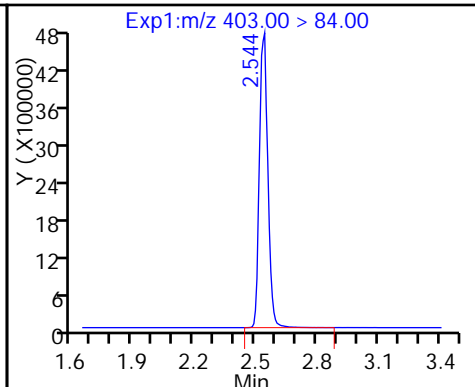
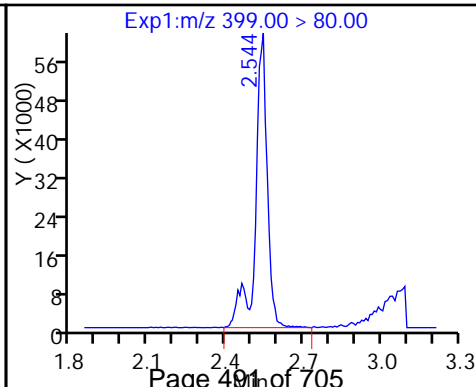
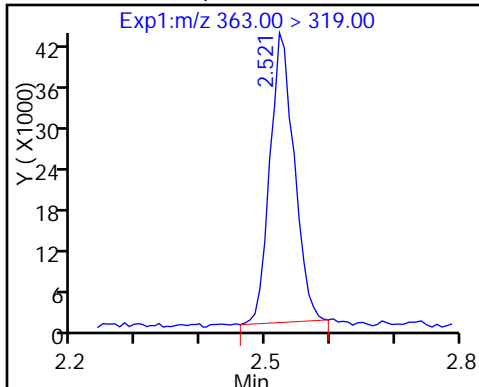
D 11 13C4-PFHpA



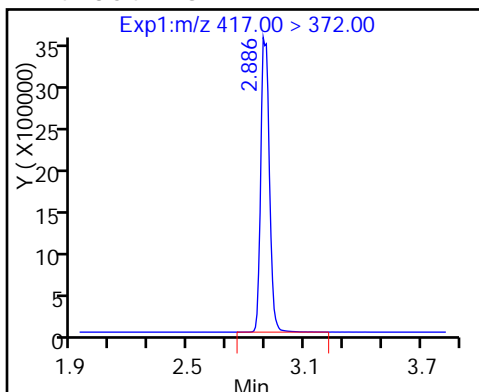
12 Perfluoroheptanoic acid

9 Perfluorohexanesulfonic acid

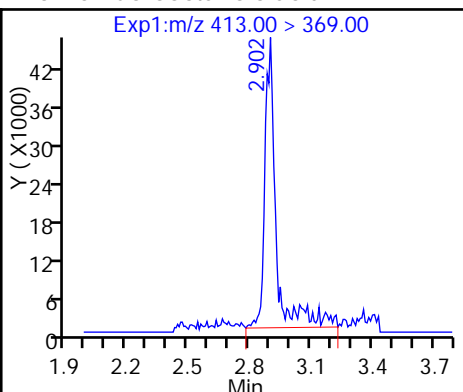
D 10 18O2 PFHxS



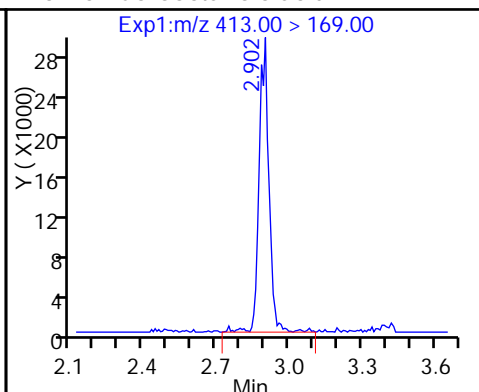
D 14 13C4 PFOA



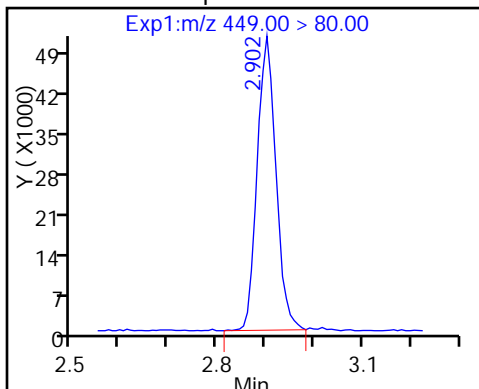
15 Perfluorooctanoic acid



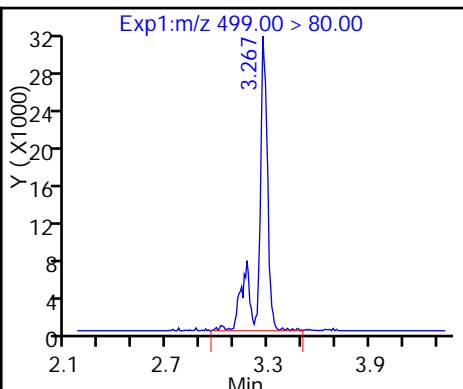
15 Perfluorooctanoic acid



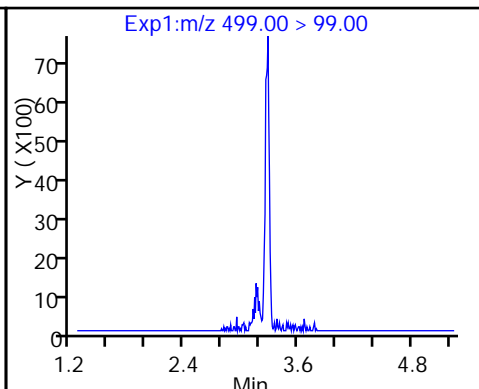
13 Perfluoroheptanesulfonic Acid



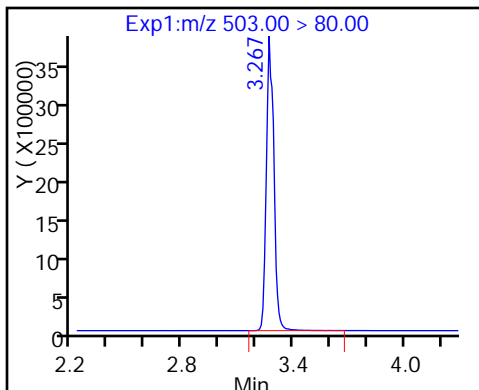
18 Perfluorooctane sulfonic acid



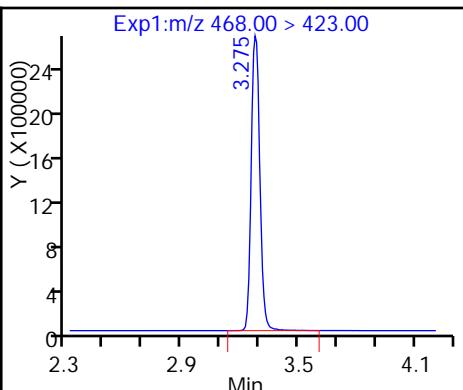
18 Perfluorooctane sulfonic acid



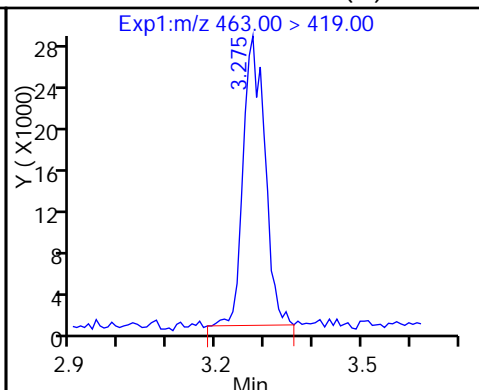
D 17 13C4 PFOS



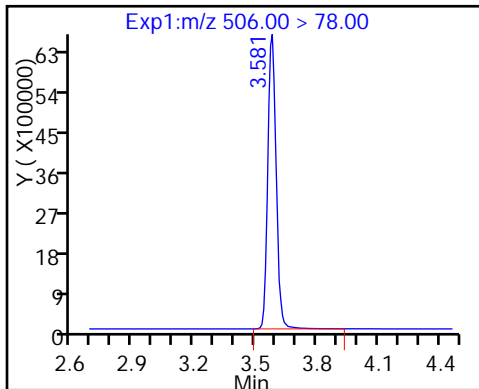
D 19 13C5 PFNA



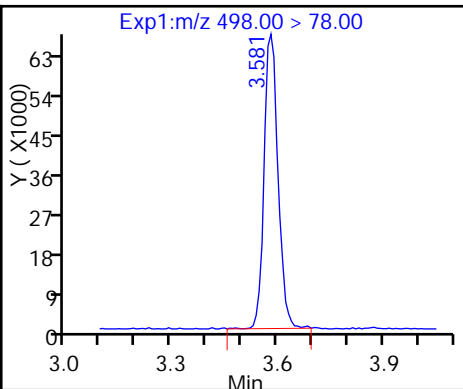
20 Perfluorononanoic acid (M)



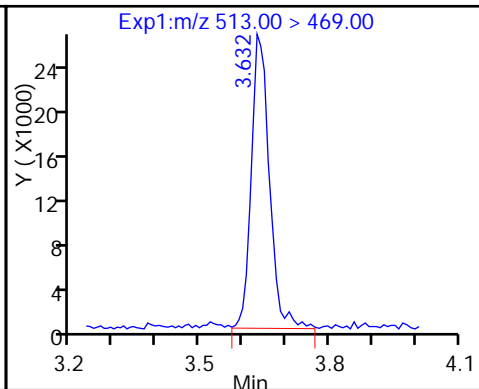
D 21 13C8 FOSA



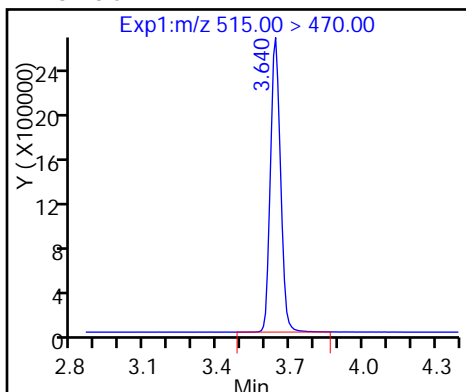
22 Perfluorooctane Sulfonamide



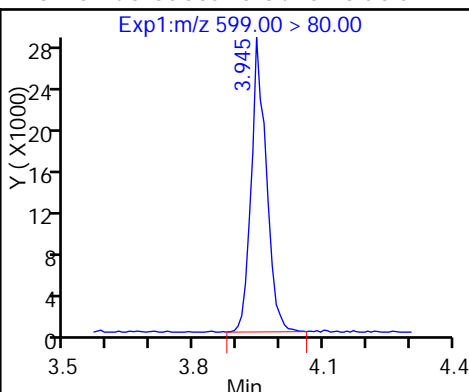
24 Perfluorodecanoic acid



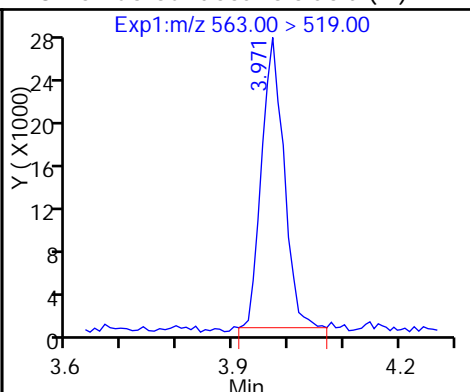
D 23 13C2 PFDA



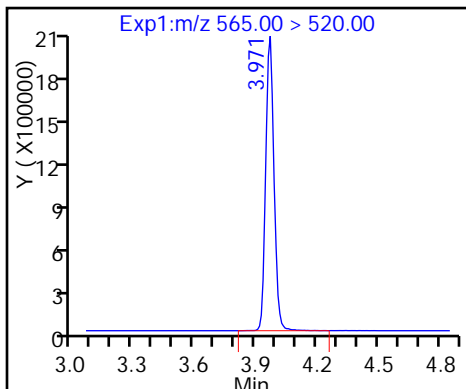
26 Perfluorodecane Sulfonic acid



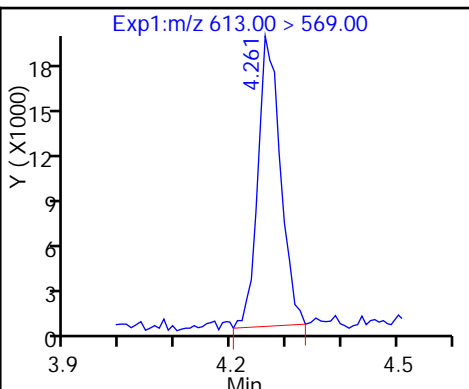
28 Perfluoroundecanoic acid (M)



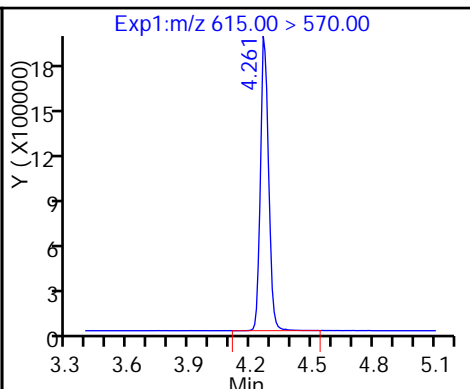
D 27 13C2 PFUa



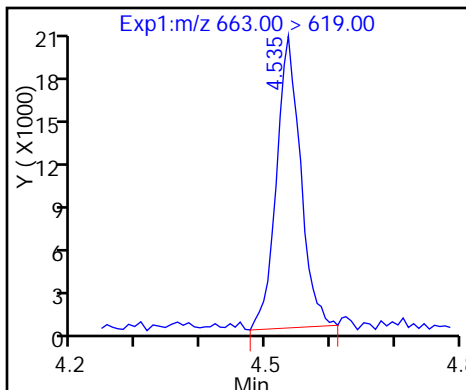
29 Perfluorododecanoic acid



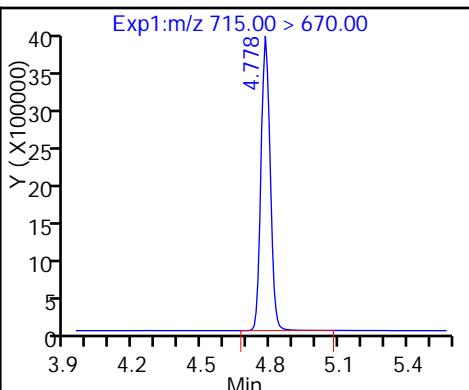
D 30 13C2 PFDa



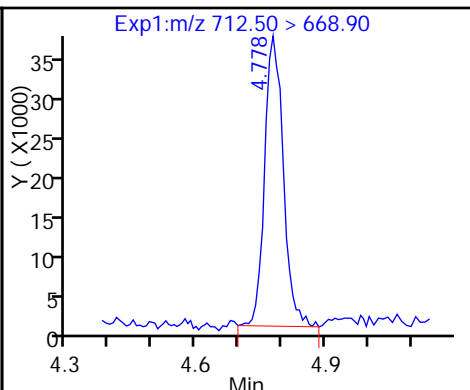
31 Perfluorotridecanoic acid



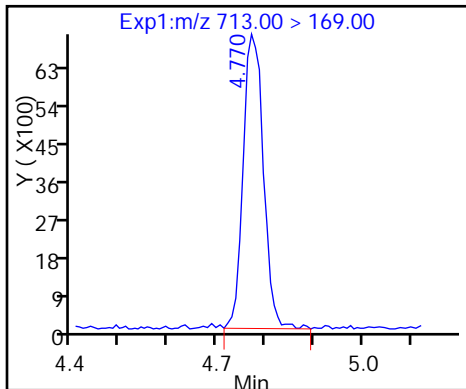
D 32 13C2-PFTeDa



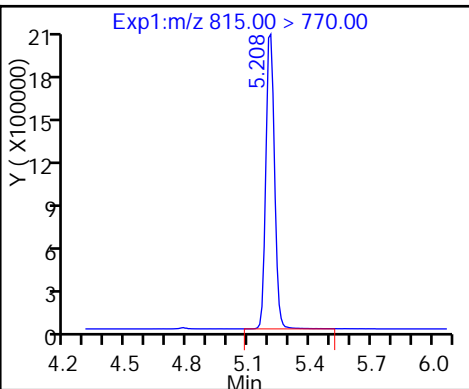
33 Perfluorotetradecanoic acid



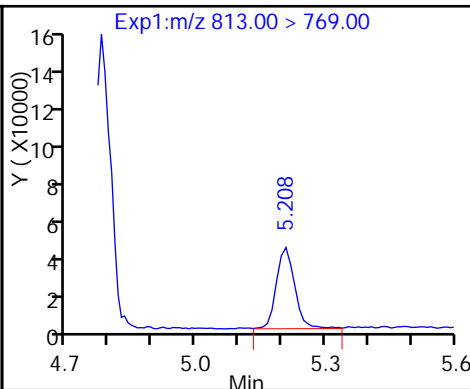
33 Perfluorotetradecanoic acid



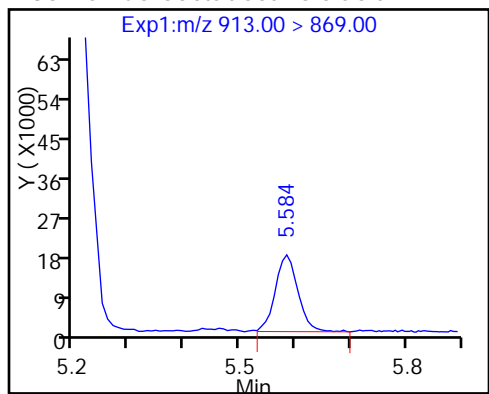
D 34 13C2-PFHxDa



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



TestAmerica Sacramento

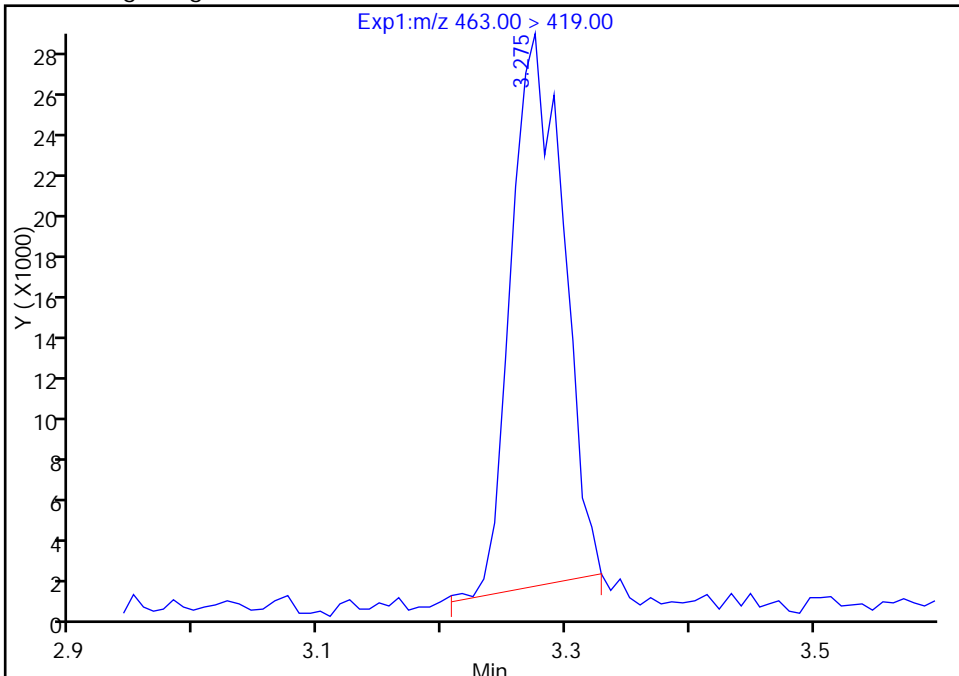
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_004.d
Injection Date: 03-Dec-2016 13:48:41 Instrument ID: A8_N
Lims ID: IC L1
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 37 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

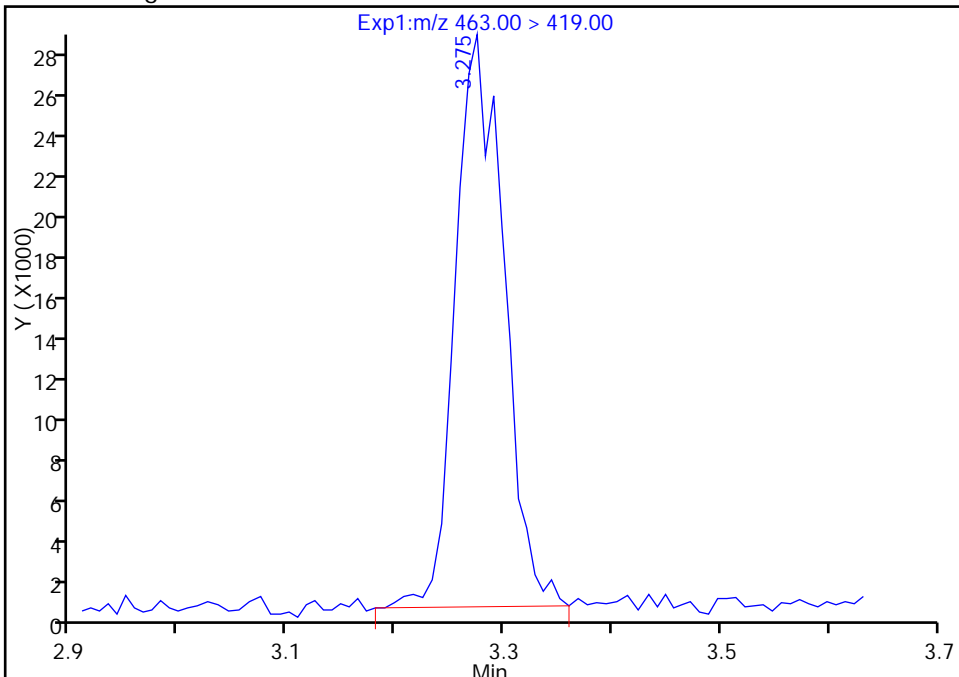
RT: 3.28
Area: 78587
Amount: 0.492646
Amount Units: ng/ml

Processing Integration Results



RT: 3.28
Area: 86737
Amount: 0.534631
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 05-Dec-2016 09:42:37

Audit Action: Manually Integrated

Audit Reason: Incomplete Integration

TestAmerica Sacramento

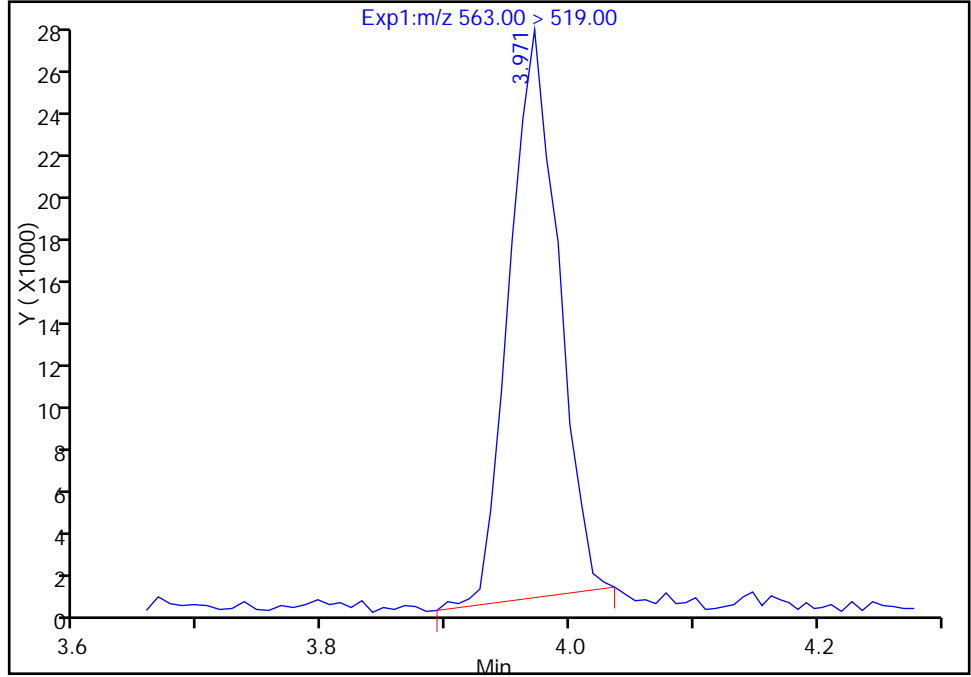
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Injection Date: 03-Dec-2016 13:48:41 Instrument ID: A8_N
Lims ID: IC L1
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 37 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

28 Perfluoroundecanoic acid, CAS: 2058-94-8

Signal: 1

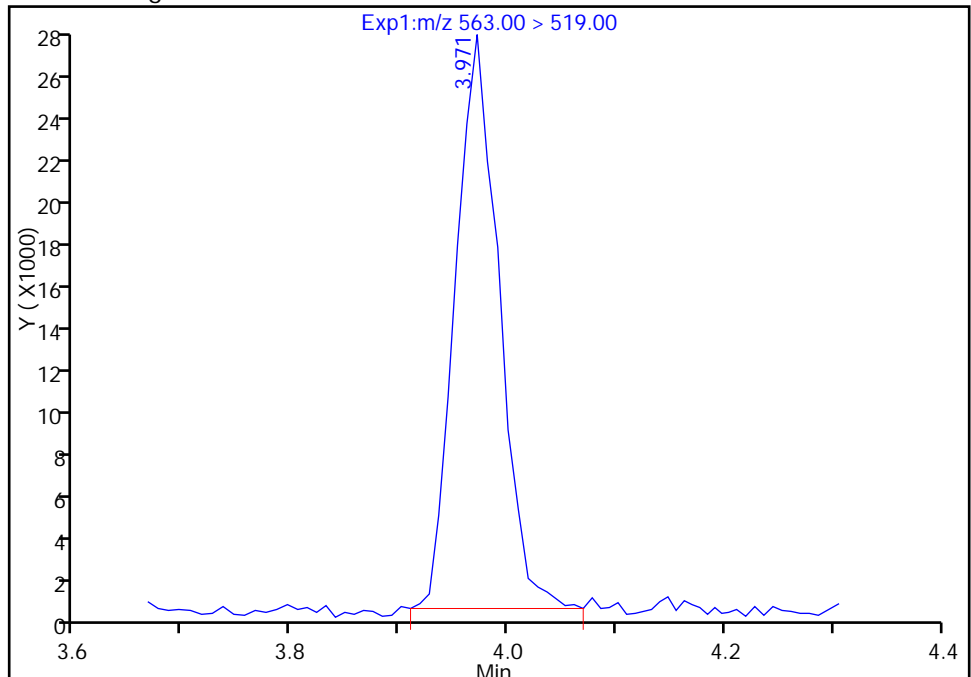
RT: 3.97
Area: 74499
Amount: 0.603647
Amount Units: ng/ml

Processing Integration Results



RT: 3.97
Area: 77125
Amount: 0.620524
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 05-Dec-2016 09:42:37

Audit Action: Manually Integrated

Audit Reason: Incomplete Integration

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_005.d
 Lims ID: IC L2
 Client ID:
 Sample Type: IC Calib Level: 2
 Inject. Date: 03-Dec-2016 13:56:13 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*sub3
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 05-Dec-2016 10:24:08 Calib Date: 03-Dec-2016 15:33:40
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d

Column 1 : Det: EXP1
 Process Host: XAWRK020

First Level Reviewer: chandrasenas Date: 05-Dec-2016 09:43:09

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	1.574	1.574	0.0	16567343	49.3		98.7	1253121	
1 Perfluorobutyric acid	212.90 > 169.00	1.574	1.577	-0.003	1.000	286663	0.9899	99.0	1783	
3 Perfluoropentanoic acid	262.90 > 219.00	1.858	1.861	-0.003	1.000	267561	1.02	102	2233	
D 4 13C5-PFPeA	267.90 > 223.00	1.858	1.861	-0.003		12919402	48.8	97.7	738841	
5 Perfluorobutanesulfonic acid	298.90 > 80.00	1.897	1.900	-0.003	1.000	433384	0.8763	99.1		
	298.90 > 99.00	1.897	1.900	-0.003	1.000	173533	2.50(0.00-0.00)	99.1		
7 Perfluorohexanoic acid	313.00 > 269.00	2.164	2.164	0.0	1.000	221801	0.9891	98.9	4857	
D 6 13C2 PFHxA	315.00 > 270.00	2.164	2.164	0.0		11763139	49.5	99.1	702628	
D 11 13C4-PFHpA	367.00 > 322.00	2.512	2.511	0.001		10489748	50.6	101	757325	
12 Perfluoroheptanoic acid	363.00 > 319.00	2.512	2.512	0.0	1.000	215700	1.00	100	2505	
9 Perfluorohexanesulfonic acid	399.00 > 80.00	2.535	2.531	0.004	1.000	340243	1.00	110		
D 10 18O2 PFHxS	403.00 > 84.00	2.535	2.531	0.004		14656306	46.9	99.2	569002	
D 14 13C4 PFOA	417.00 > 372.00	2.886	2.880	0.006		11390215	51.9	104	1255788	

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	2.894	2.887	0.007	1.000	266474	1.09		109	2568	
413.00 > 169.00	2.886	2.887	-0.001	0.997	153584		1.74(0.90-1.10)	109	8517	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.886	2.888	-0.002	1.000	251617	0.9178		96.4		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.259	3.258	0.001	1.000	230863	0.9134		98.4	60496	
499.00 > 99.00	3.268	3.258	0.010	1.003	49554		4.66(0.90-1.10)	98.4	7390	
D 17 13C4 PFOS										
503.00 > 80.00	3.259	3.259	0.0		11132983	45.3		94.7	553508	
D 19 13C5 PFNA										
468.00 > 423.00	3.268	3.263	0.005		8362456	50.3		101	686636	
20 Perfluorononanoic acid										
463.00 > 419.00	3.268	3.263	0.005	1.000	158219	0.9495		94.9	2139	
D 21 13C8 FOSA										
506.00 > 78.00	3.565	3.571	-0.006		19849207	49.3		98.7	435087	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.573	3.574	-0.001	1.000	375193	1.01		101	37696	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.632	3.623	0.009	1.000	147102	0.9741		97.4	6264	
D 23 13C2 PFDA										
515.00 > 470.00	3.624	3.626	-0.002		7861453	49.8		99.6	210924	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.944	3.936	0.008	1.000	150371	1.01		105		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.953	3.955	-0.003	1.000	130643	1.01		101	3153	
D 27 13C2 PFUnA										
565.00 > 520.00	3.961	3.958	0.003		6085968	51.2		102	355525	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.254	4.250	0.004	1.000	100943	0.9761		97.6	1508	
D 30 13C2 PFDaA										
615.00 > 570.00	4.262	4.251	0.011		5448882	48.6		97.2	155924	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.515	4.518	-0.003	1.000	100348	0.9695		96.9	172	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.762	4.759	0.003		11401035	49.3		98.6	776058	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.770	4.761	0.009	1.000	215694	1.07		107	105	
713.00 > 169.00	4.762	4.761	0.001	0.998	35526		6.07(0.00-0.00)	107	12035	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.196	5.186	0.010		6483658	50.0		100.0	170445	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.196	5.186	0.010	1.000	184956	0.9549		95.5	215	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.565	5.559	0.006	1.000	119152	1.10		110	244	

Reagents:

LCPFC-L2_00022

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_005.d

Injection Date: 03-Dec-2016 13:56:13

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

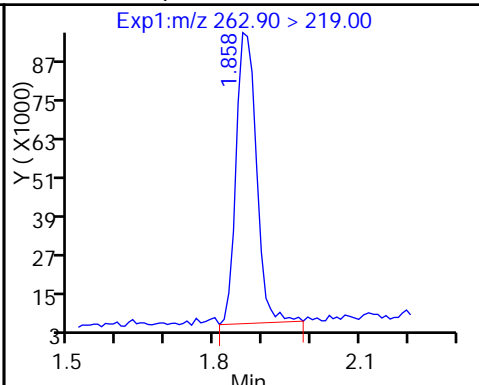
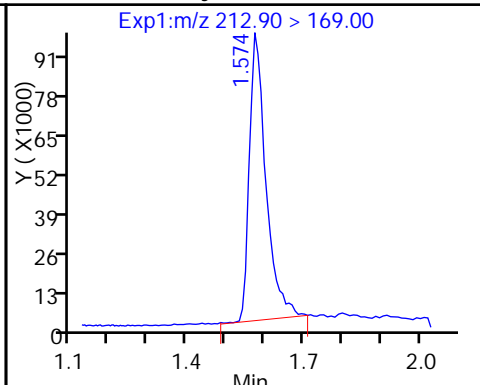
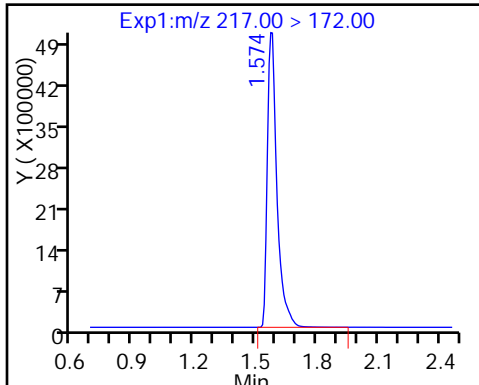
Method: A8_N

Limit Group: LC PFC_DOD ICAL

D 2 13C4 PFBA

1 Perfluorobutyric acid

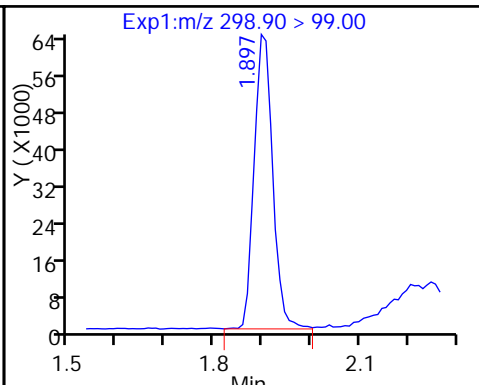
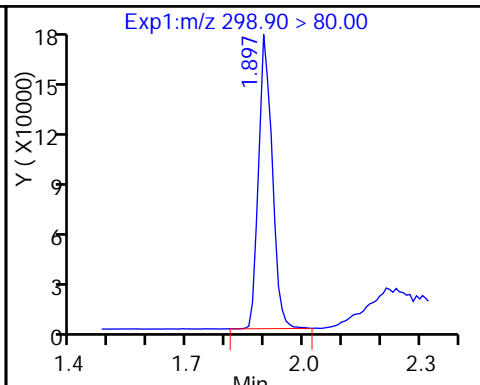
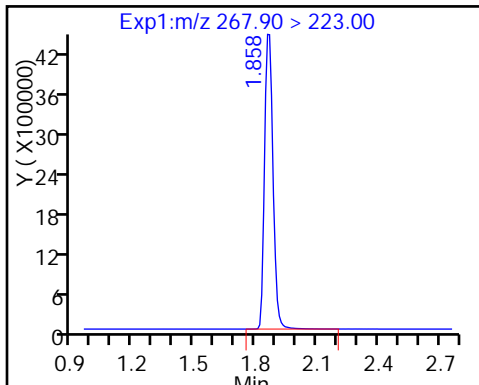
3 Perfluoropentanoic acid



D 4 13C5-PFPeA

5 Perfluorobutanesulfonic acid

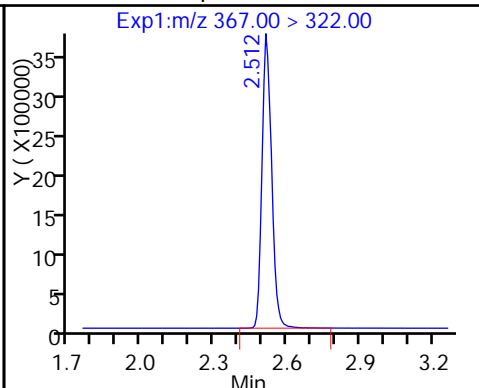
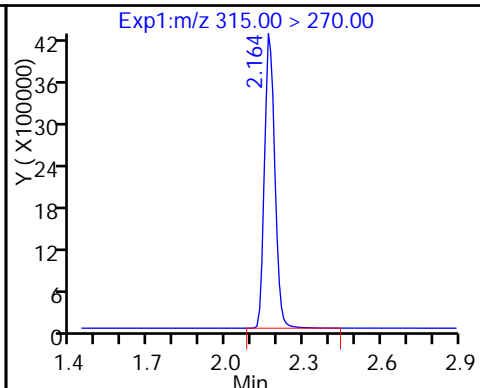
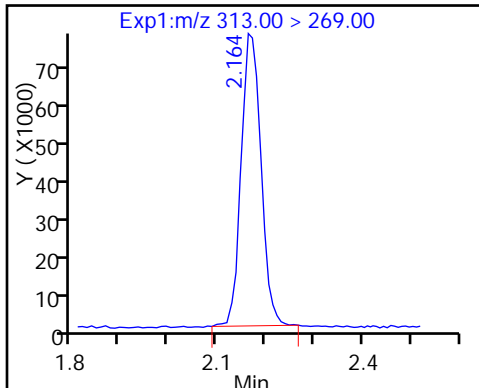
5 Perfluorobutanesulfonic acid



7 Perfluorohexanoic acid

D 6 13C2 PFHxA

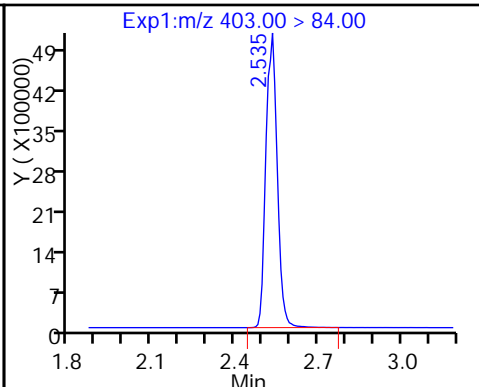
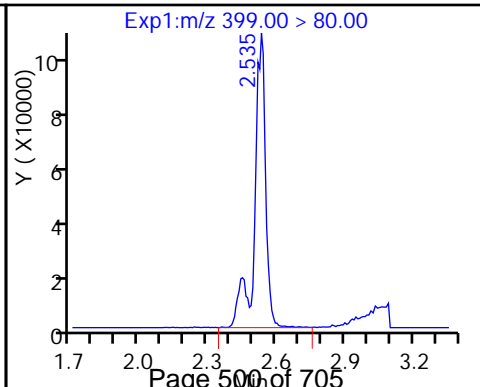
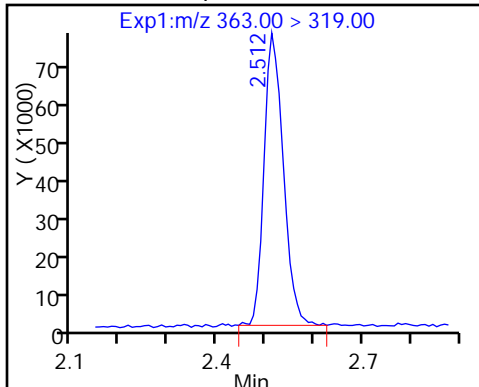
D 11 13C4-PFHpA



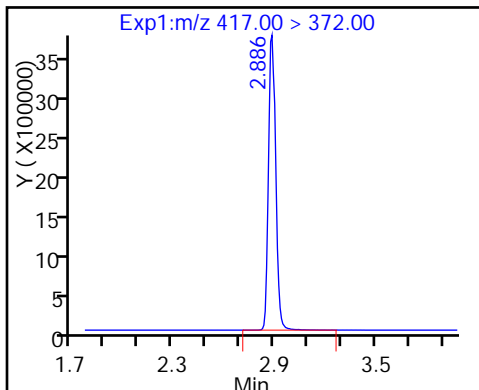
12 Perfluoroheptanoic acid

9 Perfluorohexanesulfonic acid

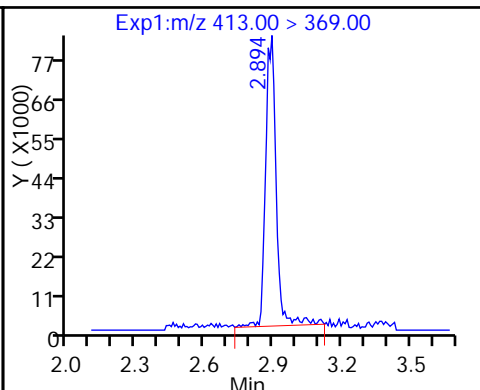
D 10 18O2 PFHxS



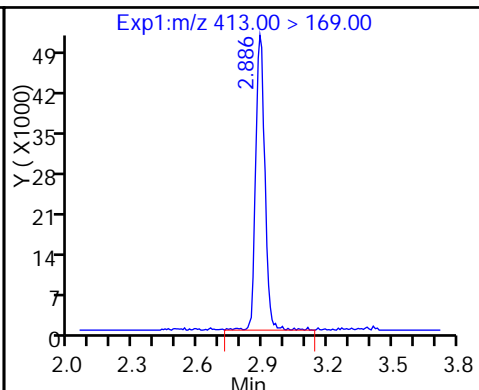
D 14 13C4 PFOA



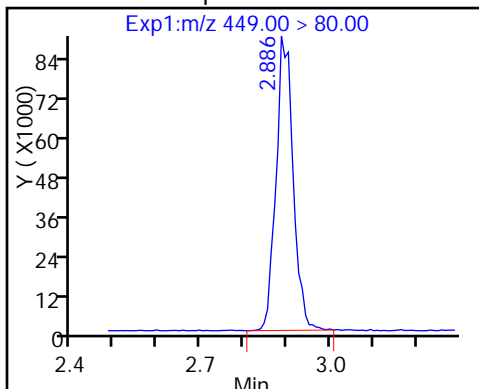
15 Perfluorooctanoic acid



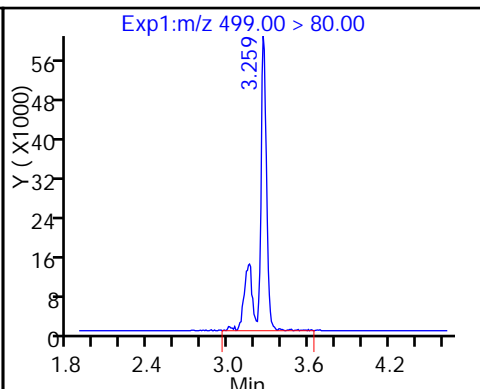
15 Perfluorooctanoic acid



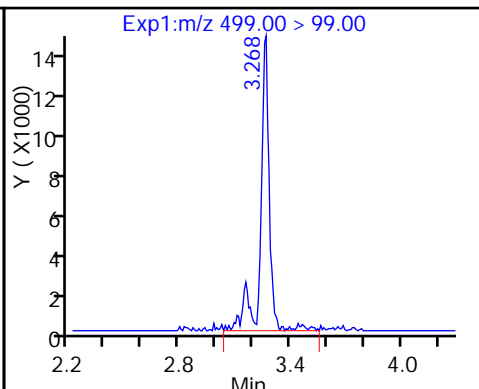
13 Perfluoroheptanesulfonic Acid



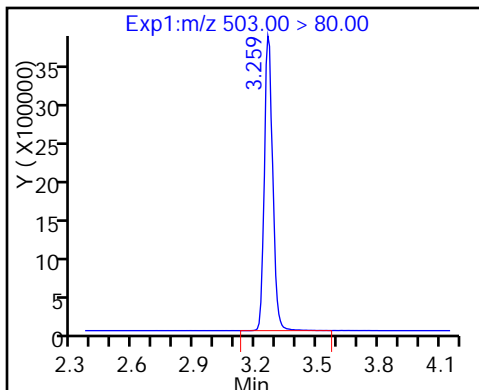
18 Perfluorooctane sulfonic acid



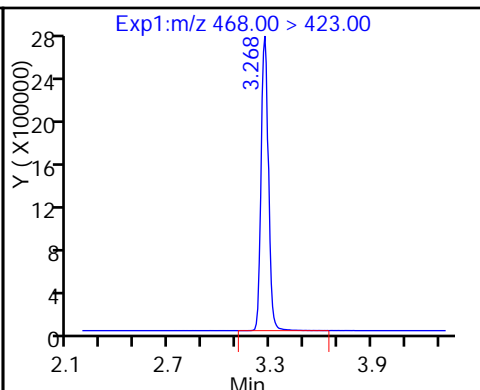
18 Perfluorooctane sulfonic acid



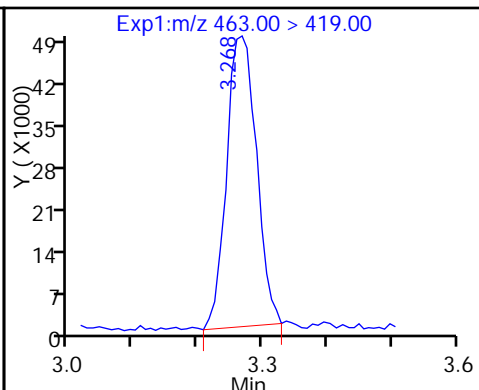
D 17 13C4 PFOS



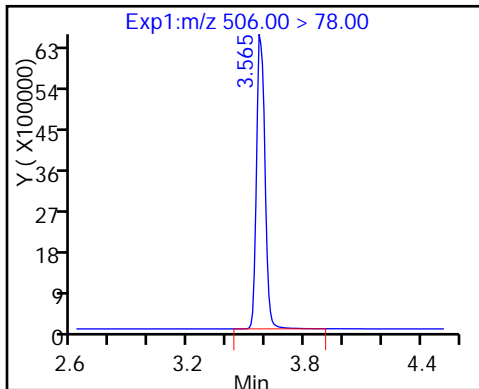
D 19 13C5 PFNA



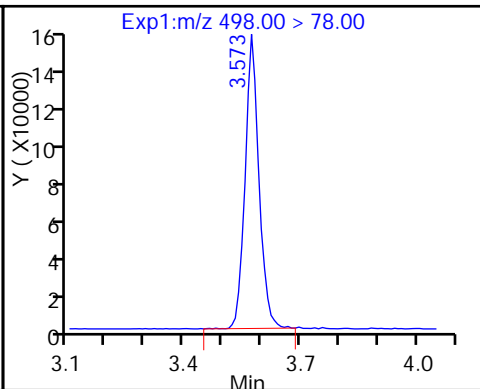
20 Perfluorononanoic acid



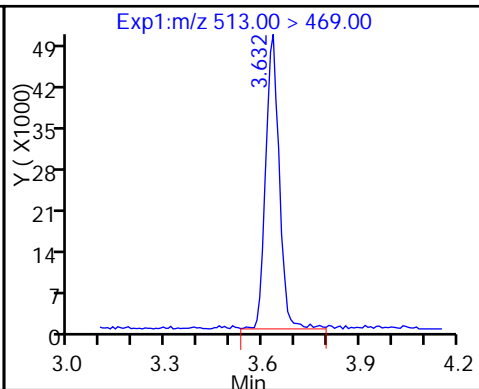
D 21 13C8 FOSA



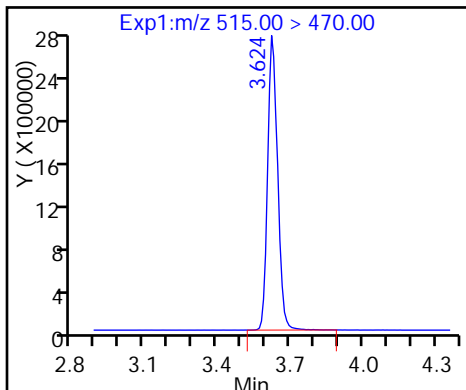
22 Perfluorooctane Sulfonamide



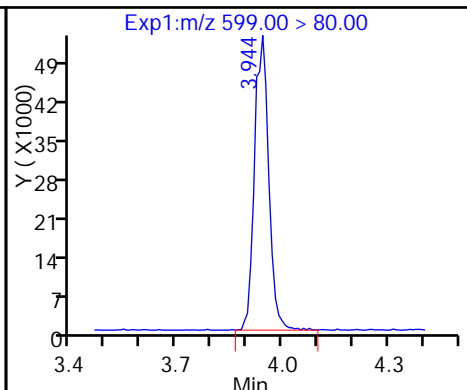
24 Perfluorodecanoic acid



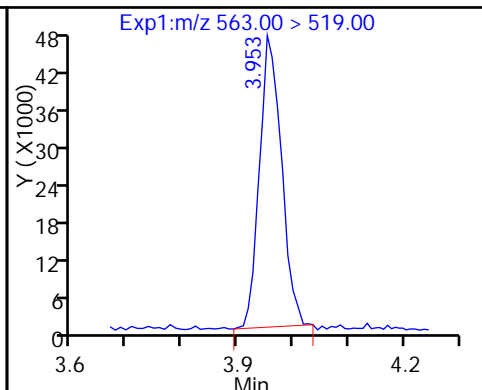
D 23 13C2 PFDA



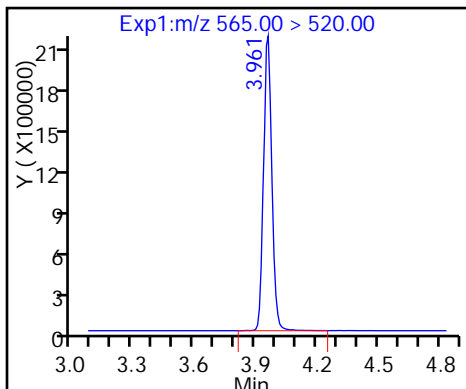
26 Perfluorodecane Sulfonic acid



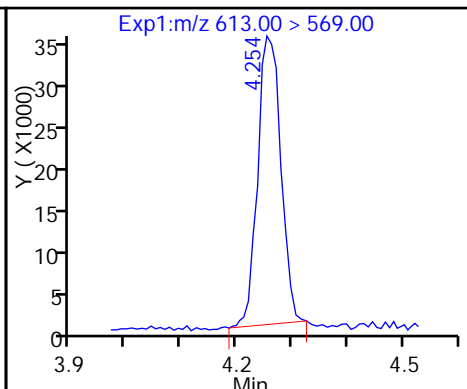
28 Perfluoroundecanoic acid



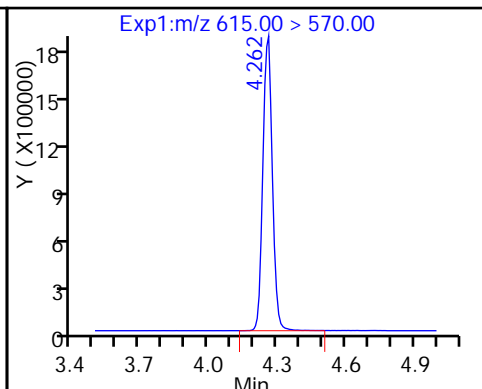
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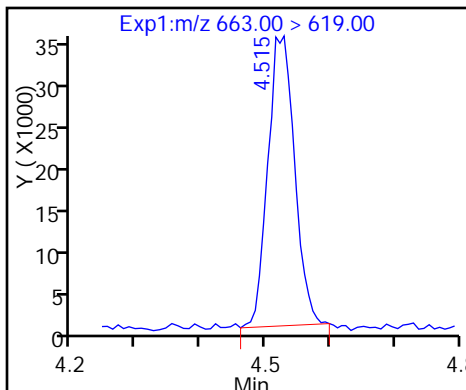
29 Perfluorododecanoic acid



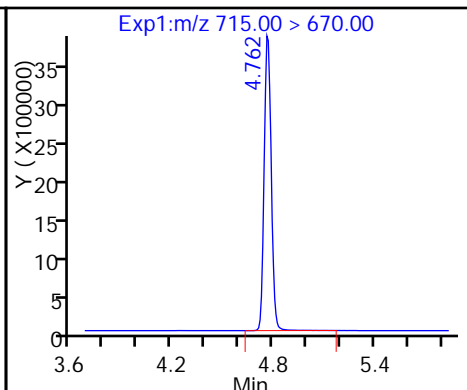
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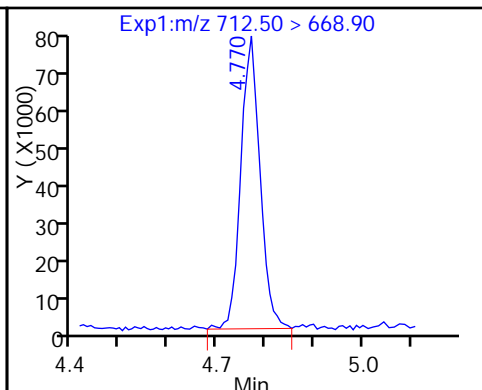
31 Perfluorotridecanoic acid



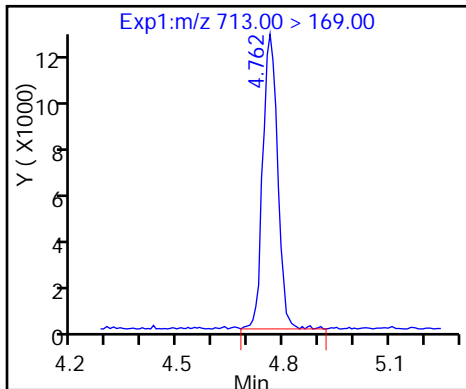
D 32 13C2-PFTeDa



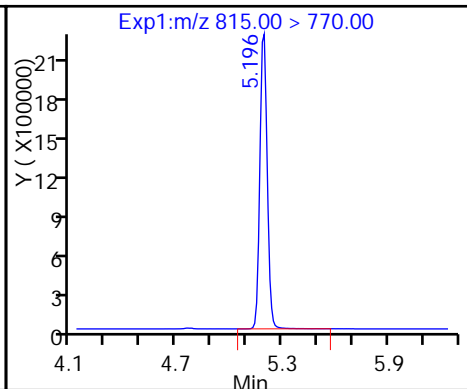
33 Perfluorotetradecanoic acid



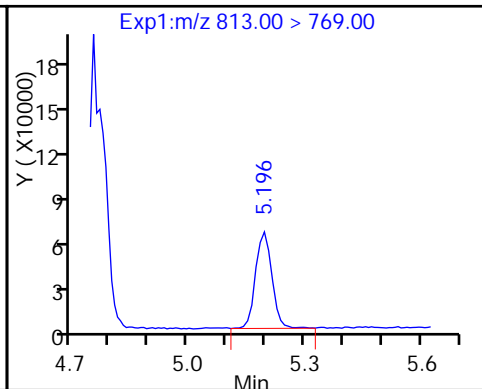
33 Perfluorotetradecanoic acid



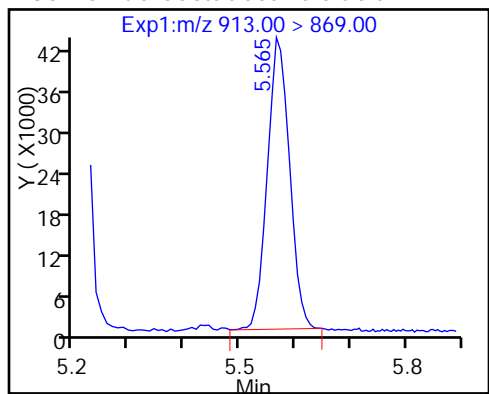
D 34 13C2-PFHxDa



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_006.d
 Lims ID: IC L3
 Client ID:
 Sample Type: IC Calib Level: 3
 Inject. Date: 03-Dec-2016 14:03:44 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*sub3
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 05-Dec-2016 10:24:10 Calib Date: 03-Dec-2016 15:33:40
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d
 Column 1 : Det: EXP1
 Process Host: XAWRK020

First Level Reviewer: chandrasenas Date: 05-Dec-2016 09:43:24

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	1.574	1.574	0.0	19799279	59.0		118	1507463	
1 Perfluorobutyric acid	212.90 > 169.00	1.574	1.577	-0.003	1758998	5.08		102	10276	
3 Perfluoropentanoic acid	262.90 > 219.00	1.858	1.861	-0.003	1580002	4.98		99.6	13754	
D 4 13C5-PFPeA	267.90 > 223.00	1.858	1.861	-0.003	15634346	59.1		118	910049	
5 Perfluorobutanesulfonic acid	298.90 > 80.00	1.897	1.900	-0.003	2768149	4.72		107		
	298.90 > 99.00	1.897	1.900	-0.003	1152600		2.40(0.00-0.00)	107		
7 Perfluorohexanoic acid	313.00 > 269.00	2.163	2.164	-0.001	1358530	5.11		102	38617	
D 6 13C2 PFHxA	315.00 > 270.00	2.163	2.164	-0.001	13959775	58.8		118	866927	
D 11 13C4-PFHpA	367.00 > 322.00	2.508	2.511	-0.003	12498264	60.3		121	1070818	
12 Perfluoroheptanoic acid	363.00 > 319.00	2.516	2.512	0.004	1254320	4.89		97.7	16816	
9 Perfluorohexanesulfonic acid	399.00 > 80.00	2.531	2.531	0.0	1846932	4.58		101		
D 10 18O2 PFHxS	403.00 > 84.00	2.531	2.531	0.0	17374498	55.6		118	872275	
D 14 13C4 PFOA	417.00 > 372.00	2.880	2.880	0.0	13257596	60.5		121	935997	

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	2.880	2.887	-0.007	1.000	1455373	5.12		102	23006	
413.00 > 169.00	2.888	2.887	0.001	1.003	828495		1.76(0.90-1.10)	102	49224	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.888	2.888	0.0	1.000	1641199	4.77		100		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.255	3.258	-0.003	1.000	1443163	4.55		98.0	374092	
499.00 > 99.00	3.255	3.258	-0.003	1.000	319030		4.52(0.90-1.10)	98.0	32937	
D 17 13C4 PFOS										
503.00 > 80.00	3.263	3.259	0.004		13983781	56.8		119	604878	
D 19 13C5 PFNA										
468.00 > 423.00	3.263	3.263	0.0		10108070	60.7		121	545062	
20 Perfluorononanoic acid										
463.00 > 419.00	3.263	3.263	0.0	1.000	981559	4.87		97.5	16647	
D 21 13C8 FOSA										
506.00 > 78.00	3.576	3.571	0.005		23126232	57.5		115	745838	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.576	3.574	0.002	1.000	2262174	5.24		105	133644	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.618	3.623	-0.005	1.000	868604	4.91		98.1	29437	
D 23 13C2 PFDA										
515.00 > 470.00	3.627	3.626	0.001		9213875	58.4		117	291561	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.938	3.936	0.002	1.000	868168	4.64		96.2		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.956	3.955	0.001	1.000	704273	4.66		93.2	19079	
D 27 13C2 PFUnA										
565.00 > 520.00	3.956	3.958	-0.002		7086903	59.7		119	336150	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.253	4.250	0.003	1.000	606951	4.85		96.9	11284	
D 30 13C2 PFDaA										
615.00 > 570.00	4.253	4.251	0.002		6599493	58.9		118	172819	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.521	4.518	0.003	1.000	627673	5.01		100	1096	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.761	4.759	0.002		13488161	58.3		117	1155339	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.761	4.761	0.0	1.000	1175506	4.80		96.1	484	
713.00 > 169.00	4.761	4.761	0.0	1.000	194335		6.05(0.00-0.00)	96.1	68892	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.180	5.186	-0.006		7591947	58.5		117	144235	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.191	5.186	0.005	1.000	766480	5.09		102	693	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.561	5.559	0.002	1.000	673971	5.14		103	887	

Reagents:

LCPFC-L3_00019

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_006.d

Injection Date: 03-Dec-2016 14:03:44

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

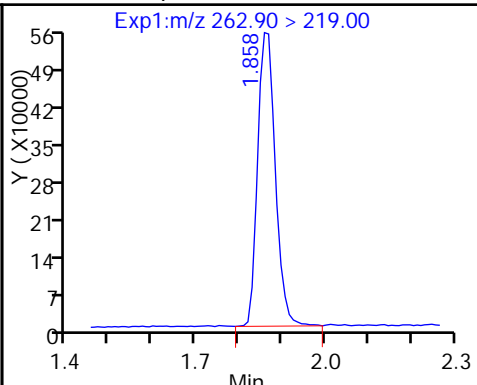
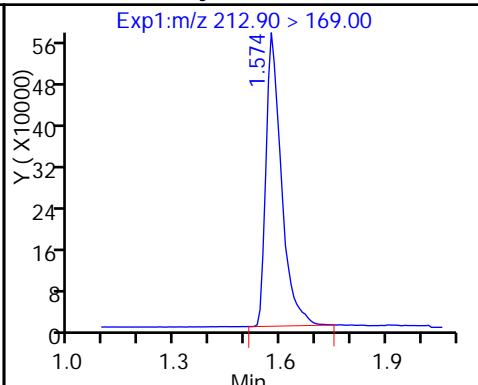
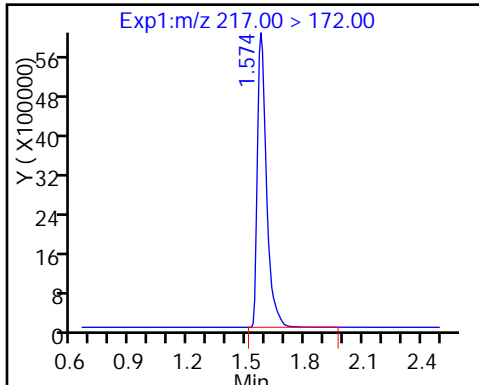
Method: A8_N

Limit Group: LC PFC_DOD ICAL

D 2 13C4 PFBA

1 Perfluorobutyric acid

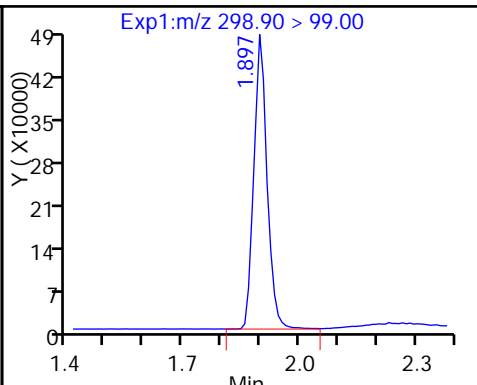
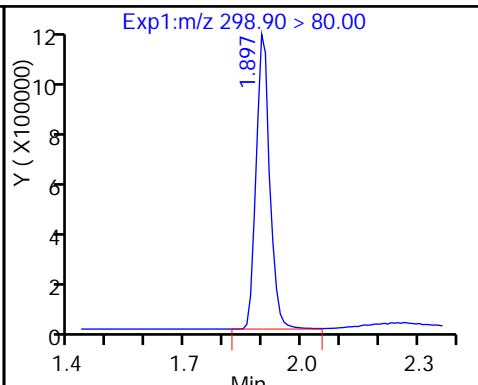
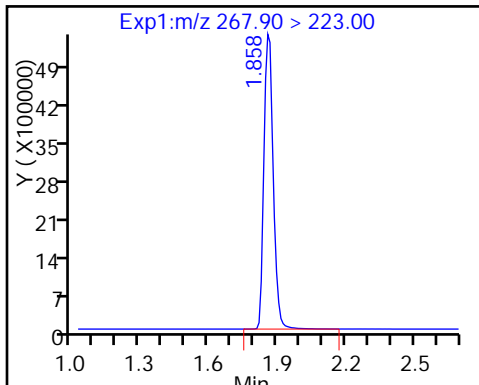
3 Perfluoropentanoic acid



D 4 13C5-PFPeA

5 Perfluorobutanesulfonic acid

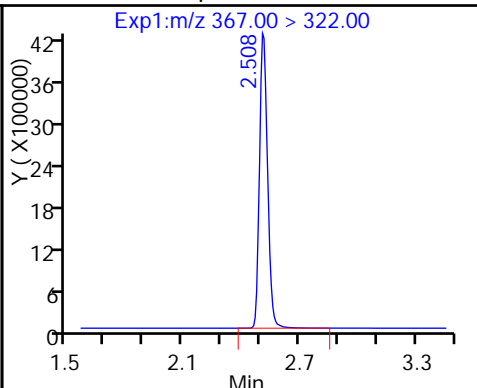
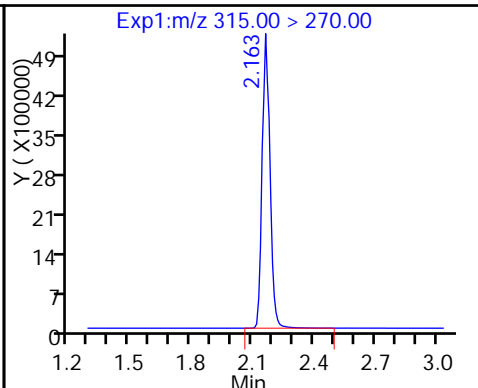
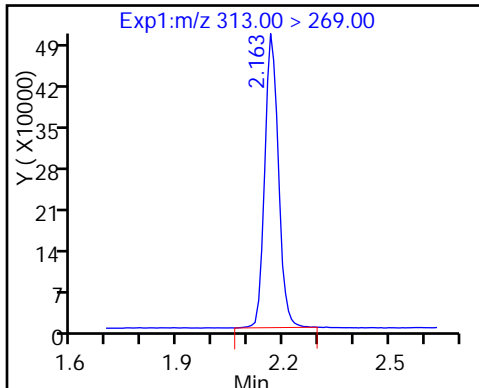
5 Perfluorobutanesulfonic acid



7 Perfluorohexanoic acid

D 6 13C2 PFHxA

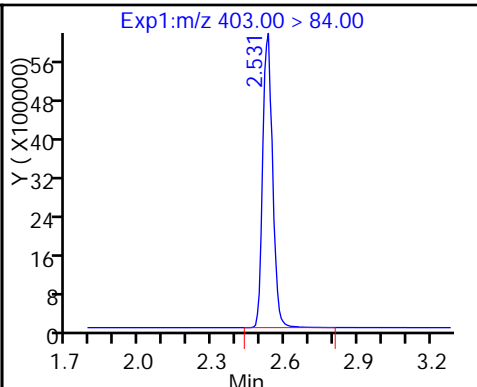
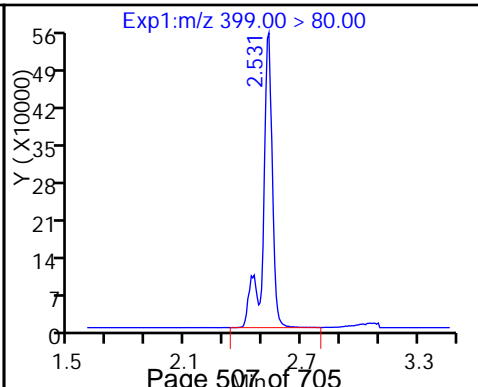
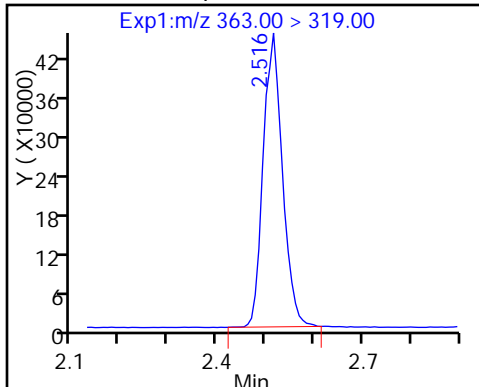
D 11 13C4-PFHpA



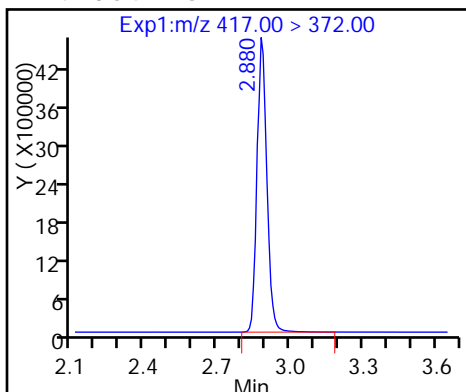
12 Perfluoroheptanoic acid

9 Perfluorohexanesulfonic acid

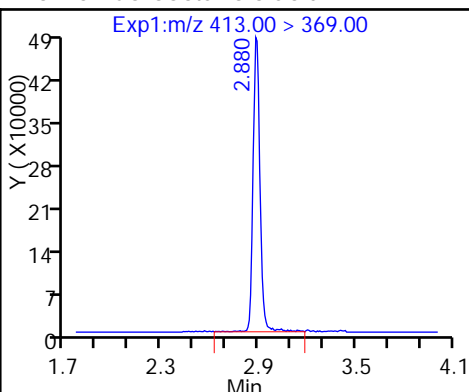
D 10 18O2 PFHxS



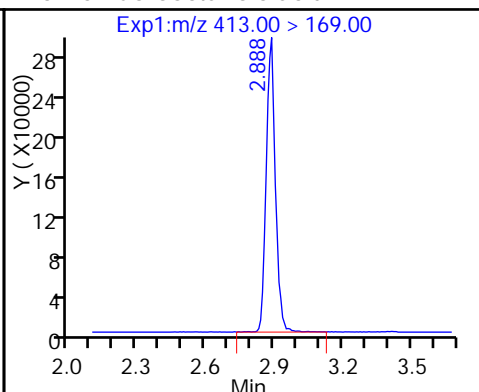
D 14 13C4 PFOA



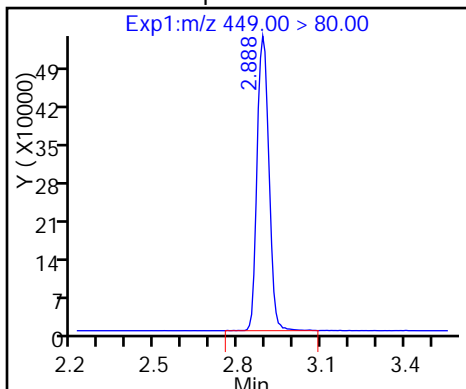
15 Perfluorooctanoic acid



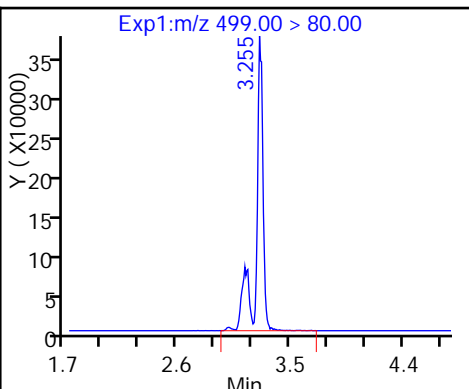
15 Perfluorooctanoic acid



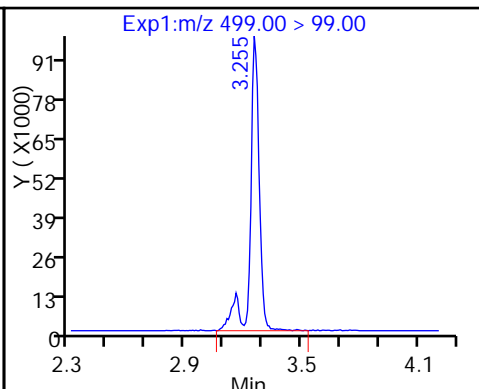
13 Perfluoroheptanesulfonic Acid



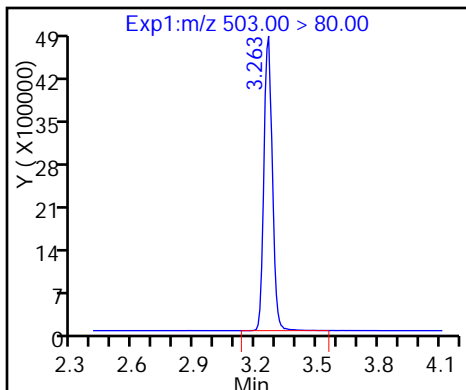
18 Perfluorooctane sulfonic acid



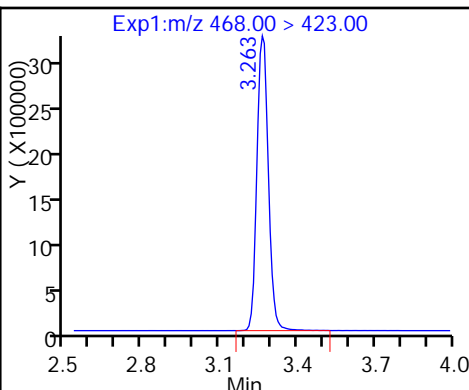
18 Perfluorooctane sulfonic acid



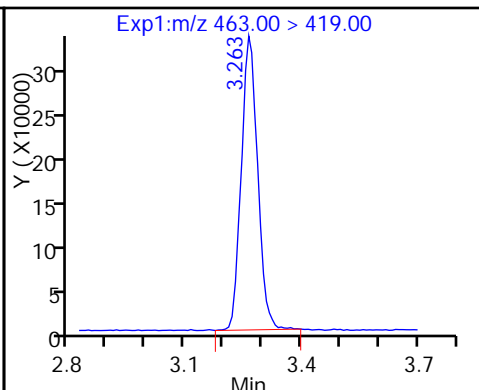
D 17 13C4 PFOS



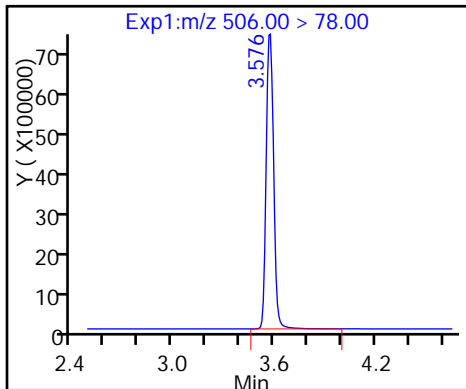
D 19 13C5 PFNA



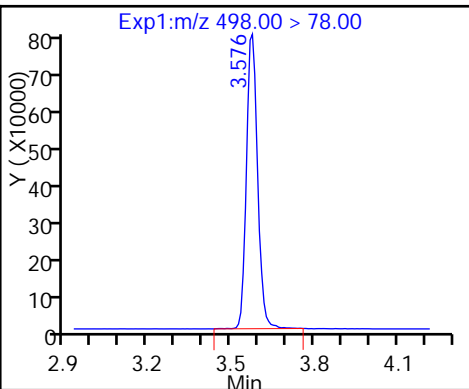
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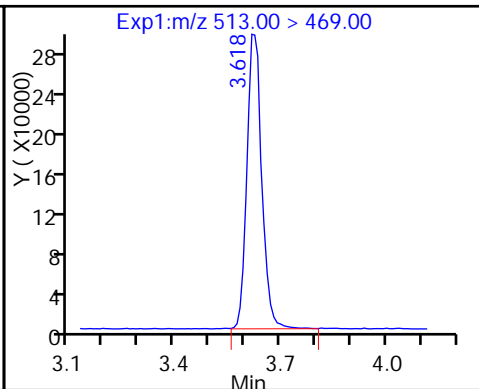
D 21 13C8 FOSA



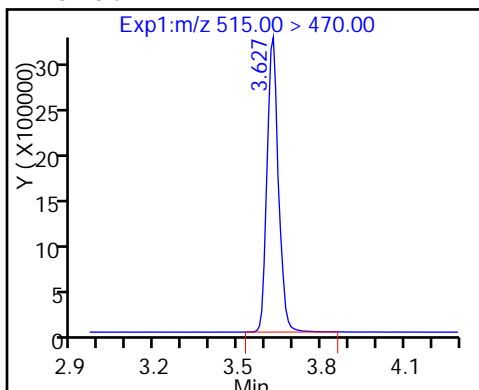
22 Perfluorooctane Sulfonamide



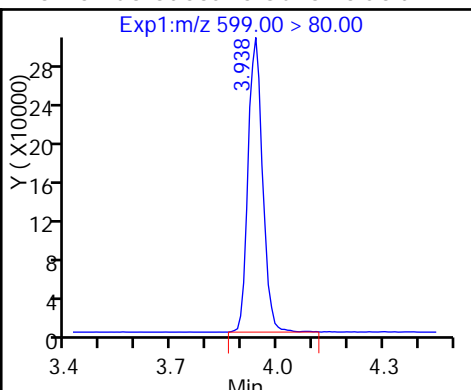
24 Perfluorodecanoic acid



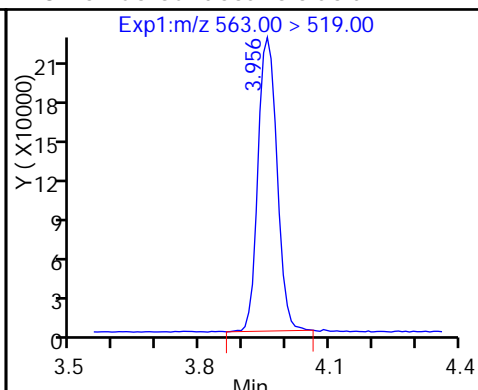
D 23 13C2 PFDA



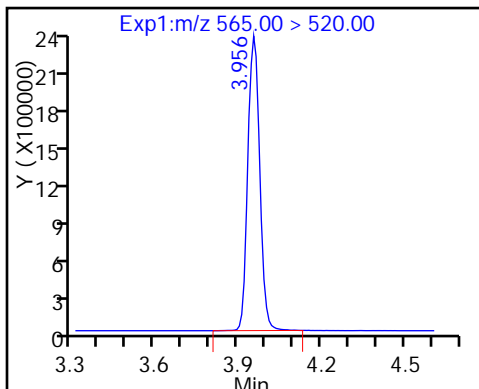
26 Perfluorodecane Sulfonic acid



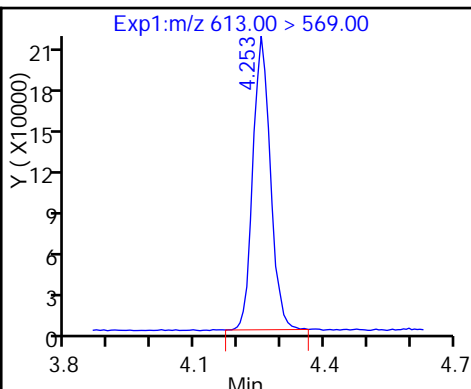
28 Perfluoroundecanoic acid



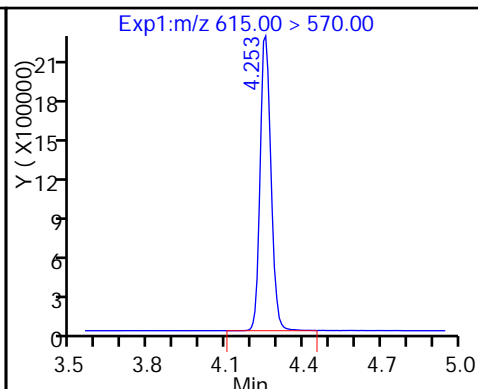
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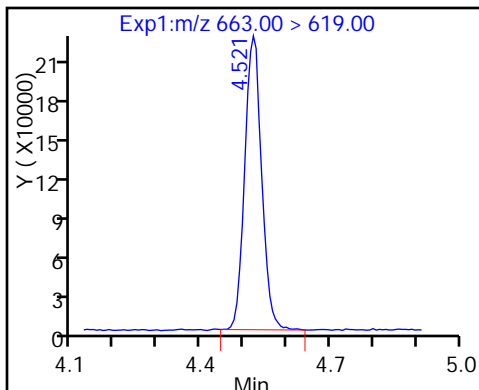
29 Perfluorododecanoic acid



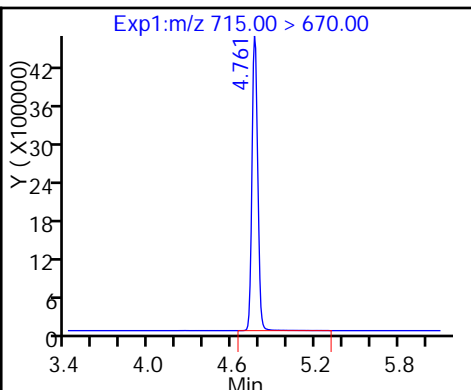
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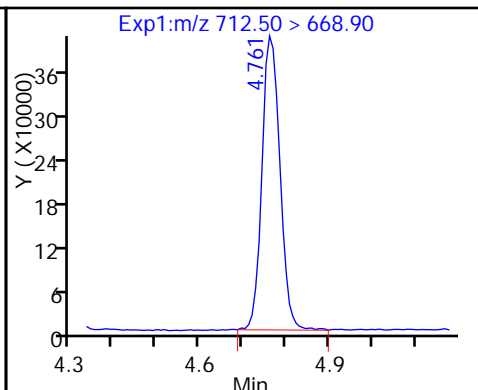
31 Perfluorotridecanoic acid



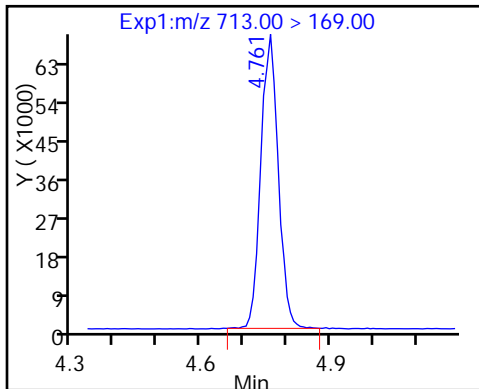
D 32 13C2-PFTeDA



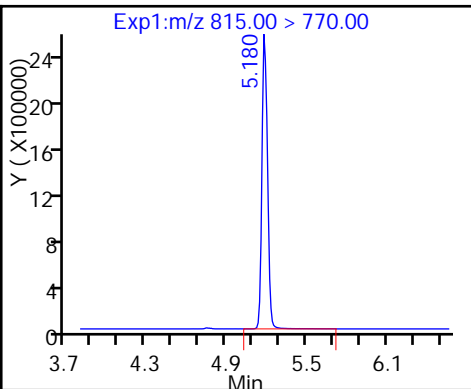
33 Perfluorotetradecanoic acid



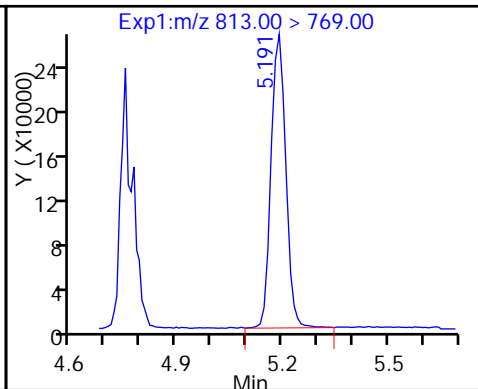
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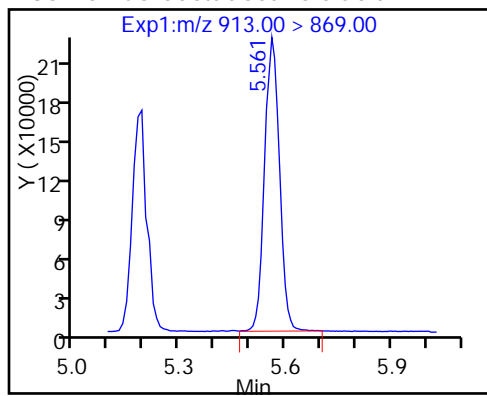
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_007.d
 Lims ID: IC L4
 Client ID:
 Sample Type: IC Calib Level: 4
 Inject. Date: 03-Dec-2016 14:11:14 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*sub3
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 05-Dec-2016 10:24:13 Calib Date: 03-Dec-2016 15:33:40
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d

Column 1 : Det: EXP1
 Process Host: XAWRK020

First Level Reviewer: chandrasenas Date: 05-Dec-2016 09:41:57

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	1.574	1.574	0.0	18254473	54.4		109	916244	
1 Perfluorobutyric acid	212.90 > 169.00	1.582	1.577	0.005	7008467	22.0		110	42848	
3 Perfluoropentanoic acid	262.90 > 219.00	1.868	1.861	0.007	6115663	20.9		104	53754	
D 4 13C5-PFPeA	267.90 > 223.00	1.868	1.861	0.007	14426922	54.5		109	1030803	
5 Perfluorobutanesulfonic acid	298.90 > 80.00	1.907	1.900	0.007	10888534	20.0		113		
	298.90 > 99.00	1.897	1.900	-0.003	4709173		2.31(0.00-0.00)	113		
7 Perfluorohexanoic acid	313.00 > 269.00	2.171	2.164	0.007	5224102	21.6		108	141802	
D 6 13C2 PFHxA	315.00 > 270.00	2.162	2.164	-0.002	12716423	53.5		107	709396	
D 11 13C4-PFHpA	367.00 > 322.00	2.512	2.511	0.001	11474824	55.3		111	830208	
12 Perfluoroheptanoic acid	363.00 > 319.00	2.512	2.512	0.0	4918226	20.9		104	66176	
9 Perfluorohexanesulfonic acid	399.00 > 80.00	2.527	2.531	-0.004	6968734	18.7		102		M M
D 10 18O2 PFHxS	403.00 > 84.00	2.535	2.531	0.004	16099619	51.5		109	1076833	
D 14 13C4 PFOA	417.00 > 372.00	2.886	2.880	0.006	12069172	55.0		110	656359	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.894	2.887	0.007	1.000	5292388	20.5		102	50246	M
413.00 > 169.00	2.886	2.887	-0.001	0.997	3252983		1.63(0.90-1.10)	102	188817	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.886	2.888	-0.002	1.000	6678298	20.6		108		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.259	3.258	0.001	1.000	5631788	18.8		101	741165	
499.00 > 99.00	3.259	3.258	0.001	1.000	1257953		4.48(0.90-1.10)	101	196382	
D 17 13C4 PFOS										
503.00 > 80.00	3.259	3.259	0.0		13189624	53.6		112	527854	
D 19 13C5 PFNA										
468.00 > 423.00	3.267	3.263	0.004		8920352	53.6		107	500218	
20 Perfluorononanoic acid										
463.00 > 419.00	3.267	3.263	0.004	1.000	3804327	21.4		107	70301	
D 21 13C8 FOSA										
506.00 > 78.00	3.573	3.571	0.002		22326638	55.5		111	379770	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.573	3.574	-0.001	1.000	9111782	21.8		109	354493	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.623	3.623	0.0	1.000	3434382	20.3		102	104771	
D 23 13C2 PFDA										
515.00 > 470.00	3.623	3.626	-0.003		8786342	55.7		111	333180	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.939	3.936	0.003	1.000	3548629	20.1		104		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.956	3.955	0.001	1.000	2673576	19.3		96.7	68734	
D 27 13C2 PFUnA										
565.00 > 520.00	3.965	3.958	0.007		6485474	54.6		109	683577	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.253	4.250	0.003	1.000	2415187	21.0		105	47125	
D 30 13C2 PFDaA										
615.00 > 570.00	4.253	4.251	0.002		6067987	54.1		108	181188	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.524	4.518	0.006	1.000	2373060	20.6		103	5080	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.764	4.759	0.005		12877999	55.7		111	442175	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.764	4.761	0.003	1.000	4681126	20.8		104	1697	
713.00 > 169.00	4.756	4.761	-0.005	0.998	771098		6.07(0.00-0.00)	104	90317	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.187	5.186	0.001		7363997	56.8		114	132680	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.187	5.186	0.001	1.000	2870345	23.1		115	2476	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.563	5.559	0.004	1.000	2205153	18.3		91.5	3091	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LCPFC-L4_00022

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_007.d

Injection Date: 03-Dec-2016 14:11:14

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

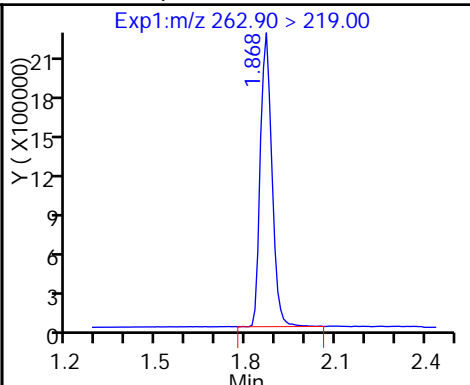
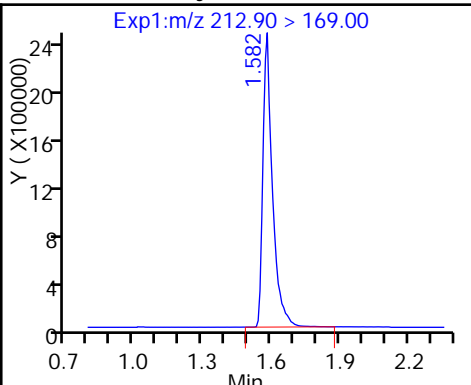
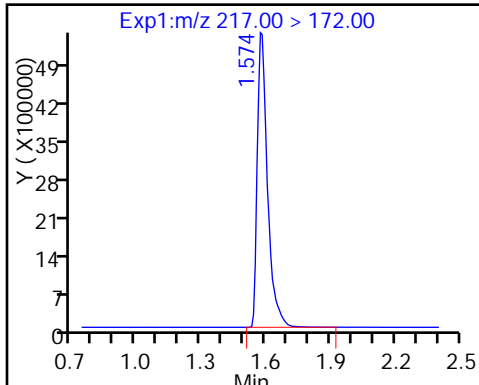
Method: A8_N

Limit Group: LC PFC_DOD ICAL

D 2 13C4 PFBA

1 Perfluorobutyric acid

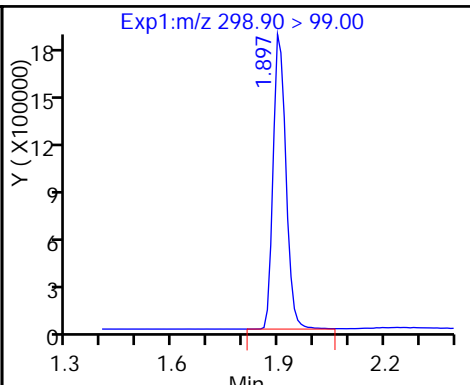
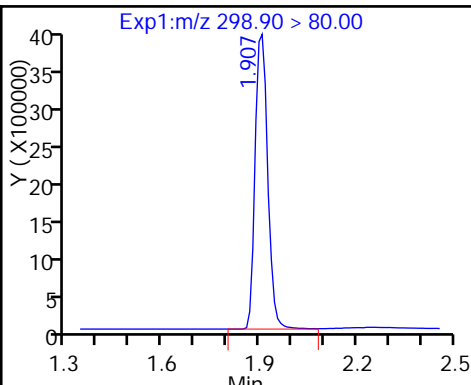
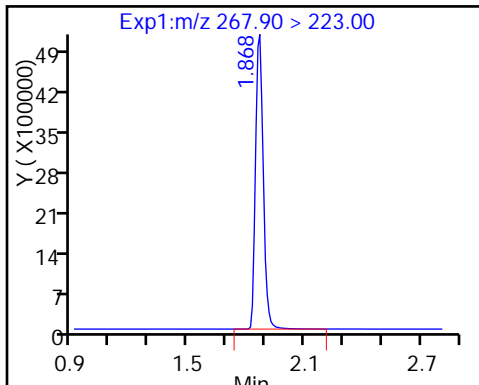
3 Perfluoropentanoic acid



D 4 13C5-PFPeA

5 Perfluorobutanesulfonic acid

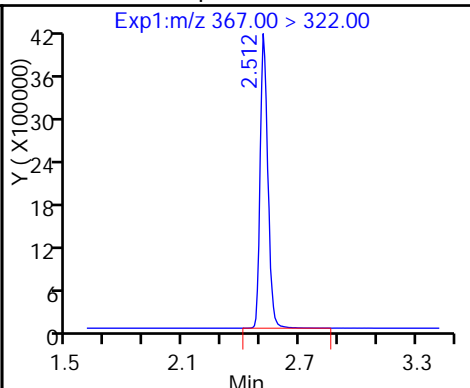
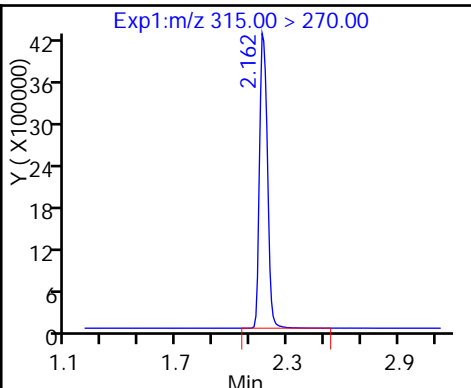
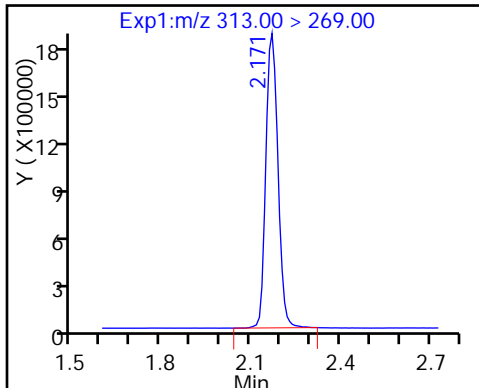
5 Perfluorobutanesulfonic acid



7 Perfluorohexanoic acid

D 6 13C2 PFHxA

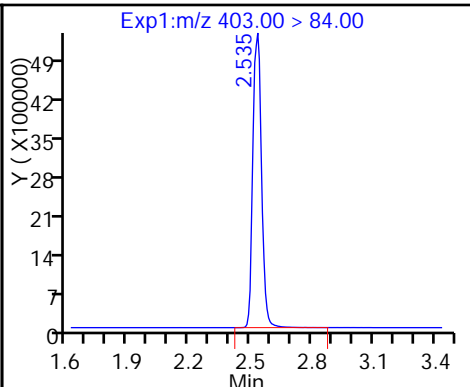
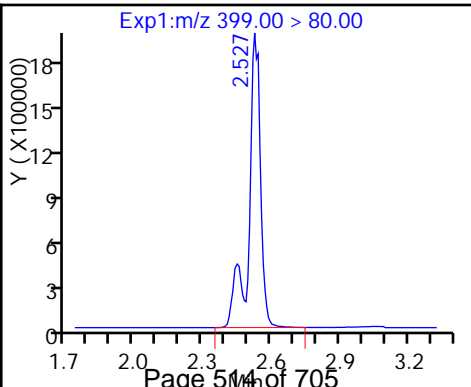
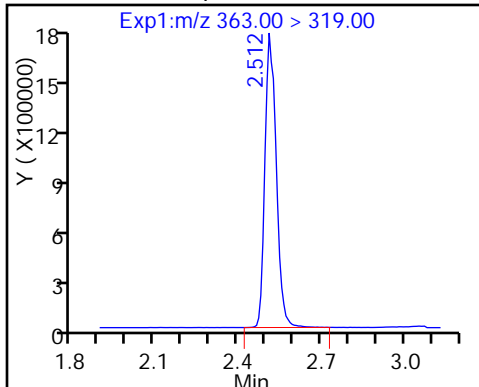
D 11 13C4-PFHpA



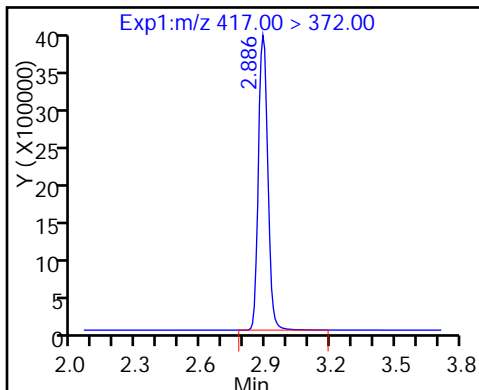
12 Perfluoroheptanoic acid

9 Perfluorohexanesulfonic acid (M)

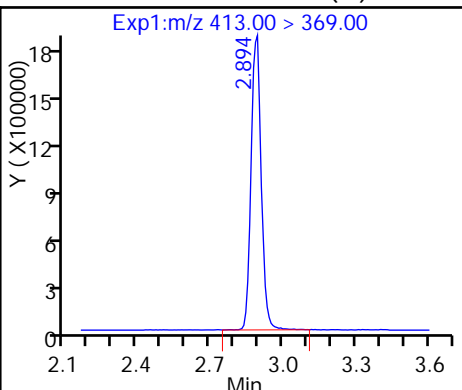
D 10 18O2 PFHxS



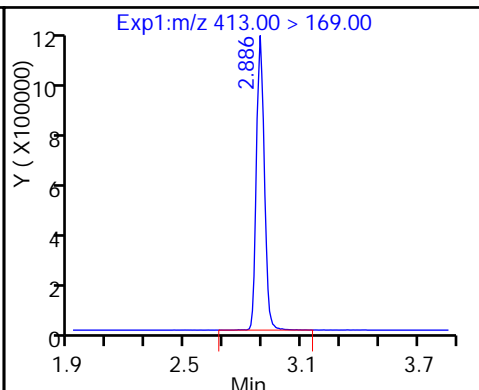
D 14 13C4 PFOA



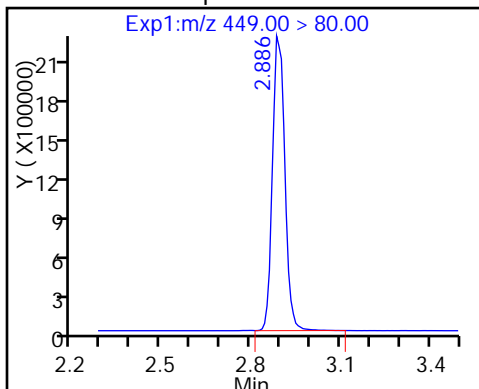
15 Perfluorooctanoic acid (M)



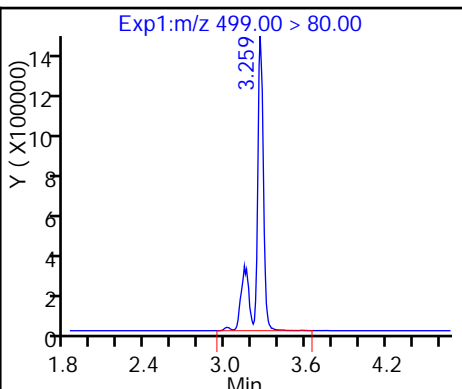
15 Perfluorooctanoic acid



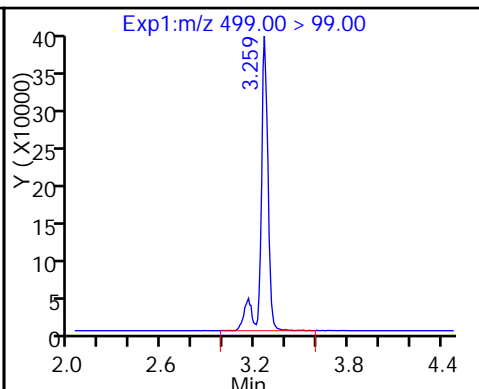
13 Perfluoroheptanesulfonic Acid



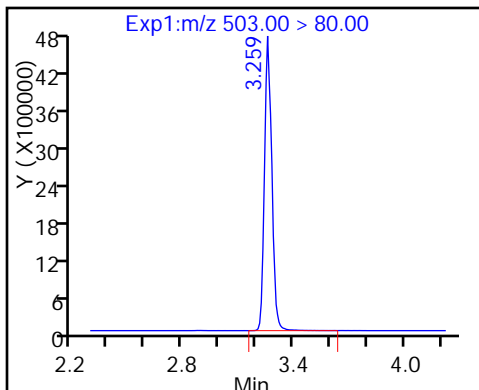
18 Perfluorooctane sulfonic acid



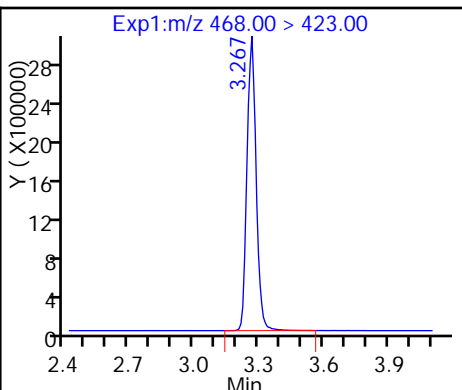
18 Perfluorooctane sulfonic acid



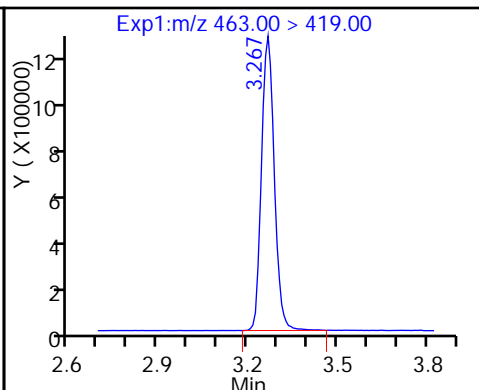
D 17 13C4 PFOS



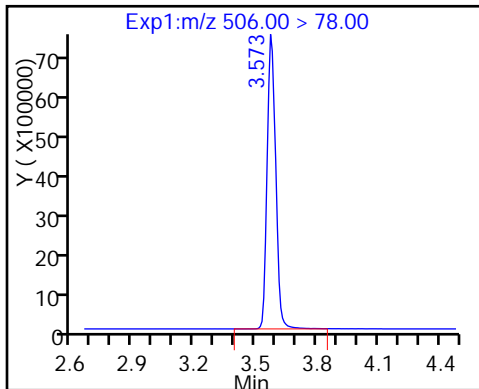
D 19 13C5 PFNA



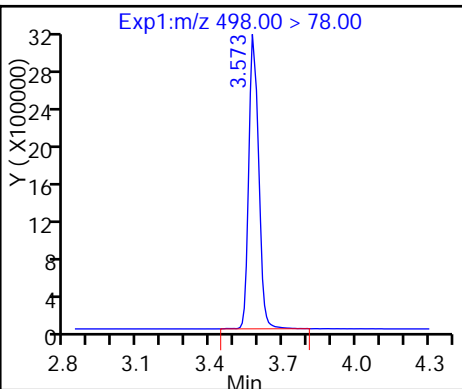
20 Perfluorononanoic acid



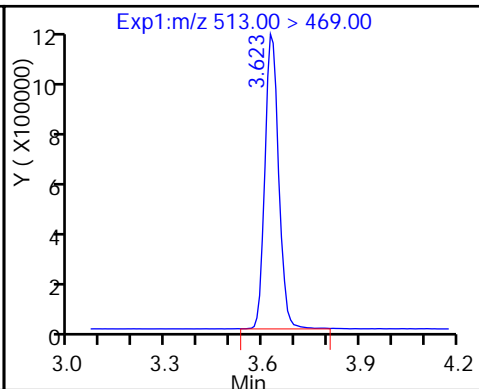
D 21 13C8 FOSA



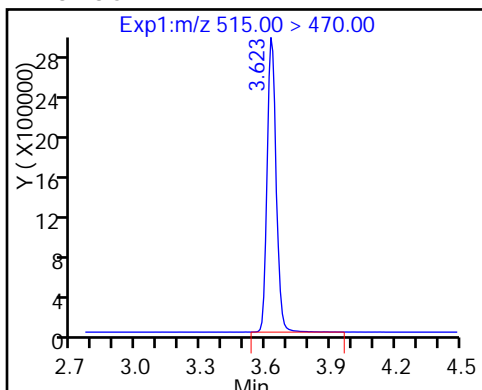
22 Perfluorooctane Sulfonamide



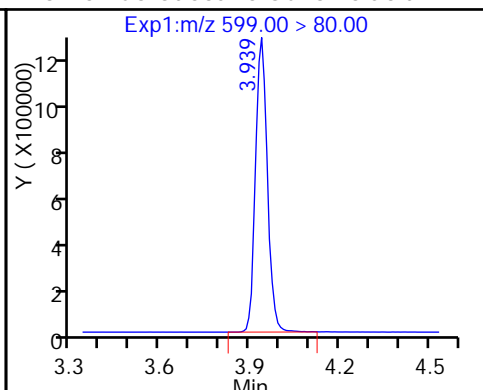
24 Perfluorodecanoic acid



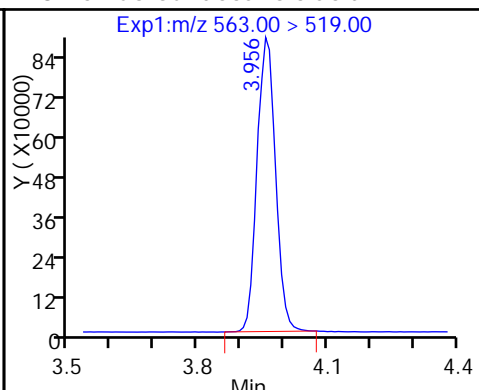
D 23 13C2 PFDA



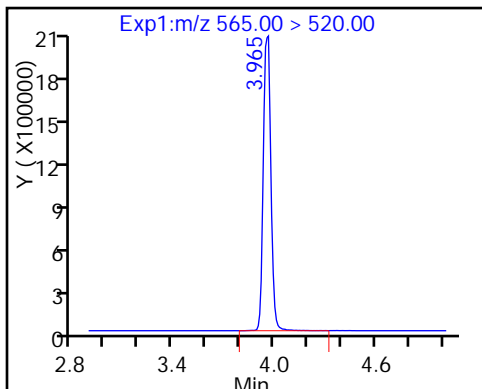
26 Perfluorodecane Sulfonic acid



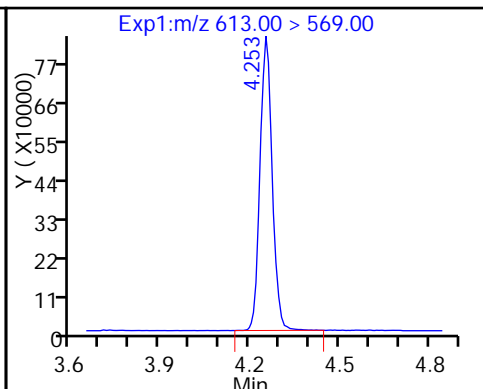
28 Perfluoroundecanoic acid



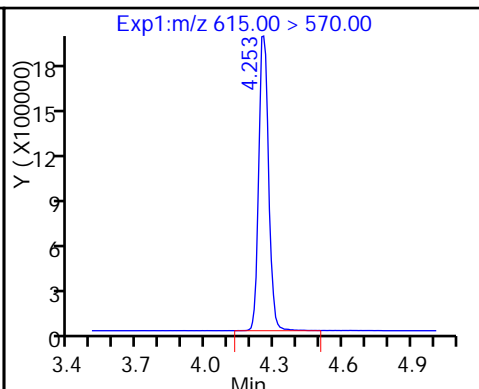
D 27 13C2 PFUa



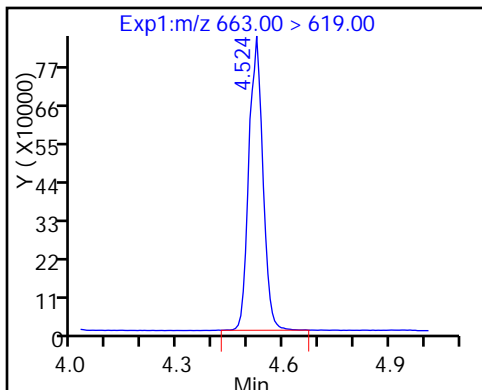
29 Perfluorododecanoic acid



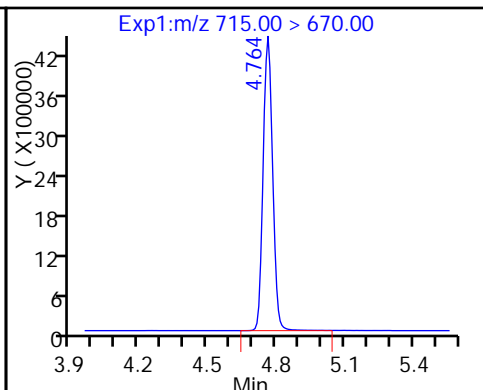
D 30 13C2 PFDa



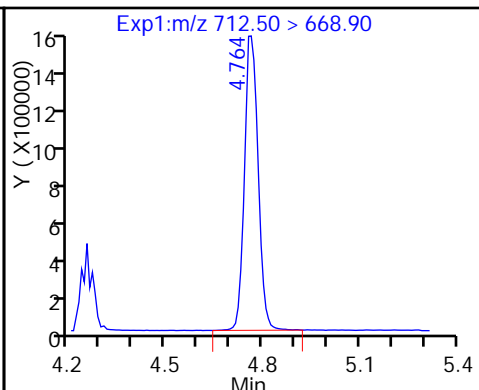
31 Perfluorotridecanoic acid



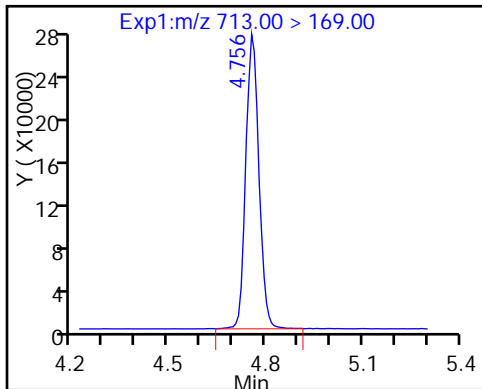
D 32 13C2-PFTeDA



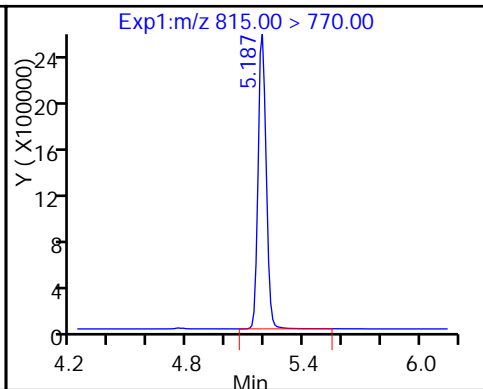
33 Perfluorotetradecanoic acid



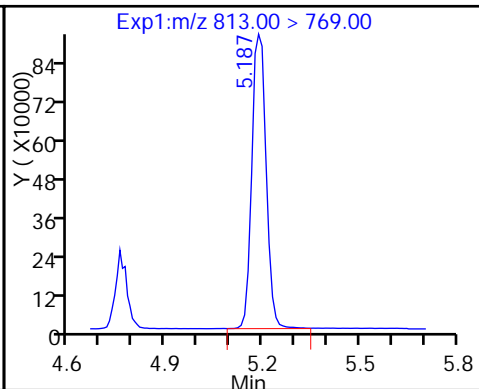
33 Perfluorotetradecanoic acid



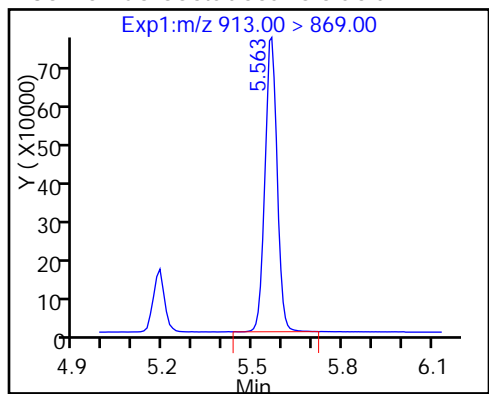
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



TestAmerica Sacramento

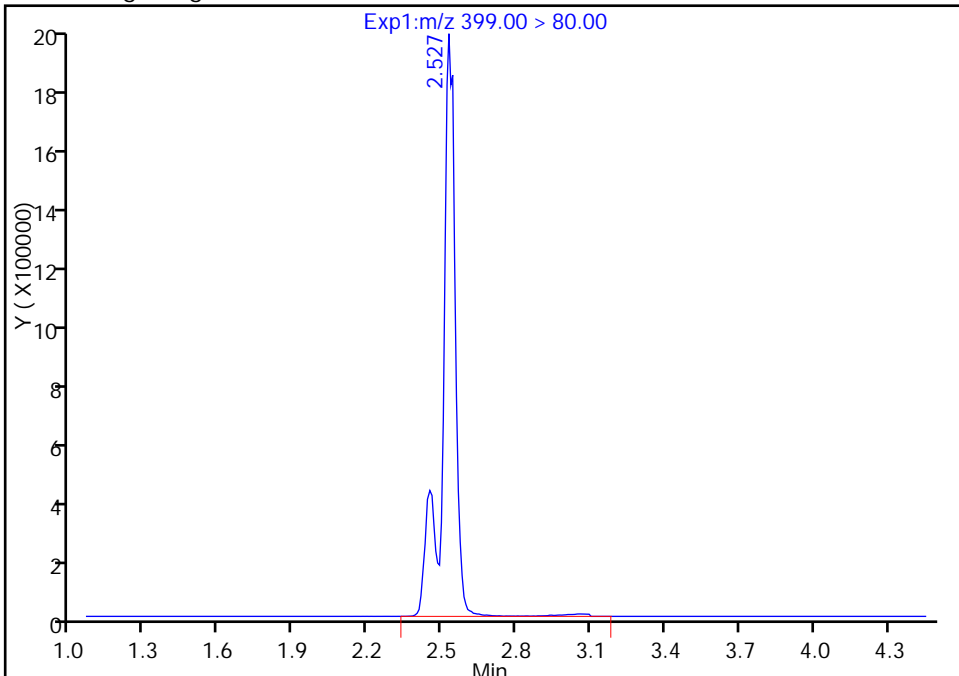
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_007.d
Injection Date: 03-Dec-2016 14:11:14 Instrument ID: A8_N
Lims ID: IC L4
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 40 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

9 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

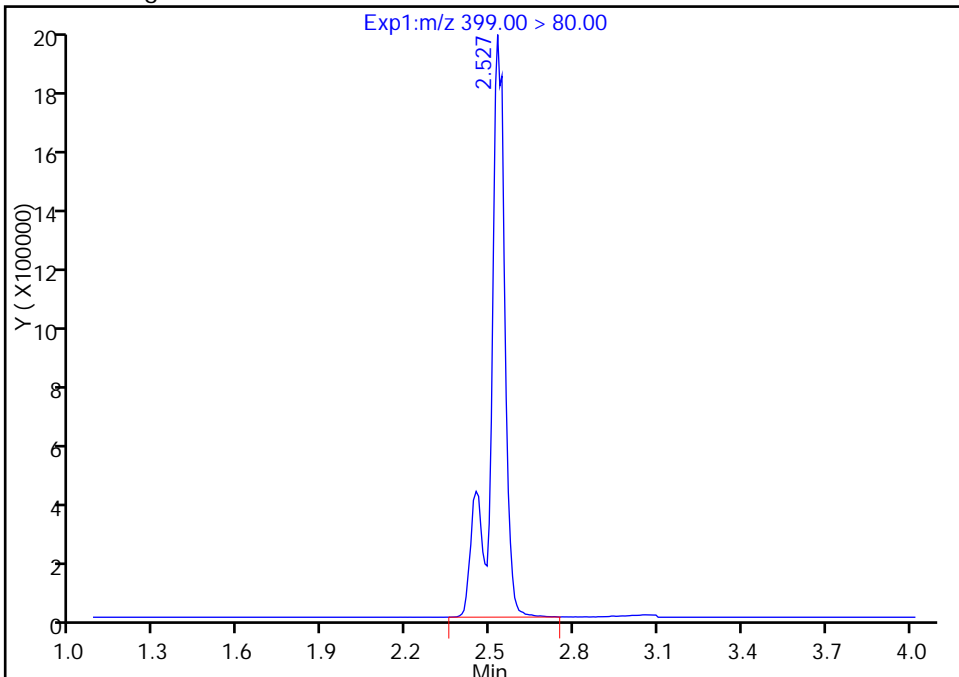
RT: 2.53
Area: 7050184
Amount: 18.826548
Amount Units: ng/ml

Processing Integration Results



RT: 2.53
Area: 6968734
Amount: 18.653631
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

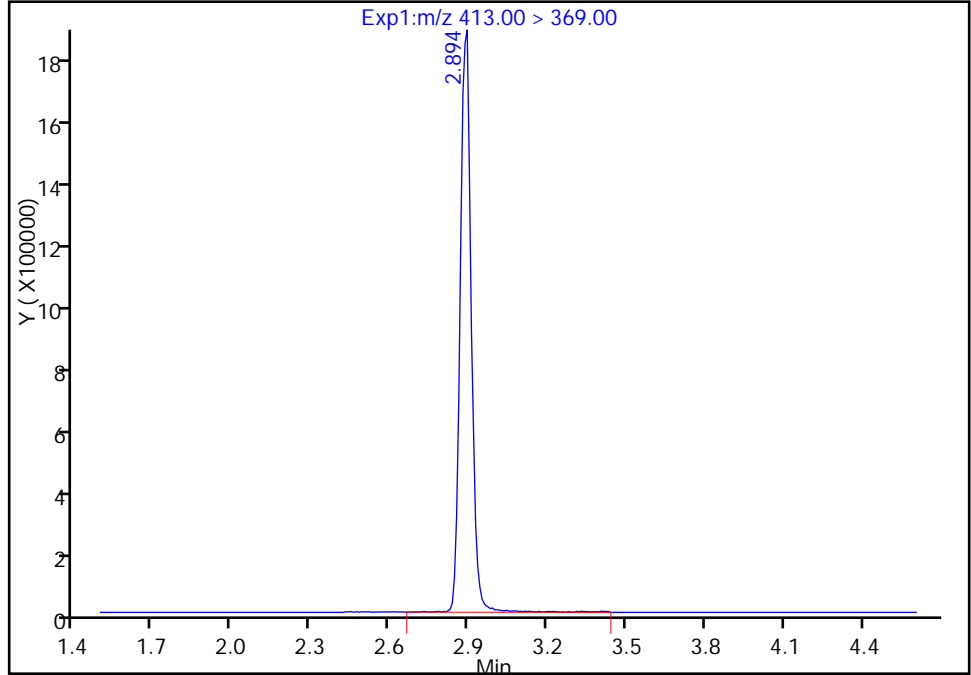
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_007.d
Injection Date: 03-Dec-2016 14:11:14 Instrument ID: A8_N
Lims ID: IC L4
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 40 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

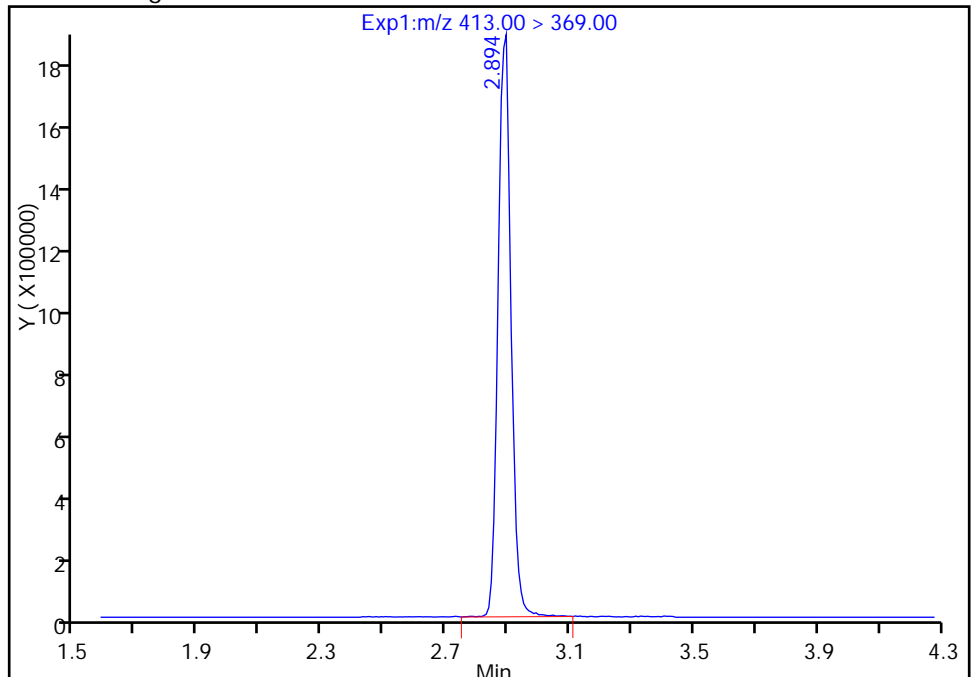
RT: 2.89
Area: 5360428
Amount: 20.662890
Amount Units: ng/ml

Processing Integration Results



RT: 2.89
Area: 5292388
Amount: 20.454262
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 05-Dec-2016 09:41:57

Audit Action: Manually Integrated

Audit Reason: Baseline

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_008.d
 Lims ID: IC L5
 Client ID:
 Sample Type: IC Calib Level: 5
 Inject. Date: 03-Dec-2016 14:18:44 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*sub3
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 05-Dec-2016 10:24:15 Calib Date: 03-Dec-2016 15:33:40
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d

Column 1 : Det: EXP1
 Process Host: XAWRK020

First Level Reviewer: chandrasenas Date: 05-Dec-2016 09:43:57

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	1.574	1.574	0.0	16029004	47.7		95.5	1234710	
1 Perfluorobutyric acid	212.90 > 169.00	1.574	1.577	-0.003	14048645	50.1		100	74155	
3 Perfluoropentanoic acid	262.90 > 219.00	1.858	1.861	-0.003	12597041	49.7		99.5	116129	
D 4 13C5-PFPeA	267.90 > 223.00	1.858	1.861	-0.003	12477636	47.2		94.3	1170062	
5 Perfluorobutanesulfonic acid	298.90 > 80.00	1.897	1.900	-0.003	21513660	44.6		101		
	298.90 > 99.00	1.897	1.900	-0.003	9875959		2.18(0.00-0.00)	101		
7 Perfluorohexanoic acid	313.00 > 269.00	2.160	2.164	-0.004	10420431	49.8		99.5	246256	
D 6 13C2 PFHxA	315.00 > 270.00	2.160	2.164	-0.004	10985481	46.3		92.5	787845	
D 11 13C4-PFHpA	367.00 > 322.00	2.510	2.511	-0.001	9653835	46.5		93.1	803660	
12 Perfluoroheptanoic acid	363.00 > 319.00	2.510	2.512	-0.002	9915679	50.0		100	147911	
9 Perfluorohexanesulfonic acid	399.00 > 80.00	2.525	2.531	-0.006	14498414	43.7		96.0		
D 10 18O2 PFHxS	403.00 > 84.00	2.525	2.531	-0.006	14303487	45.8		96.8	5055434	
D 14 13C4 PFOA	417.00 > 372.00	2.876	2.880	-0.004	9909434	45.2		90.4	408580	

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	2.884	2.887	-0.003	1.000	10434085	49.1		98.2	197146	
413.00 > 169.00	2.876	2.887	-0.011	0.997	6358650		1.64(0.90-1.10)	98.2	316749	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.884	2.888	-0.004	1.000	13806464	49.7		104		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.257	3.258	-0.001	1.000	11953842	46.7		101	39071	
499.00 > 99.00	3.248	3.258	-0.010	0.997	2570510		4.65(0.90-1.10)	101	263704	
D 17 13C4 PFOS										
503.00 > 80.00	3.257	3.259	-0.002		11281105	45.9		95.9	268992	
D 19 13C5 PFNA										
468.00 > 423.00	3.257	3.263	-0.006		7854327	47.2		94.4	841834	
20 Perfluorononanoic acid										
463.00 > 419.00	3.257	3.263	-0.006	1.000	7675034	49.0		98.1	142675	
D 21 13C8 FOSA										
506.00 > 78.00	3.570	3.571	-0.001		19293148	48.0		95.9	389510	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.570	3.574	-0.004	1.000	18269014	50.7		101	626245	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.620	3.623	-0.003	1.000	7159278	50.3		101	175242	
D 23 13C2 PFDA										
515.00 > 470.00	3.620	3.626	-0.006		7405870	46.9		93.9	311468	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.928	3.936	-0.008	1.000	7347809	48.7		101		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.946	3.955	-0.009	1.000	5553051	46.3		92.6	133337	
D 27 13C2 PFUnA										
565.00 > 520.00	3.946	3.958	-0.012		5625237	47.4		94.7	281129	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.242	4.250	-0.008	1.000	5000795	49.4		98.7	86155	
D 30 13C2 PFDoA										
615.00 > 570.00	4.242	4.251	-0.009		5338479	47.6		95.3	147109	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.510	4.518	-0.008	1.000	5034109	49.6		99.3	21741	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.750	4.759	-0.009		11031119	47.7		95.4	553742	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.750	4.761	-0.011	1.000	9601518	48.5		97.0	4445	
713.00 > 169.00	4.750	4.761	-0.011	1.000	1523287		6.30(0.00-0.00)	97.0	181298	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.177	5.186	-0.009		5893329	45.4		90.9	104400	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.177	5.186	-0.009	1.000	5382109	50.0		100	6406	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.547	5.559	-0.012	1.000	5729058	54.0		108	9772	

Reagents:

LCPFC-L5_00020

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_008.d

Injection Date: 03-Dec-2016 14:18:44

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

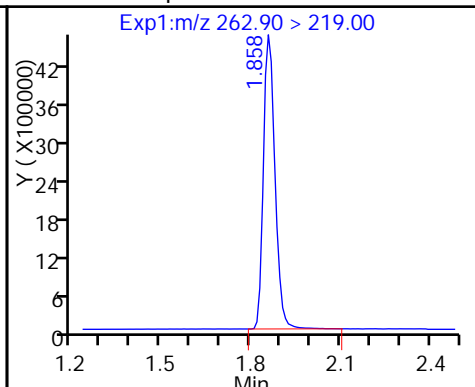
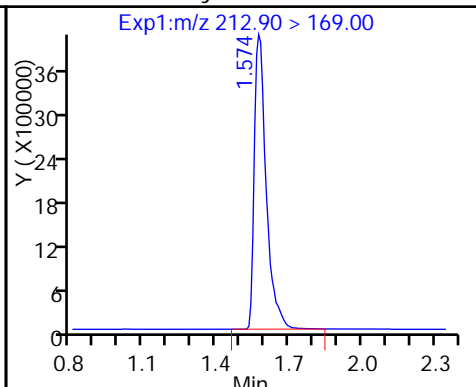
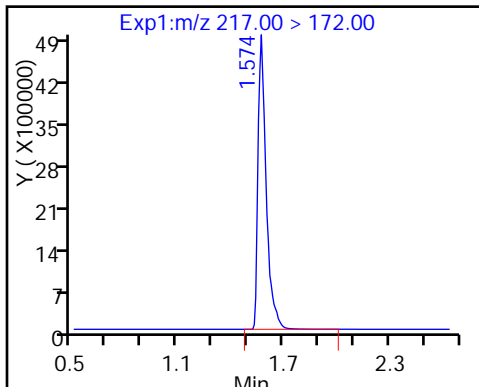
Method: A8_N

Limit Group: LC PFC_DOD ICAL

D 2 13C4 PFBA

1 Perfluorobutyric acid

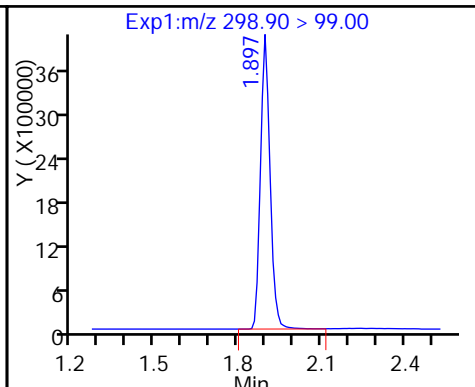
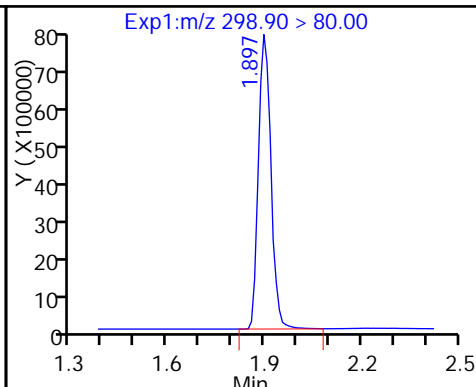
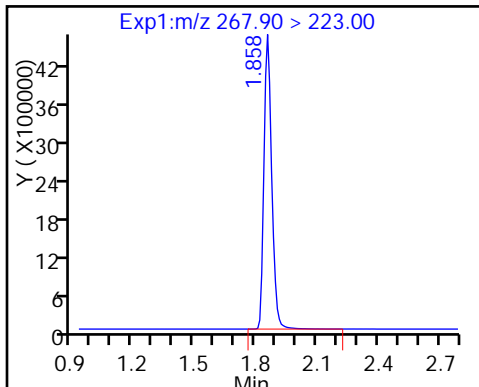
3 Perfluoropentanoic acid



D 4 13C5-PFPeA

5 Perfluorobutanesulfonic acid

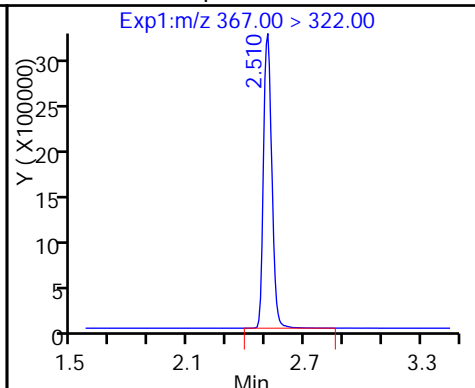
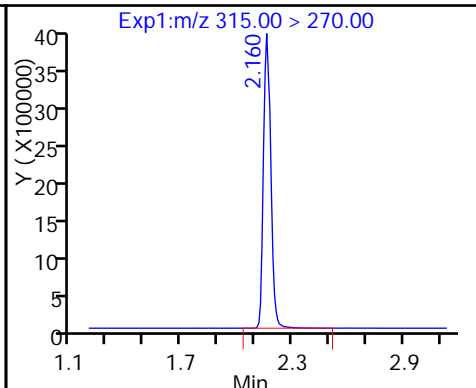
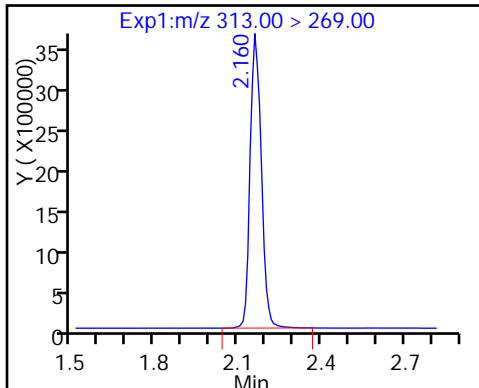
5 Perfluorobutanesulfonic acid



7 Perfluorohexanoic acid

D 6 13C2 PFHxA

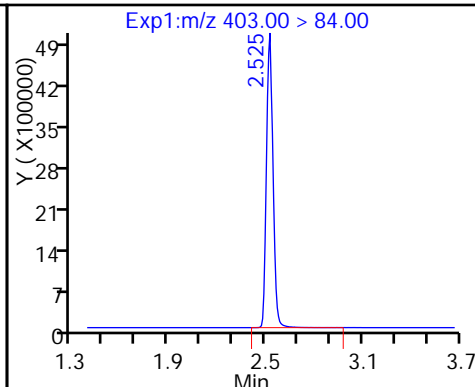
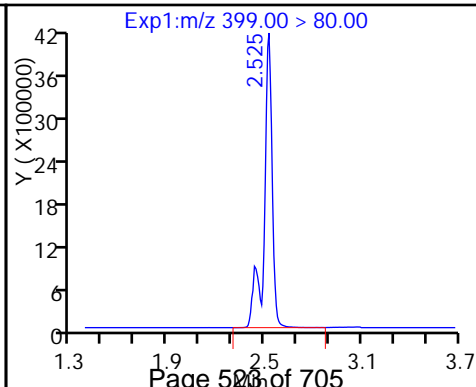
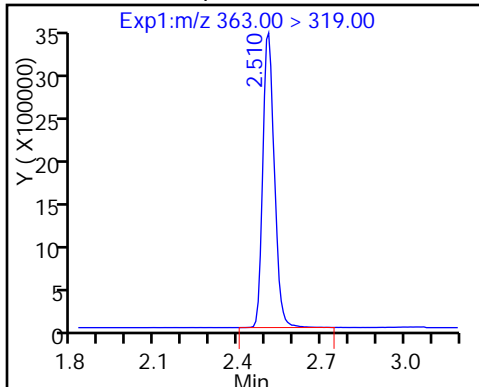
D 11 13C4-PFHpA



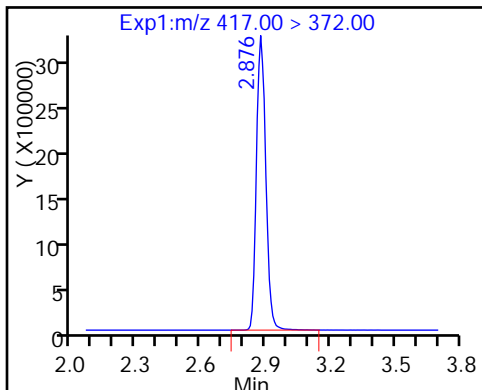
12 Perfluoroheptanoic acid

9 Perfluorohexanesulfonic acid

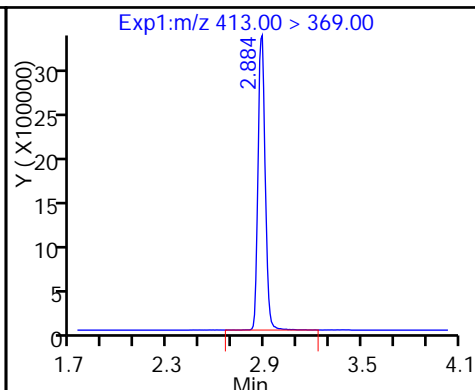
D 10 18O2 PFHxS



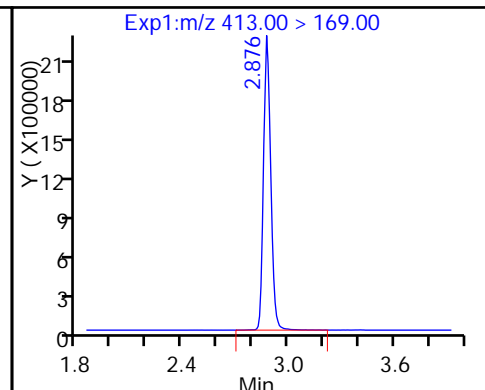
D 14 13C4 PFOA



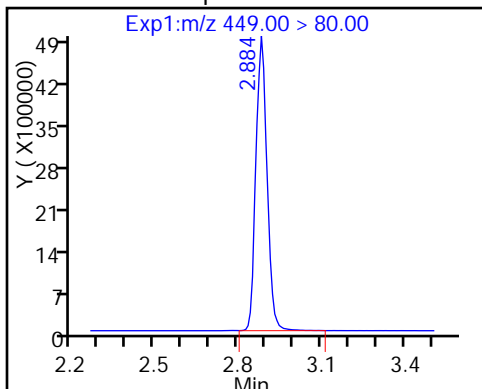
15 Perfluorooctanoic acid



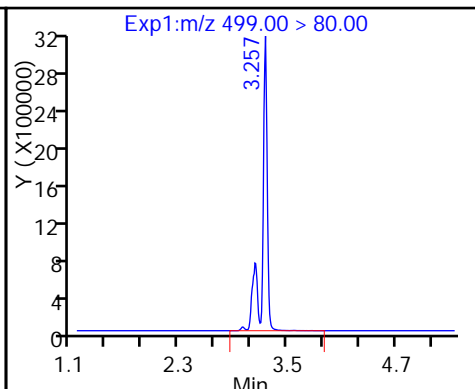
15 Perfluorooctanoic acid



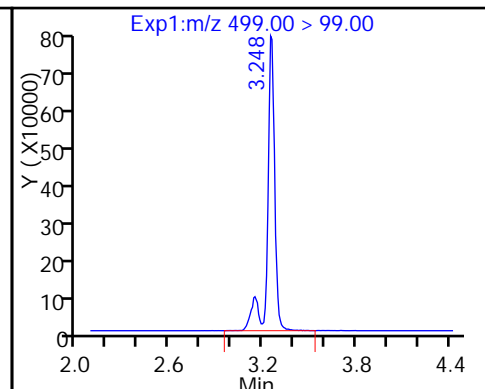
13 Perfluoroheptanesulfonic Acid



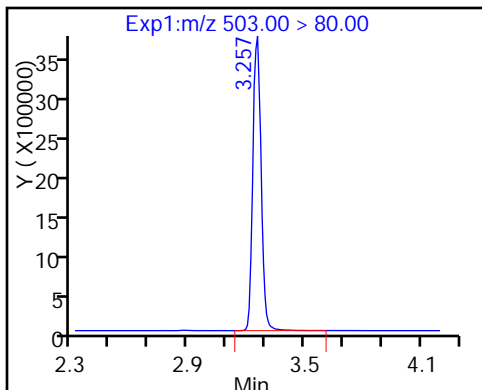
18 Perfluorooctane sulfonic acid



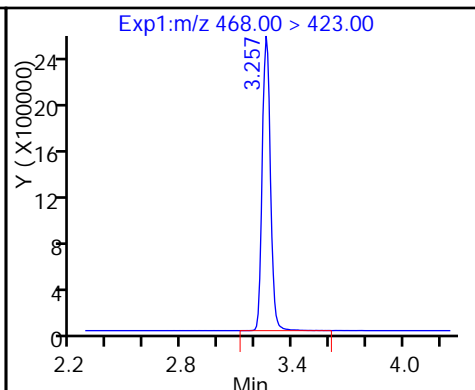
18 Perfluorooctane sulfonic acid



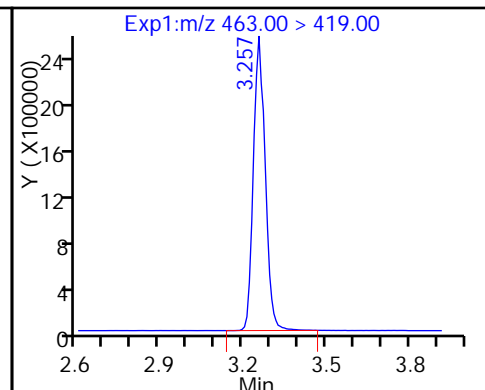
D 17 13C4 PFOS



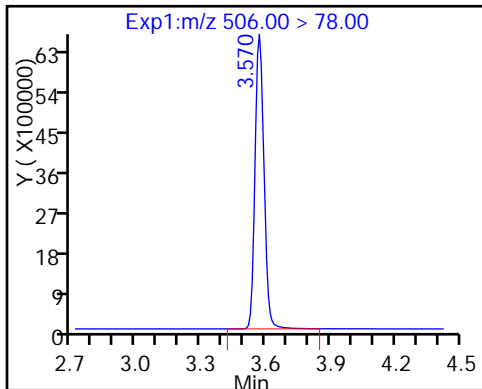
D 19 13C5 PFNA



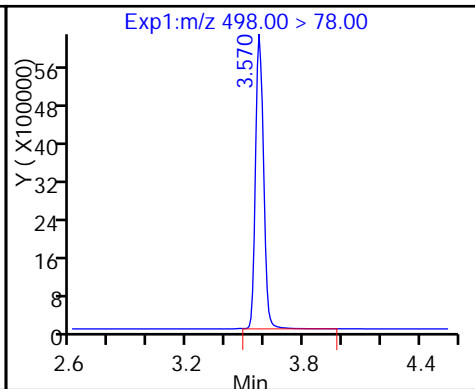
20 Perfluorononanoic acid



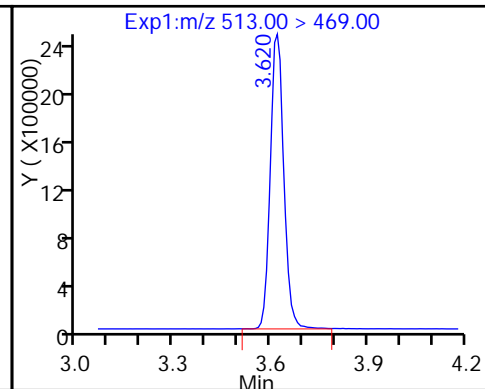
D 21 13C8 FOSA



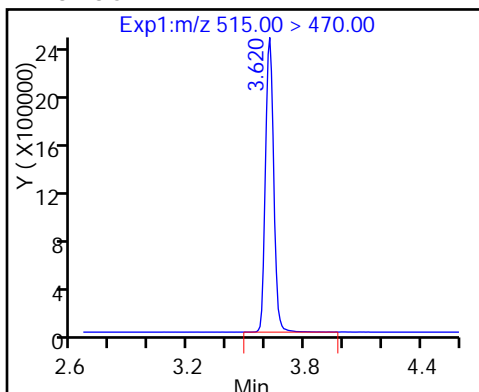
22 Perfluorooctane Sulfonamide



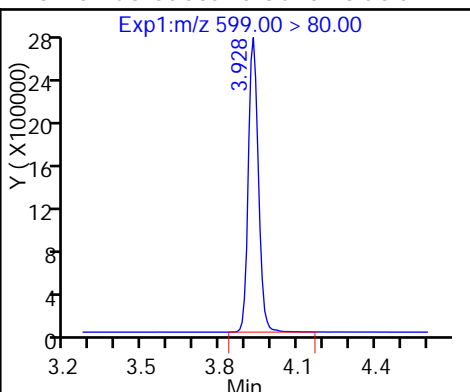
24 Perfluorodecanoic acid



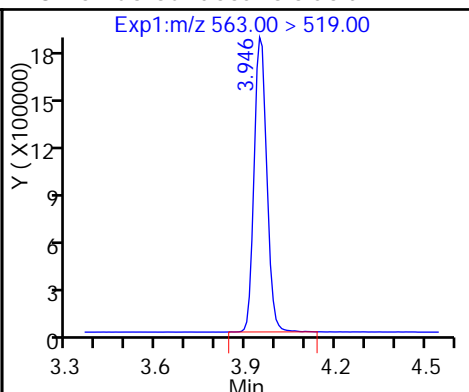
D 23 13C2 PFDA



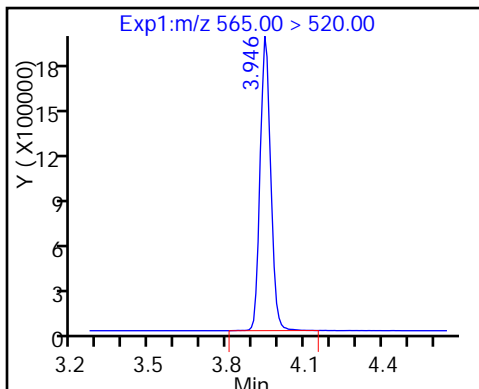
26 Perfluorodecane Sulfonic acid



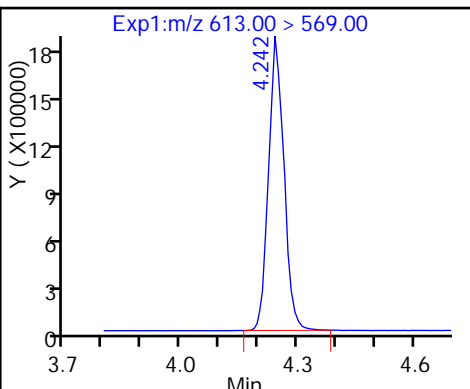
28 Perfluoroundecanoic acid



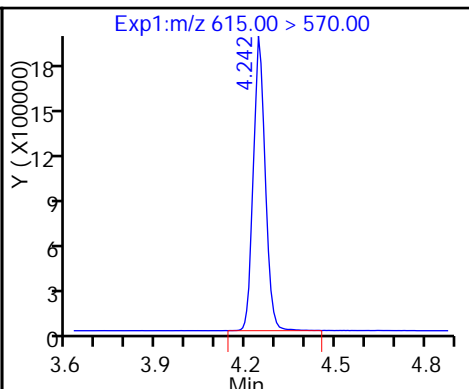
D 27 13C2 PFUa



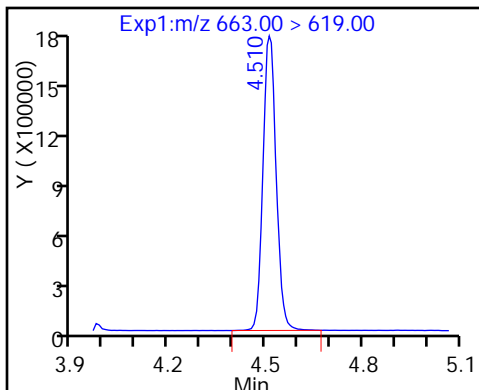
29 Perfluorododecanoic acid



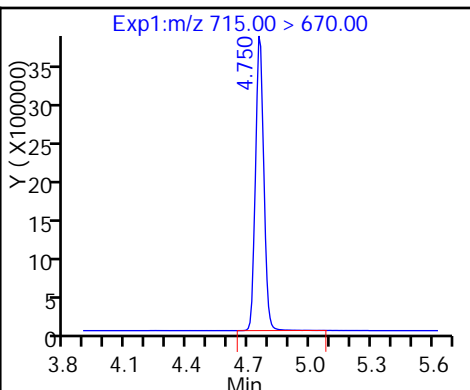
D 30 13C2 PFDa



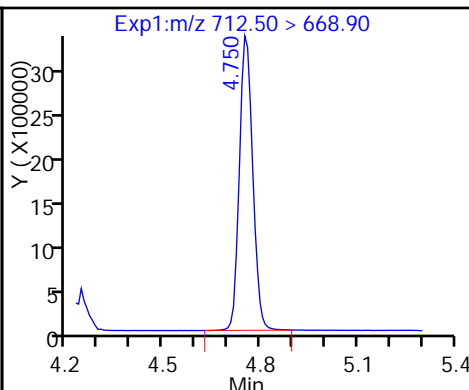
31 Perfluorotridecanoic acid



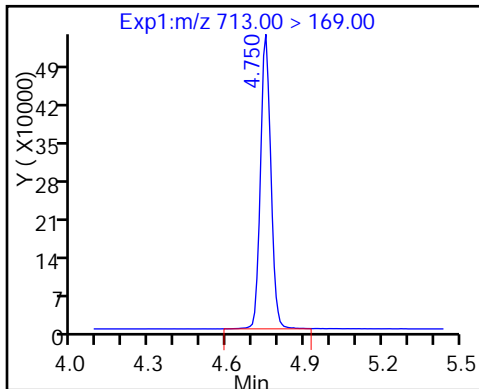
D 32 13C2-PFTeDA



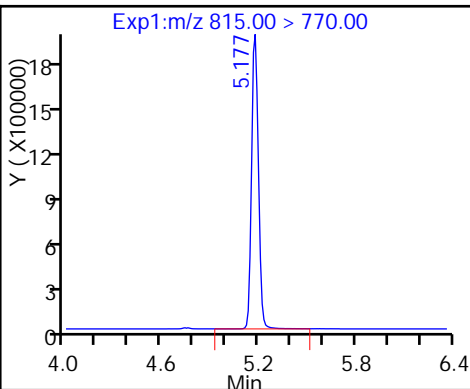
33 Perfluorotetradecanoic acid



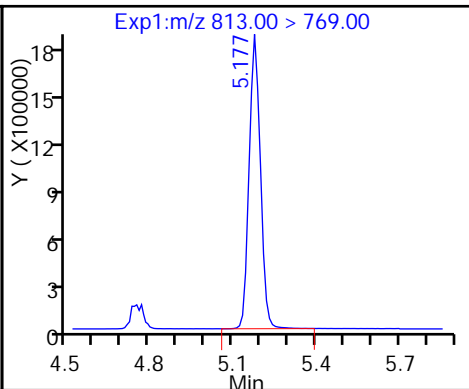
33 Perfluorotetradecanoic acid



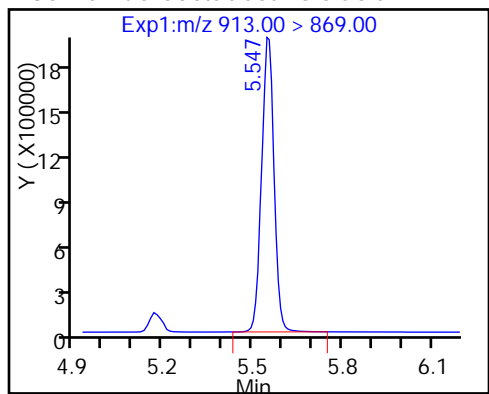
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_009.d
 Lims ID: IC L6
 Client ID:
 Sample Type: IC Calib Level: 6
 Inject. Date: 03-Dec-2016 14:26:13 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*sub3
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 05-Dec-2016 10:24:17 Calib Date: 03-Dec-2016 15:33:40
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d
 Column 1 : Det: EXP1
 Process Host: XAWRK020

First Level Reviewer: chandrasenas Date: 05-Dec-2016 09:44:26

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	1.565	1.574	-0.009	14589192	43.4		86.9	865034	
1 Perfluorobutyric acid	212.90 > 169.00	1.574	1.577	-0.003	1.000	42806432	167.9	83.9	195743	
3 Perfluoropentanoic acid	262.90 > 219.00	1.858	1.861	-0.003	1.000	35527936	156.8	78.4	261830	
D 4 13C5-PFPeA	267.90 > 223.00	1.858	1.861	-0.003		11161582	42.2	84.4	966643	
5 Perfluorobutanesulfonic acid	298.90 > 80.00	1.896	1.900	-0.004	1.000	53135654	128.0	72.4		
	298.90 > 99.00	1.896	1.900	-0.004	1.000	29815085	1.78(0.00-0.00)	72.4		
7 Perfluorohexanoic acid	313.00 > 269.00	2.157	2.164	-0.007	1.000	33117925	168.5	84.2	581515	
D 6 13C2 PFHxA	315.00 > 270.00	2.157	2.164	-0.007		10311260	43.4	86.8	509947	
D 11 13C4-PFHpA	367.00 > 322.00	2.501	2.511	-0.010		8082881	39.0	77.9	826093	
12 Perfluoroheptanoic acid	363.00 > 319.00	2.501	2.512	-0.011	1.000	30013620	180.8	90.4	294610	
9 Perfluorohexanesulfonic acid	399.00 > 80.00	2.526	2.531	-0.005	1.000	47221104	165.4	90.9		
D 10 18O2 PFHxS	403.00 > 84.00	2.518	2.531	-0.013		12302944	39.4	83.3	1330084	
D 14 13C4 PFOA	417.00 > 372.00	2.868	2.880	-0.012		8181000	37.3	74.6	486964	

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	2.868	2.887	-0.019	1.000	30853962	175.9		88.0	291973	
413.00 > 169.00	2.876	2.887	-0.011	1.003	20504099		1.50(0.90-1.10)	88.0	540708	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.884	2.888	-0.004	1.000	39398056	159.1		83.6		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.249	3.258	-0.009	1.000	43077470	188.7		102	75165	
499.00 > 99.00	3.249	3.258	-0.009	1.000	9992099		4.31(0.90-1.10)	102	2648708	
D 17 13C4 PFOS										
503.00 > 80.00	3.249	3.259	-0.010		10053294	40.9		85.5	90966	
D 19 13C5 PFNA										
468.00 > 423.00	3.249	3.263	-0.014		6537549	39.3		78.6	482383	
20 Perfluorononanoic acid										
463.00 > 419.00	3.249	3.263	-0.014	1.000	24899337	191.1		95.6	358972	
D 21 13C8 FOSA										
506.00 > 78.00	3.562	3.571	-0.009		16949269	42.1		84.3	560152	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.571	3.574	-0.003	1.000	50658186	160.0		80.0	335690	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.613	3.623	-0.010	1.000	23571490	191.4		95.7	488396	
D 23 13C2 PFDA										
515.00 > 470.00	3.621	3.626	-0.005		6410340	40.6		81.2	207594	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.921	3.936	-0.015	1.000	24987612	185.7		96.3		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.947	3.955	-0.008	1.000	17818228	185.2		92.6	329189	
D 27 13C2 PFUnA										
565.00 > 520.00	3.947	3.958	-0.011		4513820	38.0		76.0	155727	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.236	4.250	-0.014	1.000	17773370	194.4		97.2	287464	
D 30 13C2 PFDaA										
615.00 > 570.00	4.236	4.251	-0.015		4817286	43.0		86.0	195663	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.501	4.518	-0.017	1.000	17494025	191.2		95.6	67382	M
D 32 13C2-PFTeDA										
715.00 > 670.00	4.738	4.759	-0.021		9518260	41.2		82.3	367157	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.746	4.761	-0.015	1.000	30593527	171.3		85.7	17849	
713.00 > 169.00	4.746	4.761	-0.015	1.000	5666745		5.40(0.00-0.00)	85.7	258419	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.171	5.186	-0.015		5482429	42.3		84.5	117464	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.160	5.186	-0.026	1.000	18912385	196.9		98.5	16230	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.536	5.559	-0.023	1.000	17844066	186.5		93.3	33443	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LCPFC-L6_00019

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_009.d

Injection Date: 03-Dec-2016 14:26:13

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

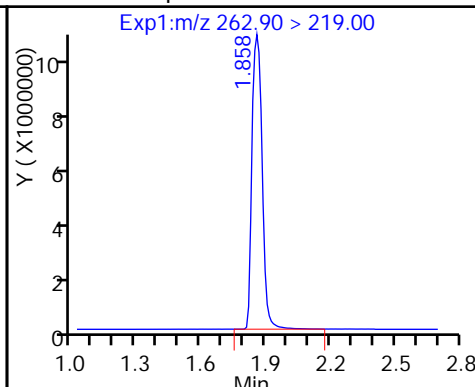
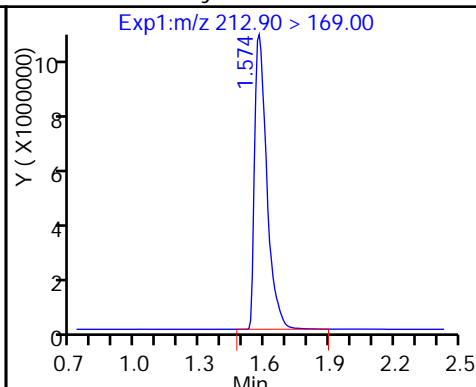
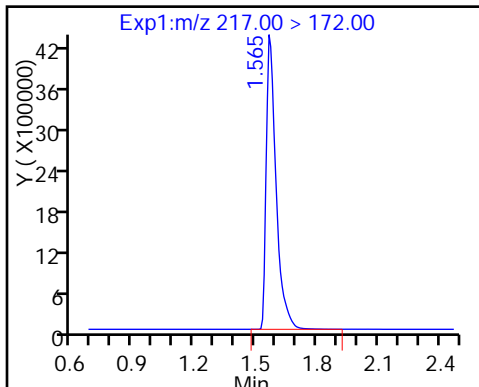
Method: A8_N

Limit Group: LC PFC_DOD ICAL

D 2 13C4 PFBA

1 Perfluorobutyric acid

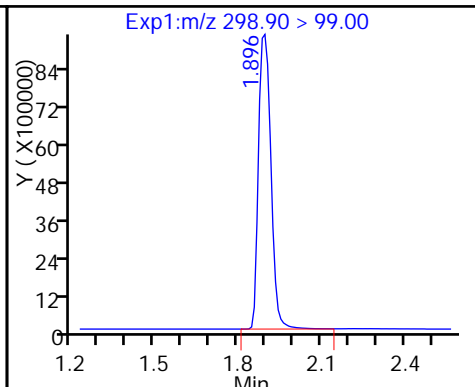
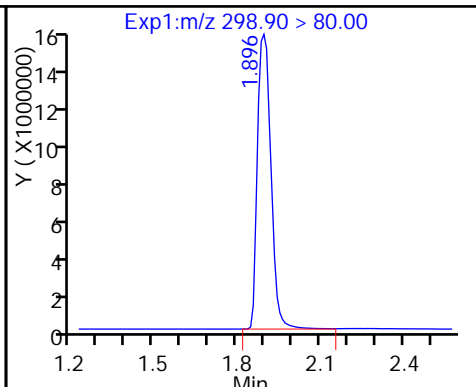
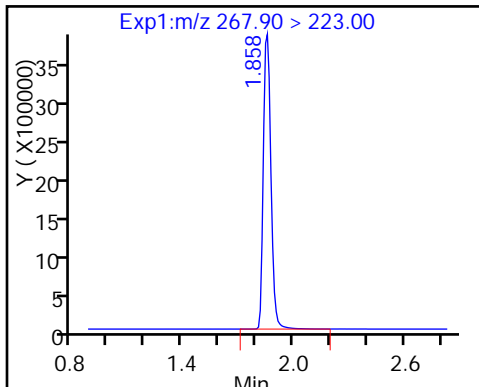
3 Perfluoropentanoic acid



D 4 13C5-PFPeA

5 Perfluorobutanesulfonic acid

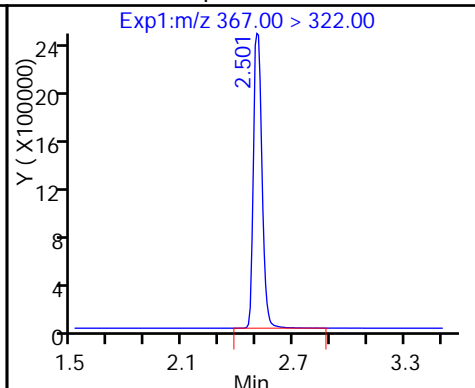
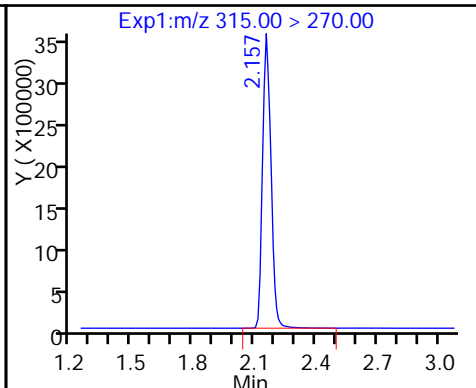
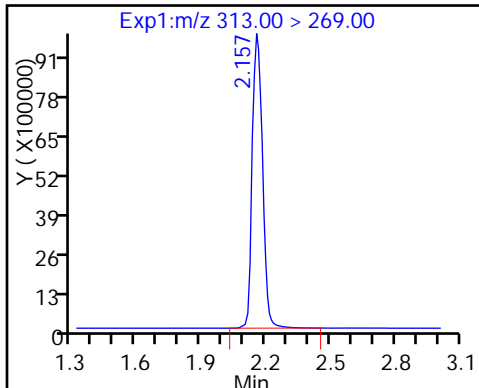
5 Perfluorobutanesulfonic acid



7 Perfluorohexanoic acid

D 6 13C2 PFHxA

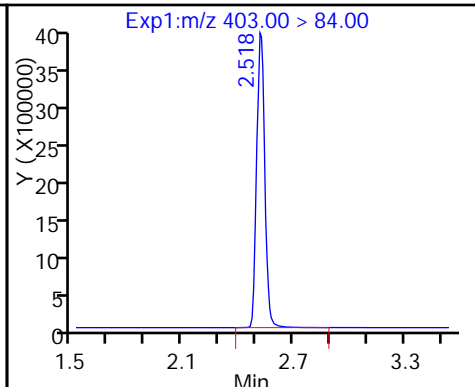
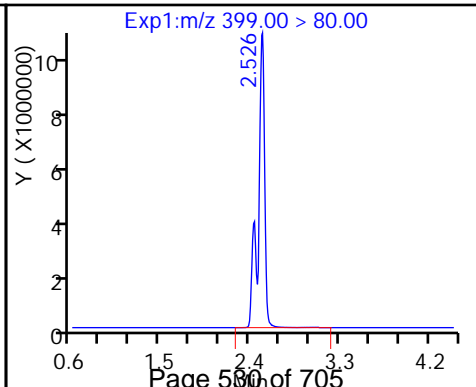
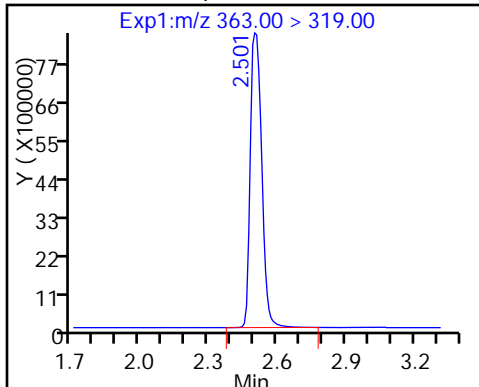
D 11 13C4-PFHpA



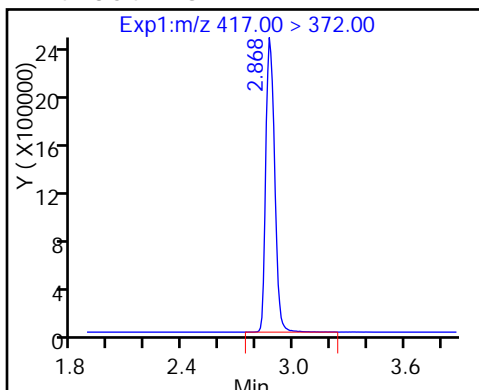
12 Perfluoroheptanoic acid

9 Perfluorohexanesulfonic acid

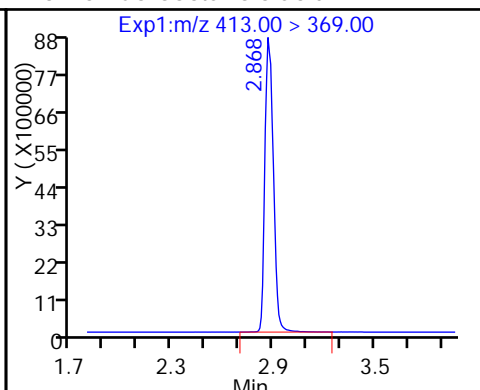
D 10 18O2 PFHxS



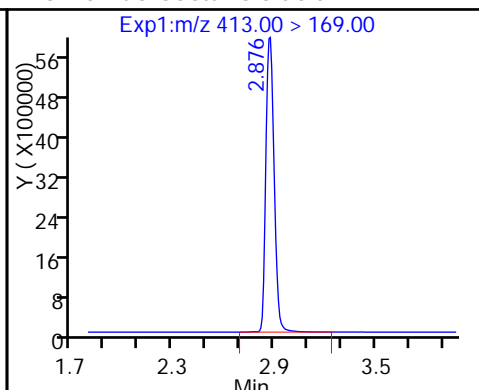
D 14 13C4 PFOA



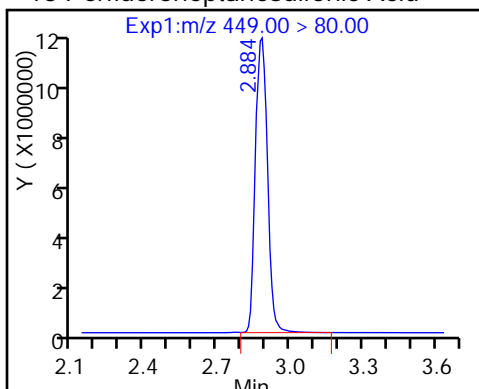
15 Perfluorooctanoic acid



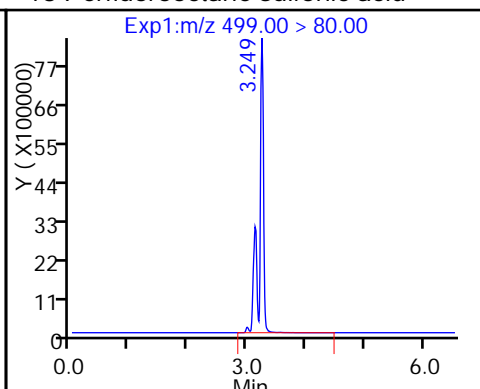
15 Perfluorooctanoic acid



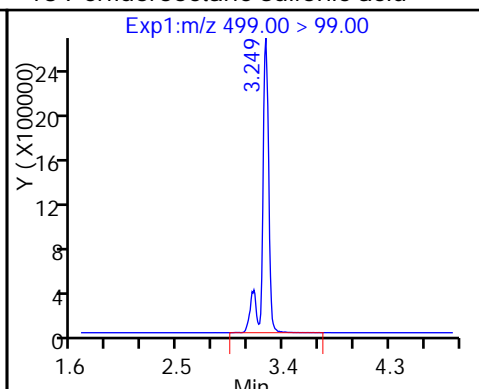
13 Perfluoroheptanesulfonic Acid



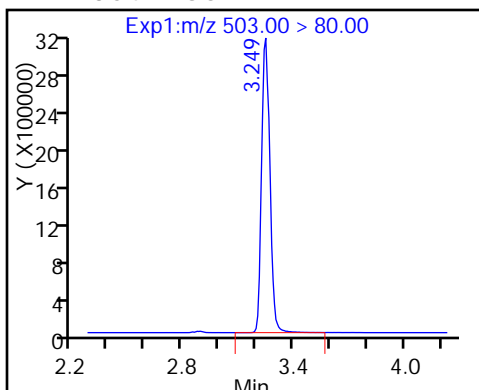
18 Perfluorooctane sulfonic acid



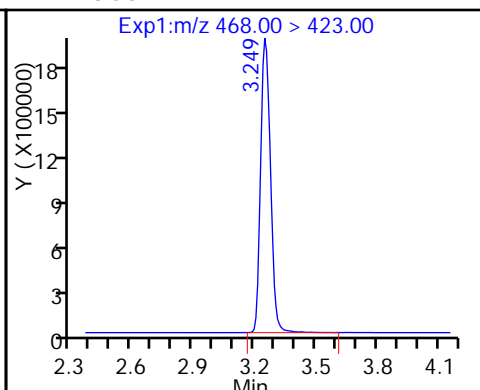
18 Perfluorooctane sulfonic acid



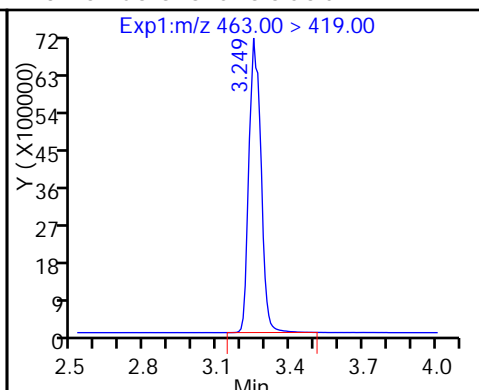
D 17 13C4 PFOS



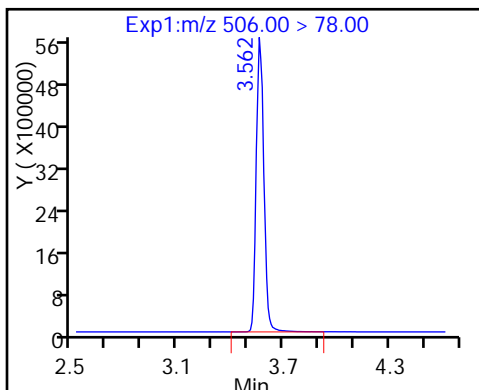
D 19 13C5 PFNA



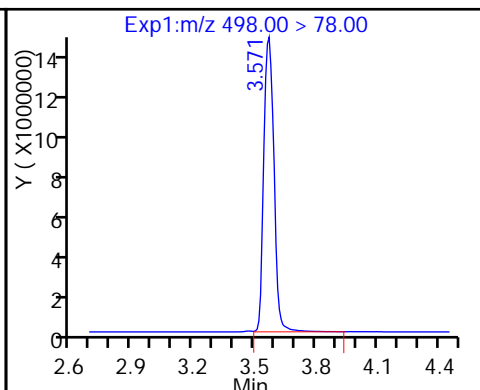
20 Perfluorononanoic acid



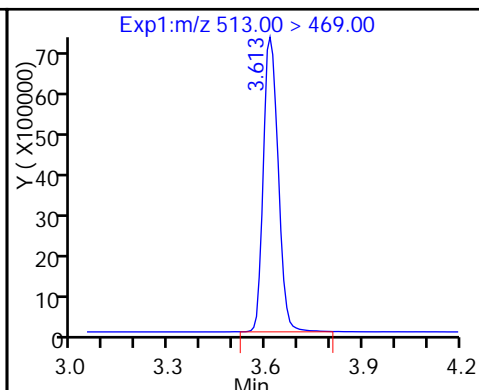
D 21 13C8 FOSA



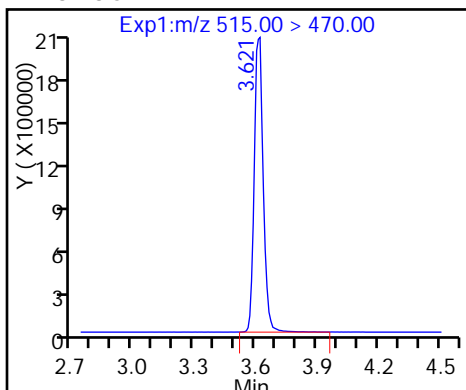
22 Perfluorooctane Sulfonamide



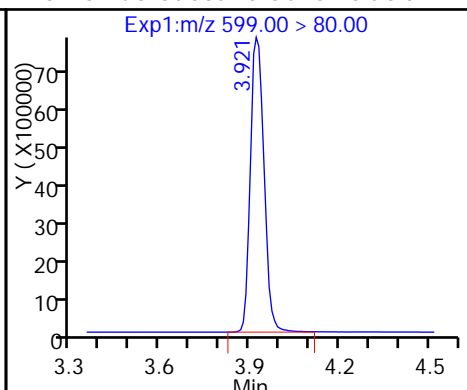
24 Perfluorodecanoic acid



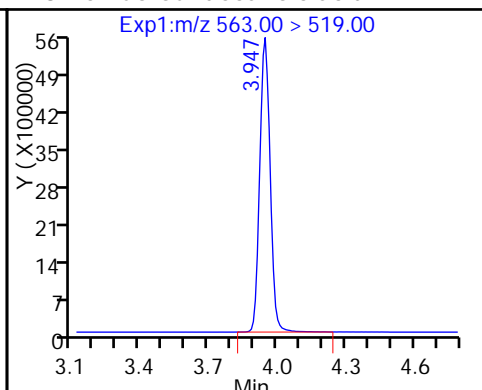
D 23 13C2 PFDA



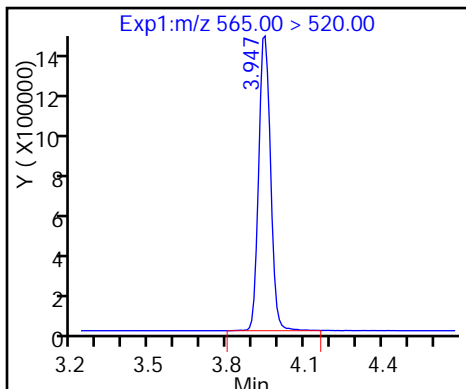
26 Perfluorodecane Sulfonic acid



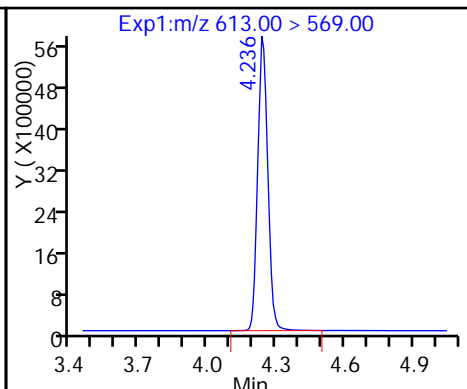
28 Perfluoroundecanoic acid



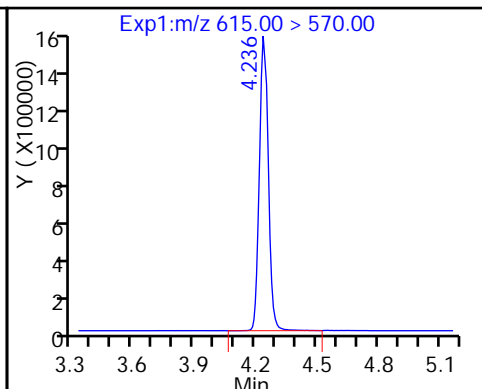
D 27 13C2 PFUa



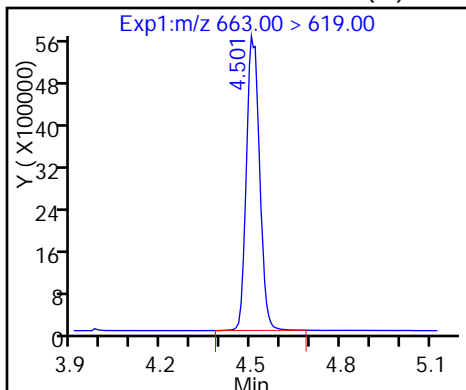
29 Perfluorododecanoic acid



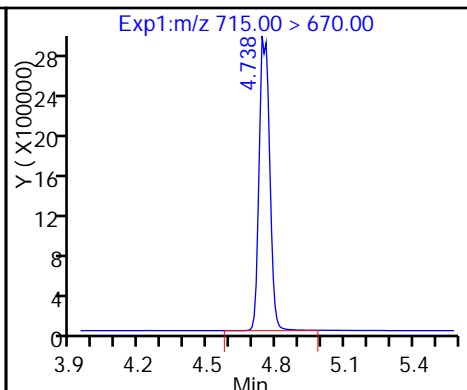
D 30 13C2 PFDa



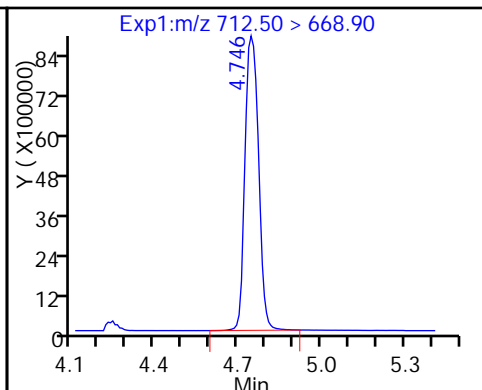
31 Perfluorotridecanoic acid (M)



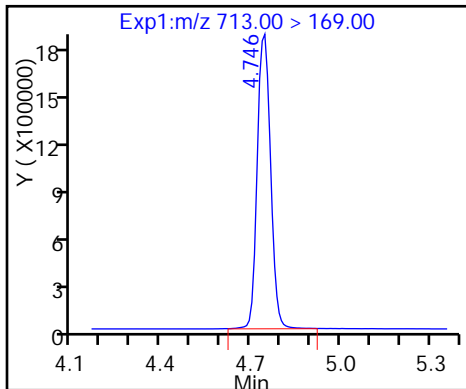
D 32 13C2-PFTeDA



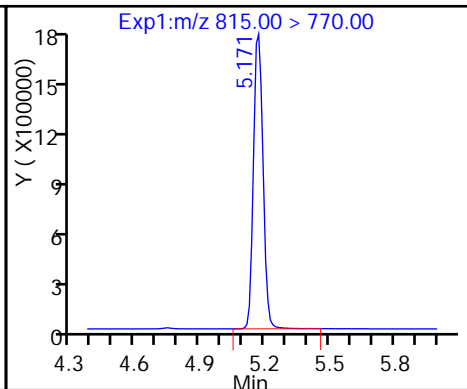
33 Perfluorotetradecanoic acid



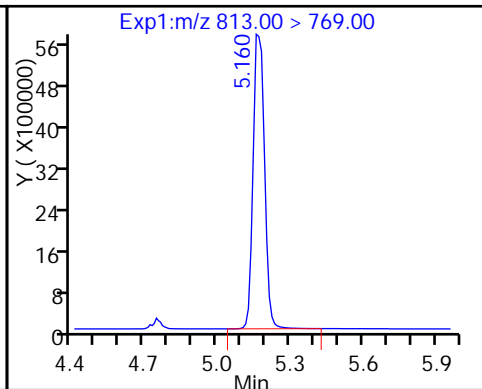
33 Perfluorotetradecanoic acid



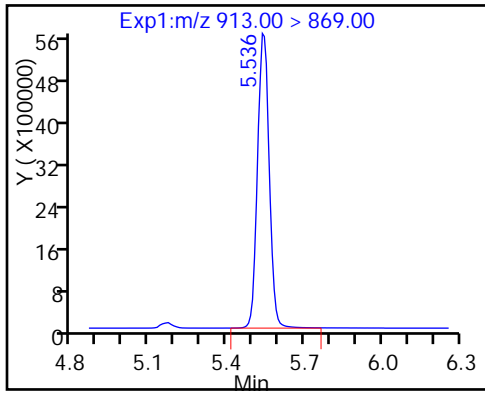
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



TestAmerica Sacramento

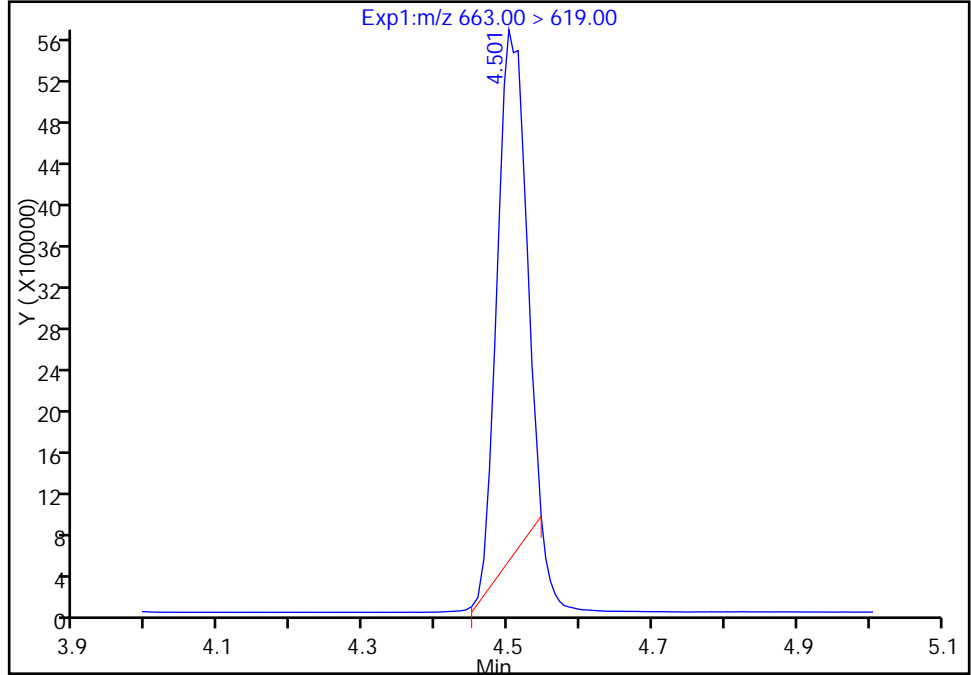
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_009.d
Injection Date: 03-Dec-2016 14:26:13 Instrument ID: A8_N
Lims ID: IC L6
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 42 Worklist Smp#: 9
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

31 Perfluorotridecanoic acid, CAS: 72629-94-8

Signal: 1

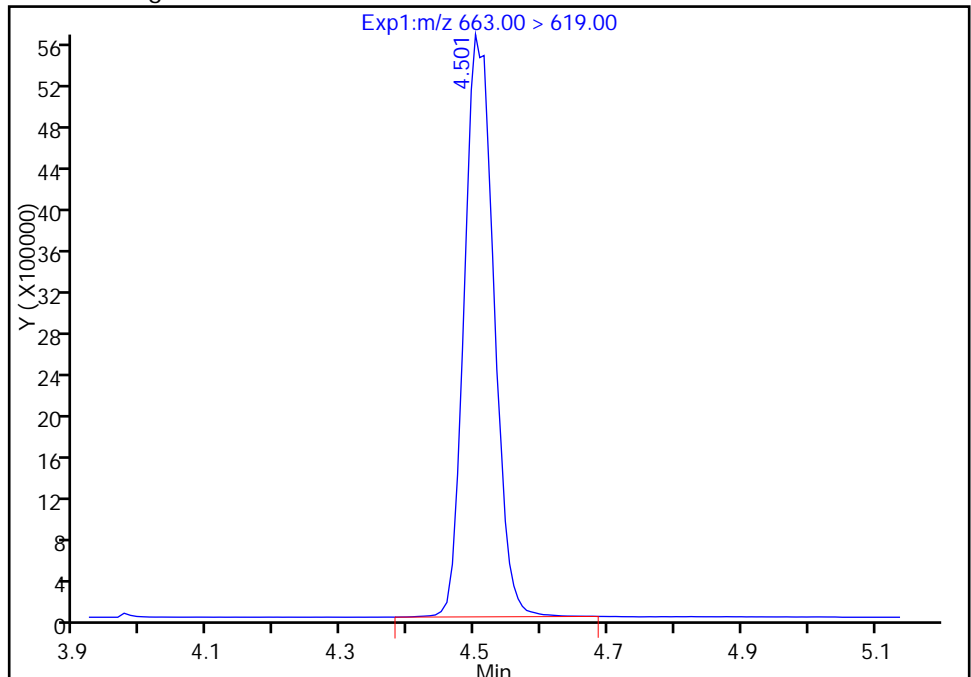
RT: 4.50
Area: 14077685
Amount: 158.7746
Amount Units: ng/ml

Processing Integration Results



RT: 4.50
Area: 17494025
Amount: 191.1674
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 05-Dec-2016 09:44:26

Audit Action: Manually Integrated

Audit Reason: Incomplete Integration

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_013.d
 Lims ID: IC L1 Add-on
 Client ID:
 Sample Type: IC Calib Level: 1
 Inject. Date: 03-Dec-2016 14:56:13 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*sub3
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 05-Dec-2016 10:28:00 Calib Date: 03-Dec-2016 15:33:40
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d
 Column 1 : Det: EXP1
 Process Host: XAWRK020

First Level Reviewer: chandrasenas Date: 05-Dec-2016 09:47:53

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
48 Sodium 1H,1H,2H,2H-perfluorooctane	427.00 > 407.00	2.840	2.836	0.004	1.000	40088	0.5222	110		
D 47 M2-6:2FTS	429.00 > 409.00	2.840	2.836	0.004		4340981	41.1	86.6		
43 Sodium 1H,1H,2H,2H-perfluorooctane	527.00 > 507.00	3.601	3.588	0.013	1.000	37551	0.4928	103		
D 42 M2-8:2FTS	529.00 > 509.00	3.601	3.591	0.010		4263521	43.9	91.6		
D 45 d3-NMeFOSAA	573.00 > 419.00	3.765	3.756	0.009		3321758	45.8	91.6		
44 N-methyl perfluorooctane sulfonami	570.00 > 419.00	3.774	3.759	0.015	1.002	23619	0.4142	82.8		
D 46 d5-NEtFOSAA	589.00 > 419.00	3.931	3.922	0.009		3822164	48.0	96.0		
49 N-ethyl perfluorooctane sulfonamid	584.00 > 419.00	3.931	3.929	0.002	1.000	25433	0.4345	86.9		
D 52 d-N-MeFOSA-M	515.00 > 169.00	4.054	4.051	0.003		4696243	44.7	89.4		
54 MeFOSA	512.00 > 169.00	4.063	4.057	0.006	1.000	37442	0.4934	98.7		
D 51 d-N-EtFOSA-M	531.00 > 169.00	4.244	4.239	0.005		4355916	43.9	87.9		
53 N-ethylperfluoro-1-octanesulfonami	526.00 > 169.00	4.253	4.245	0.008	1.000	36079	0.4813	96.3		

Reagents:

LCPFC2-L1_00002

Amount Added: 1.00

Units: mL

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_013.d

Injection Date: 03-Dec-2016 14:56:13

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

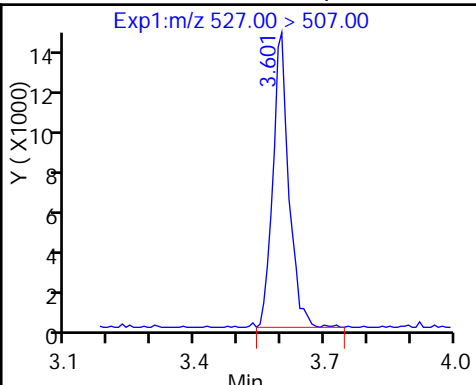
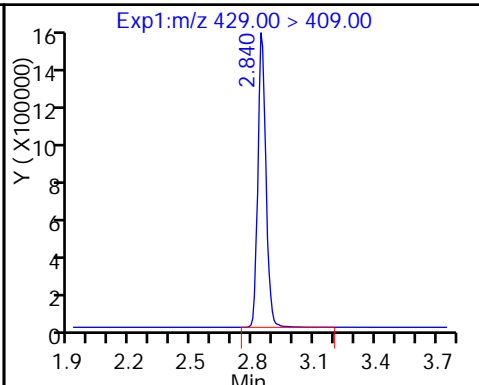
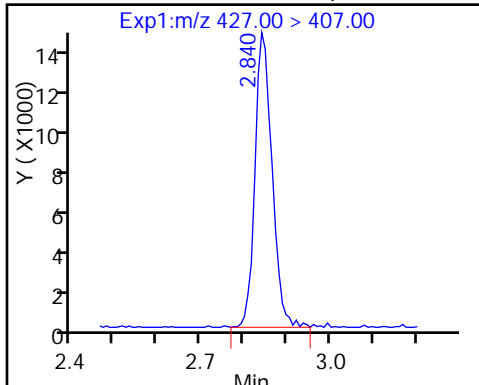
Dil. Factor: 1.0000

Method: A8_N

Limit Group: LC PFC_DOD ICAL

48 Sodium 1H,1H,2H,2H-perfluorooctane

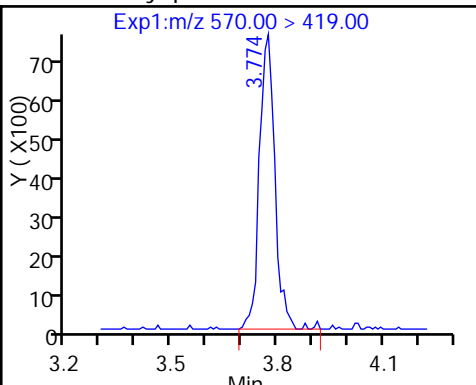
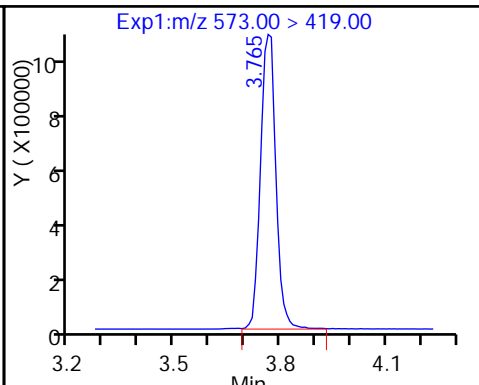
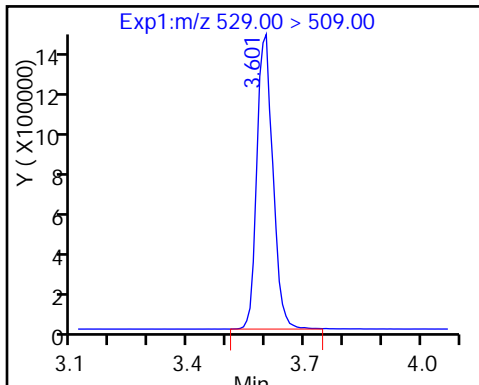
43 Sodium 1H,1H,2H,2H-perfluorooctane



D 42 M2-8:2FTS

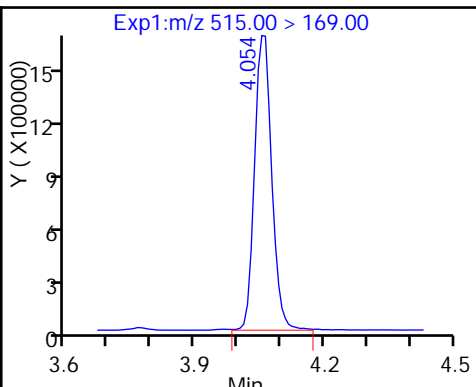
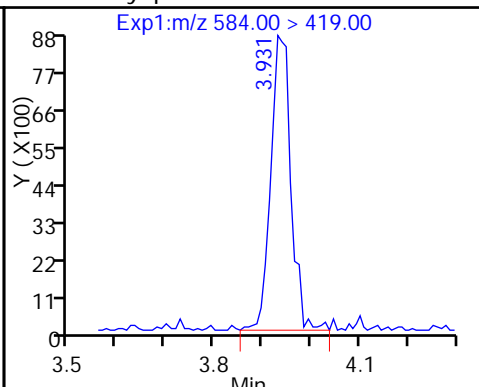
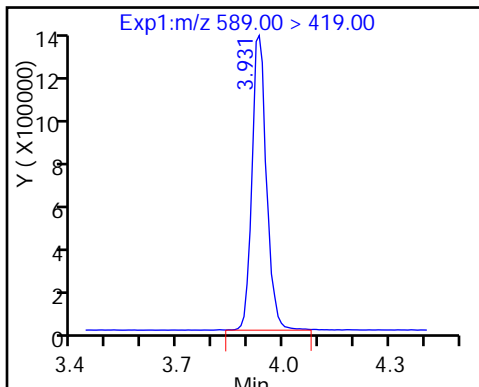
D 45 d3-NMeFOSAA

44 N-methyl perfluorooctane sulfonami



D 46 d5-NEtFOSAA

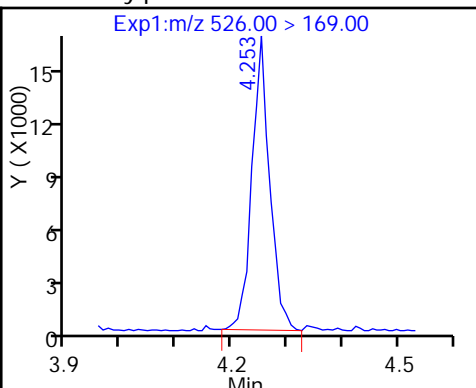
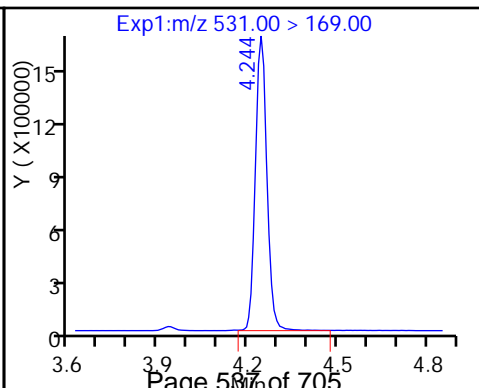
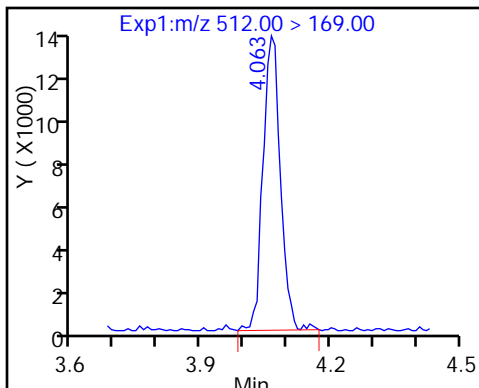
49 N-ethyl perfluorooctane sulfonamid D 52 d-N-MeFOSA-M



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\20161205-37491.b\03DEC2016A_014.d
 Lims ID: IC L2 Add-on
 Client ID:
 Sample Type: IC Calib Level: 2
 Inject. Date: 03-Dec-2016 15:03:43 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*sub3
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 05-Dec-2016 10:28:01 Calib Date: 03-Dec-2016 15:33:40
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d
 Column 1 : Det: EXP1
 Process Host: XAWRK020

First Level Reviewer: chandrasenas Date: 05-Dec-2016 09:48:07

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
48 Sodium 1H,1H,2H,2H-perfluorooctane	427.00 > 407.00	2.830	2.836	-0.006	1.000	69385	0.9534	101		
D 47 M2-6:2FTS	429.00 > 409.00	2.830	2.836	-0.006		4115043	39.0	82.1		
43 Sodium 1H,1H,2H,2H-perfluorooctane	527.00 > 507.00	3.579	3.588	-0.009	1.000	63932	0.9133	95.3		
D 42 M2-8:2FTS	529.00 > 509.00	3.579	3.591	-0.012		3917070	40.3	84.2		
D 45 d3-NMeFOSAA	573.00 > 419.00	3.760	3.756	0.004		3368323	46.4	92.9		
44 N-methyl perfluorooctane sulfonami	570.00 > 419.00	3.760	3.759	0.001	1.000	53845	0.9312	93.1		
D 46 d5-NEtFOSAA	589.00 > 419.00	3.918	3.922	-0.004		3818745	47.9	95.9		
49 N-ethyl perfluorooctane sulfonamid	584.00 > 419.00	3.935	3.929	0.006	1.004	49948	0.8541	85.4		
D 52 d-N-MeFOSA-M	515.00 > 169.00	4.051	4.051	0.0		4885054	46.5	93.0		
54 MeFOSA	512.00 > 169.00	4.051	4.057	-0.006	1.000	72155	0.9140	91.4		
D 51 d-N-EtFOSA-M	531.00 > 169.00	4.231	4.239	-0.008		4699997	47.4	94.8		
53 N-ethylperfluoro-1-octanesulfonami	526.00 > 169.00	4.239	4.245	-0.006	1.000	72107	0.8915	89.1		

Reagents:

LCPFC2-L2_00002

Amount Added: 1.00

Units: mL

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_014.d

Injection Date: 03-Dec-2016 15:03:43

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

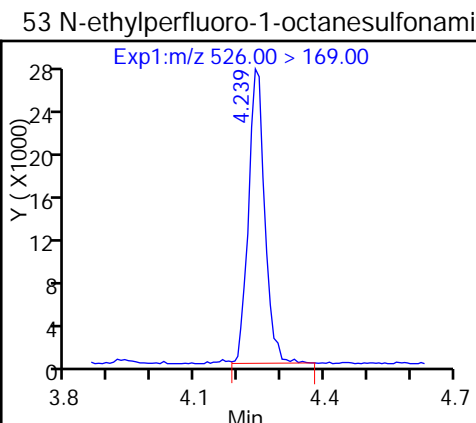
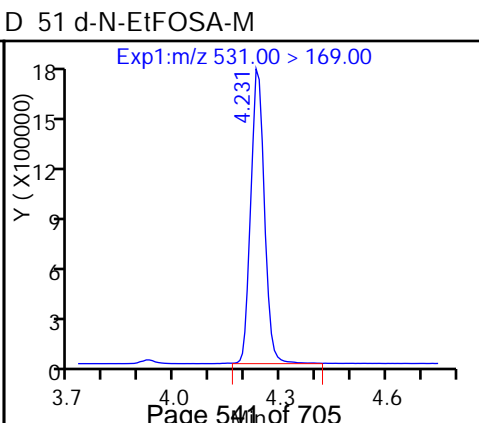
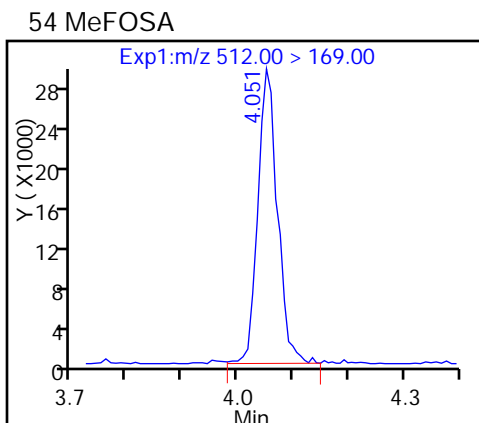
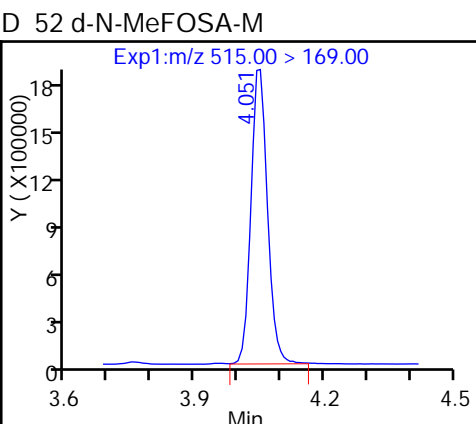
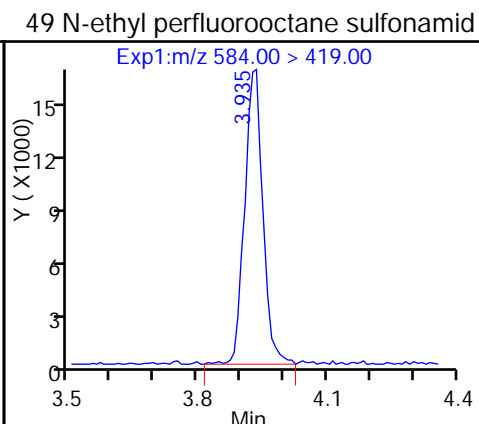
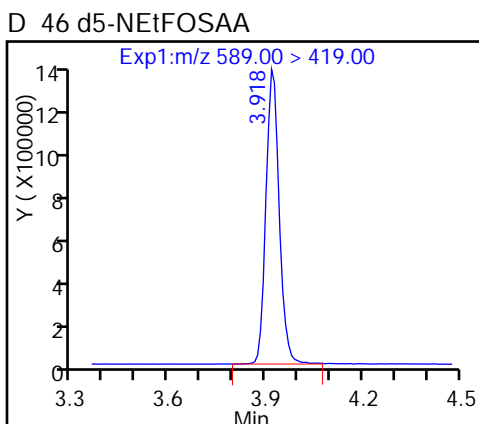
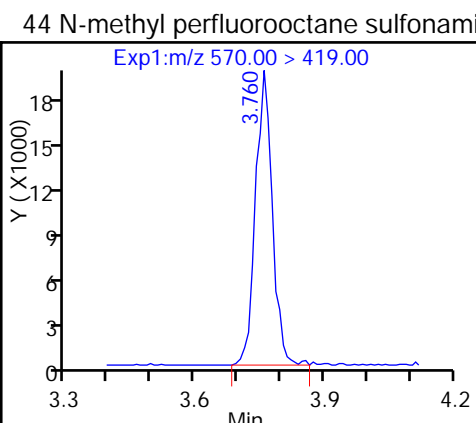
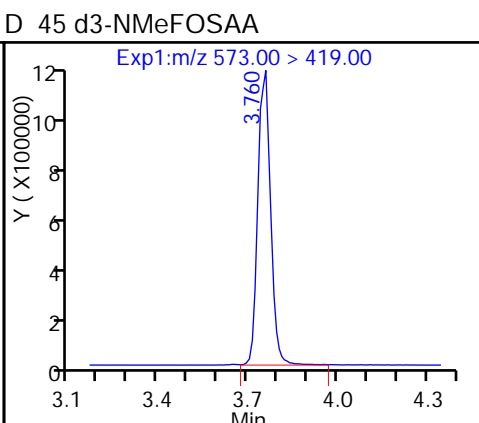
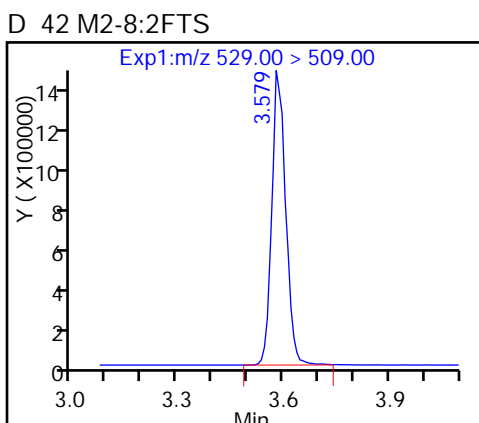
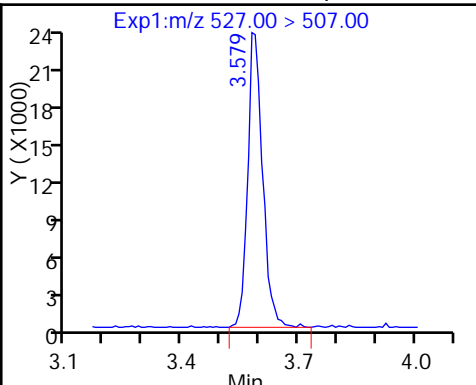
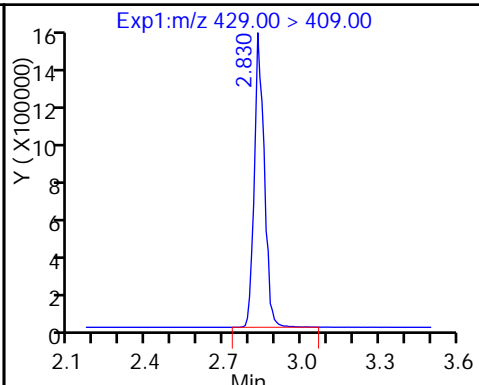
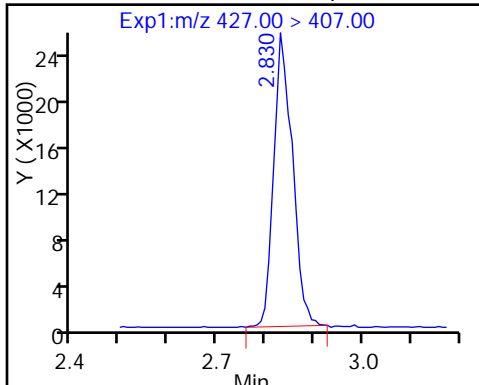
Dil. Factor: 1.0000

Method: A8_N

Limit Group: LC PFC_DOD ICAL

48 Sodium 1H,1H,2H,2H-perfluorooctane

43 Sodium 1H,1H,2H,2H-perfluorooctane



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_015.d
 Lims ID: IC L3 Add-on
 Client ID:
 Sample Type: IC Calib Level: 3
 Inject. Date: 03-Dec-2016 15:11:13 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*sub3
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 05-Dec-2016 10:28:04 Calib Date: 03-Dec-2016 15:33:40
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d
 Column 1 : Det: EXP1
 Process Host: XAWRK020

First Level Reviewer: chandrasenas Date: 05-Dec-2016 09:48:18

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
48 Sodium 1H,1H,2H,2H-perfluorooctane	427.00 > 407.00	2.838	2.836	0.002	1.000	352721	4.15	87.6		
D 47 M2-6:2FTS	429.00 > 409.00	2.838	2.836	0.002		4800798	45.5	95.8		
43 Sodium 1H,1H,2H,2H-perfluorooctane	527.00 > 507.00	3.588	3.588	0.0	0.998	326213	4.10	85.6		
D 42 M2-8:2FTS	529.00 > 509.00	3.596	3.591	0.005		4450751	45.8	95.7		
D 45 d3-NMeFOSAA	573.00 > 419.00	3.751	3.756	-0.005		3668263	50.6	101		
44 N-methyl perfluorooctane sulfonami	570.00 > 419.00	3.760	3.759	0.001	1.002	260030	4.13	82.6		
D 46 d5-NEtFOSAA	589.00 > 419.00	3.918	3.922	-0.004		4095032	51.4	103		
49 N-ethyl perfluorooctane sulfonamid	584.00 > 419.00	3.926	3.929	-0.003	1.002	265257	4.23	84.6		
D 52 d-N-MeFOSA-M	515.00 > 169.00	4.051	4.051	0.0		5526561	52.6	105		
54 MeFOSA	512.00 > 169.00	4.051	4.057	-0.006	1.000	356898	4.00	79.9		
D 51 d-N-EtFOSA-M	531.00 > 169.00	4.240	4.239	0.001		5054297	51.0	102		
53 N-ethylperfluoro-1-octanesulfonami	526.00 > 169.00	4.240	4.245	-0.005	1.000	365313	4.20	84.0		

Reagents:

LCPFC2-L3_00002

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_015.d

Injection Date: 03-Dec-2016 15:11:13

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

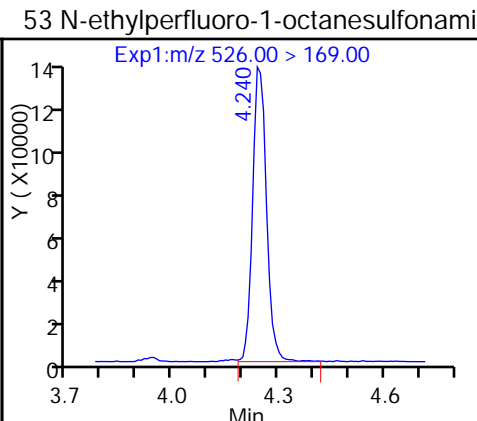
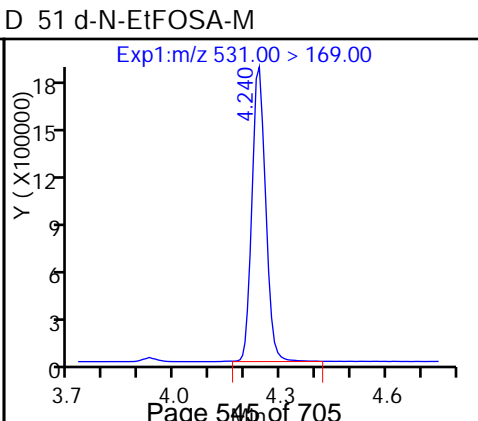
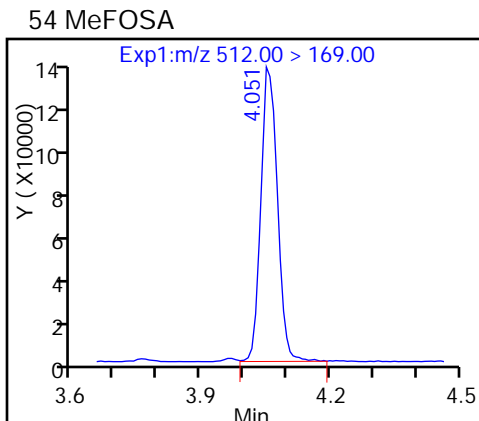
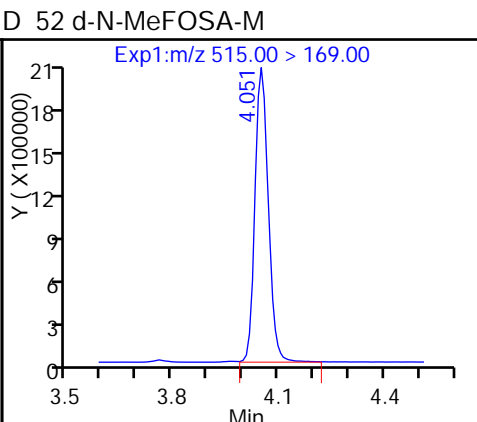
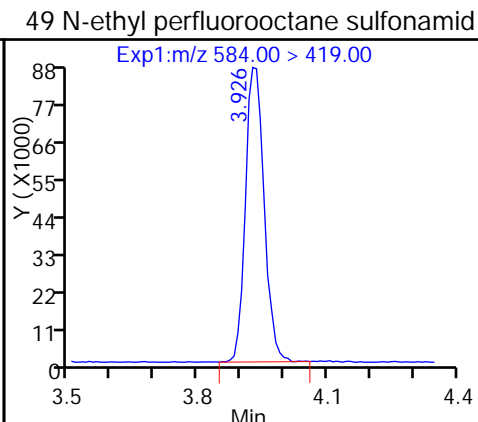
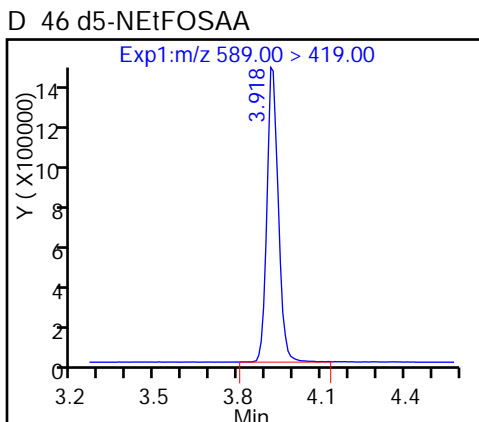
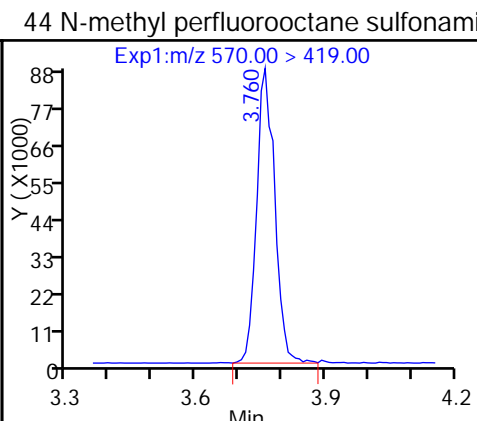
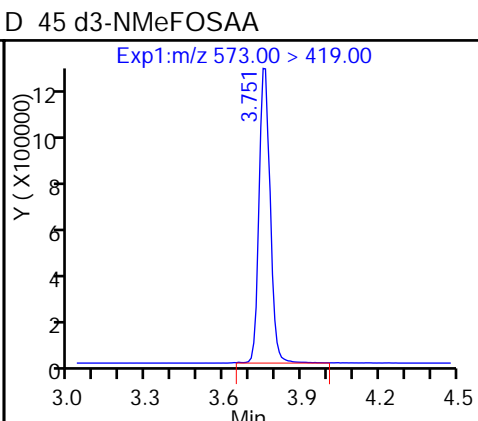
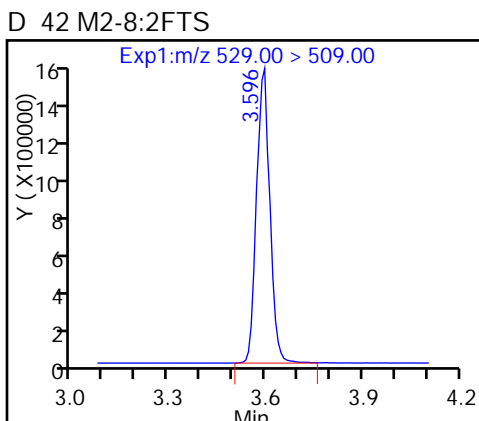
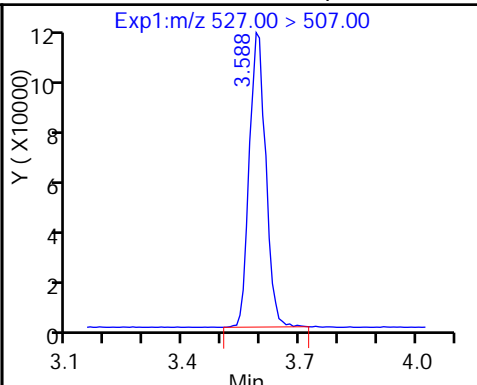
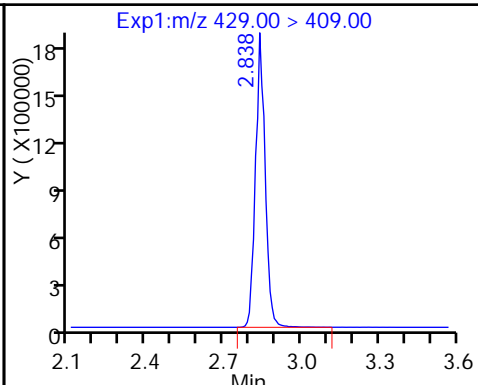
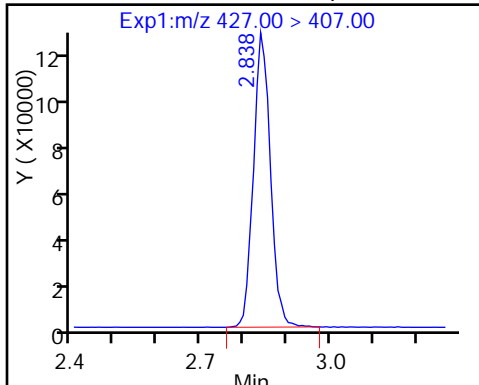
Dil. Factor: 1.0000

Method: A8_N

Limit Group: LC PFC_DOD ICAL

48 Sodium 1H,1H,2H,2H-perfluorooctane

43 Sodium 1H,1H,2H,2H-perfluorooctane



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_016.d
 Lims ID: IC L4 Add-on
 Client ID:
 Sample Type: IC Calib Level: 4
 Inject. Date: 03-Dec-2016 15:18:43 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*sub3
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 05-Dec-2016 10:28:06 Calib Date: 03-Dec-2016 15:33:40
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d
 Column 1 : Det: EXP1
 Process Host: XAWRK020

First Level Reviewer: chandrasenas Date: 05-Dec-2016 09:47:40

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
48 Sodium 1H,1H,2H,2H-perfluorooctane	427.00 > 407.00	2.840	2.836	0.004	1.000	2169230	19.5	103		
D 47 M2-6:2FTS	429.00 > 409.00	2.840	2.836	0.004		6295656	59.7	126		
43 Sodium 1H,1H,2H,2H-perfluorooctane	527.00 > 507.00	3.592	3.588	0.004	1.000	2029390	21.1	110		
D 42 M2-8:2FTS	529.00 > 509.00	3.592	3.591	0.001		5378444	55.4	116		
D 45 d3-NMeFOSAA	573.00 > 419.00	3.756	3.756	0.0		4323749	59.6	119		
44 N-methyl perfluorooctane sulfonami	570.00 > 419.00	3.756	3.759	-0.003	1.000	1655435	22.3	112		
D 46 d5-NEtFOSAA	589.00 > 419.00	3.931	3.922	0.009		4650188	58.4	117		
49 N-ethyl perfluorooctane sulfonamid	584.00 > 419.00	3.931	3.929	0.002	1.000	1629443	22.9	114		
D 52 d-N-MeFOSA-M	515.00 > 169.00	4.055	4.051	0.004		6162693	58.6	117		
54 MeFOSA	512.00 > 169.00	4.063	4.057	0.006	1.000	2189848	22.0	110		
D 51 d-N-EtFOSA-M	531.00 > 169.00	4.244	4.239	0.005		5747792	58.0	116		
53 N-ethylperfluoro-1-octanesulfonami	526.00 > 169.00	4.244	4.245	-0.001	1.000	2201423	22.3	111		

Reagents:

LCPFC2-L4_00003

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_016.d

Injection Date: 03-Dec-2016 15:18:43

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

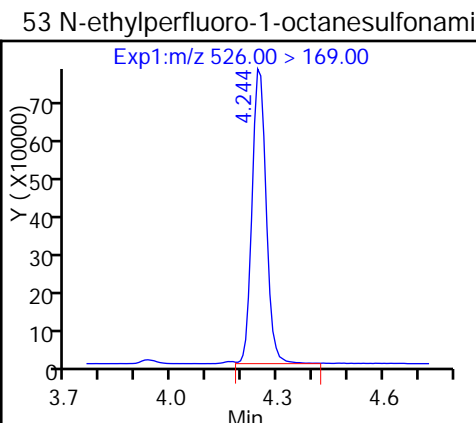
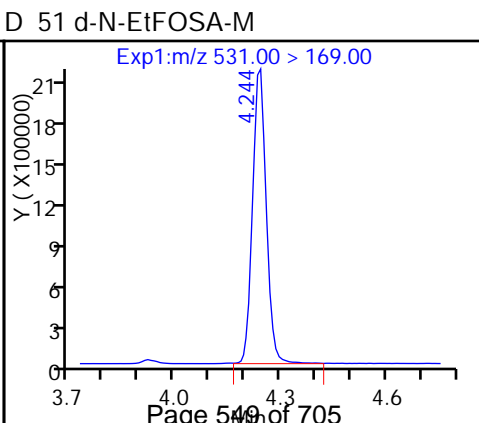
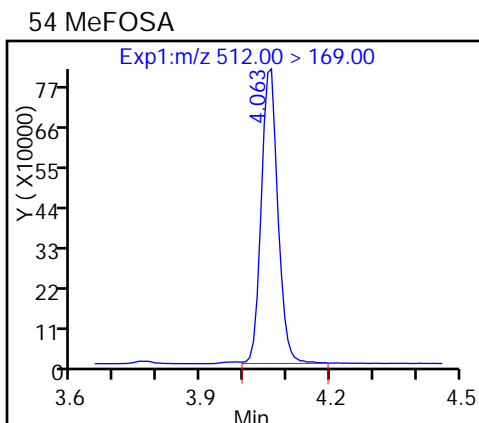
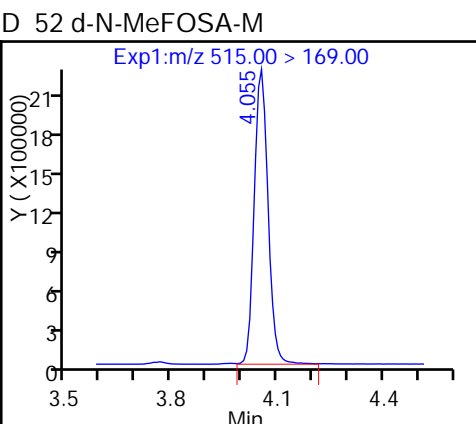
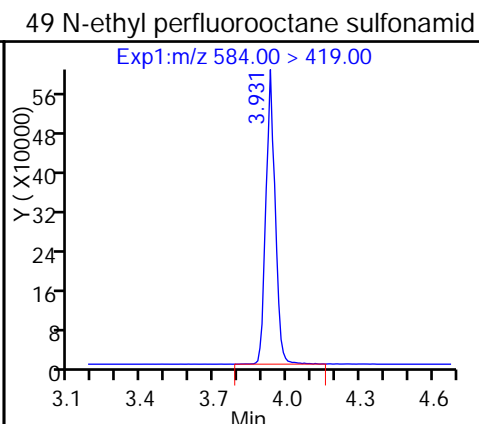
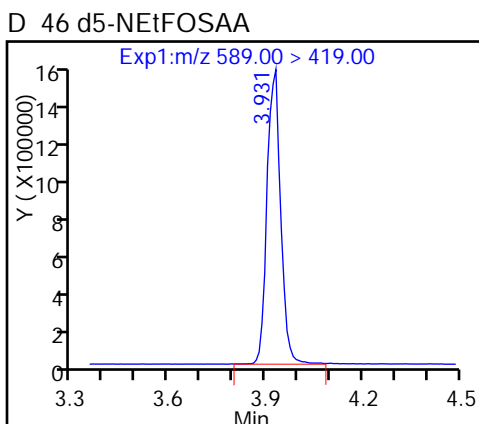
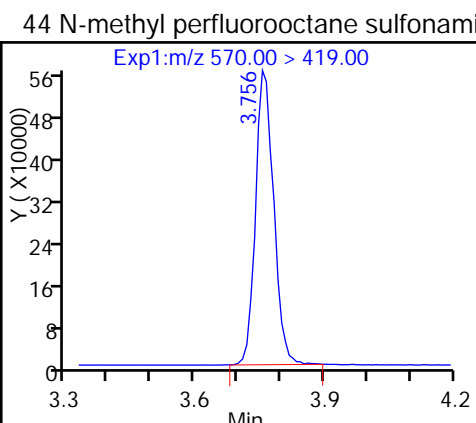
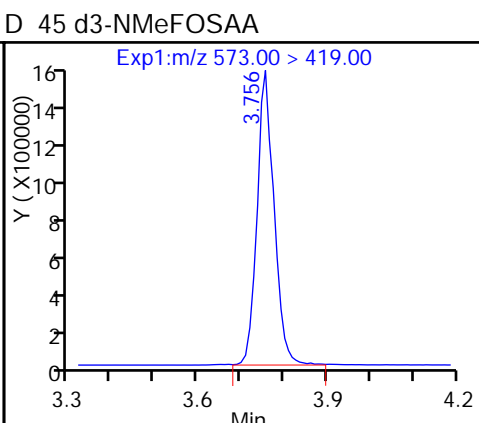
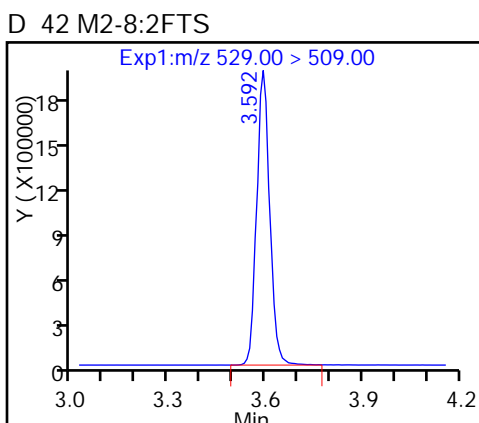
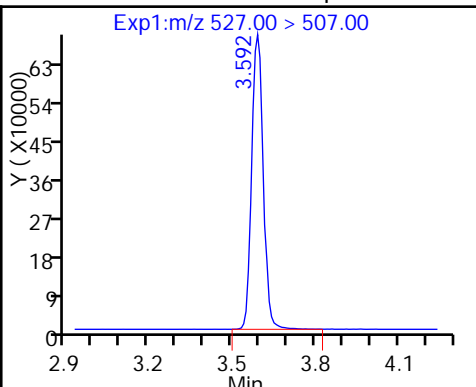
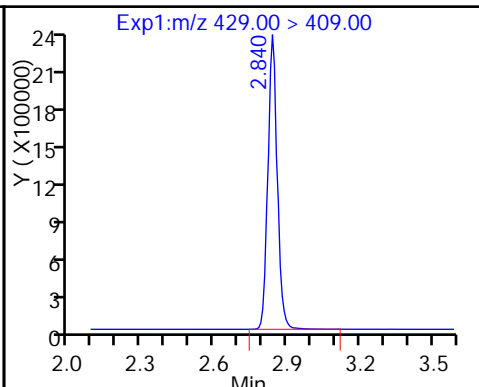
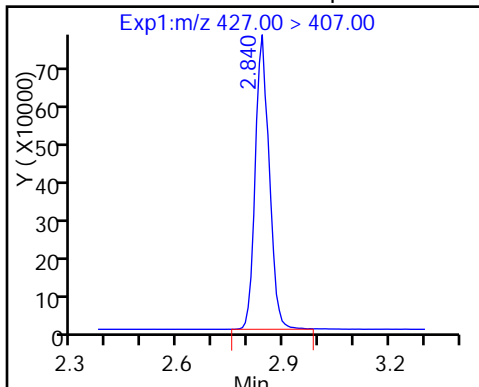
Dil. Factor: 1.0000

Method: A8_N

Limit Group: LC PFC_DOD ICAL

48 Sodium 1H,1H,2H,2H-perfluorooctane

43 Sodium 1H,1H,2H,2H-perfluorooctane



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_017.d
 Lims ID: IC L5 Add-on
 Client ID:
 Sample Type: IC Calib Level: 5
 Inject. Date: 03-Dec-2016 15:26:12 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*sub3
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 05-Dec-2016 10:28:07 Calib Date: 03-Dec-2016 15:33:40
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d
 Column 1 : Det: EXP1
 Process Host: XAWRK020

First Level Reviewer: chandrasenas Date: 05-Dec-2016 09:48:43

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
48 Sodium 1H,1H,2H,2H-perfluorooctane	427.00 > 407.00	2.830	2.836	-0.006	1.000	4576863	55.8	118		
D 47 M2-6:2FTS	429.00 > 409.00	2.830	2.836	-0.006		4638709	44.0	92.5		
43 Sodium 1H,1H,2H,2H-perfluorooctane	527.00 > 507.00	3.579	3.588	-0.009	0.998	4279048	57.8	121		
D 42 M2-8:2FTS	529.00 > 509.00	3.587	3.591	-0.004		4144623	42.7	89.1		
D 45 d3-NMeFOSAA	573.00 > 419.00	3.750	3.756	-0.006		3122973	43.1	86.1		
44 N-methyl perfluorooctane sulfonami	570.00 > 419.00	3.750	3.759	-0.009	1.000	3484088	65.0	130		
D 46 d5-NEtFOSAA	589.00 > 419.00	3.917	3.922	-0.005		3419439	42.9	85.9		
49 N-ethyl perfluorooctane sulfonamid	584.00 > 419.00	3.925	3.929	-0.004	1.002	3261537	62.3	125		
D 52 d-N-MeFOSA-M	515.00 > 169.00	4.042	4.051	-0.009		4794382	45.6	91.2		
54 MeFOSA	512.00 > 169.00	4.051	4.057	-0.006	1.000	4656344	60.1	120		
D 51 d-N-EtFOSA-M	531.00 > 169.00	4.236	4.239	-0.003		4667809	47.1	94.1		
53 N-ethylperfluoro-1-octanesulfonami	526.00 > 169.00	4.245	4.245	0.0	1.000	4735360	58.9	118		

Reagents:

LCPFC2-L5_00002

Amount Added: 1.00

Units: mL

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_017.d

Injection Date: 03-Dec-2016 15:26:12

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

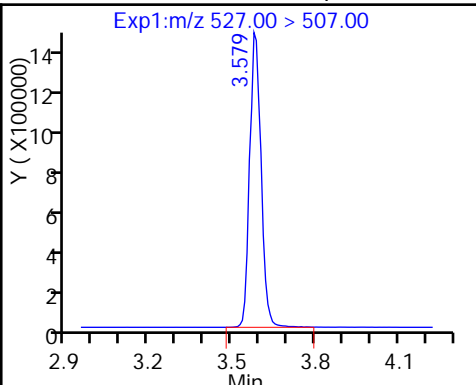
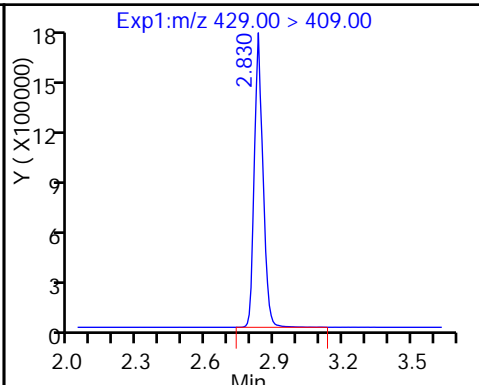
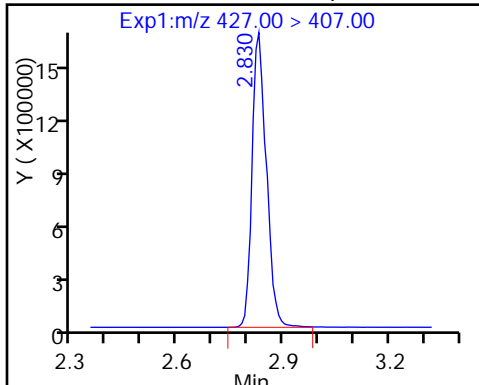
Dil. Factor: 1.0000

Method: A8_N

Limit Group: LC PFC_DOD ICAL

48 Sodium 1H,1H,2H,2H-perfluorooctane D 47 M2-6:2FTS

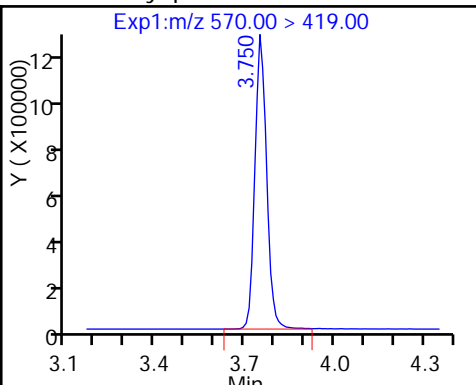
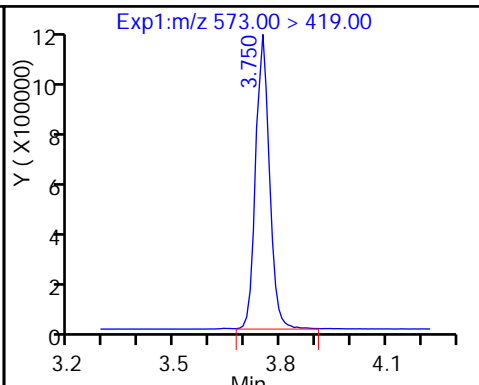
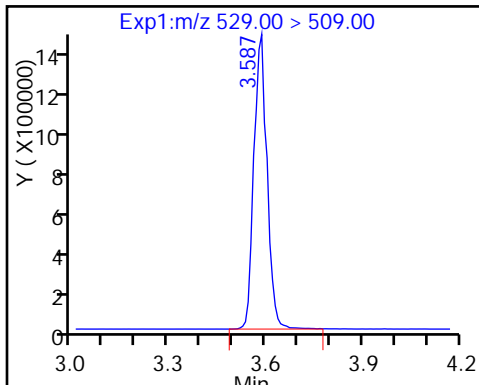
43 Sodium 1H,1H,2H,2H-perfluorooctane



D 42 M2-8:2FTS

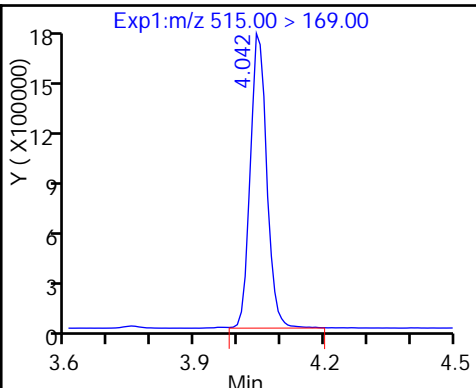
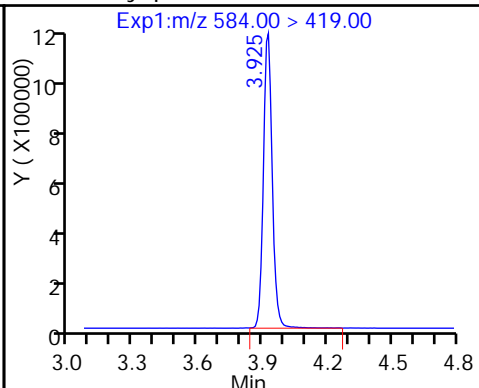
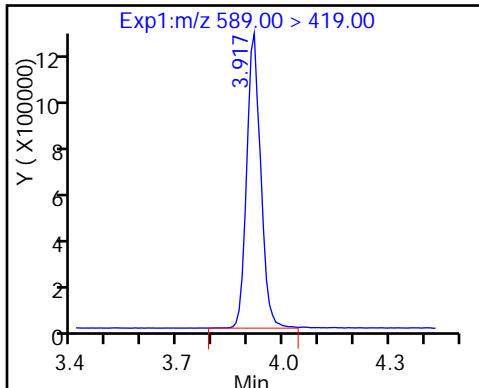
D 45 d3-NMeFOSAA

44 N-methyl perfluorooctane sulfonami



D 46 d5-NEtFOSAA

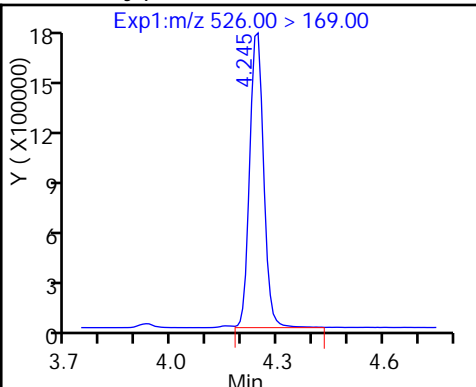
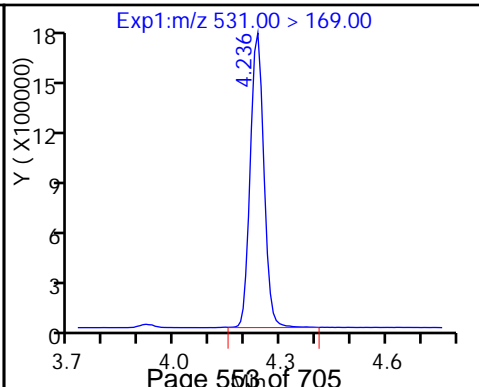
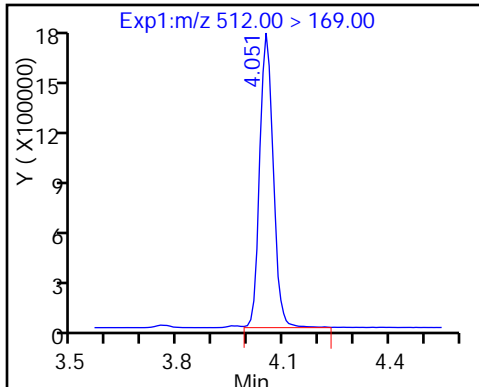
49 N-ethyl perfluorooctane sulfonamid D 52 d-N-MeFOSA-M



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\20161205-37491.b\03DEC2016A_018.d
 Lims ID: IC L6 Add-on
 Client ID:
 Sample Type: IC Calib Level: 6
 Inject. Date: 03-Dec-2016 15:33:40 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*sub3
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 05-Dec-2016 10:28:09 Calib Date: 03-Dec-2016 15:33:40
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d
 Column 1 : Det: EXP1
 Process Host: XAWRK020

First Level Reviewer: chandrasenas Date: 05-Dec-2016 09:49:51

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
48 Sodium 1H,1H,2H,2H-perfluorooctane	427.00 > 407.00	2.838	2.836	0.002	1.000	18026595	173.2	91.3		
D 47 M2-6:2FTS	429.00 > 409.00	2.838	2.836	0.002		5885296	55.8	117		
43 Sodium 1H,1H,2H,2H-perfluorooctane	527.00 > 507.00	3.589	3.588	0.001	1.000	16850029	163.6	85.4		
D 42 M2-8:2FTS	529.00 > 509.00	3.589	3.591	-0.002		5764339	59.3	124		
D 45 d3-NMeFOSAA	573.00 > 419.00	3.752	3.756	-0.004		3953776	54.5	109		
44 N-methyl perfluorooctane sulfonami	570.00 > 419.00	3.752	3.759	-0.007	1.000	13566790	199.9	99.9		
D 46 d5-NEtFOSAA	589.00 > 419.00	3.919	3.922	-0.003		4091711	51.4	103		
49 N-ethyl perfluorooctane sulfonamid	584.00 > 419.00	3.927	3.929	-0.002	1.002	13047697	208.2	104		
D 52 d-N-MeFOSA-M	515.00 > 169.00	4.052	4.051	0.001		5465444	52.0	104		
54 MeFOSA	512.00 > 169.00	4.061	4.057	0.004	1.000	17635948	199.7	99.8		
D 51 d-N-EtFOSA-M	531.00 > 169.00	4.239	4.239	0.0		5223764	52.7	105		
53 N-ethylperfluoro-1-octanesulfonami	526.00 > 169.00	4.249	4.245	0.003	1.000	18234509	202.8	101		

Reagents:

LCPFC2-L6_00002

Amount Added: 1.00

Units: mL

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d

Injection Date: 03-Dec-2016 15:33:40

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

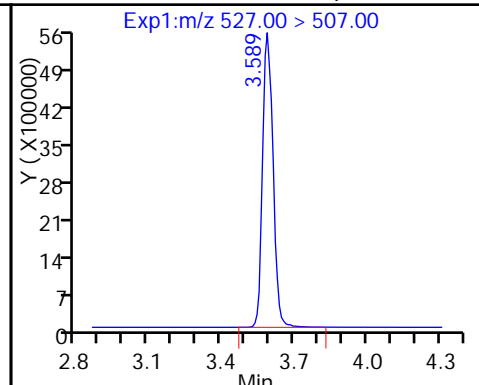
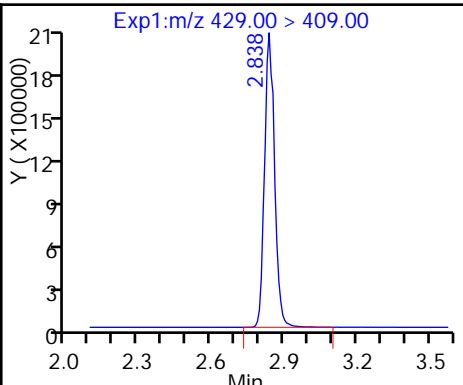
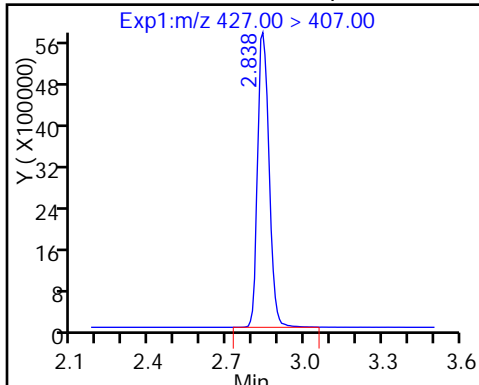
Dil. Factor: 1.0000

Method: A8_N

Limit Group: LC PFC_DOD ICAL

48 Sodium 1H,1H,2H,2H-perfluorooctane

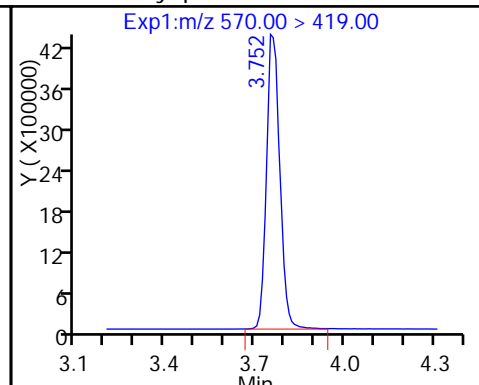
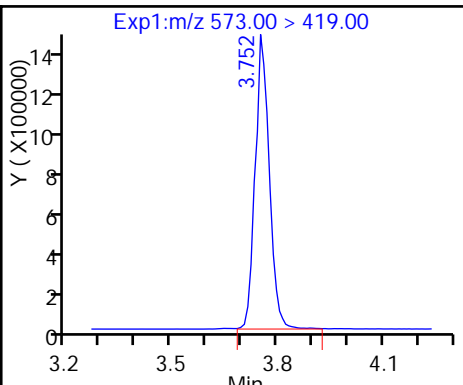
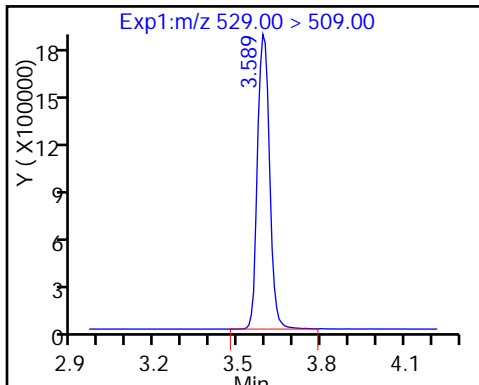
43 Sodium 1H,1H,2H,2H-perfluorooctane



D 42 M2-8:2FTS

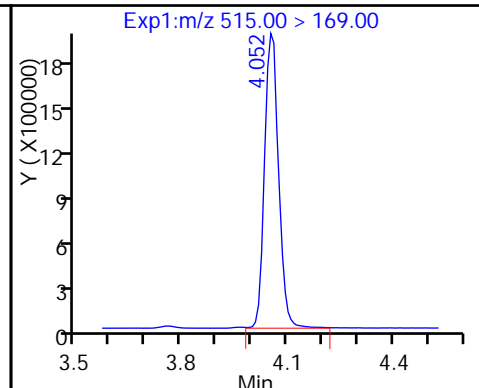
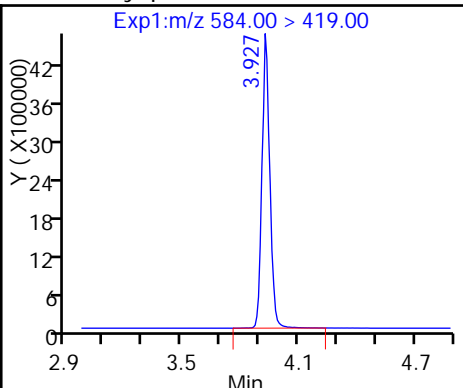
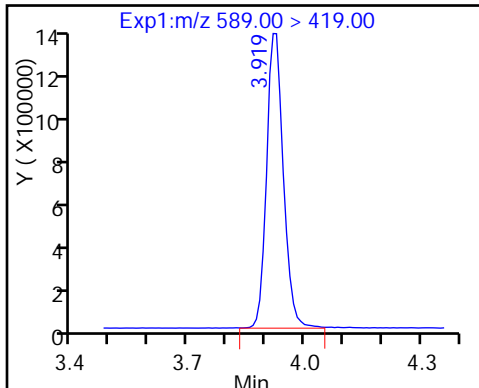
D 45 d3-NMeFOSAA

44 N-methyl perfluorooctane sulfonami



D 46 d5-NEtFOSAA

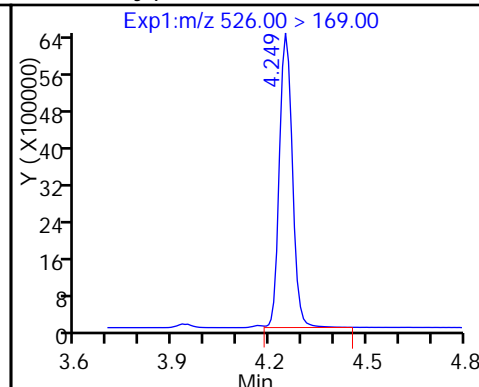
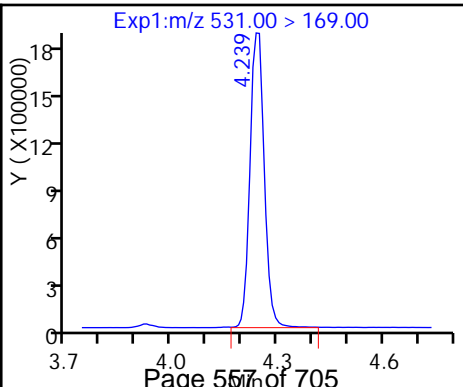
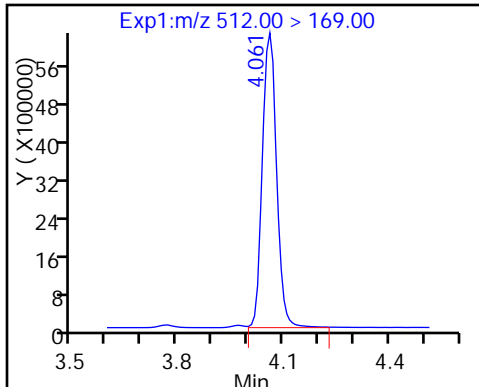
49 N-ethyl perfluorooctane sulfonamid D 52 d-N-MeFOSA-M



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.: 320-23696-1
 SDG No.: _____
 Lab Sample ID: ICV 320-140564/11 Calibration Date: 12/03/2016 14:41
 Instrument ID: A8_N Calib Start Date: 12/03/2016 13:48
 GC Column: Acquity ID: 2.10 (mm) Calib End Date: 12/03/2016 15:33
 Lab File ID: 03DEC2016A_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	0.8740	0.8445		48.3	50.0	-3.4	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.015	0.9455		46.6	50.0	-6.8	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.596	1.545		42.8	44.3	-3.2	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9531	0.8739		45.8	50.0	-8.3	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.027	0.9517		46.3	50.0	-7.3	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.098	0.9678		41.7	47.3	-11.8	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.177	1.212		49.0	47.6	3.0	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.072	0.9942		46.4	50.0	-7.2	25.0
Perfluorononanoic acid (PFNA)	AveID	0.996	0.9336		46.9	50.0	-6.3	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.085	0.9006		39.6	47.8	-17.0	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9341	0.8796		47.1	50.0	-5.8	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9605	0.9194		47.9	50.0	-4.3	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6398	0.6253		47.2	48.3	-2.3	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.066	0.9541		44.8	50.0	-10.5	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9490	0.9026		47.6	50.0	-4.9	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9498	0.8737		46.0	50.0	-8.0	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.854	1.715		46.3	50.0	-7.5	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		0.9305		46.1	50.0	-7.8	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.9929	1.003		50.5	50.0	1.1	25.0
13C4 PFBA	Ave	335829	312410		46.5	50.0	-7.0	50.0
13C5-PFPeA	Ave	264545	243307		46.0	50.0	-8.0	50.0
13C2 PFHxA	Ave	237486	229267		48.3	50.0	-3.5	50.0
13C4-PFHpA	Ave	207413	195333		47.1	50.0	-5.8	50.0
18O2 PFHxS	Ave	312342	294291		44.6	47.3	-5.8	50.0
13C4 PFOA	Ave	219258	198224		45.2	50.0	-9.6	50.0
13C4 PFOS	Ave	246009	225320		43.8	47.8	-8.4	50.0
13C5 PFNA	Ave	166415	156724		47.1	50.0	-5.8	50.0
13C8 FOSA	Ave	402279	382595		47.6	50.0	-4.9	50.0
13C2 PFDA	Ave	157817	146344		46.4	50.0	-7.3	50.0
13C2 PFUnA	Ave	118762	109554		46.1	50.0	-7.8	50.0
13C2 PFDoA	Ave	112084	109278		48.7	50.0	-2.5	50.0
13C2-PFTeDA	Ave	231173	214390		46.4	50.0	-7.3	50.0
13C2-PFHxDA	Ave	129725	121978		47.0	50.0	-6.0	50.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_011.d
 Lims ID: ICV
 Client ID:
 Sample Type: ICV
 Inject. Date: 03-Dec-2016 14:41:13 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\20161205-37491.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 05-Dec-2016 10:26:23 Calib Date: 03-Dec-2016 15:33:40
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d

Column 1 : Det: EXP1
 Process Host: XAWRK020

First Level Reviewer: chandrasenas Date: 05-Dec-2016 09:47:22

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	1.566	1.574	-0.008	15620513	46.5		93.0	1612048	
1 Perfluorobutyric acid	212.90 > 169.00	1.566	1.577	-0.011	13190679	48.3			70053	
3 Perfluoropentanoic acid	262.90 > 219.00	1.848	1.861	-0.013	11502032	46.6			76938	
D 4 13C5-PFPeA	267.90 > 223.00	1.848	1.861	-0.013	12165345	46.0		92.0	911947	
5 Perfluorobutanesulfonic acid	298.90 > 80.00	1.887	1.900	-0.013	20121282	42.8				
	298.90 > 99.00	1.887	1.900	-0.013	9272505		2.17(0.00-0.00)			
7 Perfluorohexanoic acid	313.00 > 269.00	2.158	2.164	-0.006	10017573	45.8			244705	
D 6 13C2 PFHxA	315.00 > 270.00	2.158	2.164	-0.006	11463370	48.3		96.5	672140	
D 11 13C4-PFHpA	367.00 > 322.00	2.499	2.511	-0.012	9766668	47.1		94.2	852072	
12 Perfluoroheptanoic acid	363.00 > 319.00	2.499	2.512	-0.013	9294490	46.3			100010	
9 Perfluorohexanesulfonic acid	399.00 > 80.00	2.514	2.531	-0.017	13456842	41.7				
D 10 18O2 PFHxS	403.00 > 84.00	2.514	2.531	-0.017	13919947	44.6		94.2	810316	
D 14 13C4 PFOA	417.00 > 372.00	2.870	2.880	-0.010	9911203	45.2		90.4	548349	

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	2.870	2.887	-0.017	1.000	9853753	46.4			123535	
413.00 > 169.00	2.862	2.887	-0.025	0.997	6029090		1.63(0.90-1.10)		244064	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.870	2.888	-0.018	1.000	13003397	49.0				
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.244	3.258	-0.014	1.000	9689735	39.6			1641854	
499.00 > 99.00	3.235	3.258	-0.023	0.997	2361166		4.10(0.90-1.10)		256440	
D 17 13C4 PFOS										
503.00 > 80.00	3.235	3.259	-0.024		10770309	43.8		91.6	336185	
D 19 13C5 PFNA										
468.00 > 423.00	3.244	3.263	-0.019		7836220	47.1		94.2	638662	
20 Perfluorononanoic acid										
463.00 > 419.00	3.244	3.263	-0.019	1.000	7315987	46.9			101636	
D 21 13C8 FOSA										
506.00 > 78.00	3.557	3.571	-0.014		19129770	47.6		95.1	889404	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.565	3.574	-0.009	1.000	16827146	47.1			307442	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.607	3.623	-0.016	1.000	6727679	47.9			161083	
D 23 13C2 PFDA										
515.00 > 470.00	3.607	3.626	-0.019		7317194	46.4		92.7	293278	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.912	3.936	-0.024	1.000	6797886	47.2				
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.938	3.955	-0.017	1.000	5226274	44.8			120213	
D 27 13C2 PFUnA										
565.00 > 520.00	3.938	3.958	-0.020		5477711	46.1		92.2	312875	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.224	4.250	-0.026	1.000	4931801	47.6			90828	
D 30 13C2 PFDoA										
615.00 > 570.00	4.232	4.251	-0.019		5463889	48.7		97.5	309492	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.503	4.518	-0.015	1.000	4773745	46.0			36970	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.732	4.759	-0.027		10719523	46.4		92.7	360593	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.740	4.761	-0.021	1.000	9370597	46.3			4744	
713.00 > 169.00	4.732	4.761	-0.029	0.998	1459995		6.42(0.00-0.00)		102221	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.158	5.186	-0.028		6098899	47.0		94.0	113553	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.158	5.186	-0.028	1.000	5084325	46.1			4219	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.523	5.559	-0.036	1.000	5482963	50.5			9364	

Reagents:

LCPFCIC_00020

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_011.d

Injection Date: 03-Dec-2016 14:41:13

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

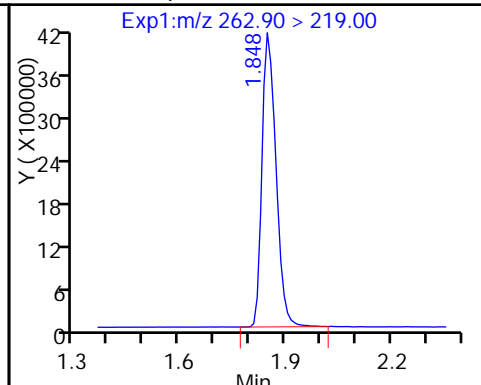
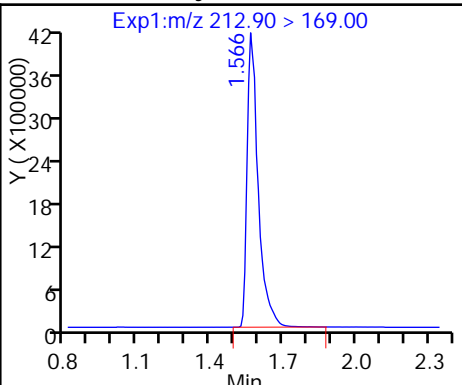
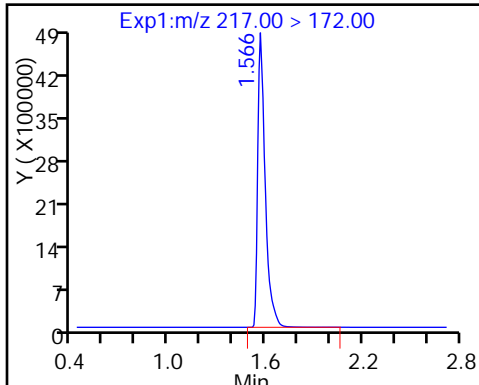
Method: A8_N

Limit Group: LC PFC_DOD ICAL

D 2 13C4 PFBA

1 Perfluorobutyric acid

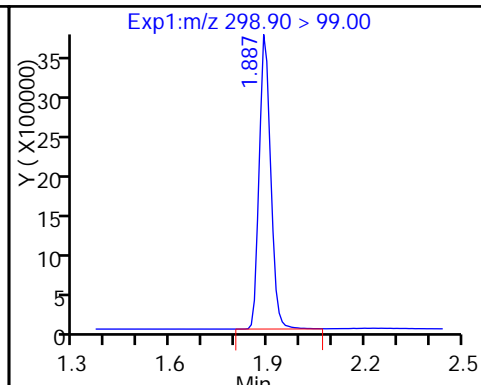
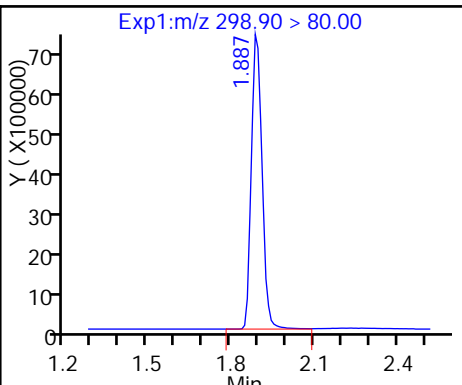
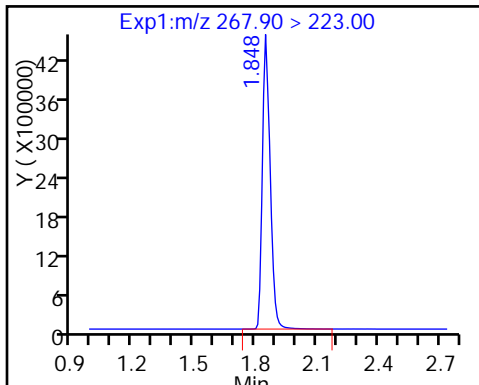
3 Perfluoropentanoic acid



D 4 13C5-PFPeA

5 Perfluorobutanesulfonic acid

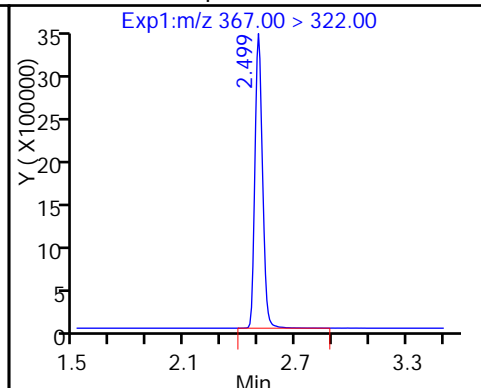
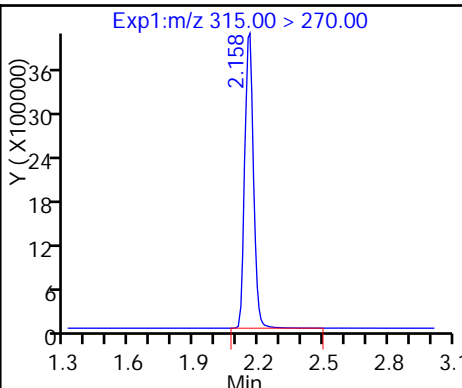
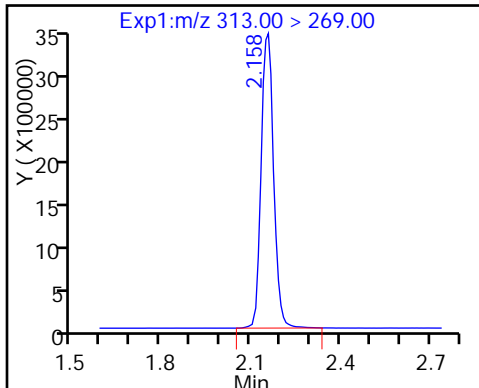
5 Perfluorobutanesulfonic acid



7 Perfluorohexanoic acid

D 6 13C2 PFHxA

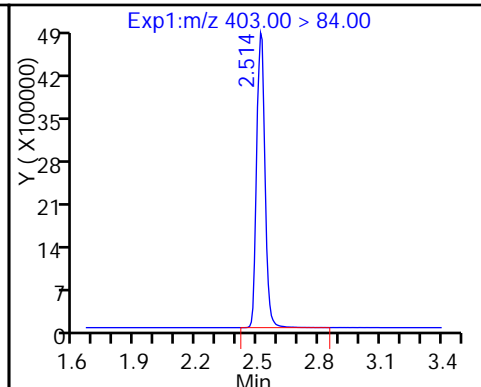
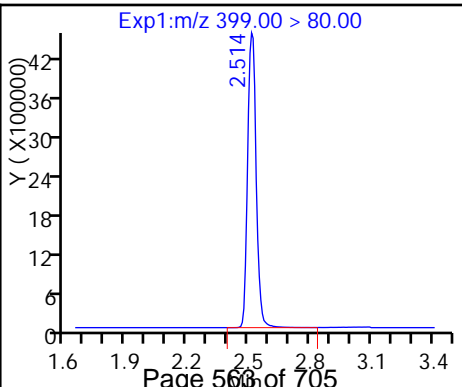
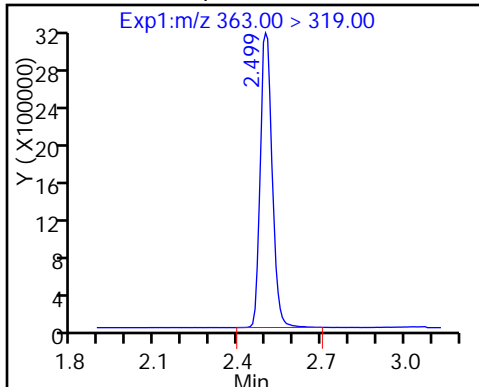
D 11 13C4-PFHpA



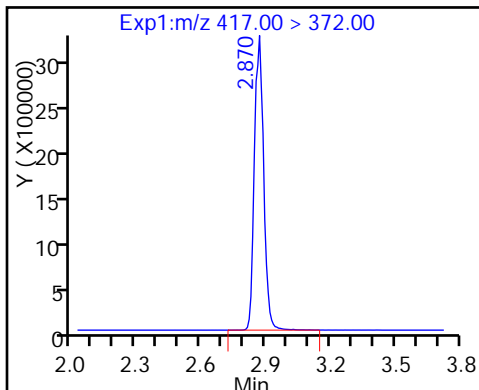
12 Perfluoroheptanoic acid

9 Perfluorohexanesulfonic acid

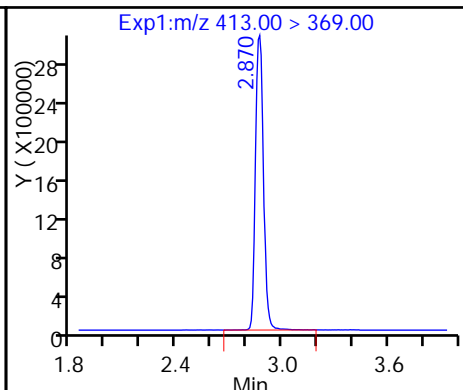
D 10 18O2 PFHxS



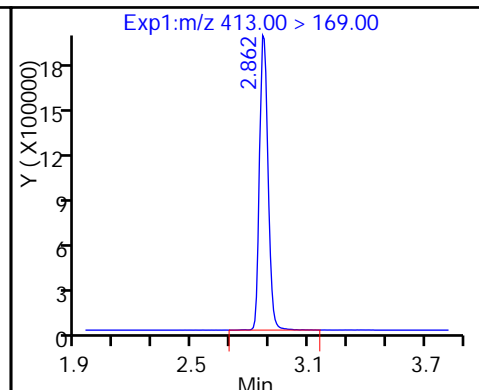
D 14 13C4 PFOA



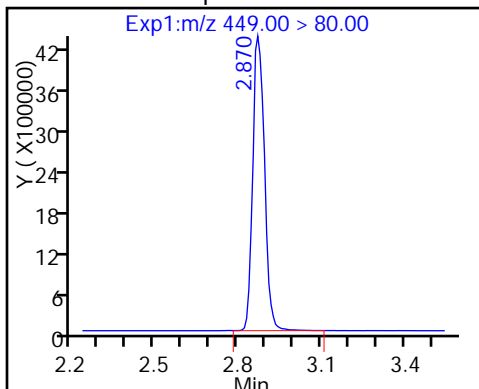
15 Perfluorooctanoic acid



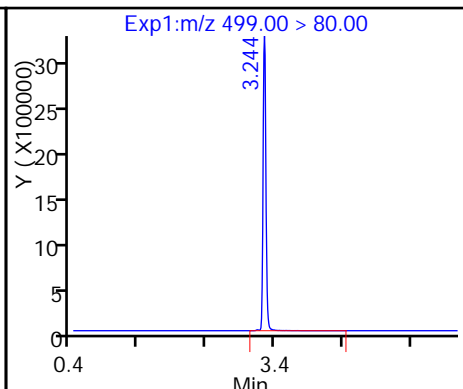
15 Perfluorooctanoic acid



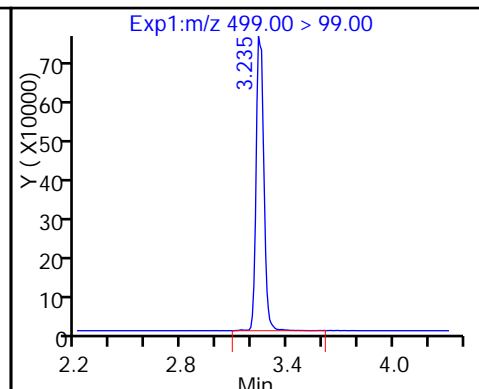
13 Perfluoroheptanesulfonic Acid



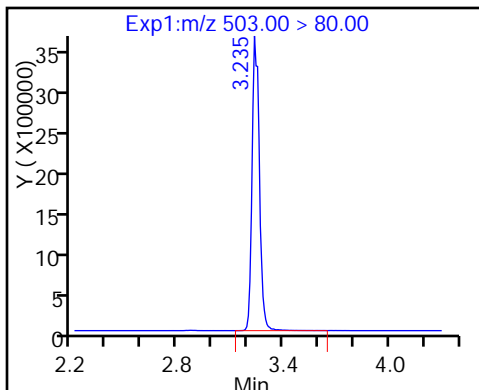
18 Perfluorooctane sulfonic acid



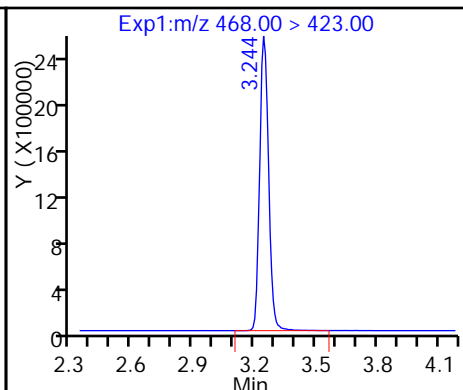
18 Perfluorooctane sulfonic acid



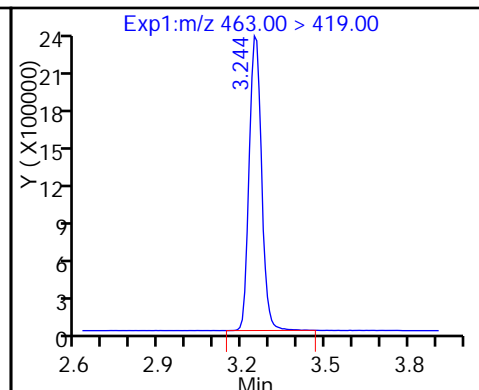
D 17 13C4 PFOS



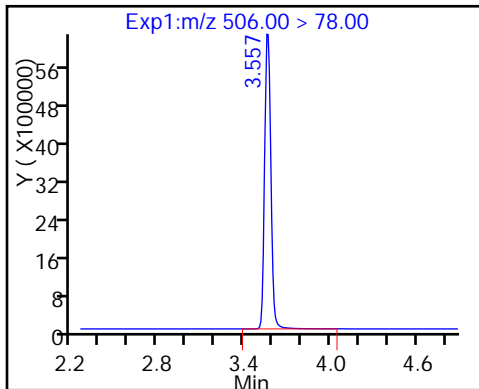
D 19 13C5 PFNA



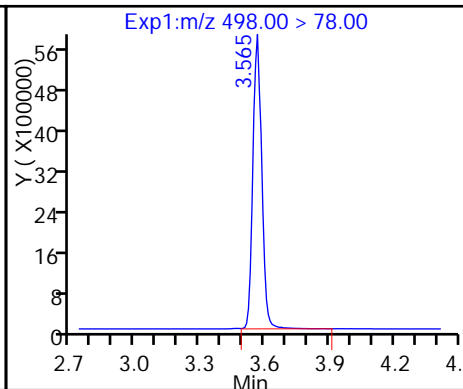
20 Perfluorononanoic acid



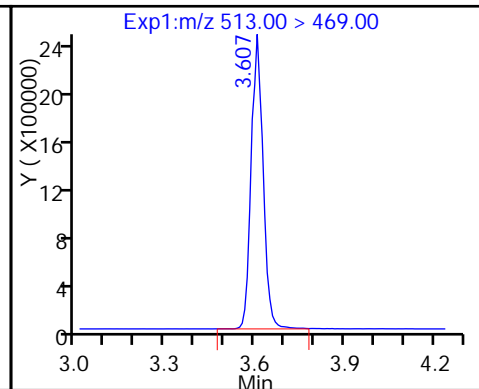
D 21 13C8 FOSA



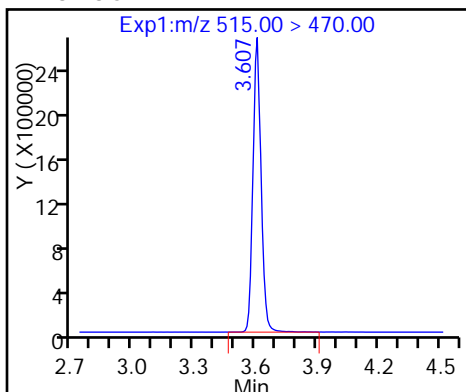
22 Perfluorooctane Sulfonamide



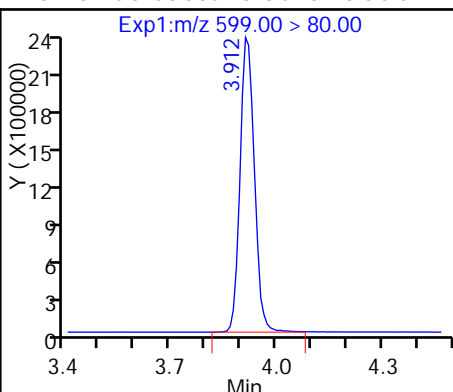
24 Perfluorodecanoic acid



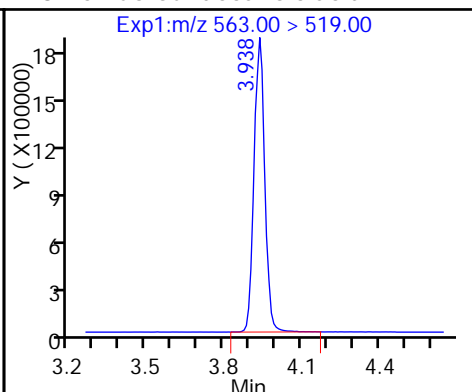
D 23 13C2 PFDA



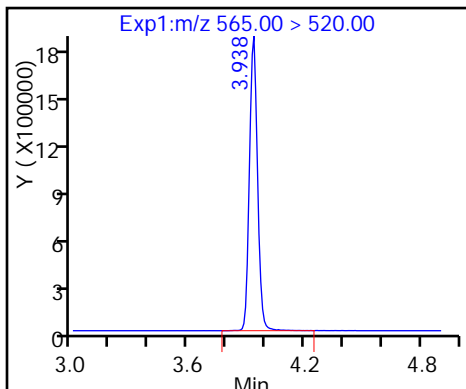
26 Perfluorodecane Sulfonic acid



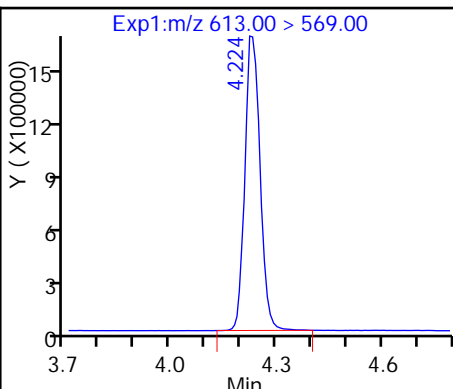
28 Perfluoroundecanoic acid



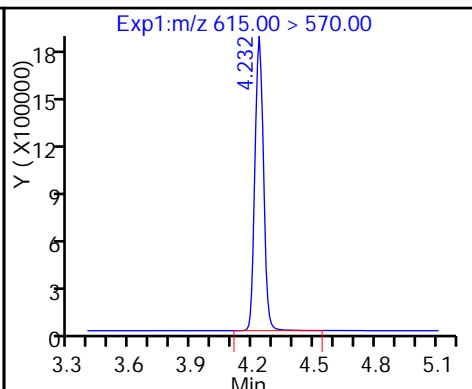
D 27 13C2 PFUa



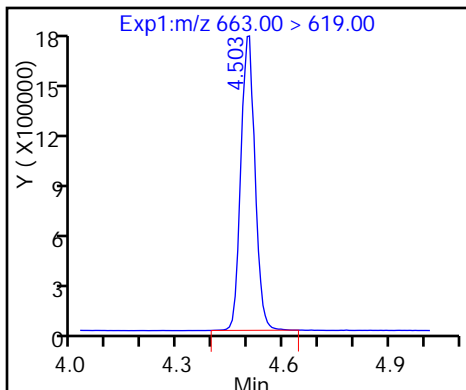
29 Perfluorododecanoic acid



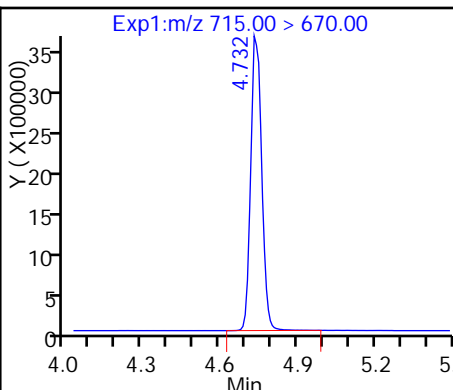
D 30 13C2 PFDa



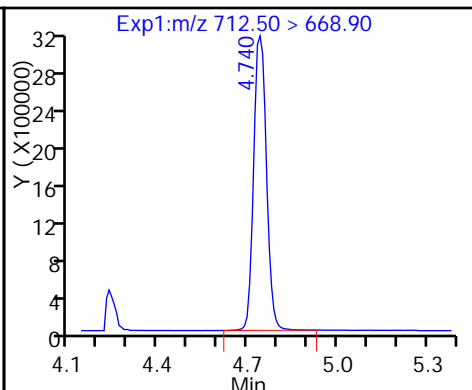
31 Perfluorotridecanoic acid



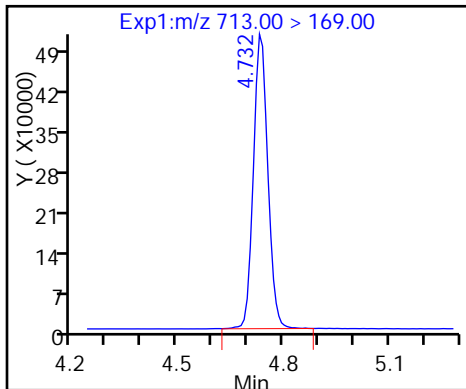
D 32 13C2-PFTeDA



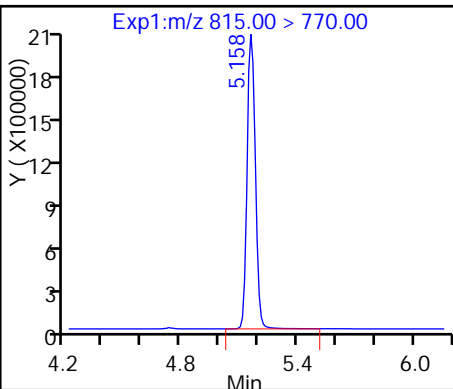
33 Perfluorotetradecanoic acid



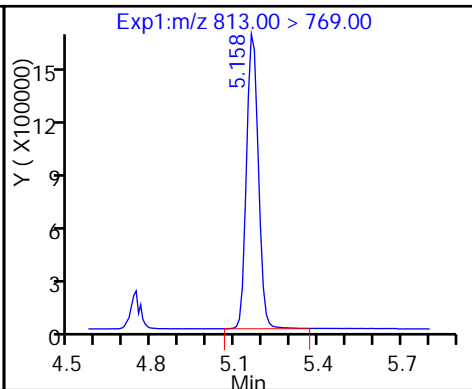
33 Perfluorotetradecanoic acid



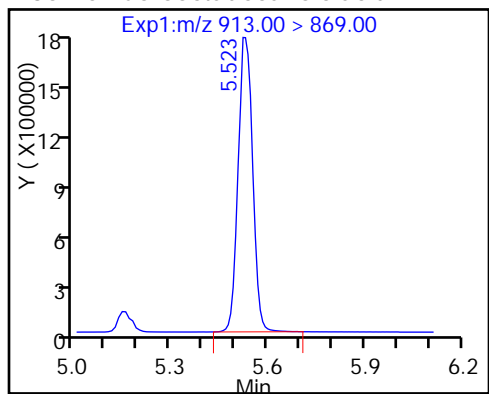
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-23696-1
 SDG No.: _____
 Lab Sample ID: CCV 320-140675/2 Calibration Date: 12/03/2016 18:48
 Instrument ID: A8_N Calib Start Date: 12/03/2016 13:48
 GC Column: Acquity ID: 2.10 (mm) Calib End Date: 12/03/2016 15:33
 Lab File ID: 03DEC2016C_002.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.8740	0.8870		50.7	50.0	1.5	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.015	0.9860		48.6	50.0	-2.8	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.596	1.630		45.1	44.2	2.1	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9531	0.9496		49.8	50.0	-0.4	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.027	1.022		49.8	50.0	-0.5	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.098	1.042		43.2	45.5	-5.1	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.072	1.038		48.4	50.0	-3.2	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.177	1.170		47.3	47.6	-0.6	25.0
Perfluorononanoic acid (PFNA)	AveID	0.996	1.019		51.1	50.0	2.2	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.085	1.083		46.3	46.4	-0.2	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9341	0.9263		49.6	50.0	-0.8	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9605	0.9574		49.8	50.0	-0.3	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6398	0.6461		48.7	48.2	1.0	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.066	1.002		47.0	50.0	-6.0	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9490	0.9155		48.2	50.0	-3.5	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9498	0.9108		47.9	50.0	-4.1	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.854	1.663		44.9	50.0	-10.3	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		0.9334		46.2	50.0	-7.5	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.9929	0.9371		47.2	50.0	-5.6	25.0
13C4 PFBA	Ave	335829	317895		47.3	50.0	-5.3	50.0
13C5-PFPeA	Ave	264545	246822		46.7	50.0	-6.7	50.0
13C2 PFHxA	Ave	237486	222152		46.8	50.0	-6.5	50.0
13C4-PFHpA	Ave	207413	192428		46.4	50.0	-7.2	50.0
18O2 PFHxS	Ave	312342	301492		45.7	47.3	-3.5	50.0
13C4 PFOA	Ave	219258	204589		46.7	50.0	-6.7	50.0
13C4 PFOS	Ave	246009	237189		46.1	47.8	-3.6	50.0
13C5 PFNA	Ave	166415	152839		45.9	50.0	-8.2	50.0
13C8 FOSA	Ave	402279	381872		47.5	50.0	-5.1	50.0
13C2 PFDA	Ave	157817	142696		45.2	50.0	-9.6	50.0
13C2 PFUnA	Ave	118762	106534		44.9	50.0	-10.3	50.0
13C2 PFDoA	Ave	112084	108237		48.3	50.0	-3.4	50.0
13C2-PFTeDA	Ave	231173	210290		45.5	50.0	-9.0	50.0
13C2-PFHxDA	Ave	129725	114152		44.0	50.0	-12.0	50.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b\03DEC2016C_002.d
 Lims ID: CCV L5
 Client ID:
 Sample Type: CCV
 Inject. Date: 03-Dec-2016 18:48:43 ALS Bottle#: 41 Worklist Smp#: 2
 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*sub1
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 06-Dec-2016 15:46:29 Calib Date: 03-Dec-2016 15:33:40
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d
 Column 1 : Det: EXP1
 Process Host: XAWRK027

First Level Reviewer: chandrasenas Date: 06-Dec-2016 15:46:28

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	1.549	1.549	0.0	15894745	47.3		94.7	958748	
1 Perfluorobutyric acid	212.90 > 169.00	1.558	1.558	0.0	14098512	50.7		101	84606	
3 Perfluoropentanoic acid	262.90 > 219.00	1.829	1.829	0.0	12168319	48.6		97.2	103529	
D 4 13C5-PFPeA	267.90 > 223.00	1.829	1.829	0.0	12341093	46.7		93.3	1123757	
5 Perfluorobutanesulfonic acid	298.90 > 80.00	1.877	1.877	0.0	21720920	45.1		102		
	298.90 > 99.00	1.877	1.877	0.0	10181627		2.13(0.00-0.00)			
D 6 13C2 PFHxA	315.00 > 270.00	2.129	2.129	0.0	11107576	46.8		93.5	748884	
7 Perfluorohexanoic acid	313.00 > 269.00	2.138	2.138	0.0	10547762	49.8		99.6	235486	
12 Perfluoroheptanoic acid	363.00 > 319.00	2.466	2.466	0.0	9833631	49.8		99.5	94455	
D 11 13C4-PFHpA	367.00 > 322.00	2.473	2.473	0.0	9621389	46.4		92.8	563290	
D 10 18O2 PFHxS	403.00 > 84.00	2.481	2.481	0.0	14260550	45.7		96.5	532618	
9 Perfluorohexanesulfonic acid	399.00 > 80.00	2.496	2.496	0.0	14288466	43.2		94.9		M
15 Perfluorooctanoic acid	413.00 > 369.00	2.836	2.836	0.0	10614419	48.4		96.8	137120	
	413.00 > 169.00	2.836	2.836	0.0	6412073		1.66(0.90-1.10)		409924	
D 14 13C4 PFOA	417.00 > 372.00	2.836	2.836	0.0	10229453	46.7		93.3	414272	

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	2.845	2.845	0.0	1.000	13208901	47.3	99.4	
18 Perfluorooctane sulfonic acid	499.00	> 80.00	3.215	3.215	0.0	1.000	11914246	46.3	99.8	3171452
	499.00	> 99.00	3.215	3.215	0.0	1.000	2545283		4.68(0.90-1.10)	267307
20 Perfluorononanoic acid	463.00	> 419.00	3.215	3.215	0.0	1.000	7784054	51.1	102	139363
D 17 13C4 PFOS	503.00	> 80.00	3.215	3.215	0.0		11337625	46.1	96.4	327062
D 19 13C5 PFNA	468.00	> 423.00	3.215	3.215	0.0		7641928	45.9	91.8	419625
D 21 13C8 FOSA	506.00	> 78.00	3.537	3.537	0.0		19093582	47.5	94.9	544701
22 Perfluorooctane Sulfonamide	498.00	> 78.00	3.546	3.546	0.0	1.000	17685723	49.6	99.2	383341
24 Perfluorodecanoic acid	513.00	> 469.00	3.571	3.571	0.0	1.000	6830682	49.8	99.7	214871
D 23 13C2 PFDA	515.00	> 470.00	3.580	3.580	0.0		7134818	45.2	90.4	398107
26 Perfluorodecane Sulfonic acid	599.00	> 80.00	3.879	3.879	0.0	1.000	7386951	48.7	101	
D 27 13C2 PFUnA	565.00	> 520.00	3.897	3.897	0.0		5326723	44.9	89.7	201306
28 Perfluoroundecanoic acid	563.00	> 519.00	3.897	3.897	0.0	1.000	5337461	47.0	94.0	121632
29 Perfluorododecanoic acid	613.00	> 569.00	4.193	4.193	0.0	1.000	4954410	48.2	96.5	81350
D 30 13C2 PFDoA	615.00	> 570.00	4.193	4.193	0.0		5411867	48.3	96.6	152672
31 Perfluorotridecanoic acid	663.00	> 619.00	4.460	4.460	0.0	1.000	4929029	47.9	95.9	77514
33 Perfluorotetradecanoic acid	712.50	> 668.90	4.703	4.703	0.0	1.000	8998609	44.9	89.7	10356
	713.00	> 169.00	4.694	4.703	-0.008	0.998	1477525		6.09(0.00-0.00)	262211
D 32 13C2-PFTeDA	715.00	> 670.00	4.703	4.703	0.0		10514518	45.5	91.0	606589
35 Perfluorohexadecanoic acid	813.00	> 769.00	5.122	5.122	0.0	1.000	5051202	46.2	92.5	4673
D 34 13C2-PFHxDA	815.00	> 770.00	5.122	5.122	0.0		5707582	44.0	88.0	126024
36 Perfluorooctadecanoic acid	913.00	> 869.00	5.476	5.476	0.0	1.000	5071280	47.2	94.4	7993

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LCPFC-L5_00020

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b\03DEC2016C_002.d

Injection Date: 03-Dec-2016 18:48:43

Instrument ID: A8_N

Lims ID: CCV L5

Client ID:

Operator ID: A8-PC\A8

ALS Bottle#: 41

Worklist Smp#: 2

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

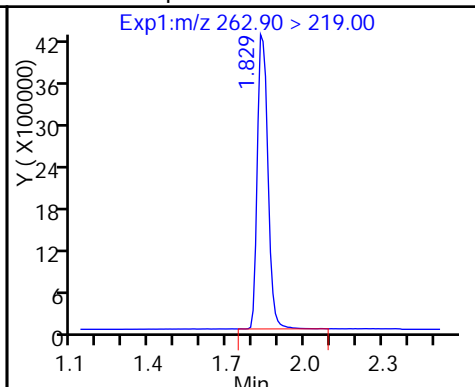
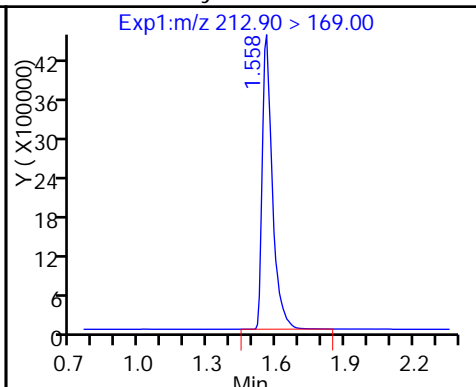
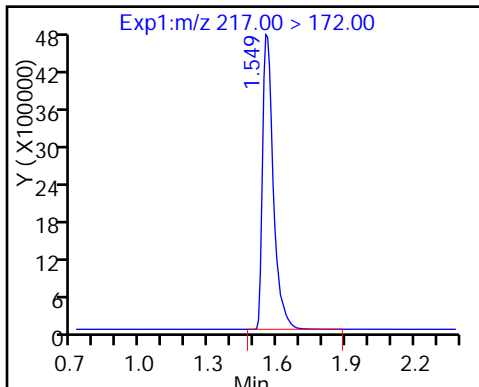
Method: A8_N

Limit Group: LC PFC_DOD ICAL

D 2 13C4 PFBA

1 Perfluorobutyric acid

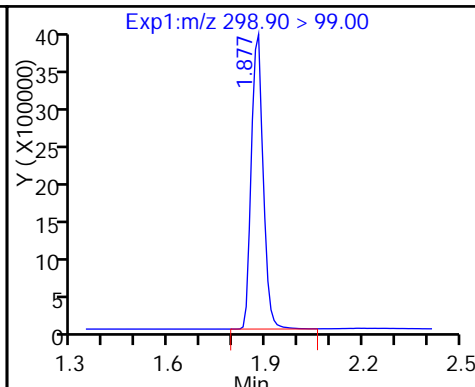
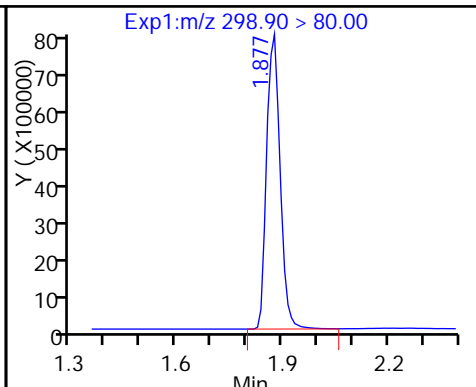
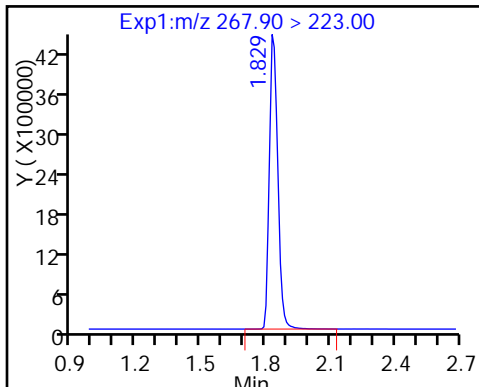
3 Perfluoropentanoic acid



D 4 13C5-PFPeA

5 Perfluorobutanesulfonic acid

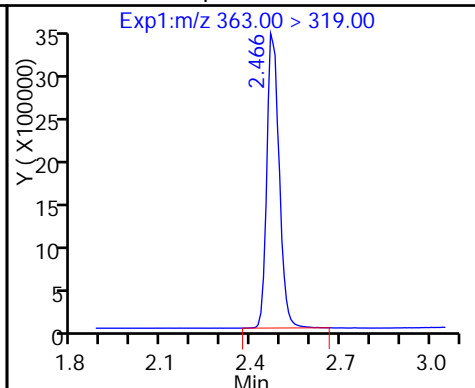
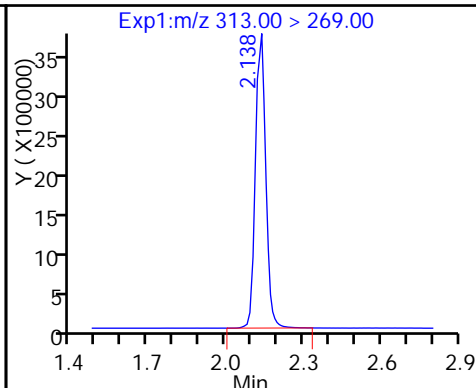
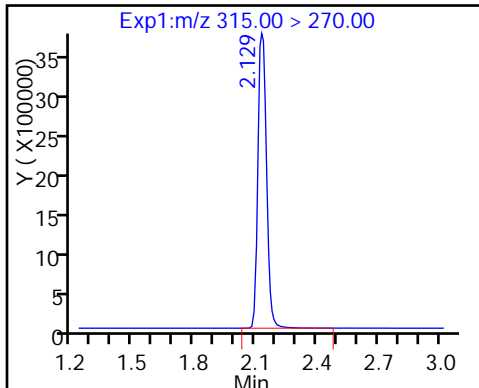
5 Perfluorobutanesulfonic acid



D 6 13C2 PFHxA

7 Perfluorohexanoic acid

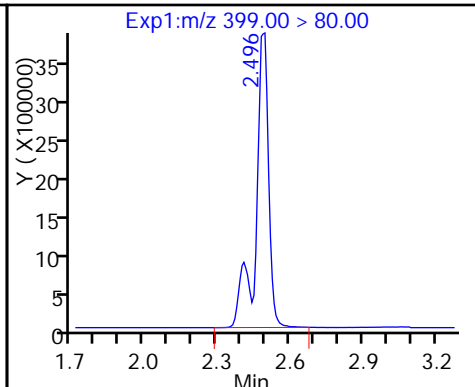
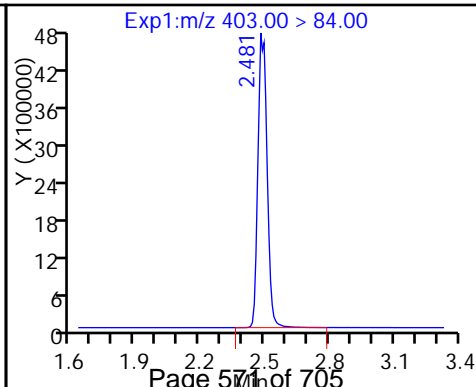
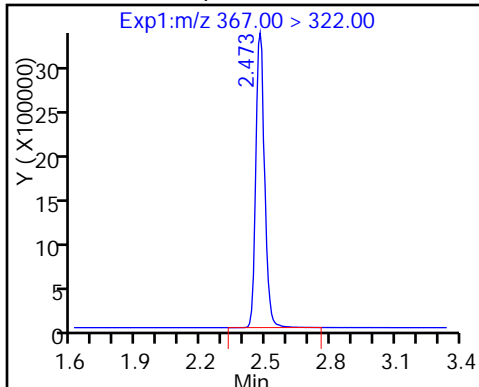
12 Perfluoroheptanoic acid

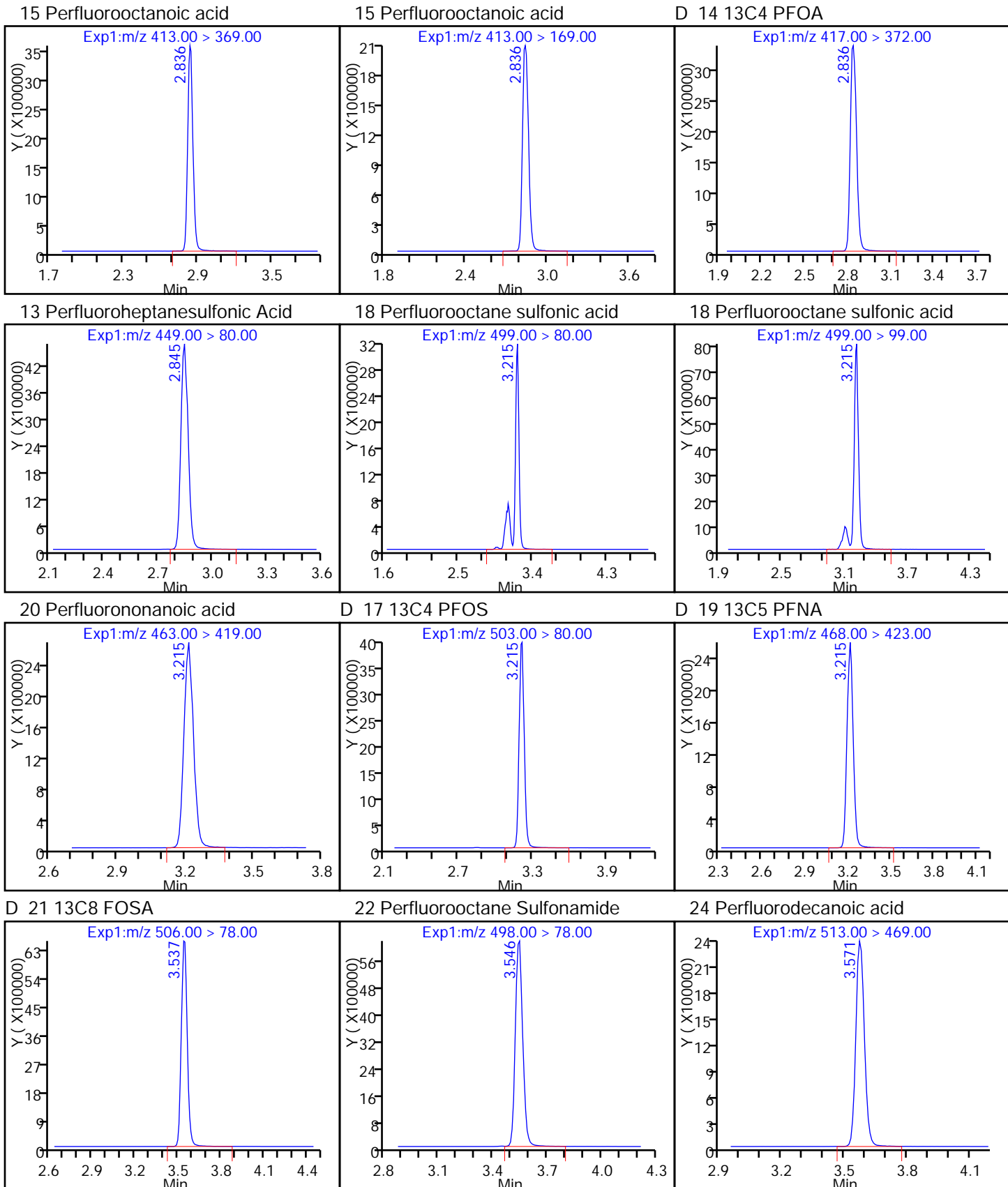


D 11 13C4-PFHpA

D 10 18O2 PFHxS

9 Perfluorohexanesulfonic acid (M)

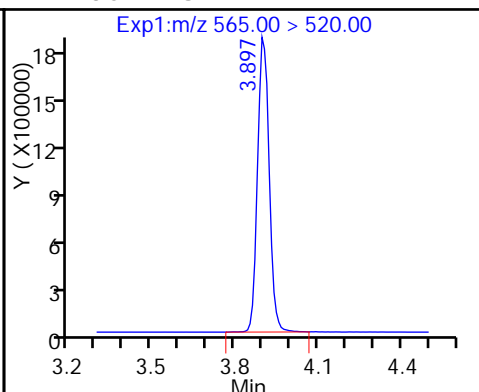
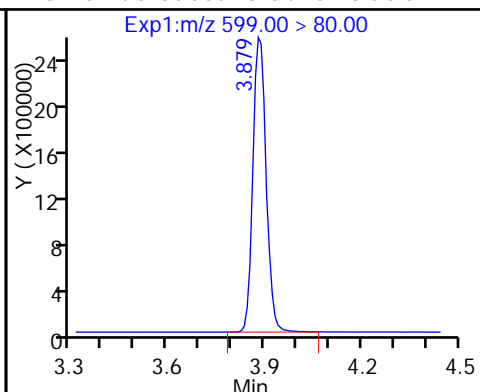
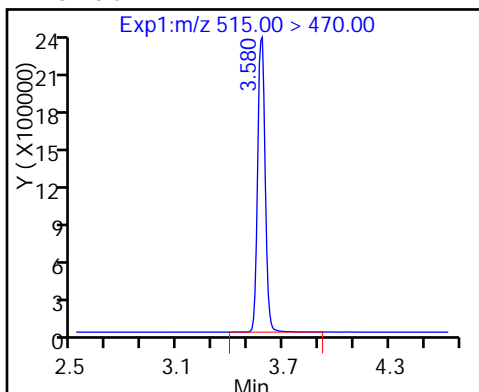




D 23 13C2 PFDA

26 Perfluorodecane Sulfonic acid

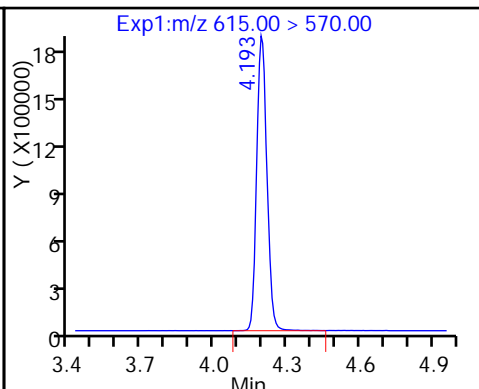
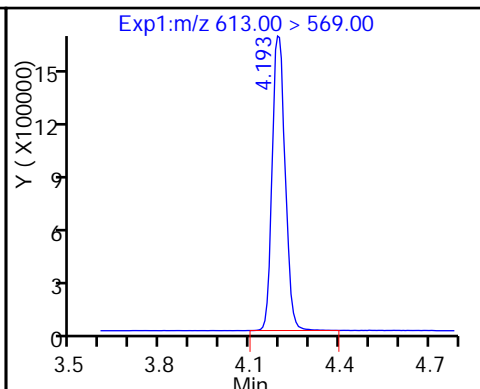
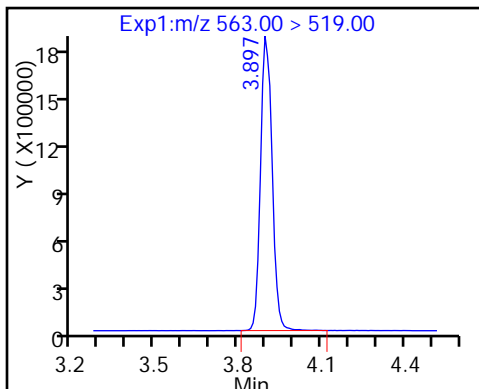
D 27 13C2 PFUnA



28 Perfluoroundecanoic acid

29 Perfluorododecanoic acid

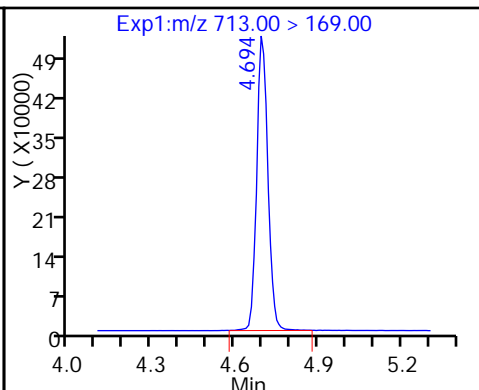
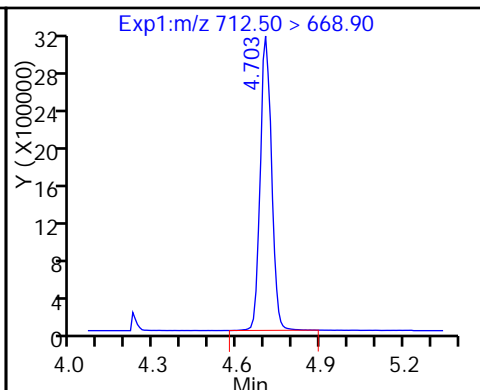
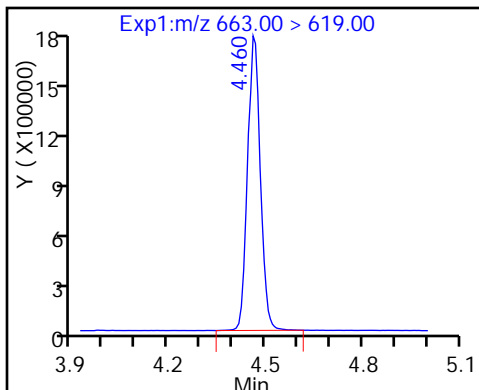
D 30 13C2 PFDaA



31 Perfluorotridecanoic acid

33 Perfluorotetradecanoic acid

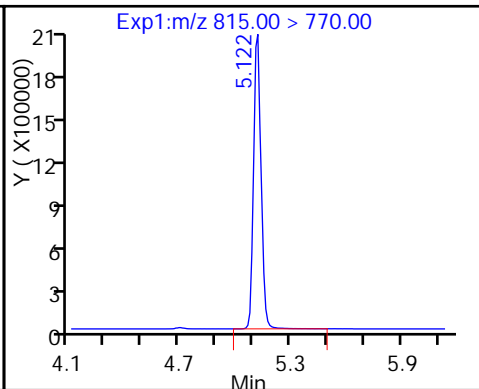
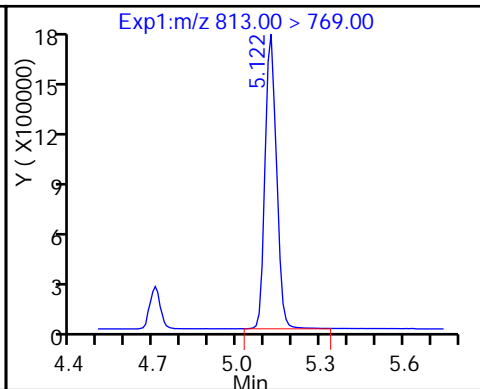
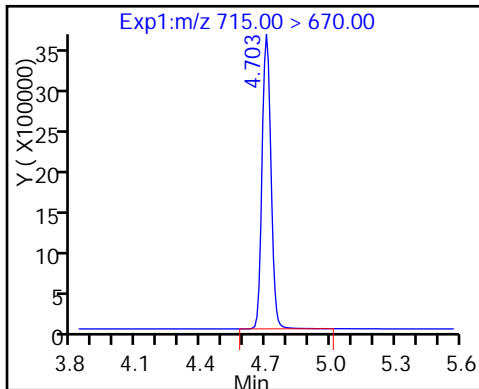
33 Perfluorotetradecanoic acid



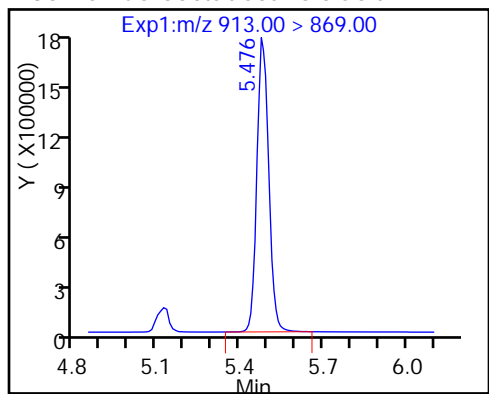
D 32 13C2-PFTeDA

35 Perfluorohexadecanoic acid

D 34 13C2-PFHxDA



36 Perfluorooctadecanoic acid



TestAmerica Sacramento

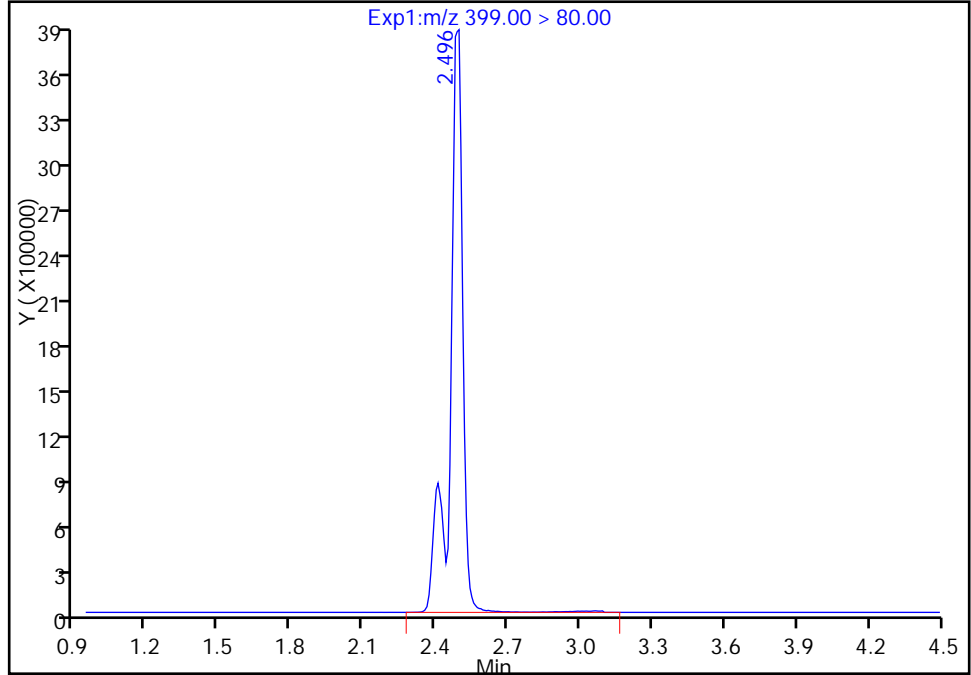
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Injection Date: 03-Dec-2016 18:48:43 Instrument ID: A8_N
Lims ID: CCV L5
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 41 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

9 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

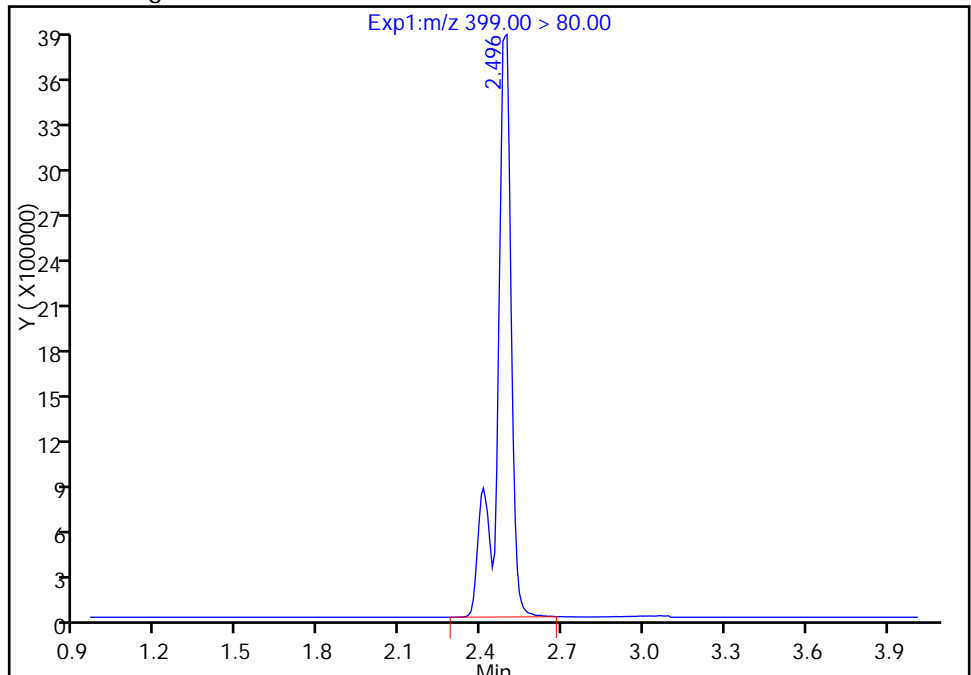
RT: 2.50
Area: 14447568
Amount: 43.659984
Amount Units: ng/ml

Processing Integration Results



RT: 2.50
Area: 14288466
Amount: 43.179184
Amount Units: ng/ml

Manual Integration Results



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-23696-1
 SDG No.: _____
 Lab Sample ID: CCV 320-140675/16 Calibration Date: 12/03/2016 20:33
 Instrument ID: A8_N Calib Start Date: 12/03/2016 13:48
 GC Column: Acquity ID: 2.10 (mm) Calib End Date: 12/03/2016 15:33
 Lab File ID: 03DEC2016C_016.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.8740	0.8914		51.0	50.0	2.0	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.015	0.9617		47.4	50.0	-5.2	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.596	1.587		43.9	44.2	-0.6	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9531	0.9270		48.6	50.0	-2.7	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.027	1.008		49.1	50.0	-1.9	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.098	1.055		43.7	45.5	-3.9	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.072	1.013		47.3	50.0	-5.5	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.177	1.185		47.9	47.6	0.7	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.085	1.064		45.5	46.4	-2.0	25.0
Perfluorononanoic acid (PFNA)	AveID	0.996	0.9823		49.3	50.0	-1.4	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9341	0.9224		49.4	50.0	-1.3	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9605	0.9516		49.5	50.0	-0.9	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6398	0.6457		48.6	48.2	0.9	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.066	0.9823		46.1	50.0	-7.8	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9490	0.9146		48.2	50.0	-3.6	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9498	0.8914		46.9	50.0	-6.2	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.854	1.608		43.4	50.0	-13.3	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		0.9333		46.2	50.0	-7.5	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.9929	0.9514		47.9	50.0	-4.2	25.0
13C4 PFBA	Ave	335829	326803		48.7	50.0	-2.7	50.0
13C5-PFPeA	Ave	264545	259678		49.1	50.0	-1.8	50.0
13C2 PFHxA	Ave	237486	232896		49.0	50.0	-1.9	50.0
13C4-PFHpA	Ave	207413	199363		48.1	50.0	-3.9	50.0
18O2 PFHxS	Ave	312342	305681		46.3	47.3	-2.1	50.0
13C4 PFOA	Ave	219258	209830		47.9	50.0	-4.3	50.0
13C5 PFNA	Ave	166415	160335		48.2	50.0	-3.7	50.0
13C4 PFOS	Ave	246009	234145		45.5	47.8	-4.8	50.0
13C8 FOSA	Ave	402279	382450		47.5	50.0	-4.9	50.0
13C2 PFDA	Ave	157817	148747		47.1	50.0	-5.7	50.0
13C2 PFUnA	Ave	118762	110669		46.6	50.0	-6.8	50.0
13C2 PFDoA	Ave	112084	111283		49.6	50.0	-0.7	50.0
13C2-PFTeDA	Ave	231173	211582		45.8	50.0	-8.5	50.0
13C2-PFHxDA	Ave	129725	119114		45.9	50.0	-8.2	50.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b\03DEC2016C_016.d
 Lims ID: CCV L5
 Client ID:
 Sample Type: CCV
 Inject. Date: 03-Dec-2016 20:33:48 ALS Bottle#: 41 Worklist Smp#: 16
 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*sub1
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 06-Dec-2016 15:54:55 Calib Date: 03-Dec-2016 15:33:40
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d
 Column 1 : Det: EXP1
 Process Host: XAWRK027

First Level Reviewer: chandrasenas Date: 06-Dec-2016 15:54:55

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	1.550	1.549	0.001	16340134	48.7		97.3	875721	
1 Perfluorobutyric acid	212.90 > 169.00	1.558	1.558	0.0	14565163	51.0		102	99308	
3 Perfluoropentanoic acid	262.90 > 219.00	1.839	1.829	0.010	12486402	47.4		94.8	92221	
D 4 13C5-PFPeA	267.90 > 223.00	1.829	1.829	0.0	12983923	49.1		98.2	934618	
5 Perfluorobutanesulfonic acid	298.90 > 80.00	1.877	1.877	0.0	21438166	43.9		99.4		
	298.90 > 99.00	1.868	1.877	-0.009	9996180		2.14(0.00-0.00)			
D 6 13C2 PFHxA	315.00 > 270.00	2.129	2.129	0.0	11644793	49.0		98.1	859379	
7 Perfluorohexanoic acid	313.00 > 269.00	2.129	2.138	-0.009	10794455	48.6		97.3	263624	
12 Perfluoroheptanoic acid	363.00 > 319.00	2.463	2.466	-0.003	10045379	49.1		98.1	133447	
D 11 13C4-PFHpA	367.00 > 322.00	2.471	2.473	-0.002	9968126	48.1		96.1	881881	
D 10 18O2 PFHxS	403.00 > 84.00	2.486	2.481	0.005	14458712	46.3		97.9	894334	
9 Perfluorohexanesulfonic acid	399.00 > 80.00	2.486	2.496	-0.010	14675162	43.7		96.1		M
15 Perfluorooctanoic acid	413.00 > 369.00	2.833	2.836	-0.003	10632043	47.3		94.5	100327	M
	413.00 > 169.00	2.833	2.836	-0.003	6500450		1.64(0.90-1.10)		262001	
D 14 13C4 PFOA	417.00 > 372.00	2.833	2.836	-0.003	10491517	47.9		95.7	599243	

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	2.842	2.845	-0.003	1.000	13211814	47.9	101		
18 Perfluorooctane sulfonic acid	499.00 > 80.00	3.203	3.215	-0.012	1.000	11558737	45.5	98.0	514286	
	499.00 > 99.00	3.203	3.215	-0.012	1.000	2568461		4.50(0.90-1.10)	395957	
20 Perfluorononanoic acid	463.00 > 419.00	3.212	3.215	-0.003	1.000	7874467	49.3	98.6	134004	
D 17 13C4 PFOS	503.00 > 80.00	3.212	3.215	-0.003		11192132	45.5	95.2	232852	
D 19 13C5 PFNA	468.00 > 423.00	3.203	3.215	-0.012		8016755	48.2	96.3	1282619	
D 21 13C8 FOSA	506.00 > 78.00	3.543	3.537	0.006		19122477	47.5	95.1	462169	
22 Perfluorooctane Sulfonamide	498.00 > 78.00	3.543	3.546	-0.003	1.000	17638669	49.4	98.7	299383	
24 Perfluorodecanoic acid	513.00 > 469.00	3.568	3.571	-0.003	1.000	7077188	49.5	99.1	317487	
D 23 13C2 PFDA	515.00 > 470.00	3.568	3.580	-0.012		7437346	47.1	94.3	272346	
26 Perfluorodecane Sulfonic acid	599.00 > 80.00	3.885	3.879	0.006	1.000	7287294	48.6	101		
D 27 13C2 PFUnA	565.00 > 520.00	3.894	3.897	-0.003		5533441	46.6	93.2	334769	
28 Perfluoroundecanoic acid	563.00 > 519.00	3.894	3.897	-0.003	1.000	5435679	46.1	92.2	136561	
29 Perfluorododecanoic acid	613.00 > 569.00	4.190	4.193	-0.003	1.000	5088854	48.2	96.4	96093	
D 30 13C2 PFDaA	615.00 > 570.00	4.190	4.193	-0.003		5564141	49.6	99.3	197986	
31 Perfluorotridecanoic acid	663.00 > 619.00	4.456	4.460	-0.004	1.000	4959865	46.9	93.8	64600	
33 Perfluorotetradecanoic acid	712.50 > 668.90	4.697	4.703	-0.005	1.000	8945568	43.4	86.7	16855	
	713.00 > 169.00	4.688	4.703	-0.014	0.998	1529851		5.85(0.00-0.00)	178000	
D 32 13C2-PFTeDA	715.00 > 670.00	4.697	4.703	-0.005		10579112	45.8	91.5	460975	
35 Perfluorohexadecanoic acid	813.00 > 769.00	5.114	5.122	-0.008	1.000	5193042	46.2	92.5	5413	
D 34 13C2-PFHxDA	815.00 > 770.00	5.114	5.122	-0.008		5955689	45.9	91.8	123000	
36 Perfluorooctadecanoic acid	913.00 > 869.00	5.478	5.476	0.002	1.000	5293904	47.9	95.8	7074	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LCPFC-L5_00020

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b\03DEC2016C_016.d

Injection Date: 03-Dec-2016 20:33:48

Instrument ID: A8_N

Lims ID: CCV L5

Client ID:

Operator ID: A8-PC\A8

ALS Bottle#: 41

Worklist Smp#: 16

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

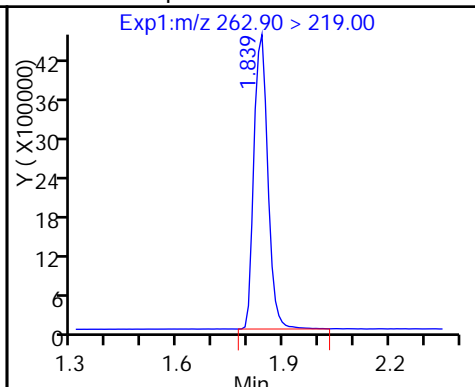
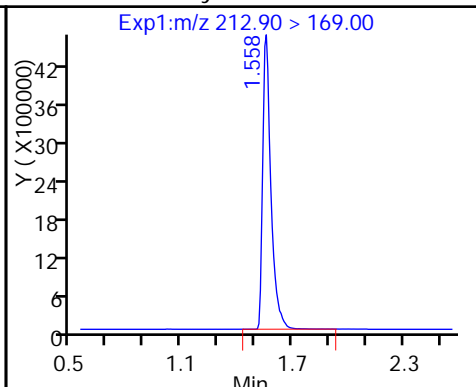
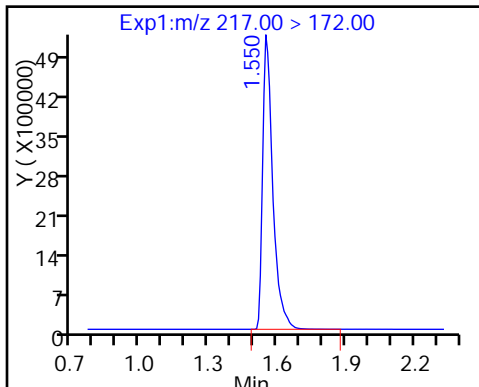
Method: A8_N

Limit Group: LC PFC_DOD ICAL

D 2 13C4 PFBA

1 Perfluorobutyric acid

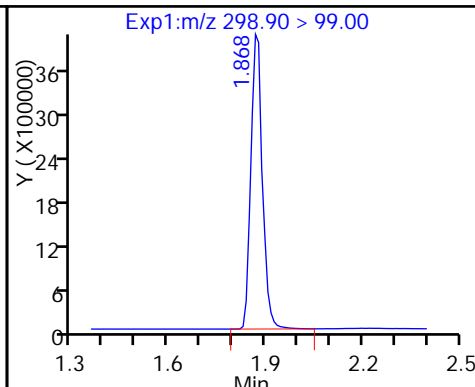
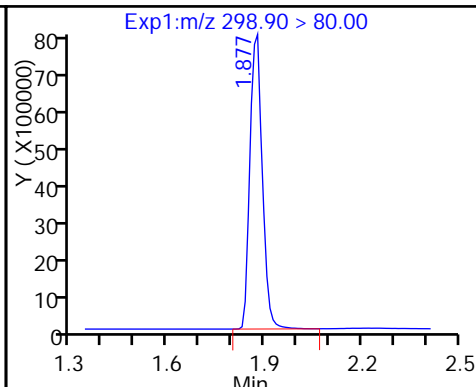
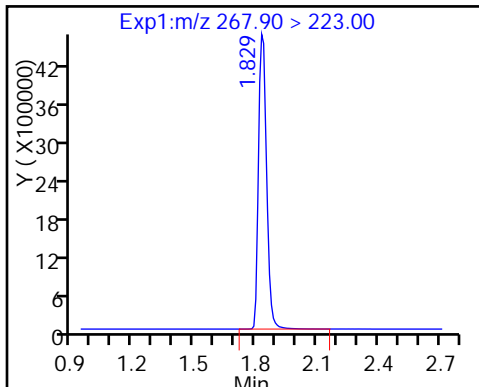
3 Perfluoropentanoic acid



D 4 13C5-PFPeA

5 Perfluorobutanesulfonic acid

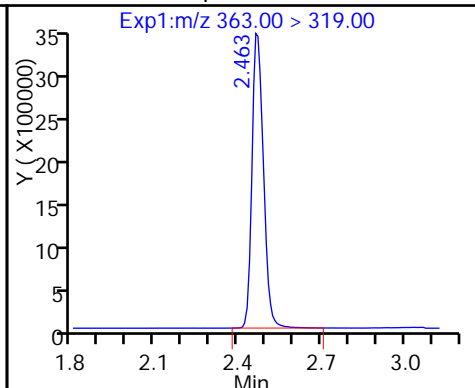
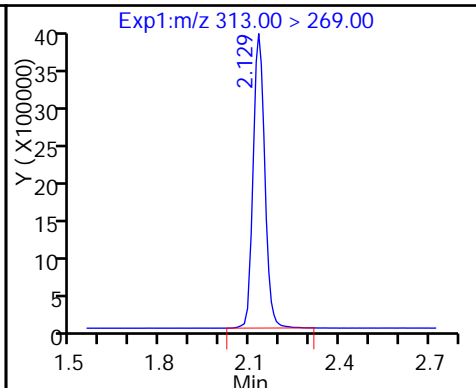
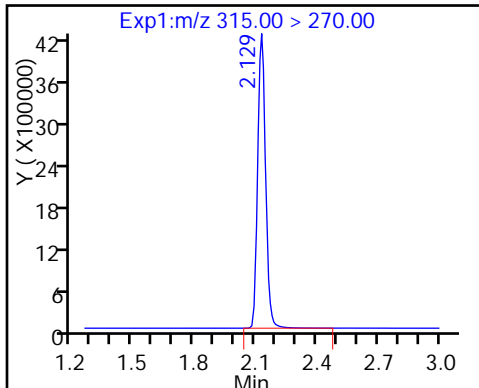
5 Perfluorobutanesulfonic acid



D 6 13C2 PFHxA

7 Perfluorohexanoic acid

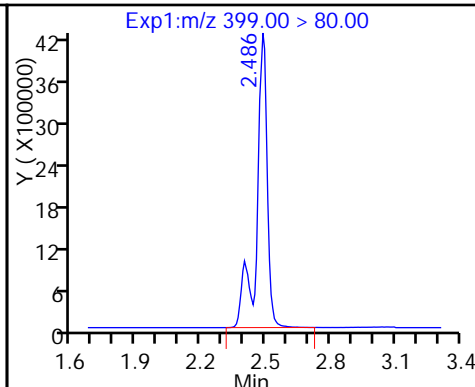
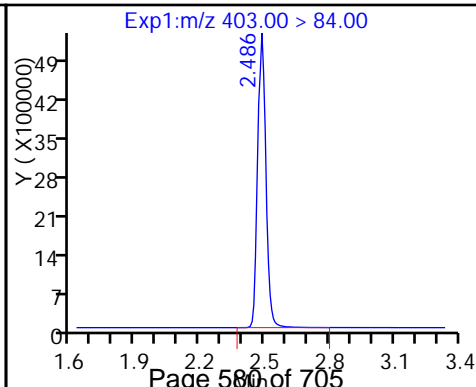
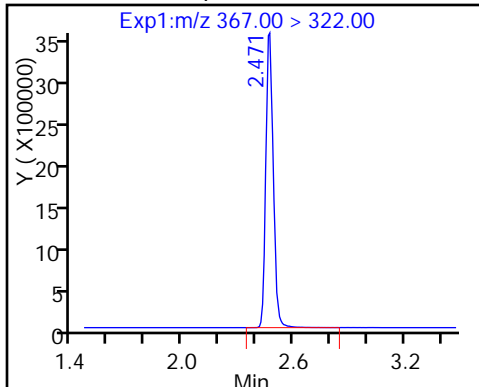
12 Perfluoroheptanoic acid

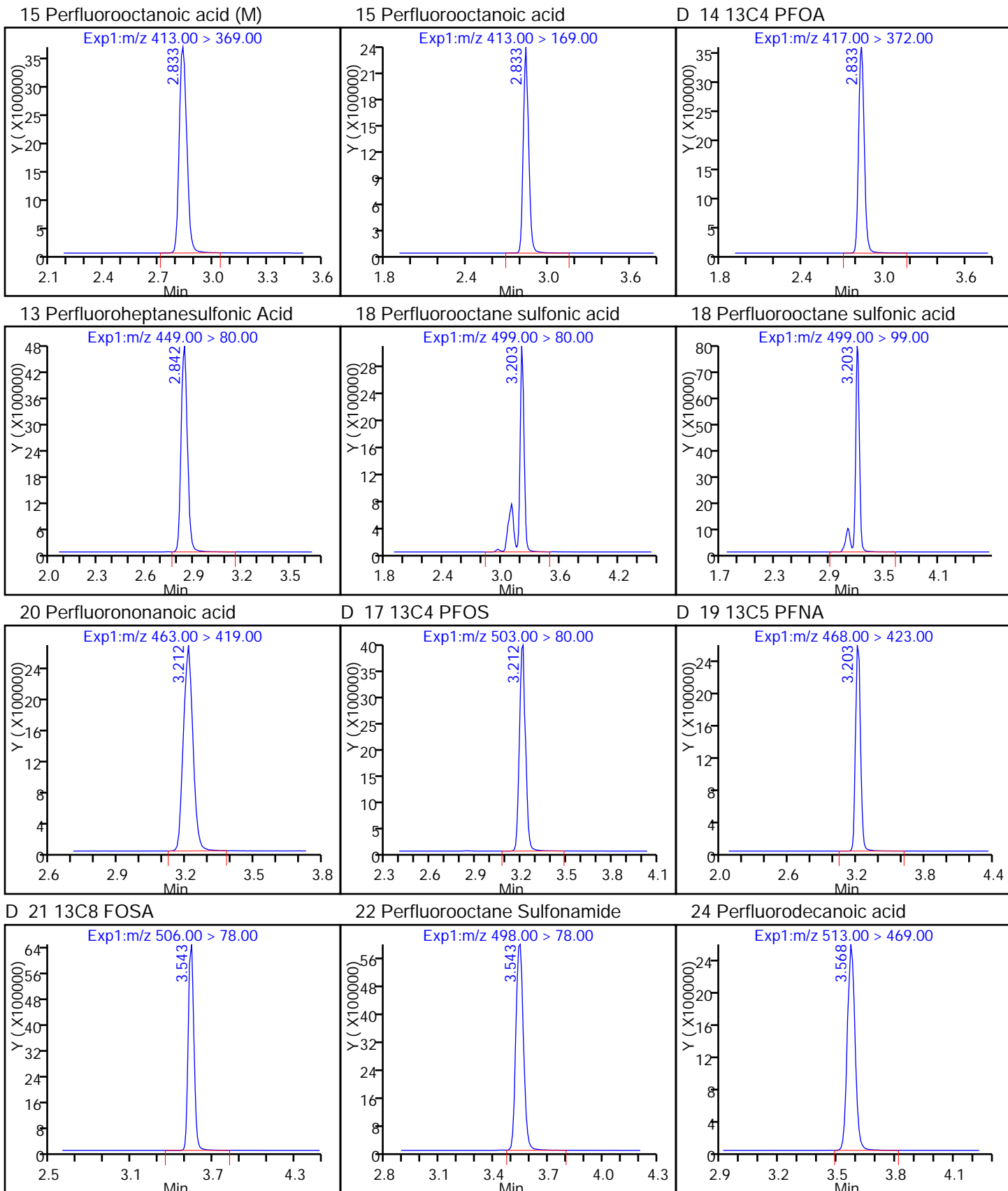


D 11 13C4-PFHpA

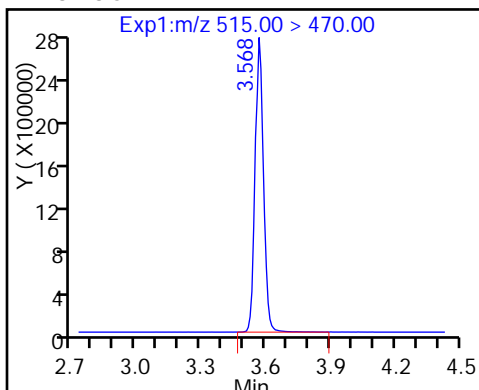
D 10 18O2 PFHxS

9 Perfluorohexanesulfonic acid (M)

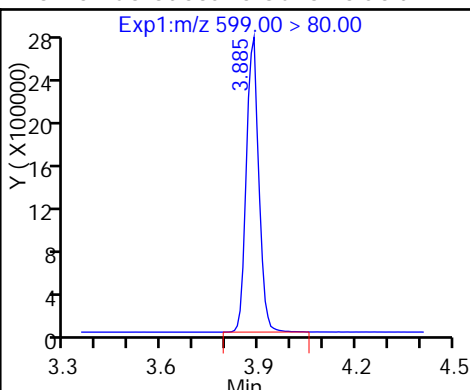




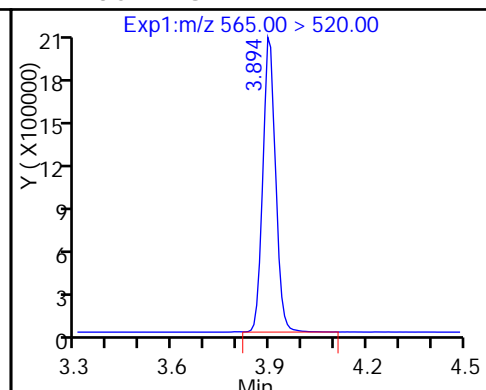
D 23 13C2 PFDA



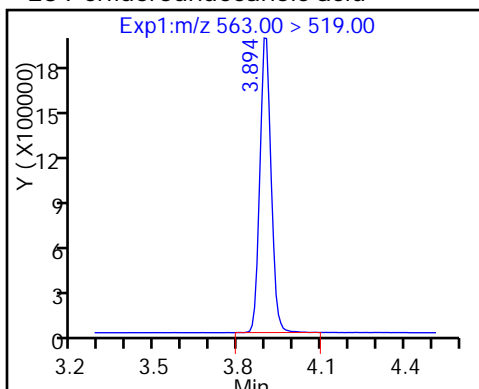
26 Perfluorodecane Sulfonic acid



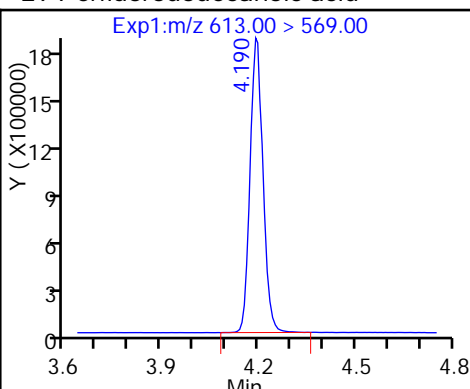
D 27 13C2 PFUnA



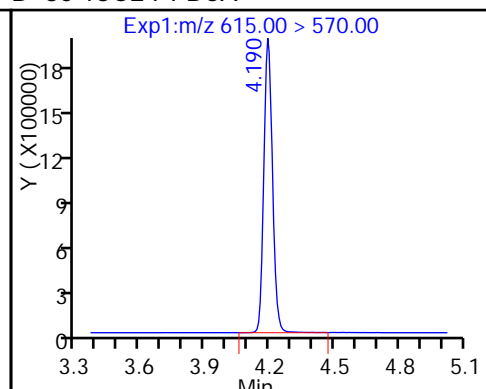
28 Perfluoroundecanoic acid



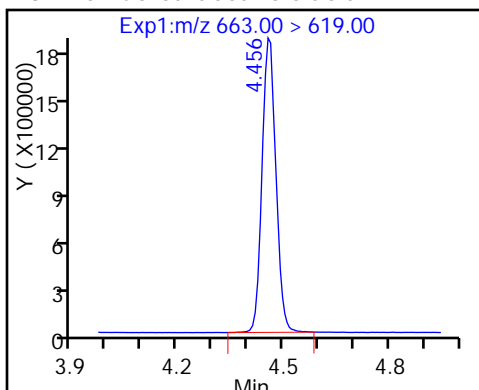
29 Perfluorododecanoic acid



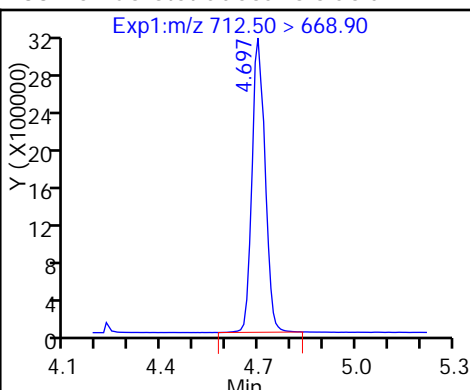
D 30 13C2 PFDaA



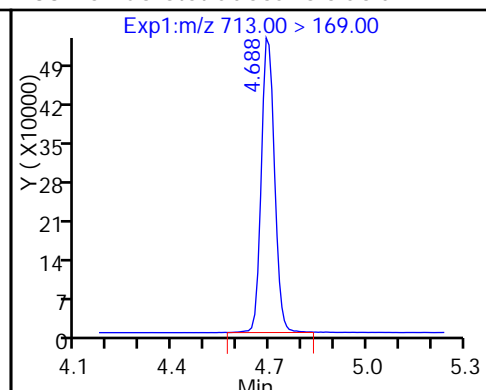
31 Perfluorotridecanoic acid



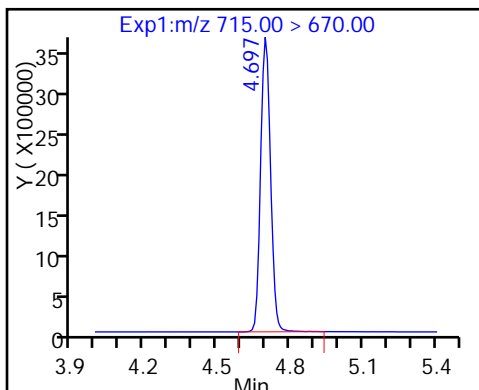
33 Perfluorotetradecanoic acid



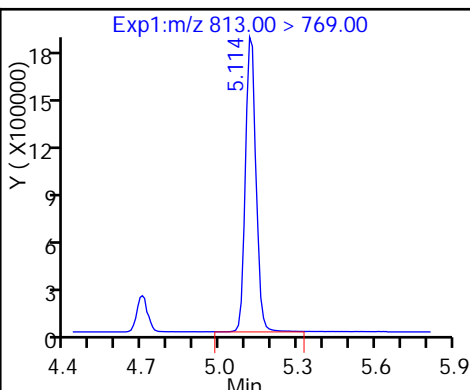
33 Perfluorotetradecanoic acid



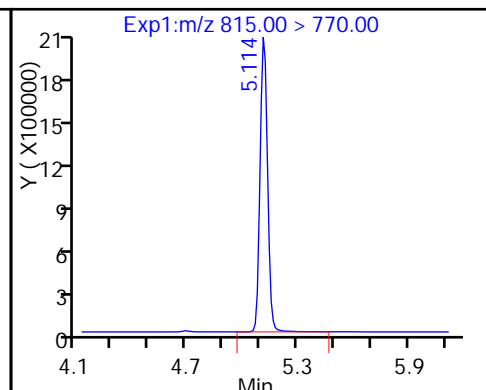
D 32 13C2-PFTeDA



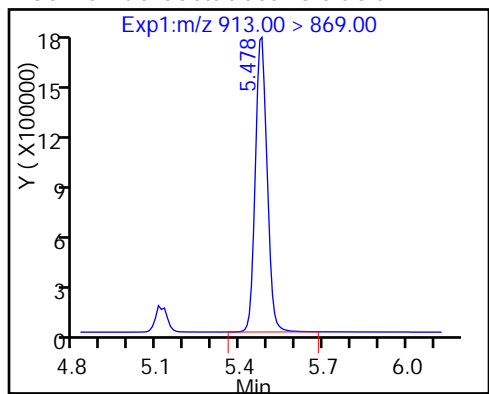
35 Perfluorohexadecanoic acid



D 34 13C2-PFHxDA



36 Perfluorooctadecanoic acid



TestAmerica Sacramento

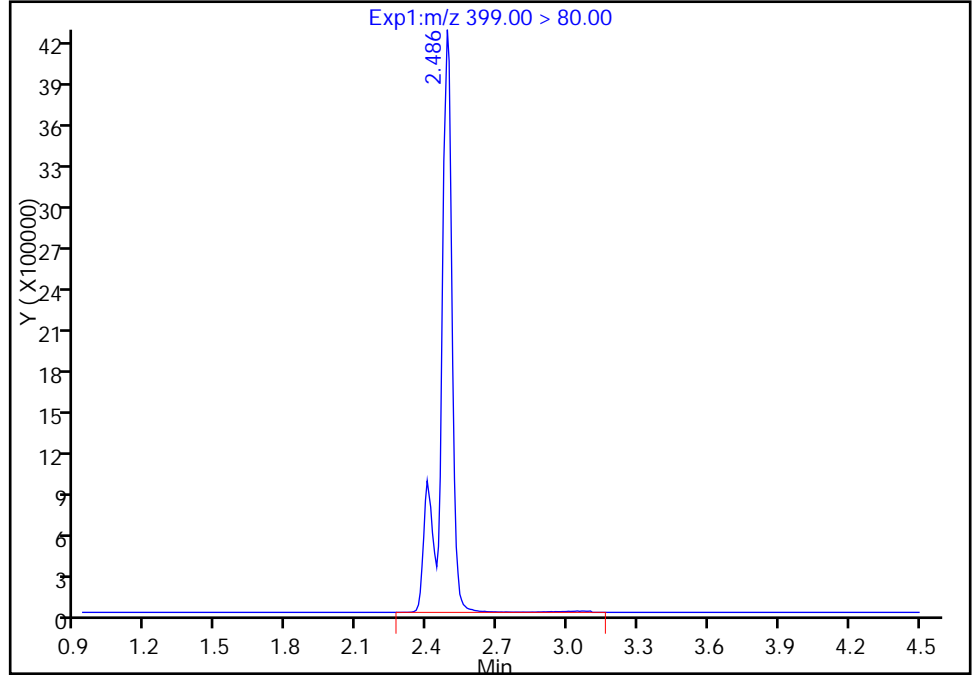
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b\03DEC2016C_016.d
Injection Date: 03-Dec-2016 20:33:48 Instrument ID: A8_N
Lims ID: CCV L5
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 41 Worklist Smp#: 16
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

9 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

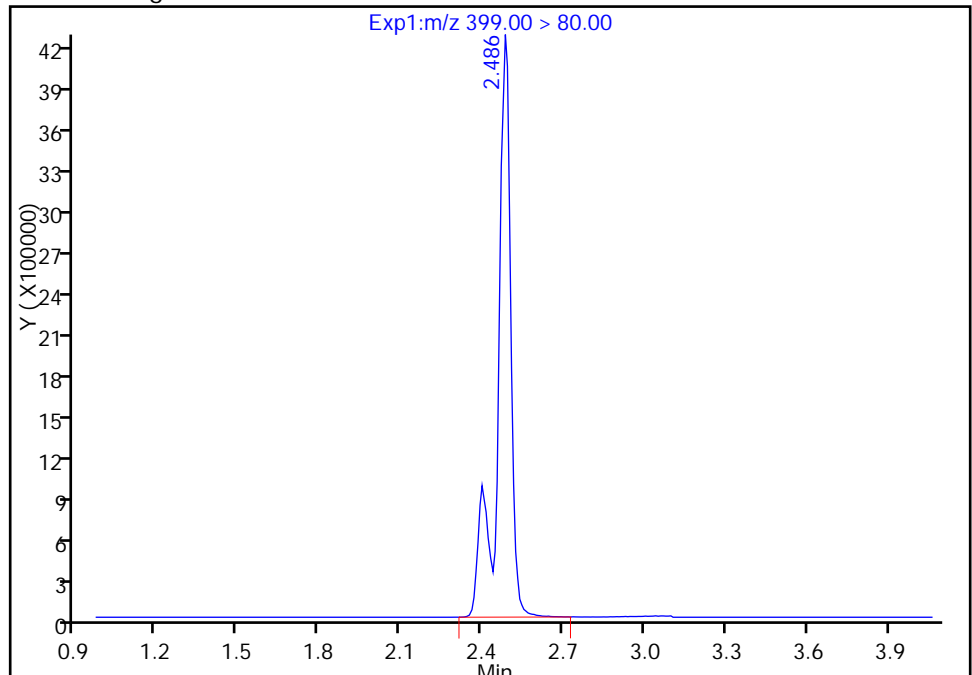
RT: 2.49
Area: 14809951
Amount: 44.141706
Amount Units: ng/ml

Processing Integration Results



RT: 2.49
Area: 14675162
Amount: 43.739961
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 06-Dec-2016 15:54:55
Audit Action: Manually Integrated

Audit Reason: Baseline

TestAmerica Sacramento

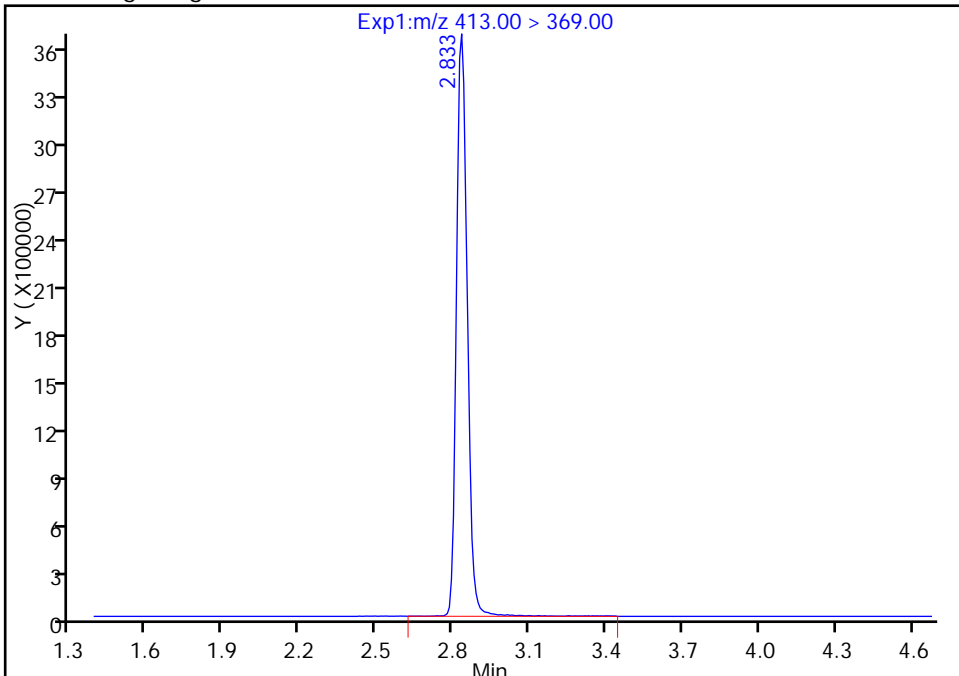
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Injection Date: 03-Dec-2016 20:33:48 Instrument ID: A8_N
Lims ID: CCV L5
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 41 Worklist Smp#: 16
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

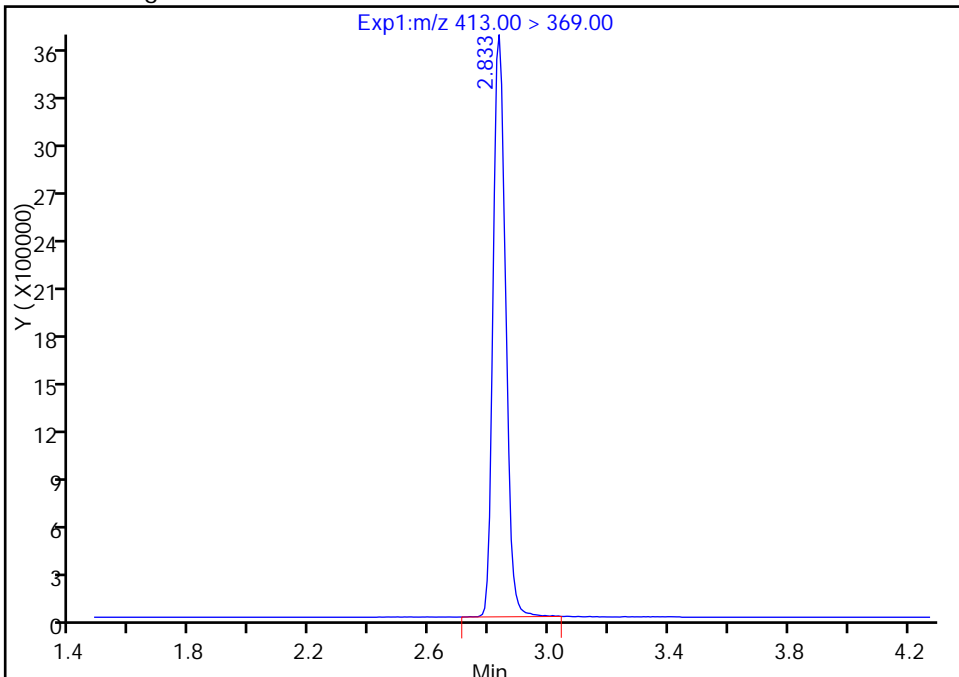
RT: 2.83
Area: 10750845
Amount: 47.798463
Amount Units: ng/ml

Processing Integration Results



RT: 2.83
Area: 10632043
Amount: 47.270267
Amount Units: ng/ml

Manual Integration Results



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-23696-1
 SDG No.: _____
 Lab Sample ID: CCV 320-140675/30 Calibration Date: 12/03/2016 22:18
 Instrument ID: A8_N Calib Start Date: 12/03/2016 13:48
 GC Column: Acquity ID: 2.10 (mm) Calib End Date: 12/03/2016 15:33
 Lab File ID: 03DEC2016C_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	0.8740	0.8841		50.6	50.0	1.1	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.015	0.997		49.1	50.0	-1.7	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.596	1.591		44.1	44.2	-0.3	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9531	0.9456		49.6	50.0	-0.8	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.027	1.030		50.2	50.0	0.3	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.098	1.037		43.0	45.5	-5.5	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.072	1.025		47.8	50.0	-4.4	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.177	1.181		47.8	47.6	0.3	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.085	1.053		45.0	46.4	-2.9	25.0
Perfluorononanoic acid (PFNA)	AveID	0.996	1.023		51.4	50.0	2.7	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9341	0.9285		49.7	50.0	-0.6	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9605	0.9506		49.5	50.0	-1.0	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6398	0.6177		46.5	48.2	-3.5	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.066	1.004		47.1	50.0	-5.8	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9490	0.9331		49.2	50.0	-1.7	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9498	0.9137		48.1	50.0	-3.8	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.854	1.697		45.8	50.0	-8.5	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		1.012		50.2	50.0	0.4	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.9929	1.017		51.2	50.0	2.5	25.0
13C4 PFBA	Ave	335829	323577		48.2	50.0	-3.6	50.0
13C5-PFPeA	Ave	264545	257425		48.7	50.0	-2.7	50.0
13C2 PFHxA	Ave	237486	216463		45.6	50.0	-8.9	50.0
13C4-PFHpA	Ave	207413	185034		44.6	50.0	-10.8	50.0
18O2 PFHxS	Ave	312342	293896		44.5	47.3	-5.9	50.0
13C4 PFOA	Ave	219258	199192		45.4	50.0	-9.2	50.0
13C4 PFOS	Ave	246009	228048		44.3	47.8	-7.3	50.0
13C5 PFNA	Ave	166415	150802		45.3	50.0	-9.4	50.0
13C8 FOSA	Ave	402279	356512		44.3	50.0	-11.4	50.0
13C2 PFDA	Ave	157817	136995		43.4	50.0	-13.2	50.0
13C2 PFUnA	Ave	118762	101020		42.5	50.0	-14.9	50.0
13C2 PFDoA	Ave	112084	100958		45.0	50.0	-9.9	50.0
13C2-PFTeDA	Ave	231173	199945		43.2	50.0	-13.5	50.0
13C2-PFHxDA	Ave	129725	112186		43.2	50.0	-13.5	50.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b\03DEC2016C_030.d
 Lims ID: CCV L5
 Client ID:
 Sample Type: CCV
 Inject. Date: 03-Dec-2016 22:18:47 ALS Bottle#: 41 Worklist Smp#: 30
 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*sub1
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 06-Dec-2016 16:22:43 Calib Date: 03-Dec-2016 15:33:40
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d
 Column 1 : Det: EXP1
 Process Host: XAWRK027

First Level Reviewer: chandrasenas Date: 06-Dec-2016 16:22:43

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	1.549	1.549	0.0	16178860	48.2		96.4	878203	
1 Perfluorobutyric acid	212.90 > 169.00	1.549	1.558	-0.009	14302861	50.6		101	67774	
3 Perfluoropentanoic acid	262.90 > 219.00	1.829	1.829	0.0	12837637	49.1		98.3	107642	
D 4 13C5-PFPeA	267.90 > 223.00	1.829	1.829	0.0	12871225	48.7		97.3	825339	
5 Perfluorobutanesulfonic acid	298.90 > 80.00	1.868	1.877	-0.009	20673428	44.1		99.7		
	298.90 > 99.00	1.868	1.877	-0.009	9710829		2.13(0.00-0.00)			
D 6 13C2 PFHxA	315.00 > 270.00	2.117	2.129	-0.012	10823150	45.6		91.1	659835	
7 Perfluorohexanoic acid	313.00 > 269.00	2.125	2.138	-0.013	10234711	49.6		99.2	244675	
12 Perfluoroheptanoic acid	363.00 > 319.00	2.465	2.466	-0.001	9531542	50.2		100	111039	
D 11 13C4-PFHpA	367.00 > 322.00	2.465	2.473	-0.008	9251718	44.6		89.2	555445	
D 10 18O2 PFHxS	403.00 > 84.00	2.472	2.481	-0.009	13901272	44.5		94.1	619986	
9 Perfluorohexanesulfonic acid	399.00 > 80.00	2.480	2.496	-0.016	13866396	43.0		94.5		
15 Perfluorooctanoic acid	413.00 > 369.00	2.828	2.836	-0.008	10204576	47.8		95.6	164927	
	413.00 > 169.00	2.828	2.836	-0.008	6229477		1.64(0.90-1.10)		269305	
D 14 13C4 PFOA	417.00 > 372.00	2.828	2.836	-0.008	9959587	45.4		90.8	582992	

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	2.836	2.845	-0.009	1.000	12818796	47.8	100	
18 Perfluorooctane sulfonic acid	499.00	> 80.00	3.196	3.215	-0.019	1.000	11146474	45.0	97.1	239276 M
	499.00	> 99.00	3.196	3.215	-0.019	1.000	2431978		4.58(0.90-1.10)	108613 M
20 Perfluorononanoic acid	463.00	> 419.00	3.205	3.215	-0.010	1.000	7716911	51.4	103	118310
D 17 13C4 PFOS	503.00	> 80.00	3.196	3.215	-0.019		10900718	44.3	92.7	336594
D 19 13C5 PFNA	468.00	> 423.00	3.196	3.215	-0.019		7540075	45.3	90.6	479882
D 21 13C8 FOSA	506.00	> 78.00	3.528	3.537	-0.009		17825594	44.3	88.6	699827
22 Perfluorooctane Sulfonamide	498.00	> 78.00	3.528	3.546	-0.018	1.000	16550782	49.7	99.4	727455
24 Perfluorodecanoic acid	513.00	> 469.00	3.562	3.571	-0.009	1.000	6511541	49.5	99.0	191212
D 23 13C2 PFDA	515.00	> 470.00	3.562	3.580	-0.018		6849768	43.4	86.8	276550
26 Perfluorodecane Sulfonic acid	599.00	> 80.00	3.868	3.879	-0.011	1.000	6789364	46.5	96.5	
D 27 13C2 PFUnA	565.00	> 520.00	3.885	3.897	-0.012		5050977	42.5	85.1	306277
28 Perfluoroundecanoic acid	563.00	> 519.00	3.885	3.897	-0.012	1.000	5069837	47.1	94.2	107401
29 Perfluorododecanoic acid	613.00	> 569.00	4.181	4.193	-0.012	1.000	4710235	49.2	98.3	123159
D 30 13C2 PFDoA	615.00	> 570.00	4.181	4.193	-0.012		5047895	45.0	90.1	143096
31 Perfluorotridecanoic acid	663.00	> 619.00	4.447	4.460	-0.013	1.000	4612398	48.1	96.2	90490
33 Perfluorotetradecanoic acid	712.50	> 668.90	4.687	4.703	-0.015	1.000	8564991	45.8	91.5	29036
	713.00	> 169.00	4.687	4.703	-0.015	1.000	1414956		6.05(0.00-0.00)	126007
D 32 13C2-PFTeDA	715.00	> 670.00	4.687	4.703	-0.015		9997263	43.2	86.5	585693
35 Perfluorohexadecanoic acid	813.00	> 769.00	5.111	5.122	-0.011	1.000	5109892	50.2	100	5605
D 34 13C2-PFHxDA	815.00	> 770.00	5.111	5.122	-0.011		5609315	43.2	86.5	114046
36 Perfluorooctadecanoic acid	913.00	> 869.00	5.468	5.476	-0.008	1.000	5134968	51.2	102	6523

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LCPFC-L5_00020

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b\03DEC2016C_030.d

Injection Date: 03-Dec-2016 22:18:47

Instrument ID: A8_N

Lims ID: CCV L5

Client ID:

Operator ID: A8-PC\A8

ALS Bottle#: 41

Worklist Smp#: 30

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

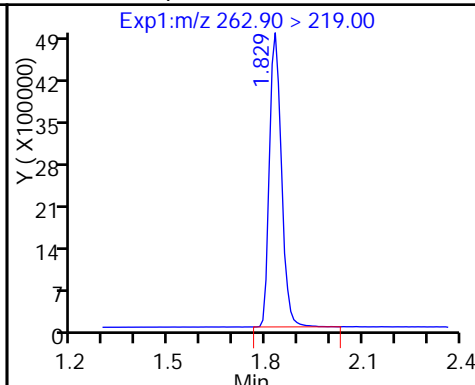
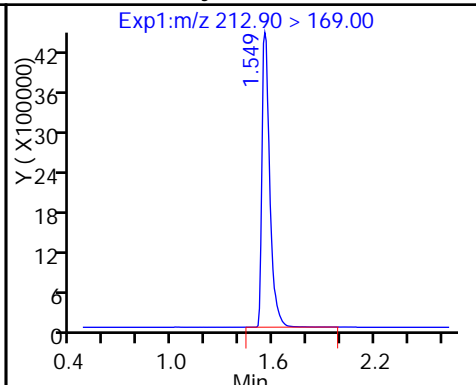
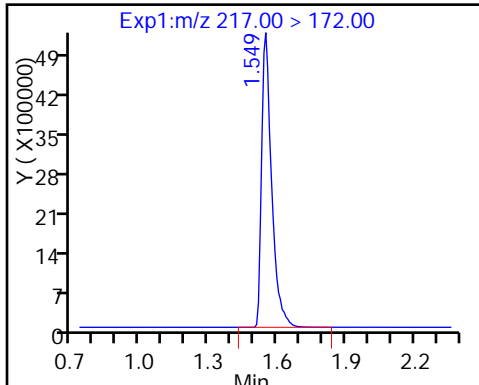
Method: A8_N

Limit Group: LC PFC_DOD ICAL

D 2 13C4 PFBA

1 Perfluorobutyric acid

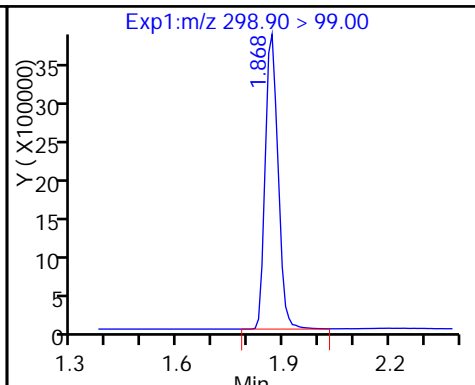
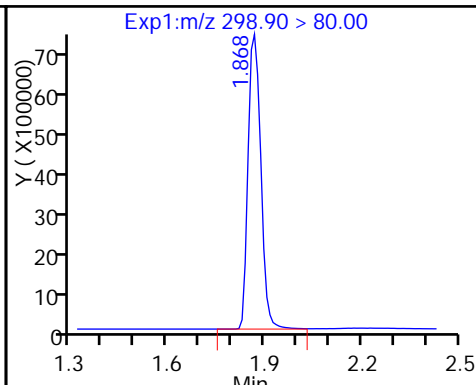
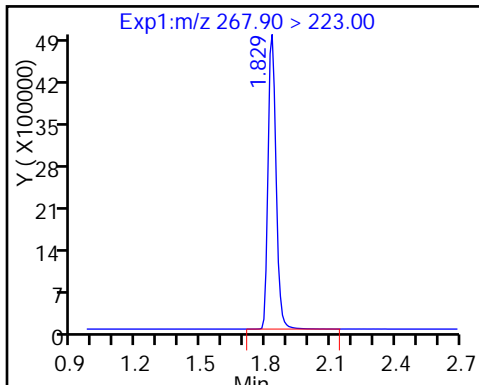
3 Perfluoropentanoic acid



D 4 13C5-PFPeA

5 Perfluorobutanesulfonic acid

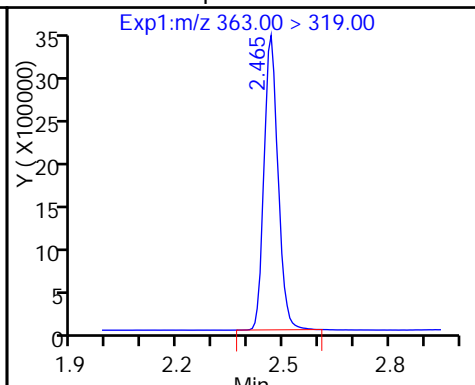
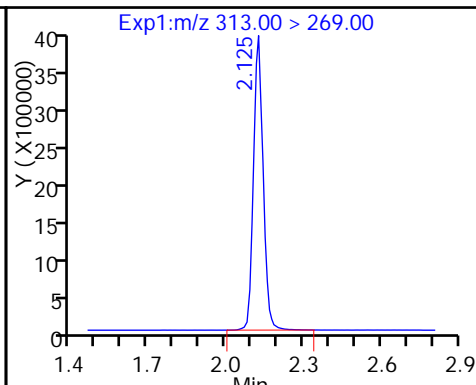
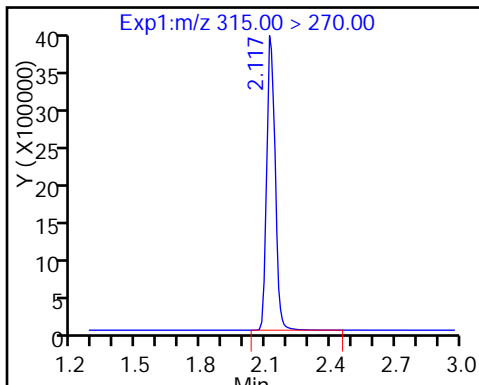
5 Perfluorobutanesulfonic acid



D 6 13C2 PFHxA

7 Perfluorohexanoic acid

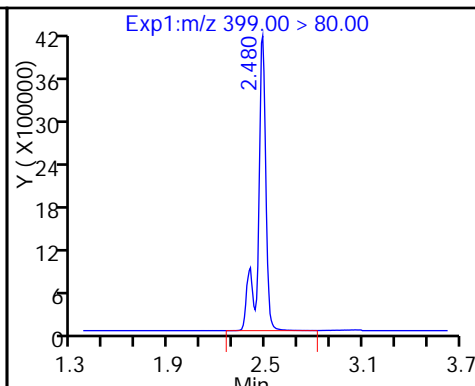
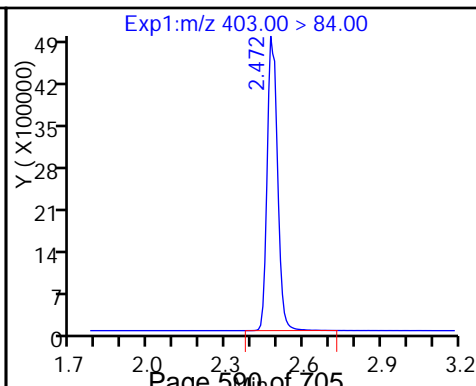
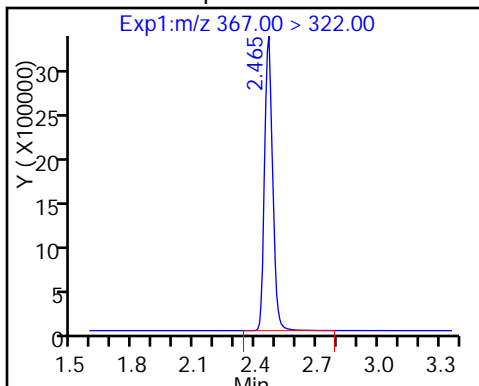
12 Perfluoroheptanoic acid

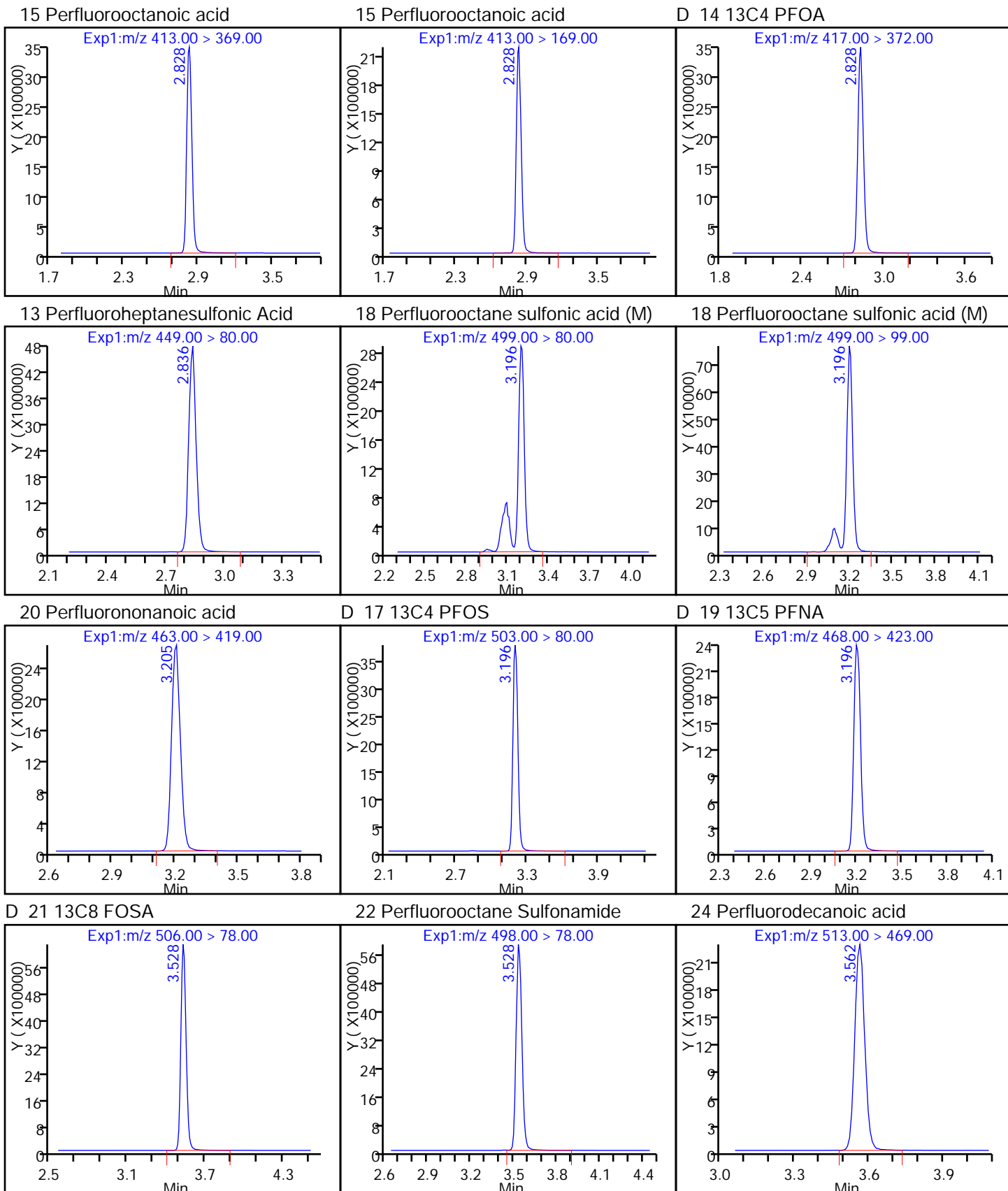


D 11 13C4-PFHpA

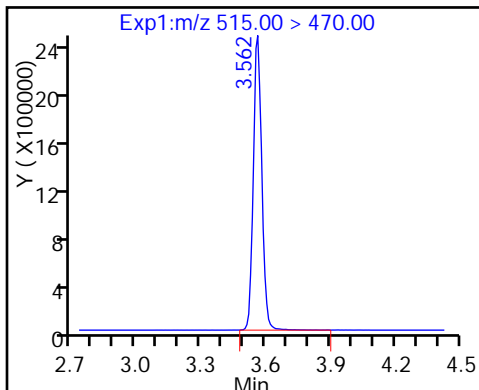
D 10 18O2 PFHxS

9 Perfluorohexanesulfonic acid

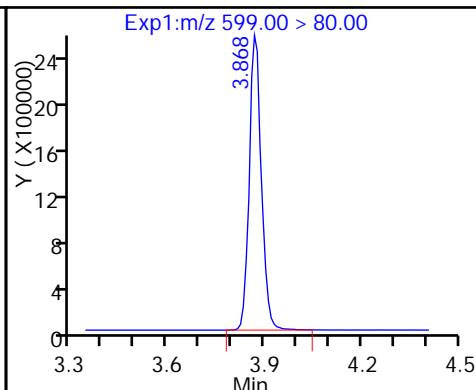




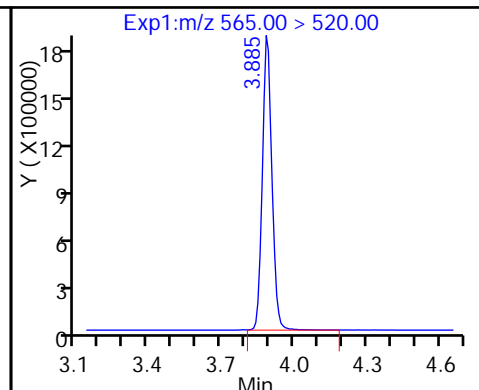
D 23 13C2 PFDA



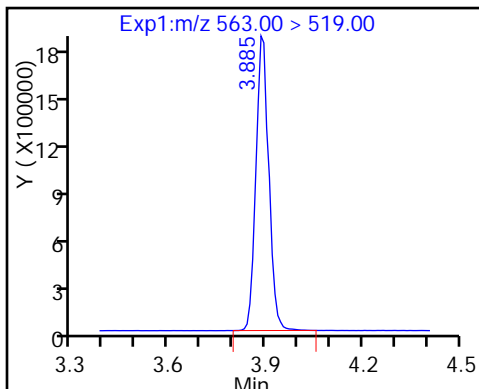
26 Perfluorodecane Sulfonic acid



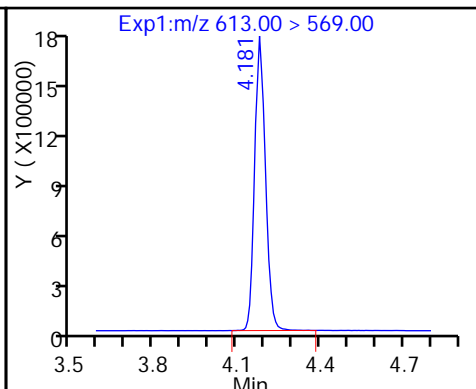
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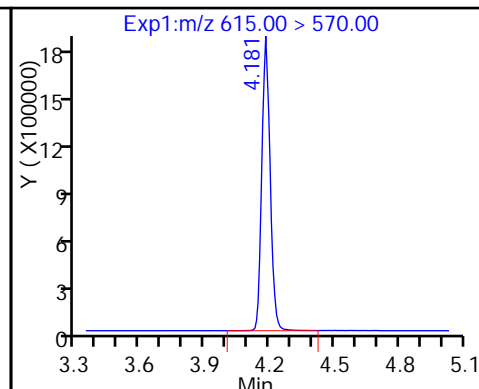
28 Perfluoroundecanoic acid



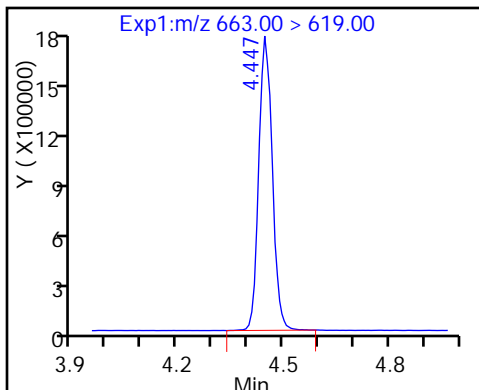
29 Perfluorododecanoic acid



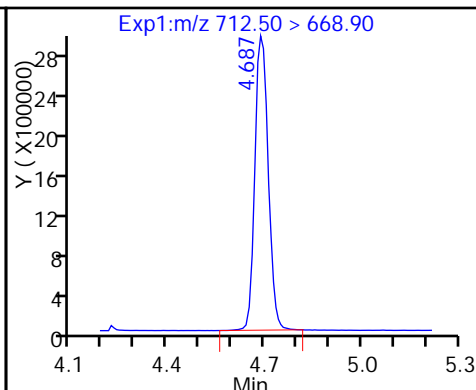
D 30 13C2 PFDaA



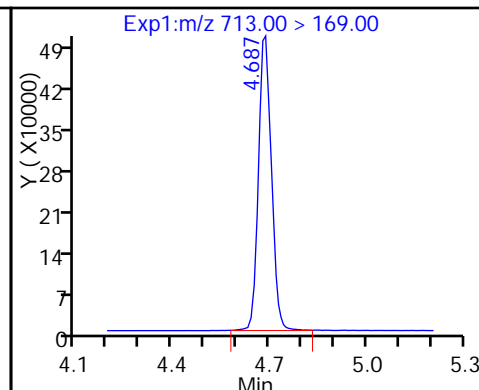
31 Perfluorotridecanoic acid



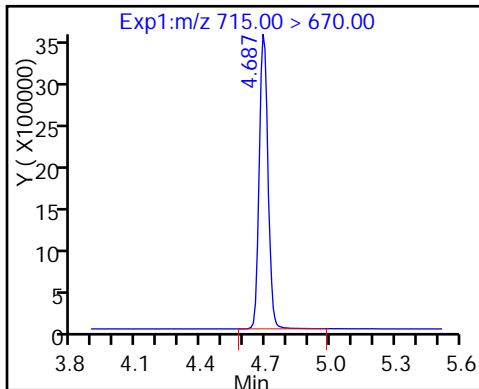
33 Perfluorotetradecanoic acid



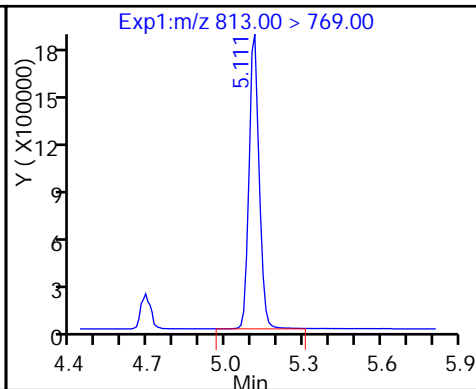
33 Perfluorotetradecanoic acid



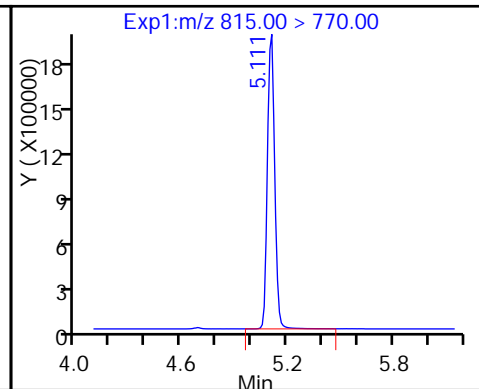
D 32 13C2-PFTeDA



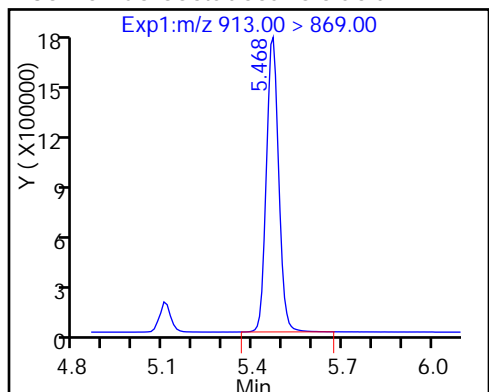
35 Perfluorohexadecanoic acid



D 34 13C2-PFHxDA



36 Perfluorooctadecanoic acid



TestAmerica Sacramento

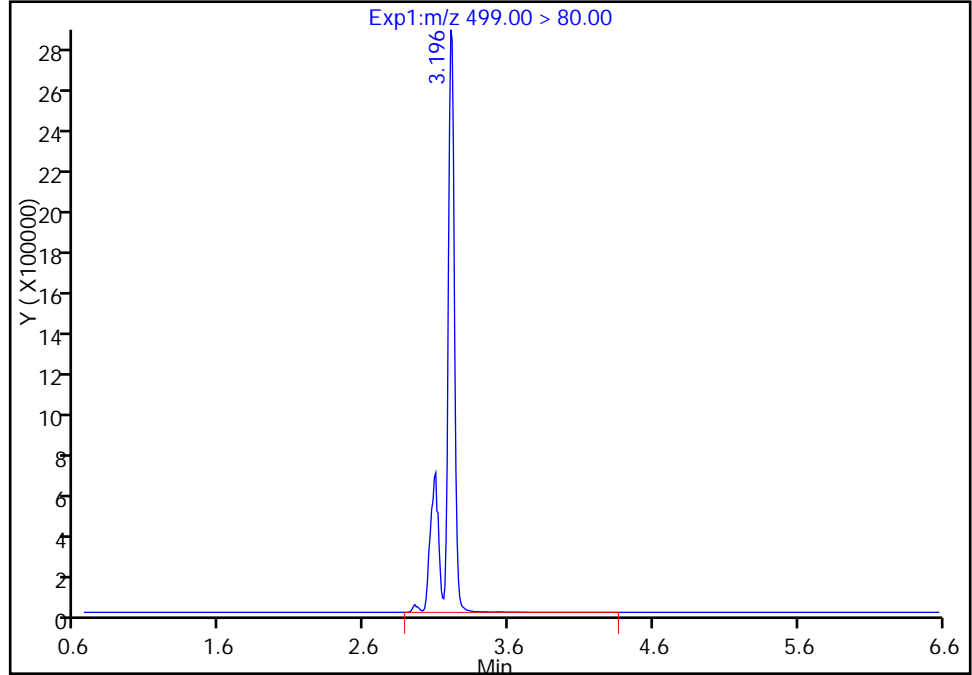
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b\03DEC2016C_030.d
Injection Date: 03-Dec-2016 22:18:47 Instrument ID: A8_N
Lims ID: CCV L5
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 41 Worklist Smp#: 30
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

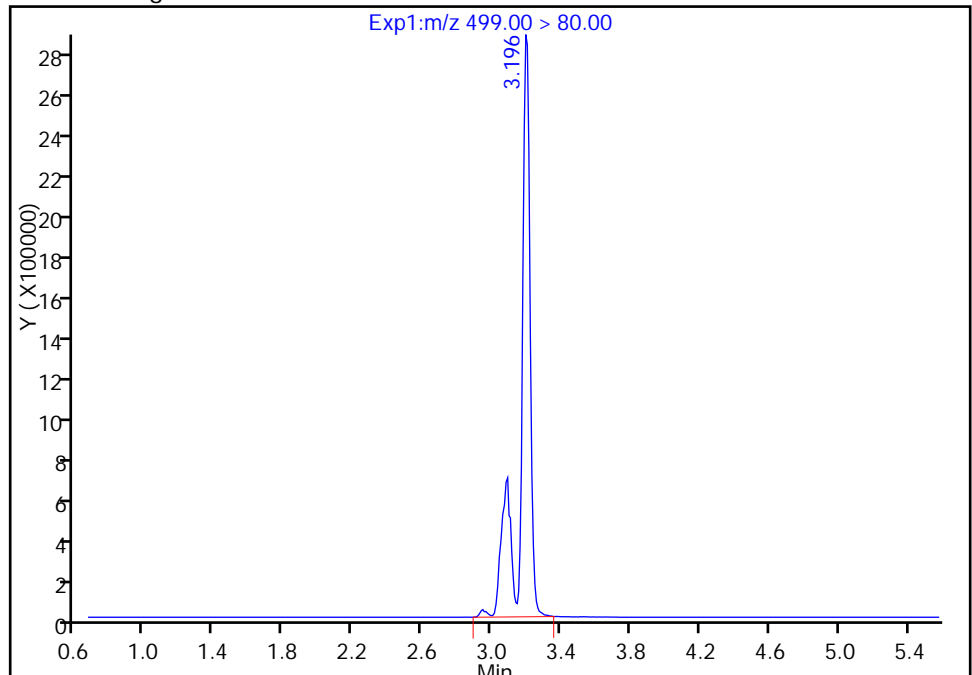
RT: 3.20
Area: 11232386
Amount: 45.386366
Amount Units: ng/ml

Processing Integration Results



RT: 3.20
Area: 11146474
Amount: 45.039224
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 06-Dec-2016 16:22:43

Audit Action: Manually Integrated

Audit Reason: Baseline

TestAmerica Sacramento

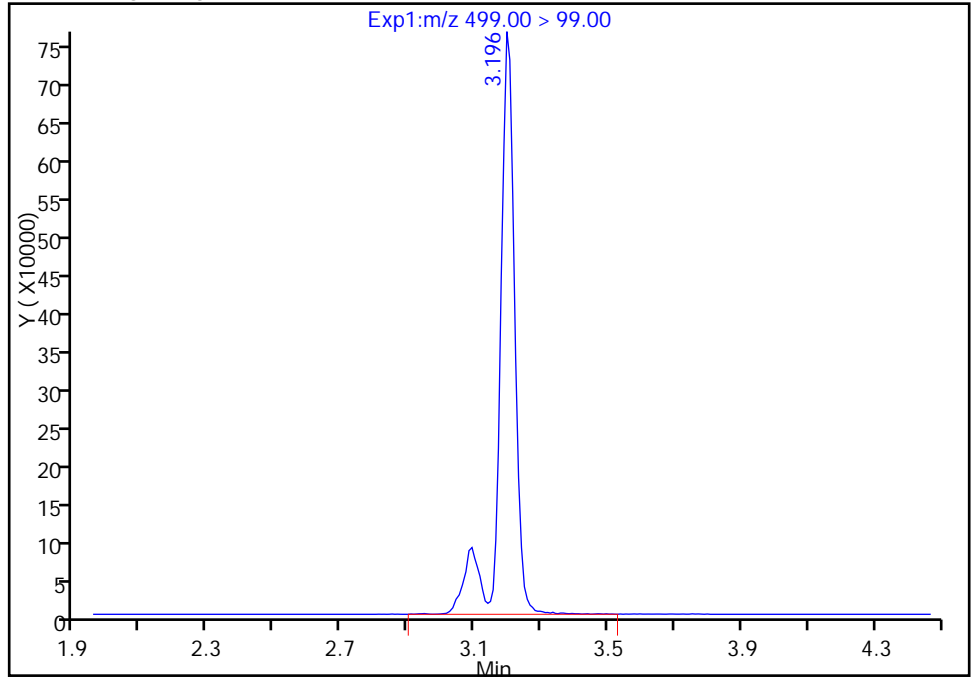
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b\03DEC2016C_030.d
Injection Date: 03-Dec-2016 22:18:47 Instrument ID: A8_N
Lims ID: CCV L5
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 41 Worklist Smp#: 30
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

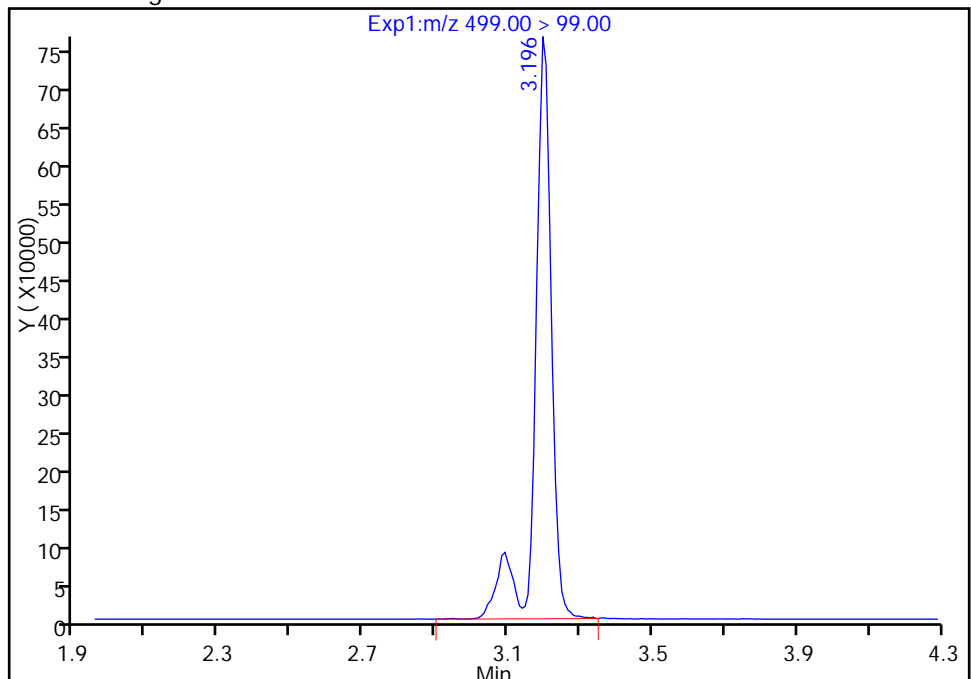
RT: 3.20
Area: 2449034
Amount: 45.386366
Amount Units: ng/ml

Processing Integration Results



RT: 3.20
Area: 2431978
Amount: 45.039224
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 06-Dec-2016 16:22:43

Audit Action: Manually Integrated

Audit Reason: Baseline

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-23696-1
 SDG No.: _____
 Lab Sample ID: CCV 320-140675/37 Calibration Date: 12/03/2016 23:11
 Instrument ID: A8_N Calib Start Date: 12/03/2016 13:48
 GC Column: Acquity ID: 2.10 (mm) Calib End Date: 12/03/2016 15:33
 Lab File ID: 03DEC2016C_037.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.8740	0.8880		50.8	50.0	1.6	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.015	0.9858		48.6	50.0	-2.9	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.596	1.568		43.4	44.2	-1.7	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9531	0.9547		50.1	50.0	0.2	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.027	1.033		50.3	50.0	0.6	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.098	1.019		42.2	45.5	-7.2	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.177	1.127		45.6	47.6	-4.2	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.072	1.016		47.4	50.0	-5.2	25.0
Perfluorononanoic acid (PFNA)	AveID	0.996	0.9791		49.1	50.0	-1.7	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.085	1.039		44.4	46.4	-4.3	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9341	0.9378		50.2	50.0	0.4	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9605	0.9644		50.2	50.0	0.4	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6398	0.5955		44.9	48.2	-6.9	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.066	0.9715		45.6	50.0	-8.8	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9490	0.9286		48.9	50.0	-2.2	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9498	0.9359		49.3	50.0	-1.5	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.854	1.713		46.2	50.0	-7.6	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		0.9879		49.0	50.0	-2.0	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.9929	0.9811		49.4	50.0	-1.2	25.0
13C4 PFBA	Ave	335829	323734		48.2	50.0	-3.6	50.0
13C5-PFPeA	Ave	264545	256247		48.4	50.0	-3.1	50.0
13C2 PFHxA	Ave	237486	213133		44.9	50.0	-10.3	50.0
13C4-PFHpA	Ave	207413	186204		44.9	50.0	-10.2	50.0
18O2 PFHxS	Ave	312342	301152		45.6	47.3	-3.6	50.0
13C4 PFOA	Ave	219258	202262		46.1	50.0	-7.8	50.0
13C4 PFOS	Ave	246009	245328		47.7	47.8	-0.3	50.0
13C5 PFNA	Ave	166415	158752		47.7	50.0	-4.6	50.0
13C8 FOSA	Ave	402279	369839		46.0	50.0	-8.1	50.0
13C2 PFDA	Ave	157817	144444		45.8	50.0	-8.5	50.0
13C2 PFUnA	Ave	118762	107880		45.4	50.0	-9.2	50.0
13C2 PFDoA	Ave	112084	105567		47.1	50.0	-5.8	50.0
13C2-PFTeA	Ave	231173	212476		46.0	50.0	-8.1	50.0
13C2-PFHxDA	Ave	129725	117651		45.3	50.0	-9.3	50.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b\03DEC2016C_037.d
 Lims ID: CCV L5
 Client ID:
 Sample Type: CCV
 Inject. Date: 03-Dec-2016 23:11:14 ALS Bottle#: 41 Worklist Smp#: 37
 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*sub1
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 06-Dec-2016 16:26:18 Calib Date: 03-Dec-2016 15:33:40
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d
 Column 1 : Det: EXP1
 Process Host: XAWRK027

First Level Reviewer: chandrasenas Date: 06-Dec-2016 16:26:18

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	1.541	1.549	-0.008	16186696	48.2		96.4	824948	
1 Perfluorobutyric acid	212.90 > 169.00	1.549	1.558	-0.009	14374443	50.8		102	61249	
3 Perfluoropentanoic acid	262.90 > 219.00	1.829	1.829	0.0	12630046	48.6		97.1	104762	
D 4 13C5-PFPeA	267.90 > 223.00	1.819	1.829	-0.010	12812333	48.4		96.9	969518	
5 Perfluorobutanesulfonic acid	298.90 > 80.00	1.858	1.877	-0.019	20876141	43.4		98.3		
	298.90 > 99.00	1.858	1.877	-0.019	9908739		2.11(0.00-0.00)			
D 6 13C2 PFHxA	315.00 > 270.00	2.116	2.129	-0.013	10656634	44.9		89.7	581654	
7 Perfluorohexanoic acid	313.00 > 269.00	2.116	2.138	-0.022	10174078	50.1		100	189762	
12 Perfluoroheptanoic acid	363.00 > 319.00	2.454	2.466	-0.012	9619656	50.3		101	93182	
D 11 13C4-PFHpA	367.00 > 322.00	2.454	2.473	-0.019	9310212	44.9		89.8	406143	
D 10 18O2 PFHxS	403.00 > 84.00	2.477	2.481	-0.004	14244501	45.6		96.4	987840	
9 Perfluorohexanesulfonic acid	399.00 > 80.00	2.477	2.496	-0.019	13955855	42.2		92.8		M
15 Perfluorooctanoic acid	413.00 > 369.00	2.823	2.836	-0.013	10278491	47.4		94.8	202830	
	413.00 > 169.00	2.823	2.836	-0.013	6395967		1.61(0.90-1.10)		224839	
D 14 13C4 PFOA	417.00 > 372.00	2.815	2.836	-0.021	10113109	46.1		92.2	1152644	

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	2.823	2.845	-0.022	1.000	13164627	45.6	95.8	
18 Perfluorooctane sulfonic acid	499.00	> 80.00	3.192	3.215	-0.023	1.000	11825913	44.4	95.7	308926 M
	499.00	> 99.00	3.192	3.215	-0.023	1.000	2680501		4.41(0.90-1.10)	411990 M
20 Perfluorononanoic acid	463.00	> 419.00	3.192	3.215	-0.023	1.000	7771874	49.1	98.3	117089
D 17 13C4 PFOS	503.00	> 80.00	3.192	3.215	-0.023		11726685	47.7	99.7	336397
D 19 13C5 PFNA	468.00	> 423.00	3.192	3.215	-0.023		7937602	47.7	95.4	539516
D 21 13C8 FOSA	506.00	> 78.00	3.524	3.537	-0.013		18491944	46.0	91.9	541053
22 Perfluorooctane Sulfonamide	498.00	> 78.00	3.524	3.546	-0.022	1.000	17341417	50.2	100	418336
24 Perfluorodecanoic acid	513.00	> 469.00	3.549	3.571	-0.022	1.000	6965213	50.2	100	183703
D 23 13C2 PFDA	515.00	> 470.00	3.549	3.580	-0.031		7222217	45.8	91.5	423939
26 Perfluorodecane Sulfonic acid	599.00	> 80.00	3.862	3.879	-0.017	1.000	7041449	44.9	93.1	
D 27 13C2 PFUnA	565.00	> 520.00	3.880	3.897	-0.017		5393978	45.4	90.8	267304
28 Perfluoroundecanoic acid	563.00	> 519.00	3.888	3.897	-0.009	1.000	5240104	45.6	91.2	148812
29 Perfluorododecanoic acid	613.00	> 569.00	4.175	4.193	-0.018	1.000	4901369	48.9	97.8	92759
D 30 13C2 PFDaA	615.00	> 570.00	4.175	4.193	-0.018		5278332	47.1	94.2	242018
31 Perfluorotridecanoic acid	663.00	> 619.00	4.447	4.460	-0.013	1.000	4940194	49.3	98.5	88855
33 Perfluorotetradecanoic acid	712.50	> 668.90	4.678	4.703	-0.024	1.000	9039190	46.2	92.4	56322
	713.00	> 169.00	4.678	4.703	-0.024	1.000	1474531		6.13(0.00-0.00)	133397
D 32 13C2-PFTeDA	715.00	> 670.00	4.678	4.703	-0.024		10623779	46.0	91.9	546288
35 Perfluorohexadecanoic acid	813.00	> 769.00	5.100	5.122	-0.022	1.000	5214175	49.0	98.0	5794
D 34 13C2-PFHxDA	815.00	> 770.00	5.100	5.122	-0.022		5882557	45.3	90.7	140258
36 Perfluorooctadecanoic acid	913.00	> 869.00	5.459	5.476	-0.017	1.000	5178656	49.4	98.8	8252

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LCPFC-L5_00020

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b\03DEC2016C_037.d

Injection Date: 03-Dec-2016 23:11:14

Instrument ID: A8_N

Lims ID: CCV L5

Client ID:

Operator ID: A8-PC\A8

ALS Bottle#: 41

Worklist Smp#: 37

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

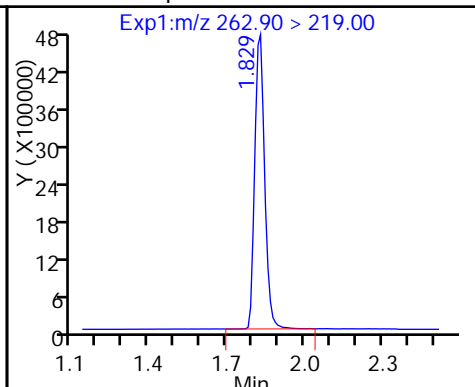
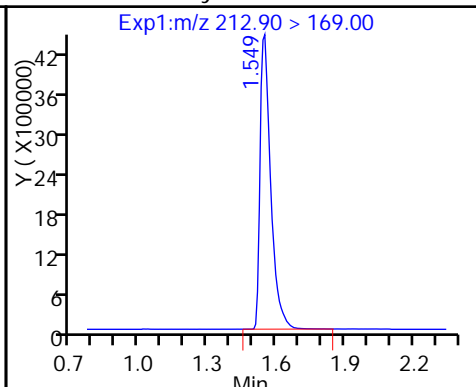
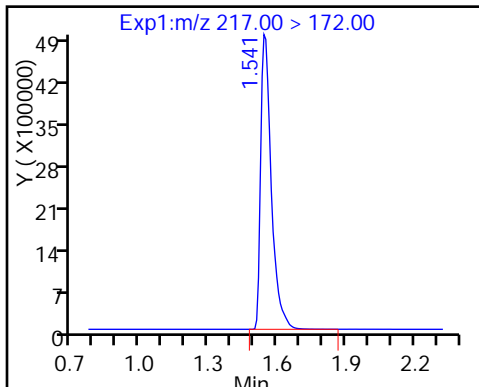
Method: A8_N

Limit Group: LC PFC_DOD ICAL

D 2 13C4 PFBA

1 Perfluorobutyric acid

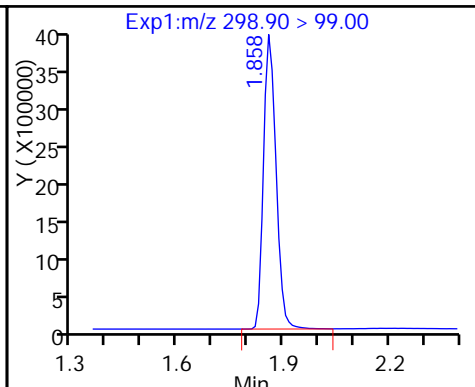
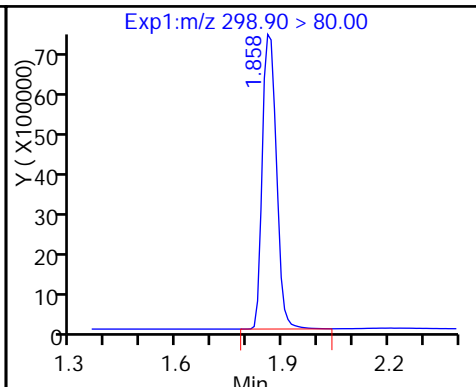
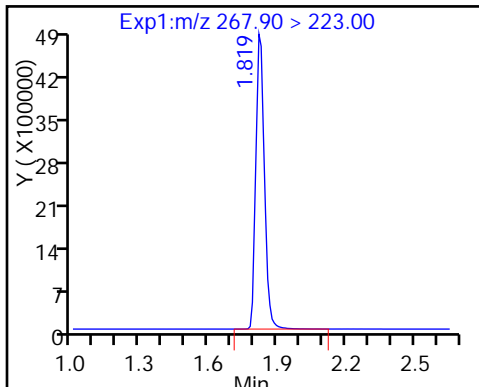
3 Perfluoropentanoic acid



D 4 13C5-PFPeA

5 Perfluorobutanesulfonic acid

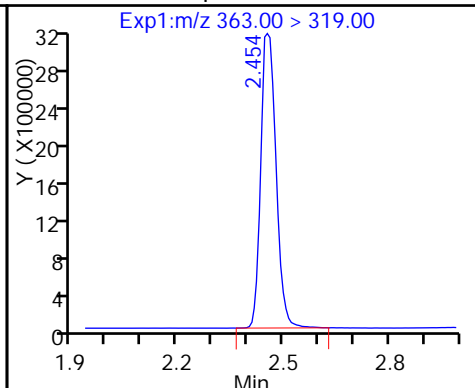
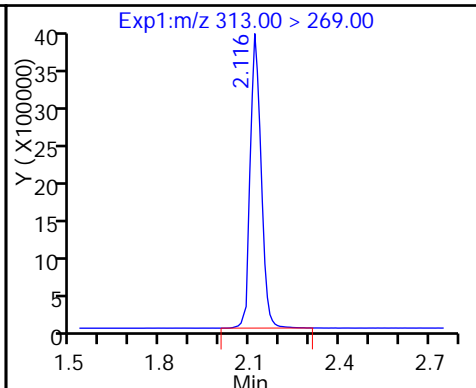
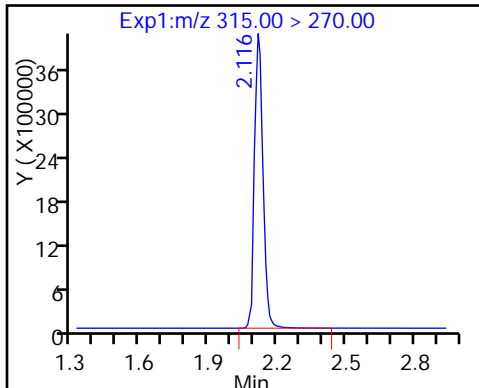
5 Perfluorobutanesulfonic acid



D 6 13C2 PFHxA

7 Perfluorohexanoic acid

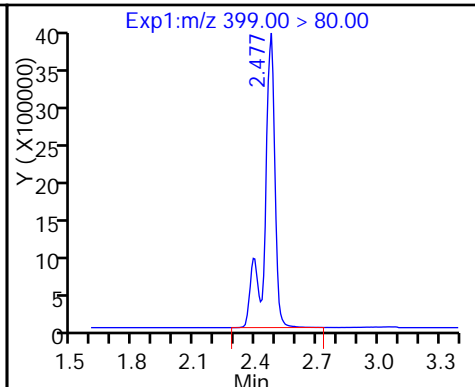
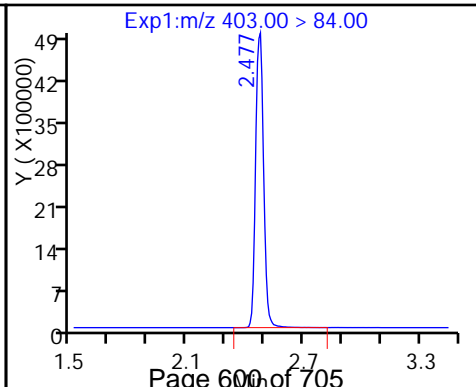
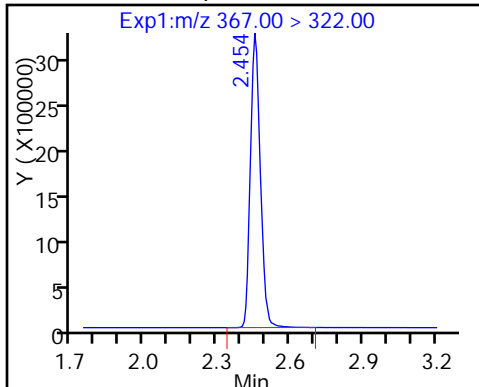
12 Perfluoroheptanoic acid

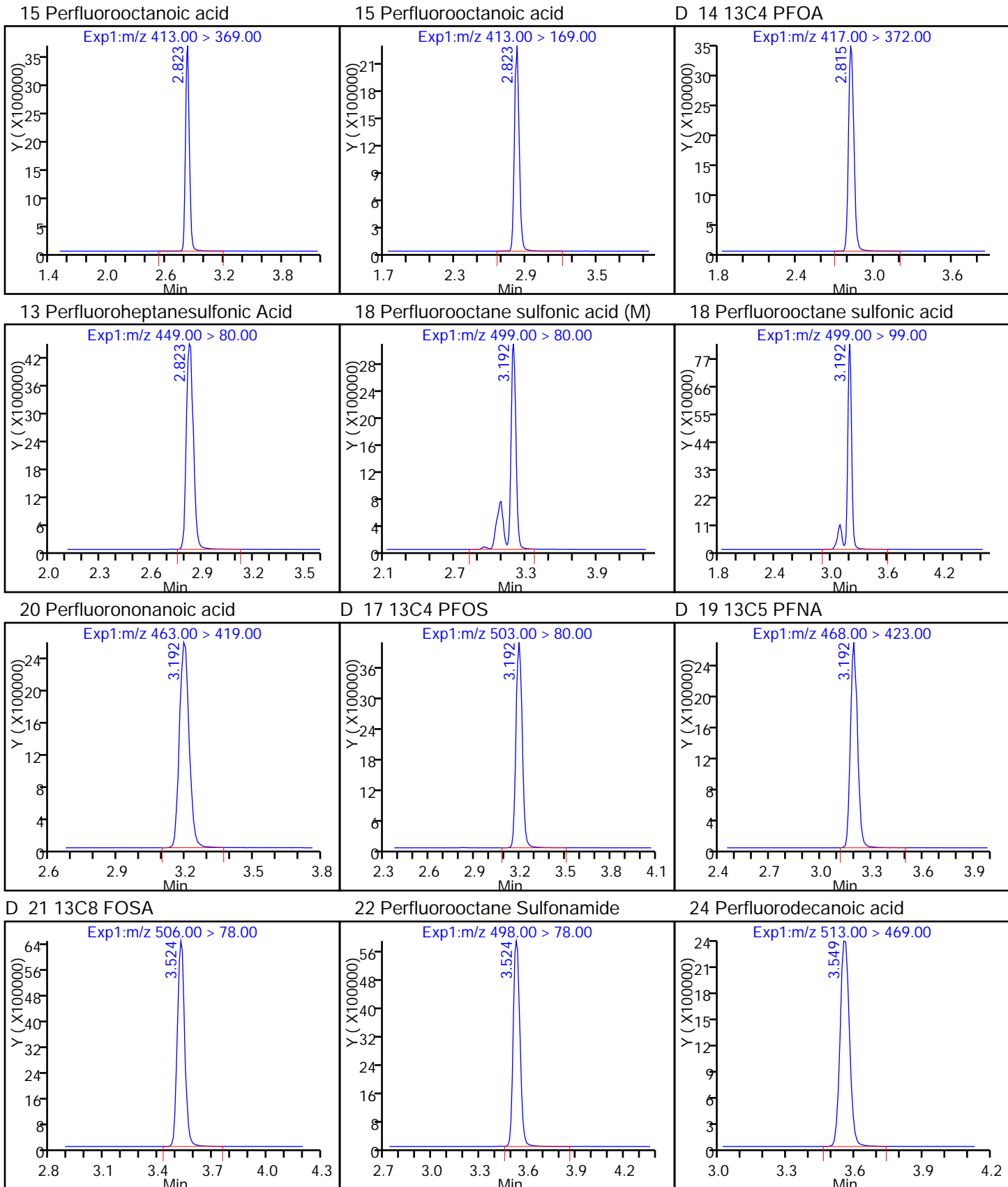


D 11 13C4-PFHpA

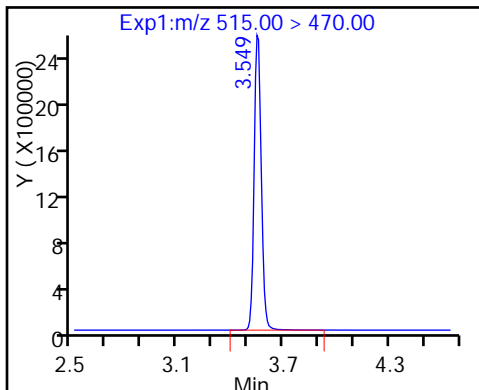
D 10 18O2 PFHxS

9 Perfluorohexanesulfonic acid (M)

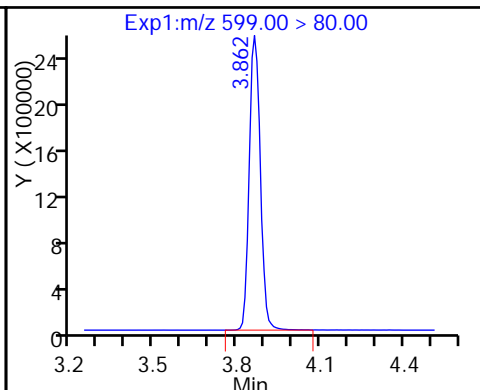




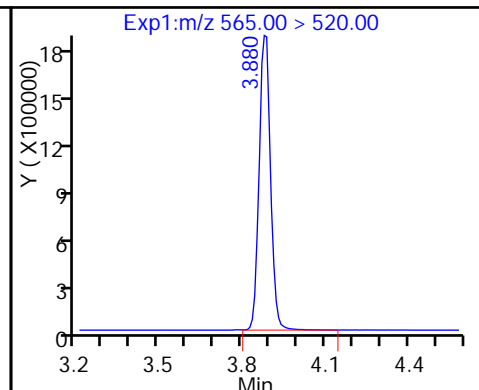
D 23 13C2 PFDA



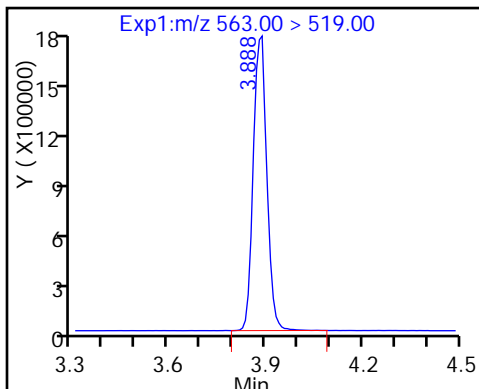
26 Perfluorodecane Sulfonic acid



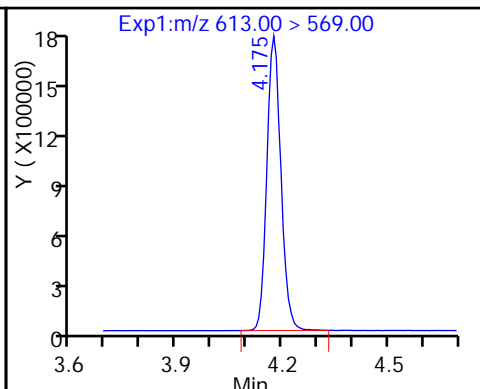
D 27 13C2 PFUnA



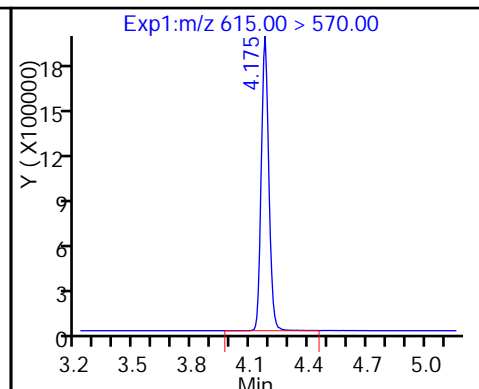
28 Perfluoroundecanoic acid



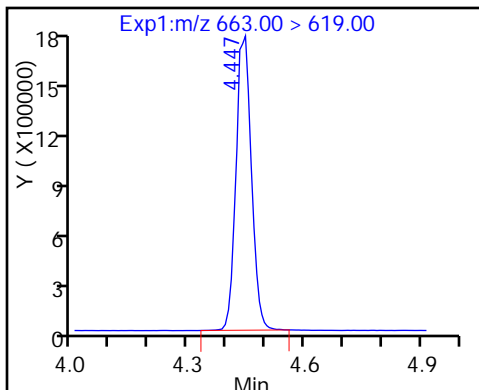
29 Perfluorododecanoic acid



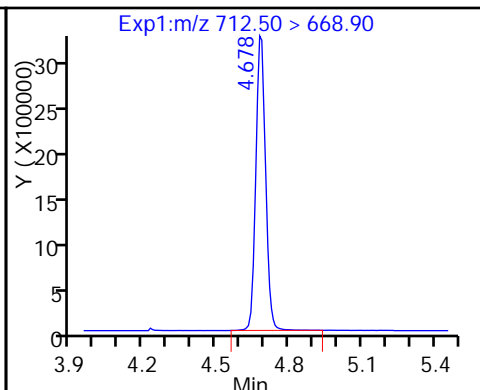
D 30 13C2 PFDaA



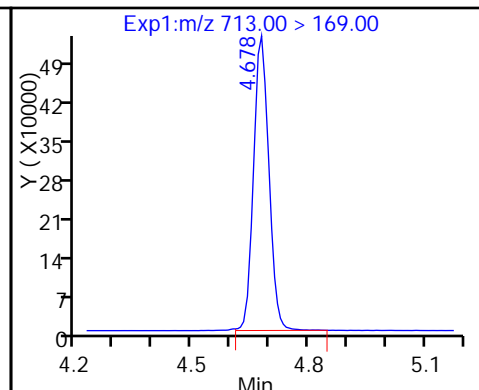
31 Perfluorotridecanoic acid



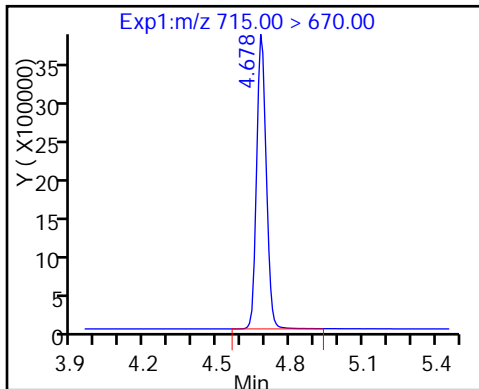
33 Perfluorotetradecanoic acid



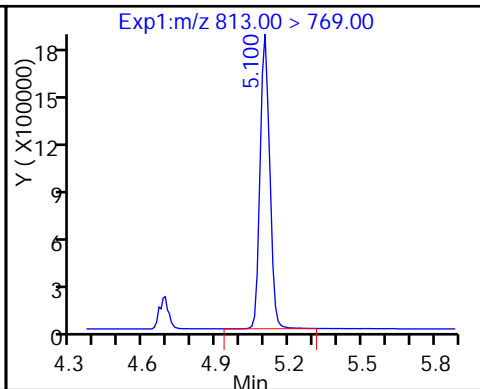
33 Perfluorotetradecanoic acid



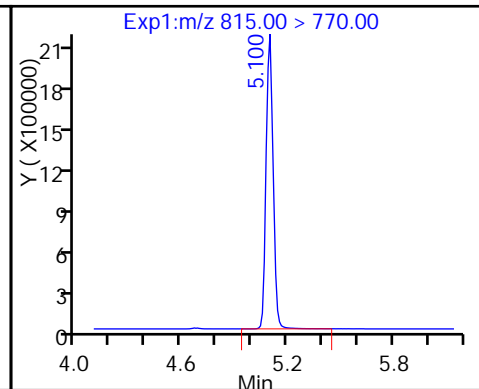
D 32 13C2-PFTeDA



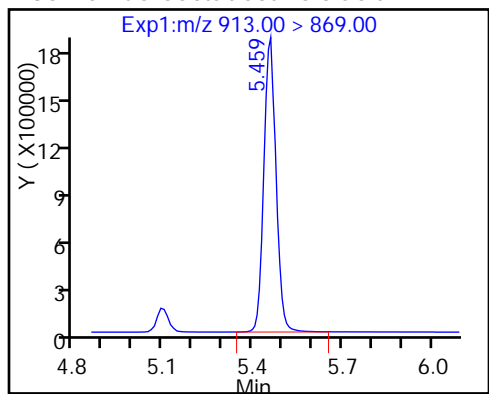
35 Perfluorohexadecanoic acid



D 34 13C2-PFHxDA



36 Perfluorooctadecanoic acid



TestAmerica Sacramento

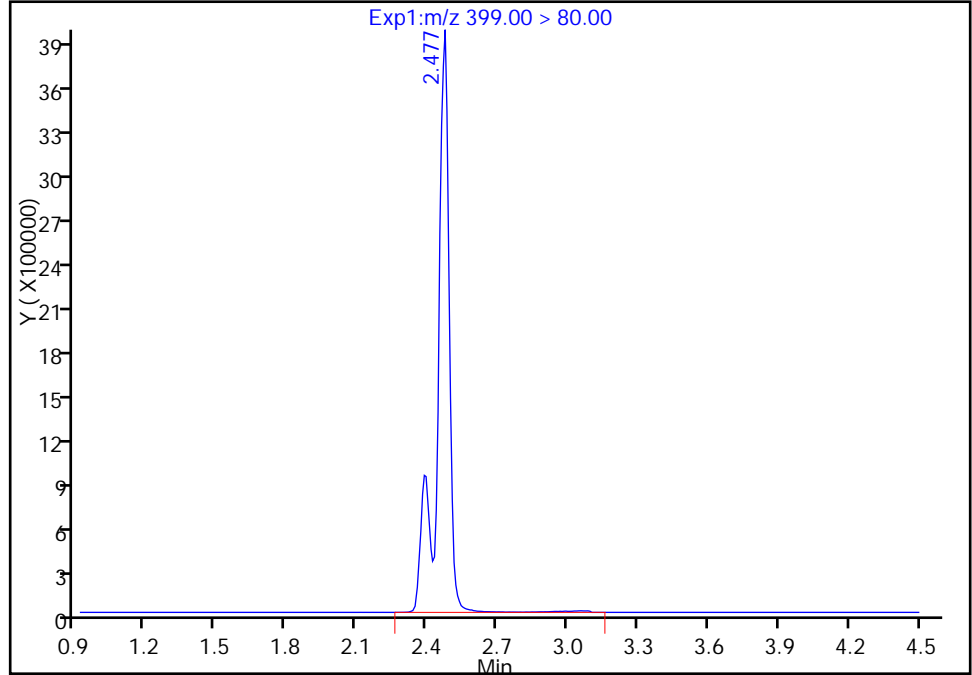
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b\03DEC2016C_037.d
Injection Date: 03-Dec-2016 23:11:14 Instrument ID: A8_N
Lims ID: CCV L5
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 41 Worklist Smp#: 37
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

9 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

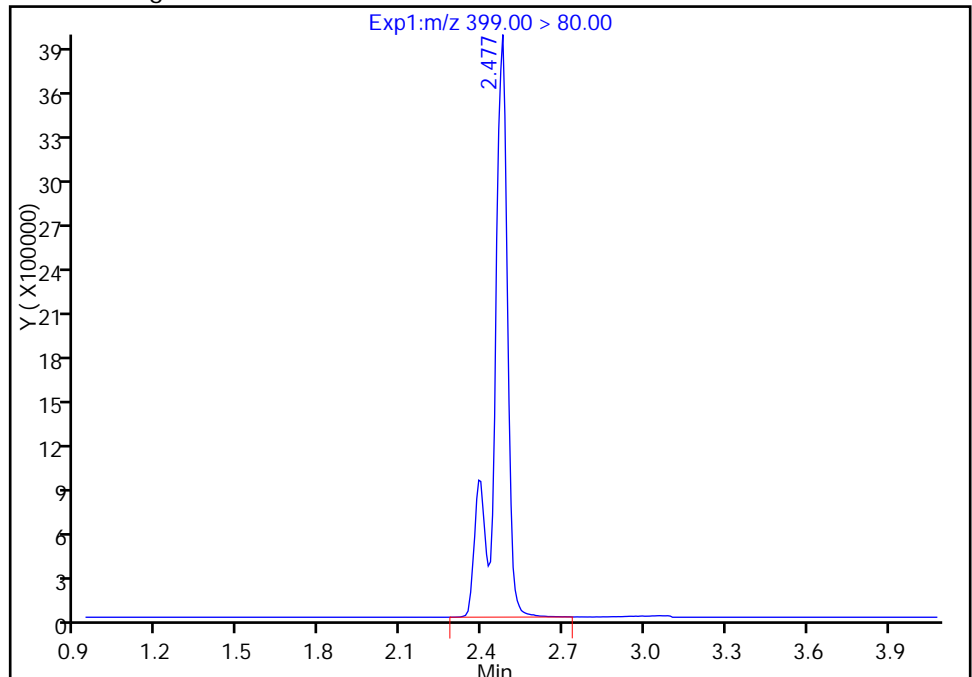
RT: 2.48
Area: 14095943
Amount: 42.645381
Amount Units: ng/ml

Processing Integration Results



RT: 2.48
Area: 13955855
Amount: 42.221563
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

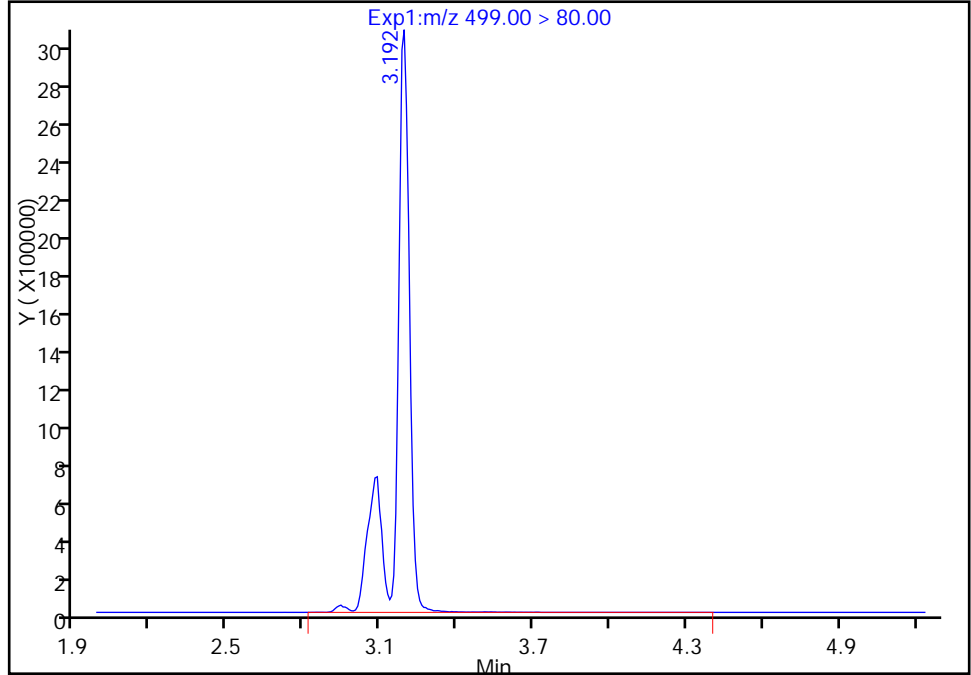
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Injection Date: 03-Dec-2016 23:11:14 Instrument ID: A8_N
Lims ID: CCV L5
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 41 Worklist Smp#: 37
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

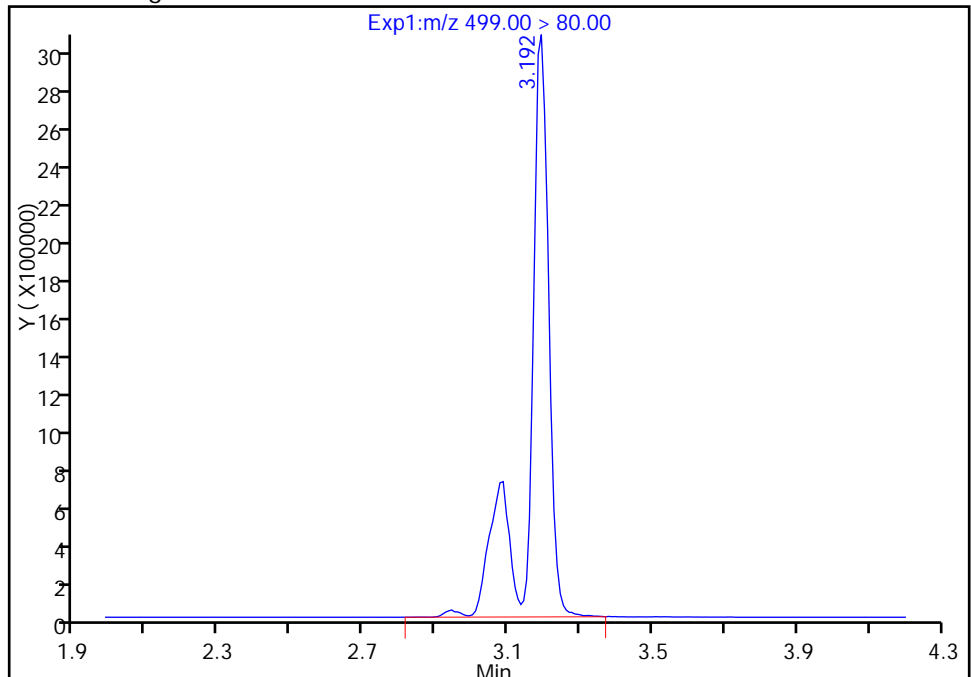
RT: 3.19
Area: 11904137
Amount: 44.712726
Amount Units: ng/ml

Processing Integration Results



RT: 3.19
Area: 11825913
Amount: 44.418912
Amount Units: ng/ml

Manual Integration Results



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-23696-1
 SDG No.: _____
 Lab Sample ID: CCV 320-141150/2 Calibration Date: 12/07/2016 21:33
 Instrument ID: A8_N Calib Start Date: 12/03/2016 13:48
 GC Column: Acquity ID: 2.10 (mm) Calib End Date: 12/03/2016 15:33
 Lab File ID: 07DEC2016C_002.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.8740	0.8929		51.1	50.0	2.2	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.015	0.9705		47.8	50.0	-4.4	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.596	1.601		44.3	44.2	0.3	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9531	0.9186		48.2	50.0	-3.6	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.098	1.024		42.5	45.5	-6.7	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.027	1.004		48.9	50.0	-2.2	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.072	1.001		46.7	50.0	-6.6	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.177	1.147		46.4	47.6	-2.6	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.085	1.076		46.0	46.4	-0.8	25.0
Perfluorononanoic acid (PFNA)	AveID	0.996	1.005		50.4	50.0	0.9	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9341	0.9349		50.0	50.0	0.0	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9605	0.9427		49.1	50.0	-1.9	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6398	0.6191		46.6	48.2	-3.2	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.066	0.997		46.8	50.0	-6.4	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9490	0.9741		51.3	50.0	2.6	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9498	0.9299		49.0	50.0	-2.1	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.854	1.840		49.6	50.0	-0.7	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		0.9701		48.1	50.0	-3.8	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.9929	0.9948		50.1	50.0	0.2	25.0
13C4 PFBA	Ave	335829	313808		46.7	50.0	-6.6	50.0
13C5-PFPeA	Ave	264545	241403		45.6	50.0	-8.7	50.0
13C2 PFHxA	Ave	237486	215721		45.4	50.0	-9.2	50.0
13C4-PFHpA	Ave	207413	186974		45.1	50.0	-9.9	50.0
18O2 PFHxS	Ave	312342	292055		44.2	47.3	-6.5	50.0
13C4 PFOA	Ave	219258	191699		43.7	50.0	-12.6	50.0
13C4 PFOS	Ave	246009	226536		44.0	47.8	-7.9	50.0
13C5 PFNA	Ave	166415	146298		44.0	50.0	-12.1	50.0
13C8 FOSA	Ave	402279	349287		43.4	50.0	-13.2	50.0
13C2 PFDA	Ave	157817	128864		40.8	50.0	-18.3	50.0
13C2 PFUnA	Ave	118762	96745		40.7	50.0	-18.5	50.0
13C2 PFDoA	Ave	112084	88255		39.4	50.0	-21.3	50.0
13C2-PFTeDA	Ave	231173	188667		40.8	50.0	-18.4	50.0
13C2-PFHxDA	Ave	129725	99848		38.5	50.0	-23.0	50.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161208-37624.b\07DEC2016C_002.d
 Lims ID: CCV L5
 Client ID:
 Sample Type: CCV
 Inject. Date: 07-Dec-2016 21:33:19 ALS Bottle#: 41 Worklist Smp#: 2
 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*sub1
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20161208-37624.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 08-Dec-2016 09:11:42 Calib Date: 03-Dec-2016 15:33:40
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d
 Column 1 : Det: EXP1
 Process Host: XAWRK027

First Level Reviewer: chandrasenas Date: 08-Dec-2016 09:11:42

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	15690399	46.7		93.4	993945	
1 Perfluorobutyric acid	212.90 > 169.00	1.542	1.542	0.0	14009755	51.1		102	117433	
D 4 13C5-PFPeA	267.90 > 223.00	1.820	1.820	0.0	12070158	45.6		91.3	909702	
3 Perfluoropentanoic acid	262.90 > 219.00	1.820	1.820	0.0	11714439	47.8		95.6	109500	
5 Perfluorobutanesulfonic acid	298.90 > 80.00	1.858	1.858	0.0	20662689	44.3		100		
	298.90 > 99.00	1.849	1.858	-0.009	0.995	9479963	2.18(0.00-0.00)			
7 Perfluorohexanoic acid	313.00 > 269.00	2.100	2.100	0.0	9907975	48.2		96.4	240440	
D 6 13C2 PFHxA	315.00 > 270.00	2.109	2.109	0.0	10786057	45.4		90.8	771535	
9 Perfluorohexanesulfonic acid	399.00 > 80.00	2.372	2.372	0.0	13609241	42.5		93.3		
12 Perfluoroheptanoic acid	363.00 > 319.00	2.438	2.438	0.0	9389556	48.9		97.8	90973	
D 11 13C4-PFHpA	367.00 > 322.00	2.438	2.438	0.0	9348701	45.1		90.1	462207	
D 10 18O2 PFHxS	403.00 > 84.00	2.455	2.455	0.0	13814188	44.2		93.5	1264979	
15 Perfluorooctanoic acid	413.00 > 369.00	2.796	2.796	0.0	9592956	46.7		93.4	130702	
	413.00 > 169.00	2.796	2.796	0.0	1.000	6082518	1.58(0.90-1.10)		362704	
D 14 13C4 PFOA	417.00 > 372.00	2.804	2.804	0.0	9584954	43.7		87.4	543938	

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	2.804	2.804	0.0	1.000	12364299	46.4	97.4	
18 Perfluorooctane sulfonic acid	499.00	> 80.00	3.147	3.147	0.0	1.000	11313496	46.0	99.2	713818
	499.00	> 99.00	3.163	3.147	0.016	1.005	2483275	4.56(0.90-1.10)		188112
D 17 13C4 PFOS	503.00	> 80.00	3.163	3.163	0.0		10828436	44.0	92.1	251226
20 Perfluorononanoic acid	463.00	> 419.00	3.171	3.171	0.0	1.000	7351744	50.4	101	132669
D 19 13C5 PFNA	468.00	> 423.00	3.171	3.171	0.0		7314922	44.0	87.9	404702
D 21 13C8 FOSA	506.00	> 78.00	3.503	3.503	0.0		17464332	43.4	86.8	680321
22 Perfluorooctane Sulfonamide	498.00	> 78.00	3.503	3.503	0.0	1.000	16327322	50.0	100	580500
24 Perfluorodecanoic acid	513.00	> 469.00	3.528	3.528	0.0	1.000	6073671	49.1	98.1	242069
D 23 13C2 PFDA	515.00	> 470.00	3.528	3.528	0.0		6443201	40.8	81.7	258759
26 Perfluorodecane Sulfonic acid	599.00	> 80.00	3.839	3.839	0.0	1.000	6760137	46.6	96.8	
28 Perfluoroundecanoic acid	563.00	> 519.00	3.857	3.857	0.0	1.000	4823862	46.8	93.6	123357
D 27 13C2 PFUnA	565.00	> 520.00	3.857	3.857	0.0		4837236	40.7	81.5	423244
29 Perfluorododecanoic acid	613.00	> 569.00	4.147	4.147	0.0	1.000	4298560	51.3	103	125525
D 30 13C2 PFDoA	615.00	> 570.00	4.154	4.154	0.0		4412738	39.4	78.7	197348
31 Perfluorotridecanoic acid	663.00	> 619.00	4.418	4.418	0.0	1.000	4103441	49.0	97.9	64591
33 Perfluorotetradecanoic acid	712.50	> 668.90	4.652	4.652	0.0	1.000	8121601	49.6	99.3	113423
	713.00	> 169.00	4.652	4.652	0.0	1.000	1285928	6.32(0.00-0.00)		158877
D 32 13C2-PFTeDA	715.00	> 670.00	4.652	4.652	0.0		9433347	40.8	81.6	460915
D 34 13C2-PFHxDA	815.00	> 770.00	5.068	5.068	0.0		4992423	38.5	77.0	99189
35 Perfluorohexadecanoic acid	813.00	> 769.00	5.079	5.079	0.0	1.000	4280851	48.1	96.2	4786
36 Perfluorooctadecanoic acid	913.00	> 869.00	5.428	5.428	0.0	1.000	4389630	50.1	100	7429

Reagents:

LCPFC-L5_00020

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161208-37624.b\07DEC2016C_002.d

Injection Date: 07-Dec-2016 21:33:19

Instrument ID: A8_N

Lims ID: CCV L5

Client ID:

Operator ID: A8-PC\A8

ALS Bottle#: 41

Worklist Smp#: 2

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

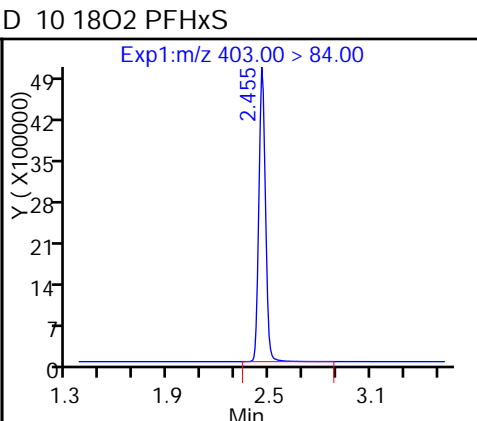
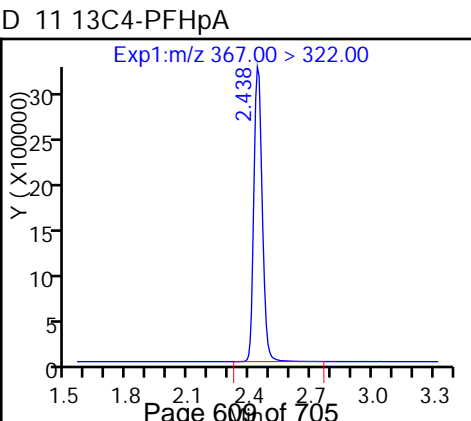
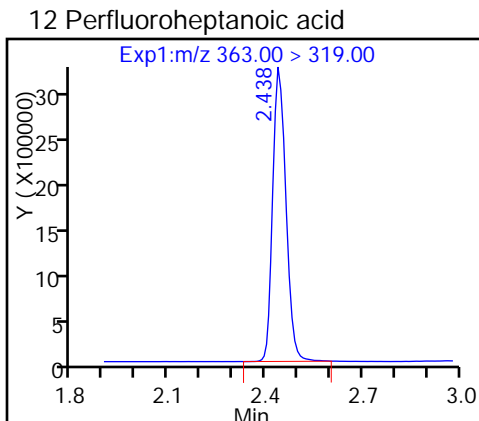
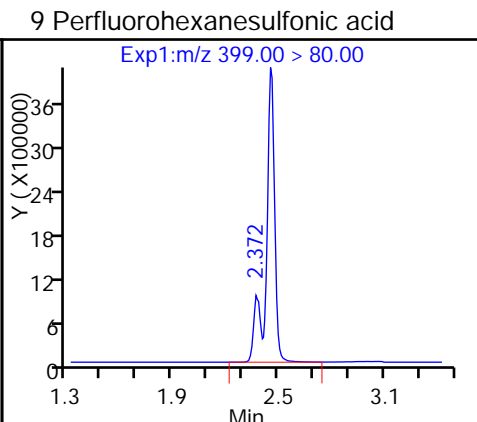
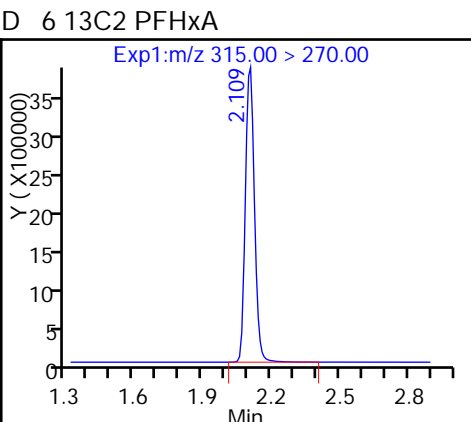
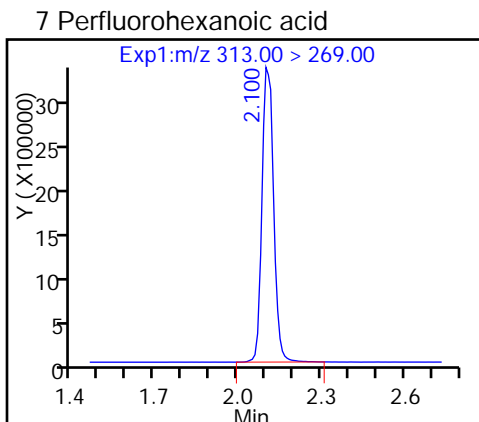
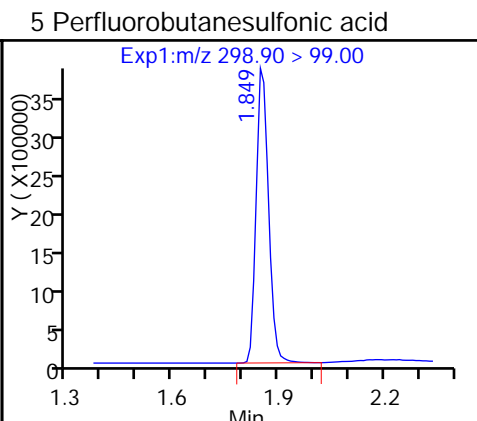
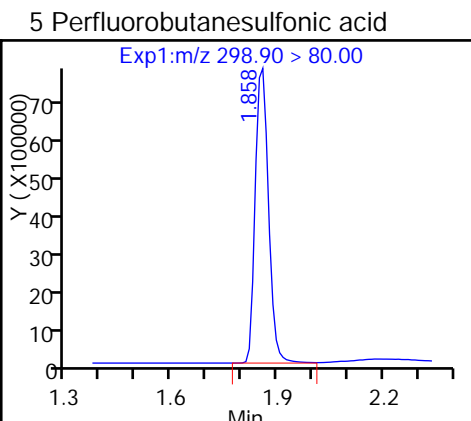
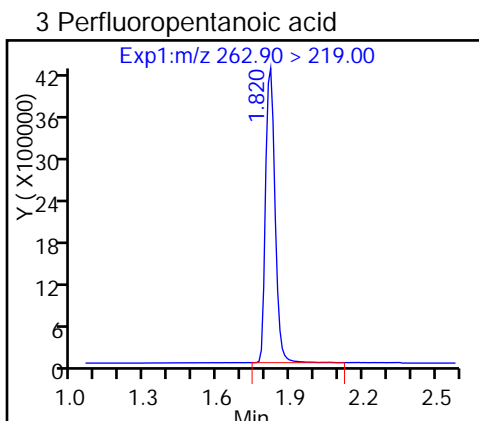
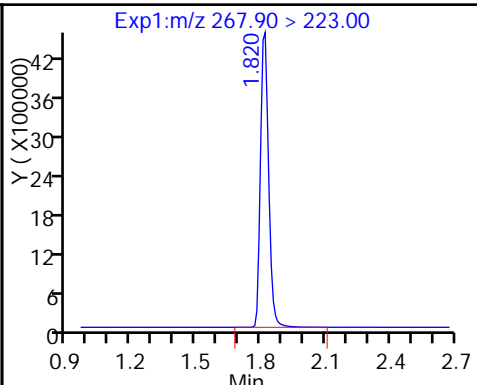
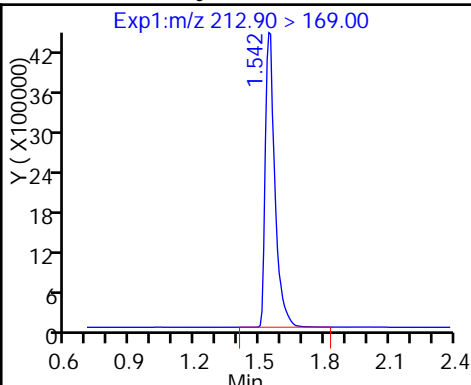
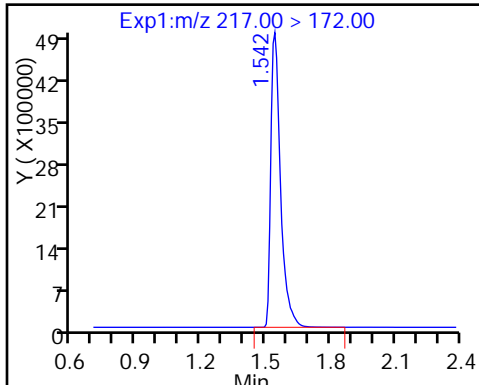
Method: A8_N

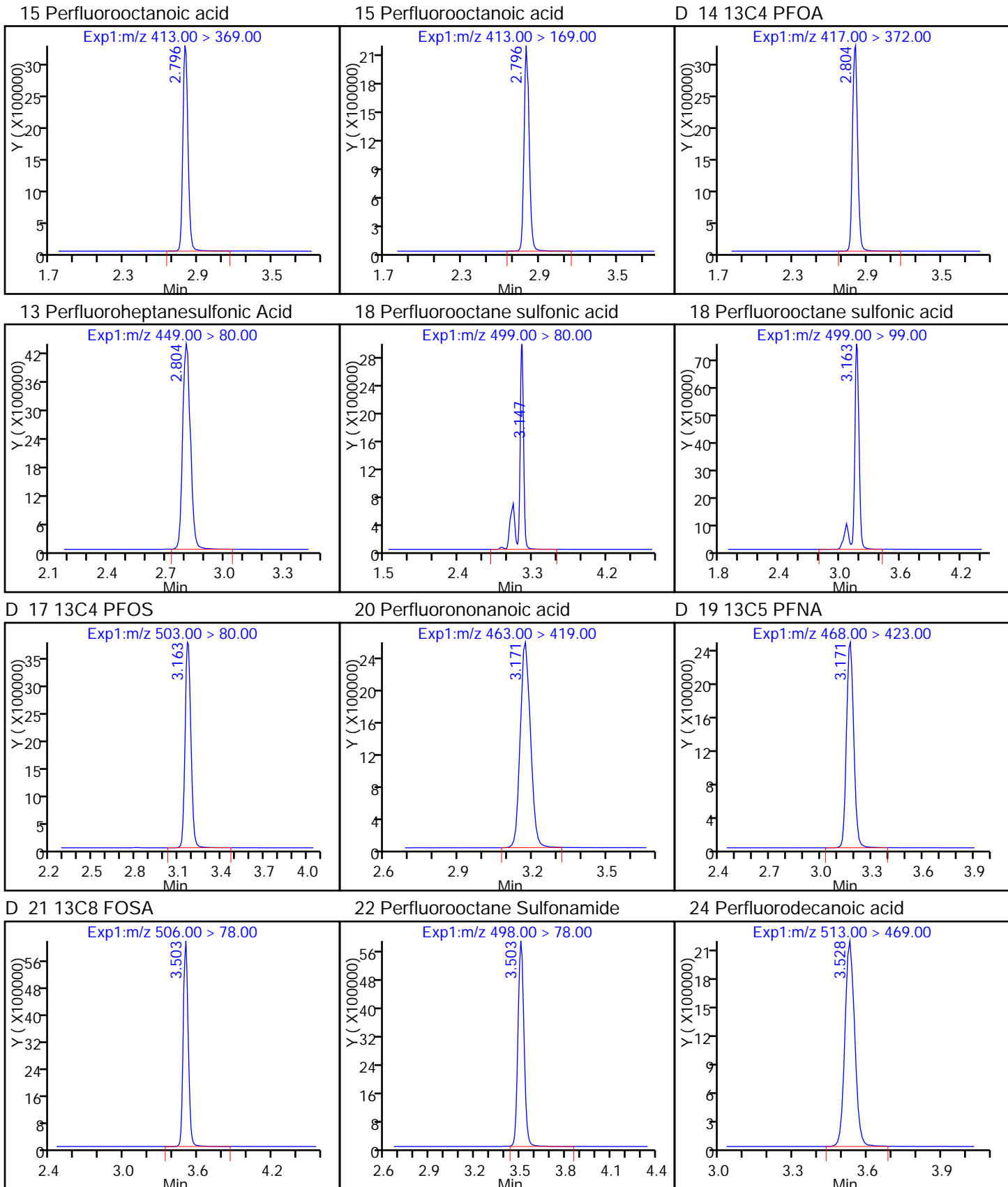
Limit Group: LC PFC_DOD ICAL

D 2 13C4 PFBA

1 Perfluorobutyric acid

D 4 13C5-PFPeA

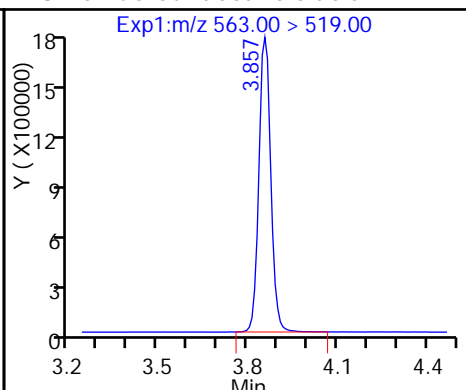
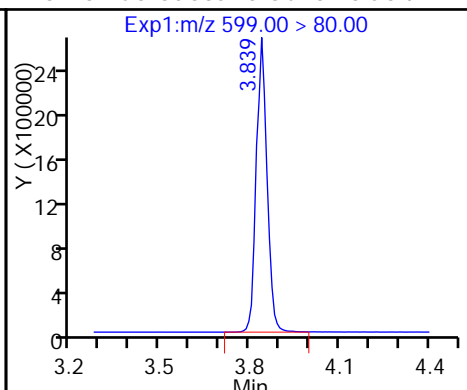
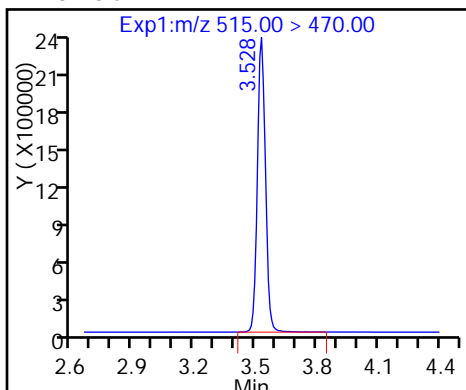




D 23 13C2 PFDA

26 Perfluorodecane Sulfonic acid

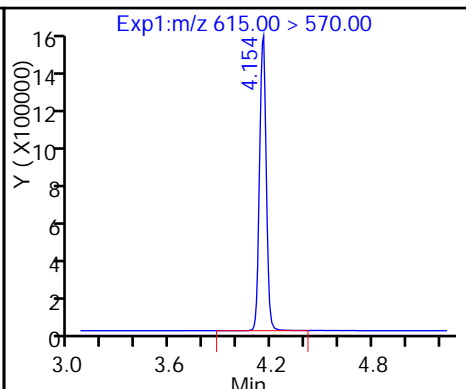
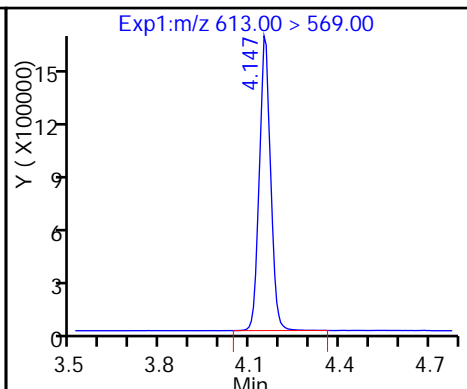
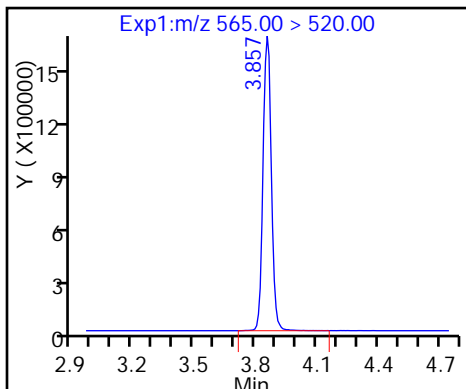
28 Perfluoroundecanoic acid



D 27 13C2 PFUa

29 Perfluorododecanoic acid

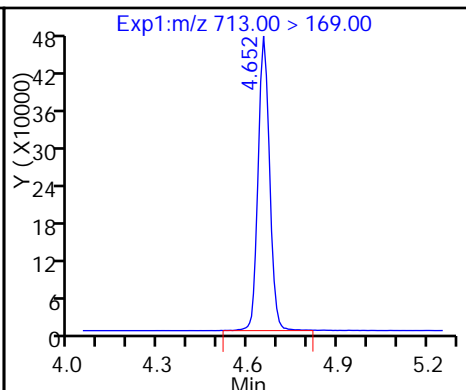
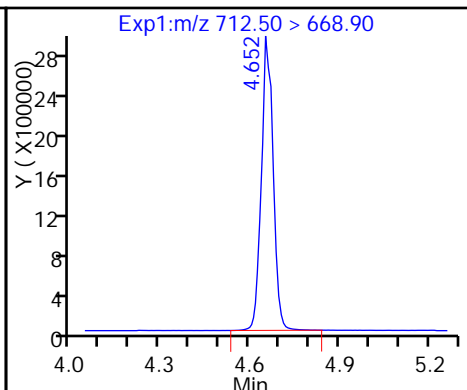
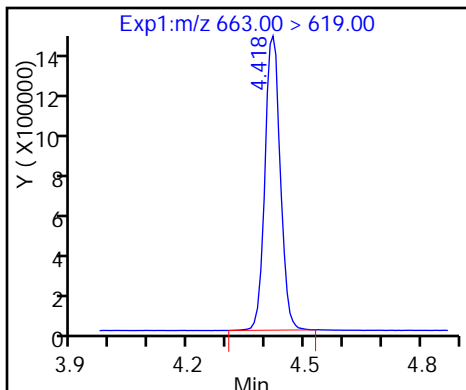
D 30 13C2 PFDa



31 Perfluorotridecanoic acid

33 Perfluorotetradecanoic acid

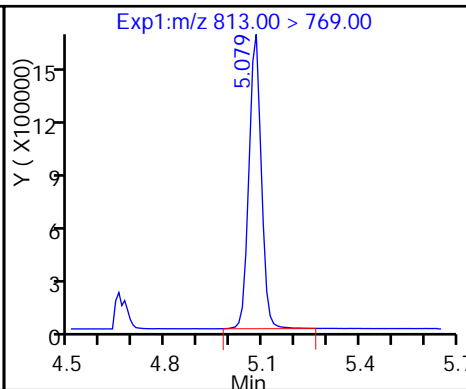
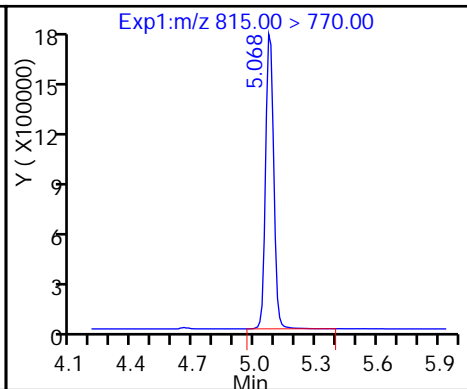
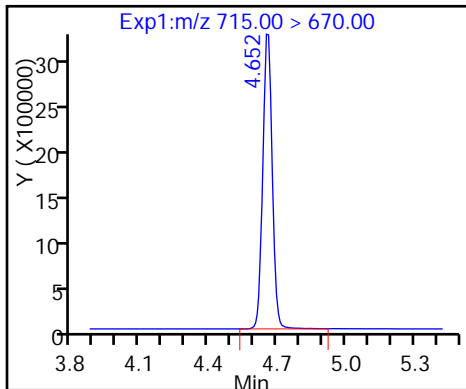
33 Perfluorotetradecanoic acid



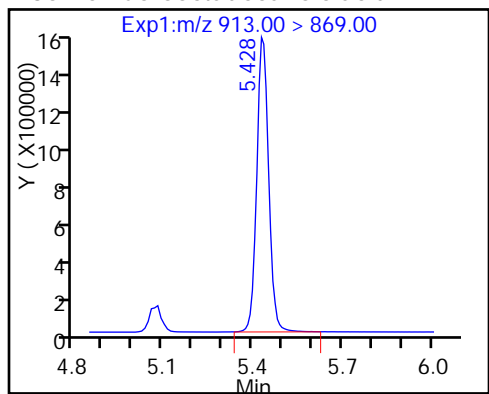
D 32 13C2-PFTeDA

D 34 13C2-PFHxDA

35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-23696-1
 SDG No.: _____
 Lab Sample ID: CCV 320-141150/16 Calibration Date: 12/07/2016 23:18
 Instrument ID: A8_N Calib Start Date: 12/03/2016 13:48
 GC Column: Acquity ID: 2.10 (mm) Calib End Date: 12/03/2016 15:33
 Lab File ID: 07DEC2016C_016.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.8740	0.9585		21.9	20.0	9.7	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.015	1.080		21.3	20.0	6.4	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.596	1.697		18.8	17.7	6.3	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9531	0.995		20.9	20.0	4.4	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.098	1.077		17.9	18.2	-1.9	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.027	1.109		21.6	20.0	7.9	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.072	1.078		20.1	20.0	0.6	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.177	1.248		20.2	19.0	6.0	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.085	1.093		18.7	18.6	0.7	25.0
Perfluorononanoic acid (PFNA)	AveID	0.996	1.020		20.5	20.0	2.4	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9341	0.9932		21.3	20.0	6.3	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9605	0.9756		20.3	20.0	1.6	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6398	0.6337		19.1	19.3	-1.0	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.066	1.020		19.1	20.0	-4.3	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9490	0.9786		20.6	20.0	3.1	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9498	0.9761		20.6	20.0	2.8	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.854	1.856		20.0	20.0	0.1	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		1.096		21.3	20.0	6.6	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.9929	0.8895		17.9	20.0	-10.4	25.0
13C4 PFBA	Ave	335829	355145		52.9	50.0	5.8	50.0
13C5-PFPeA	Ave	264545	267781		50.6	50.0	1.2	50.0
13C2 PFHxA	Ave	237486	248080		52.2	50.0	4.5	50.0
13C4-PFHpA	Ave	207413	218271		52.6	50.0	5.2	50.0
18O2 PFHxS	Ave	312342	338981		51.3	47.3	8.5	50.0
13C4 PFOA	Ave	219258	228459		52.1	50.0	4.2	50.0
13C4 PFOS	Ave	246009	258148		50.2	47.8	4.9	50.0
13C5 PFNA	Ave	166415	172899		51.9	50.0	3.9	50.0
13C8 FOSA	Ave	402279	409311		50.9	50.0	1.7	50.0
13C2 PFDA	Ave	157817	152554		48.3	50.0	-3.3	50.0
13C2 PFUnA	Ave	118762	111532		47.0	50.0	-6.1	50.0
13C2 PFDoA	Ave	112084	101776		45.4	50.0	-9.2	50.0
13C2-PFTeDA	Ave	231173	216240		46.8	50.0	-6.5	50.0
13C2-PFHxDA	Ave	129725	114279		44.0	50.0	-11.9	50.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161208-37624.b\07DEC2016C_016.d
 Lims ID: CCV L4
 Client ID:
 Sample Type: CCV
 Inject. Date: 07-Dec-2016 23:18:15 ALS Bottle#: 40 Worklist Smp#: 16
 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*sub1
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20161208-37624.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 08-Dec-2016 09:17:55 Calib Date: 03-Dec-2016 15:33:40
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d
 Column 1 : Det: EXP1
 Process Host: XAWRK027

First Level Reviewer: chandrasenas Date: 08-Dec-2016 09:17:55

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	1.542	-0.009	17757265	52.9		106	1449252	
1 Perfluorobutyric acid	212.90 > 169.00	1.541	1.542	-0.001	1.000	6808011	21.9	110	61777	
D 4 13C5-PFPeA	267.90 > 223.00	1.810	1.820	-0.010	13389070	50.6		101	1220562	
3 Perfluoropentanoic acid	262.90 > 219.00	1.810	1.820	-0.010	1.000	5782419	21.3	106	48767	
5 Perfluorobutanesulfonic acid	298.90 > 80.00	1.848	1.858	-0.010	1.000	10168705	18.8	106		
	298.90 > 99.00	1.848	1.858	-0.010	1.000	4304232	2.36(0.00-0.00)			
7 Perfluorohexanoic acid	313.00 > 269.00	2.103	2.100	0.003	1.000	4937797	20.9	104	137850	
D 6 13C2 PFHxA	315.00 > 270.00	2.103	2.109	-0.006	12404021	52.2		104	877289	
9 Perfluorohexanesulfonic acid	399.00 > 80.00	2.372	2.372	0.0	1.000	6644061	17.9	98.1		
12 Perfluoroheptanoic acid	363.00 > 319.00	2.434	2.438	-0.004	1.000	4839885	21.6	108	57483	
D 11 13C4-PFHpA	367.00 > 322.00	2.434	2.438	-0.004	10913532	52.6		105	537982	
D 10 18O2 PFHxS	403.00 > 84.00	2.452	2.455	-0.003	16033787	51.3		109	1913411	
15 Perfluorooctanoic acid	413.00 > 369.00	2.793	2.796	-0.003	1.000	4925782	20.1	101	67203	
	413.00 > 169.00	2.793	2.796	-0.003	1.000	3037470	1.62(0.90-1.10)		117484	
D 14 13C4 PFOA	417.00 > 372.00	2.793	2.804	-0.011	11422929	52.1		104	654293	

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	2.801	2.804	-0.003	1.000	6135354	20.2	106		
18 Perfluorooctane sulfonic acid	499.00 > 80.00	3.051	3.147	-0.096	1.000	5237805	18.7	101	151917	
	499.00 > 99.00	3.161	3.147	0.014	1.036	1169477	4.48(0.90-1.10)		123789	
D 17 13C4 PFOS	503.00 > 80.00	3.161	3.163	-0.002		12339479	50.2	105	361537	
20 Perfluorononanoic acid	463.00 > 419.00	3.161	3.171	-0.010	1.000	3526393	20.5	102	61200	
D 19 13C5 PFNA	468.00 > 423.00	3.161	3.171	-0.010		8644950	51.9	104	490965	
D 21 13C8 FOSA	506.00 > 78.00	3.501	3.503	-0.002		20465532	50.9	102	963934	
22 Perfluorooctane Sulfonamide	498.00 > 78.00	3.501	3.503	-0.002	1.000	8130291	21.3	106	279112	
24 Perfluorodecanoic acid	513.00 > 469.00	3.526	3.528	-0.002	1.000	2976660	20.3	102	109255	
D 23 13C2 PFDA	515.00 > 470.00	3.526	3.528	-0.002		7627723	48.3	96.7	273507	
26 Perfluorodecane Sulfonic acid	599.00 > 80.00	3.828	3.839	-0.011	1.000	3153762	19.1	99.0		
28 Perfluoroundecanoic acid	563.00 > 519.00	3.854	3.857	-0.003	1.000	2275594	19.1	95.7	51860	
D 27 13C2 PFUnA	565.00 > 520.00	3.846	3.857	-0.011		5576610	47.0	93.9	329978	
29 Perfluorododecanoic acid	613.00 > 569.00	4.145	4.147	-0.002	1.000	1992009	20.6	103	47831	
D 30 13C2 PFDoA	615.00 > 570.00	4.145	4.154	-0.009		5088816	45.4	90.8	206766	
31 Perfluorotridecanoic acid	663.00 > 619.00	4.416	4.418	-0.002	1.000	1986943	20.6	103	36211	
33 Perfluorotetradecanoic acid	712.50 > 668.90	4.658	4.652	0.006	1.000	3778015	20.0	100	56330	
	713.00 > 169.00	4.648	4.652	-0.004	0.998	618333	6.11(0.00-0.00)		78052	
D 32 13C2-PFTeDA	715.00 > 670.00	4.658	4.652	0.006		10812003	46.8	93.5	460831	
D 34 13C2-PFHxDA	815.00 > 770.00	5.072	5.068	0.004		5713944	44.0	88.1	114132	
35 Perfluorohexadecanoic acid	813.00 > 769.00	5.072	5.079	-0.007	1.000	2230255	21.3	107	2372	
36 Perfluorooctadecanoic acid	913.00 > 869.00	5.431	5.428	0.003	1.000	1810548	17.9	89.6	2103	

Reagents:

LCPFC-L4_00023

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161208-37624.b\07DEC2016C_016.d

Injection Date: 07-Dec-2016 23:18:15

Instrument ID: A8_N

Lims ID: CCV L4

Client ID:

Operator ID: A8-PC\A8

ALS Bottle#: 40

Worklist Smp#: 16

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

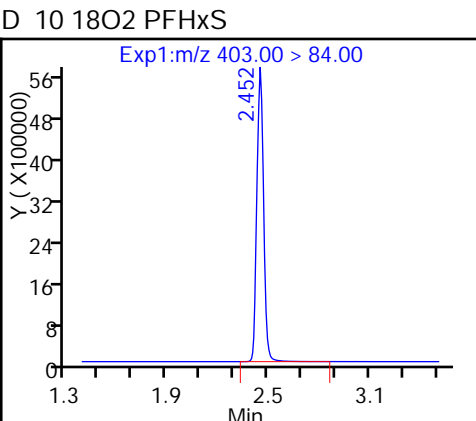
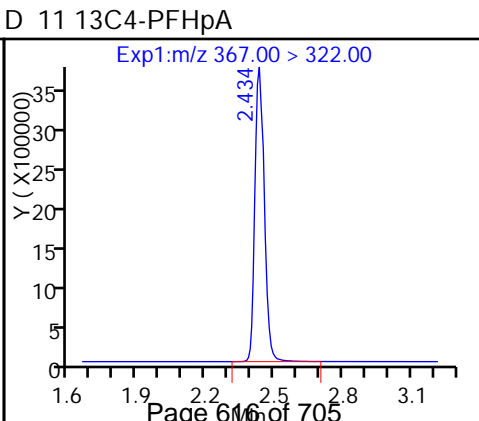
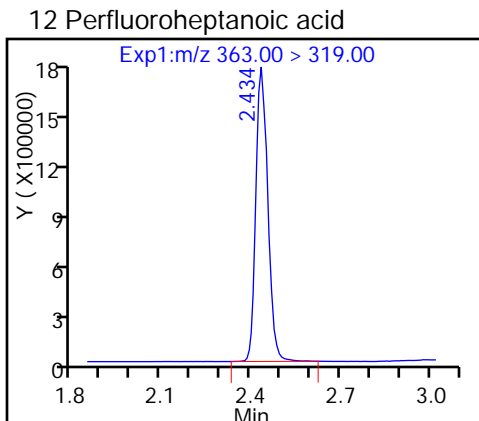
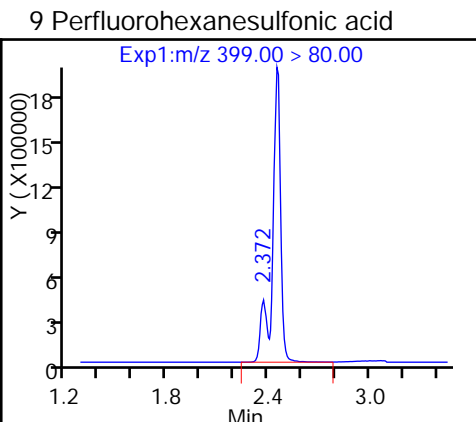
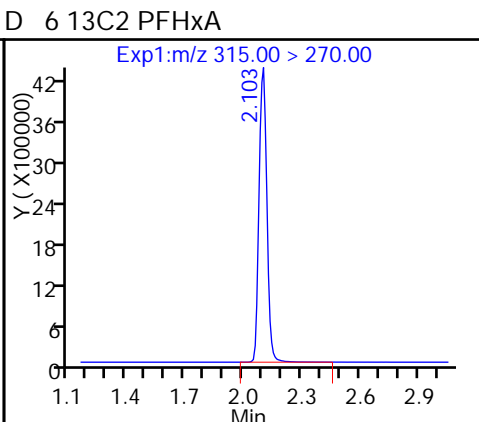
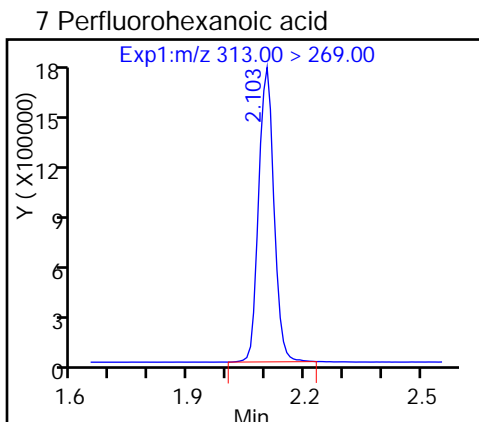
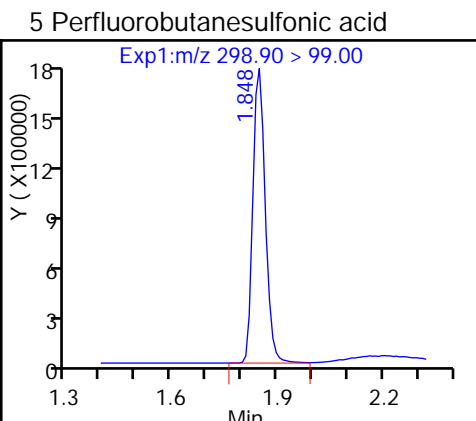
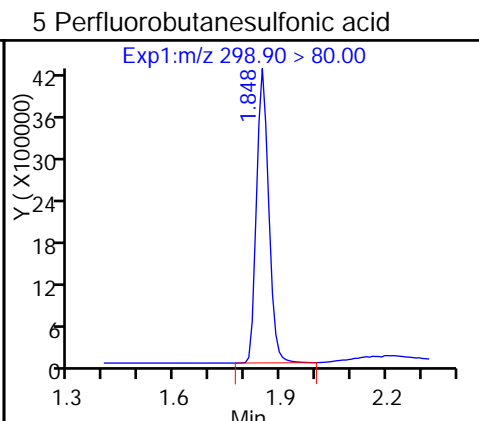
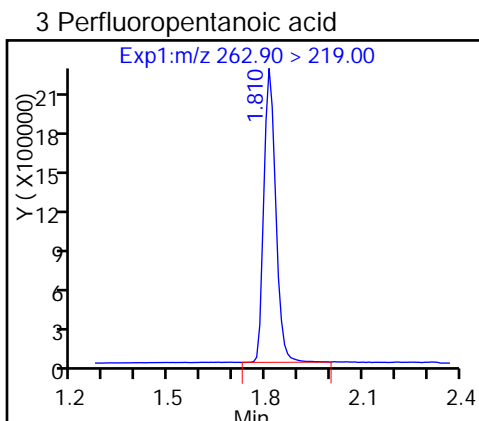
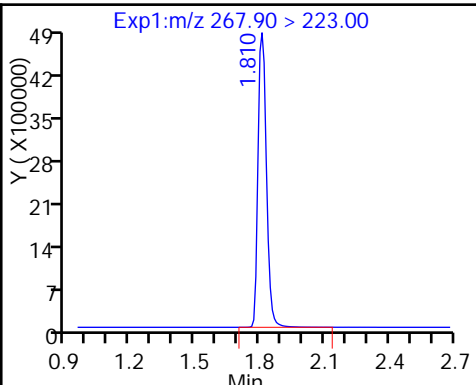
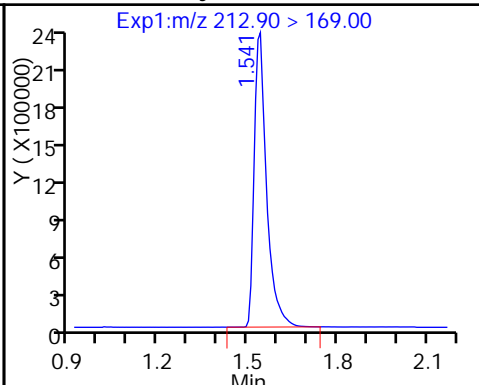
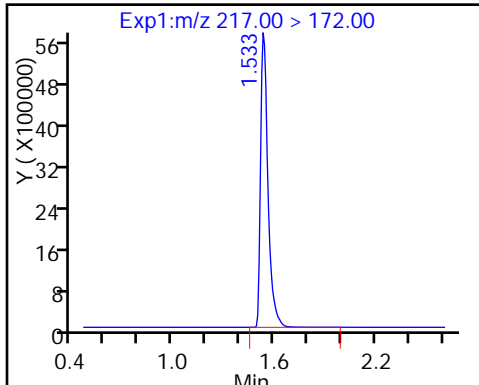
Method: A8_N

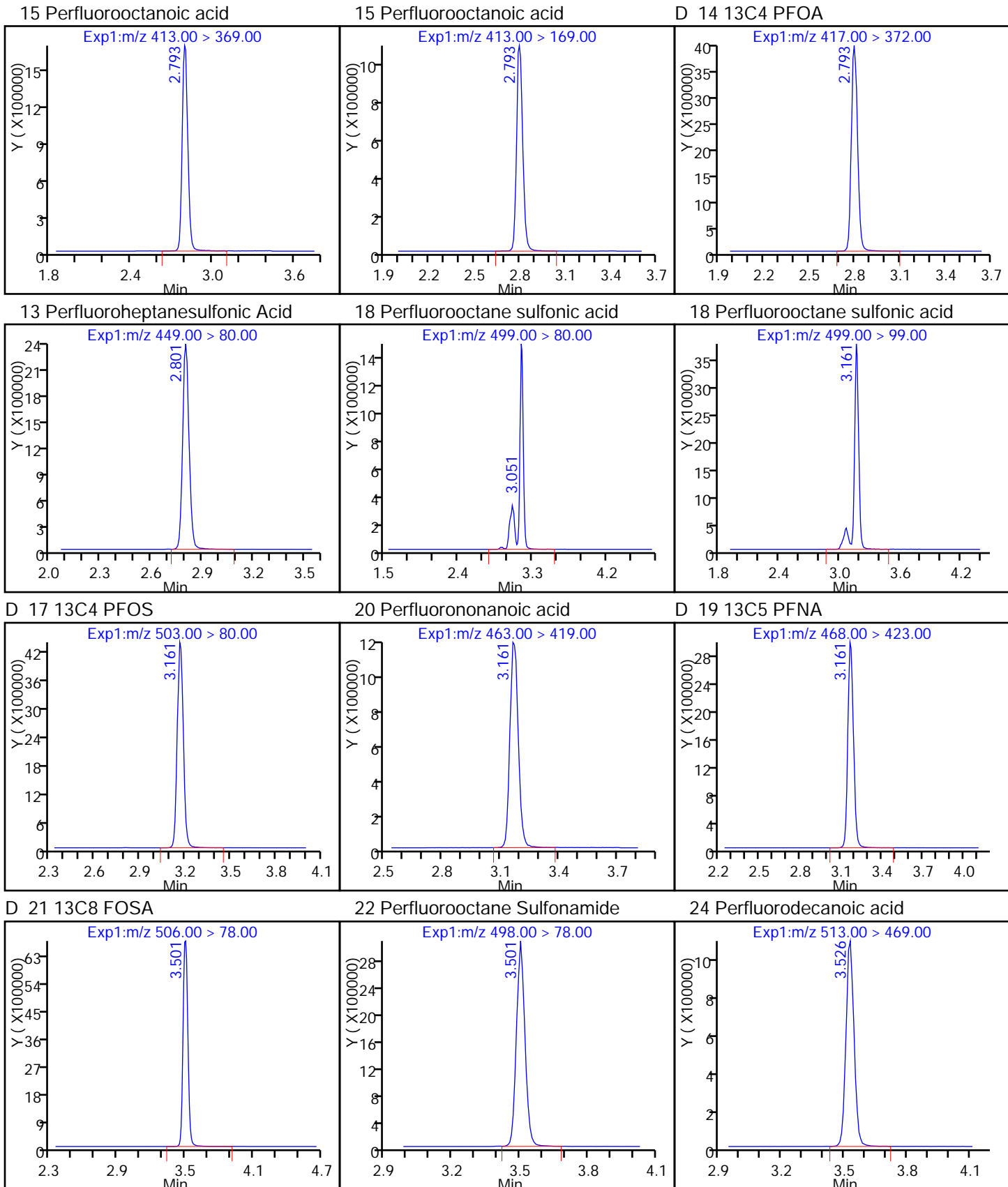
Limit Group: LC PFC_DOD ICAL

D 2 13C4 PFBA

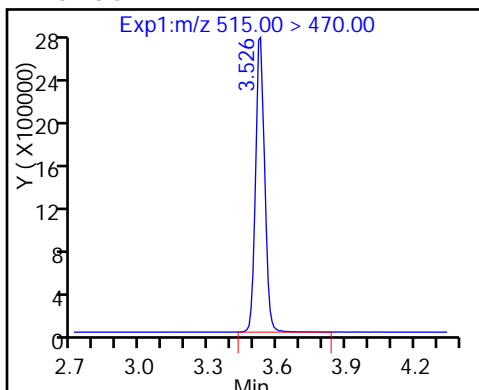
1 Perfluorobutyric acid

D 4 13C5-PFPeA

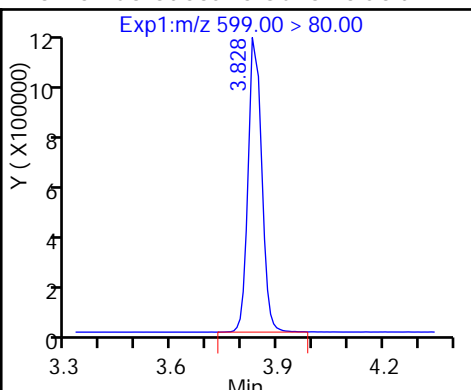




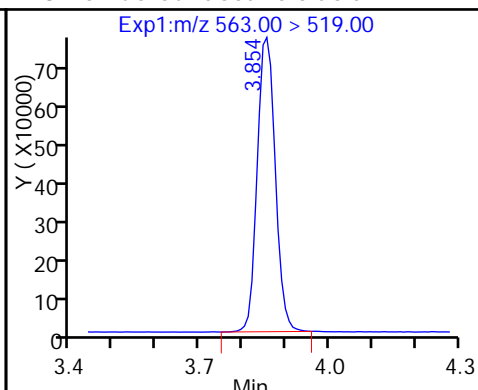
D 23 13C2 PFDA



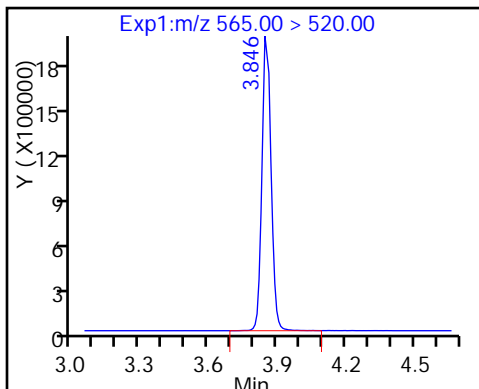
26 Perfluorodecane Sulfonic acid



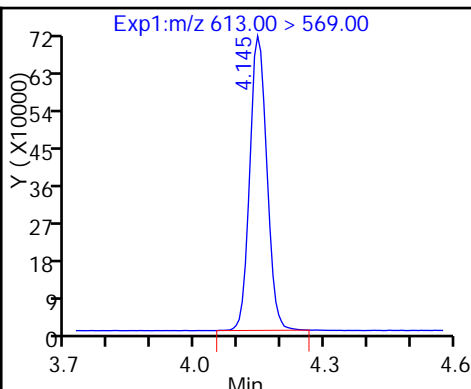
28 Perfluoroundecanoic acid



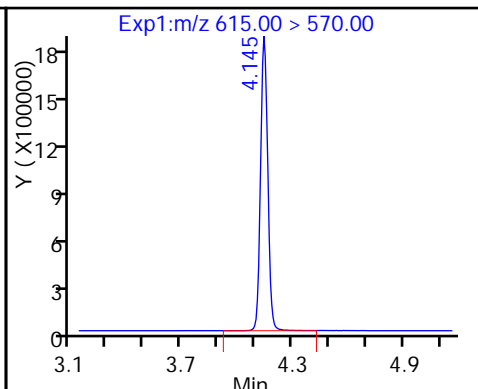
D 27 13C2 PFUa



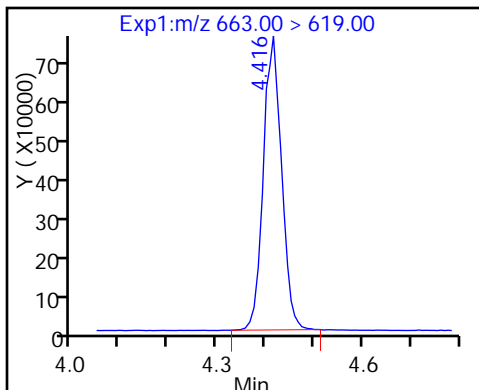
29 Perfluorododecanoic acid



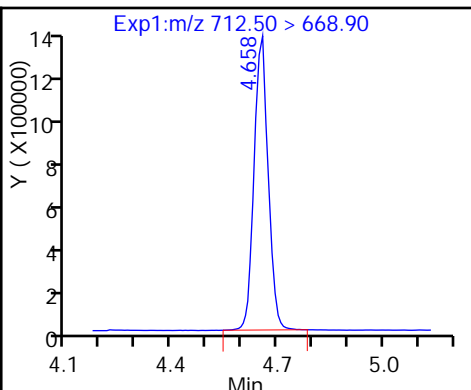
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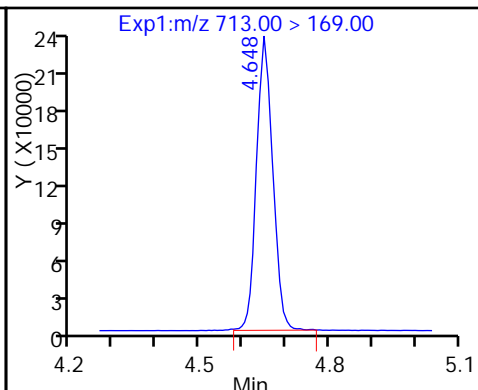
31 Perfluorotridecanoic acid



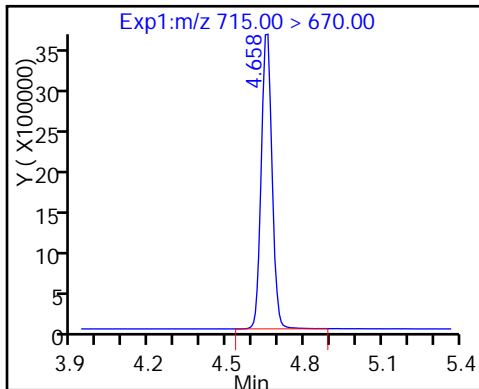
33 Perfluorotetradecanoic acid



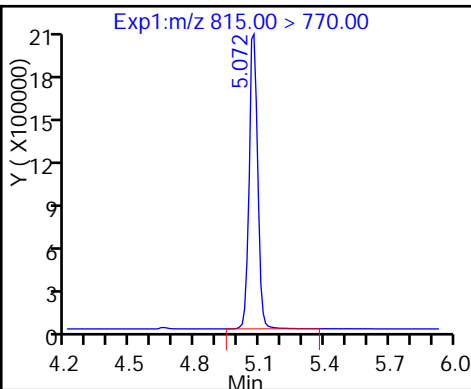
33 Perfluorotetradecanoic acid



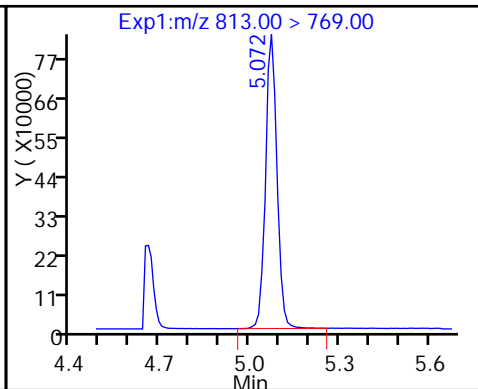
D 32 13C2-PFTeDA



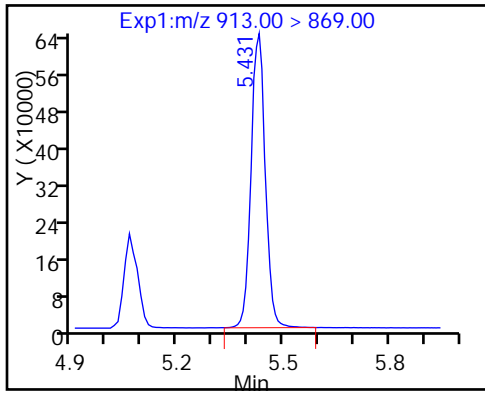
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23696-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: MB 320-139316/1-A
 Matrix: Water Lab File ID: 03DEC2016C_008.d
 Analysis Method: 537 (Modified) Date Collected: _____
 Extraction Method: 3535 Date Extracted: 11/23/2016 11:47
 Sample wt/vol: 500 (mL) Date Analyzed: 12/03/2016 19:33
 Con. Extract Vol.: 1.0 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: Acquity ID: 2.1 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 140675 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	2.0	U	2.5	2.0	0.92
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.0	U	2.5	2.0	0.80
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.0	U	2.5	2.0	0.87
375-95-1	Perfluorononanoic acid (PFNA)	2.0	U	2.5	2.0	0.65
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	3.0	U	4.0	3.0	1.3
335-67-1	Perfluorooctanoic acid (PFOA)	2.0	U	2.5	2.0	0.75

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	112		25-150
STL00991	13C4 PFOS	105		25-150
STL01892	13C4-PFHpA	113		25-150
STL00995	13C5 PFNA	113		25-150
STL00994	18O2 PFHxS	107		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b\03DEC2016C_008.d
 Lims ID: MB 320-139316/1-A
 Client ID:
 Sample Type: MB
 Inject. Date: 03-Dec-2016 19:33:46 ALS Bottle#: 13 Worklist Smp#: 8
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: mb 320-139316/1-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: A8-PC\A8 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 06-Dec-2016 15:49:08 Calib Date: 03-Dec-2016 15:33:40
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d
 Column 1 : Det: EXP1
 Process Host: XAWRK027

First Level Reviewer: chandrasenas Date: 06-Dec-2016 15:50:11

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	1.558	1.549	0.009	17986499	53.6		107	1090112	
1 Perfluorobutyric acid	212.90 > 169.00	1.582	1.558	0.024	1.000	24006	0.0764		119	
3 Perfluoropentanoic acid	262.90 > 219.00	1.820	1.829	-0.009	1.000	21286	0.0747		125	
D 4 13C5-PFPeA	267.90 > 223.00	1.839	1.829	0.010		14040985	53.1	106	751340	
5 Perfluorobutanesulfonic acid	298.90 > 80.00	1.868	1.877	-0.009	1.000	7839	0.0147			
	298.90 > 99.00	1.868	1.877	-0.009	1.000	3359	2.33(0.00-0.00)			
D 6 13C2 PFHxA	315.00 > 270.00	2.124	2.129	-0.005		12350519	52.0	104	708347	
7 Perfluorohexanoic acid	313.00 > 269.00	2.132	2.138	-0.006	1.000	9030	0.0384		255	
D 11 13C4-PFHpA	367.00 > 322.00	2.474	2.473	0.001		11743803	56.6	113	843584	
D 10 18O2 PFHxS	403.00 > 84.00	2.481	2.481	0.0		15762243	50.5	107	927043	
9 Perfluorohexanesulfonic acid	399.00 > 80.00	2.489	2.496	-0.007	1.000	62165	0.1700			
D 47 M2-6:2FTS	429.00 > 409.00	2.796	2.813	-0.017		716	0.006785	0.0		
48 Sodium 1H,1H,2H,2H-perfluorooctane	427.00 > 407.00	2.805	2.821	-0.016	1.000	3227	NR			
15 Perfluorooctanoic acid	413.00 > 369.00	2.829	2.836	-0.007	1.000	42937	0.1624		271	
	413.00 > 169.00	2.829	2.836	-0.007	1.000	17217	2.49(0.90-1.10)		651	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 14 13C4 PFOA	417.00	> 372.00	2.837	2.836	0.001	12328940	56.2	112	868925	
D 17 13C4 PFOS	503.00	> 80.00	3.206	3.215	-0.009	12313037	50.1	105	776821	
D 19 13C5 PFNA	468.00	> 423.00	3.215	3.215	0.0	9428372	56.7	113	459518	
D 21 13C8 FOSA	506.00	> 78.00	3.546	3.537	0.009	4393510	10.9	21.8	148767	
43 Sodium 1H,1H,2H,2H-perfluorooctane	527.00	> 507.00	3.537	3.566	-0.029	1.010	713	NR		
D 42 M2-8:2FTS	529.00	> 509.00	3.504	3.566	-0.062	220	0.002265	0.0		
24 Perfluorodecanoic acid	513.00	> 469.00	3.579	3.571	0.008	1.000	6777	0.0401	208	
D 23 13C2 PFDA	515.00	> 470.00	3.571	3.580	-0.009	8792754	55.7	111	410788	
D 45 d3-NMeFOSAA	573.00	> 419.00	3.725	3.727	-0.002	2273	0.0313	0.0		
26 Perfluorodecane Sulfonic acid	599.00	> 80.00	3.885	3.879	0.006	1.000	3582	0.0217		
D 46 d5-NEtFOSAA	589.00	> 419.00	3.885	3.895	-0.010	5871	0.0737	0.0		
D 27 13C2 PFUnA	565.00	> 520.00	3.903	3.897	0.006	6741755	56.8	114	491146	
28 Perfluoroundecanoic acid	563.00	> 519.00	3.903	3.897	0.006	1.000	23180	0.1613	800	
49 N-ethyl perfluorooctane sulfonamid	584.00	> 419.00	3.894	3.904	-0.010	1.002	1795	NR		
D 52 d-N-MeFOSA-M	515.00	> 169.00	4.206	4.037	0.169	246	0.002341	0.0		
29 Perfluorododecanoic acid	613.00	> 569.00	4.193	4.193	0.0	1.000	12413	0.1066	248	
D 30 13C2 PFDoA	615.00	> 570.00	4.193	4.193	0.0	6137029	54.8	110	269767	
31 Perfluorotridecanoic acid	663.00	> 619.00	4.459	4.460	-0.001	1.000	26950	0.2312	410	
33 Perfluorotetradecanoic acid	712.50	> 668.90	4.702	4.703	0.0	1.000	76308	0.3354	98.7	
	713.00	> 169.00	4.693	4.703	-0.009	0.998	12990	5.87(0.00-0.00)	5324	
D 32 13C2-PFTeDA	715.00	> 670.00	4.702	4.703	0.0	16746967	72.4	145	6038021	
35 Perfluorohexadecanoic acid	813.00	> 769.00	5.120	5.122	-0.002	1.000	84192	-0.0636	147	
D 34 13C2-PFHxDA	815.00	> 770.00	5.120	5.122	-0.002	6590246	50.8	102	260449	
36 Perfluorooctadecanoic acid	913.00	> 869.00	5.475	5.476	-0.001	1.000	6337	0.0520	7.6	

[QC Flag Legend](#)

Processing Flags

NR - Missing Quant Standard

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b\03DEC2016C_008.d

Injection Date: 03-Dec-2016 19:33:46

Instrument ID: A8_N

Lims ID: MB 320-139316/1-A

Client ID:

Operator ID: A8-PC\A8

ALS Bottle#: 13

Worklist Smp#: 8

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

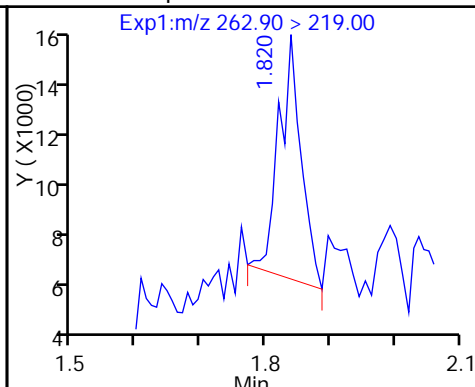
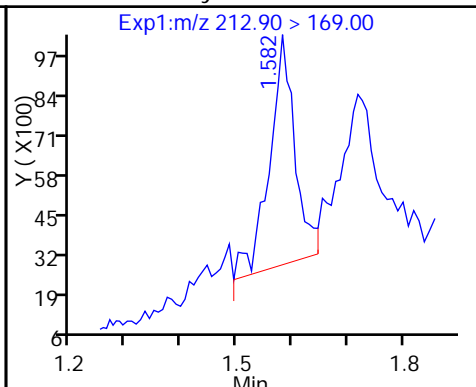
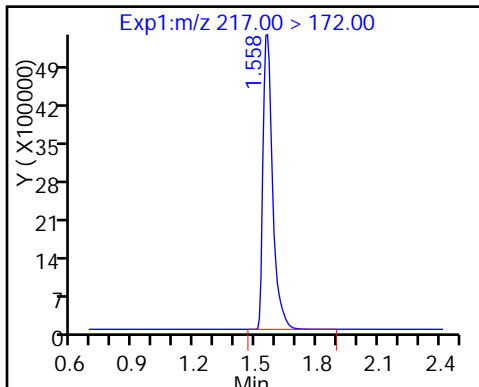
Method: A8_N

Limit Group: LC PFC_DOD ICAL

D 2 13C4 PFBA

1 Perfluorobutyric acid

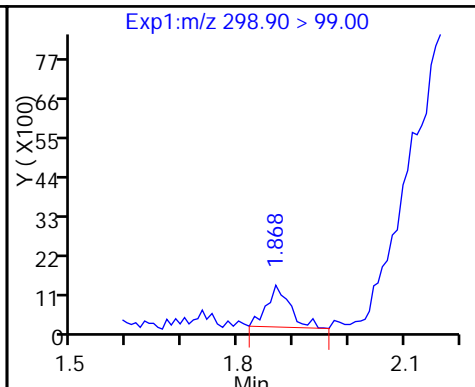
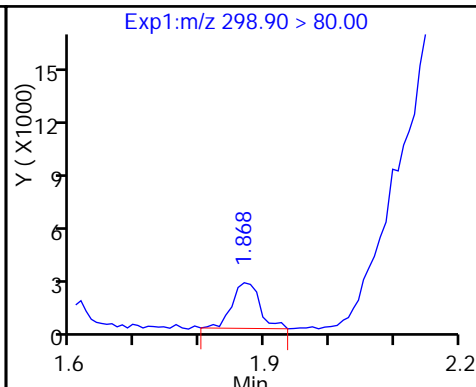
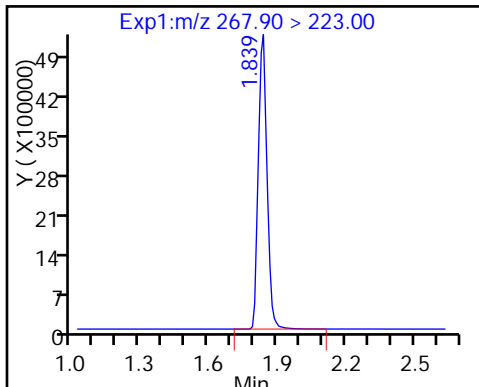
3 Perfluoropentanoic acid



D 4 13C5-PFPeA

5 Perfluorobutanesulfonic acid

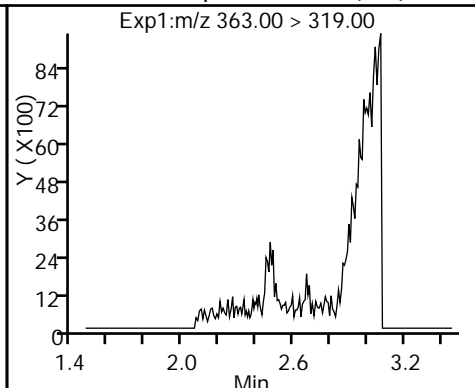
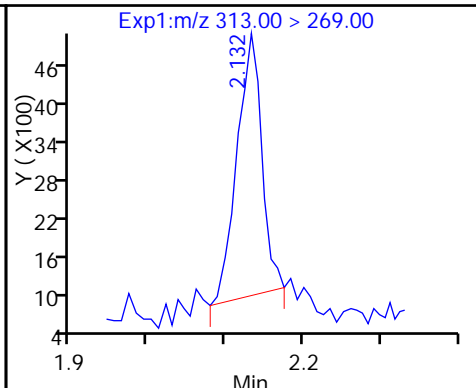
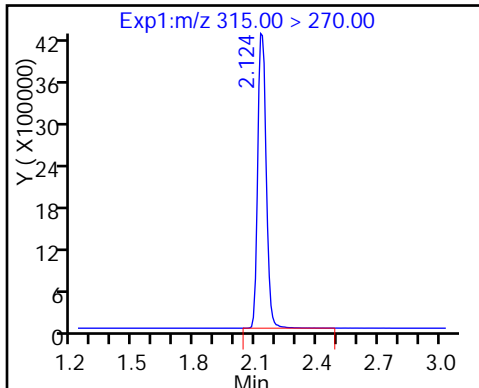
5 Perfluorobutanesulfonic acid



D 6 13C2 PFHxA

7 Perfluorohexanoic acid

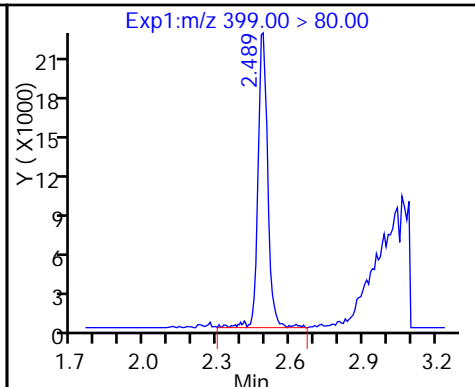
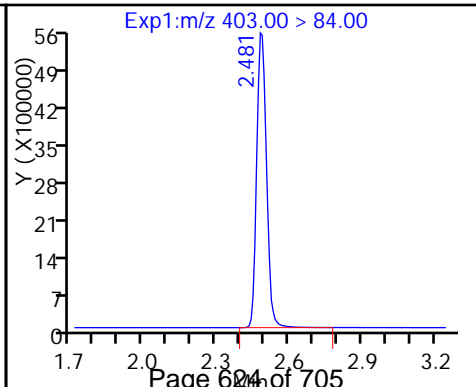
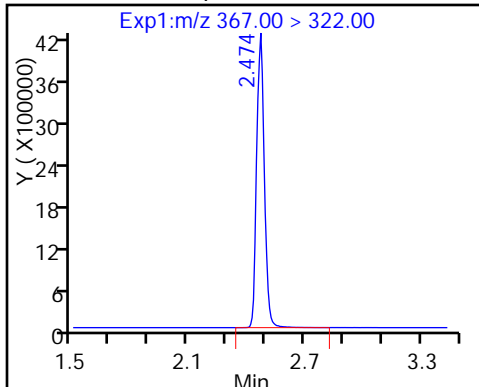
12 Perfluoroheptanoic acid (ND)



D 11 13C4-PFHpA

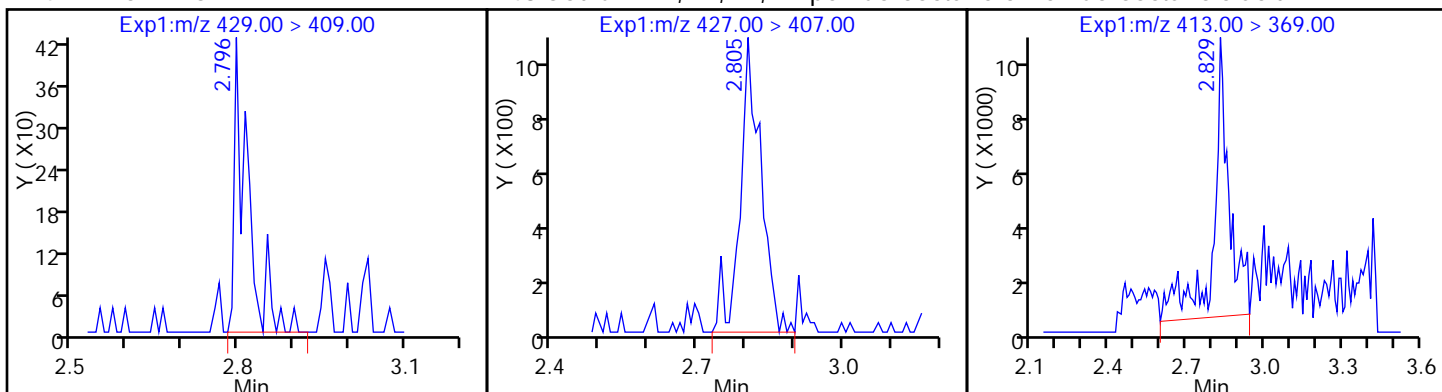
D 10 18O2 PFHxS

9 Perfluorohexanesulfonic acid



D 47 M2-6:2FTS

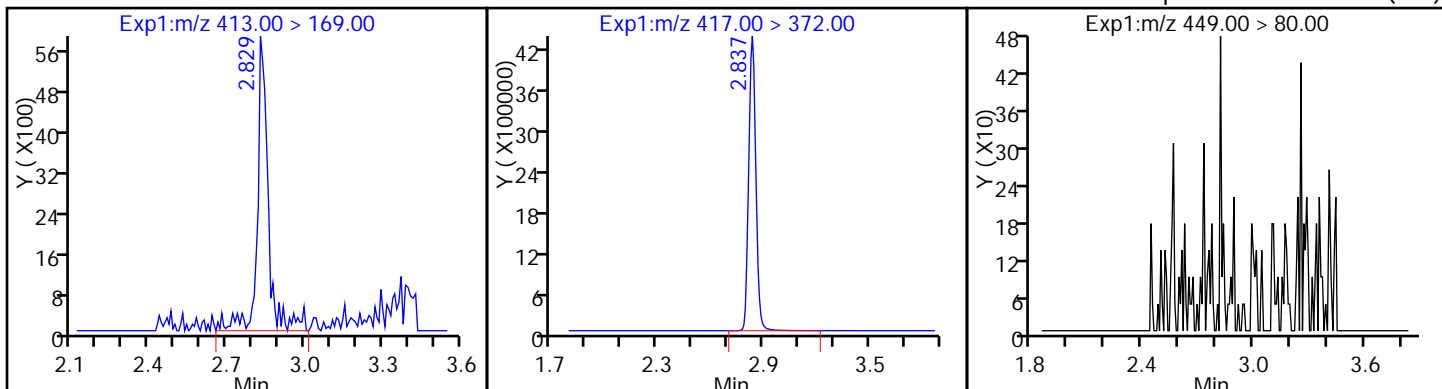
48 Sodium 1H,1H,2H,2H-perfluorooctane15 Perfluorooctanoic acid



15 Perfluorooctanoic acid

D 14 13C4 PFOA

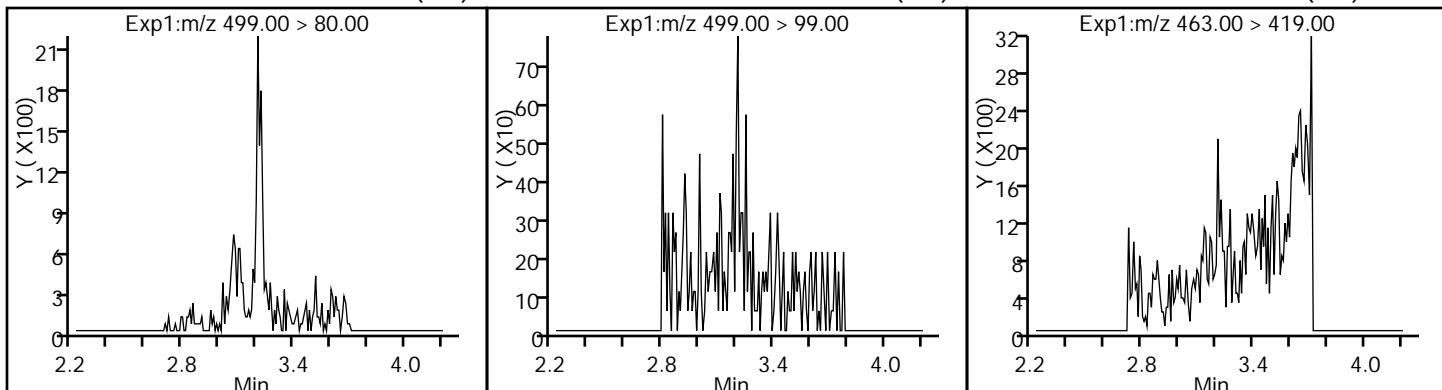
13 Perfluoroheptanesulfonic Acid (ND)



18 Perfluorooctane sulfonic acid (ND)

18 Perfluorooctane sulfonic acid (ND)

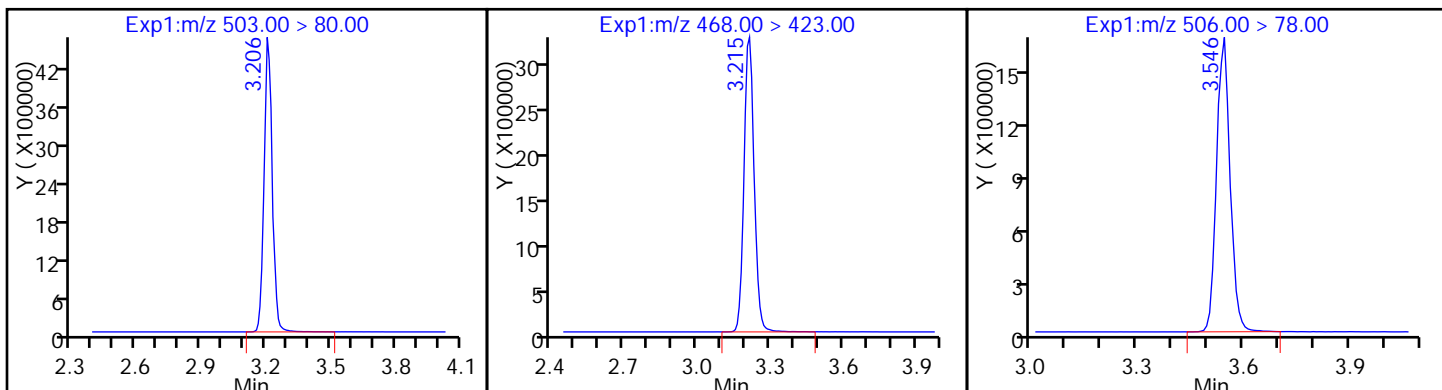
20 Perfluorononanoic acid (ND)



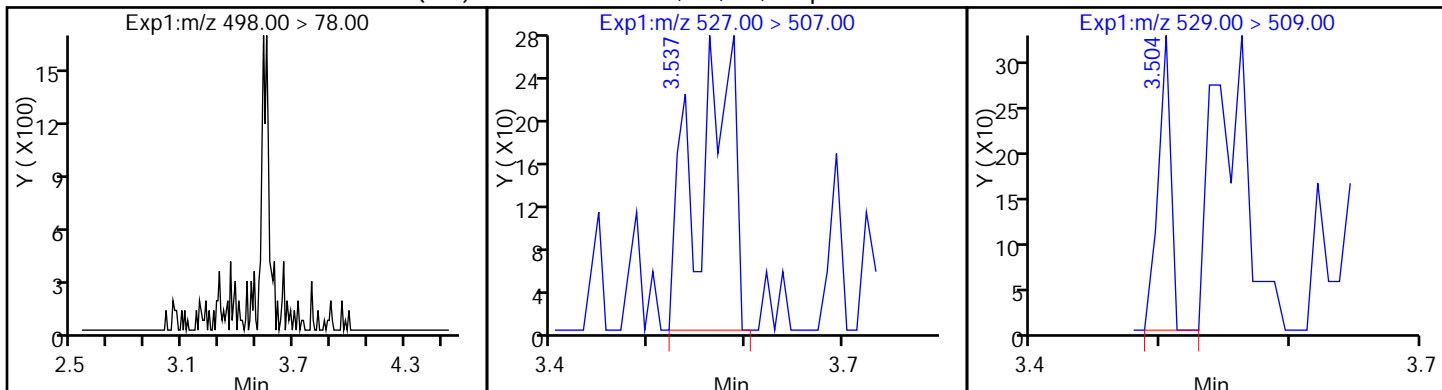
D 17 13C4 PFOS

D 19 13C5 PFNA

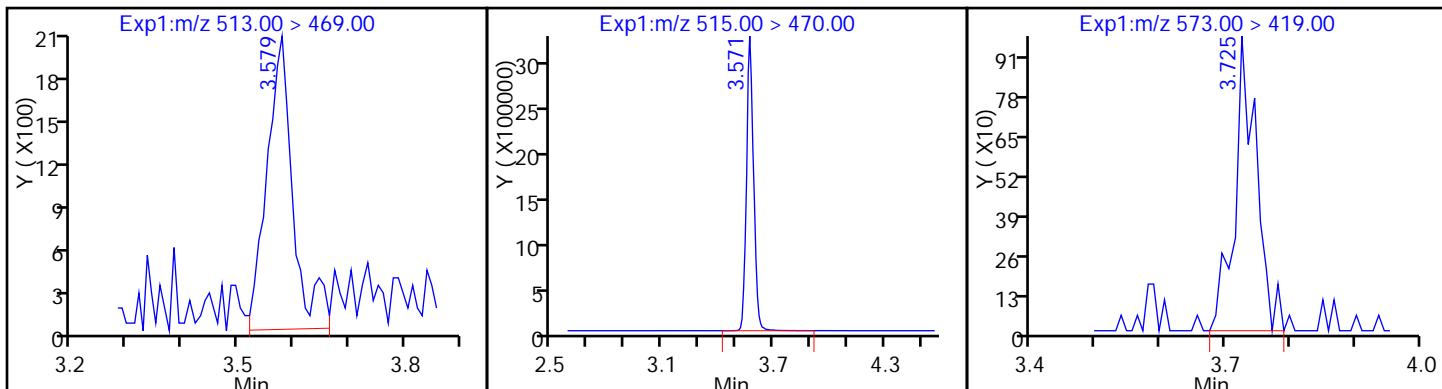
D 21 13C8 FOSA



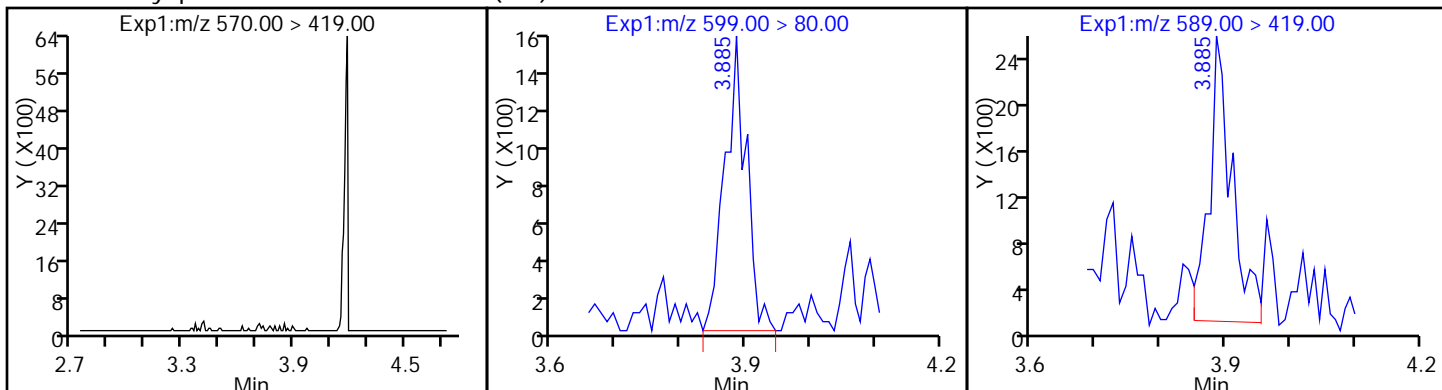
22 Perfluorooctane Sulfonamide (ND) 43 Sodium 1H,1H,2H,2H-perfluorooctane Sulfonate 42 M2-8:2FTS



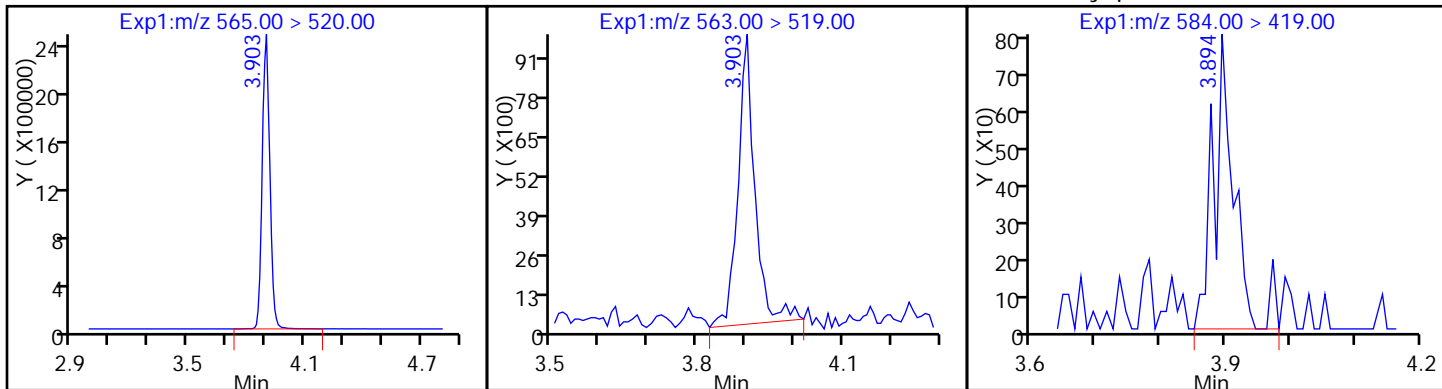
24 Perfluorodecanoic acid D 23 13C2 PFDA D 45 d3-NMeFOSAA

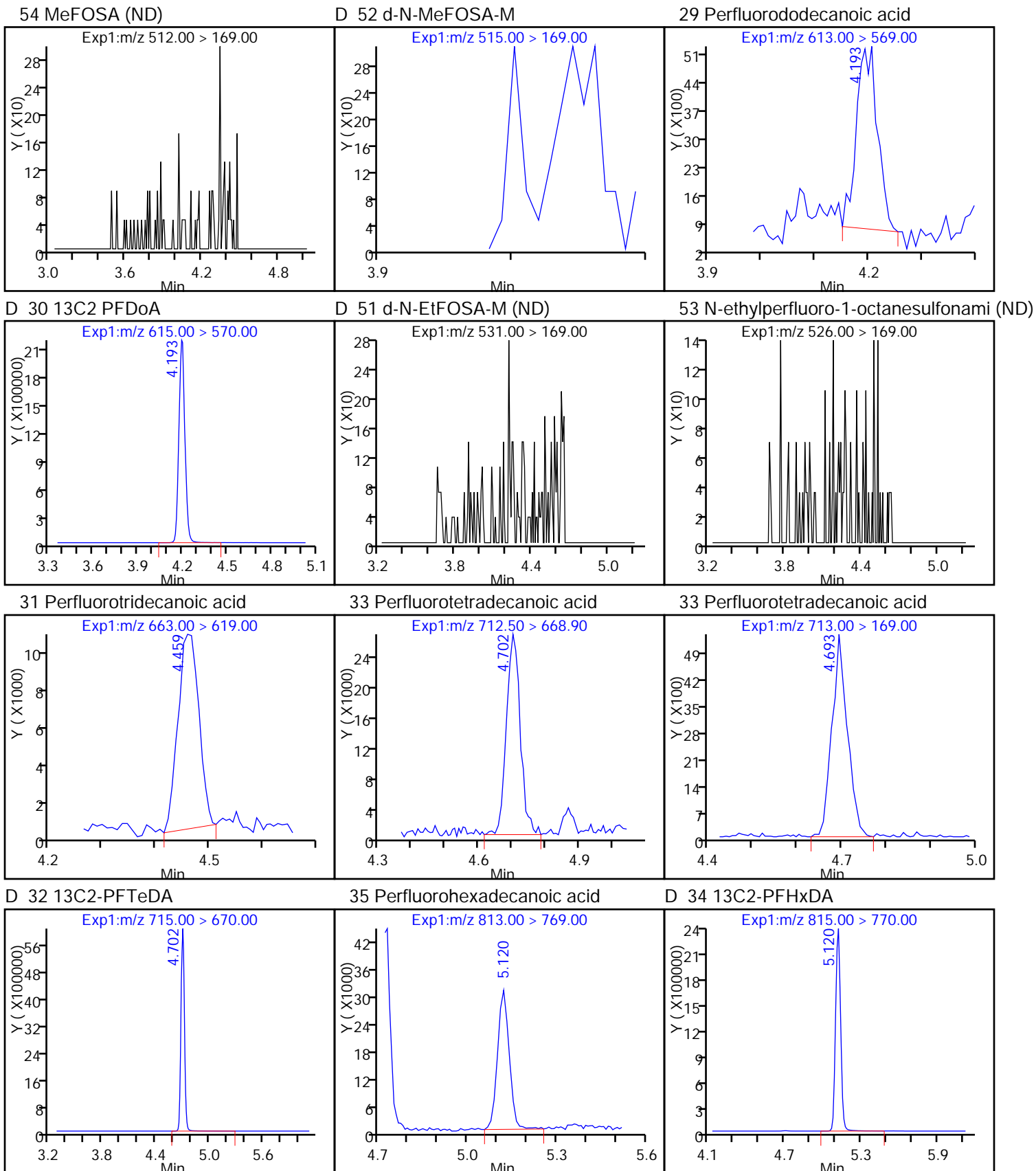


44 N-methyl perfluorooctane sulfonamide (ND) 46 Perfluorodecane Sulfonic acid D 46 d5-NEtFOSAA

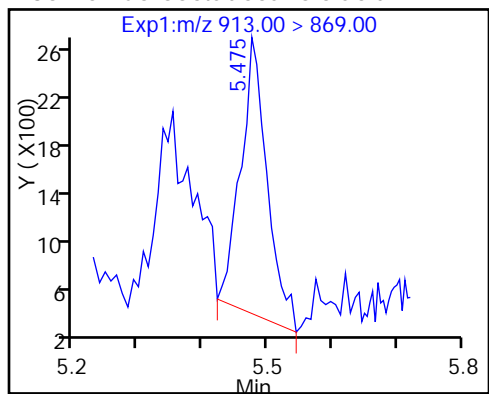


D 27 13C2 PFUnA 28 Perfluoroundecanoic acid 49 N-ethyl perfluorooctane sulfonamide





36 Perfluorooctadecanoic acid



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23696-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: LCS 320-139316/2-A
 Matrix: Water Lab File ID: 03DEC2016C_009.d
 Analysis Method: 537 (Modified) Date Collected: _____
 Extraction Method: 3535 Date Extracted: 11/23/2016 11:47
 Sample wt/vol: 500 (mL) Date Analyzed: 12/03/2016 19:41
 Con. Extract Vol.: 1.0 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: Acquity ID: 2.1 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 140675 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	38.7		2.5	2.0	0.92
375-85-9	Perfluoroheptanoic acid (PFHpA)	40.1		2.5	2.0	0.80
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	34.7		2.5	2.0	0.87
375-95-1	Perfluorononanoic acid (PFNA)	39.8		2.5	2.0	0.65
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	36.5		4.0	3.0	1.3
335-67-1	Perfluorooctanoic acid (PFOA)	38.8		2.5	2.0	0.75

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	120		25-150
STL00991	13C4 PFOS	111		25-150
STL01892	13C4-PFHpA	120		25-150
STL00995	13C5 PFNA	119		25-150
STL00994	18O2 PFHxS	115		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b\03DEC2016C_009.d
 Lims ID: LCS 320-139316/2-A
 Client ID:
 Sample Type: LCS
 Inject. Date: 03-Dec-2016 19:41:17 ALS Bottle#: 14 Worklist Smp#: 9
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: lcs 320-139316/2-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: A8-PC\A8 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 06-Dec-2016 15:49:08 Calib Date: 03-Dec-2016 15:33:40
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d
 Column 1 : Det: EXP1
 Process Host: XAWRK027

First Level Reviewer: chandrasenas Date: 06-Dec-2016 15:50:41

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	1.553	1.549	0.003	19739830	58.8		118	1024105	
1 Perfluorobutyric acid	212.90 > 169.00	1.561	1.558	0.003	7275131	21.1		105	42843	
3 Perfluoropentanoic acid	262.90 > 219.00	1.842	1.829	0.013	6191607	19.9		99.7	54621	
D 4 13C5-PFPeA	267.90 > 223.00	1.842	1.829	0.013	15301194	57.8		116	1104627	
5 Perfluorobutanesulfonic acid	298.90 > 80.00	1.871	1.877	-0.006	11061657	19.4		109		
	298.90 > 99.00	1.871	1.877	-0.006	4820547		2.29(0.00-0.00)			
D 6 13C2 PFHxA	315.00 > 270.00	2.133	2.129	0.004	13274190	55.9		112	807201	
7 Perfluorohexanoic acid	313.00 > 269.00	2.133	2.138	-0.005	5223477	20.6		103	108635	
12 Perfluoroheptanoic acid	363.00 > 319.00	2.471	2.466	0.005	5107764	20.1		100	58725	
D 11 13C4-PFHpA	367.00 > 322.00	2.471	2.473	-0.002	12400368	59.8		120	907045	
D 10 18O2 PFHxS	403.00 > 84.00	2.486	2.481	0.005	16938278	54.2		115	2054913	
9 Perfluorohexanesulfonic acid	399.00 > 80.00	2.486	2.496	-0.010	6811386	17.3		95.2		
15 Perfluorooctanoic acid	413.00 > 369.00	2.834	2.836	-0.002	5456468	19.4		97.0	121222	
	413.00 > 169.00	2.834	2.836	-0.002	3310646		1.65(0.90-1.10)		104205	
D 14 13C4 PFOA	417.00 > 372.00	2.834	2.836	-0.002	13113137	59.8		120	766203	

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	2.850	2.845	0.005	1.000	6264975	19.5	103		
18 Perfluorooctane sulfonic acid	499.00 > 80.00	3.213	3.215	-0.002	1.000	5392394	18.2	98.3	367386	
	499.00 > 99.00	3.213	3.215	-0.002	1.000	1143167		4.72(0.90-1.10)	115834	
20 Perfluorononanoic acid	463.00 > 419.00	3.213	3.215	-0.002	1.000	3924933	19.9	99.6	59080	
D 17 13C4 PFOS	503.00 > 80.00	3.213	3.215	-0.002		13015373	52.9	111	538734	
D 19 13C5 PFNA	468.00 > 423.00	3.213	3.215	-0.002		9892674	59.4	119	403313	
D 21 13C8 FOSA	506.00 > 78.00	3.537	3.537	0.0		7807054	19.4	38.8	446777	
22 Perfluorooctane Sulfonamide	498.00 > 78.00	3.537	3.546	-0.009	1.000	3030755	20.8	104	175082	
24 Perfluorodecanoic acid	513.00 > 469.00	3.570	3.571	-0.001	1.000	3535285	20.3	102	103519	
D 23 13C2 PFDA	515.00 > 470.00	3.570	3.580	-0.010		9044687	57.3	115	447859	
26 Perfluorodecane Sulfonic acid	599.00 > 80.00	3.877	3.879	-0.002	1.000	3365630	19.3	100		
D 27 13C2 PFUnA	565.00 > 520.00	3.903	3.897	0.006		6632274	55.8	112	469914	
28 Perfluoroundecanoic acid	563.00 > 519.00	3.895	3.897	-0.002	1.000	2491656	17.6	88.1	56546	
29 Perfluorododecanoic acid	613.00 > 569.00	4.195	4.193	0.002	1.000	2393774	20.0	100	51506	
D 30 13C2 PFDaA	615.00 > 570.00	4.195	4.193	0.002		6306401	56.3	113	227621	
31 Perfluorotridecanoic acid	663.00 > 619.00	4.463	4.460	0.003	1.000	2497796	20.8	104	36475	
33 Perfluorotetradecanoic acid	712.50 > 668.90	4.705	4.703	0.003	1.000	5385397	23.0	115	8459	
	713.00 > 169.00	4.697	4.703	-0.005	0.998	902213		5.97(0.00-0.00)	108293	
D 32 13C2-PFTeDA	715.00 > 670.00	4.697	4.703	-0.005		15353007	66.4	133	1346820	
35 Perfluorohexadecanoic acid	813.00 > 769.00	5.112	5.122	-0.010	1.000	2552534	19.6	98.1	4732	
D 34 13C2-PFHxDA	815.00 > 770.00	5.112	5.122	-0.010		7043708	54.3	109	163235	
36 Perfluorooctadecanoic acid	913.00 > 869.00	5.477	5.476	0.001	1.000	2591201	20.7	103	2747	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b\03DEC2016C_009.d

Injection Date: 03-Dec-2016 19:41:17

Instrument ID: A8_N

Lims ID: LCS 320-139316/2-A

Client ID:

Operator ID: A8-PC\A8

ALS Bottle#: 14

Worklist Smp#: 9

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

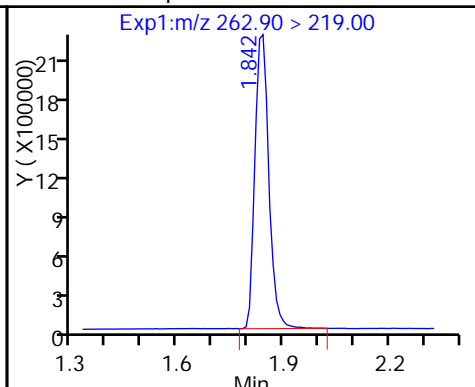
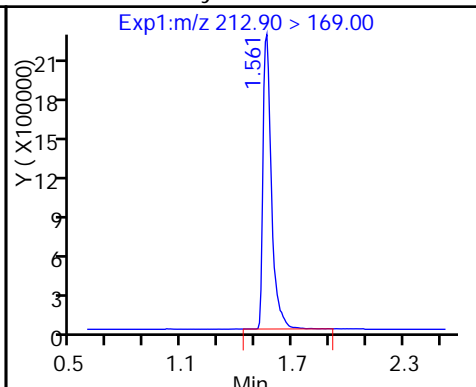
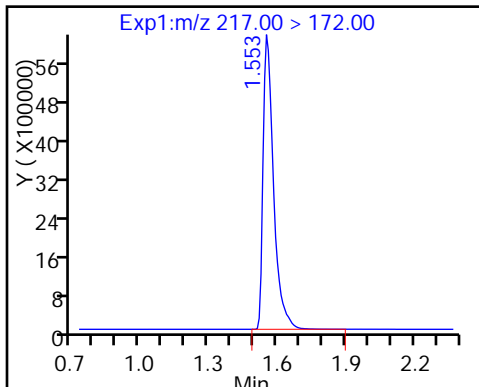
Method: A8_N

Limit Group: LC PFC_DOD ICAL

D 2 13C4 PFBA

1 Perfluorobutyric acid

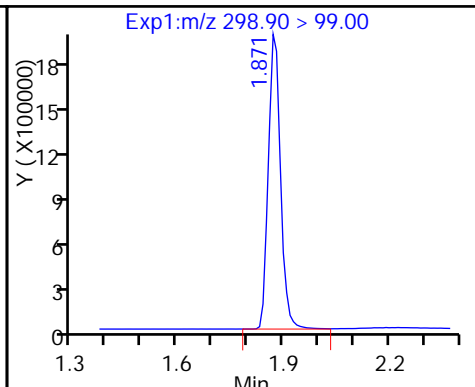
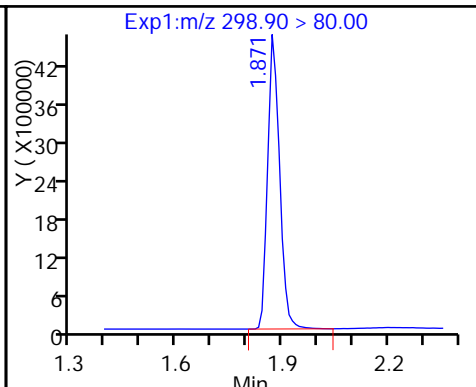
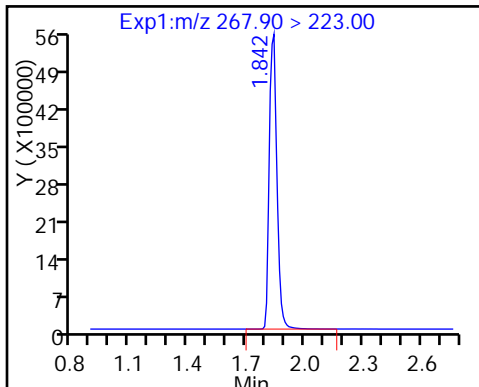
3 Perfluoropentanoic acid



D 4 13C5-PFPeA

5 Perfluorobutanesulfonic acid

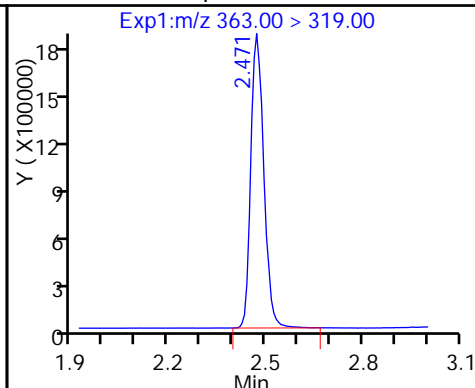
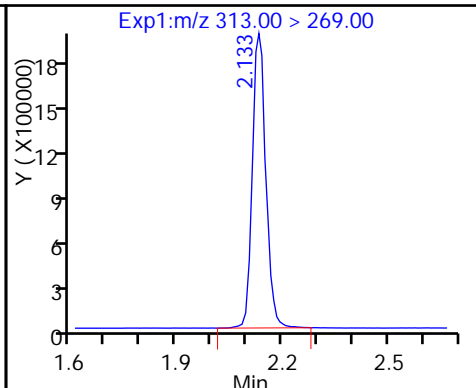
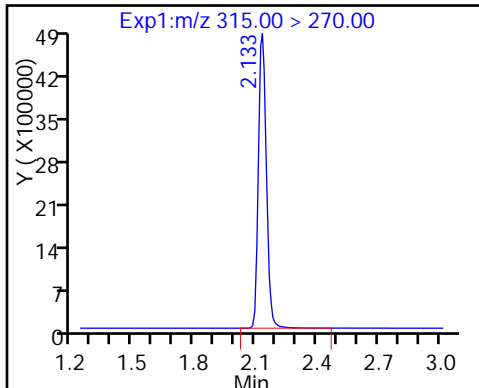
5 Perfluorobutanesulfonic acid



D 6 13C2 PFHxA

7 Perfluorohexanoic acid

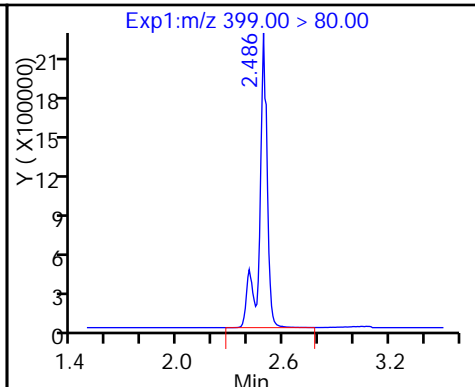
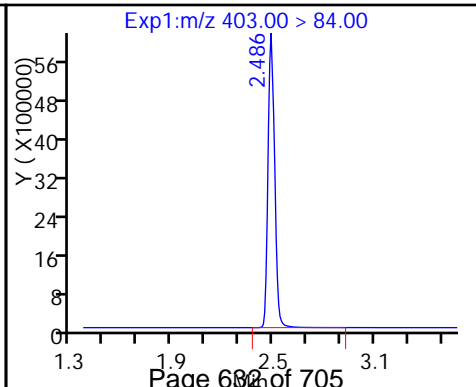
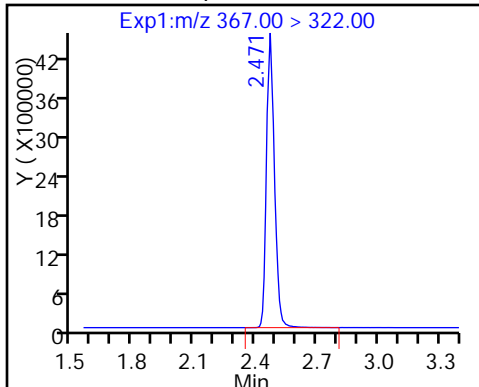
12 Perfluoroheptanoic acid

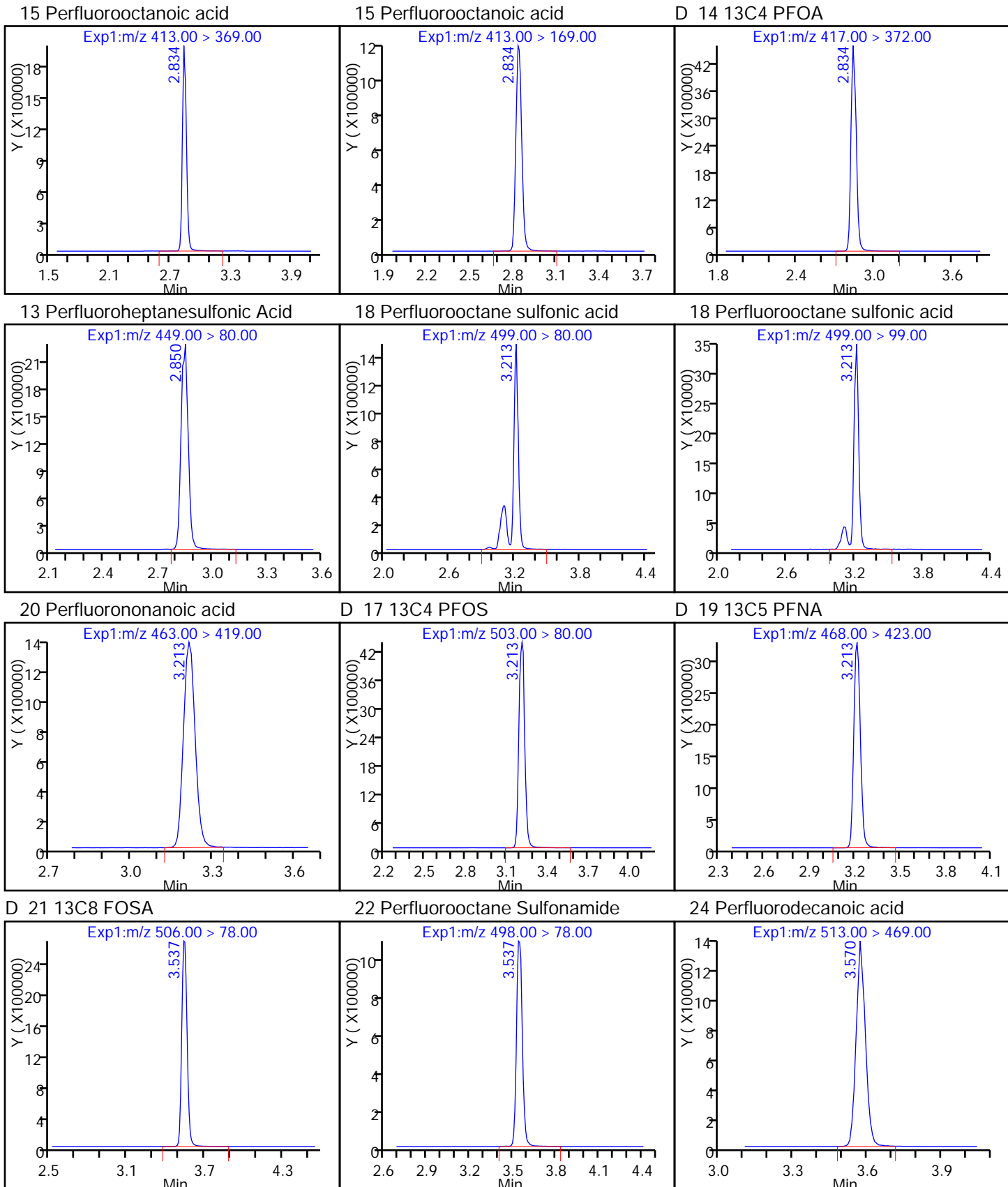


D 11 13C4-PFHpA

D 10 18O2 PFHxS

9 Perfluorohexanesulfonic acid

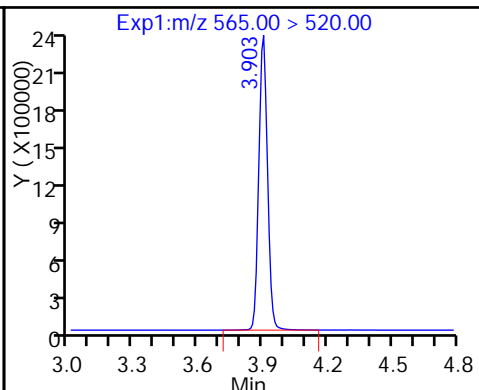
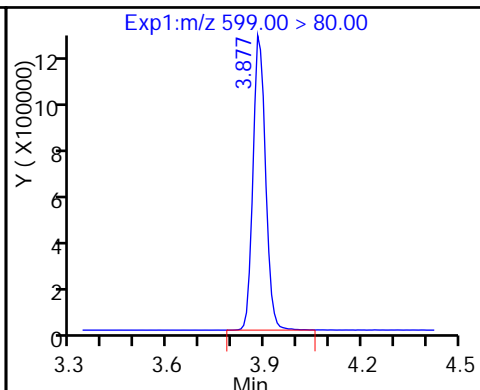
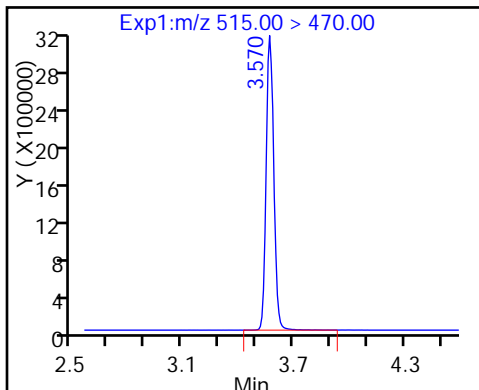




D 23 13C2 PFDA

26 Perfluorodecane Sulfonic acid

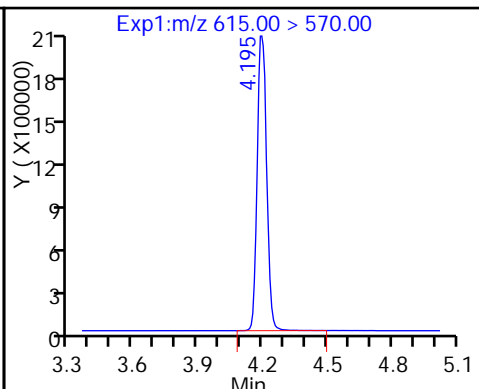
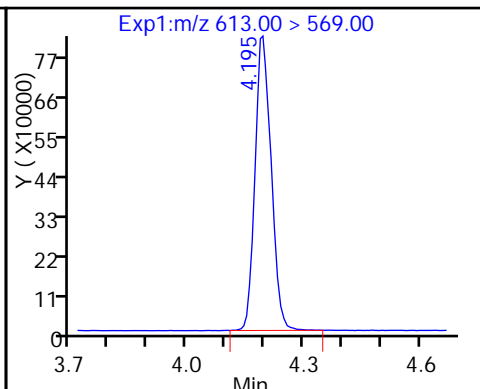
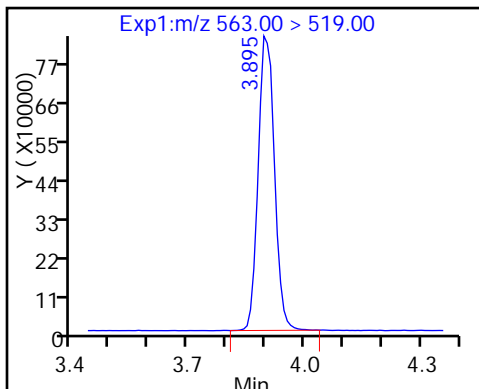
D 27 13C2 PFUa



28 Perfluoroundecanoic acid

29 Perfluorododecanoic acid

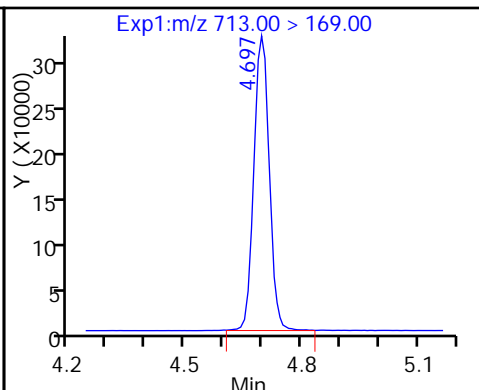
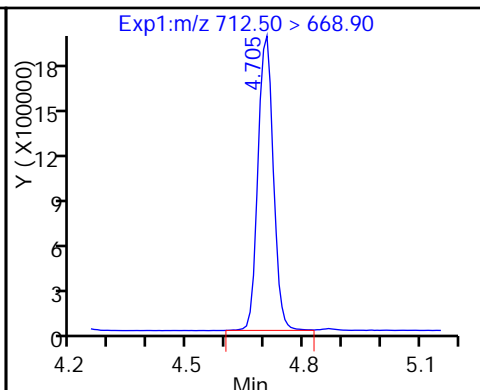
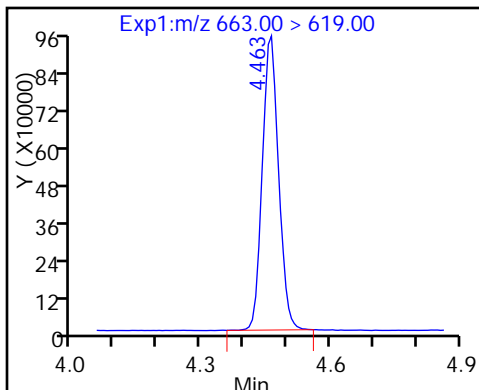
D 30 13C2 PFDa



31 Perfluorotridecanoic acid

33 Perfluorotetradecanoic acid

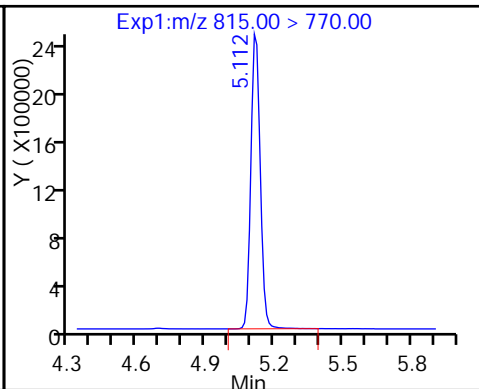
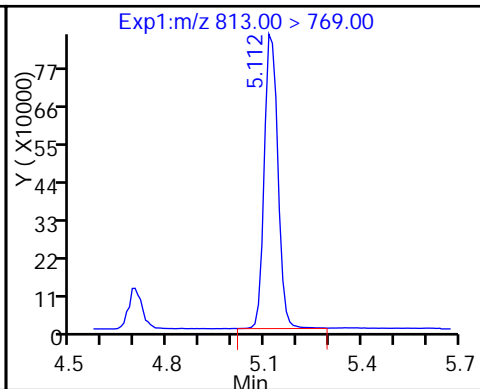
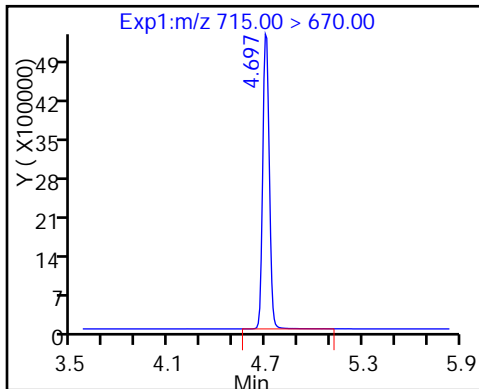
33 Perfluorotetradecanoic acid



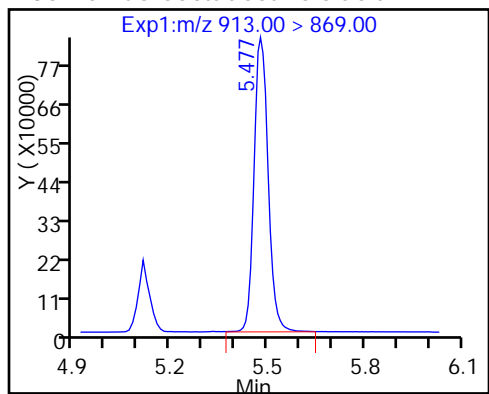
D 32 13C2-PFTeDA

35 Perfluorohexadecanoic acid

D 34 13C2-PFHxDA



36 Perfluorooctadecanoic acid



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23696-1
 SDG No.: _____
 Client Sample ID: MCFSMWFM-01 MS Lab Sample ID: 320-23696-3 MS
 Matrix: Water Lab File ID: 07DEC2016C_012.d
 Analysis Method: 537 (Modified) Date Collected: 11/16/2016 11:11
 Extraction Method: 3535 Date Extracted: 11/23/2016 11:47
 Sample wt/vol: 481.5 (mL) Date Analyzed: 12/07/2016 22:48
 Con. Extract Vol.: 1.0 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: Acquity ID: 2.1 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 141150 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	58.8		2.6	2.1	0.95
375-85-9	Perfluoroheptanoic acid (PFHpA)	131		2.6	2.1	0.83
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	147	M	2.6	2.1	0.90
375-95-1	Perfluorononanoic acid (PFNA)	425	J 4	2.6	2.1	0.68
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	236	4	4.2	3.1	1.3
335-67-1	Perfluorooctanoic acid (PFOA)	126	M	2.6	2.1	0.78

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	94		25-150
STL00991	13C4 PFOS	99		25-150
STL01892	13C4-PFHpA	96		25-150
STL00995	13C5 PFNA	72		25-150
STL00994	18O2 PFHxS	96		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161208-37624.b\07DEC2016C_012.d
 Lims ID: 320-23696-A-3-B MS
 Client ID: MCFSMWFM-01
 Sample Type: MS
 Inject. Date: 07-Dec-2016 22:48:16 ALS Bottle#: 47 Worklist Smp#: 12
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-23696-a-3-b ms
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: A8-PC\A8 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20161208-37624.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 08-Dec-2016 09:14:55 Calib Date: 03-Dec-2016 15:33:40
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d
 Column 1 : Det: EXP1
 Process Host: XAWRK027

First Level Reviewer: chandrasenas Date: 08-Dec-2016 09:14:55

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	1.542	-0.008	3459199	10.3		20.6	235492	
1 Perfluorobutyric acid	212.90 > 169.00	1.542	1.542	0.0	2909278	48.1		241	4262	
D 4 13C5-PFPeA	267.90 > 223.00	1.810	1.820	-0.010	7512204	28.4		56.8	216889	
3 Perfluoropentanoic acid	262.90 > 219.00	1.810	1.820	-0.010	13622010	89.3		447	4644	
5 Perfluorobutanesulfonic acid	298.90 > 80.00	1.848	1.858	-0.010	13490701	28.3		160		
	298.90 > 99.00	1.848	1.858	-0.010	5695805		2.37(0.00-0.00)			
7 Perfluorohexanoic acid	313.00 > 269.00	2.093	2.100	-0.007	21428548	121.1		605	50134	
D 6 13C2 PFHxA	315.00 > 270.00	2.093	2.109	-0.016	9285411	39.1		78.2	343607	
9 Perfluorohexanesulfonic acid	399.00 > 80.00	2.452	2.372	0.080	23188782	70.8		389		M
										M
12 Perfluoroheptanoic acid	363.00 > 319.00	2.437	2.438	-0.001	13015398	63.3		317	43628	
D 11 13C4-PFHpA	367.00 > 322.00	2.430	2.438	-0.008	10007284	48.2		96.5	491185	
D 10 18O2 PFHxS	403.00 > 84.00	2.452	2.455	-0.003	14121590	45.2		95.6	416128	
48 Sodium 1H,1H,2H,2H-perfluorooctane	427.00 > 407.00	2.773	2.774	-0.001	25286471	NR		0.0		
D 47 M2-6:2FTS	429.00 > 409.00	2.765	2.774	-0.009	1485234	14.1		0.0		

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.796	2.796	0.0	1.000	13394743	60.9		304	62641	M
413.00 > 169.00	2.796	2.796	0.0	1.000	8574619		1.56(0.90-1.10)		431006	
D 14 13C4 PFOA										
417.00 > 372.00	2.796	2.804	-0.008		10266080	46.8		93.6	446559	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.813	2.804	0.009	1.000	6411370	22.4		118		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.054	3.147	-0.093	1.000	30011239	113.6		612	396601	
499.00 > 99.00	3.172	3.147	0.025	1.039	6316189		4.75(0.90-1.10)		857210	
D 17 13C4 PFOS										
503.00 > 80.00	3.172	3.163	0.009		11632809	47.3		98.9	272520	
20 Perfluorononanoic acid										E
463.00 > 419.00	3.172	3.171	0.001	1.000	24252165	204.4		1022	72937	E
D 19 13C5 PFNA										
468.00 > 423.00	3.172	3.171	0.001		5954510	35.8		71.6	504693	
D 21 13C8 FOSA										
506.00 > 78.00	3.509	3.503	0.006		313088	0.7783		1.6	23315	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.509	3.503	0.006	1.000	128231	21.9		110	15591	
D 42 M2-8:2FTS										
529.00 > 509.00	3.517	3.520	-0.003		15458	0.1591		0.0		
43 Sodium 1H,1H,2H,2H-perfluorooctane										
527.00 > 507.00	3.526	3.520	0.006	1.002	268417	NR		0.0		
24 Perfluorodecanoic acid										
513.00 > 469.00	3.534	3.528	0.006	1.000	2131066	22.9		114	25335	
D 23 13C2 PFDA										
515.00 > 470.00	3.526	3.528	-0.002		4846670	30.7		61.4	215496	
D 45 d3-NMeFOSAA										
573.00 > 419.00	3.652	3.683	-0.031		538	0.007418		0.0		
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.836	3.839	-0.003	1.000	3173334	20.4		106		
D 46 d5-NEtFOSAA										
589.00 > 419.00	3.836	3.847	-0.011		5224	0.0656		0.0		
49 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.845	3.856	-0.011	1.002	769	NR		0.0		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.853	3.857	-0.004	1.000	1258751	20.1		100	23768	
D 27 13C2 PFUnA										
565.00 > 520.00	3.853	3.857	-0.004		2940118	24.8		49.5	270790	
D 52 d-N-MeFOSA-M										
515.00 > 169.00	3.905	3.997	-0.092		861	0.008192		0.0		
54 MeFOSA										
512.00 > 169.00	4.253	4.007	0.246	1.000	237	NR		0.0		
29 Perfluorododecanoic acid										
613.00 > 569.00	4.149	4.147	0.002	1.000	1171300	20.7		104	29343	
D 30 13C2 PFDaA										
615.00 > 570.00	4.149	4.154	-0.005		2977430	26.6		53.1	117664	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 51 d-N-EtFOSA-M	531.00	> 169.00	4.220	4.192	0.028	459	0.004629	0.0		
31 Perfluorotridecanoic acid	663.00	> 619.00	4.421	4.418	0.003	1.000	1368342	24.2	121	27332
33 Perfluorotetradecanoic acid	712.50	> 668.90	4.663	4.652	0.011	1.000	2848185	25.8	129	37665
713.00	> 169.00	4.654	4.652	0.002	0.998	458087	6.22(0.00-0.00)		87915	
D 32 13C2-PFTeDA	715.00	> 670.00	4.663	4.652	0.011		8239247	35.6	71.3	422196
D 34 13C2-PFHxDA	815.00	> 770.00	5.069	5.068	0.001		1478397	11.4	22.8	90931
35 Perfluorohexadecanoic acid	813.00	> 769.00	5.069	5.079	-0.010	1.000	598250	9.36	46.8	1823
36 Perfluorooctadecanoic acid	913.00	> 869.00	5.436	5.428	0.008	1.000	452294	7.65	38.3	1964

QC Flag Legend

Processing Flags

NR - Missing Quant Standard

E - Exceeded Maximum Amount

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161208-37624.b\07DEC2016C_012.d

Injection Date: 07-Dec-2016 22:48:16

Instrument ID: A8_N

Lims ID: 320-23696-A-3-B MS

Client ID: MCFSMWFM-01

Operator ID: A8-PC\A8

ALS Bottle#: 47

Worklist Smp#: 12

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

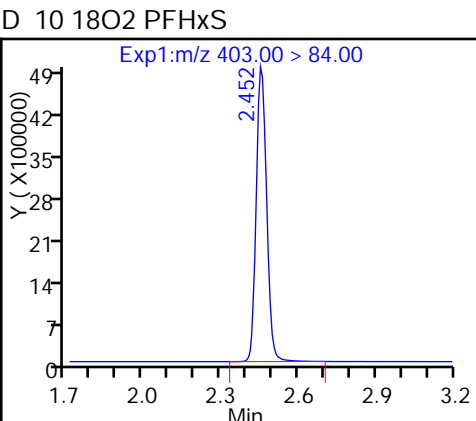
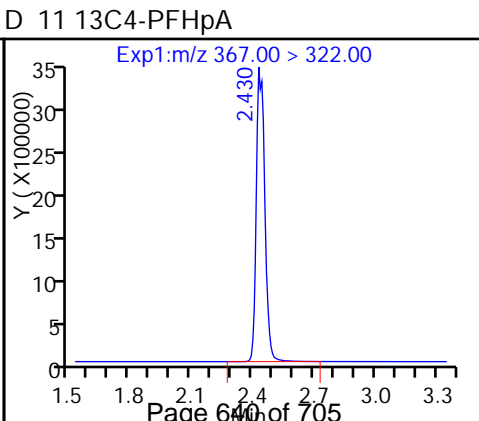
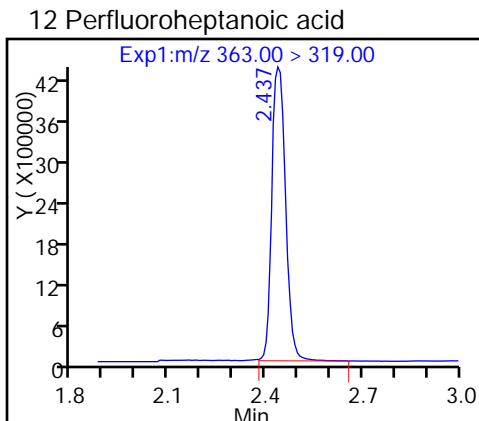
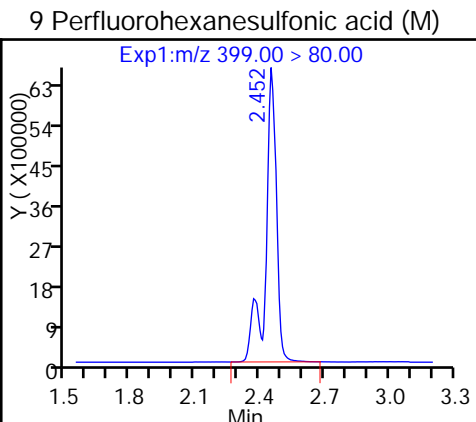
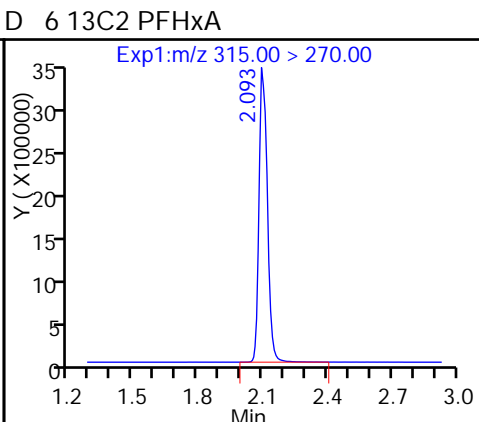
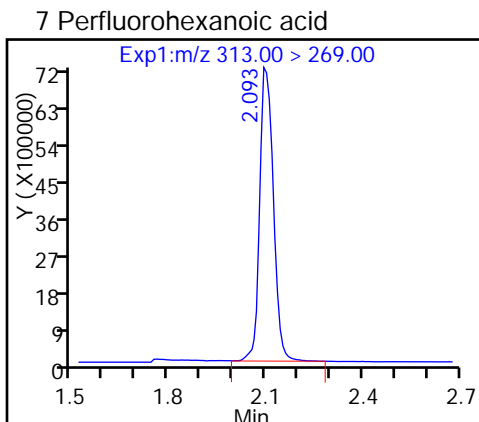
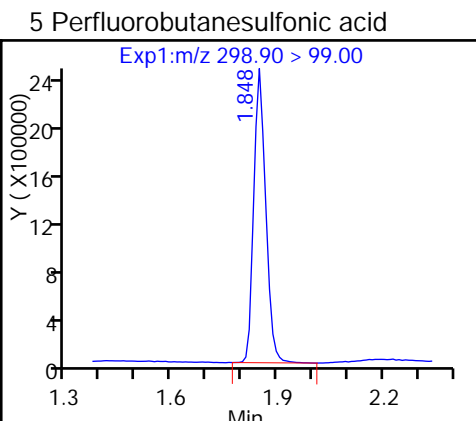
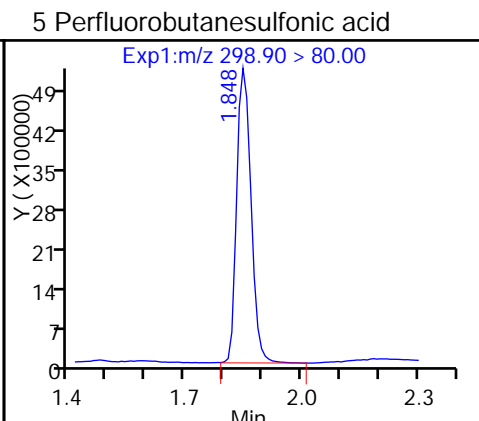
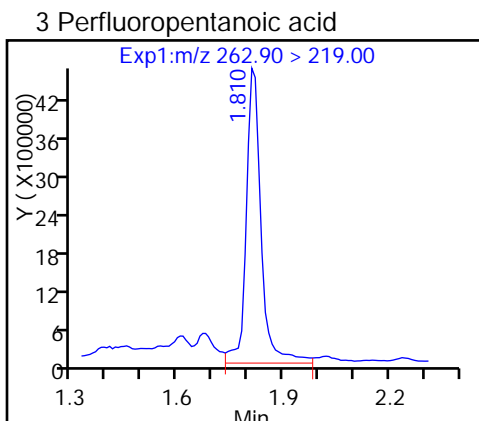
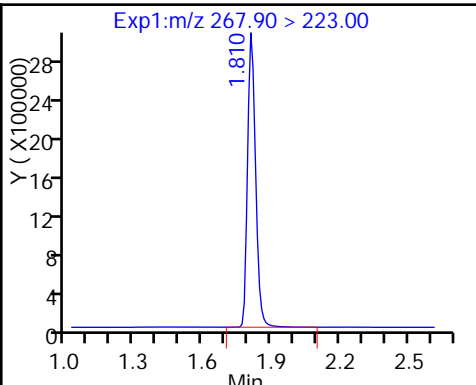
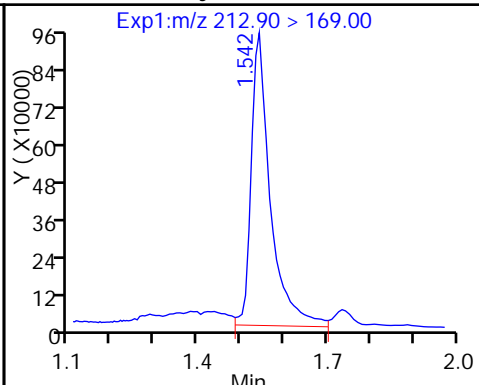
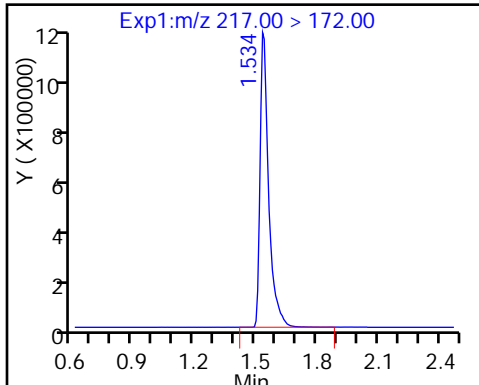
Method: A8_N

Limit Group: LC PFC_DOD ICAL

D 2 13C4 PFBA

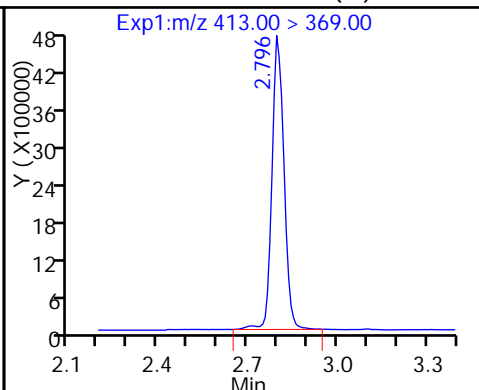
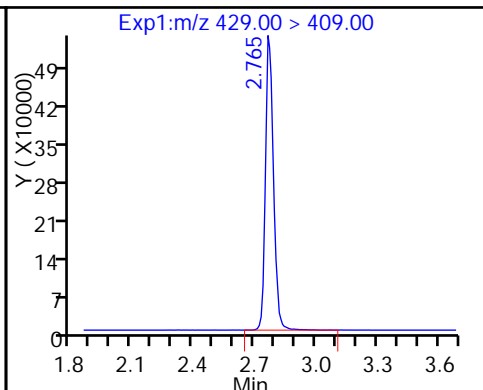
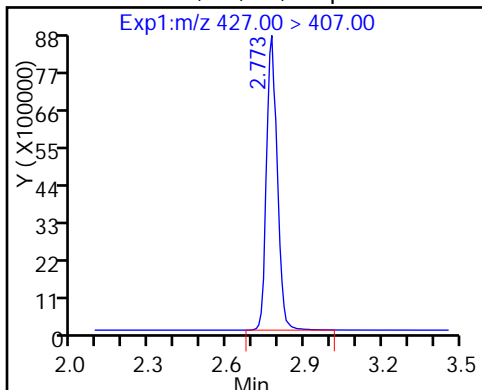
1 Perfluorobutyric acid

D 4 13C5-PFPeA



48 Sodium 1H,1H,2H,2H-perfluorooctanoate

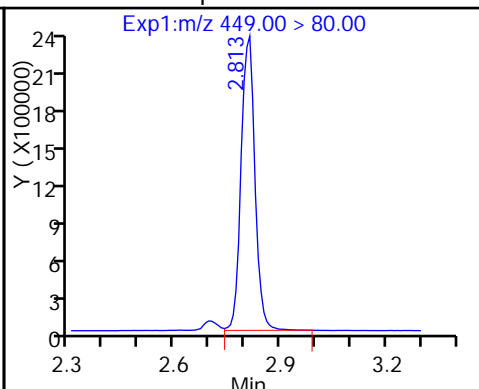
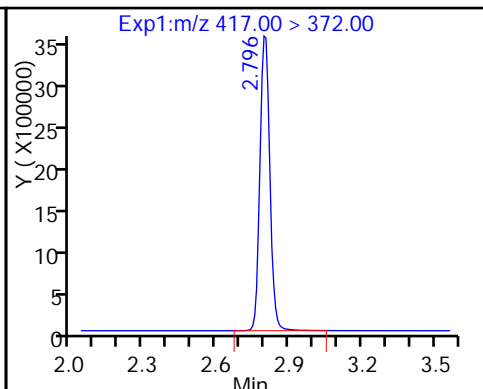
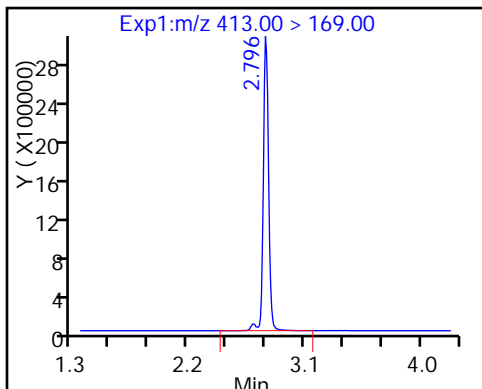
15 Perfluorooctanoic acid (M)



15 Perfluorooctanoic acid

D 14 13C4 PFOA

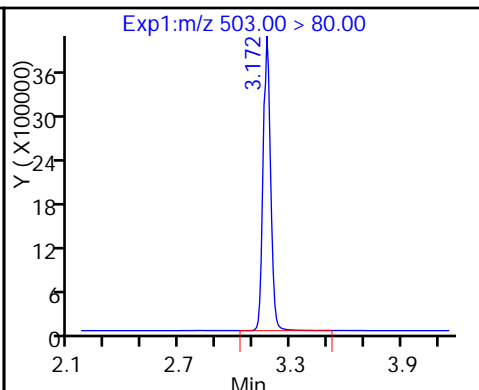
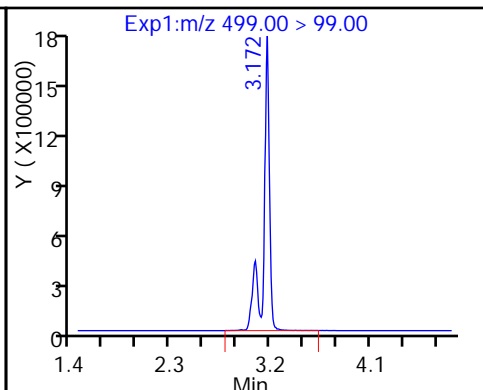
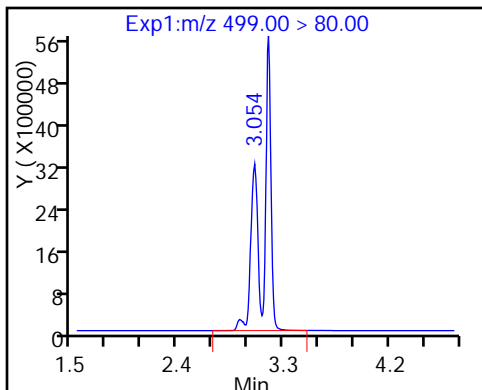
13 Perfluoroheptanesulfonic Acid



18 Perfluorooctane sulfonic acid

18 Perfluorooctane sulfonic acid

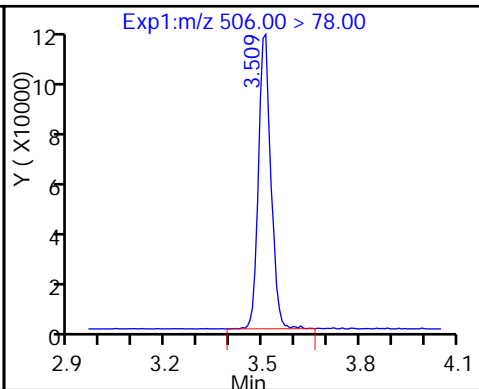
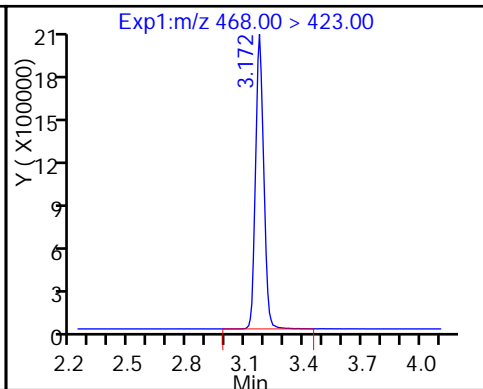
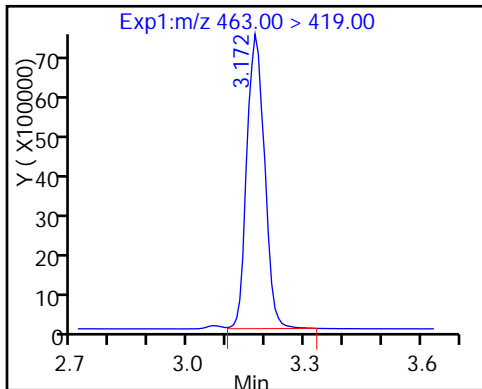
D 17 13C4 PFOS



20 Perfluorononanoic acid

D 19 13C5 PFNA

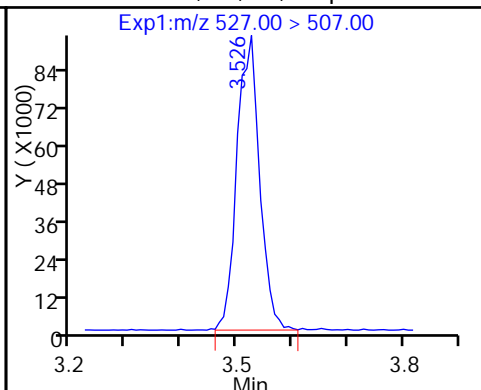
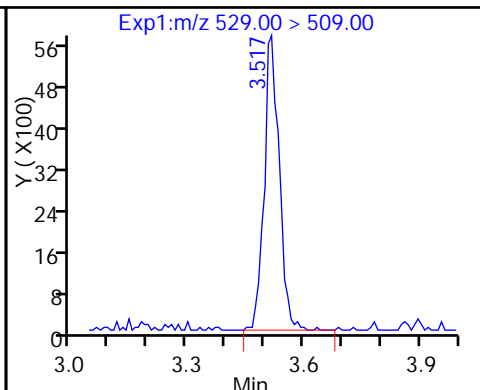
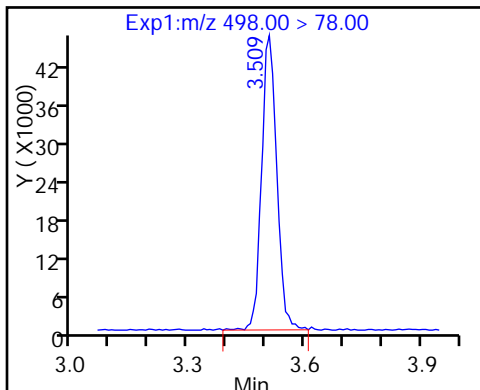
D 21 13C8 FOSA



22 Perfluorooctane Sulfonamide

D 42 M2-8:2FTS

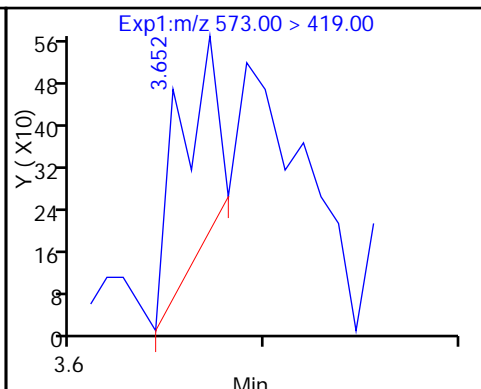
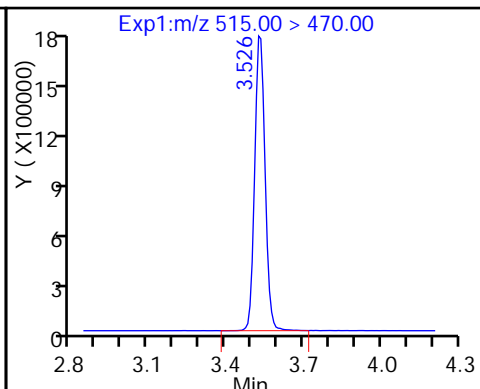
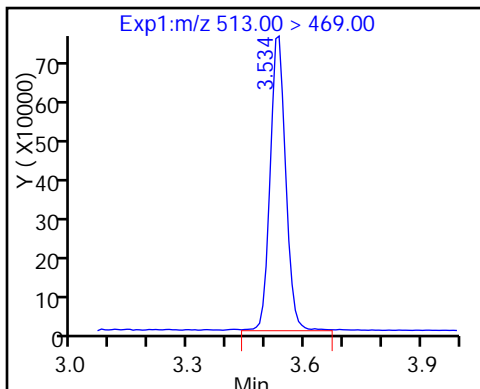
43 Sodium 1H,1H,2H,2H-perfluorooctane



24 Perfluorodecanoic acid

D 23 13C2 PFDA

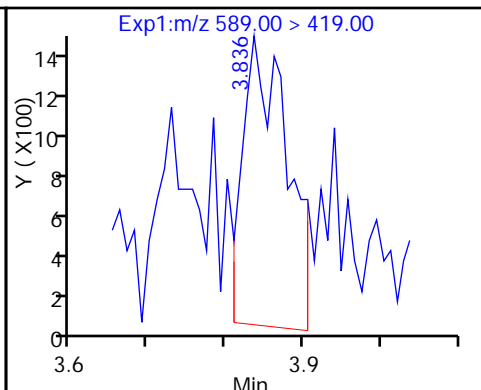
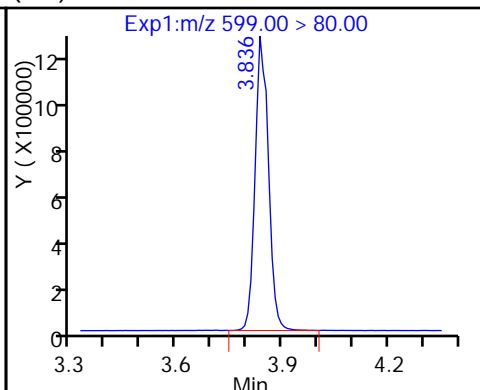
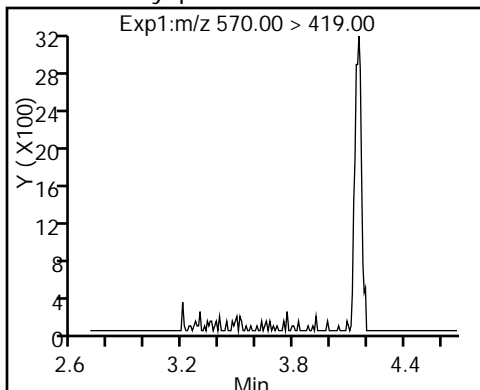
D 45 d3-NMeFOSAA



44 N-methyl perfluorooctane sulfonamide

D 46 d5-NEtFOSAA

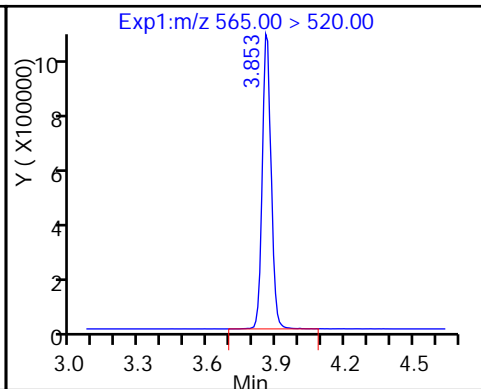
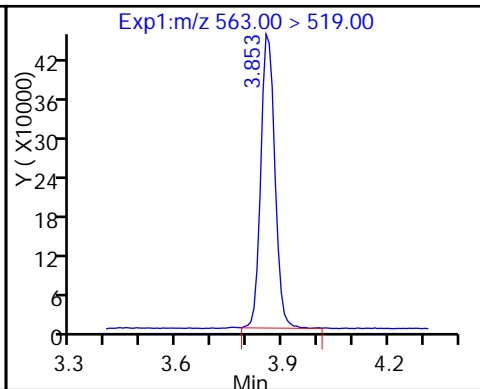
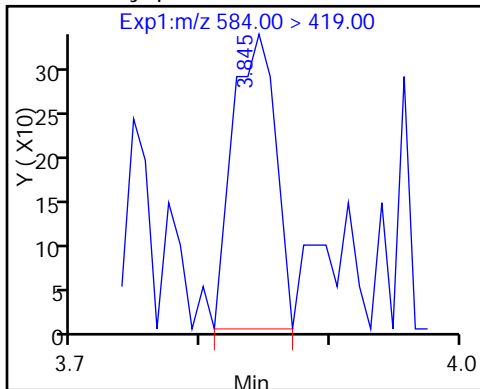
D 46 d5-NEtFOSAA



49 N-ethyl perfluorooctane sulfonamid

28 Perfluoroundecanoic acid

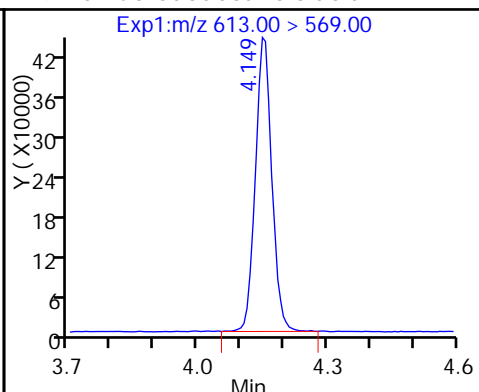
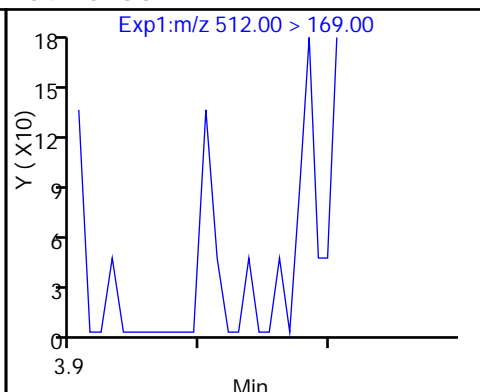
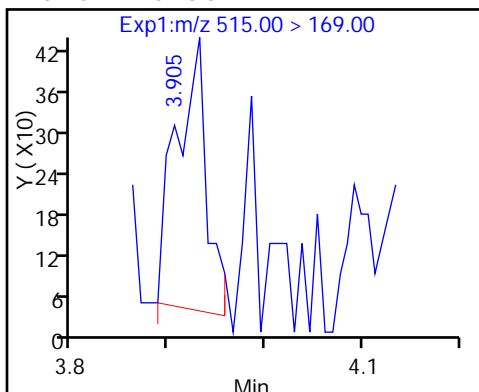
D 27 13C2 PFUnA



D 52 d-N-MeFOSA-M

54 MeFOSA

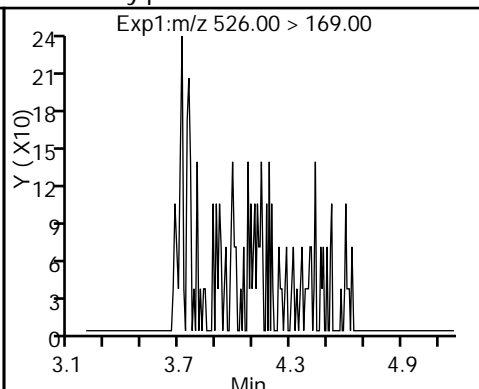
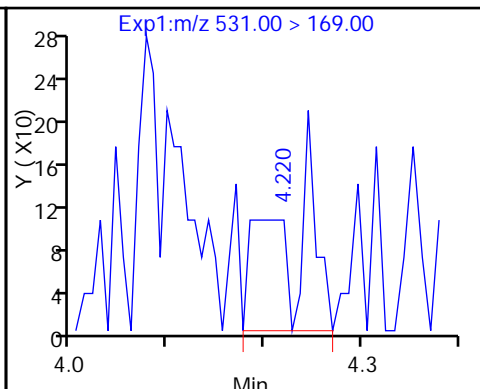
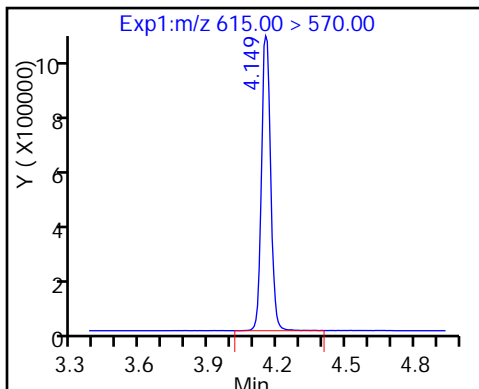
29 Perfluorododecanoic acid



D 30 13C2 PFDaA

D 51 d-N-EtFOSA-M

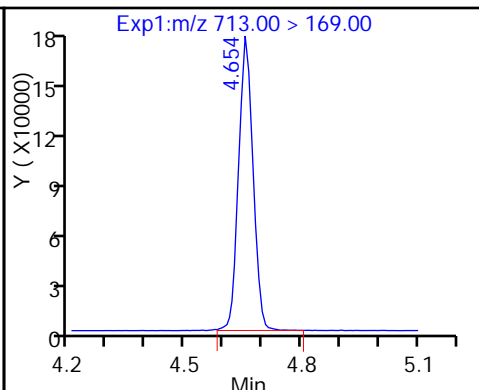
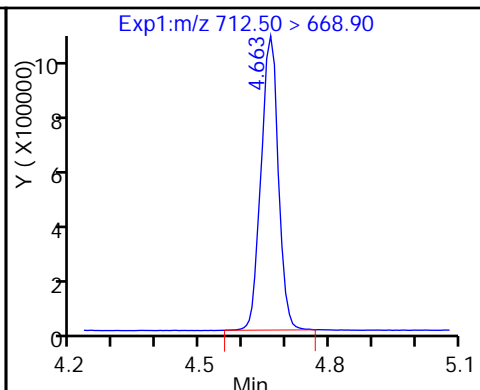
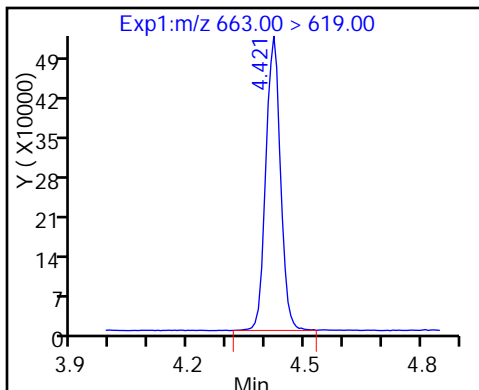
53 N-ethylperfluoro-1-octanesulfonami (ND)



31 Perfluorotridecanoic acid

33 Perfluorotetradecanoic acid

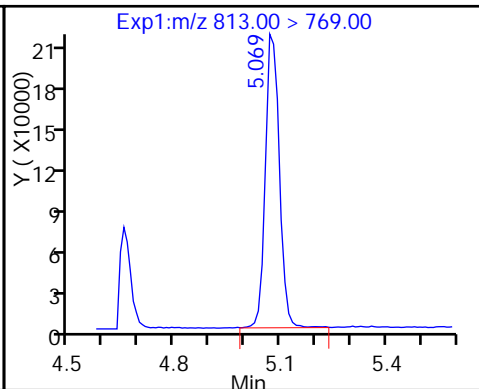
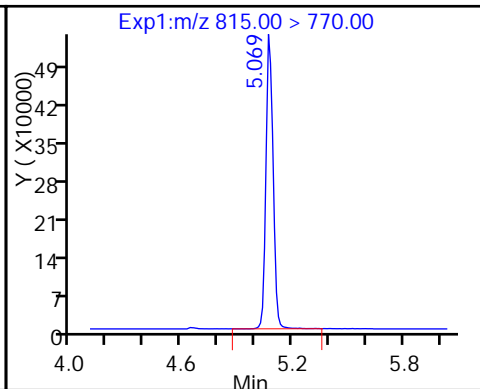
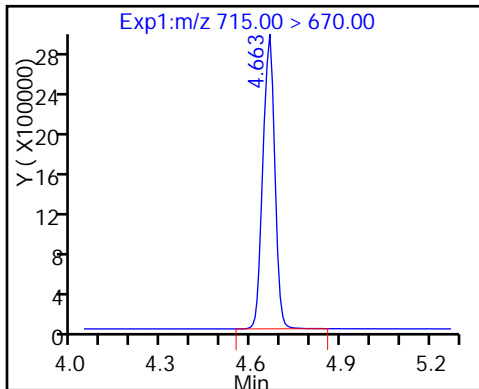
33 Perfluorotetradecanoic acid



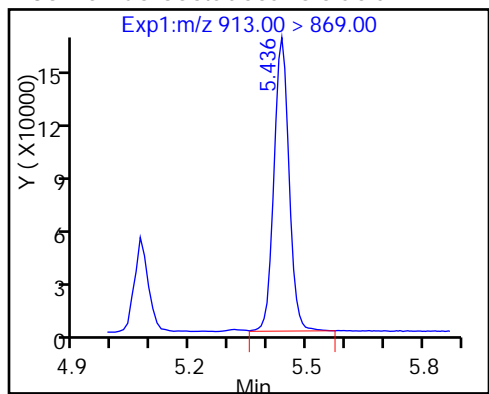
D 32 13C2-PFTeDA

D 34 13C2-PFHxDA

35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



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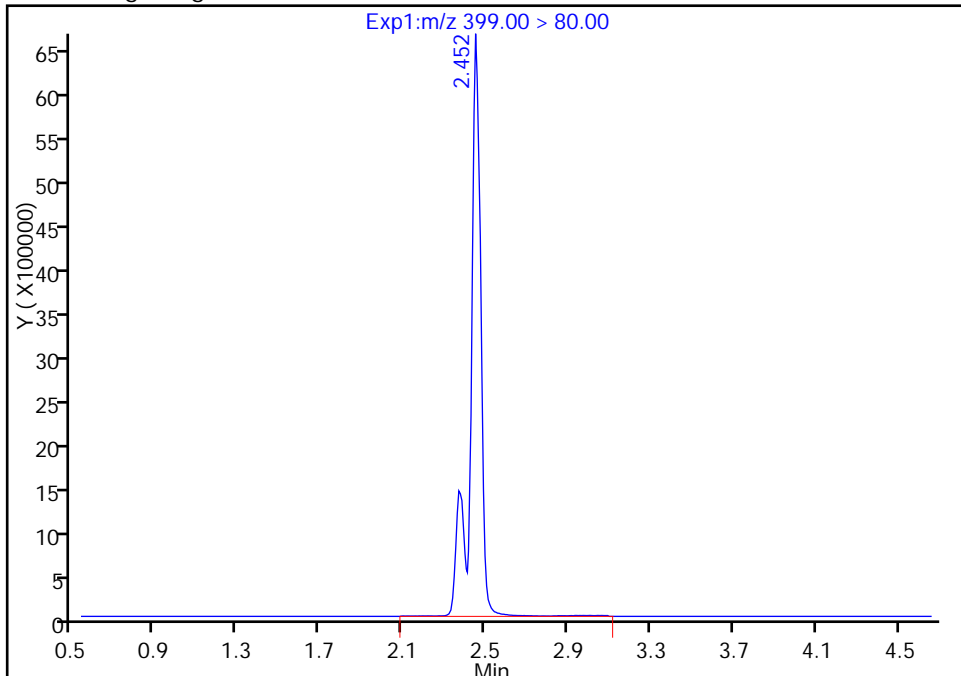
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Injection Date: 07-Dec-2016 22:48:16 Instrument ID: A8_N
Lims ID: 320-23696-A-3-B MS
Client ID: MCFSMWFM-01
Operator ID: A8-PC\A8 ALS Bottle#: 47 Worklist Smp#: 12
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

9 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

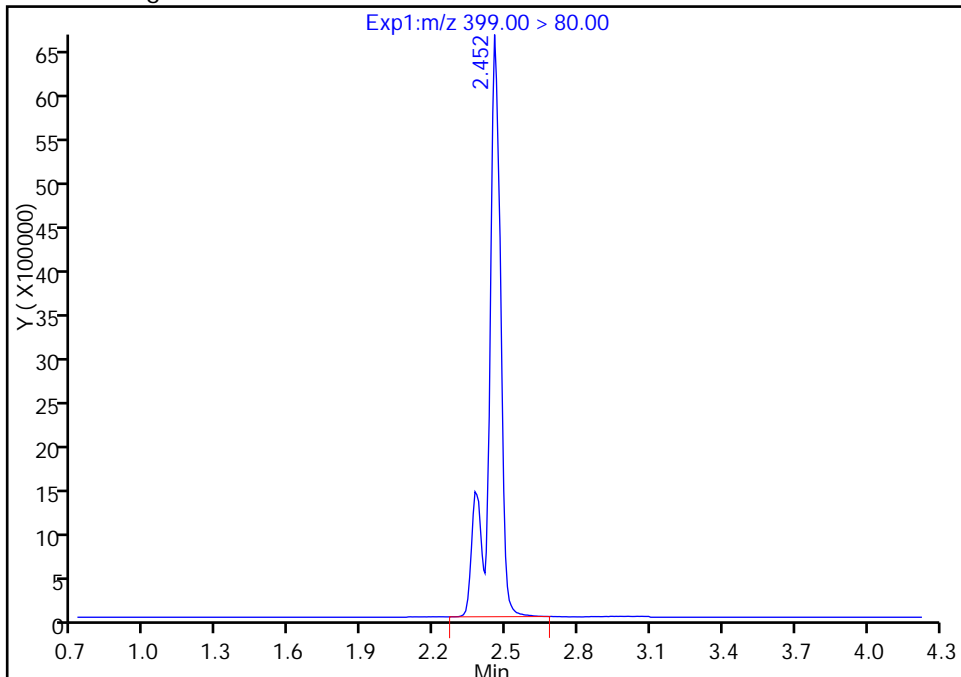
RT: 2.45
Area: 23580223
Amount: 71.959711
Amount Units: ng/ml

Processing Integration Results



RT: 2.45
Area: 23188782
Amount: 70.765151
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 08-Dec-2016 09:14:55
Audit Action: Manually Integrated

Audit Reason: Baseline

TestAmerica Sacramento

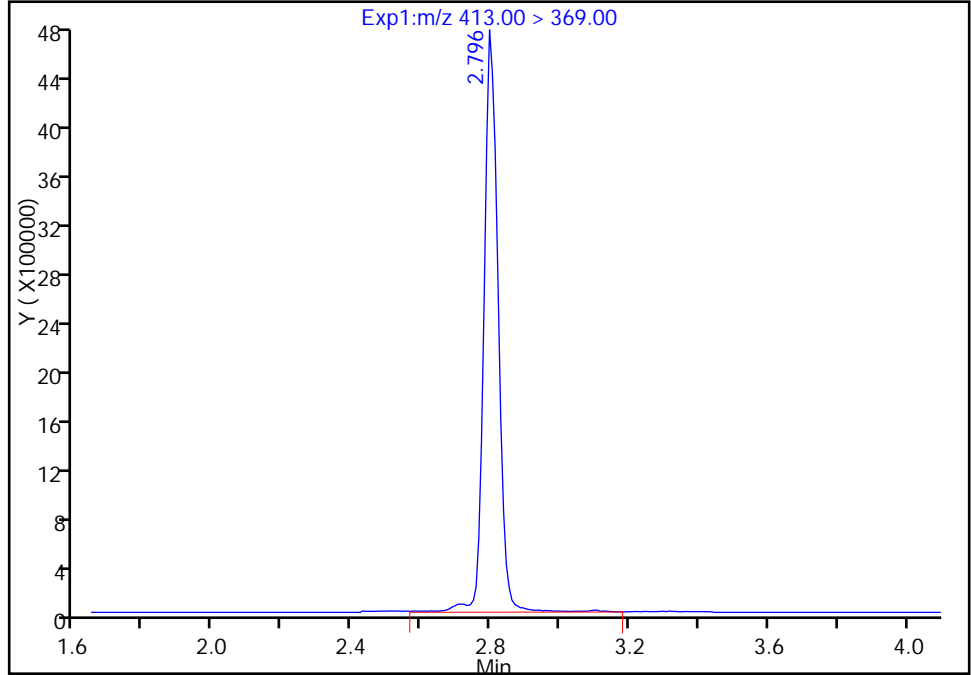
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Injection Date: 07-Dec-2016 22:48:16 Instrument ID: A8_N
Lims ID: 320-23696-A-3-B MS
Client ID: MCFSMWFM-01
Operator ID: A8-PC\A8 ALS Bottle#: 47 Worklist Smp#: 12
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

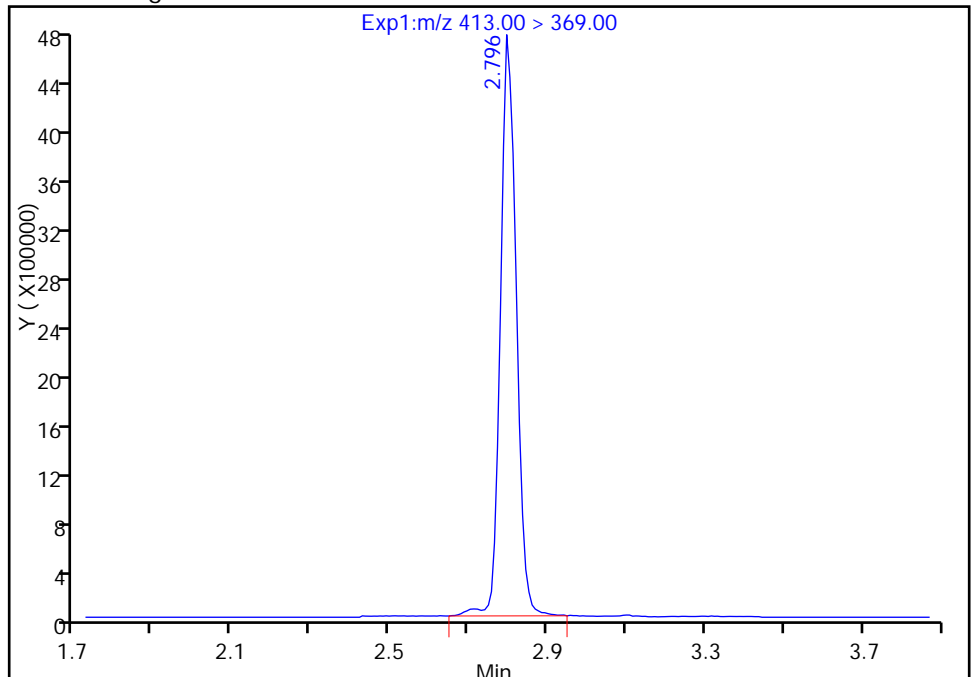
RT: 2.80
Area: 13715096
Amount: 62.316611
Amount Units: ng/ml

Processing Integration Results



RT: 2.80
Area: 13394743
Amount: 60.861038
Amount Units: ng/ml

Manual Integration Results



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23696-1
 SDG No.: _____
 Client Sample ID: MCFSMWFM-01 MS DL Lab Sample ID: 320-23696-3 MS DL
 Matrix: Water Lab File ID: 07DEC2016C_007.d
 Analysis Method: 537 (Modified) Date Collected: 11/16/2016 11:11
 Extraction Method: 3535 Date Extracted: 11/23/2016 11:47
 Sample wt/vol: 481.5 (mL) Date Analyzed: 12/07/2016 22:10
 Con. Extract Vol.: 1.0 (mL) Dilution Factor: 10
 Injection Volume: 2 (uL) GC Column: Acquity ID: 2.1 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 141150 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	<i>Perfluorobutanesulfonic acid (PFBS)</i>	79.6	D	26	21	9.5
375-85-9	<i>Perfluoroheptanoic acid (PFHpA)</i>	130	D	26	21	8.3
355-46-4	<i>Perfluorohexanesulfonic acid (PFHxS)</i>	154	D	26	21	9.0
375-95-1	<i>Perfluorononanoic acid (PFNA)</i>	464	D 4	26	21	6.8
1763-23-1	<i>Perfluorooctanesulfonic acid (PFOS)</i>	225	D 4	42	31	13
335-67-1	<i>Perfluorooctanoic acid (PFOA)</i>	136	D	26	21	7.8

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	122		25-150
STL00991	13C4 PFOS	118		25-150
STL01892	13C4-PFHpA	138		25-150
STL00995	13C5 PFNA	97		25-150
STL00994	18O2 PFHxS	129		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161208-37624.b\07DEC2016C_007.d
 Lims ID: 320-23696-A-3-B MS
 Client ID: MCFSMWFM-01
 Sample Type: MS
 Inject. Date: 07-Dec-2016 22:10:49 ALS Bottle#: 42 Worklist Smp#: 7
 Injection Vol: 2.0 ul Dil. Factor: 10.0000
 Sample Info: 320-23696-a-3-b ms 10X
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: A8-PC\A8 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20161208-37624.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 08-Dec-2016 09:17:55 Calib Date: 03-Dec-2016 15:33:40
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d

Column 1 : Det: EXP1
 Process Host: XAWRK027

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	1.542	-0.008	1267765	3.78		7.6	137822	
1 Perfluorobutyric acid	212.90 > 169.00	1.542	1.542	0.0	1027946	4.64		232	3422	
D 4 13C5-PFPeA	267.90 > 223.00	1.810	1.820	-0.010	1714444	6.48		13.0	86088	
3 Perfluoropentanoic acid	262.90 > 219.00	1.810	1.820	-0.010	3107244	8.93		446	4398	
5 Perfluorobutanesulfonic acid	298.90 > 80.00	1.849	1.858	-0.009	2462679	3.83		217		
	298.90 > 99.00	1.849	1.858	-0.009	1018290		2.42(0.00-0.00)			
7 Perfluorohexanoic acid	313.00 > 269.00	2.103	2.100	0.003	3737632	13.1		655	38221	
D 6 13C2 PFHxA	315.00 > 270.00	2.103	2.109	-0.006	1496919	6.30		12.6	137410	
9 Perfluorohexanesulfonic acid	399.00 > 80.00	2.451	2.372	0.079	3274776	7.41		407		
12 Perfluoroheptanoic acid	363.00 > 319.00	2.443	2.438	0.005	1836881	6.27		314	14388	
D 11 13C4-PFHpA	367.00 > 322.00	2.434	2.438	-0.004	1426050	6.88		13.8	127897	
D 10 18O2 PFHxS	403.00 > 84.00	2.460	2.455	0.005	1904170	6.10		12.9	178194	
48 Sodium 1H,1H,2H,2H-perfluorooctane	427.00 > 407.00	2.780	2.774	0.006	2666997	NR		0.0		
D 47 M2-6:2FTS	429.00 > 409.00	2.772	2.774	-0.002	140364	1.33		0.0		
15 Perfluorooctanoic acid	413.00 > 369.00	2.804	2.796	0.008	1878139	6.53		327	30307	
	413.00 > 169.00	2.804	2.796	0.008	1125017		1.67(0.90-1.10)		68878	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 14 13C4 PFOA										
417.00 > 372.00	2.804	2.804	0.0		1341356	6.12		12.2	164802	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.804	2.804	0.0	1.000	729056	2.14		112		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.171	3.147	0.024	1.000	3400117	10.8		583	182284	
499.00 > 99.00	3.147	3.147	0.0	0.993	733826		4.63(0.90-1.10)		30164	
D 17 13C4 PFOS										
503.00 > 80.00	3.171	3.163	0.008		1384275	5.63		11.8	55464	
20 Perfluorononanoic acid										
463.00 > 419.00	3.171	3.171	0.0	1.000	3608829	22.3		1117	47395	
D 19 13C5 PFNA										
468.00 > 423.00	3.171	3.171	0.0		810498	4.87		9.7	98205	
D 21 13C8 FOSA										
506.00 > 78.00	3.503	3.503	0.0		34288	0.0852		0.2	3170	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.512	3.503	0.009	1.000	12895	2.01		101	1094	
D 42 M2-8:2FTS										
529.00 > 509.00	3.503	3.520	-0.017		1401	0.0144		0.0		
43 Sodium 1H,1H,2H,2H-perfluorooctane										
527.00 > 507.00	3.512	3.520	-0.008	1.002	21857	NR		0.0		
24 Perfluorodecanoic acid										
513.00 > 469.00	3.529	3.528	0.0	1.000	208783	2.34		117	6114	
D 23 13C2 PFDA										
515.00 > 470.00	3.529	3.528	0.0		464622	2.94		5.9	18786	
D 45 d3-NMeFOSAA										
573.00 > 419.00	3.693	3.683	0.010		1614	0.0223		0.0		
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.839	3.839	0.0	1.000	318229	1.72		89.1		
D 46 d5-NEtFOSAA										
589.00 > 419.00	3.848	3.847	0.001		3049	0.0383		0.0		
49 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.865	3.856	0.009	1.005	991	NR		0.0		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.857	3.857	0.0	1.000	123175	2.05		103	3109	
D 27 13C2 PFUnA										
565.00 > 520.00	3.857	3.857	0.0		281559	2.37		4.7	26271	
D 52 d-N-MeFOSA-M										
515.00 > 169.00	3.926	3.997	-0.071		361	0.003435		0.0		
29 Perfluorododecanoic acid										
613.00 > 569.00	4.151	4.147	0.004	1.000	111742	1.96		98.1	2421	
D 30 13C2 PFDaA										
615.00 > 570.00	4.151	4.154	-0.003		299929	2.68		5.4	17324	
D 51 d-N-EtFOSA-M										
531.00 > 169.00	4.180	4.192	-0.012		435	0.004387		0.0		
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.415	4.418	-0.003	1.000	119141	2.09		105	2316	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.657	4.652	0.005	1.000	228740	2.06		103	3037	
713.00 > 169.00	4.657	4.652	0.005	1.000	34758		6.58(0.00-0.00)		13657	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.657	4.652	0.005		603833	2.61		5.2	118589	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.071	5.068	0.003		152950	1.18		2.4	14543	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.082	5.079	0.003	1.000	61874	0.2844		14.2	765	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.430	5.428	0.002	1.000	45871	0.7702		38.5	1172	

QC Flag Legend

Processing Flags

NR - Missing Quant Standard

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161208-37624.b\07DEC2016C_007.d

Injection Date: 07-Dec-2016 22:10:49

Instrument ID: A8_N

Lims ID: 320-23696-A-3-B MS

Client ID: MCFSMWFM-01

Operator ID: A8-PC\A8

ALS Bottle#: 42

Worklist Smp#: 7

Injection Vol: 2.0 ul

Dil. Factor: 10.0000

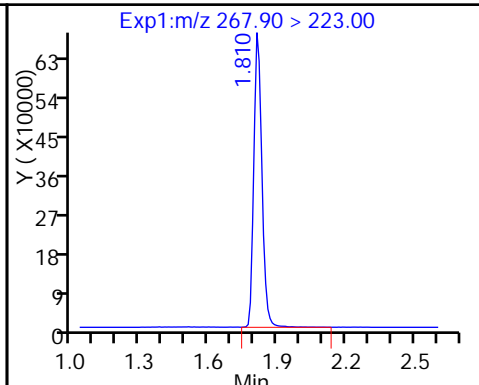
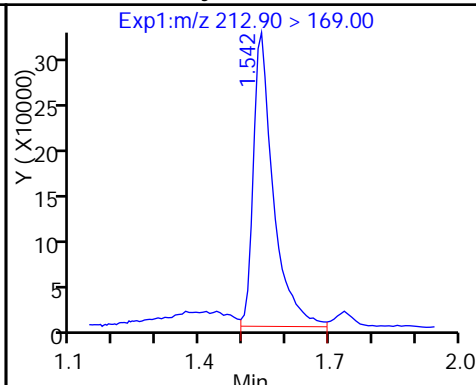
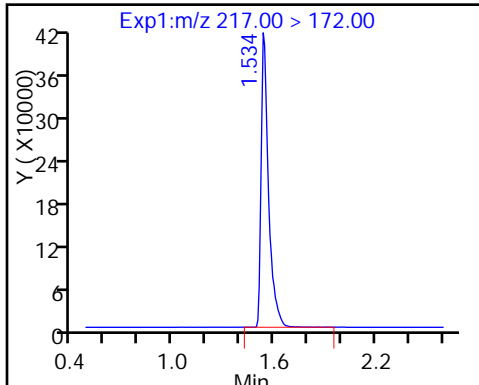
Method: A8_N

Limit Group: LC PFC_DOD ICAL

D 2 13C4 PFBA

1 Perfluorobutyric acid

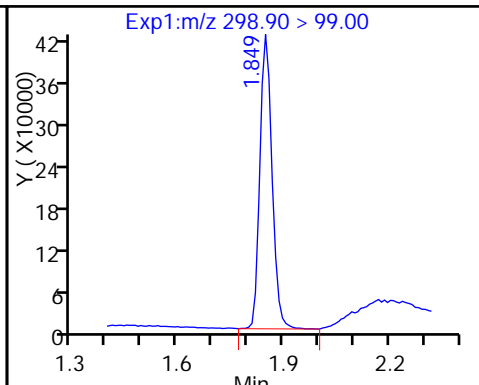
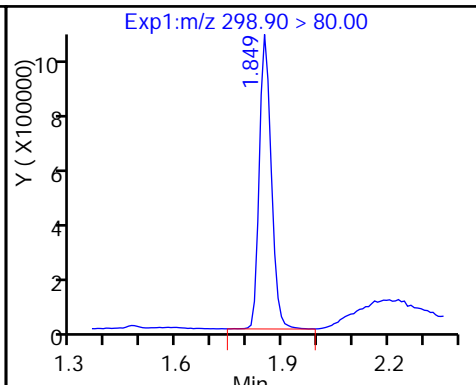
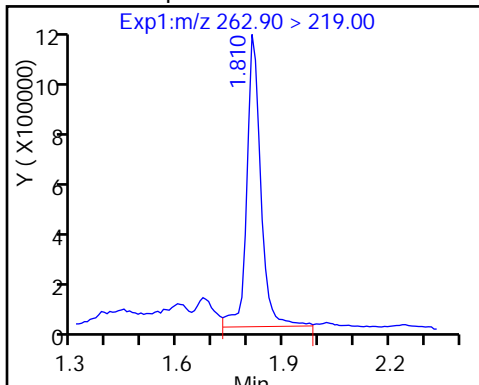
D 4 13C5-PFPeA



3 Perfluoropentanoic acid

5 Perfluorobutanesulfonic acid

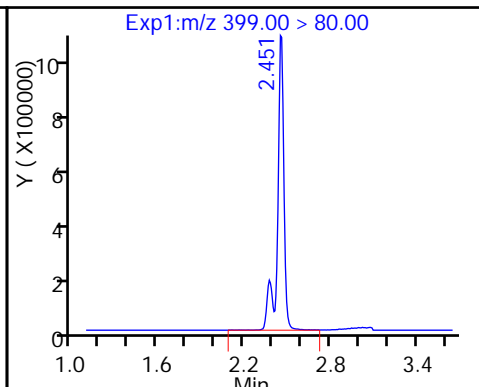
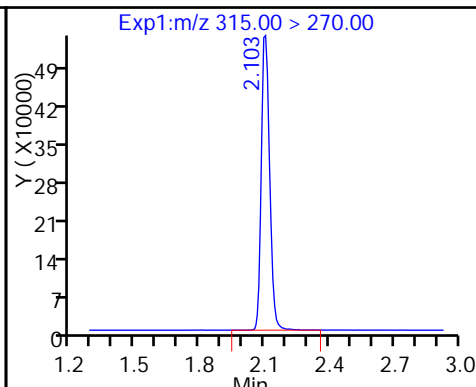
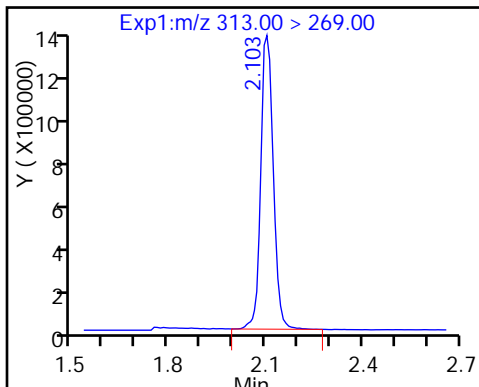
5 Perfluorobutanesulfonic acid



7 Perfluorohexanoic acid

D 6 13C2 PFHxA

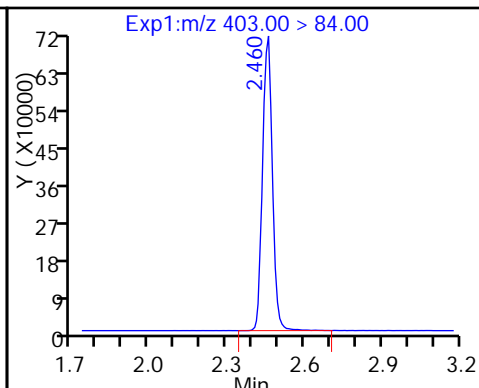
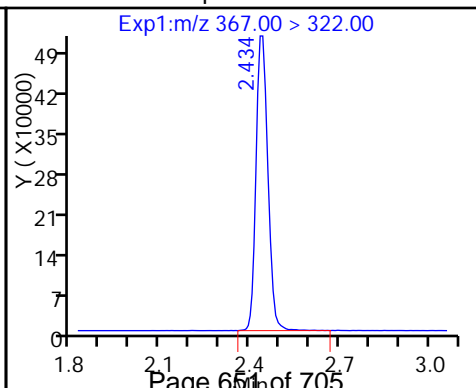
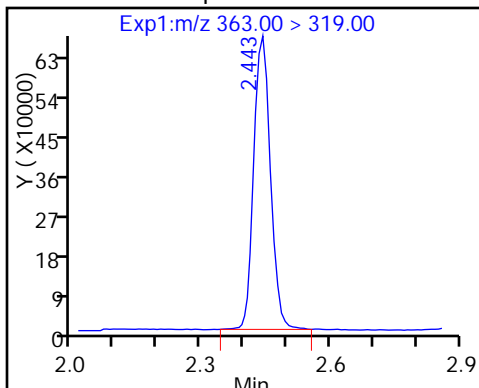
9 Perfluorohexanesulfonic acid



12 Perfluoroheptanoic acid

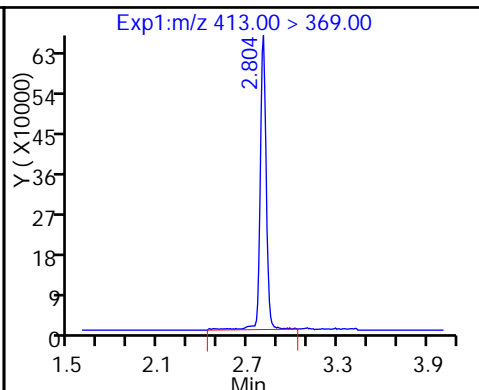
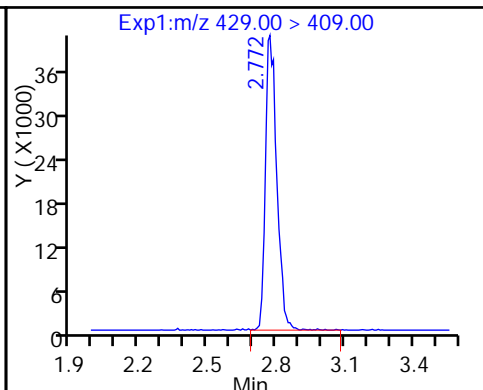
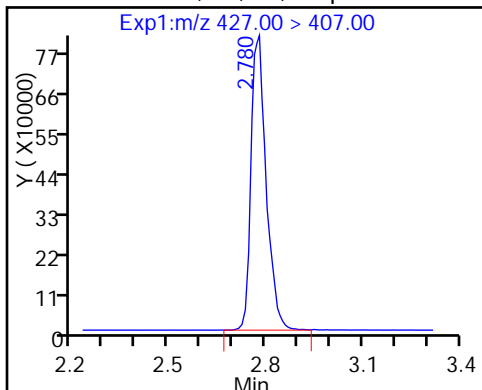
D 11 13C4-PFHpA

D 10 18O2 PFHxS



48 Sodium 1H,1H,2H,2H-perfluorooctanoate

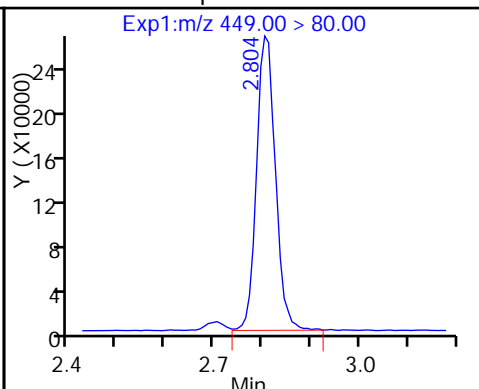
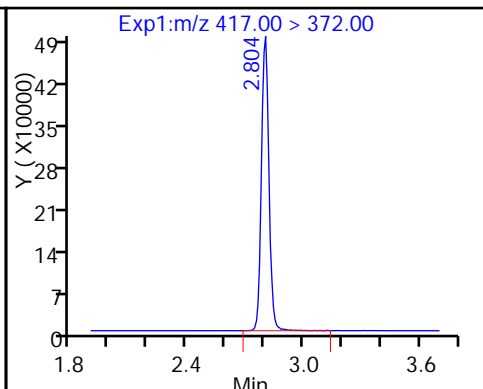
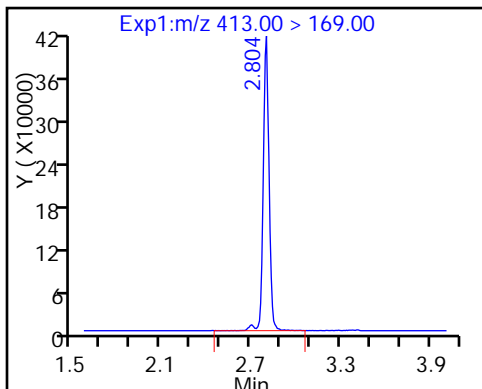
15 Perfluorooctanoic acid



15 Perfluorooctanoic acid

D 14 13C4 PFOA

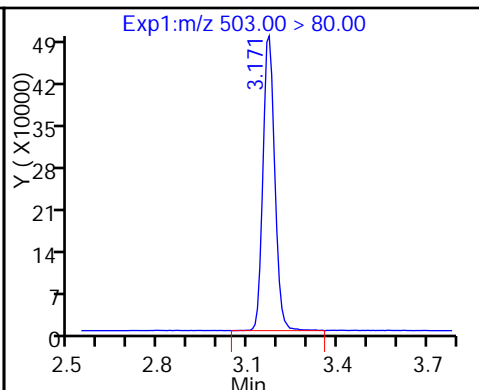
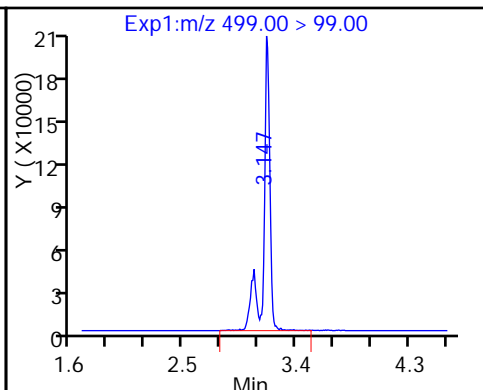
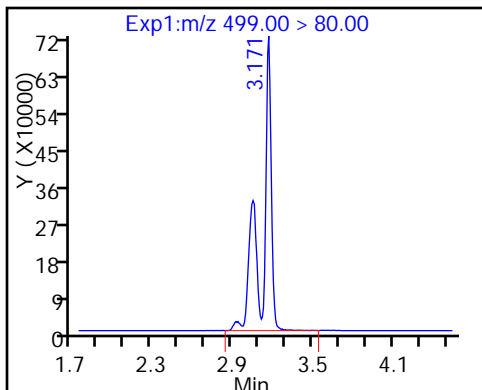
13 Perfluoroheptanesulfonic Acid



18 Perfluorooctane sulfonic acid

18 Perfluorooctane sulfonic acid

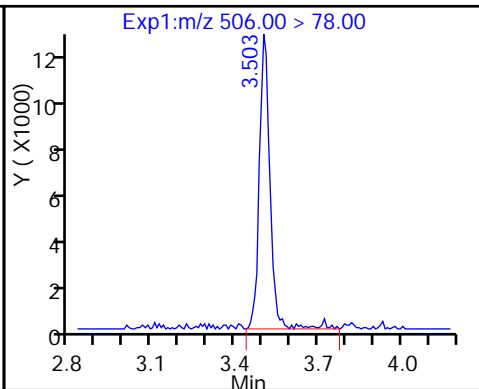
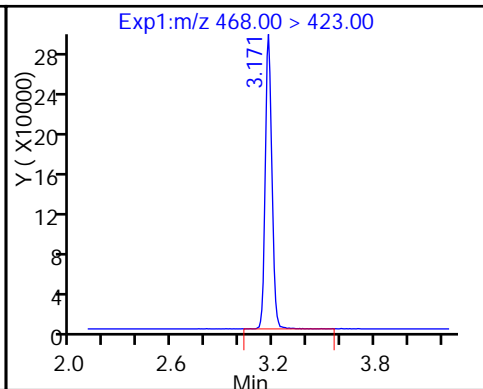
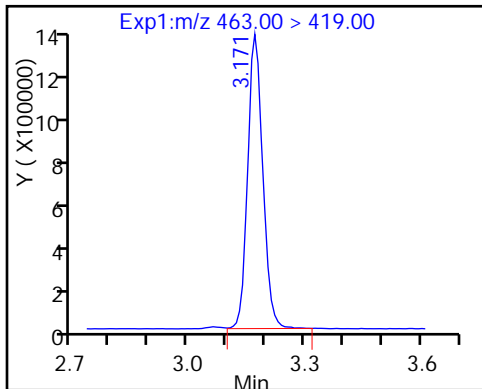
D 17 13C4 PFOS



20 Perfluorononanoic acid

D 19 13C5 PFNA

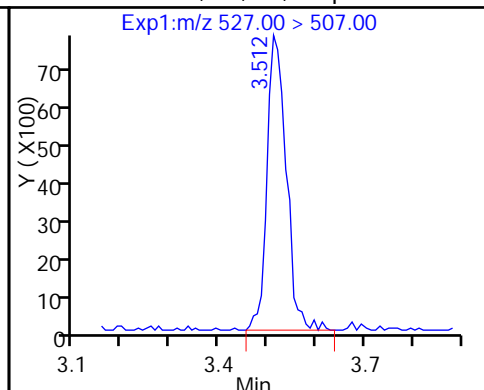
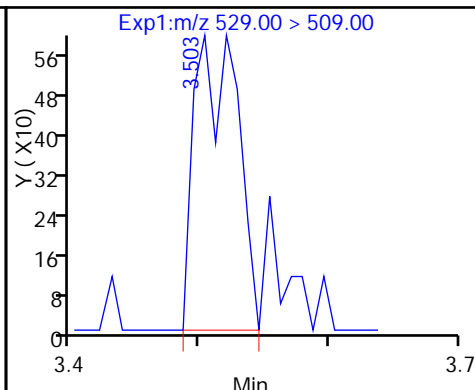
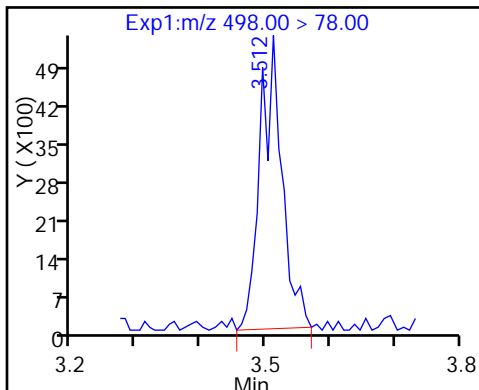
D 21 13C8 FOSA



22 Perfluorooctane Sulfonamide

D 42 M2-8:2FTS

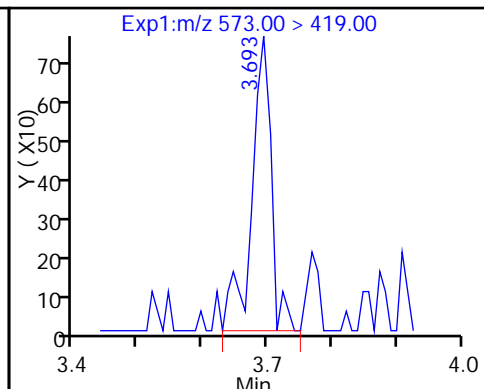
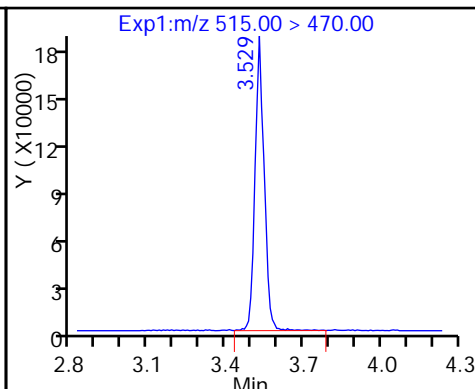
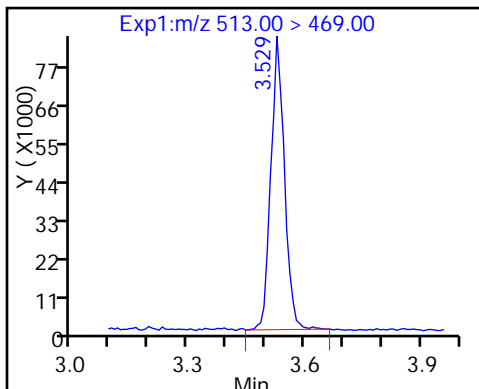
43 Sodium 1H,1H,2H,2H-perfluorooctane



24 Perfluorodecanoic acid

D 23 13C2 PFDA

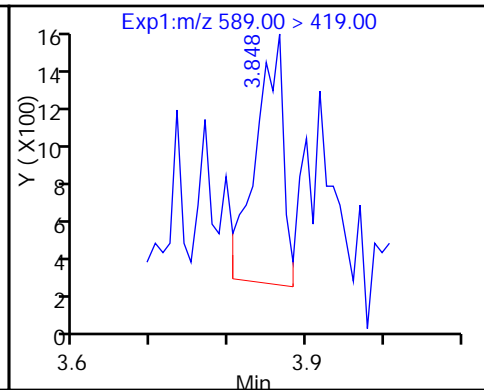
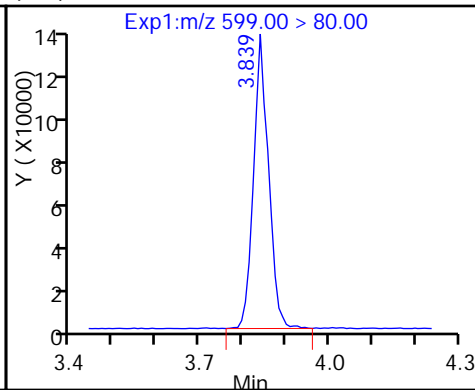
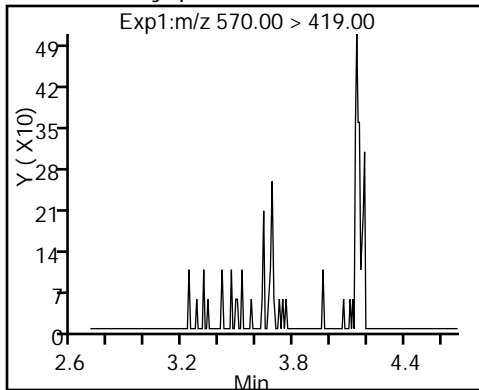
D 45 d3-NMeFOSAA



44 N-methyl perfluorooctane sulfonamide

D 46 d5-NEtFOSAA

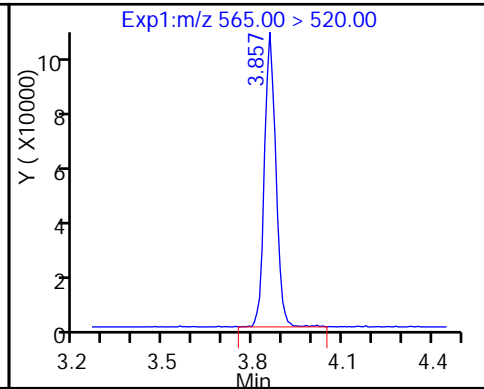
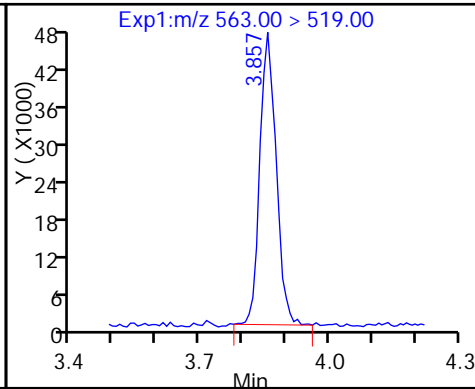
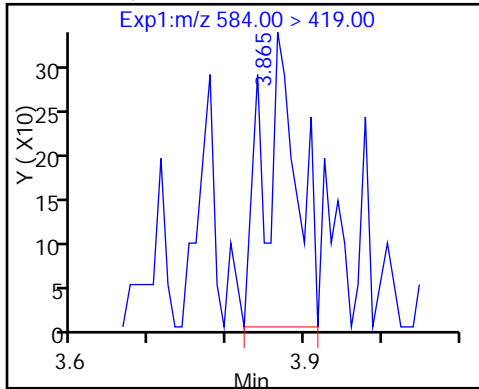
D 46 d5-NEtFOSAA



49 N-ethyl perfluorooctane sulfonamid

28 Perfluoroundecanoic acid

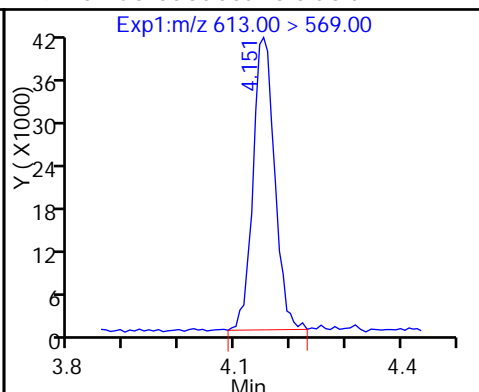
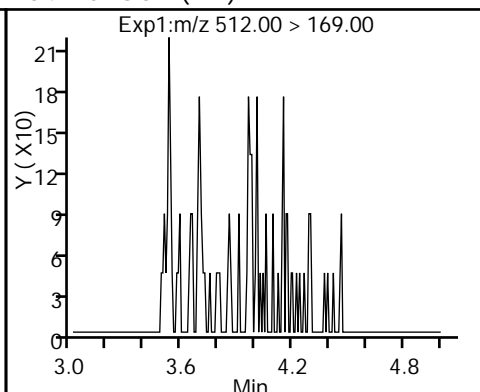
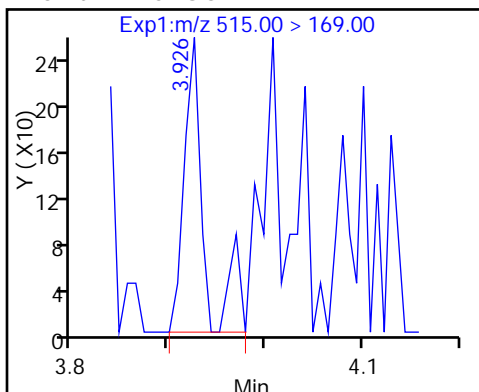
D 27 13C2 PFUnA



D 52 d-N-MeFOSA-M

54 MeFOSA (ND)

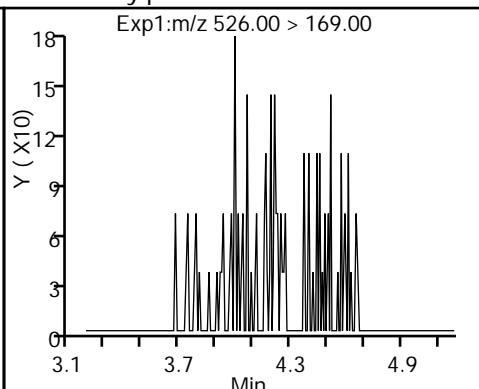
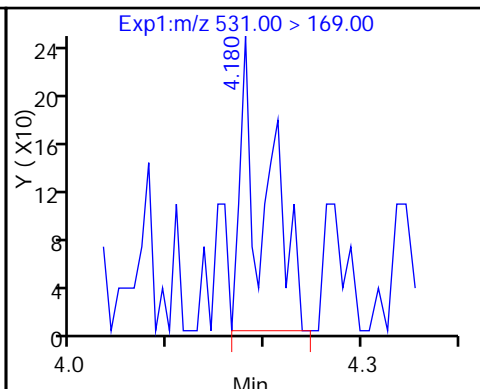
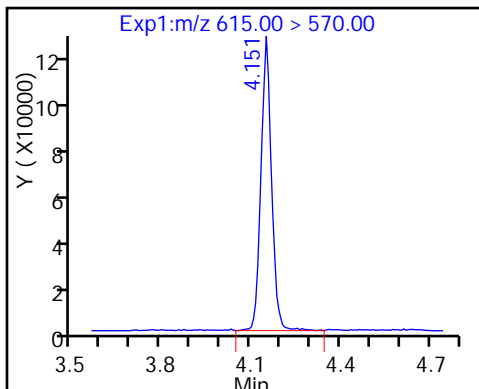
29 Perfluorododecanoic acid



D 30 13C2 PFDa

D 51 d-N-EtFOSA-M

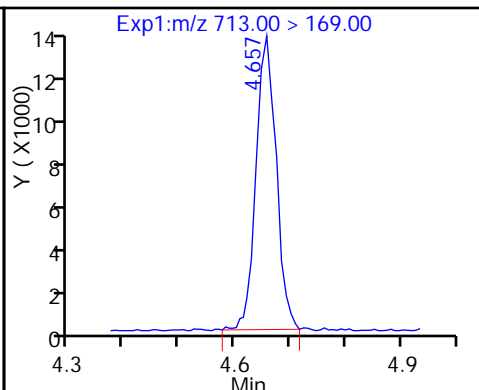
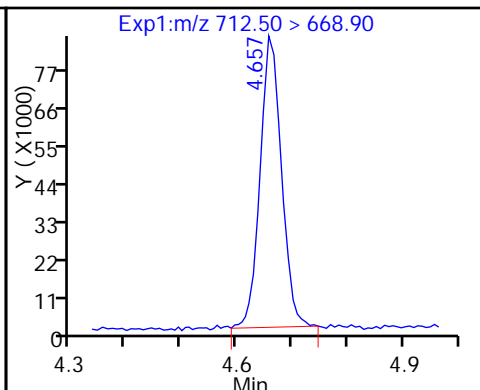
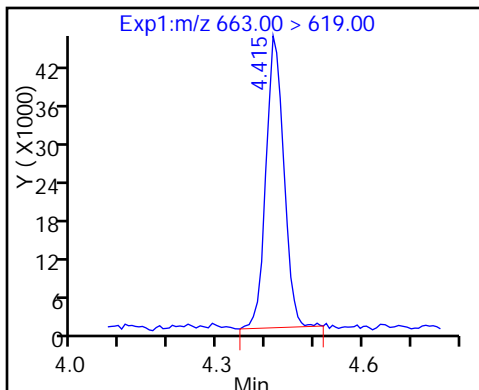
53 N-ethylperfluoro-1-octanesulfonami (ND)



31 Perfluorotridecanoic acid

33 Perfluorotetradecanoic acid

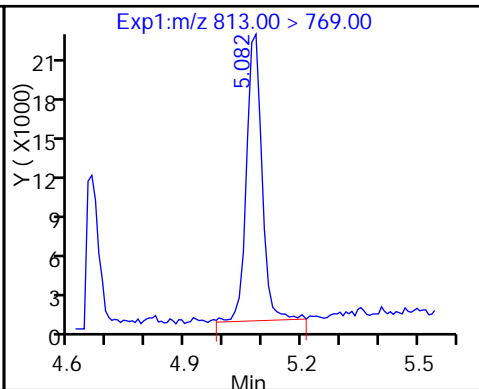
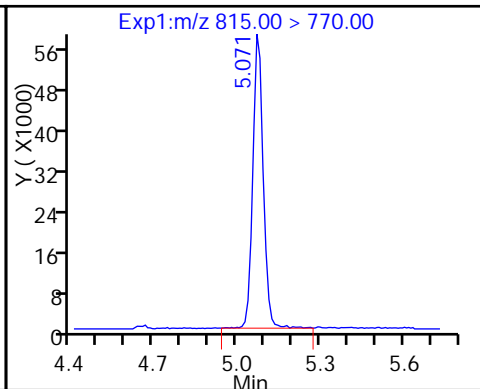
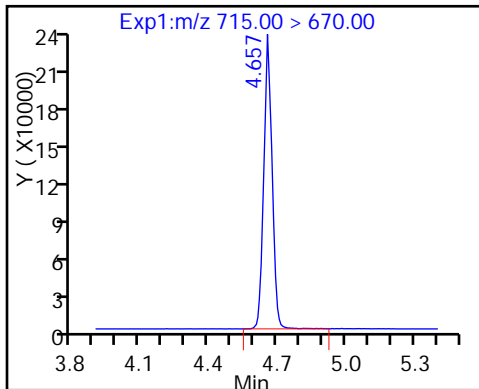
33 Perfluorotetradecanoic acid



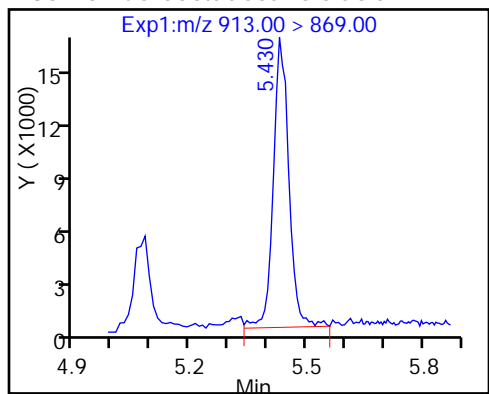
D 32 13C2-PFTeDA

D 34 13C2-PFHxDA

35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23696-1
 SDG No.: _____
 Client Sample ID: MCFSMWFM-01 MSD Lab Sample ID: 320-23696-3 MSD
 Matrix: Water Lab File ID: 07DEC2016C_013.d
 Analysis Method: 537 (Modified) Date Collected: 11/16/2016 11:11
 Extraction Method: 3535 Date Extracted: 11/23/2016 11:47
 Sample wt/vol: 484.9 (mL) Date Analyzed: 12/07/2016 22:55
 Con. Extract Vol.: 1.0 (mL) Dilution Factor: 1
 Injection Volume: 2 (uL) GC Column: Acquity ID: 2.1 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 141150 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	56.8		2.6	2.1	0.95
375-85-9	Perfluoroheptanoic acid (PFHpA)	127		2.6	2.1	0.83
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	146	M	2.6	2.1	0.90
375-95-1	Perfluorononanoic acid (PFNA)	420	J 4	2.6	2.1	0.67
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	232	4	4.1	3.1	1.3
335-67-1	Perfluorooctanoic acid (PFOA)	123	M	2.6	2.1	0.77

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	98		25-150
STL00991	13C4 PFOS	105		25-150
STL01892	13C4-PFHpA	99		25-150
STL00995	13C5 PFNA	79		25-150
STL00994	18O2 PFHxS	99		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161208-37624.b\07DEC2016C_013.d
 Lims ID: 320-23696-A-3-C MSD
 Client ID: MCFSMWFM-01
 Sample Type: MSD
 Inject. Date: 07-Dec-2016 22:55:46 ALS Bottle#: 48 Worklist Smp#: 13
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-23696-a-3-c msd
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: A8-PC\A8 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20161208-37624.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 08-Dec-2016 09:15:43 Calib Date: 03-Dec-2016 15:33:40
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d
 Column 1 : Det: EXP1
 Process Host: XAWRK027

First Level Reviewer: chandrasenas Date: 08-Dec-2016 09:15:43

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	1.542	-0.008	3452749	10.3		20.6	199342	
1 Perfluorobutyric acid	212.90 > 169.00	1.534	1.542	-0.008	1.000	2857797	47.4	237	4053	
D 4 13C5-PFPeA	267.90 > 223.00	1.810	1.820	-0.010	7373854	27.9		55.7	175343	
3 Perfluoropentanoic acid	262.90 > 219.00	1.810	1.820	-0.010	1.000	13426516	89.7	449	4333	
5 Perfluorobutanesulfonic acid	298.90 > 80.00	1.848	1.858	-0.010	1.000	13636408	27.5	156		
	298.90 > 99.00	1.848	1.858	-0.010	1.000	6016968	2.27(0.00-0.00)			
7 Perfluorohexanoic acid	313.00 > 269.00	2.093	2.100	-0.007	1.000	21892292	119.0	595	56878	
D 6 13C2 PFHxA	315.00 > 270.00	2.093	2.109	-0.016	9648556	40.6		81.3	536723	
9 Perfluorohexanesulfonic acid	399.00 > 80.00	2.452	2.372	0.080	1.000	24077551	70.7	388		M
										M
12 Perfluoroheptanoic acid	363.00 > 319.00	2.430	2.438	-0.008	1.000	13040558	61.6	308	52164	
D 11 13C4-PFHpA	367.00 > 322.00	2.430	2.438	-0.008	10311828	49.7		99.4	459227	
D 10 18O2 PFHxS	403.00 > 84.00	2.452	2.455	-0.003	14676485	47.0		99.3	600985	
48 Sodium 1H,1H,2H,2H-perfluorooctane	427.00 > 407.00	2.767	2.774	-0.007	1.000	24933681	NR	0.0		
D 47 M2-6:2FTS	429.00 > 409.00	2.767	2.774	-0.007	1512931	14.3		0.0		

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.798	2.796	0.002	1.000	13653037	59.6		298	58365	M
413.00 > 169.00	2.790	2.796	-0.006	0.997	8999171		1.52(0.90-1.10)		376884	
D 14 13C4 PFOA										
417.00 > 372.00	2.798	2.804	-0.006		10691844	48.8		97.5	638407	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.798	2.804	-0.006	1.000	6245485	20.6		108		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.057	3.147	-0.090	1.000	31391533	112.4		605	787896	
499.00 > 99.00	3.167	3.147	0.020	1.036	6713170		4.68(0.90-1.10)		441919	
D 17 13C4 PFOS										
503.00 > 80.00	3.167	3.163	0.004		12306078	50.0		105	232222	
20 Perfluorononanoic acid										E
463.00 > 419.00	3.175	3.171	0.004	1.000	26752580	203.6		1018	90328	E
D 19 13C5 PFNA										
468.00 > 423.00	3.167	3.171	-0.004		6593134	39.6		79.2	418301	
D 21 13C8 FOSA										
506.00 > 78.00	3.502	3.503	-0.001		270771	0.6731		1.3	33396	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.502	3.503	-0.001	1.000	103715	20.5		103	13143	
D 42 M2-8:2FTS										
529.00 > 509.00	3.511	3.520	-0.009		14971	0.1541		0.0		
43 Sodium 1H,1H,2H,2H-perfluorooctane										
527.00 > 507.00	3.511	3.520	-0.009	1.000	275774	NR		0.0		
24 Perfluorodecanoic acid										
513.00 > 469.00	3.527	3.528	-0.001	1.000	2737930	23.2		116	38825	
D 23 13C2 PFDA										
515.00 > 470.00	3.527	3.528	-0.001		6130479	38.8		77.7	249761	
D 45 d3-NMeFOSAA										
573.00 > 419.00	3.673	3.683	-0.010		1858	0.0256		0.0		
44 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.683	3.693	-0.010	1.003	528	NR		0.0		
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.838	3.839	-0.001	1.000	3154232	19.2		99.3		
D 46 d5-NEtFOSAA										
589.00 > 419.00	3.830	3.847	-0.017		2293	0.0288		0.0		
49 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.847	3.856	-0.009	1.005	3317	NR		0.0		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.856	3.857	-0.001	1.000	1686227	19.5		97.4	34860	
D 27 13C2 PFUnA										
565.00 > 520.00	3.856	3.857	-0.001		4061455	34.2		68.4	368438	
D 52 d-N-MeFOSA-M										
515.00 > 169.00	3.960	3.997	-0.037		525	0.004995		0.0		
54 MeFOSA										
512.00 > 169.00	4.221	4.007	0.214	1.000	212	NR		0.0		
29 Perfluorododecanoic acid										
613.00 > 569.00	4.143	4.147	-0.004	1.000	1366063	19.8		98.9	29632	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 30 13C2 PFDaA	615.00 > 570.00	4.143	4.154	-0.011		3639772	32.5	64.9	146738	
D 51 d-N-EtFOSA-M	531.00 > 169.00	4.172	4.192	-0.020		476	0.004800	0.0		
53 N-ethylperfluoro-1-octanesulfonami	526.00 > 169.00	4.100	4.192	-0.092	1.000	323	NR	0.0		
31 Perfluorotridecanoic acid	663.00 > 619.00	4.414	4.418	-0.004	1.000	1408793	20.4	102	28668	
33 Perfluorotetradecanoic acid	712.50 > 668.90	4.657	4.652	0.005	1.000	2943225	21.8	109	42461	
	713.00 > 169.00	4.657	4.652	0.005	1.000	451012	6.53(0.00-0.00)		84653	
D 32 13C2-PFTeDA	715.00 > 670.00	4.657	4.652	0.005		8317964	36.0	72.0	765402	
D 34 13C2-PFHxDA	815.00 > 770.00	5.071	5.068	0.003		1486129	11.5	22.9	80646	
35 Perfluorohexadecanoic acid	813.00 > 769.00	5.071	5.079	-0.008	1.000	553440	6.90	34.5	1724	
36 Perfluorooctadecanoic acid	913.00 > 869.00	5.430	5.428	0.002	1.000	339623	4.70	23.5	1499	

QC Flag Legend

Processing Flags

NR - Missing Quant Standard

E - Exceeded Maximum Amount

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161208-37624.b\07DEC2016C_013.d

Injection Date: 07-Dec-2016 22:55:46

Instrument ID: A8_N

Lims ID: 320-23696-A-3-C MSD

Client ID: MCFSMWFM-01

Operator ID: A8-PC\A8

ALS Bottle#: 48

Worklist Smp#: 13

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

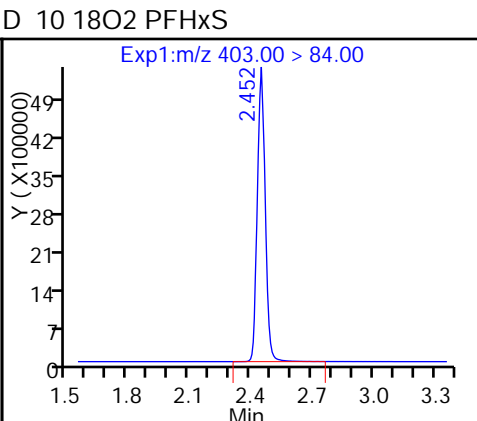
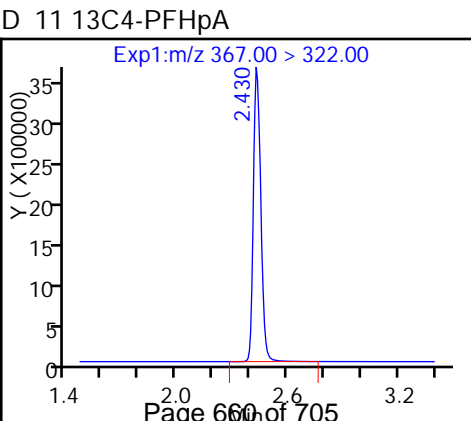
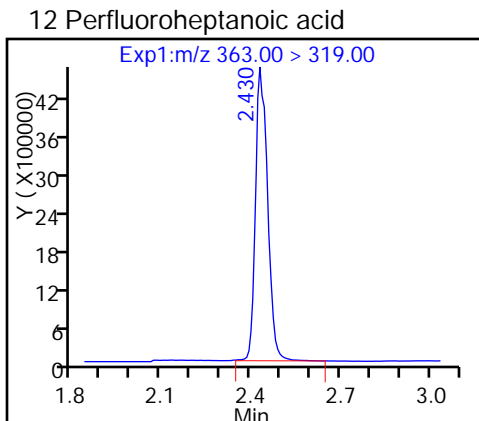
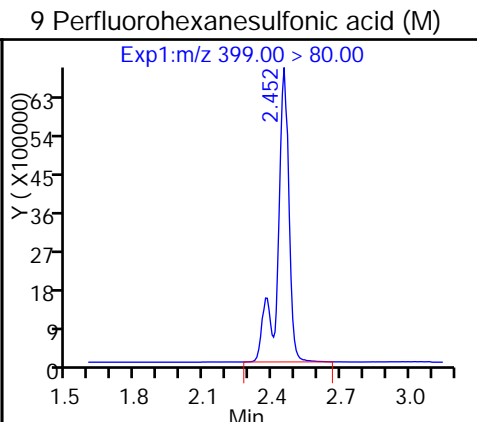
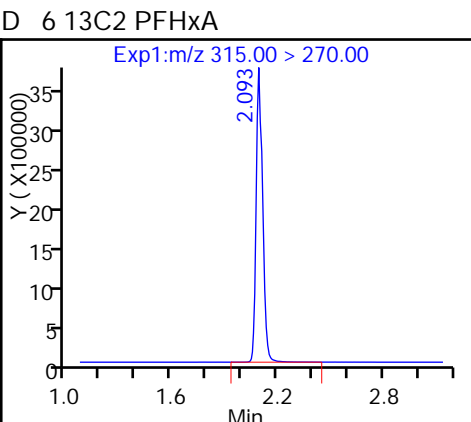
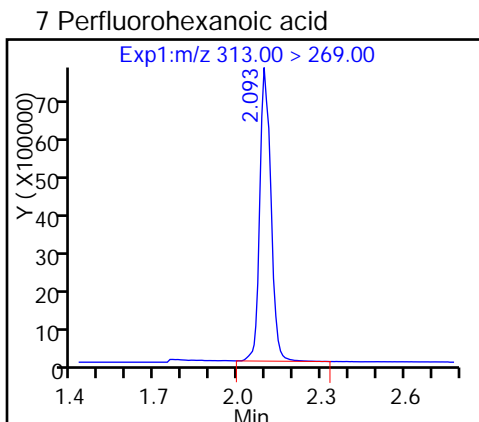
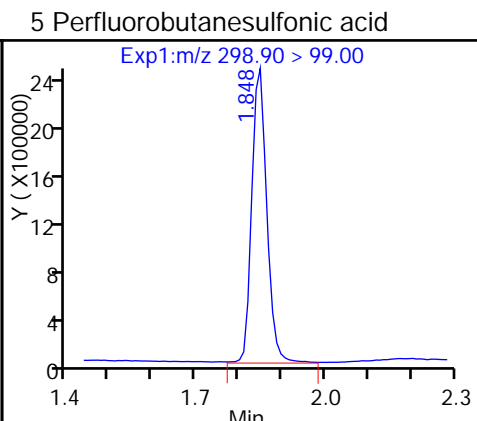
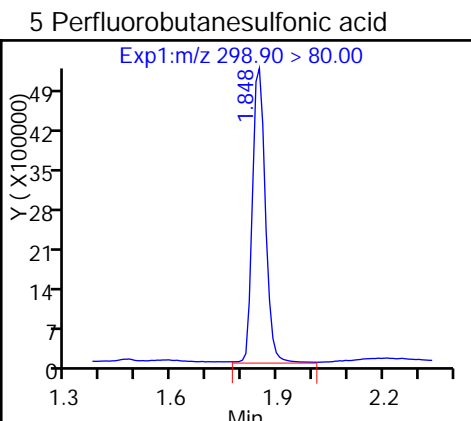
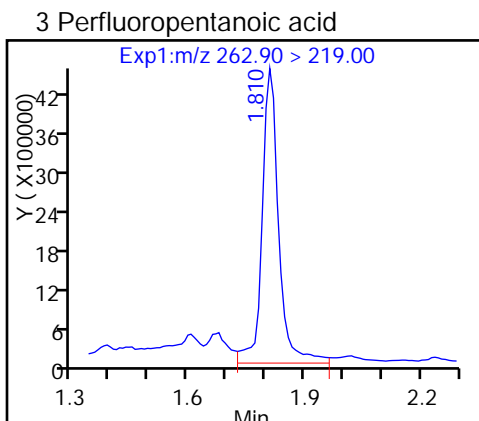
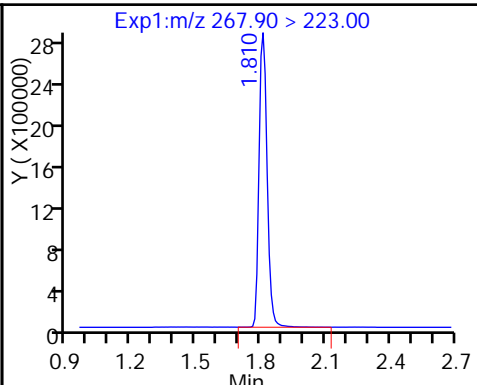
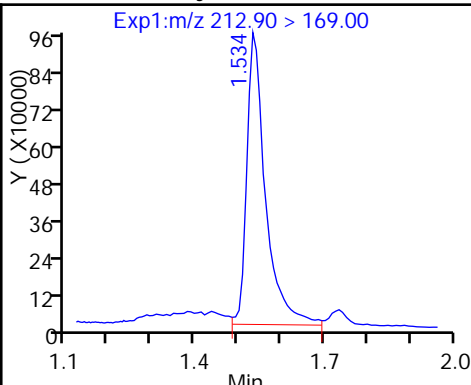
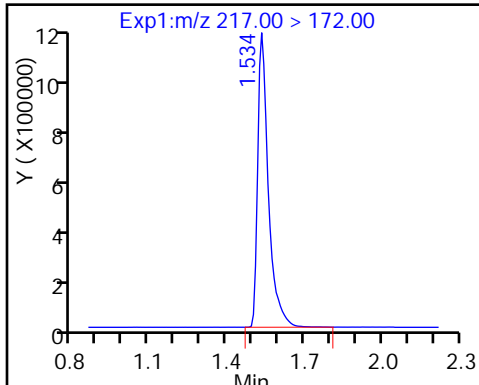
Method: A8_N

Limit Group: LC PFC_DOD ICAL

D 2 13C4 PFBA

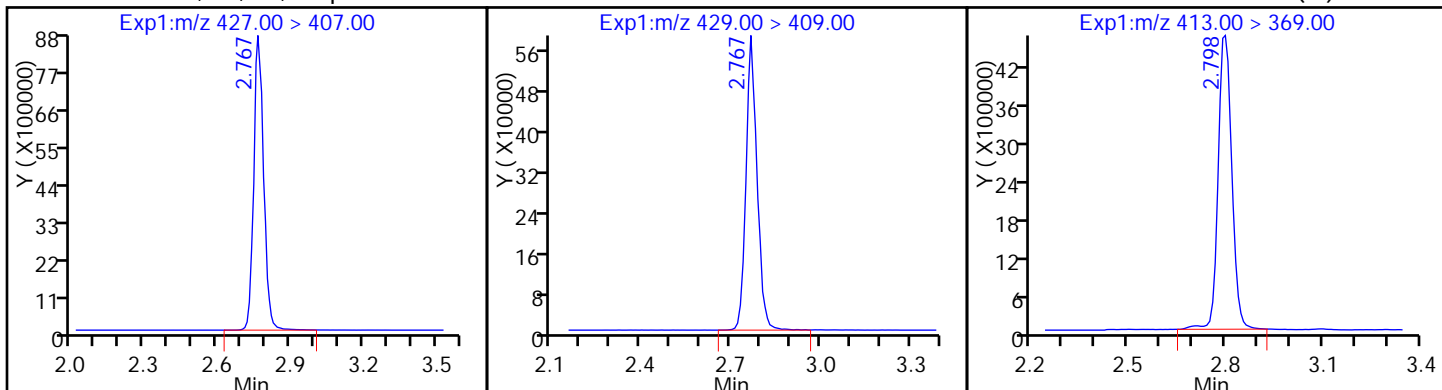
1 Perfluorobutyric acid

D 4 13C5-PFPeA



48 Sodium 1H,1H,2H,2H-perfluorooctanoate

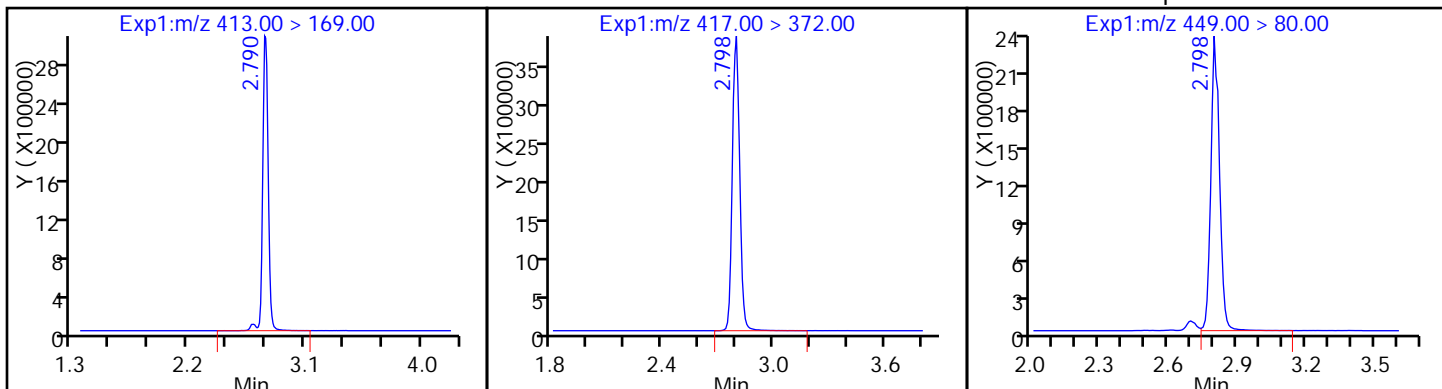
15 Perfluorooctanoic acid (M)



15 Perfluorooctanoic acid

D 14 13C4 PFOA

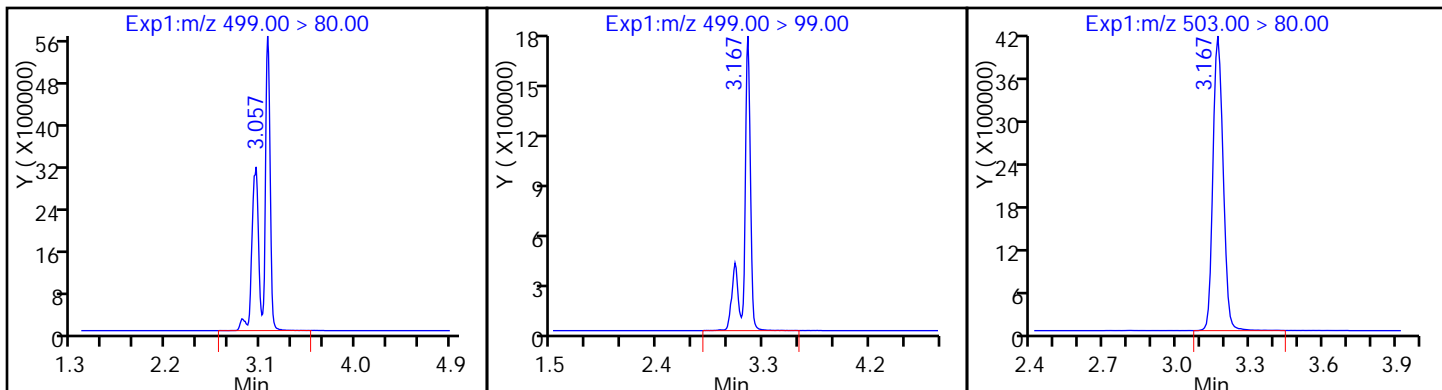
13 Perfluoroheptanesulfonic Acid



18 Perfluorooctane sulfonic acid

18 Perfluorooctane sulfonic acid

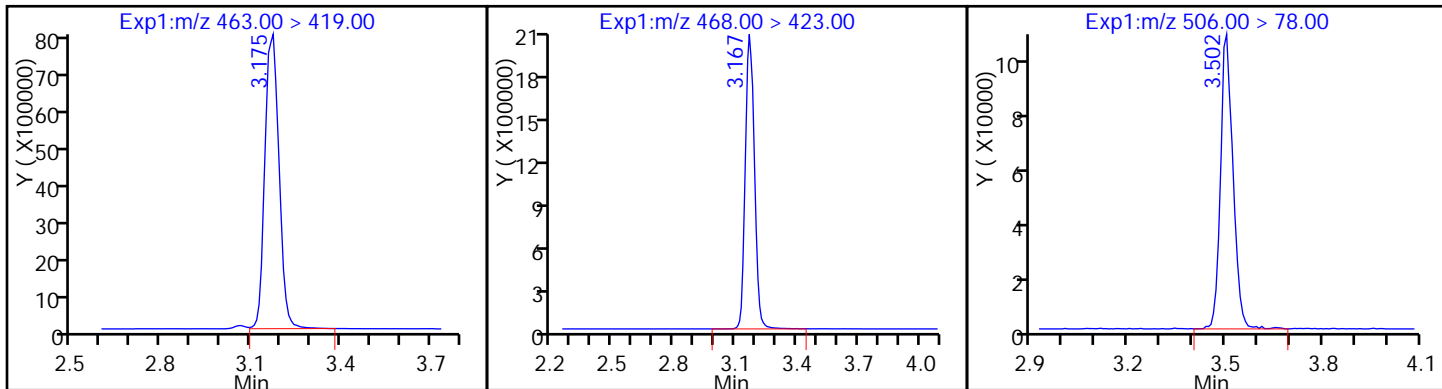
D 17 13C4 PFOS



20 Perfluorononanoic acid

D 19 13C5 PFNA

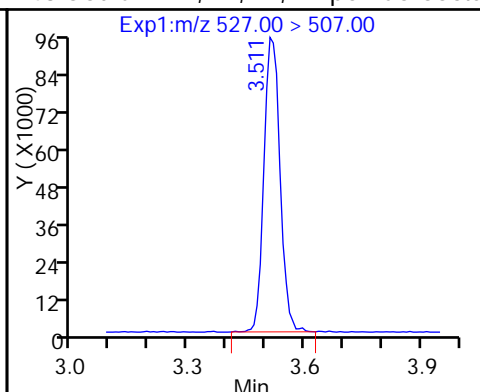
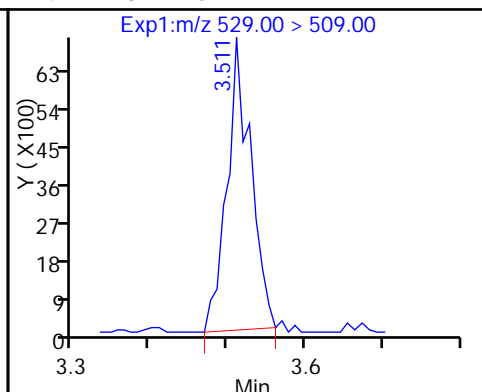
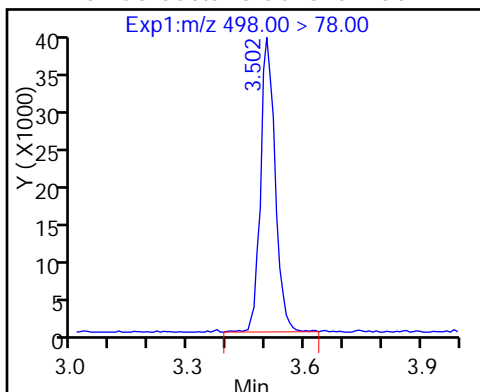
D 21 13C8 FOSA



22 Perfluorooctane Sulfonamide

D 42 M2-8:2FTS

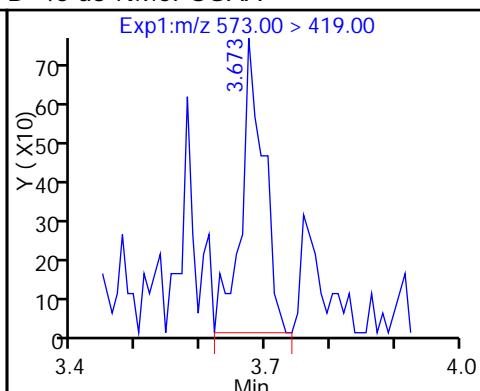
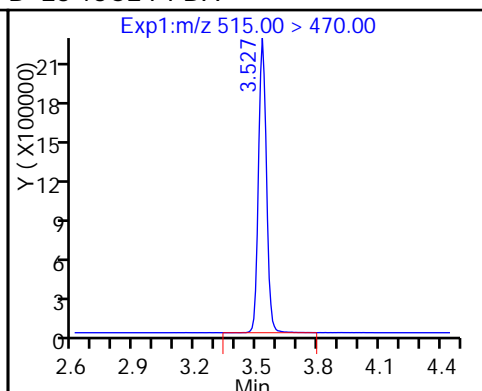
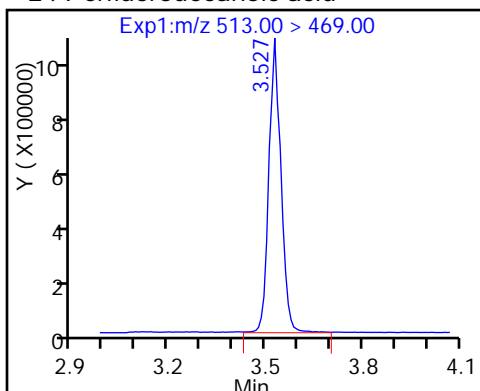
43 Sodium 1H,1H,2H,2H-perfluorooctane



24 Perfluorodecanoic acid

D 23 13C2 PFDA

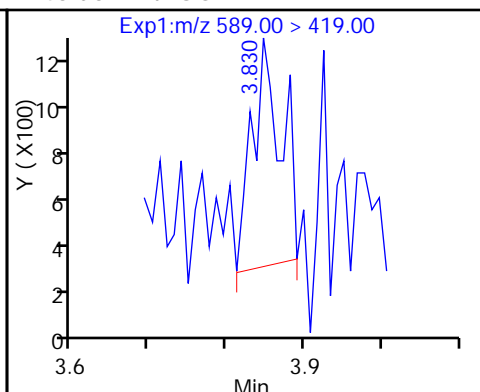
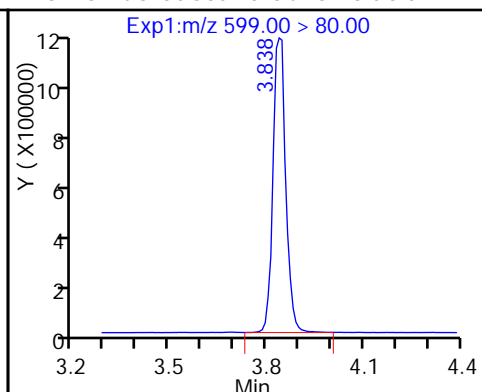
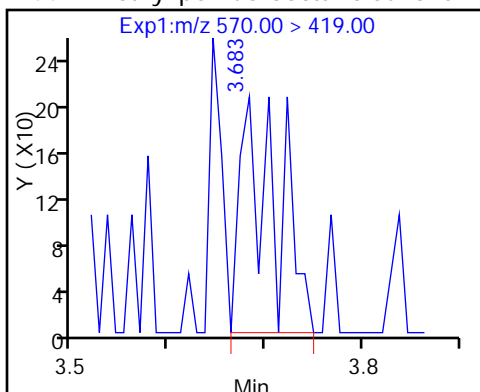
D 45 d3-NMeFOSAA



44 N-methyl perfluorooctane sulfonami

26 Perfluorodecane Sulfonic acid

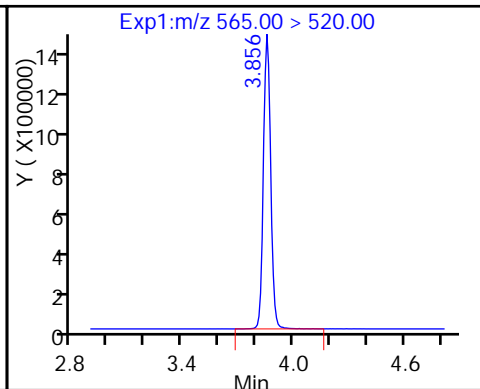
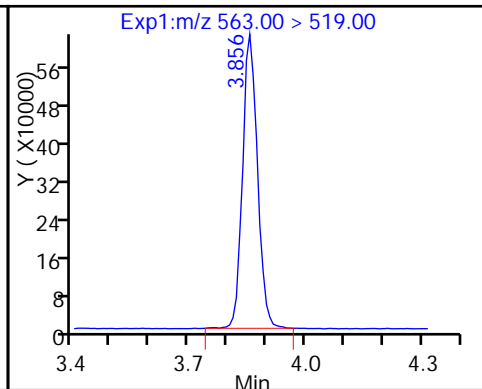
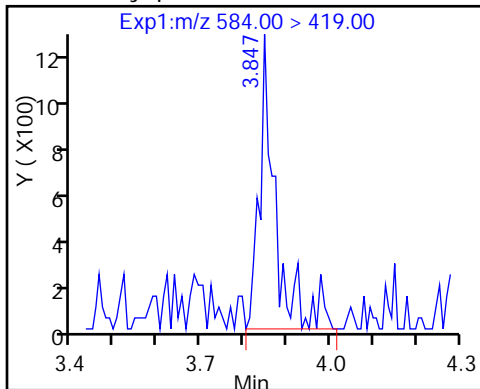
D 46 d5-NEtFOSAA



49 N-ethyl perfluorooctane sulfonamid

28 Perfluoroundecanoic acid

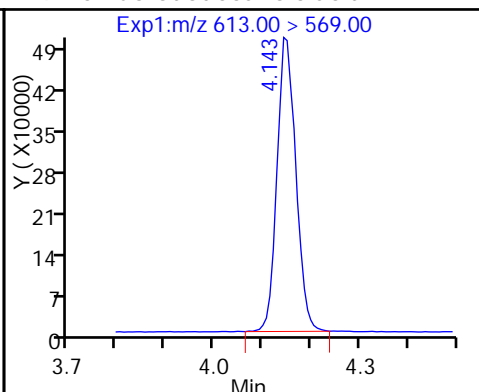
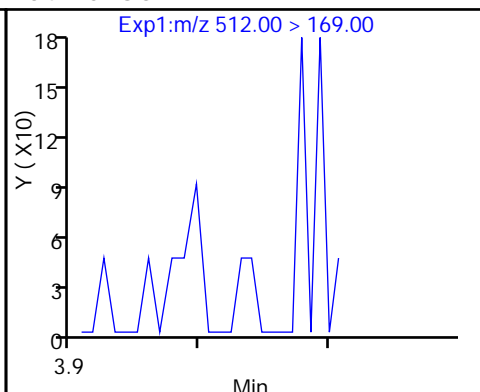
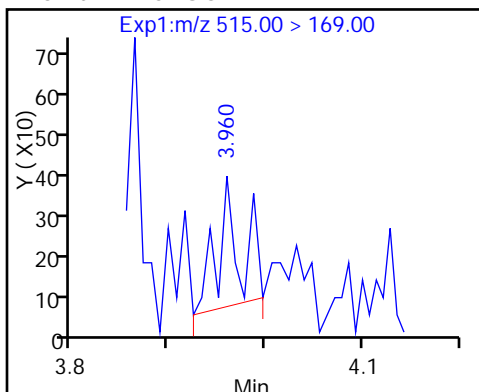
D 27 13C2 PFUnA



D 52 d-N-MeFOSA-M

54 MeFOSA

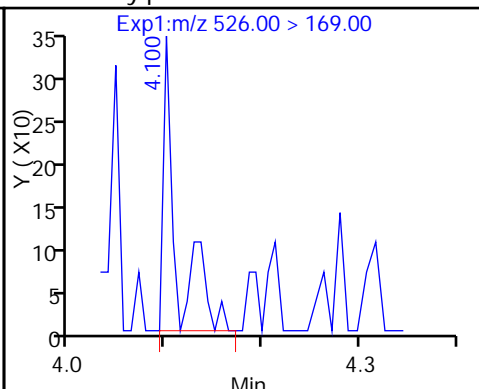
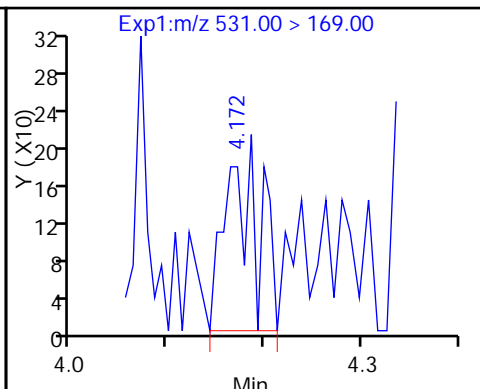
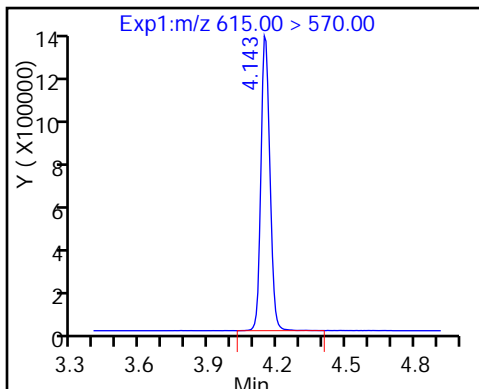
29 Perfluorododecanoic acid



D 30 13C2 PFDaA

D 51 d-N-EtFOSA-M

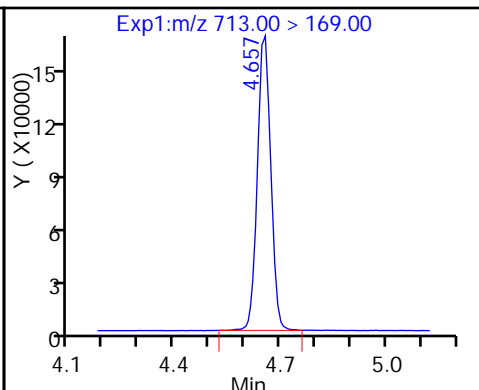
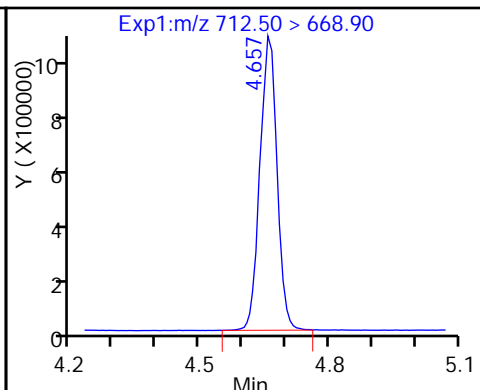
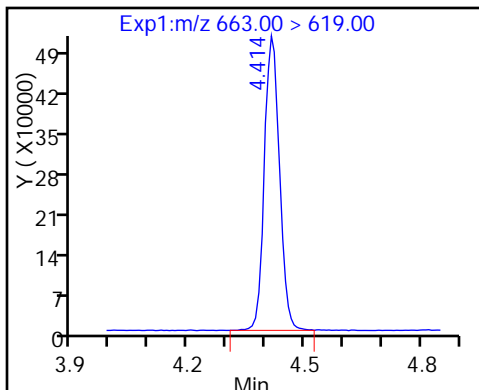
53 N-ethylperfluoro-1-octanesulfonami



31 Perfluorotridecanoic acid

33 Perfluorotetradecanoic acid

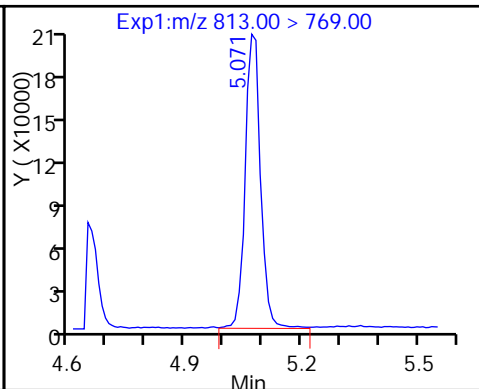
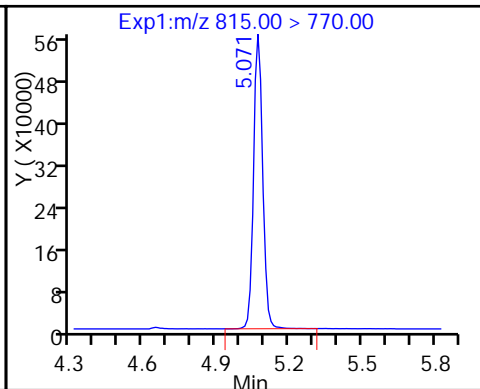
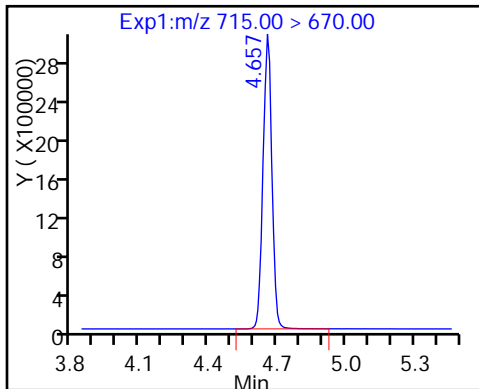
33 Perfluorotetradecanoic acid



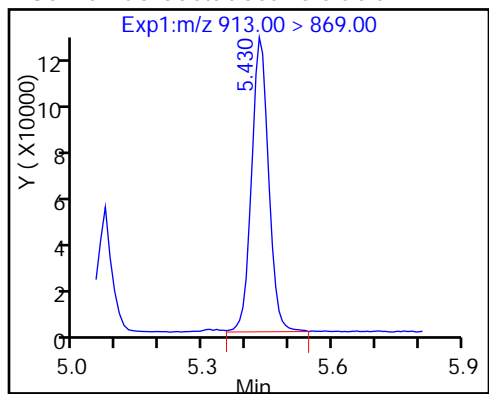
D 32 13C2-PFTeDA

D 34 13C2-PFHxDA

35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



TestAmerica Sacramento

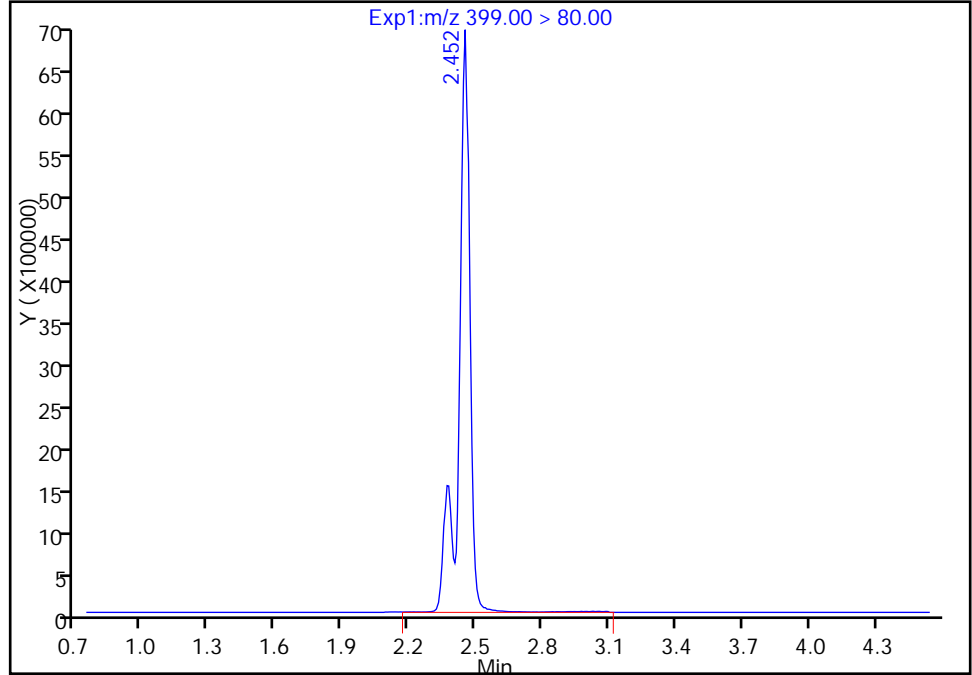
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Injection Date: 07-Dec-2016 22:55:46 Instrument ID: A8_N
Lims ID: 320-23696-A-3-C MSD
Client ID: MCFSMWFM-01
Operator ID: A8-PC\A8 ALS Bottle#: 48 Worklist Smp#: 13
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

9 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

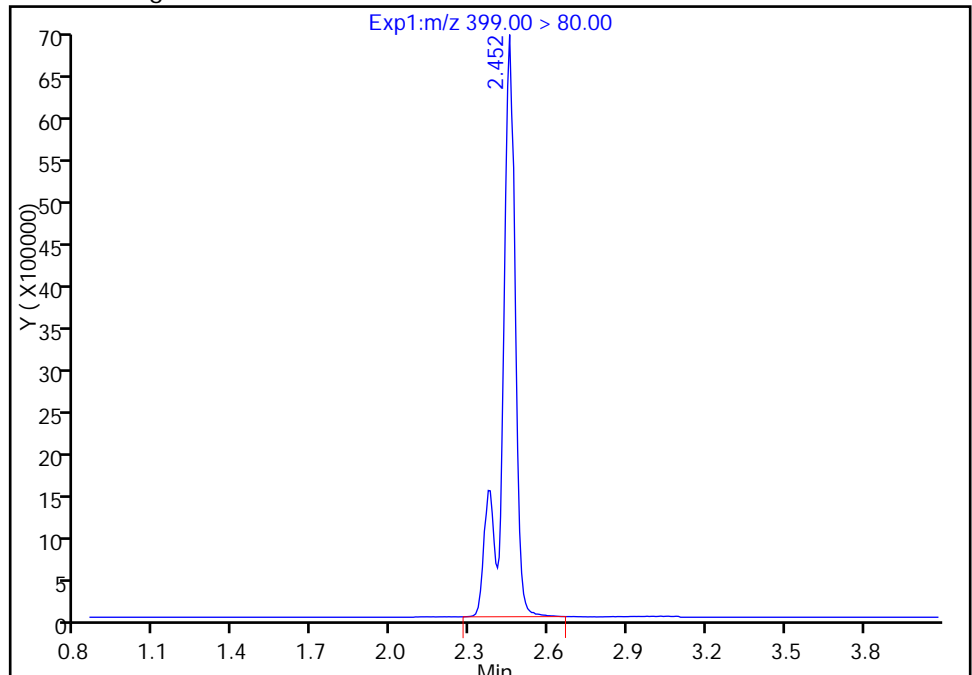
RT: 2.45
Area: 24460115
Amount: 71.822669
Amount Units: ng/ml

Processing Integration Results



RT: 2.45
Area: 24077551
Amount: 70.699339
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 08-Dec-2016 09:15:43
Audit Action: Manually Integrated

Audit Reason: Baseline

TestAmerica Sacramento

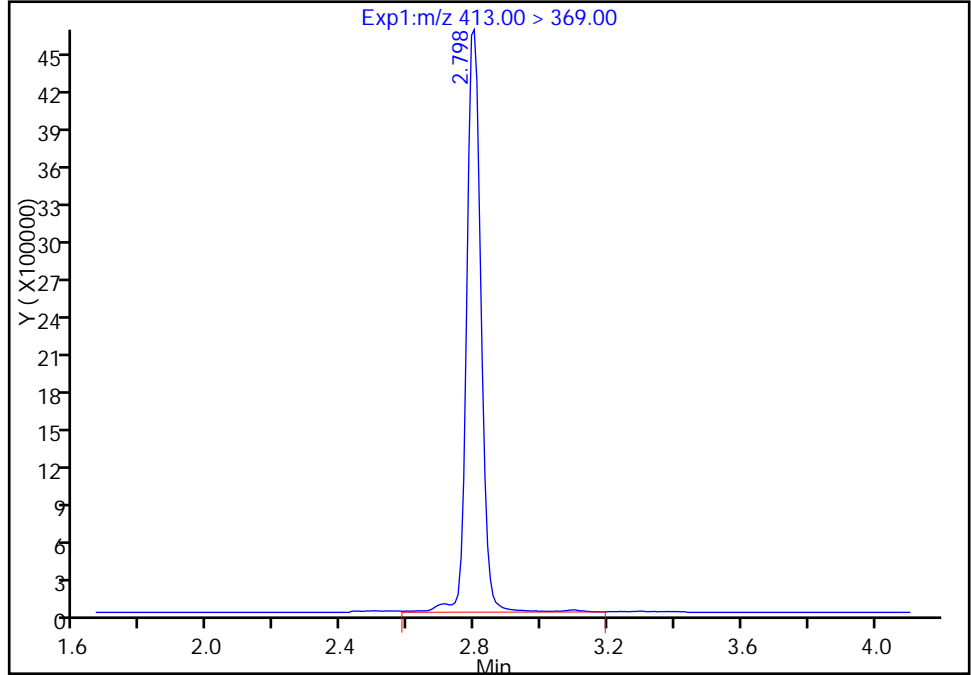
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Injection Date: 07-Dec-2016 22:55:46 Instrument ID: A8_N
Lims ID: 320-23696-A-3-C MSD
Client ID: MCFSMWFM-01
Operator ID: A8-PC\A8 ALS Bottle#: 48 Worklist Smp#: 13
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

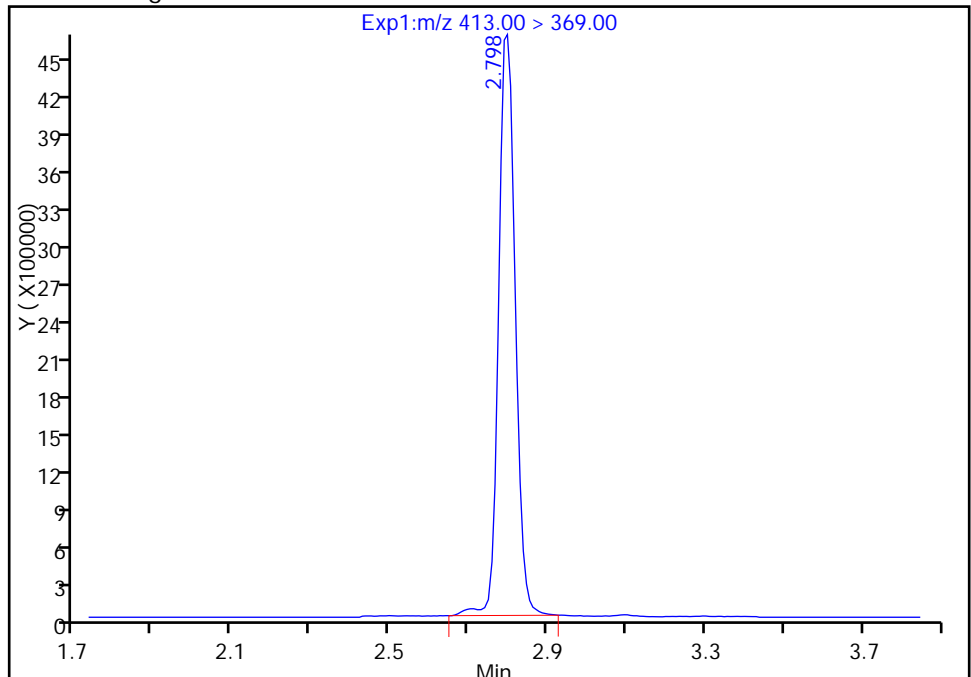
RT: 2.80
Area: 14030675
Amount: 61.211859
Amount Units: ng/ml

Processing Integration Results



RT: 2.80
Area: 13653037
Amount: 59.564331
Amount Units: ng/ml

Manual Integration Results



Reviewer: chandrasenas, 08-Dec-2016 09:15:43
Audit Action: Manually Integrated

Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23696-1
 SDG No.: _____
 Client Sample ID: MCFSMWFM-01 MSD DL Lab Sample ID: 320-23696-3 MSD DL
 Matrix: Water Lab File ID: 07DEC2016C_008.d
 Analysis Method: 537 (Modified) Date Collected: 11/16/2016 11:11
 Extraction Method: 3535 Date Extracted: 11/23/2016 11:47
 Sample wt/vol: 484.9(mL) Date Analyzed: 12/07/2016 22:18
 Con. Extract Vol.: 1.0(mL) Dilution Factor: 10
 Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 141150 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	<i>Perfluorobutanesulfonic acid (PFBS)</i>	77.9	D	26	21	9.5
375-85-9	<i>Perfluoroheptanoic acid (PFHpA)</i>	133	D	26	21	8.3
355-46-4	<i>Perfluorohexanesulfonic acid (PFHxS)</i>	151	D	26	21	9.0
375-95-1	<i>Perfluorononanoic acid (PFNA)</i>	473	D 4	26	21	6.7
1763-23-1	<i>Perfluorooctanesulfonic acid (PFOS)</i>	219	D 4	41	31	13
335-67-1	<i>Perfluorooctanoic acid (PFOA)</i>	129	D	26	21	7.7

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	142		25-150
STL00991	13C4 PFOS	131		25-150
STL01892	13C4-PFHpA	146		25-150
STL00995	13C5 PFNA	116		25-150
STL00994	18O2 PFHxS	138		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161208-37624.b\07DEC2016C_008.d
 Lims ID: 320-23696-A-3-C MSD
 Client ID: MCFSMWFM-01
 Sample Type: MSD
 Inject. Date: 07-Dec-2016 22:18:20 ALS Bottle#: 43 Worklist Smp#: 8
 Injection Vol: 2.0 ul Dil. Factor: 10.0000
 Sample Info: 320-23696-a-3-c msd 10X
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: A8-PC\A8 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20161208-37624.b\A8_N.m
 Limit Group: LC PFC_DOD ICAL
 Last Update: 08-Dec-2016 09:17:55 Calib Date: 03-Dec-2016 15:33:40
 Integrator: Picker
 Quant Method: Isotopic Dilution Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161205-37491.b\03DEC2016A_018.d

Column 1 : Det: EXP1
 Process Host: XAWRK027

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	1316647	3.92		7.8	145641	
1 Perfluorobutyric acid	212.90 > 169.00	1.542	1.542	0.0	1085335	4.72		236	3732	
D 4 13C5-PFPeA	267.90 > 223.00	1.810	1.820	-0.010	1831643	6.92		13.8	102935	
3 Perfluoropentanoic acid	262.90 > 219.00	1.820	1.820	0.0	3113117	8.37		419	3703	
5 Perfluorobutanesulfonic acid	298.90 > 80.00	1.848	1.858	-0.010	2599250	3.78		214		
	298.90 > 99.00	1.848	1.858	-0.010	1083844		2.40(0.00-0.00)			
7 Perfluorohexanoic acid	313.00 > 269.00	2.103	2.100	0.003	4046807	13.5		677	36352	
D 6 13C2 PFHxA	315.00 > 270.00	2.111	2.109	0.002	1568265	6.60		13.2	142949	
9 Perfluorohexanesulfonic acid	399.00 > 80.00	2.425	2.372	0.053	3472144	7.34		403		
12 Perfluoroheptanoic acid	363.00 > 319.00	2.442	2.438	0.004	2010221	6.47		323	16678	
D 11 13C4-PFHpA	367.00 > 322.00	2.442	2.438	0.004	1513467	7.30		14.6	139879	
D 10 18O2 PFHxS	403.00 > 84.00	2.460	2.455	0.005	2038956	6.53		13.8	161347	
48 Sodium 1H,1H,2H,2H-perfluorooctane	427.00 > 407.00	2.781	2.774	0.007	3428651	NR		0.0		
D 47 M2-6:2FTS	429.00 > 409.00	2.773	2.774	-0.001	185132	1.75		0.0		
15 Perfluorooctanoic acid	413.00 > 369.00	2.805	2.796	0.009	2073691	6.23		312	38456	
	413.00 > 169.00	2.805	2.796	0.009	1235014		1.68(0.90-1.10)		44304	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 14 13C4 PFOA										
417.00 > 372.00	2.805	2.804	0.001		1551430	7.08		14.2	113892	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.805	2.804	0.001	1.000	762906	2.01		106		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.173	3.147	0.026	1.000	3703690	10.6		571	409232	
499.00 > 99.00	3.065	3.147	-0.082	0.966	795851		4.65(0.90-1.10)		15211	
D 17 13C4 PFOS										
503.00 > 80.00	3.173	3.163	0.010		1538433	6.25		13.1	72173	
20 Perfluorononanoic acid										
463.00 > 419.00	3.173	3.171	0.002	1.000	4426418	22.9		1146	42482	
D 19 13C5 PFNA										
468.00 > 423.00	3.165	3.171	-0.006		969034	5.82		11.6	81818	
D 21 13C8 FOSA										
506.00 > 78.00	3.506	3.503	0.003		31768	0.0790		0.2	2789	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.506	3.503	0.003	1.000	11816	1.99		99.5	1614	
D 42 M2-8:2FTS										
529.00 > 509.00	3.506	3.520	-0.014		1731	0.0178		0.0		
43 Sodium 1H,1H,2H,2H-perfluorooctane										
527.00 > 507.00	3.523	3.520	0.003	1.005	27318	NR		0.0		
24 Perfluorodecanoic acid										
513.00 > 469.00	3.523	3.528	-0.005	1.000	289714	2.34		117	7519	
D 23 13C2 PFDA										
515.00 > 470.00	3.523	3.528	-0.005		644883	4.09		8.2	26454	
D 45 d3-NMeFOSAA										
573.00 > 419.00	3.667	3.683	-0.016		1111	0.0153		0.0		
44 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.780	3.693	0.087	1.031	300	NR		0.0		
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.842	3.839	0.003	1.000	351512	1.71		88.5		
D 46 d5-NEtFOSAA										
589.00 > 419.00	3.859	3.847	0.012		1490	0.0187		0.0		
49 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.859	3.856	0.003	1.000	1016	NR		0.0		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.859	3.857	0.002	1.000	176555	2.01		100	4206	
D 27 13C2 PFUnA										
565.00 > 520.00	3.859	3.857	0.002		412128	3.47		6.9	52653	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.154	4.147	0.007	1.000	150672	2.05		103	3550	
D 30 13C2 PFDoA										
615.00 > 570.00	4.147	4.154	-0.007		386660	3.45		6.9	18916	
D 51 d-N-EtFOSA-M										
531.00 > 169.00	4.168	4.192	-0.024		321	0.003237		0.0		
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.410	4.418	-0.008	1.000	135175	1.84		92.0	2165	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.661	4.652	0.009	1.000	251267	1.75		87.6	3145	
713.00 > 169.00	4.652	4.652	0.0	0.998	40247		6.24(0.00-0.00)		16027	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.661	4.652	0.009		697247	3.02		6.0	130508	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.068	5.068	0.0		156950	1.21		2.4	14651	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.068	5.079	-0.011	1.000	60483	0.0333		1.7	655	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.436	5.428	0.008	1.000	41285	0.5377		26.9	804	

QC Flag Legend

Processing Flags

NR - Missing Quant Standard

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161208-37624.b\07DEC2016C_008.d

Injection Date: 07-Dec-2016 22:18:20

Instrument ID: A8_N

Lims ID: 320-23696-A-3-C MSD

Client ID: MCFSMWFM-01

Operator ID: A8-PC\A8

ALS Bottle#: 43

Worklist Smp#: 8

Injection Vol: 2.0 ul

Dil. Factor: 10.0000

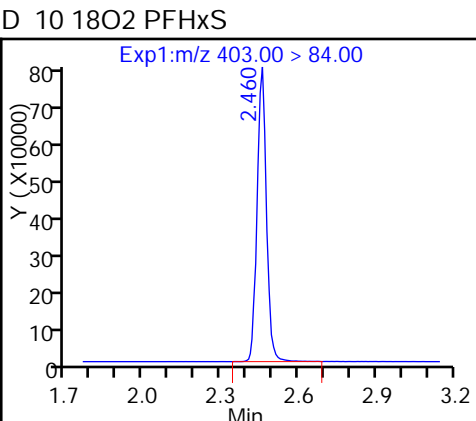
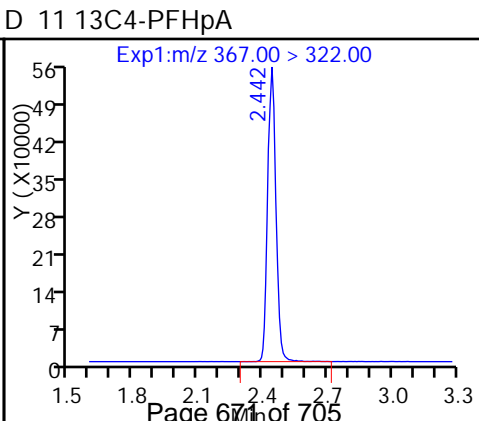
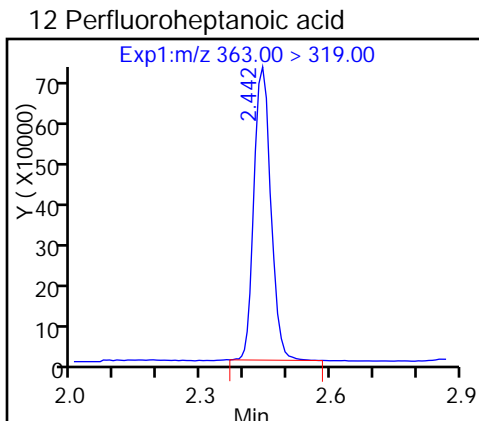
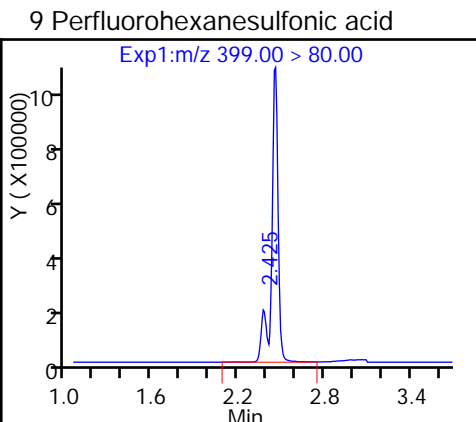
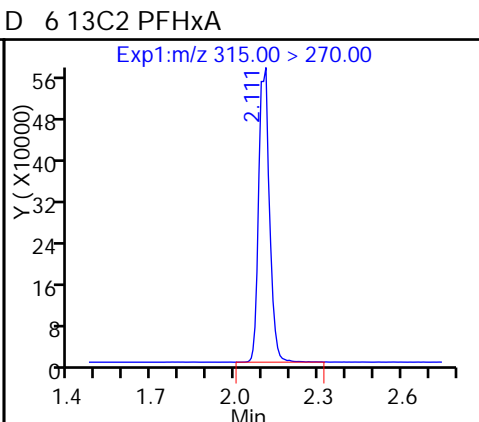
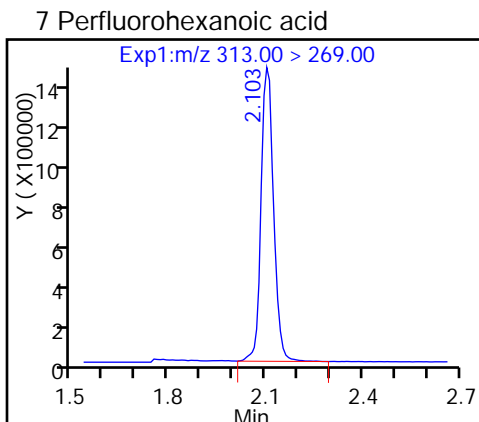
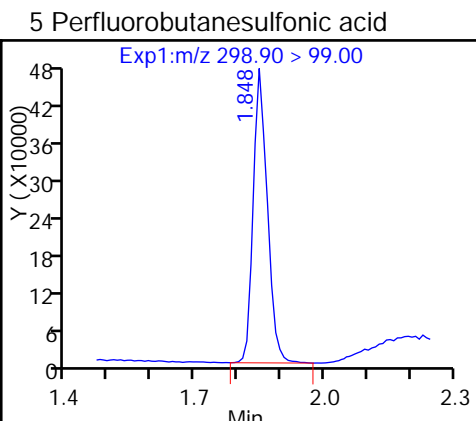
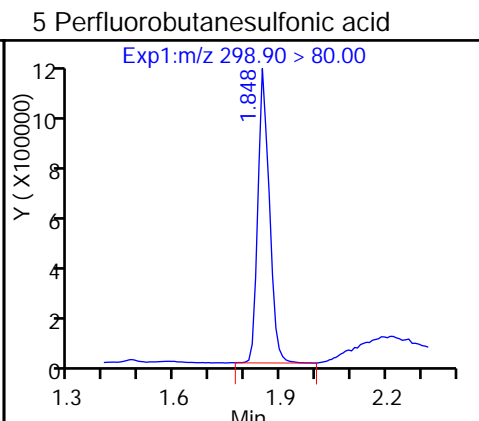
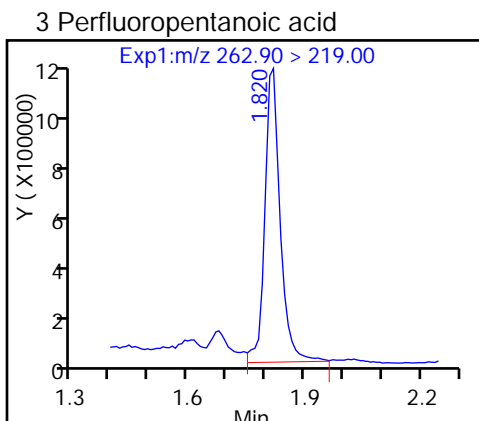
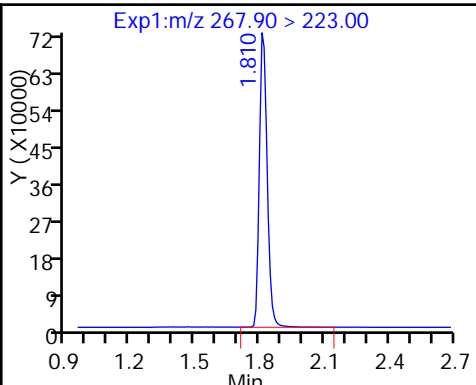
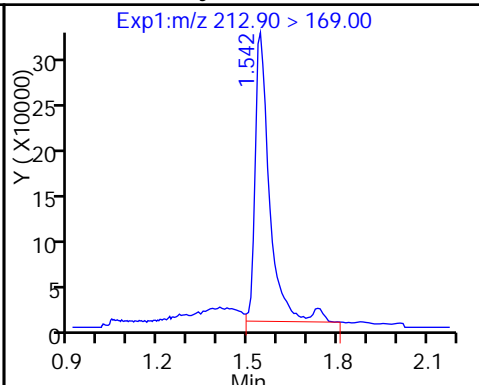
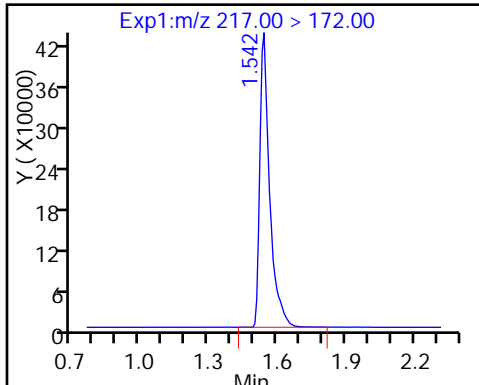
Method: A8_N

Limit Group: LC PFC_DOD ICAL

D 2 13C4 PFBA

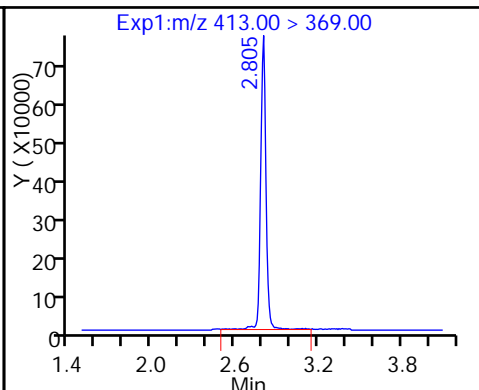
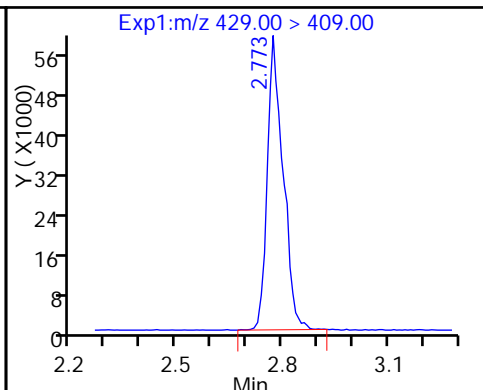
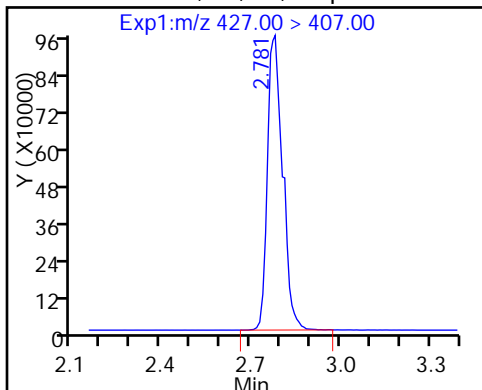
1 Perfluorobutyric acid

D 4 13C5-PFPeA



48 Sodium 1H,1H,2H,2H-perfluorooctanoate

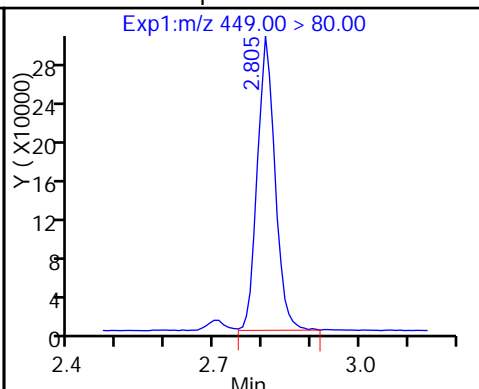
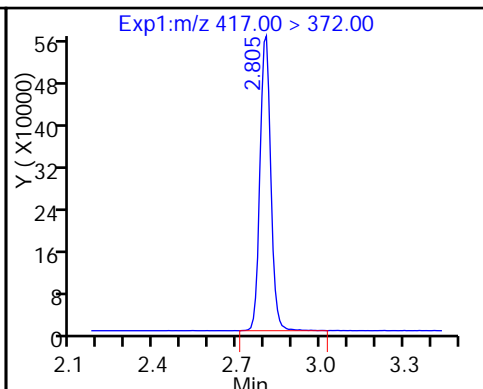
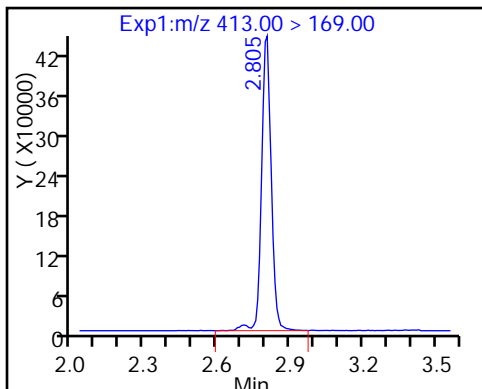
15 Perfluorooctanoic acid



15 Perfluorooctanoic acid

D 14 13C4 PFOA

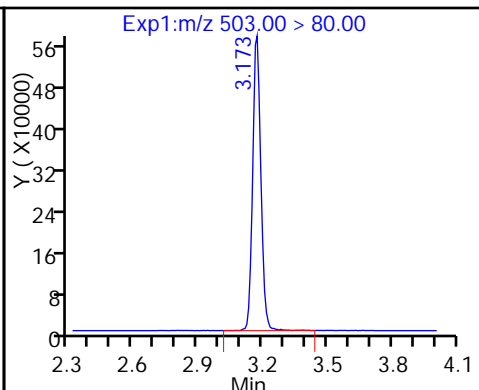
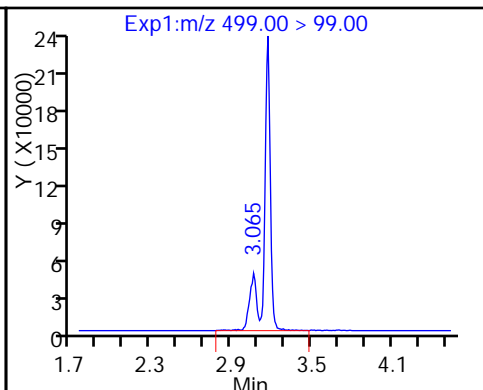
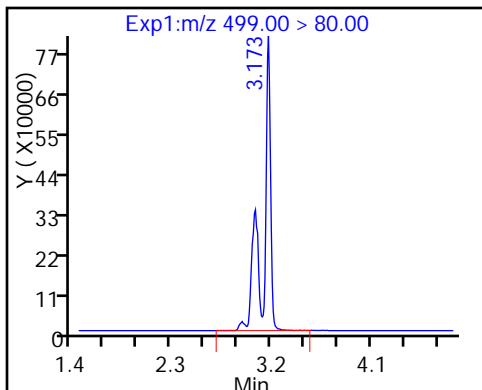
13 Perfluoroheptanesulfonic Acid



18 Perfluorooctane sulfonic acid

18 Perfluorooctane sulfonic acid

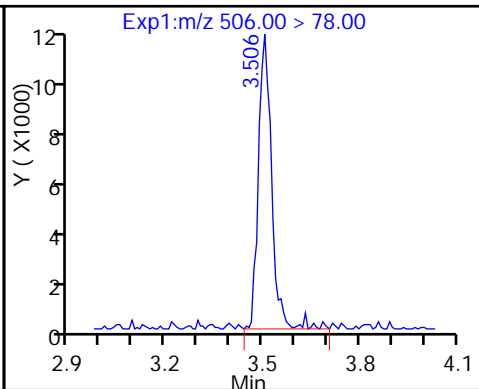
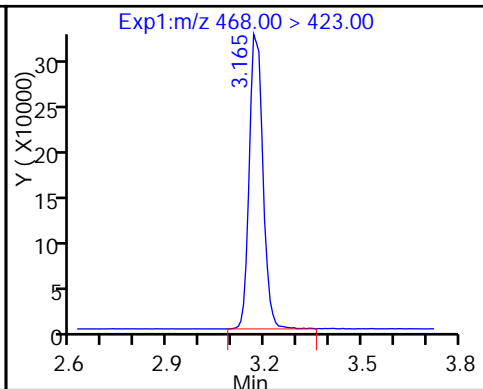
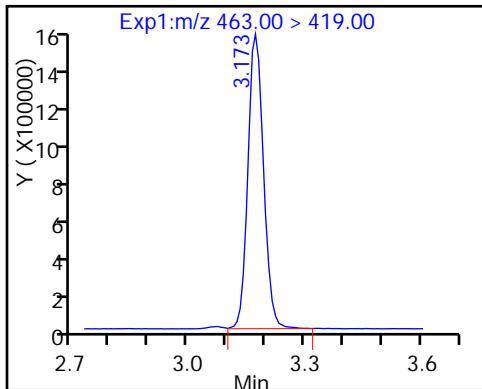
D 17 13C4 PFOS



20 Perfluorononanoic acid

D 19 13C5 PFNA

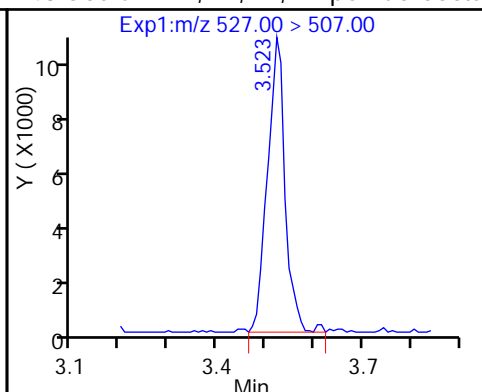
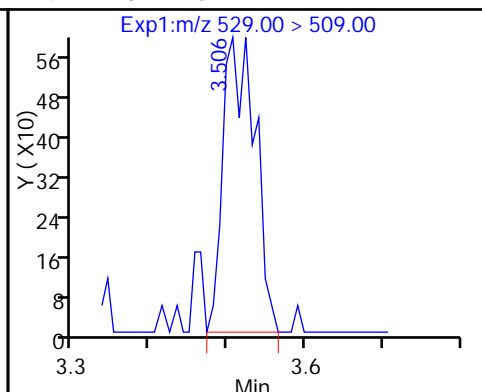
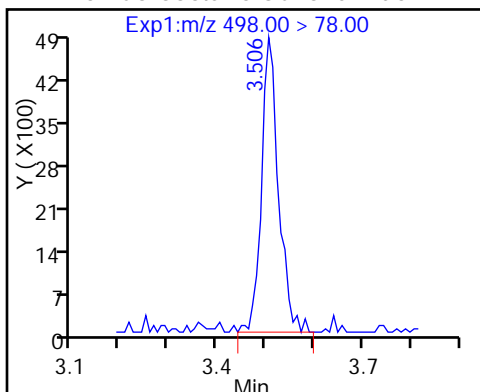
D 21 13C8 FOSA



22 Perfluorooctane Sulfonamide

D 42 M2-8:2FTS

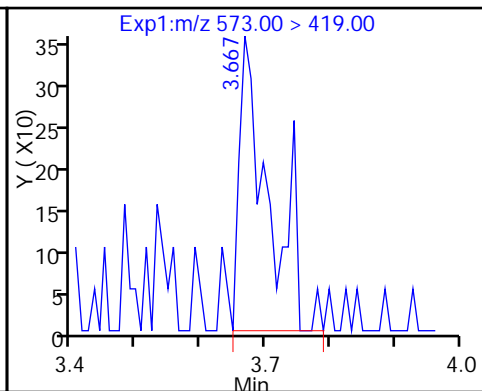
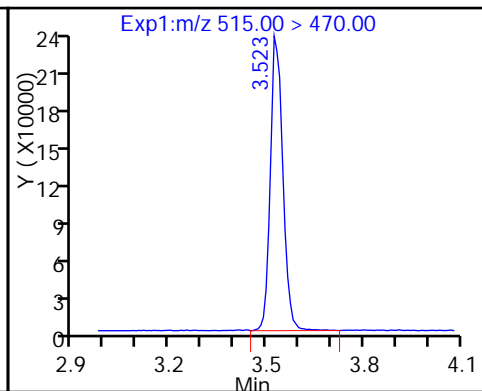
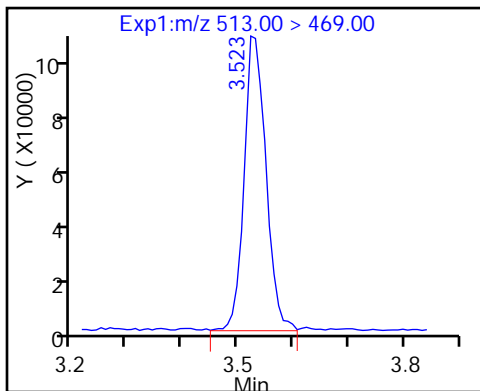
43 Sodium 1H,1H,2H,2H-perfluorooctane



24 Perfluorodecanoic acid

D 23 13C2 PFDA

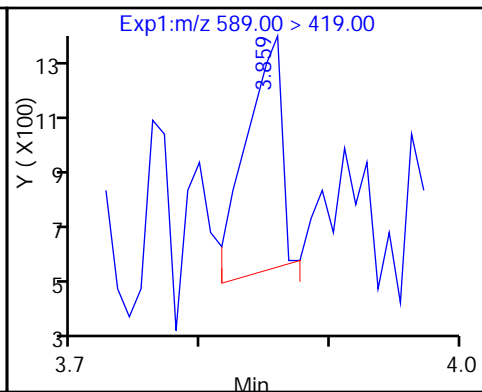
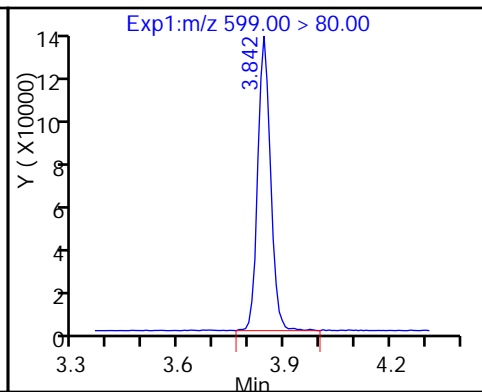
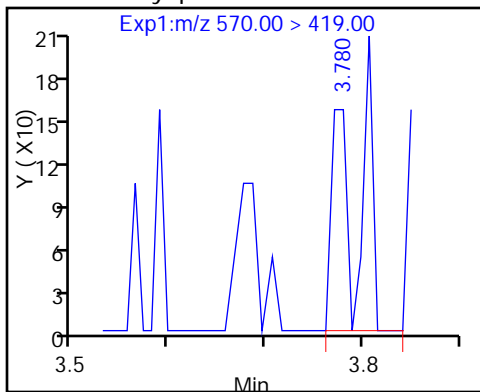
D 45 d3-NMeFOSAA



44 N-methyl perfluorooctane sulfonami

26 Perfluorodecane Sulfonic acid

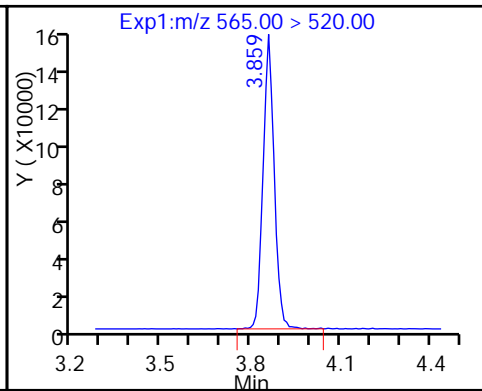
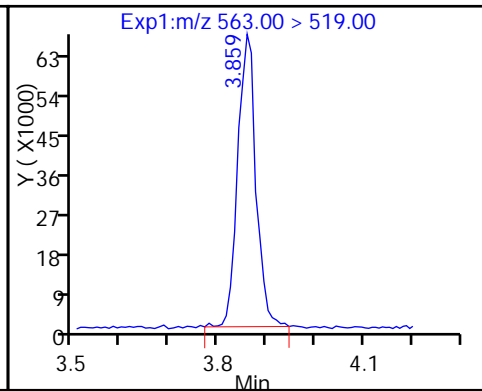
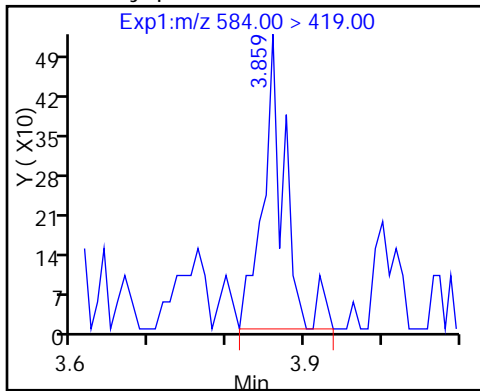
D 46 d5-NEtFOSAA



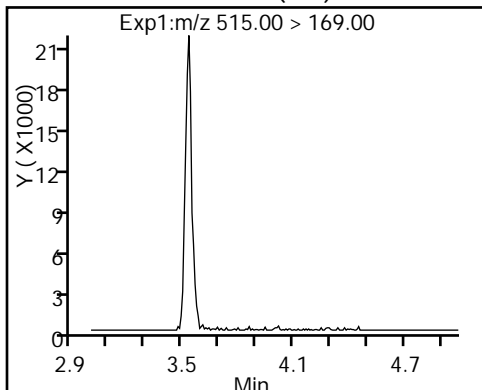
49 N-ethyl perfluorooctane sulfonamid

28 Perfluoroundecanoic acid

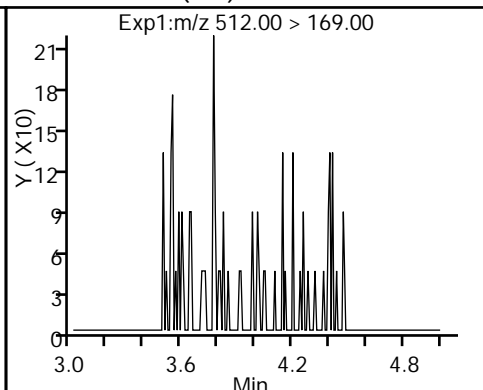
D 27 13C2 PFUnA



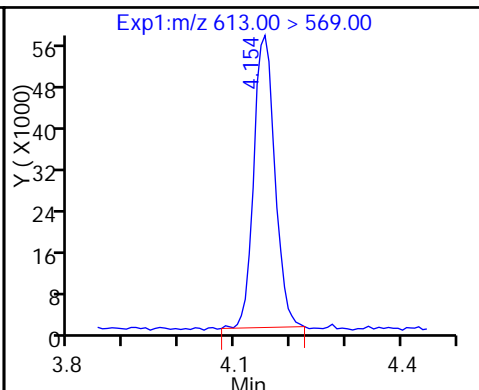
D 52 d-N-MeFOSA-M (ND)



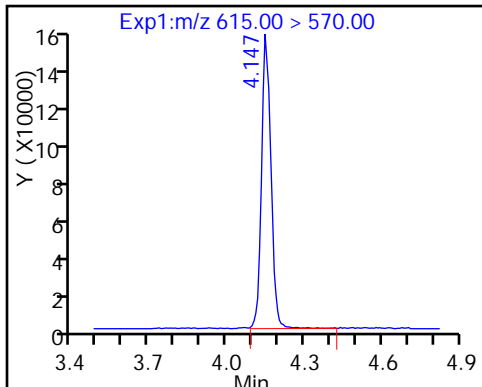
54 MeFOSA (ND)



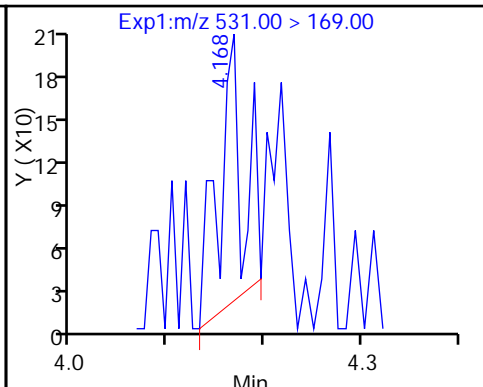
29 Perfluorododecanoic acid



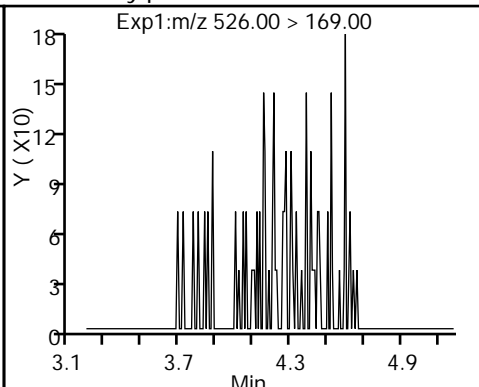
D 30 13C2 PFDaA



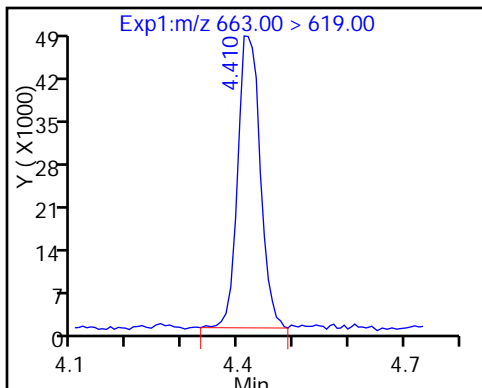
D 51 d-N-EtFOSA-M



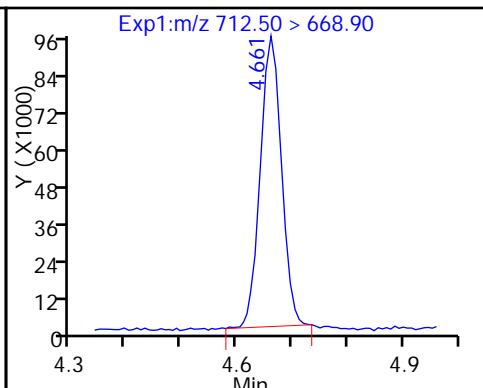
53 N-ethylperfluoro-1-octanesulfonami (ND)



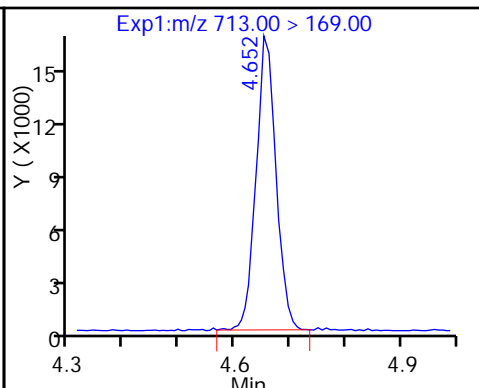
31 Perfluorotridecanoic acid



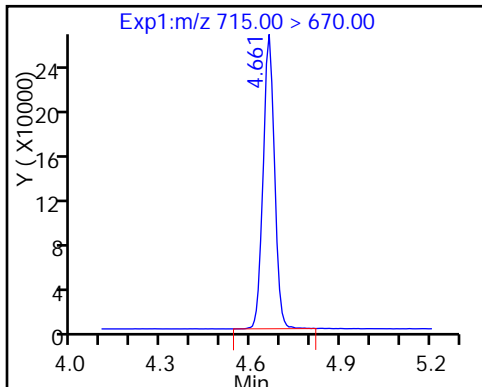
33 Perfluorotetradecanoic acid



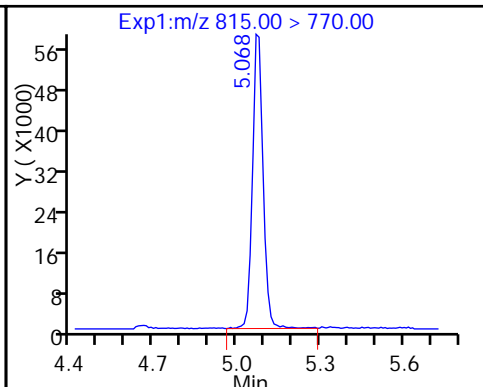
33 Perfluorotetradecanoic acid



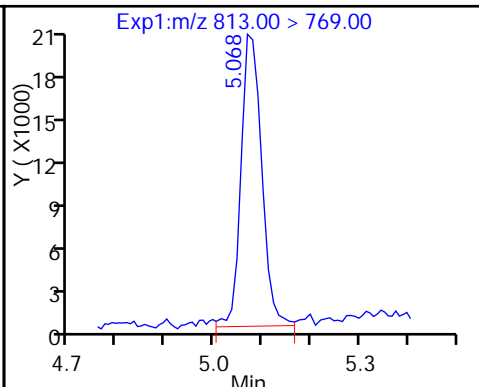
D 32 13C2-PFTeDA



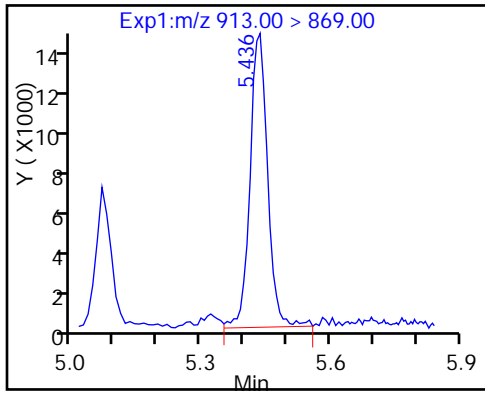
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-23696-1

SDG No.: _____

Instrument ID: A8_N Start Date: 12/03/2016 13:26

Analysis Batch Number: 140564 End Date: 12/03/2016 18:33

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
RB 320-140564/1 CCB		12/03/2016 13:26	1		Acquity 2.1(mm)
RB 320-140564/2 CCB		12/03/2016 13:33	1		Acquity 2.1(mm)
RB 320-140564/3 CCB		12/03/2016 13:41	1		Acquity 2.1(mm)
IC 320-140564/4		12/03/2016 13:48	1	03DEC2016A_004.d	Acquity 2.1(mm)
IC 320-140564/5		12/03/2016 13:56	1	03DEC2016A_005.d	Acquity 2.1(mm)
IC 320-140564/6		12/03/2016 14:03	1	03DEC2016A_006.d	Acquity 2.1(mm)
IC 320-140564/7		12/03/2016 14:11	1	03DEC2016A_007.d	Acquity 2.1(mm)
IC 320-140564/8		12/03/2016 14:18	1	03DEC2016A_008.d	Acquity 2.1(mm)
IC 320-140564/9		12/03/2016 14:26	1	03DEC2016A_009.d	Acquity 2.1(mm)
ICB 320-140564/10		12/03/2016 14:33	1		Acquity 2.1(mm)
ICV 320-140564/11		12/03/2016 14:41	1	03DEC2016A_011.d	Acquity 2.1(mm)
RB 320-140564/12 CCB		12/03/2016 14:48	1		Acquity 2.1(mm)
IC 320-140564/13		12/03/2016 14:56	1	03DEC2016A_013.d	Acquity 2.1(mm)
IC 320-140564/14		12/03/2016 15:03	1	03DEC2016A_014.d	Acquity 2.1(mm)
IC 320-140564/15		12/03/2016 15:11	1	03DEC2016A_015.d	Acquity 2.1(mm)
IC 320-140564/16		12/03/2016 15:18	1	03DEC2016A_016.d	Acquity 2.1(mm)
IC 320-140564/17		12/03/2016 15:26	1	03DEC2016A_017.d	Acquity 2.1(mm)
IC 320-140564/18		12/03/2016 15:33	1	03DEC2016A_018.d	Acquity 2.1(mm)
ICB 320-140564/19		12/03/2016 15:41	1		Acquity 2.1(mm)
ICV 320-140564/20		12/03/2016 15:48	1		Acquity 2.1(mm)
RB 320-140564/21 CCB		12/03/2016 15:56	1		Acquity 2.1(mm)
ZZZZZ		12/03/2016 16:03	1		Acquity 2.1(mm)
ZZZZZ		12/03/2016 16:11	1		Acquity 2.1(mm)
ZZZZZ		12/03/2016 16:18	1		Acquity 2.1(mm)
ZZZZZ		12/03/2016 16:26	1		Acquity 2.1(mm)
ZZZZZ		12/03/2016 16:33	1		Acquity 2.1(mm)
ZZZZZ		12/03/2016 16:41	1		Acquity 2.1(mm)
ZZZZZ		12/03/2016 16:48	1		Acquity 2.1(mm)
RB 320-140564/29 CCB		12/03/2016 16:56	1		Acquity 2.1(mm)
CCV 320-140564/30		12/03/2016 17:03	1		Acquity 2.1(mm)
CCV 320-140564/31		12/03/2016 17:11	1		Acquity 2.1(mm)
RB 320-140564/32 CCB		12/03/2016 17:18	1		Acquity 2.1(mm)
RB 320-140564/39 CCB		12/03/2016 18:11	1		Acquity 2.1(mm)
CCV 320-140564/40		12/03/2016 18:18	1		Acquity 2.1(mm)
CCV 320-140564/41		12/03/2016 18:26	1		Acquity 2.1(mm)
RB 320-140564/42 CCB		12/03/2016 18:33	1		Acquity 2.1(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-23696-1

SDG No.: _____

Instrument ID: A8_N Start Date: 12/03/2016 18:41

Analysis Batch Number: 140675 End Date: 12/03/2016 23:26

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
RB 320-140675/1 CCB		12/03/2016 18:41	1		Acquity 2.1(mm)
CCV 320-140675/2		12/03/2016 18:48	1	03DEC2016C_002.d	Acquity 2.1(mm)
CCV 320-140675/3		12/03/2016 18:56	1		Acquity 2.1(mm)
RB 320-140675/4 CCB		12/03/2016 19:03	1		Acquity 2.1(mm)
ZZZZZ		12/03/2016 19:11	10		Acquity 2.1(mm)
ZZZZZ		12/03/2016 19:18	10		Acquity 2.1(mm)
ZZZZZ		12/03/2016 19:26	10		Acquity 2.1(mm)
MB 320-139316/1-A		12/03/2016 19:33	1	03DEC2016C_008.d	Acquity 2.1(mm)
LCS 320-139316/2-A		12/03/2016 19:41	1	03DEC2016C_009.d	Acquity 2.1(mm)
ZZZZZ		12/03/2016 19:48	100		Acquity 2.1(mm)
ZZZZZ		12/03/2016 19:56	100		Acquity 2.1(mm)
ZZZZZ		12/03/2016 20:03	100		Acquity 2.1(mm)
ZZZZZ		12/03/2016 20:11	10		Acquity 2.1(mm)
ZZZZZ		12/03/2016 20:18	10		Acquity 2.1(mm)
RB 320-140675/15 CCB		12/03/2016 20:26	1		Acquity 2.1(mm)
CCV 320-140675/16		12/03/2016 20:33	1	03DEC2016C_016.d	Acquity 2.1(mm)
CCV 320-140675/17		12/03/2016 20:41	1		Acquity 2.1(mm)
RB 320-140675/18 CCB		12/03/2016 20:48	1		Acquity 2.1(mm)
320-23696-1		12/03/2016 20:56	1	03DEC2016C_019.d	Acquity 2.1(mm)
320-23696-2		12/03/2016 21:03	1	03DEC2016C_020.d	Acquity 2.1(mm)
320-23696-4		12/03/2016 21:11	1	03DEC2016C_021.d	Acquity 2.1(mm)
320-23696-5		12/03/2016 21:18	1	03DEC2016C_022.d	Acquity 2.1(mm)
320-23696-8		12/03/2016 21:26	1	03DEC2016C_023.d	Acquity 2.1(mm)
320-23696-9		12/03/2016 21:33	1	03DEC2016C_024.d	Acquity 2.1(mm)
ZZZZZ		12/03/2016 21:41	1		Acquity 2.1(mm)
ZZZZZ		12/03/2016 21:48	1		Acquity 2.1(mm)
ZZZZZ		12/03/2016 21:56	1		Acquity 2.1(mm)
ZZZZZ		12/03/2016 22:03	1		Acquity 2.1(mm)
RB 320-140675/29 CCB		12/03/2016 22:11	1		Acquity 2.1(mm)
CCV 320-140675/30		12/03/2016 22:18	1	03DEC2016C_030.d	Acquity 2.1(mm)
CCV 320-140675/31		12/03/2016 22:26	1		Acquity 2.1(mm)
RB 320-140675/32 CCB		12/03/2016 22:33	1		Acquity 2.1(mm)
ZZZZZ		12/03/2016 22:41	1		Acquity 2.1(mm)
320-23696-6		12/03/2016 22:48	1	03DEC2016C_034.d	Acquity 2.1(mm)
320-23696-7		12/03/2016 22:56	1	03DEC2016C_035.d	Acquity 2.1(mm)
RB 320-140675/36 CCB		12/03/2016 23:03	1		Acquity 2.1(mm)
CCV 320-140675/37		12/03/2016 23:11	1	03DEC2016C_037.d	Acquity 2.1(mm)
CCV 320-140675/38		12/03/2016 23:18	1		Acquity 2.1(mm)
RB 320-140675/39 CCB		12/03/2016 23:26	1		Acquity 2.1(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-23696-1

SDG No.: _____

Instrument ID: A8_N Start Date: 12/07/2016 21:25

Analysis Batch Number: 141150 End Date: 12/07/2016 23:33

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
RB 320-141150/1 CCB		12/07/2016 21:25	1		Acquity 2.1 (mm)
CCV 320-141150/2		12/07/2016 21:33	1	07DEC2016C_002.d	Acquity 2.1 (mm)
CCV 320-141150/3		12/07/2016 21:40	1		Acquity 2.1 (mm)
RB 320-141150/4 CCB		12/07/2016 21:48	1		Acquity 2.1 (mm)
320-23696-6 DL		12/07/2016 21:55	100	07DEC2016C_005.d	Acquity 2.1 (mm)
ZZZZZ		12/07/2016 22:03	10		Acquity 2.1 (mm)
320-23696-3 MS DL		12/07/2016 22:10	10	07DEC2016C_007.d	Acquity 2.1 (mm)
320-23696-3 MSD DL		12/07/2016 22:18	10	07DEC2016C_008.d	Acquity 2.1 (mm)
320-23696-2 DL		12/07/2016 22:25	10	07DEC2016C_009.d	Acquity 2.1 (mm)
ZZZZZ		12/07/2016 22:33	1		Acquity 2.1 (mm)
320-23696-3		12/07/2016 22:40	1	07DEC2016C_011.d	Acquity 2.1 (mm)
320-23696-3 MS		12/07/2016 22:48	1	07DEC2016C_012.d	Acquity 2.1 (mm)
320-23696-3 MSD		12/07/2016 22:55	1	07DEC2016C_013.d	Acquity 2.1 (mm)
RB 320-141150/14 CCB		12/07/2016 23:03	1		Acquity 2.1 (mm)
RB 320-141150/15 CCB		12/07/2016 23:10	1		Acquity 2.1 (mm)
CCV 320-141150/16		12/07/2016 23:18	1	07DEC2016C_016.d	Acquity 2.1 (mm)
CCV 320-141150/17		12/07/2016 23:25	1		Acquity 2.1 (mm)
RB 320-141150/18 CCB		12/07/2016 23:33	1		Acquity 2.1 (mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23696-1

SDG No.: _____

Batch Number: 139316 Batch Start Date: 11/23/16 11:47 Batch Analyst: Sharifi, Nooshin

Batch Method: 3535 Batch End Date: 11/25/16 12:49

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	LCMPFCSU 00046	LCPFCSU 00070
MB 320-139316/1		3535, 537 (Modified)				500 mL	1.0 mL	50 uL	
LCS 320-139316/2		3535, 537 (Modified)				500 mL	1.0 mL	50 uL	40 uL
320-23696-A-1	46MW01	3535, 537 (Modified)	T	568.18 g	43.60 g	524.6 mL	1.0 mL	50 uL	
320-23696-A-2	46MW05	3535, 537 (Modified)	T	564.77 g	44.61 g	520.2 mL	1.0 mL	50 uL	
320-23696-A-3	MCFSMWFM-01	3535, 537 (Modified)	T	527.27 g	44.83 g	482.4 mL	1.0 mL	50 uL	
320-23696-A-3 MS	MCFSMWFM-01	3535, 537 (Modified)	T	526.56 g	45.09 g	481.5 mL	1.0 mL	50 uL	40 uL
320-23696-A-3 MSD	MCFSMWFM-01	3535, 537 (Modified)	T	531.69 g	46.77 g	484.9 mL	1.0 mL	50 uL	40 uL
320-23696-A-4	MCFSMW-4	3535, 537 (Modified)	T	551.15 g	44.20 g	507 mL	1.0 mL	50 uL	
320-23696-A-5	MCFSMW-2	3535, 537 (Modified)	T	541.80 g	45.75 g	496.1 mL	1.0 mL	50 uL	
320-23696-A-6	MCFSMW5U-01	3535, 537 (Modified)	T	552.52 g	45.65 g	506.9 mL	1.0 mL	50 uL	
320-23696-A-7	MCFSMW-16	3535, 537 (Modified)	T	525.84 g	44.73 g	481.1 mL	1.0 mL	50 uL	
320-23696-A-8	DUP-111616	3535, 537 (Modified)	T	556.77 g	43.62 g	513.2 mL	1.0 mL	50 uL	
320-23696-A-9	FB111616	3535, 537 (Modified)	T	560.02 g	45.48 g	514.5 mL	1.0 mL	50 uL	

Lab Sample ID	Client Sample ID	Method Chain	Basis	AnalysisComment					
MB 320-139316/1		3535, 537 (Modified)							
LCS 320-139316/2		3535, 537 (Modified)							
320-23696-A-1	46MW01	3535, 537 (Modified)	T	See NCM for these samples because they have sediment for job number 23696.					
320-23696-A-2	46MW05	3535, 537 (Modified)	T						
320-23696-A-3	MCFSMWFM-01	3535, 537 (Modified)	T						

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23696-1

SDG No.: _____

Batch Number: 139316 Batch Start Date: 11/23/16 11:47 Batch Analyst: Sharifi, Nooshin

Batch Method: 3535 Batch End Date: 11/25/16 12:49

Lab Sample ID	Client Sample ID	Method Chain	Basis	AnalysisComment					
320-23696-A-3 MS	MCFSMWFM-01	3535, 537 (Modified)	T						
320-23696-A-3 MSD	MCFSMWFM-01	3535, 537 (Modified)	T						
320-23696-A-4	MCFSMW-4	3535, 537 (Modified)	T						
320-23696-A-5	MCFSMW-2	3535, 537 (Modified)	T						
320-23696-A-6	MCFSMW5U-01	3535, 537 (Modified)	T						
320-23696-A-7	MCFSMW-16	3535, 537 (Modified)	T						
320-23696-A-8	DUP-111616	3535, 537 (Modified)	T						
320-23696-A-9	FB111616	3535, 537 (Modified)	T						

Batch Notes	
Balance ID	QA-070
Batch Comment	0.1N NaOH/H2O_00026
H2O ID	11-21-16
Hexane ID	000146278
Manifold ID	2,4
Methanol ID	769617
Pipette ID	MD05306
Analyst ID - Reagent Drop	NSH
Analyst ID - SU Reagent Drop	NSH
Analyst ID - SU Reagent Drop Witness	HJA
Solvent Lot #	776672
Solvent Name	0.3% NH4OH-Me
SOP Number	WS-IC-0025
SPE Cartridge Type	WAX 500mg
Solid Phase Extraction Disk ID	002836112A

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

537 (Modified)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23696-1

SDG No.: _____

Batch Number: 139316 Batch Start Date: 11/23/16 11:47 Batch Analyst: Sharifi, Nooshin

Batch Method: 3535 Batch End Date: 11/25/16 12:49

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.

HPLC/LCMS Data Review Checklist

Job Number(s): 23718; 23696; 23691

Work List ID(s): 37599; 37521; 37624

Extraction Batch: 139076; 139316;

Analysis Batch(es): 141054; 140675; 141150

Delivery Rank 4

Due Date: 11/25/16; 11/28/16

A. Calibration/Instrument Run QC	1 st Level	2 nd Level	N/A
1. ICAL locked in Chrom and TALS? ICAL Batch# <u>140564</u>	✓	✓	
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: 12/8/16

2nd Level Reviewer: [Signature]

Date: 12/9/16

NCMS: 72253; 71975; 72289; 72290

TestAmerica Laboratories
Worklist QC Batch Report

Worklist Name: 03DEC2016B_PFC Worklist Number: 37521
 Instrument Name: A8_N Chrom Method: A8_N
 Data Directory: \\ChromNa\Sacramento\ChromData\A8_N\20161205-37521.b
 QC Batching: Disabled Limit Group Batching: Enabled

QC Batch: 1	LC PFC_DOD ICAL Raw Batch: 140675	LC PFC ICAL Raw Batch: 140676	LC PFAS ICAL Raw Batch: 140677
# 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
# 5 320-23718-A-1-A	# 5 320-23718-A-1-A		
# 6 320-23718-A-2-A	# 6 320-23718-A-2-A		
# 7 320-23718-A-5-A	# 7 320-23718-A-5-A		
# 8 MB 320-139316/1-A	# 8 MB 320-139316/1-A		
# 9 LCS 320-139316/2-A	# 9 LCS 320-139316/2-A		
#10 320-23696-A-3-A	#10 320-23696-A-3-A		
#11 320-23696-A-3-B MS	#11 320-23696-A-3-B MS		
#12 320-23696-A-3-C MSD	#12 320-23696-A-3-C MSD		
#13 320-23696-A-6-A	#13 320-23696-A-6-A		
#14 320-23696-A-7-A	#14 320-23696-A-7-A		
#15 RB	#15 RB	#15 RB	#15 RB
#16 CCV L5	#16 CCV L5	#16 CCV L5	#16 CCV L5
#17 CCV L5 Add-on	#17 CCV L5 Add-on	#17 CCV L5 Add-on	#17 CCV L5 Add-on
#18 RB	#18 RB	#18 RB	#18 RB
#19 320-23696-A-1-A	#19 320-23696-A-1-A		
#20 320-23696-A-2-A	#20 320-23696-A-2-A		
#21 320-23696-A-4-A	#21 320-23696-A-4-A		
#22 320-23696-A-5-A	#22 320-23696-A-5-A		
#23 320-23696-A-8-A	#23 320-23696-A-8-A		
#24 320-23696-A-9-A	#24 320-23696-A-9-A		
#25 320-23691-A-1-A	#25 320-23691-A-1-A		
#26 320-23691-A-2-A	#26 320-23691-A-2-A		
#27 320-23691-A-3-A	#27 320-23691-A-3-A		
#28 320-23691-A-4-A	#28 320-23691-A-4-A		
#29 RB	#29 RB	#29 RB	#29 RB
#30 CCV L5	#30 CCV L5	#30 CCV L5	#30 CCV L5
#31 CCV L5 Add-on	#31 CCV L5 Add-on	#31 CCV L5 Add-on	#31 CCV L5 Add-on
#32 RB	#32 RB	#32 RB	#32 RB
#33 320-23691-A-5-A	#33 320-23691-A-5-A		
#34 320-23696-A-6-A	#34 320-23696-A-6-A		
#35 320-23696-A-7-A	#35 320-23696-A-7-A - no carryover		
#36 RB	#36 RB	#36 RB	#36 RB
#37 CCV L5	#37 CCV L5	#37 CCV L5	#37 CCV L5
#38 CCV L5 Add-on	#38 CCV L5 Add-on	#38 CCV L5 Add-on	#38 CCV L5 Add-on
#39 RB	#39 RB	#39 RB	#39 RB

Tune NCM
71975

needs 10x; 1x
needs 100x

↳ not necessary

E flags NCM 72289

+CV +B SBC 12/7/16

ICV 140564

TestAmerica Laboratories
Worklist QC Batch Report

Worklist Name: 07DEC2016A_PFC Worklist Number: 37599
 Instrument Name: A8_N Chrom Method: A8_N
 Data Directory: \\ChromNa\Sacramento\ChromData\A8_N\20161207-37599.b
 QC Batching: Disabled Limit Group Batching: Enabled

QC Batch: 1	LC PFC_DOD ICAL Raw Batch: 141054	LC PFC ICAL Raw Batch: 141055	LC PFAS ICAL Raw Batch: 141056
# 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 MB 320-139083/1-A		#10 MB 320-139083/1-A	
#11 LCS 320-139083/2-A		#11 LCS 320-139083/2-A	
#12 LCSD 320-139083/3-A		#12 LCSD 320-139083/3-A	
#13 320-23631-A-1-A		#13 320-23631-A-1-A	#13 320-23631-A-1-A
#14 320-23631-A-2-A		#14 320-23631-A-2-A	#14 320-23631-A-2-A
#15 MB 320-140240/1-A		#15 MB 320-140240/1-A	
#16 LCS 320-140240/2-A		#16 LCS 320-140240/2-A	
#17 LCSD 320-140240/3-A		#17 LCSD 320-140240/3-A	
#18 320-23631-B-1-A		#18 320-23631-B-1-A	#18 320-23631-B-1-A
#19 320-23631-B-2-A		#19 320-23631-B-2-A	#19 320-23631-B-2-A
#20 RB	#20 RB	#20 RB	#20 RB
#21 CCV L4	#21 CCV L4	#21 CCV L4	#21 CCV L4
#22 CCV L4 Add-on	#22 CCV L4 Add-on	#22 CCV L4 Add-on	#22 CCV L4 Add-on
#23 RB	#23 RB	#23 RB	#23 RB
#24 MB 320-139076/1-A	#24 MB 320-139076/1-A		
#25 LCS 320-139076/2-A	#25 LCS 320-139076/2-A		
#26 LCSD 320-139076/3-A	#26 LCSD 320-139076/3-A		
#27 320-23718-A-1-A	#27 320-23718-A-1-A		
#28 320-23718-A-2-A	#28 320-23718-A-2-A		
#29 320-23718-A-4-A	#29 320-23718-A-4-A		
#30 320-23718-A-5-A	#30 320-23718-A-5-A		
#31 RB	#31 RB	#31 RB	#31 RB
#32 RB	#32 RB	#32 RB	#32 RB
#33 RB	#33 RB	#33 RB	#33 RB
#34 CCV L5	#34 CCV L5	#34 CCV L5	#34 CCV L5
#35 CCV L5 Add-on	#35 CCV L5 Add-on	#35 CCV L5 Add-on	#35 CCV L5 Add-on
#36 RB	#36 RB	#36 RB	#36 RB

*E flags NCM
72253*

*ICV 140564
TUNE NCM 71975*

140565

TestAmerica Laboratories
Worklist QC Batch Report

Worklist Name: 07DEC2016C_PFC Worklist Number: 37624
 Instrument Name: A8_N Chrom Method: A8_N
 Data Directory: \\ChromNa\Sacramento\ChromData\A8_N\20161208-37624.b
 QC Batching: Disabled Limit Group Batching: Enabled

QC Batch: 1	LC PFC_DOD ICAL Raw Batch: 141150	LC PFC ICAL Raw Batch: 141151	LC PFAS ICAL Raw Batch: 141152
# 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
# 5 320-23696-A-6-A	# 5 320-23696-A-6-A		
# 6 320-23696-A-3-A	# 6 320-23696-A-3-A		
# 7 320-23696-A-3-B MS	# 7 320-23696-A-3-B MS		
# 8 320-23696-A-3-C MSD	# 8 320-23696-A-3-C MSD		
# 9 320-23696-A-2-A	# 9 320-23696-A-2-A		
# 10 320-23696-A-7-A	# 10 320-23696-A-7-A		
# 11 320-23696-A-3-A	# 11 320-23696-A-3-A		
# 12 320-23696-A-3-B MS	# 12 320-23696-A-3-B MS		
# 13 320-23696-A-3-C MSD	# 13 320-23696-A-3-C MSD		
# 14 RB	# 14 RB	# 14 RB	# 14 RB
# 15 RB	# 15 RB	# 15 RB	# 15 RB
# 16 CCV L4	# 16 CCV L4	# 16 CCV L4	# 16 CCV L4
# 17 CCV L4 Add-on	# 17 CCV L4 Add-on	# 17 CCV L4 Add-on	# 17 CCV L4 Add-on
# 18 RB	# 18 RB	# 18 RB	# 18 RB

High targets NCM 72290

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Analyst: Arauz, Horacio J

Batch Number: 320-139076

Method Code: 320-3535_IVWWT-320

A8 11/29/16

11/30/16

Batch Open: 11/22/2016 11:44:00AM

Batch End: 11/23/16 10:23

Due 12/8 12/3/16

Solid-Phase Extraction (SPE)

Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmnt		PHs		Due Date	Analytical TAT	Div Rank	Comments	Output Sample Lab ID
			FinAmnt	250 mL	Rcvd	Adj1					
1 MB-320-139076/1 N/A	N/A		250 mL				N/A	N/A	N/A	RI CCVLZ IX	MB 320-139076/1-A
			0.5 mL								
2 LCS-320-139076/2 N/A	N/A		250 mL				N/A	N/A	N/A		LCS 320-139076/2-A
			0.5 mL								
3 LCSD-320-139076/3 N/A	N/A		250 mL				N/A	N/A	N/A		LCSD 320-139076/3-A
			0.5 mL								
4 320-23718-A-1 (PFC_IDA_DOD5)	N/A (320-23718-1)	275.26 g	249.4 mL				11/25/16	16_Days	4	10x PFOA 236.07	320-23718-A-1-A
		25.84 g	0.5 mL								
5 320-23718-A-2 (PFC_IDA_DOD5)	N/A (320-23718-1)	276.54 g	250.9 mL				11/25/16	16_Days	4	10x PFOA 220.58	320-23718-A-2-A
		25.62 g	0.5 mL								
6 320-23718-A-4 (PFC_IDA_DOD5)	N/A (320-23718-1)	275.55 g	249.2 mL				11/25/16	16_Days	4		320-23718-A-4-A
		26.37 g	0.5 mL								
7 320-23718-A-5 (PFC_IDA_DOD5)	N/A (320-23718-1)	275.98 g	250.4 mL				11/25/16	16_Days	4	10x PFOA 866.46	320-23718-A-5-A
		25.56 g	0.5 mL								

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Analyst: Arauz, Horacio J

Batch Number: 320-139076

Batch Open: 11/22/2016 11:44:00AM

Method Code: 320-3535_IVWT-320

Batch End:

Batch Notes	
Manifold ID	5
Methanol ID	769617
Hexane ID	000146278
Sodium Hypochlorite ID	NA
First Start time	NA
First End time	NA
Balance ID	QA-070
SPE Cartridge Type	WAX 500mg
Solid Phase Extraction Disk ID	002836112A
H2O ID	11-21-16
Pipette ID	MD05306
Solvent Name	0.3% NH4OH-Me
Solvent Lot #	776672
Analyst ID - Reagent Drop	HJA
Analyst ID - SU Reagent Drop	HJA
Analyst ID - SU Reagent Drop Witness	EPW
Acid Name	NA
Acid ID	NA
Reagent ID	NA
Reagent Lot Number	NA
NaCl ID	NA

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-139076

Method Code: 320-3535_IVWT-320

Analyst: Arauz, Horacio J

Batch Open: 11/22/2016 11:44:00AM

Batch End:

SOP Number WS-LC-0025
Batch Comment 0.1N NaOH/H2O_00026

Comments

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-139076

Analyst: Arauz, Horacio J

Batch Open: 11/22/2016 11:44:00AM

Method Code: 320-3535_IVWT-320

Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-139076/1	LCMPFCSU_00046	25 uL	0.5 mL	HSA 11-22-16	ERW 11/22/16
LCS 320-139076/2	LCMPFCSU_00046	25 uL	0.5 mL		
LCS 320-139076/2	LCPFCSU_00066	20 uL	0.5 mL		
LCSD 320-139076/3	LCMPFCSU_00046	25 uL	0.5 mL		
LCSD 320-139076/3	LCPFCSU_00066	20 uL	0.5 mL		
320-23718-A-1	LCMPFCSU_00046	25 uL	0.5 mL		
320-23718-A-2	LCMPFCSU_00046	25 uL	0.5 mL		
320-23718-A-4	LCMPFCSU_00046	25 uL	0.5 mL		
320-23718-A-5	LCMPFCSU_00046	25 uL	0.5 mL		

Other Reagents:	Lot#:

Preparation Batch Number(s): 320-139076 Test: PFC-L

Earliest Holding Time: 11-24-16

Sample List Tab		1 st Level Reviewer	2 nd Level Reviewer
Samples identified to the correct method		/	✓
All necessary NCMs filed (including holding time)		/	✓
Method/sample/login/QAS checked and correct		/	✓
Worksheet Tab		1 st Level Reviewer	2 nd 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 CI 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		1 st Level Reviewer	2 nd Level Reviewer
All necessary reagents not expired and entered into TALS		/	✓
All spike amounts correct and added to necessary samples and QC		/	✓
Batch Information		1 st Level Reviewer	2 nd 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: 11/23/14

2nd Level Reviewer: ERW

Date: 11/23/16

Comments: _____

#5

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Analyst: Sharifi, Nooshin

Batch Number: 320-139316

Method Code: 320-3535_IVWT-320

KB 11/29/16 12/7/16
W/30/16

Batch Open: 11/23/2016 11:47:00AM

Batch End: 11/25/2016 12:49:00PM

KB 12/2/16
SBC 12/2/16
12/3/16

Due 12/8

Solid-Phase Extraction (SPE)

Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmt FinAmt	PHs		Due Date	Analytical TAT	Div Rank	Comments	Output Sample Lab ID
				Rcvd	Adj1					
1 MB-320-139316/1 N/A	N/A		500 mL 1.0 mL			N/A	N/A	N/A		MB 320-139316/1-A
2 LCS-320-139316/2 N/A	N/A		500 mL 1.0 mL			N/A	N/A	N/A		LCS 320-139316/2-A
3 320-23696-A-1 (PFC_IDA_DOD5)	N/A (320-23696-1)	568.18 g	524.6 mL			11/28/16	12_Days	4	See NCM for these samples because they have sediment for job number 23696.	320-23696-A-1-A
4 320-23696-A-2 (PFC_IDA_DOD5)	N/A (320-23696-1)	43.60 g 564.77 g 44.61 g	1.0 mL 520.2 mL 1.0 mL			11/28/16	12_Days	4	10X PHxs PHOS	320-23696-A-2-A
5 320-23696-A-3 (PFC_IDA_DOD5)	N/A (320-23696-1)	527.27 g 44.83 g	482.4 mL 1.0 mL			11/28/16	12_Days	4	100X SCREEN (10X, 1X)	320-23696-A-3-A
6 320-23696-A-3-MS (PFC_IDA_DOD5)	N/A (320-23696-1)	526.56 g 45.09 g	481.5 mL 1.0 mL			11/28/16	12_Days	4		320-23696-A-3-B MSD
7 320-23696-A-3-MSD (PFC_IDA_DOD5)	N/A (320-23696-1)	531.69 g 46.77 g	484.9 mL 1.0 mL			11/28/16	12_Days	4		320-23696-A-3-C MSD
8 320-23696-A-4 (PFC_IDA_DOD5)	N/A (320-23696-1)	551.15 g 44.20 g	507 mL 1.0 mL			11/28/16	12_Days	4		320-23696-A-4-A
9 320-23696-A-5 (PFC_IDA_DOD5)	N/A (320-23696-1)	541.80 g 45.75 g	496.1 mL 1.0 mL			11/28/16	12_Days	4		320-23696-A-5-A

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)





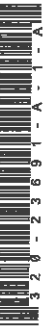




Batch Number: 320-139316

Analyst: Sharifi, Nooshin

Batch Open: 11/23/2016 11:47:00AM

Method Code: 320-3535_IJWT-320

Batch End: 11/25/2016 12:49:00PM

10	320-23696-A-6 (PFC_IDA_DOD5)	N/A (320-23696-1)	552.52 g 45.65 g	506.9 mL 1.0 mL	11/28/16	12_Days	4	10x1x 1000 PFOS	
11	320-23696-A-7 (PFC_IDA_DOD5)	N/A (320-23696-1)	525.84 g 44.73 g	481.1 mL 1.0 mL	11/28/16	12_Days	4	10x1x PFOS	
12	320-23696-A-8 (PFC_IDA_DOD5)	N/A (320-23696-1)	556.77 g 43.62 g	513.2 mL 1.0 mL	11/28/16	12_Days	4		
13	320-23696-A-9 (PFC_IDA_DOD5)	N/A (320-23696-1)	560.02 g 45.48 g	514.5 mL 1.0 mL	11/28/16	12_Days	4		
14	320-23691-A-1 (PFC_IDA_DOD5)	N/A (320-23691-1)	559.23 g 44.38 g	514.9 mL 1.0 mL	11/28/16	12_Days	4		
15	320-23691-A-2 (PFC_IDA_DOD5)	N/A (320-23691-1)	566.86 g 45.61 g	521.3 mL 1.0 mL	11/28/16	12_Days	4		
16	320-23691-A-3 (PFC_IDA_DOD5)	N/A (320-23691-1)	548.61 g 44.46 g	504.2 mL 1.0 mL	11/28/16	12_Days	4		
17	320-23691-A-4 (PFC_IDA_DOD5)	N/A (320-23691-1)	552.53 g 45.25 g	507.3 mL 1.0 mL	11/28/16	12_Days	4		
18	320-23691-A-5 (PFC_IDA_DOD5)	N/A (320-23691-1)	563.48 g 45.48 g	518 mL 1.0 mL	11/28/16	12_Days	4		

#5

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-139316

Analyst: Sharifi, Nooshin

Batch Open: 11/23/2016 11:47:00AM

Method Code: 320-3535_IVWT-320

Batch End: 11/25/2016 12:49:00PM

Dec 12/16

Solid-Phase Extraction (SPE)

Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmt FinAmt	PHs		Due Date	Analytical TAT	Div Rank	Comments	Output Sample Lab ID
				Rcvd	Adj1					
1 MB-320-139316/1 N/A	N/A		500 mL 1.0 mL			N/A	N/A	N/A		MB-320-139316/1-A
2 LCS-320-139316/2 N/A	N/A		500 mL 1.0 mL			N/A	N/A	N/A		LCS-320-139316/2-A
3 320-23696-A-1 (PFC_IDA_DOD5)	N/A (320-23696-1)	568.18 g	524.6 mL			11/28/16	12_Days	4	See NCM for these samples because they have sediment for job number 23696.	320-23696-A-1-A
4 320-23696-A-2 (PFC_IDA_DOD5)	N/A (320-23696-1)	43.60 g 564.77 g 44.61 g	1.0 mL 520.2 mL 1.0 mL			11/28/16	12_Days	4		320-23696-A-2-A
5 320-23696-A-3 (PFC_IDA_DOD5)	N/A (320-23696-1)	527.27 g 44.83 g	482.4 mL 1.0 mL			11/28/16	12_Days	4	100x tox, scrubby	320-23696-A-3-A
6 320-23696-A-3-MS (PFC_IDA_DOD5)	N/A (320-23696-1)	526.56 g 45.09 g	481.5 mL 1.0 mL			11/28/16	12_Days	4		320-23696-A-3-B MSD
7 320-23696-A-3-MSD (PFC_IDA_DOD5)	N/A (320-23696-1)	531.69 g 46.77 g	484.9 mL 1.0 mL			11/28/16	12_Days	4		320-23696-A-3-C MSD
8 320-23696-A-4 (PFC_IDA_DOD5)	N/A (320-23696-1)	551.15 g 44.20 g	507 mL 1.0 mL			11/28/16	12_Days	4		320-23696-A-4-A
9 320-23696-A-5 (PFC_IDA_DOD5)	N/A (320-23696-1)	541.80 g 45.75 g	496.1 mL 1.0 mL			11/28/16	12_Days	4		320-23696-A-5-A

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-139316

Analyst: Sharifi, Nooshin

Batch Open: 11/23/2016 11:47:00AM

Method Code: 320-3535_IVWT-320

Batch End:

Line	Sample ID	Weight (g)	Volume (mL)	Date	12_Days	See NCM	Barcode
11	320-23696-A-7 (PFC_IDA_DOD5)	525.84 g	481.1 mL	11/28/16	12_Days	See NCM	
		44.73 g	1.0 mL				
12	320-23696-A-8 (PFC_IDA_DOD5)	556.77 g	513.2 mL	11/28/16	12_Days	See NCM	
		43.62 g	1.0 mL				
13	320-23696-A-9 (PFC_IDA_DOD5)	560.02 g	514.5 mL	11/28/16	12_Days	See NCM	
		45.48 g	1.0 mL				
14	320-23691-A-1 (PFC_IDA_DOD5)	559.23 g	514.9 mL	11/28/16	12_Days	See NCM	
		44.38 g	1.0 mL				
15	320-23691-A-2 (PFC_IDA_DOD5)	566.86 g	521.3 mL	11/28/16	12_Days	See NCM	
		45.61 g	1.0 mL				
16	320-23691-A-3 (PFC_IDA_DOD5)	548.61 g	504.2 mL	11/28/16	12_Days	See NCM	
		44.46 g	1.0 mL				
17	320-23691-A-4 (PFC_IDA_DOD5)	552.53 g	507.3 mL	11/28/16	12_Days	See NCM	
		45.25 g	1.0 mL				
18	320-23691-A-5 (PFC_IDA_DOD5)	563.48 g	518 mL	11/28/16	12_Days	See NCM	
		45.48 g	1.0 mL				

10x, 1x

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-139316

Analyst: Sharifi, Nooshin

Batch Open: 11/23/2016 11:47:00AM

Method Code: 320-3535_IVWT-320

Batch End:

Batch Notes	
Manifold ID	2,4
Methanol ID	769617
Hexane ID	000146278
Sodium Hypochlorite ID	NA
First Start time	NA
First End time	NA
Balance ID	QA-070
SPE Cartridge Type	WAX 500mg
Solid Phase Extraction Disk ID	002836112A
H2O ID	11-21-16
Pipette ID	MD05306
Solvent Name	0.3% NH4OH-Me
Solvent Lot #	776672
Analyst ID - Reagent Drop	NSH
Analyst ID - SU Reagent Drop	NSH
Analyst ID - SU Reagent Drop Witness	HJA
Acid Name	NA
Acid ID	NA
Reagent ID	NA
Reagent Lot Number	NA
NaCl ID	NA

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-139316

Analyst: Sharifi, Nooshin

Batch Open: 11/23/2016 11:47:00AM

Method Code: 320-3535_IVWT-320

Batch End:

SOP Number WS-LC-0025

Batch Comment 0.1N NaOH/H2O_00026

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-139316

Analyst: Sharifi, Nooshin

Batch Open: 11/23/2016 11:47:00AM

Method Code: 320-3535_IVWT-320

Batch End:

Comments

320-23696-A-1	Method Comments: Q5Rev111213_StdVarApp_30day disposal
320-23696-A-2	Method Comments: Q5Rev111213_StdVarApp_30day disposal
320-23696-A-3	Method Comments: Q5Rev111213_StdVarApp_30day disposal
320-23696-A-3-MS	Method Comments: Q5Rev111213_StdVarApp_30day disposal
320-23696-A-3~MSD	Method Comments: Q5Rev111213_StdVarApp_30day disposal
320-23696-A-4	Method Comments: Q5Rev111213_StdVarApp_30day disposal
320-23696-A-5	Method Comments: Q5Rev111213_StdVarApp_30day disposal
320-23696-A-6	Method Comments: Q5Rev111213_StdVarApp_30day disposal
320-23696-A-7	Method Comments: Q5Rev111213_StdVarApp_30day disposal
320-23696-A-8	Method Comments: Q5Rev111213_StdVarApp_30day disposal
320-23696-A-9	Method Comments: Q5Rev111213_StdVarApp_30day disposal
320-23691-A-1	Method Comments: Q5Rev111213_StdVarApp_30day disposal
320-23691-A-2	Method Comments: Q5Rev111213_StdVarApp_30day disposal
320-23691-A-3	Method Comments: Q5Rev111213_StdVarApp_30day disposal
320-23691-A-4	Method Comments: Q5Rev111213_StdVarApp_30day disposal
320-23691-A-5	Method Comments: Q5Rev111213_StdVarApp_30day disposal

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-139316

Analyst: Sharifi, Nooshin

Batch Open: 11/23/2016 11:47:00AM

Method Code: 320-3535_IVWT-320

Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-139316/1	LCMPFCSU_00046	50 uL	1.0 mL	NSH 11-23-16	[Signature] 11/23/16
LCS 320-139316/2	LCMPFCSU_00046	50 uL	1.0 mL		
LCS 320-139316/2	LCPFCSU_00070	40 uL	1.0 mL		
320-23696-A-1	LCMPFCSU_00046	50 uL	1.0 mL		
320-23696-A-2	LCMPFCSU_00046	50 uL	1.0 mL		
320-23696-A-3	LCMPFCSU_00046	50 uL	1.0 mL		
320-23696-A-3 MS	LCMPFCSU_00046	50 uL	1.0 mL		
320-23696-A-3 MS	LCPFCSU_00070	40 uL	1.0 mL		
320-23696-A-3 MSD	LCMPFCSU_00046	50 uL	1.0 mL		
320-23696-A-3 MSD	LCPFCSU_00070	40 uL	1.0 mL		
320-23696-A-4	LCMPFCSU_00046	50 uL	1.0 mL		
320-23696-A-5	LCMPFCSU_00046	50 uL	1.0 mL		
320-23696-A-6	LCMPFCSU_00046	50 uL	1.0 mL		
320-23696-A-7	LCMPFCSU_00046	50 uL	1.0 mL		
320-23696-A-8	LCMPFCSU_00046	50 uL	1.0 mL		
320-23696-A-9	LCMPFCSU_00046	50 uL	1.0 mL		
320-23691-A-1	LCMPFCSU_00046	50 uL	1.0 mL		
320-23691-A-2	LCMPFCSU_00046	50 uL	1.0 mL		

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-139316

Analyst: Sharifi, Nooshin

Batch Open: 11/23/2016 11:47:00AM

Method Code: 320-3535_IVWT-320

Batch End:

Sample ID	Reagent	Amount	Instrument	Batch	Signature
320-23691-A-3	LCMPFCSU_00046	50 uL	1.0 mL	NSH 11-23-16	[Signature] 11/23/16
320-23691-A-4	LCMPFCSU_00046	50 uL	1.0 mL		
320-23691-A-5	LCMPFCSU_00046	50 uL	1.0 mL		

Other Reagents:	Amount/Units	Lot#:

Preparation Batch Number(s): 139316 Test: PFC-10A-0005 (L)

Earliest Holding Time: 11-23-16

Sample List Tab		1 st Level Reviewer	2 nd Level Reviewer
Samples identified to the correct method		/	✓
All necessary NCMs filed (including holding time)		/	✓
Method/sample/login/QAS checked and correct		/	✓
Worksheet Tab		1 st Level Reviewer	2 nd Level Reviewer
All samples properly preserved		NA	NS
Weights in anticipated range and not targeted		/	✓
All additional test requirements performed, documented, and uploaded to TALS correctly (e.g. final amount, initial amount, turbidity, and CI Check)		/	✓
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		1 st Level Reviewer	2 nd Level Reviewer
All necessary reagents not expired and entered into TALS		/	✓
All spike amounts correct and added to necessary samples and QC		/	✓
Batch Information		1 st Level Reviewer	2 nd 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: 11/25/16

2nd Level Reviewer: ERW

Date: 11/25/16

Comments: _____

Method ID PFC-IDA-BOD5

Job # 23696

Analyst (Print Name) Srinivas Chandrasekar Analyst Initials SC

Date 11/29/16

Sample#	Original F.V. (uL)	Aliquot (uL)	Dilution F.V. (uL)	Dilution Factor
3	1000	100	1000	10
MS	↓	100	1000	10
MSD		100	1000	10
3		100	1000	100
MS		100	1000	100
MSD		100	1000	100
6		100	1000	10
7		100	1000	10

Comments:

Shipping and Receiving Documents

Chain of Custody Record

Client Information
 Client Contact: Mike Dryden
 Company: Earth Toxics, Inc
 Address: PO BOX 3382
 City: Logan
 State/Zip: UT, 84321
 Phone: [Blank]
 Email: mdyden@earthtoxics.com
 Project Name: Ensate-NWS - Earle, NJ PFGS
 Site: Groundwater

Sample Information
 Sampler: S Knight / M Lesiak / A. Vengro
 Lab PM: Johnston, Michelle A
 E-Mail: michelle.johnston@estamericacorp.com

Analysis Requested
 Due Date Requested: [Blank]
 TAT Requested (days): [Blank]
 PO #: [Blank]
 Purchase Order Requested: [Blank]
 Project #: 28014493
 SOW#: [Blank]

Carrier Tracking No(s)
 COC No: 280-48902-18075_1
 Page: Page 1 of 2
 Job #:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix (W=Water, S=solid, O=soil, B=issue Anal)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Analysis Requested	Total Number of containers	Special Instructions/Note:
46mw61	11/16/16	1101	G	AQ	X	N			
46mw05	11/16/16	1221	G	AQ	X	N			
MCFS MW FM-01	11/16/16	1111	G	AQ	X	N			
MCFS MW-4	11/16/16	1331	G	AQ	X	N			
MCFS MW-2	11/16/16	1421	G	AQ	X	N			
MCFS MW SU-01	11/16/16	1501	G	AQ	X	N			
MCFS MW-16	11/16/16	1606	G	AQ	X	N			
DUP-11616	11/16/16	1101	G	AQ	X	N			
MCFS MW 16	11/16/16	1606	G	AQ	X	N			
FB11616	11/16/16	1345	G	AQ	X	N			



Possible Hazard Identification
 Non-Hazard Flammable Skin Irritant Poison B Unknown Radiological

Deliverable Requested: I, II, III, IV, Other (specify) [Blank]

Empty Kit Relinquished by: [Blank] Date: [Blank]

Relinquished by: [Signature] Date/Time: 11/16/16 1750 Company: [Blank]

Relinquished by: [Signature] Date/Time: 11/17/16 1800 Company: [Blank]

Relinquished by: [Blank] Date/Time: [Blank] Company: [Blank]

Custody Seals Intact: Yes No Custody Seal No.: [Blank]

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
 Return To Client Disposal By Lab Archive For _____ Months

Special Instructions/QC Requirements: [Blank]

Method of Shipment: Ship to Sacramento

Received by: [Signature] Date/Time: 11/16/16 1750 Company: [Blank]

Received by: [Signature] Date/Time: 11/17/16 1800 Company: [Blank]

Received by: [Blank] Date/Time: [Blank] Company: [Blank]

Cooler Temperature(s) °C and Other Remarks: [Blank]

Re: 088 11/18/16 0920 725/12.7 = Temp 60.0/11.21

Login Sample Receipt Checklist

Client: Earth Toxics, Inc

Job Number: 320-23696-1

Login Number: 23696
List Number: 1
Creator: Edman, Connor M

List Source: TestAmerica Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	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?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



Purpose

Complete one copy of this form to accompany the paper and electronic versions of Environmental Restoration Program (ERP) records submitted for inclusion to NIRIS.

Submitted By:

Name:	_____
Organization:	_____
Email:	_____ Phone: _____

Record Information:

Installation:	_____						
Program:	ERN	BRAC	Supporting:	<input type="checkbox"/> MRP	<input type="checkbox"/> LUC	<input type="checkbox"/> RAD	<input type="checkbox"/> POL
Document Title:	_____						
AOC, SITE, SWMU, UST, UXO:	_____						
Sample Delivery Groups (SDGs):	_____						
Document Date:	_____	Number of Pages:	_____				
Contract Number:	_____	CTO/DO Number:	_____				
Author/Affiliation:	_____						
Distribution/Availability Statement:	<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D	<input type="checkbox"/> E	<input type="checkbox"/> F	
Sensitive Content	Yes	No	Cite Pages:	_____			
Recommended File Type:	Administrative Record	Post Decision	Site File				

Notes:

DATA VALIDATION REPORT

Site Name:	Naval Weapons Station Earle, Colts Neck, New Jersey, Site 46 — Military Sealift Command Firefighting School
Sample Date:	16 November 2016
Laboratory:	Test America, Sacramento, California
Sample Delivery Groups:	320-23691-1 and 320-23696-1
Matrix:	Groundwater and Potable Water
Data Quality Level:	Stage 4, Electronic and Manual
Analysis:	Select Perfluorinated Compounds (PFCs) via Method 537 Modified

This report summarizes data review findings for groundwater and potable water samples collected in November 2016 using the following reference documents:

- *Internal Draft Perfluorinated Compound Groundwater Investigation Sampling and Analysis Plan, Site 46 Military Sealift Command, Naval Weapons Station Earle Newport, Colts Neck, New Jersey*, Resolution Consultants. (December 2015).
- Laboratory standard operating procedure (SOP) *Perfluorinated Compounds (PFCs) in Water, Soils, Sediments, and Tissue [Method 537 Modified]*, Test America, Sacramento, California, WS-LC-0025, Revision 1.9. (May 2016).
- *Contract Laboratory Program National Functional Guidelines for Chlorinated Dioxin/Furan Data review*, United States Environmental Protection Agency. (September 2011).
- *Department of Defense Quality Systems Manual for Environmental Laboratories*, Version 5.0. (July 2013).

Validation was performed on groundwater, potable water and quality control (QC) samples, summarized in Attachment A, Table A-1. Samples discussed in this validation report were analyzed and reported as definitive data. A full deliverable data packages, QC summaries and raw data, were submitted for data review.

The data were evaluated based on the following review elements:

- | | |
|---|---|
| * Data completeness | * Holding times |
| * Sample receipt and preservation | * Isotope dilution recoveries |
| * Initial calibration | * Laboratory method blanks |
| * Initial calibration verification | * Blanks (equipment and field) |
| * Continuing calibration verification | * Field duplicate precision |
| * Laboratory control sample/laboratory control sample duplicate results | * Matrix spike/matrix spike duplicates |
| | * Sample result transcriptions/recalculations |

Acceptable data parameters for which all criteria were met or not qualified, as indicated above with an asterisk (*), are not discussed further.



Overall Assessment

The data from sample delivery groups 320-23691-1 and 320-23696-1 were reviewed independently from the laboratory to assess data quality. No results were qualified and the data are usable for their intended purpose, according to U.S. Environmental Protection Agency and Department of Defense guidelines. Attachment B provides final results after data review.

Attachment A
Sample and Analysis Summary

**Table A-1
Sample Summary**

Sample Delivery Group	Lab Identification	Sample Identification	Location	Sample Date	Matrix
320236911	320-23691-1	PWSB2_1116	PWSB2	11/16/2016	Potable Water
320236911	320-23691-2	POSTTB2_1116	POSTTB2	11/16/2016	Potable Water
320236911	320-23691-3	PWSF1_1116	PWSF1	11/16/2016	Potable Water
320236911	320-23691-4	POSTTF1_1116	POSTTF1	11/16/2016	Potable Water
320236911	320-23691-5	FB-111616		11/16/2016	Field Blank
320236961	320-23696-1	46MW01_1116	46MW01	11/16/2016	Groundwater
320236961	320-23696-2	46MW05_1116	46MW05	11/16/2016	Groundwater
320236961	320-23696-3	MCFSMWFM-01_1116	MCFSMWFM	11/16/2016	Groundwater
320236961	320-23696-4	MCFSMW-4_1116	MCFSMW04	11/16/2016	Groundwater
320236961	320-23696-5	MCFSMW-2_1116	MCFSMW02	11/16/2016	Groundwater
320236961	320-23696-6	MCFSMW5U-01_1116	MCFSMW05U	11/16/2016	Groundwater
320236961	320-23696-7	MCFSMW-16_1116	MCFSMW16	11/16/2016	Groundwater
320236961	320-23696-8	DUP-111616	46MW01	11/16/2016	Duplicate of 46MW01_1116
320236961	320-23696-9	FB111616		11/16/2016	Field Blank

Notes:

All samples were analyzed via laboratory standard operating procedure *Perfluorinated Compounds (PFCs) in Water, Soils, Sediments, and Tissue [Method 537 Modified]*, Test America, Sacramento, California, WS-LC-0025, Revision 1.9, (May 2016) for the following select list of analytes: Perfluorobutanesulfonic Acid (PFBS), Perfluoroheptanoic Acid (PFHPA), Perfluorohexanesulfonic Acid (PFHXS), Perfluorononanoic Acid (PFNA), Perfluorooctane Sulfonic Acid (PFOS), and Perfluorooctanoic Acid (PFOA).

Attachment B
Final Validated Results after Data Review

Table B-1
Perfluorinated Compound Results: Groundwater – November 2016

				Sample Delivery Group:	320236961	320236961	320236961	320236961	320236961
				Laboratory ID:	320-23696-1	320-23696-2	320-23696-3	320-23696-4	320-23696-5
				Location:	46MW01	46MW05	MCFSMWFM	MCFSMW04	MCFSMW02
				Sample ID:	46MW01_1116	46MW05_1116	MCFSMWFM-01_1116	MCFSMW-4_1116	MCFSMW-2_1116
				Sample Date:	11/16/2016	11/16/2016	11/16/2016	11/16/2016	11/16/2016
				Matrix:	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Method	Analyte	CAS No	Units						
TA_WS-LC-0025	PERFLUOROBUTANESULFONIC ACID (PFBS)	375-73-5	NG_L	1.9 U	57	29	12	23	
TA_WS-LC-0025	PERFLUOROHEPTANOIC ACID (PFHPA)	375-85-9	NG_L	1.9 U	21	87	40	29	
TA_WS-LC-0025	PERFLUOROHEXANESULFONIC ACID (PFHXS)	355-46-4	NG_L	1.9 U	570	110	97	220	
TA_WS-LC-0025	PERFLUORONONANOIC ACID (PFNA)	375-95-1	NG_L	1.9 U	1.1 J	380	15	4.6	
TA_WS-LC-0025	PERFLUOROOCCTANE SULFONIC ACID (PFOS)	1763-23-1	NG_L	7.1	1000	200	58	25	
TA_WS-LC-0025	PERFLUOROOCCTANOIC ACID (PFOA)	335-67-1	NG_L	1.9 U	62	85	73	86	

				Sample Delivery Group:	320236961	320236961	320236961	320236961
				Laboratory ID:	320-23696-6	320-23696-7	320-23696-8	320-23696-9
				Location:	MCFSMW05U	MCFSMW16	46MW01	
				Sample ID:	MCFSMW5U-01_1116	MCFSMW-16_1116	DUP-111616	FB111616
				Sample Date:	11/16/2016	11/16/2016	11/16/2016	11/16/2016
				Matrix:	Groundwater	Groundwater	Groundwater	Field Blank
Method	Analyte	CAS No	Units					
TA_WS-LC-0025	PERFLUOROBUTANESULFONIC ACID (PFBS)	375-73-5	NG_L	160	37	1.9 U	1.9 U	
TA_WS-LC-0025	PERFLUOROHEPTANOIC ACID (PFHPA)	375-85-9	NG_L	41	50	1.9 U	1.9 U	
TA_WS-LC-0025	PERFLUOROHEXANESULFONIC ACID (PFHXS)	355-46-4	NG_L	1000	340	1.9 U	1.9 U	
TA_WS-LC-0025	PERFLUORONONANOIC ACID (PFNA)	375-95-1	NG_L	11	2.8	1.9 U	1.9 U	
TA_WS-LC-0025	PERFLUOROOCCTANE SULFONIC ACID (PFOS)	1763-23-1	NG_L	3900	280	5.7	2.9 U	
TA_WS-LC-0025	PERFLUOROOCCTANOIC ACID (PFOA)	335-67-1	NG_L	84	120	1.9 U	1.9 U	

Notes:

NG_L = Nanograms per liter

U = **Undetected** — The parameter was analyzed but undetected.

J = **Estimated Value** —The analyte concentration was less than the limit of quantitation.

Table B-2
Perfluorinated Compound Results: Potable Water – November 2016

				Sample Delivery Group:	320236911	320236911	320236911	320236911	320236911
				Laboratory ID:	320-23691-1	320-23691-2	320-23691-3	320-23691-4	320-23691-5
				Location:	PWSB2	POSTTB2	PWSF1	POSTTF1	
				Sample ID:	PWSB2_1116	POSTTB2_1116	PWSF1_1116	POSTTF1_1116	FB-111616
				Sample Date:	11/16/2016	11/16/2016	11/16/2016	11/16/2016	11/16/2016
				Matrix:	Potable Water	Potable Water	Potable Water	Potable Water	Field Blank
Method	Analyte	CAS No	Units						
TA_WS-LC-0025	PERFLUOROBUTANESULFONIC ACID (PFBS)	375-73-5	NG_L	1.9 U	1.9 U	2 U	2 U	1.9 U	
TA_WS-LC-0025	PERFLUOROHEPTANOIC ACID (PFHPA)	375-85-9	NG_L	1.9 U	1.9 U	2 U	2 U	1.9 U	
TA_WS-LC-0025	PERFLUOROHEXANESULFONIC ACID (PFHXS)	355-46-4	NG_L	1.9 U	1.9 U	2 U	2 U	1.9 U	
TA_WS-LC-0025	PERFLUORONONANOIC ACID (PFNA)	375-95-1	NG_L	1.9 U	1.9 U	2 U	2 U	1.9 U	
TA_WS-LC-0025	PERFLUOROOCTANE SULFONIC ACID (PFOS)	1763-23-1	NG_L	2.9 U	2.9 U	3 U	3 U	2.9 U	
TA_WS-LC-0025	PERFLUOROOCTANOIC ACID (PFOA)	335-67-1	NG_L	1.9 U	1.9 U	2 U	2 U	1.9 U	

Notes:

NG_L = Nanograms per liter

U = **Undetected** — The parameter was analyzed but undetected.

