NAVFAC
Naval Facilities Engineering Command

Groundwater Sample Results, Level 4 Laboratory Report, and the Sample Location Report, SDG EML22 (1608156)

Naval Air Station Pensacola
Pensacola, Florida

July 2019

N00215_002645
NAS DALLAS, TX
SSIC 5000-33c

LABORATORY DATA PACKAGE 320-23931-1 NAS DALLAS TX

12/22/2016

TEST AMERICA, INC.

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TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

Job Number: 320-23931-1

Job Description: PFAS, NAS Dallas

For:
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Attention: Thomas Wiberg

Approved for release.
David R Alltucker
Project Manager I
12/22/2016 2:47 PM

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12/22/2016

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Qualifiers

LCMS

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

Glossary

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

CASE NARRATIVE

Client: EnSafe, Inc.

Project: PFAS, NAS Dallas

Report Number: 320-23931-1

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

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

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

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

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

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

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

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

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

RECEIPT

The samples were received on 12/01/2016; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 0.4 C.

PFAS

Perfluorotetradecanoic acid (PFTeA) was detected in method blank MB 320-140536/1-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

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.

The continuing calibration verification (CCV) associated with batch 320-142751 recovered above the upper control limit for Perfluorobutanesulfonic acid (PFBS). The following samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported: FB113016 (320-23931-6) and (CCV 320-142751/16).

The Isotope Dilution Analyte (IDA) recoveries for several analytes in the following sample are below the method recommended limit: 608D132MW-LF-1116 (320-23931-1), 608D33MW-LF-1116 (320-23931-2), 61301MW-LF-1116 (320-23931-3), 613D41MW-LF-1116 (320-23931-4), 613D39MW-LF-1116 (320-23931-5) and (320-23884-A-3-C MSD). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the samples.

The Isotope Dilution Analyte (IDA) recovery for 13C8 FOSA in the following sample is below the method recommended limit in the diluted sample analysis: 608D33MW-LF-1116 (320-23931-2). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the sample.

Isotope Dilution Analyte (IDA) recoveries for several analytes are above the method recommended limit for the following samples in the diluted sample analysis: 608D132MW-LF-1116 (320-23931-1) and 608D33MW-LF-1116 (320-23931-2). Quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries.

The concentration of one or more analytes associated with the following samples exceeded the instrument calibration range: 608D132MW-LF-1116 (320-23931-1) and 608D33MW-LF-1116 (320-23931-2). These samples have been run at dilution and both sets of data have been reported.

The following sample was diluted due to the nature of the sample matrix: 608D132MW-LF-1116 (320-23931-1) and 608D33MW-LF-1116 (320-23931-2). Elevated reporting limits (RLs) are provided.

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

Detection Summary

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

TestAmerica Job ID: 320-23931-1

Client Sample ID: 608D132MW-LF-1116 — Lab Sample ID: 320-23931-1

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	0.50	E	0.0024	0.00043	ug/L	1		537 (Modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	0.61	E	0.0024	0.00093	ug/L	1		537 (Modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	1.5	E	0.0024	0.00074	ug/L	1		537 (Modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.32		0.0024	0.00076	ug/L	1		537 (Modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.52	E M	0.0024	0.00071	ug/L	1		537 (Modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.00064	J	0.0024	0.00062	ug/L	1		537 (Modified)	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.00056	J	0.0024	0.00038	ug/L	1		537 (Modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	2.6	E	0.0024	0.00082	ug/L	1		537 (Modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	1.2	E	0.0038	0.0012	ug/L	1		537 (Modified)	Total/NA
Perfluorobutanoic acid (PFBA) - DL	0.52	D	0.12	0.022	ug/L	50		537 (Modified)	Total/NA
Perfluoropentanoic acid (PFPeA) - DL	0.76	D	0.12	0.047	ug/L	50		537 (Modified)	Total/NA
Perfluorohexanoic acid (PFHxA) - DL	2.1	D	0.12	0.037	ug/L	50		537 (Modified)	Total/NA
Perfluoroheptanoic acid (PFHpA) - DL	0.34	D	0.12	0.038	ug/L	50		537 (Modified)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	0.55	D M	0.12	0.035	ug/L	50		537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	1.5	D	0.12	0.043	ug/L	50		537 (Modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	3.7	D	0.12	0.041	ug/L	50		537 (Modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	1.4	D	0.19	0.060	ug/L	50		537 (Modified)	Total/NA

Client Sample ID: 608D33MW-LF-1116 — Lab Sample ID: 320-23931-2

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	0.26	M	0.0024	0.00044	ug/L	1		537 (Modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	0.40	E	0.0024	0.00095	ug/L	1		537 (Modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	0.80	E	0.0024	0.00076	ug/L	1		537 (Modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.21		0.0024	0.00077	ug/L	1		537 (Modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.38	M	0.0024	0.00072	ug/L	1		537 (Modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.017		0.0024	0.00063	ug/L	1		537 (Modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.0022	J M	0.0024	0.00042	ug/L	1		537 (Modified)	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.00039	J	0.0024	0.00038	ug/L	1		537 (Modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	2.4	E	0.0024	0.00084	ug/L	1		537 (Modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	10	E M	0.0038	0.0012	ug/L	1		537 (Modified)	Total/NA
Perfluorodecanesulfonic acid (PFDS)	0.0039		0.0038	0.0012	ug/L	1		537 (Modified)	Total/NA
Perfluorooctane Sulfonamide (FOSA)	0.043		0.0024	0.00061	ug/L	1		537 (Modified)	Total/NA
Perfluorobutanoic acid (PFBA) - DL	0.29	D	0.24	0.044	ug/L	100		537 (Modified)	Total/NA
Perfluoropentanoic acid (PFPeA) - DL	0.47	D	0.24	0.095	ug/L	100		537 (Modified)	Total/NA
Perfluorohexanoic acid (PFHxA) - DL	0.94	D	0.24	0.076	ug/L	100		537 (Modified)	Total/NA
Perfluoroheptanoic acid (PFHpA) - DL	0.21	J D	0.24	0.077	ug/L	100		537 (Modified)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	0.43	D M	0.24	0.072	ug/L	100		537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	0.73	D	0.24	0.088	ug/L	100		537 (Modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	5.4	D	0.24	0.084	ug/L	100		537 (Modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	21	D	0.38	0.12	ug/L	100		537 (Modified)	Total/NA

Client Sample ID: 61301MW-LF-1116 — Lab Sample ID: 320-23931-3

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	0.17	M	0.0024	0.00043	ug/L	1		537 (Modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: 61301MW-LF-1116 (Continued) — Lab Sample ID: 320-23931-3

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluoropentanoic acid (PFPeA)	0.18		0.0024	0.00093	ug/L	1		537 (Modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	0.15		0.0024	0.00074	ug/L	1		537 (Modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.11		0.0024	0.00076	ug/L	1		537 (Modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.10	M	0.0024	0.00070	ug/L	1		537 (Modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.0080		0.0024	0.00062	ug/L	1		537 (Modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.0016	J	0.0024	0.00041	ug/L	1		537 (Modified)	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.00079	J	0.0024	0.00038	ug/L	1		537 (Modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.071		0.0024	0.00082	ug/L	1		537 (Modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.061		0.0038	0.0012	ug/L	1		537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - RA	0.014		0.0024	0.00086	ug/L	1		537 (Modified)	Total/NA

Client Sample ID: 613D41MW-LF-1116 — Lab Sample ID: 320-23931-4

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	0.012	M	0.0024	0.00043	ug/L	1		537 (Modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	0.0063		0.0024	0.00093	ug/L	1		537 (Modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	0.0074		0.0024	0.00074	ug/L	1		537 (Modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.0036	M	0.0024	0.00075	ug/L	1		537 (Modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.035	M	0.0024	0.00070	ug/L	1		537 (Modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.00092	J M	0.0024	0.00062	ug/L	1		537 (Modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.00063	J	0.0024	0.00041	ug/L	1		537 (Modified)	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.00078	J M	0.0024	0.00038	ug/L	1		537 (Modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.032		0.0024	0.00082	ug/L	1		537 (Modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.070		0.0038	0.0012	ug/L	1		537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - RA	0.0053		0.0024	0.00086	ug/L	1		537 (Modified)	Total/NA

Client Sample ID: 613D39MW-LF-1116 — Lab Sample ID: 320-23931-5

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	0.0028		0.0023	0.00041	ug/L	1		537 (Modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.0013	J	0.0023	0.00067	ug/L	1		537 (Modified)	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.00062	J	0.0023	0.00036	ug/L	1		537 (Modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.022		0.0023	0.00078	ug/L	1		537 (Modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.026		0.0036	0.0011	ug/L	1		537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - RA	0.0062		0.0023	0.00083	ug/L	1		537 (Modified)	Total/NA

Client Sample ID: FB113016 — Lab Sample ID: 320-23931-6

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorotetradecanoic acid (PFTeA)	0.00041	J	0.0022	0.00036	ug/L	1		537 (Modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: 608D132MW-LF-1116

Date Collected: 11/30/16 09:40
Date Received: 12/01/16 09:50

Lab Sample ID: 320-23931-1

Matrix: Water

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**0.50**	**E**	0.0024	0.00043	ug/L		12/05/16 08:31	12/16/16 19:30	1
Perfluoropentanoic acid (PFPeA)	**0.61**	**E**	0.0024	0.00093	ug/L		12/05/16 08:31	12/16/16 19:30	1
Perfluorohexanoic acid (PFHxA)	**1.5**	**E**	0.0024	0.00074	ug/L		12/05/16 08:31	12/16/16 19:30	1
Perfluoroheptanoic acid (PFHpA)	**0.32**		0.0024	0.00076	ug/L		12/05/16 08:31	12/16/16 19:30	1
Perfluorooctanoic acid (PFOA)	**0.52**	**E M**	0.0024	0.00071	ug/L		12/05/16 08:31	12/16/16 19:30	1
Perfluorononanoic acid (PFNA)	**0.00064**	**J**	0.0024	0.00062	ug/L		12/05/16 08:31	12/16/16 19:30	1
Perfluorodecanoic acid (PFDA)	0.00095	U	0.0024	0.00042	ug/L		12/05/16 08:31	12/16/16 19:30	1
Perfluoroundecanoic acid (PFUnA)	0.0019	U	0.0024	0.00071	ug/L		12/05/16 08:31	12/16/16 19:30	1
Perfluorododecanoic acid (PFDoA)	0.0019	U	0.0024	0.00055	ug/L		12/05/16 08:31	12/16/16 19:30	1
Perfluorotridecanoic Acid (PFTriA)	0.0019	U	0.0024	0.00052	ug/L		12/05/16 08:31	12/16/16 19:30	1
Perfluorotetradecanoic acid (PFTeA)	**0.00056**	**J**	0.0024	0.00038	ug/L		12/05/16 08:31	12/16/16 19:30	1
Perfluorohexanesulfonic acid (PFHxS)	**2.6**	**E**	0.0024	0.00082	ug/L		12/05/16 08:31	12/16/16 19:30	1
Perfluorooctanesulfonic acid (PFOS)	**1.2**	**E**	0.0038	0.0012	ug/L		12/05/16 08:31	12/16/16 19:30	1
Perfluorodecanesulfonic acid (PFDS)	0.0028	U	0.0038	0.0011	ug/L		12/05/16 08:31	12/16/16 19:30	1
Perfluorooctane Sulfonamide (FOSA)	0.0019	U	0.0024	0.00060	ug/L		12/05/16 08:31	12/16/16 19:30	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*18*	*Q*	*25 - 150*	*12/05/16 08:31*	*12/16/16 19:30*	*1*
13C4 PFBA	*32*		*25 - 150*	*12/05/16 08:31*	*12/16/16 19:30*	*1*
13C2 PFHxA	*41*		*25 - 150*	*12/05/16 08:31*	*12/16/16 19:30*	*1*
13C4 PFOA	*62*		*25 - 150*	*12/05/16 08:31*	*12/16/16 19:30*	*1*
13C5 PFNA	*72*		*25 - 150*	*12/05/16 08:31*	*12/16/16 19:30*	*1*
13C2 PFDA	*106*		*25 - 150*	*12/05/16 08:31*	*12/16/16 19:30*	*1*
13C2 PFUnA	*104*		*25 - 150*	*12/05/16 08:31*	*12/16/16 19:30*	*1*
13C2 PFDoA	*104*		*25 - 150*	*12/05/16 08:31*	*12/16/16 19:30*	*1*
18O2 PFHxS	*35*		*25 - 150*	*12/05/16 08:31*	*12/16/16 19:30*	*1*
13C4 PFOS	*84*		*25 - 150*	*12/05/16 08:31*	*12/16/16 19:30*	*1*
13C5-PFPeA	*52*		*25 - 150*	*12/05/16 08:31*	*12/16/16 19:30*	*1*
13C4-PFHpA	*37*		*25 - 150*	*12/05/16 08:31*	*12/16/16 19:30*	*1*

Method: 537 (Modified) - Perfluorinated Hydrocarbons - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**0.52**	**D**	0.12	0.022	ug/L		12/05/16 08:31	12/20/16 18:37	50
Perfluoropentanoic acid (PFPeA)	**0.76**	**D**	0.12	0.047	ug/L		12/05/16 08:31	12/20/16 18:37	50
Perfluorohexanoic acid (PFHxA)	**2.1**	**D**	0.12	0.037	ug/L		12/05/16 08:31	12/20/16 18:37	50
Perfluoroheptanoic acid (PFHpA)	**0.34**	**D**	0.12	0.038	ug/L		12/05/16 08:31	12/20/16 18:37	50
Perfluorooctanoic acid (PFOA)	**0.55**	**D M**	0.12	0.035	ug/L		12/05/16 08:31	12/20/16 18:37	50
Perfluorononanoic acid (PFNA)	0.095	U	0.12	0.031	ug/L		12/05/16 08:31	12/20/16 18:37	50
Perfluorodecanoic acid (PFDA)	0.047	U	0.12	0.021	ug/L		12/05/16 08:31	12/20/16 18:37	50
Perfluoroundecanoic acid (PFUnA)	0.095	U	0.12	0.035	ug/L		12/05/16 08:31	12/20/16 18:37	50
Perfluorododecanoic acid (PFDoA)	0.095	U	0.12	0.028	ug/L		12/05/16 08:31	12/20/16 18:37	50
Perfluorotridecanoic Acid (PFTriA)	0.095	U	0.12	0.026	ug/L		12/05/16 08:31	12/20/16 18:37	50
Perfluorotetradecanoic acid (PFTeA)	0.047	U	0.12	0.019	ug/L		12/05/16 08:31	12/20/16 18:37	50
Perfluorobutanesulfonic acid (PFBS)	**1.5**	**D**	0.12	0.043	ug/L		12/05/16 08:31	12/20/16 18:37	50
Perfluorohexanesulfonic acid (PFHxS)	**3.7**	**D**	0.12	0.041	ug/L		12/05/16 08:31	12/20/16 18:37	50
Perfluorooctanesulfonic acid (PFOS)	**1.4**	**D**	0.19	0.060	ug/L		12/05/16 08:31	12/20/16 18:37	50

Client Sample ID: 608D132MW-LF-1116

Lab Sample ID: 320-23931-1

Date Collected: 11/30/16 09:40

Matrix: Water

Date Received: 12/01/16 09:50

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorodecanesulfonic acid (PFDS)	0.14	U	0.19	0.057	ug/L		12/05/16 08:31	12/20/16 18:37	50
Perfluorooctane Sulfonamide (FOSA)	0.095	U	0.12	0.030	ug/L		12/05/16 08:31	12/20/16 18:37	50

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*224*	*Q*	*25 - 150*	*12/05/16 08:31*	*12/20/16 18:37*	*50*
13C4 PFBA	*802*	*Q*	*25 - 150*	*12/05/16 08:31*	*12/20/16 18:37*	*50*
13C2 PFHxA	*857*	*Q*	*25 - 150*	*12/05/16 08:31*	*12/20/16 18:37*	*50*
13C4 PFOA	*1153*	*Q*	*25 - 150*	*12/05/16 08:31*	*12/20/16 18:37*	*50*
13C5 PFNA	*1303*	*Q*	*25 - 150*	*12/05/16 08:31*	*12/20/16 18:37*	*50*
13C2 PFDA	*1335*	*Q*	*25 - 150*	*12/05/16 08:31*	*12/20/16 18:37*	*50*
13C2 PFUnA	*1305*	*Q*	*25 - 150*	*12/05/16 08:31*	*12/20/16 18:37*	*50*
13C2 PFDoA	*1231*	*Q*	*25 - 150*	*12/05/16 08:31*	*12/20/16 18:37*	*50*
18O2 PFHxS	*842*	*Q*	*25 - 150*	*12/05/16 08:31*	*12/20/16 18:37*	*50*
13C4 PFOS	*1317*	*Q*	*25 - 150*	*12/05/16 08:31*	*12/20/16 18:37*	*50*
13C5-PFPeA	*1140*	*Q*	*25 - 150*	*12/05/16 08:31*	*12/20/16 18:37*	*50*
13C4-PFHpA	*751*	*Q*	*25 - 150*	*12/05/16 08:31*	*12/20/16 18:37*	*50*

Client Sample ID: 608D33MW-LF-1116

Lab Sample ID: 320-23931-2

Date Collected: 11/30/16 11:00

Matrix: Water

Date Received: 12/01/16 09:50

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**0.26**	**M**	0.0024	0.00044	ug/L		12/05/16 08:31	12/16/16 19:37	1
Perfluoropentanoic acid (PFPeA)	**0.40**	**E**	0.0024	0.00095	ug/L		12/05/16 08:31	12/16/16 19:37	1
Perfluorohexanoic acid (PFHxA)	**0.80**	**E**	0.0024	0.00076	ug/L		12/05/16 08:31	12/16/16 19:37	1
Perfluoroheptanoic acid (PFHpA)	**0.21**		0.0024	0.00077	ug/L		12/05/16 08:31	12/16/16 19:37	1
Perfluorooctanoic acid (PFOA)	**0.38**	**M**	0.0024	0.00072	ug/L		12/05/16 08:31	12/16/16 19:37	1
Perfluorononanoic acid (PFNA)	**0.017**		0.0024	0.00063	ug/L		12/05/16 08:31	12/16/16 19:37	1
Perfluorodecanoic acid (PFDA)	**0.0022**	**J M**	0.0024	0.00042	ug/L		12/05/16 08:31	12/16/16 19:37	1
Perfluoroundecanoic acid (PFUnA)	0.0019	U	0.0024	0.00072	ug/L		12/05/16 08:31	12/16/16 19:37	1
Perfluorododecanoic acid (PFDoA)	0.0019	U	0.0024	0.00056	ug/L		12/05/16 08:31	12/16/16 19:37	1
Perfluorotridecanoic Acid (PFTriA)	0.0019	U	0.0024	0.00053	ug/L		12/05/16 08:31	12/16/16 19:37	1
Perfluorotetradecanoic acid (PFTeA)	**0.00039**	**J**	0.0024	0.00038	ug/L		12/05/16 08:31	12/16/16 19:37	1
Perfluorohexanesulfonic acid (PFHxS)	**2.4**	**E**	0.0024	0.00084	ug/L		12/05/16 08:31	12/16/16 19:37	1
Perfluorooctanesulfonic acid (PFOS)	**10**	**E M**	0.0038	0.0012	ug/L		12/05/16 08:31	12/16/16 19:37	1
Perfluorodecanesulfonic acid (PFDS)	**0.0039**		0.0038	0.0012	ug/L		12/05/16 08:31	12/16/16 19:37	1
Perfluorooctane Sulfonamide (FOSA)	**0.043**		0.0024	0.00061	ug/L		12/05/16 08:31	12/16/16 19:37	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*8*	*Q*	*25 - 150*	*12/05/16 08:31*	*12/16/16 19:37*	*1*
13C4 PFBA	*9*	*Q*	*25 - 150*	*12/05/16 08:31*	*12/16/16 19:37*	*1*
13C2 PFHxA	*47*		*25 - 150*	*12/05/16 08:31*	*12/16/16 19:37*	*1*
13C4 PFOA	*60*		*25 - 150*	*12/05/16 08:31*	*12/16/16 19:37*	*1*
13C5 PFNA	*27*		*25 - 150*	*12/05/16 08:31*	*12/16/16 19:37*	*1*
13C2 PFDA	*97*		*25 - 150*	*12/05/16 08:31*	*12/16/16 19:37*	*1*
13C2 PFUnA	*112*		*25 - 150*	*12/05/16 08:31*	*12/16/16 19:37*	*1*

Client Sample ID: 608D33MW-LF-1116

Lab Sample ID: 320-23931-2

Date Collected: 11/30/16 11:00

Matrix: Water

Date Received: 12/01/16 09:50

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

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFDoA	*108*		*25 - 150*	*12/05/16 08:31*	*12/16/16 19:37*	*1*
18O2 PFHxS	*34*		*25 - 150*	*12/05/16 08:31*	*12/16/16 19:37*	*1*
13C4 PFOS	*21*	*Q*	*25 - 150*	*12/05/16 08:31*	*12/16/16 19:37*	*1*
13C5-PFPeA	*42*		*25 - 150*	*12/05/16 08:31*	*12/16/16 19:37*	*1*
13C4-PFHpA	*36*		*25 - 150*	*12/05/16 08:31*	*12/16/16 19:37*	*1*

Method: 537 (Modified) - Perfluorinated Hydrocarbons - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**0.29**	**D**	0.24	0.044	ug/L		12/05/16 08:31	12/20/16 18:22	100
Perfluoropentanoic acid (PFPeA)	**0.47**	**D**	0.24	0.095	ug/L		12/05/16 08:31	12/20/16 18:22	100
Perfluorohexanoic acid (PFHxA)	**0.94**	**D**	0.24	0.076	ug/L		12/05/16 08:31	12/20/16 18:22	100
Perfluoroheptanoic acid (PFHpA)	**0.21**	**J D**	0.24	0.077	ug/L		12/05/16 08:31	12/20/16 18:22	100
Perfluorooctanoic acid (PFOA)	**0.43**	**D M**	0.24	0.072	ug/L		12/05/16 08:31	12/20/16 18:22	100
Perfluorononanoic acid (PFNA)	0.19	U	0.24	0.063	ug/L		12/05/16 08:31	12/20/16 18:22	100
Perfluorodecanoic acid (PFDA)	0.096	U	0.24	0.042	ug/L		12/05/16 08:31	12/20/16 18:22	100
Perfluoroundecanoic acid (PFUnA)	0.19	U	0.24	0.072	ug/L		12/05/16 08:31	12/20/16 18:22	100
Perfluorododecanoic acid (PFDoA)	0.19	U	0.24	0.056	ug/L		12/05/16 08:31	12/20/16 18:22	100
Perfluorotridecanoic Acid (PFTriA)	0.19	U	0.24	0.053	ug/L		12/05/16 08:31	12/20/16 18:22	100
Perfluorotetradecanoic acid (PFTeA)	0.096	U	0.24	0.038	ug/L		12/05/16 08:31	12/20/16 18:22	100
Perfluorobutanesulfonic acid (PFBS)	**0.73**	**D**	0.24	0.088	ug/L		12/05/16 08:31	12/20/16 18:22	100
Perfluorohexanesulfonic acid (PFHxS)	**5.4**	**D**	0.24	0.084	ug/L		12/05/16 08:31	12/20/16 18:22	100
Perfluorooctanesulfonic acid (PFOS)	**21**	**D**	0.38	0.12	ug/L		12/05/16 08:31	12/20/16 18:22	100
Perfluorodecanesulfonic acid (PFDS)	0.29	U	0.38	0.12	ug/L		12/05/16 08:31	12/20/16 18:22	100
Perfluorooctane Sulfonamide (FOSA)	0.19	U	0.24	0.061	ug/L		12/05/16 08:31	12/20/16 18:22	100

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*17*	*Q*	*25 - 150*	*12/05/16 08:31*	*12/20/16 18:22*	*100*
13C4 PFBA	*54*		*25 - 150*	*12/05/16 08:31*	*12/20/16 18:22*	*100*
13C2 PFHxA	*154*	*Q*	*25 - 150*	*12/05/16 08:31*	*12/20/16 18:22*	*100*
13C4 PFOA	*181*	*Q*	*25 - 150*	*12/05/16 08:31*	*12/20/16 18:22*	*100*
13C5 PFNA	*145*		*25 - 150*	*12/05/16 08:31*	*12/20/16 18:22*	*100*
13C2 PFDA	*162*	*Q*	*25 - 150*	*12/05/16 08:31*	*12/20/16 18:22*	*100*
13C2 PFUnA	*163*	*Q*	*25 - 150*	*12/05/16 08:31*	*12/20/16 18:22*	*100*
13C2 PFDoA	*155*	*Q*	*25 - 150*	*12/05/16 08:31*	*12/20/16 18:22*	*100*
18O2 PFHxS	*150*		*25 - 150*	*12/05/16 08:31*	*12/20/16 18:22*	*100*
13C4 PFOS	*144*		*25 - 150*	*12/05/16 08:31*	*12/20/16 18:22*	*100*
13C5-PFPeA	*179*	*Q*	*25 - 150*	*12/05/16 08:31*	*12/20/16 18:22*	*100*
13C4-PFHpA	*154*	*Q*	*25 - 150*	*12/05/16 08:31*	*12/20/16 18:22*	*100*

Client Sample ID: 61301MW-LF-1116

Lab Sample ID: 320-23931-3

Date Collected: 11/30/16 12:45

Matrix: Water

Date Received: 12/01/16 09:50

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**0.17**	**M**	0.0024	0.00043	ug/L		12/05/16 08:31	12/16/16 20:15	1
Perfluoropentanoic acid (PFPeA)	**0.18**		0.0024	0.00093	ug/L		12/05/16 08:31	12/16/16 20:15	1
Perfluorohexanoic acid (PFHxA)	**0.15**		0.0024	0.00074	ug/L		12/05/16 08:31	12/16/16 20:15	1

Client Sample ID: 61301MW-LF-1116

Lab Sample ID: 320-23931-3

Date Collected: 11/30/16 12:45

Matrix: Water

Date Received: 12/01/16 09:50

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**0.11**		0.0024	0.00076	ug/L		12/05/16 08:31	12/16/16 20:15	1
Perfluorooctanoic acid (PFOA)	**0.10**	**M**	0.0024	0.00070	ug/L		12/05/16 08:31	12/16/16 20:15	1
Perfluorononanoic acid (PFNA)	**0.0080**		0.0024	0.00062	ug/L		12/05/16 08:31	12/16/16 20:15	1
Perfluorodecanoic acid (PFDA)	**0.0016**	**J**	0.0024	0.00041	ug/L		12/05/16 08:31	12/16/16 20:15	1
Perfluoroundecanoic acid (PFUnA)	0.0019	U	0.0024	0.00070	ug/L		12/05/16 08:31	12/16/16 20:15	1
Perfluorododecanoic acid (PFDoA)	0.0019	U	0.0024	0.00055	ug/L		12/05/16 08:31	12/16/16 20:15	1
Perfluorotridecanoic Acid (PFTriA)	0.0019	U	0.0024	0.00052	ug/L		12/05/16 08:31	12/16/16 20:15	1
Perfluorotetradecanoic acid (PFTeA)	**0.00079**	**J**	0.0024	0.00038	ug/L		12/05/16 08:31	12/16/16 20:15	1
Perfluorohexanesulfonic acid (PFHxS)	**0.071**		0.0024	0.00082	ug/L		12/05/16 08:31	12/16/16 20:15	1
Perfluorooctanesulfonic acid (PFOS)	**0.061**		0.0038	0.0012	ug/L		12/05/16 08:31	12/16/16 20:15	1
Perfluorodecanesulfonic acid (PFDS)	0.0028	U	0.0038	0.0011	ug/L		12/05/16 08:31	12/16/16 20:15	1
Perfluorooctane Sulfonamide (FOSA)	0.0019	U	0.0024	0.00060	ug/L		12/05/16 08:31	12/16/16 20:15	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*9*	*Q*	*25 - 150*	*12/05/16 08:31*	*12/16/16 20:15*	*1*
13C4 PFBA	*45*		*25 - 150*	*12/05/16 08:31*	*12/16/16 20:15*	*1*
13C2 PFHxA	*78*		*25 - 150*	*12/05/16 08:31*	*12/16/16 20:15*	*1*
13C4 PFOA	*85*		*25 - 150*	*12/05/16 08:31*	*12/16/16 20:15*	*1*
13C5 PFNA	*88*		*25 - 150*	*12/05/16 08:31*	*12/16/16 20:15*	*1*
13C2 PFDA	*97*		*25 - 150*	*12/05/16 08:31*	*12/16/16 20:15*	*1*
13C2 PFUnA	*104*		*25 - 150*	*12/05/16 08:31*	*12/16/16 20:15*	*1*
13C2 PFDoA	*104*		*25 - 150*	*12/05/16 08:31*	*12/16/16 20:15*	*1*
18O2 PFHxS	*93*		*25 - 150*	*12/05/16 08:31*	*12/16/16 20:15*	*1*
13C4 PFOS	*102*		*25 - 150*	*12/05/16 08:31*	*12/16/16 20:15*	*1*
13C5-PFPeA	*78*		*25 - 150*	*12/05/16 08:31*	*12/16/16 20:15*	*1*
13C4-PFHpA	*82*		*25 - 150*	*12/05/16 08:31*	*12/16/16 20:15*	*1*

Method: 537 (Modified) - Perfluorinated Hydrocarbons - RA

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	**0.014**		0.0024	0.00086	ug/L		12/05/16 08:31	12/20/16 18:52	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*111*		*25 - 150*	*12/05/16 08:31*	*12/20/16 18:52*	*1*

Client Sample ID: 613D41MW-LF-1116

Lab Sample ID: 320-23931-4

Date Collected: 11/30/16 13:55

Matrix: Water

Date Received: 12/01/16 09:50

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**0.012**	**M**	0.0024	0.00043	ug/L		12/05/16 08:31	12/16/16 20:22	1
Perfluoropentanoic acid (PFPeA)	**0.0063**		0.0024	0.00093	ug/L		12/05/16 08:31	12/16/16 20:22	1
Perfluorohexanoic acid (PFHxA)	**0.0074**		0.0024	0.00074	ug/L		12/05/16 08:31	12/16/16 20:22	1
Perfluoroheptanoic acid (PFHpA)	**0.0036**	**M**	0.0024	0.00075	ug/L		12/05/16 08:31	12/16/16 20:22	1
Perfluorooctanoic acid (PFOA)	**0.035**	**M**	0.0024	0.00070	ug/L		12/05/16 08:31	12/16/16 20:22	1
Perfluorononanoic acid (PFNA)	**0.00092**	**J M**	0.0024	0.00062	ug/L		12/05/16 08:31	12/16/16 20:22	1
Perfluorodecanoic acid (PFDA)	**0.00063**	**J**	0.0024	0.00041	ug/L		12/05/16 08:31	12/16/16 20:22	1
Perfluoroundecanoic acid (PFUnA)	0.0019	U	0.0024	0.00070	ug/L		12/05/16 08:31	12/16/16 20:22	1

Client Sample ID: 613D41MW-LF-1116

Date Collected: 11/30/16 13:55
Date Received: 12/01/16 09:50

Lab Sample ID: 320-23931-4

Matrix: Water

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorododecanoic acid (PFDoA)	0.0019	U	0.0024	0.00055	ug/L		12/05/16 08:31	12/16/16 20:22	1
Perfluorotridecanoic Acid (PFTriA)	0.0019	U	0.0024	0.00052	ug/L		12/05/16 08:31	12/16/16 20:22	1
Perfluorotetradecanoic acid (PFTeA)	**0.00078**	**J M**	0.0024	0.00038	ug/L		12/05/16 08:31	12/16/16 20:22	1
Perfluorohexanesulfonic acid (PFHxS)	**0.032**		0.0024	0.00082	ug/L		12/05/16 08:31	12/16/16 20:22	1
Perfluorooctanesulfonic acid (PFOS)	**0.070**		0.0038	0.0012	ug/L		12/05/16 08:31	12/16/16 20:22	1
Perfluorodecanesulfonic acid (PFDS)	0.0028	U	0.0038	0.0011	ug/L		12/05/16 08:31	12/16/16 20:22	1
Perfluorooctane Sulfonamide (FOSA)	0.0019	U	0.0024	0.00060	ug/L		12/05/16 08:31	12/16/16 20:22	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*15*	*Q*	*25 - 150*	*12/05/16 08:31*	*12/16/16 20:22*	*1*
13C4 PFBA	*48*		*25 - 150*	*12/05/16 08:31*	*12/16/16 20:22*	*1*
13C2 PFHxA	*77*		*25 - 150*	*12/05/16 08:31*	*12/16/16 20:22*	*1*
13C4 PFOA	*77*		*25 - 150*	*12/05/16 08:31*	*12/16/16 20:22*	*1*
13C5 PFNA	*70*		*25 - 150*	*12/05/16 08:31*	*12/16/16 20:22*	*1*
13C2 PFDA	*68*		*25 - 150*	*12/05/16 08:31*	*12/16/16 20:22*	*1*
13C2 PFUnA	*70*		*25 - 150*	*12/05/16 08:31*	*12/16/16 20:22*	*1*
13C2 PFDoA	*77*		*25 - 150*	*12/05/16 08:31*	*12/16/16 20:22*	*1*
18O2 PFHxS	*96*		*25 - 150*	*12/05/16 08:31*	*12/16/16 20:22*	*1*
13C4 PFOS	*101*		*25 - 150*	*12/05/16 08:31*	*12/16/16 20:22*	*1*
13C5-PFPeA	*80*		*25 - 150*	*12/05/16 08:31*	*12/16/16 20:22*	*1*
13C4-PFHpA	*77*		*25 - 150*	*12/05/16 08:31*	*12/16/16 20:22*	*1*

Method: 537 (Modified) - Perfluorinated Hydrocarbons - RA

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	**0.0053**		0.0024	0.00086	ug/L		12/05/16 08:31	12/20/16 18:59	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*126*		*25 - 150*	*12/05/16 08:31*	*12/20/16 18:59*	*1*

Client Sample ID: 613D39MW-LF-1116

Date Collected: 11/30/16 15:20
Date Received: 12/01/16 09:50

Lab Sample ID: 320-23931-5

Matrix: Water

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**0.0028**		0.0023	0.00041	ug/L		12/05/16 08:31	12/16/16 20:30	1
Perfluoropentanoic acid (PFPeA)	0.0018	U	0.0023	0.00089	ug/L		12/05/16 08:31	12/16/16 20:30	1
Perfluorohexanoic acid (PFHxA)	0.0018	U	0.0023	0.00071	ug/L		12/05/16 08:31	12/16/16 20:30	1
Perfluoroheptanoic acid (PFHpA)	0.0018	U	0.0023	0.00072	ug/L		12/05/16 08:31	12/16/16 20:30	1
Perfluorooctanoic acid (PFOA)	**0.0013**	**J**	0.0023	0.00067	ug/L		12/05/16 08:31	12/16/16 20:30	1
Perfluorononanoic acid (PFNA)	0.0018	U	0.0023	0.00059	ug/L		12/05/16 08:31	12/16/16 20:30	1
Perfluorodecanoic acid (PFDA)	0.00090	U	0.0023	0.00040	ug/L		12/05/16 08:31	12/16/16 20:30	1
Perfluoroundecanoic acid (PFUnA)	0.0018	U	0.0023	0.00067	ug/L		12/05/16 08:31	12/16/16 20:30	1
Perfluorododecanoic acid (PFDoA)	0.0018	U	0.0023	0.00053	ug/L		12/05/16 08:31	12/16/16 20:30	1
Perfluorotridecanoic Acid (PFTriA)	0.0018	U	0.0023	0.00050	ug/L		12/05/16 08:31	12/16/16 20:30	1
Perfluorotetradecanoic acid (PFTeA)	**0.00062**	**J**	0.0023	0.00036	ug/L		12/05/16 08:31	12/16/16 20:30	1
Perfluorohexanesulfonic acid (PFHxS)	**0.022**		0.0023	0.00078	ug/L		12/05/16 08:31	12/16/16 20:30	1

Client Sample ID: 613D39MW-LF-1116

Date Collected: 11/30/16 15:20
Date Received: 12/01/16 09:50

Lab Sample ID: 320-23931-5

Matrix: Water

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**0.026**		0.0036	0.0011	ug/L		12/05/16 08:31	12/16/16 20:30	1
Perfluorodecanesulfonic acid (PFDS)	0.0027	U	0.0036	0.0011	ug/L		12/05/16 08:31	12/16/16 20:30	1
Perfluorooctane Sulfonamide (FOSA)	0.0018	U	0.0023	0.00057	ug/L		12/05/16 08:31	12/16/16 20:30	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*13*	*Q*	*25 - 150*	*12/05/16 08:31*	*12/16/16 20:30*	*1*
13C4 PFBA	*43*		*25 - 150*	*12/05/16 08:31*	*12/16/16 20:30*	*1*
13C2 PFHxA	*77*		*25 - 150*	*12/05/16 08:31*	*12/16/16 20:30*	*1*
13C4 PFOA	*92*		*25 - 150*	*12/05/16 08:31*	*12/16/16 20:30*	*1*
13C5 PFNA	*93*		*25 - 150*	*12/05/16 08:31*	*12/16/16 20:30*	*1*
13C2 PFDA	*97*		*25 - 150*	*12/05/16 08:31*	*12/16/16 20:30*	*1*
13C2 PFUnA	*97*		*25 - 150*	*12/05/16 08:31*	*12/16/16 20:30*	*1*
13C2 PFDoA	*86*		*25 - 150*	*12/05/16 08:31*	*12/16/16 20:30*	*1*
18O2 PFHxS	*92*		*25 - 150*	*12/05/16 08:31*	*12/16/16 20:30*	*1*
13C4 PFOS	*99*		*25 - 150*	*12/05/16 08:31*	*12/16/16 20:30*	*1*
13C5-PFPeA	*76*		*25 - 150*	*12/05/16 08:31*	*12/16/16 20:30*	*1*
13C4-PFHpA	*86*		*25 - 150*	*12/05/16 08:31*	*12/16/16 20:30*	*1*

Method: 537 (Modified) - Perfluorinated Hydrocarbons - RA

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	**0.0062**		0.0023	0.00083	ug/L		12/05/16 08:31	12/20/16 19:07	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*116*		*25 - 150*	*12/05/16 08:31*	*12/20/16 19:07*	*1*

Client Sample ID: FB113016

Date Collected: 11/30/16 15:35
Date Received: 12/01/16 09:50

Lab Sample ID: 320-23931-6

Matrix: Water

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	0.00089	U	0.0022	0.00041	ug/L		12/05/16 08:31	12/16/16 20:37	1
Perfluoropentanoic acid (PFPeA)	0.0018	U	0.0022	0.00088	ug/L		12/05/16 08:31	12/16/16 20:37	1
Perfluorohexanoic acid (PFHxA)	0.0018	U	0.0022	0.00070	ug/L		12/05/16 08:31	12/16/16 20:37	1
Perfluoroheptanoic acid (PFHpA)	0.0018	U	0.0022	0.00072	ug/L		12/05/16 08:31	12/16/16 20:37	1
Perfluorooctanoic acid (PFOA)	0.0018	U	0.0022	0.00067	ug/L		12/05/16 08:31	12/16/16 20:37	1
Perfluorononanoic acid (PFNA)	0.0018	U	0.0022	0.00058	ug/L		12/05/16 08:31	12/16/16 20:37	1
Perfluorodecanoic acid (PFDA)	0.00089	U	0.0022	0.00039	ug/L		12/05/16 08:31	12/16/16 20:37	1
Perfluoroundecanoic acid (PFUnA)	0.0018	U	0.0022	0.00067	ug/L		12/05/16 08:31	12/16/16 20:37	1
Perfluorododecanoic acid (PFDoA)	0.0018	U	0.0022	0.00052	ug/L		12/05/16 08:31	12/16/16 20:37	1
Perfluorotridecanoic Acid (PFTriA)	0.0018	U	0.0022	0.00049	ug/L		12/05/16 08:31	12/16/16 20:37	1
Perfluorotetradecanoic acid (PFTeA)	**0.00041**	**J**	0.0022	0.00036	ug/L		12/05/16 08:31	12/16/16 20:37	1
Perfluorobutanesulfonic acid (PFBS)	0.0018	U Q	0.0022	0.00082	ug/L		12/05/16 08:31	12/16/16 20:37	1
Perfluorohexanesulfonic acid (PFHxS)	0.0018	U	0.0022	0.00078	ug/L		12/05/16 08:31	12/16/16 20:37	1
Perfluorooctanesulfonic acid (PFOS)	0.0027	U	0.0036	0.0011	ug/L		12/05/16 08:31	12/16/16 20:37	1
Perfluorodecanesulfonic acid (PFDS)	0.0027	U	0.0036	0.0011	ug/L		12/05/16 08:31	12/16/16 20:37	1
Perfluorooctane Sulfonamide (FOSA)	0.0018	U	0.0022	0.00057	ug/L		12/05/16 08:31	12/16/16 20:37	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*55*		*25 - 150*	*12/05/16 08:31*	*12/16/16 20:37*	*1*

Client Sample ID: FB113016

Date Collected: 11/30/16 15:35
Date Received: 12/01/16 09:50

Lab Sample ID: 320-23931-6

Matrix: Water

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

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	106		25 - 150	12/05/16 08:31	12/16/16 20:37	1
13C2 PFHxA	105		25 - 150	12/05/16 08:31	12/16/16 20:37	1
13C4 PFOA	110		25 - 150	12/05/16 08:31	12/16/16 20:37	1
13C5 PFNA	109		25 - 150	12/05/16 08:31	12/16/16 20:37	1
13C2 PFDA	115		25 - 150	12/05/16 08:31	12/16/16 20:37	1
13C2 PFUnA	116		25 - 150	12/05/16 08:31	12/16/16 20:37	1
13C2 PFDoA	104		25 - 150	12/05/16 08:31	12/16/16 20:37	1
18O2 PFHxS	102		25 - 150	12/05/16 08:31	12/16/16 20:37	1
13C4 PFOS	102		25 - 150	12/05/16 08:31	12/16/16 20:37	1
13C5-PFPeA	113		25 - 150	12/05/16 08:31	12/16/16 20:37	1
13C4-PFHpA	111		25 - 150	12/05/16 08:31	12/16/16 20:37	1

Default Detection Limits

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

TestAmerica Job ID: 320-23931-1

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Prep: 3535

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

Isotope Dilution Summary

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

TestAmerica Job ID: 320-23931-1

Method: 537 (Modified) - Perfluorinated Hydrocarbons

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

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	13C8 FOSA (25-150)	13C4 PFBA (25-150)	13C2 PFHxA (25-150)	13C4 PFOA (25-150)	13C5 PFNA (25-150)	13C2 PFDA (25-150)	13C2 PFUnA (25-150)	13C2 PFDoA (25-150)
320-23931-1	608D132MW-LF-1116	18 Q	32	41	62	72	106	104	104
320-23931-1 - DL	608D132MW-LF-1116	224 Q	802 Q	857 Q	1153 Q	1303 Q	1335 Q	1305 Q	1231 Q
320-23931-2	608D33MW-LF-1116	8 Q	9 Q	47	60	27	97	112	108
320-23931-2 - DL	608D33MW-LF-1116	17 Q	54	154 Q	181 Q	145	162 Q	163 Q	155 Q
320-23931-3	61301MW-LF-1116	9 Q	45	78	85	88	97	104	104
320-23931-3 - RA	61301MW-LF-1116								
320-23931-4	613D41MW-LF-1116	15 Q	48	77	77	70	68	70	77
320-23931-4 - RA	613D41MW-LF-1116								
320-23931-5	613D39MW-LF-1116	13 Q	43	77	92	93	97	97	86
320-23931-5 - RA	613D39MW-LF-1116								
320-23931-6	FB113016	55	106	105	110	109	115	116	104
LCS 320-140536/2-A	Lab Control Sample	90	106	103	103	103	104	104	107
MB 320-140536/1-A	Method Blank	100	112	109	116	109	111	115	111

		Percent Isotope Dilution Recovery (Acceptance Limits)			
Lab Sample ID	Client Sample ID	18O2 PFHxS (25-150)	13C4 PFOS (25-150)	13C5-PFPeA (25-150)	13C4-PFHpA (25-150)
320-23931-1	608D132MW-LF-1116	35	84	52	37
320-23931-1 - DL	608D132MW-LF-1116	842 Q	1317 Q	1140 Q	751 Q
320-23931-2	608D33MW-LF-1116	34	21 Q	42	36
320-23931-2 - DL	608D33MW-LF-1116	150	144	179 Q	154 Q
320-23931-3	61301MW-LF-1116	93	102	78	82
320-23931-3 - RA	61301MW-LF-1116	111			
320-23931-4	613D41MW-LF-1116	96	101	80	77
320-23931-4 - RA	613D41MW-LF-1116	126			
320-23931-5	613D39MW-LF-1116	92	99	76	86
320-23931-5 - RA	613D39MW-LF-1116	116			
320-23931-6	FB113016	102	102	113	111
LCS 320-140536/2-A	Lab Control Sample	97	99	109	102
MB 320-140536/1-A	Method Blank	105	102	118	112

Surrogate Legend

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

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Lab Sample ID: MB 320-140536/1-A
Matrix: Water
Analysis Batch: 142751

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 140536

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	0.0010	U	0.0025	0.00046	ug/L		12/05/16 08:31	12/16/16 18:30	1
Perfluoropentanoic acid (PFPeA)	0.0020	U	0.0025	0.00099	ug/L		12/05/16 08:31	12/16/16 18:30	1
Perfluorohexanoic acid (PFHxA)	0.0020	U	0.0025	0.00079	ug/L		12/05/16 08:31	12/16/16 18:30	1
Perfluoroheptanoic acid (PFHpA)	0.0020	U	0.0025	0.00080	ug/L		12/05/16 08:31	12/16/16 18:30	1
Perfluorooctanoic acid (PFOA)	0.0020	U	0.0025	0.00075	ug/L		12/05/16 08:31	12/16/16 18:30	1
Perfluorononanoic acid (PFNA)	0.0020	U	0.0025	0.00065	ug/L		12/05/16 08:31	12/16/16 18:30	1
Perfluorodecanoic acid (PFDA)	0.0010	U	0.0025	0.00044	ug/L		12/05/16 08:31	12/16/16 18:30	1
Perfluoroundecanoic acid (PFUnA)	0.0020	U	0.0025	0.00075	ug/L		12/05/16 08:31	12/16/16 18:30	1
Perfluorododecanoic acid (PFDoA)	0.0020	U	0.0025	0.00058	ug/L		12/05/16 08:31	12/16/16 18:30	1
Perfluorotridecanoic Acid (PFTriA)	0.0020	U	0.0025	0.00055	ug/L		12/05/16 08:31	12/16/16 18:30	1
Perfluorotetradecanoic acid (PFTeA)	0.000656	J	0.0025	0.00040	ug/L		12/05/16 08:31	12/16/16 18:30	1
Perfluorobutanesulfonic acid (PFBS)	0.0020	U	0.0025	0.00092	ug/L		12/05/16 08:31	12/16/16 18:30	1
Perfluorohexanesulfonic acid (PFHxS)	0.0020	U	0.0025	0.00087	ug/L		12/05/16 08:31	12/16/16 18:30	1
Perfluorooctanesulfonic acid (PFOS)	0.0030	U	0.0040	0.0013	ug/L		12/05/16 08:31	12/16/16 18:30	1
Perfluorodecanesulfonic acid (PFDS)	0.0030	U	0.0040	0.0012	ug/L		12/05/16 08:31	12/16/16 18:30	1
Perfluorooctane Sulfonamide (FOSA)	0.0020	U	0.0025	0.00064	ug/L		12/05/16 08:31	12/16/16 18:30	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*100*		*25 - 150*	*12/05/16 08:31*	*12/16/16 18:30*	*1*
13C4 PFBA	*112*		*25 - 150*	*12/05/16 08:31*	*12/16/16 18:30*	*1*
13C2 PFHxA	*109*		*25 - 150*	*12/05/16 08:31*	*12/16/16 18:30*	*1*
13C4 PFOA	*116*		*25 - 150*	*12/05/16 08:31*	*12/16/16 18:30*	*1*
13C5 PFNA	*109*		*25 - 150*	*12/05/16 08:31*	*12/16/16 18:30*	*1*
13C2 PFDA	*111*		*25 - 150*	*12/05/16 08:31*	*12/16/16 18:30*	*1*
13C2 PFUnA	*115*		*25 - 150*	*12/05/16 08:31*	*12/16/16 18:30*	*1*
13C2 PFDoA	*111*		*25 - 150*	*12/05/16 08:31*	*12/16/16 18:30*	*1*
18O2 PFHxS	*105*		*25 - 150*	*12/05/16 08:31*	*12/16/16 18:30*	*1*
13C4 PFOS	*102*		*25 - 150*	*12/05/16 08:31*	*12/16/16 18:30*	*1*
13C5-PFPeA	*118*		*25 - 150*	*12/05/16 08:31*	*12/16/16 18:30*	*1*
13C4-PFHpA	*112*		*25 - 150*	*12/05/16 08:31*	*12/16/16 18:30*	*1*

Lab Sample ID: LCS 320-140536/2-A
Matrix: Water
Analysis Batch: 142751

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 140536

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorobutanoic acid (PFBA)	0.0400	0.0446		ug/L		112	60 - 140
Perfluoropentanoic acid (PFPeA)	0.0400	0.0431		ug/L		108	60 - 140
Perfluorohexanoic acid (PFHxA)	0.0400	0.0427		ug/L		107	60 - 140
Perfluoroheptanoic acid (PFHpA)	0.0400	0.0443		ug/L		111	60 - 140
Perfluorooctanoic acid (PFOA)	0.0400	0.0425		ug/L		106	60 - 140
Perfluorononanoic acid (PFNA)	0.0400	0.0428		ug/L		107	60 - 140
Perfluorodecanoic acid (PFDA)	0.0400	0.0420		ug/L		105	60 - 140
Perfluoroundecanoic acid (PFUnA)	0.0400	0.0410		ug/L		103	60 - 140
Perfluorododecanoic acid (PFDoA)	0.0400	0.0422		ug/L		105	60 - 140
Perfluorotridecanoic Acid (PFTriA)	0.0400	0.0436		ug/L		109	50 - 150

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

Lab Sample ID: LCS 320-140536/2-A
Matrix: Water
Analysis Batch: 142751

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 140536

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Perfluorotetradecanoic acid (PFTeA)			0.0400	0.0557		ug/L		139	50 - 150		
Perfluorobutanesulfonic acid (PFBS)			0.0354	0.0464		ug/L		131	50 - 150		
Perfluorohexanesulfonic acid (PFHxS)			0.0364	0.0375		ug/L		103	60 - 140		
Perfluorooctanesulfonic acid (PFOS)			0.0371	0.0398		ug/L		107	60 - 140		
Perfluorodecanesulfonic acid (PFDS)			0.0386	0.0412		ug/L		107	50 - 150		
Perfluorooctane Sulfonamide (FOSA)			0.0400	0.0445		ug/L		111	60 - 140		

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C8 FOSA	*90*		*25 - 150*
13C4 PFBA	*106*		*25 - 150*
13C2 PFHxA	*103*		*25 - 150*
13C4 PFOA	*103*		*25 - 150*
13C5 PFNA	*103*		*25 - 150*
13C2 PFDA	*104*		*25 - 150*
13C2 PFUnA	*104*		*25 - 150*
13C2 PFDoA	*107*		*25 - 150*
18O2 PFHxS	*97*		*25 - 150*
13C4 PFOS	*99*		*25 - 150*
13C5-PFPeA	*109*		*25 - 150*
13C4-PFHpA	*102*		*25 - 150*

LCMS

Prep Batch: 140536

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-23931-1 - DL	608D132MW-LF-1116	Total/NA	Water	3535	
320-23931-1	608D132MW-LF-1116	Total/NA	Water	3535	
320-23931-2 - DL	608D33MW-LF-1116	Total/NA	Water	3535	
320-23931-2	608D33MW-LF-1116	Total/NA	Water	3535	
320-23931-3	61301MW-LF-1116	Total/NA	Water	3535	
320-23931-3 - RA	61301MW-LF-1116	Total/NA	Water	3535	
320-23931-4 - RA	613D41MW-LF-1116	Total/NA	Water	3535	
320-23931-4	613D41MW-LF-1116	Total/NA	Water	3535	
320-23931-5	613D39MW-LF-1116	Total/NA	Water	3535	
320-23931-5 - RA	613D39MW-LF-1116	Total/NA	Water	3535	
320-23931-6	FB113016	Total/NA	Water	3535	
MB 320-140536/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-140536/2-A	Lab Control Sample	Total/NA	Water	3535	

Analysis Batch: 142751

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-23931-1	608D132MW-LF-1116	Total/NA	Water	537 (Modified)	140536
320-23931-2	608D33MW-LF-1116	Total/NA	Water	537 (Modified)	140536
320-23931-3	61301MW-LF-1116	Total/NA	Water	537 (Modified)	140536
320-23931-4	613D41MW-LF-1116	Total/NA	Water	537 (Modified)	140536
320-23931-5	613D39MW-LF-1116	Total/NA	Water	537 (Modified)	140536
320-23931-6	FB113016	Total/NA	Water	537 (Modified)	140536
MB 320-140536/1-A	Method Blank	Total/NA	Water	537 (Modified)	140536
LCS 320-140536/2-A	Lab Control Sample	Total/NA	Water	537 (Modified)	140536

Analysis Batch: 143259

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-23931-1 - DL	608D132MW-LF-1116	Total/NA	Water	537 (Modified)	140536
320-23931-2 - DL	608D33MW-LF-1116	Total/NA	Water	537 (Modified)	140536
320-23931-3 - RA	61301MW-LF-1116	Total/NA	Water	537 (Modified)	140536
320-23931-4 - RA	613D41MW-LF-1116	Total/NA	Water	537 (Modified)	140536
320-23931-5 - RA	613D39MW-LF-1116	Total/NA	Water	537 (Modified)	140536

Client Sample ID: 608D132MW-LF-1116
Lab Sample ID: 320-23931-1
Date Collected: 11/30/16 09:40
Matrix: Water
Date Received: 12/01/16 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			140536	12/05/16 08:31	HJA	TAL SAC
Total/NA	Analysis	537 (Modified)		1	142751	12/16/16 19:30	SBC	TAL SAC
Total/NA	Prep	3535	DL		140536	12/05/16 08:31	HJA	TAL SAC
Total/NA	Analysis	537 (Modified)	DL	50	143259	12/20/16 18:37	SBC	TAL SAC

Client Sample ID: 608D33MW-LF-1116
Lab Sample ID: 320-23931-2
Date Collected: 11/30/16 11:00
Matrix: Water
Date Received: 12/01/16 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			140536	12/05/16 08:31	HJA	TAL SAC
Total/NA	Analysis	537 (Modified)		1	142751	12/16/16 19:37	SBC	TAL SAC
Total/NA	Prep	3535	DL		140536	12/05/16 08:31	HJA	TAL SAC
Total/NA	Analysis	537 (Modified)	DL	100	143259	12/20/16 18:22	SBC	TAL SAC

Client Sample ID: 61301MW-LF-1116
Lab Sample ID: 320-23931-3
Date Collected: 11/30/16 12:45
Matrix: Water
Date Received: 12/01/16 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			140536	12/05/16 08:31	HJA	TAL SAC
Total/NA	Analysis	537 (Modified)		1	142751	12/16/16 20:15	SBC	TAL SAC
Total/NA	Prep	3535	RA		140536	12/05/16 08:31	HJA	TAL SAC
Total/NA	Analysis	537 (Modified)	RA	1	143259	12/20/16 18:52	SBC	TAL SAC

Client Sample ID: 613D41MW-LF-1116
Lab Sample ID: 320-23931-4
Date Collected: 11/30/16 13:55
Matrix: Water
Date Received: 12/01/16 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			140536	12/05/16 08:31	HJA	TAL SAC
Total/NA	Analysis	537 (Modified)		1	142751	12/16/16 20:22	SBC	TAL SAC
Total/NA	Prep	3535	RA		140536	12/05/16 08:31	HJA	TAL SAC
Total/NA	Analysis	537 (Modified)	RA	1	143259	12/20/16 18:59	SBC	TAL SAC

Client Sample ID: 613D39MW-LF-1116
Lab Sample ID: 320-23931-5
Date Collected: 11/30/16 15:20
Matrix: Water
Date Received: 12/01/16 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			140536	12/05/16 08:31	HJA	TAL SAC
Total/NA	Analysis	537 (Modified)		1	142751	12/16/16 20:30	SBC	TAL SAC
Total/NA	Prep	3535	RA		140536	12/05/16 08:31	HJA	TAL SAC

Lab Chronicle

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

TestAmerica Job ID: 320-23931-1

Client Sample ID: 613D39MW-LF-1116

Lab Sample ID: 320-23931-5

Date Collected: 11/30/16 15:20

Matrix: Water

Date Received: 12/01/16 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	537 (Modified)	RA	1	143259	12/20/16 19:07	SBC	TAL SAC

Client Sample ID: FB113016

Lab Sample ID: 320-23931-6

Date Collected: 11/30/16 15:35

Matrix: Water

Date Received: 12/01/16 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			140536	12/05/16 08:31	HJA	TAL SAC
Total/NA	Analysis	537 (Modified)		1	142751	12/16/16 20:37	SBC	TAL SAC

Laboratory References:

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

Certification Summary

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

TestAmerica Job ID: 320-23931-1

Laboratory: TestAmerica Sacramento

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
A2LA	DoD ELAP		2928-01	01-31-17
Oregon	NELAP	10	4040	01-29-17

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

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

Method Summary

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

TestAmerica Job ID: 320-23931-1

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

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

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

Sample Summary

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

TestAmerica Job ID: 320-23931-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-23931-1	608D132MW-LF-1116	Water	11/30/16 09:40	12/01/16 09:50
320-23931-2	608D33MW-LF-1116	Water	11/30/16 11:00	12/01/16 09:50
320-23931-3	61301MW-LF-1116	Water	11/30/16 12:45	12/01/16 09:50
320-23931-4	613D41MW-LF-1116	Water	11/30/16 13:55	12/01/16 09:50
320-23931-5	613D39MW-LF-1116	Water	11/30/16 15:20	12/01/16 09:50
320-23931-6	FB113016	Water	11/30/16 15:35	12/01/16 09:50

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 142379

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

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

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

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

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

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

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 142571

Lab Sample ID: CCV 320-142571/4 CCVL Client Sample ID:

Date Analyzed: 12/16/16 10:23 Lab File ID: 16DEC2016A_002.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	3.29	Assign Peak	chandrasenas	12/16/16 14:29

537 (Modified)

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 142751

Lab Sample ID: 320-23931-1 Client Sample ID: 608D132MW-LF-1116

Date Analyzed: 12/16/16 19:30 Lab File ID: 16DEC2016C_013.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.86	Isomers	chandrasenas	12/18/16 17:38

Lab Sample ID: 320-23931-2 Client Sample ID: 608D33MW-LF-1116

Date Analyzed: 12/16/16 19:37 Lab File ID: 16DEC2016C_014.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanoic acid (PFBA)	1.58	Baseline	chandrasenas	12/18/16 17:40
Perfluorooctanoic acid (PFOA)	2.85	Isomers	chandrasenas	12/18/16 17:40
Perfluorooctanesulfonic acid (PFOS)	3.18	Baseline	chandrasenas	12/18/16 17:40
Perfluorodecanoic acid (PFDA)	3.58	Baseline	chandrasenas	12/18/16 17:40

Lab Sample ID: 320-23931-3 Client Sample ID: 61301MW-LF-1116

Date Analyzed: 12/16/16 20:15 Lab File ID: 16DEC2016C_019.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanoic acid (PFBA)	1.59	Baseline	chandrasenas	12/18/16 17:45
Perfluorooctanoic acid (PFOA)	2.84	Isomers	chandrasenas	12/18/16 17:45

537 (Modified)

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 142751

Lab Sample ID: 320-23931-4 Client Sample ID: 613D41MW-LF-1116

Date Analyzed: 12/16/16 20:22 Lab File ID: 16DEC2016C_020.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanoic acid (PFBA)	1.57	Baseline	chandrasenas	12/18/16 17:47
Perfluoroheptanoic acid (PFHpA)	2.48	Baseline	chandrasenas	12/18/16 17:47
Perfluorooctanoic acid (PFOA)	2.84	Isomers	chandrasenas	12/18/16 17:47
Perfluorononanoic acid (PFNA)	3.22	Incomplete Integration	chandrasenas	12/18/16 17:47
Perfluorotetradecanoic acid (PFTeA)	4.71	Incomplete Integration	chandrasenas	12/18/16 17:47

537 (Modified)

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 143259

Lab Sample ID: 320-23931-2 DL Client Sample ID: 608D33MW-LF-1116 DL

Date Analyzed: 12/20/16 18:22 Lab File ID: 20DEC2016C_008.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.83	Isomers	chandrasenas	12/21/16 10:16

Lab Sample ID: 320-23931-1 DL Client Sample ID: 608D132MW-LF-1116 DL

Date Analyzed: 12/20/16 18:37 Lab File ID: 20DEC2016C_010.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.83	Isomers	chandrasenas	12/21/16 10:17

537 (Modified)

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							13C4-PFHpA	50 ng/mL
							13C5-PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							18O2 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	50 ng/mL
					LCPFCSP_00071	50 uL	Perfluorobutanoic acid (PFBA)	1 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.884 ng/mL
							Perfluorodecanoic acid (PFDA)	1 ng/mL
							Perfluorododecanoic acid (PFDoA)	1 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	0.964 ng/mL
							Perfluoroheptanoic acid (PFHpA)	1 ng/mL
							Perfluoroheptanesulfonic Acid	0.952 ng/mL
							Perfluorohexanoic acid (PFHxA)	1 ng/mL
							Perfluorohexadecanoic acid	1 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.91 ng/mL
							Perfluorononanoic acid (PFNA)	1 ng/mL
							Perfluorooctanoic acid (PFOA)	1 ng/mL
							Perfluorooctadecanoic acid	1 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.928 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	1 ng/mL
							Perfluoropentanoic acid (PFPeA)	1 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	1 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	1 ng/mL
							Perfluoroundecanoic acid (PFUnA)	1 ng/mL
.LCMPFCSU_00047	06/14/17	12/14/16	Methanol, Lot Baker 144541	50000 uL	LCM2PFHxDA_00008	1000 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00007	1000 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00007	1000 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00008	1000 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00011	1000 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00008	1000 uL	13C4 PFBA	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

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

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

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

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

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

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

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

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFUdA_00005	08/19/20	Wellington Laboratories, Lot PFUdA0815			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC-L6_00020	12/28/16	12/15/16	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00047	250 uL	13C2-PFHxDA	50 ng/mL
							13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5-PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							18O2 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	50 ng/mL
					LCPFCSP_00074	1000 uL	Perfluorobutanoic acid (PFBA)	200 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	176.8 ng/mL
							Perfluorodecanoic acid (PFDA)	200 ng/mL
							Perfluorododecanoic acid (PFDoA)	200 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	192.8 ng/mL
							Perfluoroheptanoic acid (PFHpA)	200 ng/mL
							Perfluoroheptanesulfonic Acid	190.4 ng/mL
							Perfluorohexanoic acid (PFHxA)	200 ng/mL
							Perfluorohexadecanoic acid	200 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	182 ng/mL
							Perfluorononanoic acid (PFNA)	200 ng/mL
							Perfluorooctanoic acid (PFOA)	200 ng/mL
							Perfluorooctadecanoic acid	200 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	185.6 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	200 ng/mL
							Perfluoropentanoic acid (PFPeA)	200 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	200 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	200 ng/mL
							Perfluoroundecanoic acid (PFUnA)	200 ng/mL
.LCMPFCSU_00047	06/14/17	12/14/16	Methanol, Lot Baker 144541	50000 uL	LCM2PFHxDA_00008	1000 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00007	1000 uL	13C2-PFTeDA	1 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

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

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCMPFNA_00008	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00012	01/22/21	Wellington Laboratories, Lot MPFOA0116			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00017	08/03/21	Wellington Laboratories, Lot MPFOS0816			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00009	02/12/21	Wellington Laboratories, Lot MPFUdA0216			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFACMXB_00007	11/06/20	Wellington Laboratories, Lot PFACMXB1115			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1.77 ug/mL
							Perfluorobutanoic acid (PFBA)	2 ug/mL
							Perfluorodecanesulfonic acid (PFDS)	1.93 ug/mL
							Perfluorodecanoic acid (PFDA)	2 ug/mL
							Perfluorododecanoic acid (PFDoA)	2 ug/mL
							Perfluoroheptanoic acid (PFHpA)	2 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	1.89 ug/mL
							Perfluorohexanoic acid (PFHxA)	2 ug/mL
							Perfluorononanoic acid (PFNA)	2 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	1.91 ug/mL
							Perfluorooctanoic acid (PFOA)	2 ug/mL
							Perfluoropentanoic acid (PFPeA)	2 ug/mL
							Perfluorotetradecanoic acid (PFTeA)	2 ug/mL
							Perfluorotridecanoic Acid (PFTriA)	2 ug/mL
							Perfluoroundecanoic acid (PFUnA)	2 ug/mL
.LCPFC3IM_00005	06/01/17	12/01/16	Methanol, Lot 090285	5 mL	LCPFOSA_00008	0.1 mL	Perfluorooctane Sulfonamide (FOSA)	1000 ng/mL
..LCPFOSA_00008	09/02/17	Wellington Laboratories, Lot FOSA0815I			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
LCPFCSP_00070	05/15/17	11/15/16	Methanol, Lot 090285	10000 uL	LCPFBA_00005	100 uL	Perfluorobutanoic acid (PFBA)	0.5 ug/mL
					LCPFBS_00005	100 uL	Perfluorobutane Sulfonate	0.442 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.442 ug/mL
					LCPFDA_00005	100 uL	Perfluorodecanoic acid (PFDA)	0.5 ug/mL
					LCPFDoA_00005	100 uL	Perfluorododecanoic acid (PFDoA)	0.5 ug/mL
					LCPFDS_00006	100 uL	Perfluorodecane Sulfonate	0.482 ug/mL
							Perfluorodecanesulfonic acid (PFDS)	0.482 ug/mL
					LCPFHpA_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 (PFHxA)	0.5 ug/mL
					LCPFHxDA_00006	100 uL	Perfluorohexadecanoic acid	0.5 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFHxS-br_00002	100 uL	Perfluorohexane Sulfonate	0.455 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.455 ug/mL
					LCPFNA_00005	100 uL	Perfluorononanoic acid (PFNA)	0.5 ug/mL
					LCPFOA_00006	100 uL	Perfluorooctanoic acid (PFOA)	0.5 ug/mL
					LCPFODA_00005	100 uL	Perfluorooctadecanoic acid	0.5 ug/mL
					LCPFOS-br_00002	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.464 ug/mL
					LCPFOSA_00006	100 uL	Perfluorooctane Sulfonamide (FOSA)	0.5 ug/mL
					LCPFPeA_00005	100 uL	Perfluoropentanoic acid (PFPeA)	0.5 ug/mL
					LCPFTeDA_00004	100 uL	Perfluorotetradecanoic acid (PFTeA)	0.5 ug/mL
					LCPFTrDA_00004	100 uL	Perfluorotridecanoic Acid (PFTriA)	0.5 ug/mL
					LCPFUdA_00005	100 uL	Perfluoroundecanoic acid (PFUnA)	0.5 ug/mL
.LCPFBA_00005	05/27/21	Wellington Laboratories, Lot PFBA0516			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
.LCPFBS_00005	03/15/21	Wellington Laboratories, Lot LPFBS0316			(Purchased Reagent)		Perfluorobutane Sulfonate	44.2 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
.LCPFDA_00005	07/02/20	Wellington Laboratories, Lot PFDA0615			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
.LCPFDoA_00005	01/30/20	Wellington Laboratories, Lot PFDoA0115			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
.LCPFDS_00006	05/24/21	Wellington Laboratories, Lot LPFDS0516			(Purchased Reagent)		Perfluorodecane Sulfonate	48.2 ug/mL
							Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
.LCPFHpA_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 (PFHxA)	50 ug/mL
.LCPFHxDA_00006	05/25/21	Wellington Laboratories, Lot PFHxDA0516			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
.LCPFHxS-br_00002	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexane Sulfonate	45.5 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
.LCPFNA_00005	10/23/20	Wellington Laboratories, Lot PFNA1015			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
.LCPFOA_00006	11/06/20	Wellington Laboratories, Lot PFOA1115			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
.LCPFODA_00005	01/30/20	Wellington Laboratories, Lot PFODA0115			(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
.LCPFOS-br_00002	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
.LCPFOSA_00006	09/02/17	Wellington Laboratories, Lot FOSA0815I			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
.LCPFPeA_00005	01/30/20	Wellington Laboratories, Lot PFPeA0115			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
.LCPFTeDA_00004	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
.LCPFTrDA_00004	12/10/18	Wellington Laboratories, Lot PFTrDA1213			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

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

Reagent

LC6:2FTS_00001

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

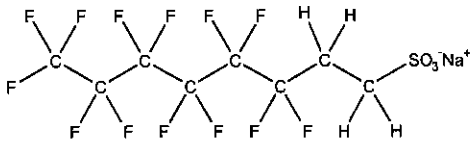
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

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

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

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$C_8H_4F_{13}SO_3Na$		**MOLECULAR WEIGHT:**	450.15
CONCENTRATION:	50.0 ± 2.5 µg/ml	(Na salt)	**SOLVENT(S):**	Methanol
	47.4 ± 2.4 µg/ml	(6:2FTS anion)		
CHEMICAL PURITY:	>98%			
LAST TESTED: (mm/dd/yyyy)	10/03/2014			
EXPIRY DATE: (mm/dd/yyyy)	10/03/2017			
RECOMMENDED STORAGE:	Refrigerate ampoule			

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: 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,...x_n on which it depends is:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

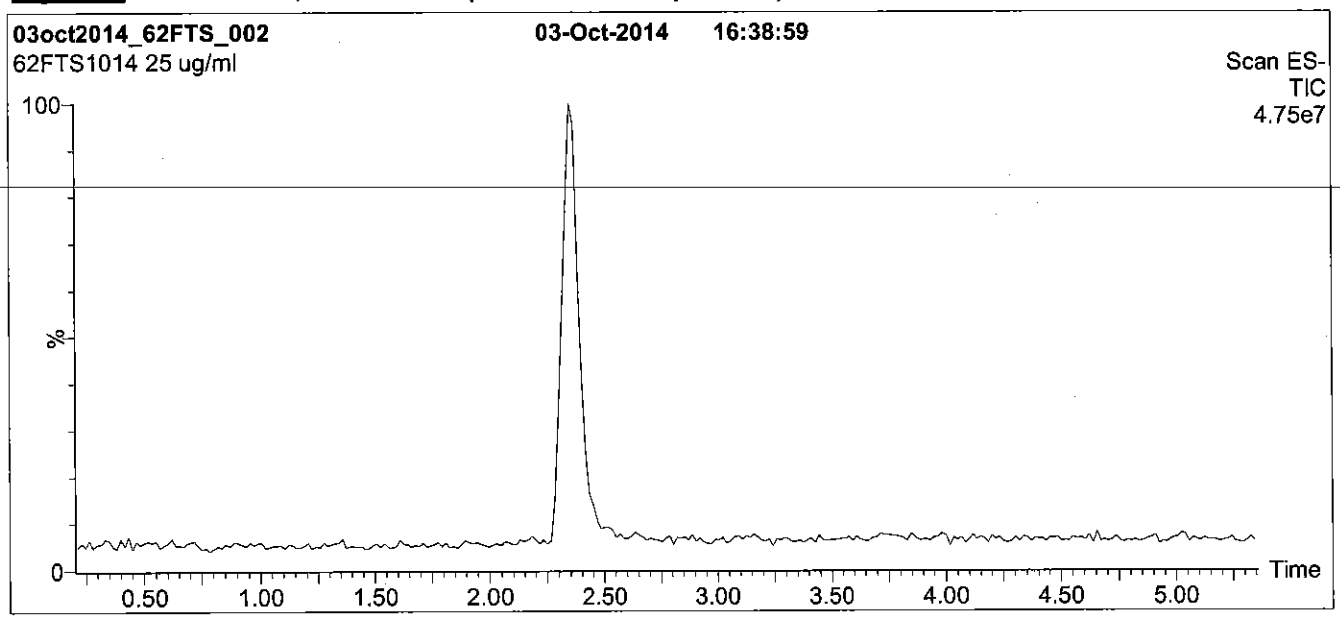
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

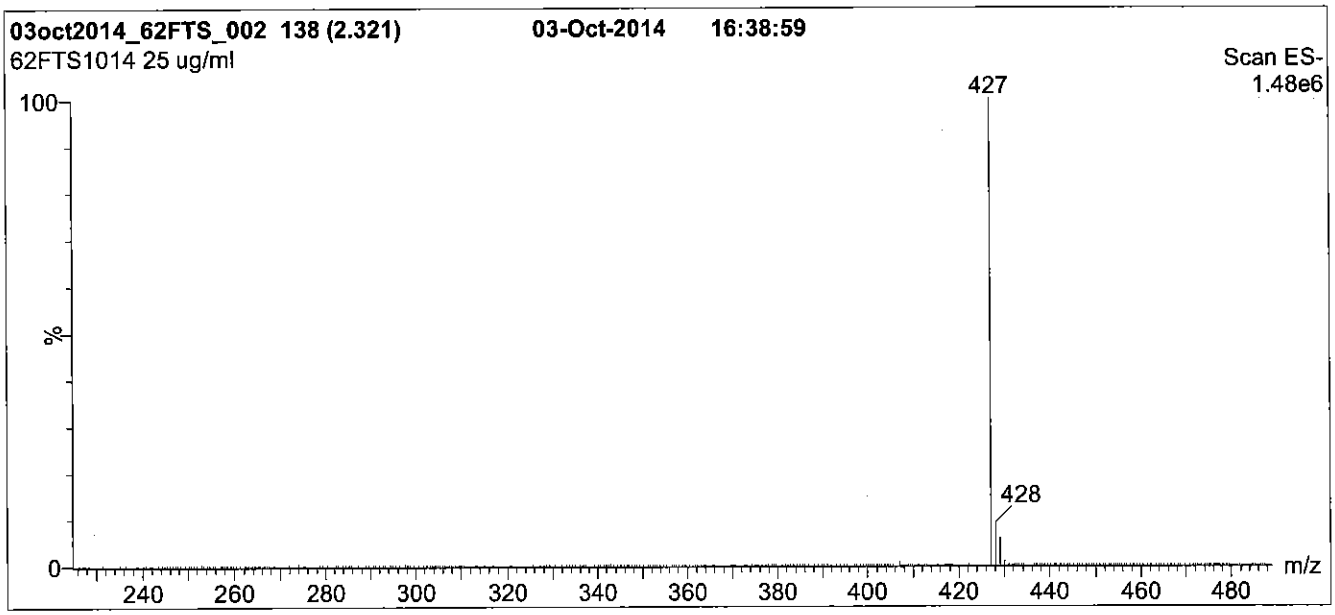
CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO Guide 34 REFERENCE MATERIAL PRODUCER

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

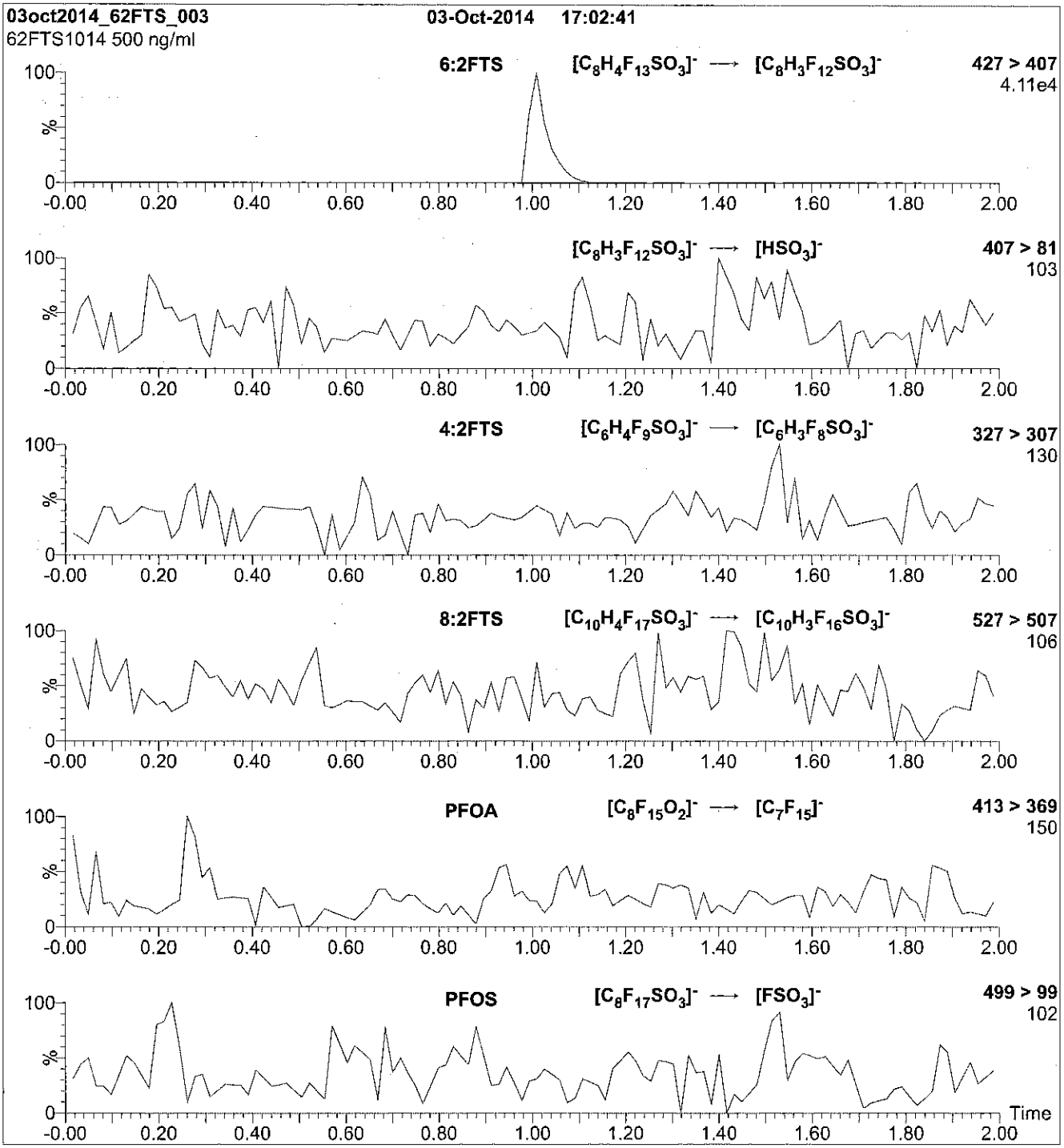
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LC6:2FTS_00002

R: 8/23/16 SBC

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

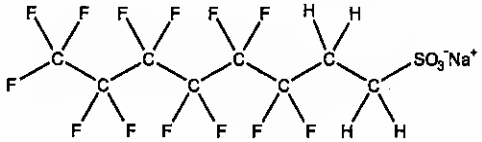
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

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

STRUCTURE: **CAS #:** Not available



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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 06/29/2016 (mm/dd/yyyy)

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

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

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TRACEABILITY:

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

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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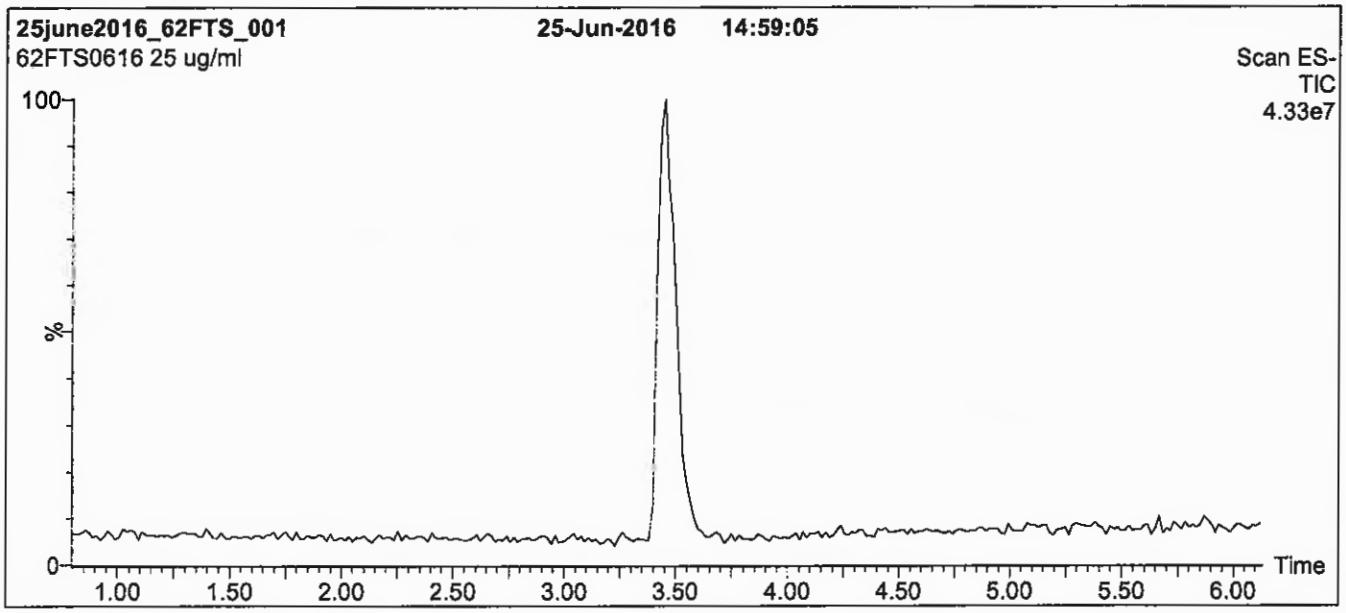
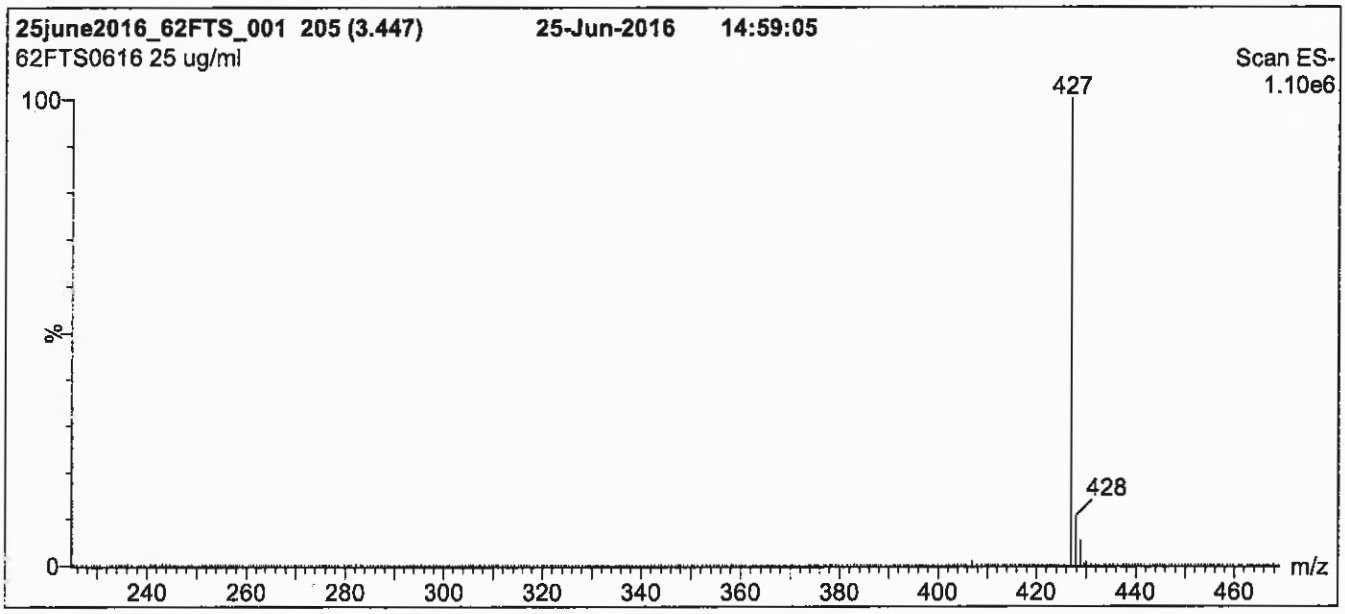
Figure 1: **6:2FTS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

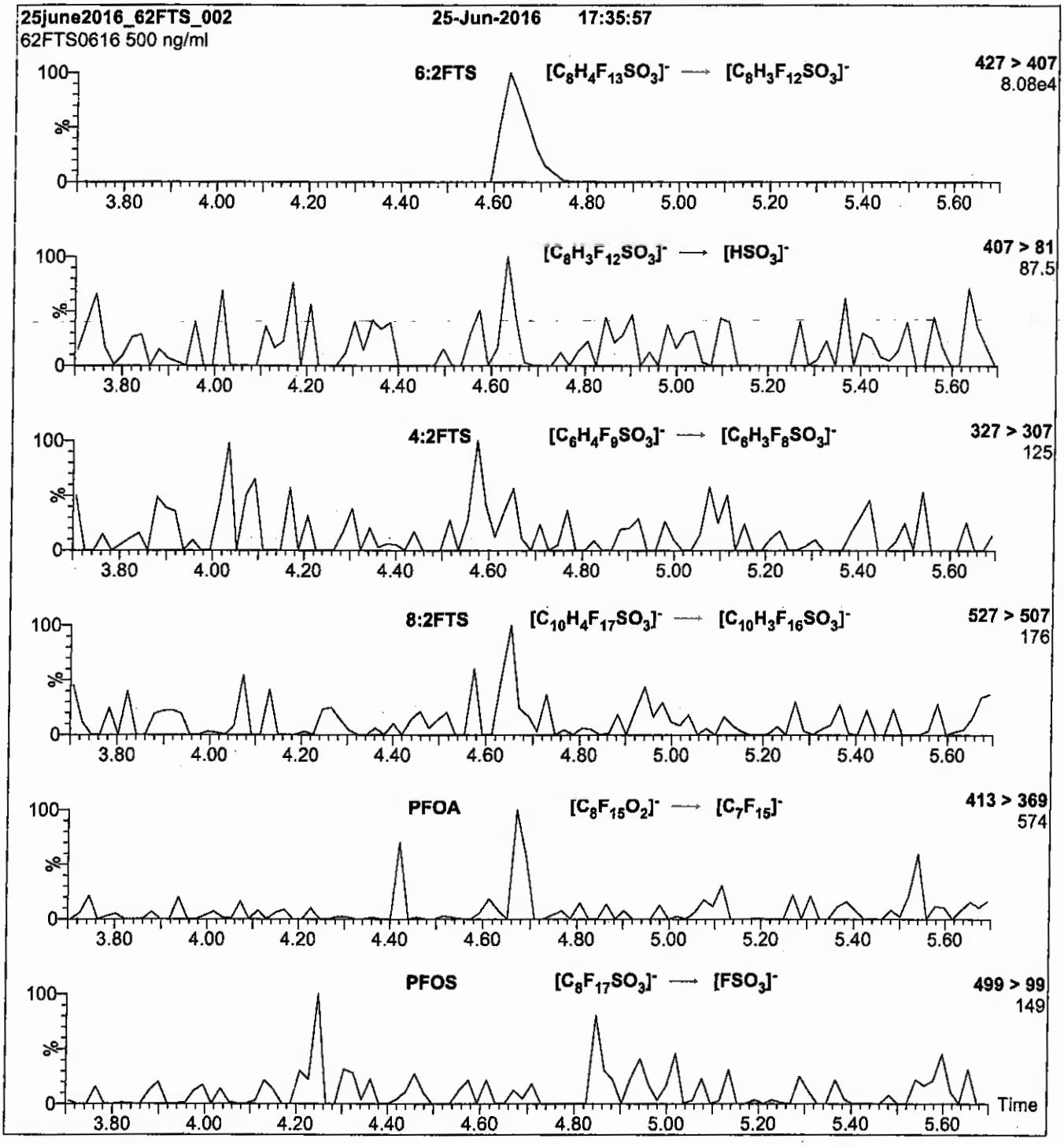
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LC8:2FTS_00001

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

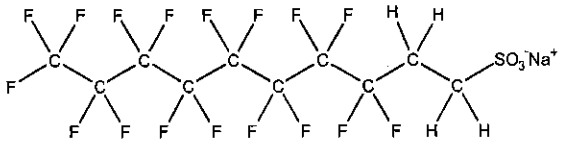
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

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

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

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$C_{10}H_4F_{17}SO_3Na$		**MOLECULAR WEIGHT:**	550.16
CONCENTRATION:	50.0 ± 2.5 µg/ml	(Na salt)	**SOLVENT(S):**	Methanol
	47.9 ± 2.4 µg/ml	(8:2FTS anion)		
CHEMICAL PURITY:	>98%			
LAST TESTED: (mm/dd/yyyy)	10/03/2014			
EXPIRY DATE: (mm/dd/yyyy)	10/03/2017			
RECOMMENDED STORAGE:	Refrigerate ampoule			

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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HAZARDS:

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

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

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

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

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

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17025 ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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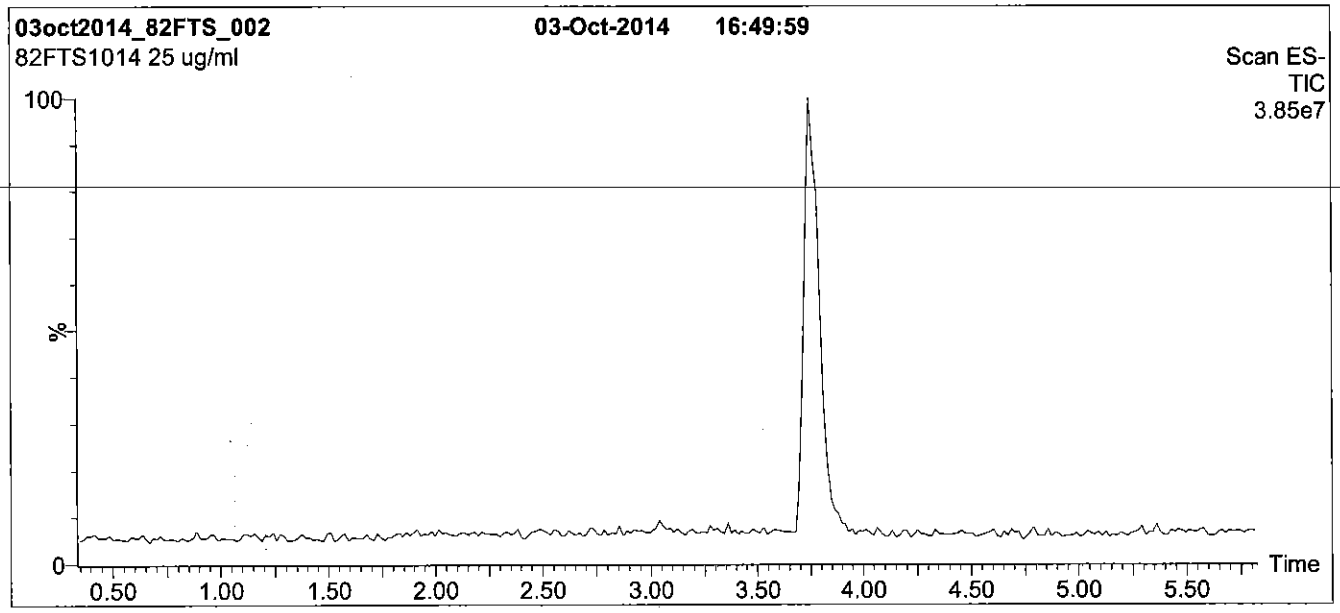

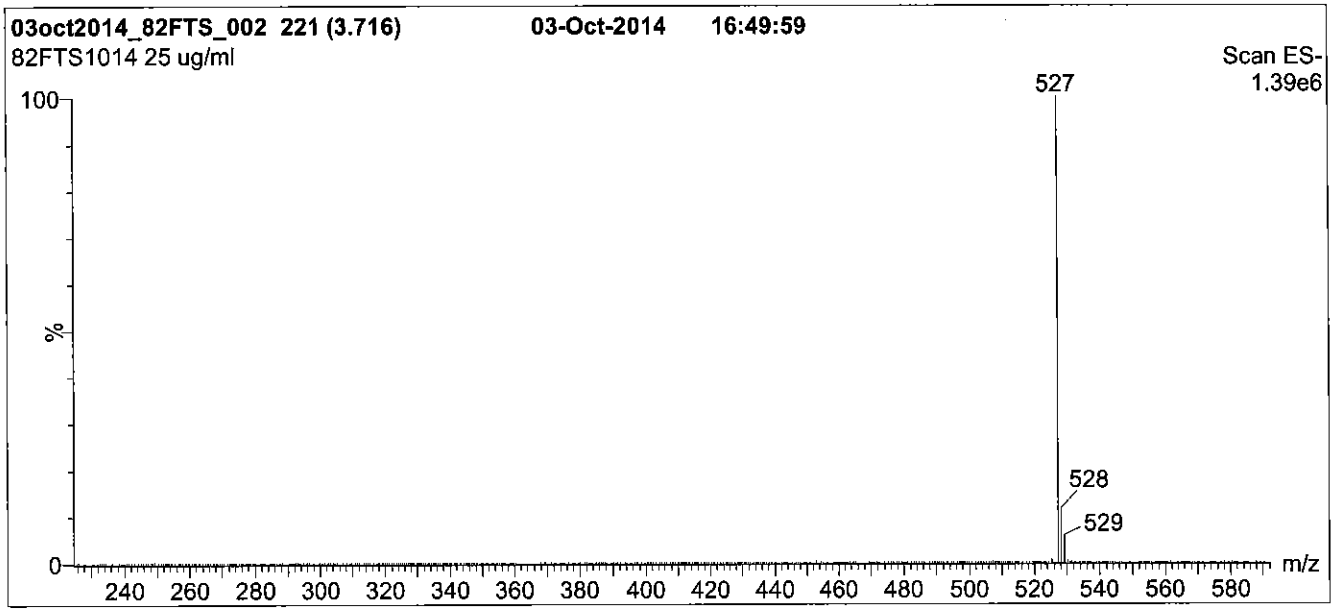

Conditions for Figure 1:

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

Chromatographic Conditions

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

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

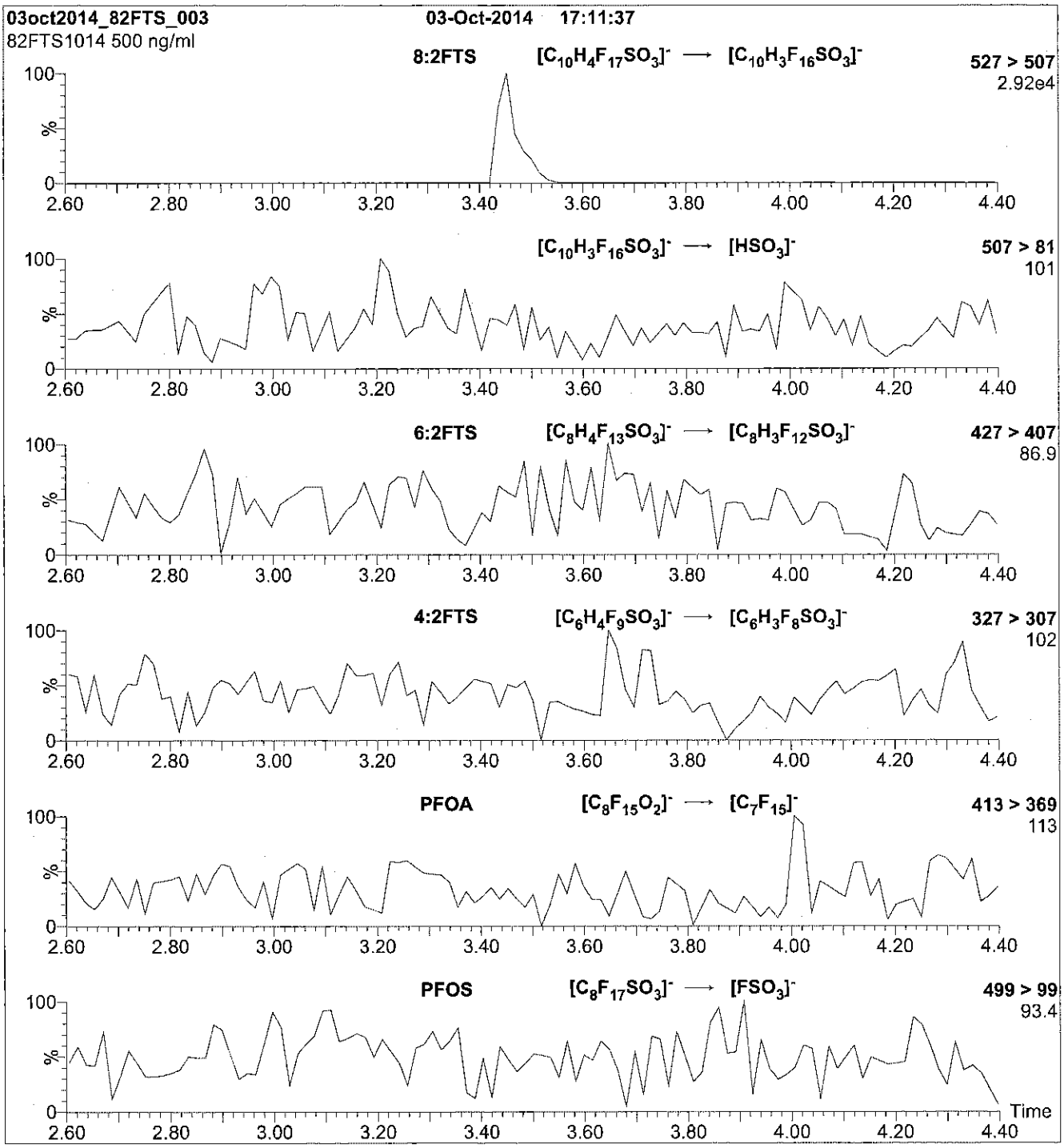
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LC8:2FTS_00002

R: 8/23/16 SBC

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

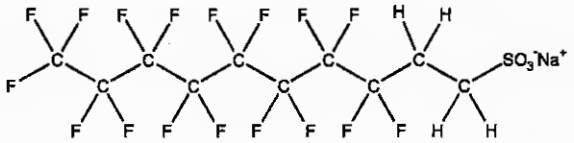
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

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

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$C_{10}H_4F_{17}SO_3Na$		**MOLECULAR WEIGHT:**	550.16
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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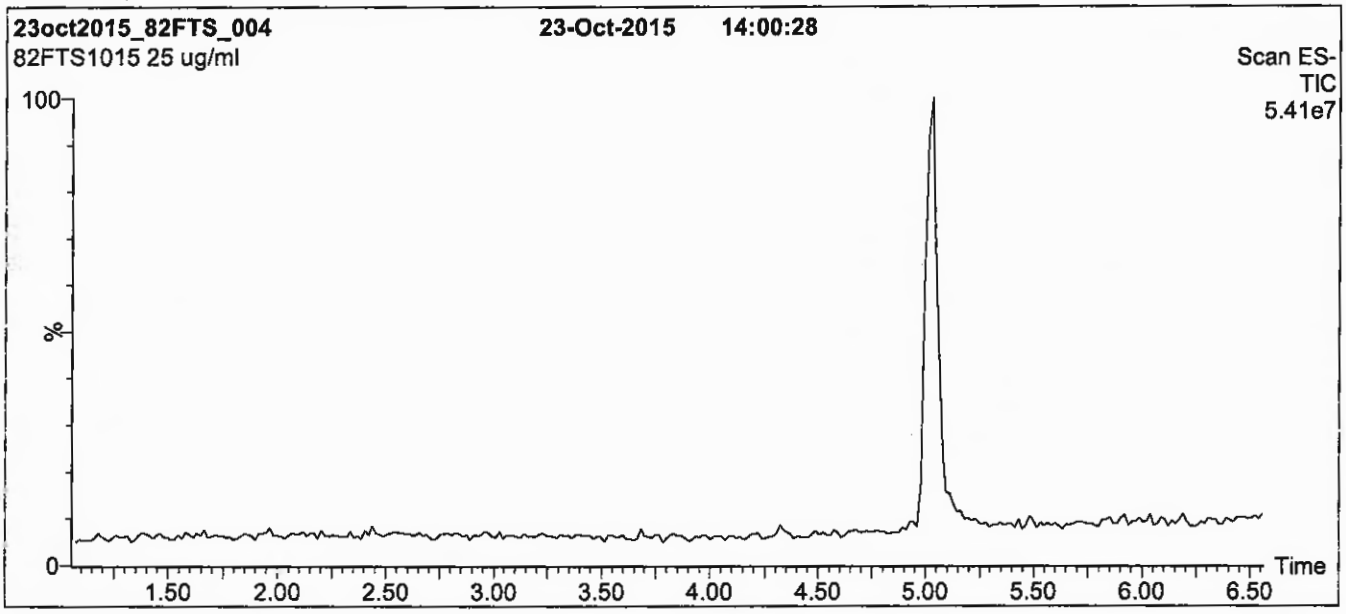
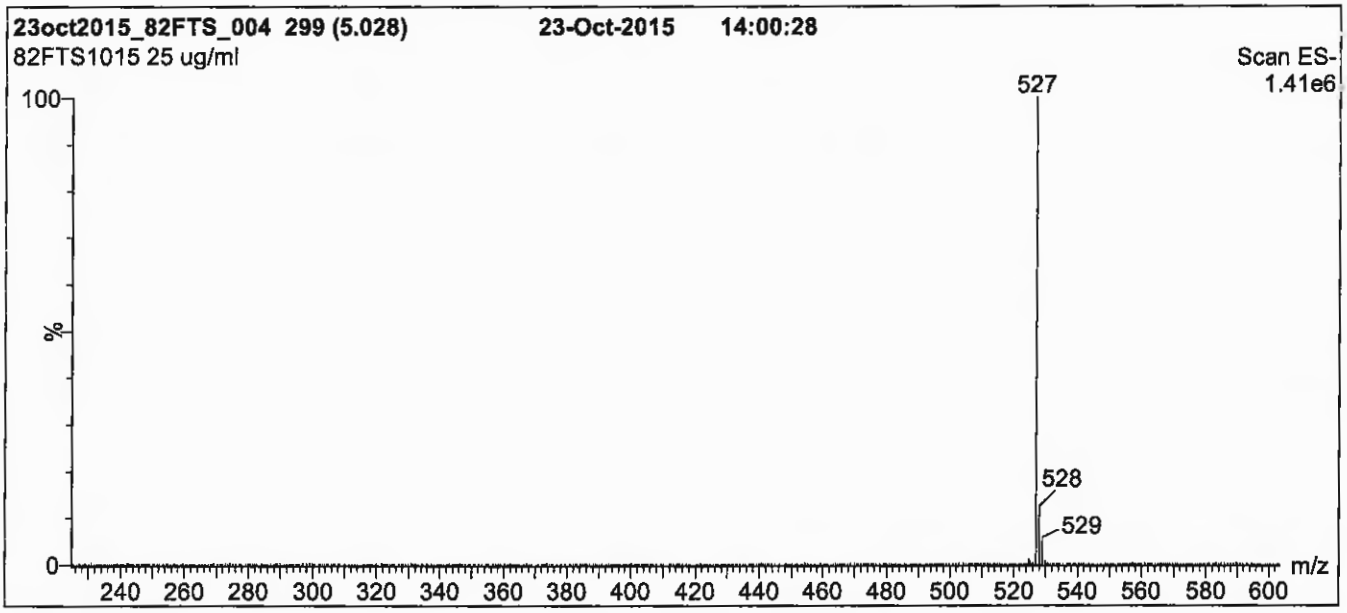
Figure 1: **8:2FTS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

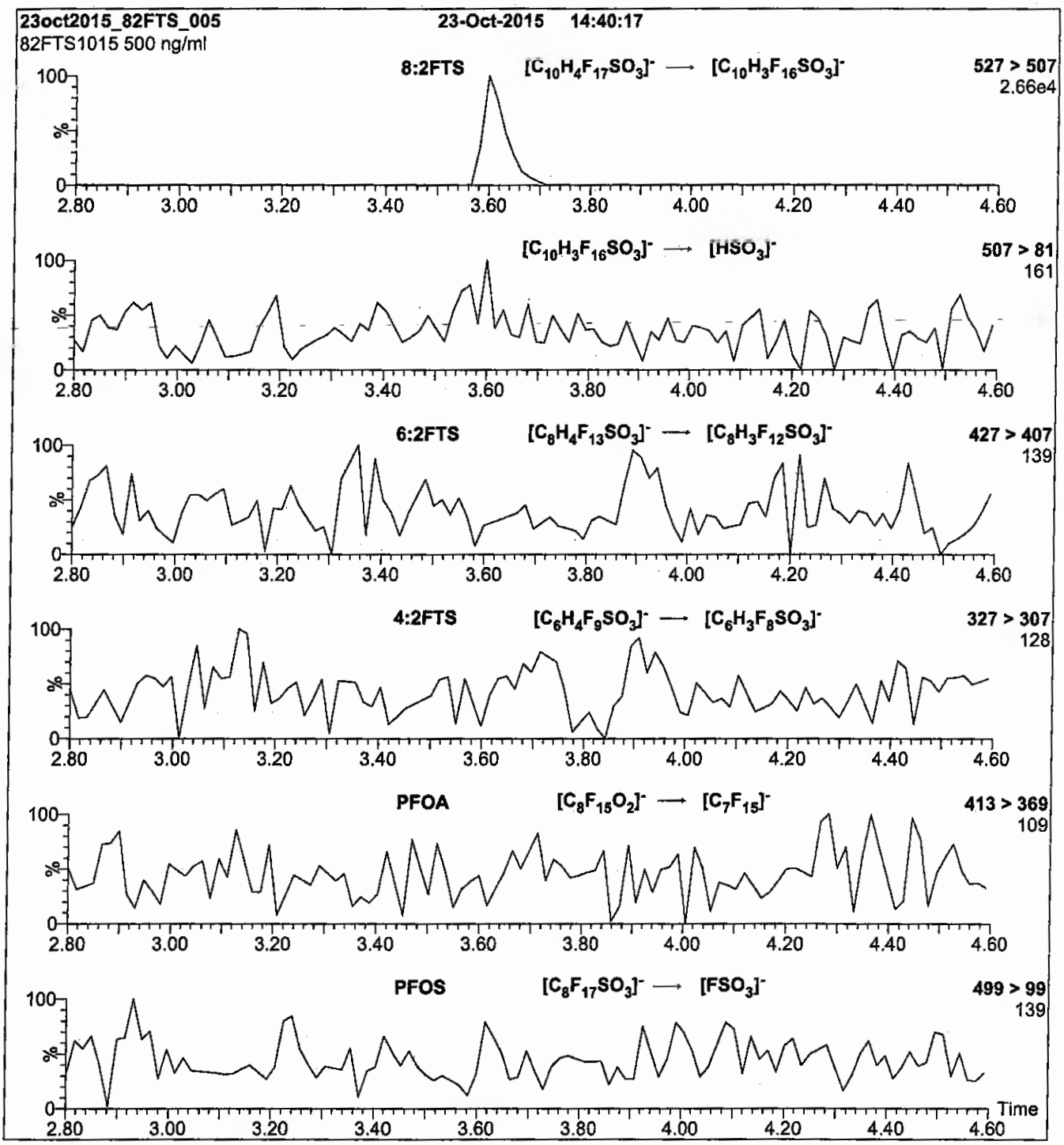
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCd-NEtFOSA-M_00001

R: 7/16/15 SV

WELLINGTON LABORATORIES

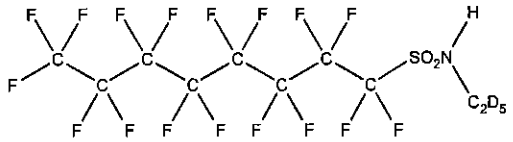
CERTIFICATE OF ANALYSIS DOCUMENTATION

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

LOT NUMBER: dNEtFOSA0314M

STRUCTURE:

CAS #: Not available



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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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Certified By: _____ **Date:** 04/01/2015
B.G. Chittim (mm/dd/yyyy)

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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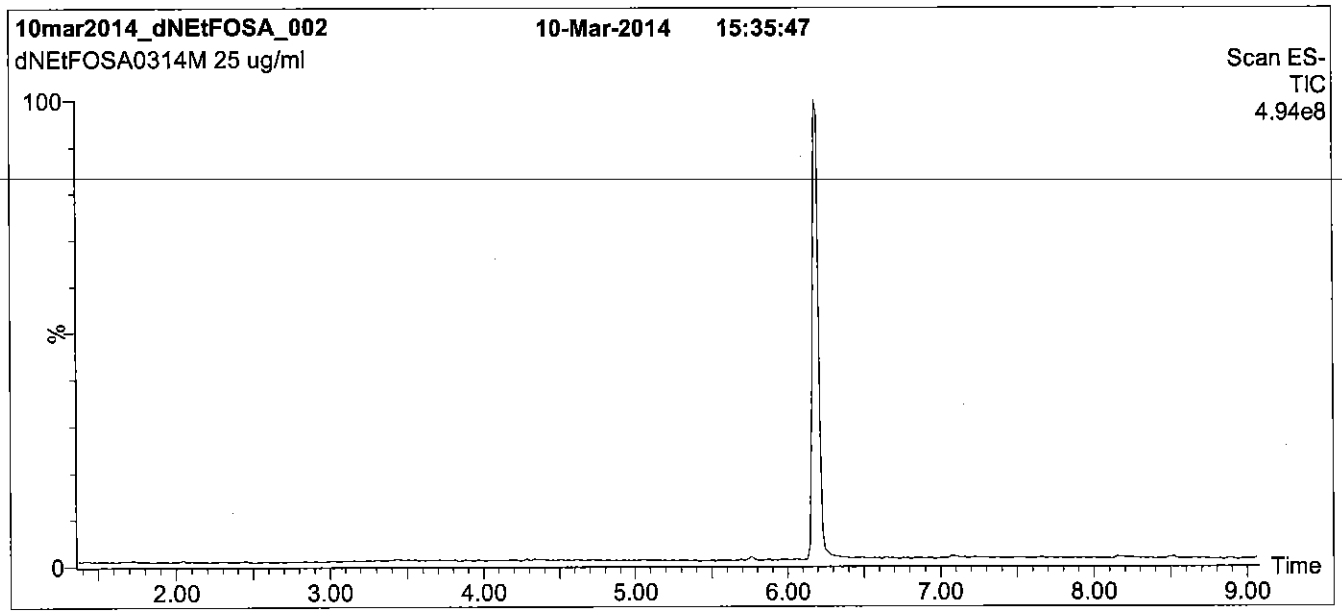

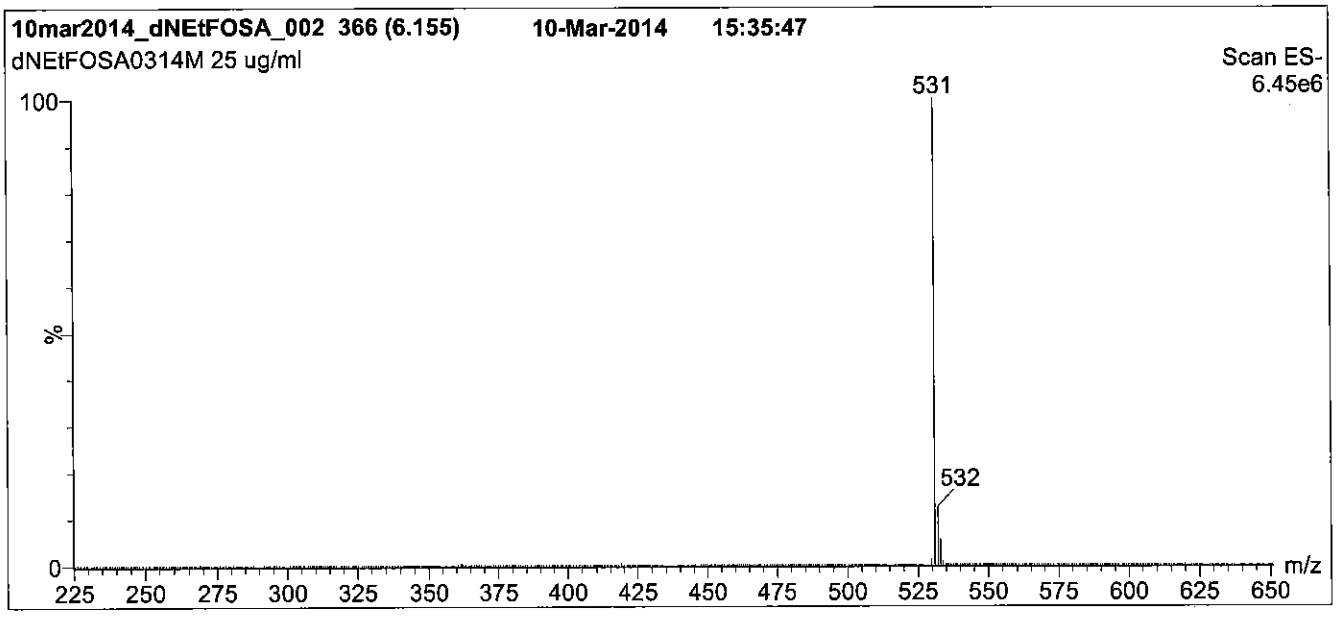

Conditions for Figure 1:

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

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

Mobile phase: Gracient
Start: 40% H_2O / 60% (80:20 MeOH:ACN)
(both with 10mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

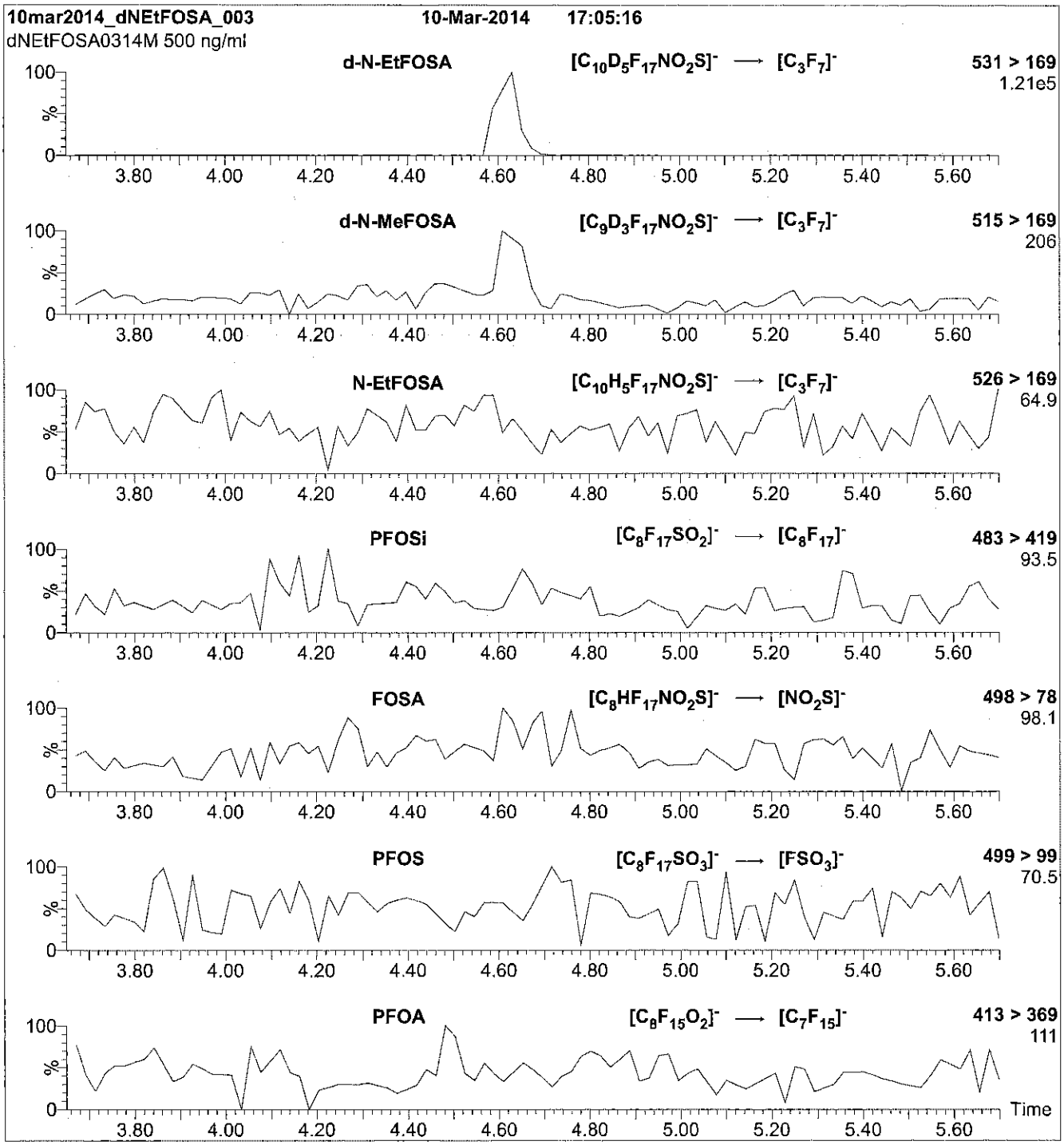
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 950 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCd-NEtFOSA-M_00002

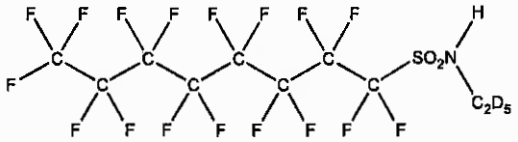
R = 7/6/16 CBW

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

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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



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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 04/01/2015 (mm/dd/yyyy)

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

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UNCERTAINTY:

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

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

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

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

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

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EXPIRY DATE / PERIOD OF VALIDITY:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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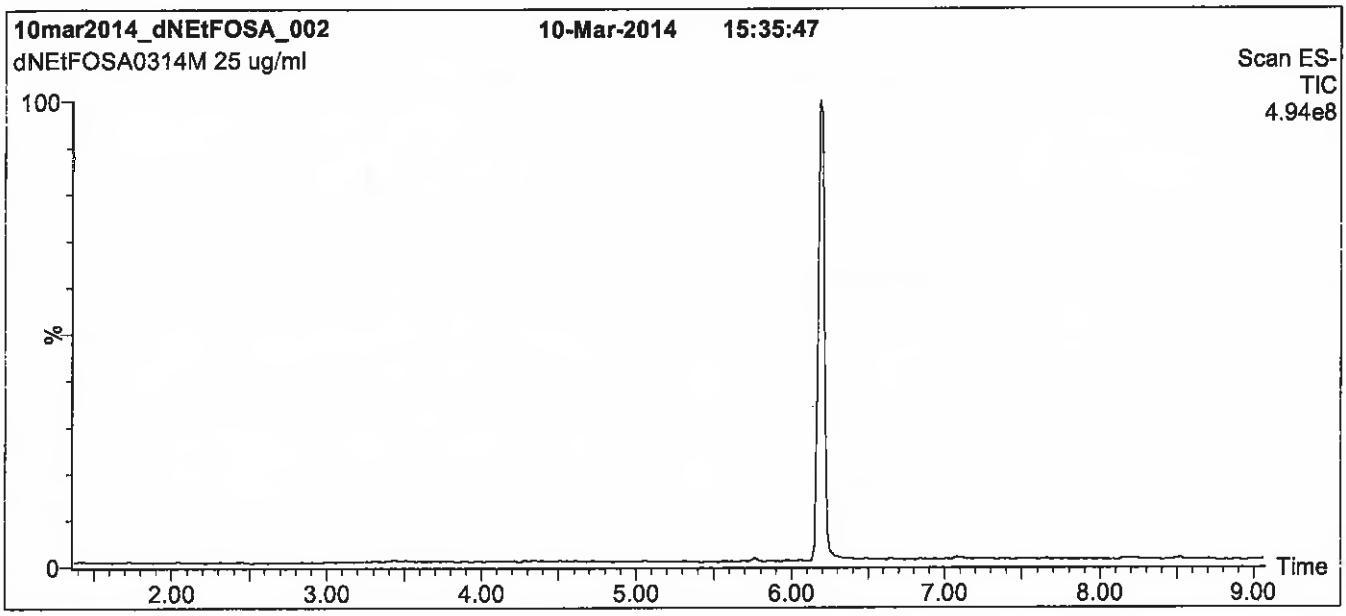
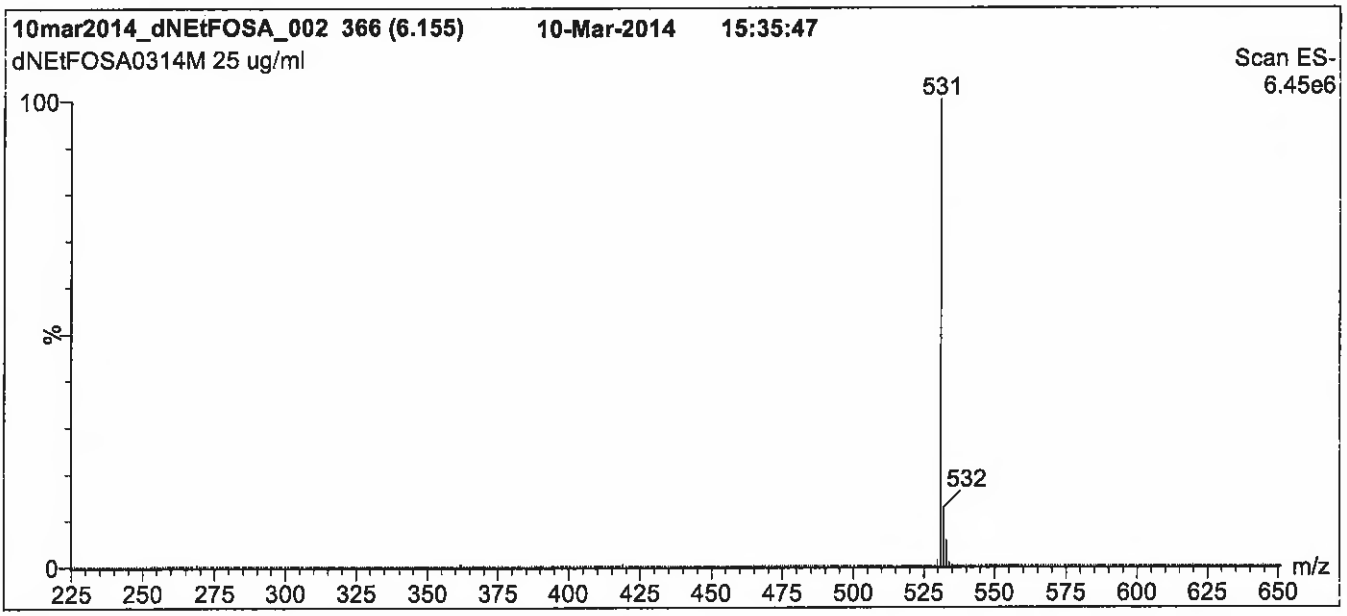
Figure 1: **d-N-EtFOSA-M; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gracient
Start: 40% H_2O / 60% (80:20 MeOH:ACN)
(both with 10mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

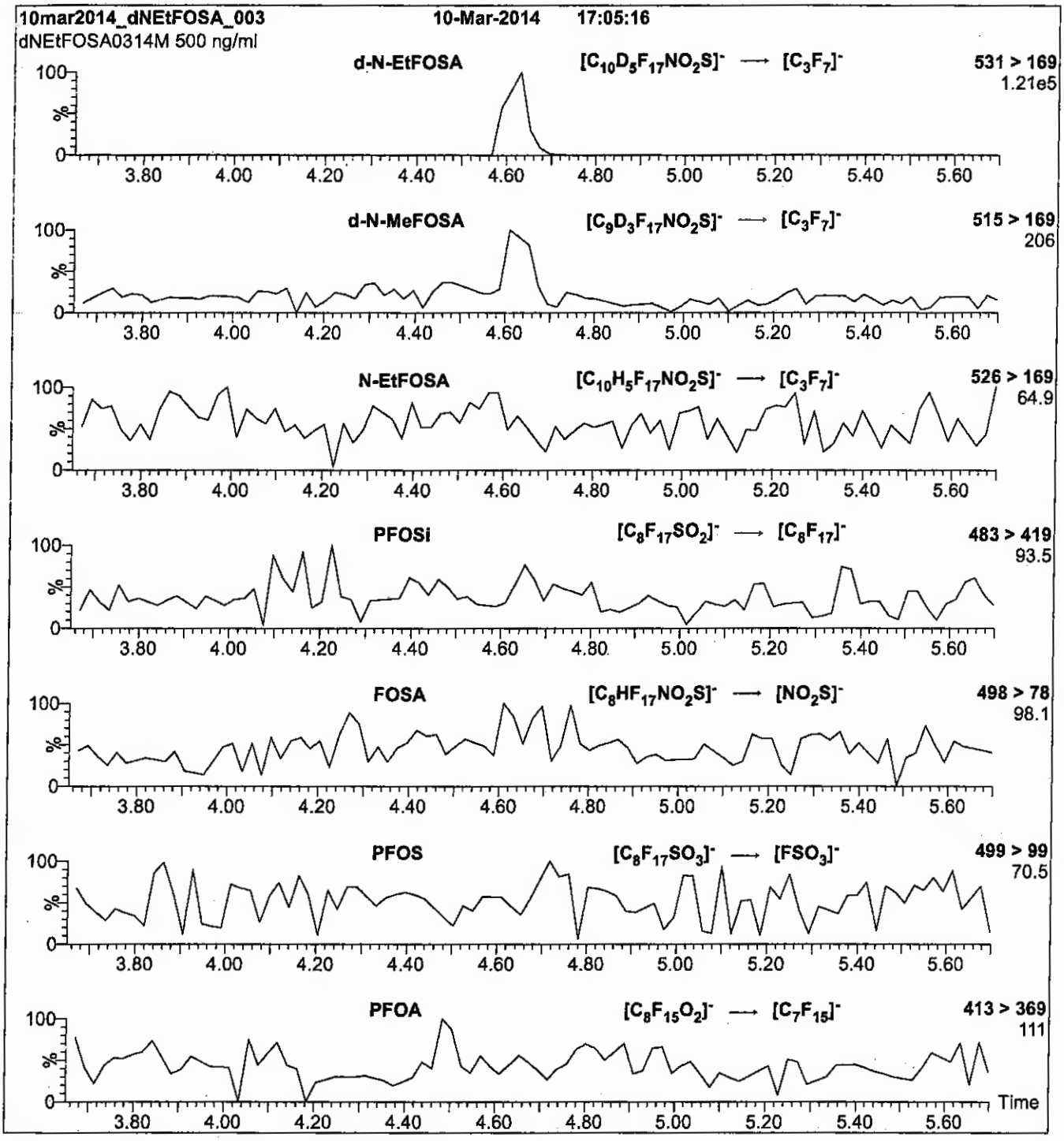
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 950 amu)

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

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



Conditions for Figure 2:

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

MS Parameters

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

Reagent

LCd-NMeFOSA-M_00001

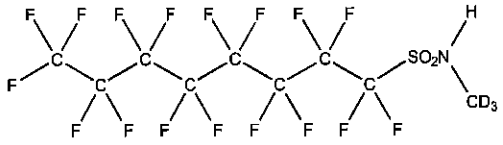
R: 7/16/15 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

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

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA:	$C_9D_3HF_{17}NO_2S$	**MOLECULAR WEIGHT:**	516.19
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥98% $^2H_3$
LAST TESTED: (mm/dd/yyyy)	01/28/2014		
EXPIRY DATE: (mm/dd/yyyy)	01/28/2019		
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.

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Certified By: _____ **Date:** 04/01/2015 (mm/dd/yyyy)
B.G. Chittim

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

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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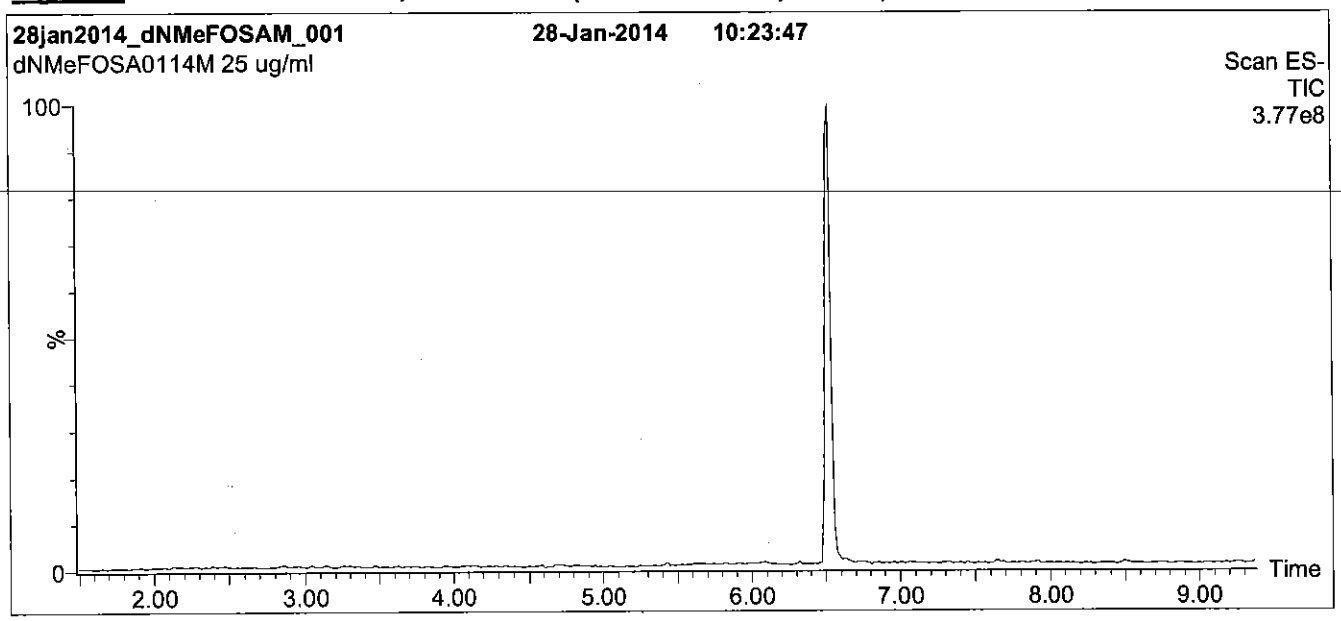
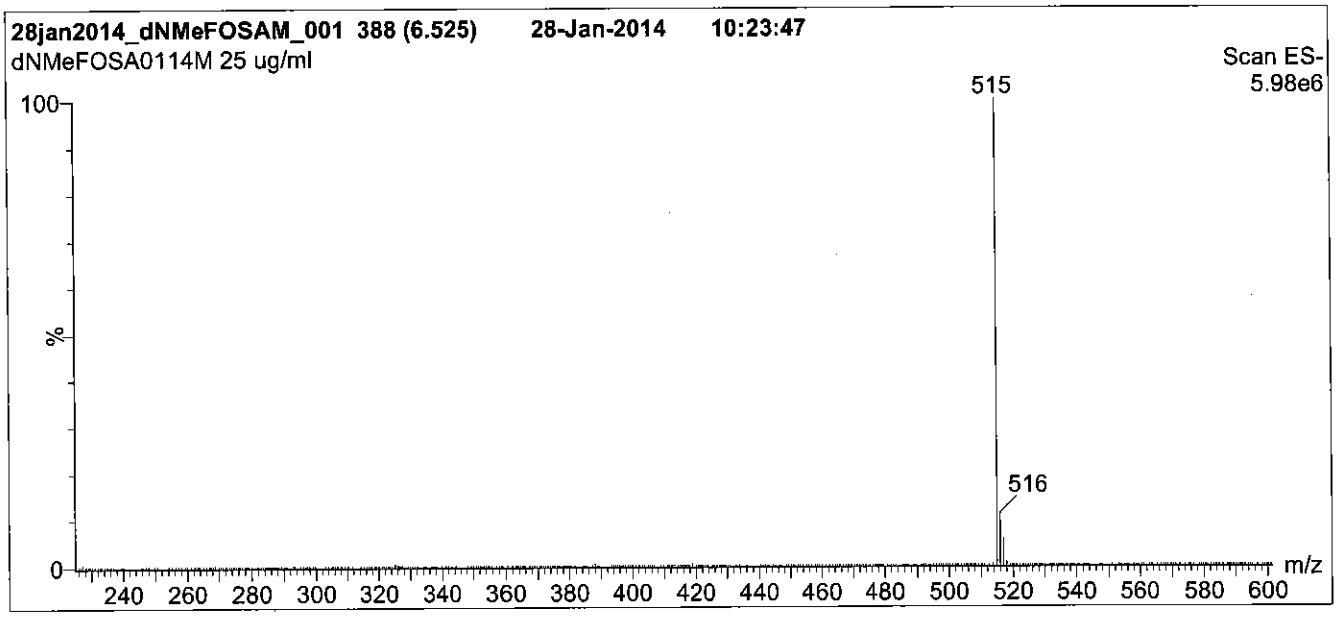
Figure 1: **d-N-MeFOSA-M; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

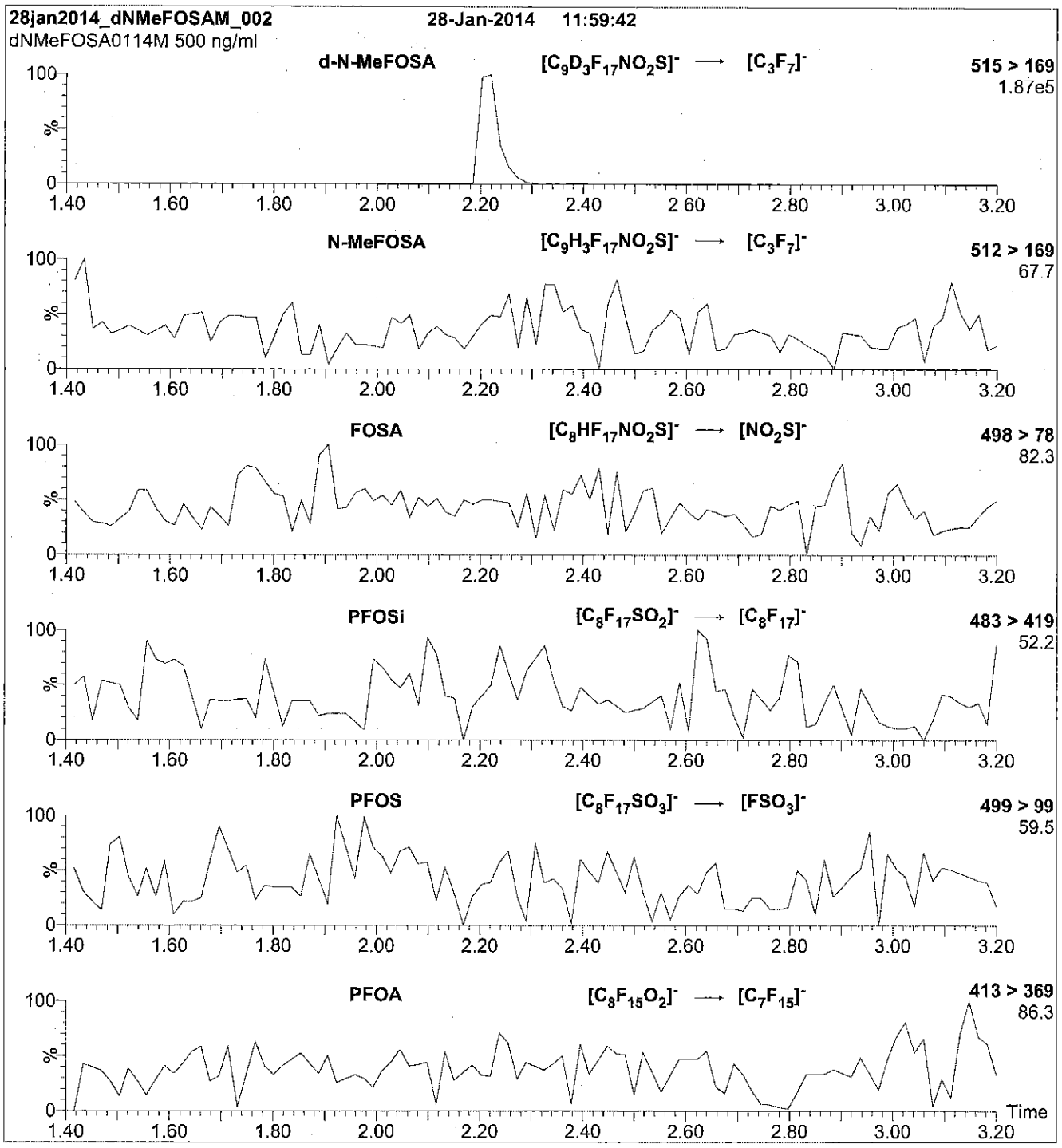
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCd-NMeFOSA-M_00002

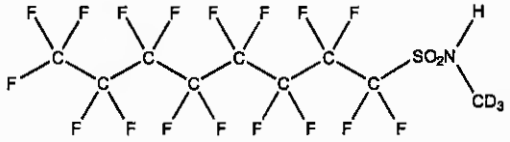
R: 7/6/16 CBW

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

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	d-N-MeFOSA-M	**LOT NUMBER:**	dNMeFOSA0616M
COMPOUND:	N-methyl-d_3-perfluoro-1-octanesulfonamide		
STRUCTURE:		**CAS #:**	Not available



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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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Certified By: B.G. Chittim **Date:** 06/16/2016 (mm/dd/yyyy)

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CALA

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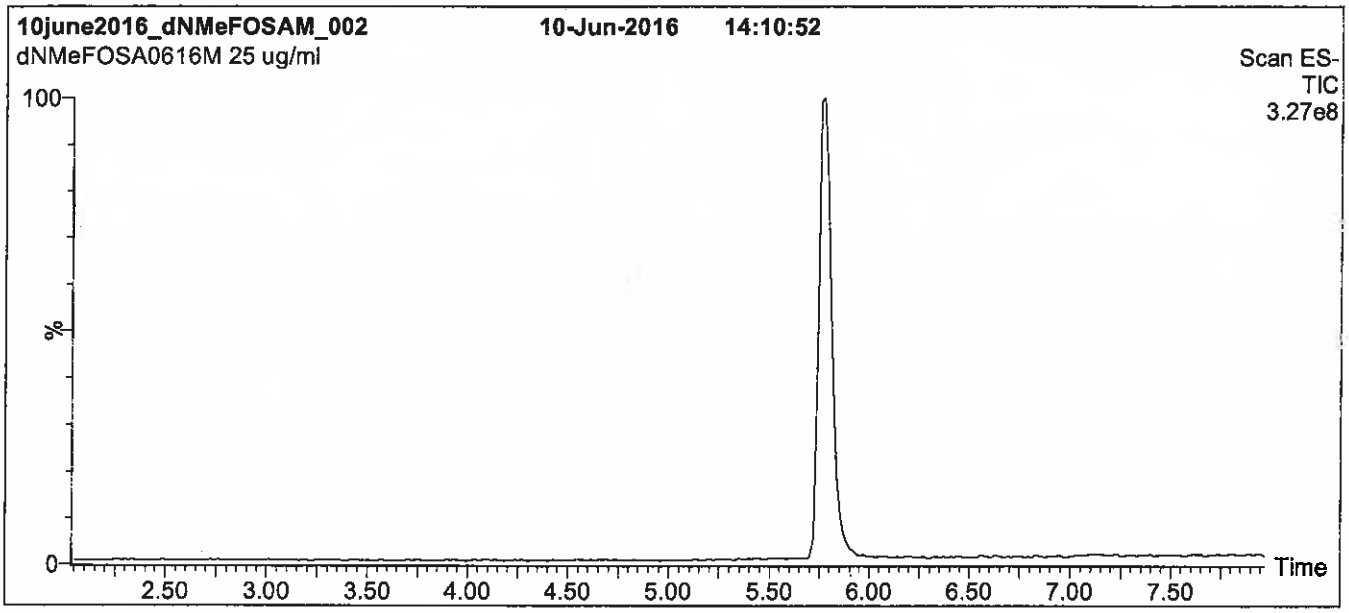

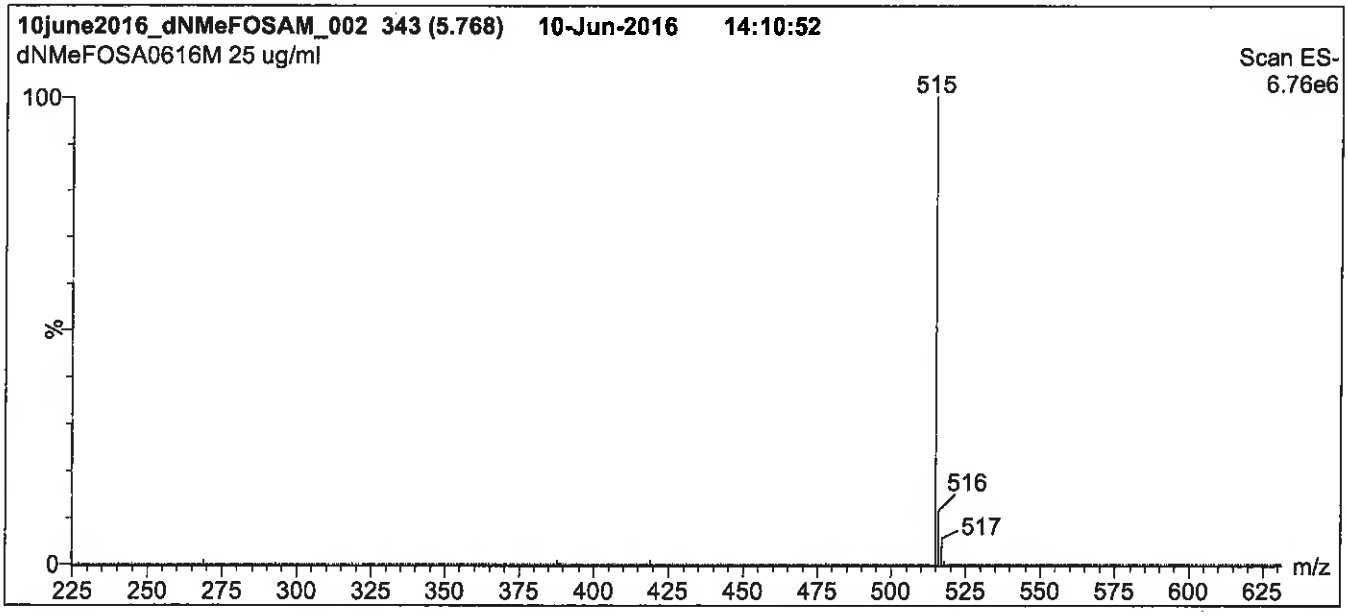

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MS: **Micromass Quattro *micro* API MS**

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

Mobile phase: Gradient
Start: 40% H_2O / 60% (80:20 MeOH:ACN)
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Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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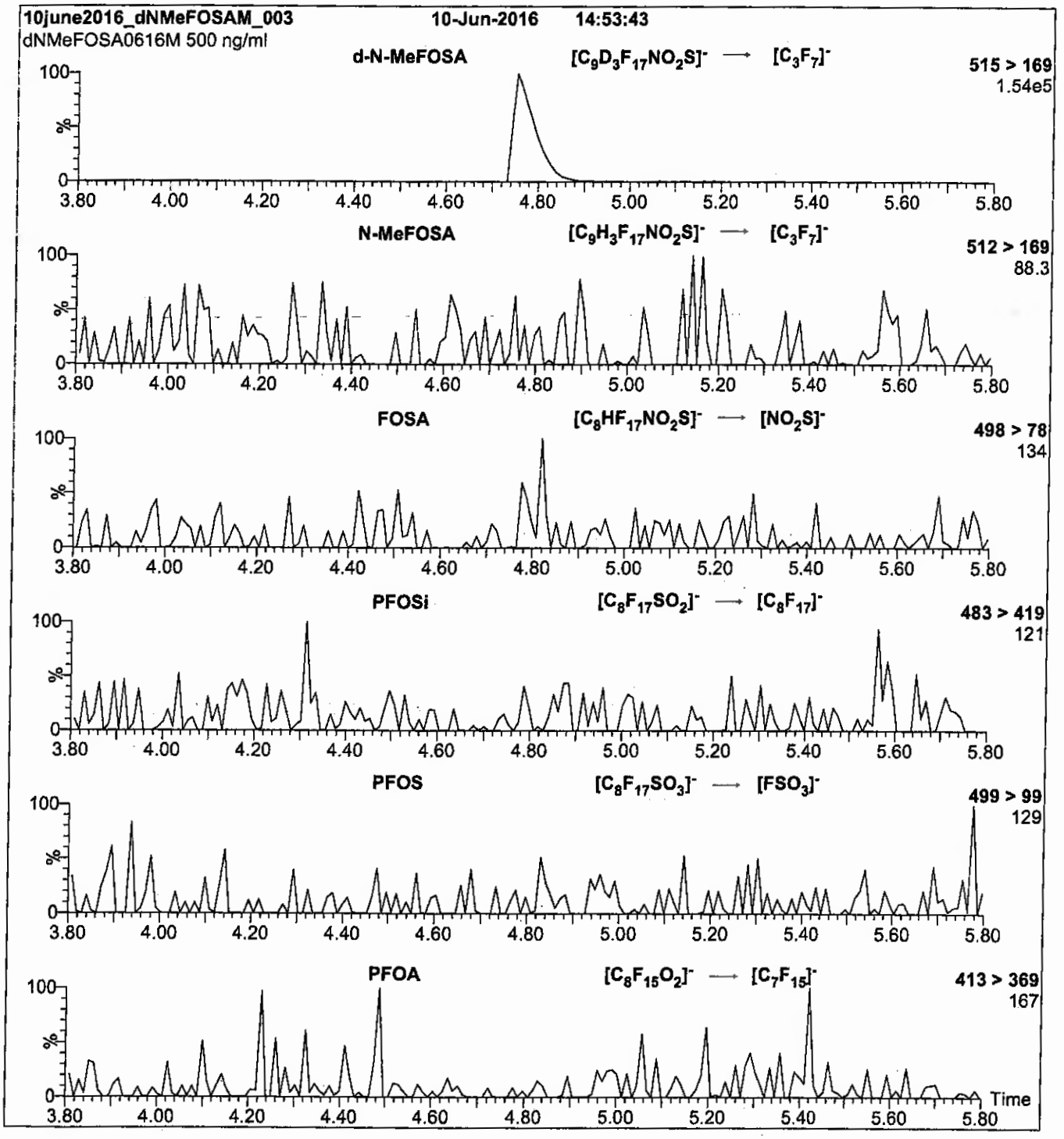
Cone Voltage (V) = 40.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCd3-NMeFOSAA_00001

r: 7/16/15 SKV

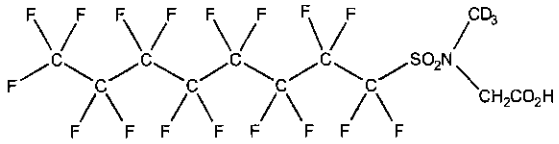
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

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

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

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: $C_{11}D_3H_3F_{17}NO_4S$ **MOLECULAR WEIGHT:** 574.23

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

CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥98% $^2H_3$

LAST TESTED: (mm/dd/yyyy) 01/31/2013

EXPIRY DATE: (mm/dd/yyyy) 01/31/2018

RECOMMENDED STORAGE: Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 04/06/2015 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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

CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17025 REFERENCE MATERIAL PRODUCER

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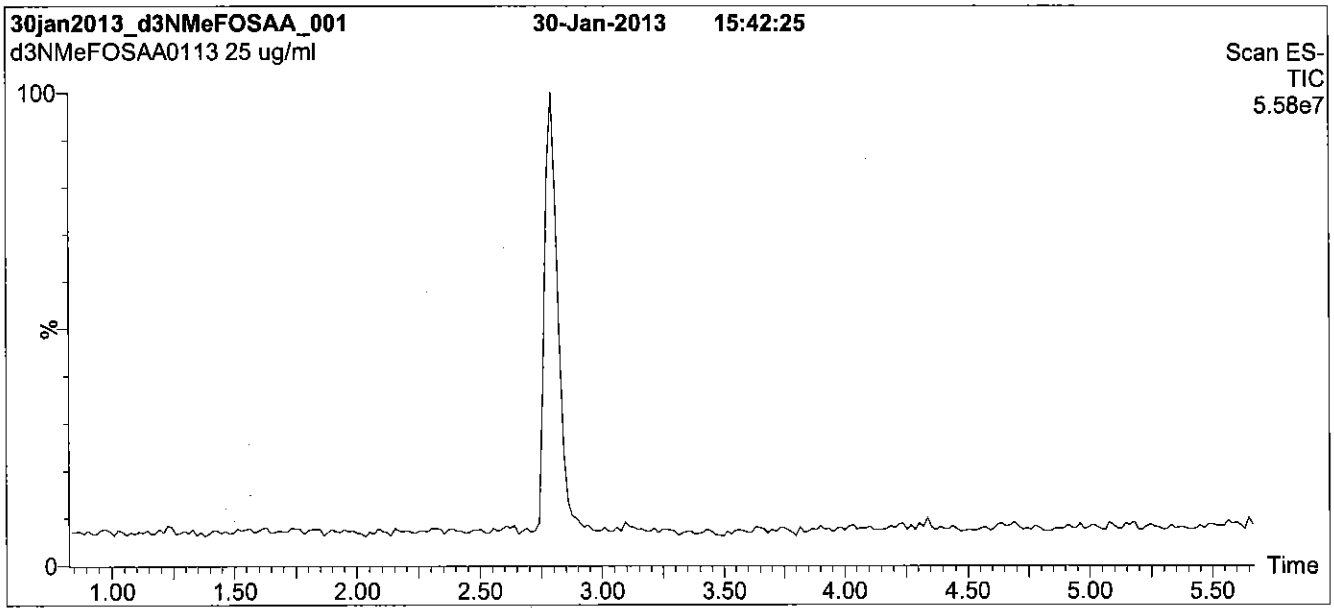
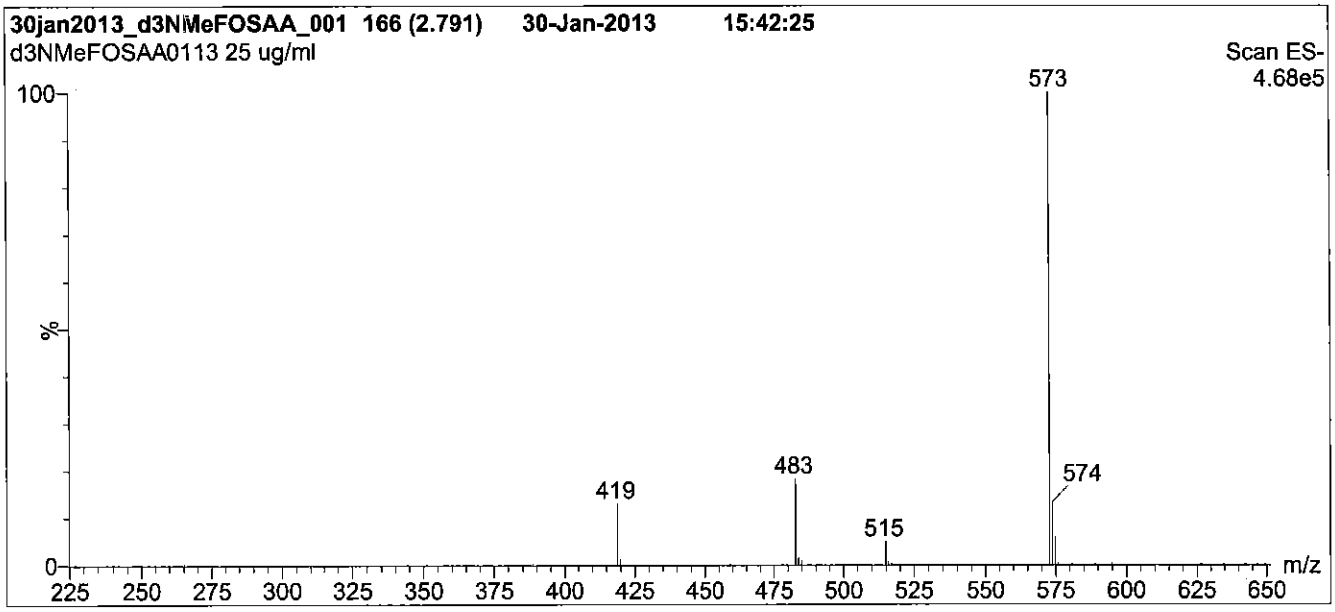
Figure 1: **d3-N-MeFOSAA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

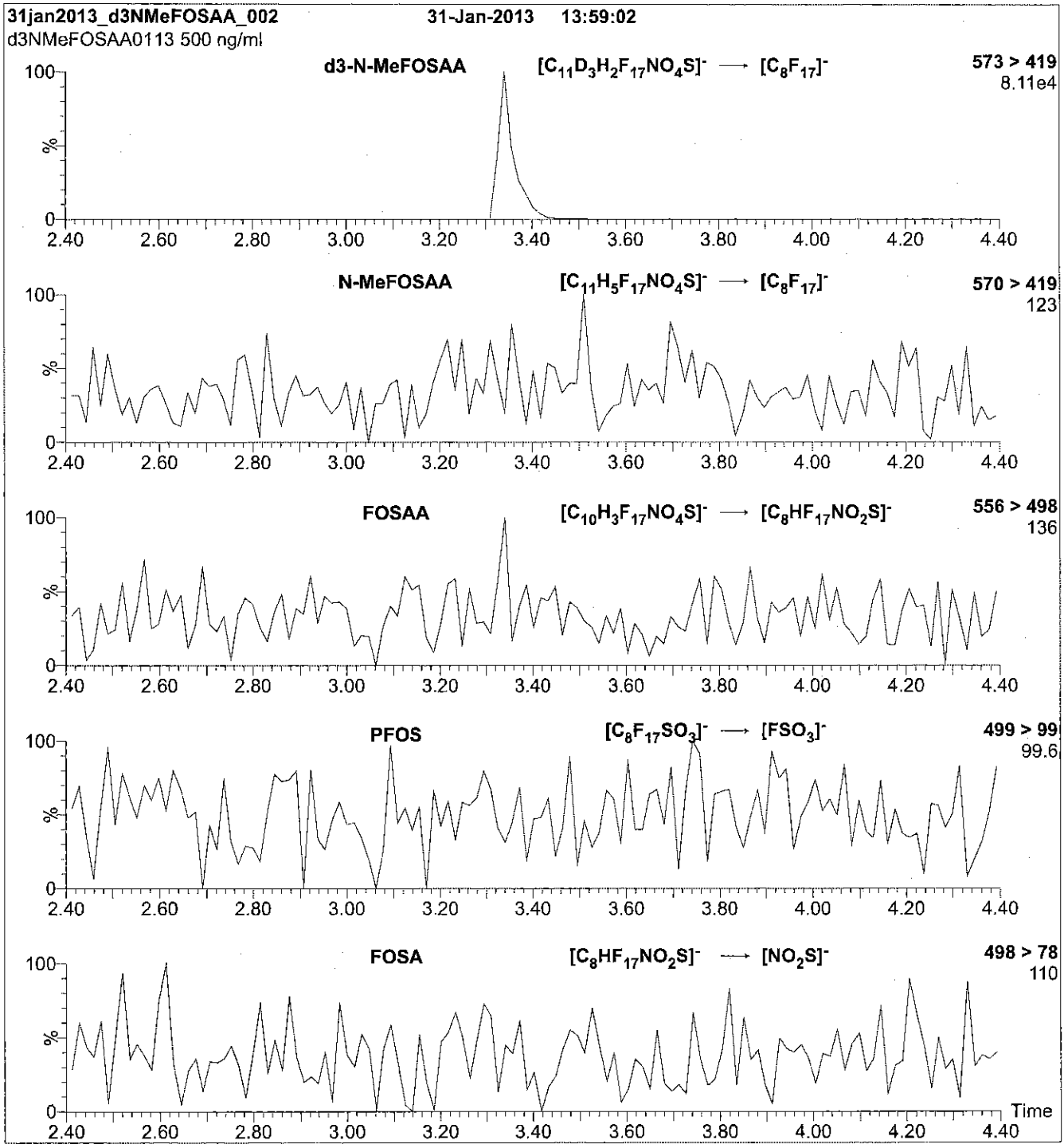
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCd3-NMeFOSAA_00002

R: 7/6/16 CBW

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

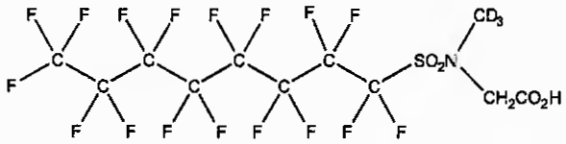
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

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

STRUCTURE: **CAS #:** Not available



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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

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:

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EXPIRY DATE / PERIOD OF VALIDITY:

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QUALITY MANAGEMENT:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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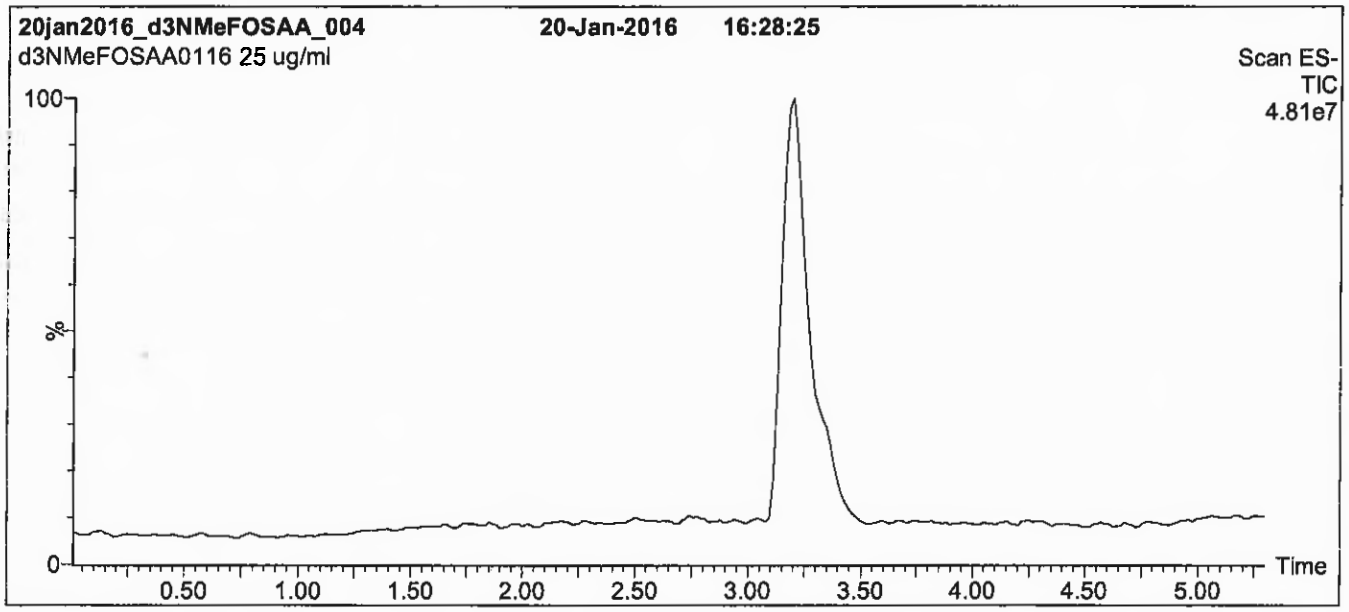
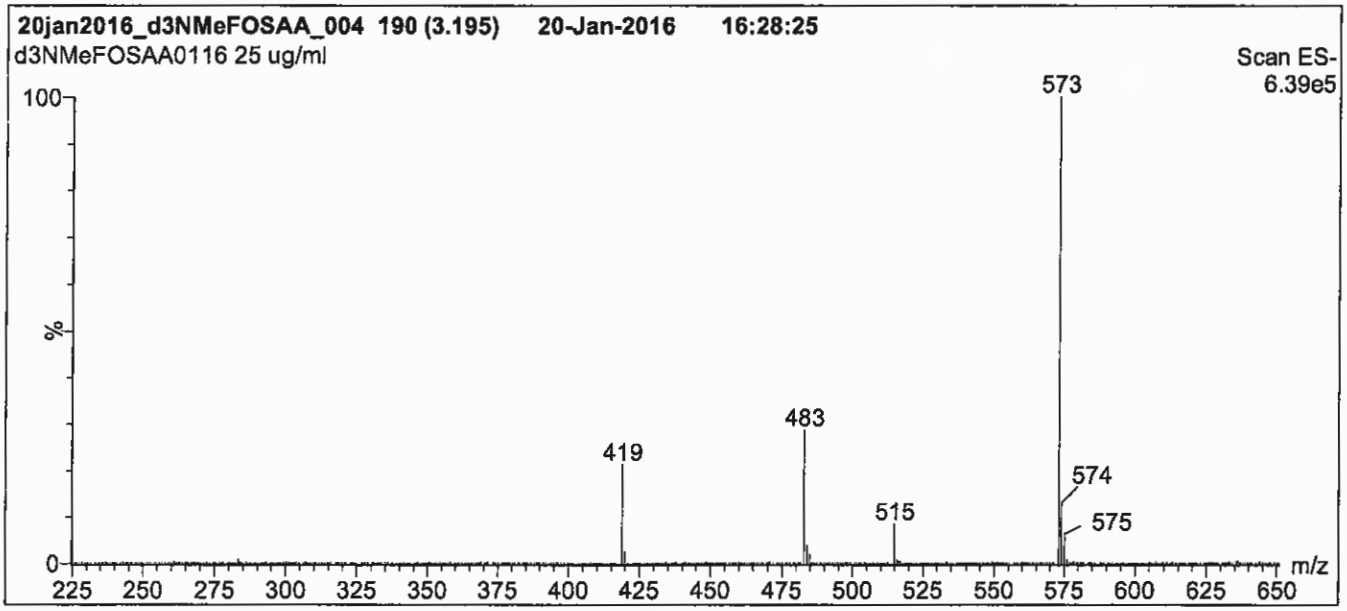
Figure 1: **d3-N-MeFOSAA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

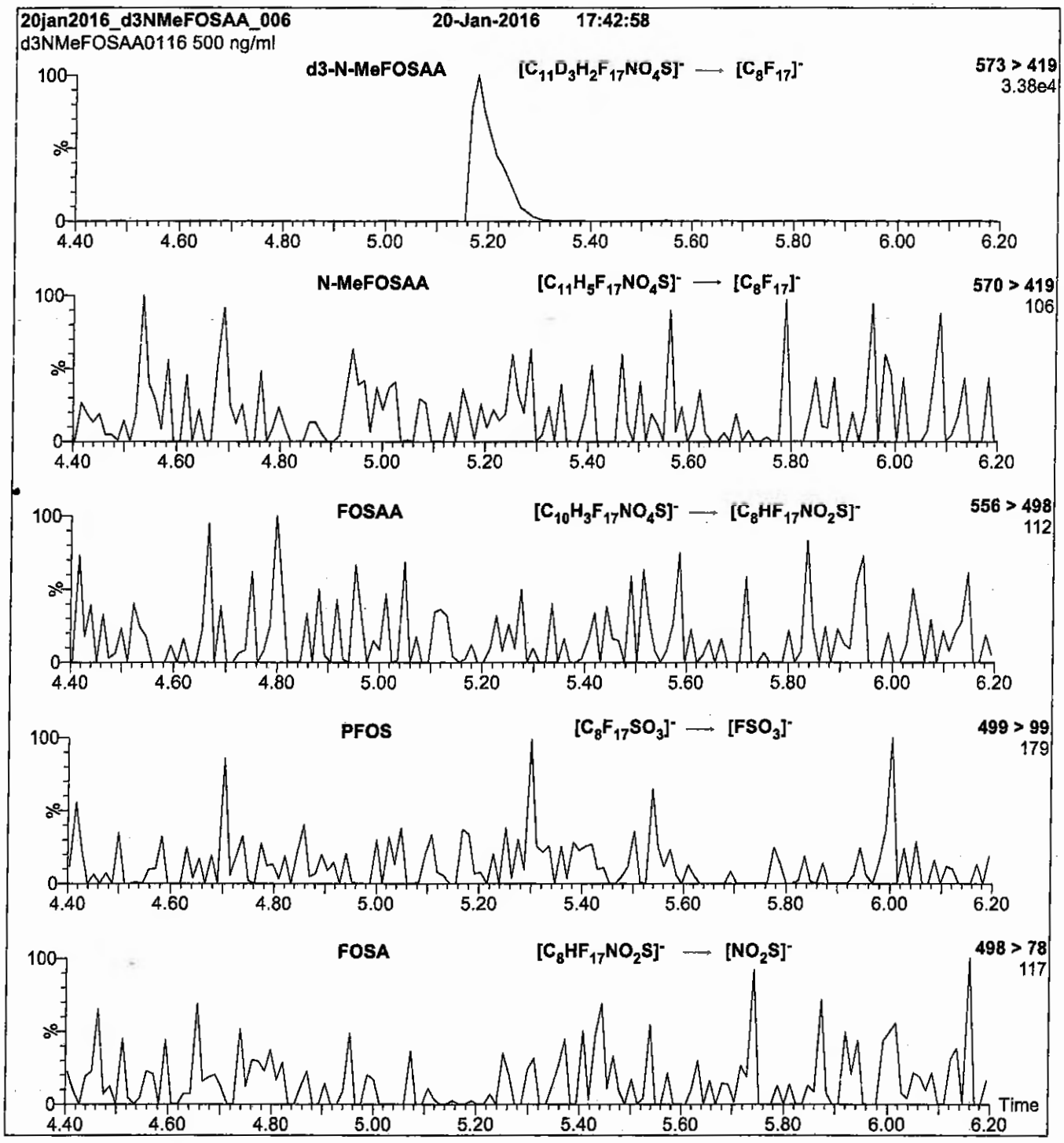
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCd5-NEtFOSAA_00001

P: 7/10/15 SW

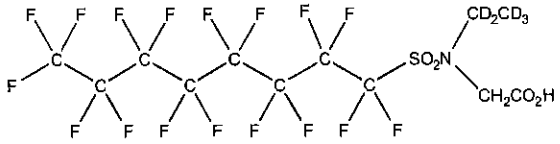
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

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

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: $C_{12}D_5H_3F_{17}NO_4S$ **MOLECULAR WEIGHT:** 590.27

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

CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥98% $^2H_5$

LAST TESTED: (mm/dd/yyyy) 05/08/2015

EXPIRY DATE: (mm/dd/yyyy) 05/08/2020

RECOMMENDED STORAGE: Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

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Certified By: B.G. Chittim **Date:** 05/11/2015 (mm/dd/yyyy)

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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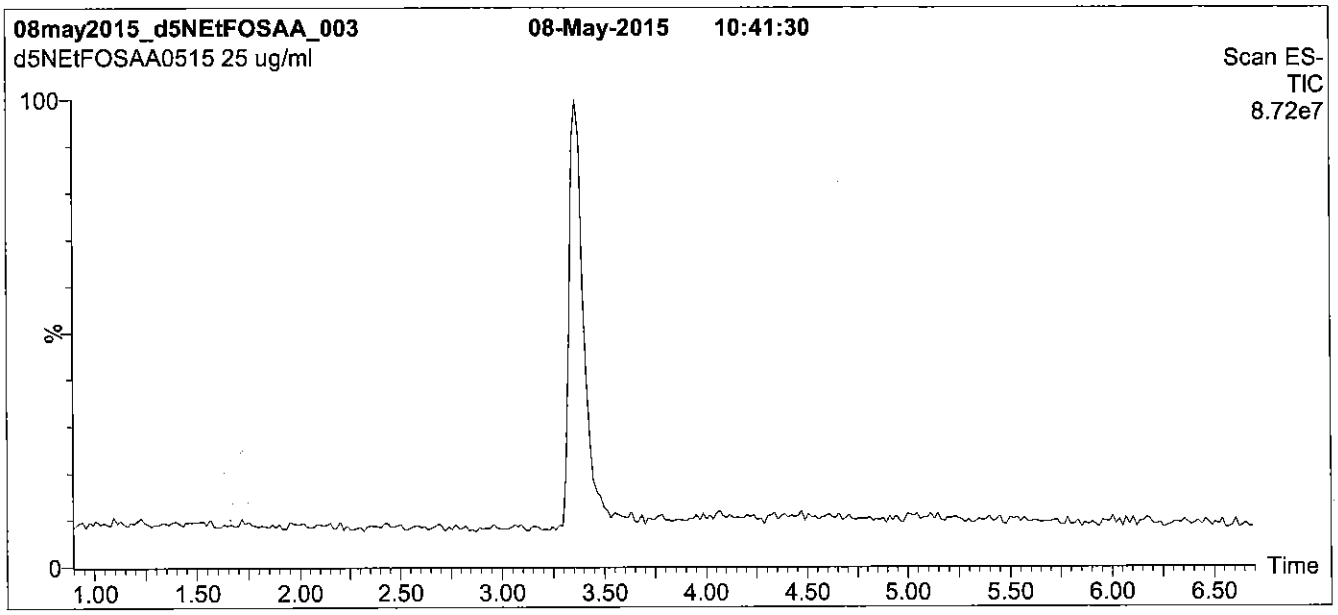
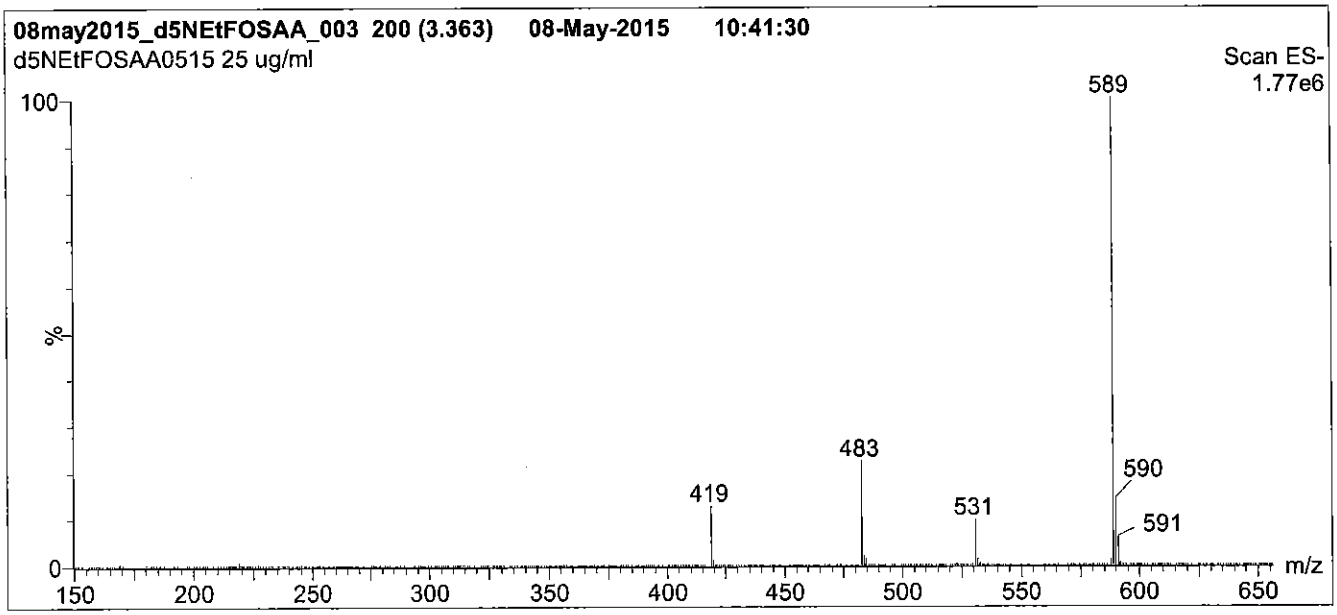
Figure 1: **d5-N-EtFOSAA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

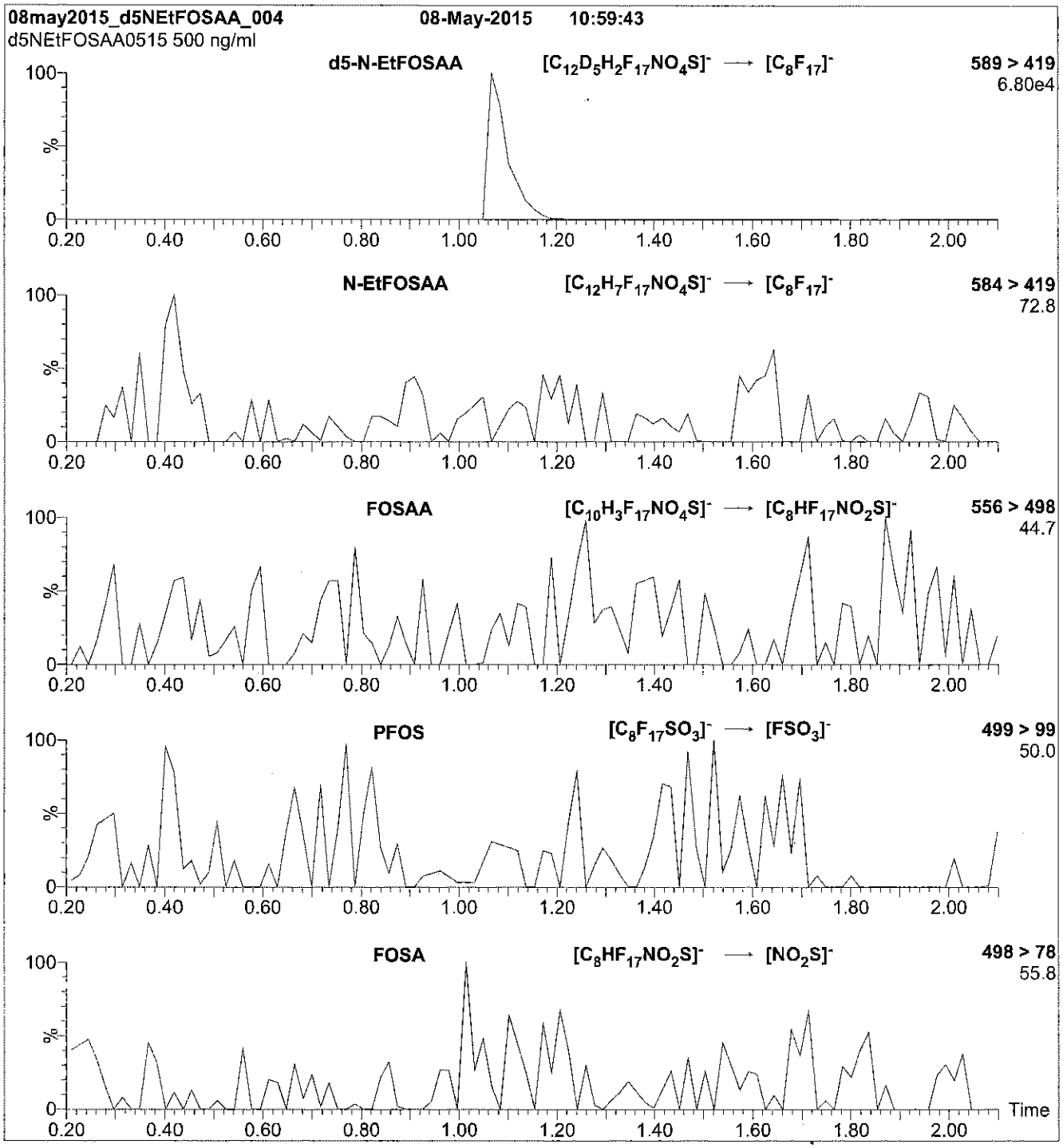
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml d5-N-EtFOSAA)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

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

Reagent

LCd5-NEtFOSAA_00002

R: 7/6/16 CBW

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

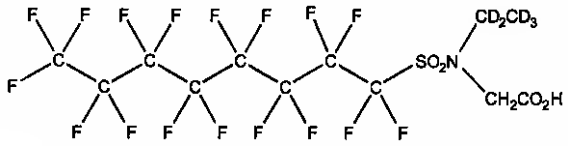
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

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

STRUCTURE: **CAS #:** Not available



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

DOCUMENTATION/ DATA ATTACHED:

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

- See page 2 for further details.
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Certified By: B.G. Chittim **Date:** 12/07/2015 (mm/dd/yyyy)

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

INTENDED USE:

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HAZARDS:

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UNCERTAINTY:

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

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

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

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

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

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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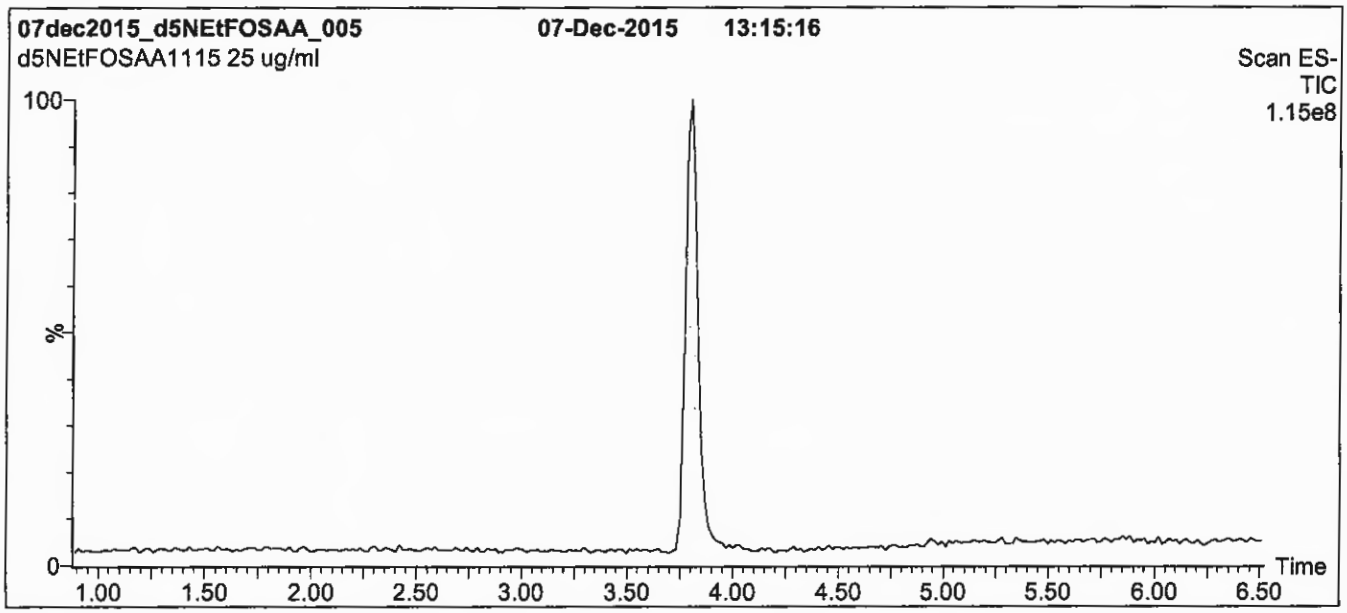
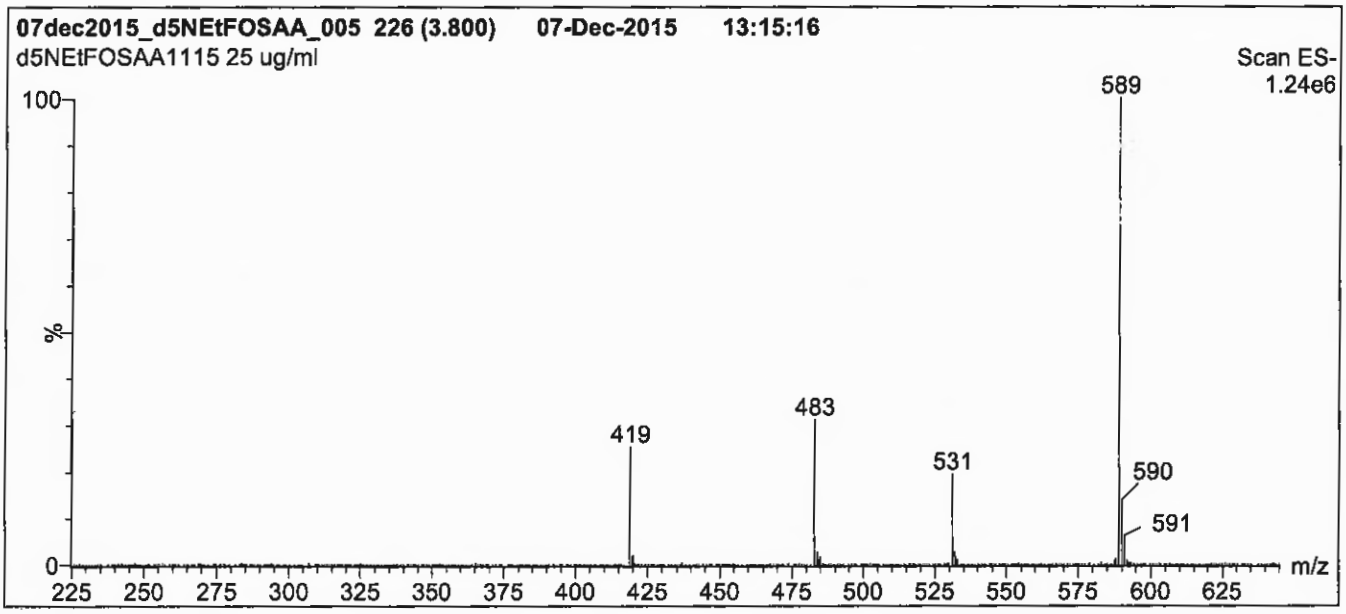
Figure 1: **d5-N-EtFOSAA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

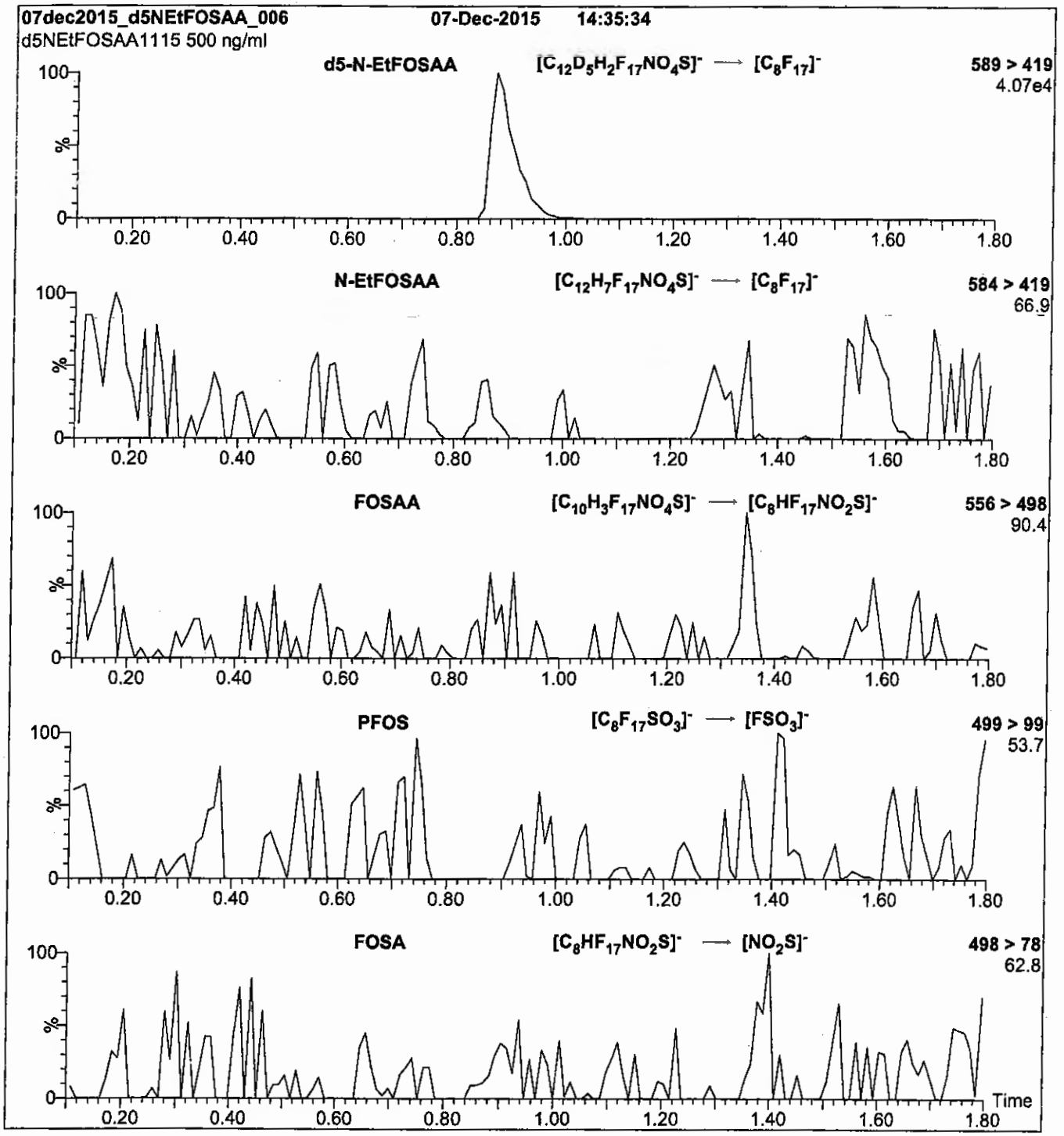
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCM2-6:FTS_00001

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

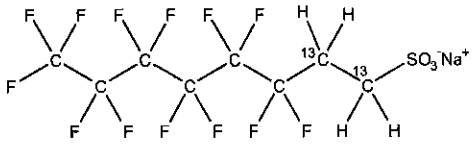
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

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

STRUCTURE: **CAS #:** Not available



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

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
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 ^{34}S (due to natural isotopic abundance) therefore both native 6:2FTS and M2-6:2FTS will produce signals in the m/z 429 to m/z 409 channel during SRM analysis. We recommend using the m/z 429 to m/z 81 transition to monitor for M2-6:2FTS during quantitative analysis as it will be free of any native contribution (see Figure 2).

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Certified By: _____ **Date:** 03/27/2015 (mm/dd/yyyy)
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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17025 REFERENCE MATERIAL PRODUCER

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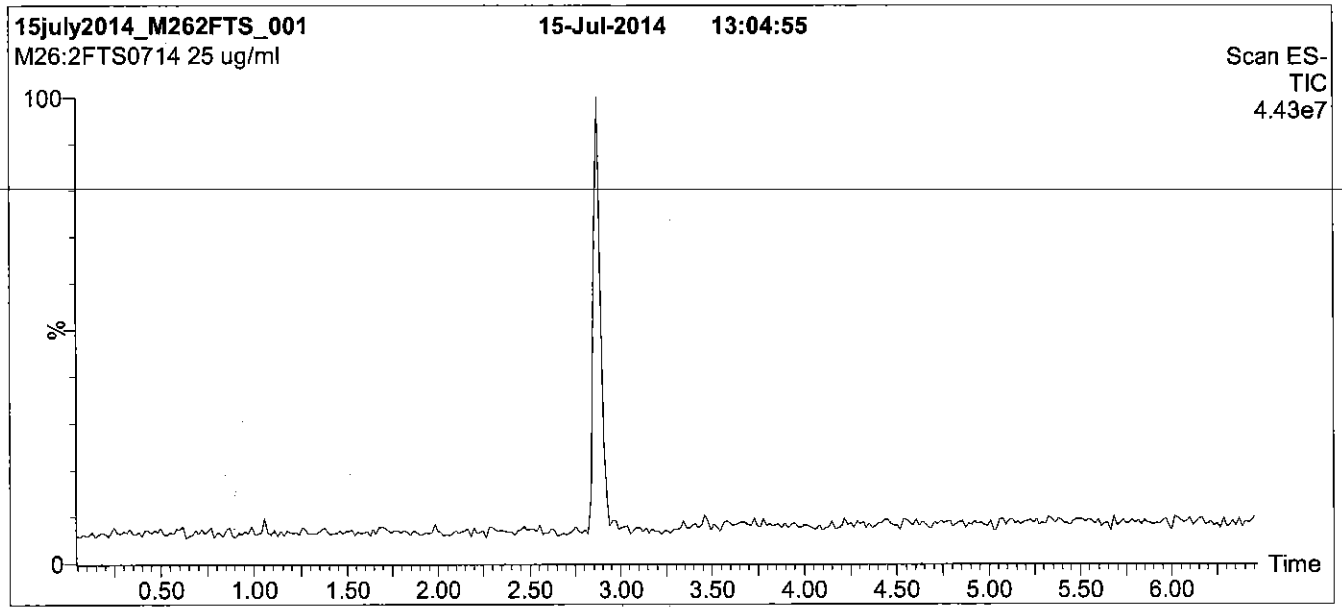

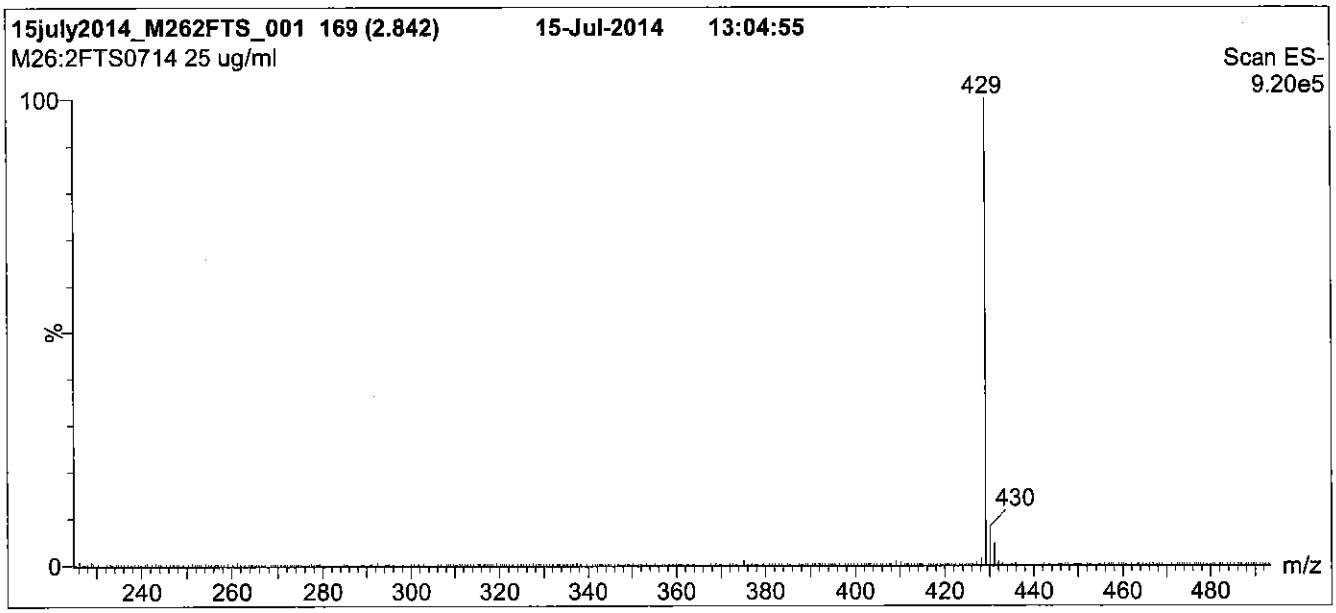

Conditions for Figure 1:

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

Chromatographic Conditions

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

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

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 950 amu)

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

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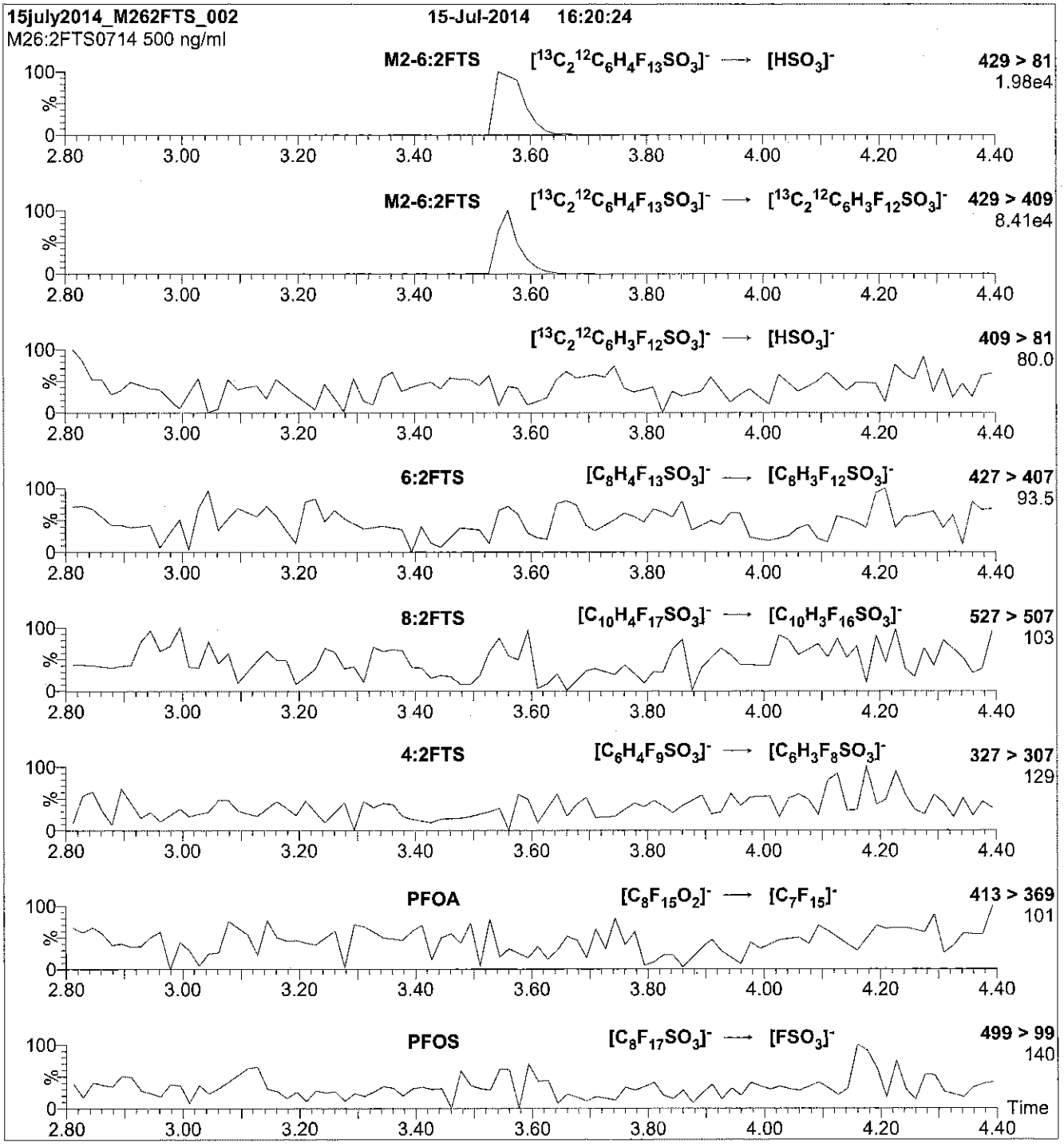


Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCM2-6:FTS_00002

R: 7/6/16 CBW

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

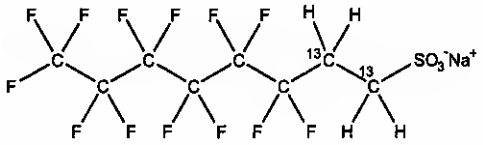
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

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

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_6H_4F_{13}SO_3Na$	**MOLECULAR WEIGHT:**	452.13
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt)	**SOLVENT(S):**	Methanol
	47.5 ± 2.4 µg/ml (M2-6:2FTS anion)		
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	01/08/2016		
EXPIRY DATE: (mm/dd/yyyy)	01/08/2021		
RECOMMENDED STORAGE:	Refrigerate ampoule		

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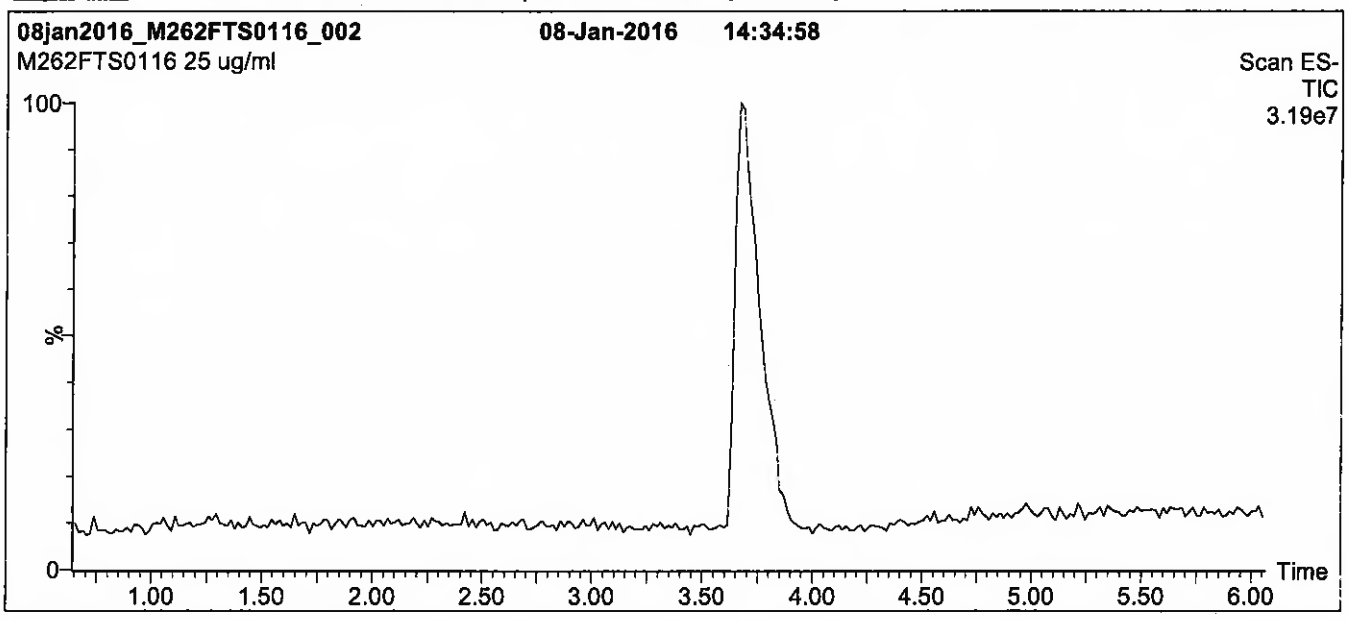

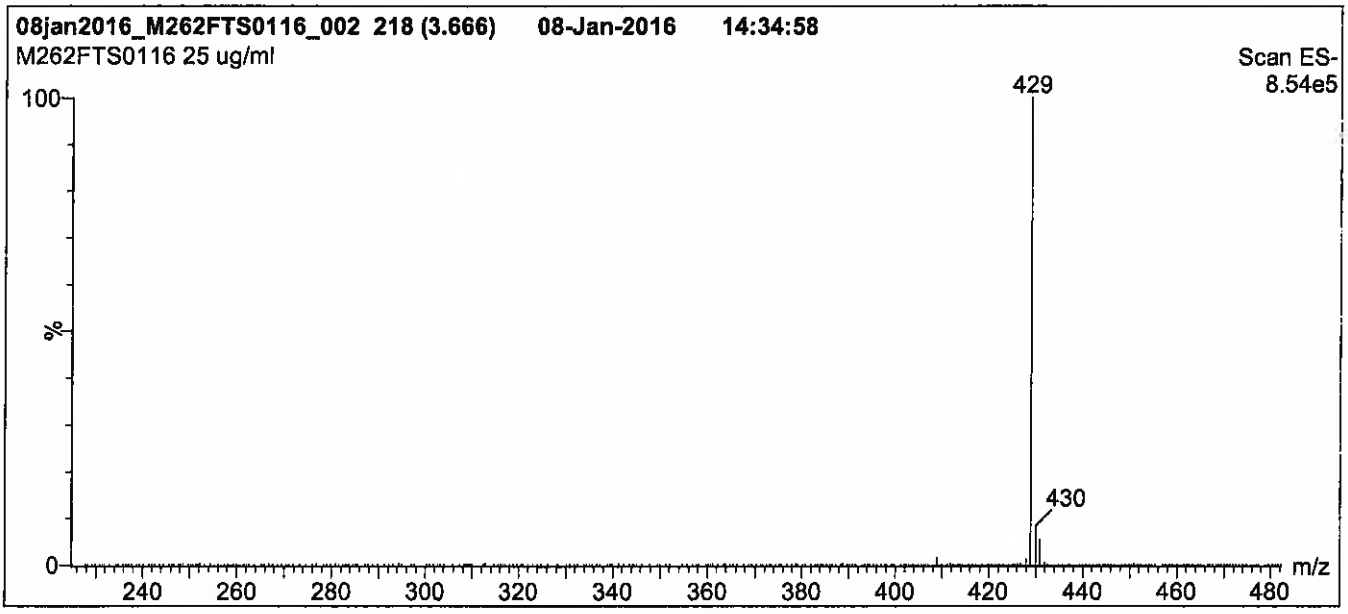

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MS: **Micromass Quattro *micro* API MS**

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1.7 µm, 2.1 x 100 mm

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

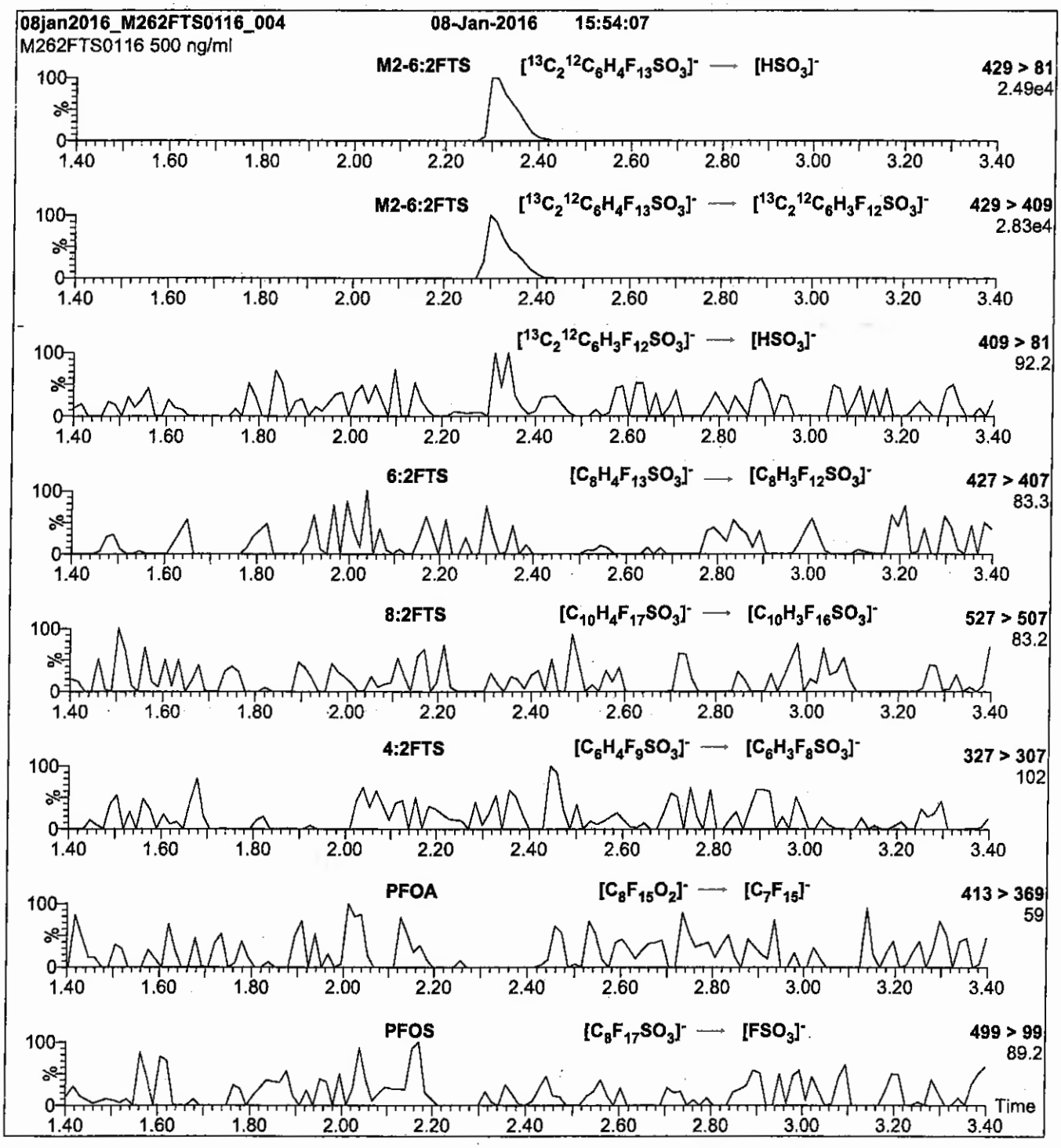
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCM2-8:2FTS_00001

r: 7/16/15 BV
S · 7/22/15 STV

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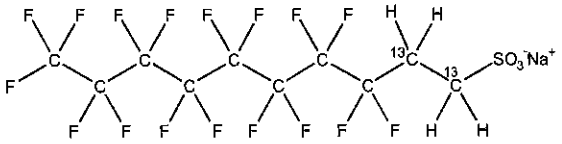
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

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

STRUCTURE: **CAS #:** Not available



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

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

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

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

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17025 REFERENCE MATERIAL PRODUCER

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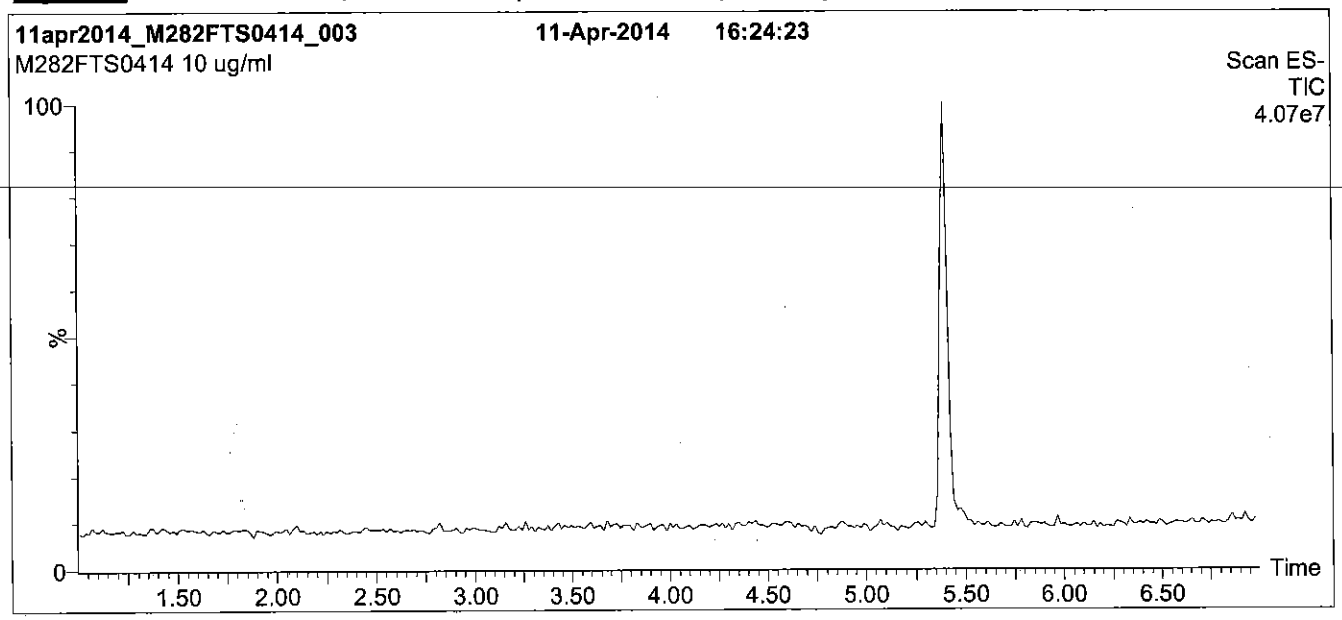
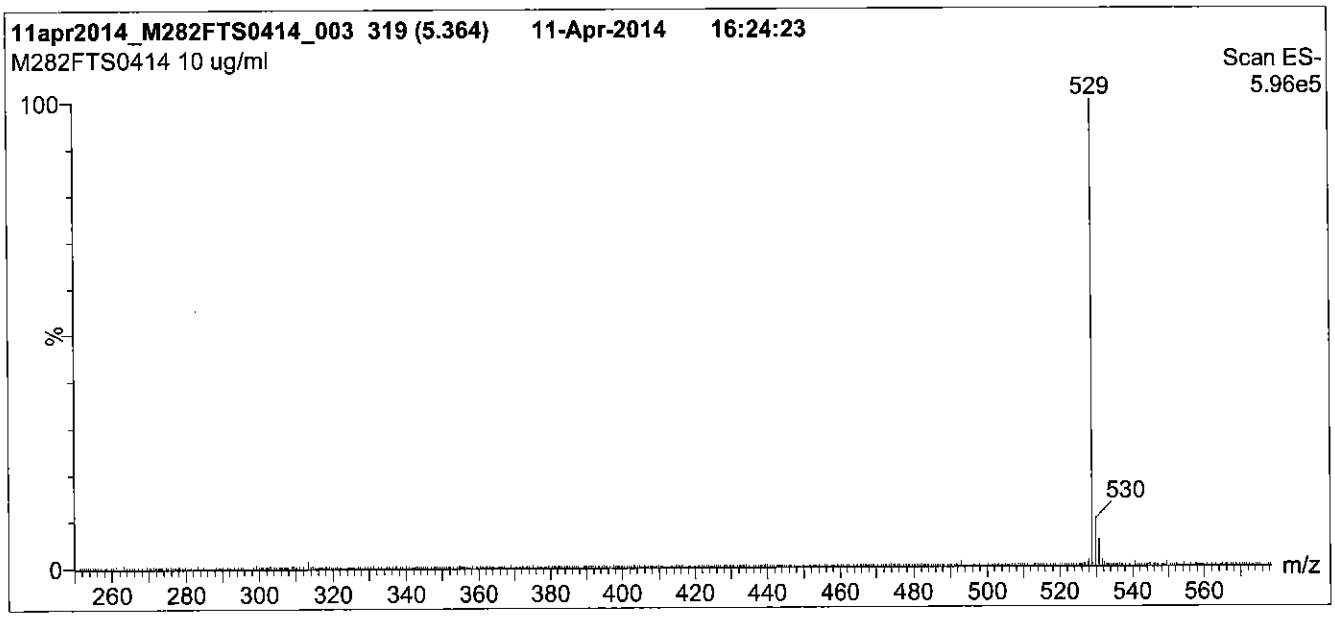
Figure 1: **M2-8:2FTS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

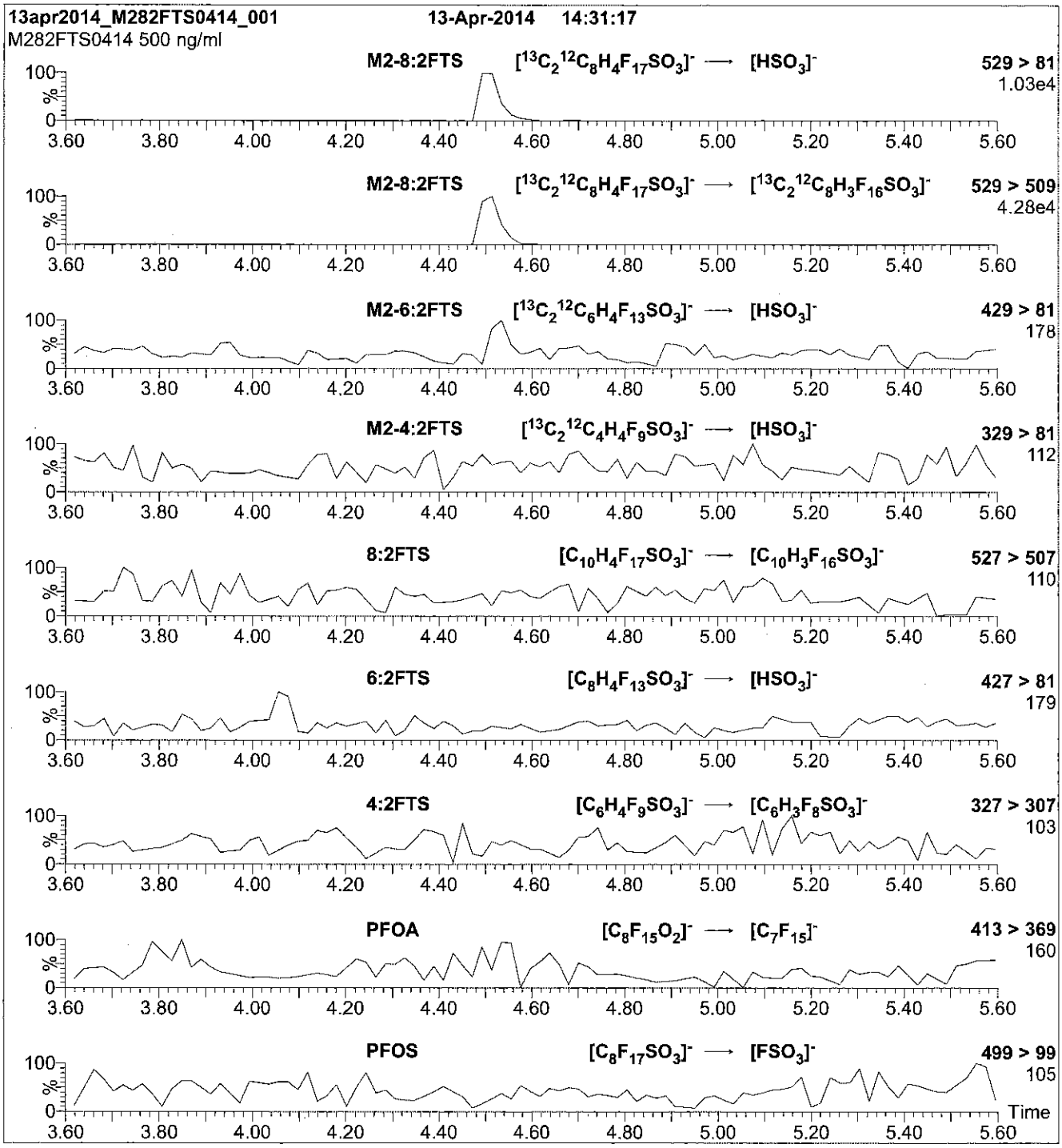
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCM2-8:2FTS_00002

R: 7/6/16 cdw

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

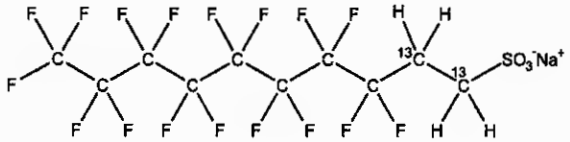
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

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

STRUCTURE: **CAS #:** Not available



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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

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CALA

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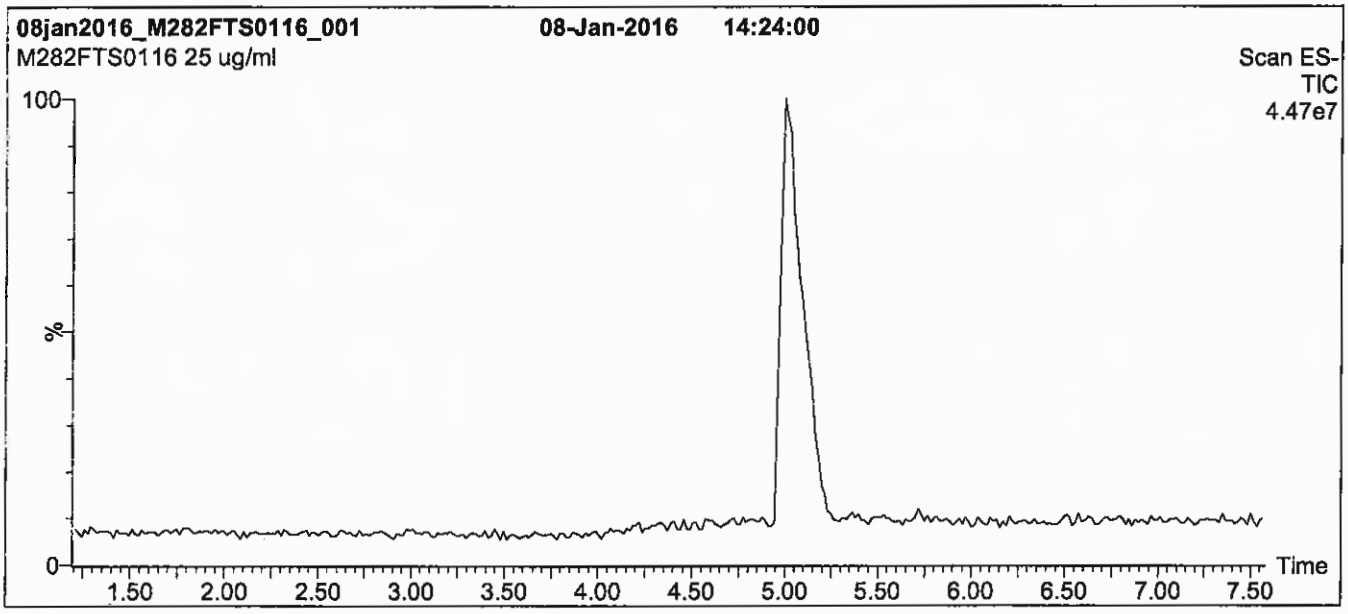
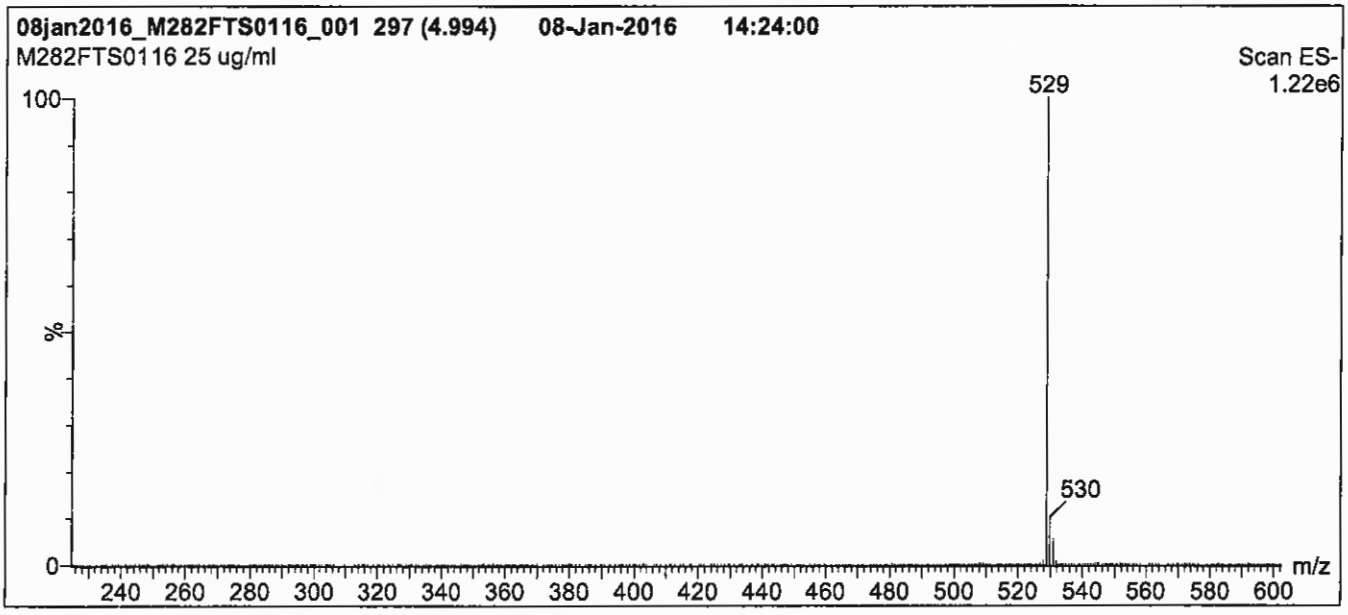




Conditions for Figure 1:

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

Chromatographic Conditions

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

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

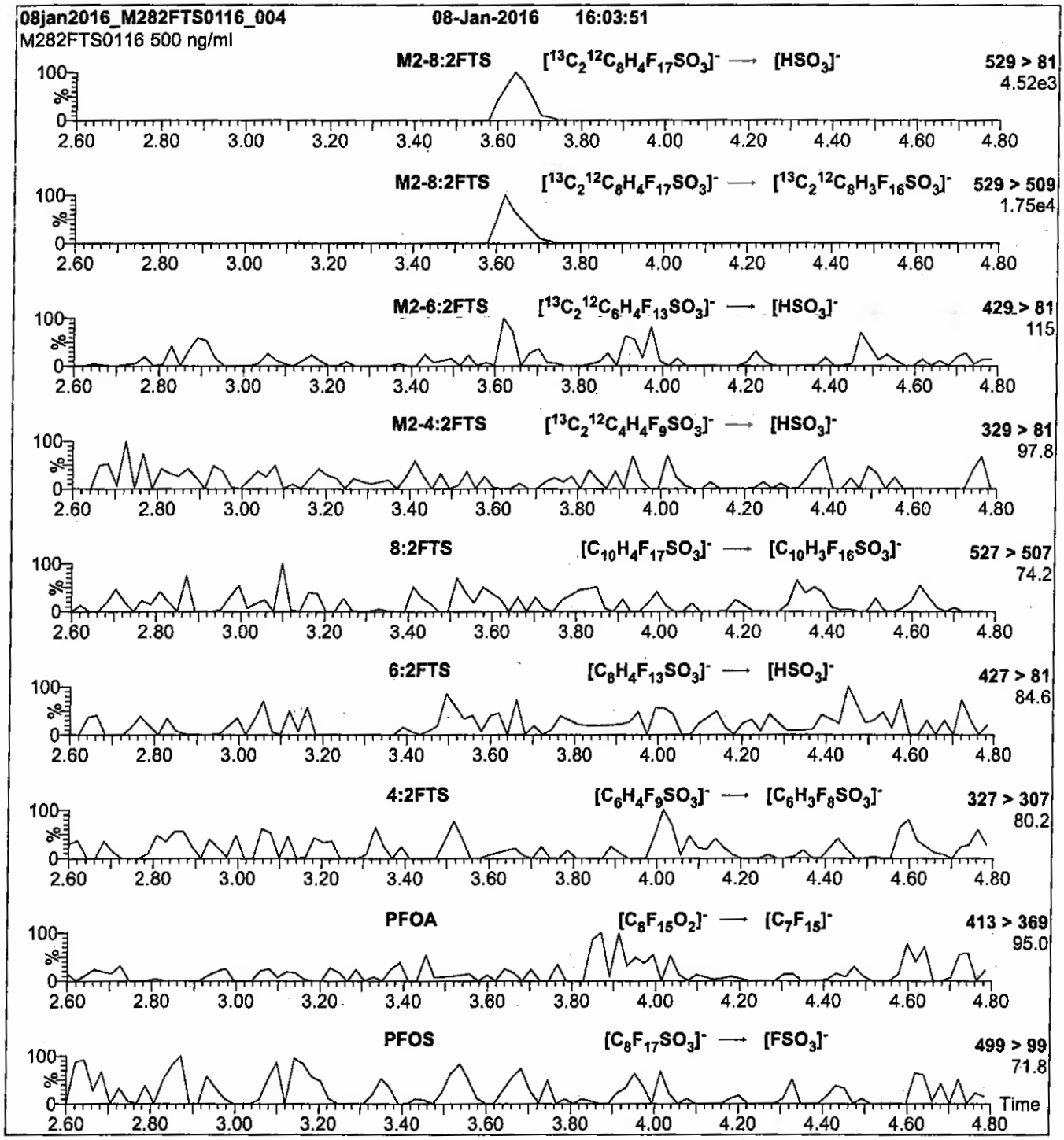
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCM2PFHxDA_00008

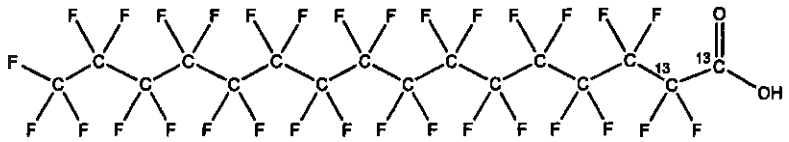
R: SBC 9/22/16

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

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

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



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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **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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CALA

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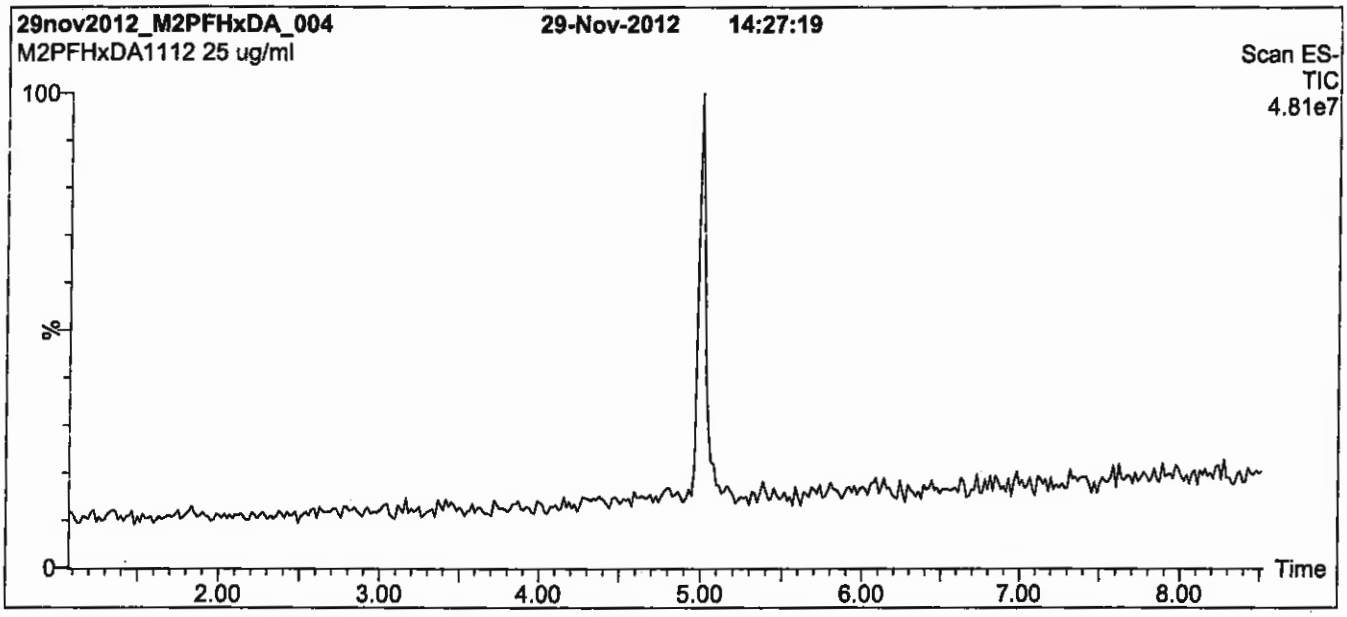
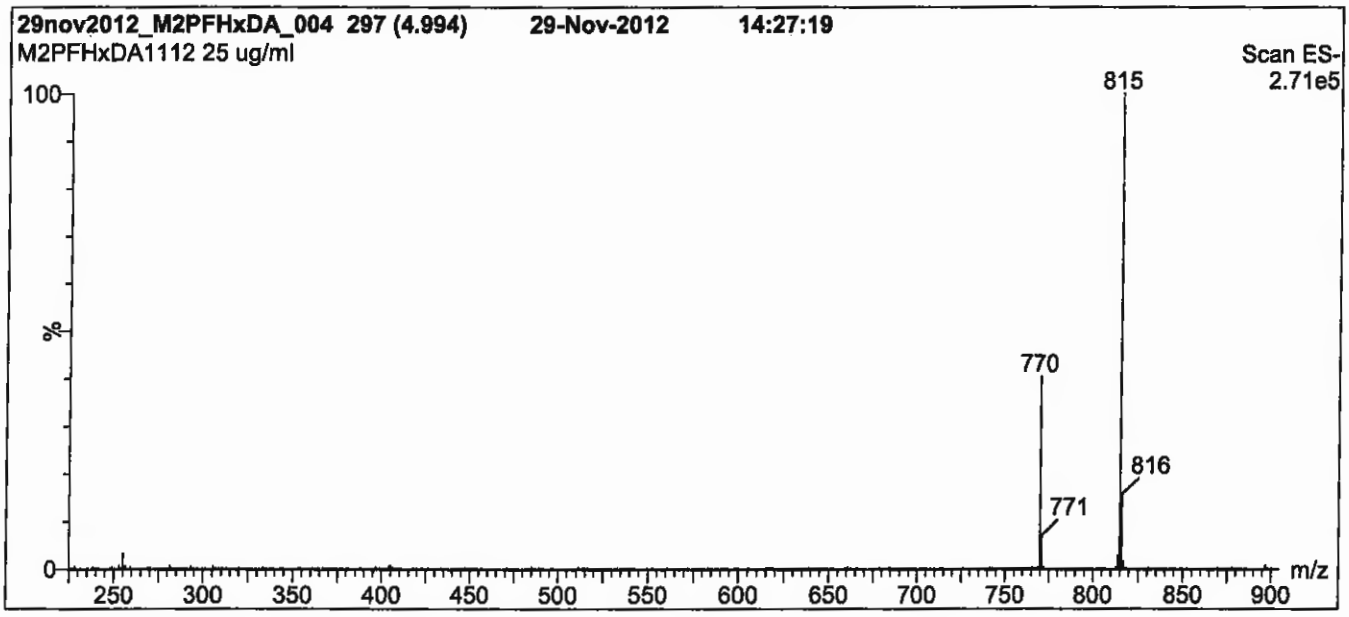
Figure 1: **M2PFHxDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

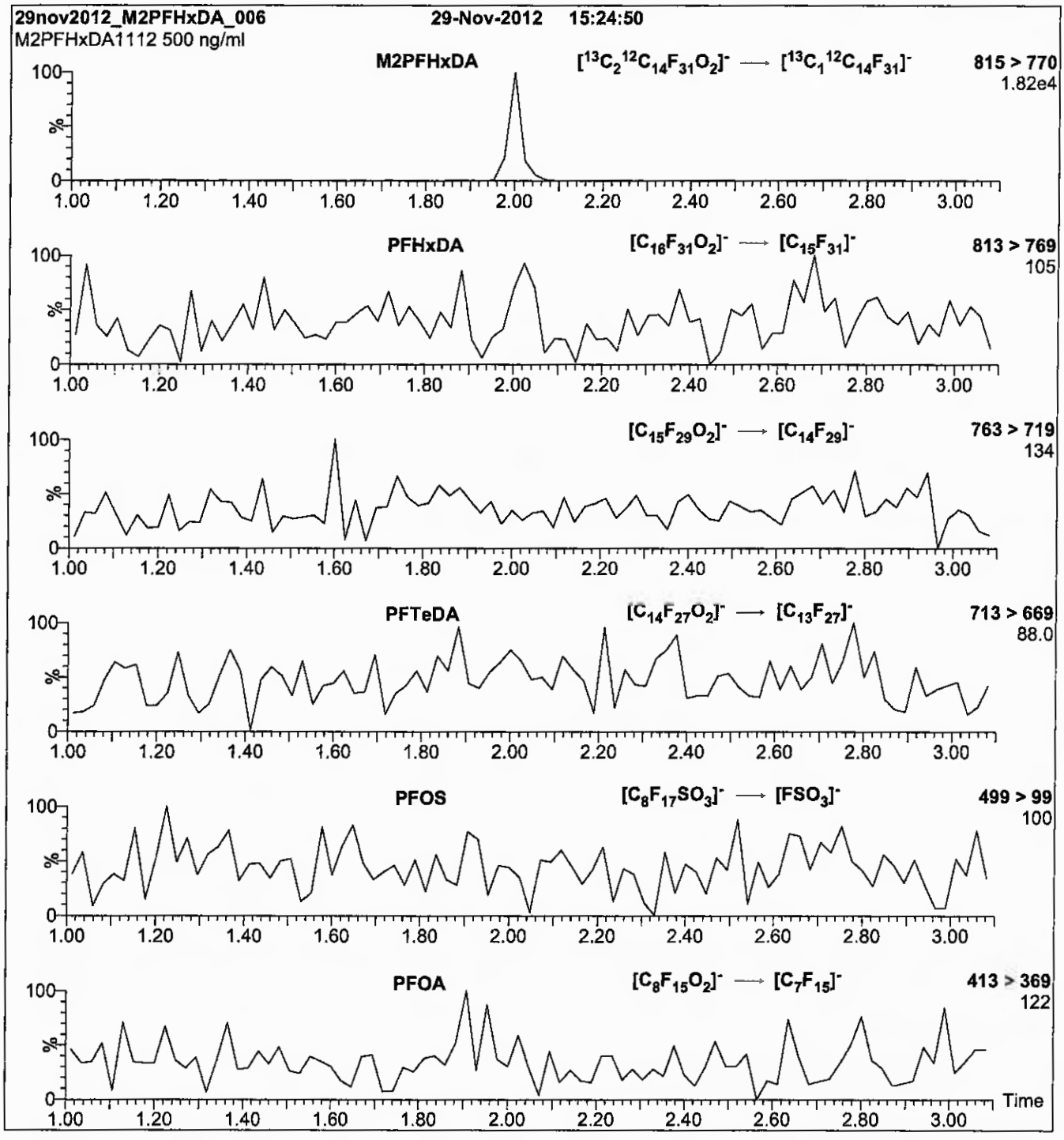
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 1200 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 25.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCM2PFTeDA_00007

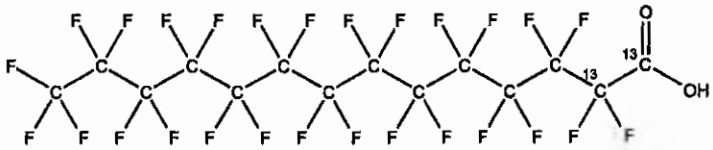
Scanned 10/14/16 R: 80c 9/22/16

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

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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



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

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

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

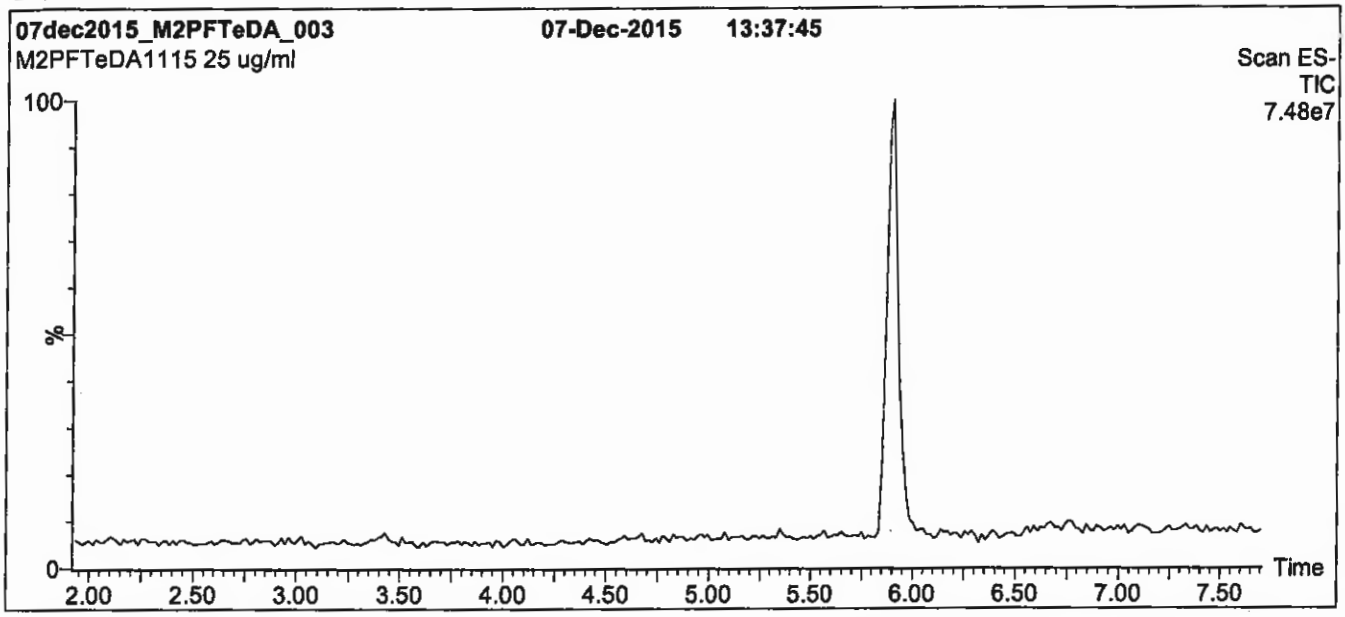
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

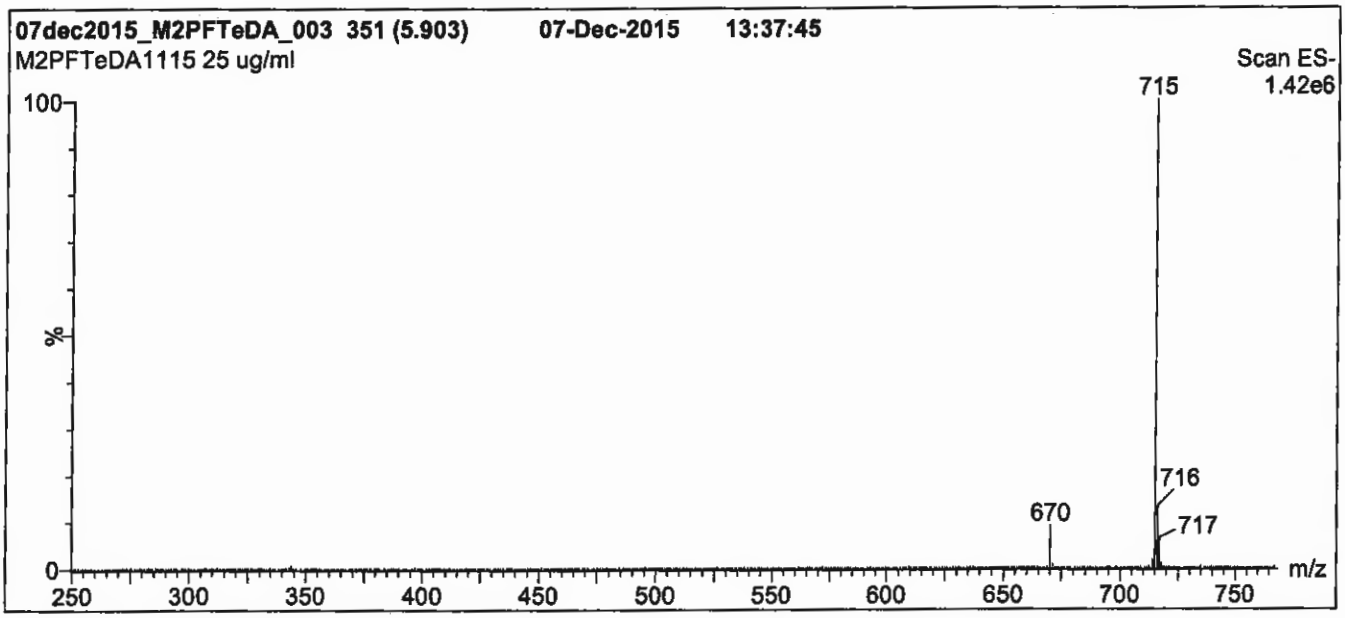
CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

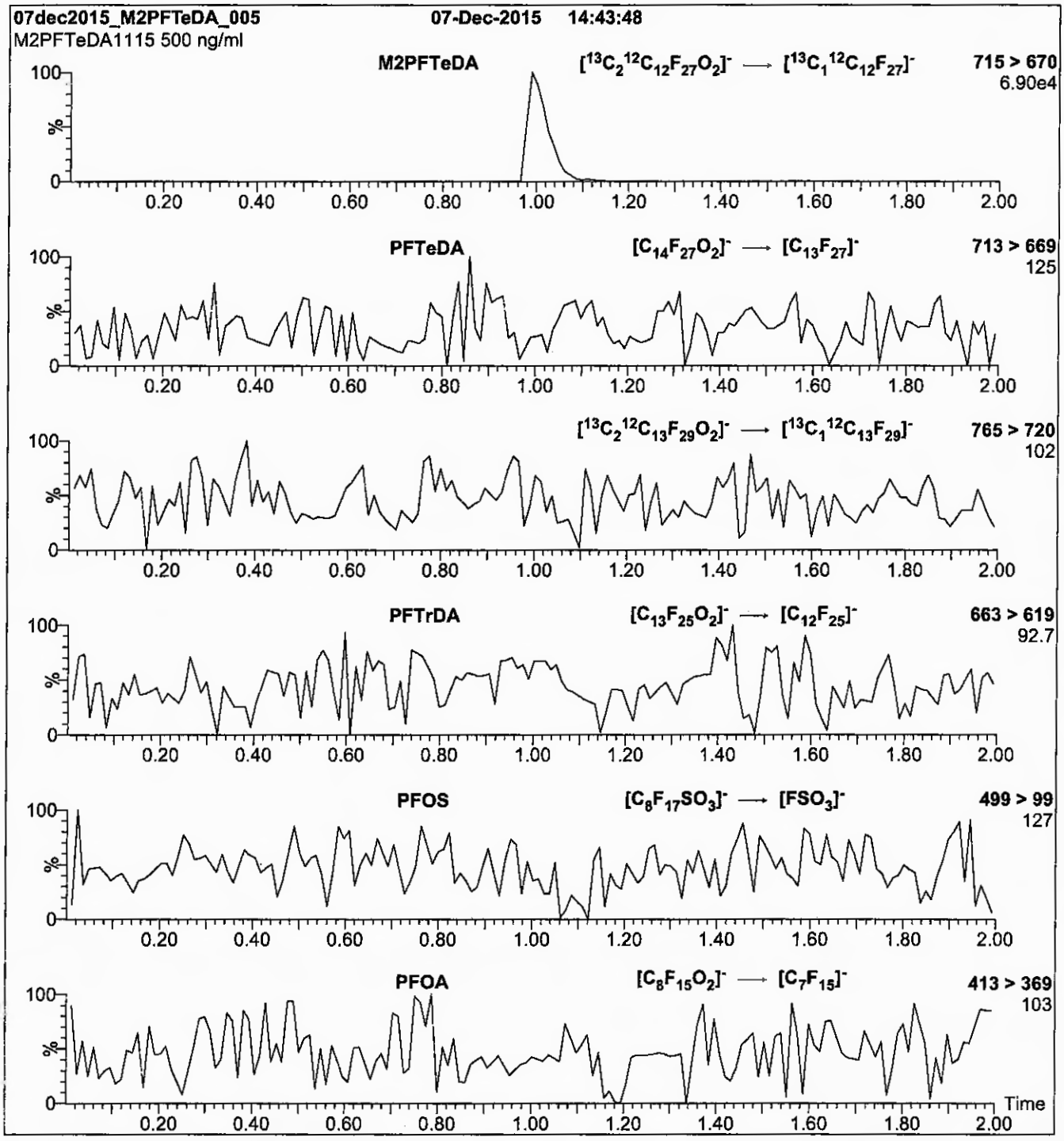
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1250 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCM4PFHPA_00007

R: SBC 9/22/16

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

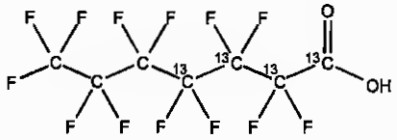
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS

DOCUMENTATION

Received 10/14/16 SBC

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



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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 07/05/2016 (mm/dd/yyyy)

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

INTENDED USE:

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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EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA Testing

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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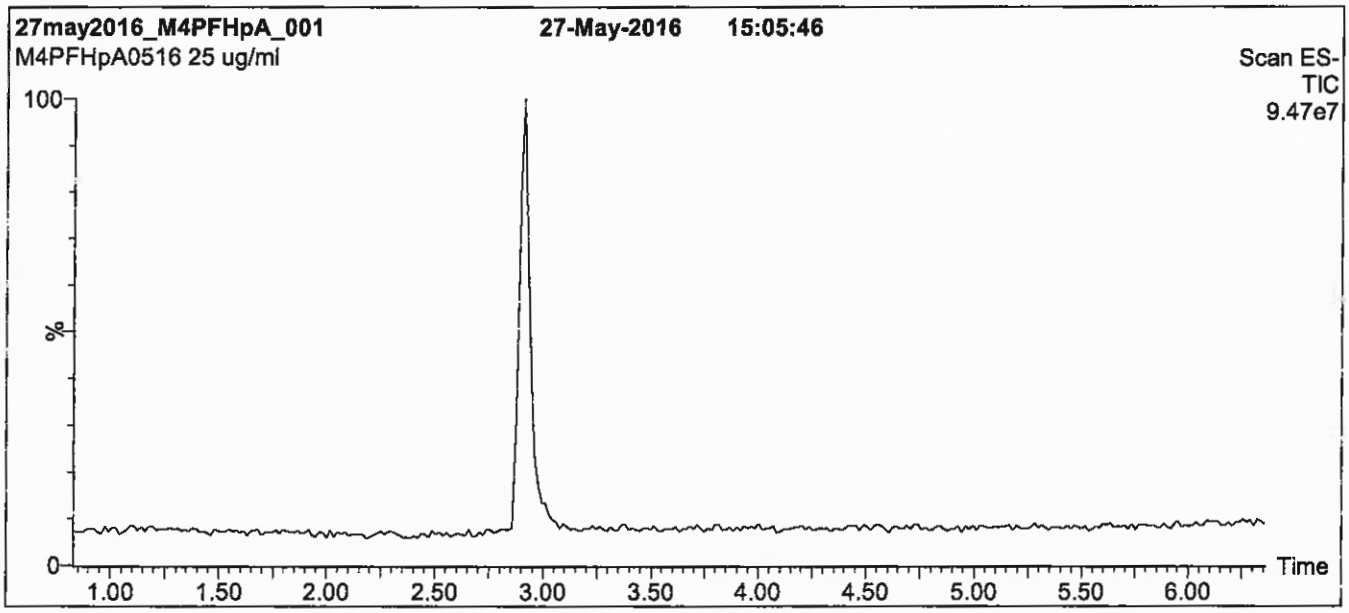
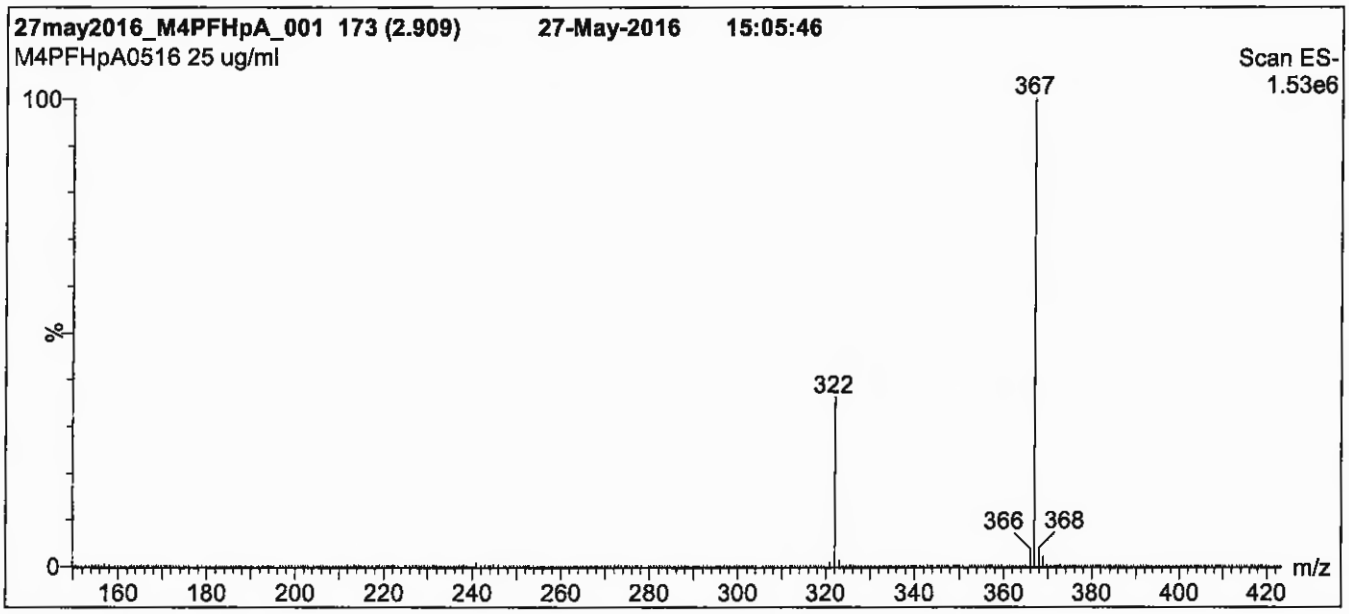
Figure 1: **M4PFHpA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

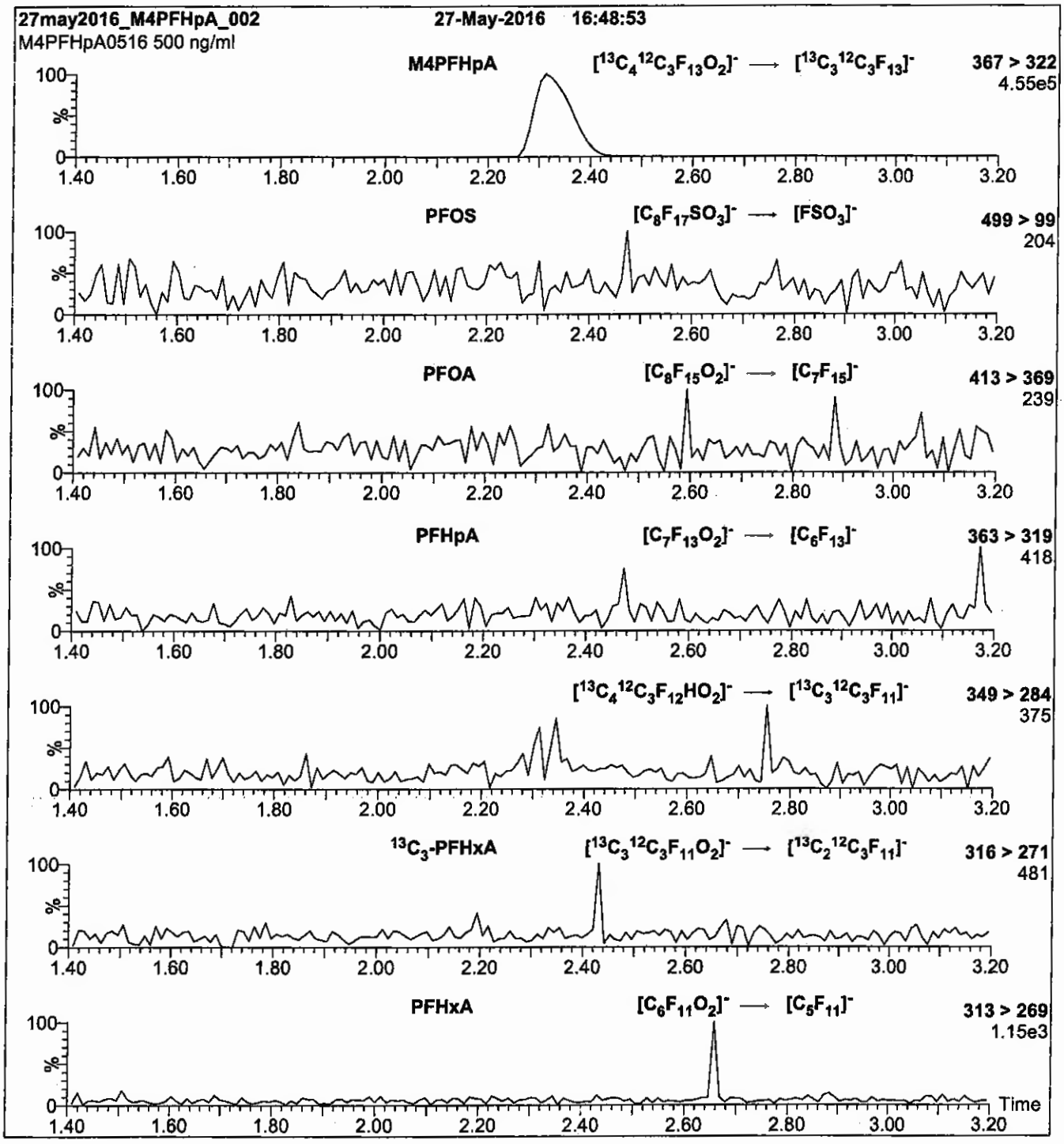
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCM5PFPEA_00008

R: SBC 9/22/16

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

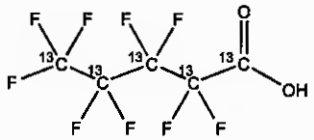
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS

DOCUMENTATION

Scanned 10/14/16 SR

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



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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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HAZARDS:

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

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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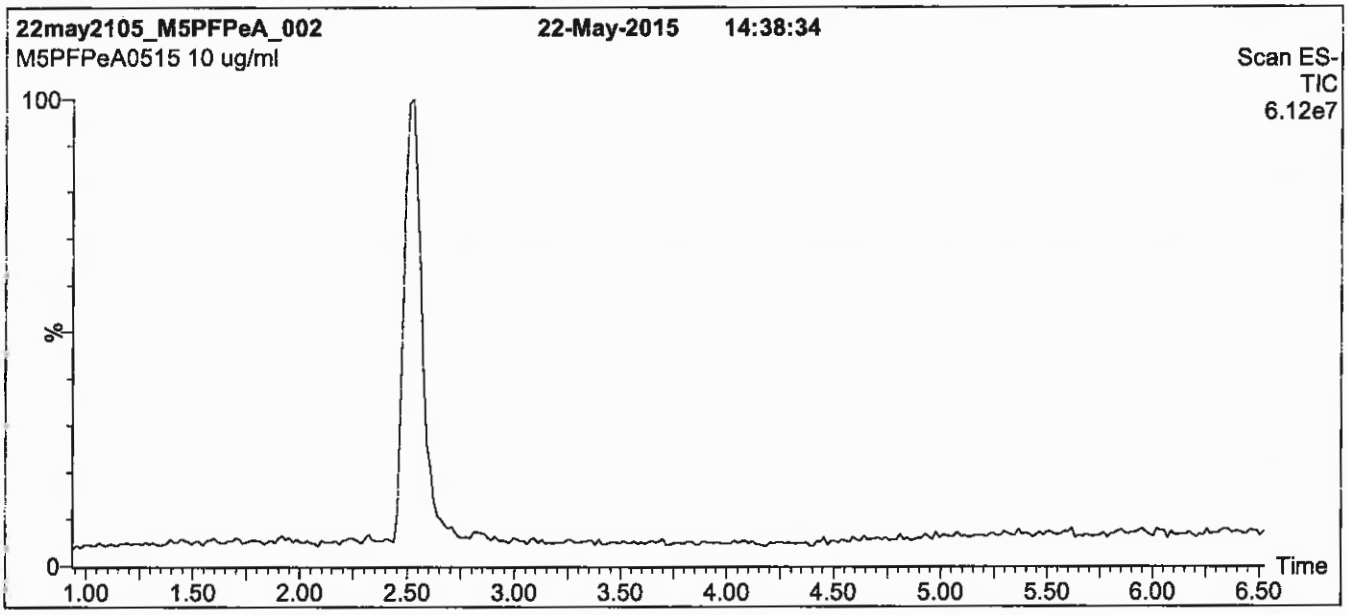
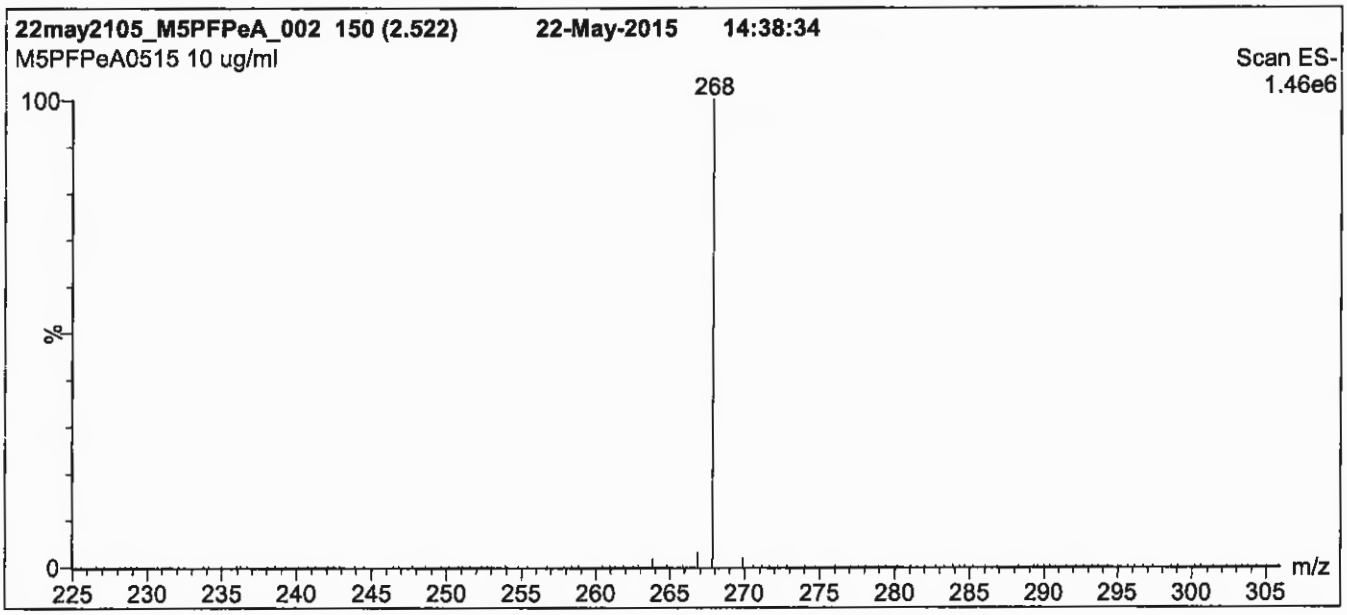
Figure 1: **M5PFPeA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

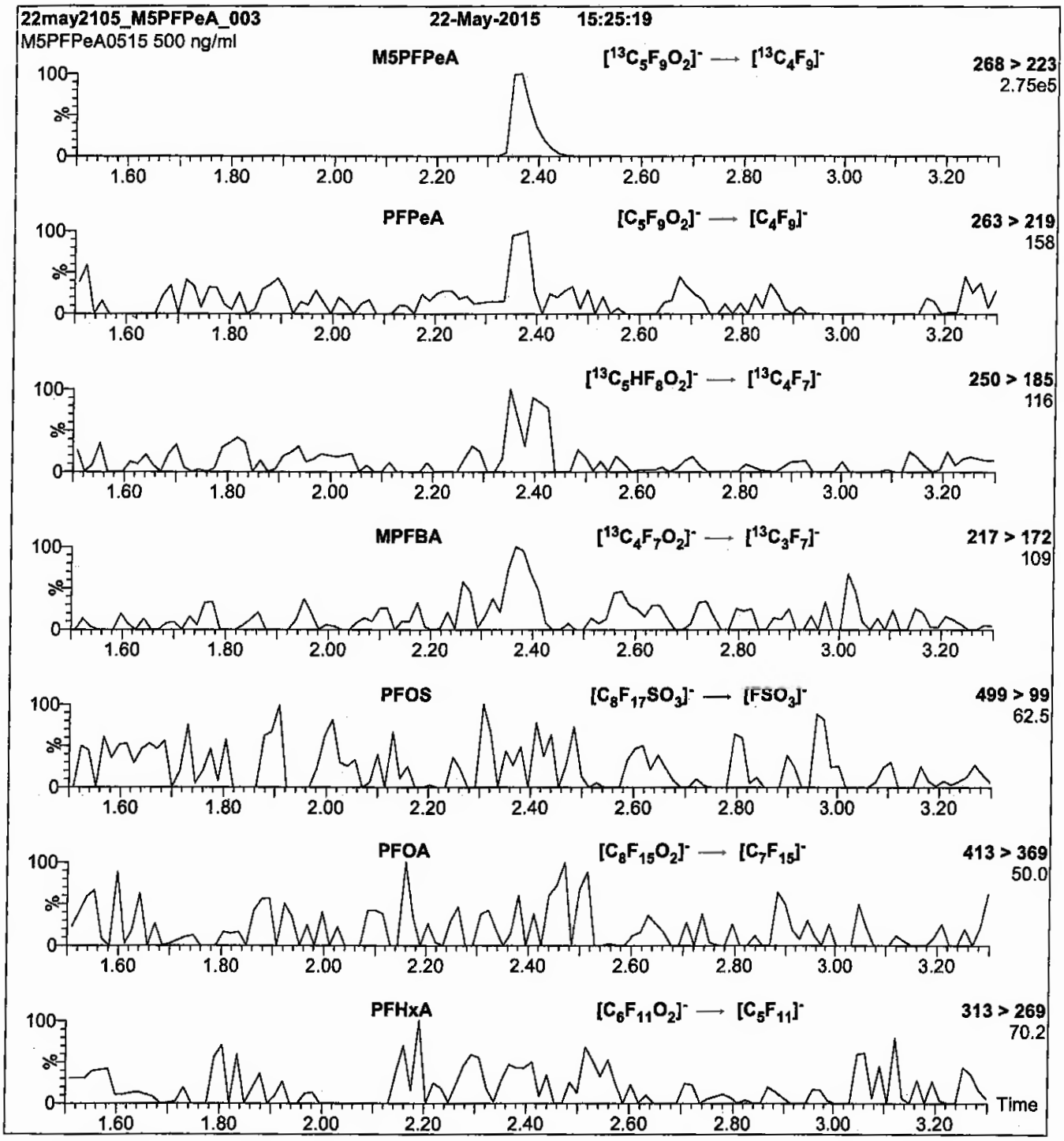
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml M5PFPeA)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

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

Reagent

LCM8FOSA_00011

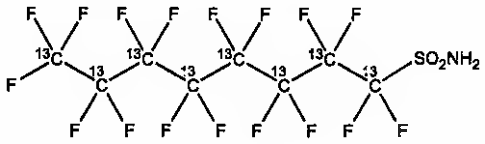
R: SBC 9/22/16
Scanned 10/14/16 SBC

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

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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



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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 01/14/2016 (mm/dd/yyyy)

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

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

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

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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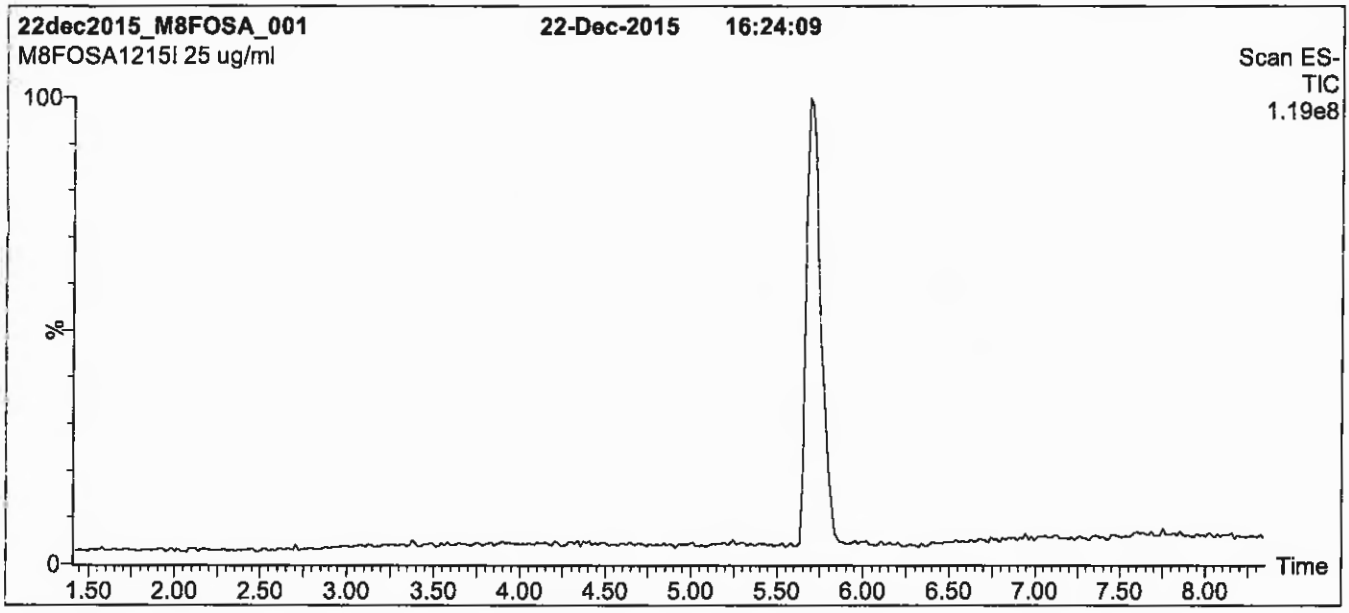
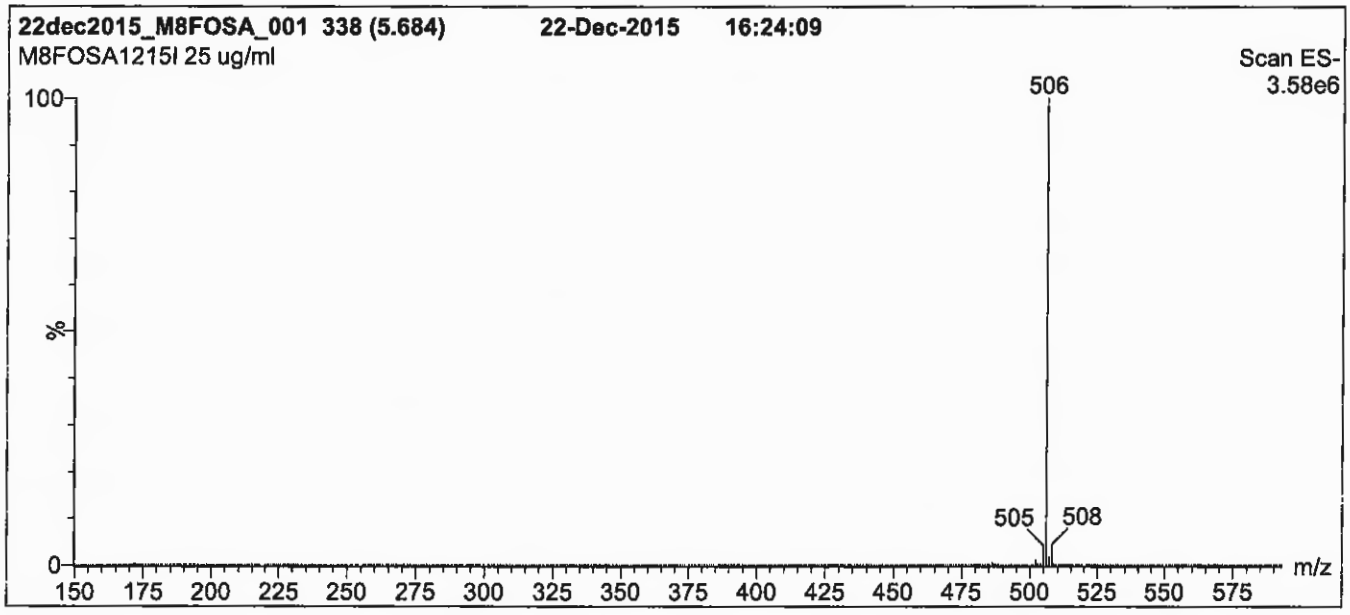
Figure 1: **M8FOSA-I; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

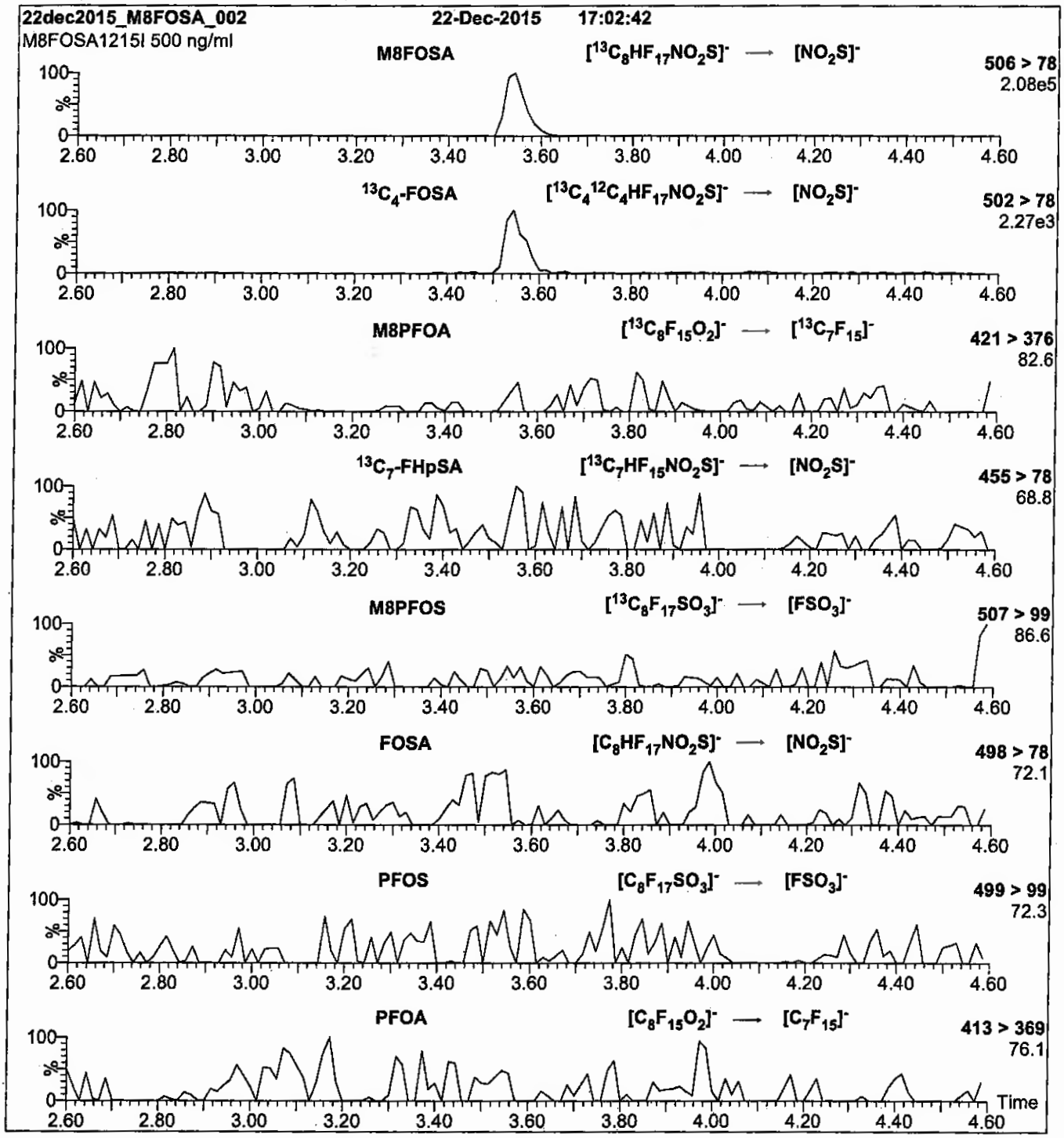
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml M8FOSA-I)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

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

Reagent

LCMPFBA_00008

R: SBC 9/22/16

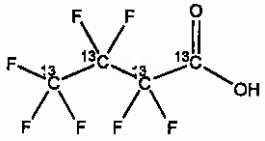
739593
ID: LCMPFBA_00008
Exp: 05/24/21 Prpd: SBC
13C4-Perfluorobutanoic ac

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

Scanned 10/14/16 SR

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



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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 05/30/2016
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:

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.

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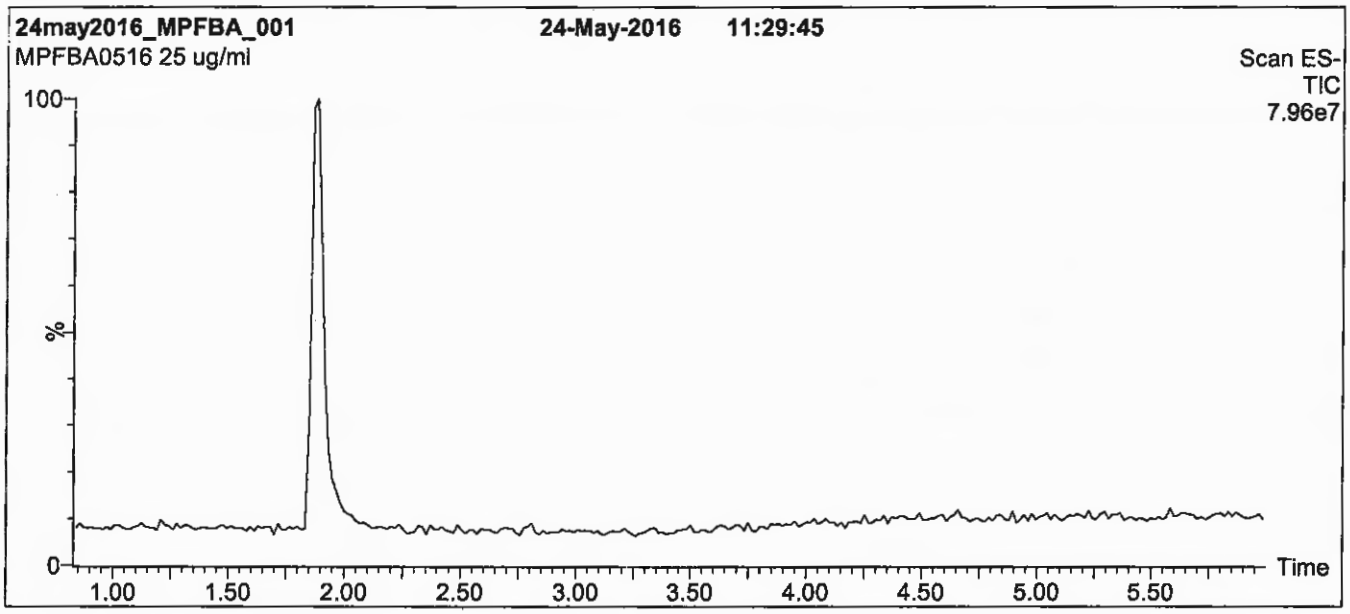
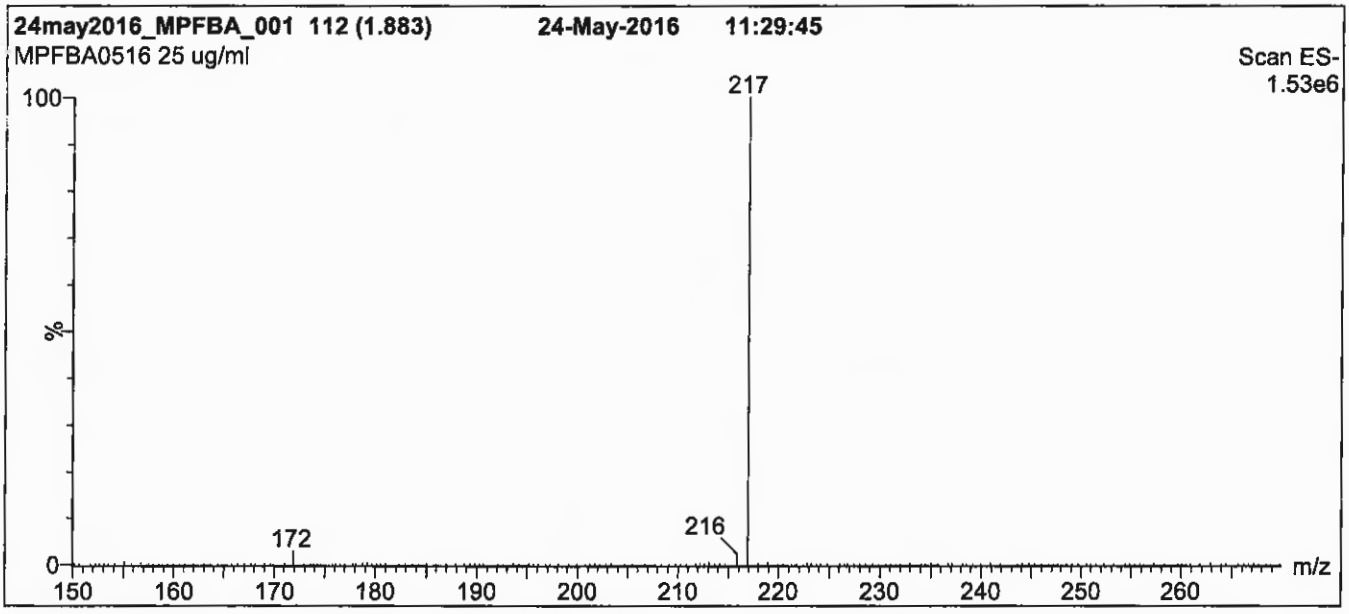




Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 30% (80:20 MeOH:ACN) / 70% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

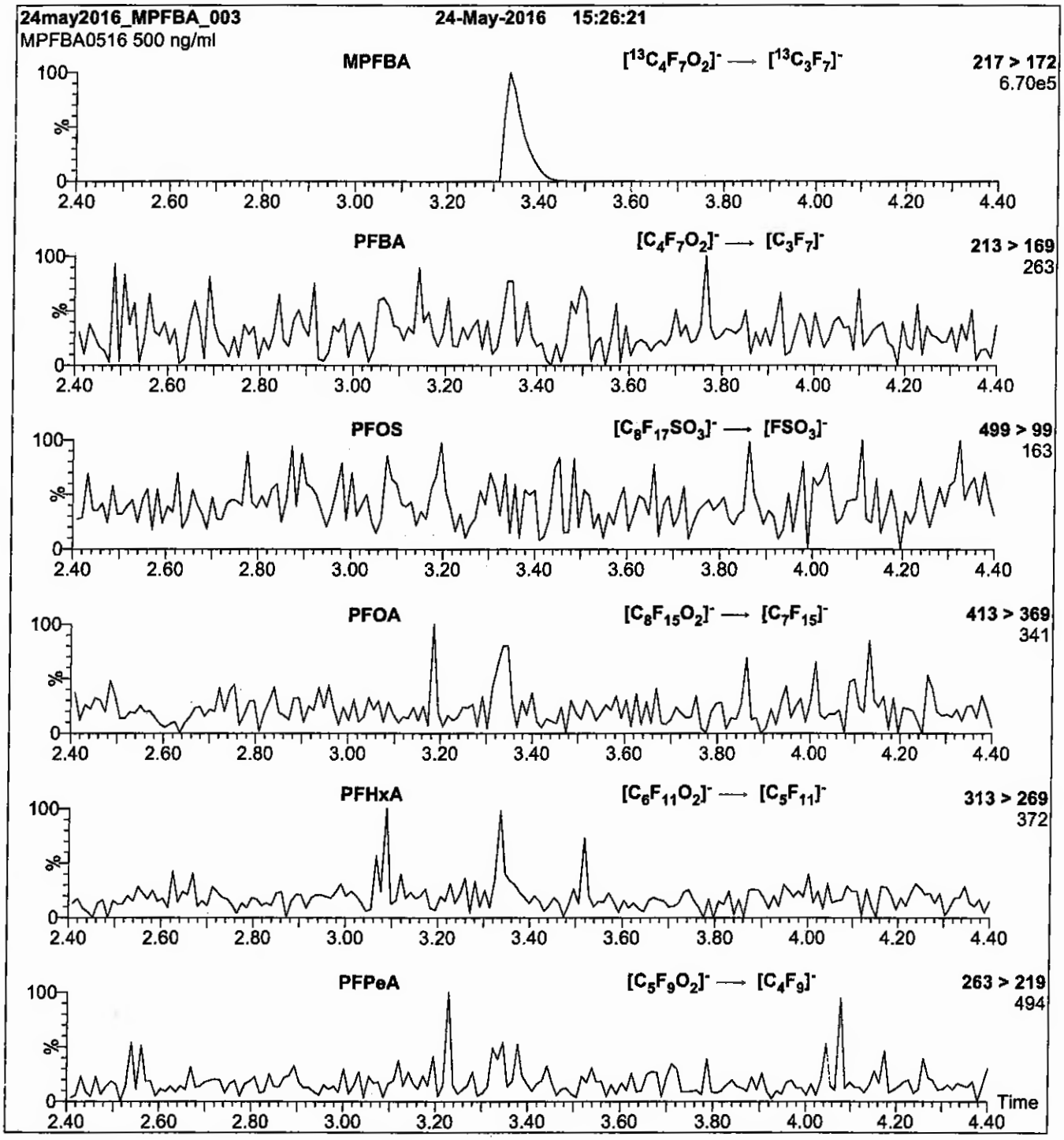
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

MS Parameters

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

Reagent

LCMPFDA_00011

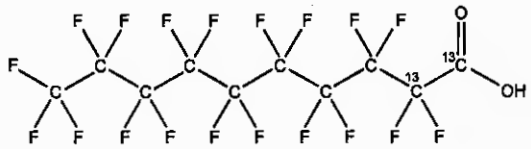
Scanned 10/14/16 R: SBC 9/22/16

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

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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



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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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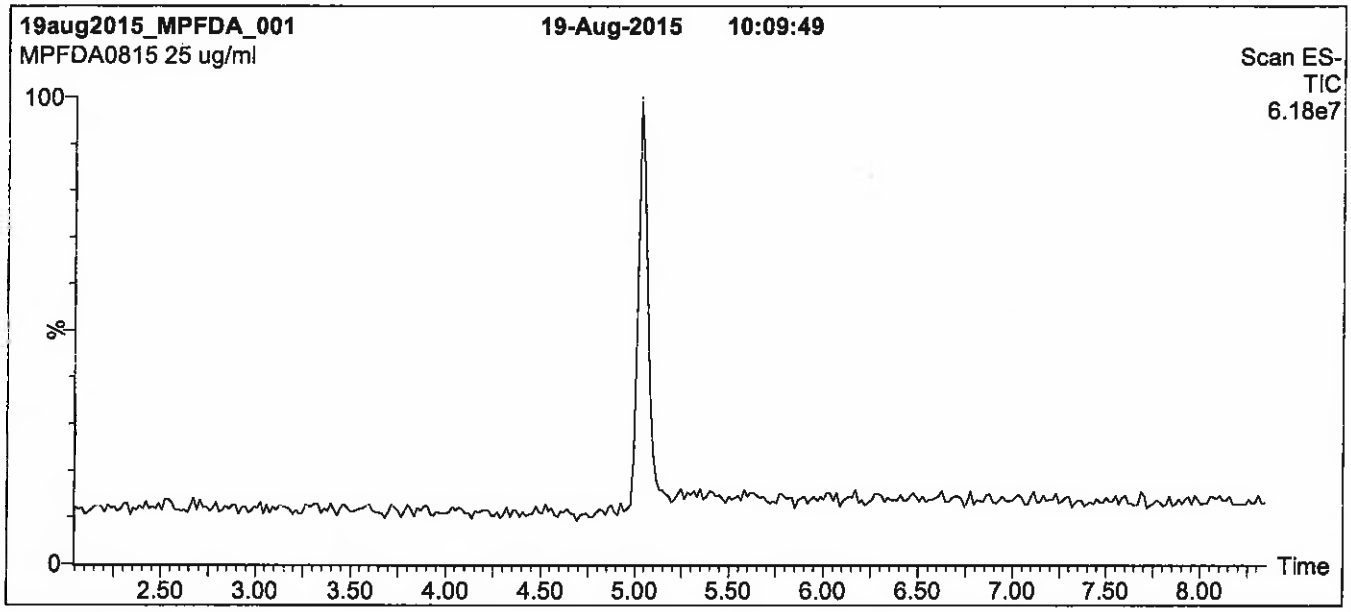
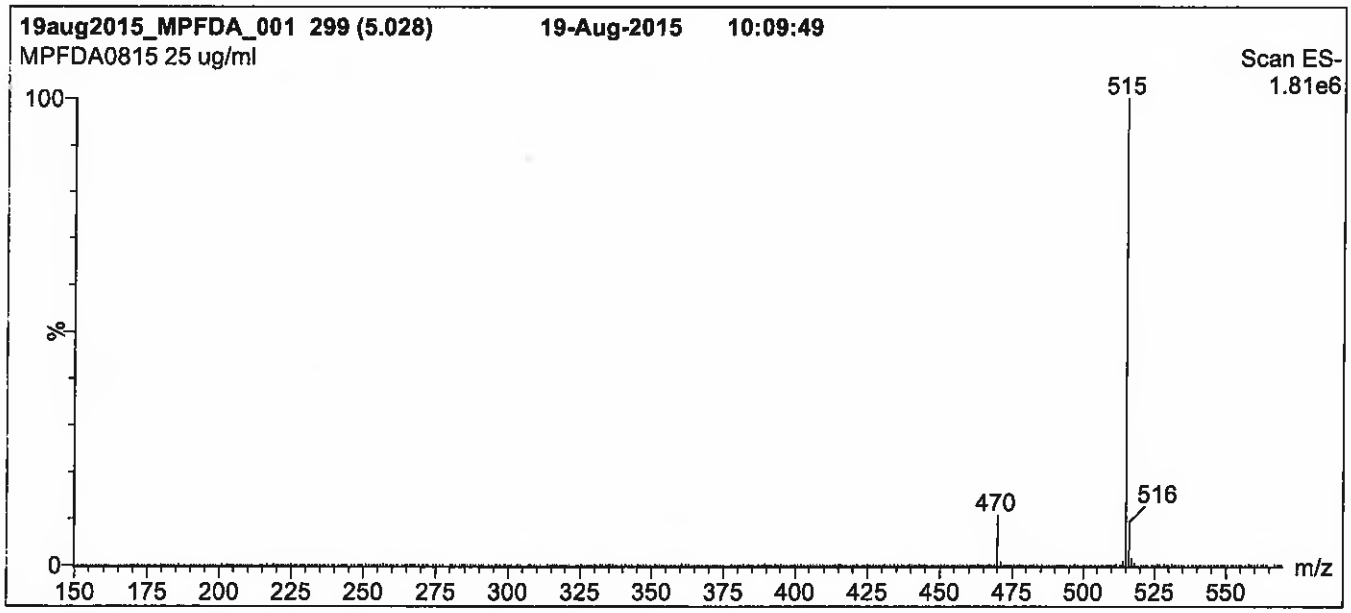




Conditions for Figure 1:

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

Chromatographic Conditions

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

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

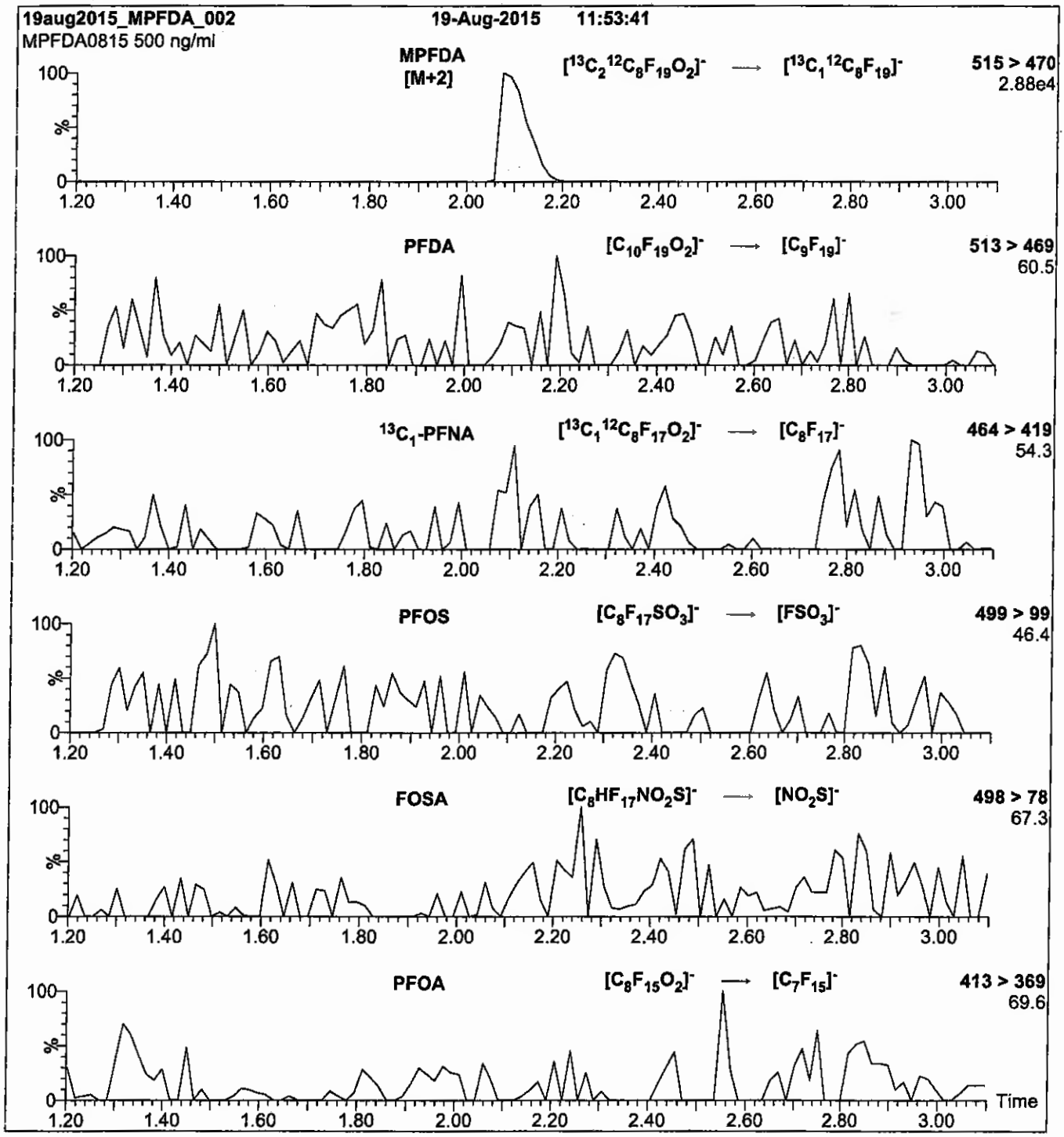
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCMPFDoA_00008

R: SBC 9/22/16

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

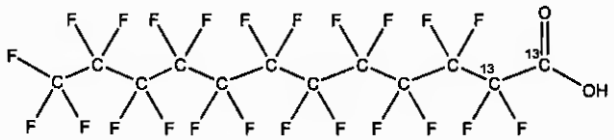
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

Scanned 10/14/16 SR

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

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_{10}HF_{23}O_2$	**MOLECULAR WEIGHT:**	616.08
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	04/08/2016		
EXPIRY DATE: (mm/dd/yyyy)	04/08/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

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

- See page 2 for further details.
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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
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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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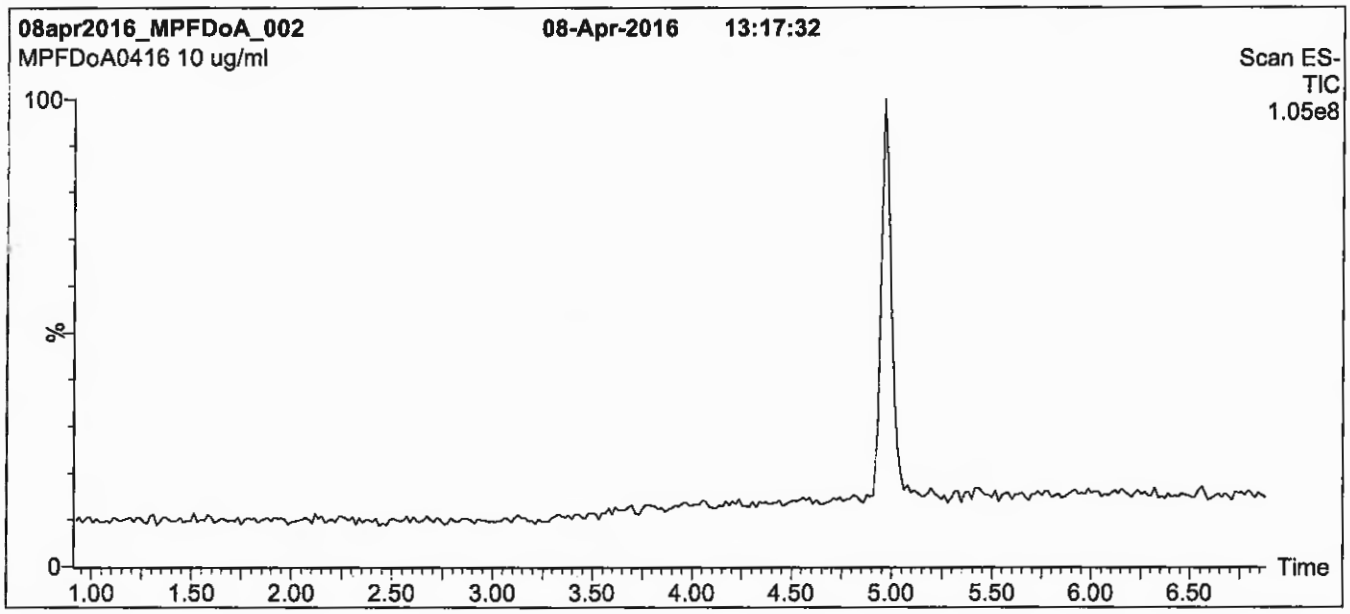
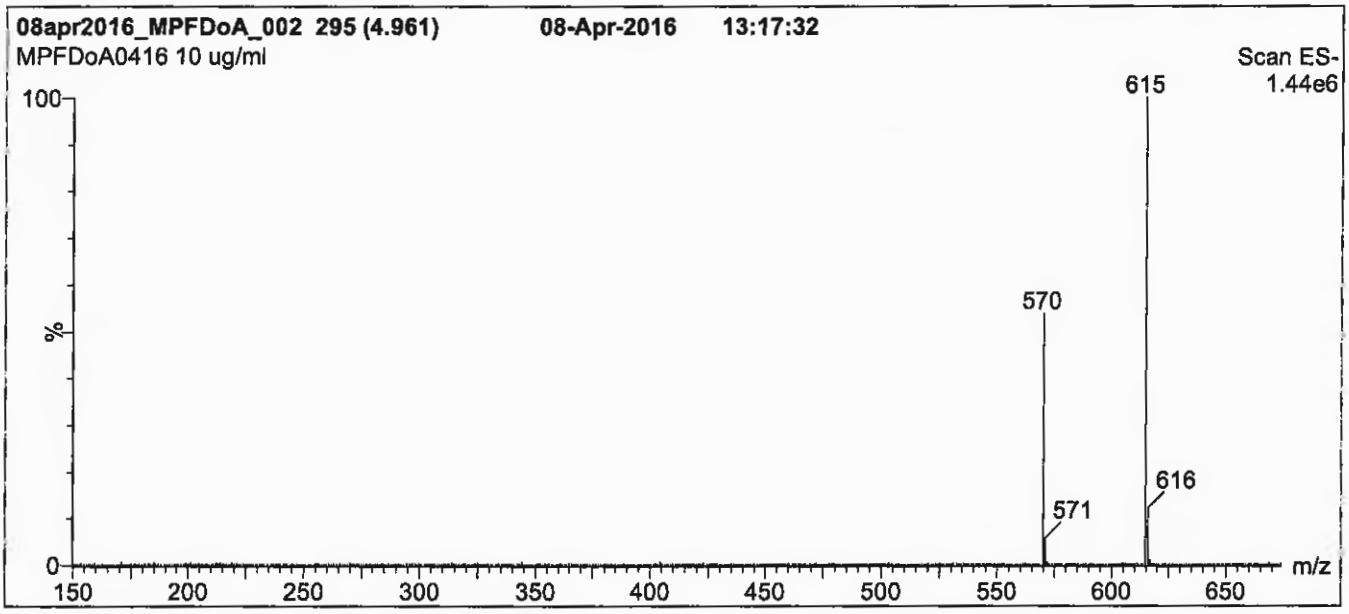
Figure 1: **MPFDoA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

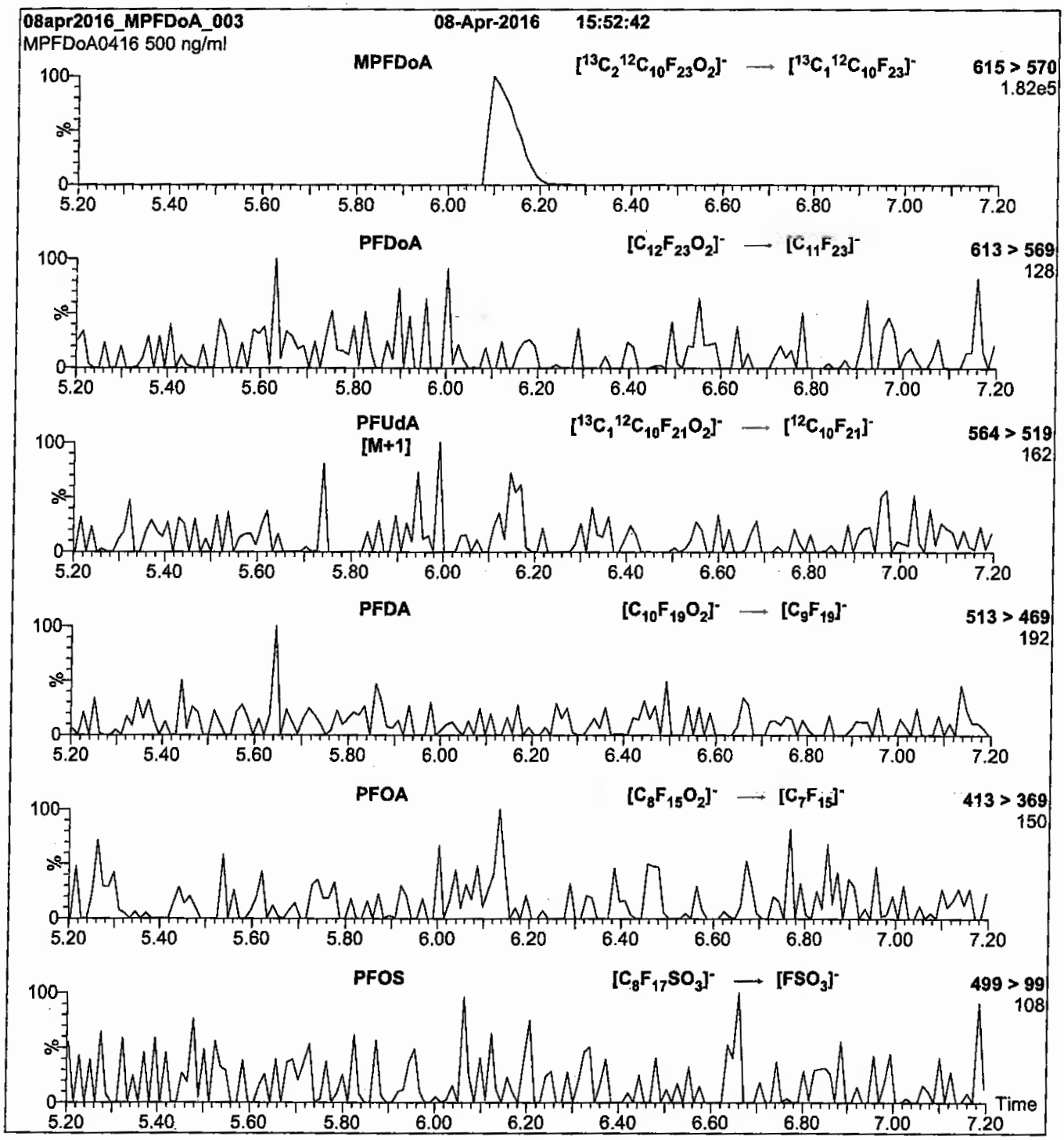
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCMPFHxA_00012

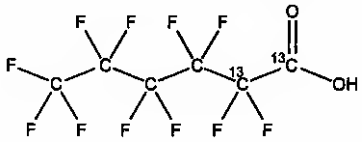
Scanned 10/14/16 JR R: SBC 9/22/16

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

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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



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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains < 0.1% of perfluoro-n-hexanoic acid and ~ 0.3% of perfluoro-n-octanoic acid.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 04/29/2016 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

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CALA

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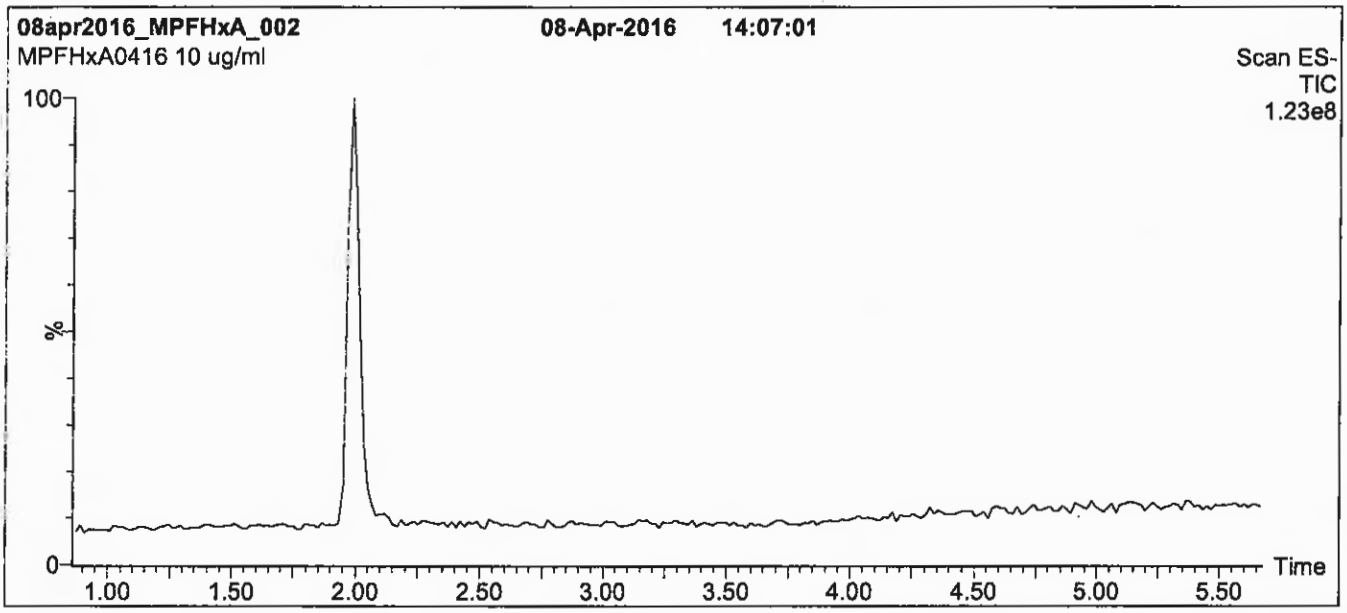
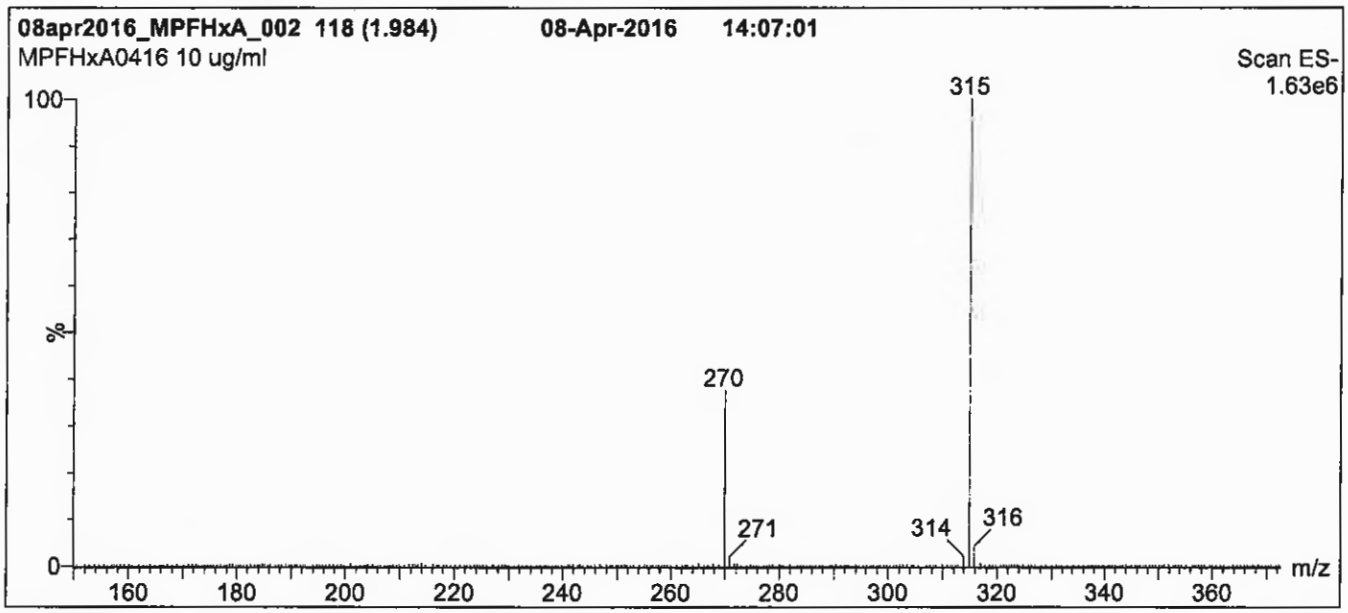
Figure 1: **MPFHxA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min before returning to initial conditions over 0.5 min.
Time: 10 min

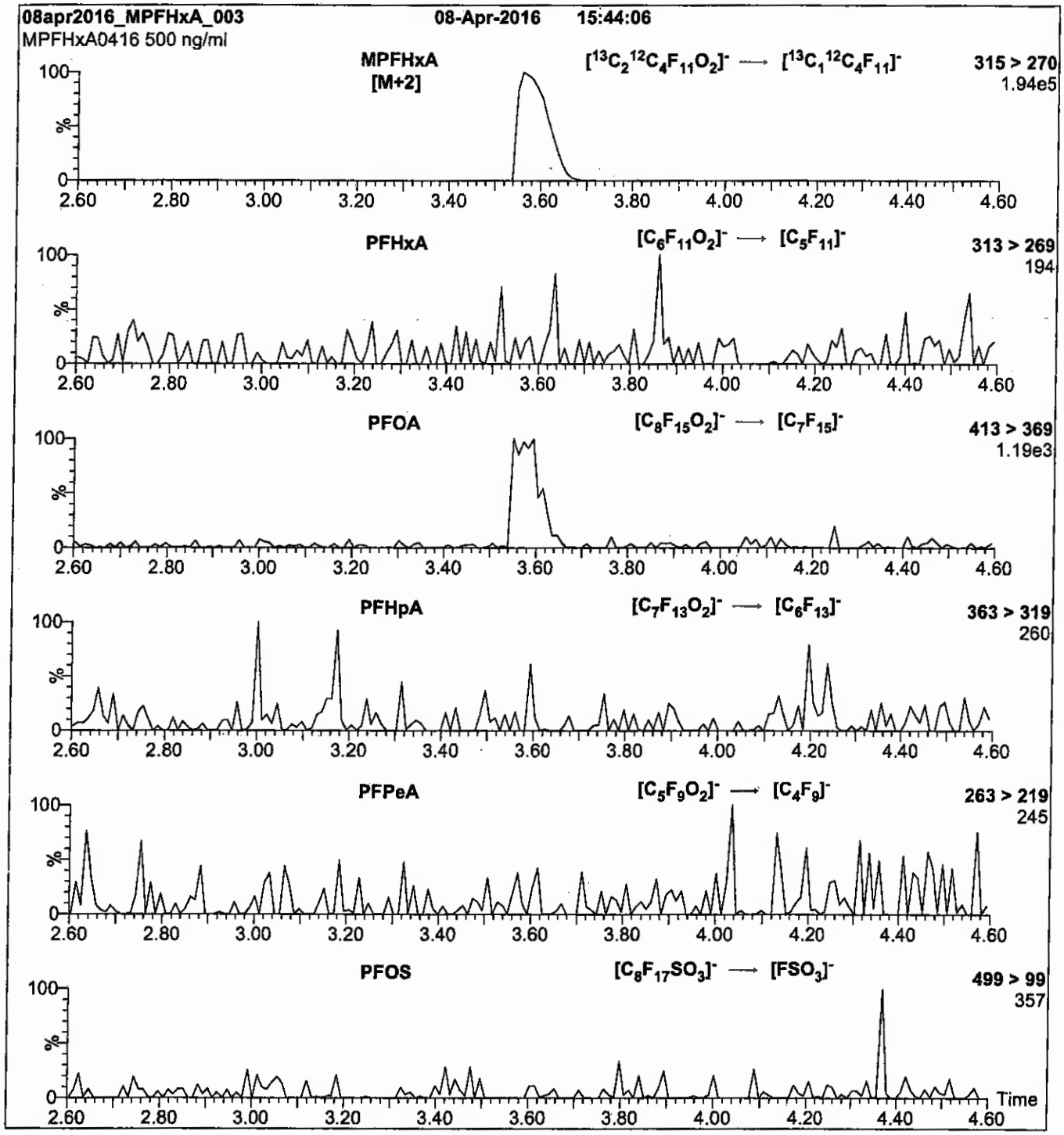
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCMPFHxS_00008

R: SBC 9/22/16

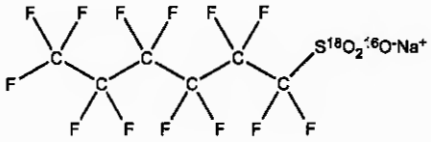
739601
ID: LCMPFHxS_00008
Exp: 10/23/20 Prpd: SBC
18O2-Perfluorohexanesulfo

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

Scanned 10/14/16 SR

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



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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 10/28/2015 (mm/dd/yyyy)

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

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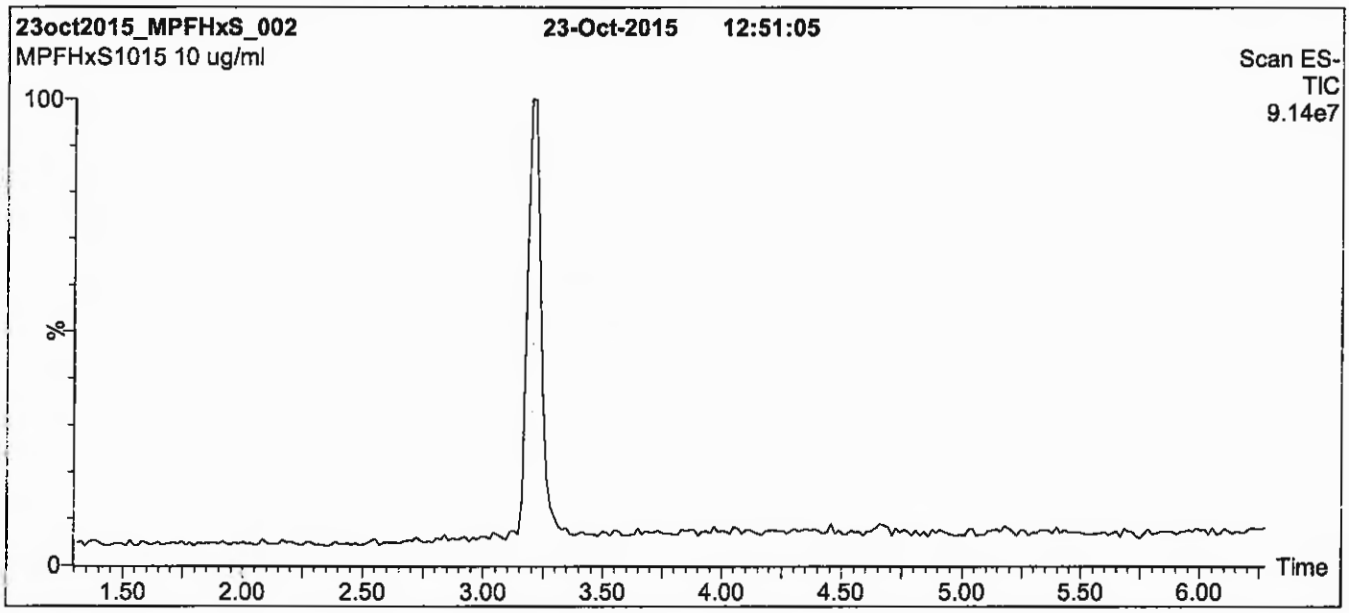
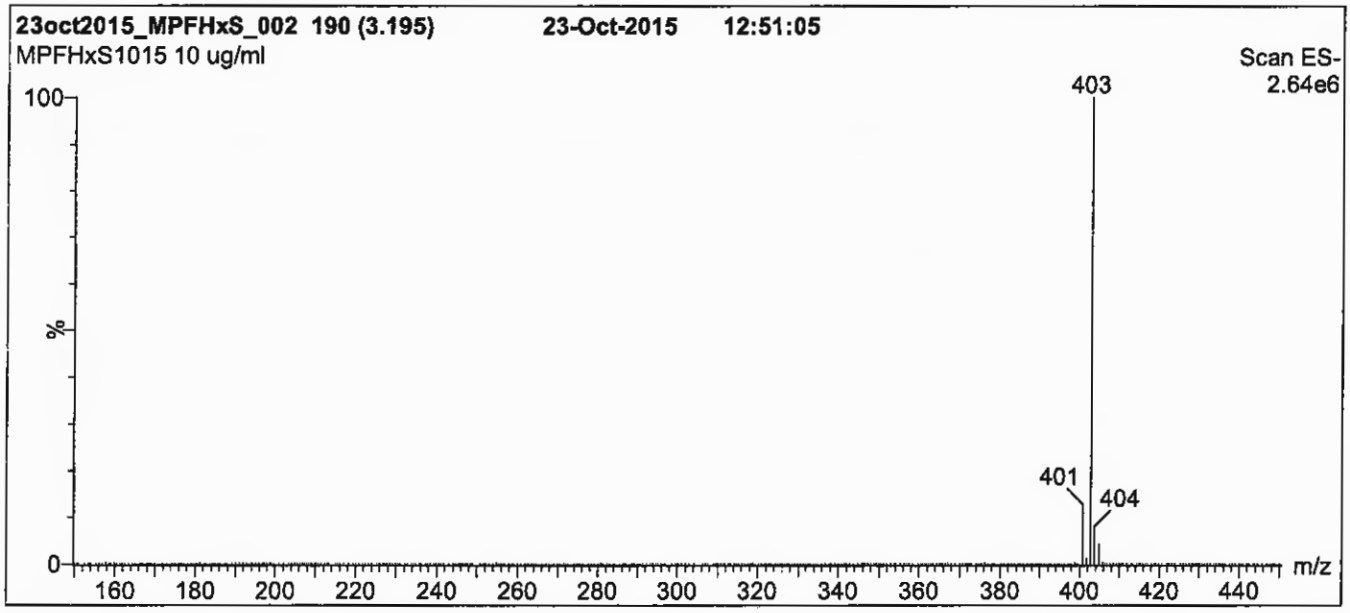




Conditions for Figure 1:

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

Chromatographic Conditions

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

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

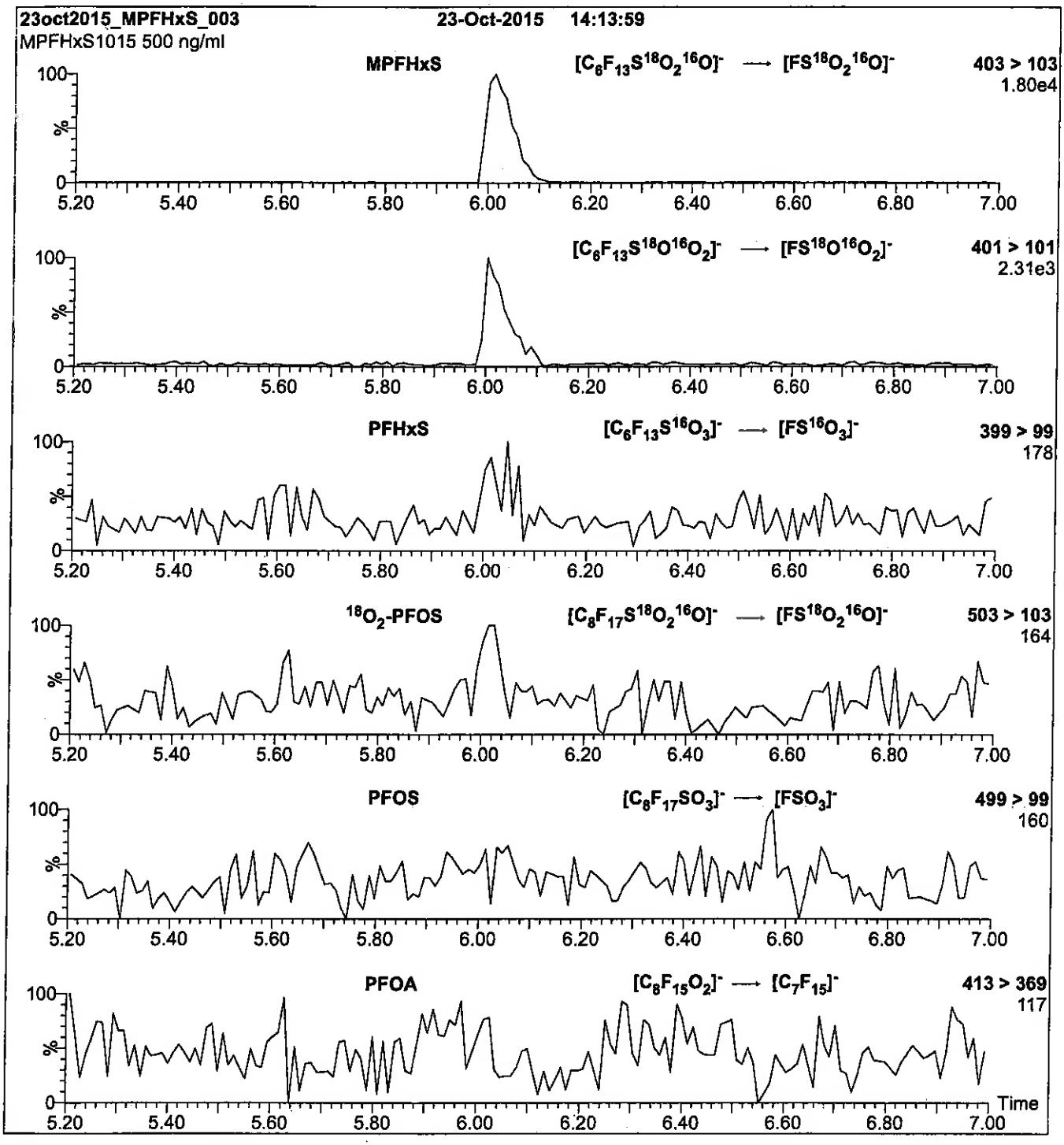
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 50.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCMPFNA_00008

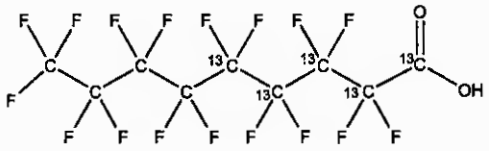
Scanned 10/14/16 R: SBC 9/22/16

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

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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



MOLECULAR FORMULA:	$^{13}C_5{}^{12}C_4HF_{17}O_2$	**MOLECULAR WEIGHT:**	469.04
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2,3,4,5-$^{13}C_5$)
LAST TESTED: (mm/dd/yyyy)	04/13/2014		
EXPIRY DATE: (mm/dd/yyyy)	04/13/2019		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 04/01/2015 (mm/dd/yyyy)

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CALA

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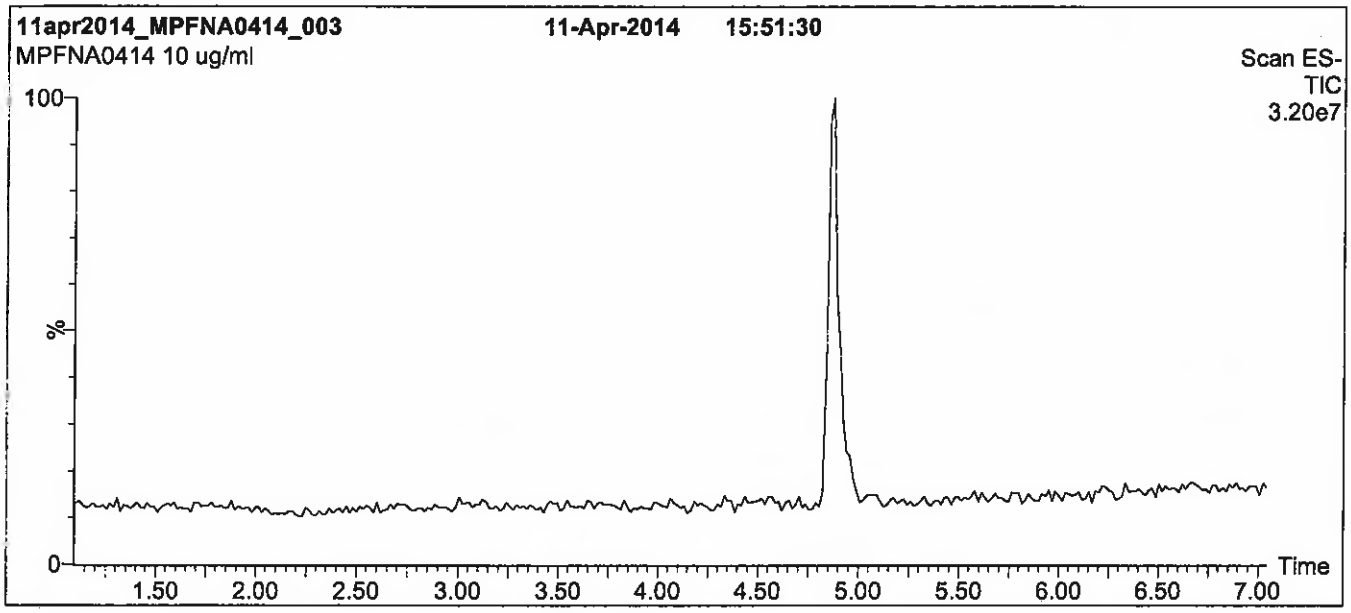
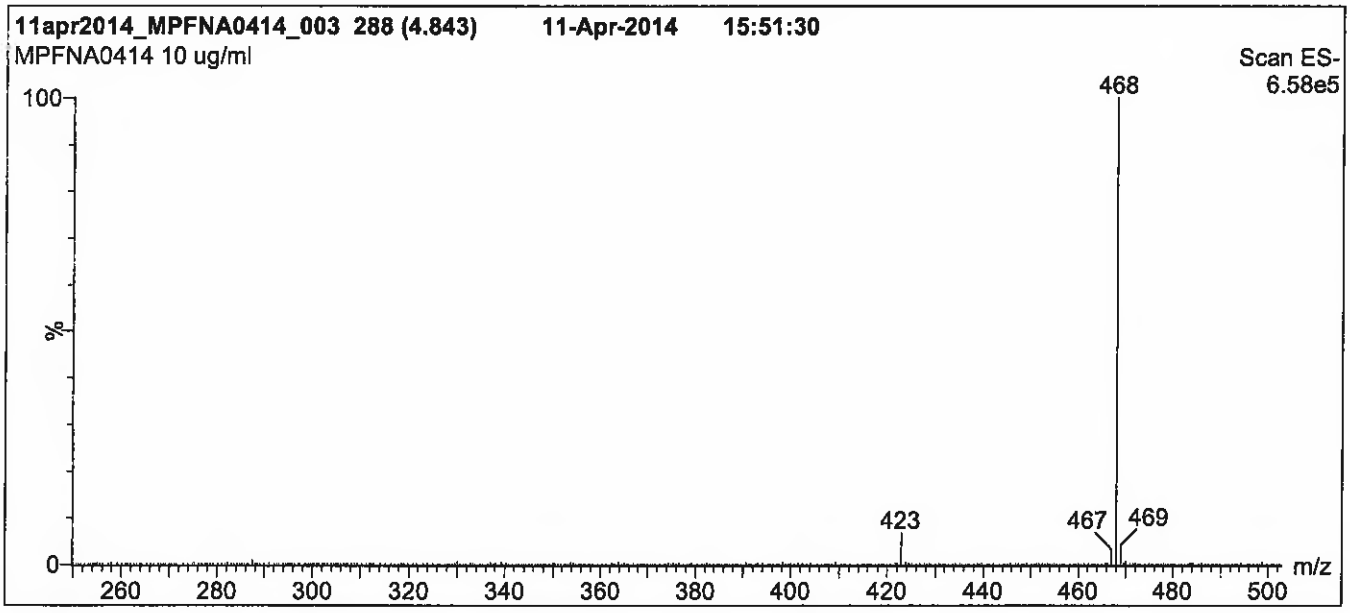
Figure 1: **MPFNA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

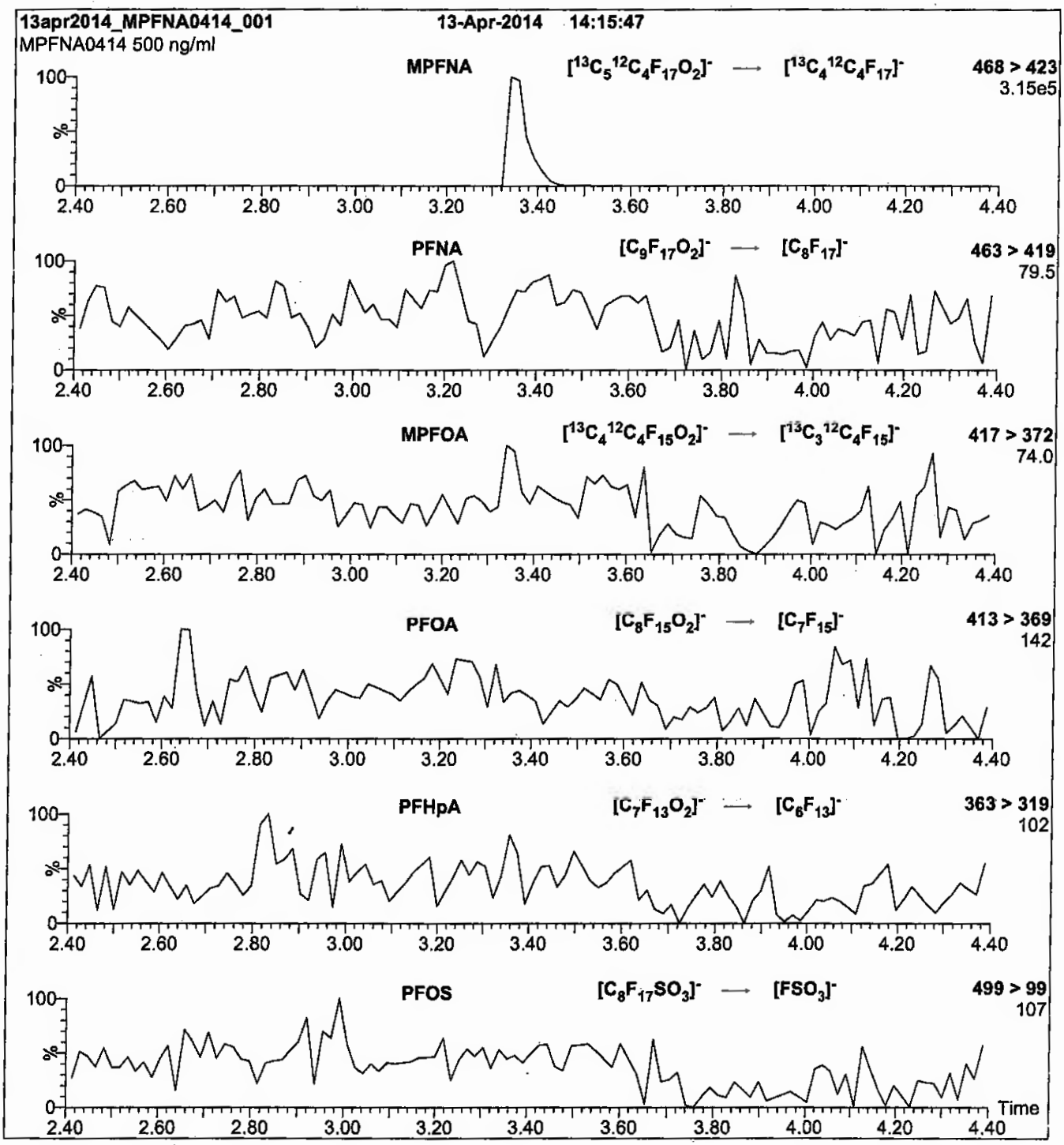
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 850 amu)

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

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



Conditions for Figure 2:

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

MS Parameters

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

Reagent

LCMPFOA_00012

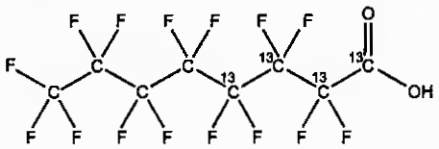
R: SBC 9/22/16

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

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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



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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.1% of native perfluoro-n-octanoic acid (PFOA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 02/01/2016 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

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

CALA Testing Accreditation No. A 1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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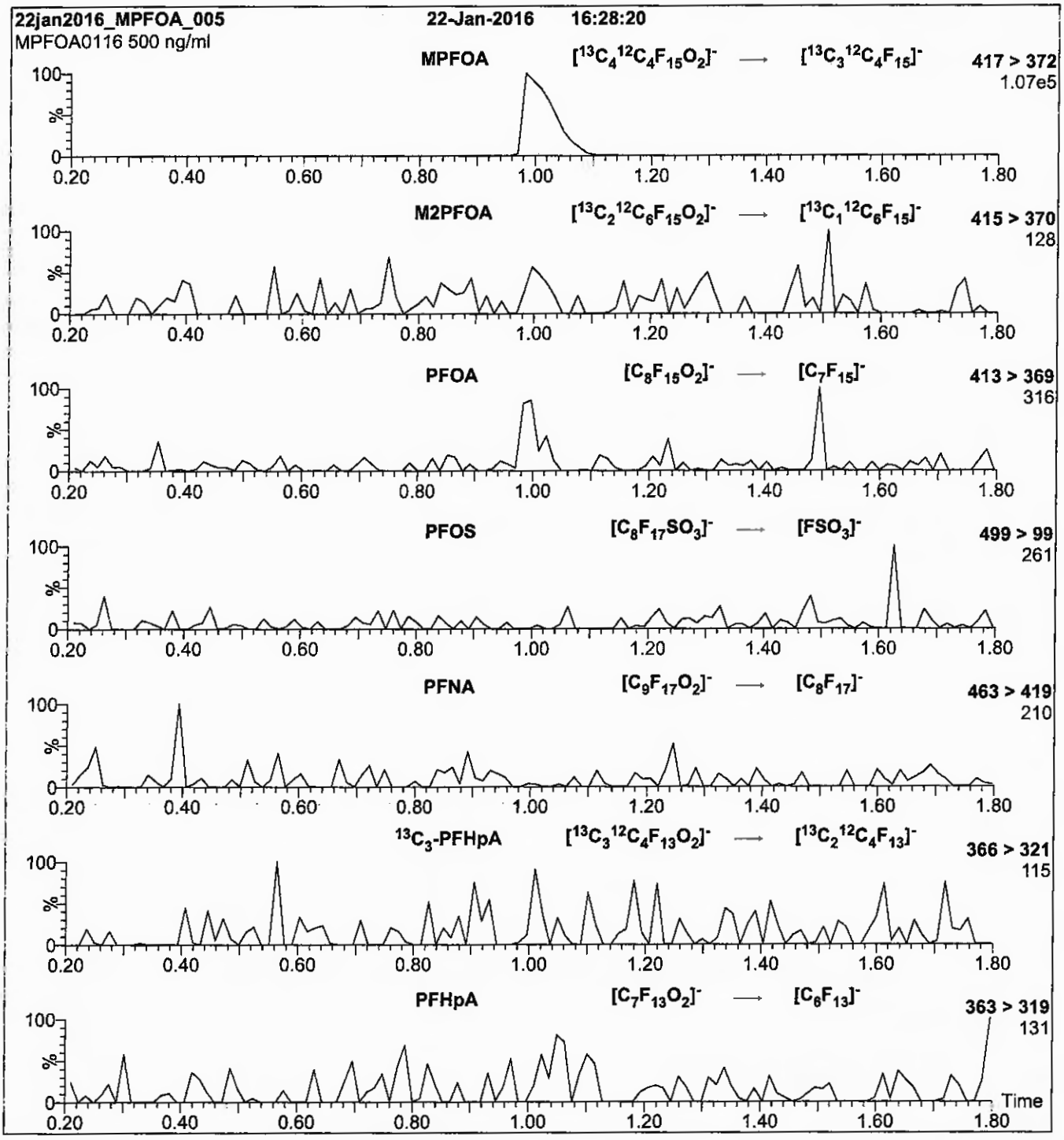
Figure 2: **MPFOA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

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

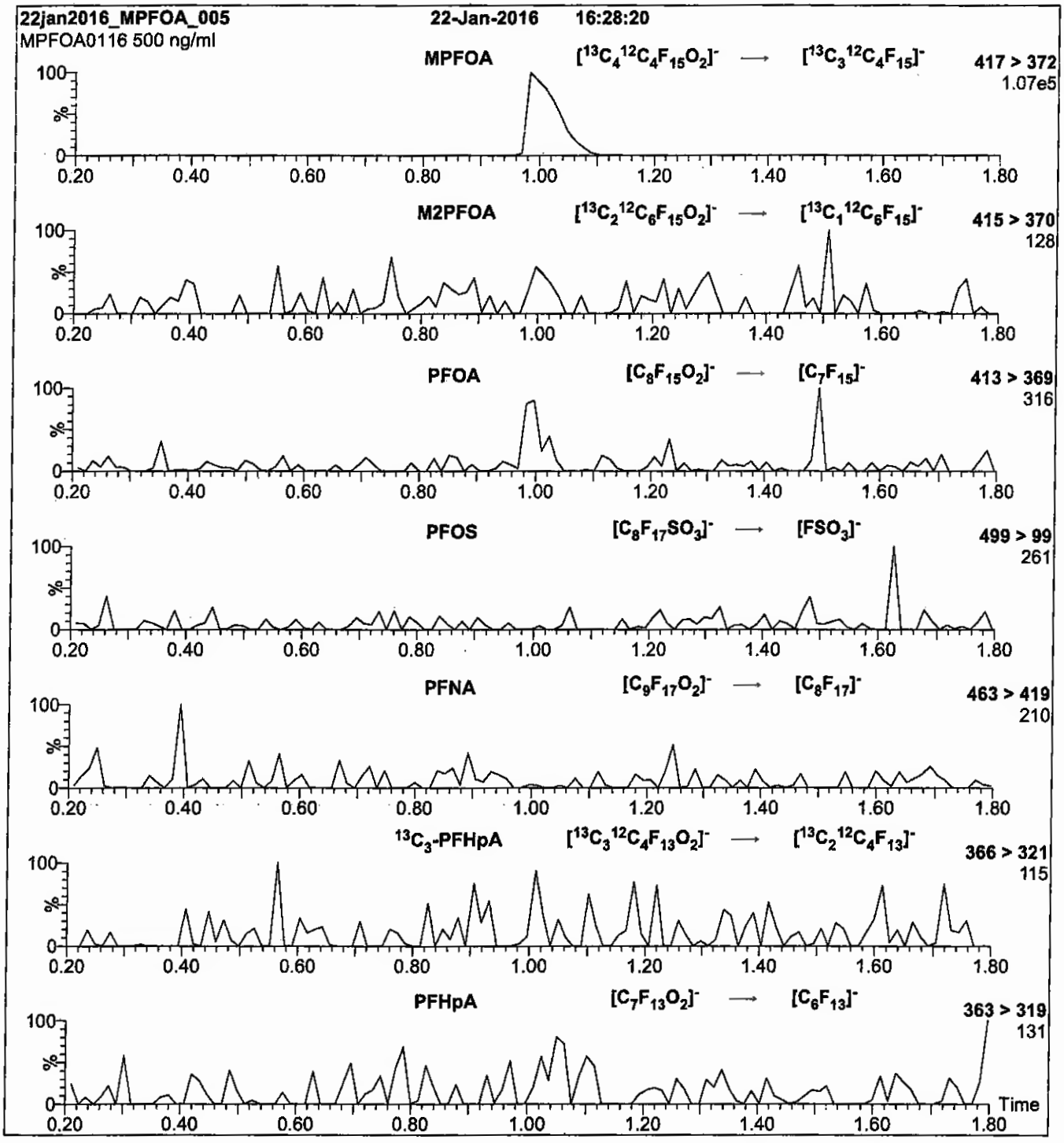
Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

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

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



Conditions for Figure 2:

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

Reagent

LCMPFOS_00017

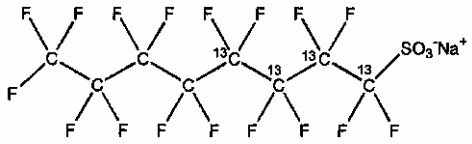
R: 9/9/16 SBC

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

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	MPFOS	**LOT NUMBER:**	MPFOS0816
COMPOUND:	Sodium perfluoro-1-[1,2,3,4-$^{13}C_4$]octanesulfonate		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_4{}^{12}C_4F_{17}SO_3Na$	**MOLECULAR WEIGHT:**	526.08
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.8 ± 2.4 µg/ml (MPFOS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2,3,4\text{-}^{13}C_4$)
LAST TESTED: (mm/dd/yyyy)	08/03/2016		
EXPIRY DATE: (mm/dd/yyyy)	08/03/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.8% Sodium perfluoro-1-[1,2,3-$^{13}C_3$]heptanesulfonate.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 08/05/2016 (mm/dd/yyyy)

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

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:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA

ANAB ACCREDITED

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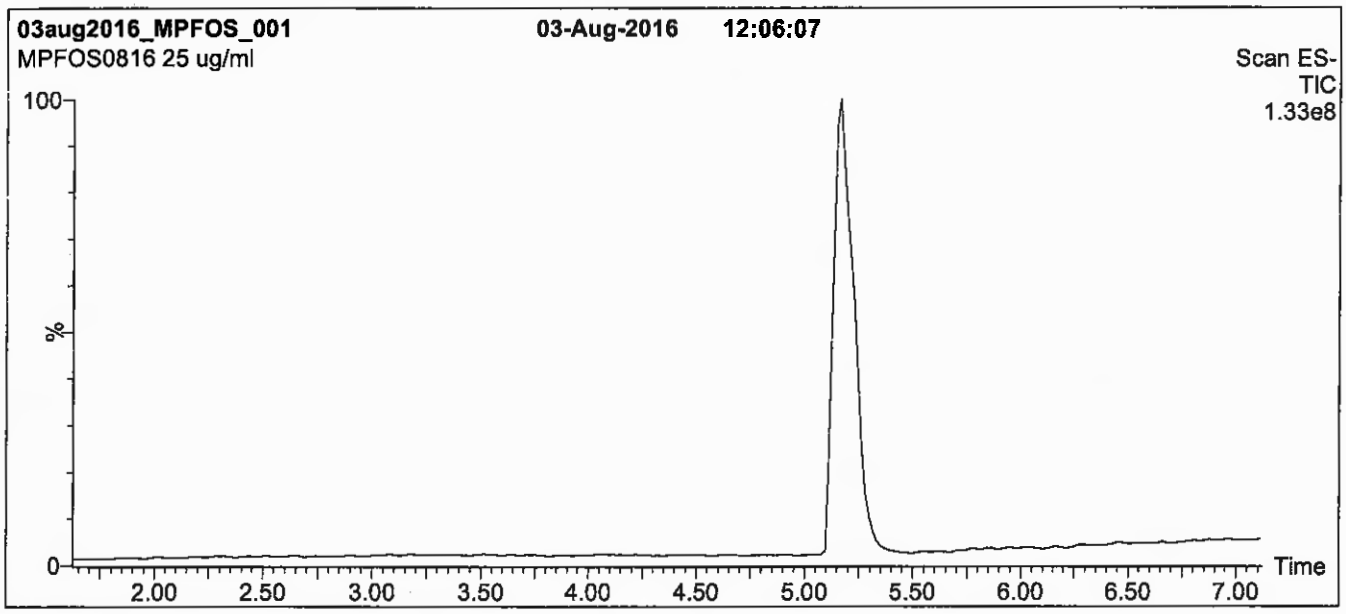
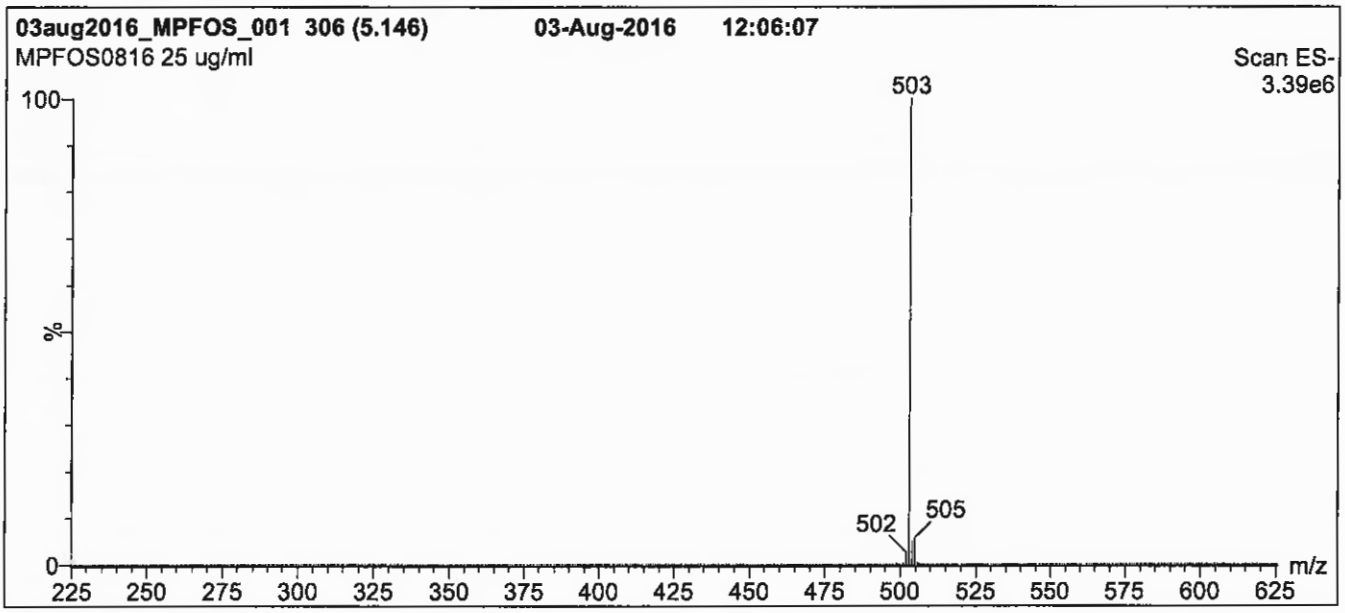
Figure 1: **MPFOS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 45% (80:20 MeOH:ACN) / 55% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

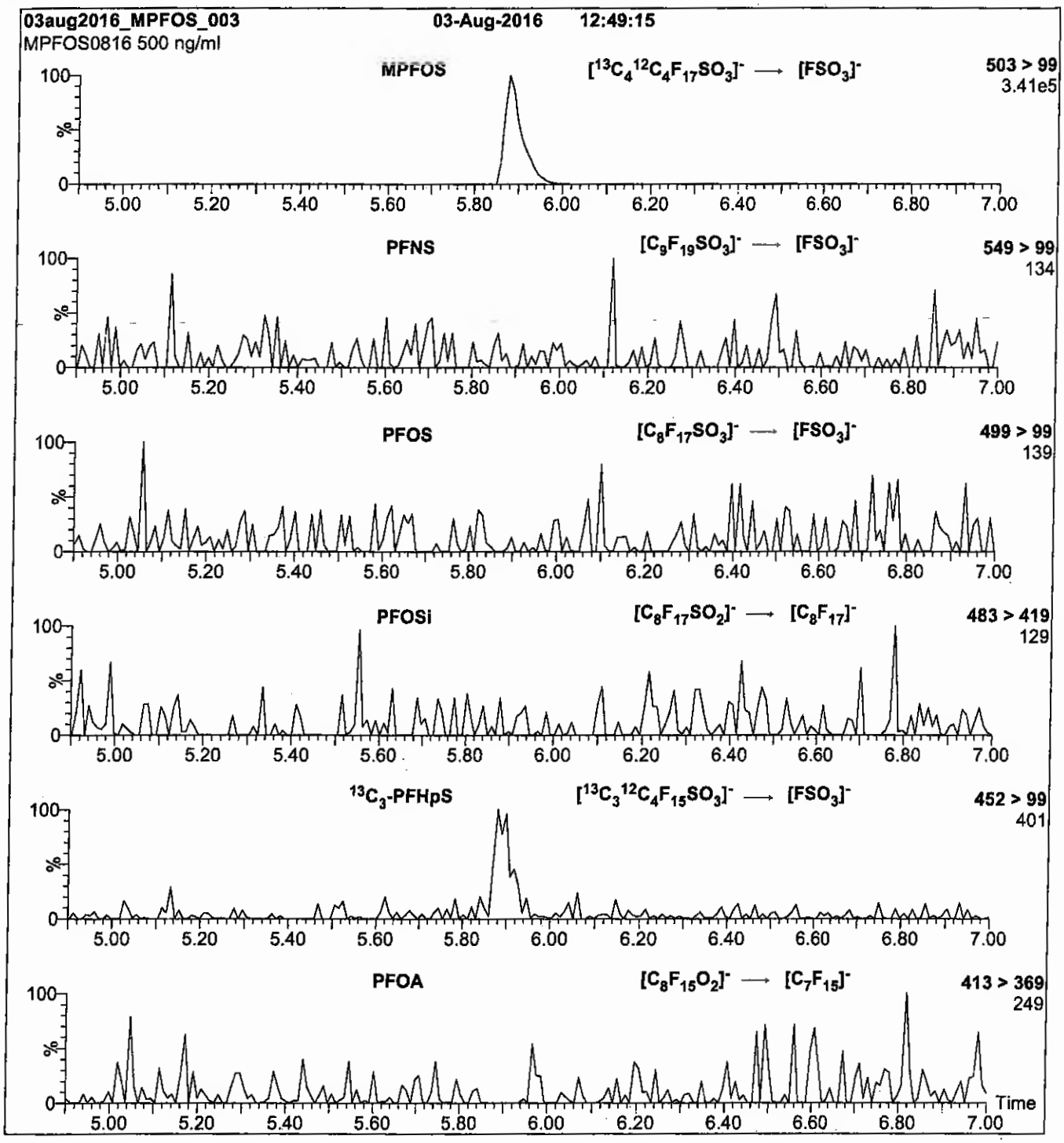
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 60.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCMPFUdA_00009

R: SBC 9/22/16

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

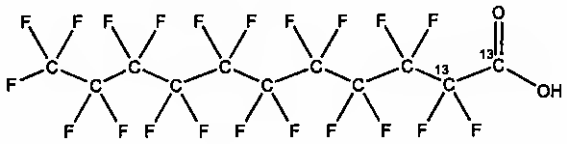
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

Scanned 10/14/16 SBC

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

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_9HF_{21}O_2$	**MOLECULAR WEIGHT:**	566.08
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	02/12/2016		
EXPIRY DATE: (mm/dd/yyyy)	02/12/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Presence of 1-$^{13}C_1$-PFUdA (~1%; see Figure 2), 2-$^{13}C_1$-PFUdA (~1%), and PFUdA (~0.2%; see Figure 2) are due to the isotopic purity of the ^{13}C-precursor.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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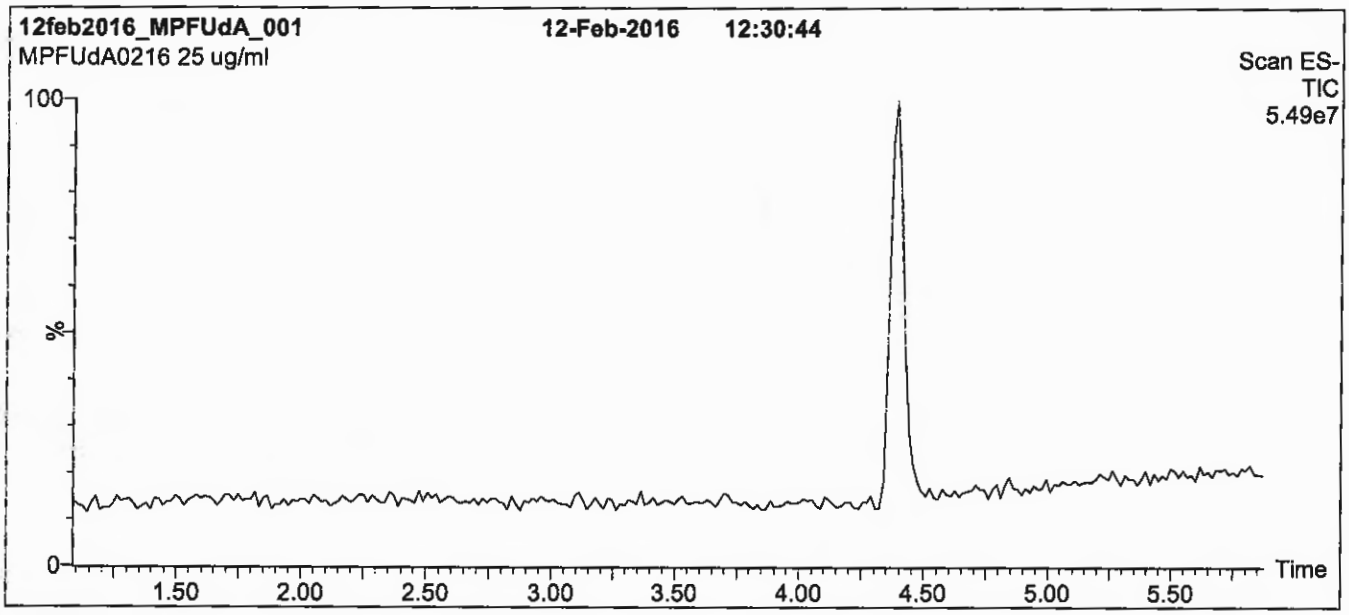
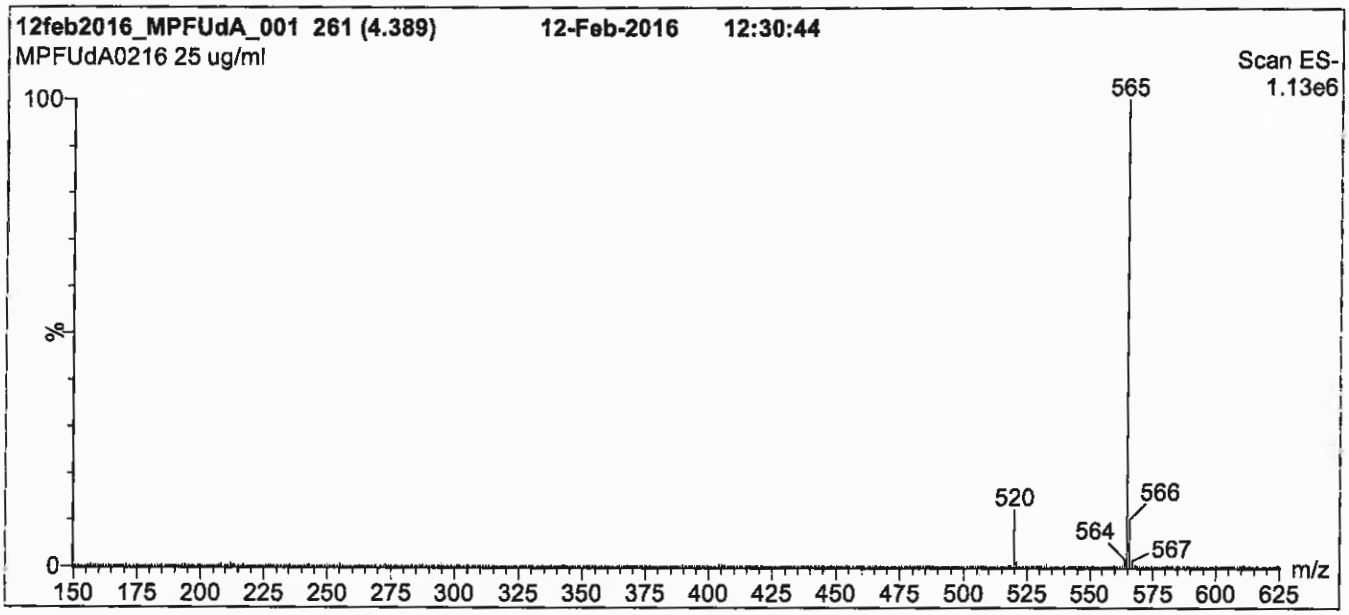
Figure 1: **MPFUdA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

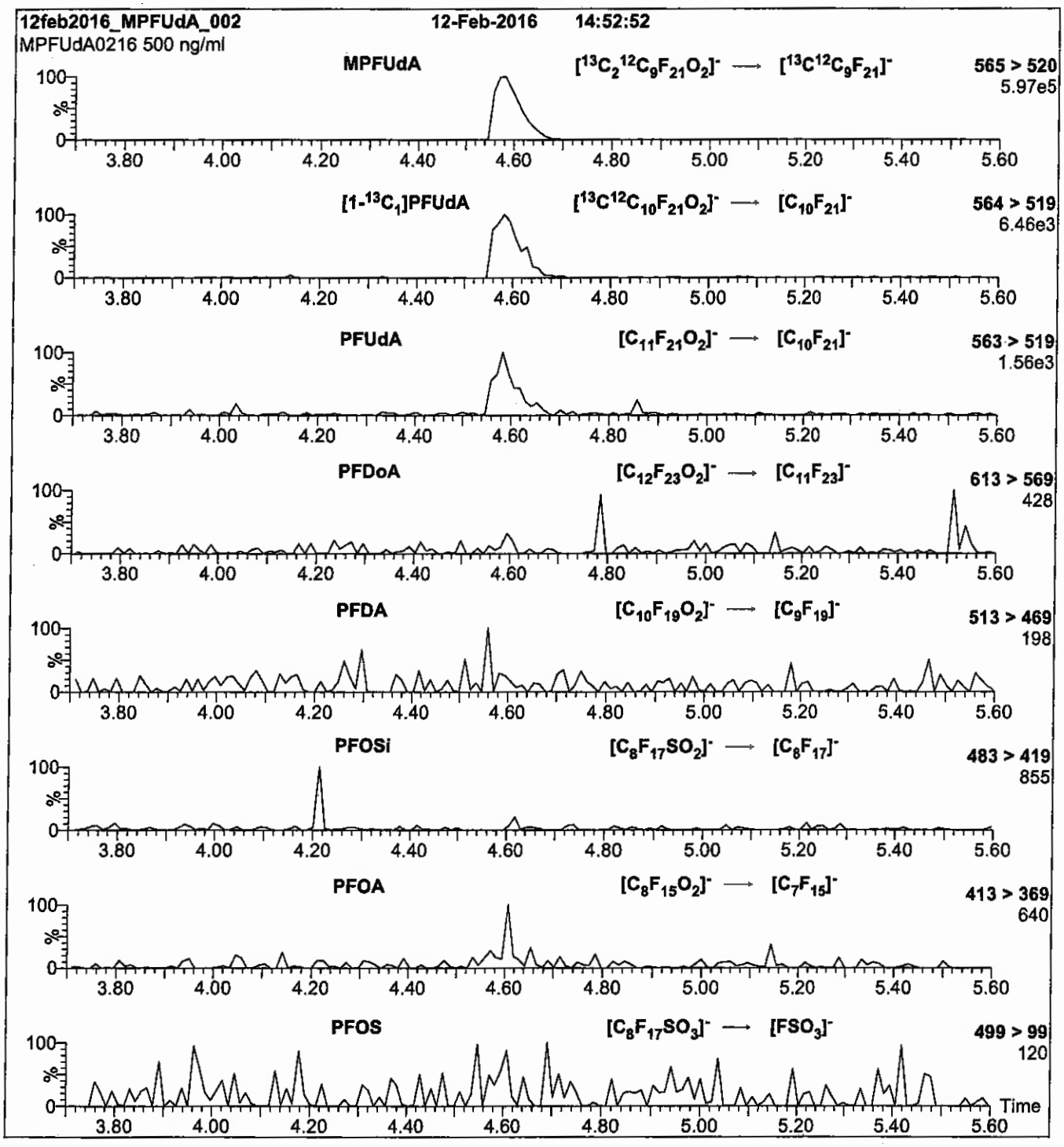
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 65
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

Mobile phase: Isocratic 80% MeOH / 20% H_2O

Flow: 300 µl/min

MS Parameters

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

Reagent

LCN-EtFOSA-M_00002

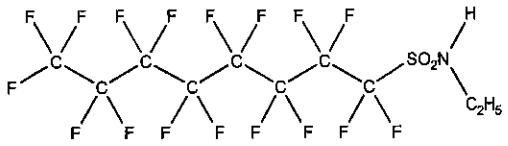
P: 7/16/15 SW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

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

STRUCTURE:
CAS #: 4151-50-2



MOLECULAR FORMULA:	$C_{10}H_6F_{17}NO_2S$	**MOLECULAR WEIGHT:**	527.20
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	07/14/2014		
EXPIRY DATE: (mm/dd/yyyy)	07/14/2019		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 04/01/2015 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

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HOMOGENEITY:

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UNCERTAINTY:

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

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

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

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

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

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

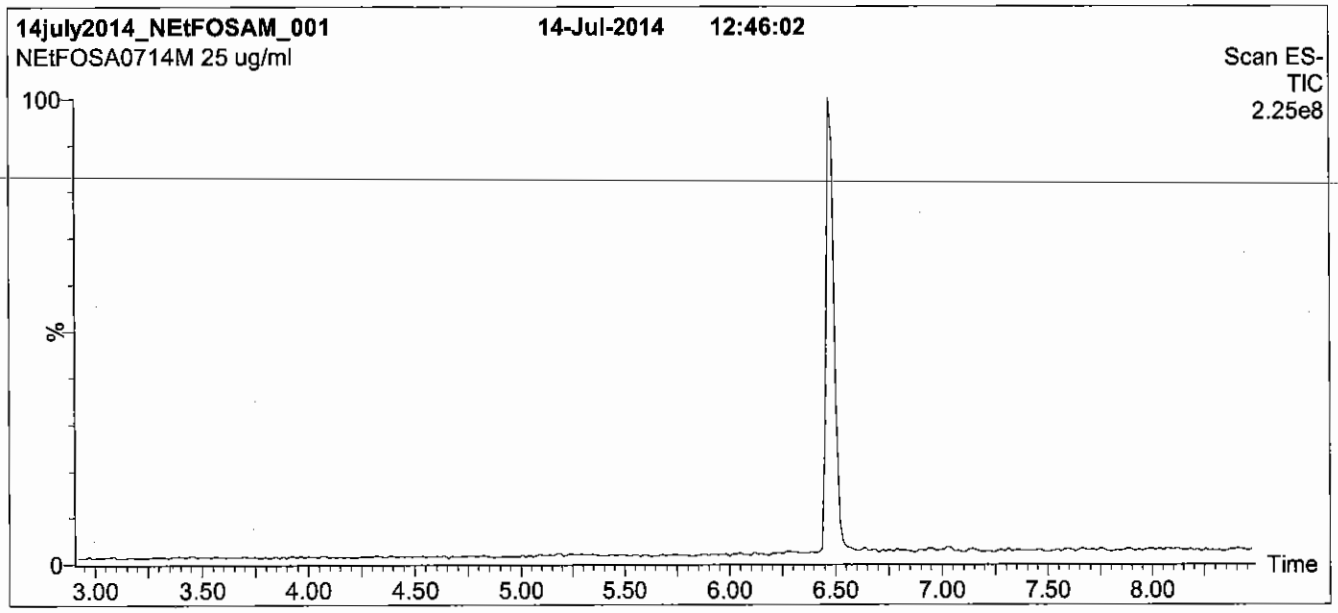
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

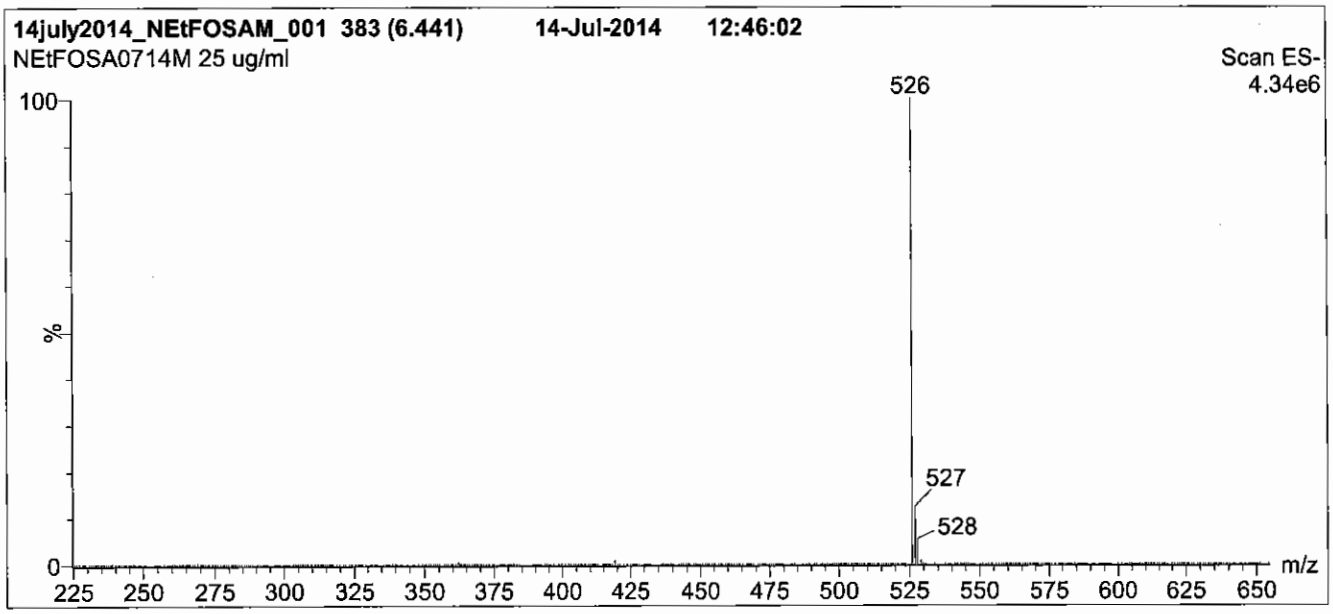
CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

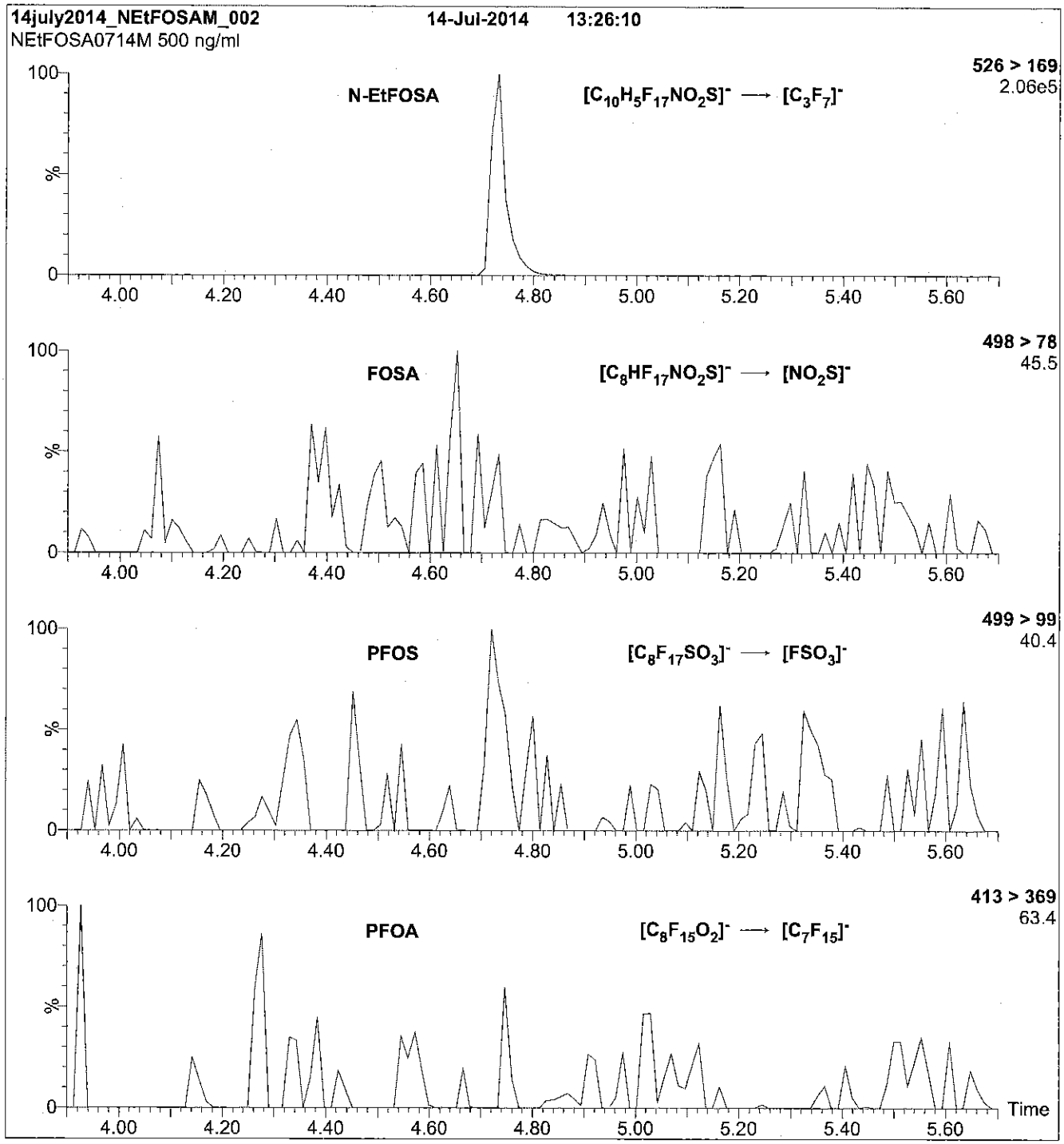
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 950 amu)

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

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



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml N-EtFOSA-M)	**MS Parameters**	
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.50e-3 Collision Energy (eV) = 30	
Flow:	300 µl/min		

Reagent

LCN-EtFOSA-M_00003

R: 8/23/16 SBC

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

WELLINGTON LABORATORIES

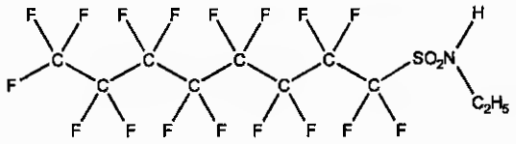
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

LOT NUMBER: NEtFOSA0516M

STRUCTURE:

CAS #: 4151-50-2



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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 05/27/2016 (mm/dd/yyyy)

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

INTENDED USE:

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EXPIRY DATE / PERIOD OF VALIDITY:

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QUALITY MANAGEMENT:

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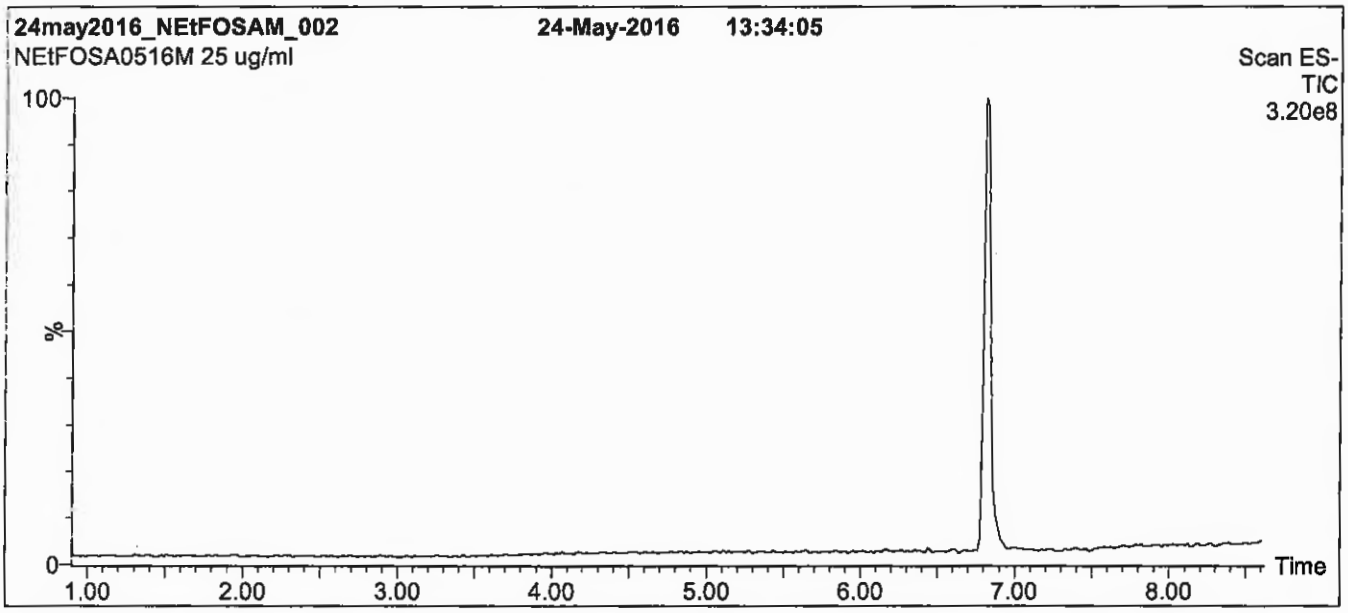
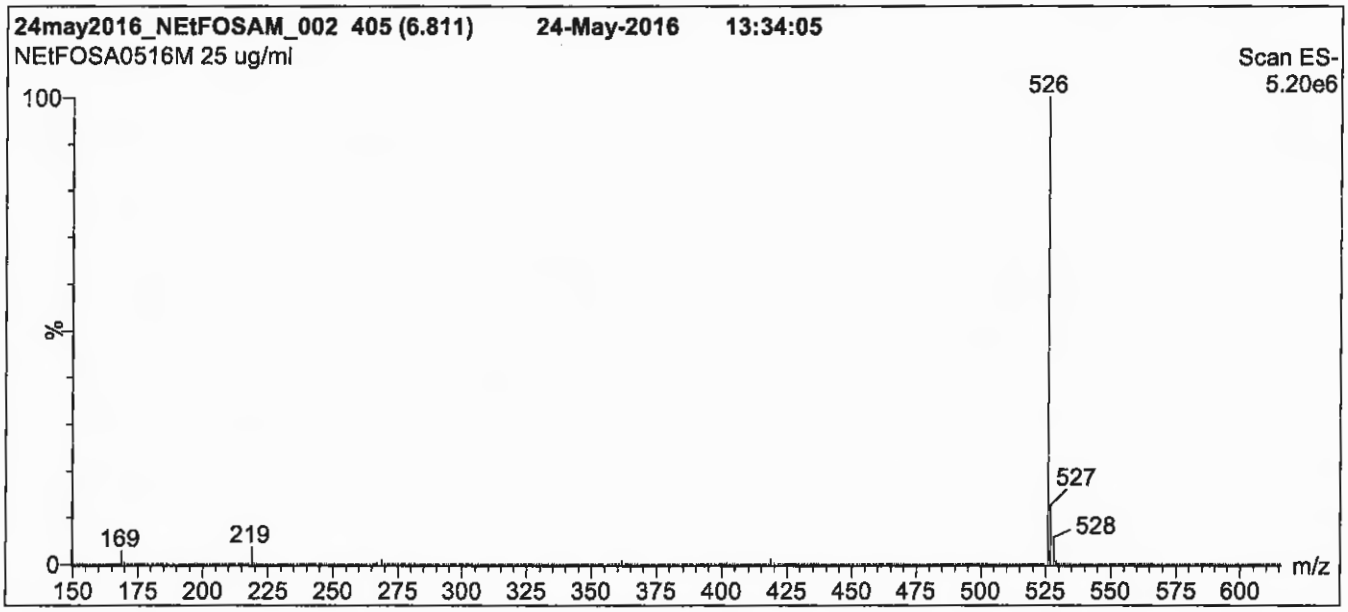
Figure 1: **N-EtFOSA-M; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 45% H_2O / 55% (80:20 MeOH:ACN)
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

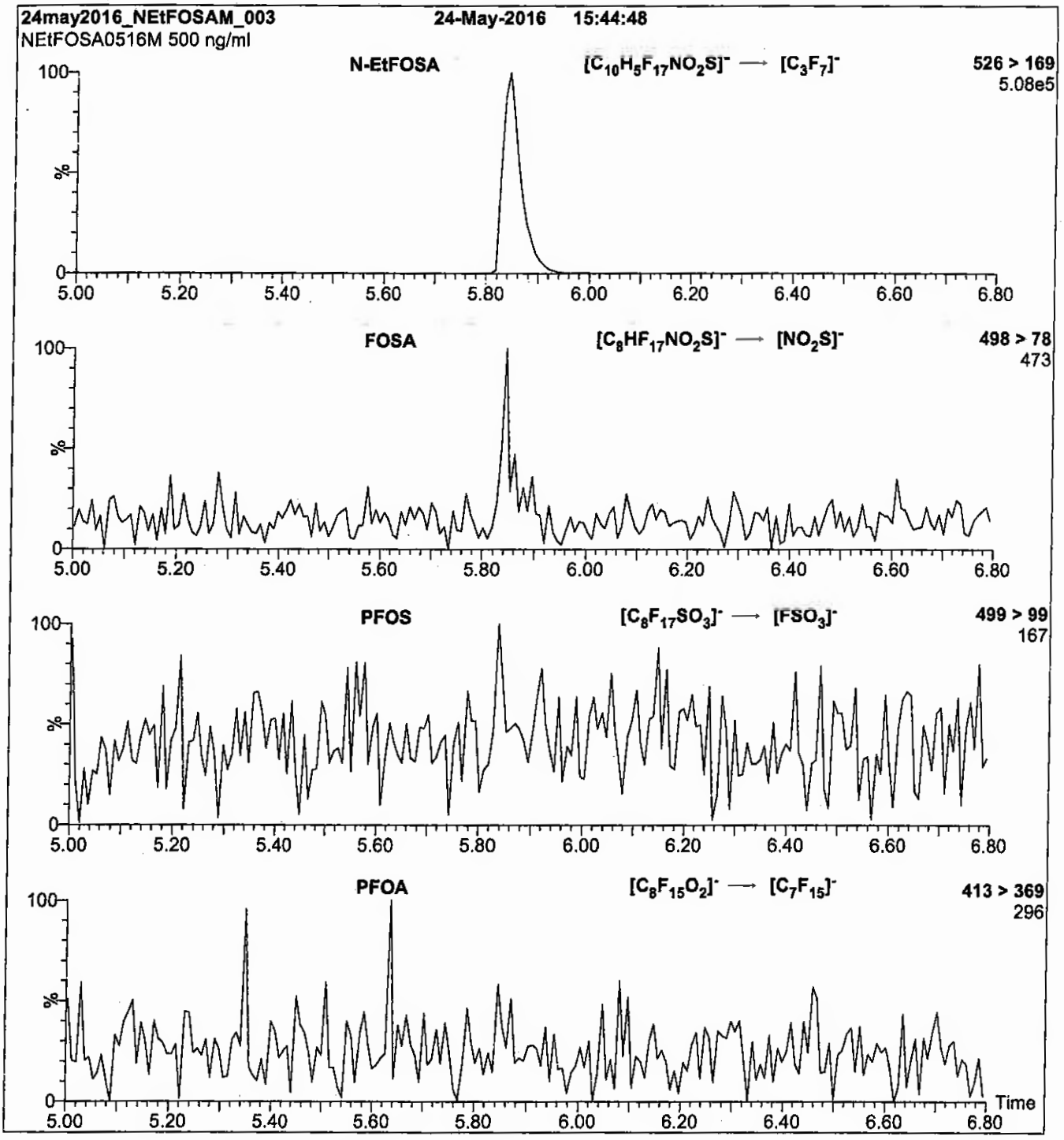
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCN-EtFOSAA_00001

N: 7/11/15 SKV

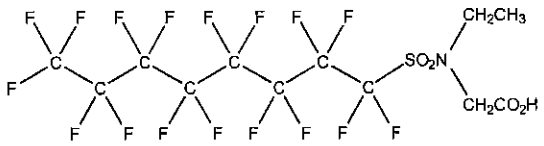
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

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

COMPOUND: N-ethylperfluoro-1-octanesulfonamidoacetic acid

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



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

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

CHEMICAL PURITY: >98%

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

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

RECOMMENDED STORAGE: Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 04/06/2015 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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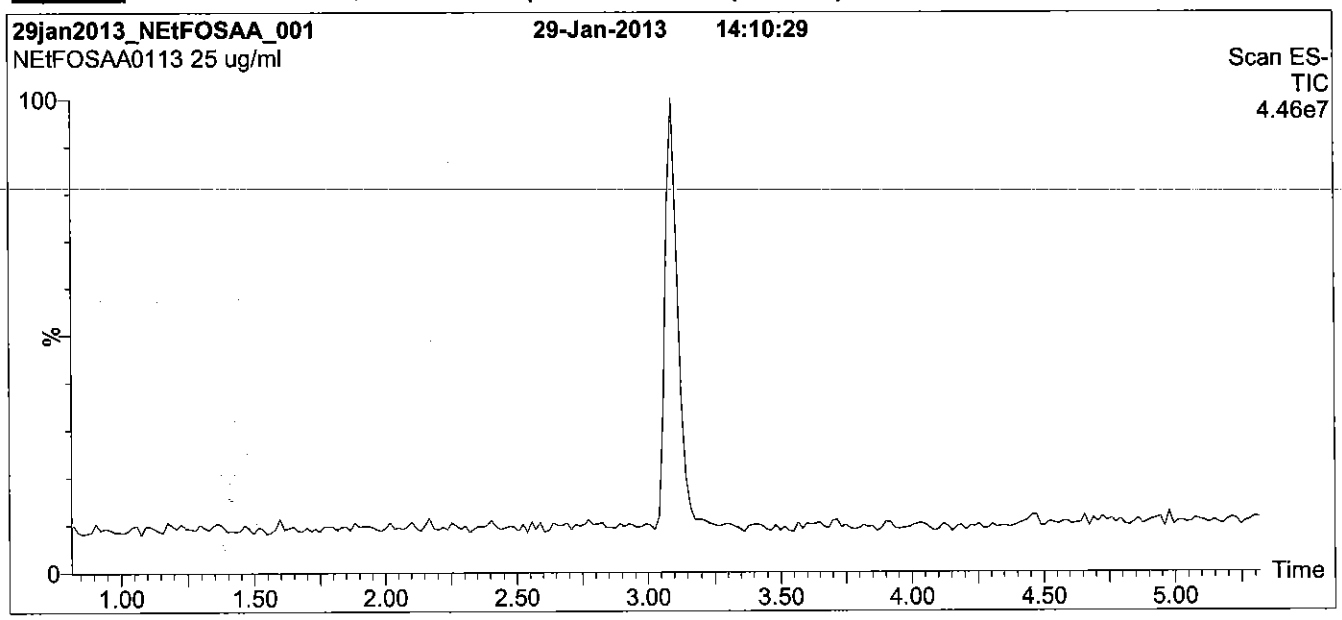
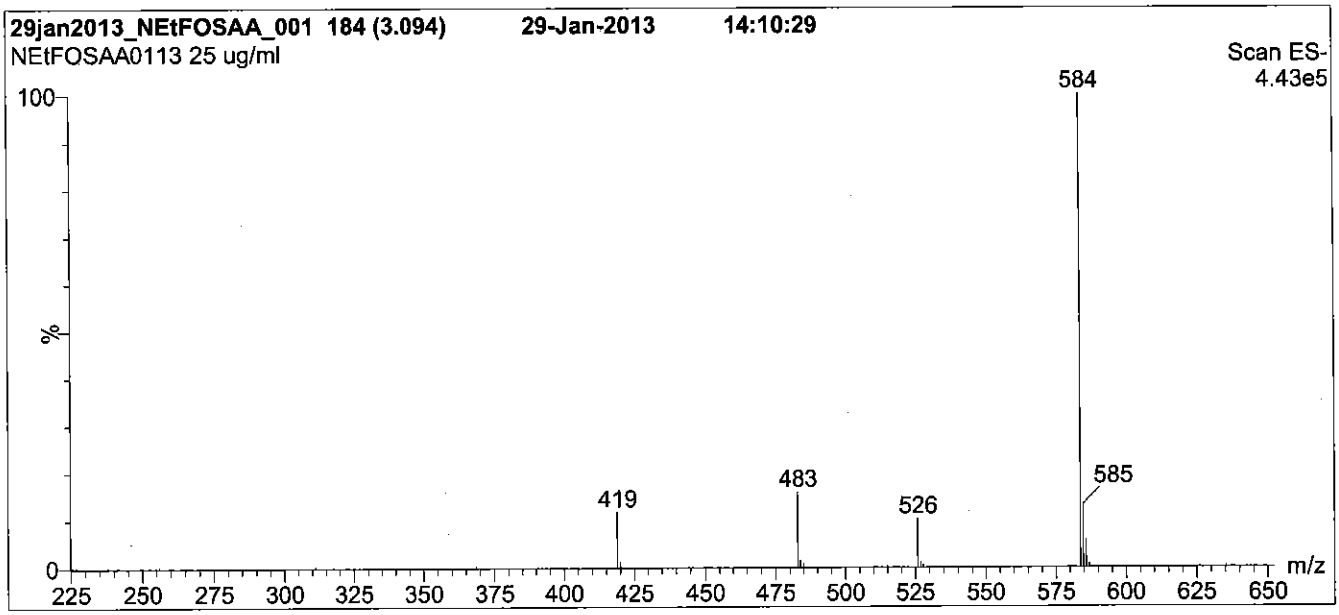
Figure 1: **N-EtFOSAA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

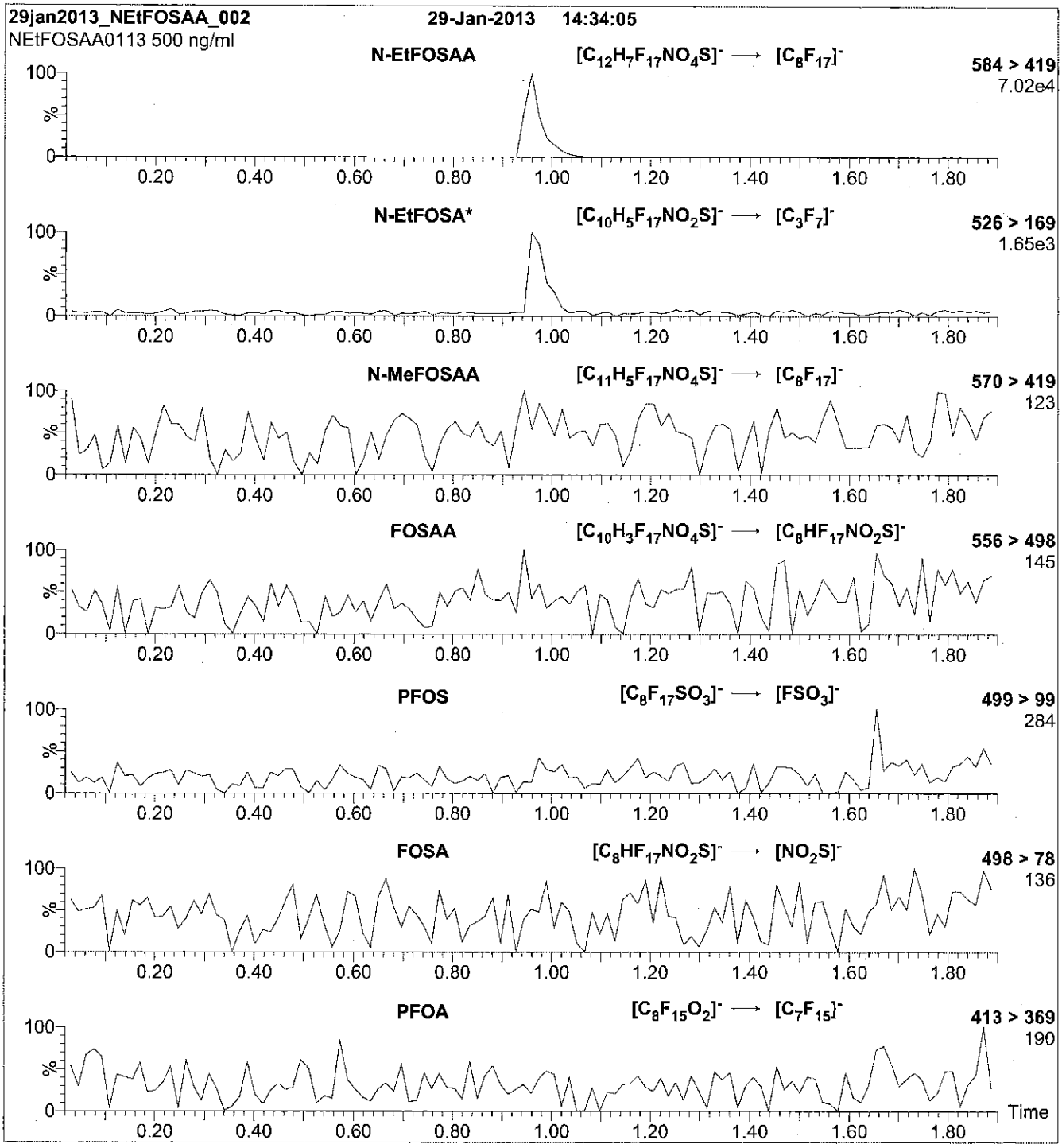
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



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

Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCN-EtFOSAA_00002

R: 8/23/16 SBC

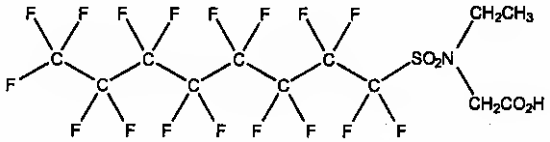
715561
ID: LCN-EtFOSAA_00002
Exp: 01/20/21 Prpd: SBC
N-EtFOSAA

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

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



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

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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

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

CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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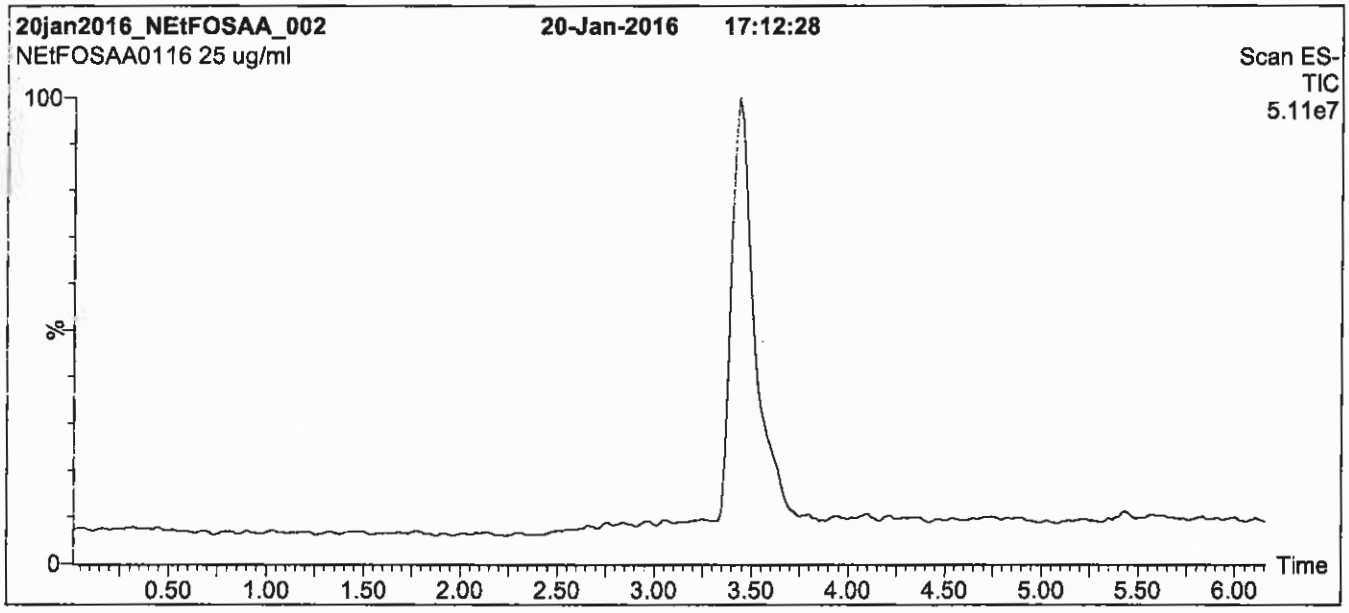
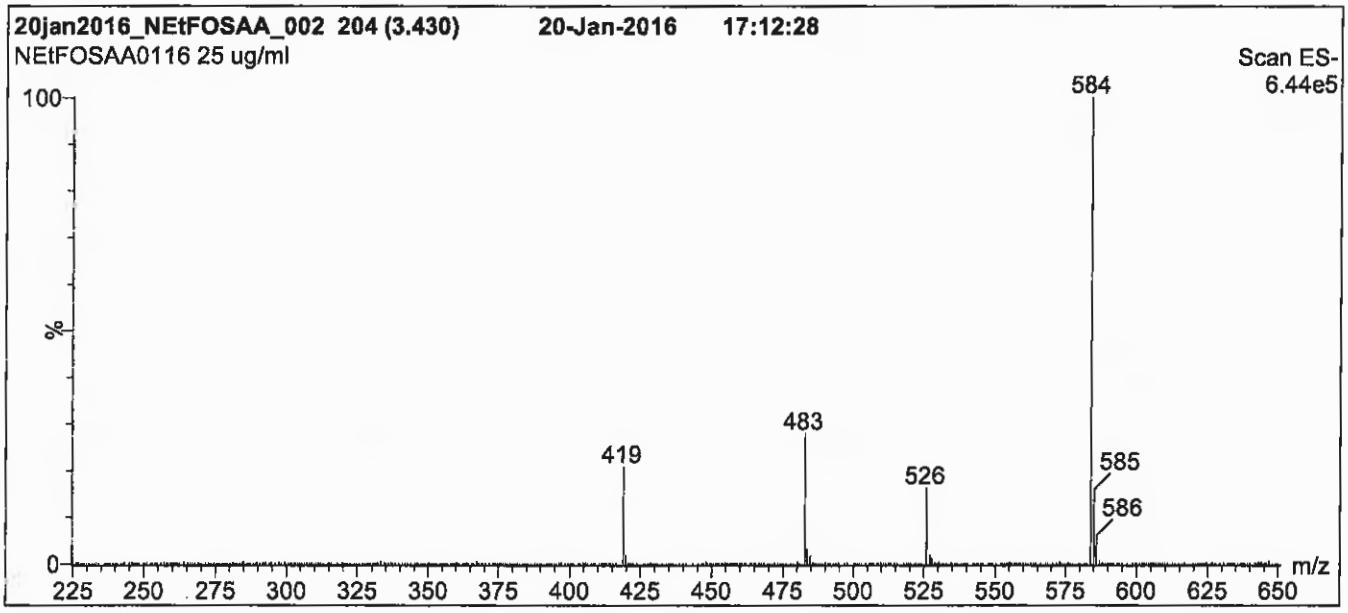
Figure 1: **N-EtFOSAA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

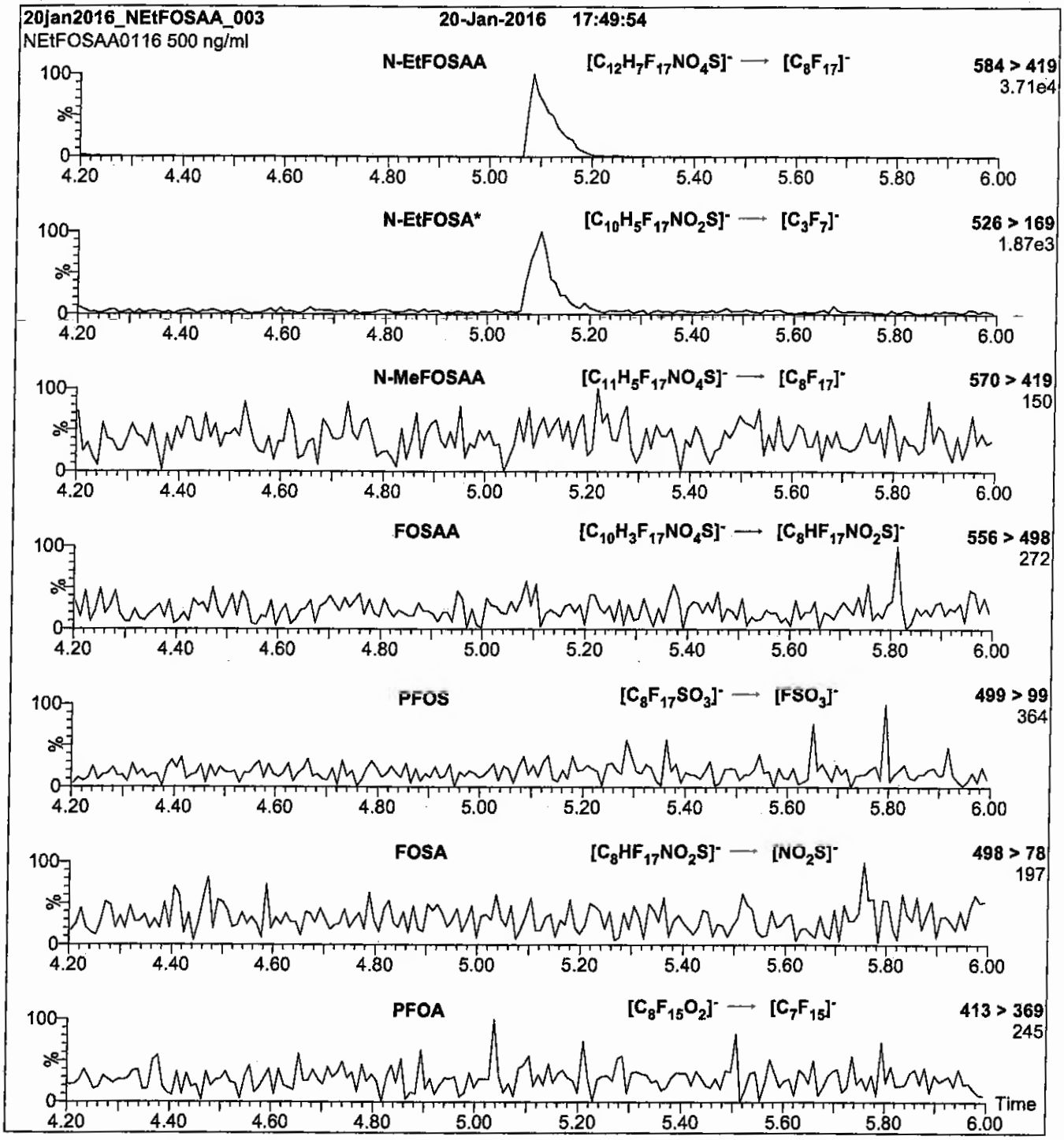
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



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

Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCN-MeFOSA-M_00001

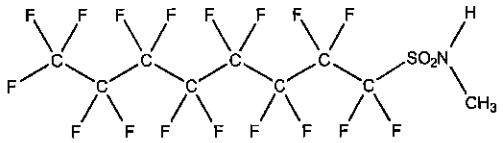
R: 7/16/15 SW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

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

STRUCTURE:
CAS #: 31506-32-8



MOLECULAR FORMULA:	$C_9H_4F_{17}NO_2S$	**MOLECULAR WEIGHT:**	513.17
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	07/15/2014		
EXPIRY DATE: (mm/dd/yyyy)	07/15/2019		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

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Certified By: B.G. Chittim **Date:** 04/01/2015 (mm/dd/yyyy)

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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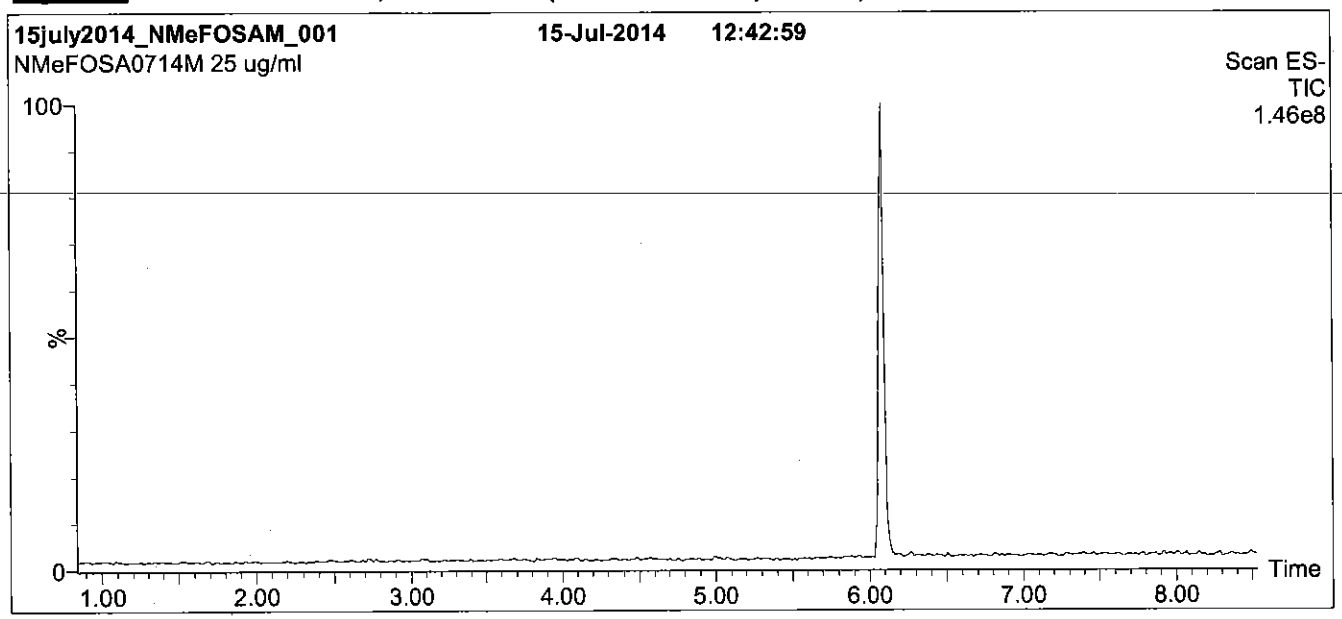
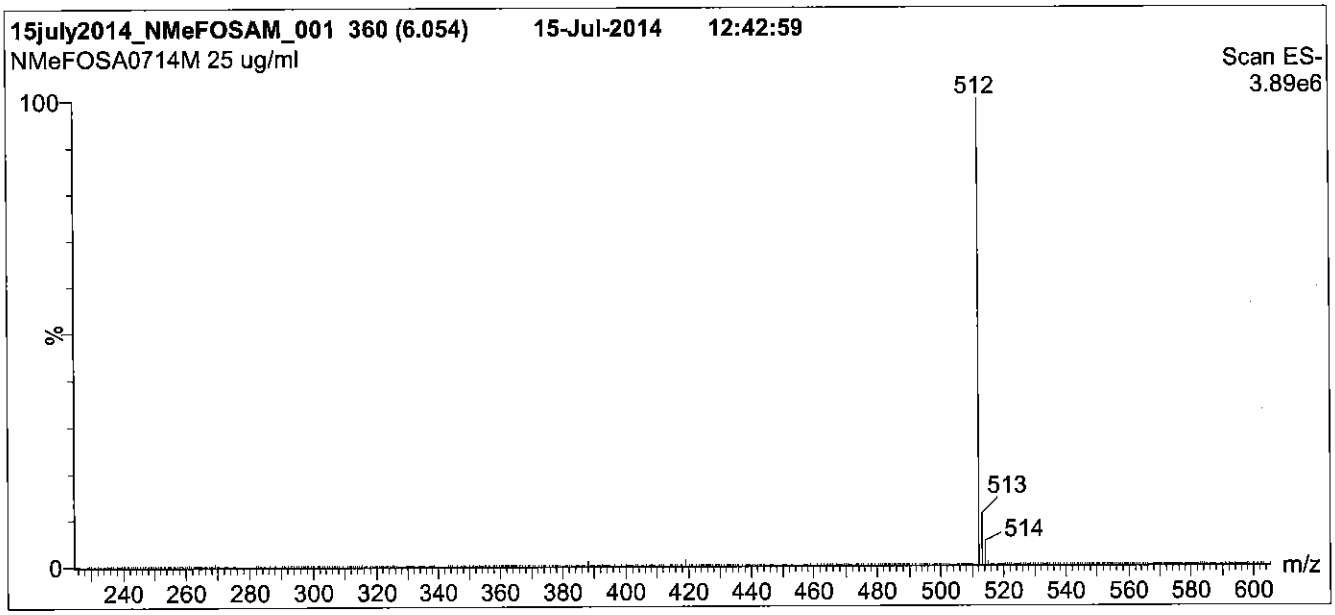
Figure 1: **N-MeFOSA-M; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

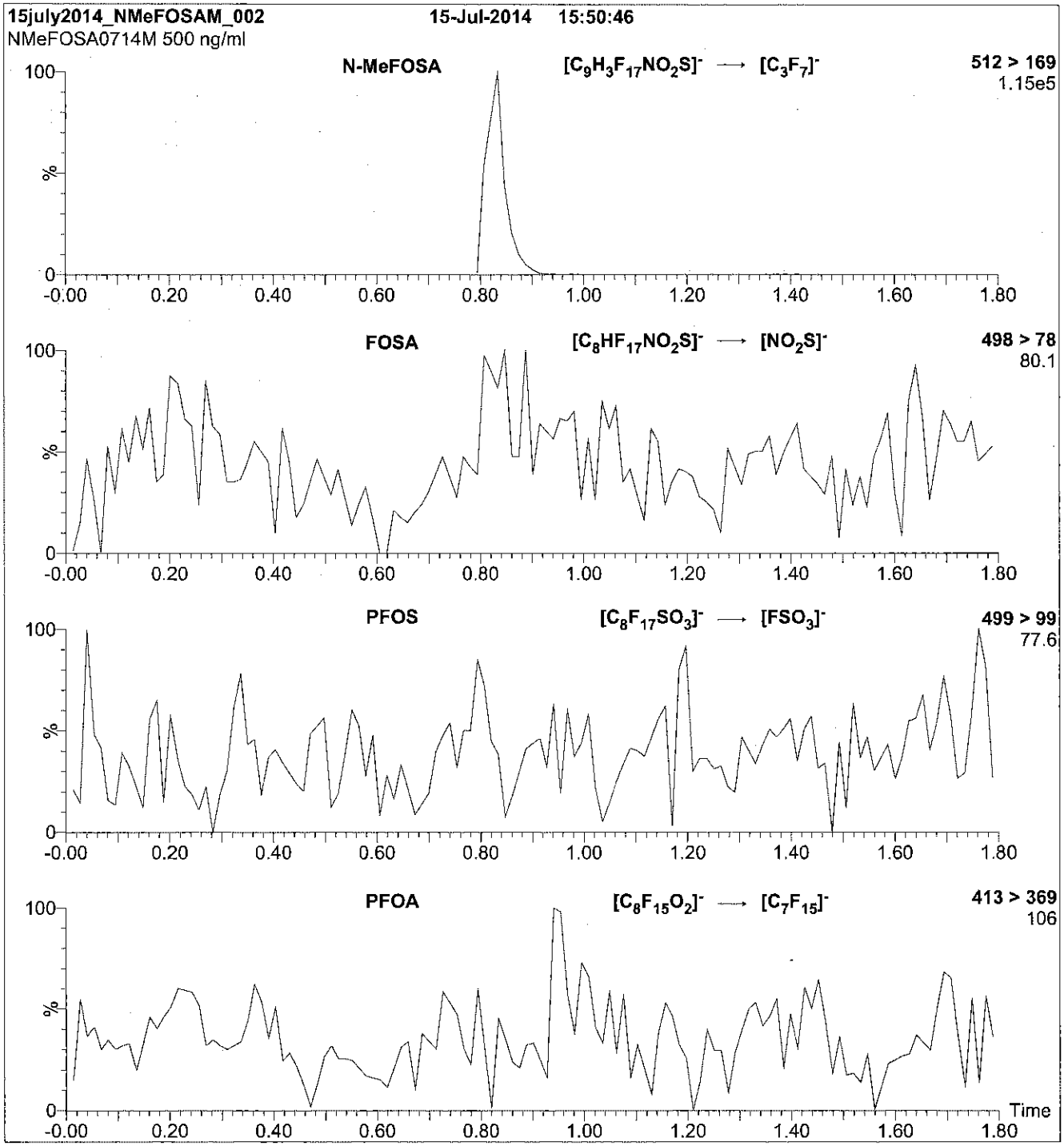
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 950 amu)

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

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



Conditions for Figure 2:

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

MS Parameters

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

Reagent

LCN-MeFOSA-M_00002

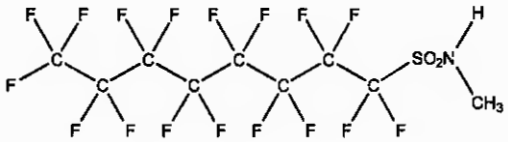
R: 8/23/16 SBC

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

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

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



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

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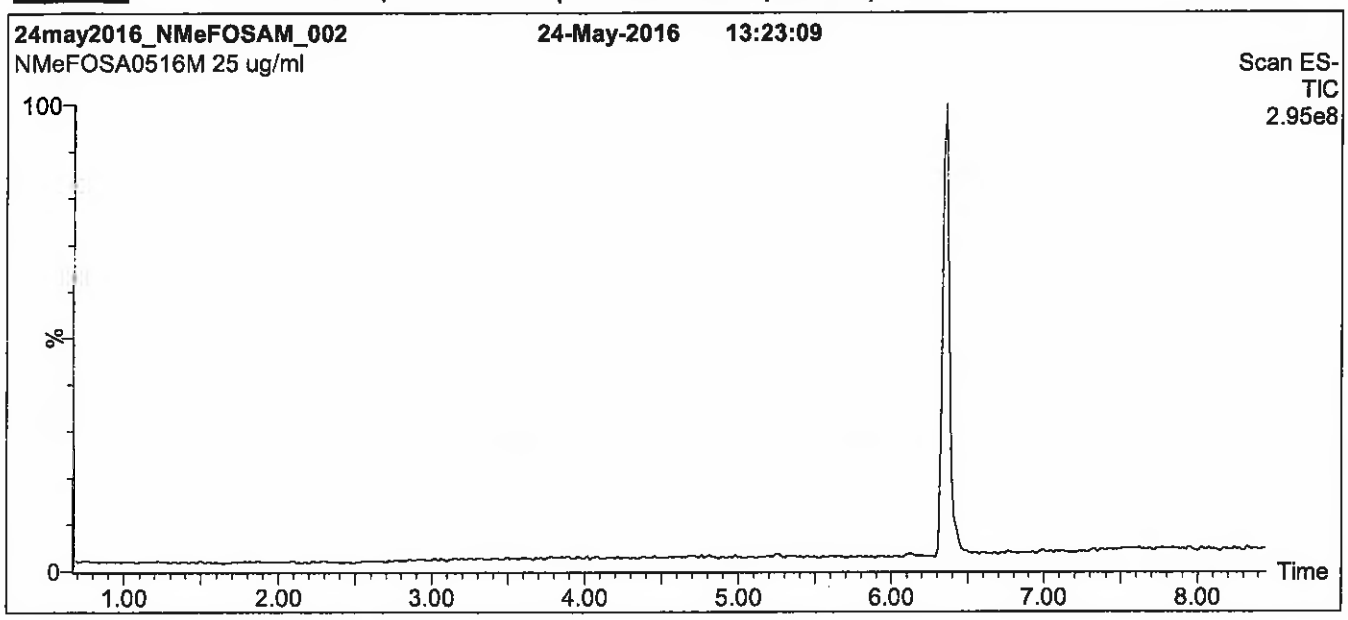
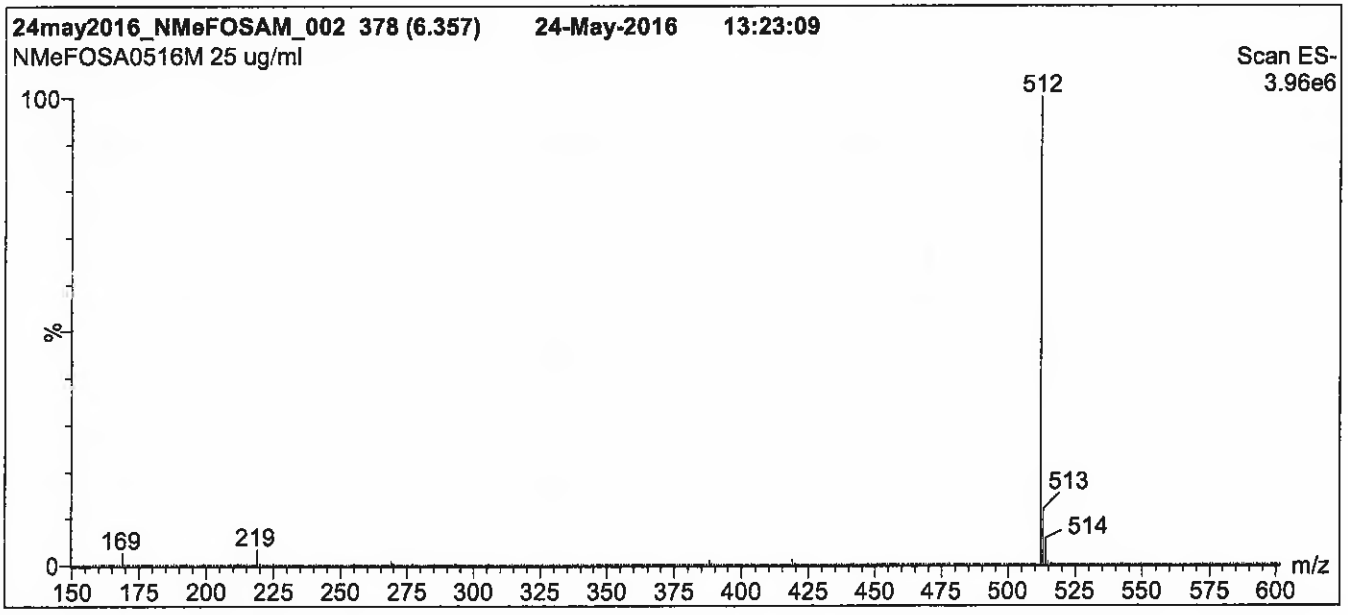
Figure 1: **N-MeFOSA-M; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 45% H_2O / 55% (80:20 MeOH:ACN)
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for
1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

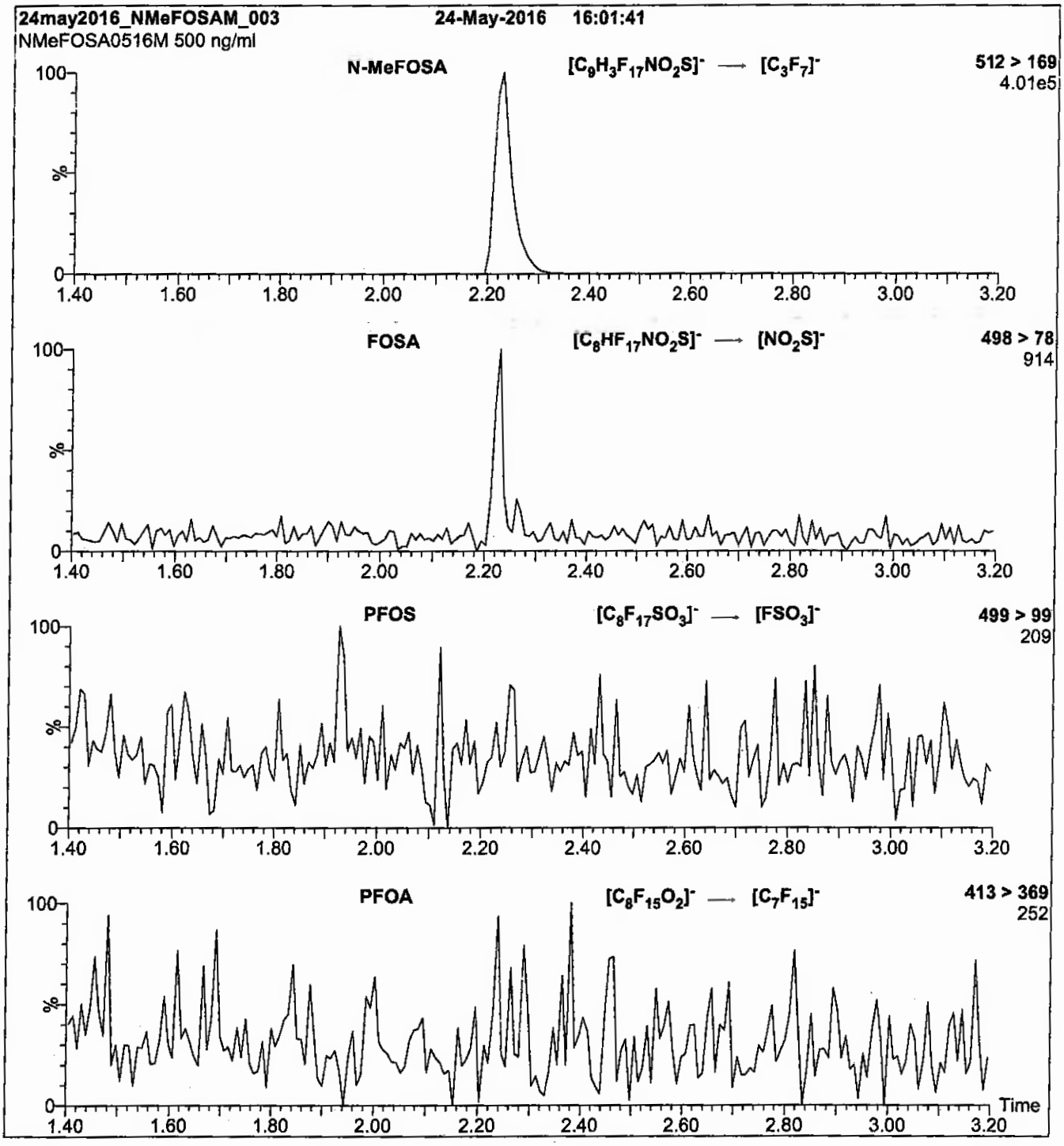
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCN-MeFOSAA_00001

R: 7/10/15 SEU

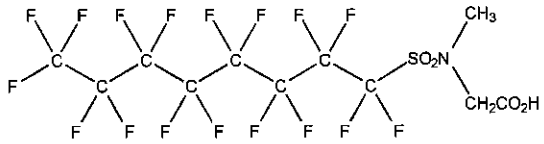
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

COMPOUND: N-methylperfluoro-1-octanesulfonamidoacetic acid

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



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

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

CHEMICAL PURITY: >98%

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

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

RECOMMENDED STORAGE: Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

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Certified By: _____ **Date:** 04/06/2015
B.G. Chittim (mm/dd/yyyy)

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

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

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

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

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

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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).

CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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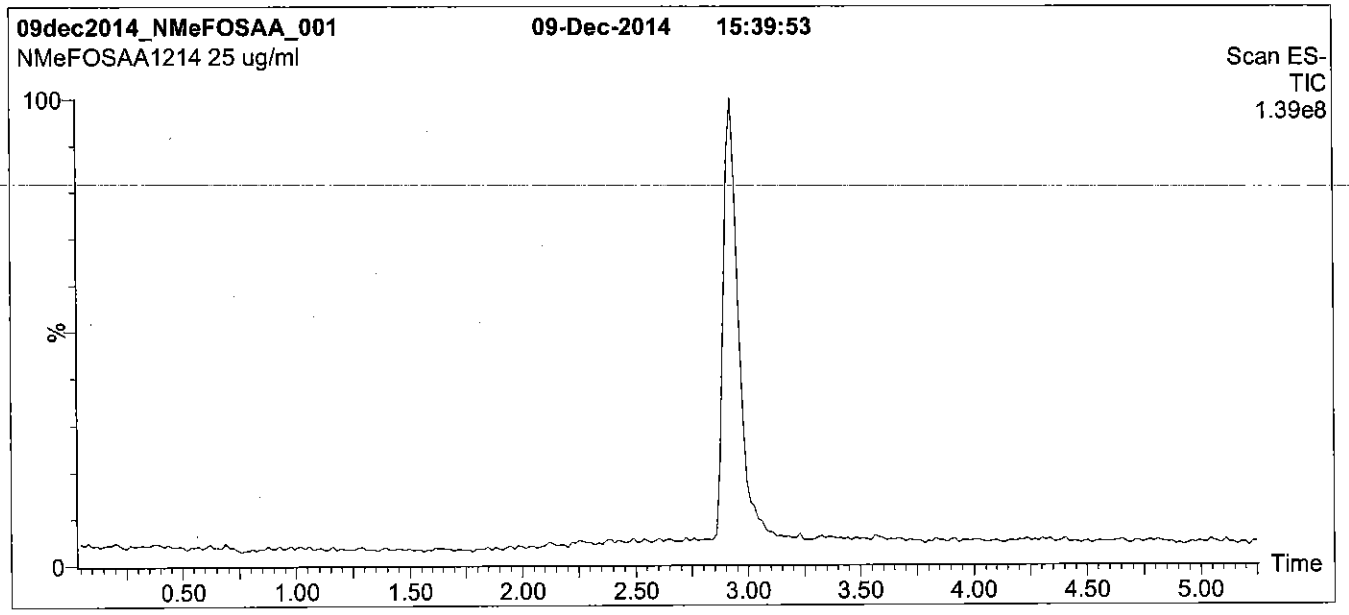
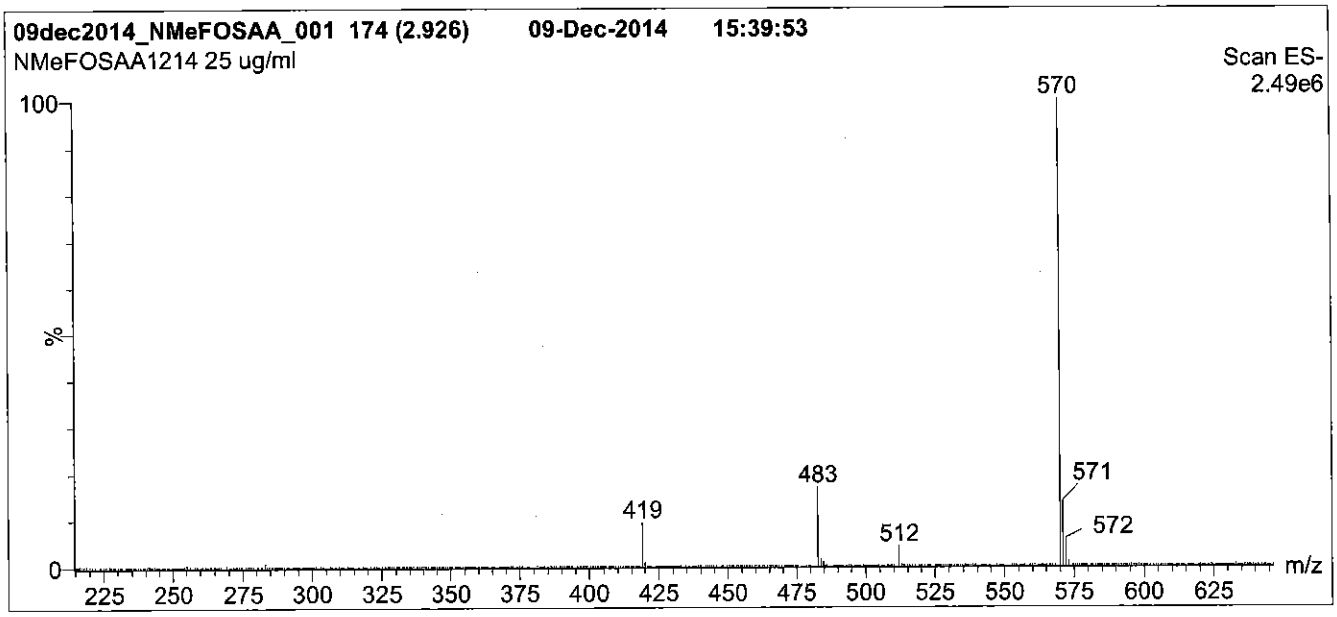
Figure 1: **N-MeFOSAA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

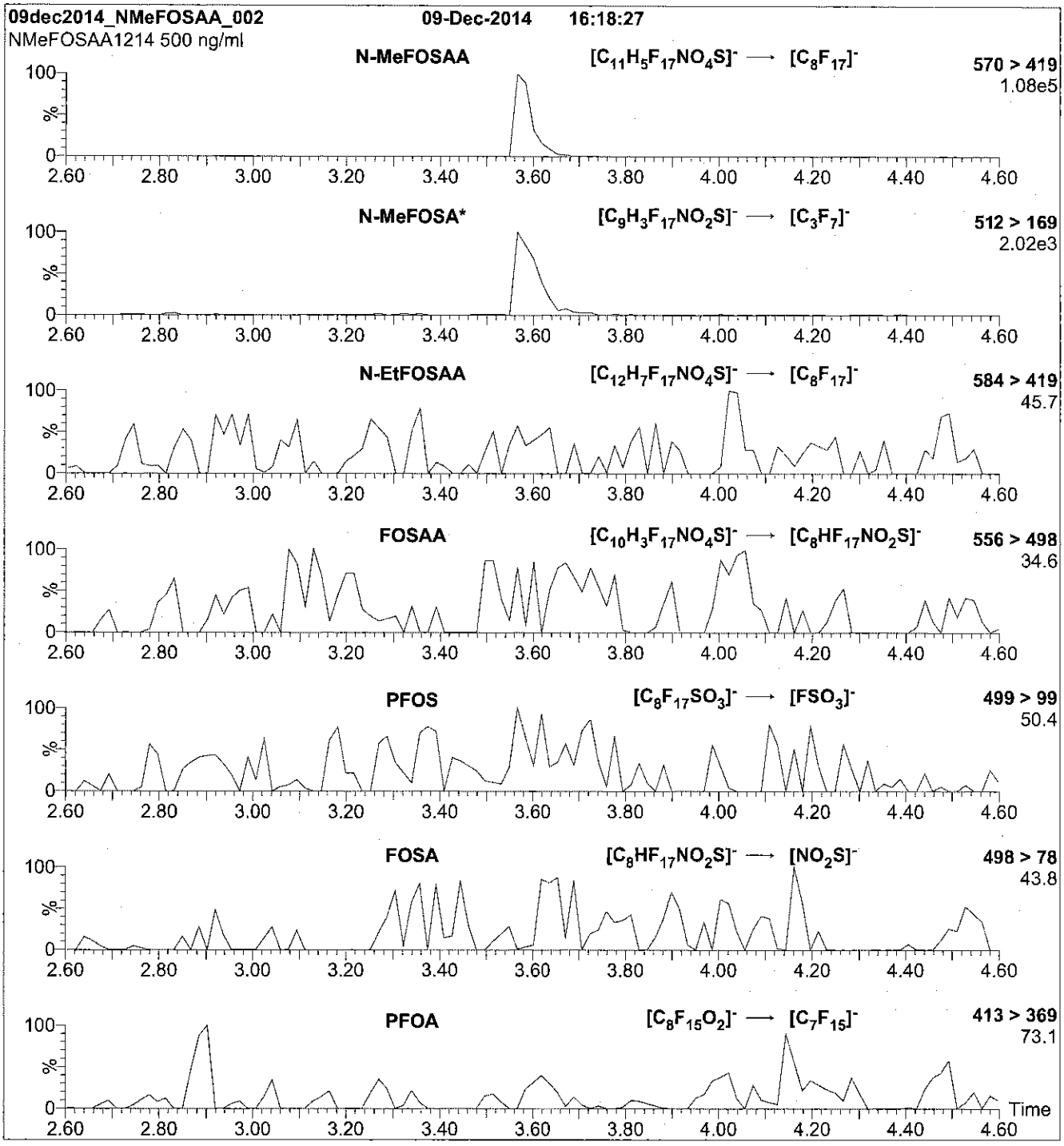
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (215 - 850 amu)

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

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



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

Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCN-MeFOSAA_00003

R: 8/23/16 SBC

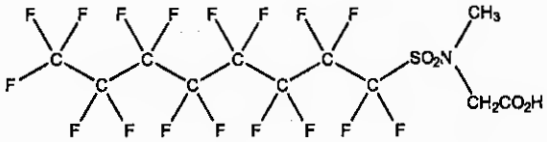
715562
ID: LCN-MeFOSAA_00003
Exp: 01/20/21 Prpd: SBC
N-MeFOSAA

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

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



MOLECULAR FORMULA: $C_{11}H_6F_{17}NO_4S$ **MOLECULAR WEIGHT:** 571.21
CONCENTRATION: 50 ± 2.5 µg/ml **SOLVENT(S):** Methanol
Water (<1%)

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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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CALA Testing

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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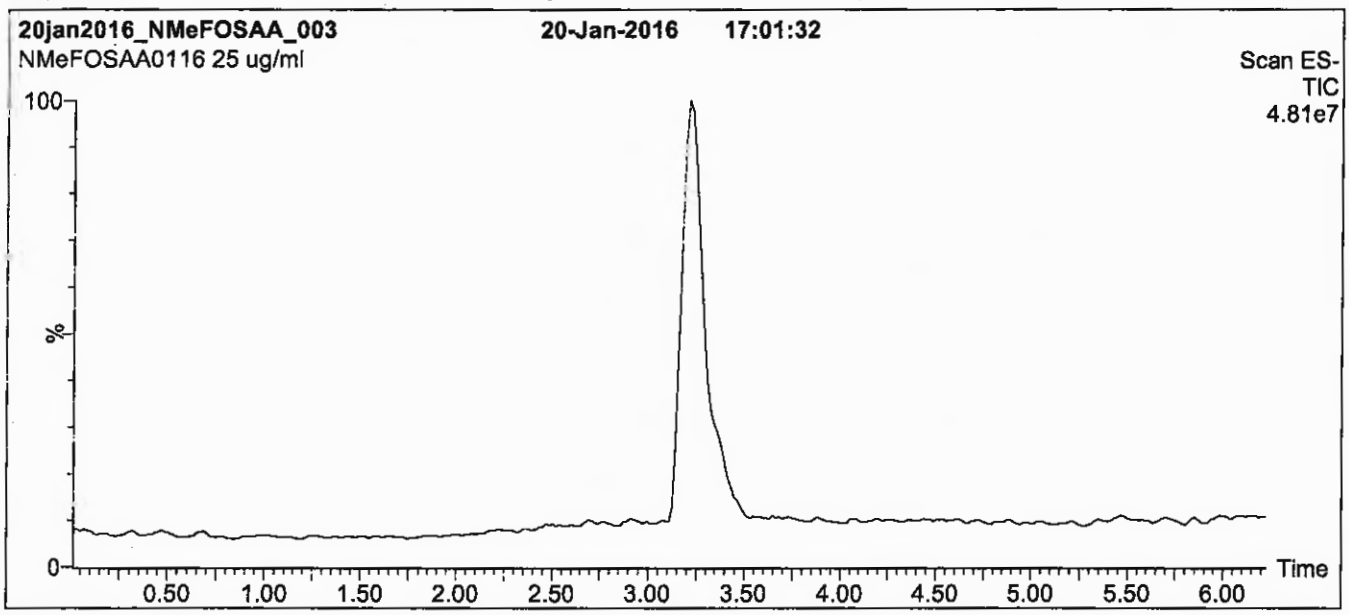
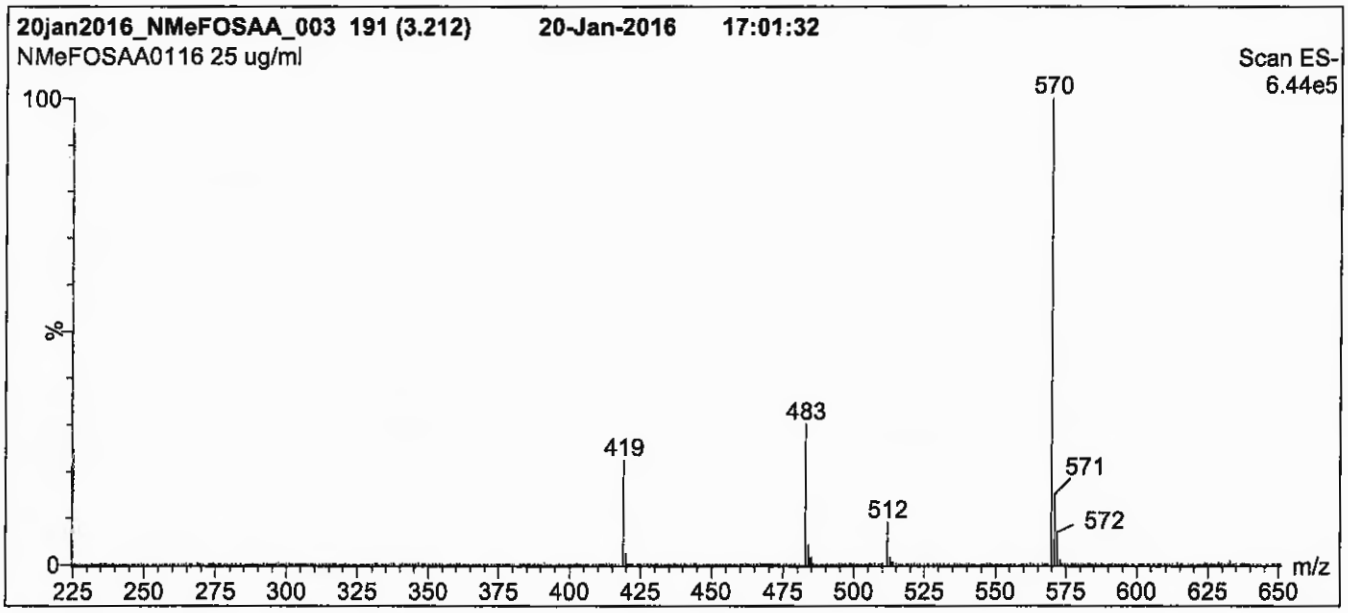
Figure 1: **N-MeFOSAA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

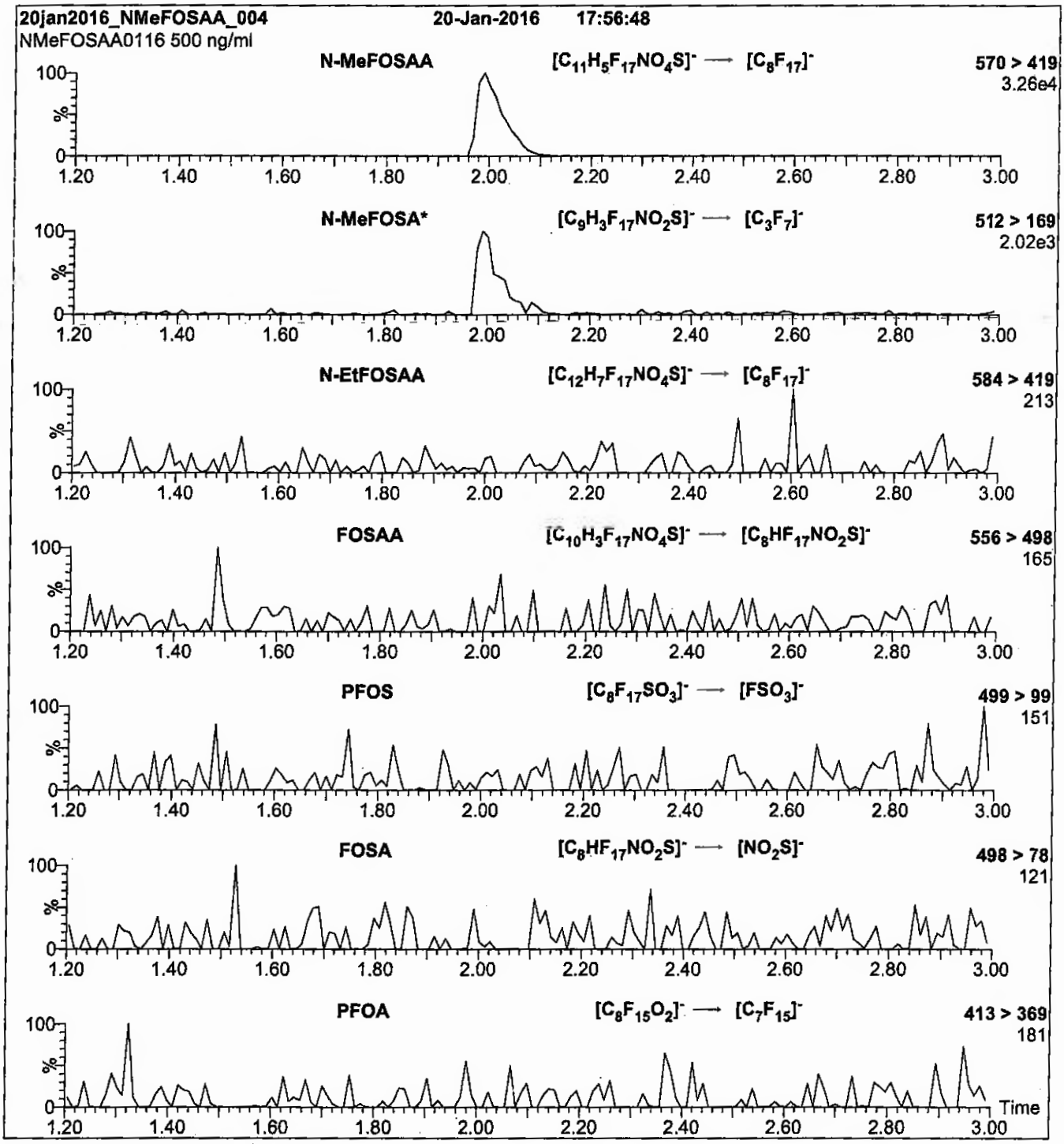
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



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

Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCPFACMXB_00007

P: 12/30/15 CW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PFAC-MXB

Solution/Mixture of Native Perfluoroalkylcarboxylic Acids and Native Perfluoroalkylsulfonates

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

DESCRIPTION:

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

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

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
Figure 1: LC/MS Data (SIR)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acids to their respective methyl esters.

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

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CALA

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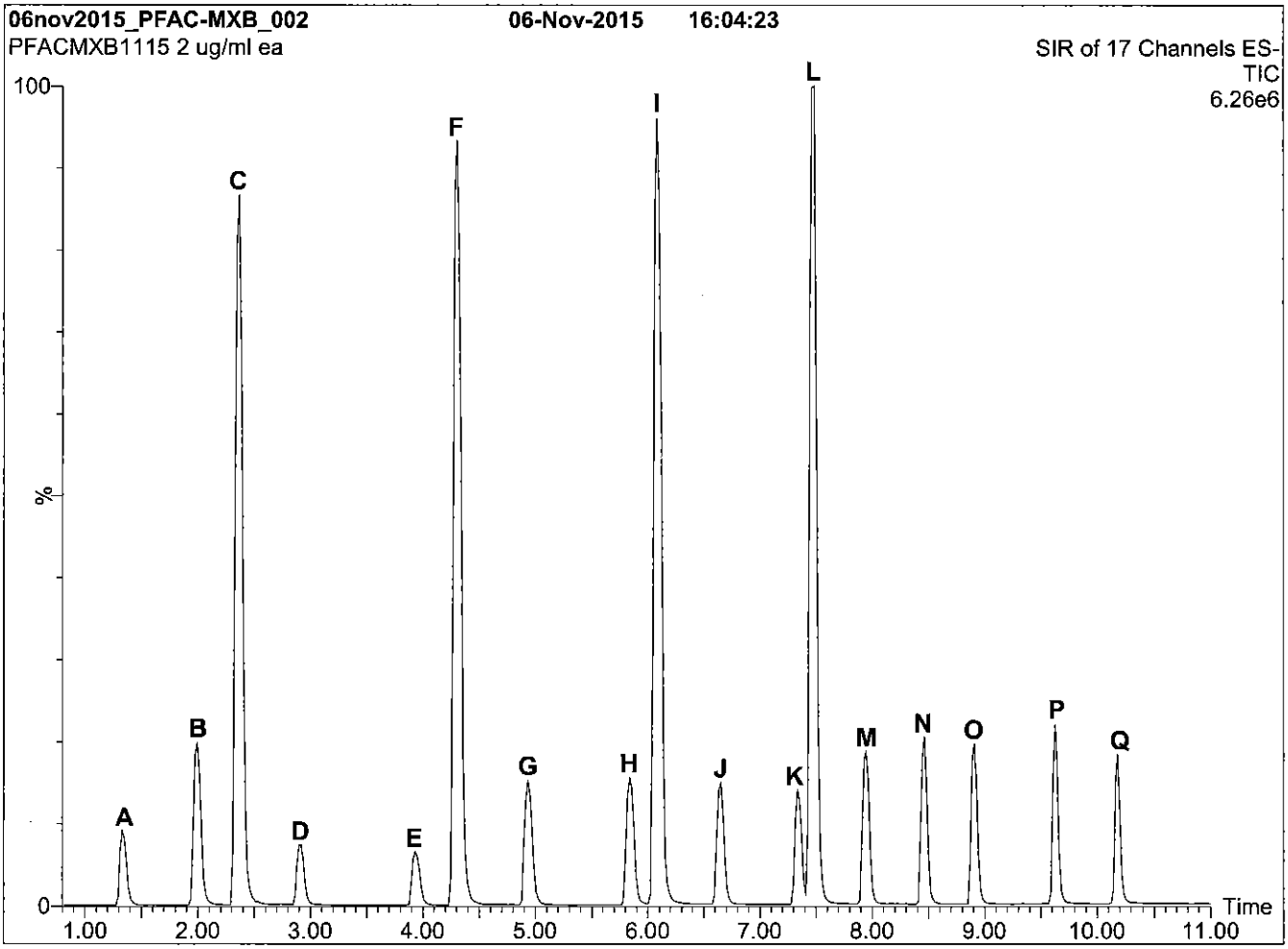
Table A: **PFAC-MXB; Components and Concentrations (ng/ml, ± 5% in Methanol / Water (<1%))**

Name	Abbreviation	Concentration (ng/ml)	Peak Assignment In Figure 1
Perfluoro-n-butanoic acid	PFBA	2000	A
Perfluoro-n-pentanoic acid	PFPeA	2000	B
Perfluoro-n-hexanoic acid	PFHxA	2000	D
Perfluoro-n-heptanoic acid	PFHpA	2000	E
Perfluoro-n-octanoic acid	PFOA	2000	G
Perfluoro-n-nonanoic acid	PFNA	2000	H
Perfluoro-n-decanoic acid	PFDA	2000	J
Perfluoro-n-undecanoic acid	PFUdA	2000	K
Perfluoro-n-dodecanoic acid	PFDoA	2000	M
Perfluoro-n-tridecanoic acid	PFTrDA	2000	N
Perfluoro-n-tetradecanoic acid	PFTeDA	2000	O
Perfluoro-n-hexadecanoic acid	PFHxDA	2000	P
Perfluoro-n-octadecanoic acid	PFODA	2000	Q

Name	Abbreviation	Concentration (ng/ml)		Peak Assignment in Figure 1
		as the salt	as the anion	
Potassium perfluoro-1-butanesulfonate	L-PFBS	2000	1770	C
Sodium perfluoro-1-hexanesulfonate	L-PFHxS	2000	1890	F
Sodium perfluoro-1-octanesulfonate	L-PFOS	2000	1910	I
Sodium perfluoro-1-decanesulfonate	L-PFDS	2000	1930	L

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

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

Time: 12 min

Flow: 300 µl/min

MS Parameters

Experiment: SIR of 17 Channels

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

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

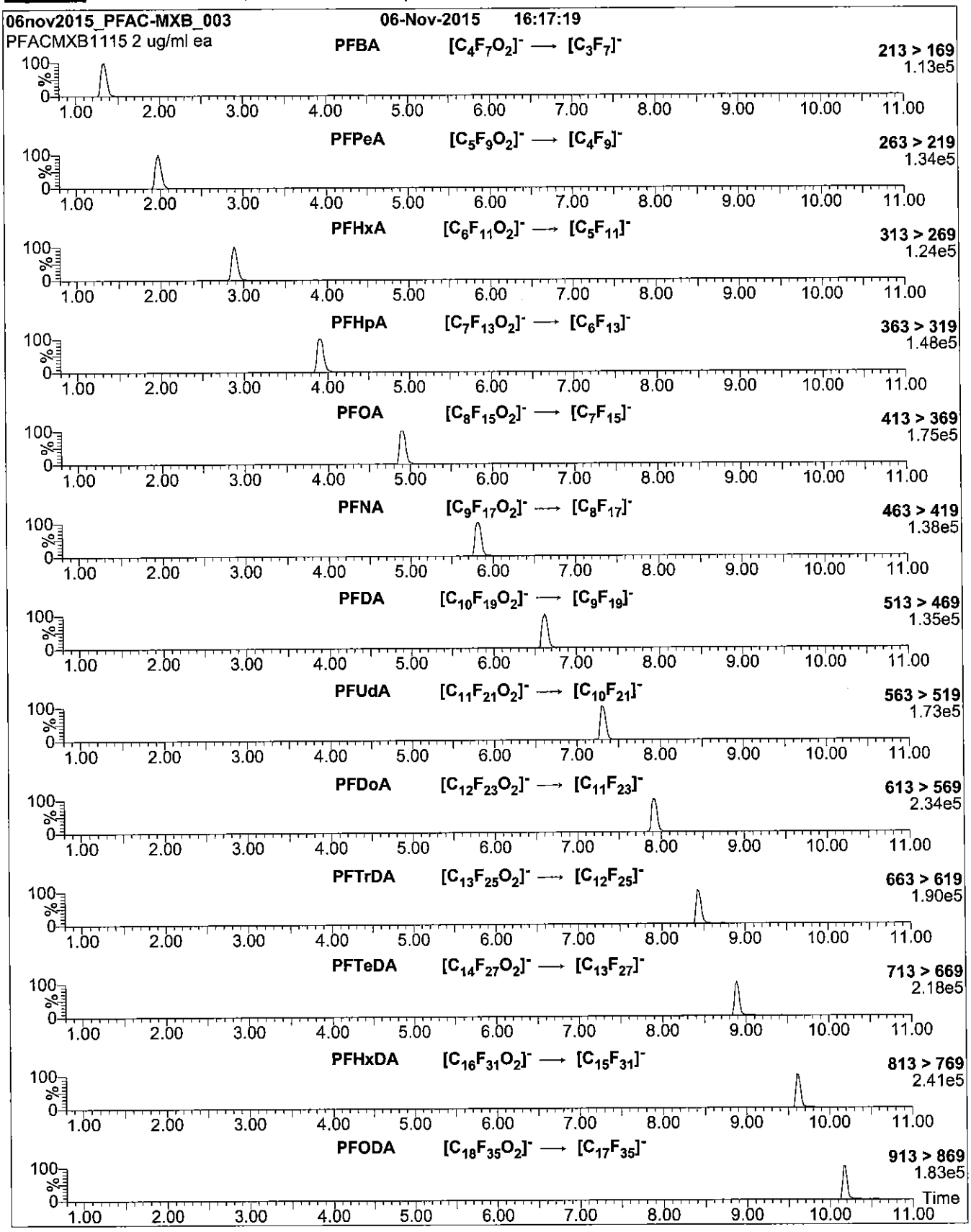
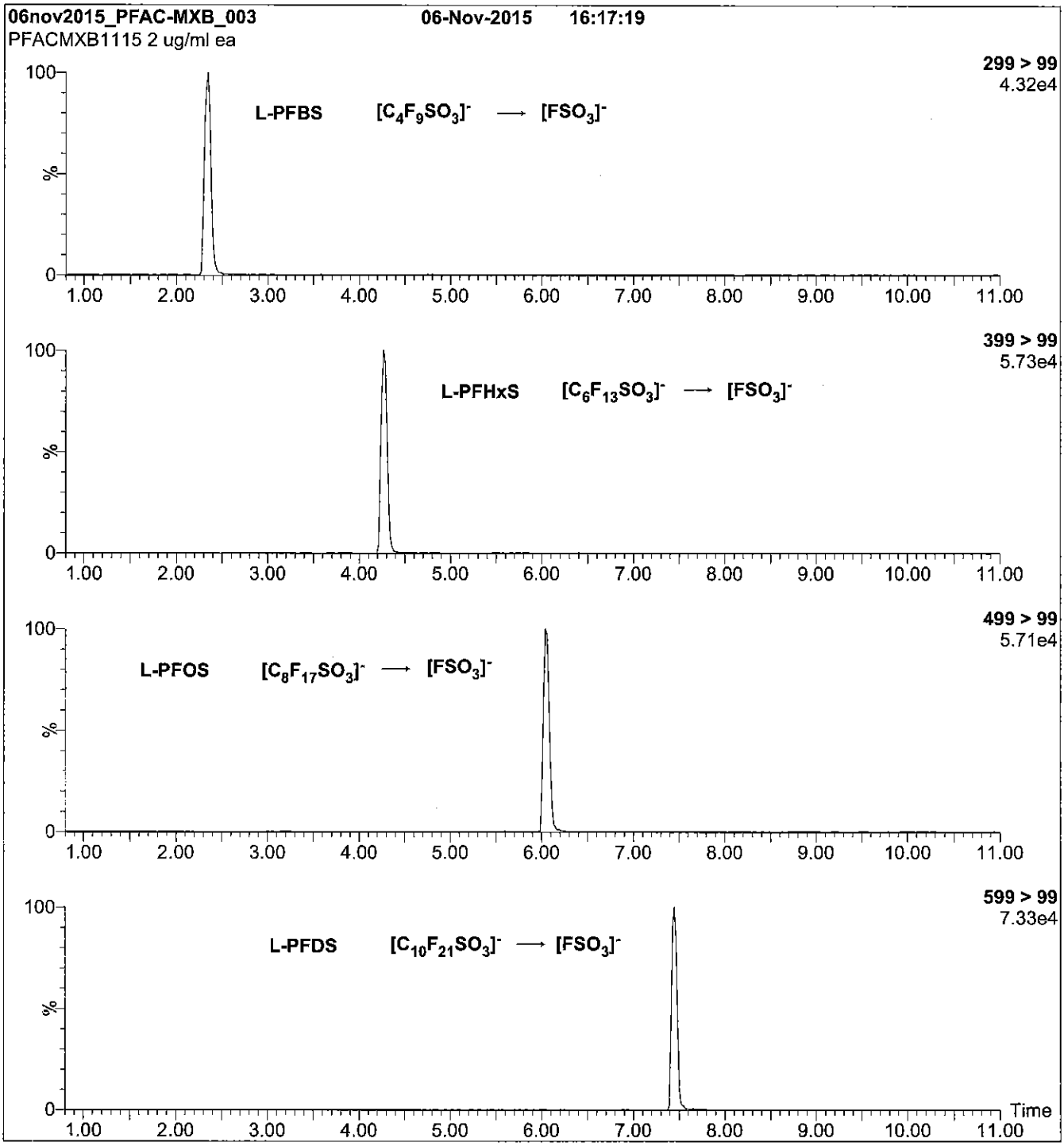


Figure 3: **PFAC-MXB; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figures 2 and 3:

Injection: on-column (PFAC-MXB)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

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

Reagent

LCPFBA_00005

Scanned 10/16/14

R: SBC 9/13/16

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

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

WELLINGTON LABORATORIES

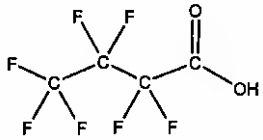
CERTIFICATE OF ANALYSIS DOCUMENTATION

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

LOT NUMBER: PFBA0516

STRUCTURE:

CAS #: 375-22-4



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

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

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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

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

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

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CALA

ANAB ACCREDITED

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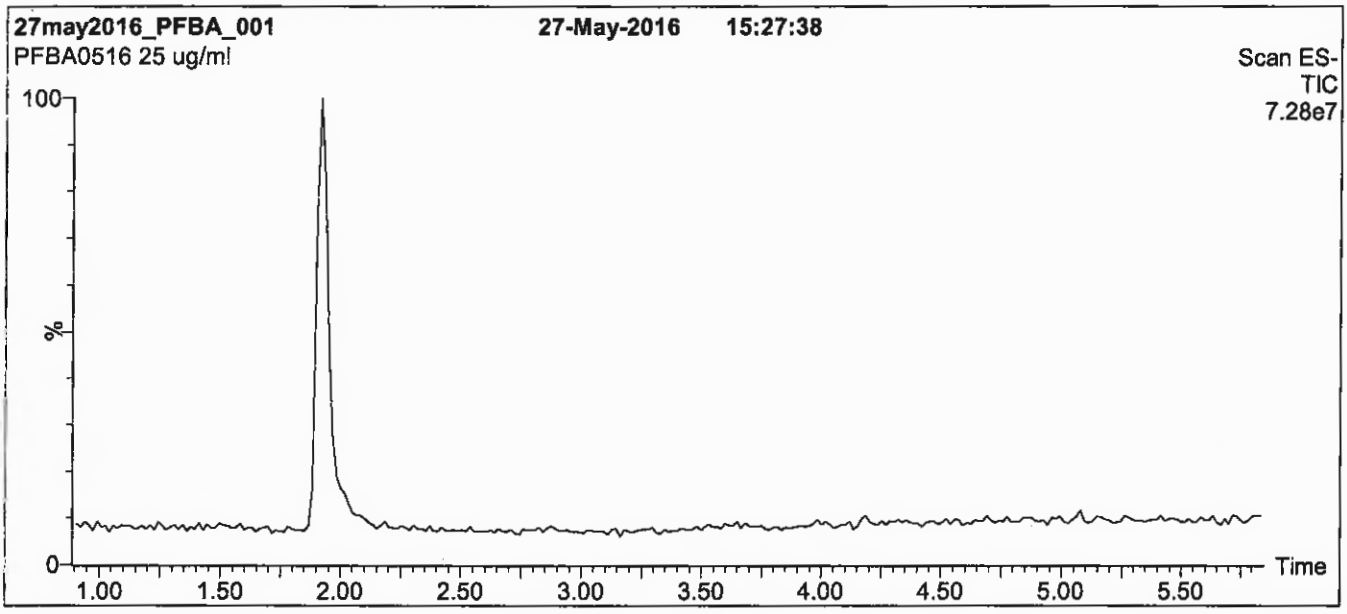
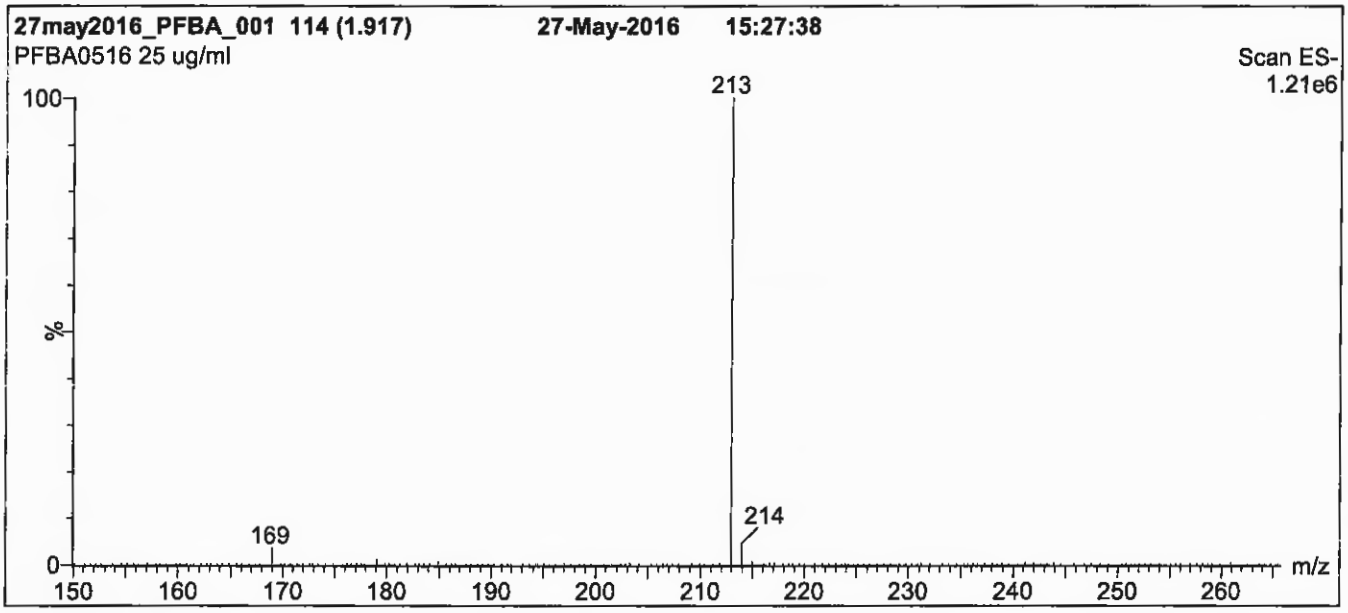
Figure 1: **PFBA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 30% (80:20 MeOH:ACN) / 70% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

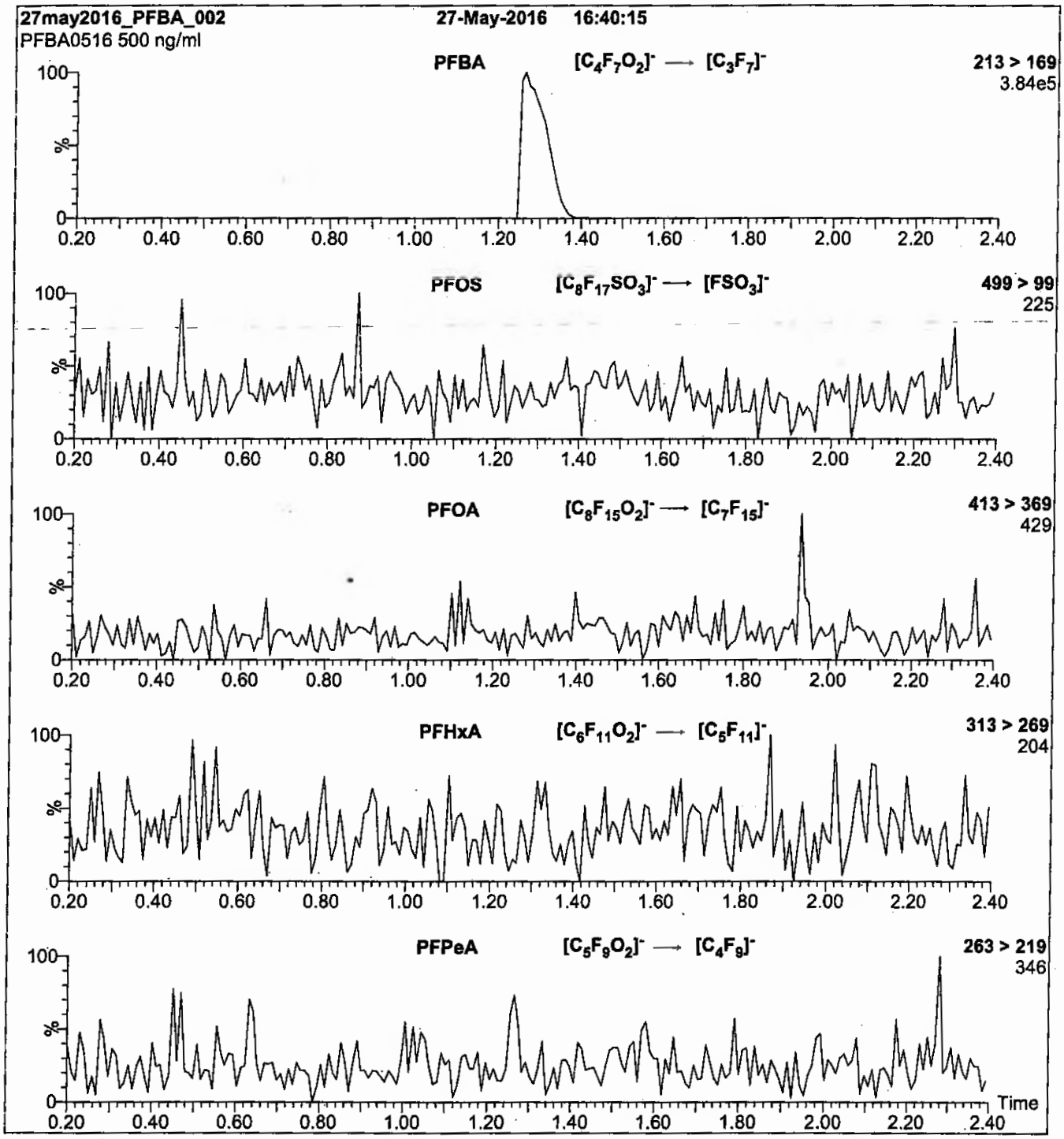
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

MS Parameters

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

Reagent

LCPFBS_00005

R: 9/9/16 SBC

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

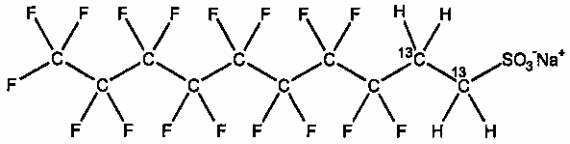
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

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

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

STRUCTURE: **CAS #:** Not available



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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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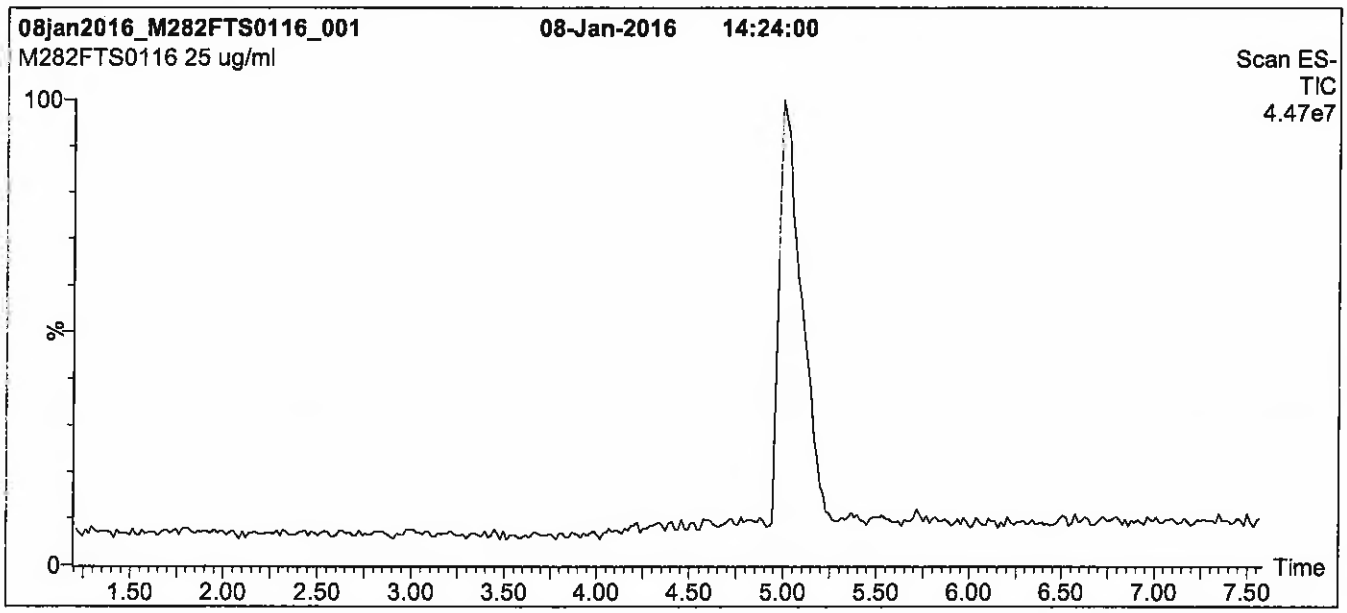
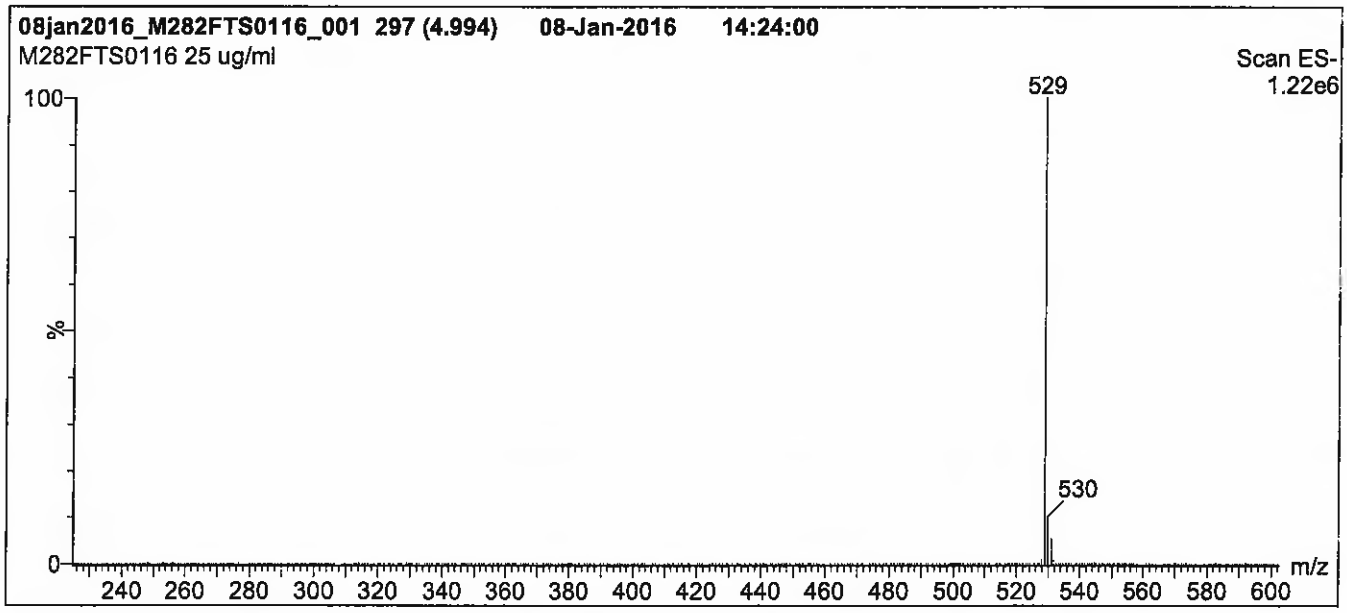




Conditions for Figure 1:

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

Chromatographic Conditions

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

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

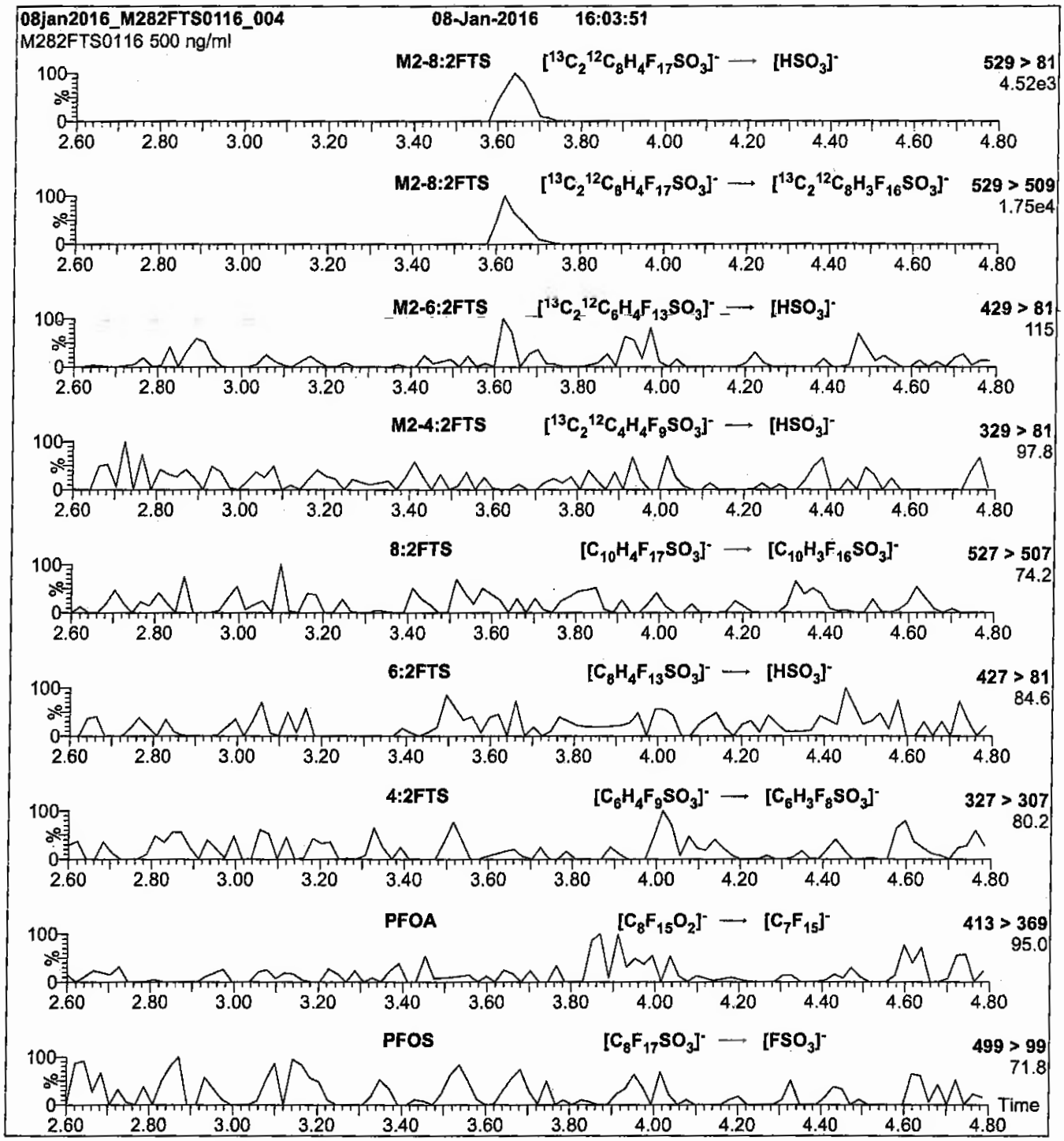
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

R: SBC 9/13/16

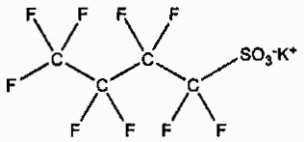
730511
ID: LCPFBS_00005
Exp: 03/15/21 Prpd: SBC
PF-1-butanesulfonate K sa

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

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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



MOLECULAR FORMULA:	$C_4F_9SO_3K$	**MOLECULAR WEIGHT:**	338.19
CONCENTRATION:	50.0 ± 2.5 µg/ml (K salt)	**SOLVENT(S):**	Methanol
	44.2 ± 2.2 µg/ml (PFBS anion)		
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	03/15/2016		
EXPIRY DATE: (mm/dd/yyyy)	03/15/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 03/21/2016 (mm/dd/yyyy)

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

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

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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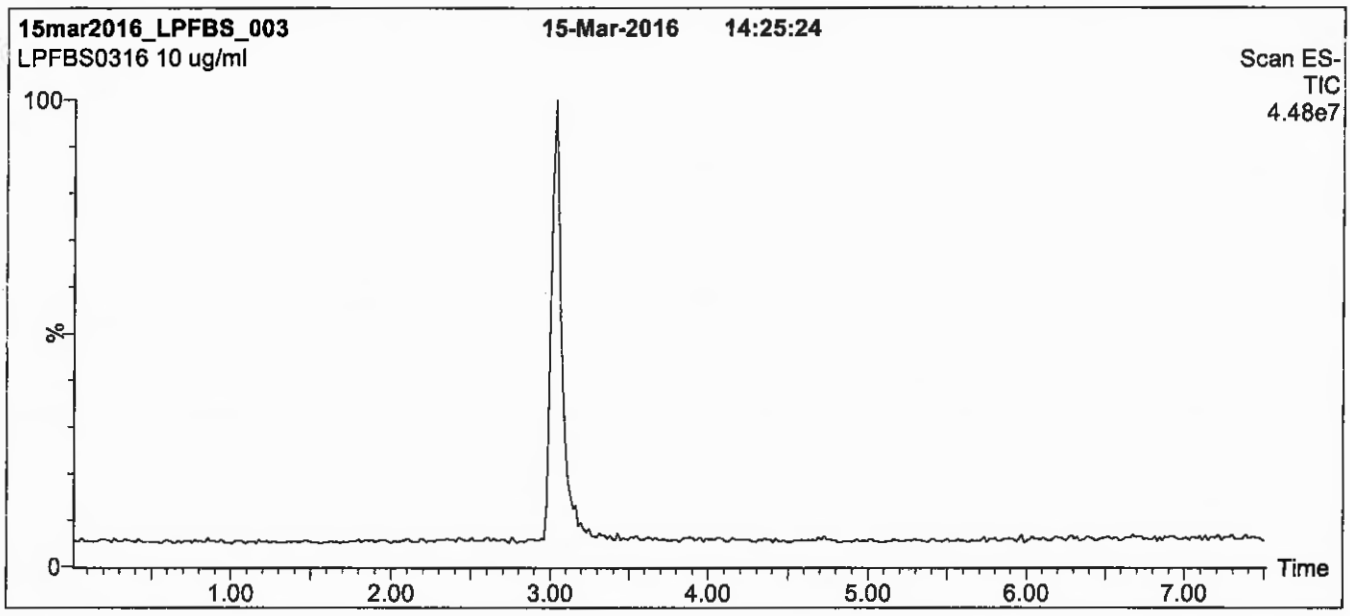

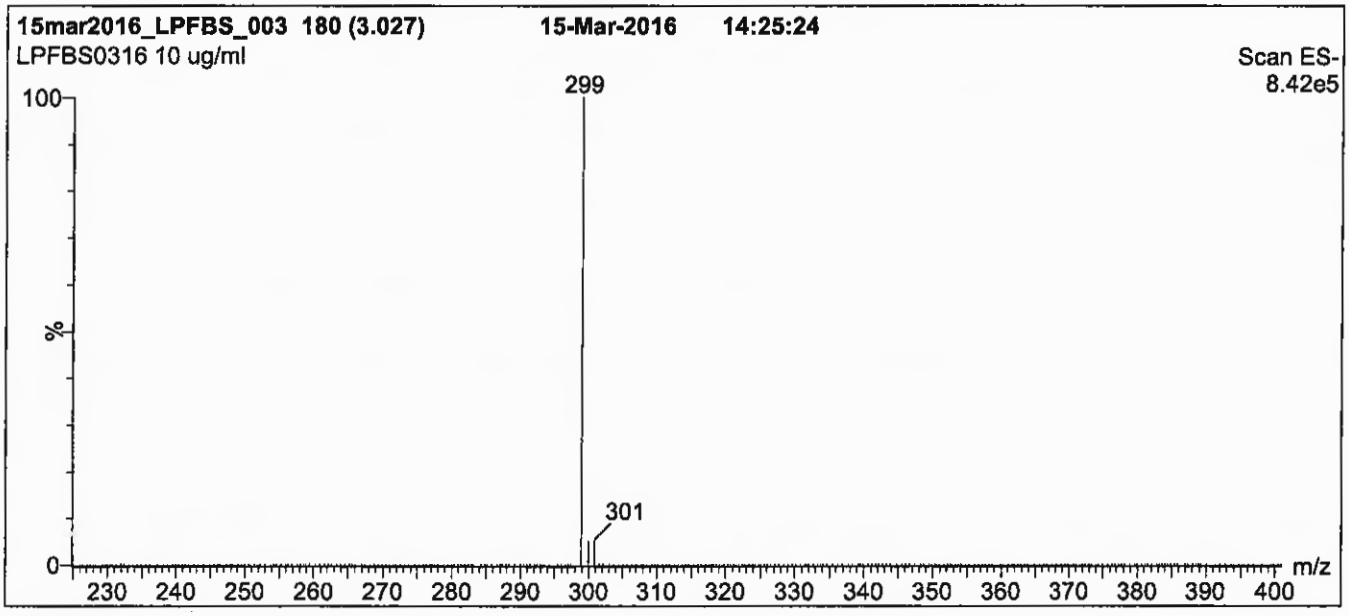

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MS: **Micromass Quattro *micro* API MS**

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1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

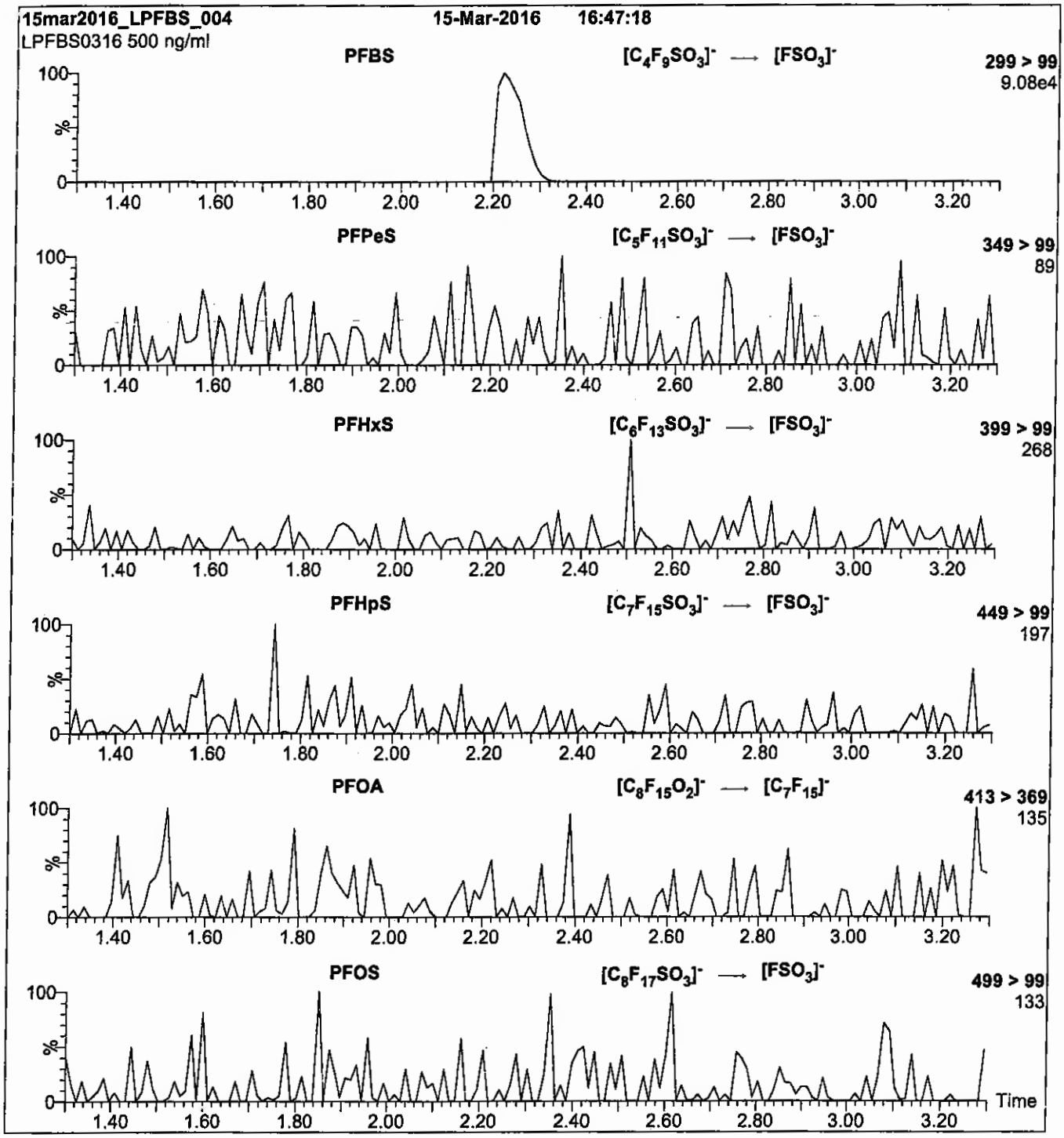
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCPFDA_00005

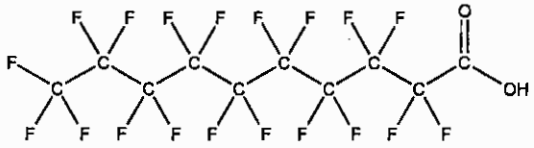
R: 7/6/16 CBW

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

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFDA	**LOT NUMBER:**	PFDA0615
COMPOUND:	Perfluoro-n-decanoic acid		
STRUCTURE:		**CAS #:**	335-76-2



MOLECULAR FORMULA:	$C_{10}HF_{19}O_2$	**MOLECULAR WEIGHT:**	514.08
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	07/02/2015		
EXPIRY DATE: (mm/dd/yyyy)	07/02/2020		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

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

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Certified By: B.G. Chittim **Date:** 07/24/2015 (mm/dd/yyyy)

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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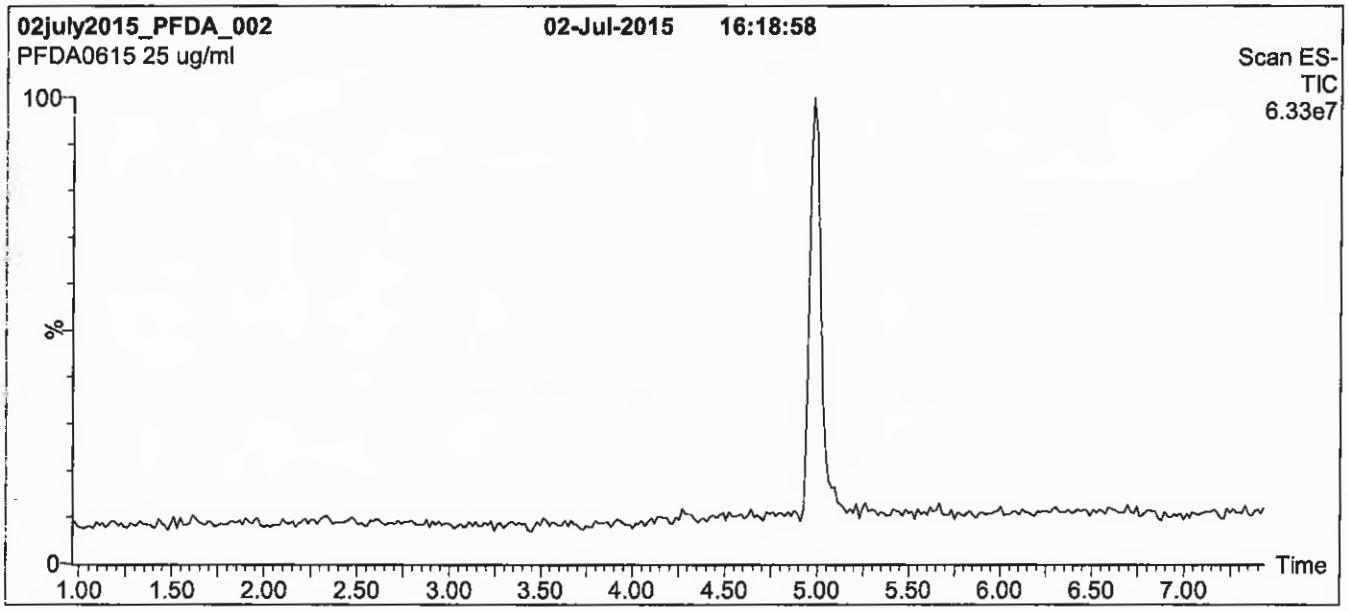
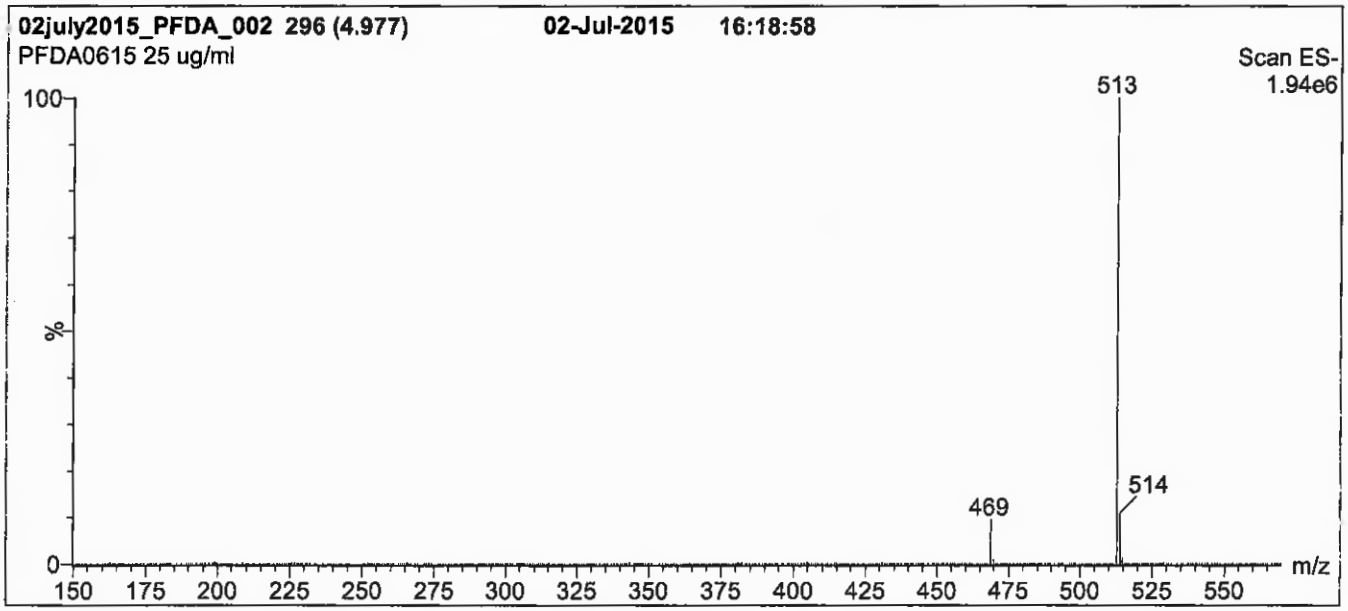
Figure 1: **PFDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

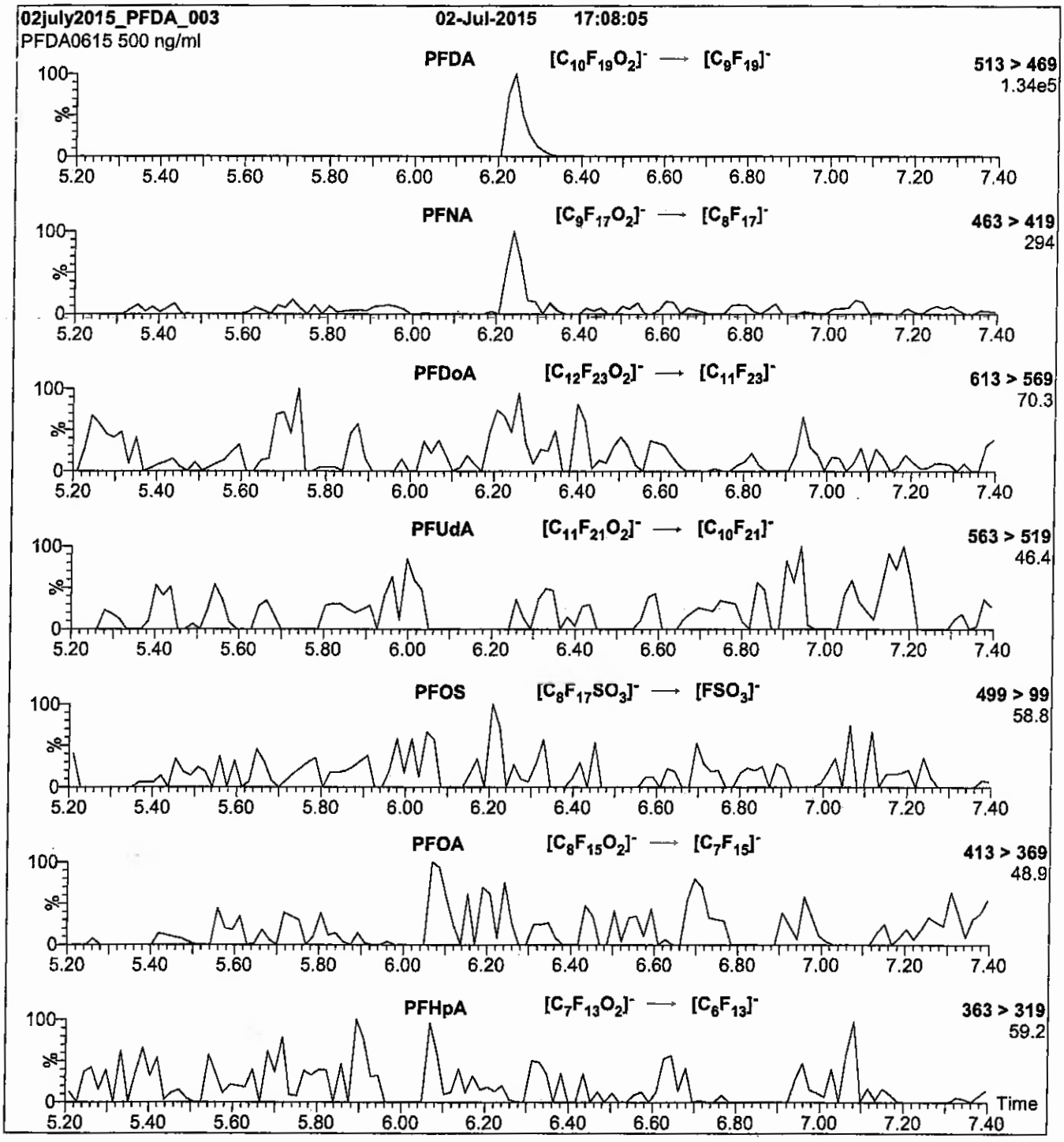
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCPFDoA_00005

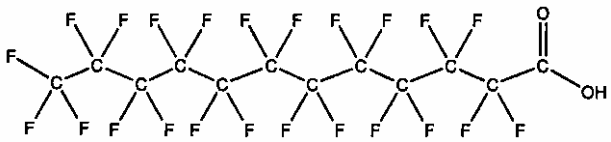
R: 7/6/16 ca

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

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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



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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 03/25/2015 (mm/dd/yyyy)

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

INTENDED USE:

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

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

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

TRACEABILITY:

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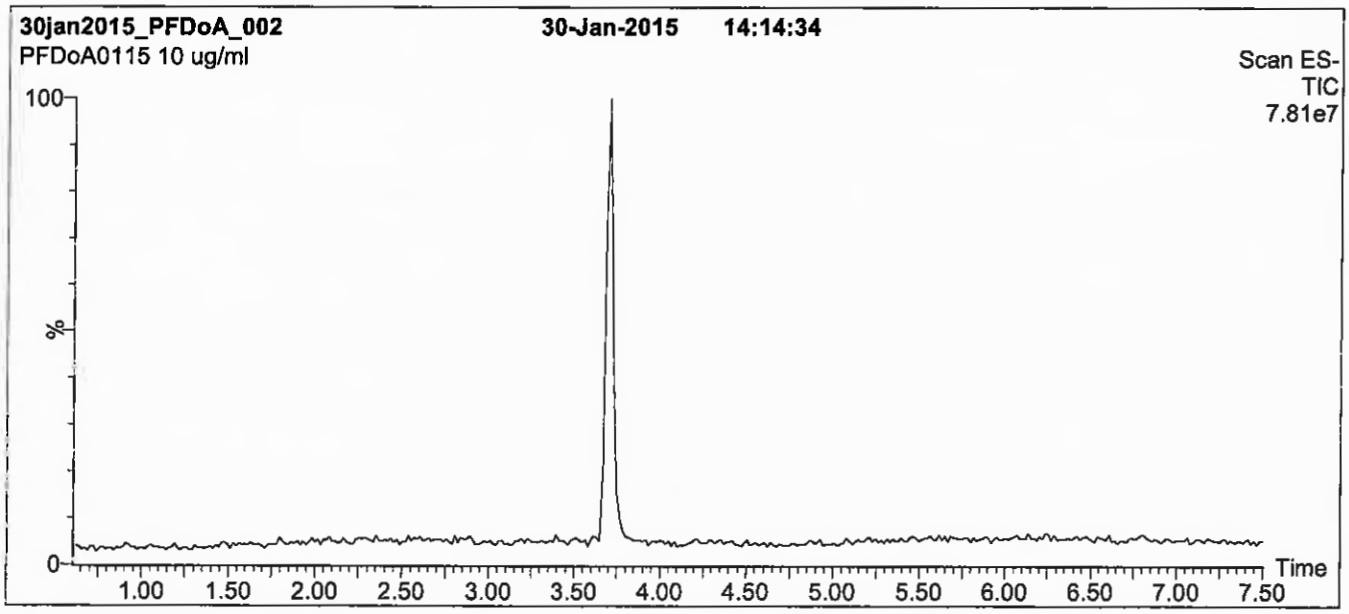
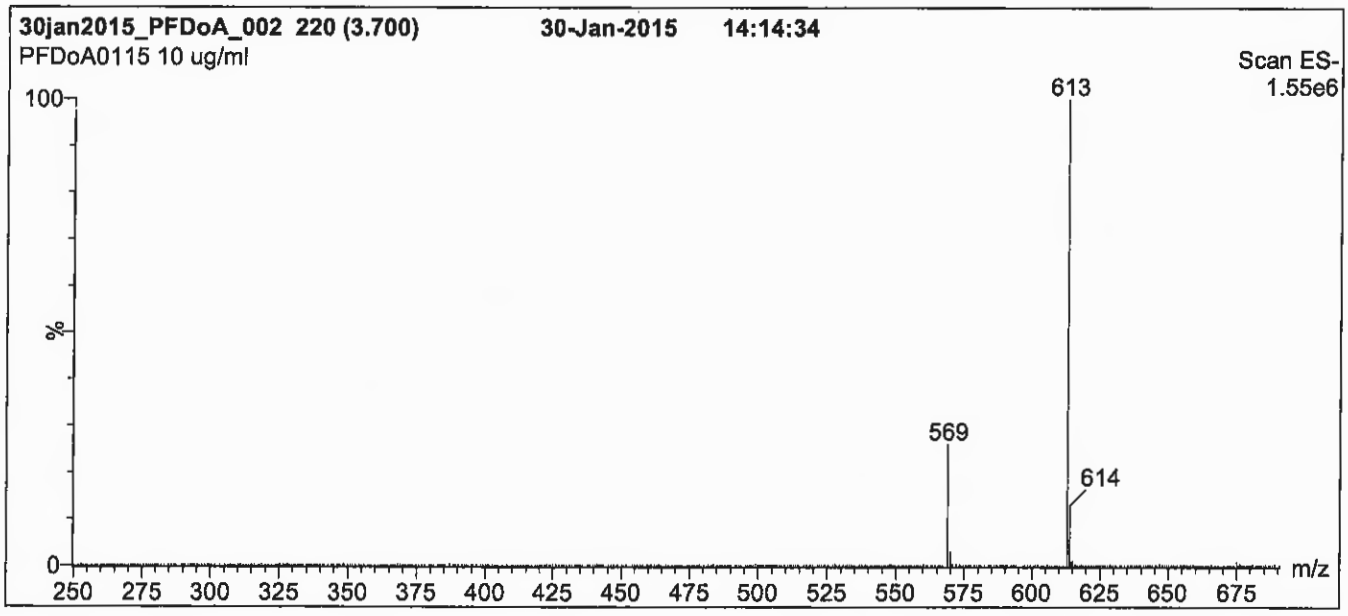




Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

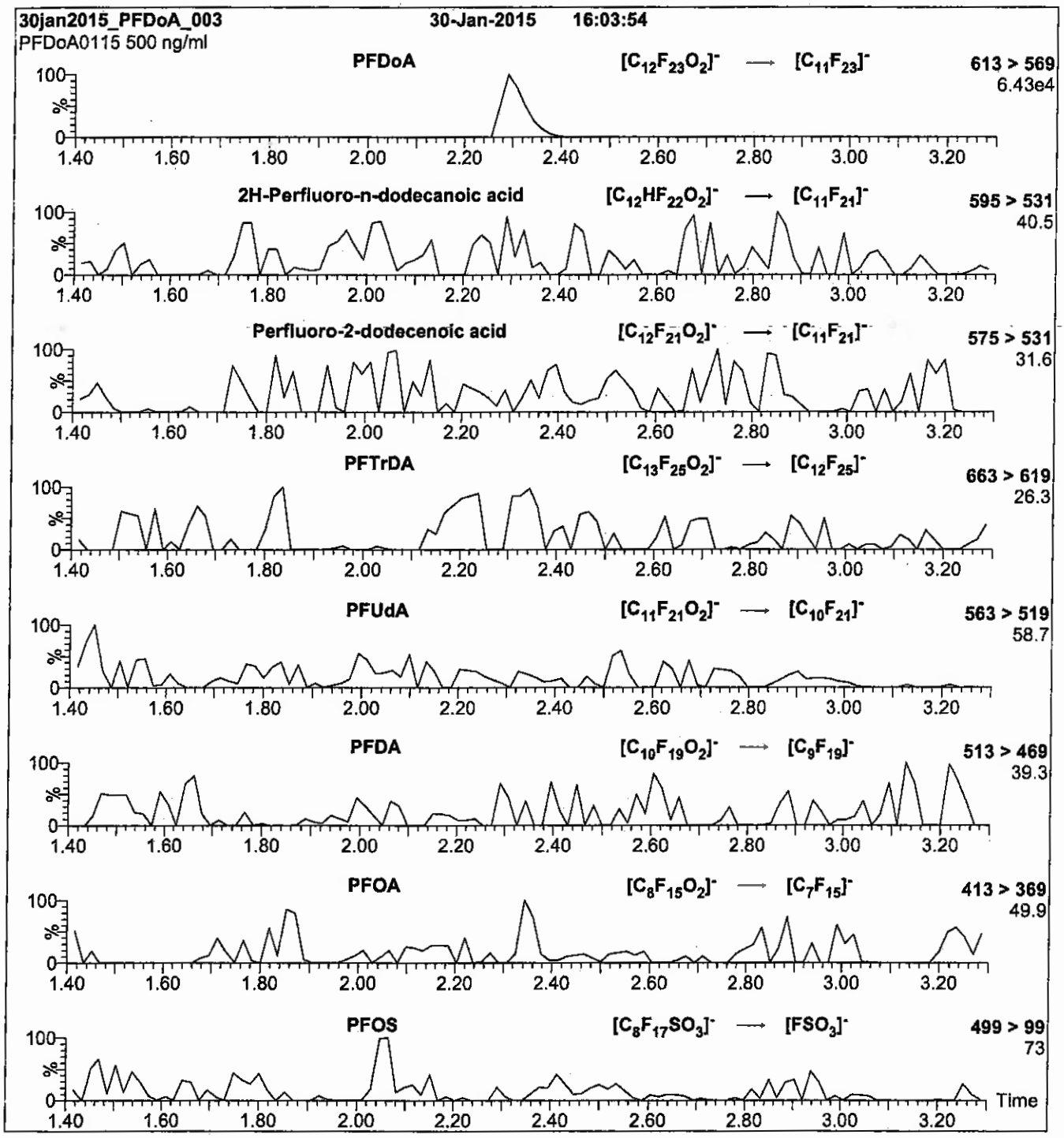
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1000 amu)

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

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



Conditions for Figure 2:

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

Reagent

LCPFHpA_00005

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

R: 4/7/16 CBW

WELLINGTON LABORATORIES

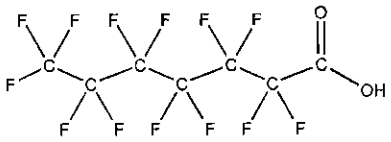
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

LOT NUMBER: PFHpA0116

STRUCTURE:

CAS #: 375-85-9



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

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

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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

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

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

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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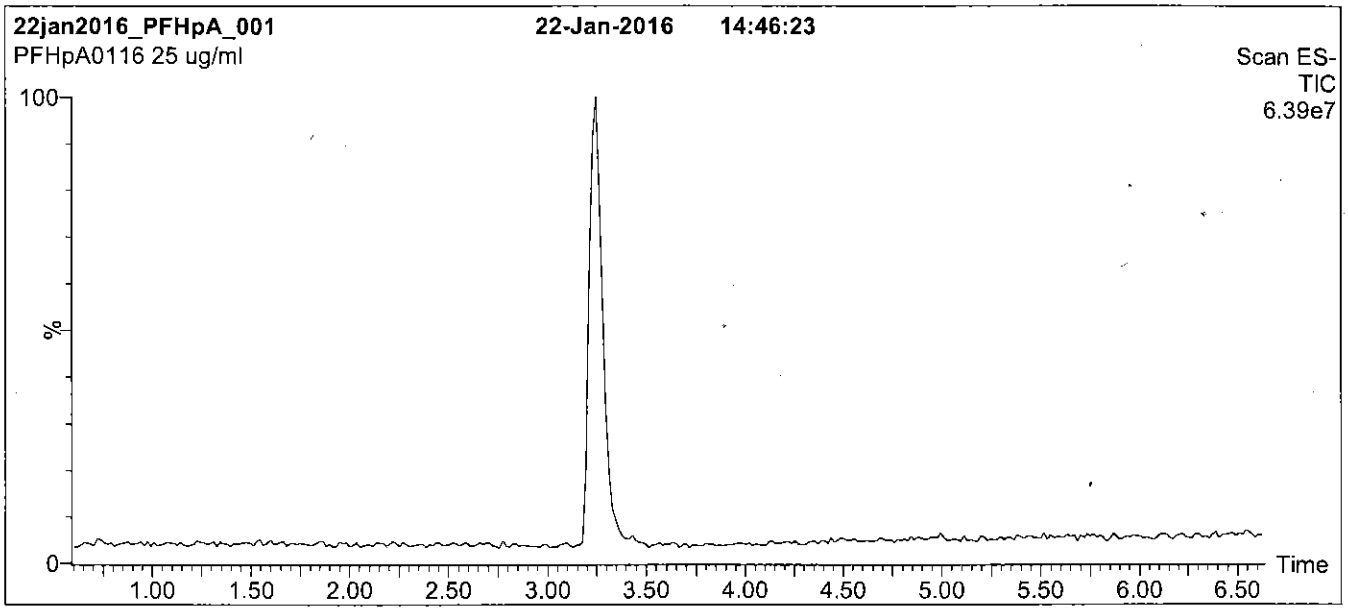
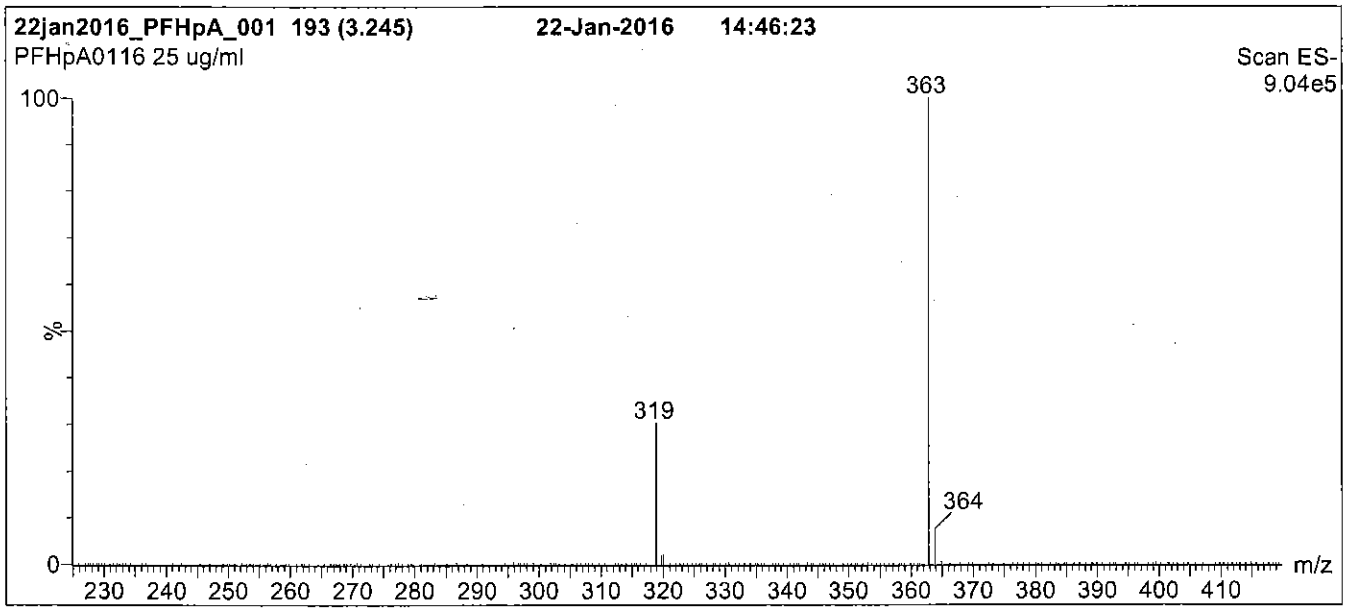
Figure 1: **PFHpA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

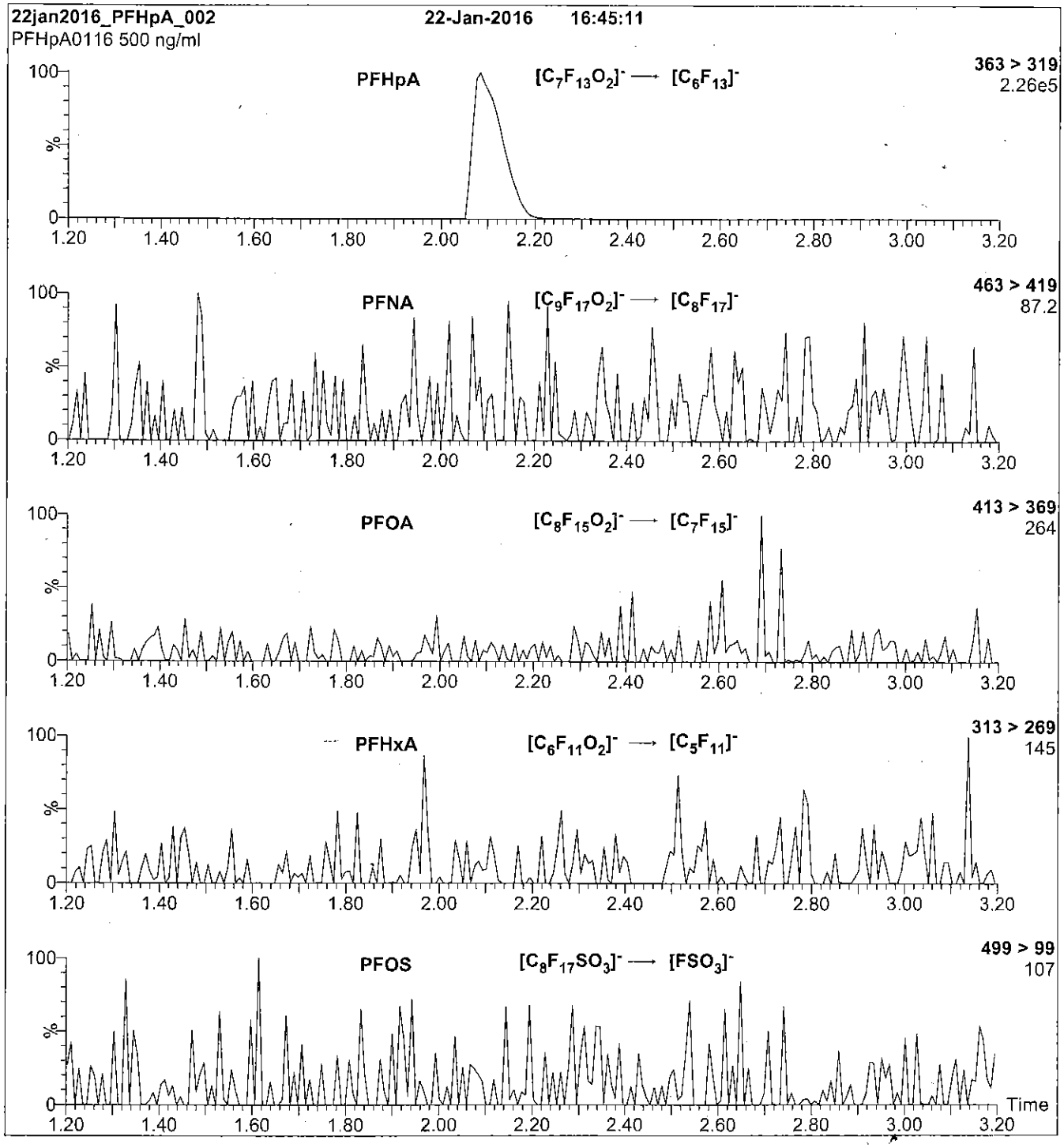
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCPFHpA_00006

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

730517
ID: LCPFHpA_00006
Exp: 01/22/21 Prpd: SBC
PF-n-heptanoic acid

730518
ID: LCPFHpA_00007
Exp: 01/22/21 Prpd: SBC
PF-n-heptanoic acid

WELLINGTON LABORATORIES

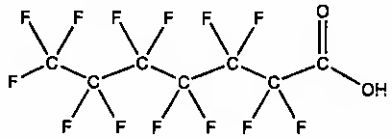
CERTIFICATE OF ANALYSIS DOCUMENTATION

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

LOT NUMBER: PFHpA0116

STRUCTURE:

CAS #: 375-85-9



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

MOLECULAR WEIGHT: 364.06
SOLVENT(S): Methanol
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CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 01/22/2016
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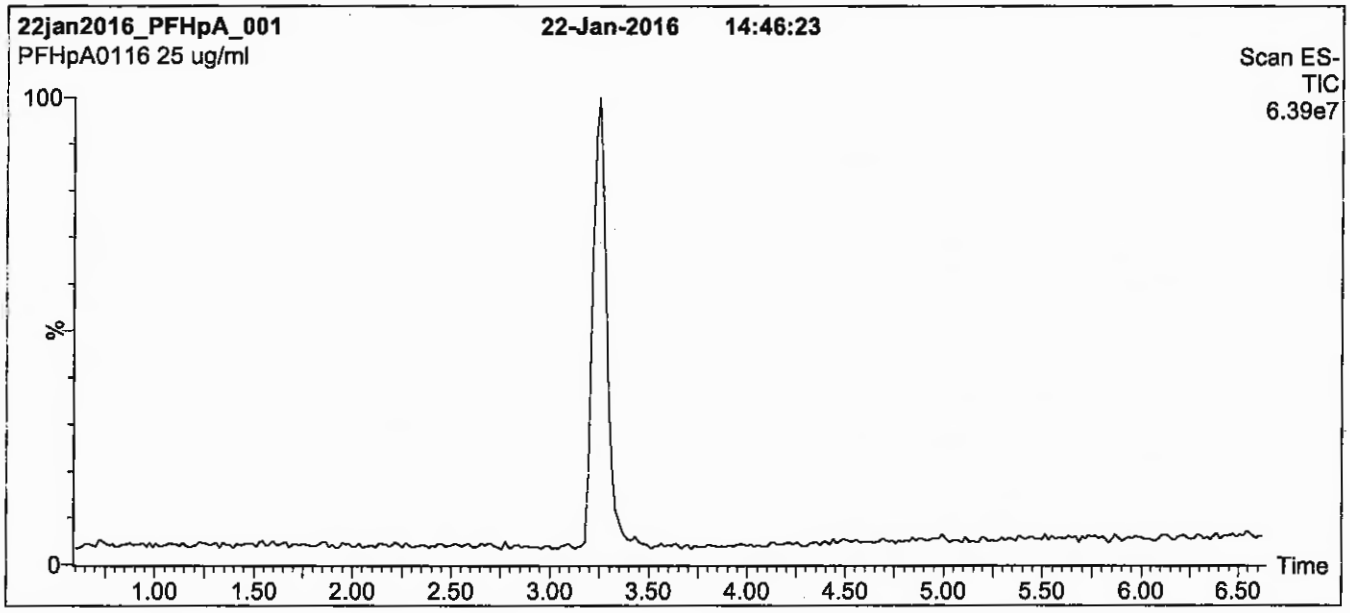

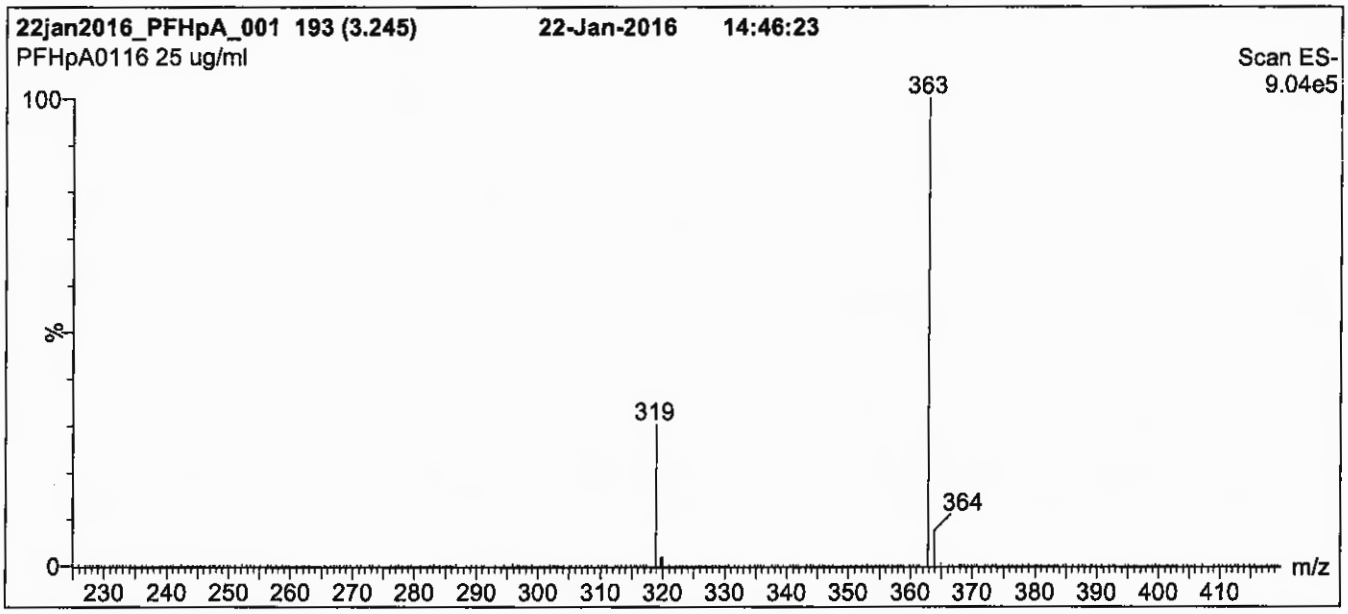

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LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

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

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

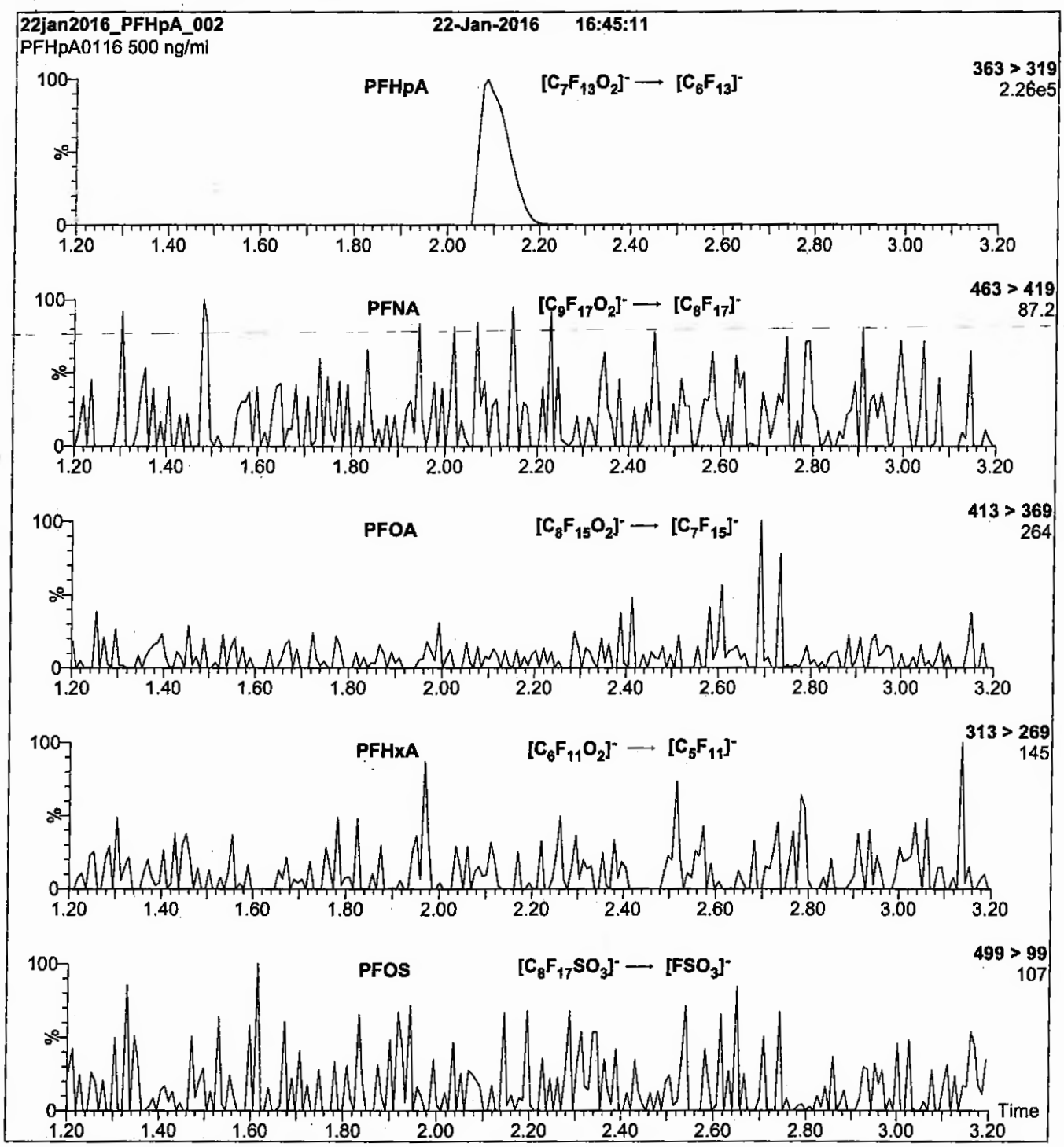
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCPFHpS_00009

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

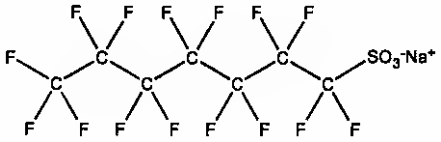
730635
ID: LCPFHpS_00009
Exp: 11/06/20 Prpd: SBC
PFHpS at 47.6ug/mL

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

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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



MOLECULAR FORMULA:	$C_7F_{15}SO_3Na$	**MOLECULAR WEIGHT:**	472.10
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.6 ± 2.4 µg/ml (PFHpS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	11/06/2015		
EXPIRY DATE: (mm/dd/yyyy)	11/06/2020		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.1% of L-PFHxS ($C_6F_{13}SO_3Na$) and ~ 0.2% of L-PFOS ($C_8F_{17}SO_3Na$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 11/09/2015 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

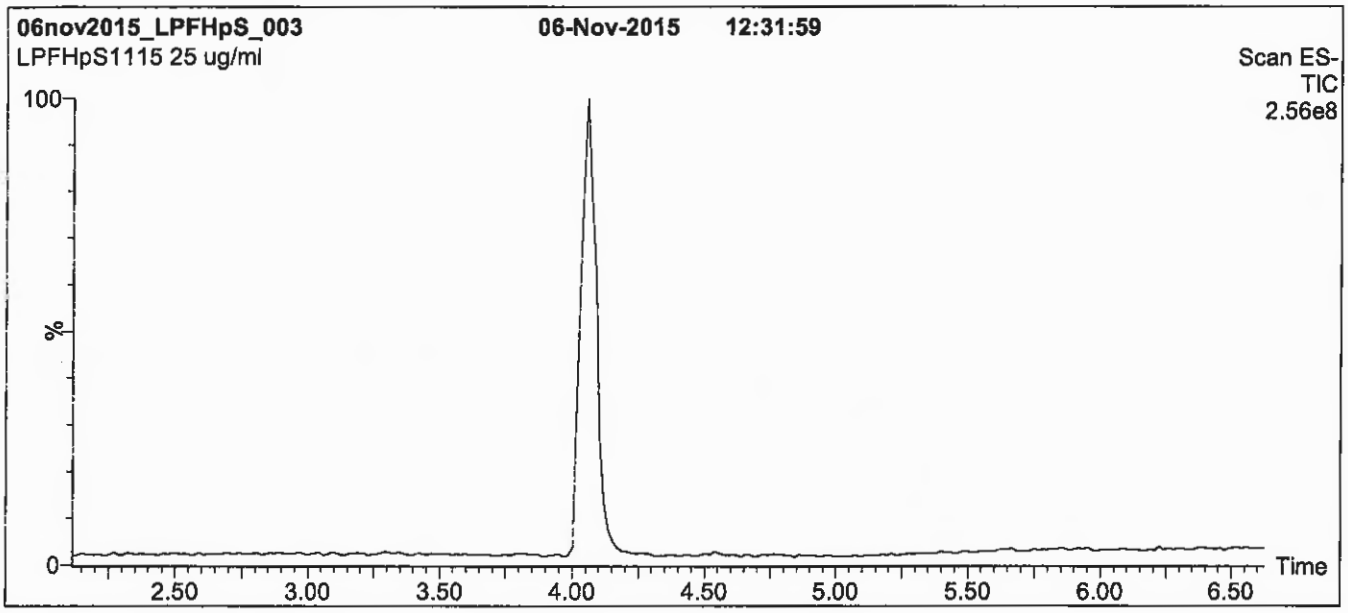
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

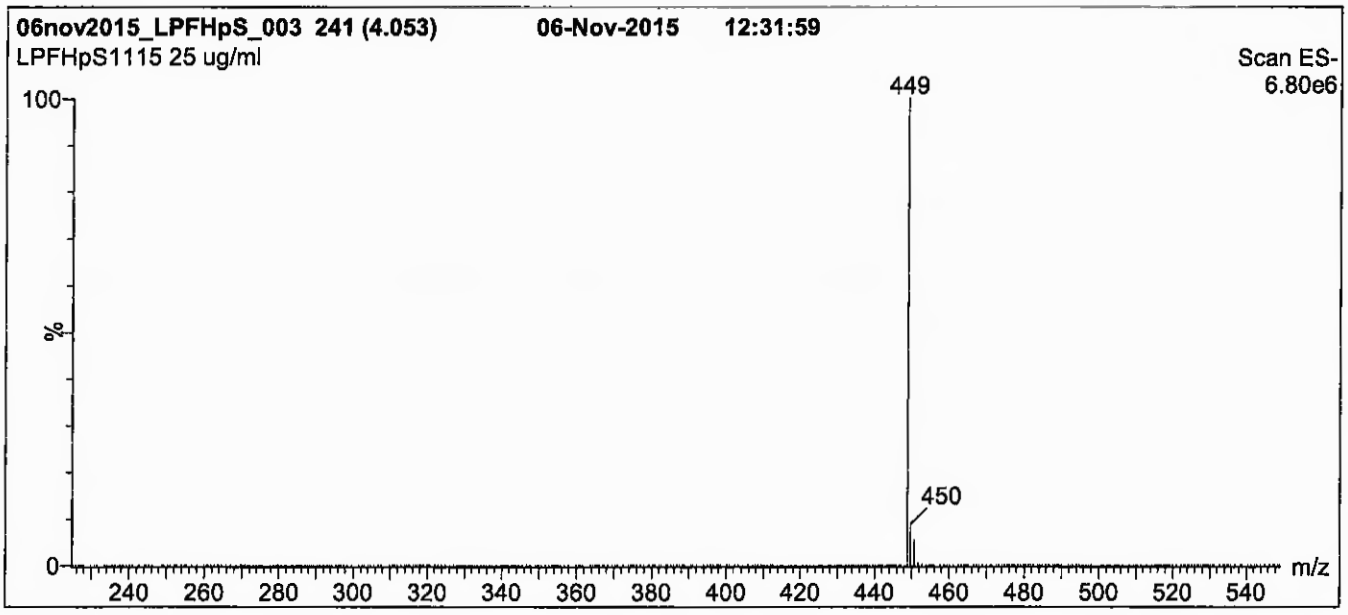
CALA

ANAB ACCREDITED

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

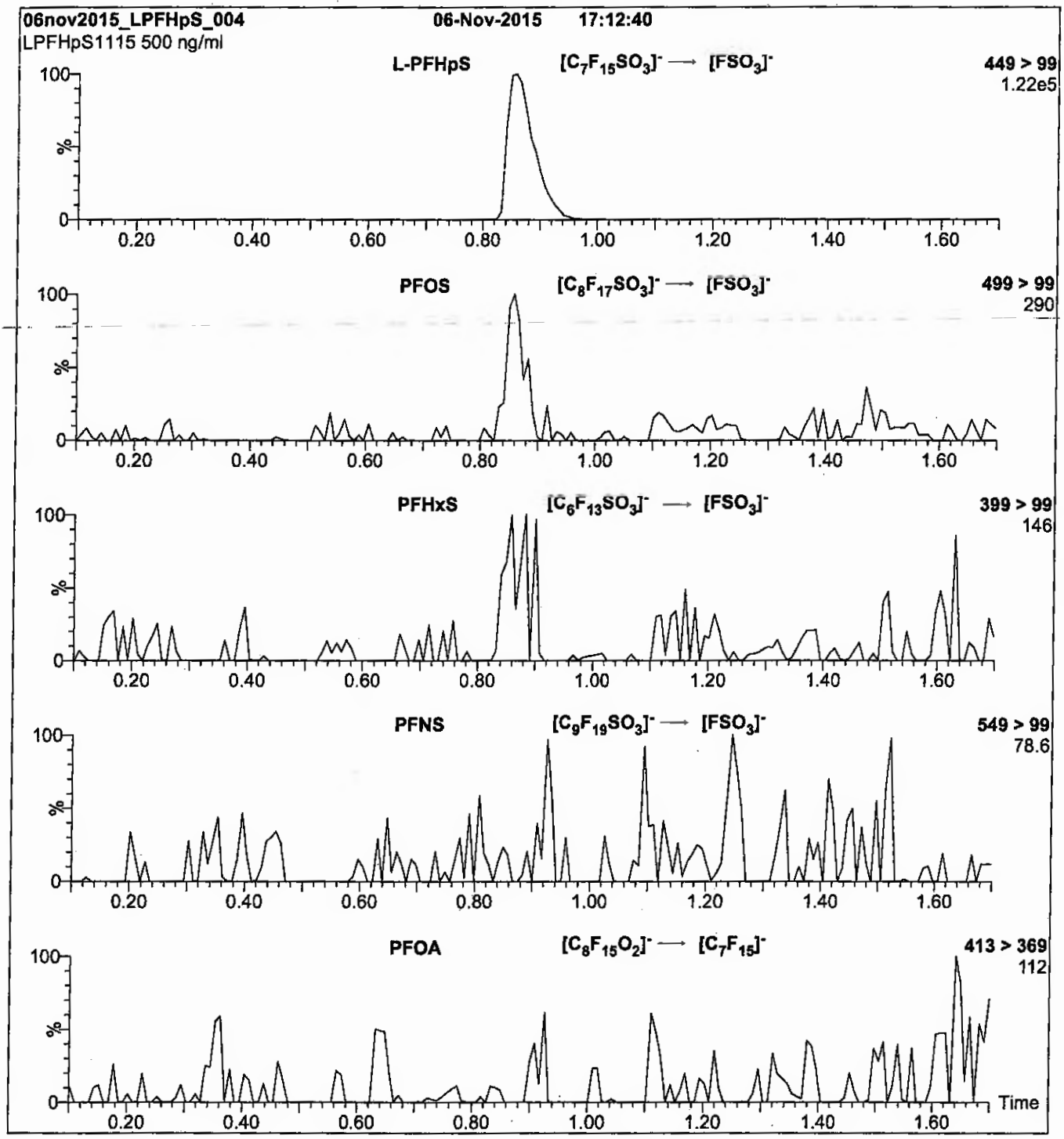
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCPFHxA_00004

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

R: 4/7/16 CBW

WELLINGTON LABORATORIES

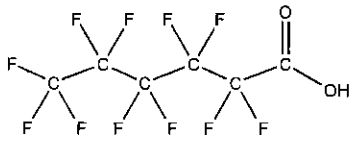
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFHxA
COMPOUND: Perfluoro-n-hexanoic acid

LOT NUMBER: PFHxA1215

STRUCTURE:

CAS #: 307-24-4



MOLECULAR FORMULA: $C_6HF_{11}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 314.05
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 12/22/2015
EXPIRY DATE: (mm/dd/yyyy) 12/22/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.2% of Perfluoro-n-pentanoic acid (PFPeA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 12/23/2015 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

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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:

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$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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QUALITY MANAGEMENT:

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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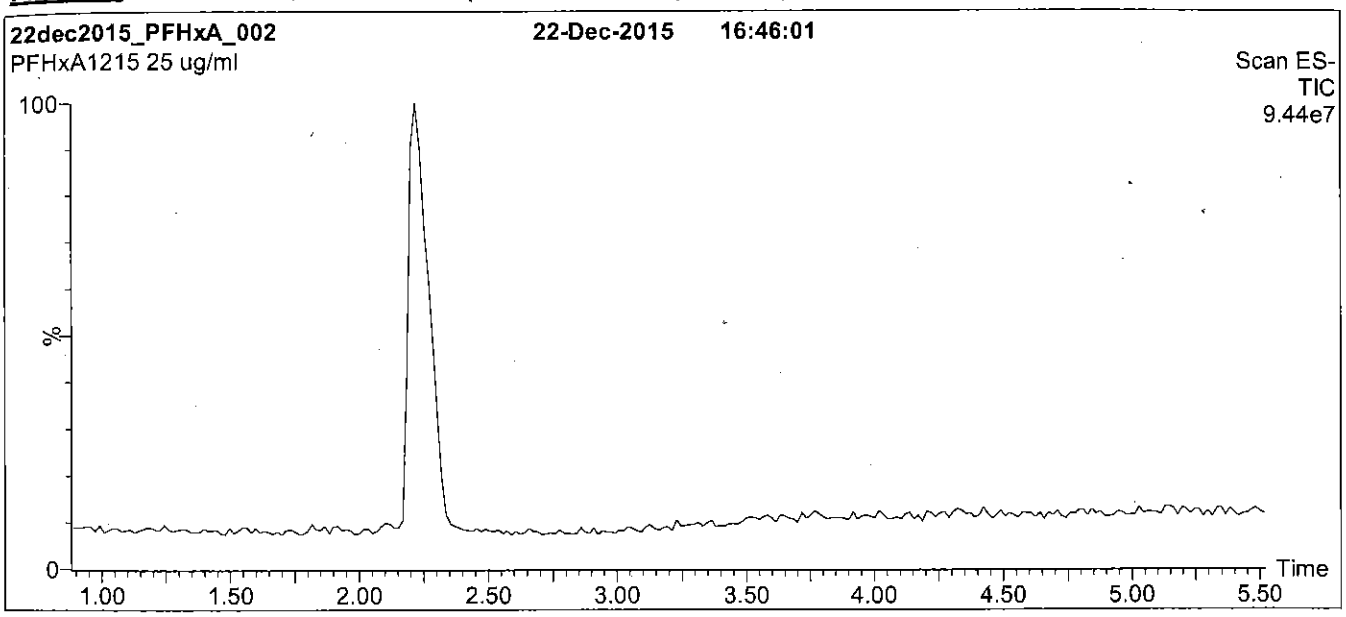
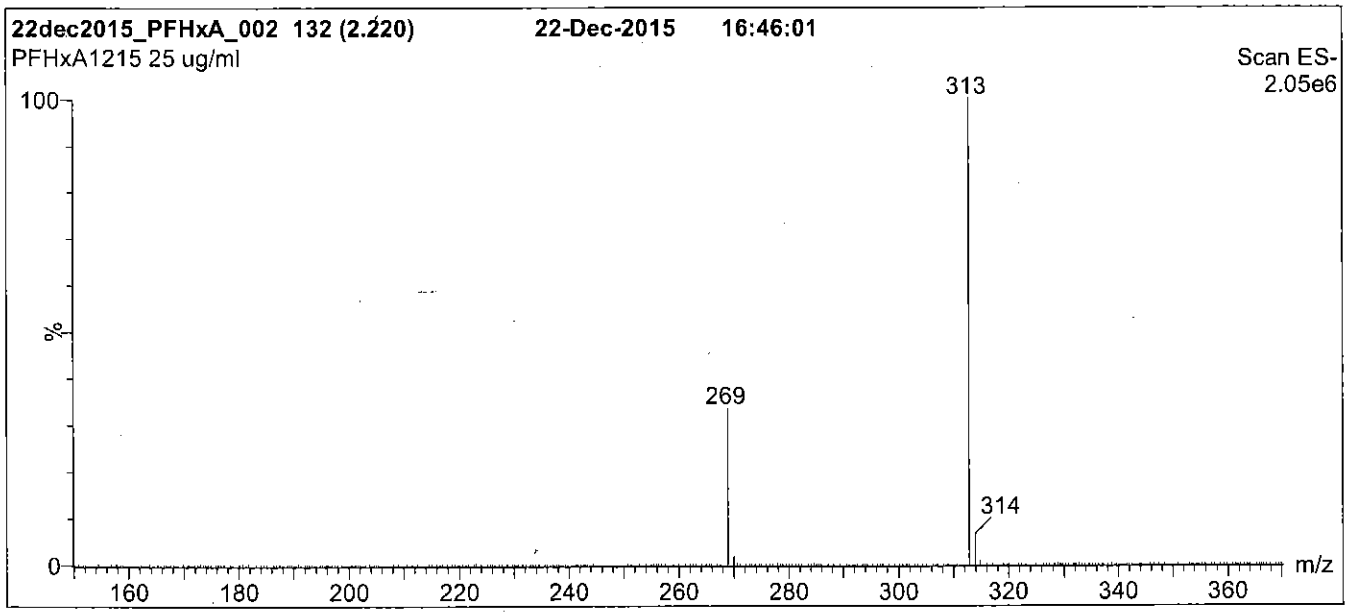
Figure 1: **PFHxA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

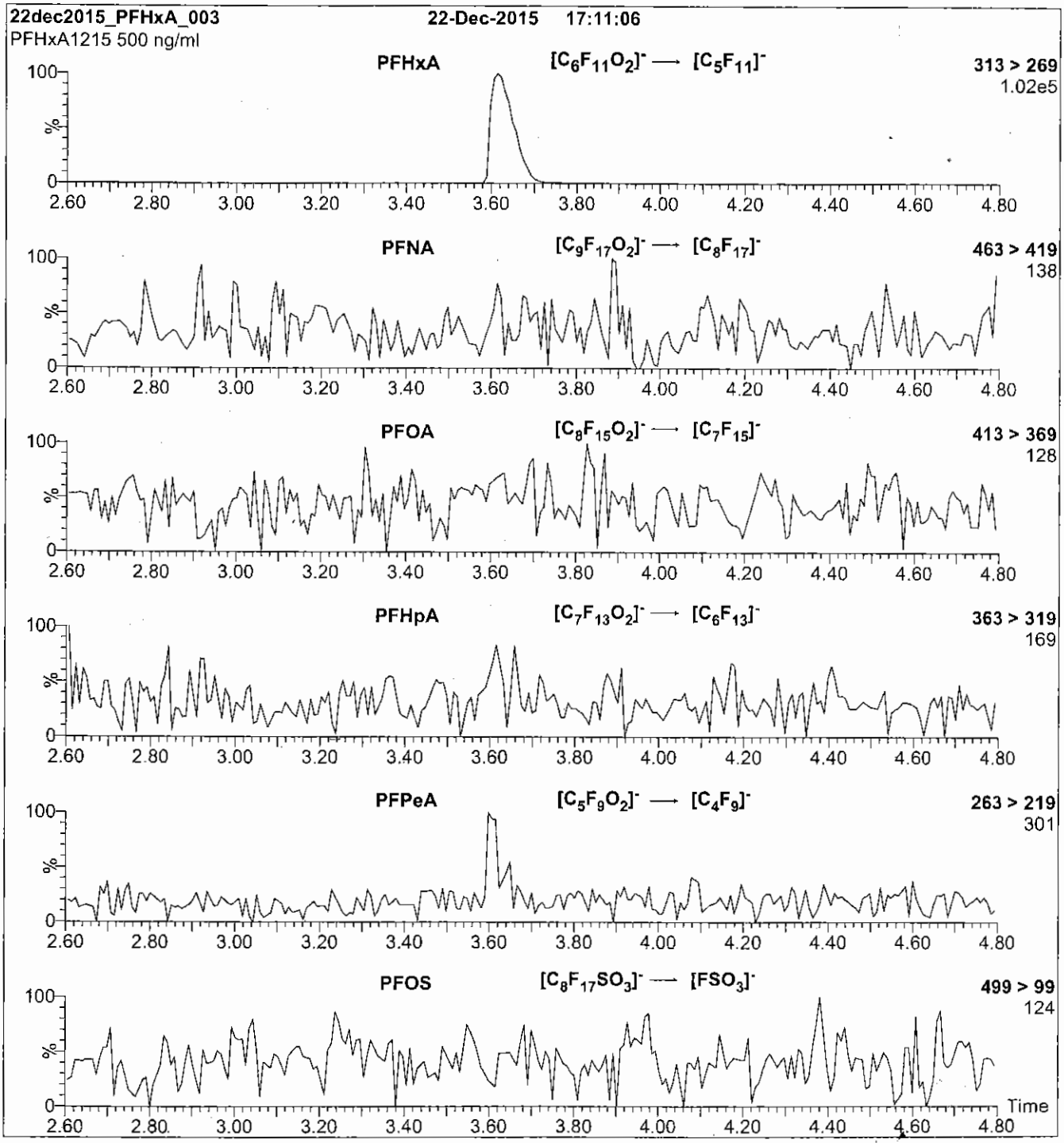
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFHxA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFHxA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 10

Reagent

LCPFHxA_00005

R: SBC 9/13/16

730551
ID: LCPFHxA_00005
Exp: 12/22/20 Prpd: SBC
PF-n-hexanoic acid

730552
ID: LCPFHxA_00006
Exp: 12/22/20 Prpd: SBC
PF-n-hexanoic acid

WELLINGTON LABORATORIES

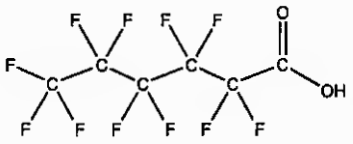
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFHxA
COMPOUND: Perfluoro-n-hexanoic acid

LOT NUMBER: PFHxA1215

STRUCTURE:

CAS #: 307-24-4



MOLECULAR FORMULA: $C_6HF_{11}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 314.05
SOLVENT(S): Methanol
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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).

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Certified By: B.G. Chittim **Date:** 12/23/2015 (mm/dd/yyyy)

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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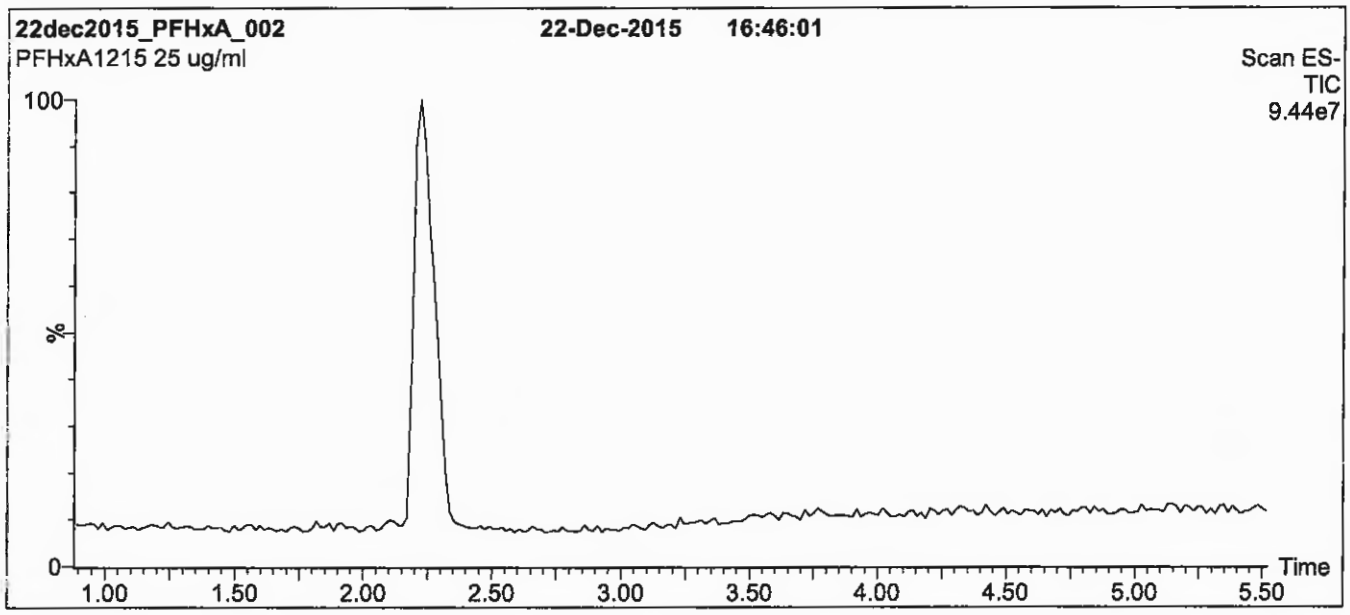
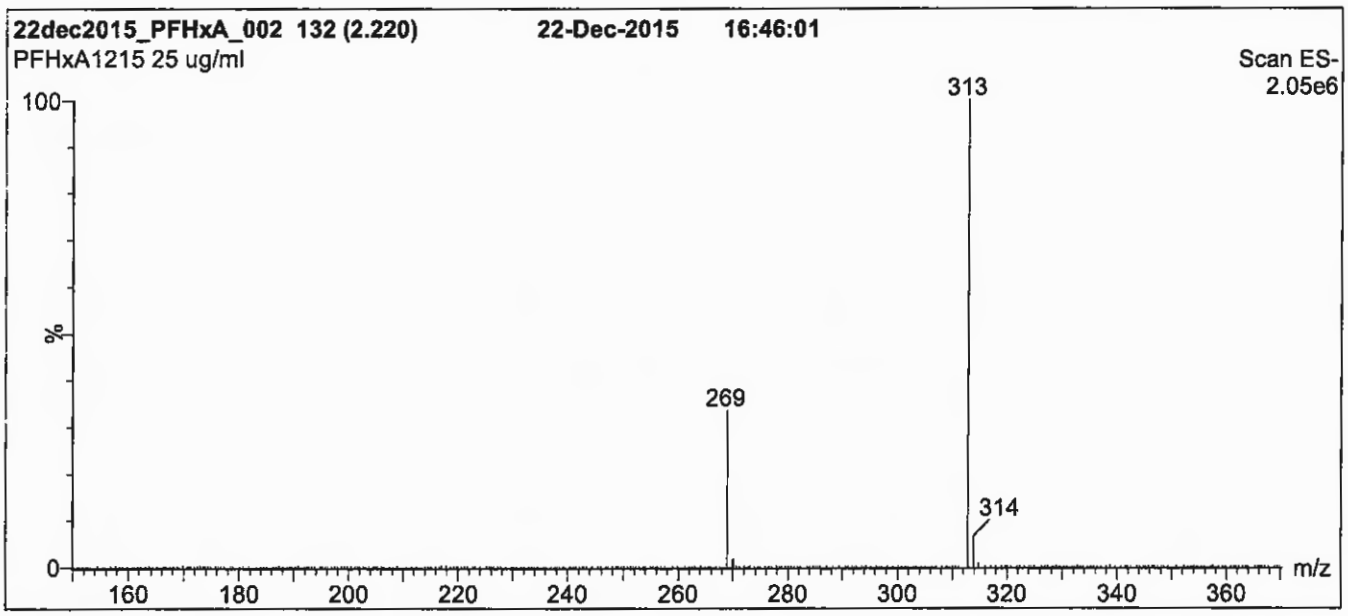
Figure 1: **PFHxA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

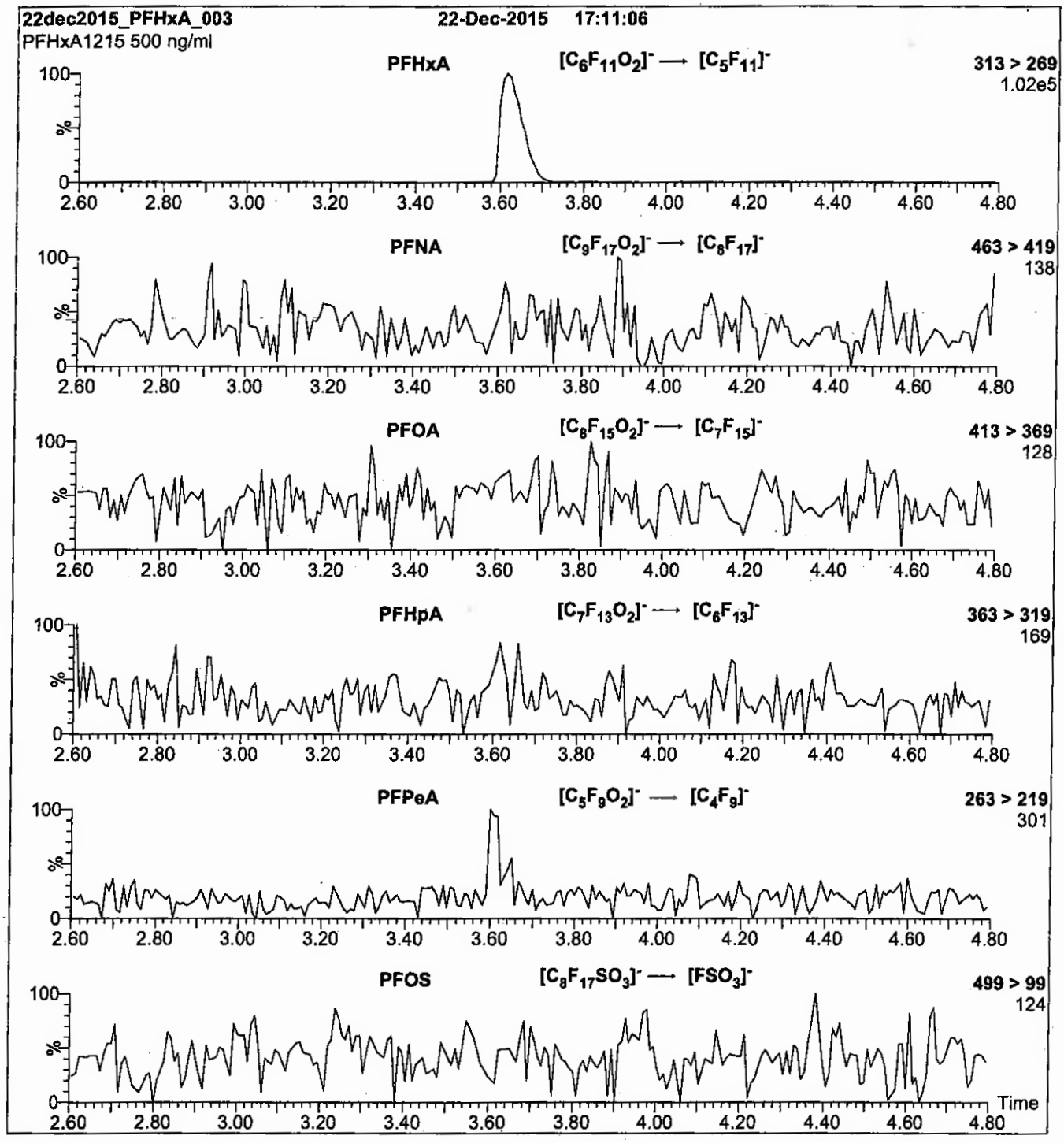
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFHxA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFHxA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 10

Reagent

LCPFHxDA_00006

R: SBC 9/13/16
Scanned 10/14/16 SBC

730630
ID: LCPFHxDA_00006
Exp: 05/25/21 Prpd: SBC
PFHxDA stock 50ug/mL

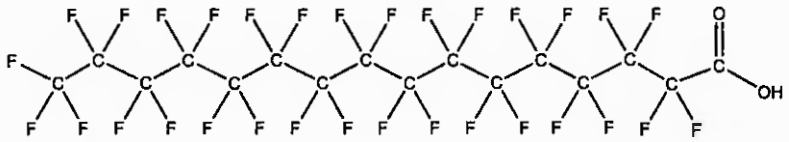
730631
ID: LCPFHxDA_00007
Exp: 05/25/21 Prpd: SBC
PFHxDA stock 50ug/mL

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFHxDA
LOT NUMBER: PFHxDA0516
COMPOUND: Perfluoro-n-hexadecanoic acid

STRUCTURE:
CAS #: 67905-19-5



MOLECULAR FORMULA: $C_{16}HF_{31}O_2$
MOLECULAR WEIGHT: 814.13
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 05/25/2016
EXPIRY DATE: (mm/dd/yyyy) 05/25/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.4% of PFODA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 05/27/2016 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters x_1, x_2,...x_n on which it depends is:

$$u_c(y(x_1, x_2, ...x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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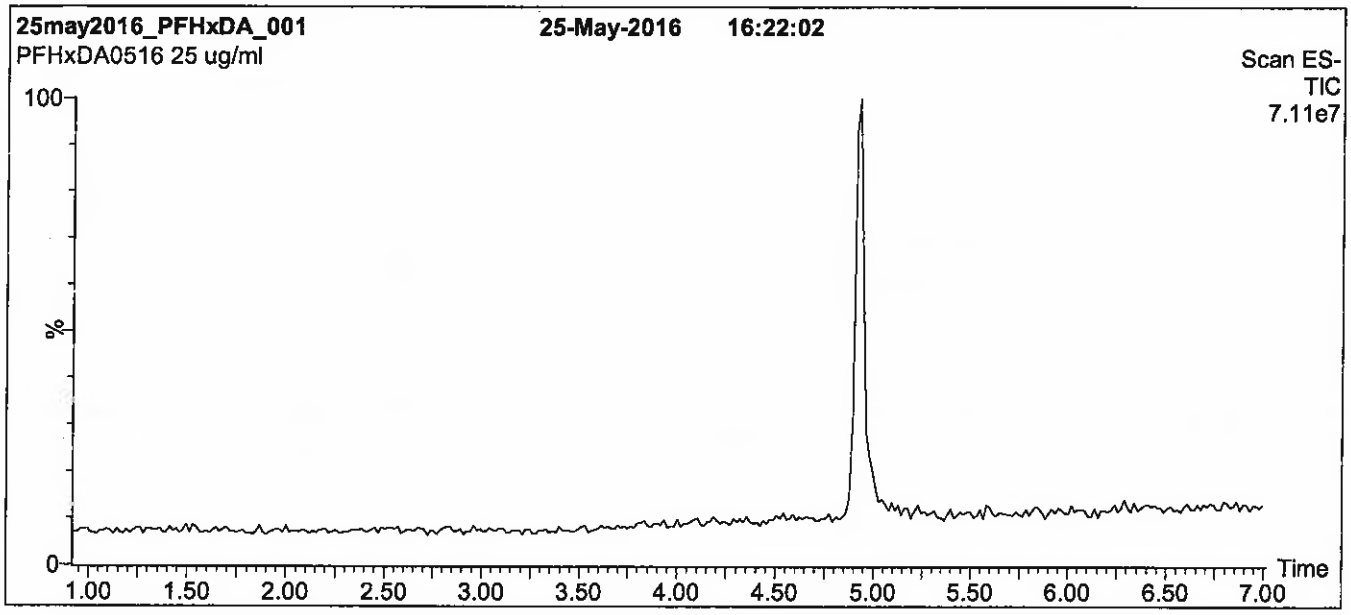
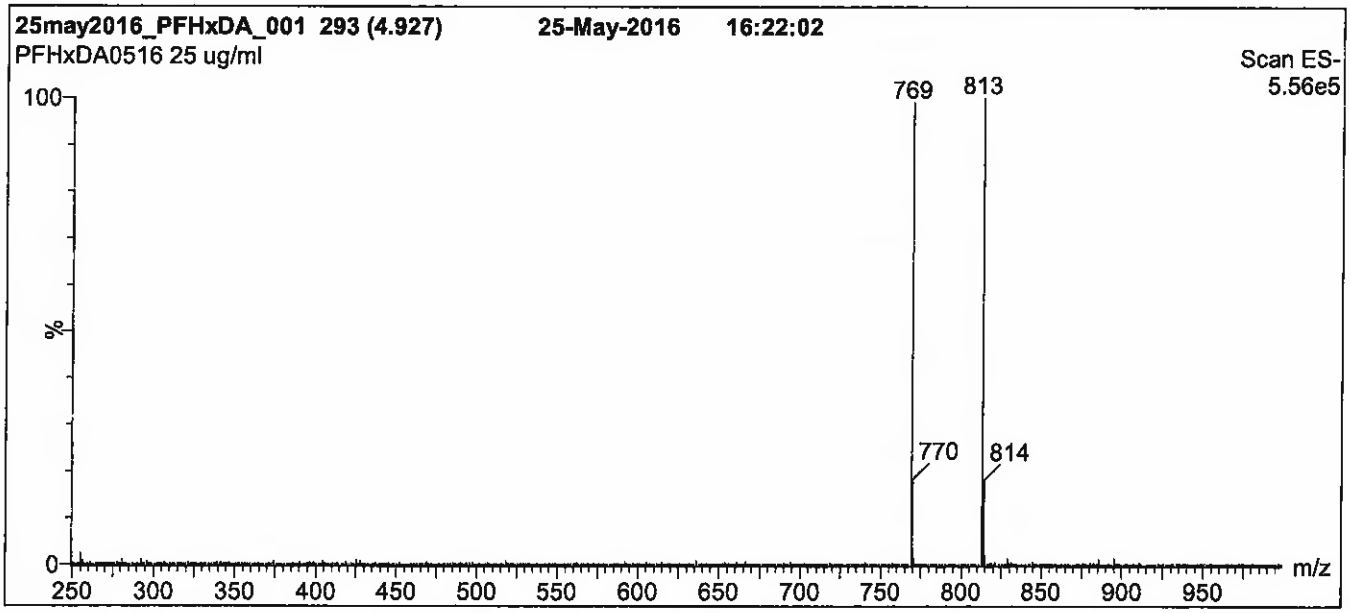
Figure 1: **PFHxDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 70% (80:20 MeOH:ACN) / 30% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 95% organic over 6 min and hold for 2.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

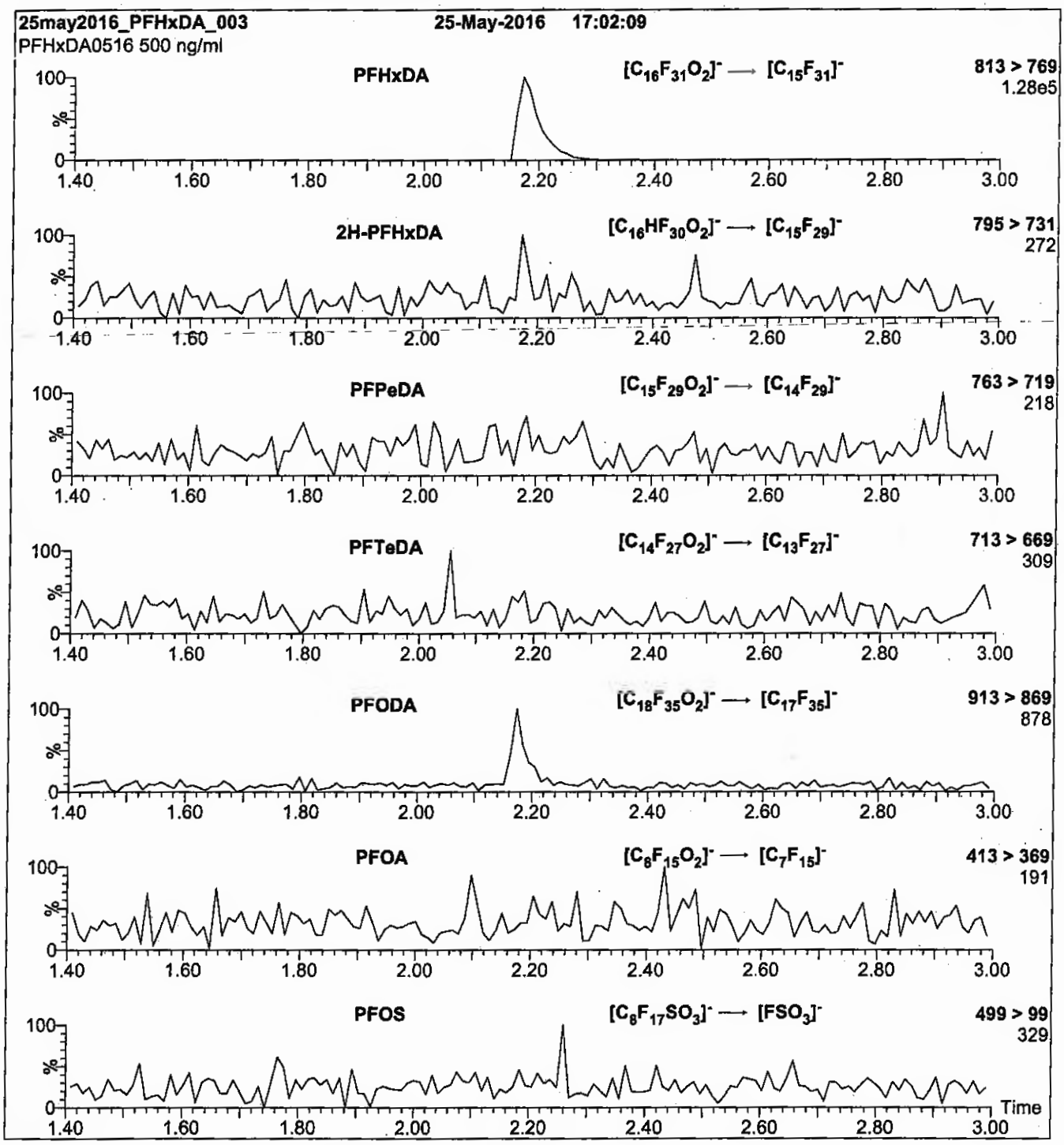
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1250 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 25.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFHxDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFHxDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.66e-3
Collision Energy (eV) = 15

Reagent

LCPFHxS-br_00002

SBC
R: 9/13/16

730513
ID: LCPFHxS-br_00002
Exp: 07/03/20 Prpd: SBC
Potassium Perfluorohexane

730514
ID: LCPFHxS-br_00003
Exp: 07/03/20 Prpd: SBC
Potassium Perfluorohexane

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

br-PFHxSK

Potassium Perfluorohexanesulfonate Solution/Mixture of Linear and Branched Isomers

PRODUCT CODE:	br-PFHxSK
LOT NUMBER:	brPFHxSK0615
CONCENTRATION:	50.0 ± 2.5 µg/ml (total potassium salt)
	45.5 ± 2.3 µg/ml (total PFHxS anion)
SOLVENT(S):	Methanol
DATE PREPARED: (mm/dd/yyyy)	06/29/2015
LAST TESTED: (mm/dd/yyyy)	07/03/2015
EXPIRY DATE: (mm/dd/yyyy)	07/03/2020
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

DESCRIPTION:

The chemical purity has been determined to be ≥98% perfluorohexanesulfonate linear and branched isomers. The full name, structure and percent composition for each of the identified isomeric components are given in Table A.

DOCUMENTATION/ DATA ATTACHED:

Table A: Isomeric Components and Percent Composition by ^{19}F-NMR
Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS Data
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.5% of perfluoro-1-pentanesulfonate and ~ 0.2% of perfluoro-1-octanesulfonate.
- CAS#: 3871-99-6 (for linear isomer; potassium salt).

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where x is expressed as a relative standard uncertainty of the individual parameter.

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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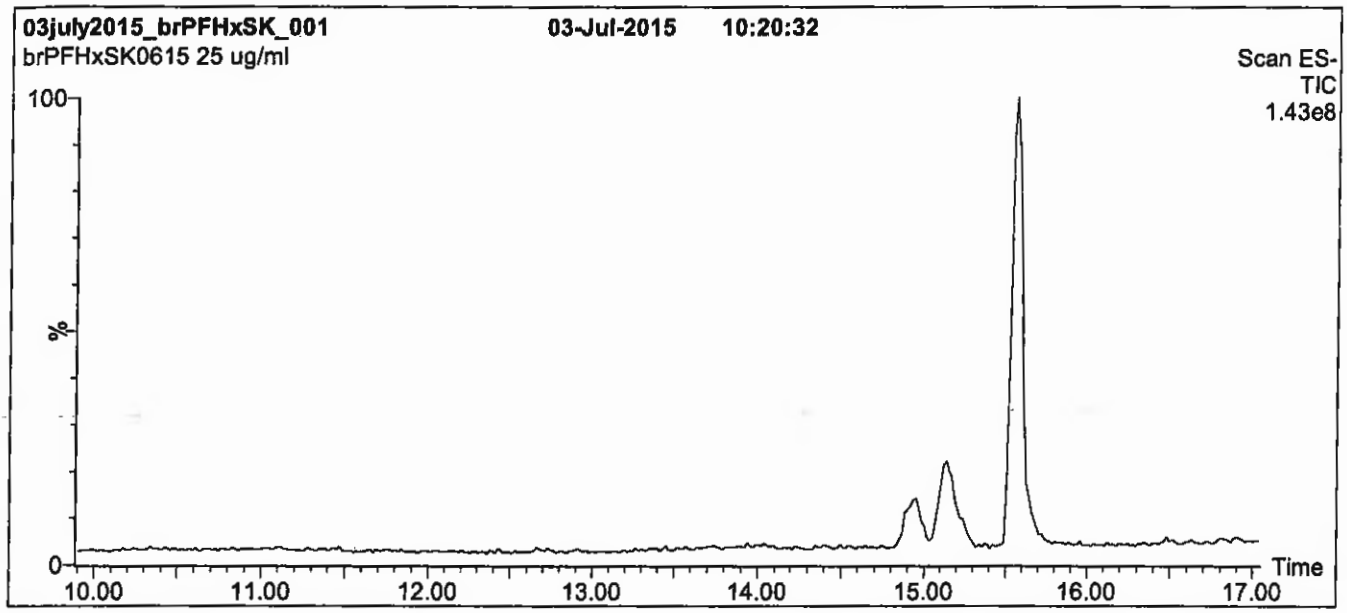
Table A: **br-PFHxSK; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

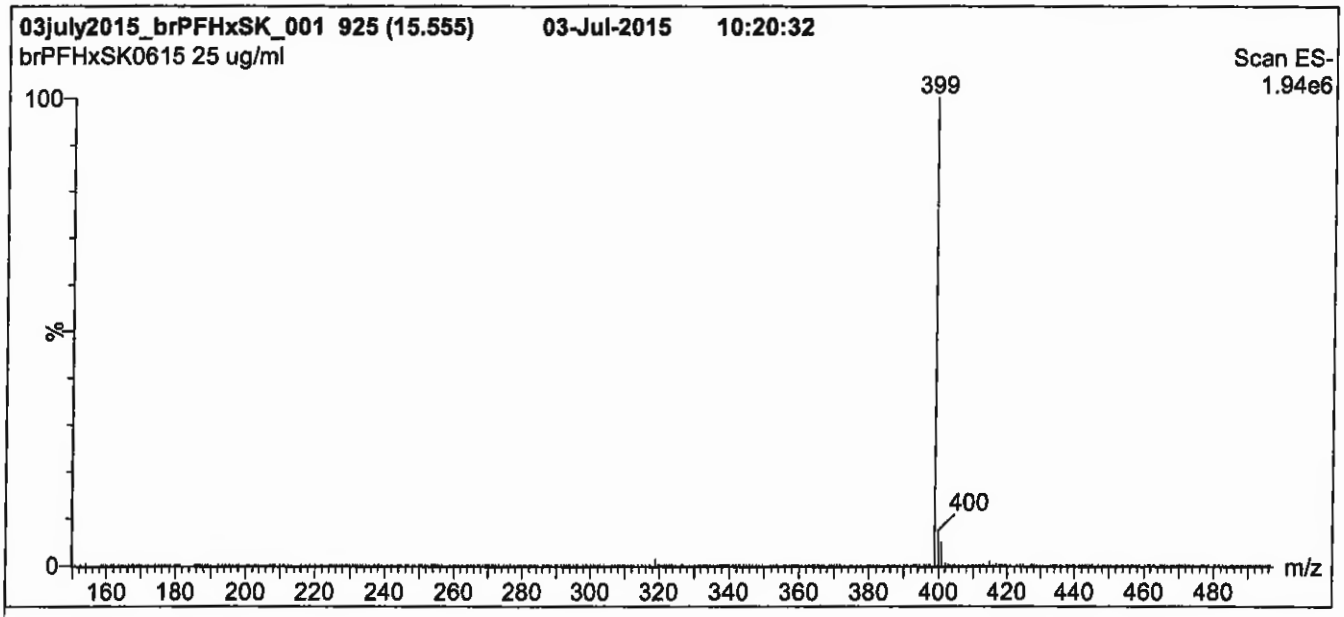
Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	Potassium perfluoro-1-hexanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	81.1
2	Potassium 1-trifluoromethylperfluoropentanesulfonate**	$CF_3CF_2CF_2CF_2CF(CF_3)SO_3^-K^+$	2.9
3	Potassium 2-trifluoromethylperfluoropentanesulfonate	$CF_3CF_2CF_2CF(CF_3)CF_2SO_3^-K^+$	1.4
4	Potassium 3-trifluoromethylperfluoropentanesulfonate	$CF_3CF_2CF(CF_3)CF_2CF_2SO_3^-K^+$	5.0
5	Potassium 4-trifluoromethylperfluoropentanesulfonate	$CF_3CF(CF_3)CF_2CF_2CF_2SO_3^-K^+$	8.9
6	Potassium 3,3-di(trifluoromethyl)perfluorobutanesulfonate	$CF_3C(CF_3)CF_2CF_2SO_3^-K^+$	0.2
7	Other Unidentified Isomers		0.5

* Percent of total perfluorohexanesulfonate isomers only.
** Systematic Name: Potassium perfluorohexane-2-sulfonate.

Certified By: B.G. Chittim **Date:** 07/15/2015 (mm/dd/yyyy)

Figure 1: **br-PFHxSK; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 20% (80:20 MeOH:ACN) / 80% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 50% organic over 14 min. Ramp to 90% organic over 3 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 20 min

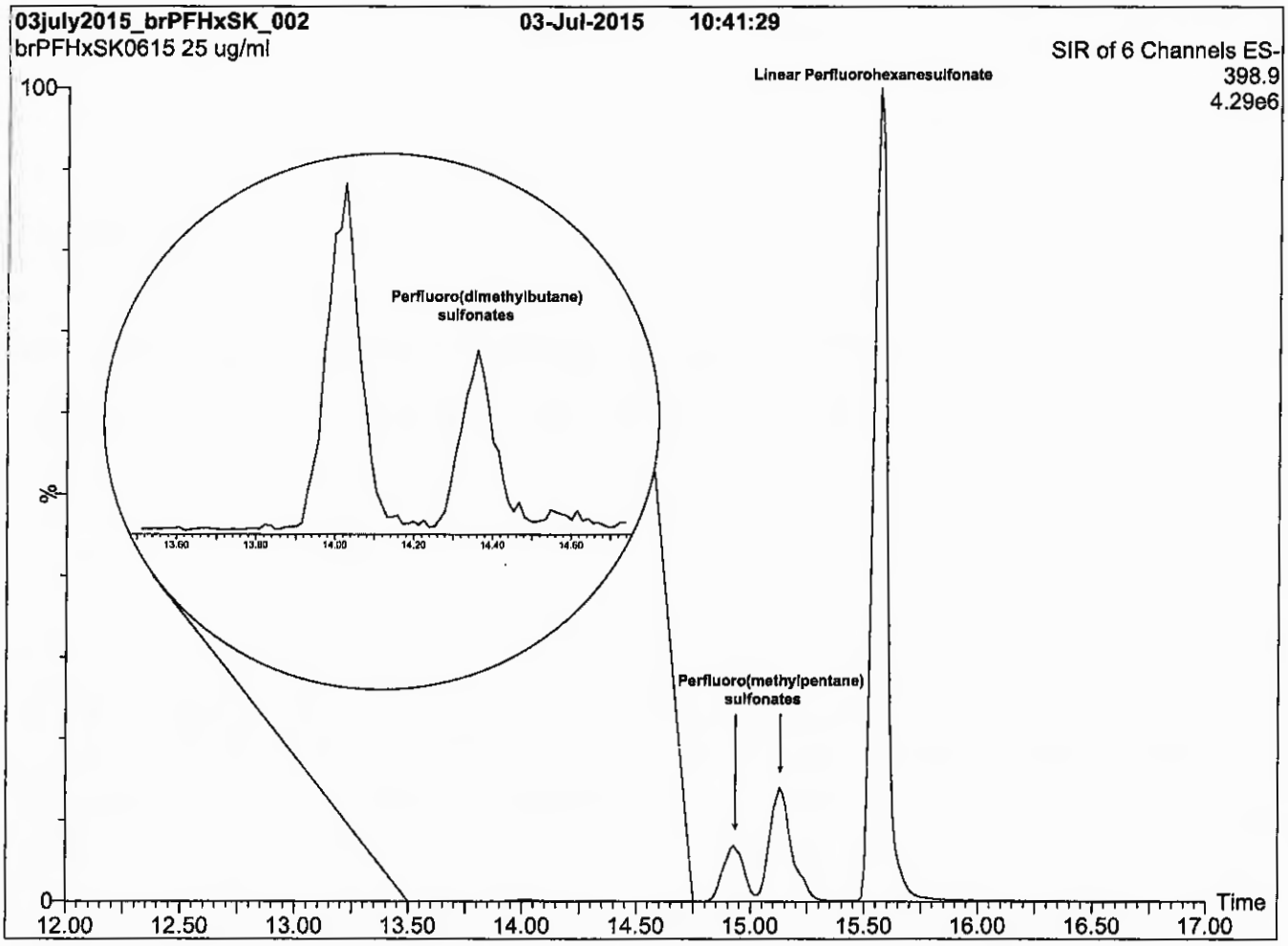
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 50.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **br-PFHxSK; LC/MS Data**



Conditions for Figure 2:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 20% (80:20 MeOH:ACN) / 80% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 50% organic over 14 min. Ramp to
90% organic over 3 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 20 min

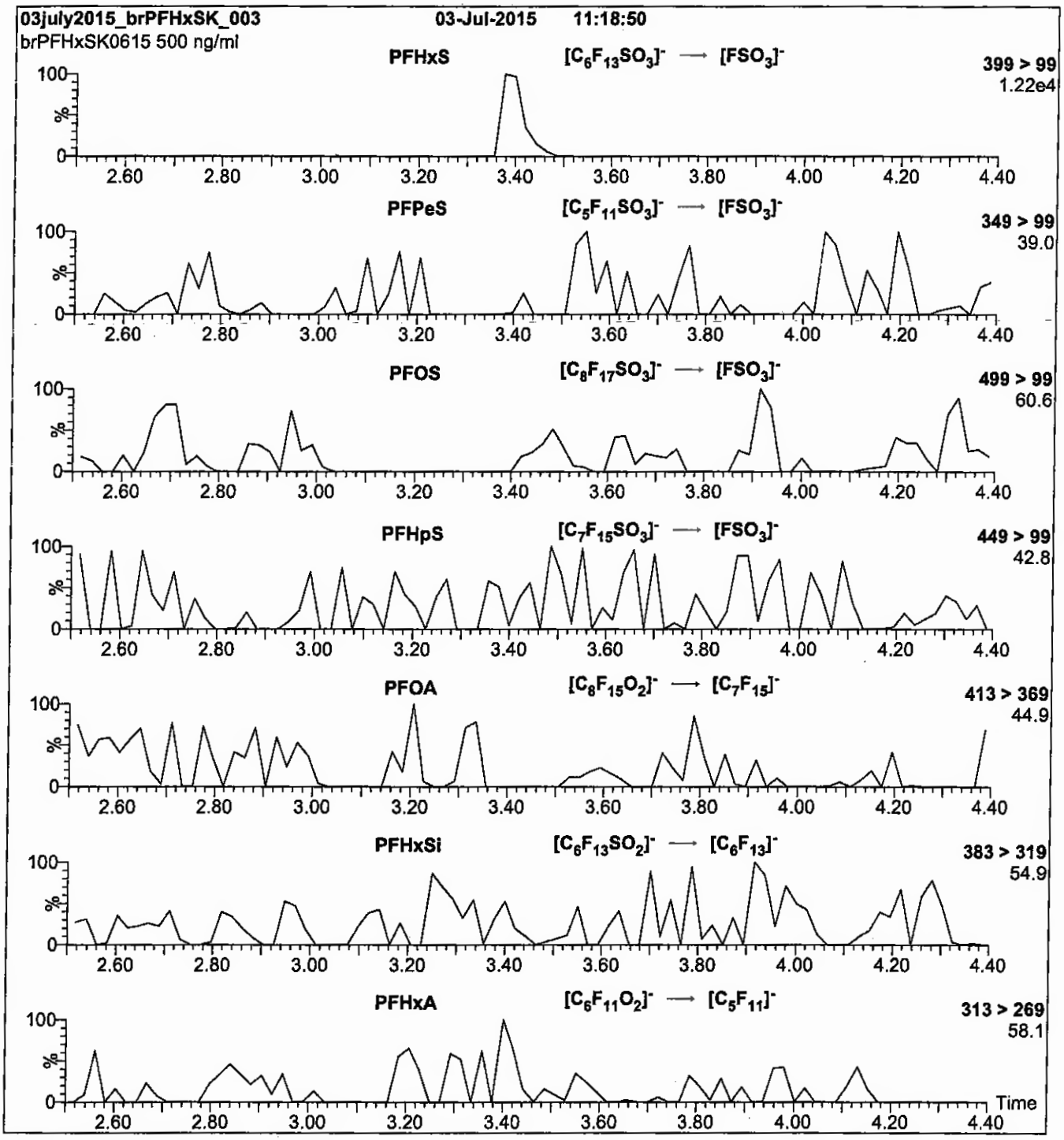
Flow: 300 µl/min

MS Parameters

Experiment: SIR (6 channels)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 50.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 3: **br-PFHxSK; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 3:

Injection: Direct loop injection
10 µl (500 ng/ml br-PFHxSK)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.54e-3
Collision Energy (eV) = 30

Reagent

LCPFNA_00005

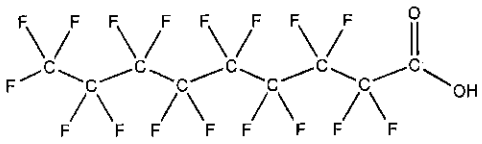
609703
ID: LCPFNA_00005
Exp: 10/23/20 Prpd: CBW
PF-n-nonanoic acid

R·4/7/16 CBW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFNA	**LOT NUMBER:**	PFNA1015
COMPOUND:	Perfluoro-n-nonanoic acid		
STRUCTURE:		**CAS #:**	375-95-1



MOLECULAR FORMULA:	$C_9HF_{17}O_2$	**MOLECULAR WEIGHT:**	464.08
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	10/23/2015		
EXPIRY DATE: (mm/dd/yyyy)	10/23/2020		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.1% of perfluoro-n-octanoic acid (PFOA) and < 0.1% of perfluoro-n-heptanoic acid (PFHpA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 10/30/2015
B.G. Chittim (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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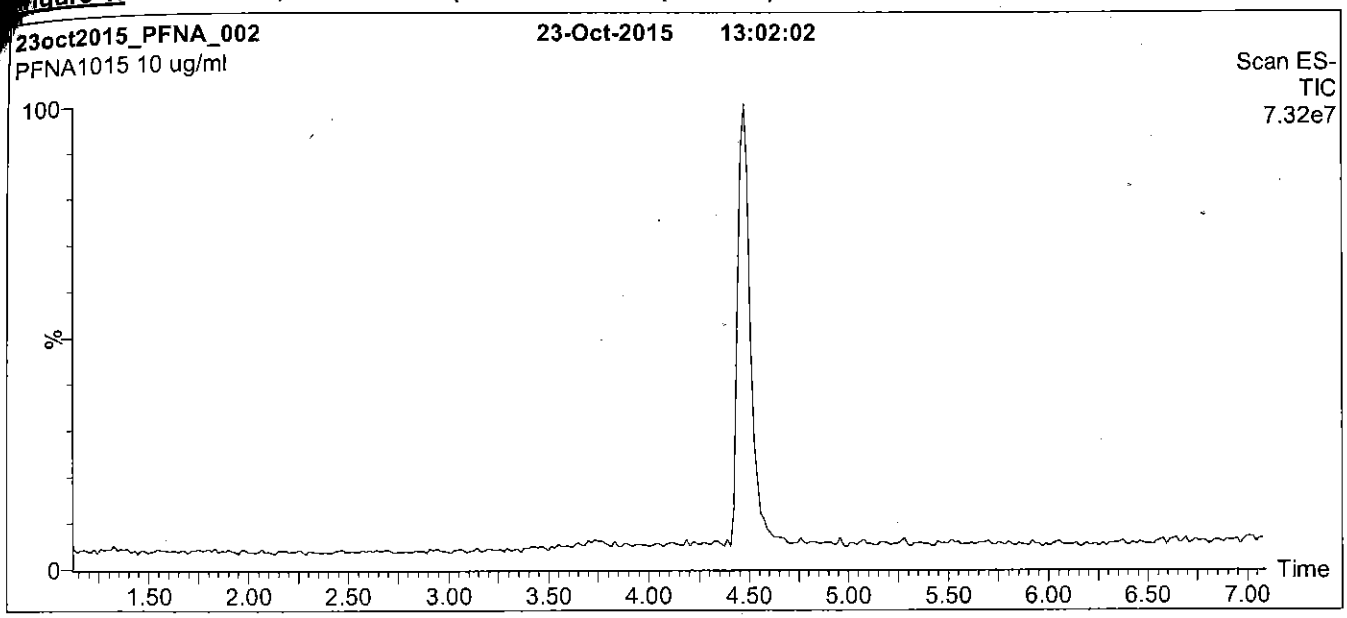
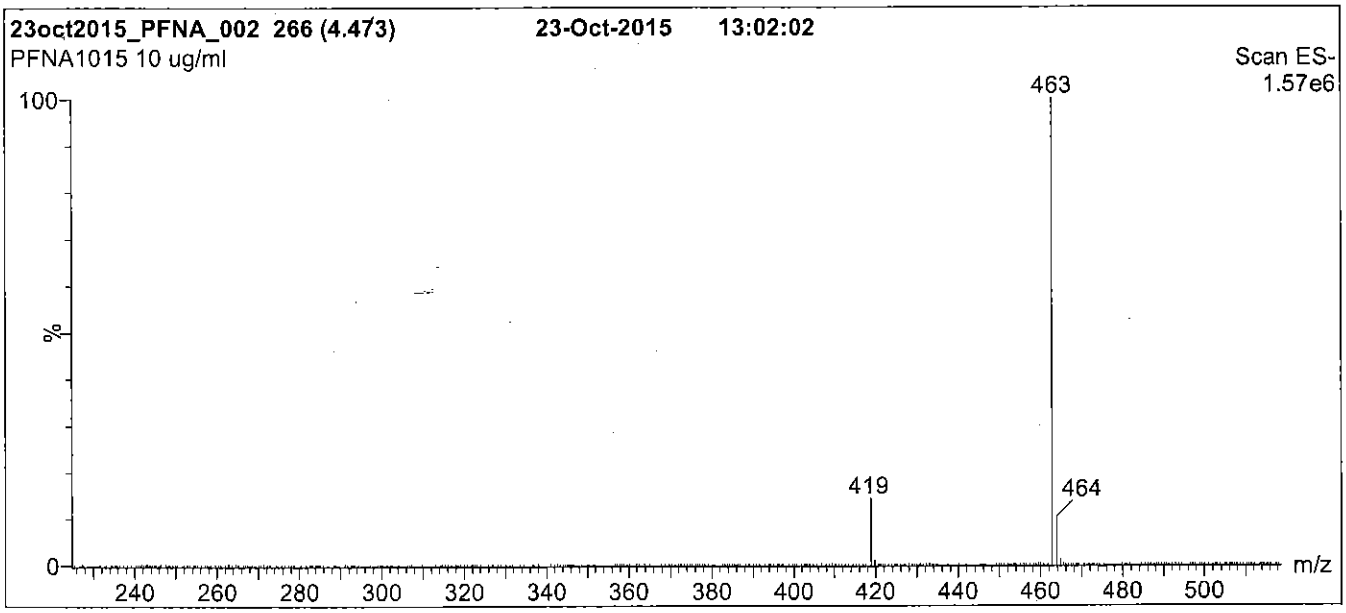
Figure 1: PFNA; LC/MS Data (TIC and Mass Spectrum)





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1.7 µm, 2.1 x 100 mm

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Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

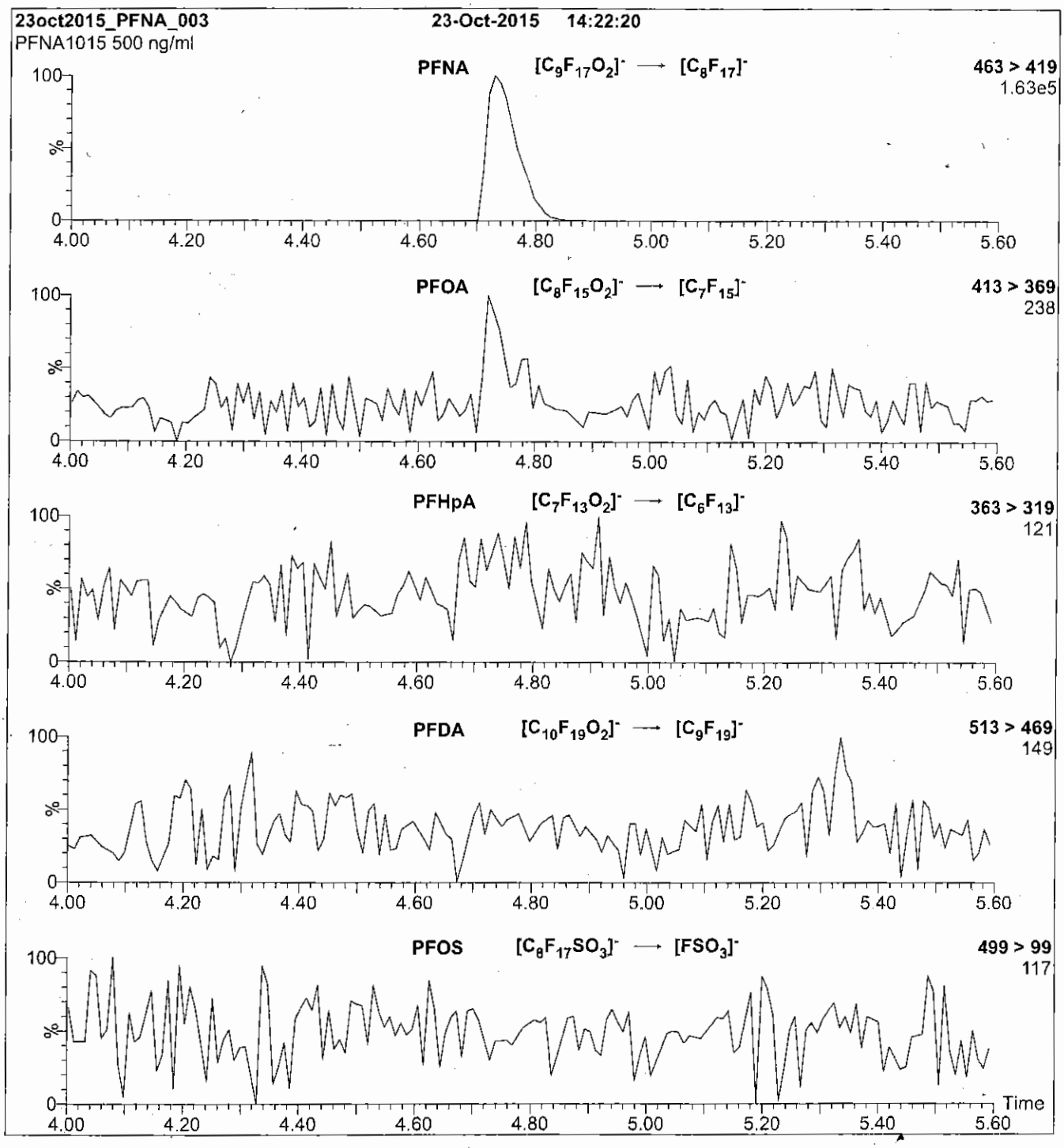
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFNA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFNA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 11

Reagent

LCPFNA_00006

R: SBC 9/13/16
Scanned 10/14/16

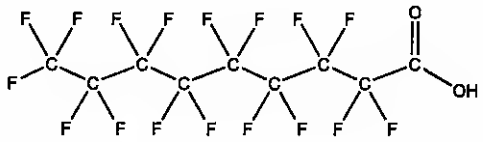
730559
ID: LCPFNA_00006
Exp: 10/23/20 Prpd: SBC
PF-n-nonanoic acid

730560
ID: LCPFNA_00007
Exp: 10/23/20 Prpd: SBC
PF-n-nonanoic acid

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFNA	**LOT NUMBER:**	PFNA1015
COMPOUND:	Perfluoro-n-nonanoic acid		
STRUCTURE:		**CAS #:**	375-95-1



MOLECULAR FORMULA:	$C_9HF_{17}O_2$	**MOLECULAR WEIGHT:**	464.08
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	10/23/2015		
EXPIRY DATE: (mm/dd/yyyy)	10/23/2020		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.1% of perfluoro-n-octanoic acid (PFOA) and < 0.1% of perfluoro-n-heptanoic acid (PFHpA).

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:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

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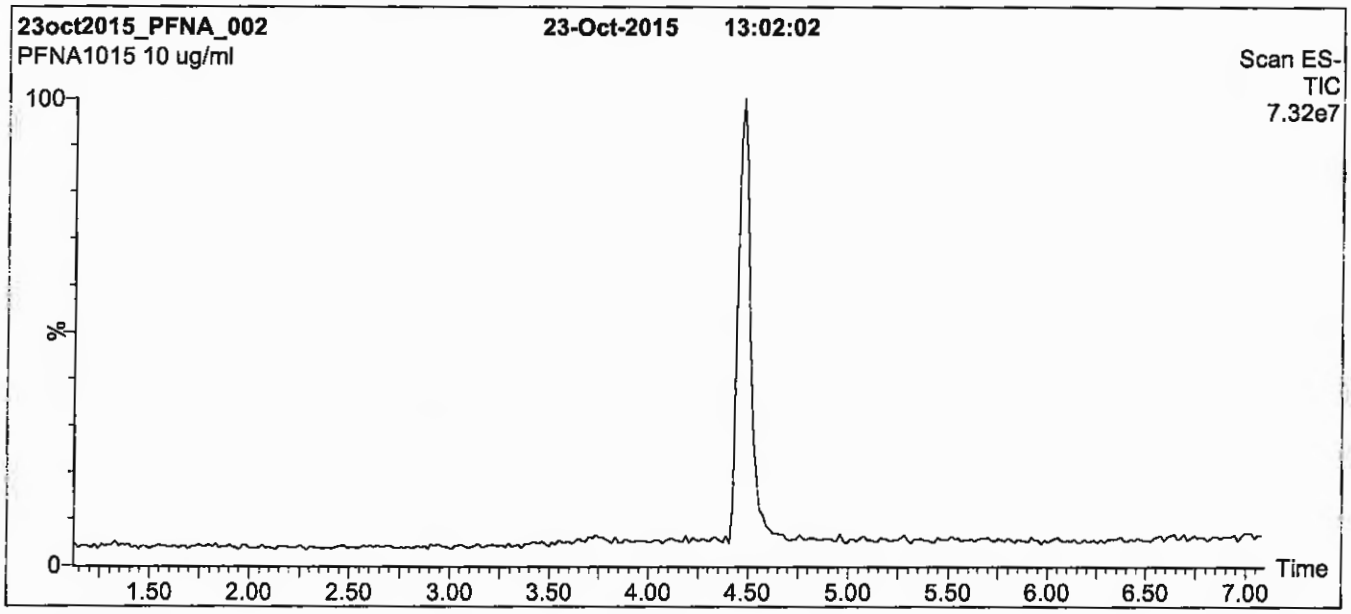
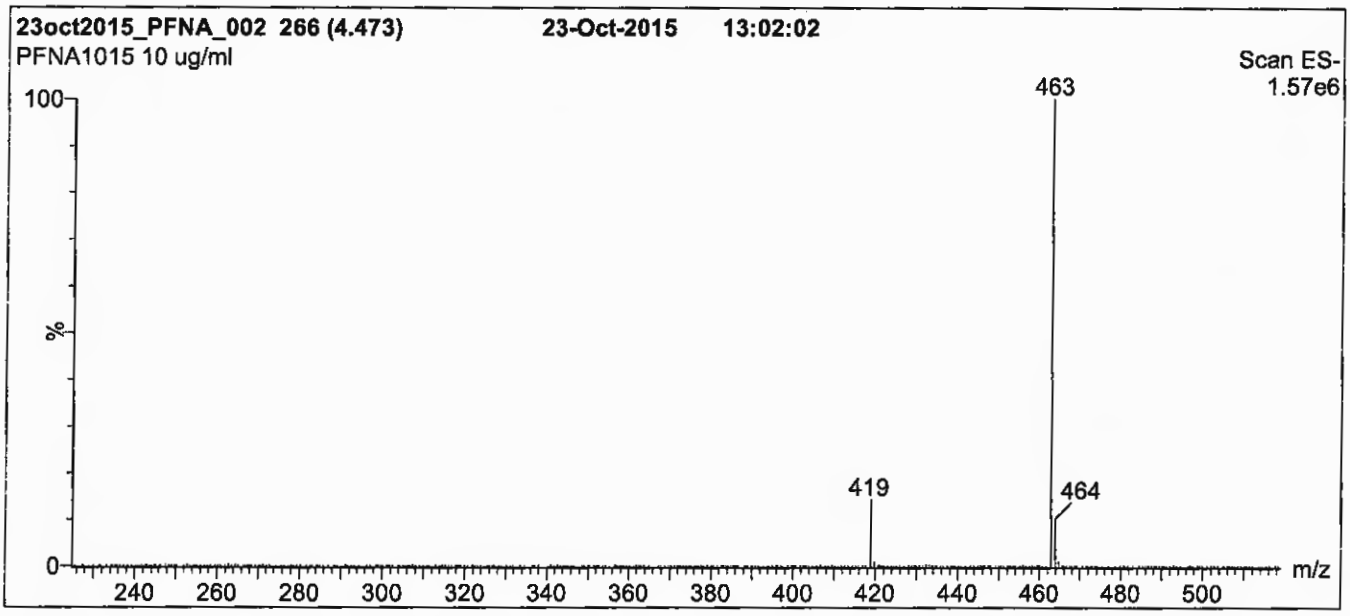
Figure 1: **PFNA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

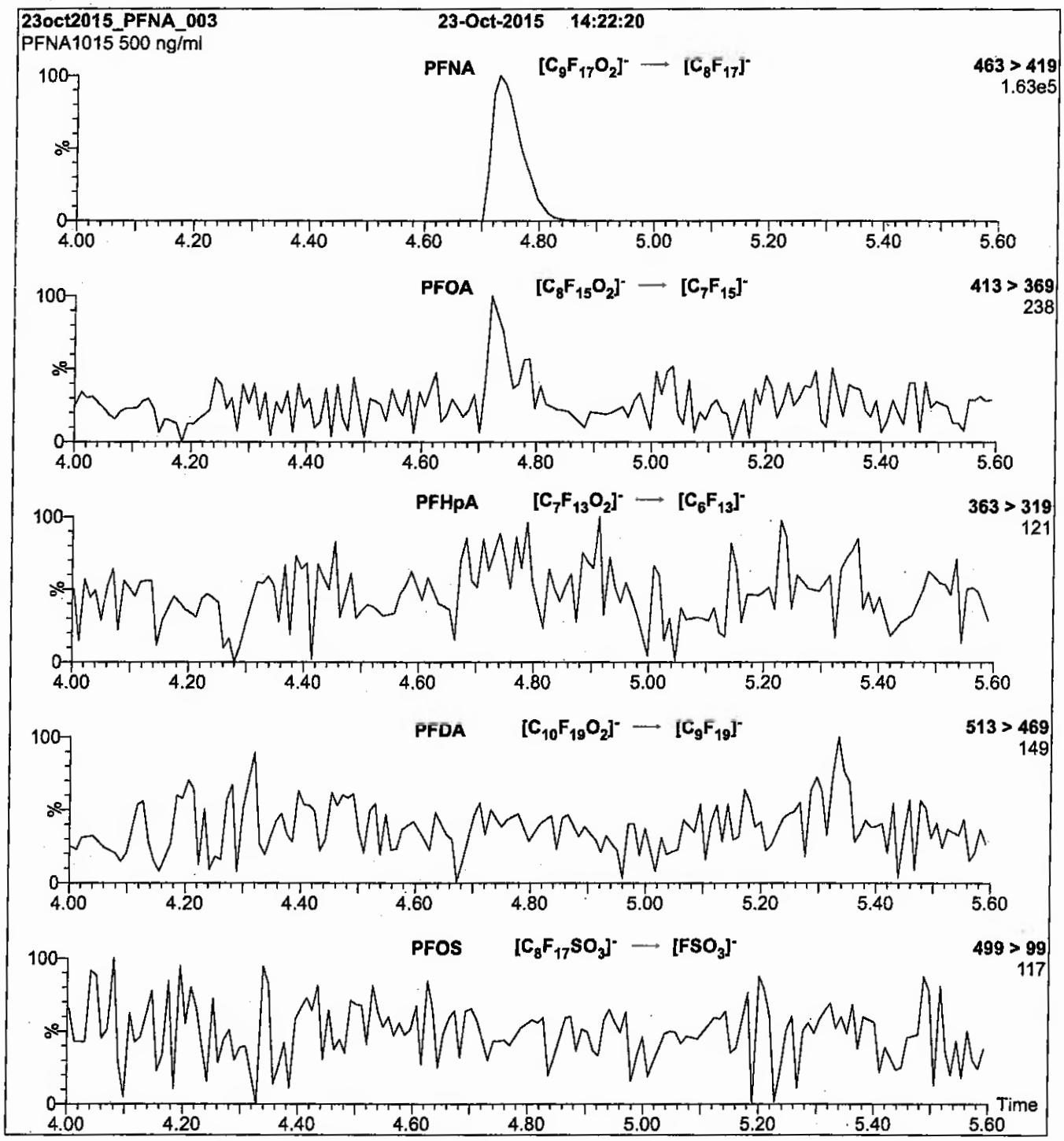
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFNA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml PFNA)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 11

Reagent

LCPFOA_00006

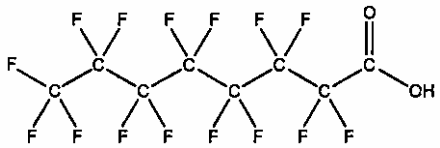
R-7/6/16 CBW

671577
ID: LCPFOA_00006
Exp: 11/06/20 Prpd: CBW
PF-n-octanoic acid

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFOA	**LOT NUMBER:**	PFOA1115
COMPOUND:	Perfluoro-n-octanoic acid		
STRUCTURE:		**CAS #:**	335-67-1



MOLECULAR FORMULA:	$C_8HF_{15}O_2$	**MOLECULAR WEIGHT:**	414.07
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	11/06/2015		
EXPIRY DATE: (mm/dd/yyyy)	11/06/2020		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 11/11/2015 (mm/dd/yyyy)

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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where x is expressed as a relative standard uncertainty of the individual parameter.

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EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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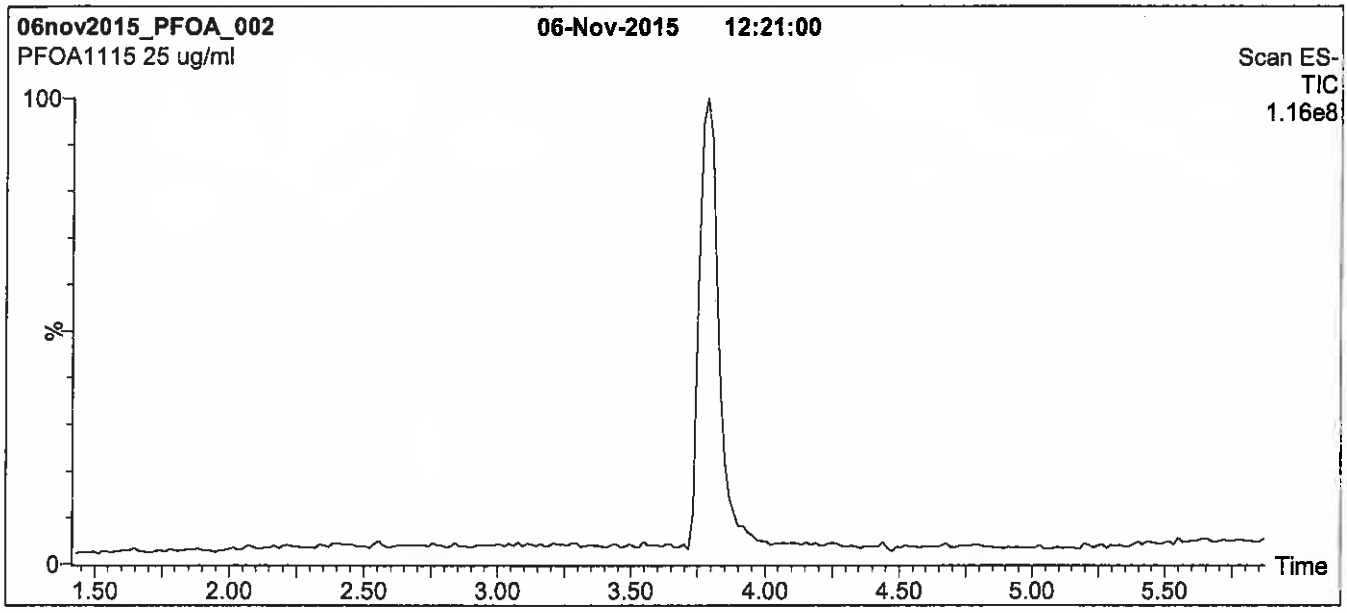
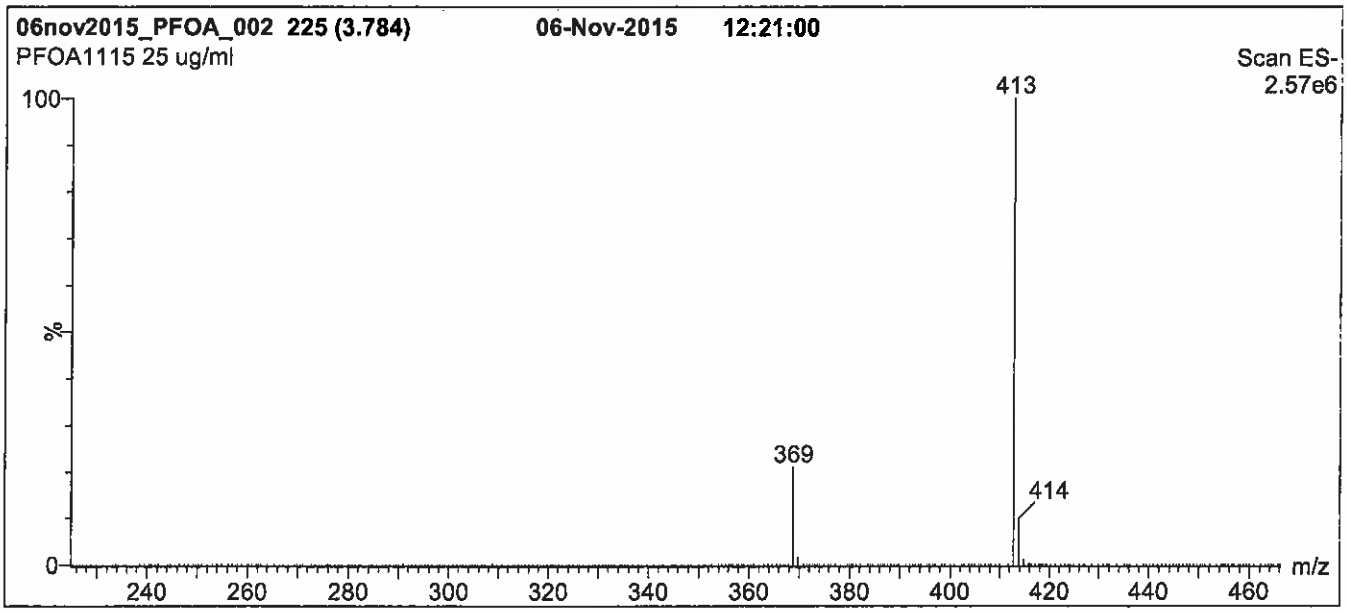
CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **PFOA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.
Time: 10 min

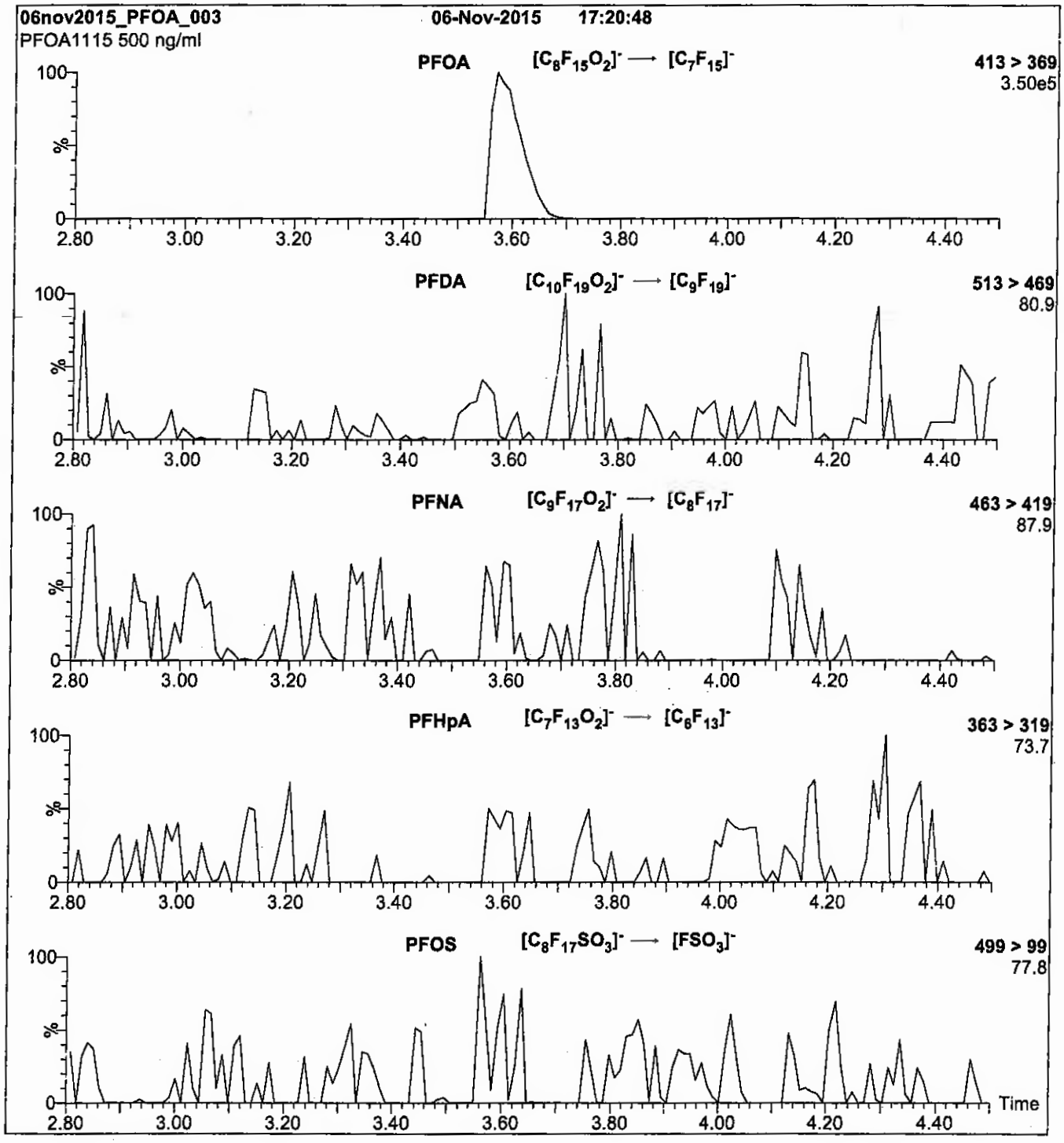
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFOA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml PFOA)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

Collision Gas (mbar) = 3.17e-3
Collision Energy (eV) = 10

Reagent

LCPFODA_00005

Rec. 3/29/16 JRB

WELLINGTON LABORATORIES

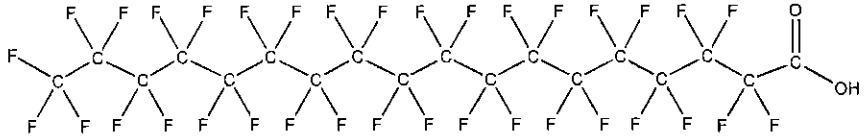
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFODA
COMPOUND: Perfluoro-n-octadecanoic acid

LOT NUMBER: PFODA0115

STRUCTURE:

CAS #: 16517-11-6



MOLECULAR FORMULA: $C_{18}HF_{35}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 914.14
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 01/30/2015
EXPIRY DATE: (mm/dd/yyyy) 01/30/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 03/25/2015 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED Reference Material Producer

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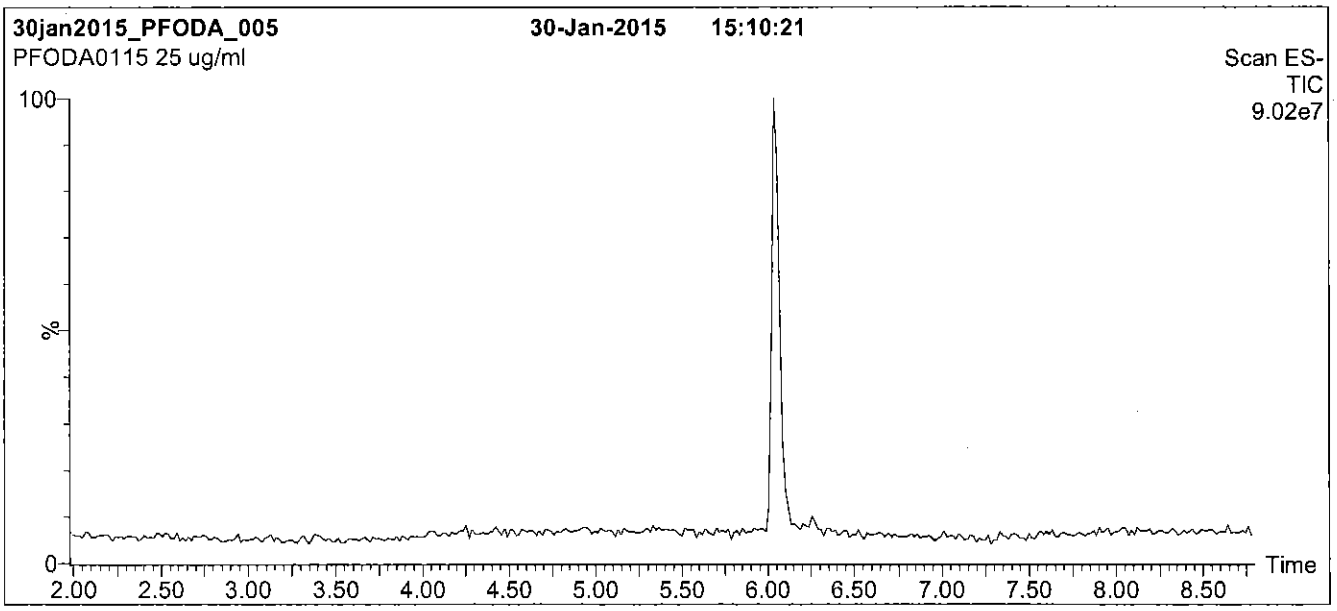
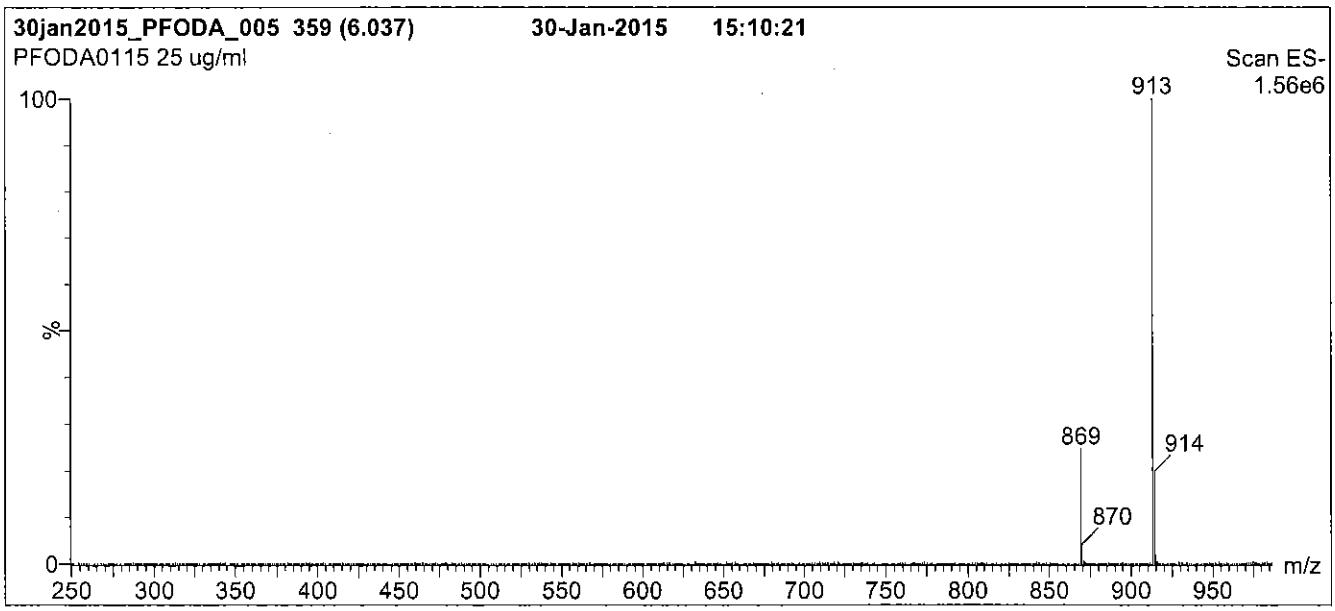
Figure 1: **PFODA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

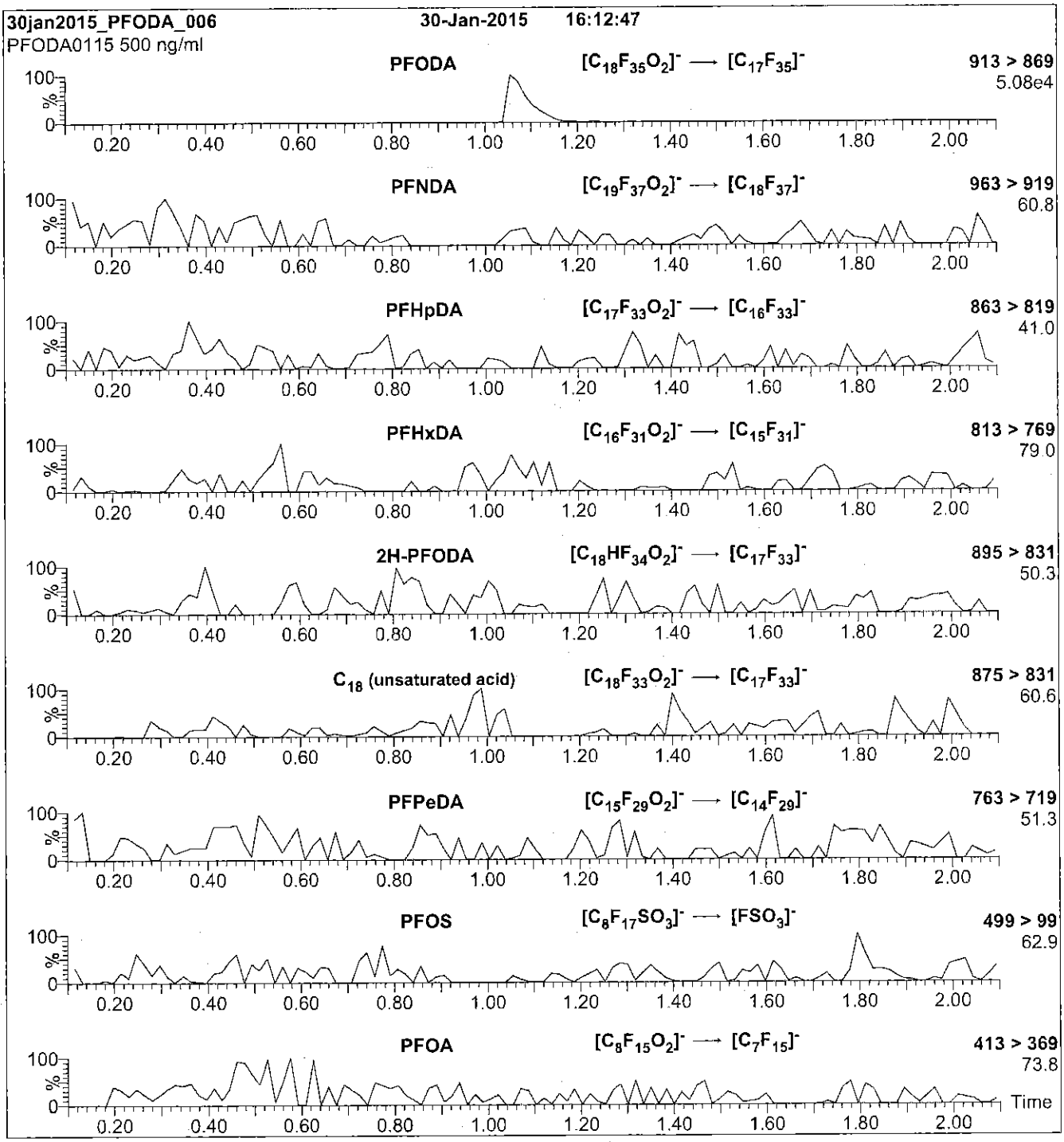
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1000 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 25.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFODA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFODA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 15

Reagent

LCPFODA_00006

Scanned 10/14/16

R: SBC 9/13/16

730632
ID: LCPFODA_00006
Exp: 04/29/21 Prpd: SBC
PFODA stock 50ug/mL

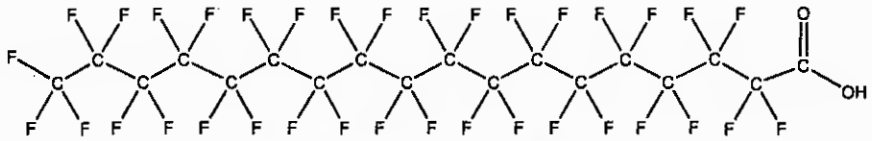
730633
ID: LCPFODA_00007
Exp: 04/29/21 Prpd: SBC
PFODA stock 50ug/mL

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFODA
COMPOUND: Perfluoro-n-octadecanoic acid
LOT NUMBER: PFODA0416

STRUCTURE:
CAS #: 16517-11-6



MOLECULAR FORMULA: $C_{18}HF_{35}O_2$
MOLECULAR WEIGHT: 914.14
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 04/29/2016
EXPIRY DATE: (mm/dd/yyyy) 04/29/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 05/20/2016 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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:

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where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

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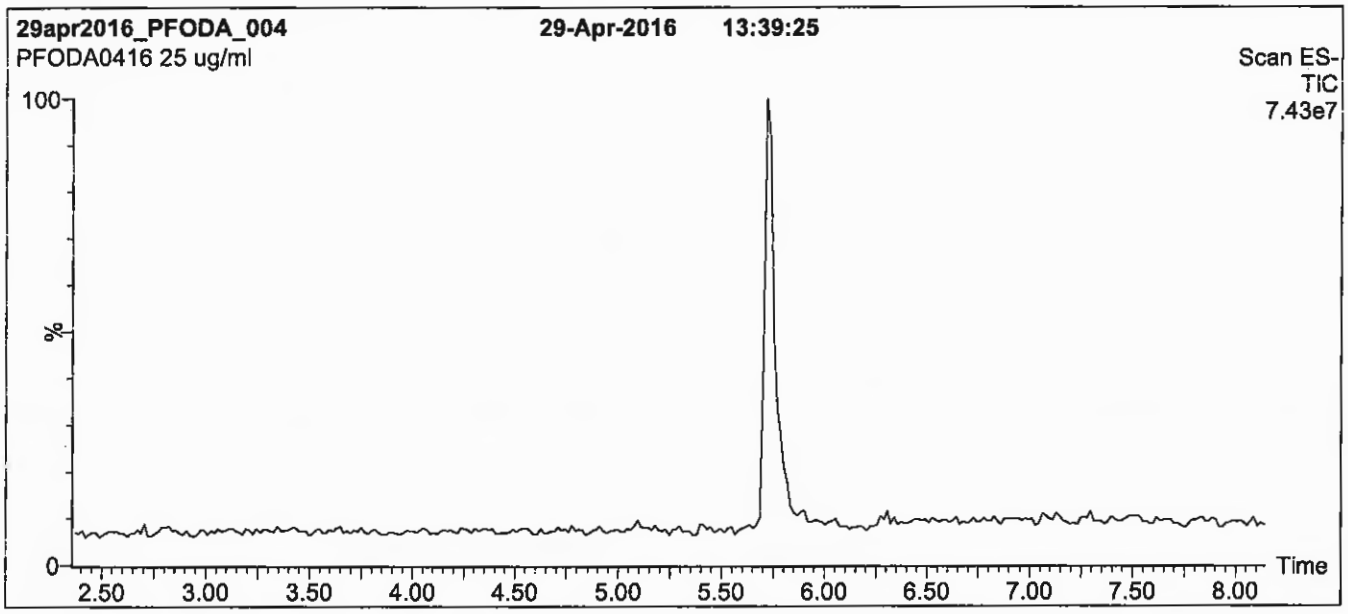
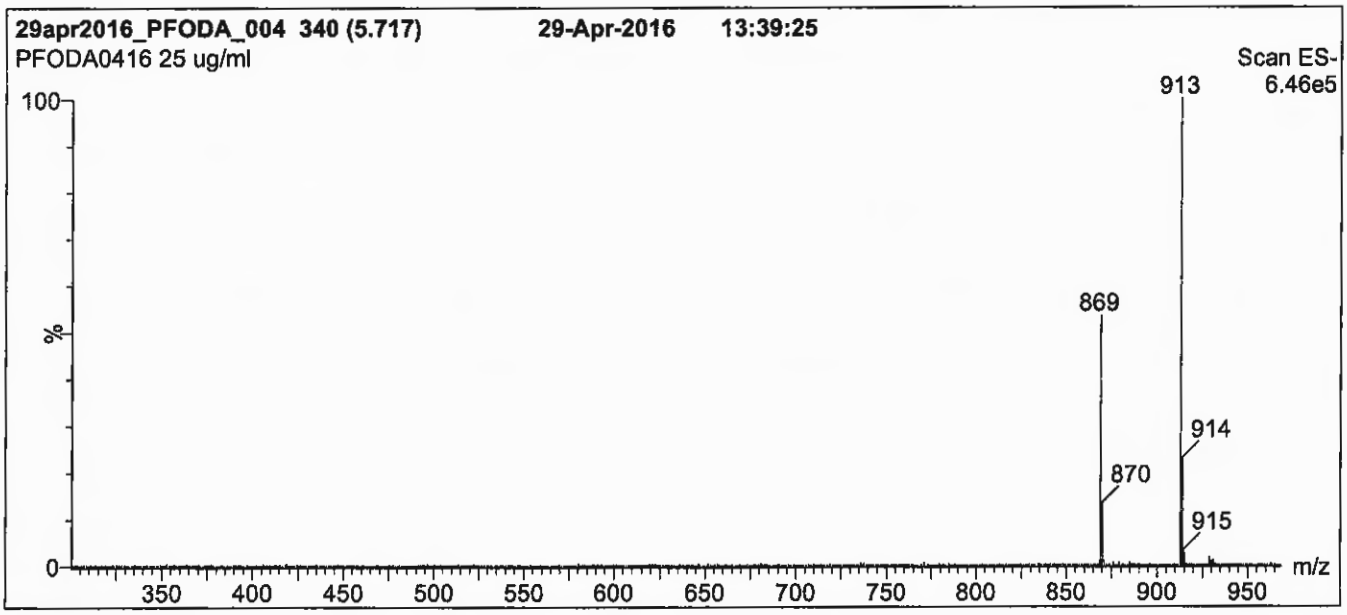
Figure 1: **PFODA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 70% (80:20 MeOH:ACN) / 30% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 95% organic over 6 min and hold for
2.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

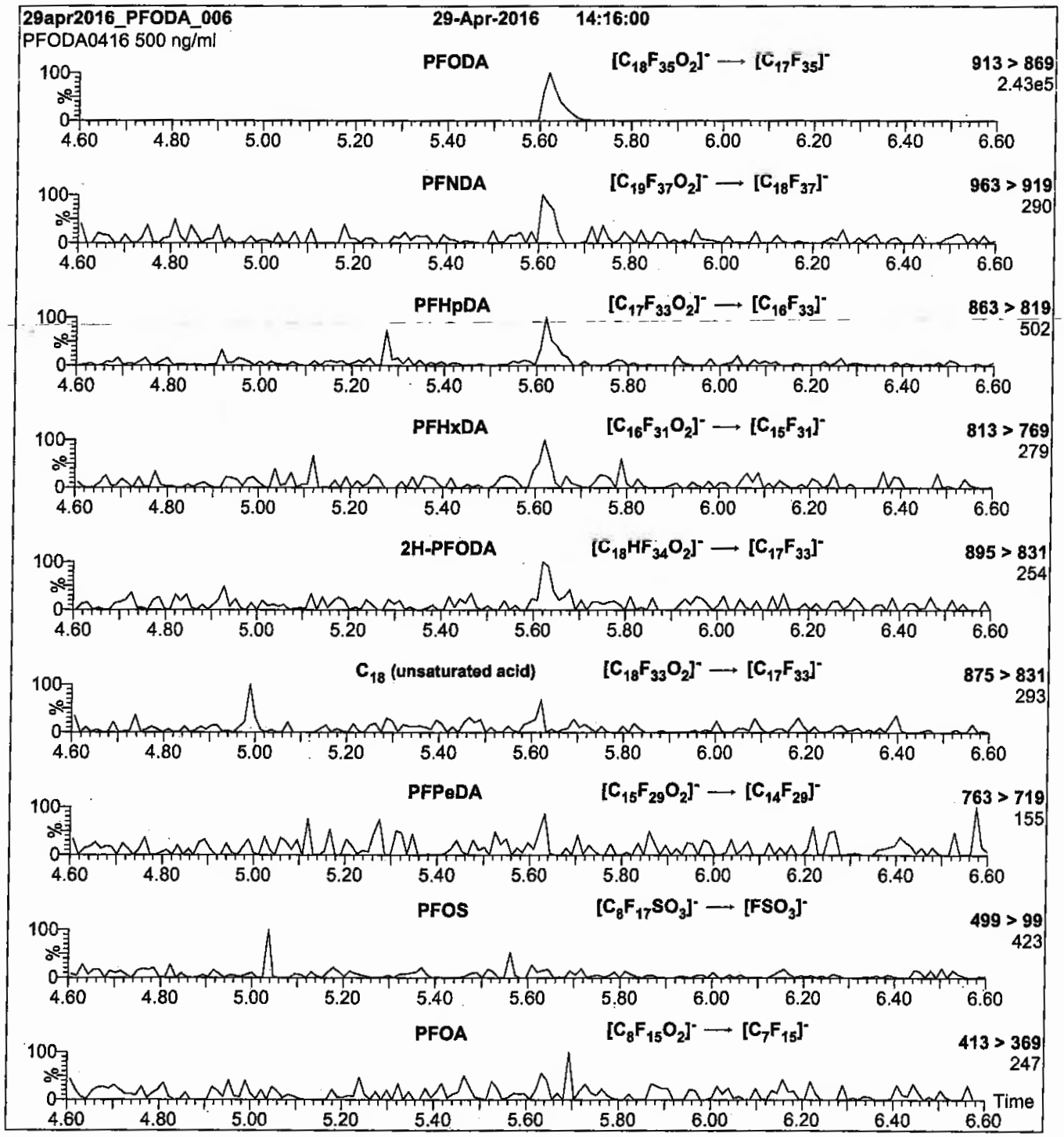
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1000 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 25.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFODA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFODA)

Mobile phase: Isocratic 90% (80:20 MeOH:ACN) / 10% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 15

Reagent

LCPFOS-br_00002

Scanned 10/14/16 SR

R: SBC 9/13/16

730515
ID: LCPFOS-br_00002
Exp: 10/14/20 Prpd: SBC
Potassium Perfluorooctane

730516
ID: LCPFOS-br_00003
Exp: 10/14/20 Prpd: SBC
Potassium Perfluorooctane

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

br-PFOSK

Potassium Perfluorooctanesulfonate
Solution/Mixture of Linear and
Branched Isomers

PRODUCT CODE:	br-PFOSK
LOT NUMBER:	brPFOSK1015
CONCENTRATION:	50 ± 2.5 µg/ml (total potassium salt)
	46.4 ± 2.3 µg/ml (total PFOS anion)
SOLVENT(S):	Methanol
DATE PREPARED: (mm/dd/yyyy)	10/13/2015
LAST TESTED: (mm/dd/yyyy)	10/14/2015
EXPIRY DATE: (mm/dd/yyyy)	10/14/2020
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

DESCRIPTION:

The chemical purity has been determined to be ≥98% perfluorooctanesulfonate linear and branched isomers. The full name, structure and percent composition for each of the isomeric components are given in Table A.

DOCUMENTATION/ DATA ATTACHED:

Table A: Isomeric Components and Percent Composition by ^{19}F-NMR
Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS Data (SIR)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- A 5-point calibration curve was generated using linear PFOS (potassium salt) and mass-labelled PFOS as an internal standard to enable quantitation of br-PFOSK using isotopic dilution.
- CAS#: 2795-39-3 (for linear isomer; potassium salt).

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CALA Testing A 1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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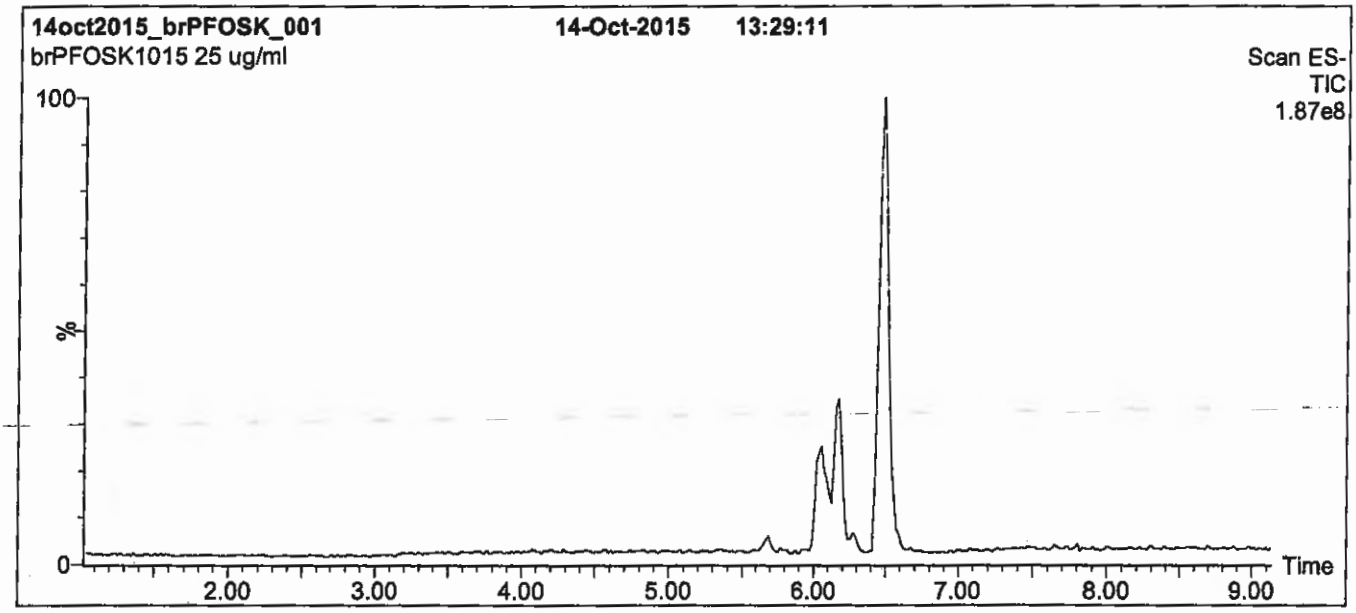
Table A: **br-PFOSK; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

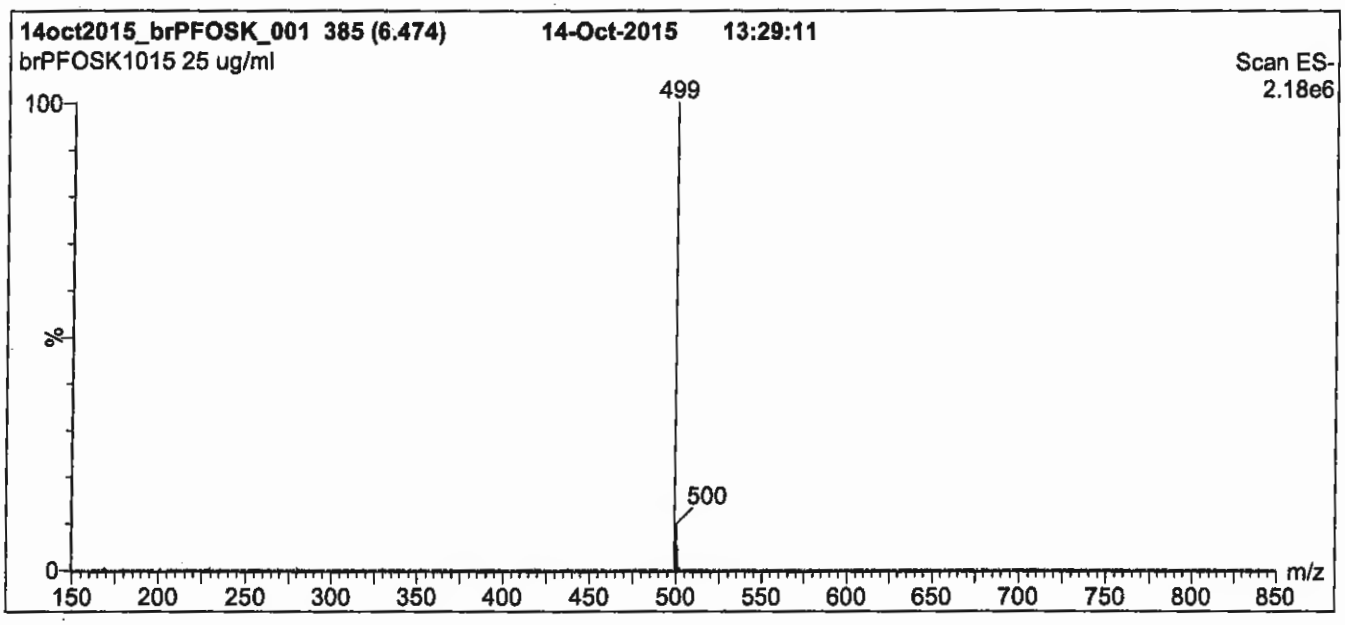
Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	Potassium perfluoro-1-octanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	78.8
2	Potassium 1-trifluoromethylperfluoroheptanesulfonate**	$CF_3CF_2CF_2CF_2CF_2CF_2CF(CF_3)SO_3^-K^+$	1.2
3	Potassium 2-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF(CF_3)CF_2SO_3^-K^+$	0.6
4	Potassium 3-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF_2CF(CF_3)CF_2CF_2SO_3^-K^+$	1.9
5	Potassium 4-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF(CF_3)CF_2CF_2CF_2SO_3^-K^+$	2.2
6	Potassium 5-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF(CF_3)CF_2CF_2CF_2CF_2SO_3^-K^+$	4.5
7	Potassium 6-trifluoromethylperfluoroheptanesulfonate	$CF_3CF(CF_3)CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	10.0
8	Potassium 5,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3-C(CF_3)CF_2CF_2CF_2CF_2SO_3^-K^+$	0.2
9	Potassium 4,4-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3CF_2-C(CF_3)-CF_2CF_2CF_2SO_3^-K^+$	0.03
10	Potassium 4,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3-CF(CF_3)-CF(CF_3)-CF_2CF_2CF_2SO_3^-K^+$	0.4
11	Potassium 3,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3-CF(CF_3)-CF_2-CF(CF_3)-CF_2CF_2SO_3^-K^+$	0.07

* Percent of total perfluorooctanesulfonate isomers only. Isomers are labelled in Figure 2.
** Systematic Name: Potassium perfluorooctane-2-sulfonate.

Certified By: _____ **Date:** 10/15/2015
B.G. Chittim (mm/dd/yyyy)

Figure 1: **br-PFOSK; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 45% (80:20 MeOH:ACN) / 55% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 12 min and hold for 2 min.
Return to initial conditions over 0.5 min.
Time: 16 min

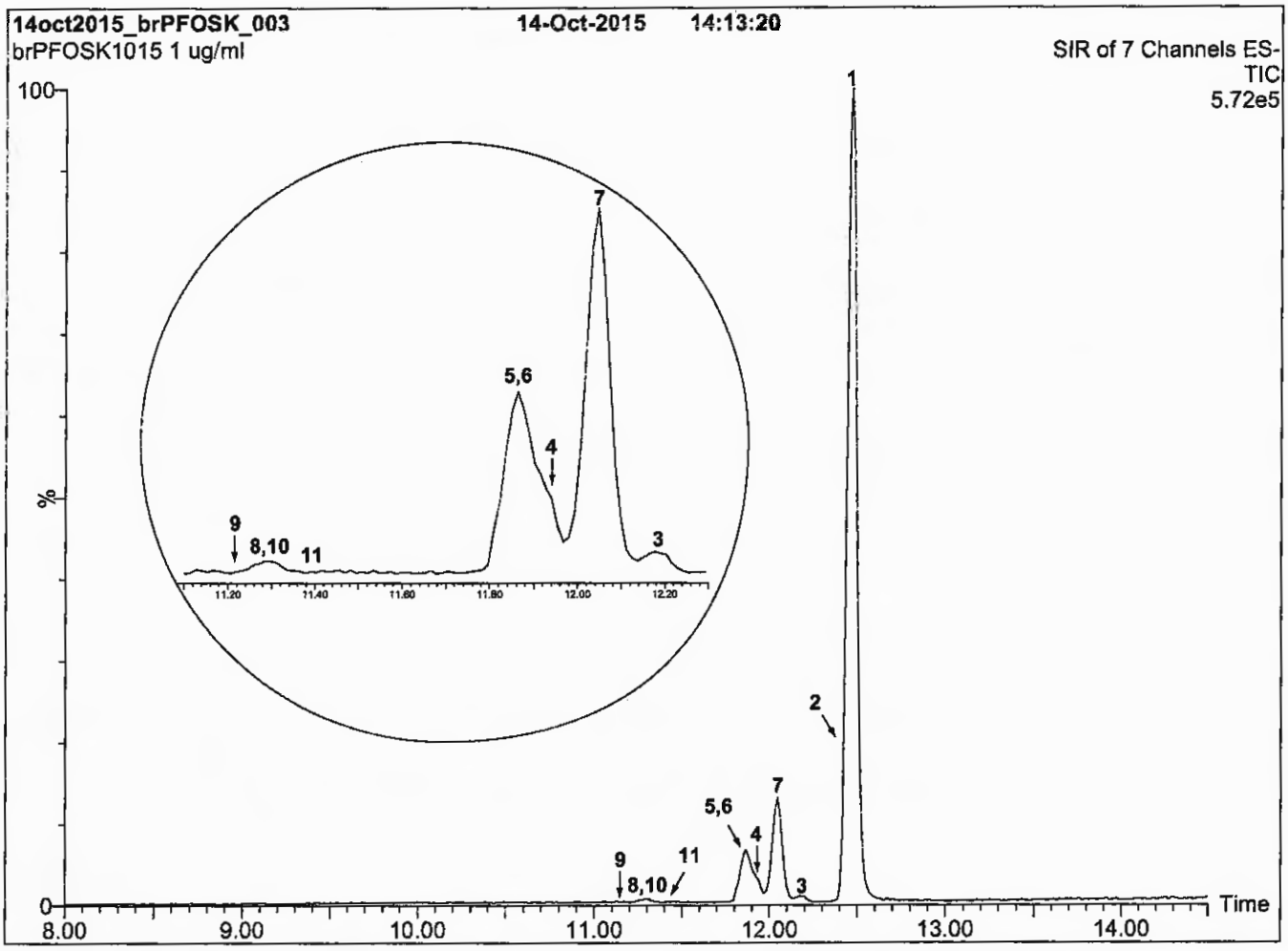
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 60.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **br-PFOSK; LC/MS Data (SIR)**



Conditions for Figure 2:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions:

Column: Acquity UPLC BEH Shield RP_{18} (1.7 µm, 2.1 x 100 mm)

Injection: 1.0 µg/ml of br-PFOSK

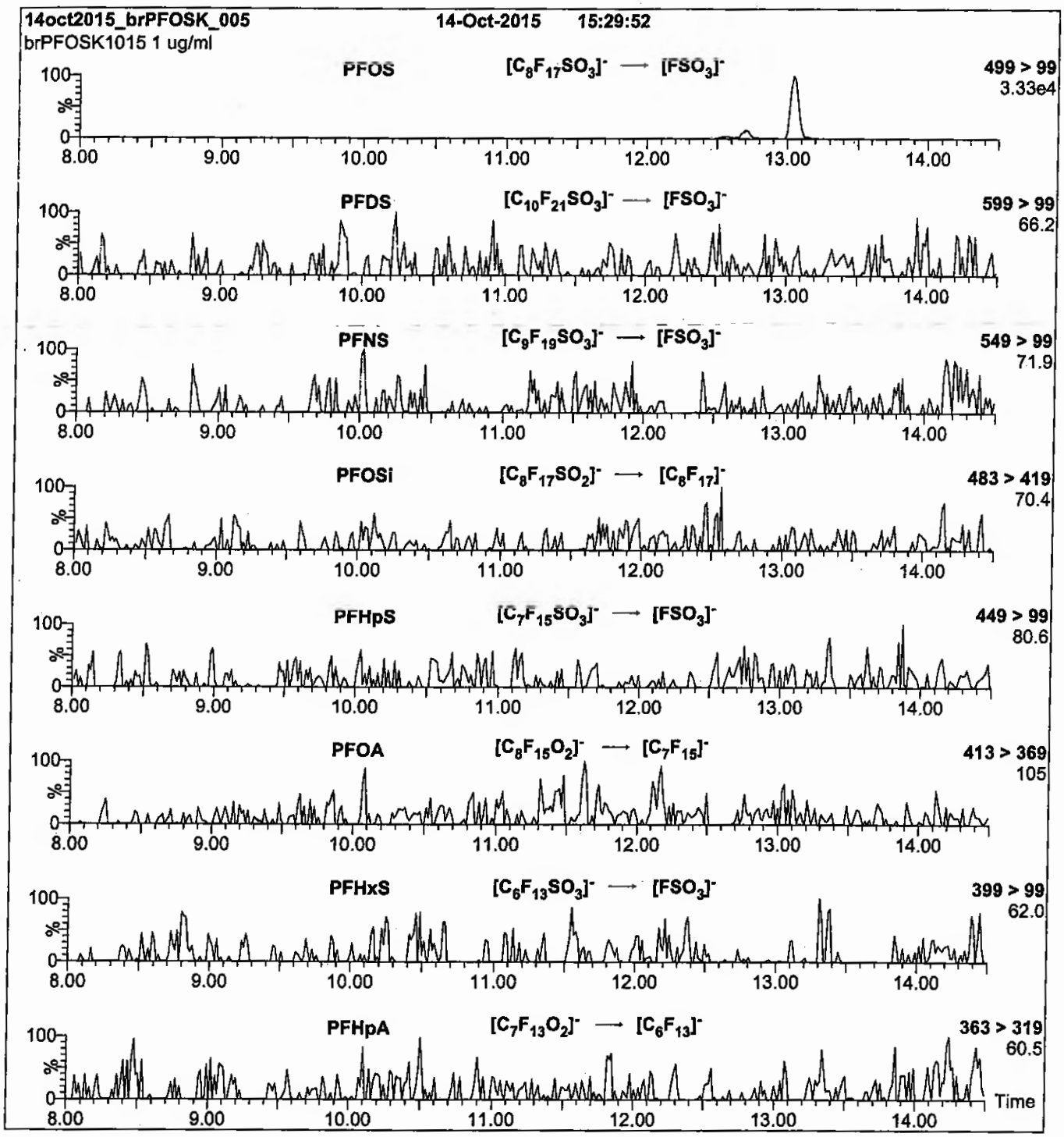
Mobile Phase: Gradient
45% (80:20 MeOH:ACN) / 55% H_2O (both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 15 min and hold for 3 min.
Return to initial conditions over 1 min.
Time: 20 min

Flow: 300 µl/min

MS Conditions:

SIR (ES^-)
Source = 110 °C
Desolvation = 325 °C
Cone Voltage = 60V

Figure 3: **br-PFOSK; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 3:

Injection: On-column

Mobile phase: Same as Figure 2

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.06e-3
Collision Energy (eV) = 11-50 (variable)

Reagent

LCPFOSA_00006

Rec 12/30/15 CW

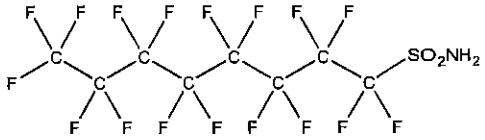
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: FOSA-I
COMPOUND: Perfluoro-1-octanesulfonamide
LOT NUMBER: FOSA0815I

STRUCTURE:

CAS #: 754-91-6



MOLECULAR FORMULA:	$C_8H_2F_{17}NO_2S$	**MOLECULAR WEIGHT:**	499.14
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Isopropanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	09/02/2015		
EXPIRY DATE: (mm/dd/yyyy)	09/02/2017		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

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Certified By: B.G. Chittim **Date:** 09/11/2015 (mm/dd/yyyy)

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17025 AR REFERENCE MATERIAL PRODUCER

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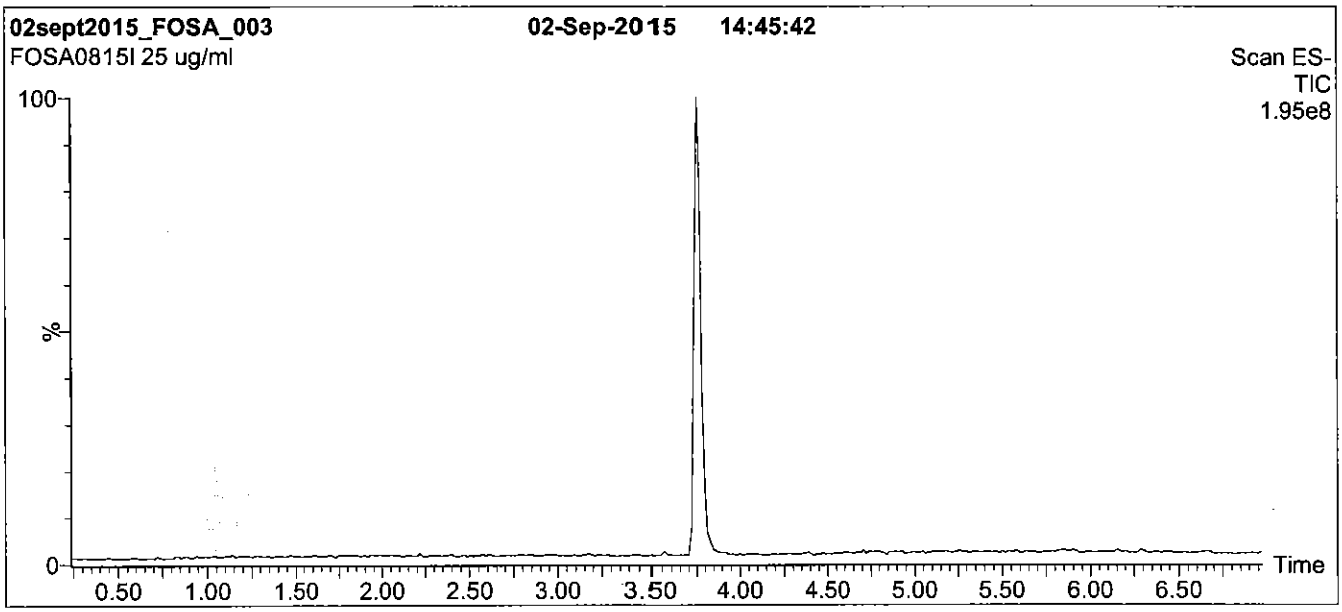
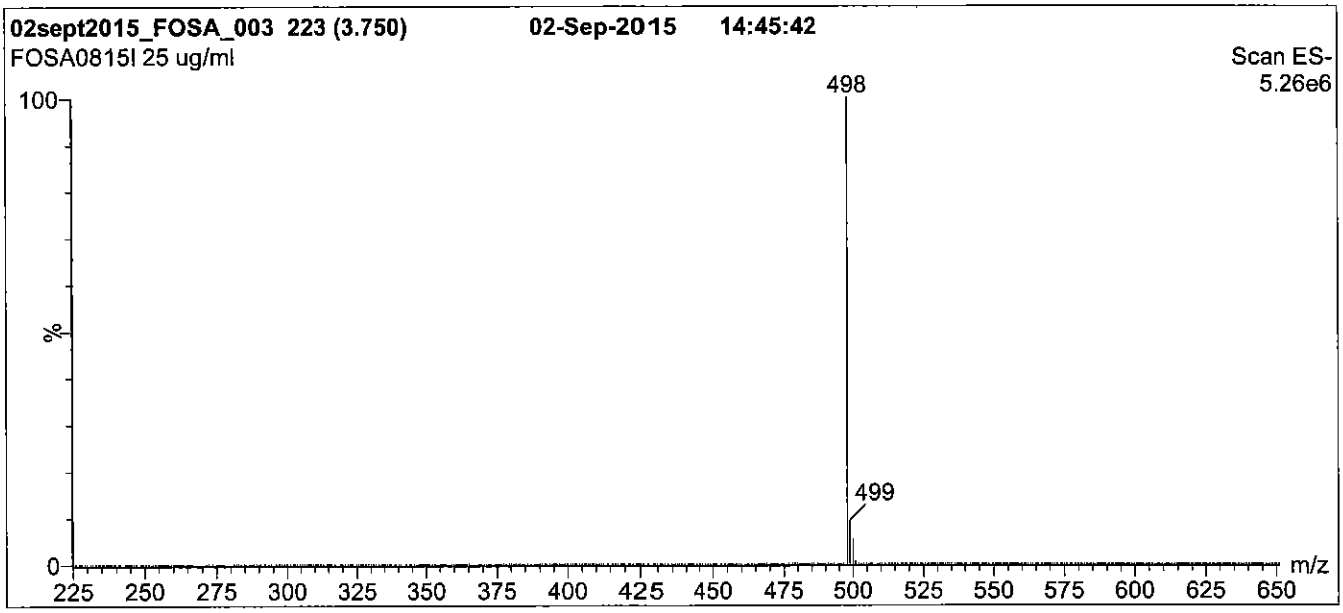
Figure 1: **FOSA-I; LC/MS Data (TIC and Mass Spectrum)**





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Ramp to 90% organic over 7 min and hold for 1.5 min
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Time: 10 min

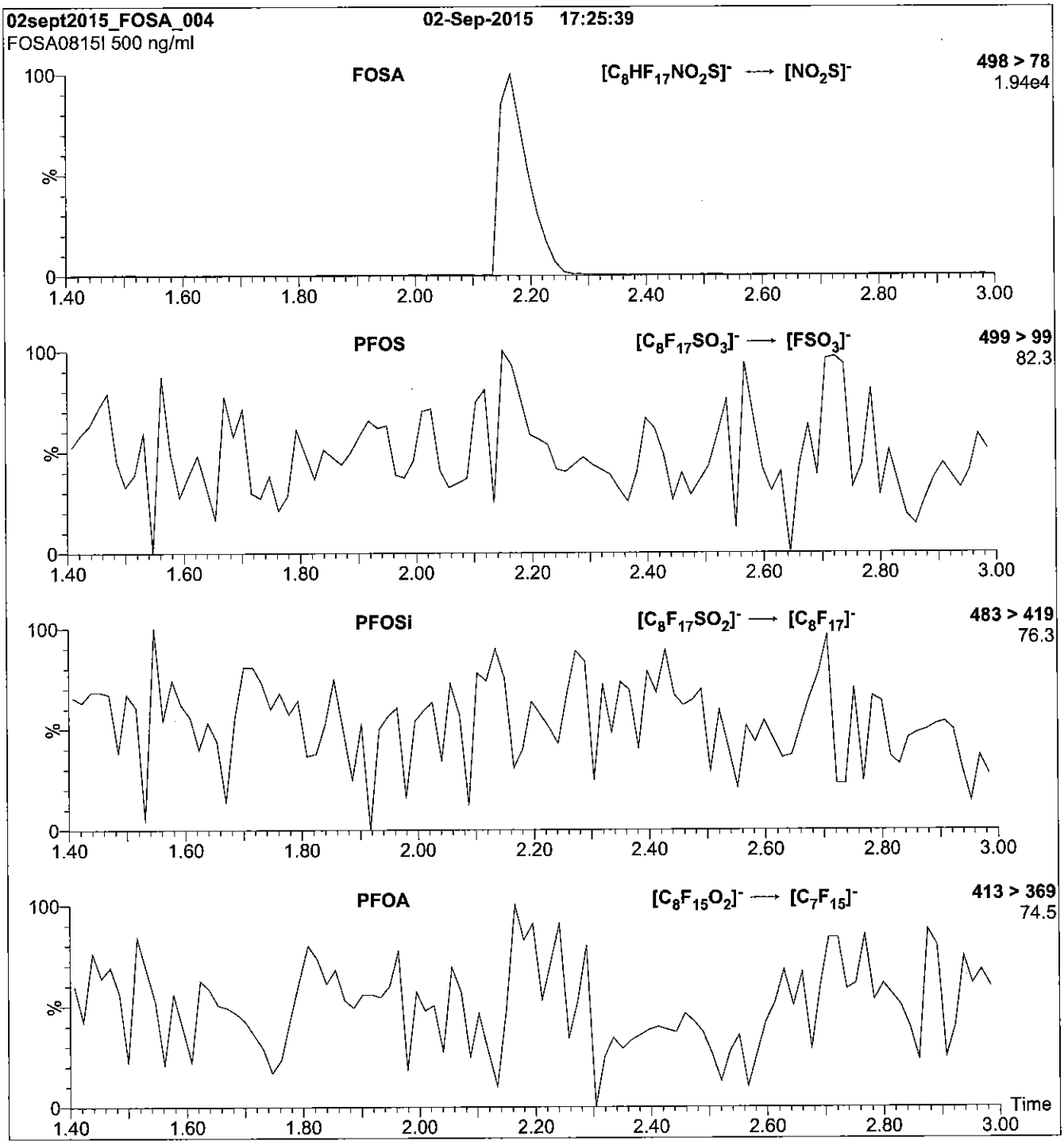
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.50
Cone Voltage (V) = 40.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **FOSA-I; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml FOSA-I)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.54e-3
Collision Energy (eV) = 30

Reagent

LCPFOSA_00008

Scanned 10/14/16

R: SBC 9/13/16

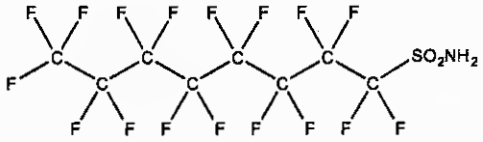
730534
ID: LCPFOSA_00009
Exp: 09/02/17 Prpd: SBC
PF-1-octanesulfonamide

730533
ID: LCPFOSA_00008
Exp: 09/02/17 Prpd: SBC
PF-1-octanesulfonamide

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	FOSA-I	**LOT NUMBER:**	FOSA0815I
COMPOUND:	Perfluoro-1-octanesulfonamide		
STRUCTURE:		**CAS #:**	754-91-6



MOLECULAR FORMULA:	$C_8H_2F_{17}NO_2S$	**MOLECULAR WEIGHT:**	499.14
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Isopropanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	09/02/2015		
EXPIRY DATE: (mm/dd/yyyy)	09/02/2017		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 09/11/2015 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

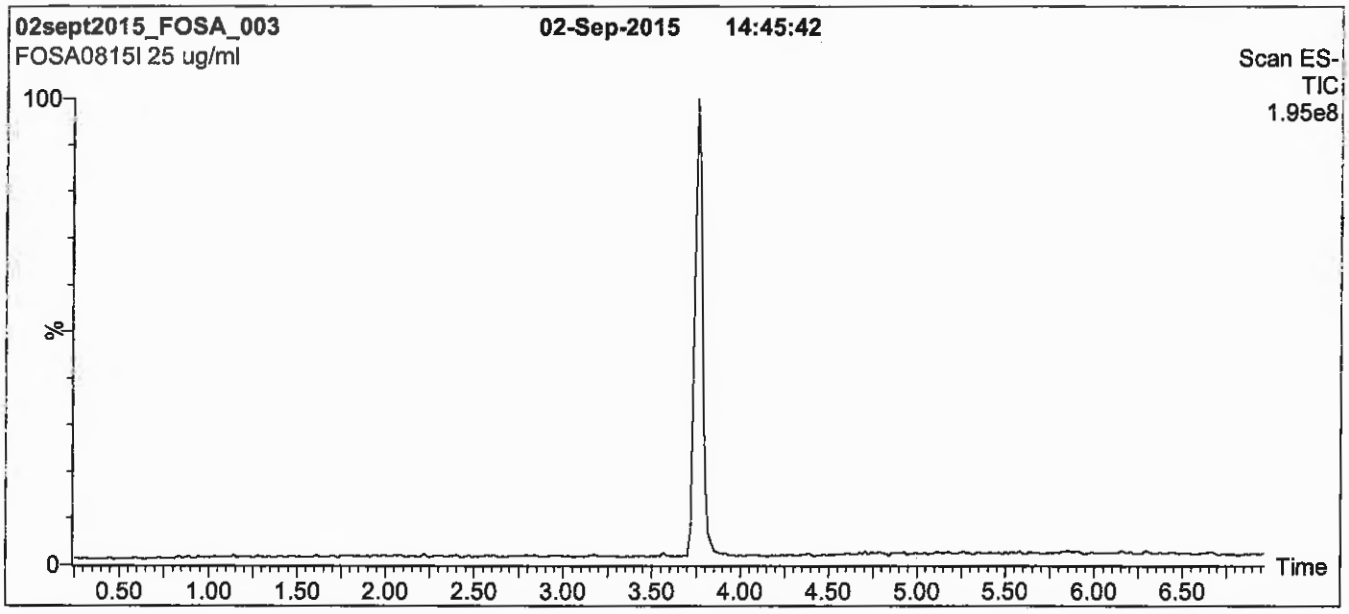
At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

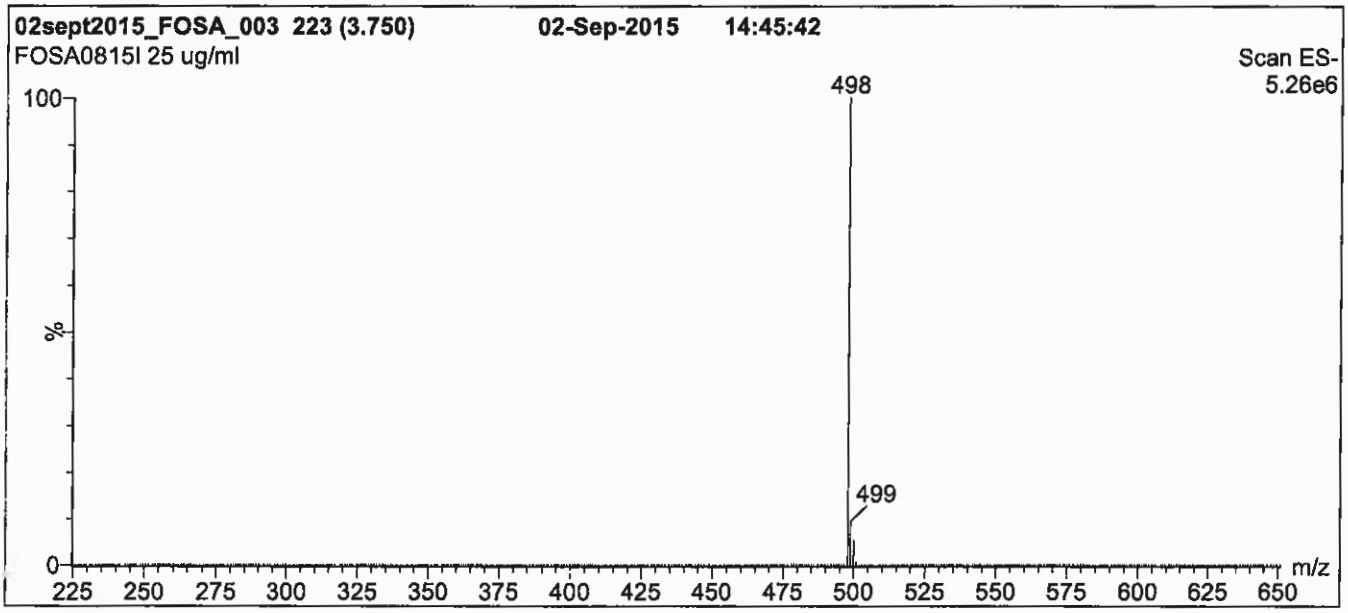
QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

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_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

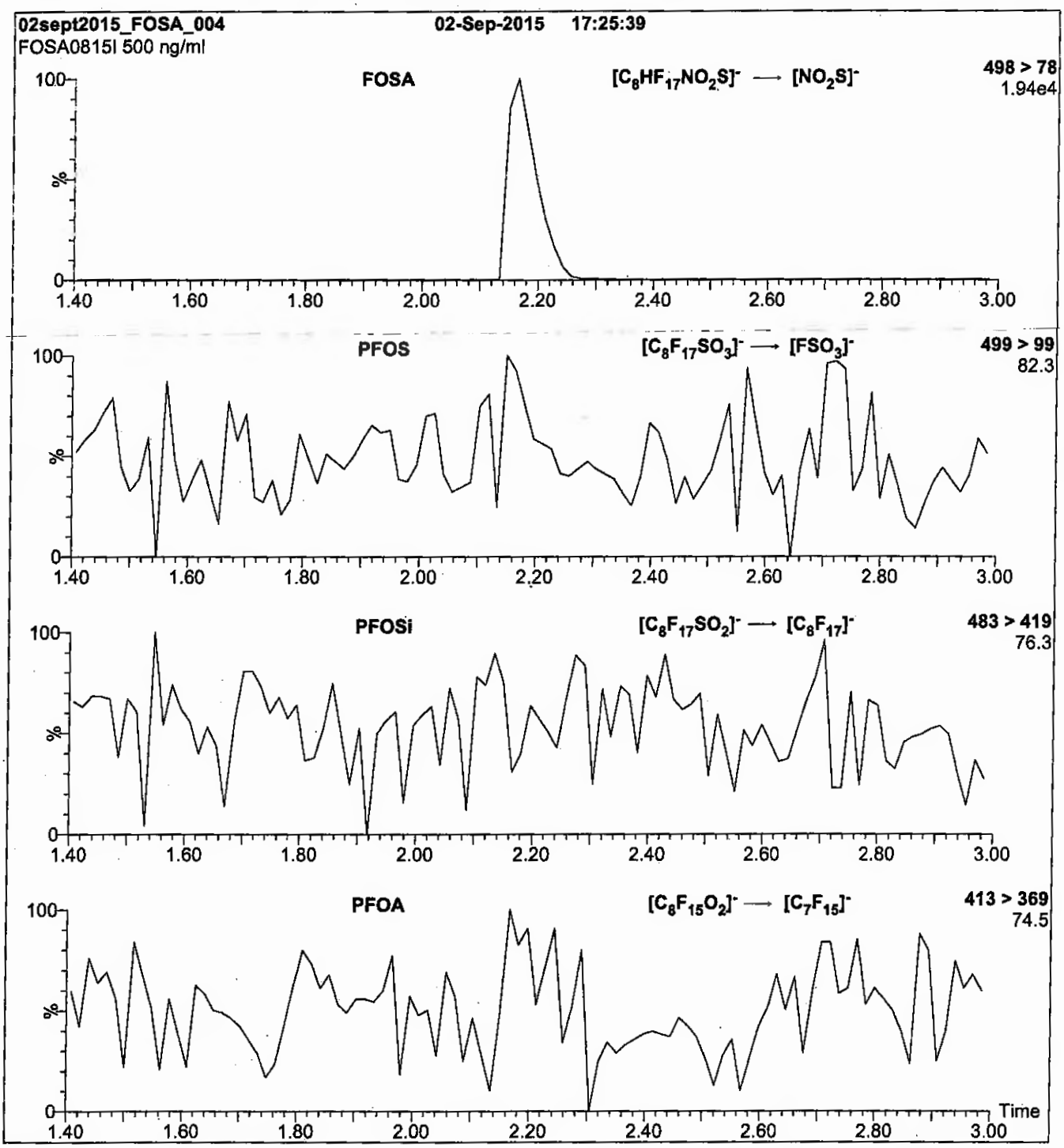
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.50
Cone Voltage (V) = 40.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **FOSA-I; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml FOSA-I)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

Collision Gas (mbar) = 3.54e-3
Collision Energy (eV) = 30

Reagent

LCPFPeA_00005

R: 7/6/16 CBW

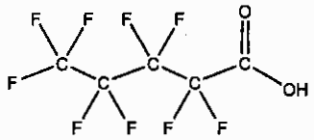
671579
ID: LCPFPeA_00005
Exp: 01/30/20 Prpd: CBW
PF-n-pentanoic acid

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFPeA
COMPOUND: Perfluoro-n-pentanoic acid
LOT NUMBER: PFPeA0115

STRUCTURE:
CAS #: 2706-90-3



MOLECULAR FORMULA: $C_5HF_9O_2$
MOLECULAR WEIGHT: 264.05
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 01/30/2015
EXPIRY DATE: (mm/dd/yyyy) 01/30/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.3% of Perfluoro-n-heptanoic acid (PFHpA) and ~ 0.2% of $C_5H_2F_8O_2$ (hydrido - derivative) as measured by ^{19}F NMR.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 03/26/2015 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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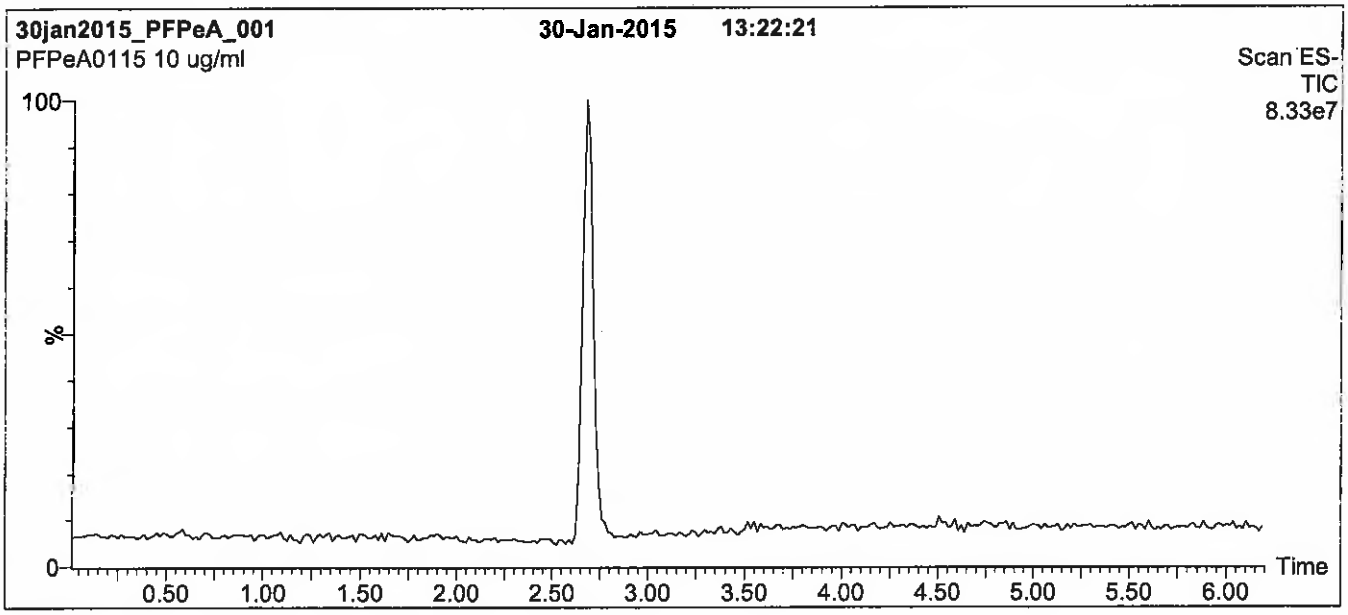
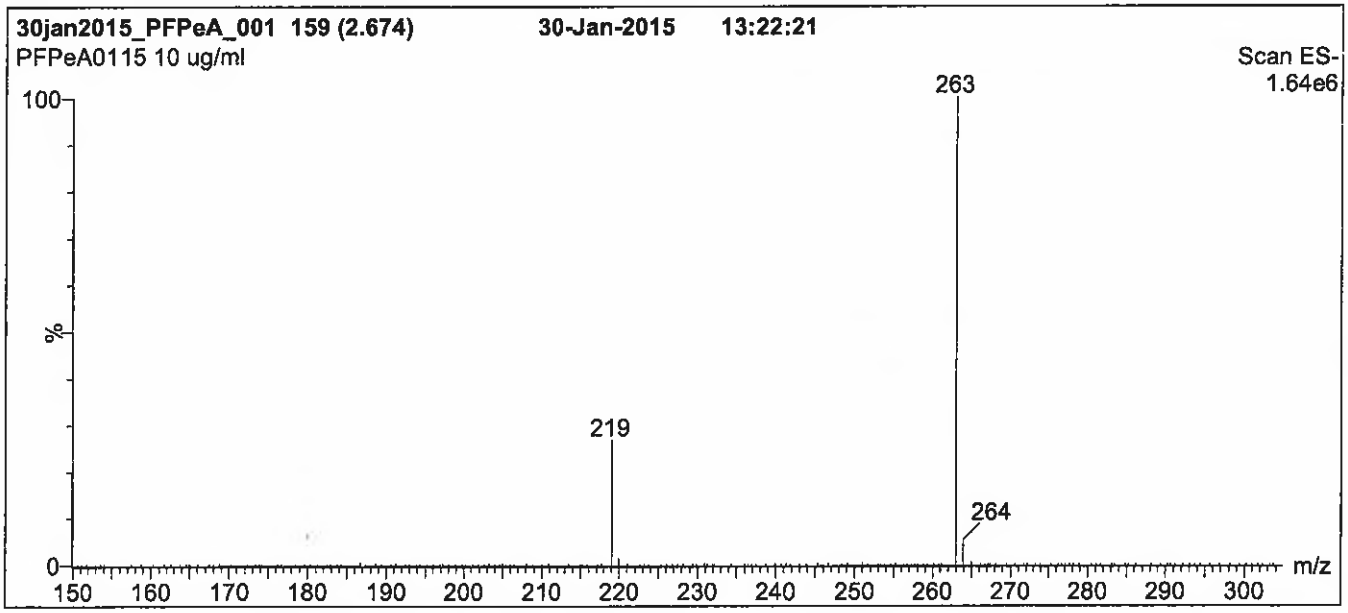
CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **PFPeA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 30% (80:20 MeOH:ACN) / 70% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1 min before returning to initial conditions in 0.5 min.
Time: 10 min

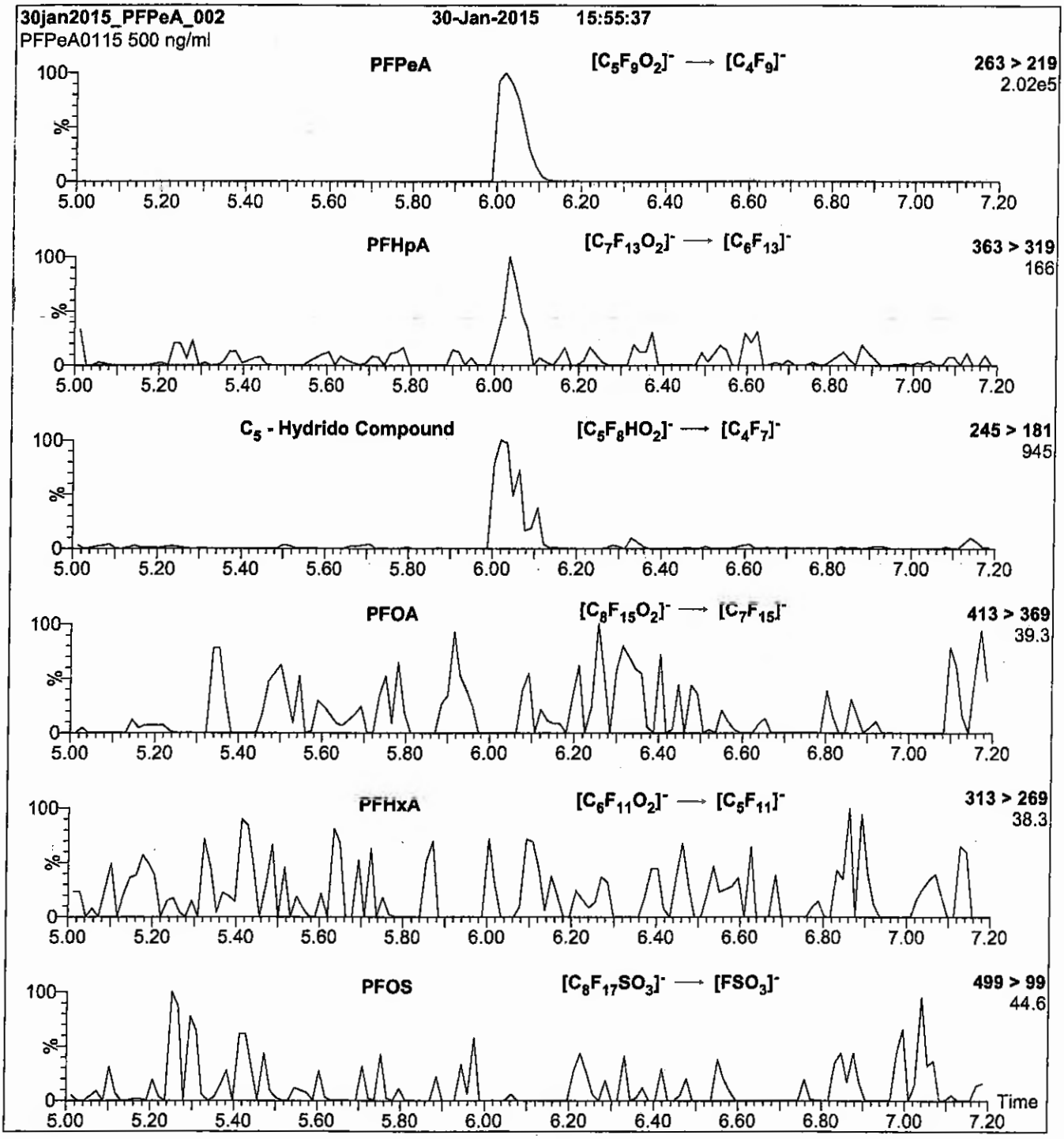
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFPeA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFPeA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 9

Reagent

LCPFTeDA_00004

609696
ID: LCPFTeDA_00004
Exp: 12/09/20 Prpd: CBW
PF-n-tetradecanoic acid

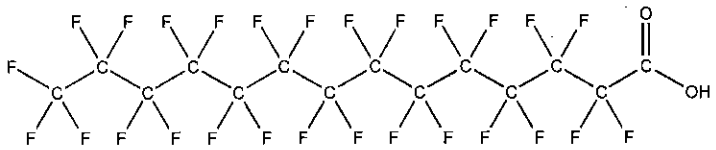
R: 4/7/16 CBW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFTeDA
LOT NUMBER: PFTeDA1215
COMPOUND: Perfluoro-n-tetradecanoic acid

STRUCTURE:
CAS #: 376-06-7



MOLECULAR FORMULA: $C_{14}HF_{27}O_2$
MOLECULAR WEIGHT: 714.11
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 12/09/2015
EXPIRY DATE: (mm/dd/yyyy) 12/09/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.2% of PFDoA ($C_{12}HF_{23}O_2$) and ~ 0.2% of PFPeDA ($C_{15}HF_{29}O_2$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 12/09/2015 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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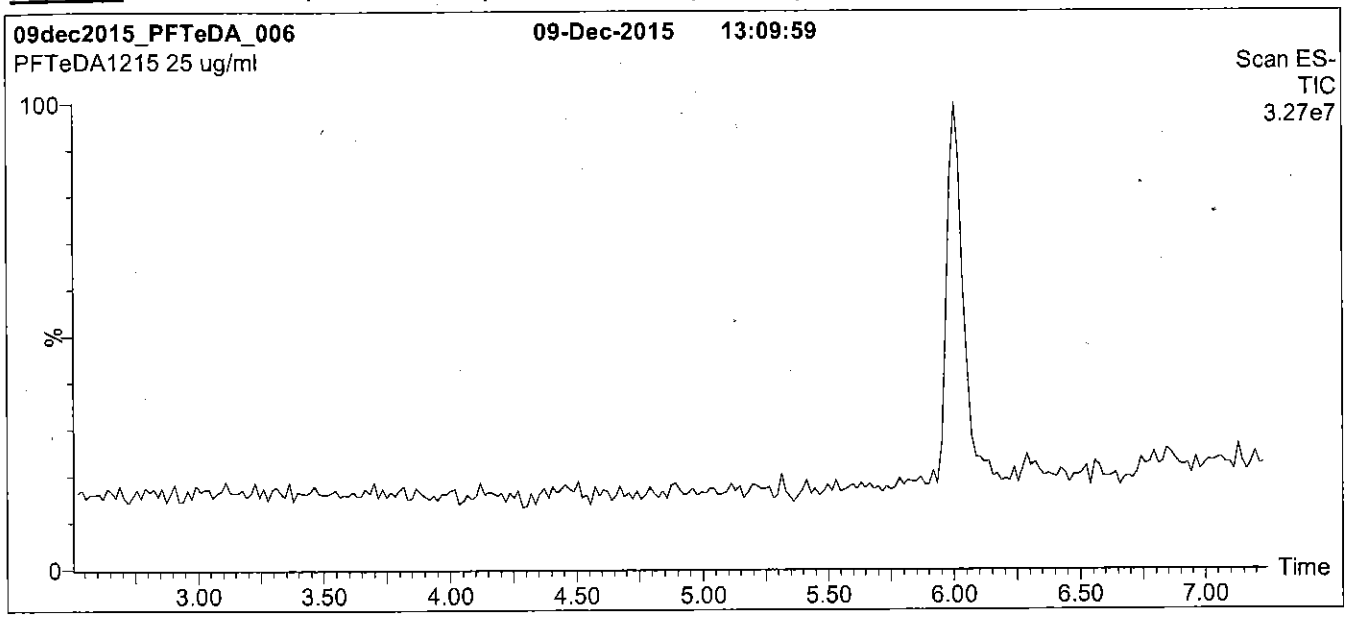
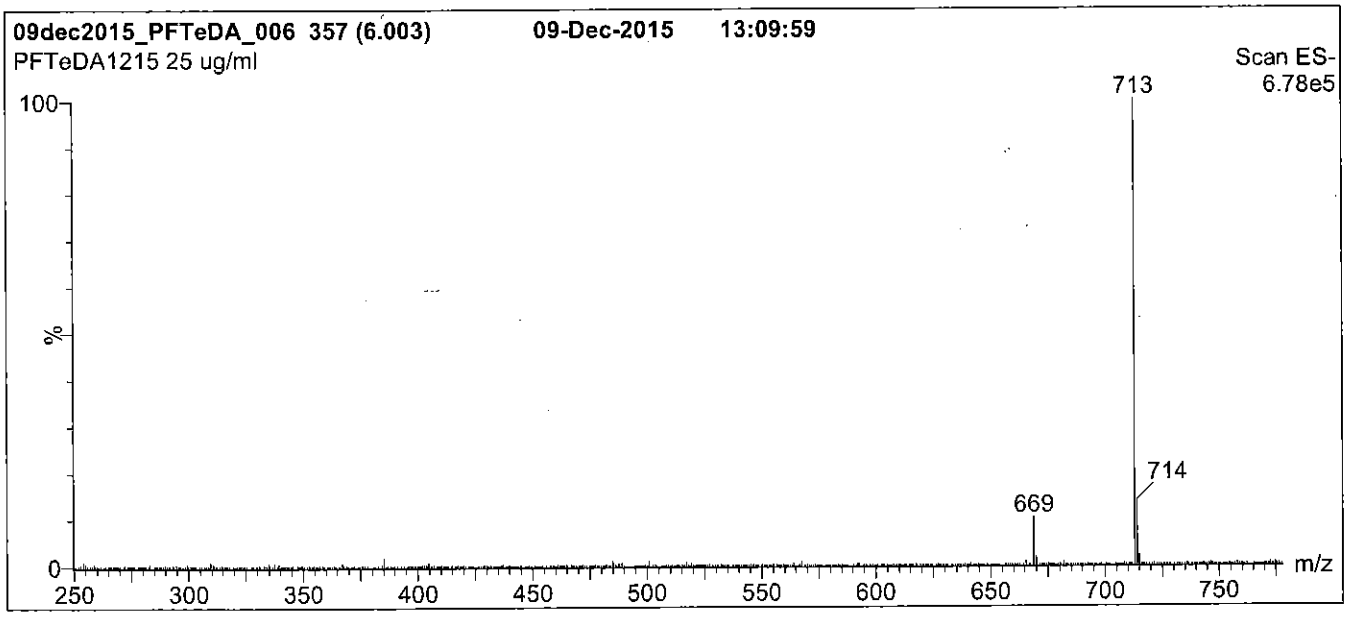
Figure 1: **PFTeDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

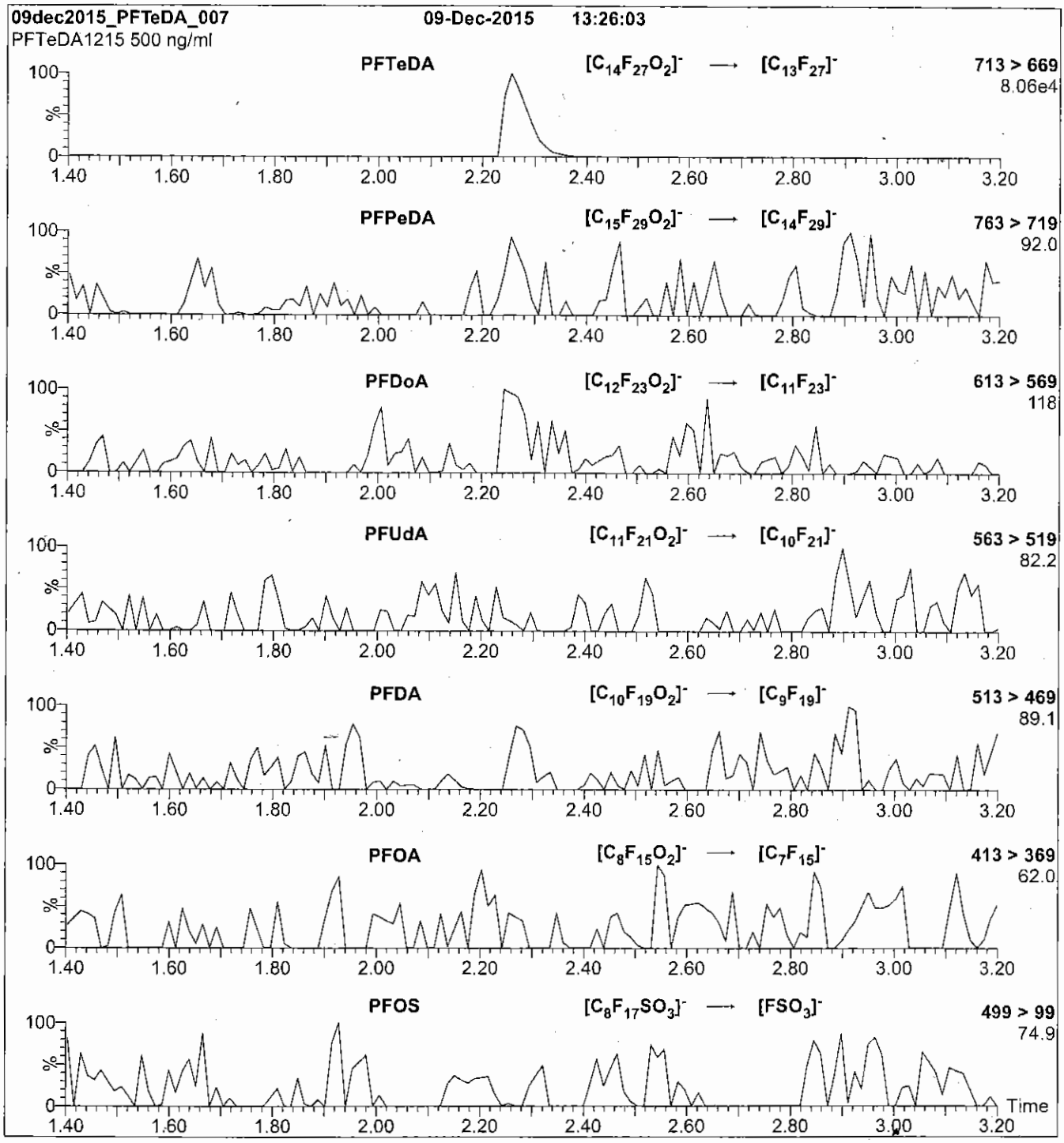
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1250 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFTeDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFTeDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 14

Reagent

LCPFTeDA_00005

R: SBG 9/13/16

730645
ID: LCPFTeDA_00005
Exp: 12/09/20 Prpd: SBC
PF-n-tetradecanoic acid

730659
ID: LCPFTeDA_00006
Exp: 12/09/20 Prpd: SBC
PF-n-tetradecanoic acid

WELLINGTON LABORATORIES

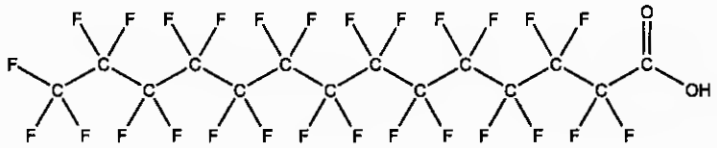
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFTeDA
COMPOUND: Perfluoro-n-tetradecanoic acid

LOT NUMBER: PFTeDA1215

STRUCTURE:

CAS #: 376-06-7



MOLECULAR FORMULA: $C_{14}HF_{27}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 714.11
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 12/09/2015
EXPIRY DATE: (mm/dd/yyyy) 12/09/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.2% of PFDoA ($C_{12}HF_{23}O_2$) and ~ 0.2% of PFPeDA ($C_{15}HF_{29}O_2$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 12/09/2015 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

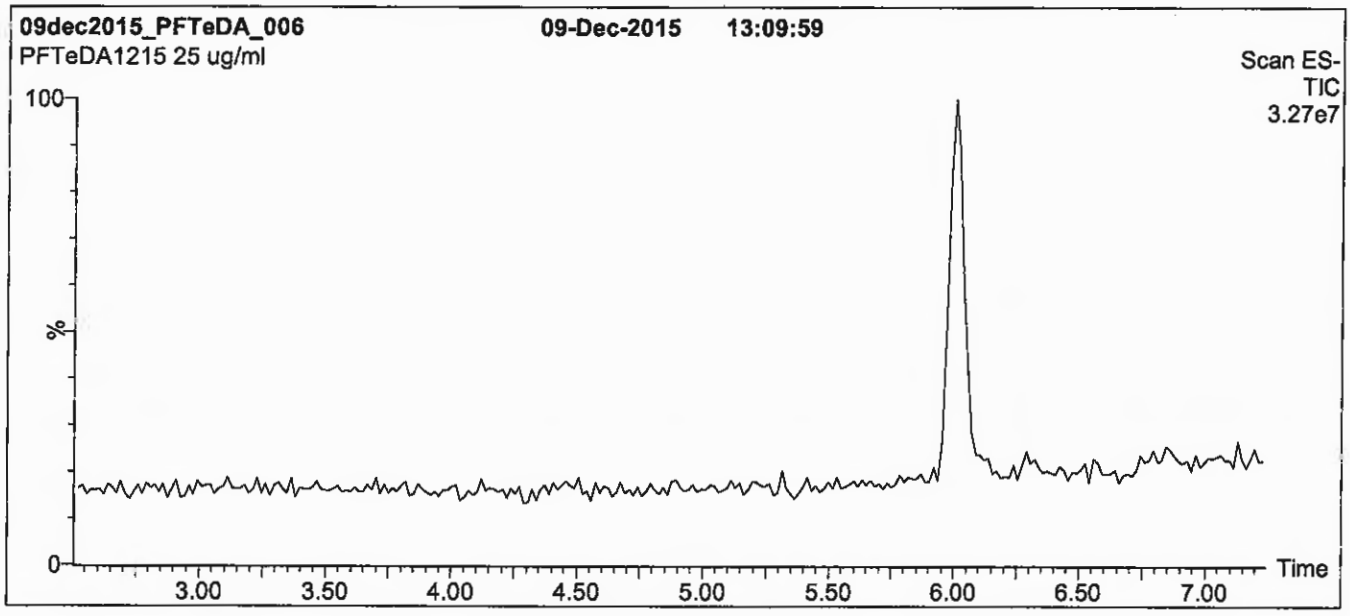
At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

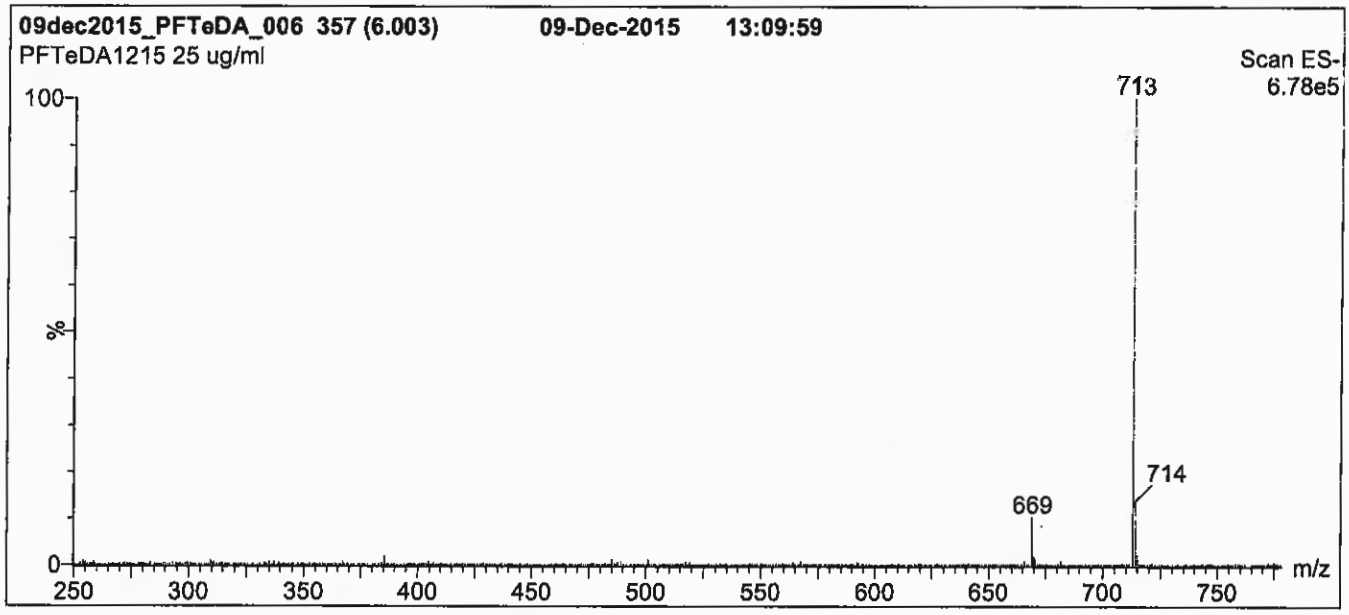
QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **PFTeDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

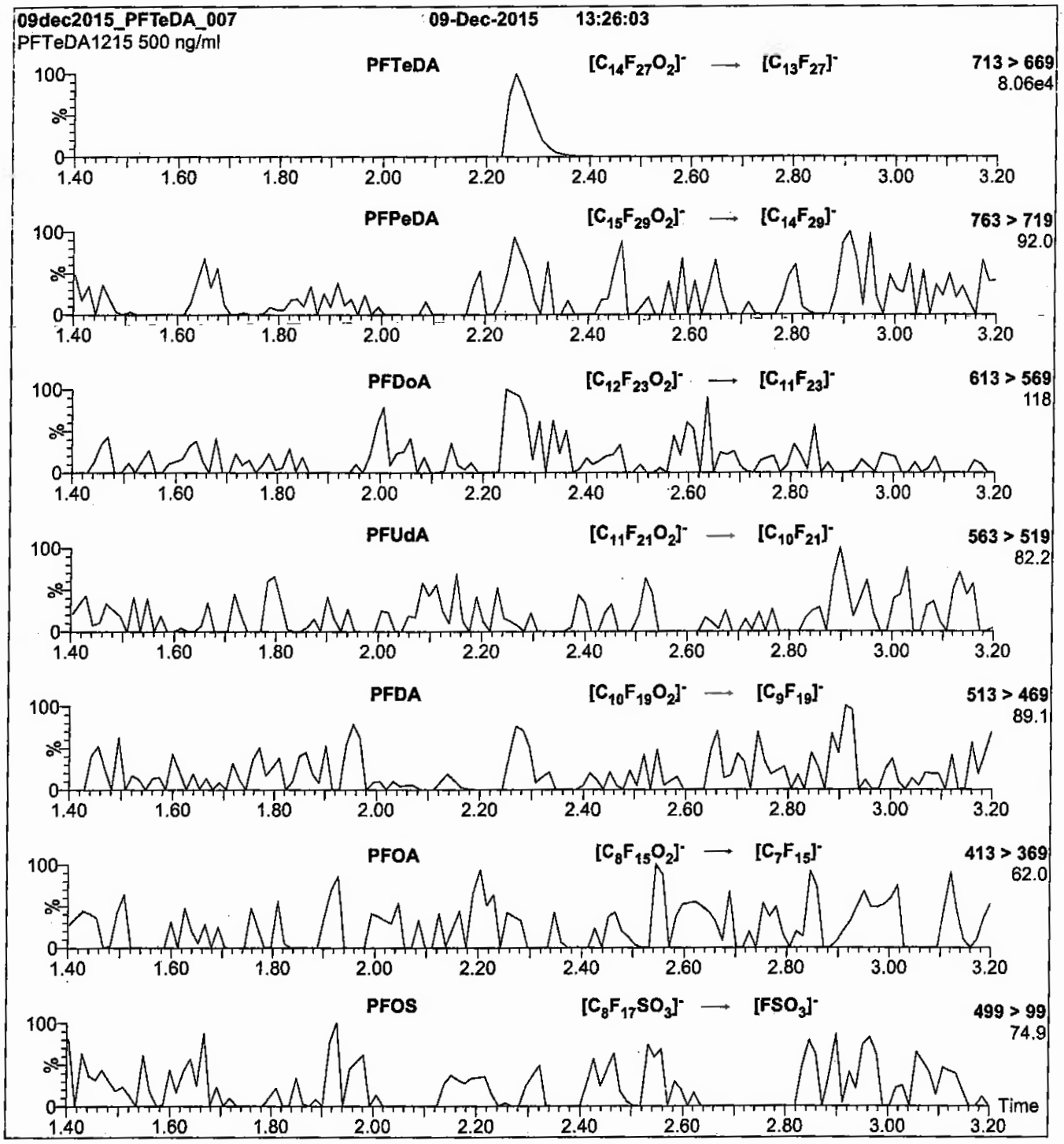
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1250 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFTeDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFTeDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 14

Reagent

LCPFTrDA_00004

609697
ID: LCPFTrDA_00004
Exp: 12/10/18 Prpd: CBW
PF-n-tridecanoic acid

R: 4/7/16 CBW

WELLINGTON LABORATORIES

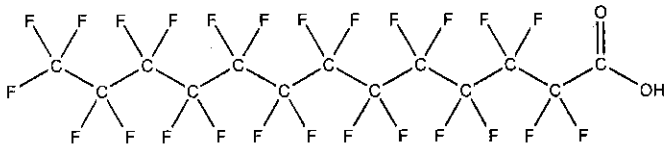
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFTrDA
COMPOUND: Perfluoro-n-tridecanoic acid

LOT NUMBER: PFTrDA1213

STRUCTURE:

CAS #: 72629-94-8



MOLECULAR FORMULA: $C_{13}HF_{25}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 664.11
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 12/10/2013
EXPIRY DATE: (mm/dd/yyyy) 12/10/2018
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.1% of PFUdA ($C_{11}HF_{21}O_2$); ~ 0.4% of PFDoA ($C_{12}HF_{23}O_2$), and ~ 0.1% of PFTeDA ($C_{14}HF_{27}O_2$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 03/25/2015 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON 'N1G 3M5 CANADA
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:

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$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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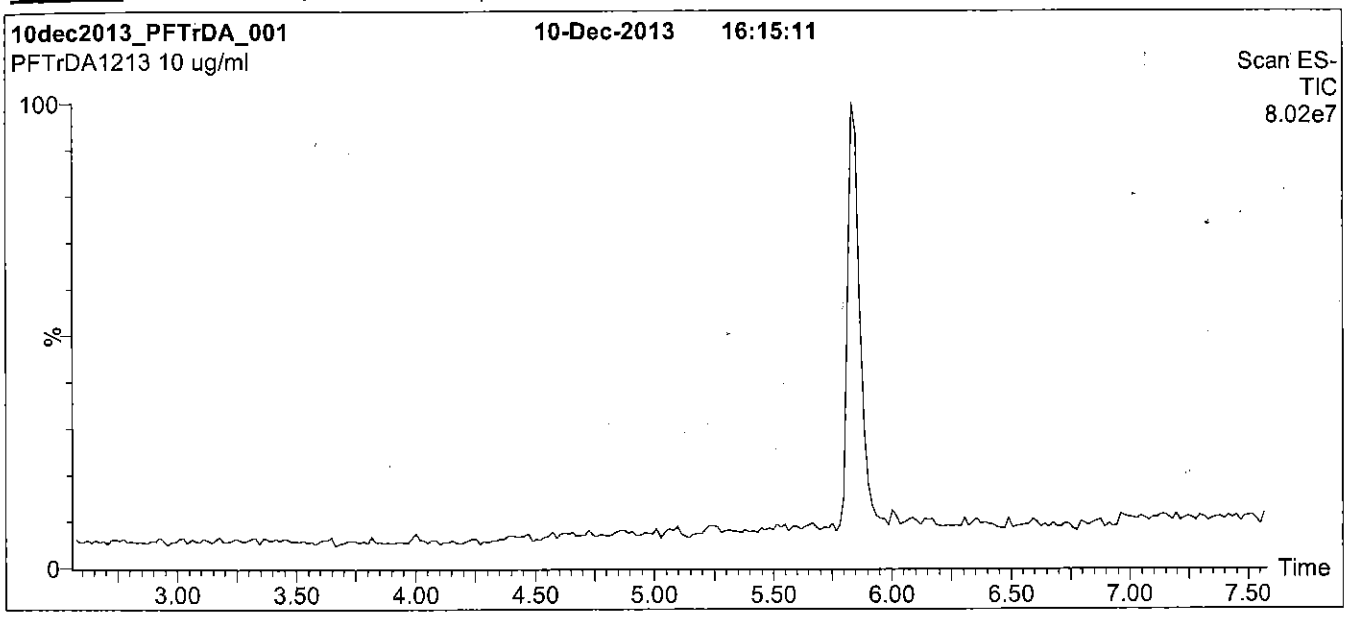
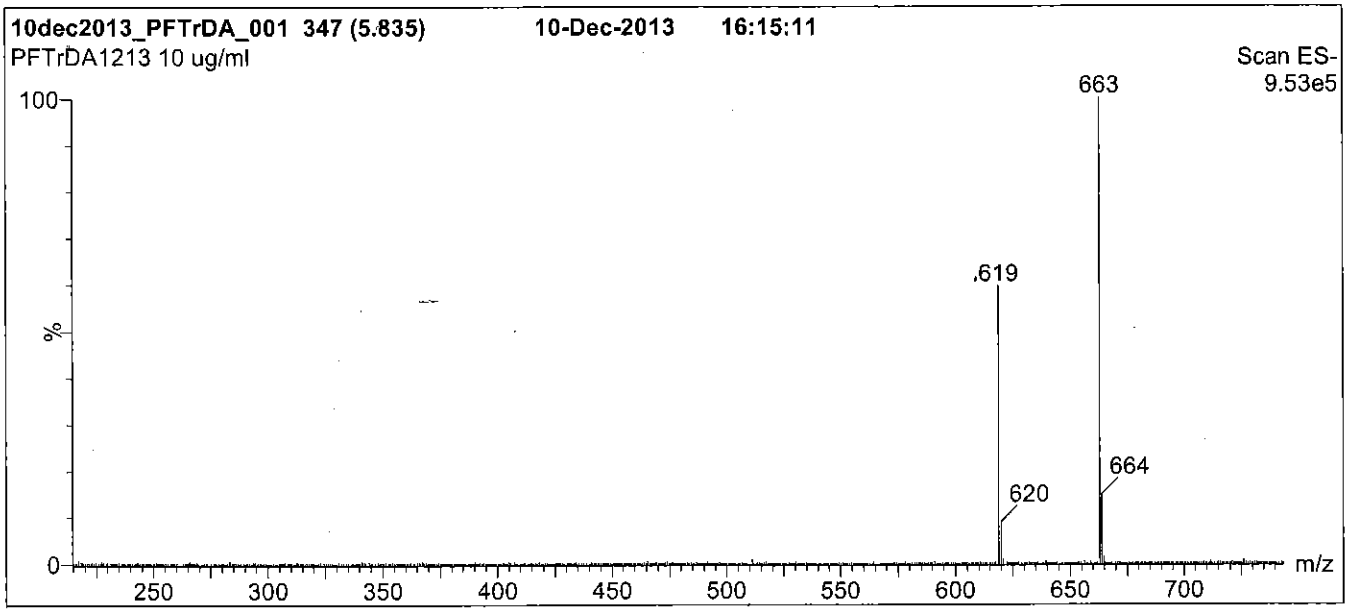
CALA Technical Accreditation No: A 1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **PFTrDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

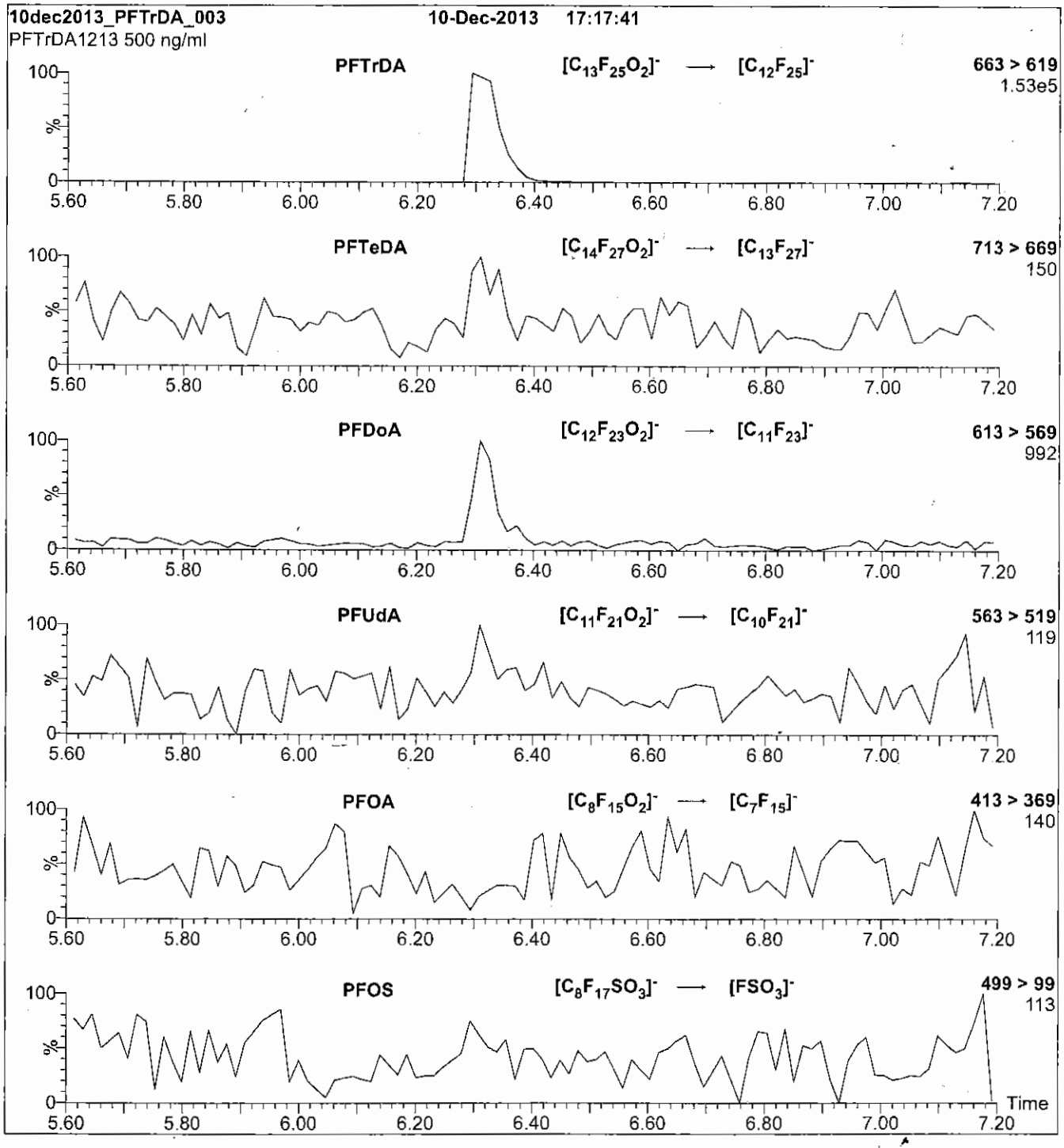
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (215 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 22.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 650

Figure 2: **PFTrDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFTrDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 15

Reagent

LCPFTrDA_00005

R: SBC 9/13/16

730665
ID: LCPFTrDA_00005
Exp: 02/12/21 Prpd: SBC
PF-n-tridecanoic acid

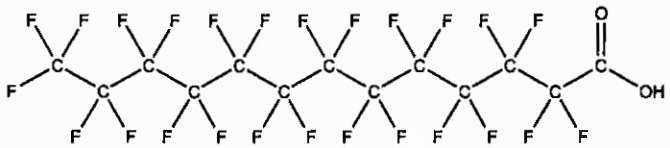
730666
ID: LCPFTrDA_00006
Exp: 02/12/21 Prpd: SBC
PF-n-tridecanoic acid

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFTrDA
LOT NUMBER: PFTrDA0216
COMPOUND: Perfluoro-n-tridecanoic acid

STRUCTURE:
CAS #: 72629-94-8



MOLECULAR FORMULA: $C_{13}HF_{25}O_2$
MOLECULAR WEIGHT: 664.11
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 02/12/2016
EXPIRY DATE: (mm/dd/yyyy) 02/12/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.1% of PFUdA ($C_{11}HF_{21}O_2$), ~ 0.4% of PFDoA ($C_{12}HF_{23}O_2$), and ~ 0.1% of PFTeDA ($C_{14}HF_{27}O_2$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 02/16/2016 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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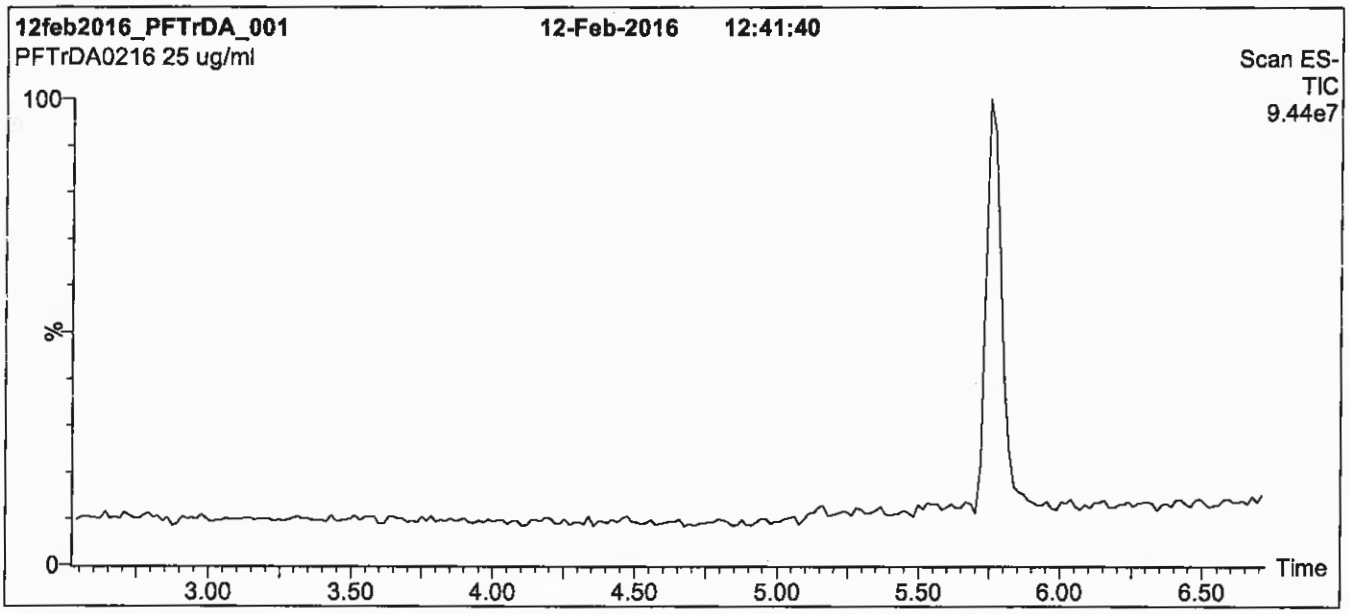
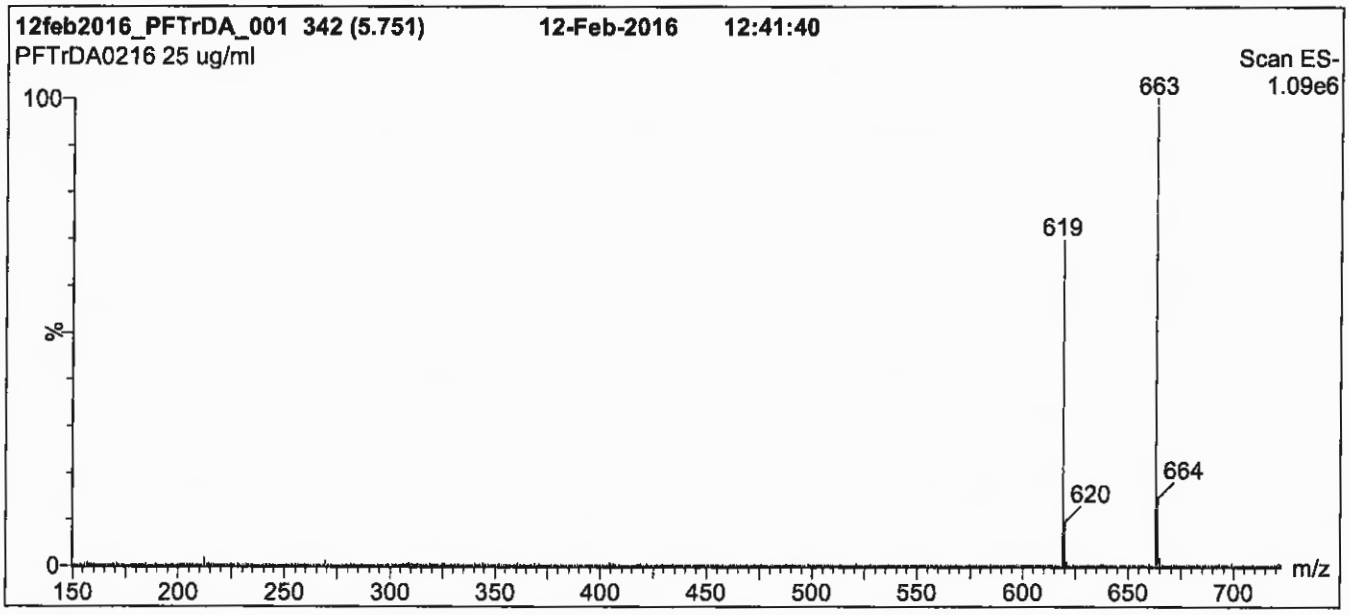
Figure 1: **PFTrDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

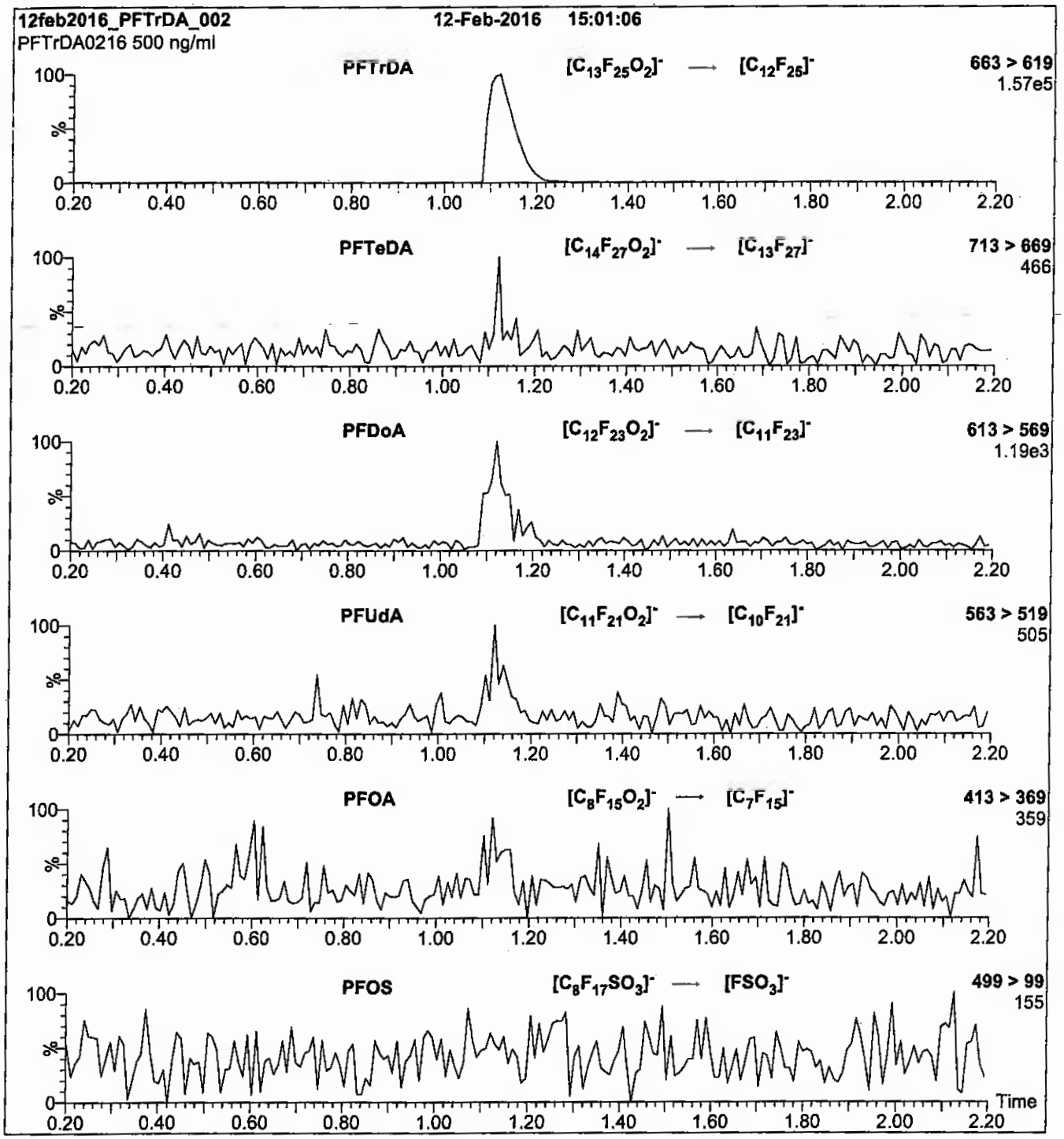
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 22.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 650

Figure 2: **PFTrDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFTrDA)

Mobile phase: Isocratic 80% MeOH / 20% H_2O

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 15

Reagent

LCPFUdA_00005

Scanned 10/14/16 R: SBC 9/13/16

730535
ID: LCPFUdA_00005
Exp: 08/19/20 Prpd: SBC
PF-n-undecanoic acid

730536
ID: LCPFUdA_00006
Exp: 08/19/20 Prpd: SBC
PF-n-undecanoic acid

WELLINGTON LABORATORIES

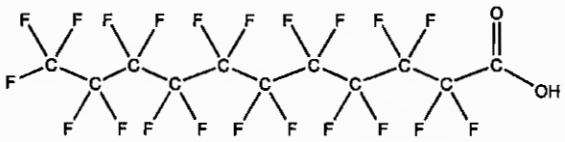
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFUdA
COMPOUND: Perfluoro-n-undecanoic acid

LOT NUMBER: PFUdA0815

STRUCTURE:

CAS #: 2058-94-8



MOLECULAR FORMULA: $C_{11}HF_{21}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 564.09
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: B.G. Chittim **Date:** 08/21/2015 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

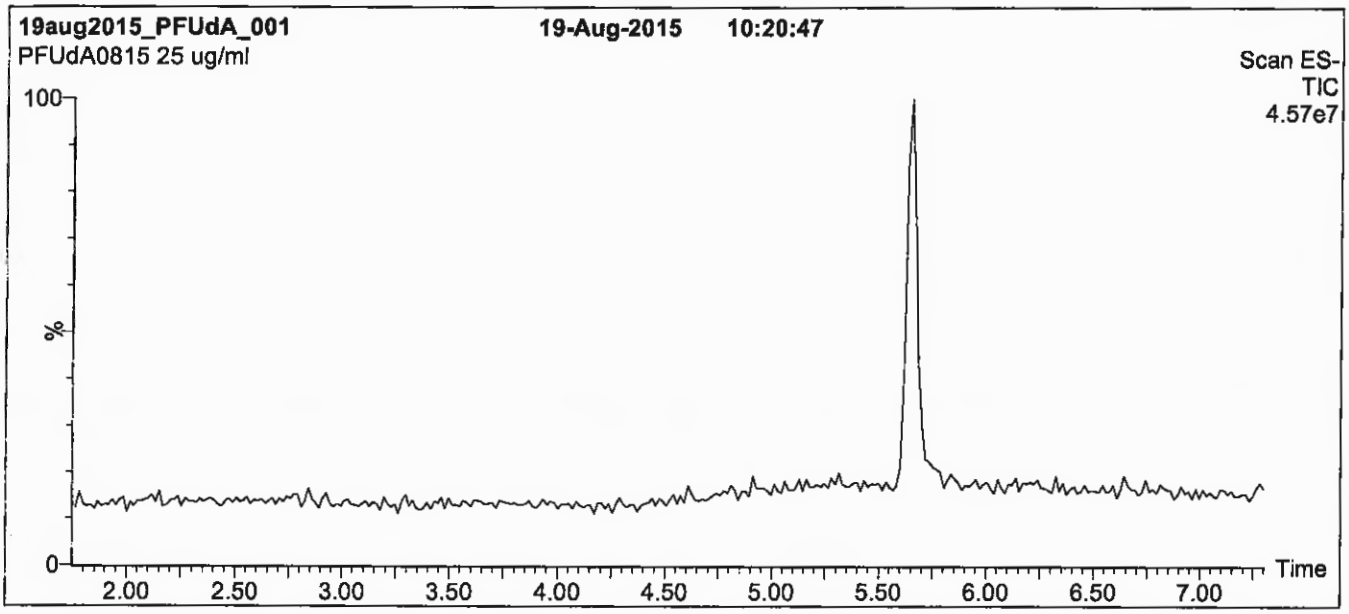
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

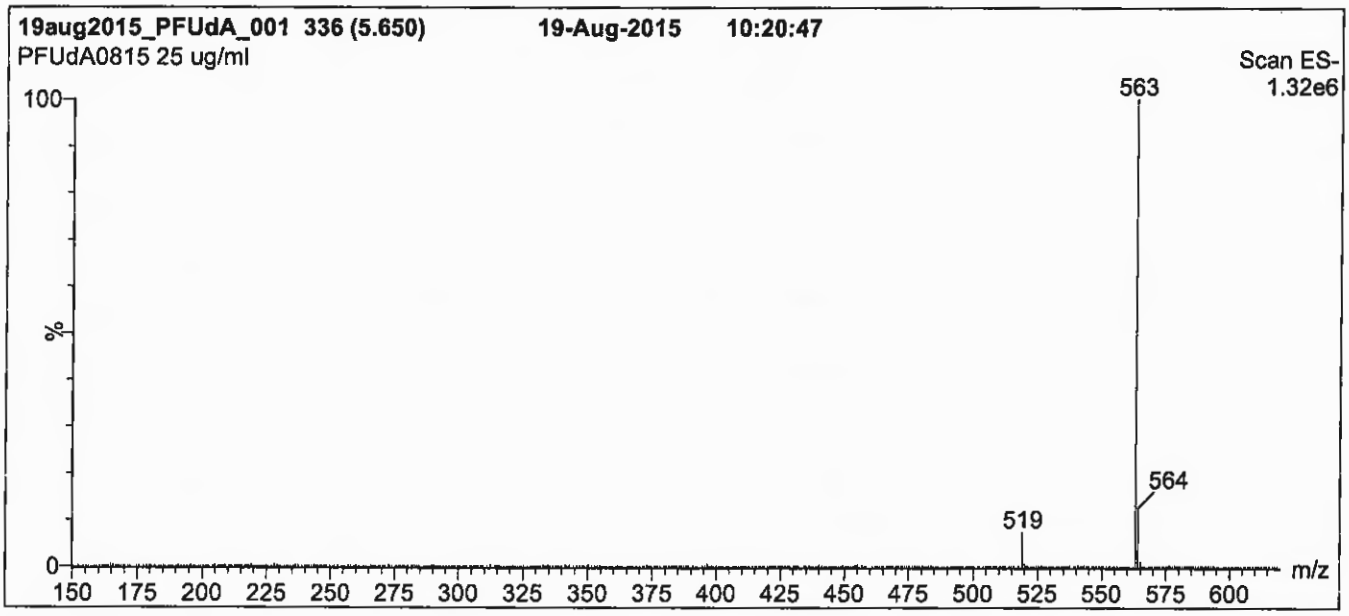
CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **PFUdA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

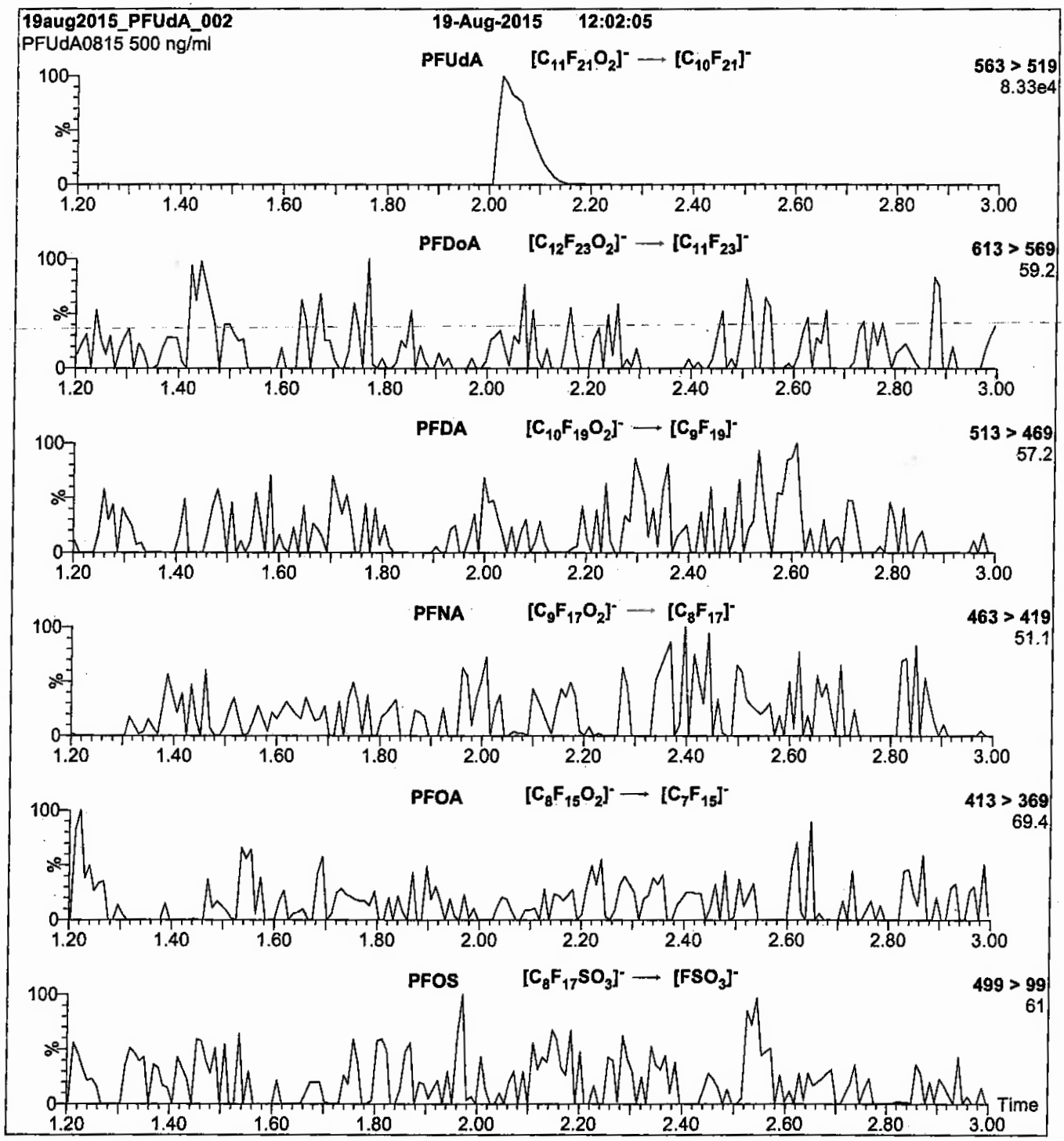
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 65
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFUdA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFUdA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 11

Method PFC DOD

Perfluronated Hydrocarbons (LC/MS) by Method PFC_DOD

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Matrix: Water Level: Low

GC Column (1): Acquity ID: 2.1 (mm)

Client Sample ID	Lab Sample ID	PFBA	#	13CPeA	#	PFHxA	#	13CHpA	#	PFHxS	#	PFOA	#	PFOS	#	PFNA	#
608D132MW-LF-1116	320-23931-1	32		52		41		37		35		62		84		72	
608D132MW-LF-1116 DL	320-23931-1 DL	802	Q	1140	Q	857	Q	751	Q	842	Q	1153	Q	1317	Q	1303	Q
608D33MW-LF-1116	320-23931-2	9	Q	42		47		36		34		60		21	Q	27	
608D33MW-LF-1116 DL	320-23931-2 DL	54		179	Q	154	Q	154	Q	150		181	Q	144		145	
61301MW-LF-1116	320-23931-3	45		78		78		82		93		85		102		88	
613D41MW-LF-1116	320-23931-4	48		80		77		77		96		77		101		70	
613D39MW-LF-1116	320-23931-5	43		76		77		86		92		92		99		93	
FB113016	320-23931-6	106		113		105		111		102		110		102		109	
	MB 320-140536/1-A	112		118		109		112		105		116		102		109	
	LCS 320-140536/2-A	106		109		103		102		97		103		99		103	

	QC LIMITS
PFBA = 13C4 PFBA	25-150
13CPeA = 13C5-PFPeA	25-150
PFHxA = 13C2 PFHxA	25-150
13CHpA = 13C4-PFHpA	25-150
PFHxS = 18O2 PFHxS	25-150
PFOA = 13C4 PFOA	25-150
PFOS = 13C4 PFOS	25-150
PFNA = 13C5 PFNA	25-150

Column to be used to flag recovery values

FORM II 537 (Modified)

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Matrix: Water Level: Low

GC Column (1): Acquity ID: 2.1 (mm)

Client Sample ID	Lab Sample ID	13C8FOS	#	PFDA	#	PFUnA	#	PFDoA	#
608D132MW-LF-1116	320-23931-1	18	Q	106		104		104	
608D132MW-LF-1116 DL	320-23931-1 DL	224	Q	1335	Q	1305	Q	1231	Q
608D33MW-LF-1116	320-23931-2	8	Q	97		112		108	
608D33MW-LF-1116 DL	320-23931-2 DL	17	Q	162	Q	163	Q	155	Q
61301MW-LF-1116	320-23931-3	9	Q	97		104		104	
613D41MW-LF-1116	320-23931-4	15	Q	68		70		77	
613D39MW-LF-1116	320-23931-5	13	Q	97		97		86	
FB113016	320-23931-6	55		115		116		104	
	MB 320-140536/1-A	100		111		115		111	
	LCS 320-140536/2-A	90		104		104		107	

	QC LIMITS
13C8FOS = 13C8 FOSA	25-150
PFDA = 13C2 PFDA	25-150
PFUnA = 13C2 PFUnA	25-150
PFDoA = 13C2 PFDoA	25-150

Column to be used to flag recovery values

FORM II 537 (Modified)

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Matrix: Water Level: Low

GC Column (1): Acquity ID: 2.1 (mm)

Client Sample ID	Lab Sample ID	PFHxS #
61301MW-LF-1116 RA	320-23931-3 RA	111
613D41MW-LF-1116 RA	320-23931-4 RA	126
613D39MW-LF-1116 RA	320-23931-5 RA	116

	QC LIMITS
PFHxS = 18O2 PFHxS	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.: 320-23931-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 16DEC2016C_006.d

Lab ID: LCS 320-140536/2-A Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
Perfluorobutanoic acid (PFBA)	0.0400	0.0446	112	60-140	
Perfluoropentanoic acid (PFPeA)	0.0400	0.0431	108	60-140	
Perfluorohexanoic acid (PFHxA)	0.0400	0.0427	107	60-140	
Perfluoroheptanoic acid (PFHpA)	0.0400	0.0443	111	60-140	
Perfluorooctanoic acid (PFOA)	0.0400	0.0425	106	60-140	
Perfluorononanoic acid (PFNA)	0.0400	0.0428	107	60-140	
Perfluorodecanoic acid (PFDA)	0.0400	0.0420	105	60-140	
Perfluoroundecanoic acid (PFUnA)	0.0400	0.0410	103	60-140	
Perfluorododecanoic acid (PFDoA)	0.0400	0.0422	105	60-140	
Perfluorotridecanoic Acid (PFTriA)	0.0400	0.0436	109	50-150	
Perfluorotetradecanoic acid (PFTeA)	0.0400	0.0557	139	50-150	
Perfluorobutanesulfonic acid (PFBS)	0.0354	0.0464	131	50-150	
Perfluorohexanesulfonic acid (PFHxS)	0.0364	0.0375	103	60-140	
Perfluorooctanesulfonic acid (PFOS)	0.0371	0.0398	107	60-140	
Perfluorodecanesulfonic acid (PFDS)	0.0386	0.0412	107	50-150	
Perfluorooctane Sulfonamide (FOSA)	0.0400	0.0445	111	60-140	
13C8 FOSA	0.100	0.0900	90	25-150	
13C4 PFBA	0.100	0.106	106	25-150	
13C2 PFHxA	0.100	0.103	103	25-150	
13C4 PFOA	0.100	0.103	103	25-150	
13C5 PFNA	0.100	0.103	103	25-150	
13C2 PFDA	0.100	0.104	104	25-150	
13C2 PFUnA	0.100	0.104	104	25-150	
13C2 PFDoA	0.100	0.107	107	25-150	
18O2 PFHxS	0.0946	0.0918	97	25-150	
13C4 PFOS	0.0956	0.0944	99	25-150	
13C5-PFPeA	0.100	0.109	109	25-150	
13C4-PFHpA	0.100	0.102	102	25-150	

Column to be used to flag recovery and RPD values

FORM III 537 (Modified)

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Lab File ID: 16DEC2016C_005.d Lab Sample ID: MB 320-140536/1-A

Matrix: Water Date Extracted: 12/05/2016 08:31

Instrument ID: A8_N Date Analyzed: 12/16/2016 18:30

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-140536/2-A	16DEC2016C_006.d	12/16/2016 18:37
608D132MW-LF-1116	320-23931-1	16DEC2016C_013.d	12/16/2016 19:30
608D33MW-LF-1116	320-23931-2	16DEC2016C_014.d	12/16/2016 19:37
61301MW-LF-1116	320-23931-3	16DEC2016C_019.d	12/16/2016 20:15
613D41MW-LF-1116	320-23931-4	16DEC2016C_020.d	12/16/2016 20:22
613D39MW-LF-1116	320-23931-5	16DEC2016C_021.d	12/16/2016 20:30
FB113016	320-23931-6	16DEC2016C_022.d	12/16/2016 20:37
608D33MW-LF-1116 DL	320-23931-2 DL	20DEC2016C_008.d	12/20/2016 18:22
608D132MW-LF-1116 DL	320-23931-1 DL	20DEC2016C_010.d	12/20/2016 18:37
61301MW-LF-1116 RA	320-23931-3 RA	20DEC2016C_012.d	12/20/2016 18:52
613D41MW-LF-1116 RA	320-23931-4 RA	20DEC2016C_013.d	12/20/2016 18:59
613D39MW-LF-1116 RA	320-23931-5 RA	20DEC2016C_014.d	12/20/2016 19:07

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-23931-1

SDG No.:

Client Sample ID: 608D132MW-LF-1116 | Lab Sample ID: 320-23931-1

Matrix: Water | Lab File ID: 16DEC2016C_013.d

Analysis Method: 537 (Modified) | Date Collected: 11/30/2016 09:40

Extraction Method: 3535 | Date Extracted: 12/05/2016 08:31

Sample wt/vol: 264.5(mL) | Date Analyzed: 12/16/2016 19:30

Con. Extract Vol.: 0.5(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 142751 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	*Perfluorobutanoic acid (PFBA)*	*0.50*	*E*	*0.0024*	0.00095	*0.00043*
2706-90-3	*Perfluoropentanoic acid (PFPeA)*	*0.61*	*E*	*0.0024*	0.0019	*0.00093*
307-24-4	*Perfluorohexanoic acid (PFHxA)*	*1.5*	*E*	*0.0024*	0.0019	*0.00074*
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.32		0.0024	0.0019	0.00076
335-67-1	*Perfluorooctanoic acid (PFOA)*	*0.52*	*E M*	*0.0024*	0.0019	*0.00071*
375-95-1	Perfluorononanoic acid (PFNA)	0.00064	J	0.0024	0.0019	0.00062
335-76-2	Perfluorodecanoic acid (PFDA)	0.00095	U	0.0024	0.00095	0.00042
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0019	U	0.0024	0.0019	0.00071
307-55-1	Perfluorododecanoic acid (PFDoA)	0.0019	U	0.0024	0.0019	0.00055
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.0019	U	0.0024	0.0019	0.00052
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.00056	J	0.0024	0.00095	0.00038
355-46-4	*Perfluorohexanesulfonic acid (PFHxS)*	*2.6*	*E*	*0.0024*	0.0019	*0.00082*
1763-23-1	*Perfluorooctanesulfonic acid (PFOS)*	*1.2*	*E*	*0.0038*	0.0028	*0.0012*
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.0028	U	0.0038	0.0028	0.0011
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.0019	U	0.0024	0.0019	0.00060

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-23931-1

SDG No.:

Client Sample ID: 608D132MW-LF-1116 | Lab Sample ID: 320-23931-1

Matrix: Water | Lab File ID: 16DEC2016C_013.d

Analysis Method: 537 (Modified) | Date Collected: 11/30/2016 09:40

Extraction Method: 3535 | Date Extracted: 12/05/2016 08:31

Sample wt/vol: 264.5(mL) | Date Analyzed: 12/16/2016 19:30

Con. Extract Vol.: 0.5(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 142751 | Units: ug/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	18	Q	25-150
STL00992	13C4 PFBA	32		25-150
STL00993	13C2 PFHxA	41		25-150
STL00990	13C4 PFOA	62		25-150
STL00995	13C5 PFNA	72		25-150
STL00996	13C2 PFDA	106		25-150
STL00997	13C2 PFUnA	104		25-150
STL00998	13C2 PFDoA	104		25-150
STL00994	18O2 PFHxS	35		25-150
STL00991	13C4 PFOS	84		25-150
STL01893	13C5-PFPeA	52		25-150
STL01892	13C4-PFHpA	37		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_013.d
Lims ID: 320-23931-B-1-A
Client ID: 608D132MW-LF-1116
Sample Type: Client
Inject. Date: 16-Dec-2016 19:30:14 ALS Bottle#: 33 Worklist Smp#: 13
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-23931-b-1-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 18-Dec-2016 17:57:40 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK028

First Level Reviewer: chandrasenas Date: 18-Dec-2016 17:38:55

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	1.582	1.582	0.0		5589368	16.1		32.1	439263	
1 Perfluorobutyric acid										E
212.90 > 169.00	1.582	1.582	0.0	1.000	25243744	264.5			96614	E
3 Perfluoropentanoic acid										E
262.90 > 219.00	1.867	1.858	0.009	1.000	44160115	322.2			81677	E
D 4 13C5-PFPeA										
267.90 > 223.00	1.858	1.858	0.0		6944609	26.1		52.2	248786	
5 Perfluorobutanesulfonic acid										EM
298.90 > 80.00	1.925	1.896	0.029	1.000	78334775	478.5				EM
298.90 > 99.00	1.906	1.896	0.010	0.990	61927799		1.26(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.155	2.155	0.0		5047070	20.6		41.2	452904	
7 Perfluorohexanoic acid										E
313.00 > 269.00	2.155	2.164	-0.009	1.000	76614448	817.2			175225	E
9 Perfluorohexanesulfonic acid										E
399.00 > 80.00	2.423	2.433	-0.010	1.000	164507534	1382.3				E
D 11 13C4-PFHpA										
367.00 > 322.00	2.491	2.494	-0.003		4213454	18.6		37.2	367049	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.491	2.502	-0.011	1.000	14133276	171.3			7636	
D 10 18O2 PFHxS										
403.00 > 84.00	2.511	2.510	0.001		5465247	16.7		35.3	114252	
15 Perfluorooctanoic acid										EM
413.00 > 369.00	2.861	2.858	0.003	1.000	39358014	272.5			136044	EM
413.00 > 169.00	2.861	2.858	0.003	1.000	29360328		1.34(0.90-1.10)		1081188	
D 14 13C4 PFOA										
417.00 > 372.00	2.861	2.858	0.003		7198216	31.2		62.5	480715	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
18 Perfluorooctane sulfonic acid										E
499.00 > 80.00	3.101	3.115	-0.014	1.000	132305023	636.2			729751	E
499.00 > 99.00	3.110	3.115	-0.005	1.003	35849743		3.69(0.90-1.10)		651230	
D 19 13C5 PFNA										
468.00 > 423.00	3.235	3.230	0.005		6411488	36.1		72.2	256057	
D 17 13C4 PFOS										
503.00 > 80.00	3.226	3.230	-0.004		9996179	40.2		84.0	99288	
20 Perfluorononanoic acid										
463.00 > 419.00	3.235	3.239	-0.004	1.000	41296	0.3383			229	
D 21 13C8 FOSA										
506.00 > 78.00	3.563	3.561	0.002		3392996	8.83		17.7	428672	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.571	3.561	0.010	1.000	7662	0.1211			620	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.596	3.586	0.010	1.000	13480	0.0860			157	
D 23 13C2 PFDA										
515.00 > 470.00	3.588	3.595	-0.007		8299376	52.8		106	417922	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.898	3.899	-0.001	1.000	876	0.007173				
D 27 13C2 PFUnA										
565.00 > 520.00	3.907	3.907	0.0		6088402	51.9		104	252495	
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.907	3.916	-0.009	1.000	15927	0.1368			241	
D 30 13C2 PFDoA										
615.00 > 570.00	4.210	4.203	0.007		5785231	52.1		104	209948	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.723	4.711	0.012	1.000	54199	0.2956			43.5	
713.00 > 169.00	4.707	4.711	-0.004	0.997	7103		7.63(0.00-0.00)		3164	

QC Flag Legend

Processing Flags

E - Exceeded Maximum Amount

Review Flags

M - Manually Integrated

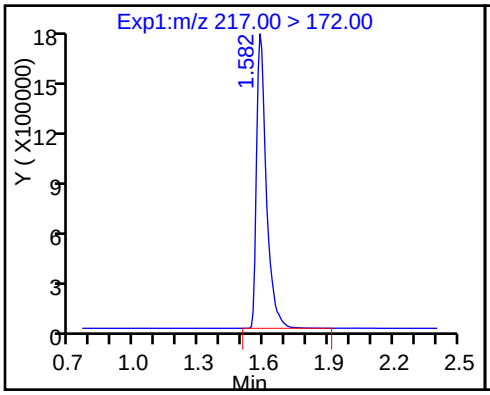
Report Date: 18-Dec-2016 17:57:56 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

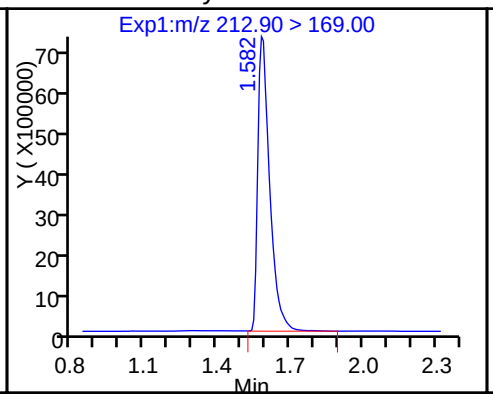
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_013.d

Injection Date:	16-Dec-2016 19:30:14	Instrument ID:	A8_N		
Lims ID:	320-23931-B-1-A	Lab Sample ID:	320-23931-1		
Client ID:	608D132MW-LF-1116				
Operator ID:	A8-PC\A8	ALS Bottle#:	33	Worklist Smp#:	13
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		

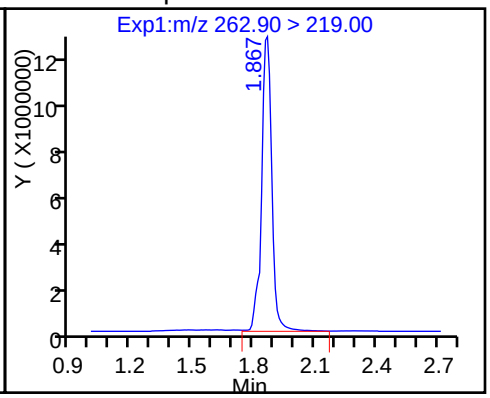
D 2 13C4 PFBA



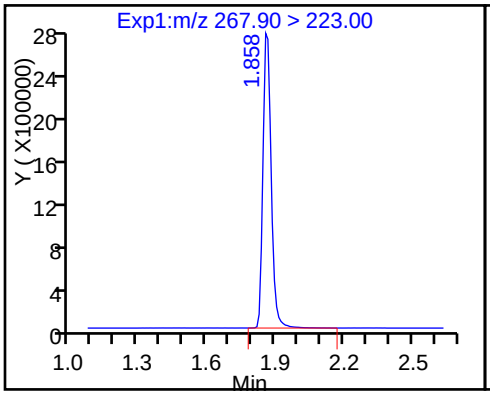
1 Perfluorobutyric acid



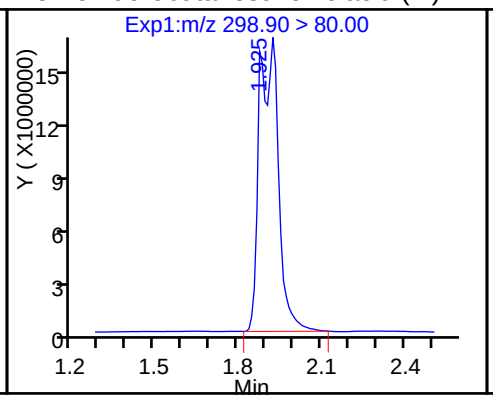
3 Perfluoropentanoic acid



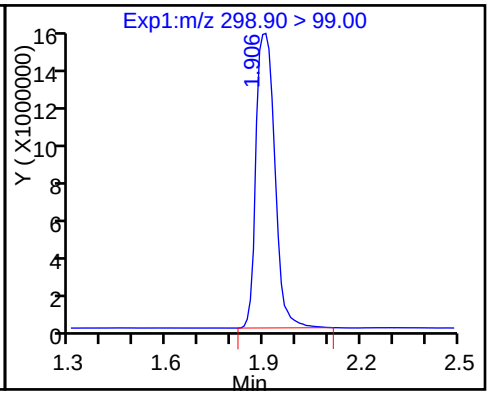
D 4 13C5-PFPeA



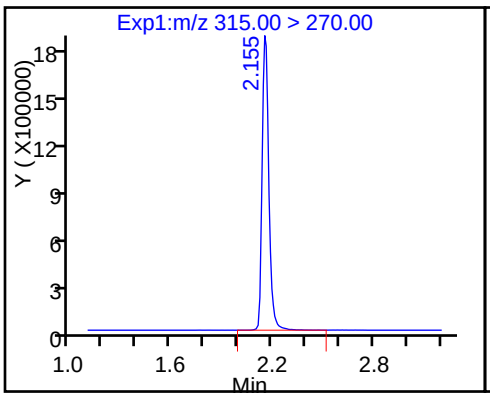
5 Perfluorobutanesulfonic acid (M)



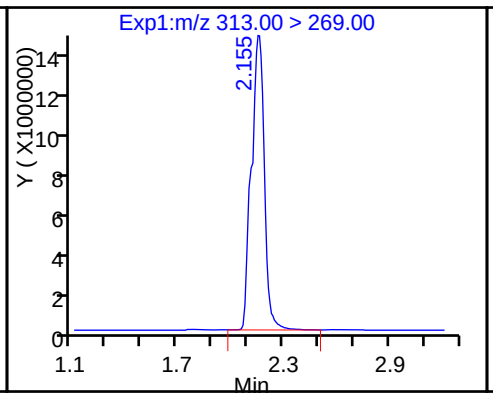
5 Perfluorobutanesulfonic acid



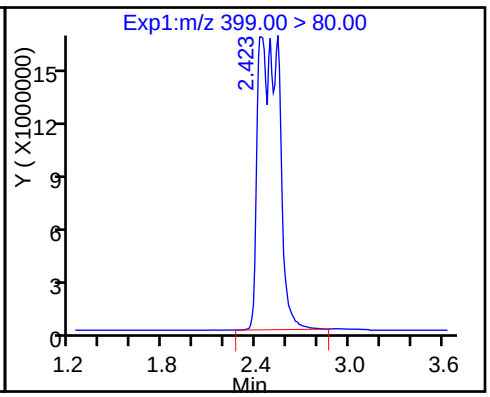
D 6 13C2 PFHxA



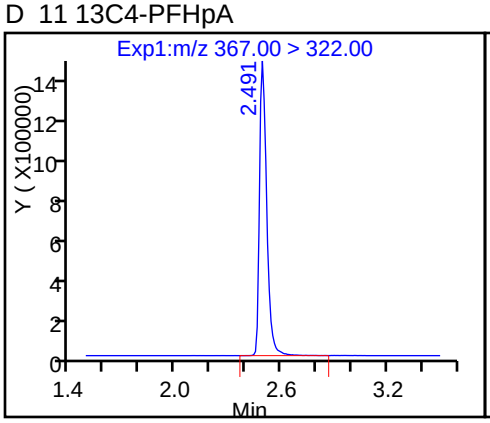
7 Perfluorohexanoic acid



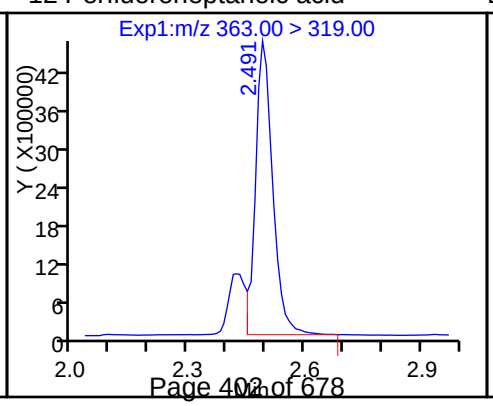
9 Perfluorohexanesulfonic acid



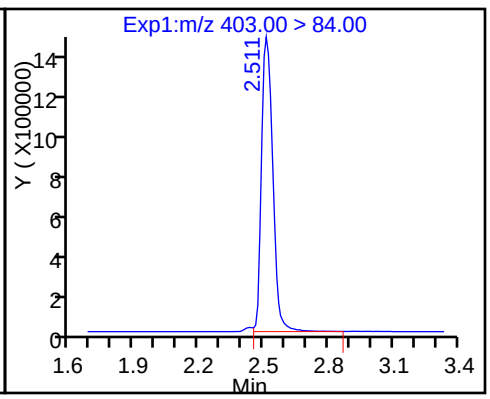
D 11 13C4-PFHpA



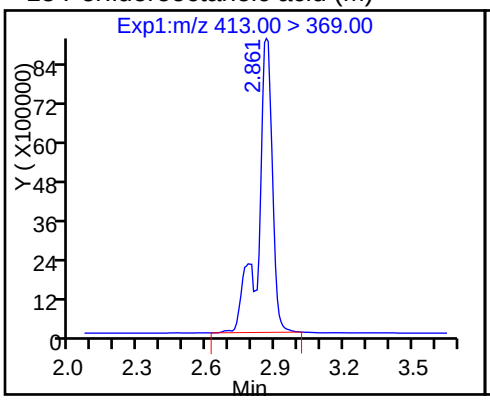
12 Perfluoroheptanoic acid



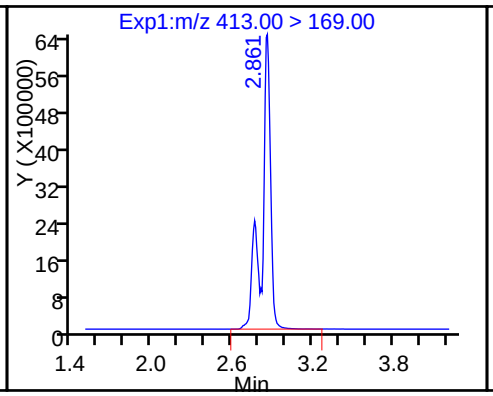
D 10 18O2 PFHxS



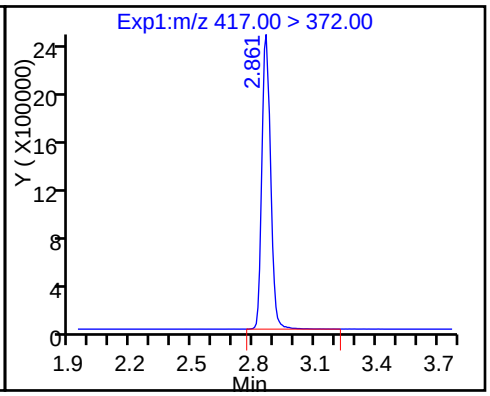
15 Perfluorooctanoic acid (M)



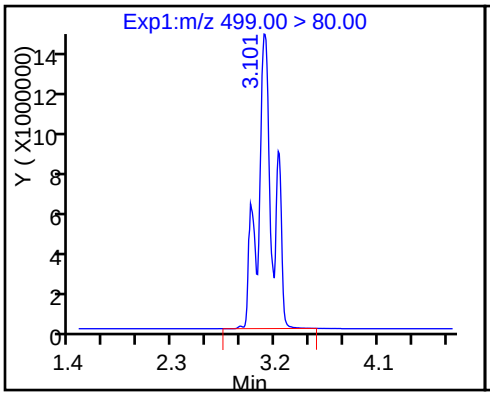
15 Perfluorooctanoic acid



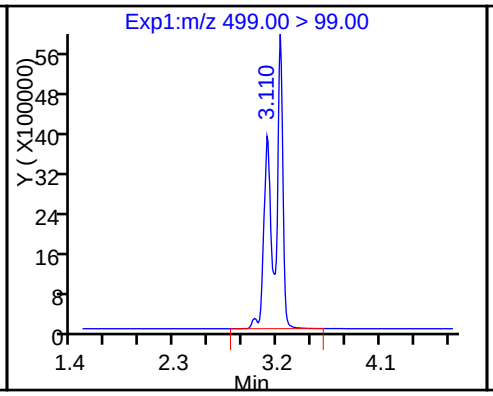
D 14 13C4 PFOA



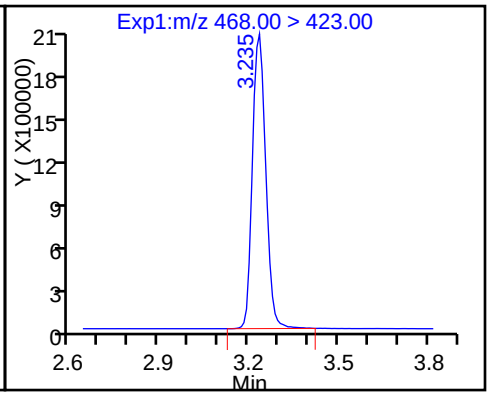
18 Perfluorooctane sulfonic acid



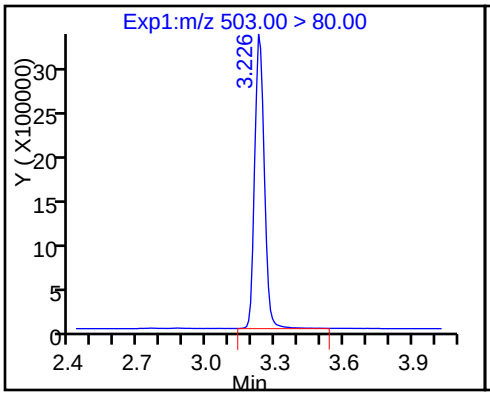
18 Perfluorooctane sulfonic acid



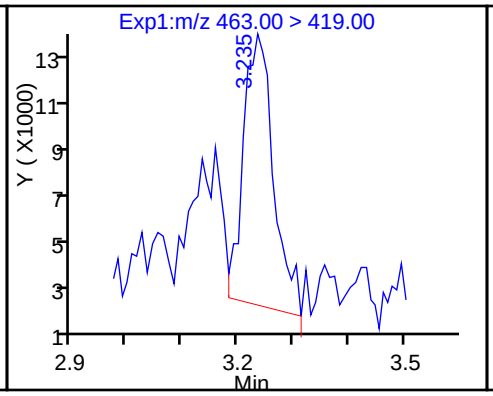
D 19 13C5 PFNA



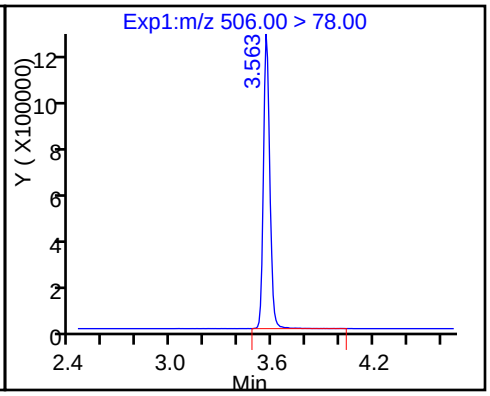
D 17 13C4 PFOS



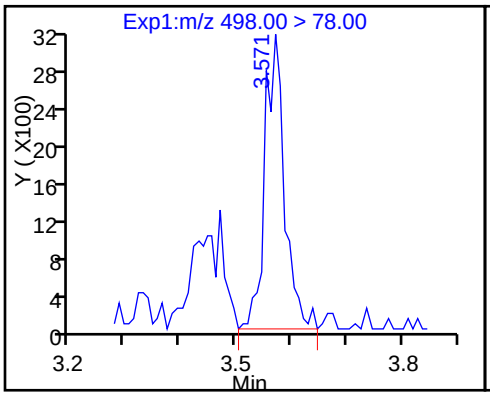
20 Perfluorononanoic acid



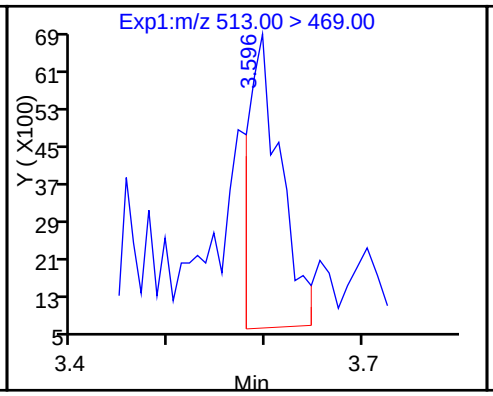
D 21 13C8 FOSA



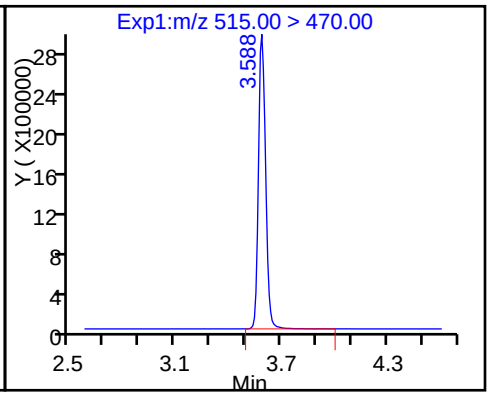
22 Perfluorooctane Sulfonamide



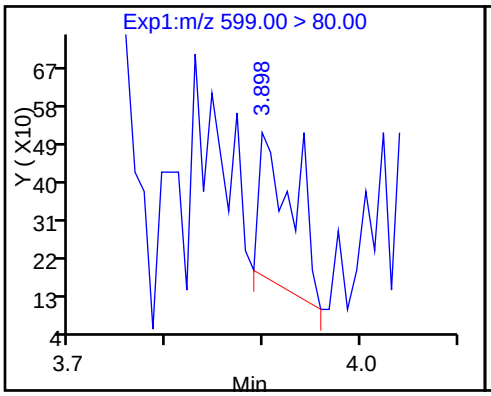
24 Perfluorodecanoic acid



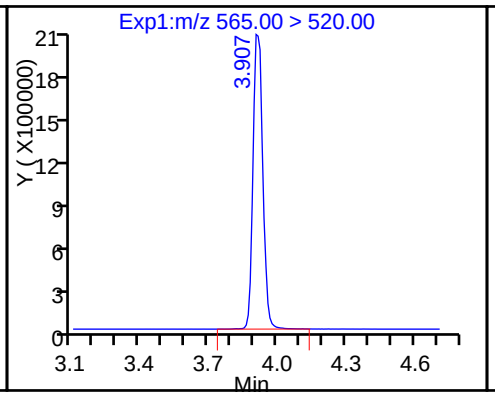
D 23 13C2 PFDA



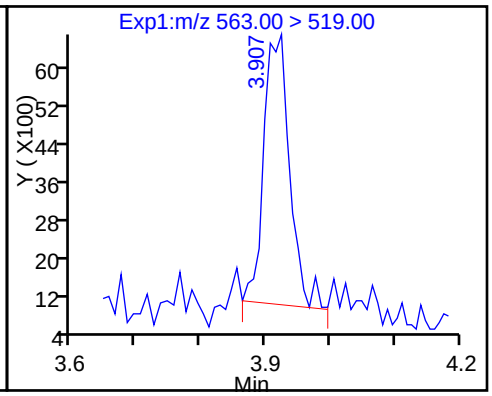
26 Perfluorodecane Sulfonic acid



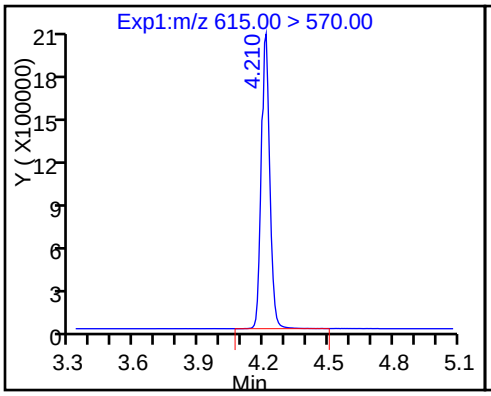
D 27 13C2 PFUnA



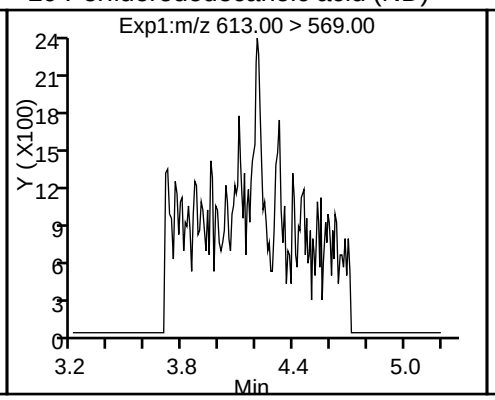
28 Perfluoroundecanoic acid



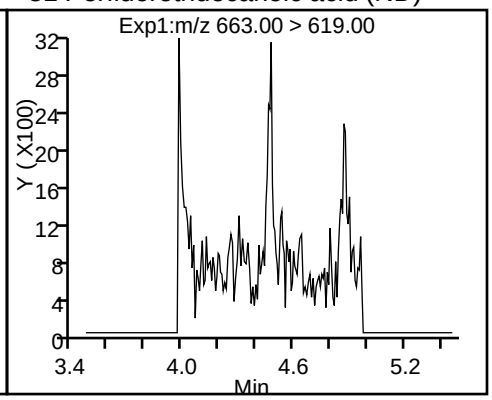
D 30 13C2 PFDoA



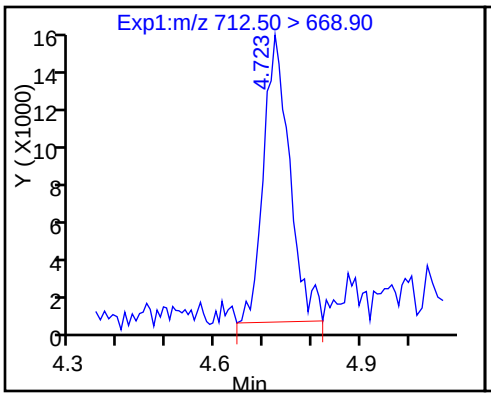
29 Perfluorododecanoic acid (ND)



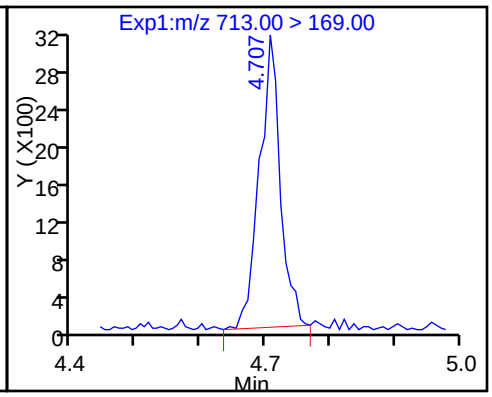
31 Perfluorotridecanoic acid (ND)



33 Perfluorotetradecanoic acid



33 Perfluorotetradecanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

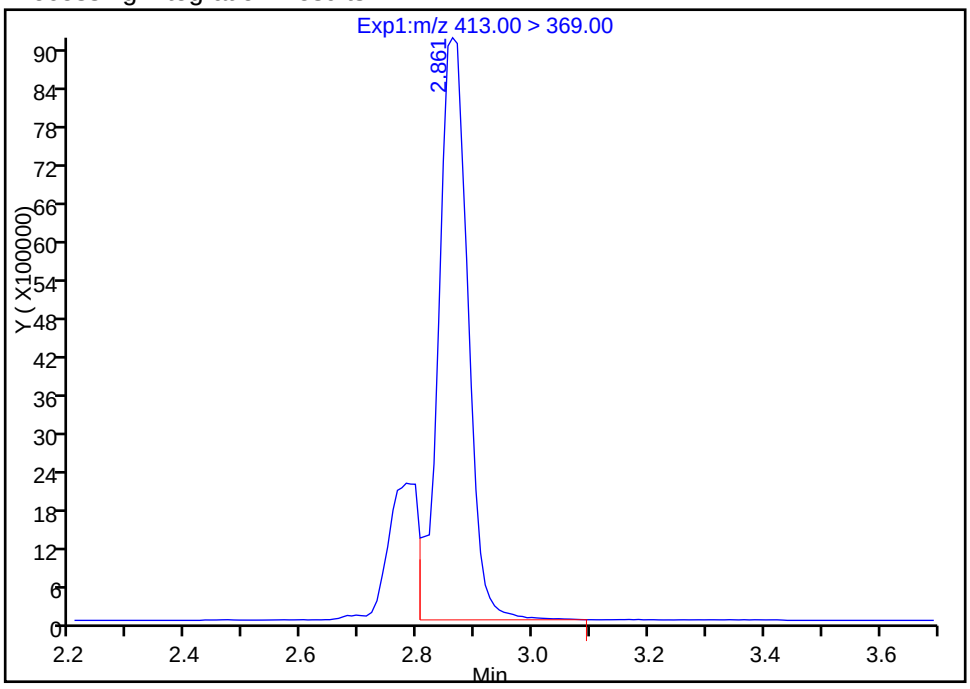
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_013.d				
Injection Date:	16-Dec-2016 19:30:14	Instrument ID:	A8_N		
Lims ID:	320-23931-B-1-A	Lab Sample ID:	320-23931-1		
Client ID:	608D132MW-LF-1116				
Operator ID:	A8-PC\A8	ALS Bottle#:	33	Worklist Smp#:	13
Injection Vol:	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

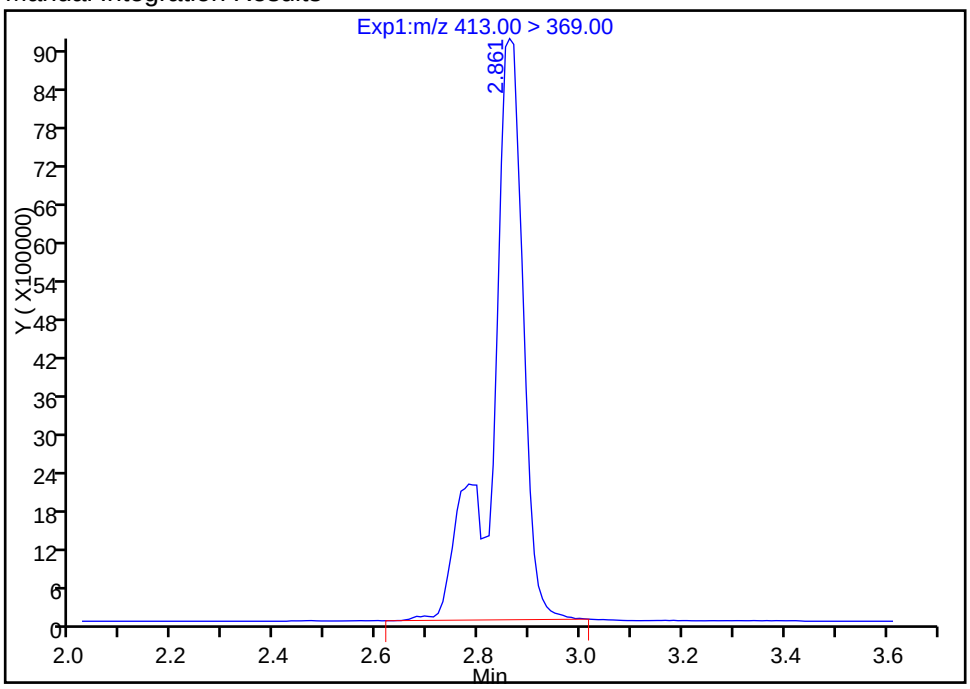
Processing Integration Results

RT: 2.86
Area: 32157632
Amount: 222.6723
Amount Units: ng/ml



Manual Integration Results

RT: 2.86
Area: 39358014
Amount: 272.5306
Amount Units: ng/ml



Reviewer: chandrasenas, 18-Dec-2016 17:38:55

Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-23931-1

SDG No.:

Client Sample ID: 608D132MW-LF-1116 DL | Lab Sample ID: 320-23931-1 DL

Matrix: Water | Lab File ID: 20DEC2016C_010.d

Analysis Method: 537 (Modified) | Date Collected: 11/30/2016 09:40

Extraction Method: 3535 | Date Extracted: 12/05/2016 08:31

Sample wt/vol: 264.5(mL) | Date Analyzed: 12/20/2016 18:37

Con. Extract Vol.: 0.5(mL) | Dilution Factor: 50

Injection Volume: 2(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 143259 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.52	D	0.12	0.047	0.022
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.76	D	0.12	0.095	0.047
307-24-4	Perfluorohexanoic acid (PFHxA)	2.1	D	0.12	0.095	0.037
375-85-9	*Perfluoroheptanoic acid (PFHpA)*	*0.34*	*D*	*0.12*	0.095	*0.038*
335-67-1	Perfluorooctanoic acid (PFOA)	0.55	D M	0.12	0.095	0.035
375-95-1	*Perfluorononanoic acid (PFNA)*	*0.095*	*U*	*0.12*	0.095	*0.031*
335-76-2	*Perfluorodecanoic acid (PFDA)*	*0.047*	*U*	*0.12*	0.047	*0.021*
2058-94-8	*Perfluoroundecanoic acid (PFUnA)*	*0.095*	*U*	*0.12*	0.095	*0.035*
307-55-1	*Perfluorododecanoic acid (PFDoA)*	*0.095*	*U*	*0.12*	0.095	*0.028*
72629-94-8	*Perfluorotridecanoic Acid (PFTriA)*	*0.095*	*U*	*0.12*	0.095	*0.026*
376-06-7	*Perfluorotetradecanoic acid (PFTeA)*	*0.047*	*U*	*0.12*	0.047	*0.019*
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.5	D	0.12	0.095	0.043
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	3.7	D	0.12	0.095	0.041
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	1.4	D	0.19	0.14	0.060
335-77-3	*Perfluorodecanesulfonic acid (PFDS)*	*0.14*	*U*	*0.19*	0.14	*0.057*
754-91-6	*Perfluorooctane Sulfonamide (FOSA)*	*0.095*	*U*	*0.12*	0.095	*0.030*

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Client Sample ID: 608D132MW-LF-1116 DL Lab Sample ID: 320-23931-1 DL

Matrix: Water Lab File ID: 20DEC2016C_010.d

Analysis Method: 537 (Modified) Date Collected: 11/30/2016 09:40

Extraction Method: 3535 Date Extracted: 12/05/2016 08:31

Sample wt/vol: 264.5(mL) Date Analyzed: 12/20/2016 18:37

Con. Extract Vol.: 0.5(mL) Dilution Factor: 50

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 143259 Units: ug/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	224	Q	25-150
STL00992	13C4 PFBA	802	Q	25-150
STL00993	13C2 PFHxA	857	Q	25-150
STL00990	13C4 PFOA	1153	Q	25-150
STL00995	13C5 PFNA	1303	Q	25-150
STL00996	13C2 PFDA	1335	Q	25-150
STL00997	13C2 PFUnA	1305	Q	25-150
STL00998	13C2 PFDoA	1231	Q	25-150
STL00994	18O2 PFHxS	842	Q	25-150
STL00991	13C4 PFOS	1317	Q	25-150
STL01893	13C5-PFPeA	1140	Q	25-150
STL01892	13C4-PFHpA	751	Q	25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161221-38078.b\20DEC2016C_010.d
Lims ID: 320-23931-B-1-A
Client ID: 608D132MW-LF-1116
Sample Type: Client
Inject. Date: 20-Dec-2016 18:37:20 ALS Bottle#: 11 Worklist Smp#: 10
Injection Vol: 2.0 ul Dil. Factor: 50.0000
Sample Info: 320-23931-b-1-a 50X
Misc. Info.: Plate: 1 Rack: 4
Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161221-38078.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 21-Dec-2016 10:21:06 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK025

First Level Reviewer: chandrasenas Date: 21-Dec-2016 10:17:58

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.558	1.558	0.0		2789348	8.02		16.0	301243	
1 Perfluorobutyric acid										
212.90 > 169.00	1.558	1.566	-0.008	1.000	13154444	5.52			63246	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.839	1.839	0.0	1.000	24007880	8.02			105452	
D 4 13C5-PFPeA										
267.90 > 223.00	1.839	1.839	0.0		3033296	11.4		22.8	176747	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.878	1.878	0.0	1.000	60591787	15.5				
298.90 > 99.00	1.878	1.878	0.0	1.000	36054109		1.68(0.00-0.00)			
7 Perfluorohexanoic acid										
313.00 > 269.00	2.133	2.135	-0.002	1.000	43142892	22.1			198848	
D 6 13C2 PFHxA										
315.00 > 270.00	2.133	2.135	-0.002		2100743	8.57		17.1	164544	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.460	2.472	-0.012	1.000	6012999	3.61			7640	
D 11 13C4-PFHpA										
367.00 > 322.00	2.460	2.480	-0.020		1699372	7.51		15.0	124285	
D 10 18O2 PFHxS										
403.00 > 84.00	2.489	2.487	0.002		2605372	7.97		16.8	138730	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.489	2.495	-0.006	1.000	110272551	38.9				
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.831	2.835	-0.004	1.000	15392771	5.77			119942	M
413.00 > 169.00	2.831	2.835	-0.004	1.000	10756009		1.43(0.90-1.10)		484625	
D 14 13C4 PFOA										
417.00 > 372.00	2.831	2.835	-0.004		2657170	11.5		23.1	197682	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.038	3.099	-0.061	1.000	47905859	14.7			103570	
499.00 > 99.00	3.087	3.099	-0.012	1.016	11002967		4.35(0.90-1.10)		254661	
D 17 13C4 PFOS										
503.00 > 80.00	3.201	3.204	-0.003		3133868	12.6		26.3	61833	
20 Perfluorononanoic acid										
463.00 > 419.00	3.201	3.213	-0.012	1.000	36817	0.0167			456	
D 19 13C5 PFNA										
468.00 > 423.00	3.201	3.213	-0.012		2314614	13.0		26.1	160433	
D 21 13C8 FOSA										
506.00 > 78.00	3.531	3.536	-0.005		859631	2.24		4.5	64848	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.548	3.570	-0.022	1.000	5241	0.002645			111	
D 23 13C2 PFDA										
515.00 > 470.00	3.556	3.570	-0.014		2099422	13.3		26.7	96959	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.834	3.877	-0.043	1.000	609	0.000318				
D 27 13C2 PFUnA										
565.00 > 520.00	3.886	3.895	-0.009		1530385	13.1		26.1	196322	
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.877	3.895	-0.018	1.000	6072	0.004149			133	
D 30 13C2 PFDoA										
615.00 > 570.00	4.176	4.182	-0.006		1365646	12.3		24.6	49999	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.688	4.698	-0.010	1.000	19075	0.008813			156	
713.00 > 169.00	4.679	4.698	-0.019	0.998	1631		11.70(0.00-0.00)		765	

QC Flag Legend

Review Flags

M - Manually Integrated

Report Date: 21-Dec-2016 10:21:28 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161221-38078.b\20DEC2016C_010.d

Injection Date: 20-Dec-2016 18:37:20 Instrument ID: A8_N

Lims ID: 320-23931-B-1-A Lab Sample ID: 320-23931-1

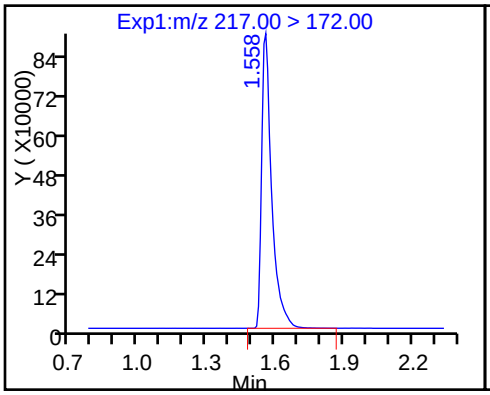
Client ID: 608D132MW-LF-1116

Operator ID: A8-PC\A8 ALS Bottle#: 11 Worklist Smp#: 10

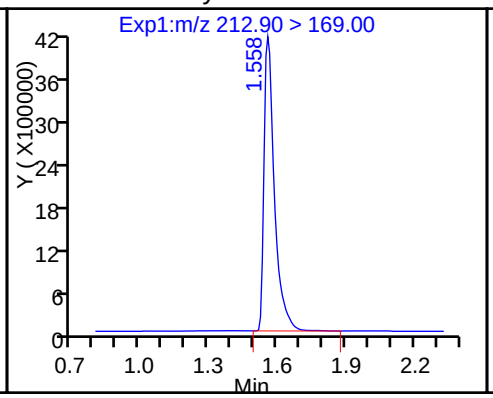
Injection Vol: 2.0 ul Dil. Factor: 50.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

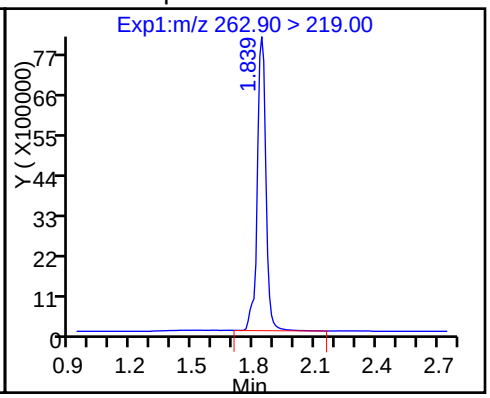
D 2 13C4 PFBA



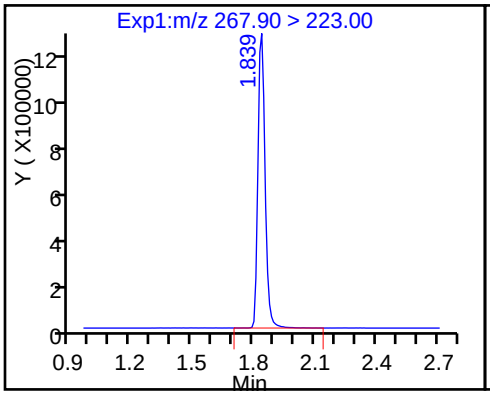
1 Perfluorobutyric acid



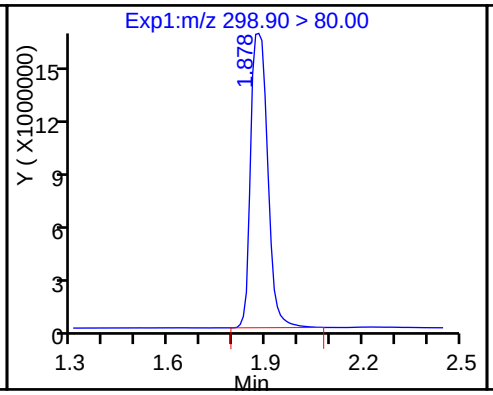
3 Perfluoropentanoic acid



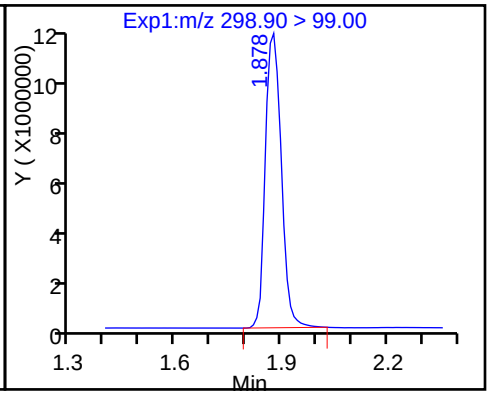
D 4 13C5-PFPeA



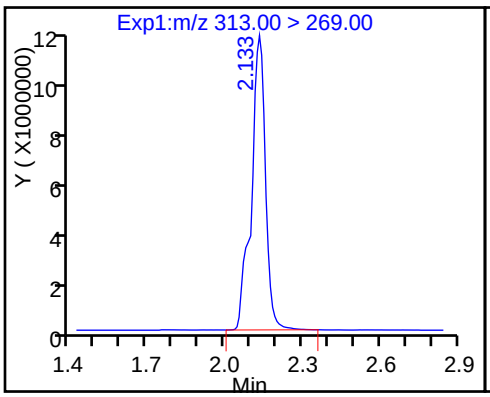
5 Perfluorobutanesulfonic acid



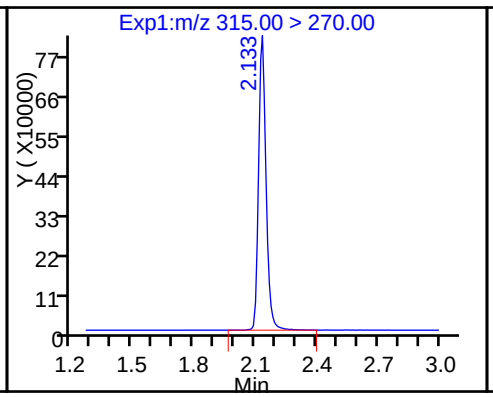
5 Perfluorobutanesulfonic acid



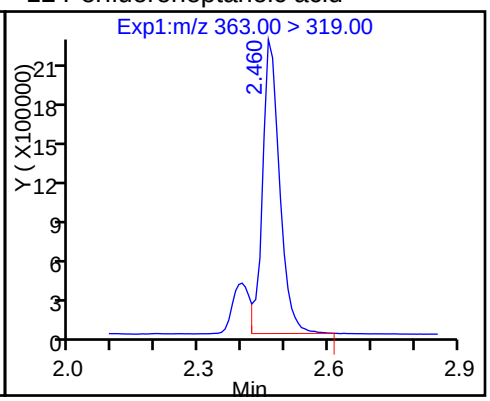
7 Perfluorohexanoic acid



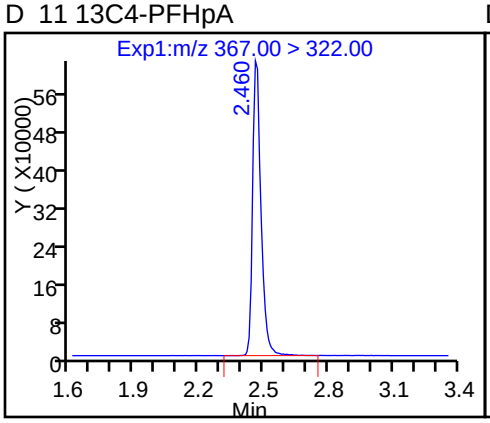
D 6 13C2 PFHxA



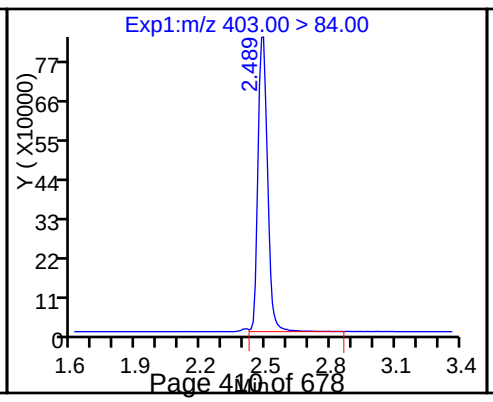
12 Perfluoroheptanoic acid



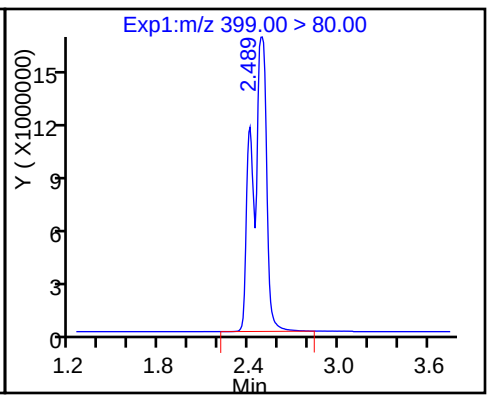
D 11 13C4-PFHpA



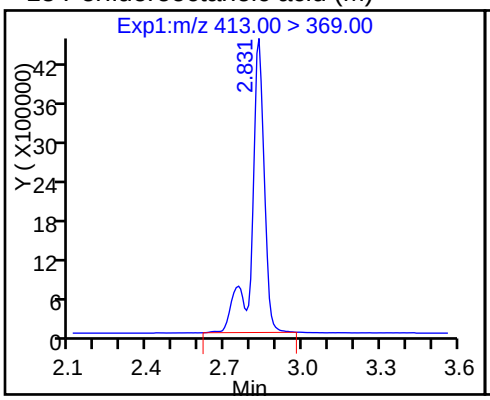
D 10 18O2 PFHxS



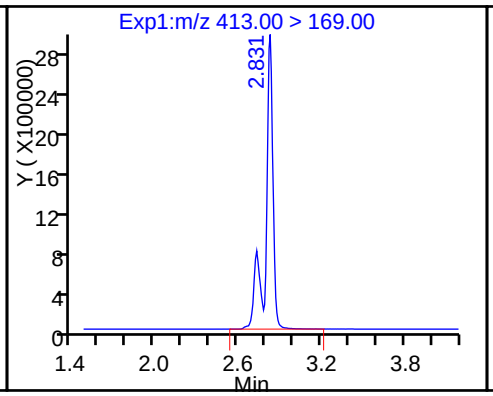
9 Perfluorohexanesulfonic acid



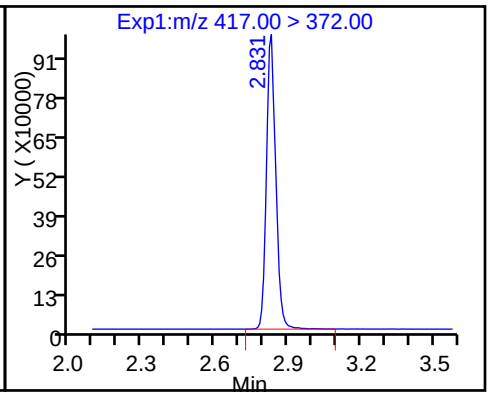
15 Perfluorooctanoic acid (M)



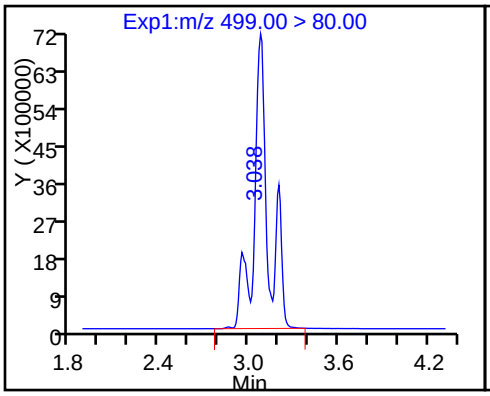
15 Perfluorooctanoic acid



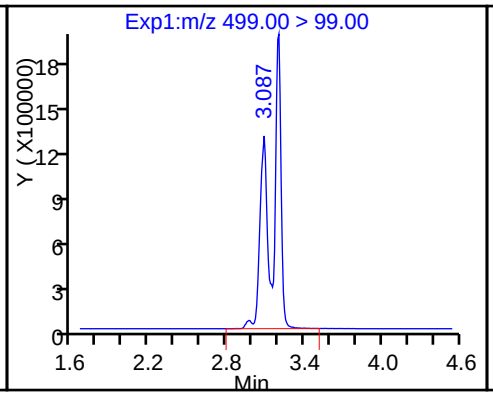
D 14 13C4 PFOA



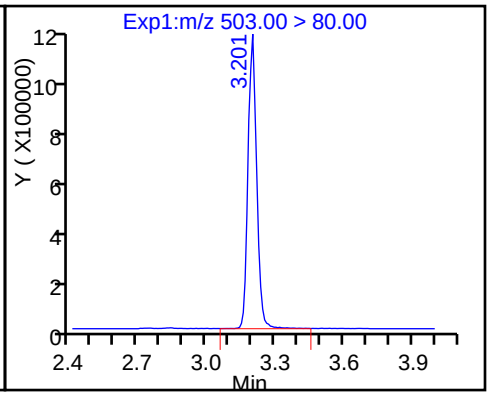
18 Perfluorooctane sulfonic acid



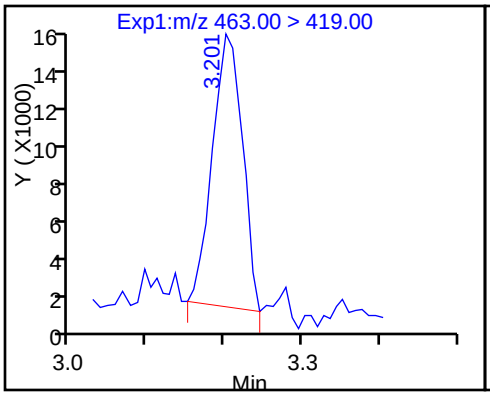
18 Perfluorooctane sulfonic acid



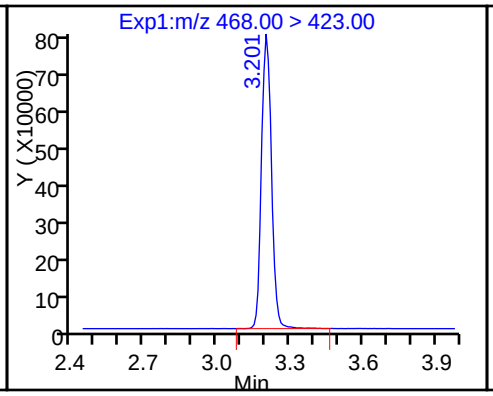
D 17 13C4 PFOS



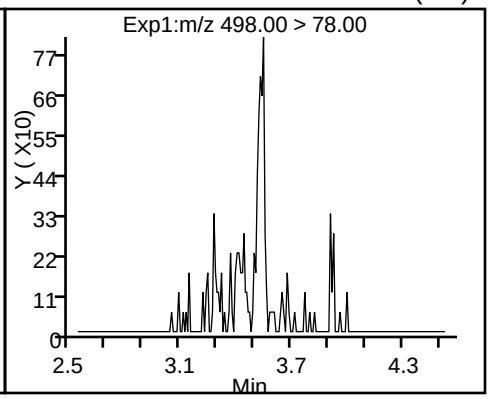
20 Perfluorononanoic acid



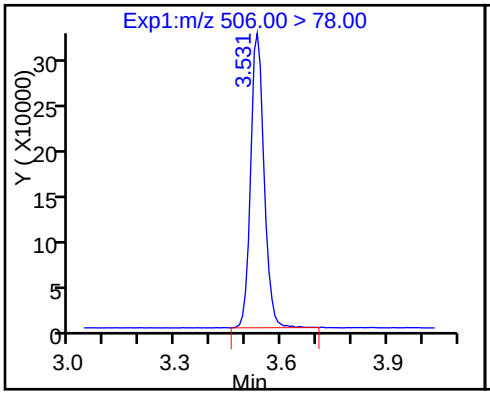
D 19 13C5 PFNA



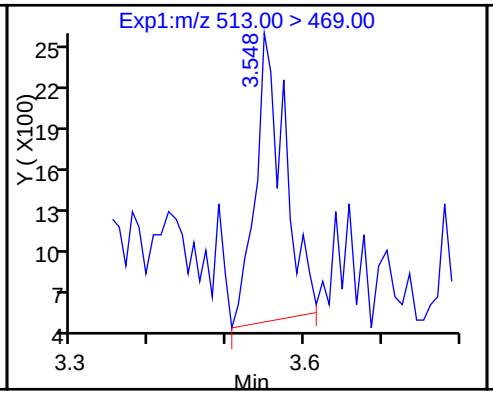
22 Perfluorooctane Sulfonamide (ND)



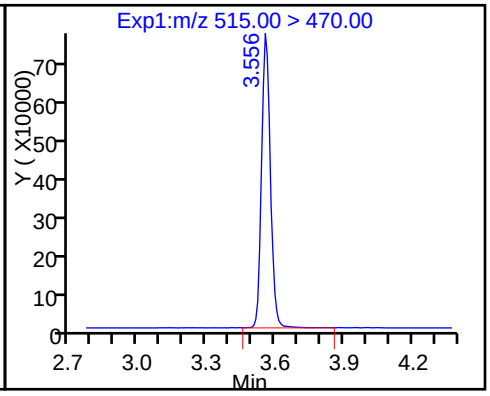
D 21 13C8 FOSA



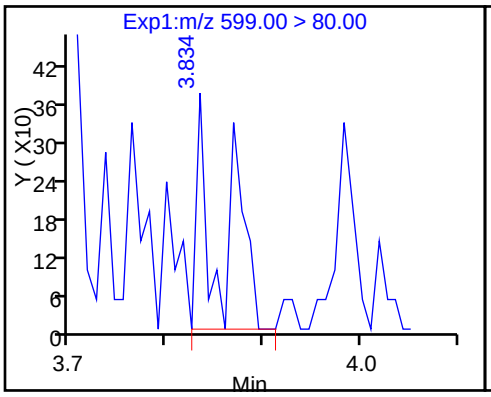
24 Perfluorodecanoic acid



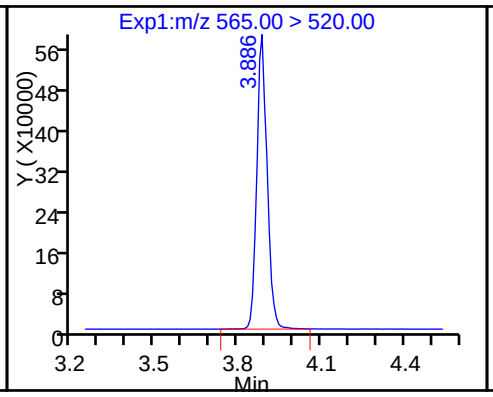
D 23 13C2 PFDA



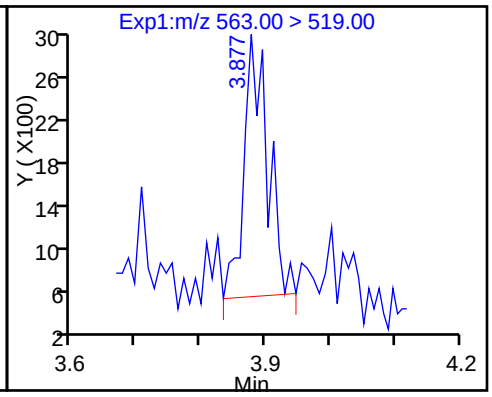
26 Perfluorodecane Sulfonic acid



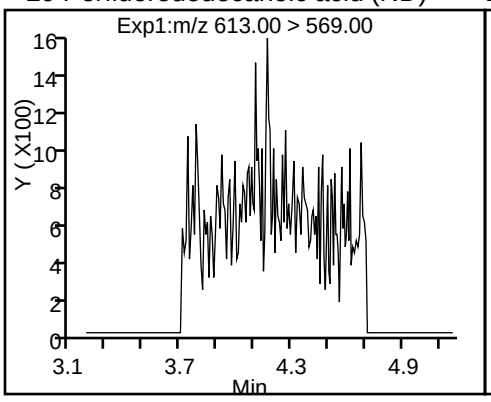
D 27 13C2 PFUnA



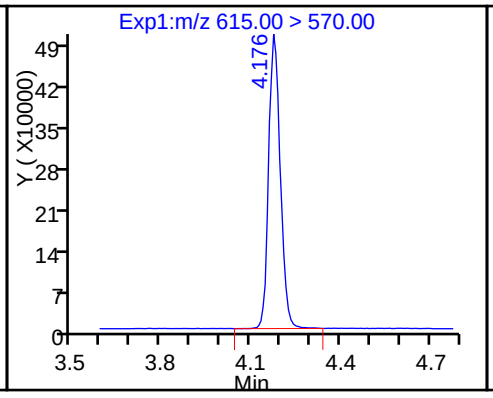
28 Perfluoroundecanoic acid



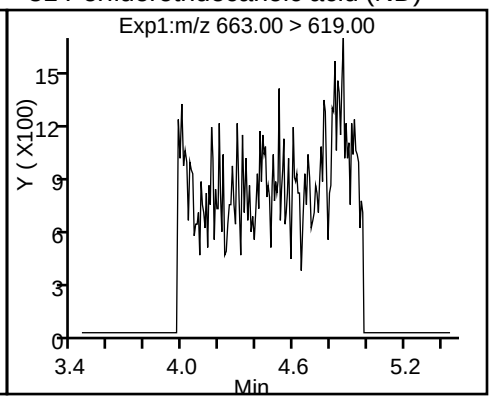
29 Perfluorododecanoic acid (ND)



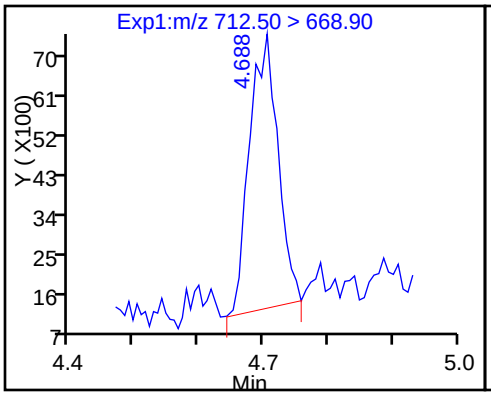
D 30 13C2 PFDoA



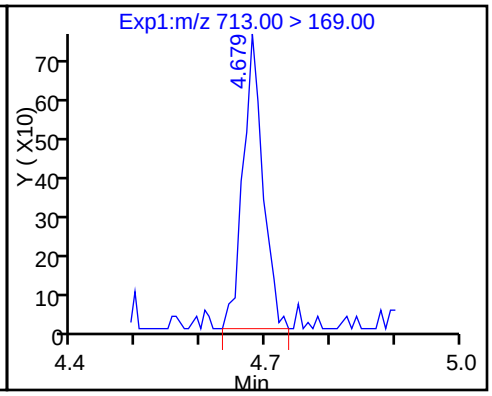
31 Perfluorotridecanoic acid (ND)



33 Perfluorotetradecanoic acid



33 Perfluorotetradecanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

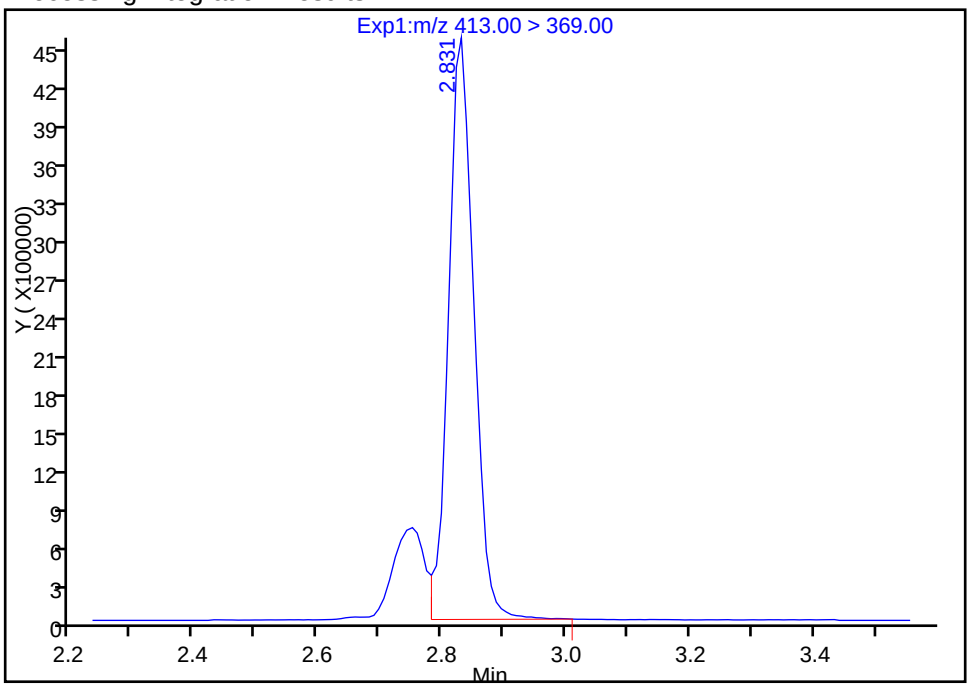
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161221-38078.b\20DEC2016C_010.d				
Injection Date:	20-Dec-2016 18:37:20	Instrument ID:	A8_N		
Lims ID:	320-23931-B-1-A	Lab Sample ID:	320-23931-1		
Client ID:	608D132MW-LF-1116				
Operator ID:	A8-PC\A8	ALS Bottle#:	11	Worklist Smp#:	10
Injection Vol:	2.0 ul	Dil. Factor:	50.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

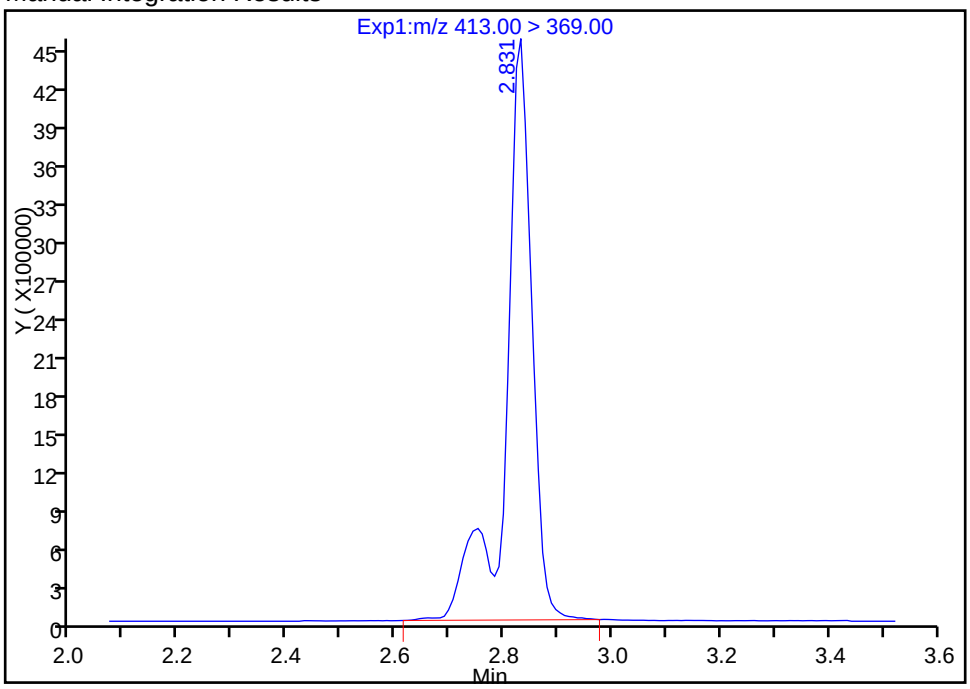
Processing Integration Results

RT: 2.83
Area: 12884602
Amount: 4.833800
Amount Units: ng/ml



Manual Integration Results

RT: 2.83
Area: 15392771
Amount: 5.774767
Amount Units: ng/ml



Reviewer: chandrasenas, 21-Dec-2016 10:17:58

Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-23931-1

SDG No.:

Client Sample ID: 608D33MW-LF-1116 | Lab Sample ID: 320-23931-2

Matrix: Water | Lab File ID: 16DEC2016C_014.d

Analysis Method: 537 (Modified) | Date Collected: 11/30/2016 11:00

Extraction Method: 3535 | Date Extracted: 12/05/2016 08:31

Sample wt/vol: 260.2(mL) | Date Analyzed: 12/16/2016 19:37

Con. Extract Vol.: 0.5(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 142751 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.26	M	0.0024	0.00096	0.00044
2706-90-3	*Perfluoropentanoic acid (PFPeA)*	*0.40*	*E*	*0.0024*	0.0019	*0.00095*
307-24-4	*Perfluorohexanoic acid (PFHxA)*	*0.80*	*E*	*0.0024*	0.0019	*0.00076*
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.21		0.0024	0.0019	0.00077
335-67-1	Perfluorooctanoic acid (PFOA)	0.38	M	0.0024	0.0019	0.00072
375-95-1	Perfluorononanoic acid (PFNA)	0.017		0.0024	0.0019	0.00063
335-76-2	Perfluorodecanoic acid (PFDA)	0.0022	J M	0.0024	0.00096	0.00042
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0019	U	0.0024	0.0019	0.00072
307-55-1	Perfluorododecanoic acid (PFDoA)	0.0019	U	0.0024	0.0019	0.00056
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.0019	U	0.0024	0.0019	0.00053
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.00039	J	0.0024	0.00096	0.00038
355-46-4	*Perfluorohexanesulfonic acid (PFHxS)*	*2.4*	*E*	*0.0024*	0.0019	*0.00084*
1763-23-1	*Perfluorooctanesulfonic acid (PFOS)*	*10*	*E M*	*0.0038*	0.0029	*0.0012*
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.0039		0.0038	0.0029	0.0012
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.043		0.0024	0.0019	0.00061

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-23931-1

SDG No.:

Client Sample ID: 608D33MW-LF-1116 | Lab Sample ID: 320-23931-2

Matrix: Water | Lab File ID: 16DEC2016C_014.d

Analysis Method: 537 (Modified) | Date Collected: 11/30/2016 11:00

Extraction Method: 3535 | Date Extracted: 12/05/2016 08:31

Sample wt/vol: 260.2(mL) | Date Analyzed: 12/16/2016 19:37

Con. Extract Vol.: 0.5(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 142751 | Units: ug/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	8	Q	25-150
STL00992	13C4 PFBA	9	Q	25-150
STL00993	13C2 PFHxA	47		25-150
STL00990	13C4 PFOA	60		25-150
STL00995	13C5 PFNA	27		25-150
STL00996	13C2 PFDA	97		25-150
STL00997	13C2 PFUnA	112		25-150
STL00998	13C2 PFDoA	108		25-150
STL00994	18O2 PFHxS	34		25-150
STL00991	13C4 PFOS	21	Q	25-150
STL01893	13C5-PFPeA	42		25-150
STL01892	13C4-PFHpA	36		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_014.d
Lims ID: 320-23931-A-2-A
Client ID: 608D33MW-LF-1116
Sample Type: Client
Inject. Date: 16-Dec-2016 19:37:45 ALS Bottle#: 34 Worklist Smp#: 14
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-23931-a-2-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 18-Dec-2016 17:57:40 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK028

First Level Reviewer: chandrasenas Date: 18-Dec-2016 17:39:03

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.574	1.582	-0.008		1532100	4.41		8.8	121936	
1 Perfluorobutyric acid										M
212.90 > 169.00	1.582	1.582	0.0	1.000	3542414	135.4			8941	M
3 Perfluoropentanoic acid										E
262.90 > 219.00	1.848	1.858	-0.010	1.000	23042163	210.2			14395	E
D 4 13C5-PFPeA										
267.90 > 223.00	1.858	1.858	0.0		5555305	20.9		41.8	163421	
5 Perfluorobutanesulfonic acid										E
298.90 > 80.00	1.887	1.896	-0.009	1.000	55311770	349.7				E
298.90 > 99.00	1.887	1.896	-0.009	1.000	31673288		1.75(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.148	2.155	-0.007		5777974	23.6		47.1	448441	
7 Perfluorohexanoic acid										E
313.00 > 269.00	2.148	2.164	-0.016	1.000	44820326	417.6			26923	E
9 Perfluorohexanesulfonic acid										E
399.00 > 80.00	2.481	2.433	0.048	1.000	143828422	1250.9				E
D 11 13C4-PFHpA										
367.00 > 322.00	2.481	2.494	-0.013		4068135	18.0		35.9	179871	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.481	2.502	-0.021	1.000	8623337	108.3			8047	
D 10 18O2 PFHxS										
403.00 > 84.00	2.498	2.510	-0.012		5280110	16.1		34.1	172067	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.846	2.858	-0.012	1.000	27570391	200.0			37909	M
413.00 > 169.00	2.822	2.858	-0.036	0.991	19985436		1.38(0.90-1.10)		199382	
D 14 13C4 PFOA										
417.00 > 372.00	2.846	2.858	-0.012		6871301	29.8		59.7	405645	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
18 Perfluorooctane sulfonic acid										EM
499.00 > 80.00	3.183	3.115	0.068	1.000	278074031	5251.2			68064	EM
499.00 > 99.00	3.209	3.115	0.094	1.008	129880966		2.14(0.90-1.10)		0.0	
D 19 13C5 PFNA										
468.00 > 423.00	3.218	3.230	-0.012		2375402	13.4		26.7	87168	
D 17 13C4 PFOS										
503.00 > 80.00	3.209	3.230	-0.021		2545360	10.2		21.4	9363	
20 Perfluorononanoic acid										
463.00 > 419.00	3.218	3.239	-0.021	1.000	407835	9.02			1157	
D 21 13C8 FOSA										
506.00 > 78.00	3.557	3.561	-0.004		1629329	4.24		8.5	68956	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.557	3.561	-0.004	1.000	675097	22.2			1721	
24 Perfluorodecanoic acid										M
513.00 > 469.00	3.582	3.586	-0.004	1.000	168886	1.17			646	M
D 23 13C2 PFDA										
515.00 > 470.00	3.574	3.595	-0.021		7662425	48.7		97.4	317696	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.886	3.899	-0.013	1.000	62369	2.01				
D 27 13C2 PFUnA										
565.00 > 520.00	3.912	3.907	0.005		6574379	56.1		112	324124	
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.903	3.916	-0.013	1.000	32430	0.2579			244	
D 30 13C2 PFDoA										
615.00 > 570.00	4.200	4.203	-0.003		5997073	54.0		108	215984	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.186	4.203	-0.017	1.000	8826	0.0802			76.6	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.710	4.711	-0.001	1.000	38316	0.2016			55.6	
713.00 > 169.00	4.694	4.711	-0.017	0.996	8244		4.65(0.00-0.00)		3291	

QC Flag Legend

Processing Flags

E - Exceeded Maximum Amount

Review Flags

M - Manually Integrated

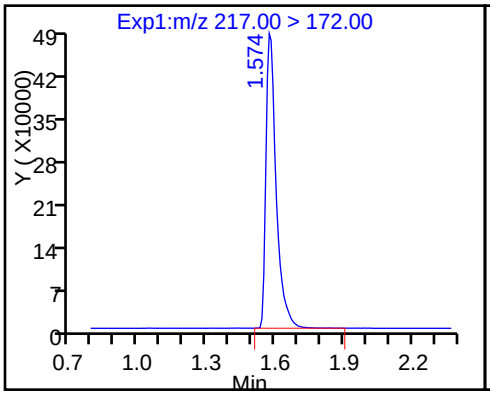
Report Date: 18-Dec-2016 17:57:57 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

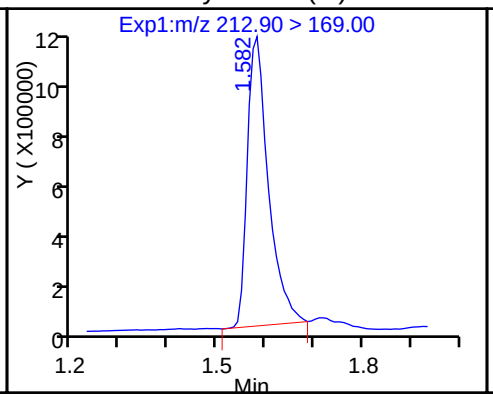
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_014.d

Injection Date:	16-Dec-2016 19:37:45	Instrument ID:	A8_N		
Lims ID:	320-23931-A-2-A	Lab Sample ID:	320-23931-2		
Client ID:	608D33MW-LF-1116				
Operator ID:	A8-PC\A8	ALS Bottle#:	34	Worklist Smp#:	14
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		

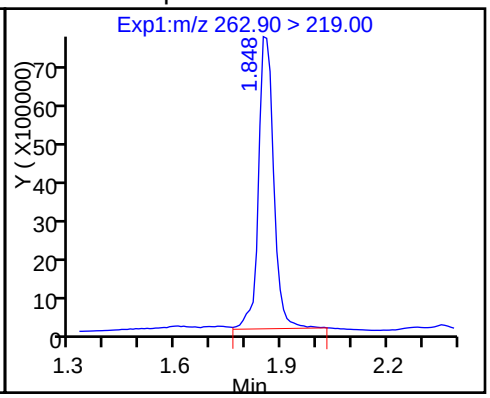
D 2 13C4 PFBA



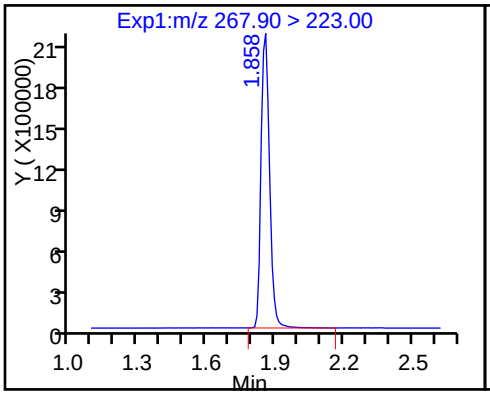
1 Perfluorobutyric acid (M)



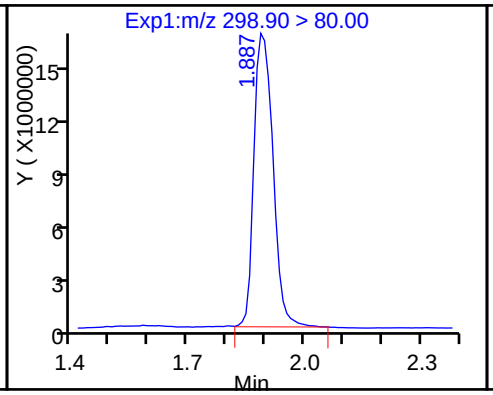
3 Perfluoropentanoic acid



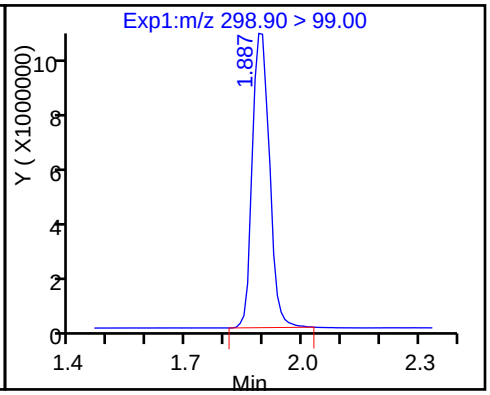
D 4 13C5-PFPeA



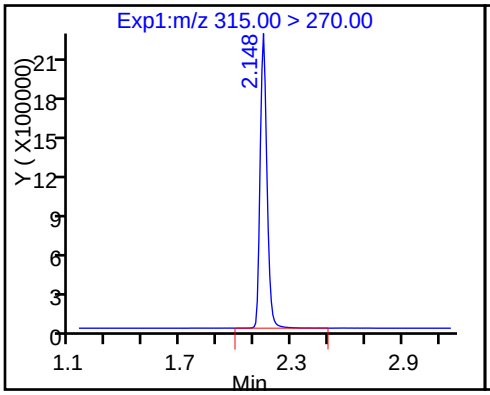
5 Perfluorobutanesulfonic acid



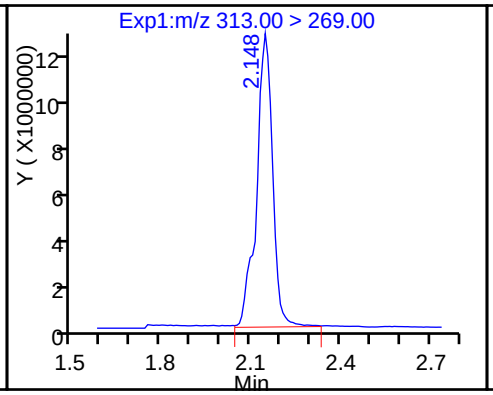
5 Perfluorobutanesulfonic acid



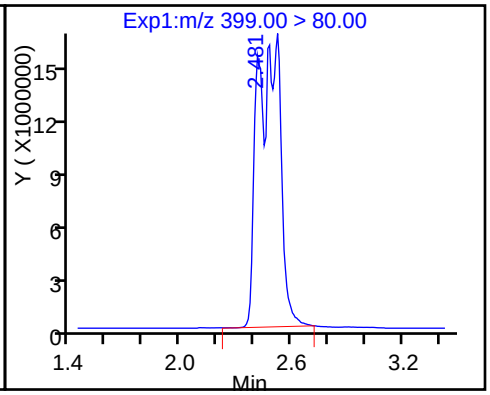
D 6 13C2 PFHxA



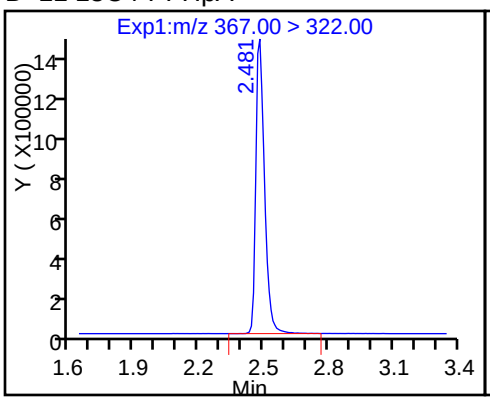
7 Perfluorohexanoic acid



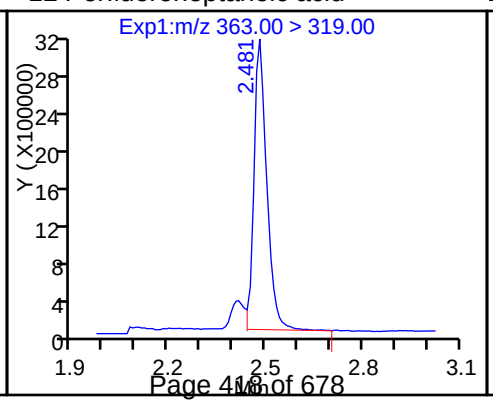
9 Perfluorohexanesulfonic acid



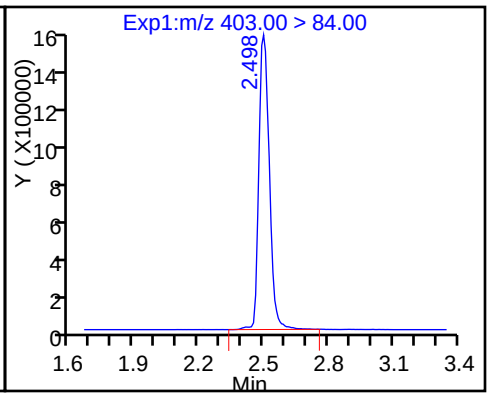
D 11 13C4-PFHpA



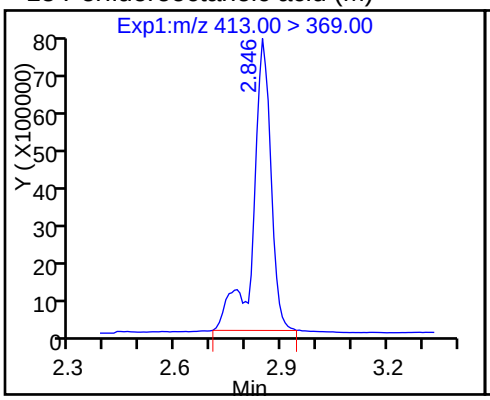
12 Perfluoroheptanoic acid



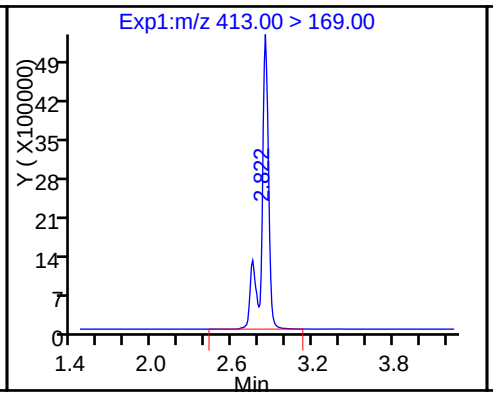
D 10 18O2 PFHxS



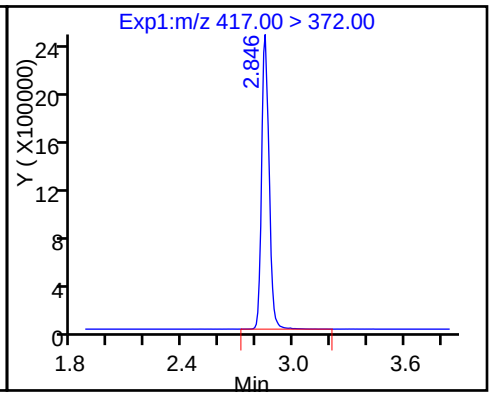
15 Perfluorooctanoic acid (M)



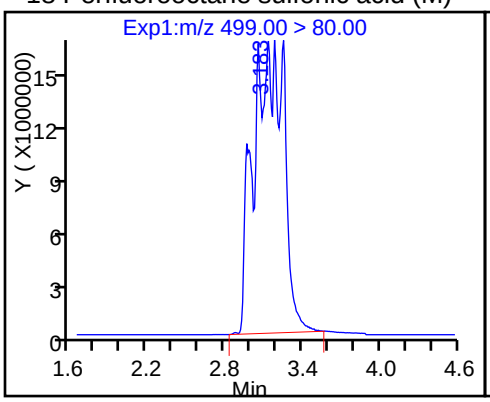
15 Perfluorooctanoic acid



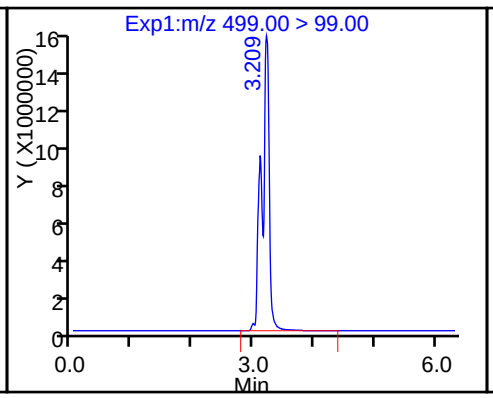
D 14 13C4 PFOA



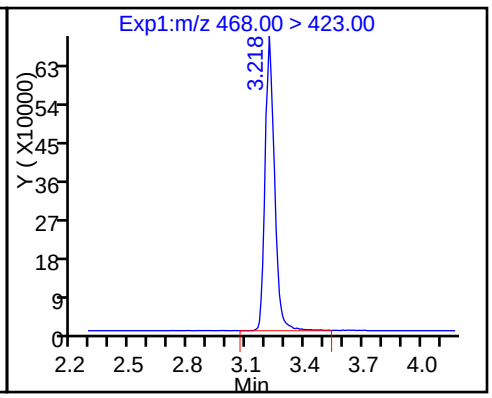
18 Perfluorooctane sulfonic acid (M)



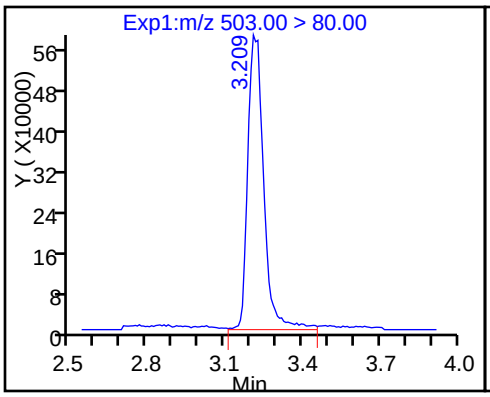
18 Perfluorooctane sulfonic acid



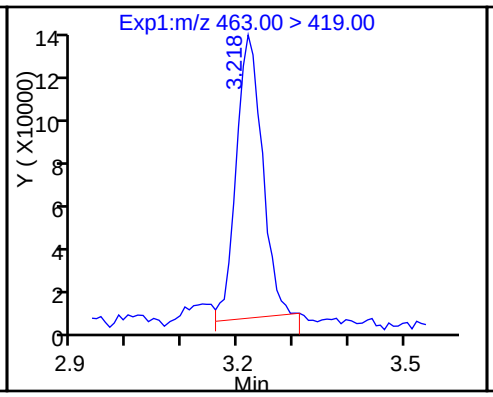
D 19 13C5 PFNA



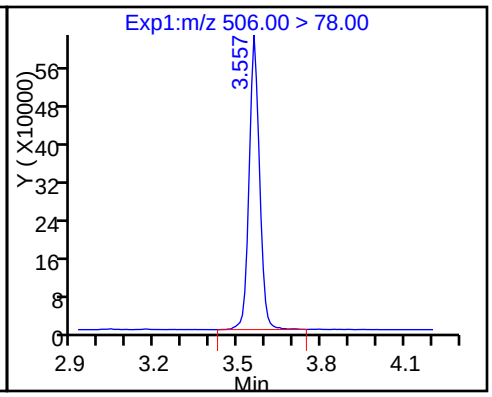
D 17 13C4 PFOS



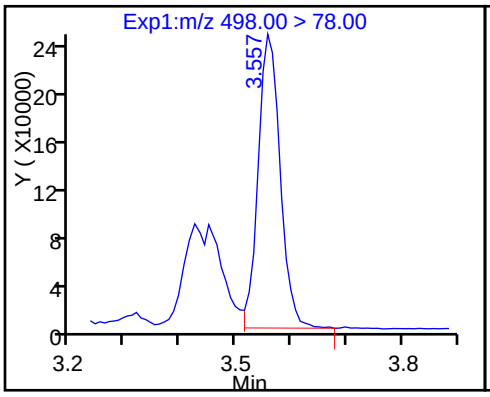
20 Perfluorononanoic acid



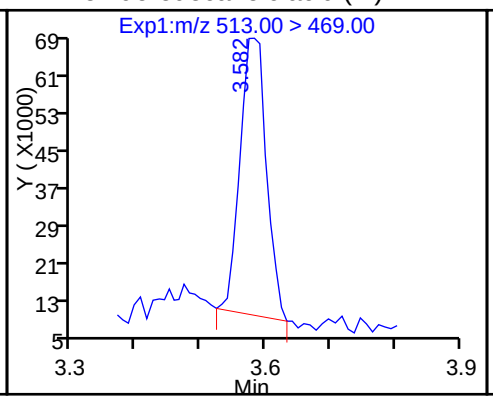
D 21 13C8 FOSA



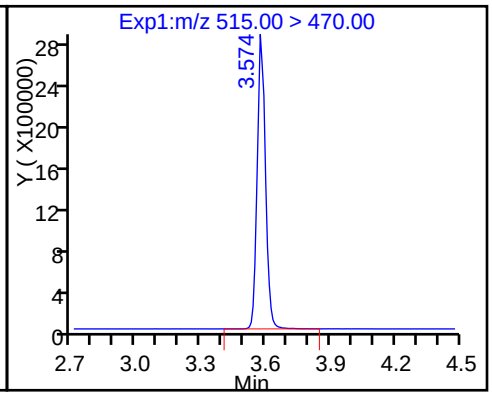
22 Perfluorooctane Sulfonamide



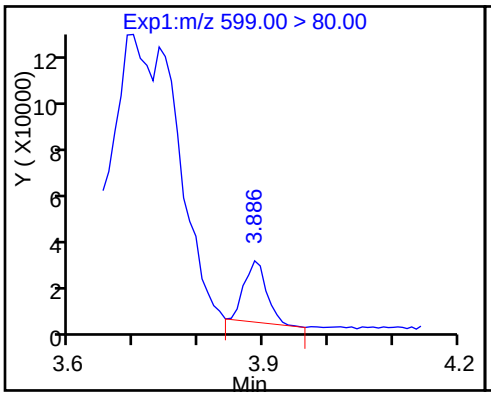
24 Perfluorodecanoic acid (M)



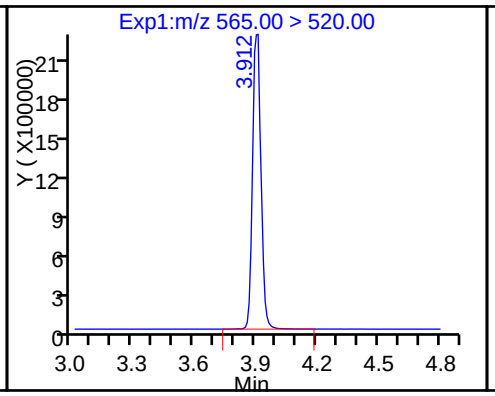
D 23 13C2 PFDA



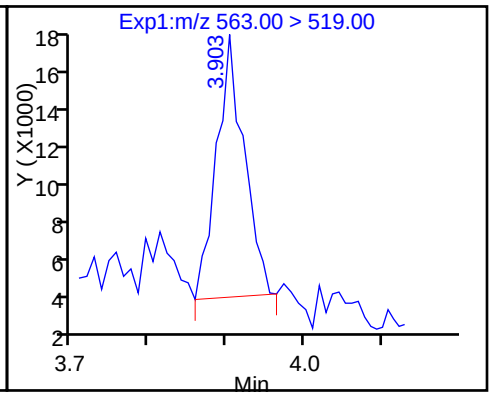
26 Perfluorodecane Sulfonic acid



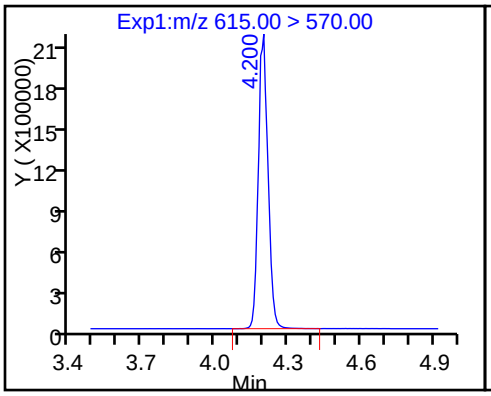
D 27 13C2 PFUnA



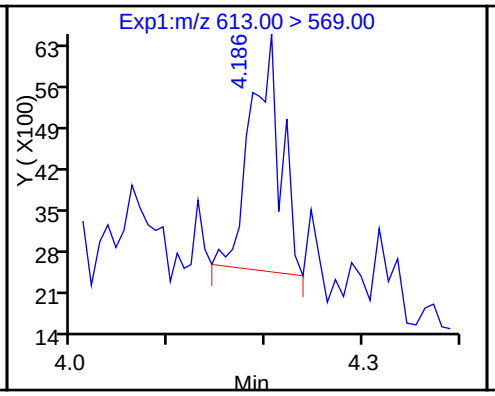
28 Perfluoroundecanoic acid



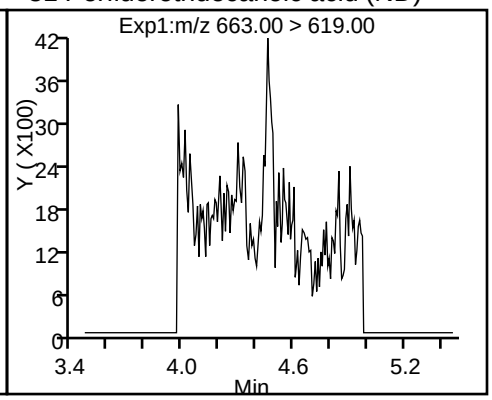
D 30 13C2 PFDoA



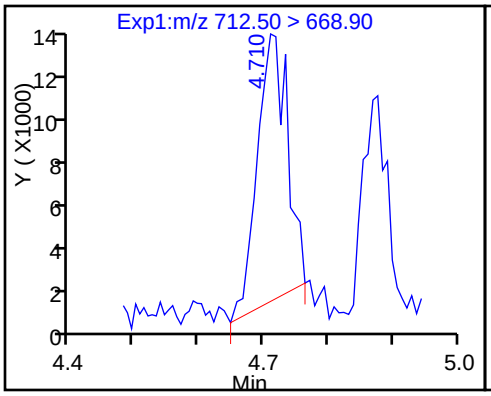
29 Perfluorododecanoic acid



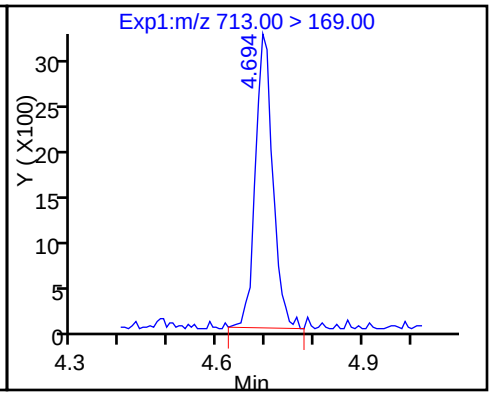
31 Perfluorotridecanoic acid (ND)



33 Perfluorotetradecanoic acid



33 Perfluorotetradecanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

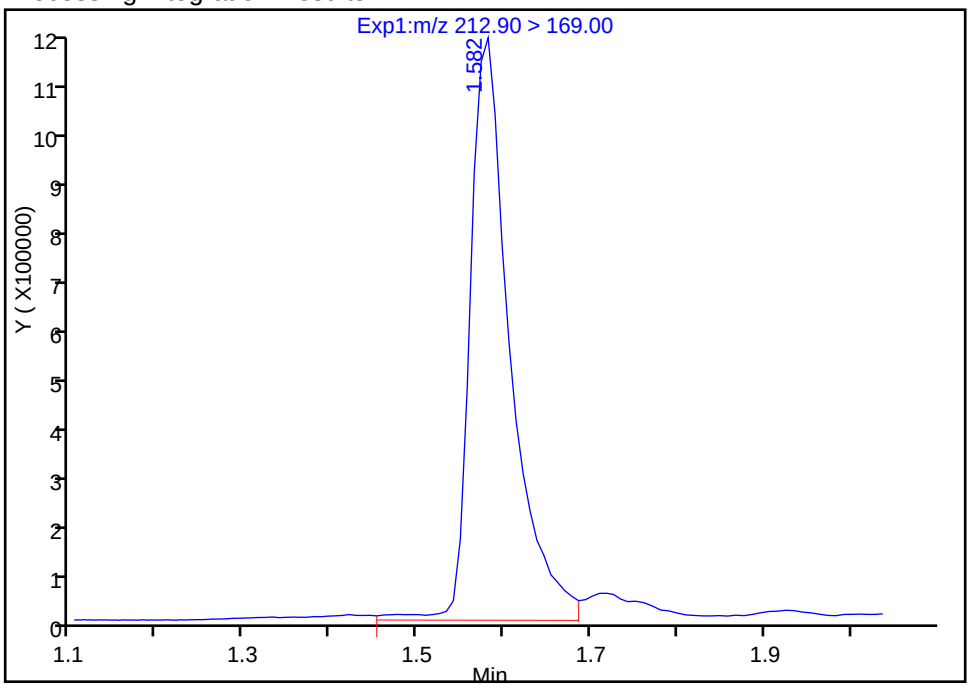
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_014.d				
Injection Date:	16-Dec-2016 19:37:45	Instrument ID:	A8_N		
Lims ID:	320-23931-A-2-A	Lab Sample ID:	320-23931-2		
Client ID:	608D33MW-LF-1116				
Operator ID:	A8-PC\A8	ALS Bottle#:	34	Worklist Smp#:	14
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

1 Perfluorobutyric acid, CAS: 375-22-4

Signal: 1

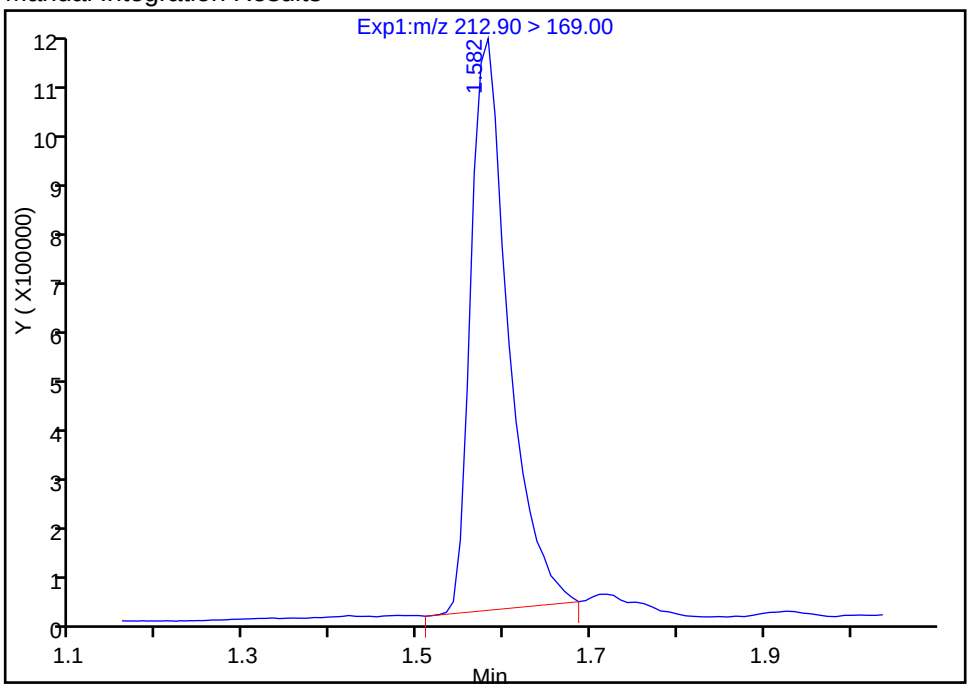
Processing Integration Results

RT: 1.58
Area: 3844300
Amount: 146.9584
Amount Units: ng/ml



Manual Integration Results

RT: 1.58
Area: 3542414
Amount: 135.4180
Amount Units: ng/ml



Reviewer: chandrasenas, 18-Dec-2016 17:40:35

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

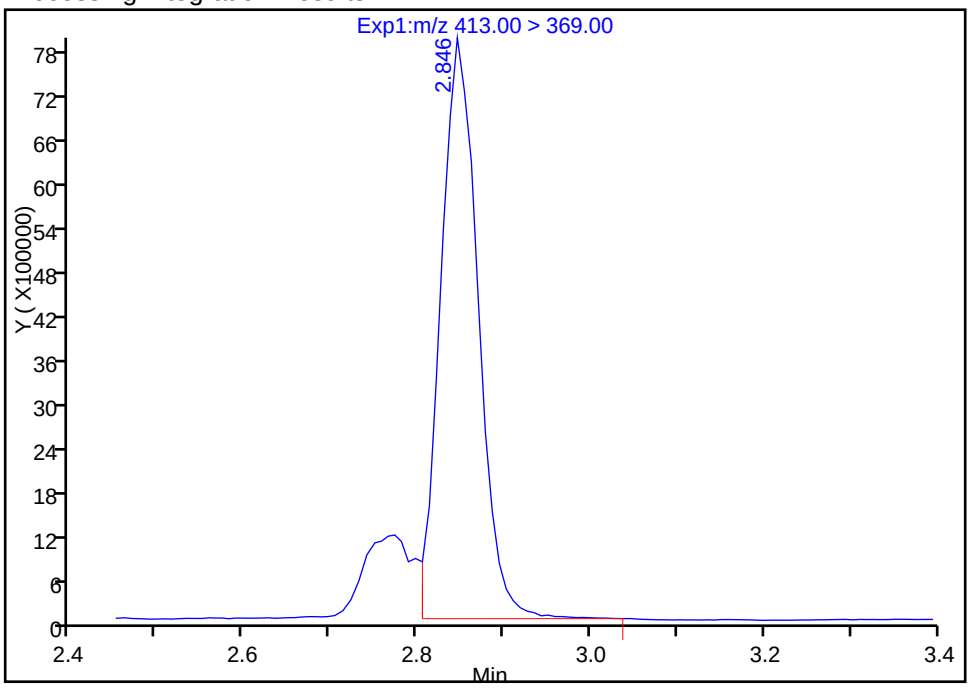
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_014.d				
Injection Date:	16-Dec-2016 19:37:45	Instrument ID:	A8_N		
Lims ID:	320-23931-A-2-A	Lab Sample ID:	320-23931-2		
Client ID:	608D33MW-LF-1116				
Operator ID:	A8-PC\A8	ALS Bottle#:	34	Worklist Smp#:	14
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

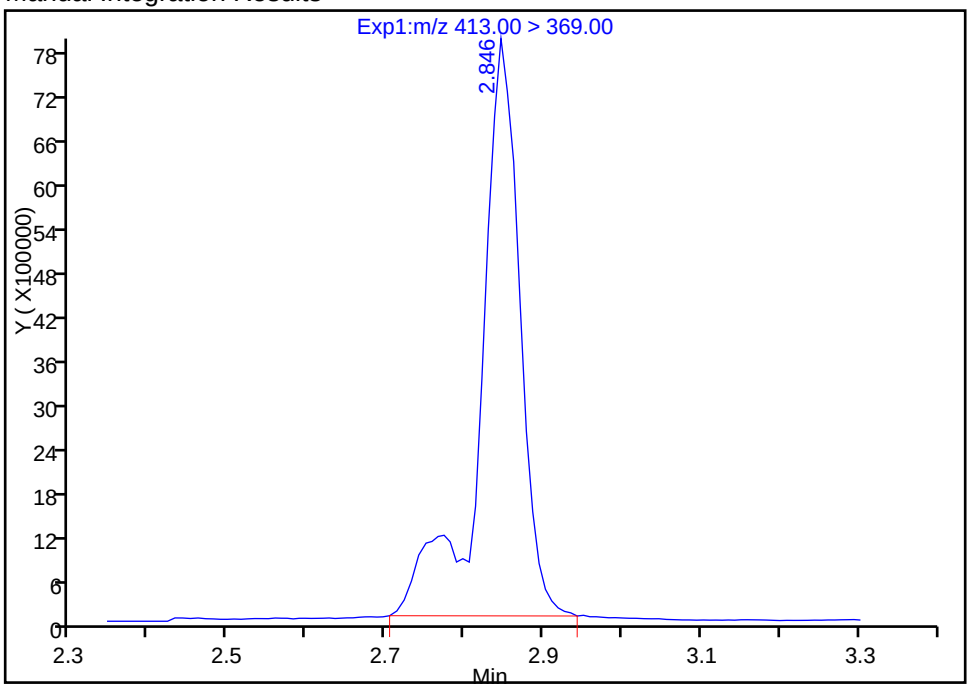
Processing Integration Results

RT: 2.85
Area: 23756618
Amount: 172.3267
Amount Units: ng/ml



Manual Integration Results

RT: 2.85
Area: 27570391
Amount: 199.9912
Amount Units: ng/ml



Reviewer: chandrasenas, 18-Dec-2016 17:40:35

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

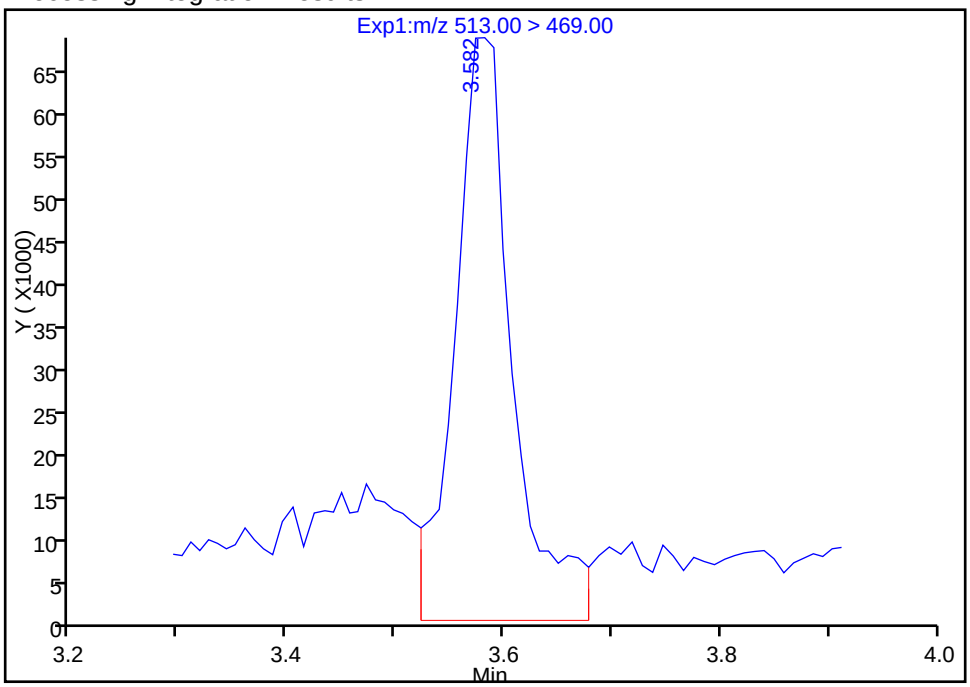
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_014.d				
Injection Date:	16-Dec-2016 19:37:45	Instrument ID:	A8_N		
Lims ID:	320-23931-A-2-A	Lab Sample ID:	320-23931-2		
Client ID:	608D33MW-LF-1116				
Operator ID:	A8-PC\A8	ALS Bottle#:	34	Worklist Smp#:	14
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

24 Perfluorodecanoic acid, CAS: 335-76-2

Signal: 1

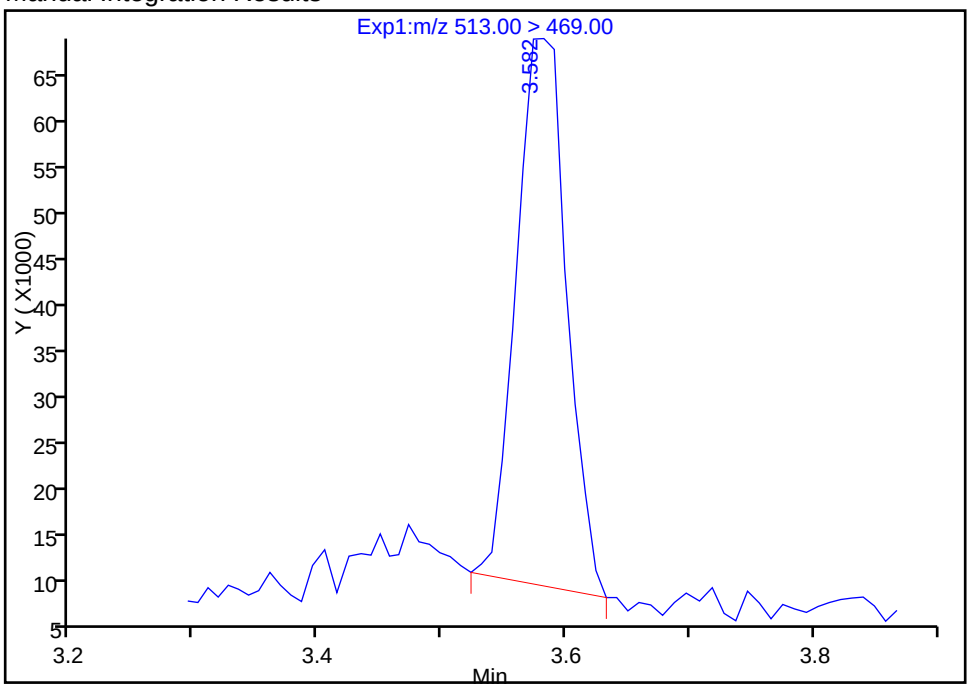
Processing Integration Results

RT: 3.58
Area: 251941
Amount: 1.741907
Amount Units: ng/ml



Manual Integration Results

RT: 3.58
Area: 168886
Amount: 1.167669
Amount Units: ng/ml



Reviewer: chandrasenas, 18-Dec-2016 17:40:35

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

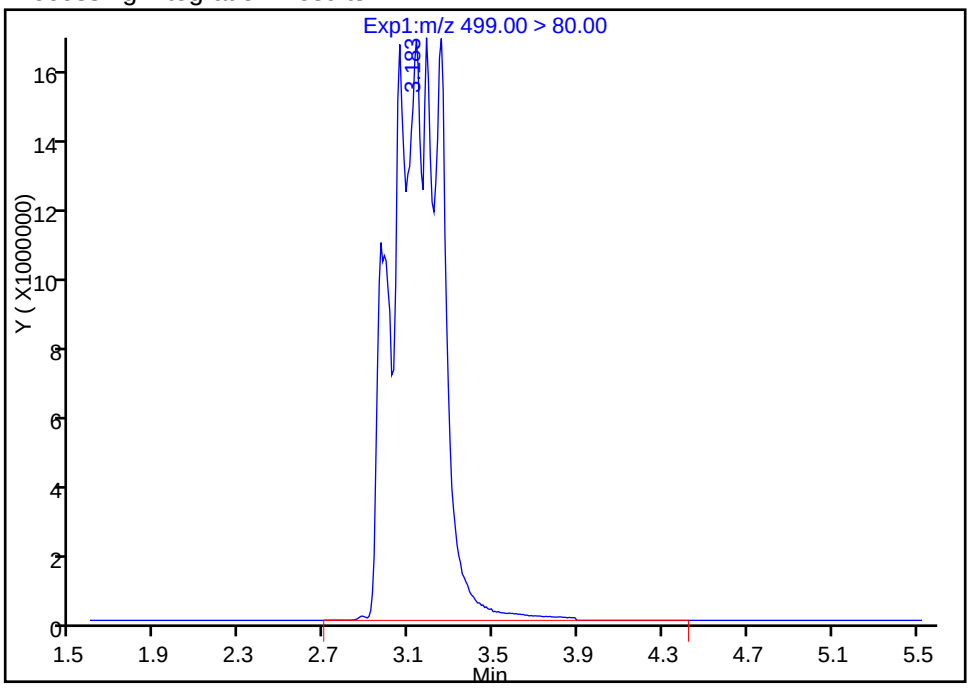
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_014.d				
Injection Date:	16-Dec-2016 19:37:45	Instrument ID:	A8_N		
Lims ID:	320-23931-A-2-A	Lab Sample ID:	320-23931-2		
Client ID:	608D33MW-LF-1116				
Operator ID:	A8-PC\A8	ALS Bottle#:	34	Worklist Smp#:	14
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

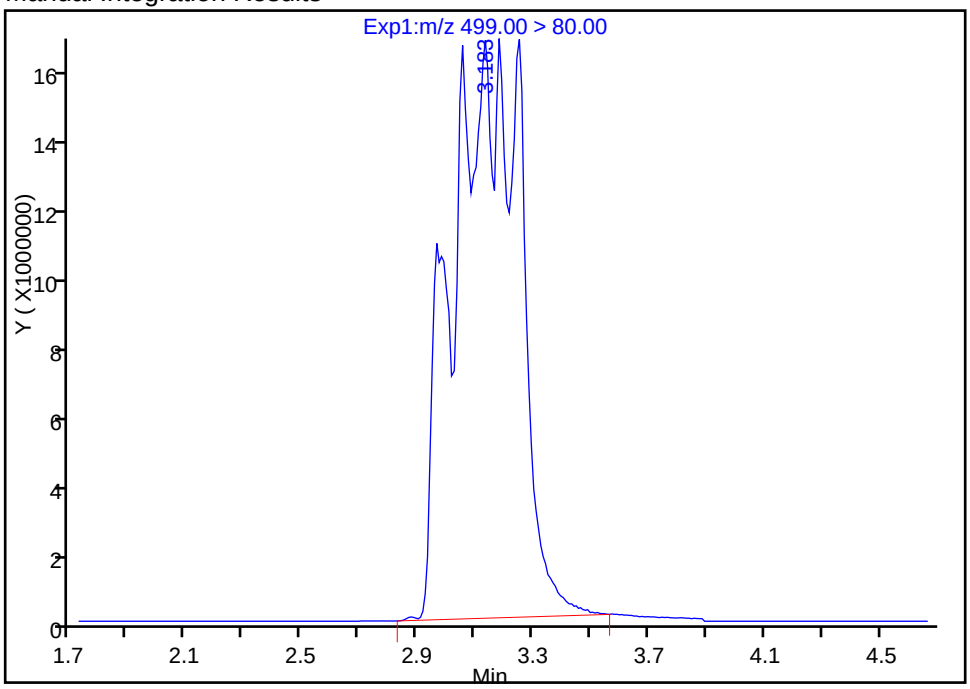
Processing Integration Results

RT: 3.18
Area: 285246019
Amount: 5386.5914
Amount Units: ng/ml



Manual Integration Results

RT: 3.18
Area: 278074031
Amount: 5251.1555
Amount Units: ng/ml



Reviewer: chandrasenas, 18-Dec-2016 17:40:35

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-23931-1

SDG No.:

Client Sample ID: 608D33MW-LF-1116 DL | Lab Sample ID: 320-23931-2 DL

Matrix: Water | Lab File ID: 20DEC2016C_008.d

Analysis Method: 537 (Modified) | Date Collected: 11/30/2016 11:00

Extraction Method: 3535 | Date Extracted: 12/05/2016 08:31

Sample wt/vol: 260.2(mL) | Date Analyzed: 12/20/2016 18:22

Con. Extract Vol.: 0.5(mL) | Dilution Factor: 100

Injection Volume: 2(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 143259 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	*Perfluorobutanoic acid (PFBA)*	*0.29*	*D*	*0.24*	0.096	*0.044*
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.47	D	0.24	0.19	0.095
307-24-4	Perfluorohexanoic acid (PFHxA)	0.94	D	0.24	0.19	0.076
375-85-9	*Perfluoroheptanoic acid (PFHpA)*	*0.21*	*J D*	*0.24*	0.19	*0.077*
335-67-1	*Perfluorooctanoic acid (PFOA)*	*0.43*	*D M*	*0.24*	0.19	*0.072*
375-95-1	*Perfluorononanoic acid (PFNA)*	*0.19*	*U*	*0.24*	0.19	*0.063*
335-76-2	*Perfluorodecanoic acid (PFDA)*	*0.096*	*U*	*0.24*	0.096	*0.042*
2058-94-8	*Perfluoroundecanoic acid (PFUnA)*	*0.19*	*U*	*0.24*	0.19	*0.072*
307-55-1	*Perfluorododecanoic acid (PFDoA)*	*0.19*	*U*	*0.24*	0.19	*0.056*
72629-94-8	*Perfluorotridecanoic Acid (PFTriA)*	*0.19*	*U*	*0.24*	0.19	*0.053*
376-06-7	*Perfluorotetradecanoic acid (PFTeA)*	*0.096*	*U*	*0.24*	0.096	*0.038*
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.73	D	0.24	0.19	0.088
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	5.4	D	0.24	0.19	0.084
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	21	D	0.38	0.29	0.12
335-77-3	*Perfluorodecanesulfonic acid (PFDS)*	*0.29*	*U*	*0.38*	0.29	*0.12*
754-91-6	*Perfluorooctane Sulfonamide (FOSA)*	*0.19*	*U*	*0.24*	0.19	*0.061*

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-23931-1

SDG No.:

Client Sample ID: 608D33MW-LF-1116 DL | Lab Sample ID: 320-23931-2 DL

Matrix: Water | Lab File ID: 20DEC2016C_008.d

Analysis Method: 537 (Modified) | Date Collected: 11/30/2016 11:00

Extraction Method: 3535 | Date Extracted: 12/05/2016 08:31

Sample wt/vol: 260.2(mL) | Date Analyzed: 12/20/2016 18:22

Con. Extract Vol.: 0.5(mL) | Dilution Factor: 100

Injection Volume: 2(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 143259 | Units: ug/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	17	Q	25-150
STL00992	13C4 PFBA	54		25-150
STL00993	13C2 PFHxA	154	Q	25-150
STL00990	13C4 PFOA	181	Q	25-150
STL00995	13C5 PFNA	145		25-150
STL00996	13C2 PFDA	162	Q	25-150
STL00997	13C2 PFUnA	163	Q	25-150
STL00998	13C2 PFDoA	155	Q	25-150
STL00994	18O2 PFHxS	150		25-150
STL00991	13C4 PFOS	144		25-150
STL01893	13C5-PFPeA	179	Q	25-150
STL01892	13C4-PFHpA	154	Q	25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161221-38078.b\20DEC2016C_008.d
Lims ID: 320-23931-A-2-A
Client ID: 608D33MW-LF-1116
Sample Type: Client
Inject. Date: 20-Dec-2016 18:22:18 ALS Bottle#: 9 Worklist Smp#: 8
Injection Vol: 2.0 ul Dil. Factor: 100.0000
Sample Info: 320-23931-a-2-a 100X
Misc. Info.: Plate: 1 Rack: 4
Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161221-38078.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 21-Dec-2016 10:21:06 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK025

First Level Reviewer: chandrasenas Date: 21-Dec-2016 10:15:20

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	1.558	0.0		93921	0.2701		0.5	10437	
1 Perfluorobutyric acid										
212.90 > 169.00	1.558	1.566	-0.008	1.000	240670	1.50			1361	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.840	1.839	0.001	1.000	1139411	2.42			9321	
D 4 13C5-PFPeA										
267.90 > 223.00	1.840	1.839	0.001		238276	0.8955		1.8	32993	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.878	1.878	0.0	1.000	2643501	3.81				
298.90 > 99.00	1.878	1.878	0.0	1.000	1110652		2.38(0.00-0.00)			
7 Perfluorohexanoic acid										
313.00 > 269.00	2.129	2.135	-0.006	1.000	1705210	4.88			16643	
D 6 13C2 PFHxA										
315.00 > 270.00	2.129	2.135	-0.006		188217	0.7679		1.5	37659	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.466	2.472	-0.006	1.000	367963	1.08			2841	
D 11 13C4-PFHpA										
367.00 > 322.00	2.466	2.480	-0.014		174429	0.7706		1.5	17621	
D 10 18O2 PFHxS										
403.00 > 84.00	2.481	2.487	-0.006		231775	0.7088		1.5	44713	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.488	2.495	-0.007	1.000	14094390	27.9				
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.828	2.835	-0.007	1.000	926939	2.21			6743	M
413.00 > 169.00	2.804	2.835	-0.031	0.991	601075		1.54(0.90-1.10)		11211	
D 14 13C4 PFOA										
417.00 > 372.00	2.828	2.835	-0.007		208817	0.9065		1.8	39500	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.083	3.099	-0.016	1.000	38917583	109.3			263540	
499.00 > 99.00	3.083	3.099	-0.016	1.000	9690405		4.02(0.90-1.10)		67557	
D 17 13C4 PFOS										
503.00 > 80.00	3.197	3.204	-0.007		171094	0.6875		1.4	7160	
20 Perfluorononanoic acid										
463.00 > 419.00	3.206	3.213	-0.007	1.000	56328	0.2296			1051	
D 19 13C5 PFNA										
468.00 > 423.00	3.206	3.213	-0.007		128850	0.7252		1.5	14828	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.538	3.536	0.002	1.000	16554	0.2682			721	
D 21 13C8 FOSA										
506.00 > 78.00	3.538	3.536	0.002		33084	0.0861		0.2	2482	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.563	3.570	-0.007	1.000	7116	0.0297			151	
D 23 13C2 PFDA										
515.00 > 470.00	3.563	3.570	-0.007		127119	0.8081		1.6	3564	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.734	3.877	-0.143	1.000	6653	0.0318				
D 27 13C2 PFUnA										
565.00 > 520.00	3.885	3.895	-0.010		95498	0.8145		1.6	12208	
D 30 13C2 PFDoA										
615.00 > 570.00	4.182	4.182	0.0		85811	0.7734		1.5	4147	

QC Flag Legend

Review Flags

M - Manually Integrated

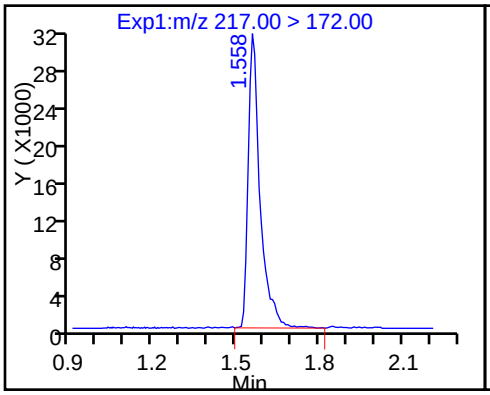
Report Date: 21-Dec-2016 10:21:23 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

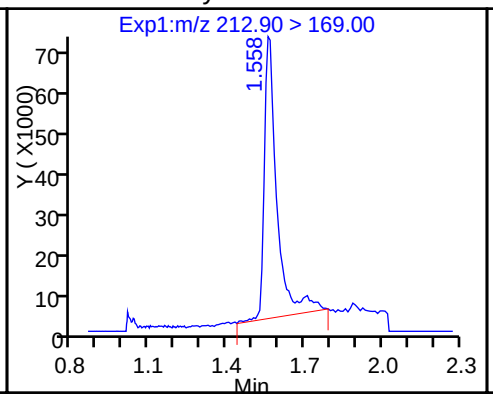
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161221-38078.b\20DEC2016C_008.d

Injection Date:	20-Dec-2016 18:22:18	Instrument ID:	A8_N
Lims ID:	320-23931-A-2-A	Lab Sample ID:	320-23931-2
Client ID:	608D33MW-LF-1116		
Operator ID:	A8-PC\A8	ALS Bottle#:	9 Worklist Smp#: 8
Injection Vol:	2.0 ul	Dil. Factor:	100.0000
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL

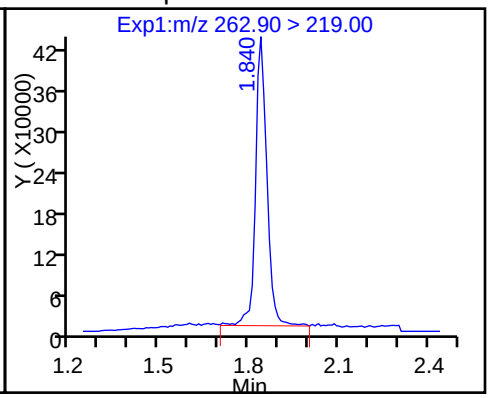
D 2 13C4 PFBA



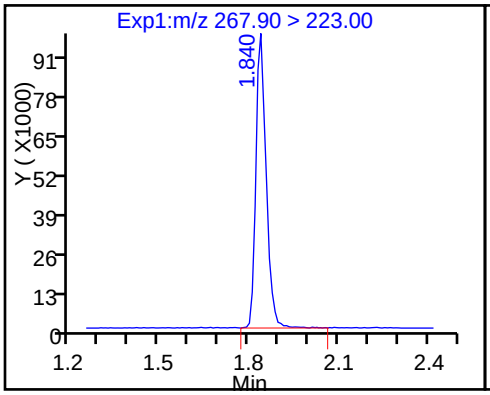
1 Perfluorobutyric acid



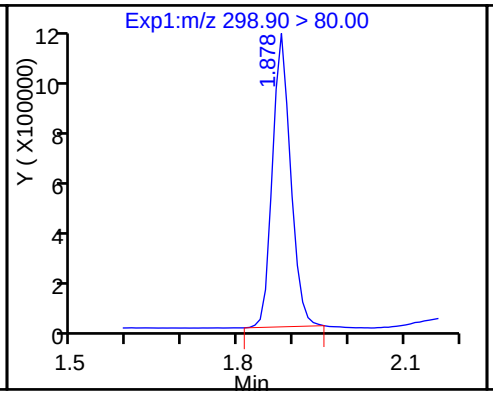
3 Perfluoropentanoic acid



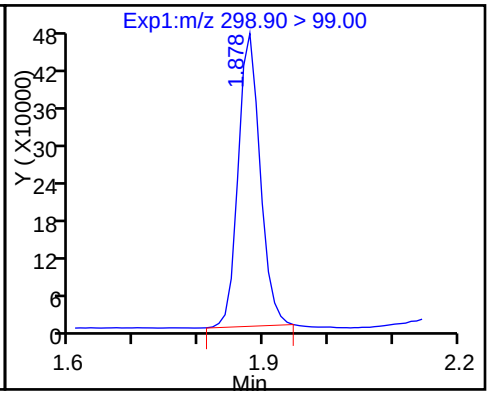
D 4 13C5-PFPeA



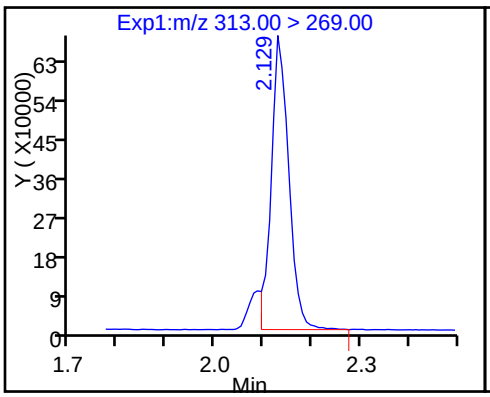
5 Perfluorobutanesulfonic acid



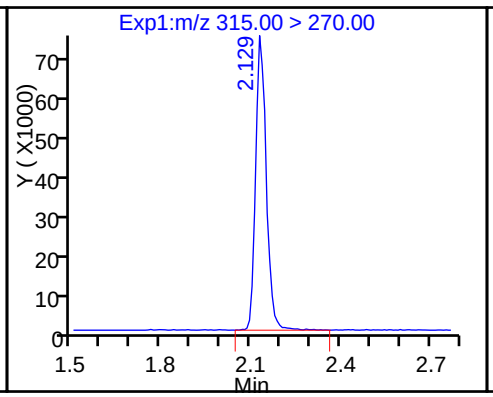
5 Perfluorobutanesulfonic acid



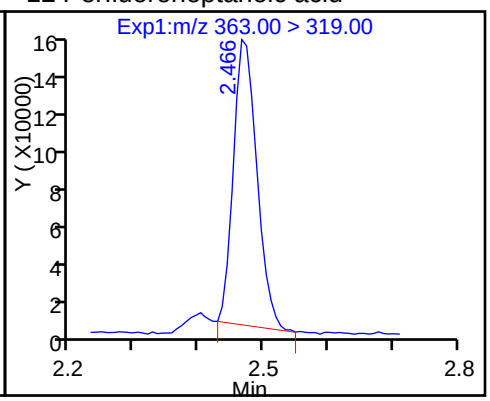
7 Perfluorohexanoic acid



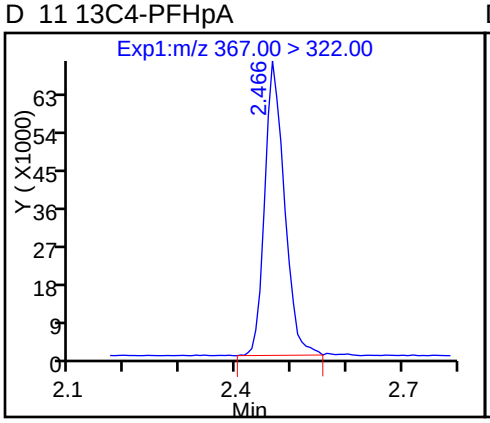
D 6 13C2 PFHxA



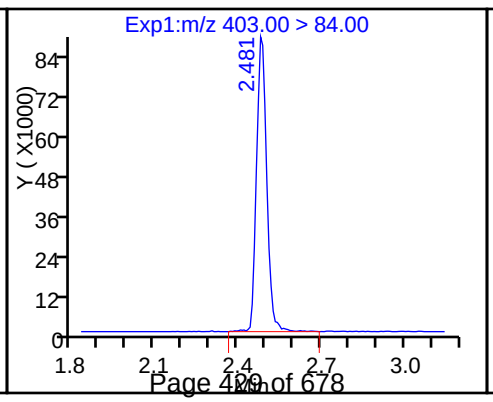
12 Perfluoroheptanoic acid



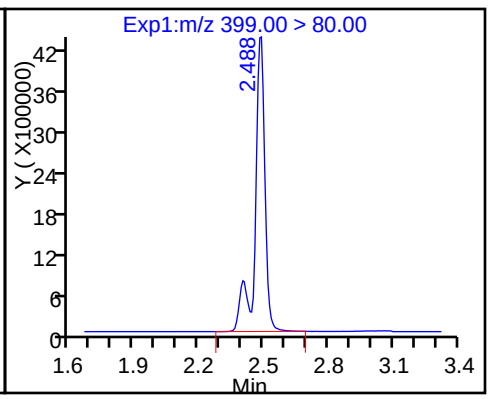
D 11 13C4-PFHpA



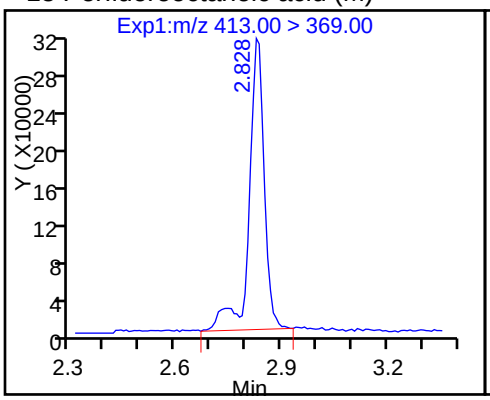
D 10 18O2 PFHxS



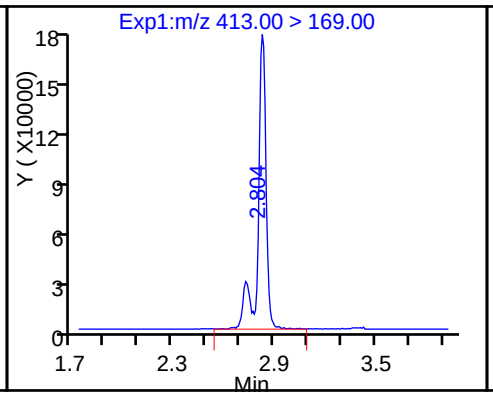
9 Perfluorohexanesulfonic acid



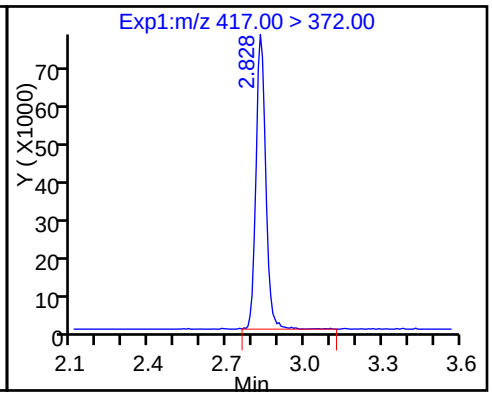
15 Perfluorooctanoic acid (M)



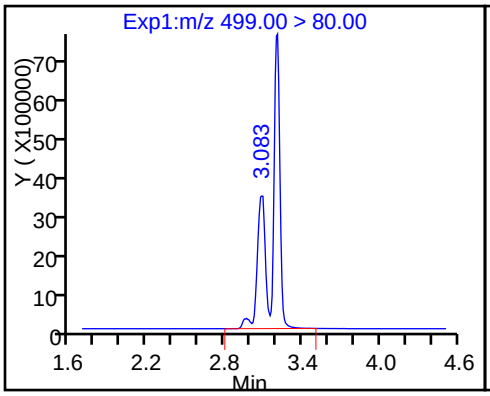
15 Perfluorooctanoic acid



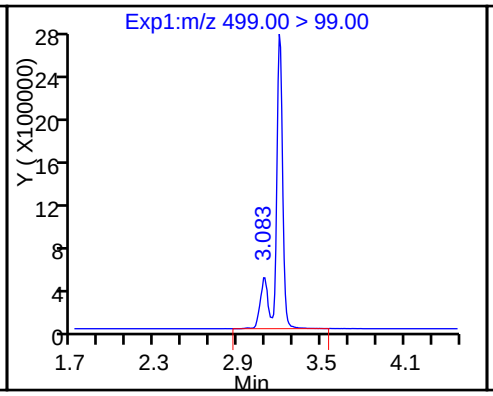
D 14 13C4 PFOA



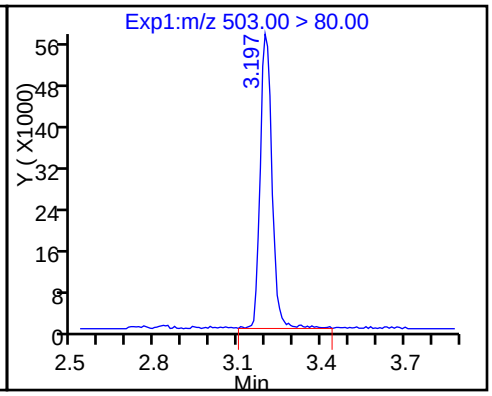
18 Perfluorooctane sulfonic acid



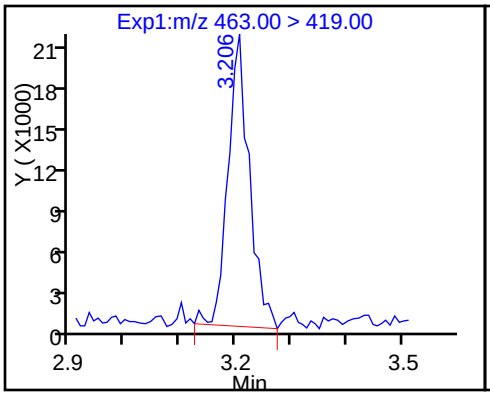
18 Perfluorooctane sulfonic acid



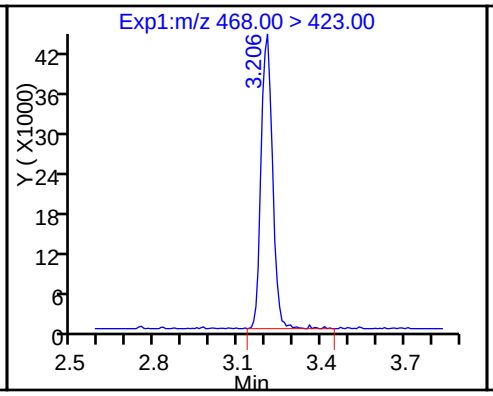
D 17 13C4 PFOS



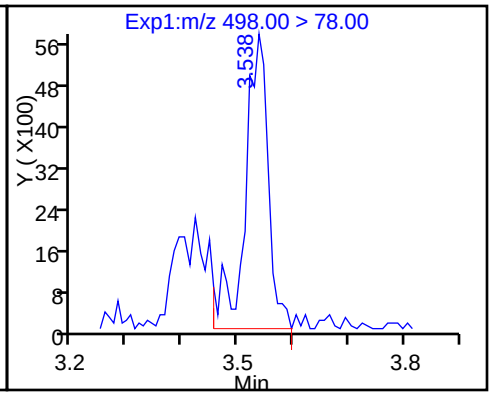
20 Perfluorononanoic acid



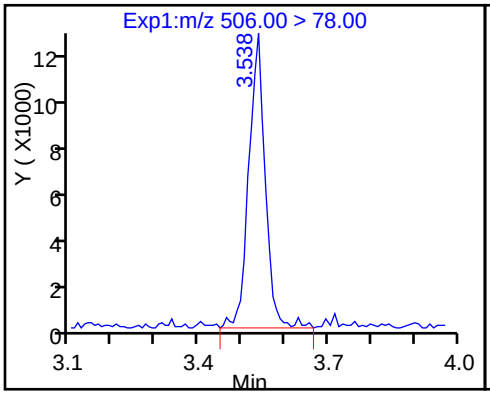
D 19 13C5 PFNA



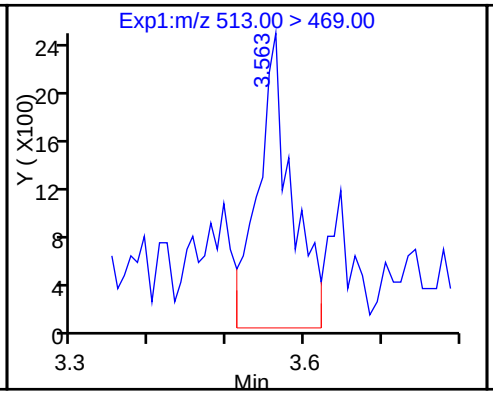
22 Perfluorooctane Sulfonamide



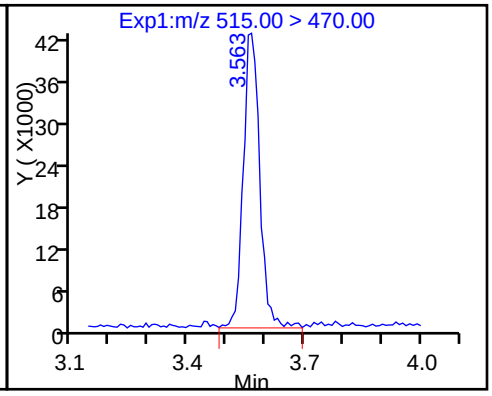
D 21 13C8 FOSA



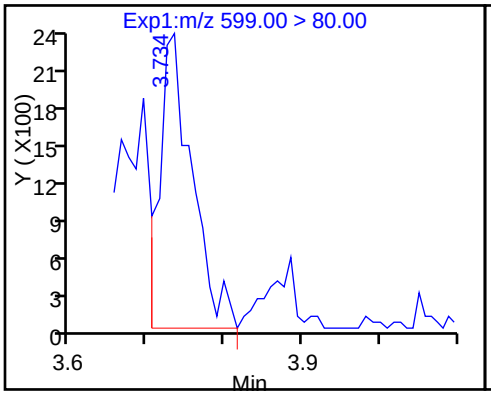
24 Perfluorodecanoic acid



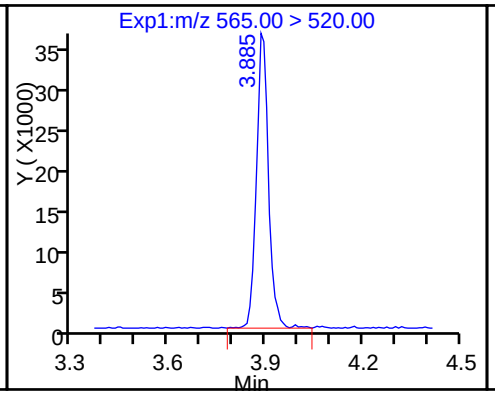
D 23 13C2 PFDA



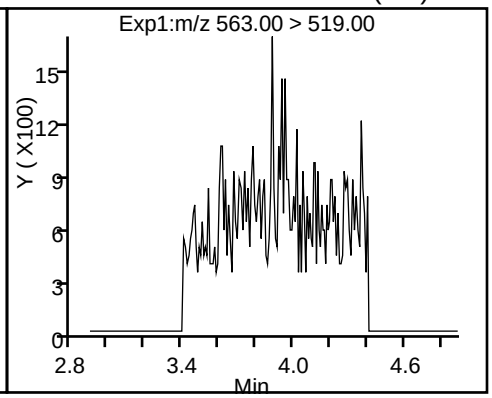
26 Perfluorodecane Sulfonic acid



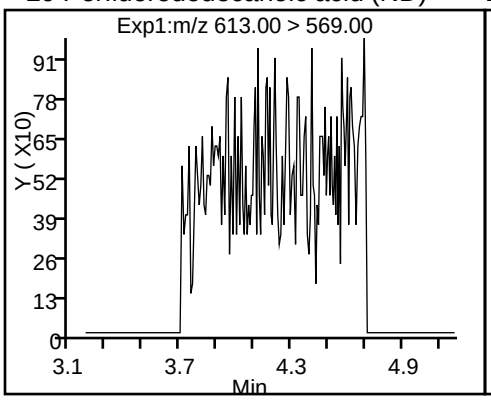
D 27 13C2 PFUnA



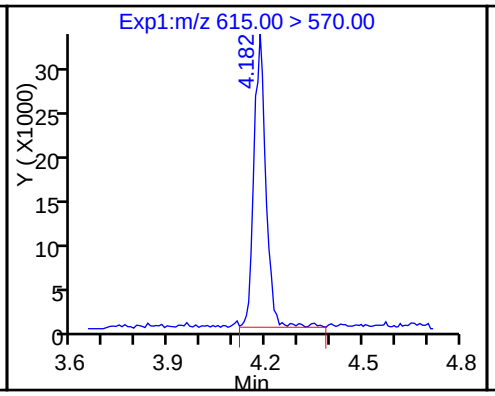
28 Perfluoroundecanoic acid (ND)



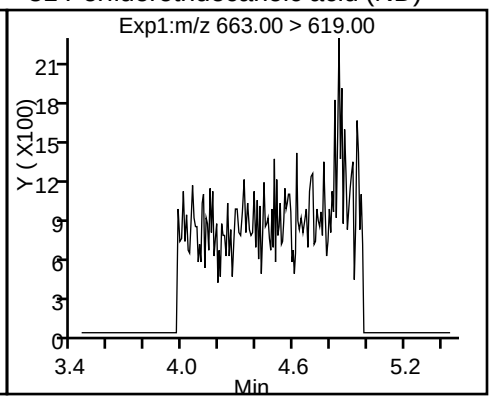
29 Perfluorododecanoic acid (ND)



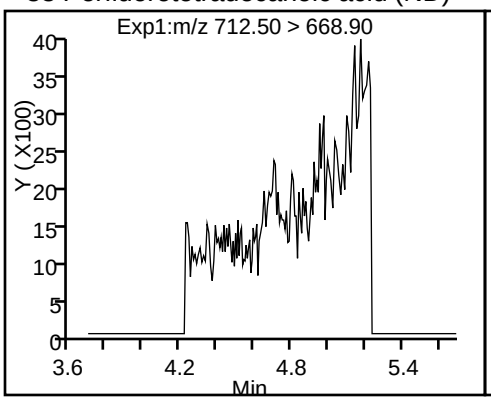
D 30 13C2 PFDoA



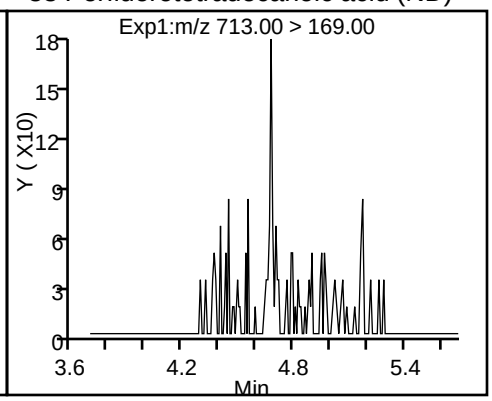
31 Perfluorotridecanoic acid (ND)



33 Perfluorotetradecanoic acid (ND)



33 Perfluorotetradecanoic acid (ND)



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

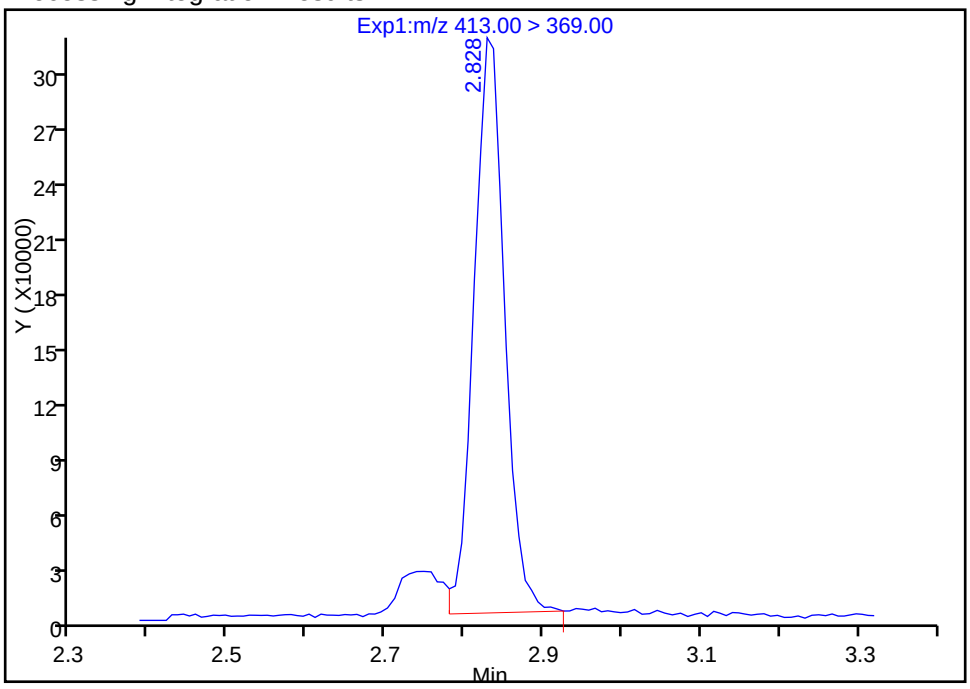
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161221-38078.b\20DEC2016C_008.d				
Injection Date:	20-Dec-2016 18:22:18	Instrument ID:	A8_N		
Lims ID:	320-23931-A-2-A	Lab Sample ID:	320-23931-2		
Client ID:	608D33MW-LF-1116				
Operator ID:	A8-PC\A8	ALS Bottle#:	9	Worklist Smp#:	8
Injection Vol:	2.0 ul	Dil. Factor:	100.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

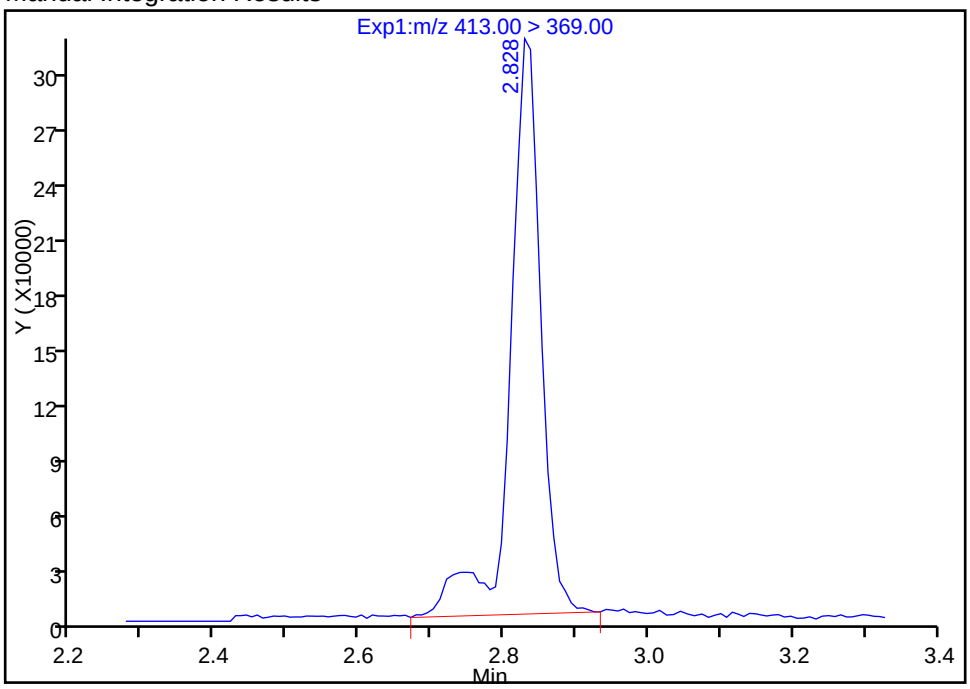
Processing Integration Results

RT: 2.83
Area: 835594
Amount: 1.994511
Amount Units: ng/ml



Manual Integration Results

RT: 2.83
Area: 926939
Amount: 2.212546
Amount Units: ng/ml



Reviewer: chandrasenas, 21-Dec-2016 10:16:22

Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-23931-1

SDG No.:

Client Sample ID: 61301MW-LF-1116 | Lab Sample ID: 320-23931-3

Matrix: Water | Lab File ID: 16DEC2016C_019.d

Analysis Method: 537 (Modified) | Date Collected: 11/30/2016 12:45

Extraction Method: 3535 | Date Extracted: 12/05/2016 08:31

Sample wt/vol: 265.5(mL) | Date Analyzed: 12/16/2016 20:15

Con. Extract Vol.: 0.5(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 142751 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.17	M	0.0024	0.00094	0.00043
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.18		0.0024	0.0019	0.00093
307-24-4	Perfluorohexanoic acid (PFHxA)	0.15		0.0024	0.0019	0.00074
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.11		0.0024	0.0019	0.00076
335-67-1	Perfluorooctanoic acid (PFOA)	0.10	M	0.0024	0.0019	0.00070
375-95-1	Perfluorononanoic acid (PFNA)	0.0080		0.0024	0.0019	0.00062
335-76-2	Perfluorodecanoic acid (PFDA)	0.0016	J	0.0024	0.00094	0.00041
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0019	U	0.0024	0.0019	0.00070
307-55-1	Perfluorododecanoic acid (PFDoA)	0.0019	U	0.0024	0.0019	0.00055
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.0019	U	0.0024	0.0019	0.00052
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.00079	J	0.0024	0.00094	0.00038
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.071		0.0024	0.0019	0.00082
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.061		0.0038	0.0028	0.0012
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.0028	U	0.0038	0.0028	0.0011
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.0019	U	0.0024	0.0019	0.00060

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-23931-1

SDG No.:

Client Sample ID: 61301MW-LF-1116 | Lab Sample ID: 320-23931-3

Matrix: Water | Lab File ID: 16DEC2016C_019.d

Analysis Method: 537 (Modified) | Date Collected: 11/30/2016 12:45

Extraction Method: 3535 | Date Extracted: 12/05/2016 08:31

Sample wt/vol: 265.5(mL) | Date Analyzed: 12/16/2016 20:15

Con. Extract Vol.: 0.5(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 142751 | Units: ug/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	9	Q	25-150
STL00992	13C4 PFBA	45		25-150
STL00993	13C2 PFHxA	78		25-150
STL00990	13C4 PFOA	85		25-150
STL00995	13C5 PFNA	88		25-150
STL00996	13C2 PFDA	97		25-150
STL00997	13C2 PFUnA	104		25-150
STL00998	13C2 PFDoA	104		25-150
STL00994	18O2 PFHxS	93		25-150
STL00991	13C4 PFOS	102		25-150
STL01893	13C5-PFPeA	78		25-150
STL01892	13C4-PFHpA	82		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_019.d
Lims ID: 320-23931-A-3-A
Client ID: 61301MW-LF-1116
Sample Type: Client
Inject. Date: 16-Dec-2016 20:15:12 ALS Bottle#: 35 Worklist Smp#: 19
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-23931-a-3-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 18-Dec-2016 17:59:51 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK028

First Level Reviewer: chandrasenas Date: 18-Dec-2016 17:45:38

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	1.577	1.582	-0.005		7811286	22.5		44.9	487724	
1 Perfluorobutyric acid										M
212.90 > 169.00	1.585	1.582	0.003	1.000	11952434	89.6			35305	M
3 Perfluoropentanoic acid										
262.90 > 219.00	1.861	1.858	0.003	1.000	19129180	93.6			43962	
D 4 13C5-PFPeA										
267.90 > 223.00	1.861	1.858	0.003		10360496	38.9		77.9	364435	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.890	1.896	-0.006	1.000	3053573	7.12				
298.90 > 99.00	1.890	1.896	-0.006	1.000	1275052		2.39(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.154	2.153	0.001		9543265	38.9		77.9	515294	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.145	2.153	-0.008	1.000	14052757	79.3			50627	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.482	2.492	-0.010	1.000	10174686	56.3			47454	
D 11 13C4-PFHpA										
367.00 > 322.00	2.482	2.500	-0.018		9232275	40.8		81.6	655316	
D 10 18O2 PFHxS										
403.00 > 84.00	2.497	2.508	-0.011		14307907	43.8		92.5	2656790	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.420	2.515	-0.095	1.000	11817983	37.9				
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.838	2.847	-0.009	1.000	10508626	53.8			51426	M
413.00 > 169.00	2.846	2.847	-0.001	1.003	7006411		1.50(0.90-1.10)		323632	
D 14 13C4 PFOA										
417.00 > 372.00	2.838	2.855	-0.017		9744611	42.3		84.6	707416	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.095	3.120	-0.025	1.000	8176964	32.5			100054	
499.00 > 99.00	3.095	3.120	-0.025	1.000	1621577		5.04(0.90-1.10)		22272	
D 19 13C5 PFNA										
468.00 > 423.00	3.208	3.227	-0.019		7844040	44.1		88.3	343652	
D 17 13C4 PFOS										
503.00 > 80.00	3.208	3.227	-0.019		12111530	48.7		102	169245	
20 Perfluorononanoic acid										
463.00 > 419.00	3.217	3.227	-0.010	1.000	631434	4.23			4694	
D 21 13C8 FOSA										
506.00 > 78.00	3.548	3.558	-0.010		1758958	4.58		9.2	134628	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.573	3.583	-0.010	1.000	122869	0.8514			1223	
D 23 13C2 PFDA										
515.00 > 470.00	3.573	3.583	-0.010		7645751	48.6		97.2	463747	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.862	3.893	-0.031	1.000	3463	0.0234				
D 27 13C2 PFUnA										
565.00 > 520.00	3.897	3.902	-0.005		6070872	51.8		104	431117	
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.897	3.911	-0.014	1.000	25060	0.2158			411	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.186	4.192	-0.006	1.000	18200	0.1722			427	
D 30 13C2 PFDoA										
615.00 > 570.00	4.186	4.198	-0.012		5757442	51.9		104	294521	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.451	4.459	-0.008	1.000	20782	0.1990			426	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.693	4.702	-0.009	1.000	76713	0.4204			175	
713.00 > 169.00	4.684	4.702	-0.018	0.998	12119		6.33(0.00-0.00)		4651	

QC Flag Legend

Review Flags

M - Manually Integrated

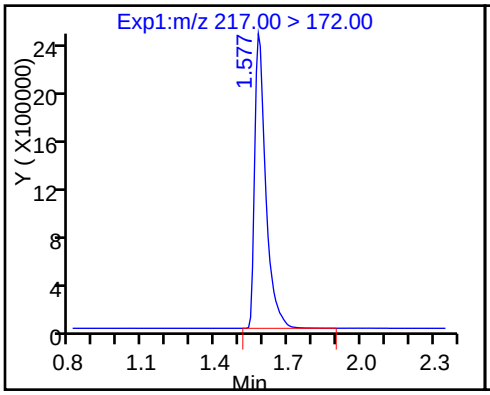
Report Date: 18-Dec-2016 17:59:55 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

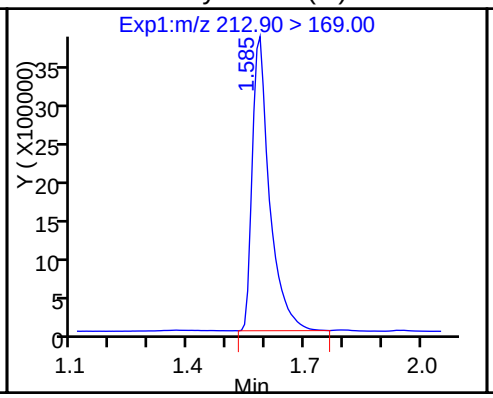
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_019.d

Injection Date:	16-Dec-2016 20:15:12	Instrument ID:	A8_N		
Lims ID:	320-23931-A-3-A	Lab Sample ID:	320-23931-3		
Client ID:	61301MW-LF-1116				
Operator ID:	A8-PC\A8	ALS Bottle#:	35	Worklist Smp#:	19
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		

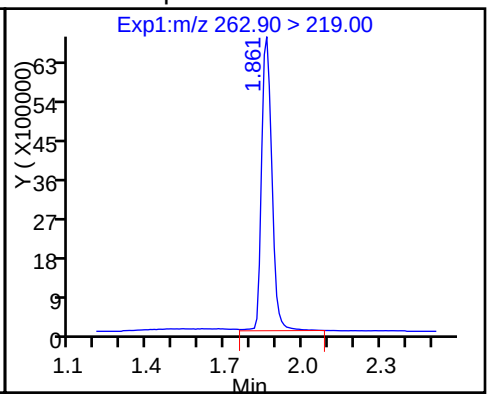
D 2 13C4 PFBA



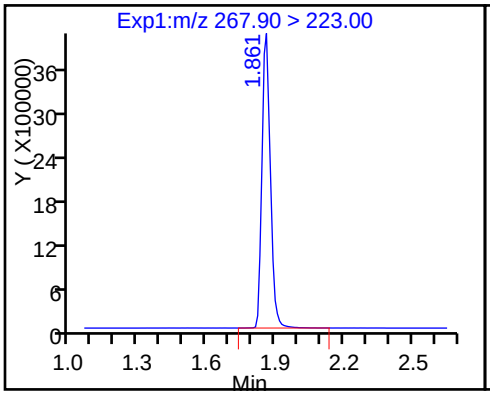
1 Perfluorobutyric acid (M)



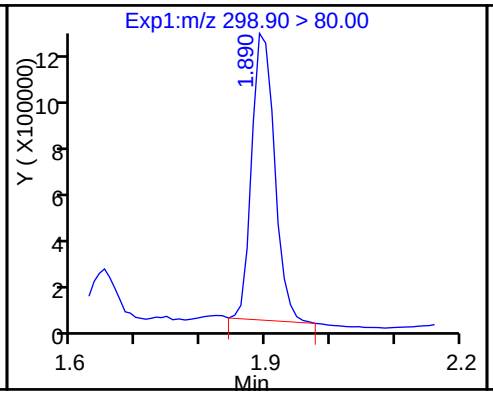
3 Perfluoropentanoic acid



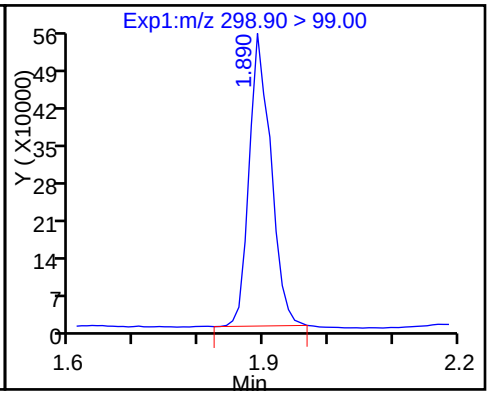
D 4 13C5-PFPeA



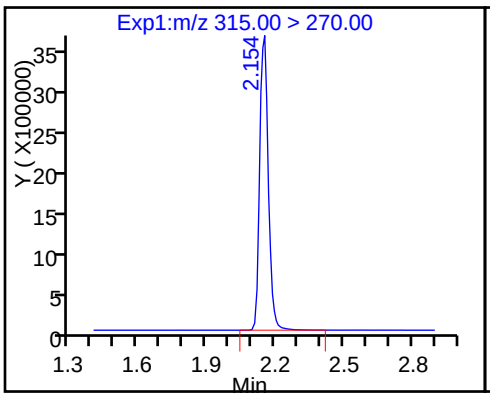
5 Perfluorobutanesulfonic acid



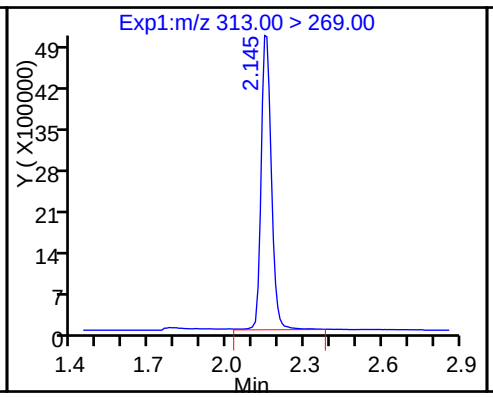
5 Perfluorobutanesulfonic acid



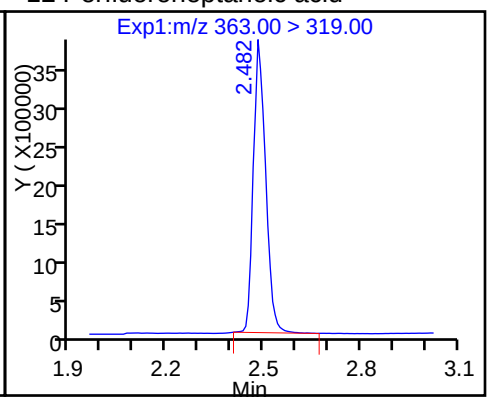
D 6 13C2 PFHxA



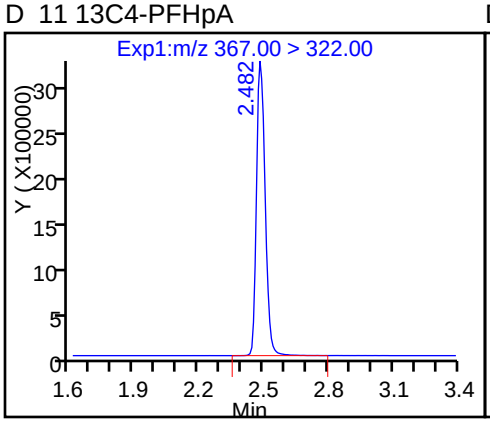
7 Perfluorohexanoic acid



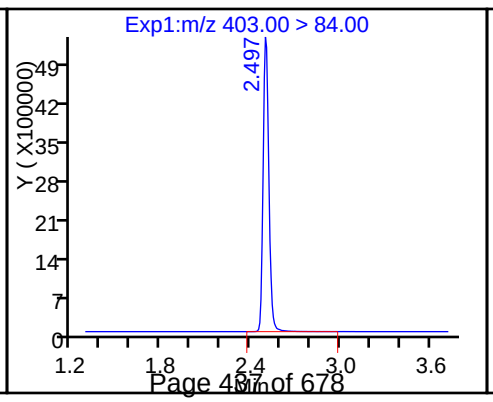
12 Perfluoroheptanoic acid



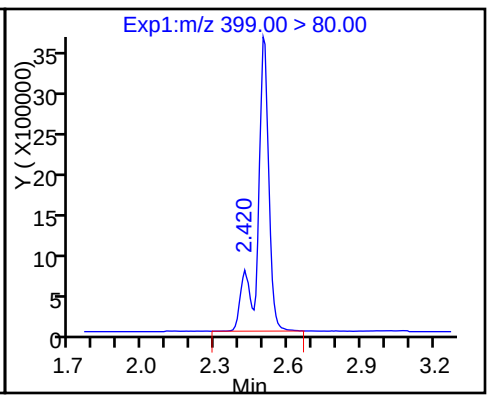
D 11 13C4-PFHpA



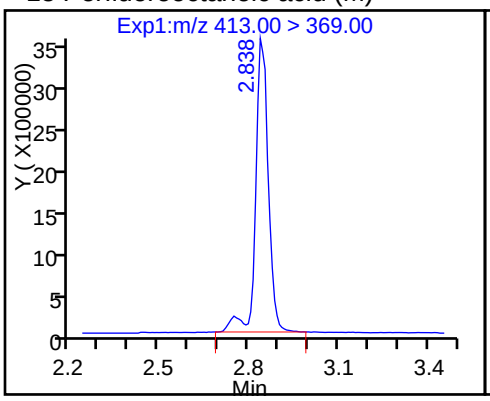
D 10 18O2 PFHxS



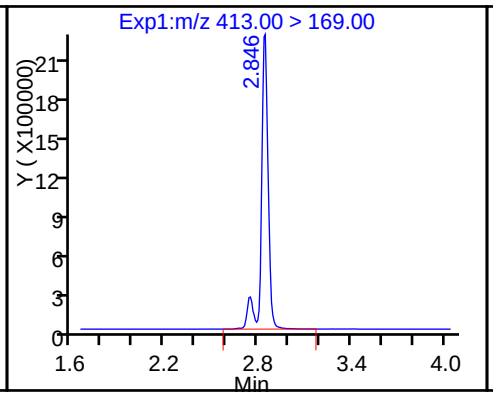
9 Perfluorohexanesulfonic acid



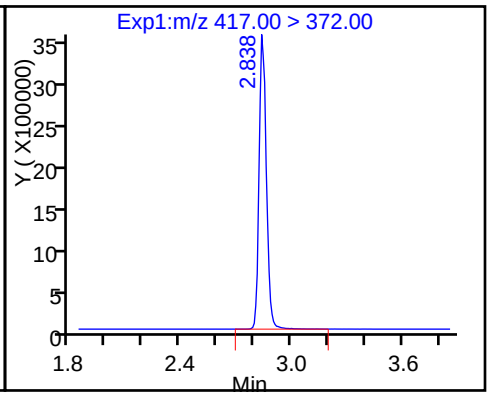
15 Perfluorooctanoic acid (M)



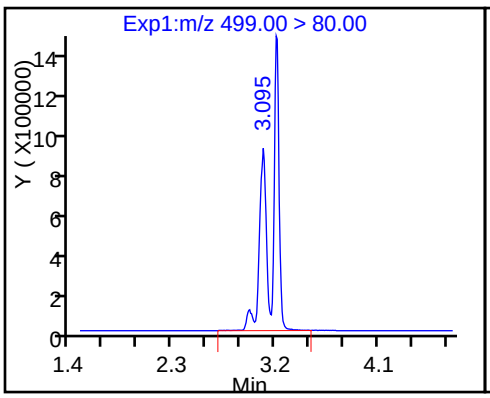
15 Perfluorooctanoic acid



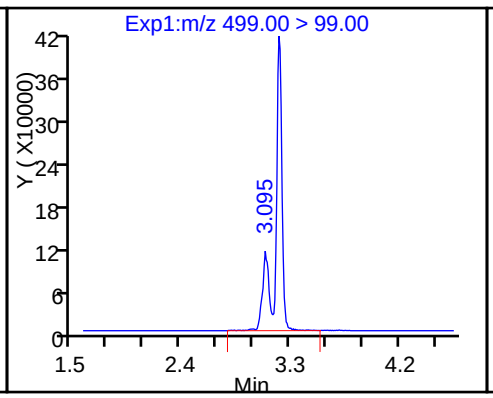
D 14 13C4 PFOA



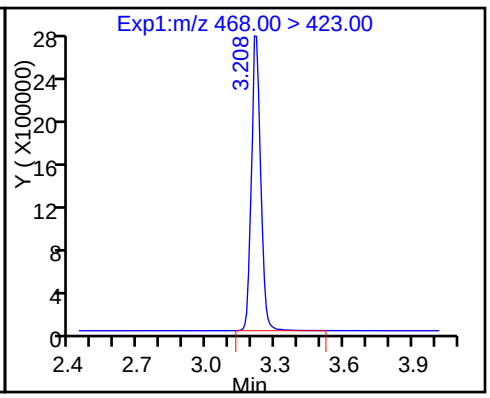
18 Perfluorooctane sulfonic acid



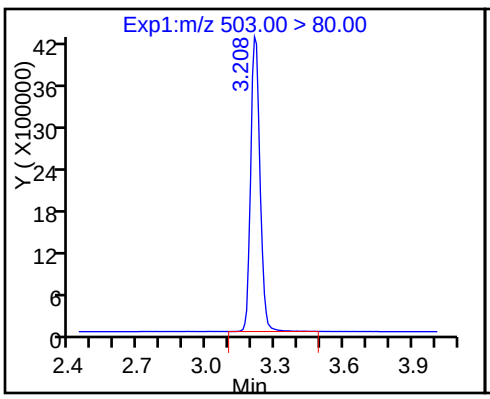
18 Perfluorooctane sulfonic acid



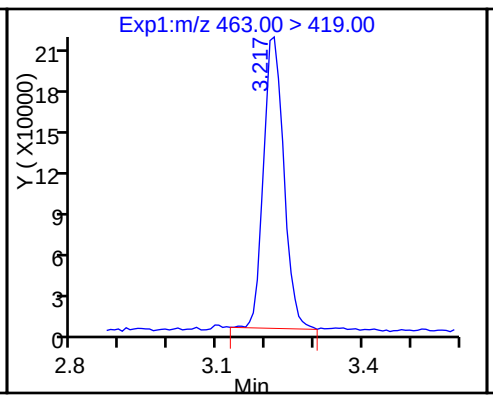
D 19 13C5 PFNA



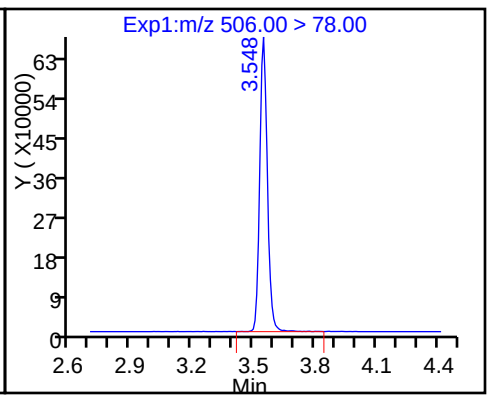
D 17 13C4 PFOS



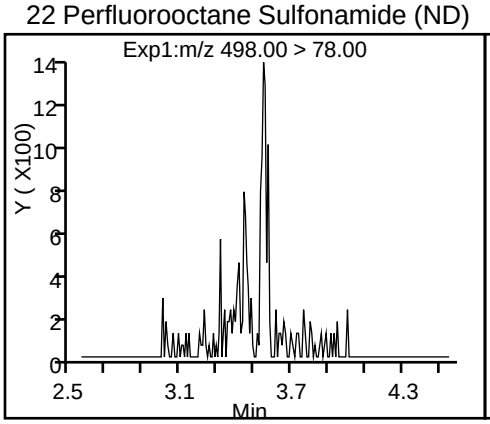
20 Perfluorononanoic acid



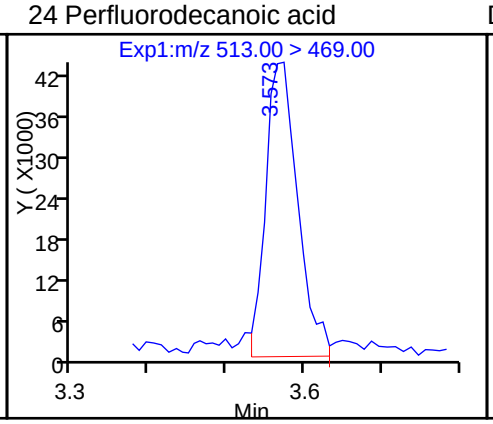
D 21 13C8 FOSA



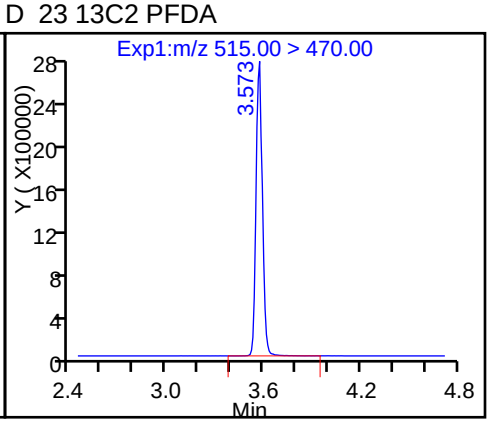
22 Perfluorooctane Sulfonamide (ND)



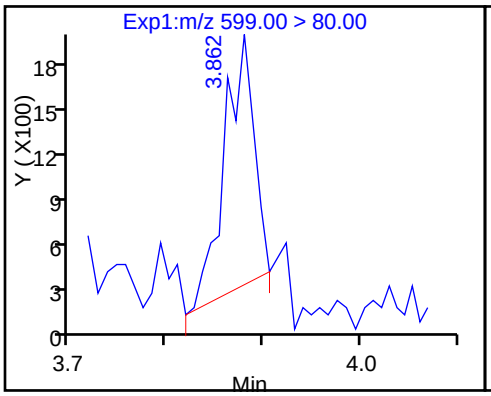
24 Perfluorodecanoic acid



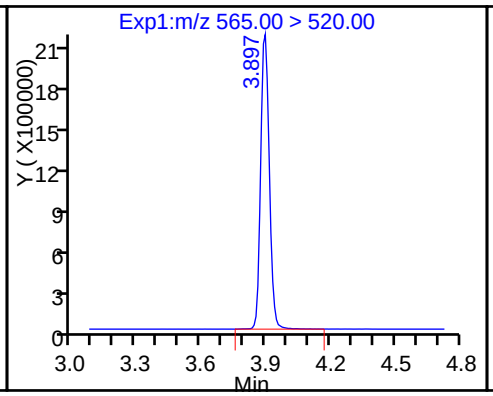
D 23 13C2 PFDA



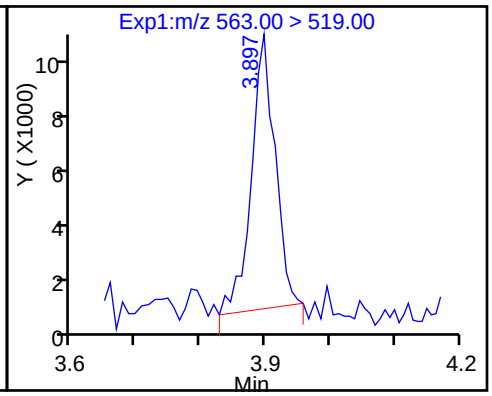
26 Perfluorodecane Sulfonic acid



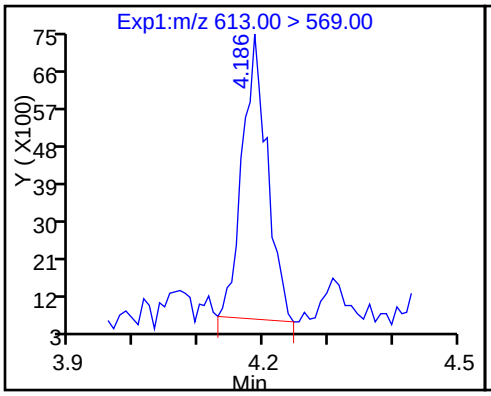
D 27 13C2 PFUnA



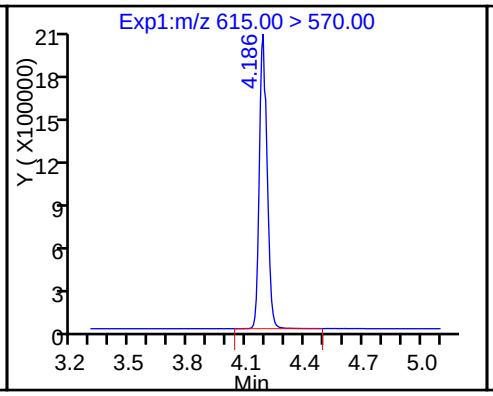
28 Perfluoroundecanoic acid



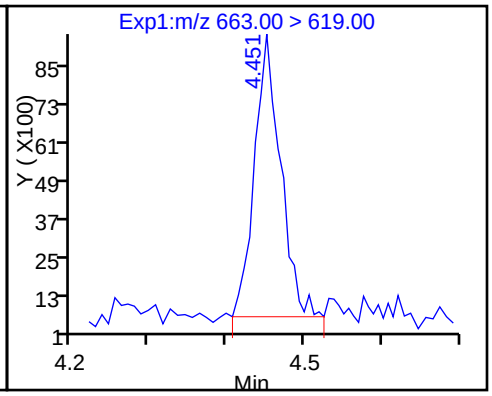
29 Perfluorododecanoic acid



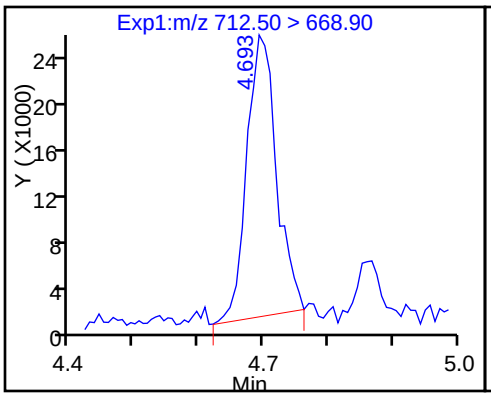
D 30 13C2 PFDoA



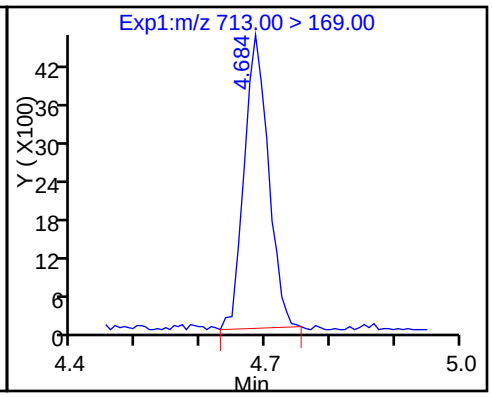
31 Perfluorotridecanoic acid



33 Perfluorotetradecanoic acid



33 Perfluorotetradecanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

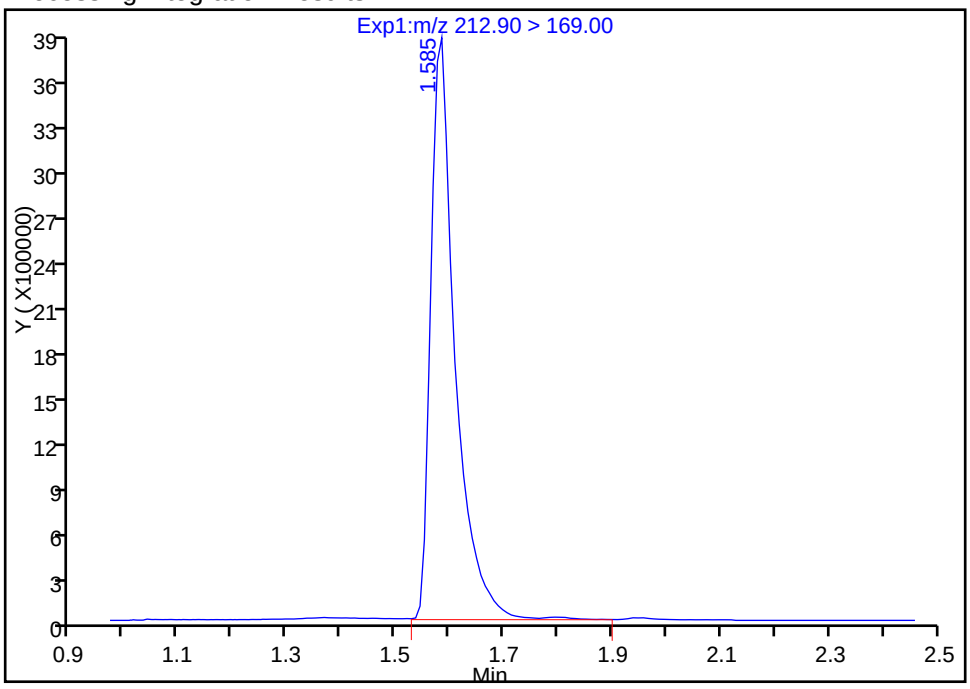
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_019.d				
Injection Date:	16-Dec-2016 20:15:12	Instrument ID:	A8_N		
Lims ID:	320-23931-A-3-A	Lab Sample ID:	320-23931-3		
Client ID:	61301MW-LF-1116				
Operator ID:	A8-PC\A8	ALS Bottle#:	35	Worklist Smp#:	19
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

1 Perfluorobutyric acid, CAS: 375-22-4

Signal: 1

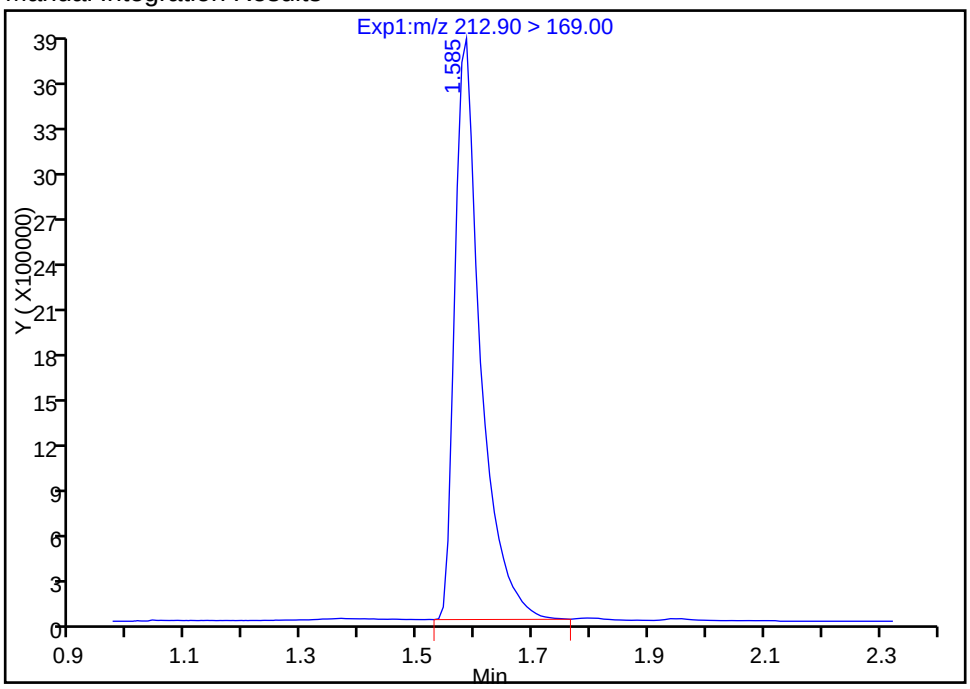
Processing Integration Results

RT: 1.58
Area: 12121855
Amount: 90.888860
Amount Units: ng/ml



Manual Integration Results

RT: 1.58
Area: 11952434
Amount: 89.618552
Amount Units: ng/ml



Reviewer: chandrasenas, 18-Dec-2016 17:45:38

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

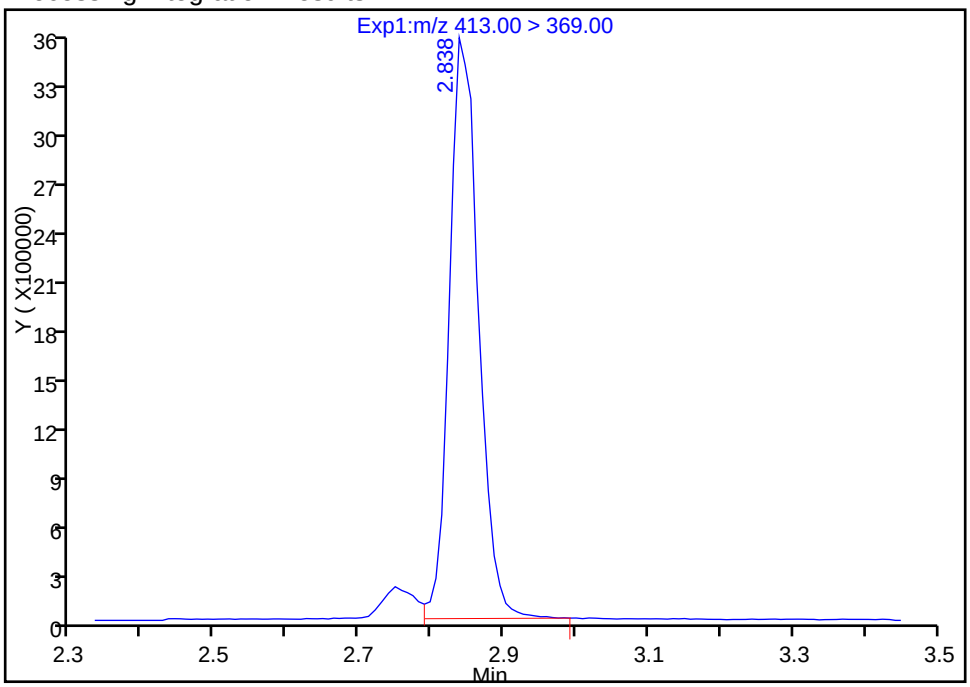
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_019.d				
Injection Date:	16-Dec-2016 20:15:12	Instrument ID:	A8_N		
Lims ID:	320-23931-A-3-A	Lab Sample ID:	320-23931-3		
Client ID:	61301MW-LF-1116				
Operator ID:	A8-PC\A8	ALS Bottle#:	35	Worklist Smp#:	19
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

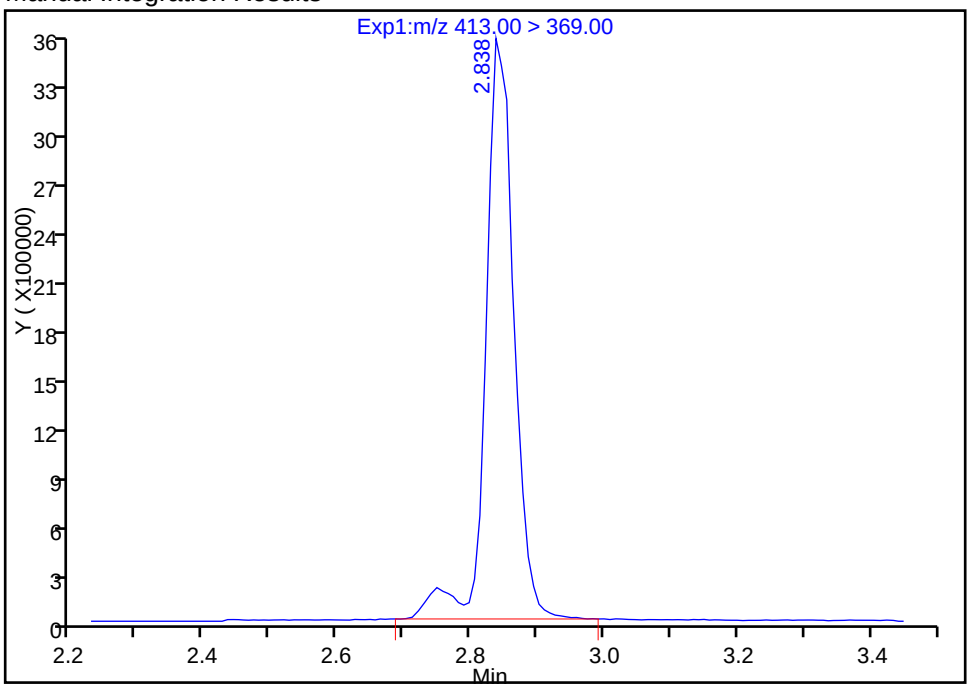
Processing Integration Results

RT: 2.84
Area: 9963124
Amount: 50.961010
Amount Units: ng/ml



Manual Integration Results

RT: 2.84
Area: 10508626
Amount: 53.751233
Amount Units: ng/ml



Reviewer: chandrasenas, 18-Dec-2016 17:45:38

Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-23931-1

SDG No.:

Client Sample ID: 61301MW-LF-1116 RA | Lab Sample ID: 320-23931-3 RA

Matrix: Water | Lab File ID: 20DEC2016C_012.d

Analysis Method: 537 (Modified) | Date Collected: 11/30/2016 12:45

Extraction Method: 3535 | Date Extracted: 12/05/2016 08:31

Sample wt/vol: 265.5(mL) | Date Analyzed: 12/20/2016 18:52

Con. Extract Vol.: 0.5(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 143259 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.014		0.0024	0.0019	0.00086

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00994	18O2 PFHxS	111		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161221-38078.b\20DEC2016C_012.d
Lims ID: 320-23931-A-3-A
Client ID: 61301MW-LF-1116
Sample Type: Client
Inject. Date: 20-Dec-2016 18:52:22 ALS Bottle#: 13 Worklist Smp#: 12
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-23931-a-3-a
Misc. Info.: Plate: 1 Rack: 4
Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161221-38078.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 21-Dec-2016 10:21:06 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK025

First Level Reviewer: chandrasenas Date: 21-Dec-2016 10:19:27

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.553	1.558	-0.005		8460736	24.3		48.7	474265	
1 Perfluorobutyric acid										
212.90 > 169.00	1.561	1.566	-0.005	1.000	13197793	91.4			37454	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.832	1.839	-0.007	1.000	21268097	89.7			54295	
D 4 13C5-PFPeA										
267.90 > 223.00	1.832	1.839	-0.007		12013635	45.2		90.3	420155	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.871	1.878	-0.007	1.000	3793522	7.41				
298.90 > 99.00	1.871	1.878	-0.007	1.000	1609731		2.36(0.00-0.00)			
7 Perfluorohexanoic acid										
313.00 > 269.00	2.129	2.135	-0.006	1.000	16328758	76.0			53468	
D 6 13C2 PFHxA										
315.00 > 270.00	2.129	2.135	-0.006		11571735	47.2		94.4	723038	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.463	2.472	-0.009	1.000	12474267	57.3			61858	
D 11 13C4-PFHpA										
367.00 > 322.00	2.463	2.480	-0.017		11122669	49.1		98.3	441456	
D 10 18O2 PFHxS										
403.00 > 84.00	2.478	2.487	-0.009		17095741	52.3		111	782642	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.478	2.495	-0.017	1.000	11774495	31.6				
15 Perfluorooctanoic acid										
413.00 > 369.00	2.817	2.835	-0.018	1.000	11952661	49.6			17292	
413.00 > 169.00	2.825	2.835	-0.010	1.003	8432704		1.42(0.90-1.10)		446651	
D 14 13C4 PFOA										
417.00 > 372.00	2.825	2.835	-0.010		12007381	52.1		104	596819	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.022	3.099	-0.077	1.000	10026968	31.7			9219	
499.00 > 99.00	3.194	3.099	0.095	1.057	2073493		4.84(0.90-1.10)		95602	
D 17 13C4 PFOS										
503.00 > 80.00	3.194	3.204	-0.010		15209033	61.1		128	203867	
20 Perfluorononanoic acid										
463.00 > 419.00	3.194	3.213	-0.019	1.000	766993	4.22			5521	
D 19 13C5 PFNA										
468.00 > 423.00	3.194	3.213	-0.019		9557809	53.8		108	562578	
D 21 13C8 FOSA										
506.00 > 78.00	3.526	3.536	-0.010		2101419	5.47		10.9	270448	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.551	3.570	-0.019	1.000	166626	0.9385			1896	
D 23 13C2 PFDA										
515.00 > 470.00	3.560	3.570	-0.010		9405410	59.8		120	388532	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.856	3.877	-0.021	1.000	5580	0.0300				
D 27 13C2 PFUnA										
565.00 > 520.00	3.882	3.895	-0.013		7348116	62.7		125	561772	
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.882	3.895	-0.013	1.000	29276	0.2083			414	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.179	4.182	-0.003	1.000	18712	0.1484			471	
D 30 13C2 PFDoA										
615.00 > 570.00	4.179	4.182	-0.003		6866087	61.9		124	284990	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.444	4.449	-0.005	1.000	23273	0.1869			477	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.691	4.698	-0.007	1.000	97332	0.4472			451	
713.00 > 169.00	4.682	4.698	-0.016	0.998	16200		6.01(0.00-0.00)		6238	

Report Date: 21-Dec-2016 10:21:33 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161221-38078.b\20DEC2016C_012.d

Injection Date: 20-Dec-2016 18:52:22 Instrument ID: A8_N

Lims ID: 320-23931-A-3-A Lab Sample ID: 320-23931-3

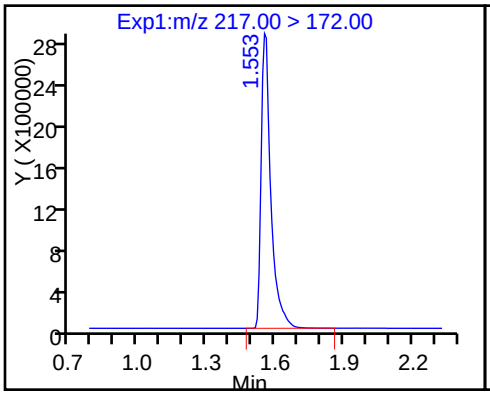
Client ID: 61301MW-LF-1116

Operator ID: A8-PC\A8 ALS Bottle#: 13 Worklist Smp#: 12

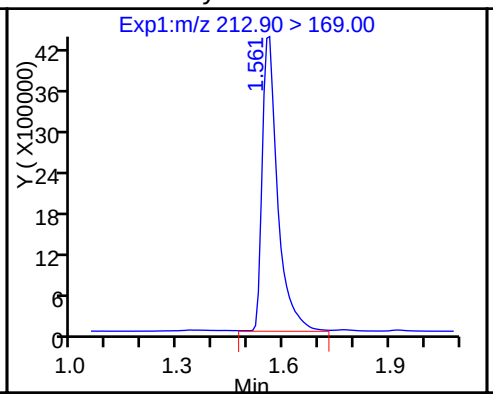
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

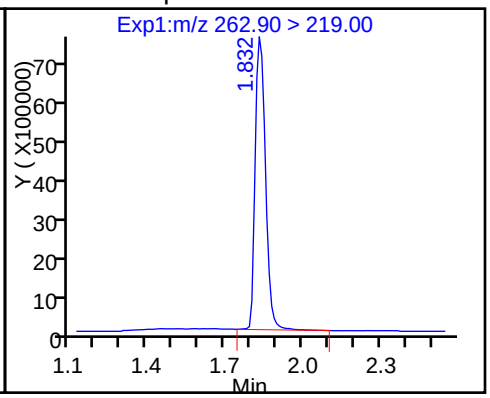
D 2 13C4 PFBA



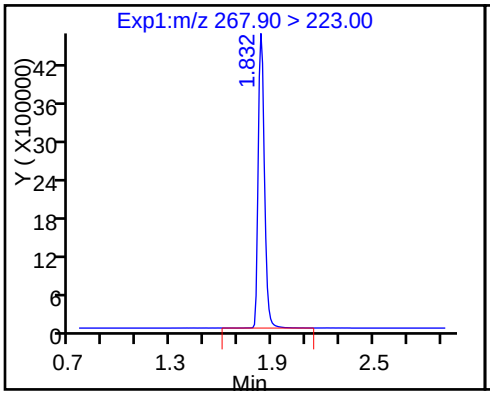
1 Perfluorobutyric acid



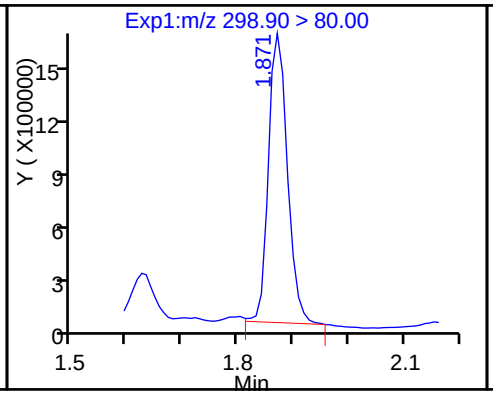
3 Perfluoropentanoic acid



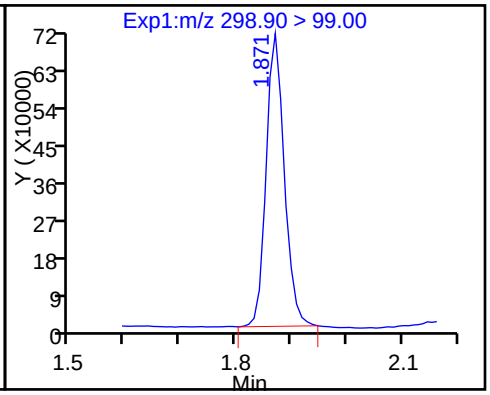
D 4 13C5-PFPeA



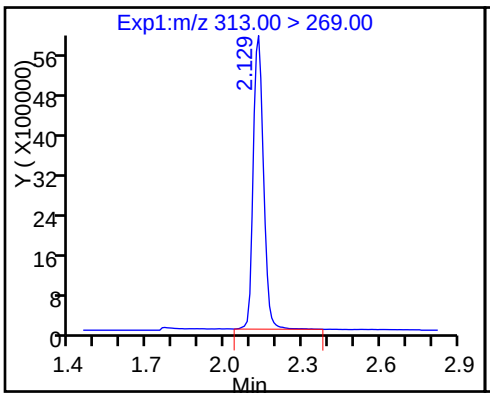
5 Perfluorobutanesulfonic acid



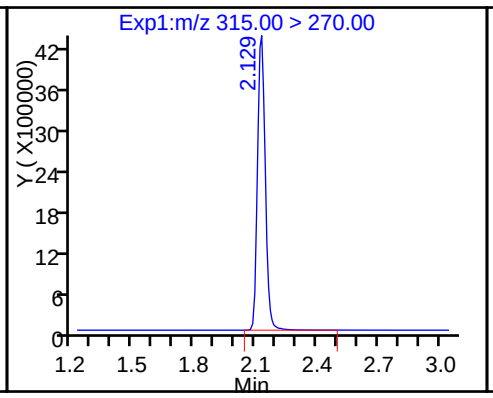
5 Perfluorobutanesulfonic acid



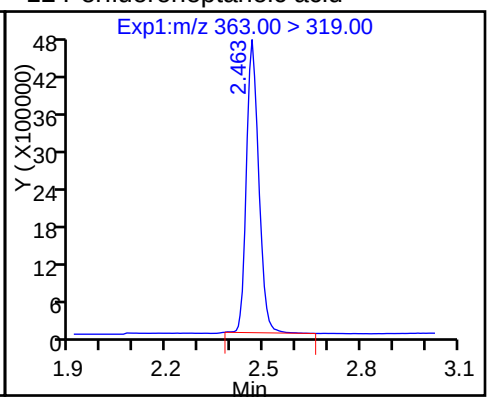
7 Perfluorohexanoic acid



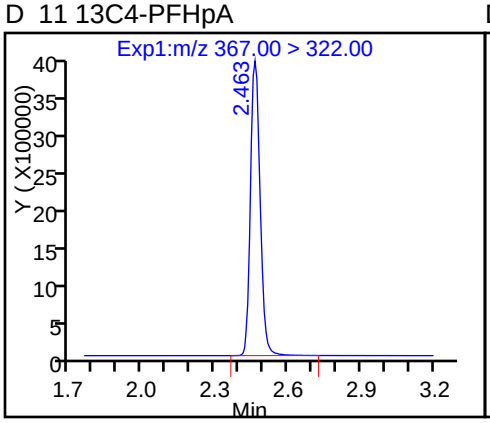
D 6 13C2 PFHxA



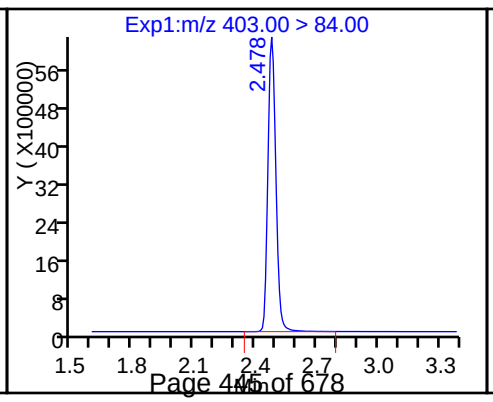
12 Perfluoroheptanoic acid



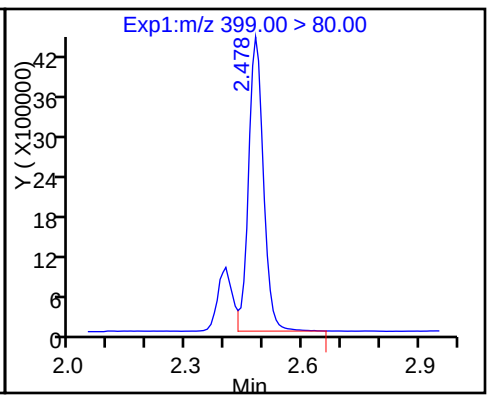
D 11 13C4-PFHpA



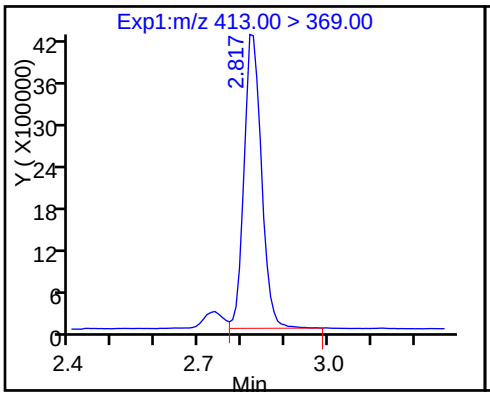
D 10 18O2 PFHxS



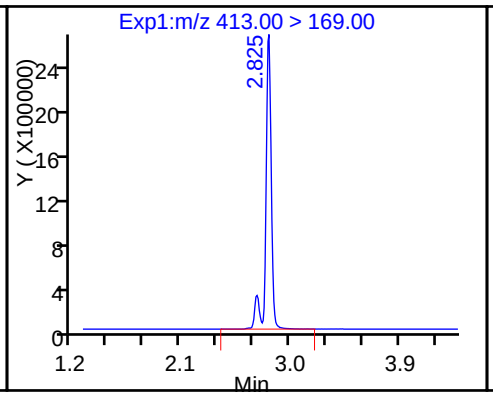
9 Perfluorohexanesulfonic acid



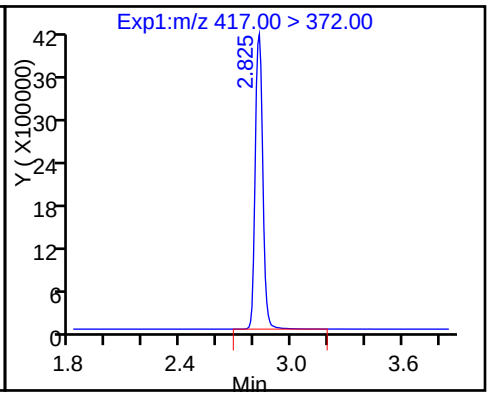
15 Perfluorooctanoic acid



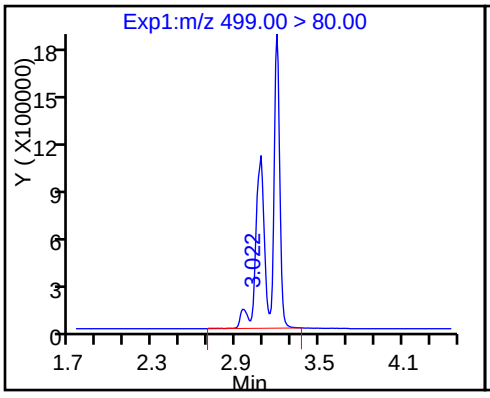
15 Perfluorooctanoic acid



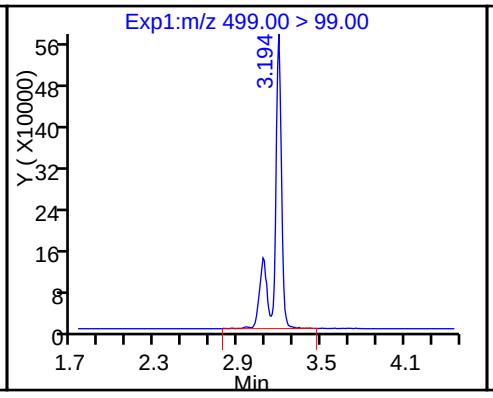
D 14 13C4 PFOA



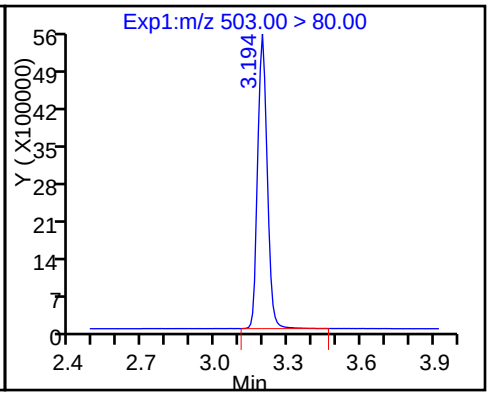
18 Perfluorooctane sulfonic acid



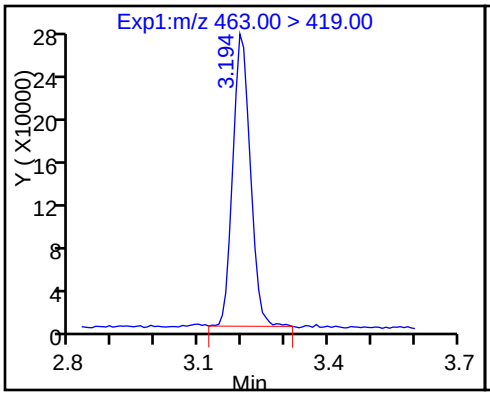
18 Perfluorooctane sulfonic acid



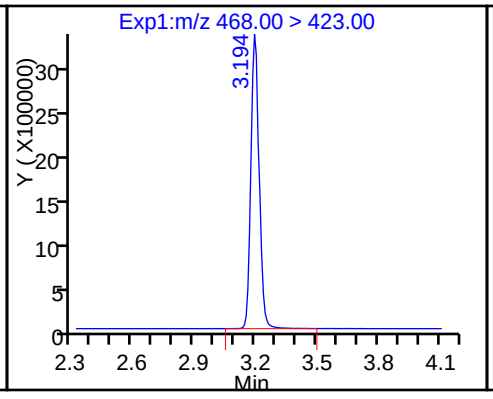
D 17 13C4 PFOS



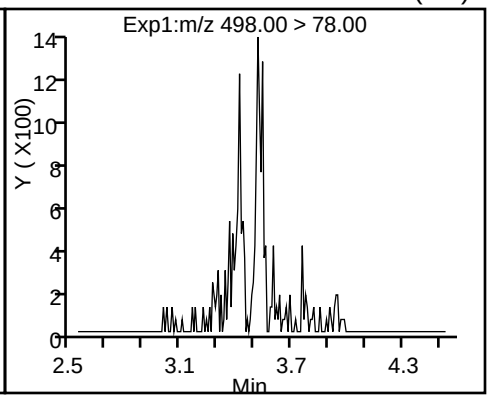
20 Perfluorononanoic acid



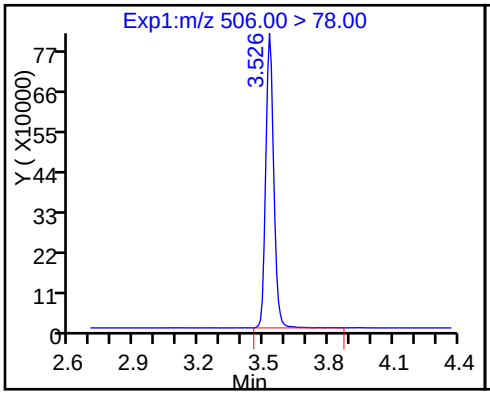
D 19 13C5 PFNA



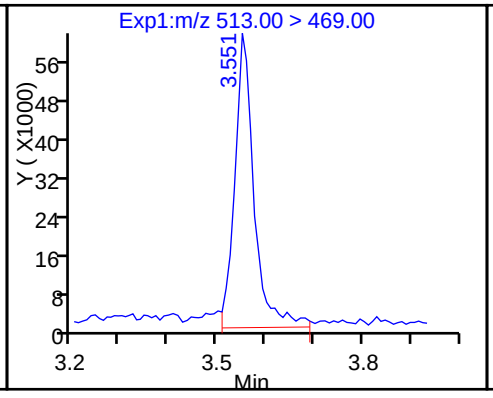
22 Perfluorooctane Sulfonamide (ND)



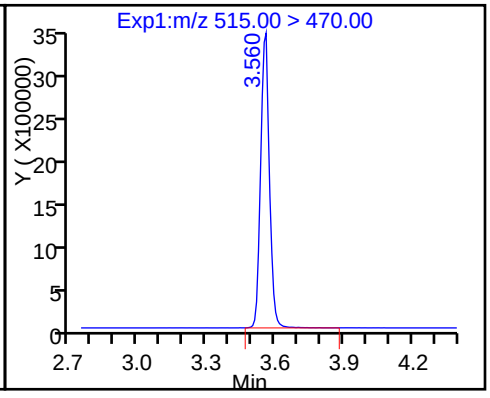
D 21 13C8 FOSA



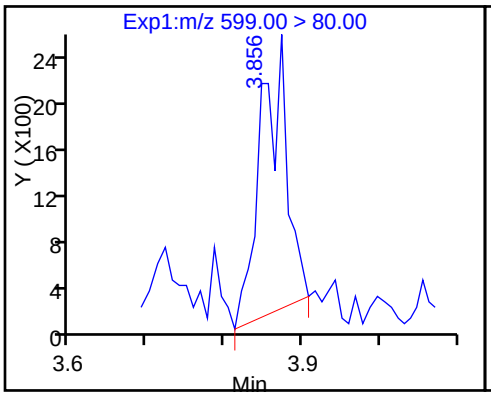
24 Perfluorodecanoic acid



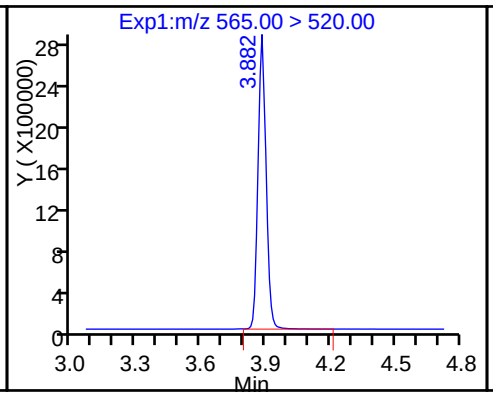
D 23 13C2 PFDA



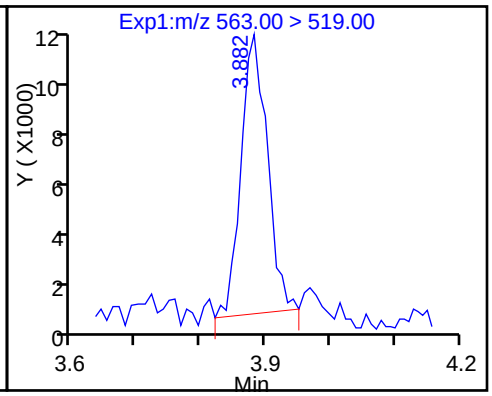
26 Perfluorodecane Sulfonic acid



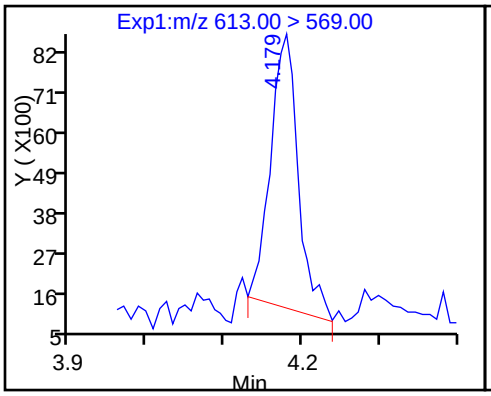
D 27 13C2 PFUnA



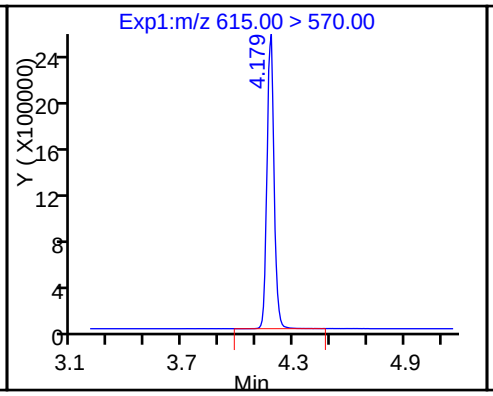
28 Perfluoroundecanoic acid



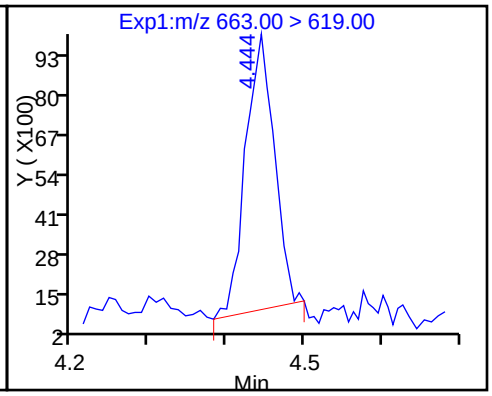
29 Perfluorododecanoic acid



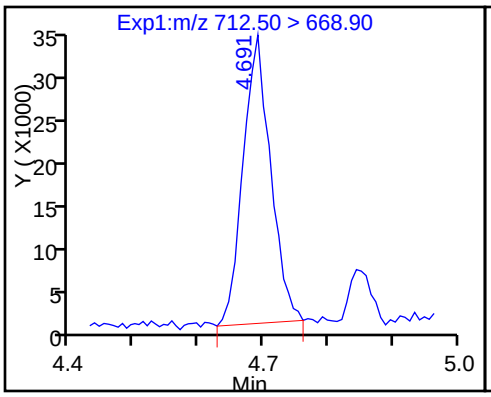
D 30 13C2 PFDoA



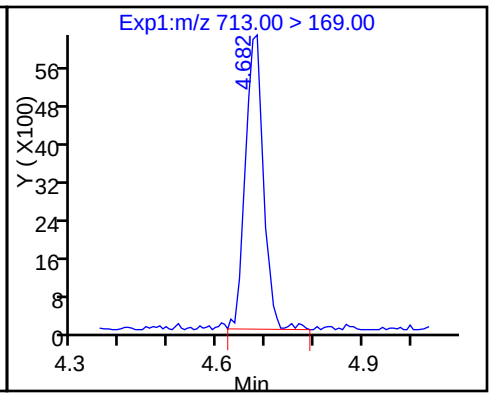
31 Perfluorotridecanoic acid



33 Perfluorotetradecanoic acid



33 Perfluorotetradecanoic acid



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-23931-1

SDG No.:

Client Sample ID: 613D41MW-LF-1116 | Lab Sample ID: 320-23931-4

Matrix: Water | Lab File ID: 16DEC2016C_020.d

Analysis Method: 537 (Modified) | Date Collected: 11/30/2016 13:55

Extraction Method: 3535 | Date Extracted: 12/05/2016 08:31

Sample wt/vol: 265.7(mL) | Date Analyzed: 12/16/2016 20:22

Con. Extract Vol.: 0.5(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 142751 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.012	M	0.0024	0.00094	0.00043
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.0063		0.0024	0.0019	0.00093
307-24-4	Perfluorohexanoic acid (PFHxA)	0.0074		0.0024	0.0019	0.00074
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0036	M	0.0024	0.0019	0.00075
335-67-1	Perfluorooctanoic acid (PFOA)	0.035	M	0.0024	0.0019	0.00070
375-95-1	Perfluorononanoic acid (PFNA)	0.00092	J M	0.0024	0.0019	0.00062
335-76-2	Perfluorodecanoic acid (PFDA)	0.00063	J	0.0024	0.00094	0.00041
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0019	U	0.0024	0.0019	0.00070
307-55-1	Perfluorododecanoic acid (PFDoA)	0.0019	U	0.0024	0.0019	0.00055
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.0019	U	0.0024	0.0019	0.00052
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.00078	J M	0.0024	0.00094	0.00038
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.032		0.0024	0.0019	0.00082
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.070		0.0038	0.0028	0.0012
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.0028	U	0.0038	0.0028	0.0011
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.0019	U	0.0024	0.0019	0.00060

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-23931-1

SDG No.:

Client Sample ID: 613D41MW-LF-1116 | Lab Sample ID: 320-23931-4

Matrix: Water | Lab File ID: 16DEC2016C_020.d

Analysis Method: 537 (Modified) | Date Collected: 11/30/2016 13:55

Extraction Method: 3535 | Date Extracted: 12/05/2016 08:31

Sample wt/vol: 265.7(mL) | Date Analyzed: 12/16/2016 20:22

Con. Extract Vol.: 0.5(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 142751 | Units: ug/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	15	Q	25-150
STL00992	13C4 PFBA	48		25-150
STL00993	13C2 PFHxA	77		25-150
STL00990	13C4 PFOA	77		25-150
STL00995	13C5 PFNA	70		25-150
STL00996	13C2 PFDA	68		25-150
STL00997	13C2 PFUnA	70		25-150
STL00998	13C2 PFDoA	77		25-150
STL00994	18O2 PFHxS	96		25-150
STL00991	13C4 PFOS	101		25-150
STL01893	13C5-PFPeA	80		25-150
STL01892	13C4-PFHpA	77		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_020.d
Lims ID: 320-23931-A-4-A
Client ID: 613D41MW-LF-1116
Sample Type: Client
Inject. Date: 16-Dec-2016 20:22:42 ALS Bottle#: 36 Worklist Smp#: 20
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-23931-a-4-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 18-Dec-2016 17:59:51 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK028

First Level Reviewer: chandrasenas Date: 18-Dec-2016 17:47:37

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	1.566	1.582	-0.016		8365287	24.1		48.1	530103	
1 Perfluorobutyric acid										M
212.90 > 169.00	1.574	1.582	-0.008	1.000	926471	6.49			3095	M
3 Perfluoropentanoic acid										
262.90 > 219.00	1.848	1.858	-0.010	1.000	703078	3.34			2744	
D 4 13C5-PFPeA										
267.90 > 223.00	1.848	1.858	-0.010		10677658	40.1		80.3	463753	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.887	1.896	-0.009	1.000	1179352	2.66				
298.90 > 99.00	1.887	1.896	-0.009	1.000	496360		2.38(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.150	2.153	-0.003		9461366	38.6		77.2	609156	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.141	2.153	-0.012	1.000	692629	3.94			2366	
12 Perfluoroheptanoic acid										M
363.00 > 319.00	2.481	2.492	-0.011	1.000	332446	1.94			1801	M
D 11 13C4-PFHpA										
367.00 > 322.00	2.481	2.500	-0.019		8767210	38.7		77.5	570315	
D 10 18O2 PFHxS										
403.00 > 84.00	2.496	2.508	-0.012		14821293	45.3		95.8	747032	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.414	2.515	-0.101	1.000	5412573	16.8				
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.844	2.847	-0.003	1.000	3331067	18.7			20442	M
413.00 > 169.00	2.844	2.847	-0.003	1.000	2232062		1.49(0.90-1.10)		96437	
D 14 13C4 PFOA										
417.00 > 372.00	2.844	2.855	-0.011		8892093	38.6		77.2	516672	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.188	3.120	0.068	1.000	9366956	37.3			150965	
499.00 > 99.00	3.206	3.120	0.086	1.005	1916522		4.89(0.90-1.10)		78651	
D 19 13C5 PFNA										
468.00 > 423.00	3.215	3.227	-0.013		6219847	35.0		70.0	697885	
D 17 13C4 PFOS										
503.00 > 80.00	3.215	3.227	-0.013		12058890	48.5		101	269034	
20 Perfluorononanoic acid										M
463.00 > 419.00	3.215	3.227	-0.013	1.000	57941	0.4894			515	M
D 21 13C8 FOSA										
506.00 > 78.00	3.546	3.558	-0.012		2908214	7.57		15.1	158516	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.546	3.558	-0.012	1.000	10022	0.1847			1020	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.563	3.583	-0.020	1.000	34076	0.3371			447	
D 23 13C2 PFDA										
515.00 > 470.00	3.571	3.583	-0.012		5355112	34.0		68.1	278843	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.852	3.893	-0.041	1.000	2633	0.0179				
D 27 13C2 PFUnA										
565.00 > 520.00	3.895	3.902	-0.007		4130707	35.2		70.5	393443	
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.904	3.911	-0.007	1.000	9829	0.1244			207	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.186	4.192	-0.006	1.000	4544	0.0581			107	
D 30 13C2 PFDoA										
615.00 > 570.00	4.186	4.198	-0.012		4259764	38.4		76.8	143678	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.451	4.459	-0.008	1.000	7989	0.1034			192	
33 Perfluorotetradecanoic acid										M
712.50 > 668.90	4.708	4.702	0.006	1.000	55931	0.4142			216	M
713.00 > 169.00	4.691	4.702	-0.011	0.996	7386		7.57(0.00-0.00)		3067	

QC Flag Legend

Review Flags

M - Manually Integrated

Report Date: 18-Dec-2016 17:59:57 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_020.d

Injection Date: 16-Dec-2016 20:22:42 Instrument ID: A8_N

Lims ID: 320-23931-A-4-A Lab Sample ID: 320-23931-4

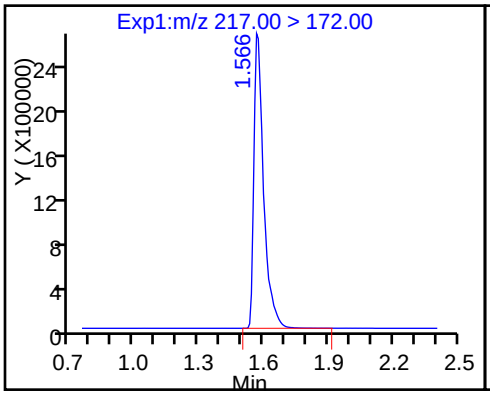
Client ID: 613D41MW-LF-1116

Operator ID: A8-PC\A8 ALS Bottle#: 36 Worklist Smp#: 20

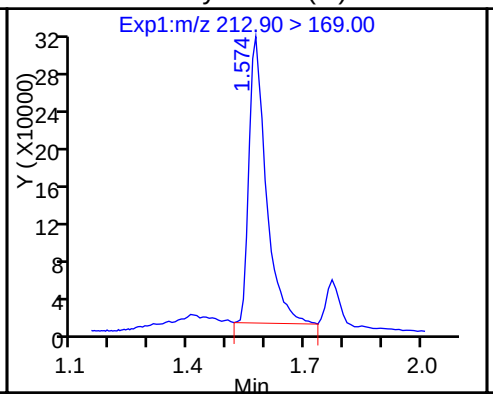
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

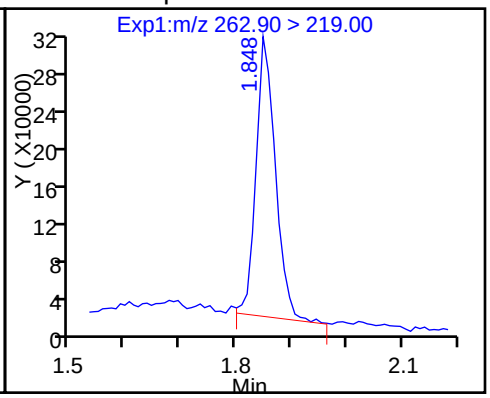
D 2 13C4 PFBA



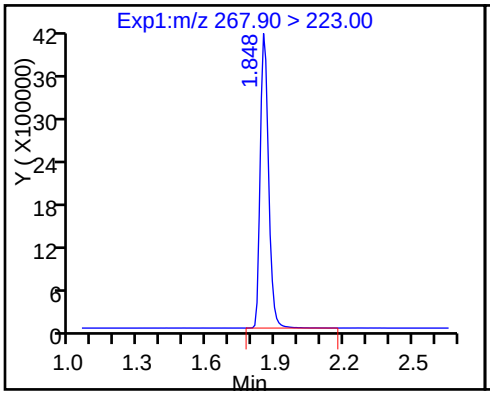
1 Perfluorobutyric acid (M)



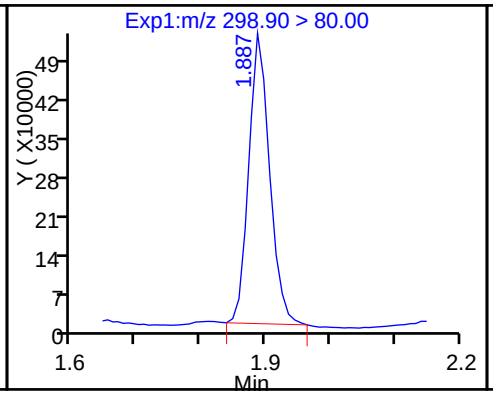
3 Perfluoropentanoic acid



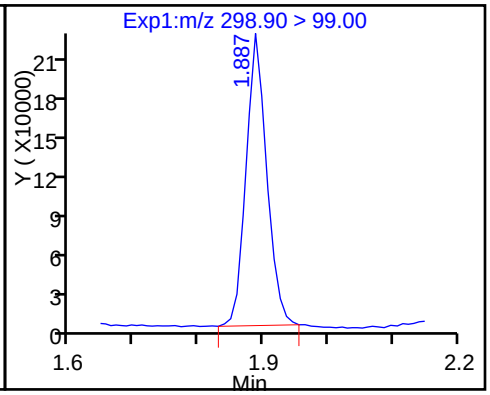
D 4 13C5-PFPeA



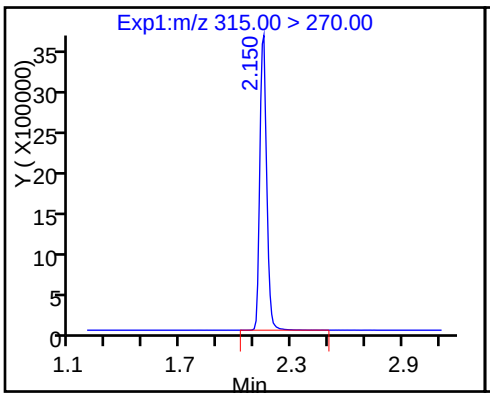
5 Perfluorobutanesulfonic acid



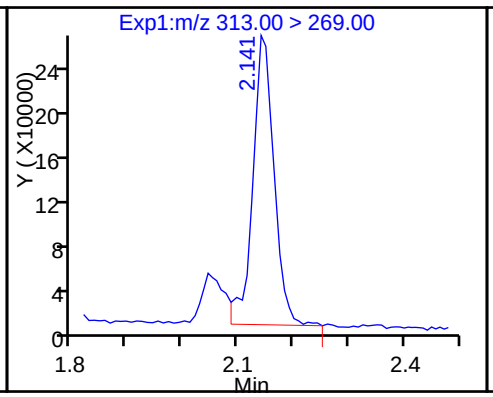
5 Perfluorobutanesulfonic acid



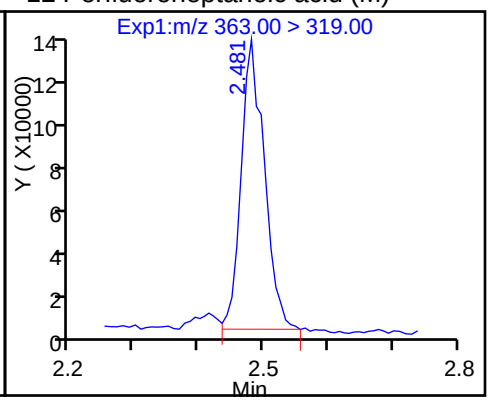
D 6 13C2 PFHxA



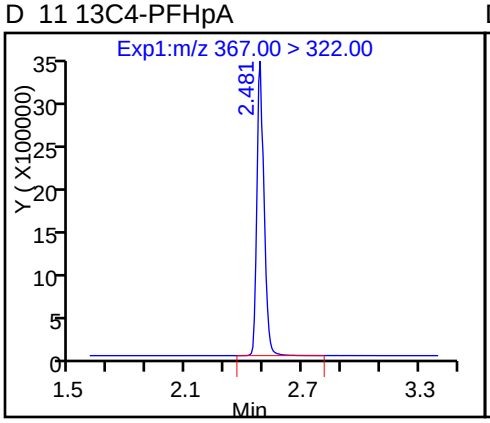
7 Perfluorohexanoic acid



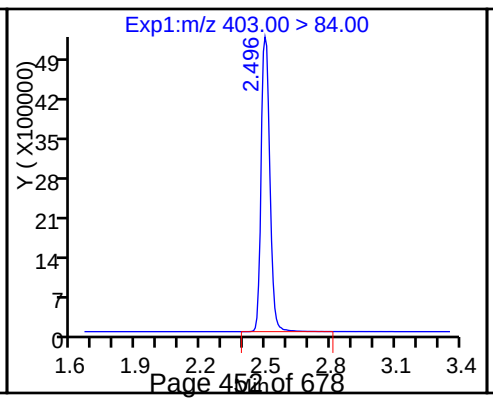
12 Perfluoroheptanoic acid (M)



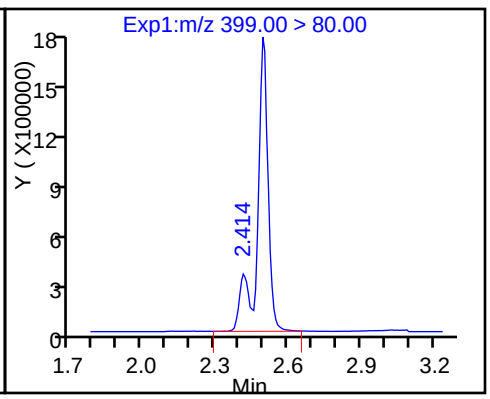
D 11 13C4-PFHpA



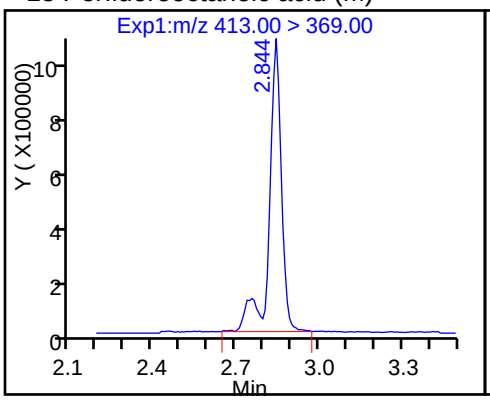
D 10 18O2 PFHxS



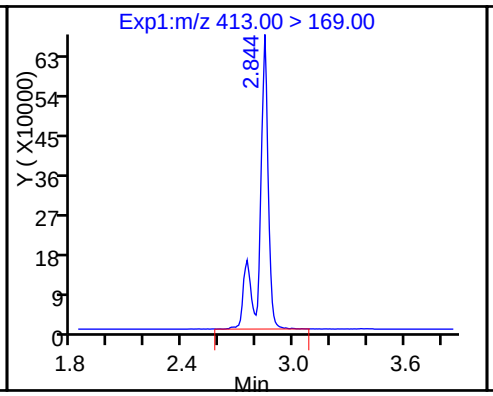
9 Perfluorohexanesulfonic acid



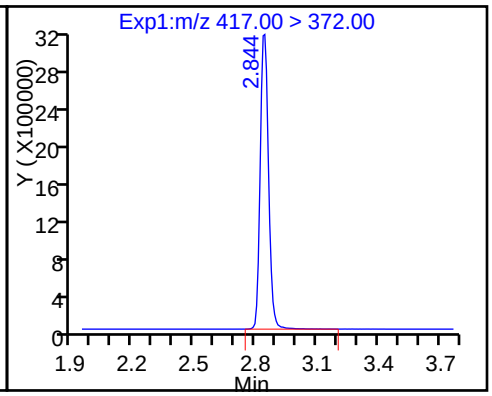
15 Perfluorooctanoic acid (M)



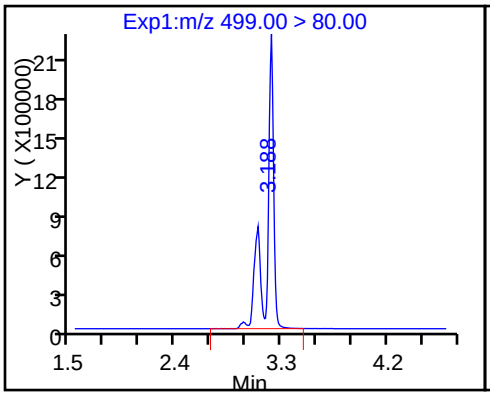
15 Perfluorooctanoic acid



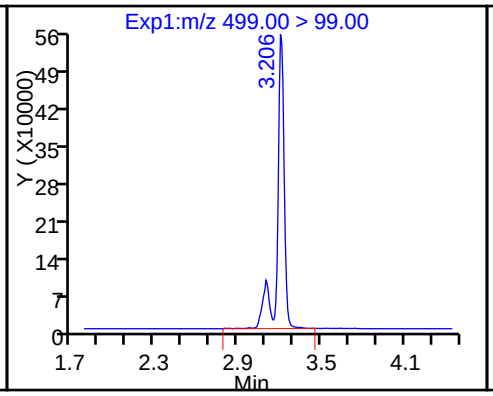
D 14 13C4 PFOA



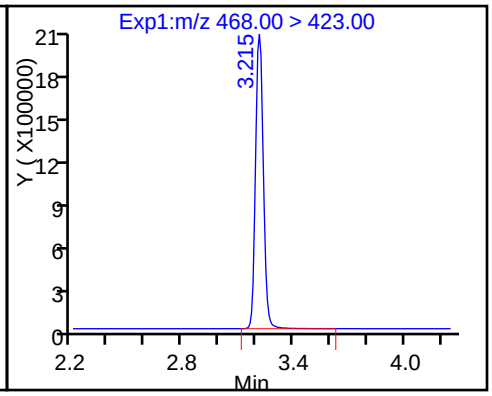
18 Perfluorooctane sulfonic acid



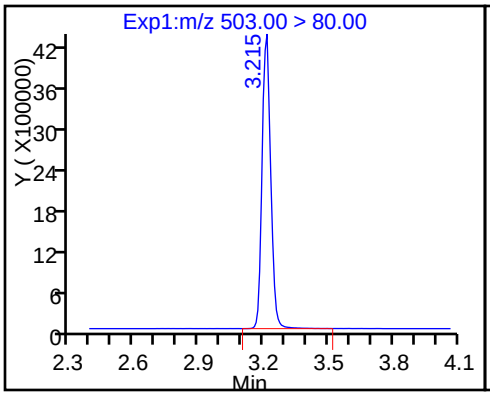
18 Perfluorooctane sulfonic acid



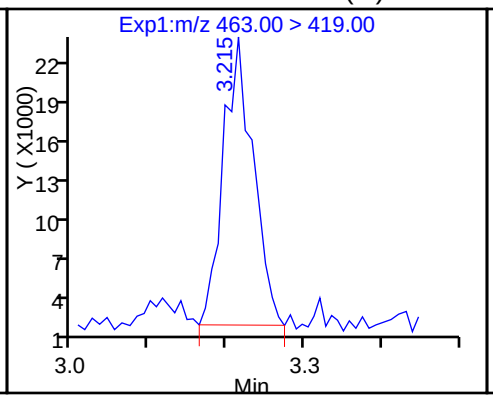
D 19 13C5 PFNA



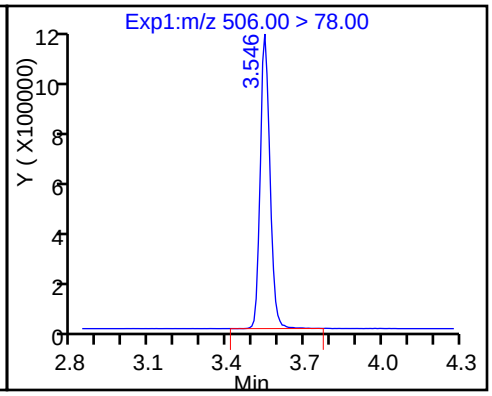
D 17 13C4 PFOS



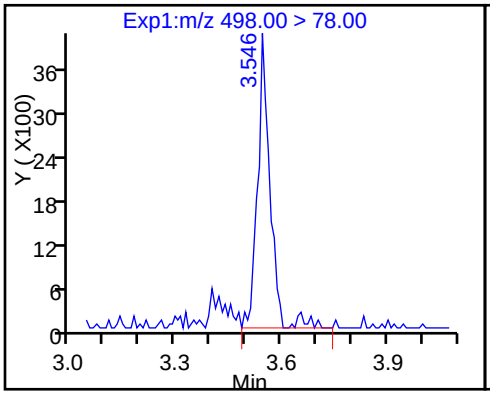
20 Perfluorononanoic acid (M)



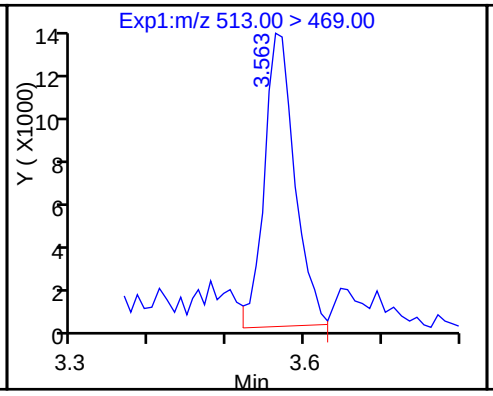
D 21 13C8 FOSA



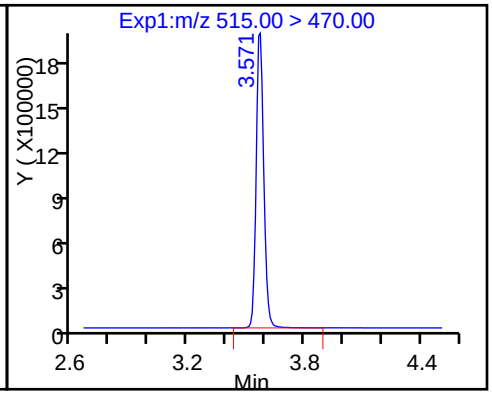
22 Perfluorooctane Sulfonamide



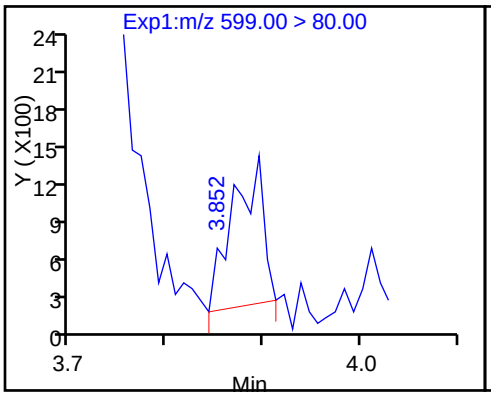
24 Perfluorodecanoic acid



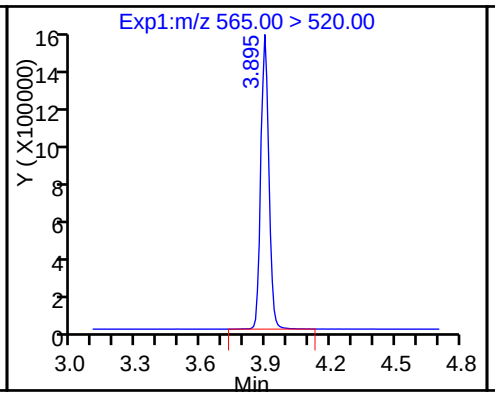
D 23 13C2 PFDA



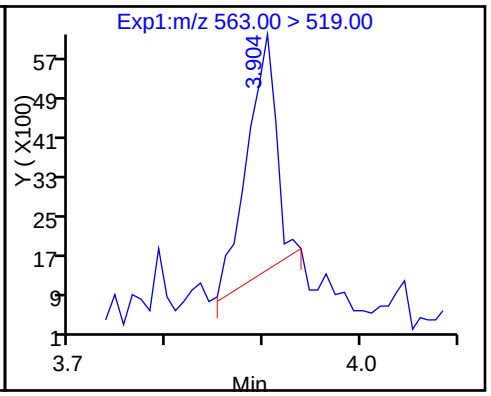
26 Perfluorodecane Sulfonic acid



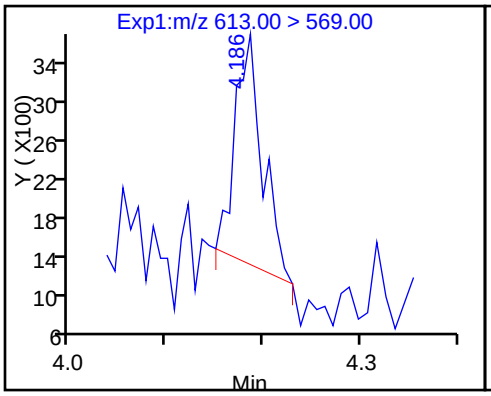
D 27 13C2 PFUnA



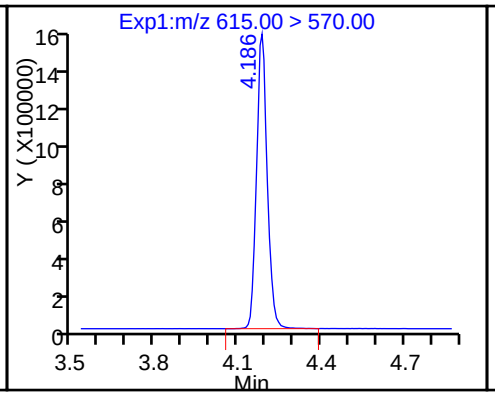
28 Perfluoroundecanoic acid



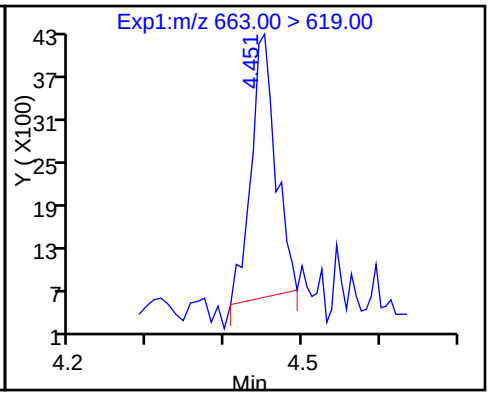
29 Perfluorododecanoic acid



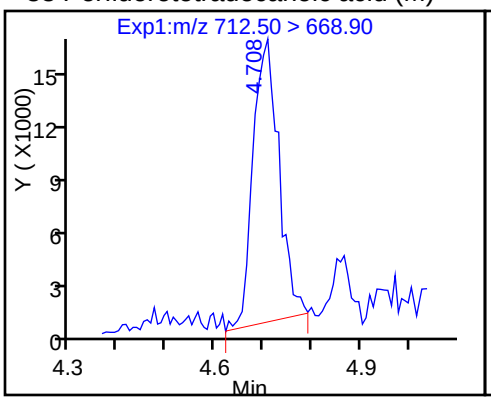
D 30 13C2 PFDoA



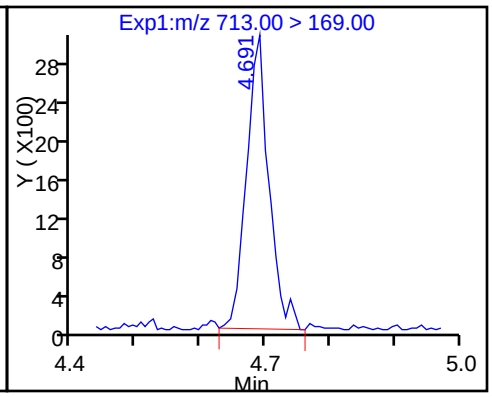
31 Perfluorotridecanoic acid



33 Perfluorotetradecanoic acid (M)



33 Perfluorotetradecanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

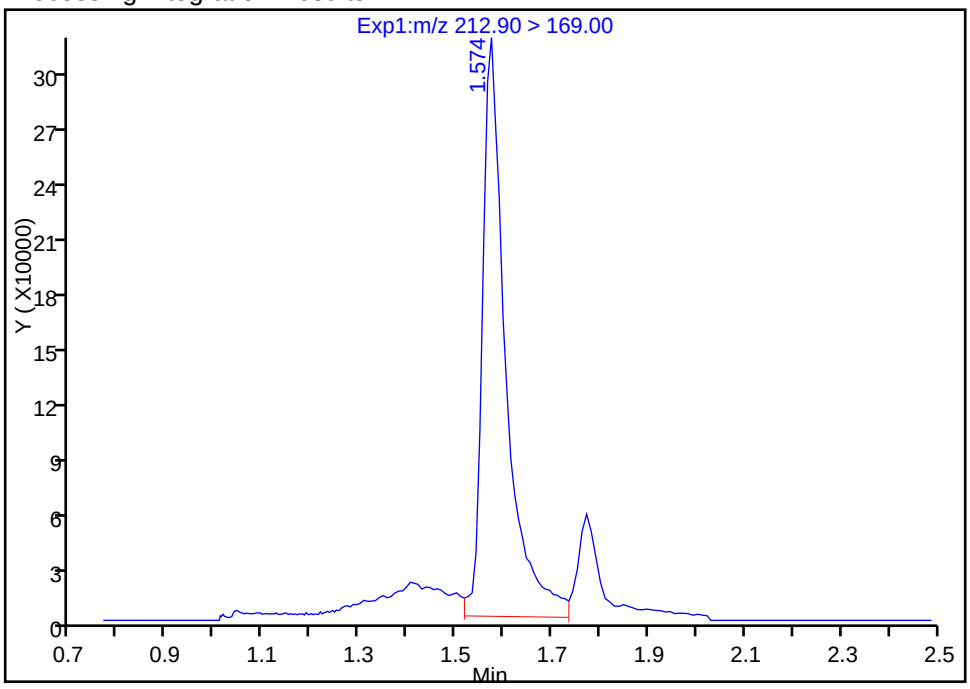
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_020.d				
Injection Date:	16-Dec-2016 20:22:42	Instrument ID:	A8_N		
Lims ID:	320-23931-A-4-A	Lab Sample ID:	320-23931-4		
Client ID:	613D41MW-LF-1116				
Operator ID:	A8-PC\A8	ALS Bottle#:	36	Worklist Smp#:	20
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

1 Perfluorobutyric acid, CAS: 375-22-4

Signal: 1

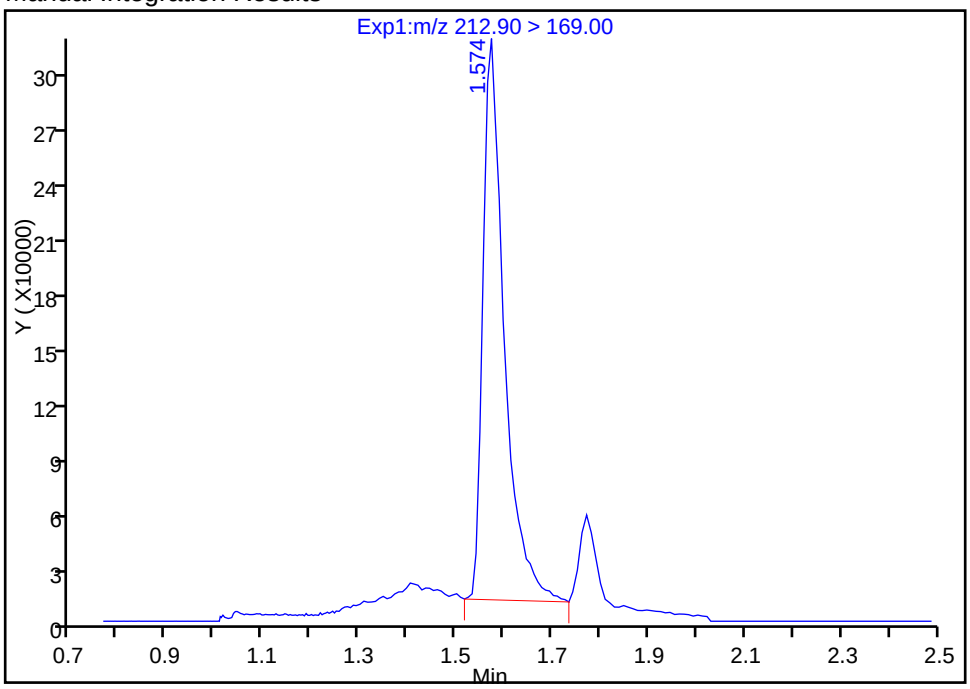
Processing Integration Results

RT: 1.57
Area: 1044848
Amount: 7.315371
Amount Units: ng/ml



Manual Integration Results

RT: 1.57
Area: 926471
Amount: 6.486570
Amount Units: ng/ml



Reviewer: chandrasenas, 18-Dec-2016 17:47:37

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

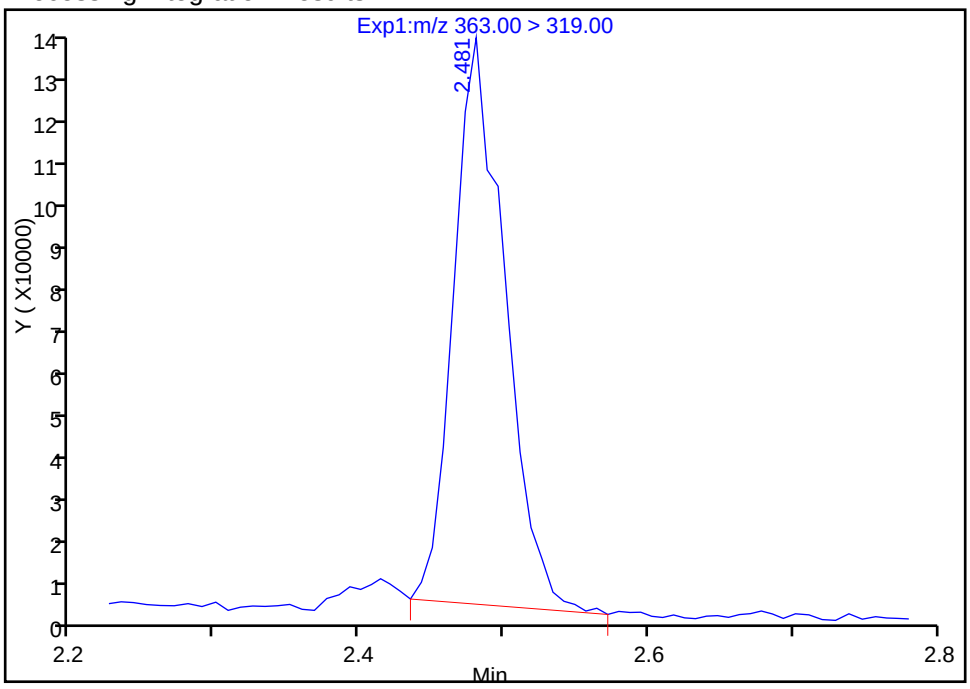
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_020.d				
Injection Date:	16-Dec-2016 20:22:42	Instrument ID:	A8_N		
Lims ID:	320-23931-A-4-A	Lab Sample ID:	320-23931-4		
Client ID:	613D41MW-LF-1116				
Operator ID:	A8-PC\A8	ALS Bottle#:	36	Worklist Smp#:	20
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

12 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

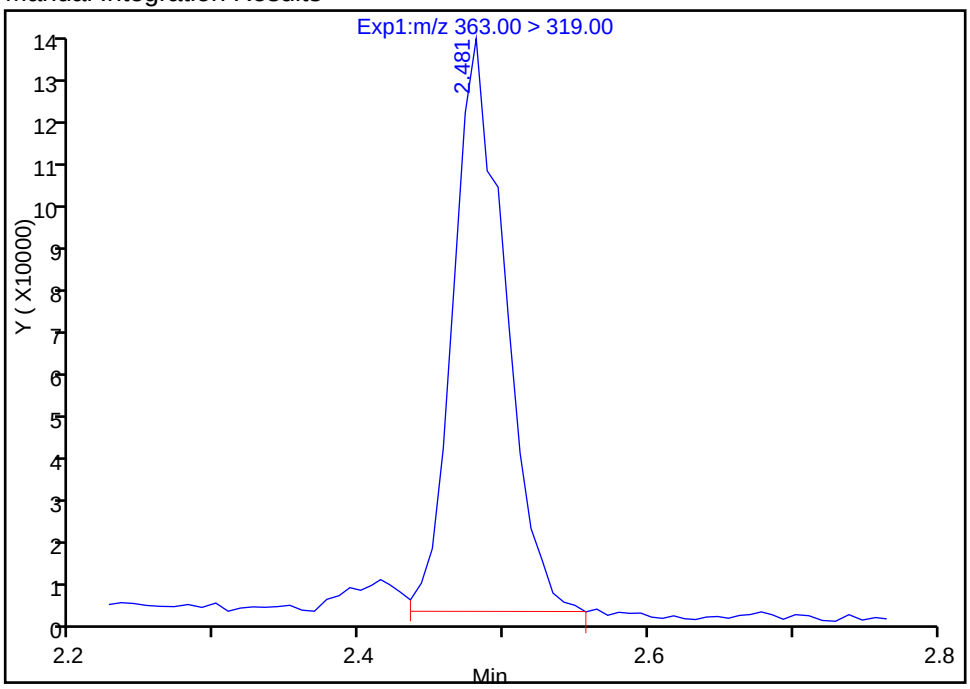
Processing Integration Results

RT: 2.48
Area: 325245
Amount: 1.895033
Amount Units: ng/ml



Manual Integration Results

RT: 2.48
Area: 332446
Amount: 1.936990
Amount Units: ng/ml



Reviewer: chandrasenas, 18-Dec-2016 17:47:37

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

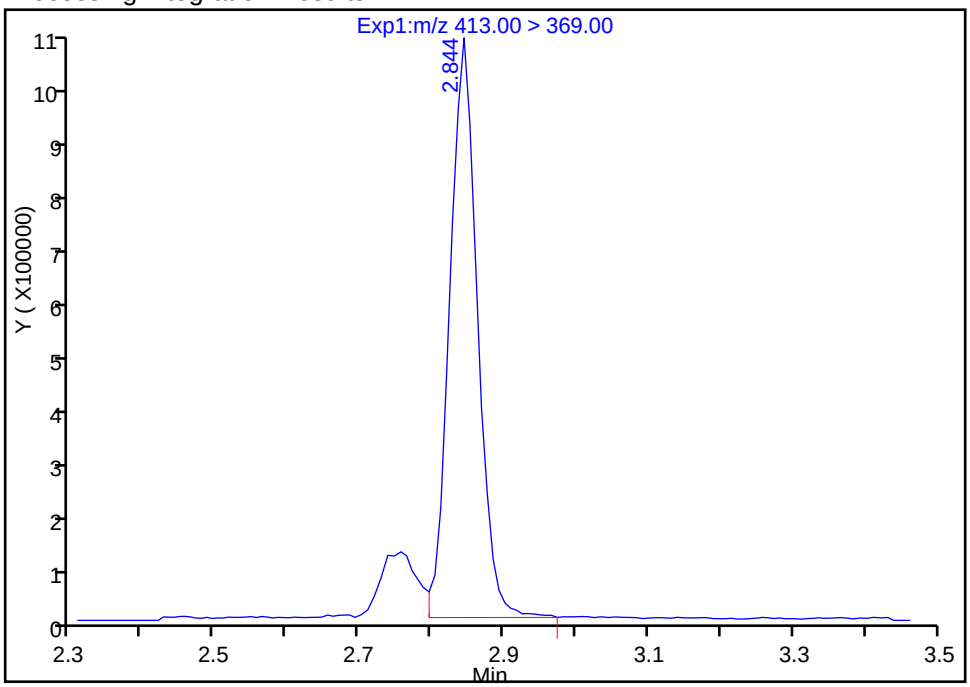
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_020.d				
Injection Date:	16-Dec-2016 20:22:42	Instrument ID:	A8_N		
Lims ID:	320-23931-A-4-A	Lab Sample ID:	320-23931-4		
Client ID:	613D41MW-LF-1116				
Operator ID:	A8-PC\A8	ALS Bottle#:	36	Worklist Smp#:	20
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

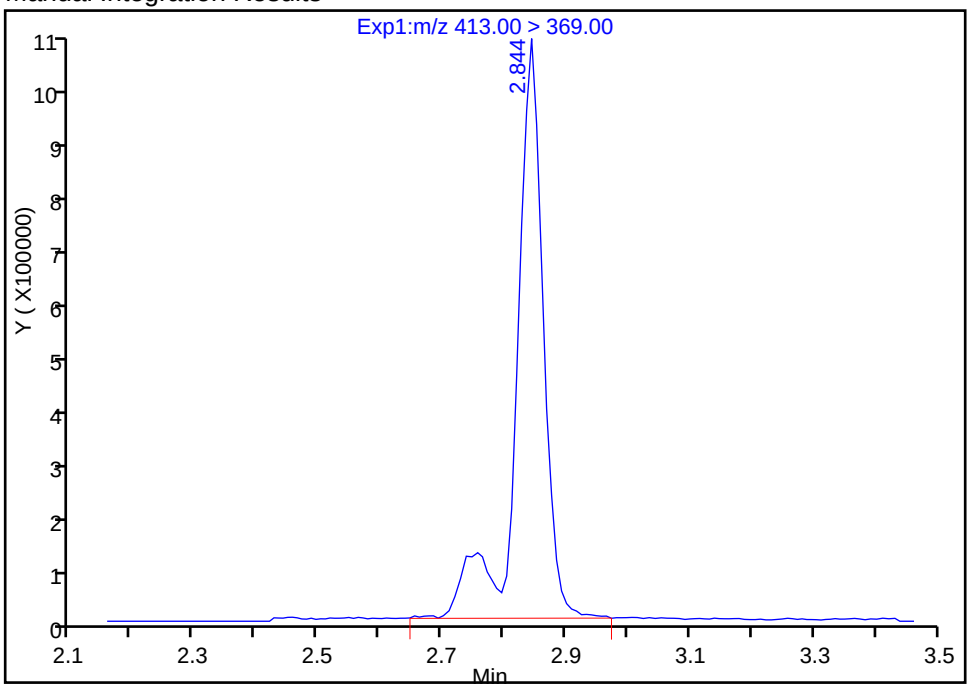
Processing Integration Results

RT: 2.84
Area: 2897142
Amount: 16.239505
Amount Units: ng/ml



Manual Integration Results

RT: 2.84
Area: 3331067
Amount: 18.671808
Amount Units: ng/ml



Reviewer: chandrasenas, 18-Dec-2016 17:47:37

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

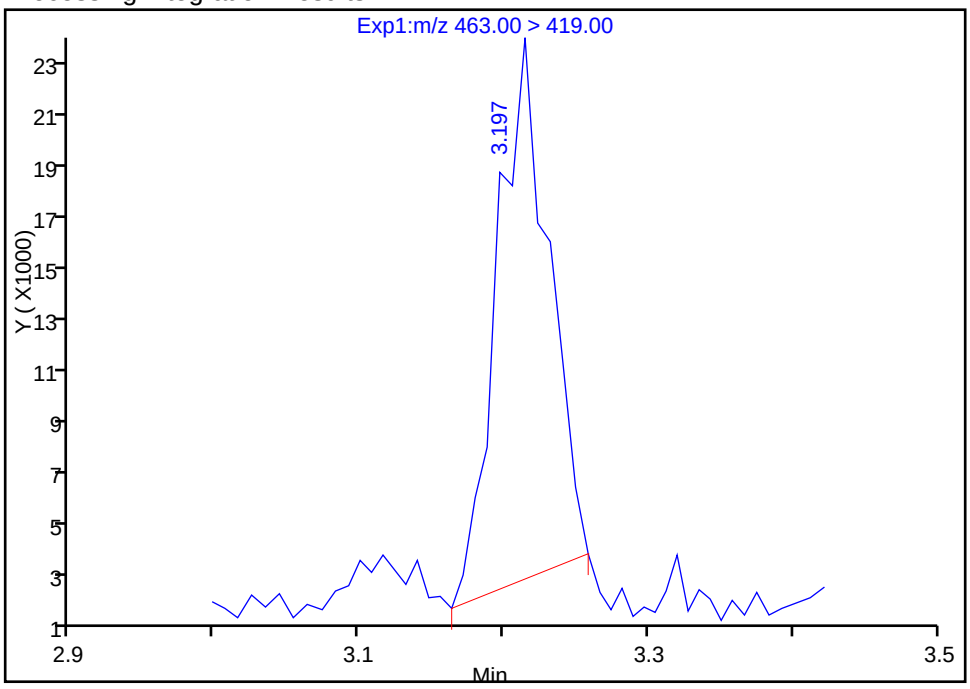
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_020.d				
Injection Date:	16-Dec-2016 20:22:42	Instrument ID:	A8_N		
Lims ID:	320-23931-A-4-A	Lab Sample ID:	320-23931-4		
Client ID:	613D41MW-LF-1116				
Operator ID:	A8-PC\A8	ALS Bottle#:	36	Worklist Smp#:	20
Injection Vol:	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

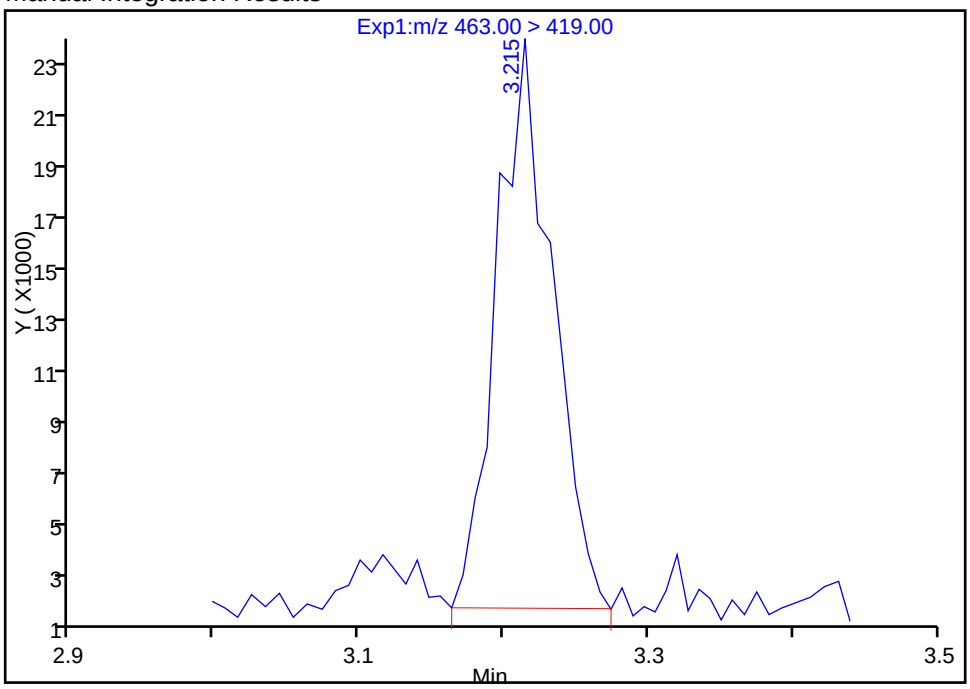
Processing Integration Results

RT: 3.20
Area: 51205
Amount: 0.432461
Amount Units: ng/ml



Manual Integration Results

RT: 3.21
Area: 57941
Amount: 0.489352
Amount Units: ng/ml



Reviewer: chandrasenas, 18-Dec-2016 17:47:37

Audit Action: Manually Integrated Audit Reason: Incomplete Integration

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

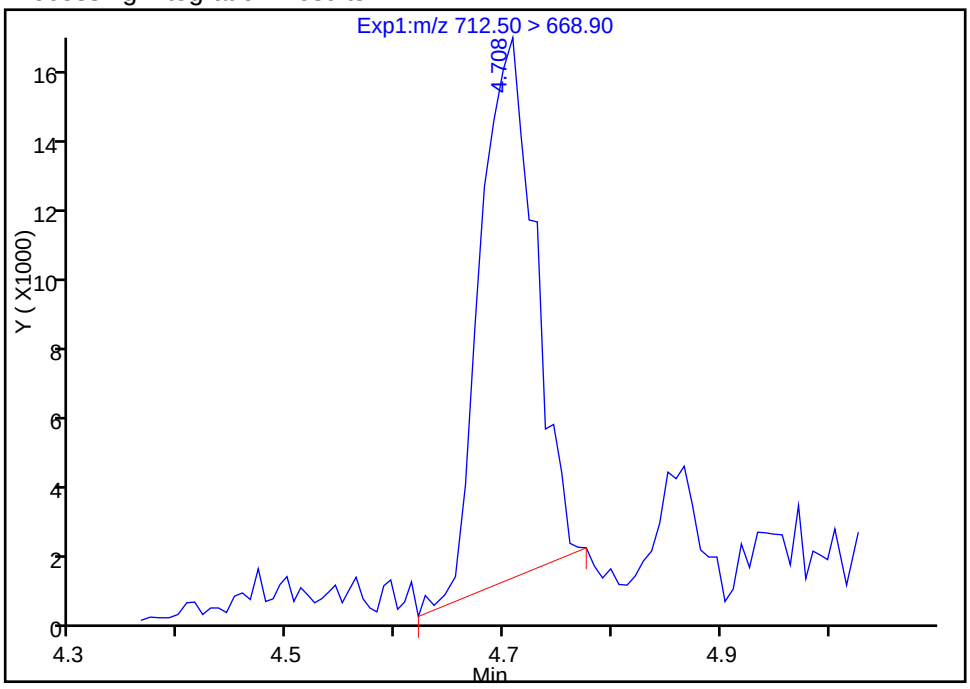
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_020.d				
Injection Date:	16-Dec-2016 20:22:42	Instrument ID:	A8_N		
Lims ID:	320-23931-A-4-A	Lab Sample ID:	320-23931-4		
Client ID:	613D41MW-LF-1116				
Operator ID:	A8-PC\A8	ALS Bottle#:	36	Worklist Smp#:	20
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

33 Perfluorotetradecanoic acid, CAS: 376-06-7

Signal: 1

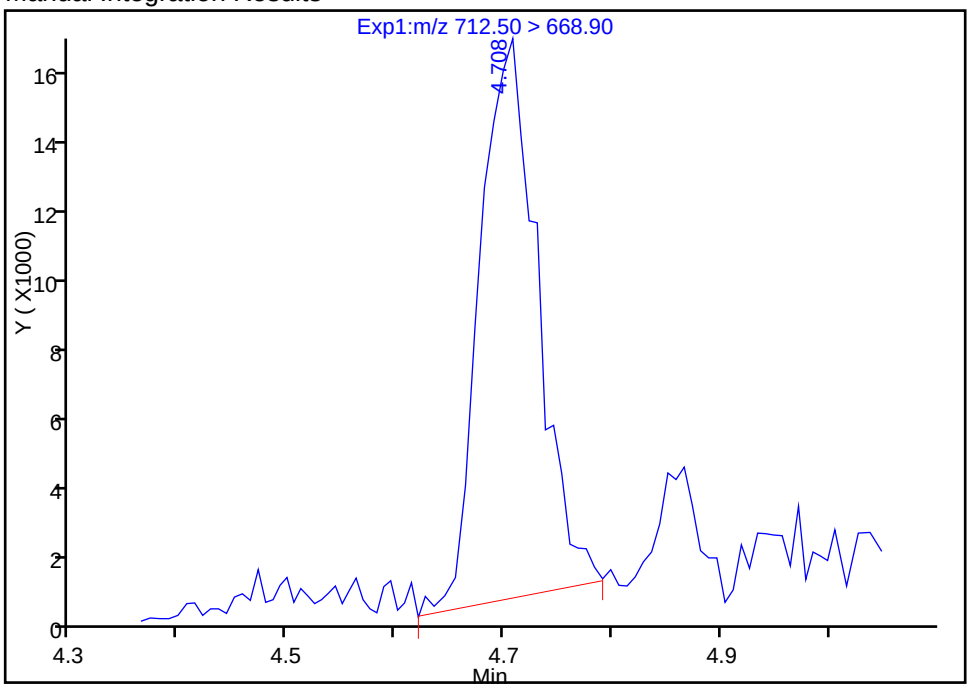
Processing Integration Results

RT: 4.71
Area: 51263
Amount: 0.379671
Amount Units: ng/ml



Manual Integration Results

RT: 4.71
Area: 55931
Amount: 0.414244
Amount Units: ng/ml



Reviewer: chandrasenas, 18-Dec-2016 17:47:37

Audit Action: Manually Integrated Audit Reason: Incomplete Integration

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-23931-1

SDG No.:

Client Sample ID: 613D41MW-LF-1116 RA | Lab Sample ID: 320-23931-4 RA

Matrix: Water | Lab File ID: 20DEC2016C_013.d

Analysis Method: 537 (Modified) | Date Collected: 11/30/2016 13:55

Extraction Method: 3535 | Date Extracted: 12/05/2016 08:31

Sample wt/vol: 265.7(mL) | Date Analyzed: 12/20/2016 18:59

Con. Extract Vol.: 0.5(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 143259 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0053		0.0024	0.0019	0.00086

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00994	18O2 PFHxS	126		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161221-38078.b\20DEC2016C_013.d
Lims ID: 320-23931-A-4-A
Client ID: 613D41MW-LF-1116
Sample Type: Client
Inject. Date: 20-Dec-2016 18:59:53 ALS Bottle#: 14 Worklist Smp#: 13
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-23931-a-4-a
Misc. Info.: Plate: 1 Rack: 4
Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161221-38078.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 21-Dec-2016 10:23:56 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK025

First Level Reviewer: chandrasenas Date: 21-Dec-2016 10:24:02

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.558	1.558	0.0		10080357	29.0		58.0	672081	
1 Perfluorobutyric acid										
212.90 > 169.00	1.558	1.566	-0.008	1.000	1182783	6.87			3127	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.839	1.839	0.0	1.000	906414	3.39			3020	
D 4 13C5-PFPeA										
267.90 > 223.00	1.839	1.839	0.0		13542044	50.9		102	766951	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.878	1.878	0.0	1.000	1650665	2.82				
298.90 > 99.00	1.878	1.878	0.0	1.000	686640		2.40(0.00-0.00)			
7 Perfluorohexanoic acid										
313.00 > 269.00	2.133	2.135	-0.002	1.000	904085	3.92			2840	
D 6 13C2 PFHxA										
315.00 > 270.00	2.133	2.135	-0.002		12417337	50.7		101	586108	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.411	2.495	-0.084	1.000	7329527	17.2				
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.474	2.472	0.002	1.000	431108	1.84			1983	
D 11 13C4-PFHpA										
367.00 > 322.00	2.474	2.480	-0.006		11957608	52.8		106	890269	
D 10 18O2 PFHxS										
403.00 > 84.00	2.489	2.487	0.002		19531448	59.7		126	883368	
D 14 13C4 PFOA										
417.00 > 372.00	2.829	2.835	-0.006		11959610	51.9		104	858142	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.838	2.835	0.003	1.000	3875639	16.2			7940	
413.00 > 169.00	2.838	2.835	0.003	1.000	3065791		1.26(0.90-1.10)		145496	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.181	3.099	0.082	1.000	12781462	37.9			183224	
499.00 > 99.00	3.181	3.099	0.082	1.000	2657320		4.81(0.90-1.10)		59868	
D 17 13C4 PFOS										
503.00 > 80.00	3.207	3.204	0.003		16191988	65.1		136	374096	
20 Perfluorononanoic acid										
463.00 > 419.00	3.199	3.213	-0.014	1.000	73713	0.4795			498	
D 19 13C5 PFNA										
468.00 > 423.00	3.207	3.213	-0.006		8075045	45.4		90.9	528513	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.539	3.536	0.003	1.000	11039	0.1507			827	
D 21 13C8 FOSA										
506.00 > 78.00	3.539	3.536	0.003		3927692	10.2		20.4	299655	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.564	3.570	-0.006	1.000	50262	0.3513			491	
D 23 13C2 PFDA										
515.00 > 470.00	3.564	3.570	-0.006		7580640	48.2		96.4	249265	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.870	3.877	-0.007	1.000	4649	0.0235				
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.887	3.895	-0.008	1.000	19564	0.1869			329	
D 27 13C2 PFUnA										
565.00 > 520.00	3.887	3.895	-0.008		5473339	46.7		93.4	347573	
D 30 13C2 PFDoA										
615.00 > 570.00	4.187	4.182	0.005		5791861	52.2		104	208775	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.444	4.449	-0.005	1.000	10851	0.1033			251	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.692	4.698	-0.006	1.000	73312	0.3993			277	
713.00 > 169.00	4.692	4.698	-0.006	1.000	9641		7.60(0.00-0.00)		1874	

Report Date: 21-Dec-2016 10:24:03 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161221-38078.b\20DEC2016C_013.d

Injection Date: 20-Dec-2016 18:59:53 Instrument ID: A8_N

Lims ID: 320-23931-A-4-A Lab Sample ID: 320-23931-4

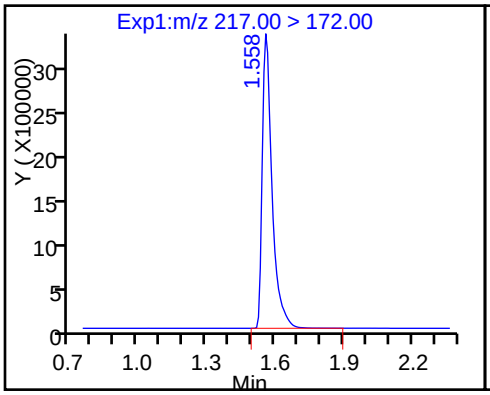
Client ID: 613D41MW-LF-1116

Operator ID: A8-PC\A8 ALS Bottle#: 14 Worklist Smp#: 13

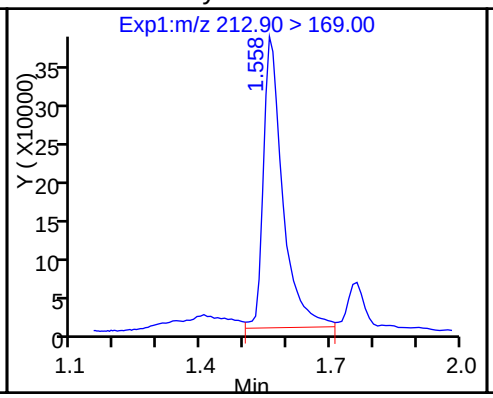
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

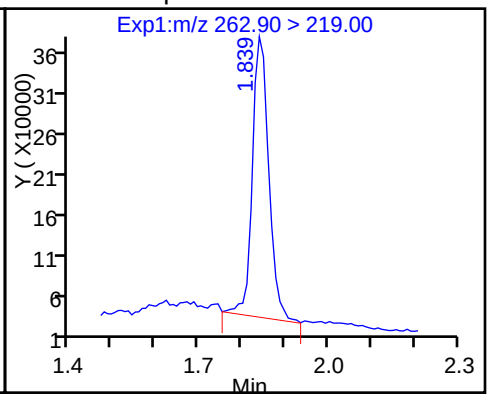
D 2 13C4 PFBA



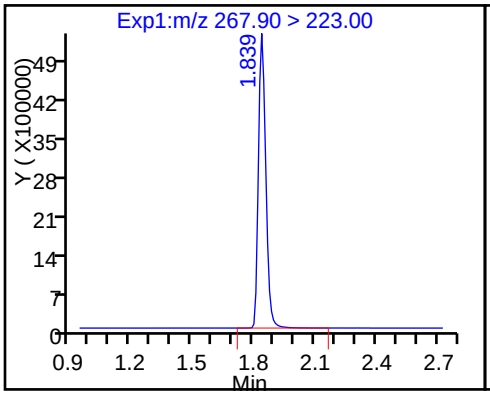
1 Perfluorobutyric acid



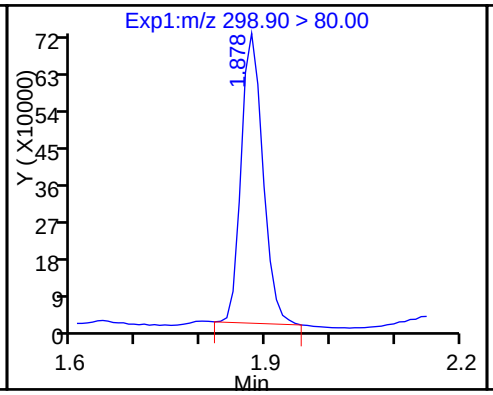
3 Perfluoropentanoic acid



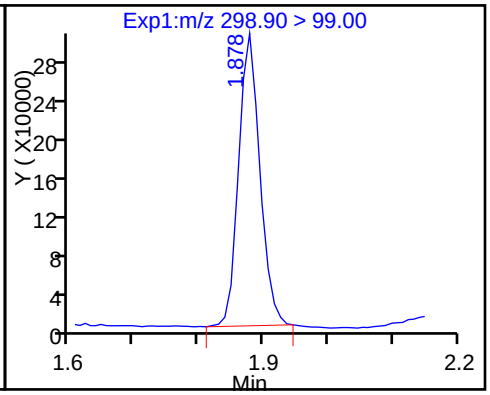
D 4 13C5-PFPeA



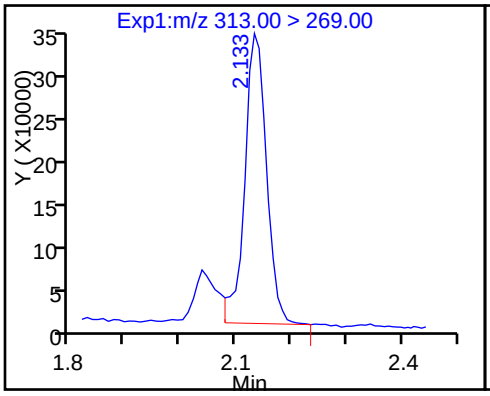
5 Perfluorobutanesulfonic acid



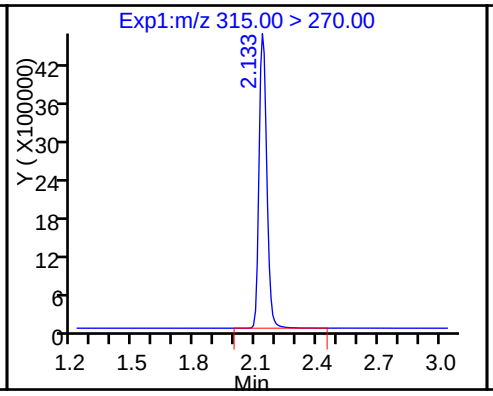
5 Perfluorobutanesulfonic acid



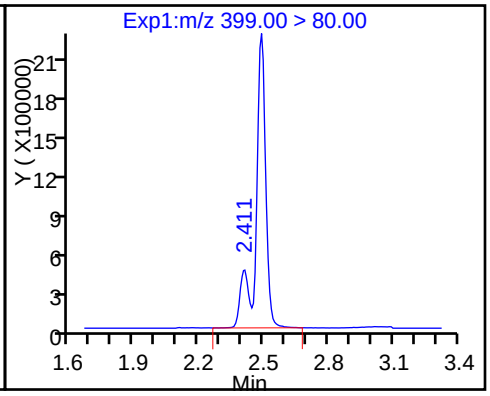
7 Perfluorohexanoic acid



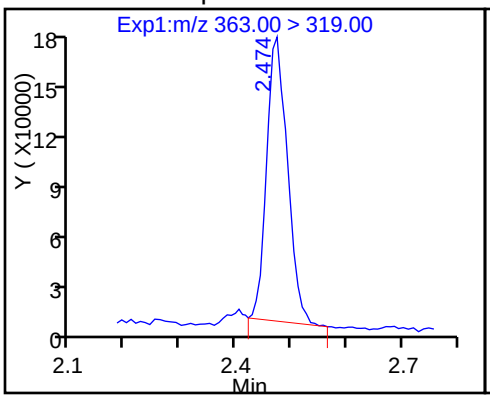
D 6 13C2 PFHxA



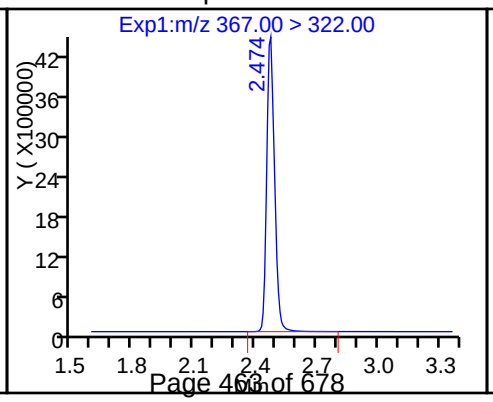
9 Perfluorohexanesulfonic acid



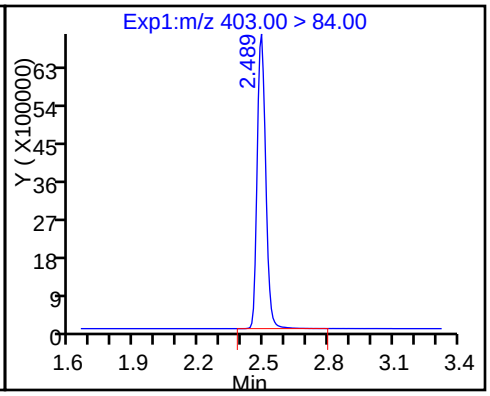
12 Perfluoroheptanoic acid



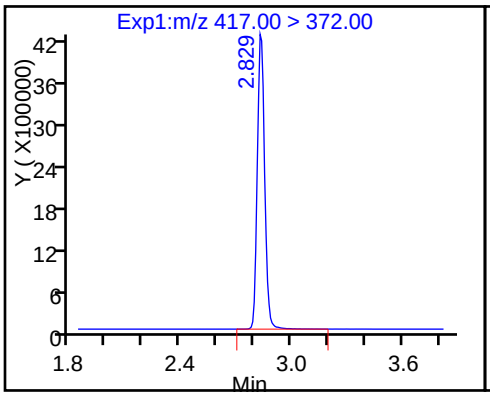
D 11 13C4-PFHpA



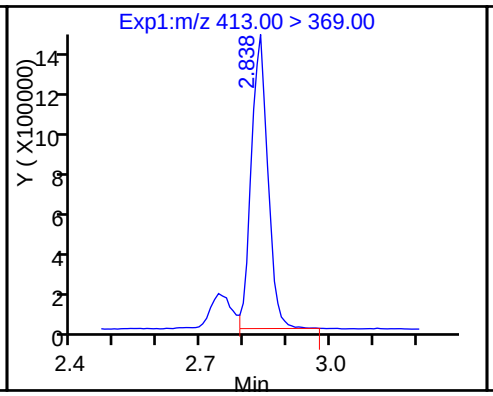
D 10 18O2 PFHxS



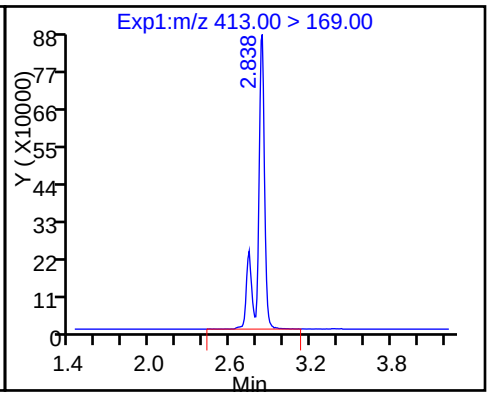
D 14 13C4 PFOA



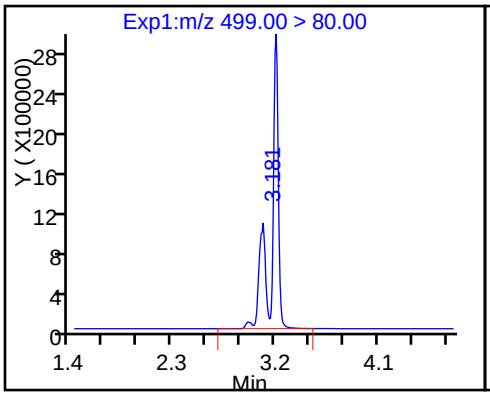
15 Perfluorooctanoic acid



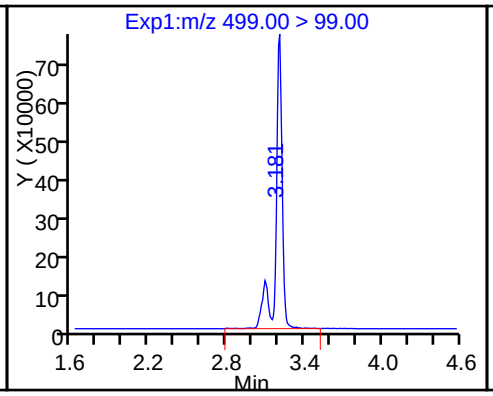
15 Perfluorooctanoic acid



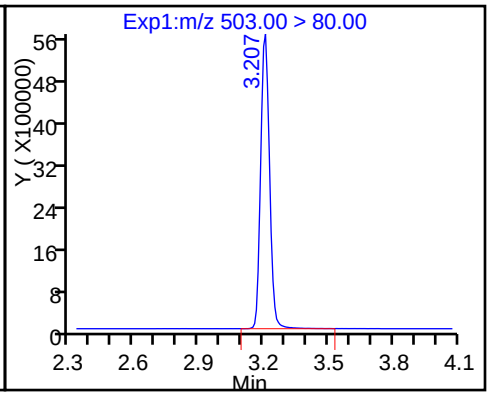
18 Perfluorooctane sulfonic acid



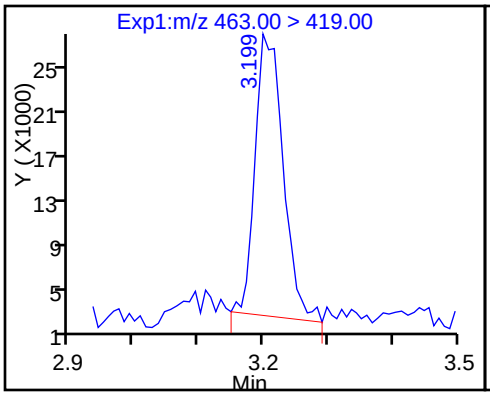
18 Perfluorooctane sulfonic acid



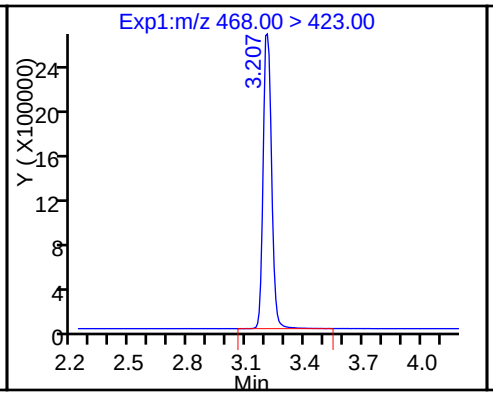
D 17 13C4 PFOS



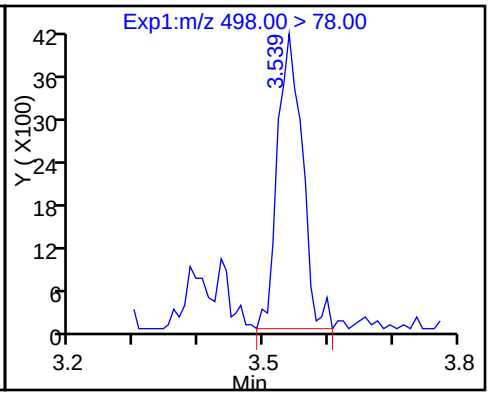
20 Perfluorononanoic acid



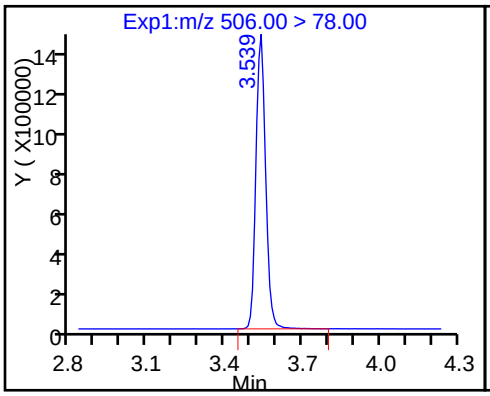
D 19 13C5 PFNA



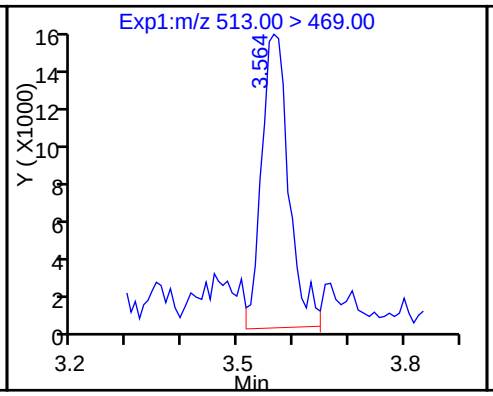
22 Perfluorooctane Sulfonamide



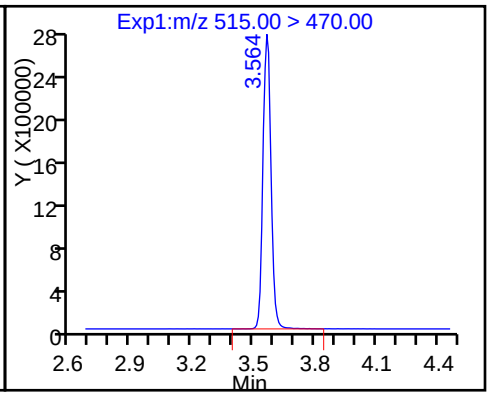
D 21 13C8 FOSA



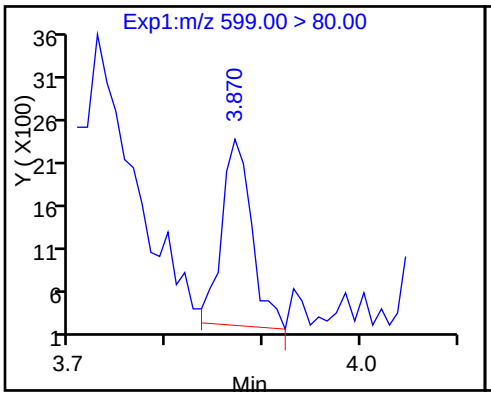
24 Perfluorodecanoic acid



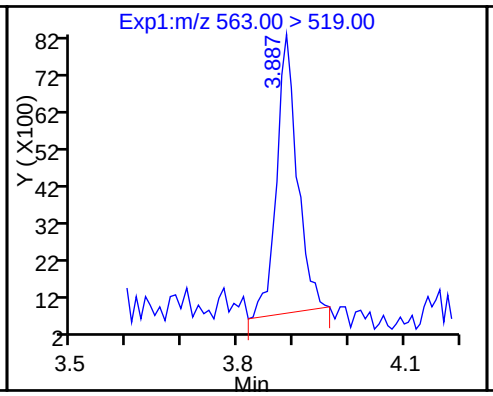
D 23 13C2 PFDA



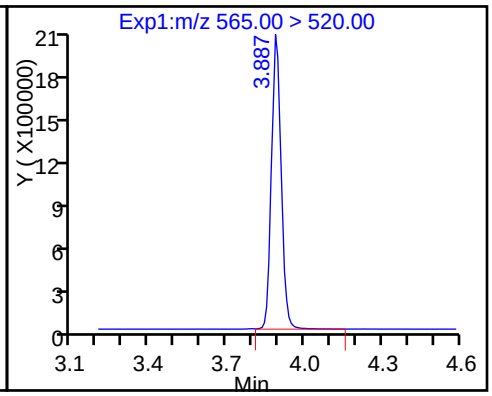
26 Perfluorodecane Sulfonic acid



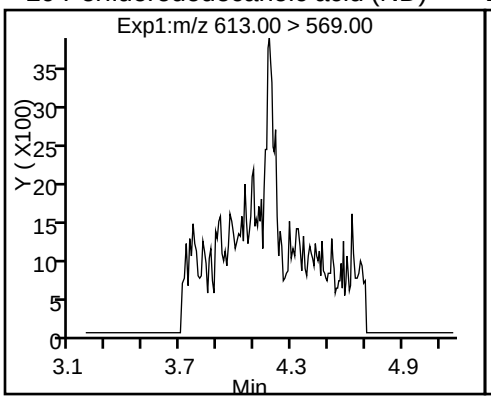
28 Perfluoroundecanoic acid



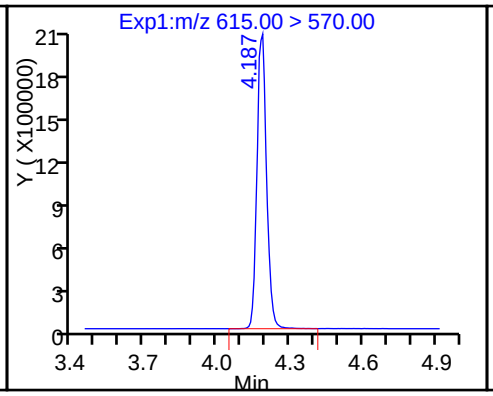
D 27 13C2 PFUnA



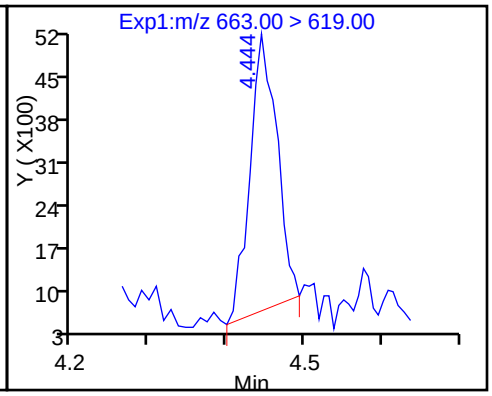
29 Perfluorododecanoic acid (ND)



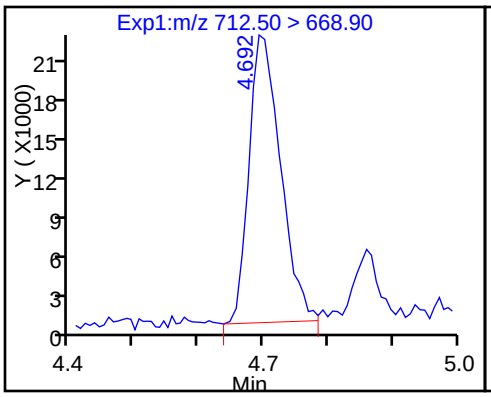
D 30 13C2 PFDoA



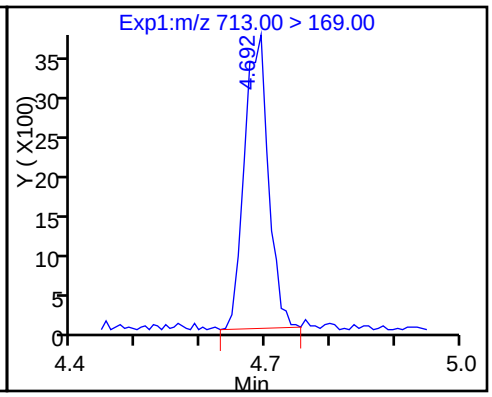
31 Perfluorotridecanoic acid



33 Perfluorotetradecanoic acid



33 Perfluorotetradecanoic acid



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-23931-1

SDG No.:

Client Sample ID: 613D39MW-LF-1116 | Lab Sample ID: 320-23931-5

Matrix: Water | Lab File ID: 16DEC2016C_021.d

Analysis Method: 537 (Modified) | Date Collected: 11/30/2016 15:20

Extraction Method: 3535 | Date Extracted: 12/05/2016 08:31

Sample wt/vol: 277.6(mL) | Date Analyzed: 12/16/2016 20:30

Con. Extract Vol.: 0.5(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 142751 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.0028		0.0023	0.00090	0.00041
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.0018	U	0.0023	0.0018	0.00089
307-24-4	Perfluorohexanoic acid (PFHxA)	0.0018	U	0.0023	0.0018	0.00071
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0018	U	0.0023	0.0018	0.00072
335-67-1	Perfluorooctanoic acid (PFOA)	0.0013	J	0.0023	0.0018	0.00067
375-95-1	Perfluorononanoic acid (PFNA)	0.0018	U	0.0023	0.0018	0.00059
335-76-2	Perfluorodecanoic acid (PFDA)	0.00090	U	0.0023	0.00090	0.00040
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0018	U	0.0023	0.0018	0.00067
307-55-1	Perfluorododecanoic acid (PFDoA)	0.0018	U	0.0023	0.0018	0.00053
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.0018	U	0.0023	0.0018	0.00050
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.00062	J	0.0023	0.00090	0.00036
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.022		0.0023	0.0018	0.00078
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.026		0.0036	0.0027	0.0011
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.0027	U	0.0036	0.0027	0.0011
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.0018	U	0.0023	0.0018	0.00057

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-23931-1

SDG No.:

Client Sample ID: 613D39MW-LF-1116 | Lab Sample ID: 320-23931-5

Matrix: Water | Lab File ID: 16DEC2016C_021.d

Analysis Method: 537 (Modified) | Date Collected: 11/30/2016 15:20

Extraction Method: 3535 | Date Extracted: 12/05/2016 08:31

Sample wt/vol: 277.6(mL) | Date Analyzed: 12/16/2016 20:30

Con. Extract Vol.: 0.5(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 142751 | Units: ug/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	13	Q	25-150
STL00992	13C4 PFBA	43		25-150
STL00993	13C2 PFHxA	77		25-150
STL00990	13C4 PFOA	92		25-150
STL00995	13C5 PFNA	93		25-150
STL00996	13C2 PFDA	97		25-150
STL00997	13C2 PFUnA	97		25-150
STL00998	13C2 PFDoA	86		25-150
STL00994	18O2 PFHxS	92		25-150
STL00991	13C4 PFOS	99		25-150
STL01893	13C5-PFPeA	76		25-150
STL01892	13C4-PFHpA	86		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_021.d
Lims ID: 320-23931-A-5-A
Client ID: 613D39MW-LF-1116
Sample Type: Client
Inject. Date: 16-Dec-2016 20:30:12 ALS Bottle#: 37 Worklist Smp#: 21
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-23931-a-5-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 18-Dec-2016 17:59:51 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK028

First Level Reviewer: chandrasenas Date: 18-Dec-2016 17:48:03

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.574	1.582	-0.008		7451065	21.4		42.9	469863	
1 Perfluorobutyric acid										
212.90 > 169.00	1.574	1.582	-0.008	1.000	194295	1.53			1149	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.849	1.858	-0.009	1.000	43654	0.2202			111	
D 4 13C5-PFPeA										
267.90 > 223.00	1.859	1.858	0.001		10045149	37.8		75.5	623293	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.888	1.896	-0.008	1.000	1390782	3.25				
298.90 > 99.00	1.888	1.896	-0.008	1.000	588049		2.37(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.141	2.153	-0.012		9470921	38.6		77.3	400119	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.141	2.153	-0.012	1.000	19748	0.1122			108	
D 11 13C4-PFHpA										
367.00 > 322.00	2.481	2.500	-0.019		9773819	43.2		86.4	745129	
D 10 18O2 PFHxS										
403.00 > 84.00	2.496	2.508	-0.012		14302399	43.7		92.5	598260	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.496	2.515	-0.019	1.000	3780800	12.1				
15 Perfluorooctanoic acid										
413.00 > 369.00	2.844	2.847	-0.003	1.000	149176	0.6986			522	
413.00 > 169.00	2.844	2.847	-0.003	1.000	94892		1.57(0.90-1.10)		4271	
D 14 13C4 PFOA										
417.00 > 372.00	2.844	2.855	-0.011		10642805	46.2		92.4	629415	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.100	3.120	-0.020	1.000	3511987	14.4			69146	
499.00 > 99.00	3.214	3.120	0.094	1.037	629850		5.58(0.90-1.10)		43344	
D 19 13C5 PFNA										
468.00 > 423.00	3.214	3.227	-0.013		8269190	46.5		93.1	464654	
D 17 13C4 PFOS										
503.00 > 80.00	3.214	3.227	-0.013		11757272	47.2		98.8	234990	
20 Perfluorononanoic acid										
463.00 > 419.00	3.206	3.227	-0.021	1.000	24499	0.1556			126	
D 21 13C8 FOSA										
506.00 > 78.00	3.546	3.558	-0.012		2420339	6.30		12.6	309808	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.571	3.583	-0.012	1.000	12854	0.0892			175	
D 23 13C2 PFDA										
515.00 > 470.00	3.571	3.583	-0.012		7630427	48.5		97.0	281862	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.929	3.893	0.036	1.000	936	0.006517				
D 27 13C2 PFUnA										
565.00 > 520.00	3.894	3.902	-0.008		5695059	48.6		97.1	530841	
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.894	3.911	-0.017	1.000	16451	0.1510			285	
D 30 13C2 PFDoA										
615.00 > 570.00	4.191	4.198	-0.007		4785622	43.1		86.3	172275	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.714	4.702	0.012	1.000	51960	0.3425			94.2	
713.00 > 169.00	4.681	4.702	-0.021	0.993	5761		9.02(0.00-0.00)		2268	

Report Date: 18-Dec-2016 17:59:58 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_021.d

Injection Date: 16-Dec-2016 20:30:12 Instrument ID: A8_N

Lims ID: 320-23931-A-5-A Lab Sample ID: 320-23931-5

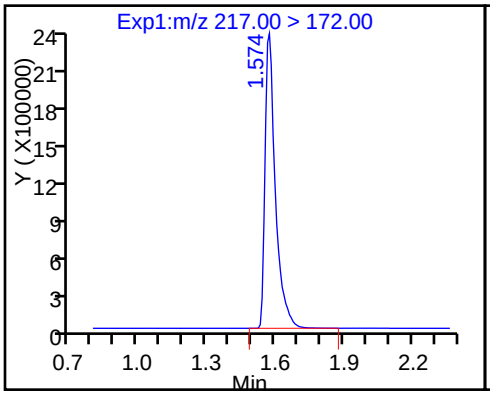
Client ID: 613D39MW-LF-1116

Operator ID: A8-PC\A8 ALS Bottle#: 37 Worklist Smp#: 21

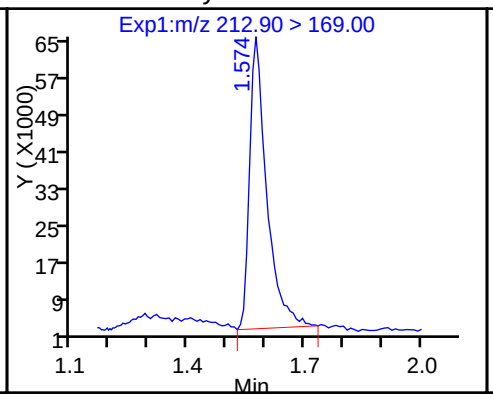
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

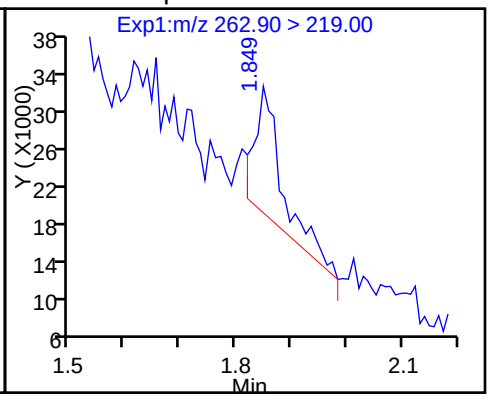
D 2 13C4 PFBA



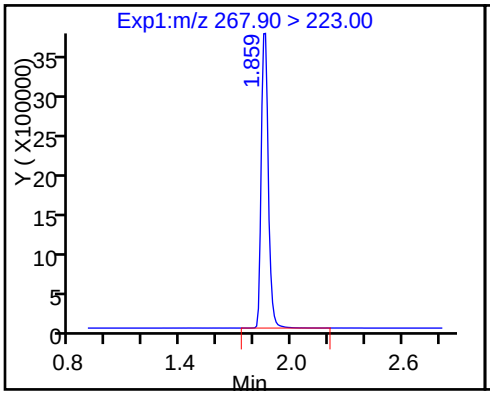
1 Perfluorobutyric acid



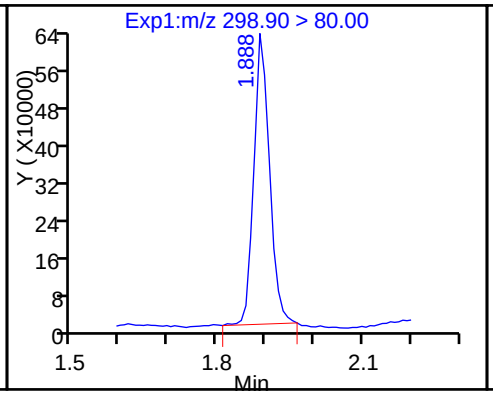
3 Perfluoropentanoic acid



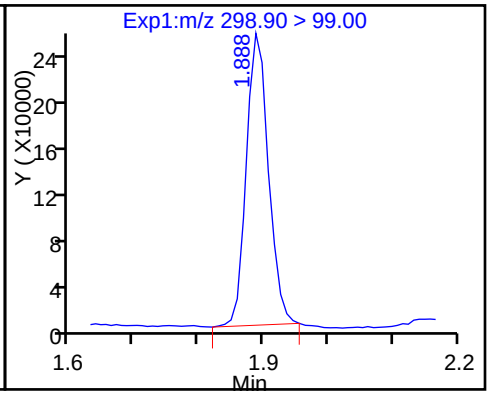
D 4 13C5-PFPeA



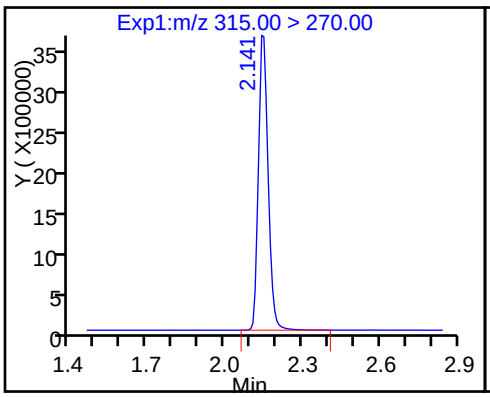
5 Perfluorobutanesulfonic acid



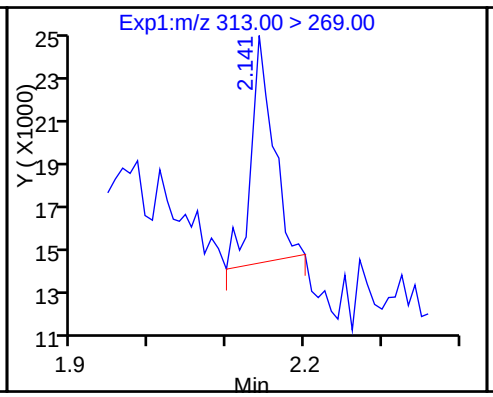
5 Perfluorobutanesulfonic acid



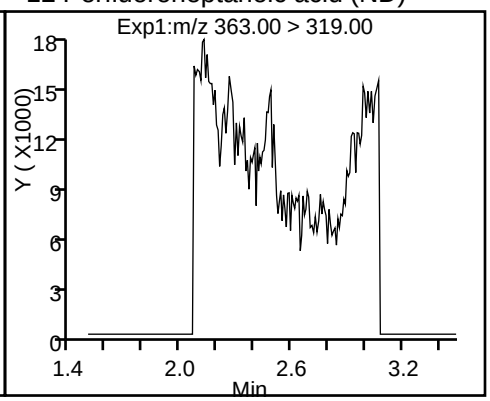
D 6 13C2 PFHxA



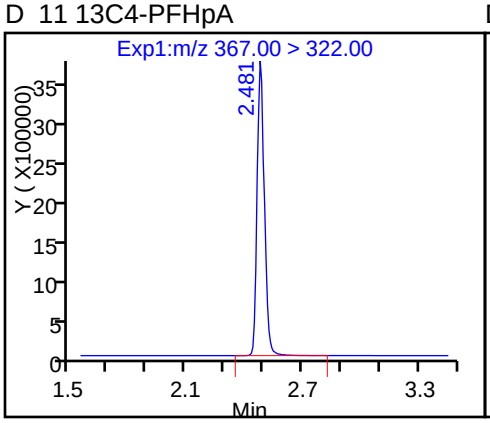
7 Perfluorohexanoic acid



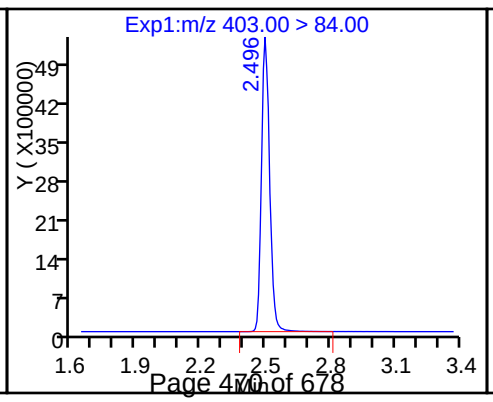
12 Perfluoroheptanoic acid (ND)



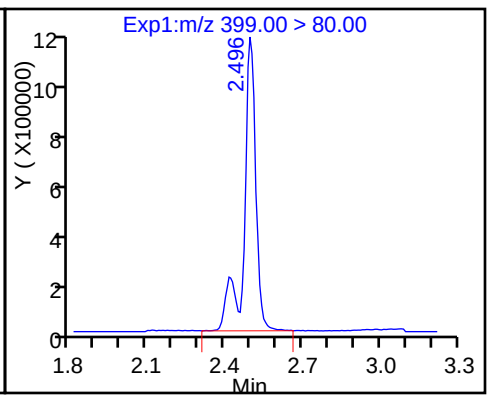
D 11 13C4-PFHpA



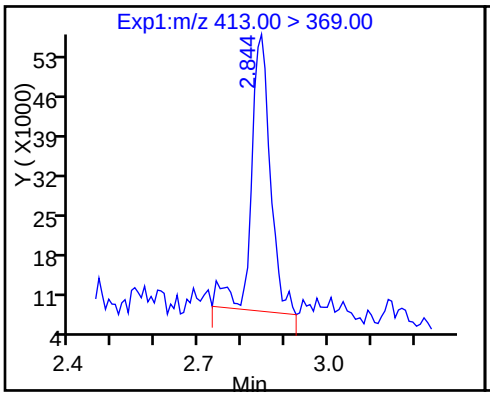
D 10 18O2 PFHxS



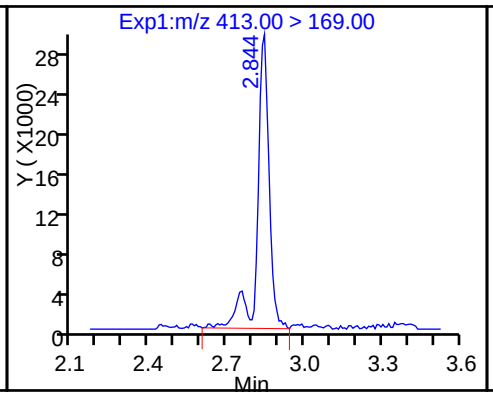
9 Perfluorohexanesulfonic acid



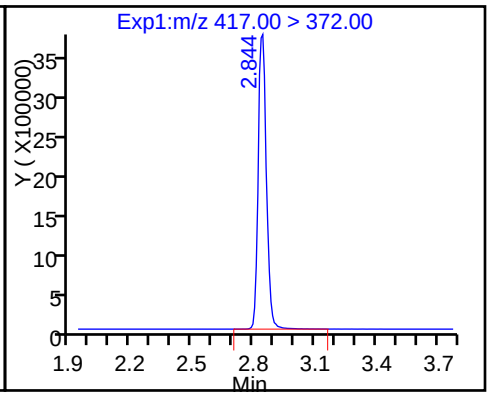
15 Perfluorooctanoic acid



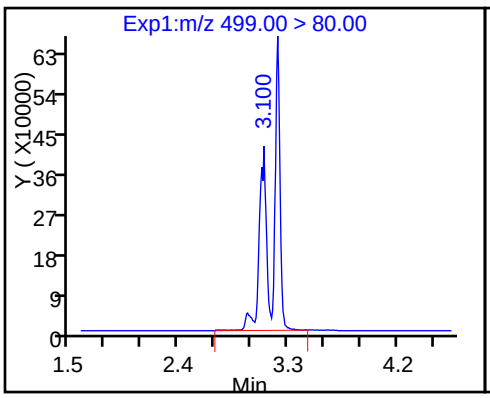
15 Perfluorooctanoic acid



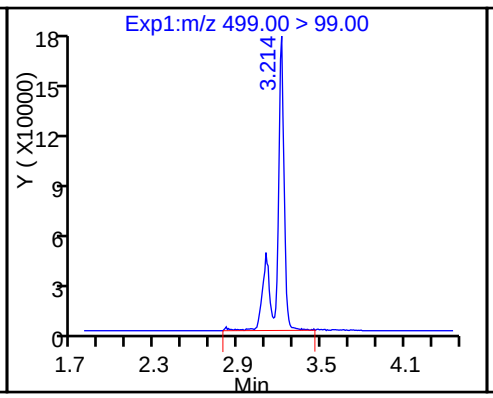
D 14 13C4 PFOA



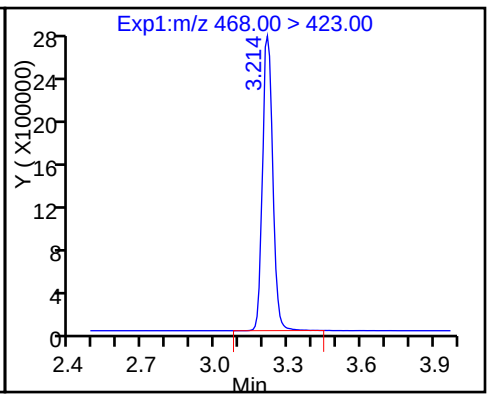
18 Perfluorooctane sulfonic acid



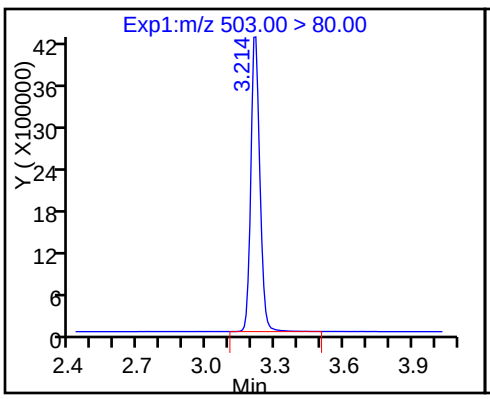
18 Perfluorooctane sulfonic acid



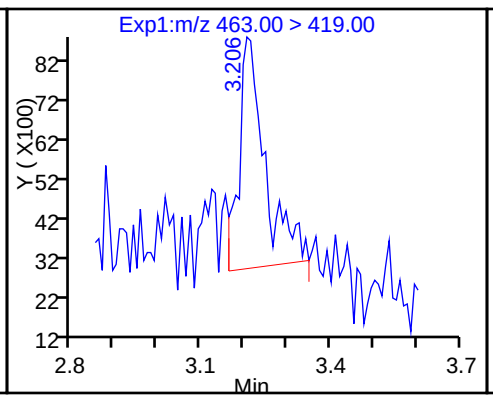
D 19 13C5 PFNA



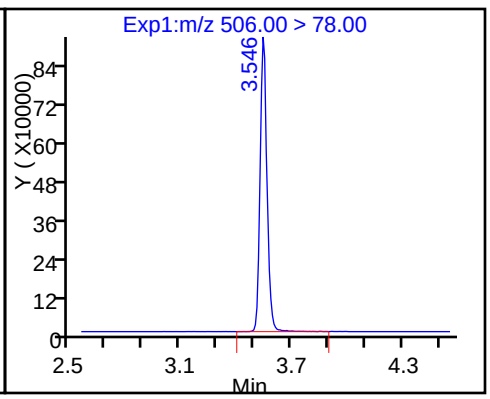
D 17 13C4 PFOS



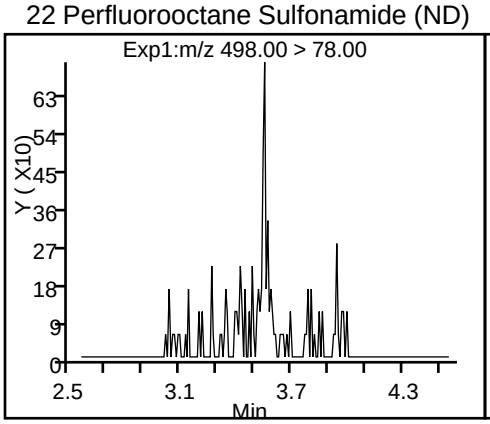
20 Perfluorononanoic acid



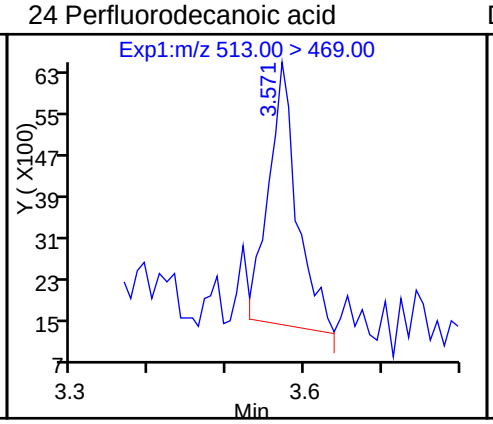
D 21 13C8 FOSA



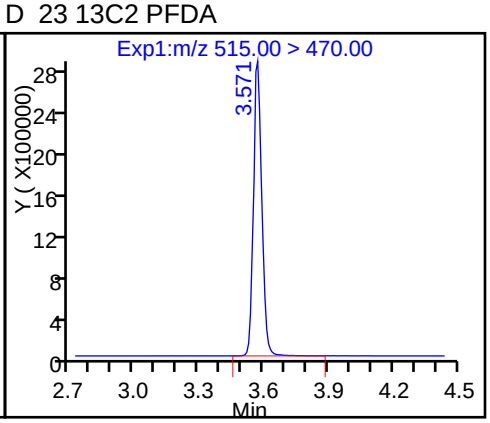
22 Perfluorooctane Sulfonamide (ND)



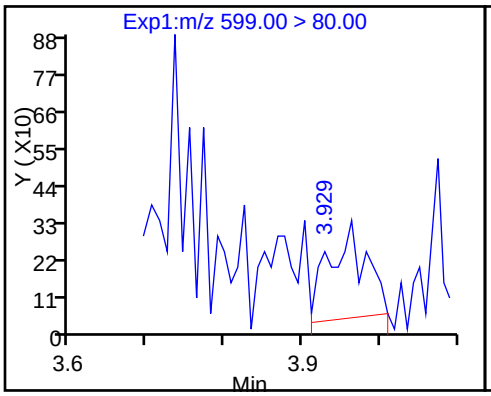
24 Perfluorodecanoic acid



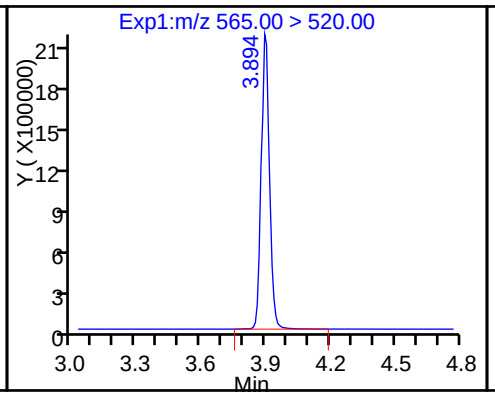
D 23 13C2 PFDA



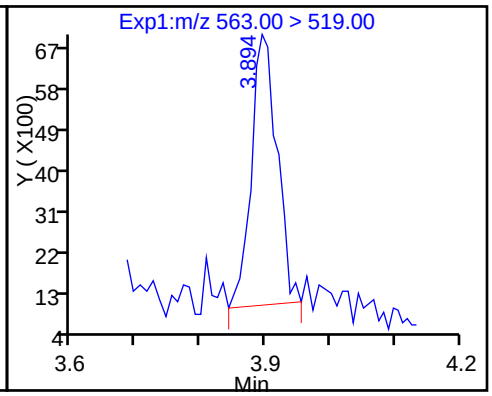
26 Perfluorodecane Sulfonic acid



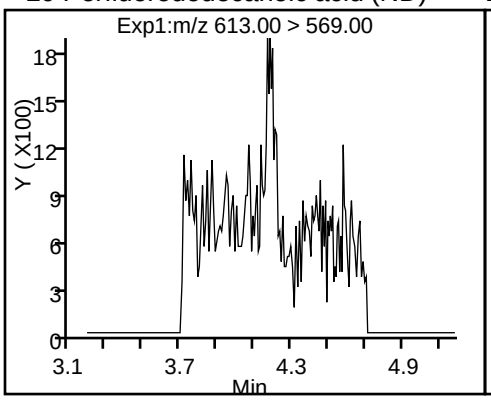
D 27 13C2 PFUnA



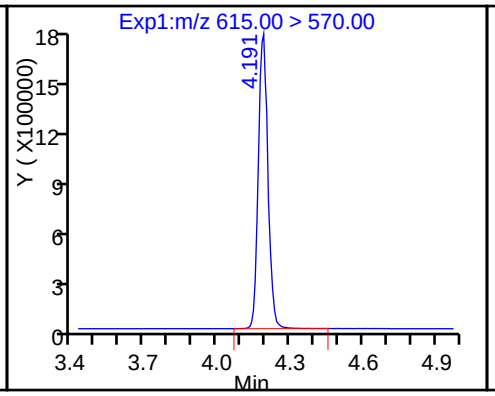
28 Perfluoroundecanoic acid



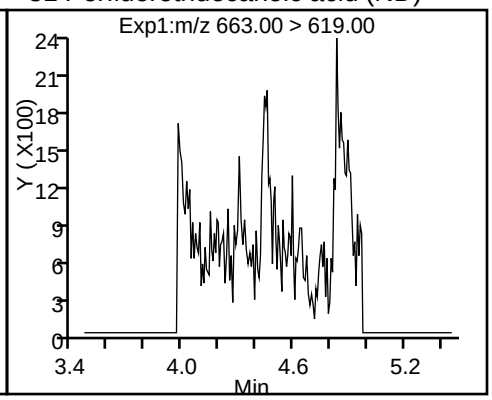
29 Perfluorododecanoic acid (ND)



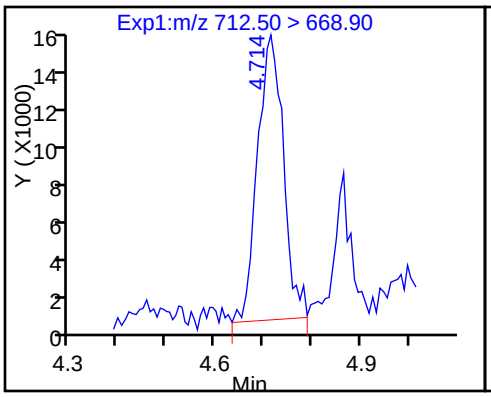
D 30 13C2 PFDoA



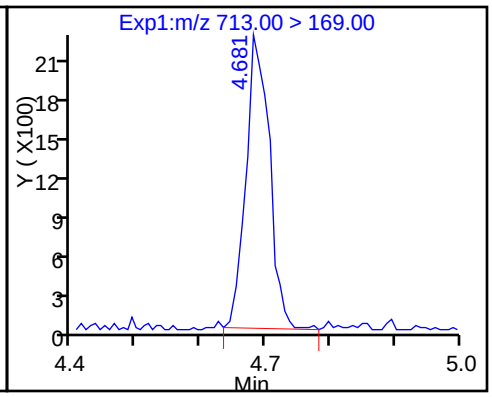
31 Perfluorotridecanoic acid (ND)



33 Perfluorotetradecanoic acid



33 Perfluorotetradecanoic acid



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-23931-1

SDG No.:

Client Sample ID: 613D39MW-LF-1116 RA | Lab Sample ID: 320-23931-5 RA

Matrix: Water | Lab File ID: 20DEC2016C_014.d

Analysis Method: 537 (Modified) | Date Collected: 11/30/2016 15:20

Extraction Method: 3535 | Date Extracted: 12/05/2016 08:31

Sample wt/vol: 277.6(mL) | Date Analyzed: 12/20/2016 19:07

Con. Extract Vol.: 0.5(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 143259 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0062		0.0023	0.0018	0.00083

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00994	18O2 PFHxS	116		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161221-38078.b\20DEC2016C_014.d
Lims ID: 320-23931-A-5-A
Client ID: 613D39MW-LF-1116
Sample Type: Client
Inject. Date: 20-Dec-2016 19:07:24 ALS Bottle#: 15 Worklist Smp#: 14
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-23931-a-5-a
Misc. Info.: Plate: 1 Rack: 4
Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161221-38078.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 21-Dec-2016 10:21:06 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK025

First Level Reviewer: chandrasenas Date: 21-Dec-2016 10:19:56

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	1.560	1.558	0.002		8629438	24.8		49.6	588480	
1 Perfluorobutyric acid										
212.90 > 169.00	1.560	1.566	-0.006	1.000	215591	1.46			1236	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.841	1.839	0.002	1.000	51923	0.2117			148	
D 4 13C5-PFPeA										
267.90 > 223.00	1.841	1.839	0.002		12427822	46.7		93.4	552533	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.880	1.878	0.002	1.000	1847814	3.45				
298.90 > 99.00	1.880	1.878	0.002	1.000	781377		2.36(0.00-0.00)			
7 Perfluorohexanoic acid										
313.00 > 269.00	2.134	2.135	-0.001	1.000	38568	0.1720			141	
D 6 13C2 PFHxA										
315.00 > 270.00	2.134	2.135	-0.001		12071697	49.3		98.5	593376	
D 11 13C4-PFHpA										
367.00 > 322.00	2.469	2.480	-0.011		12406460	54.8		110	920470	
D 10 18O2 PFHxS										
403.00 > 84.00	2.484	2.487	-0.003		17897566	54.7		116	930371	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.407	2.495	-0.088	1.000	4928844	12.6				
15 Perfluorooctanoic acid										
413.00 > 369.00	2.839	2.835	0.004	1.000	185101	0.6789			748	
413.00 > 169.00	2.831	2.835	-0.004	0.997	128053		1.45(0.90-1.10)		4484	
D 14 13C4 PFOA										
417.00 > 372.00	2.831	2.835	-0.004		13590010	59.0		118	820413	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.087	3.099	-0.012	1.000	4663886	14.6			63634	
499.00 > 99.00	3.183	3.099	0.084	1.031	839588		5.55(0.90-1.10)		55025	
D 17 13C4 PFOS										
503.00 > 80.00	3.201	3.204	-0.003		15313477	61.5		129	304164	
20 Perfluorononanoic acid										
463.00 > 419.00	3.210	3.213	-0.003	1.000	24320	0.1207			135	
D 19 13C5 PFNA										
468.00 > 423.00	3.210	3.213	-0.003		10583798	59.6		119	734075	
D 21 13C8 FOSA										
506.00 > 78.00	3.533	3.536	-0.003		3161317	8.23		16.5	206594	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.558	3.570	-0.012	1.000	16022	0.0849			170	
D 23 13C2 PFDA										
515.00 > 470.00	3.566	3.570	-0.004		10002369	63.6		127	428755	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.872	3.877	-0.005	1.000	1145	0.006120				
D 27 13C2 PFUnA										
565.00 > 520.00	3.890	3.895	-0.005		7597346	64.8		130	480605	
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.890	3.895	-0.005	1.000	25493	0.1754			319	
D 30 13C2 PFDoA										
615.00 > 570.00	4.181	4.182	-0.001		6147976	55.4		111	248422	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.705	4.698	0.007	1.000	64301	0.3300			197	
713.00 > 169.00	4.679	4.698	-0.019	0.994	8265		7.78(0.00-0.00)		3564	

Report Date: 21-Dec-2016 10:21:37 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161221-38078.b\20DEC2016C_014.d

Injection Date: 20-Dec-2016 19:07:24 Instrument ID: A8_N

Lims ID: 320-23931-A-5-A Lab Sample ID: 320-23931-5

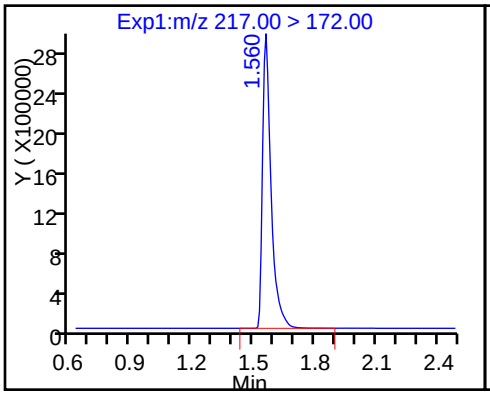
Client ID: 613D39MW-LF-1116

Operator ID: A8-PC\A8 ALS Bottle#: 15 Worklist Smp#: 14

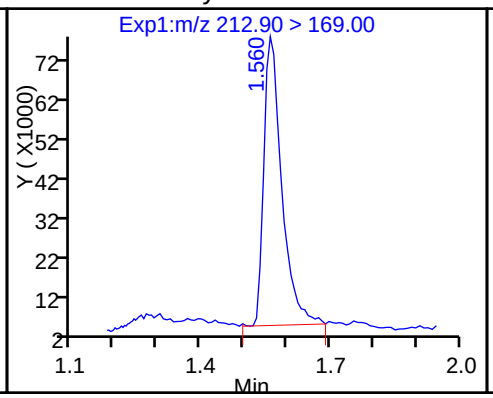
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

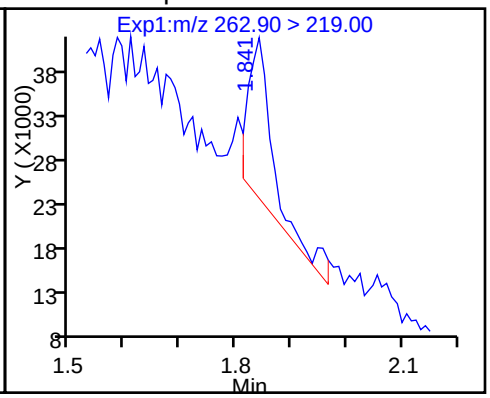
D 2 13C4 PFBA



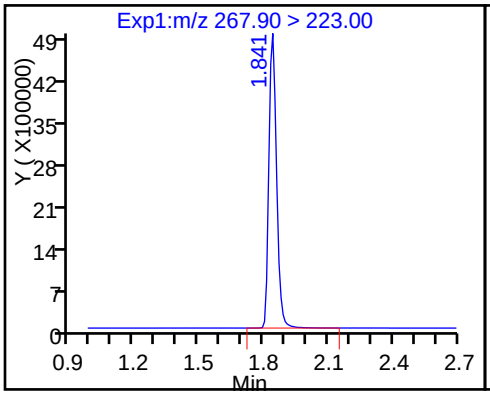
1 Perfluorobutyric acid



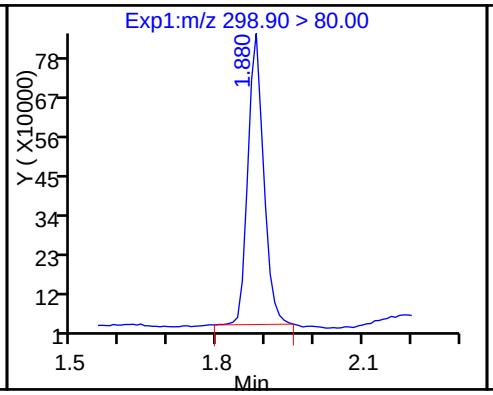
3 Perfluoropentanoic acid



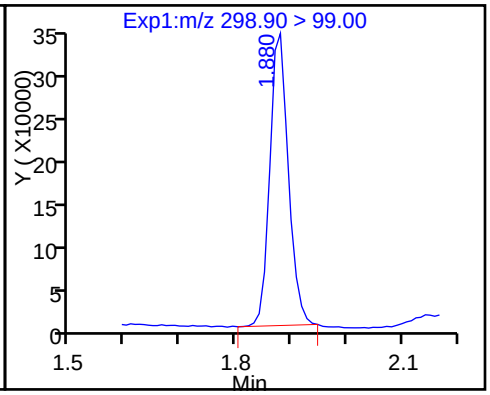
D 4 13C5-PFPeA



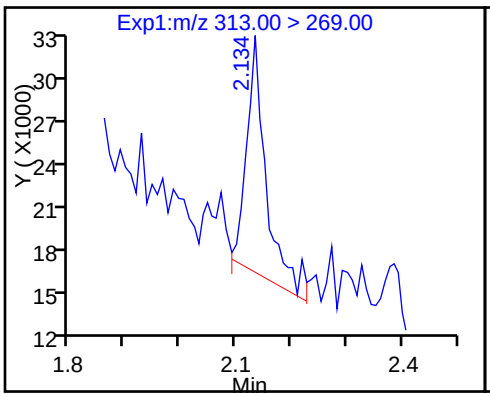
5 Perfluorobutanesulfonic acid



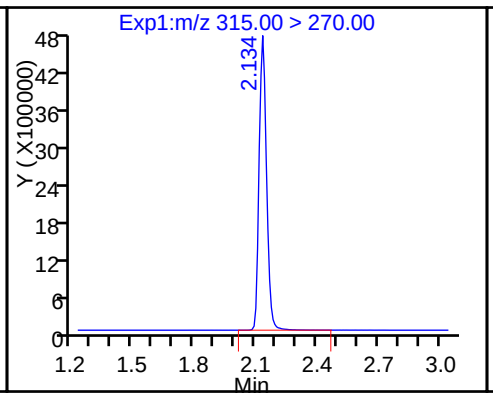
5 Perfluorobutanesulfonic acid



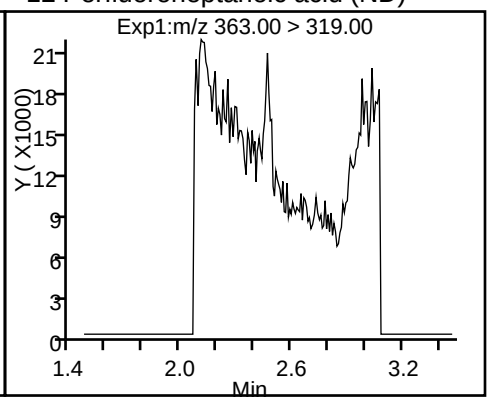
7 Perfluorohexanoic acid



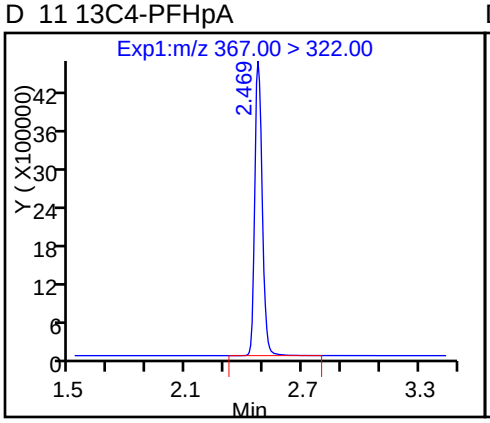
D 6 13C2 PFHxA



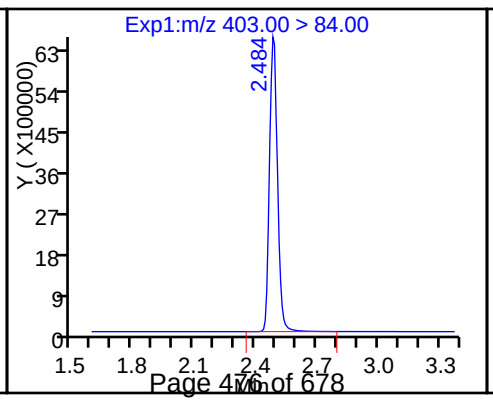
12 Perfluoroheptanoic acid (ND)



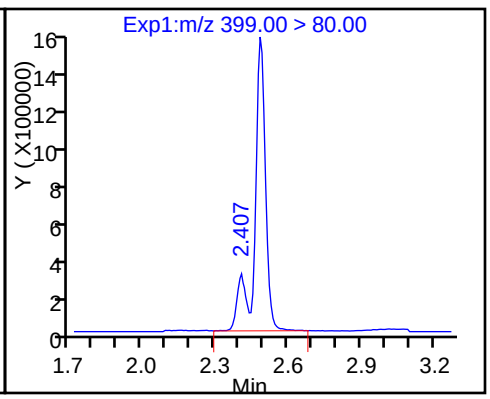
D 11 13C4-PFHpA



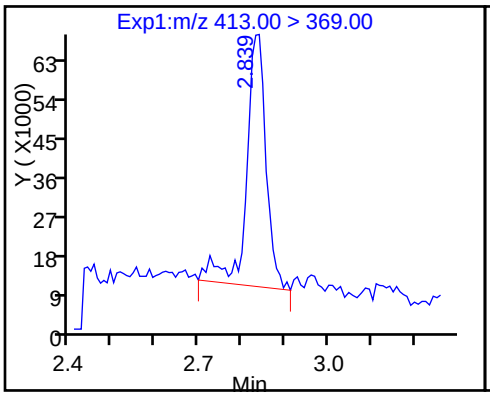
D 10 18O2 PFHxS



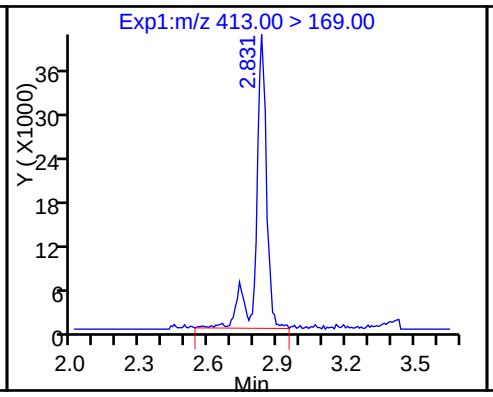
9 Perfluorohexanesulfonic acid



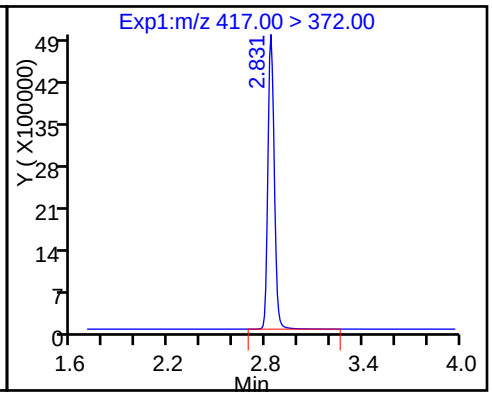
15 Perfluorooctanoic acid



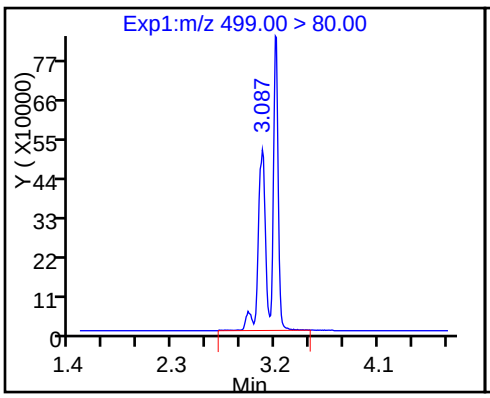
15 Perfluorooctanoic acid



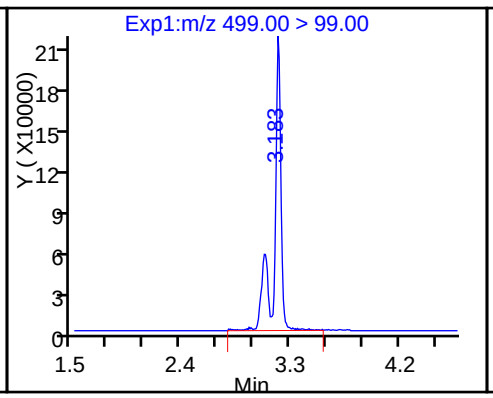
D 14 13C4 PFOA



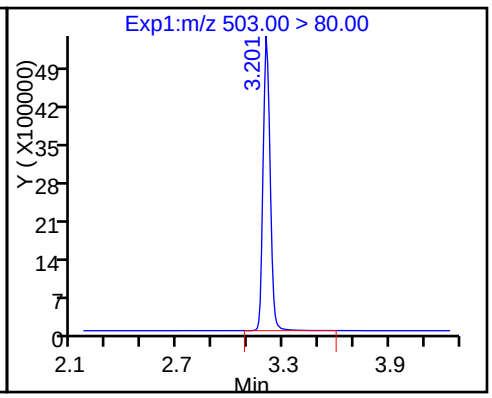
18 Perfluorooctane sulfonic acid



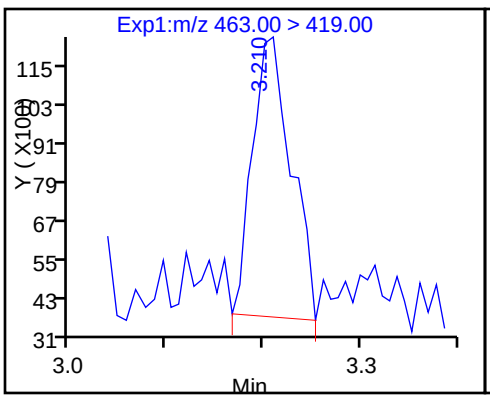
18 Perfluorooctane sulfonic acid



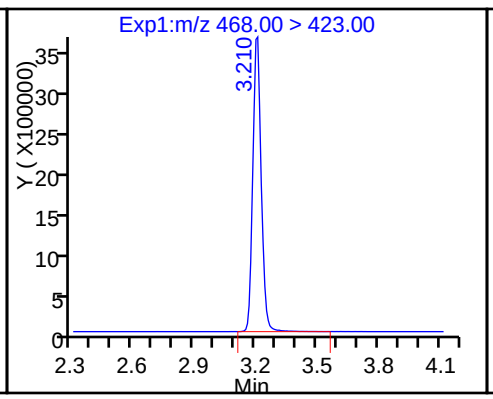
D 17 13C4 PFOS



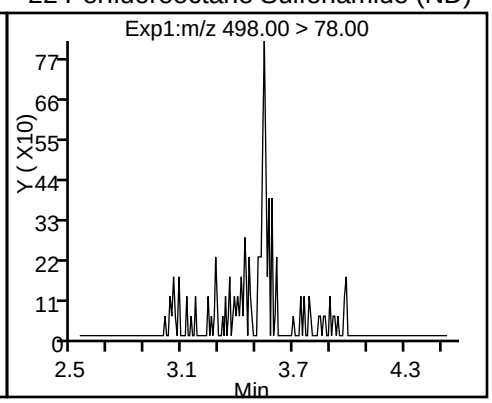
20 Perfluorononanoic acid



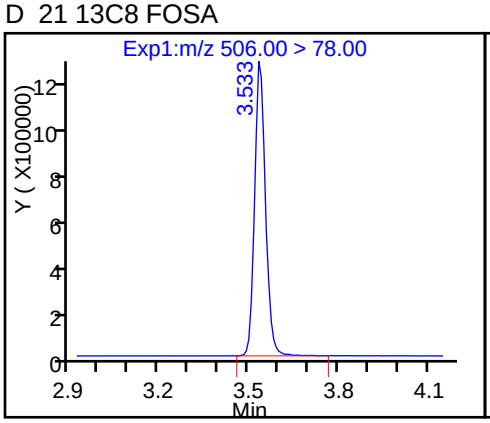
D 19 13C5 PFNA



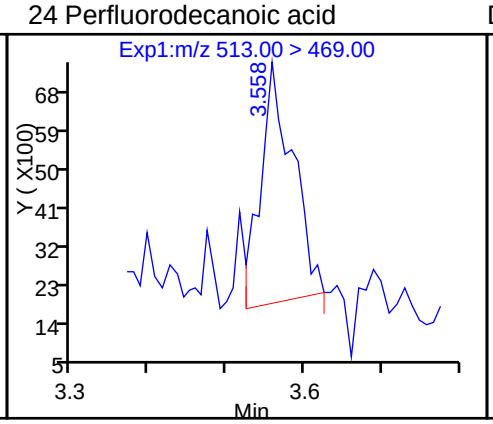
22 Perfluorooctane Sulfonamide (ND)



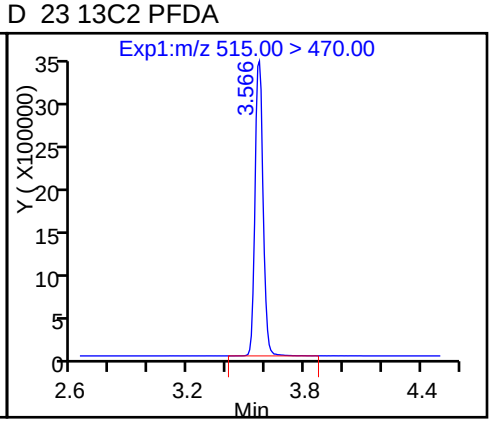
D 21 13C8 FOSA



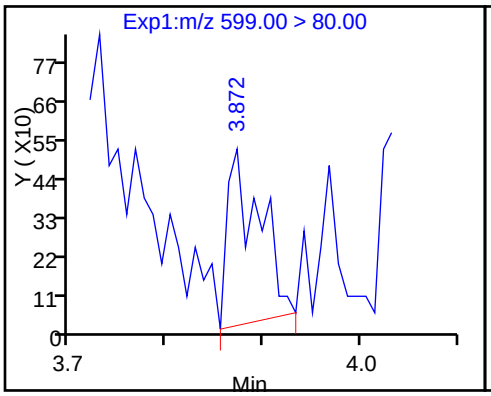
24 Perfluorodecanoic acid



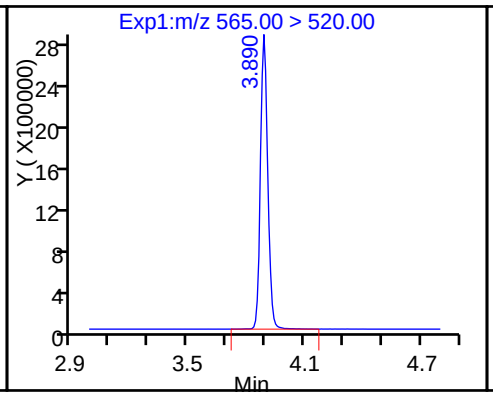
D 23 13C2 PFDA



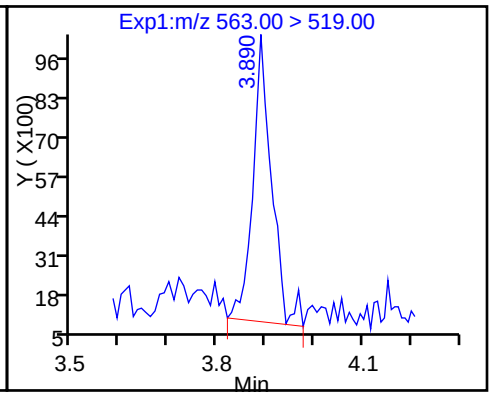
26 Perfluorodecane Sulfonic acid



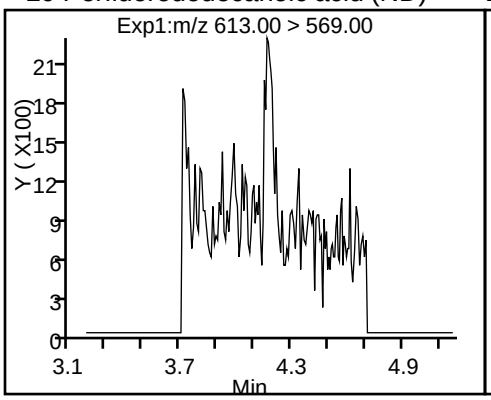
D 27 13C2 PFUnA



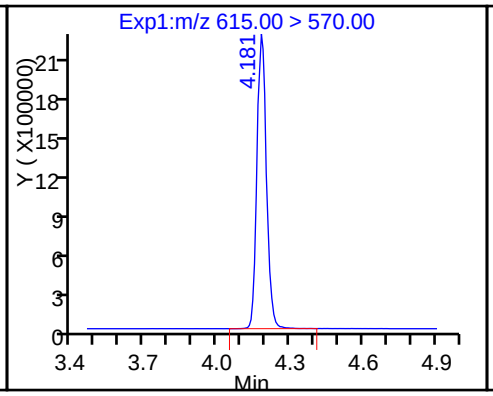
28 Perfluoroundecanoic acid



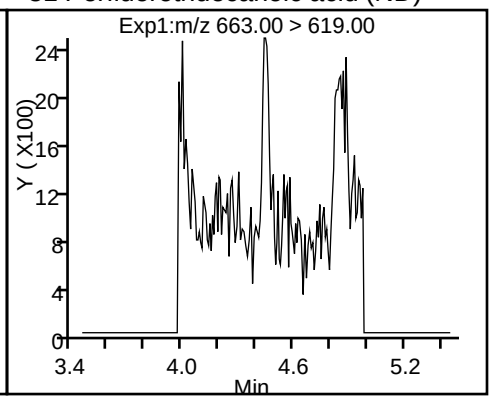
29 Perfluorododecanoic acid (ND)



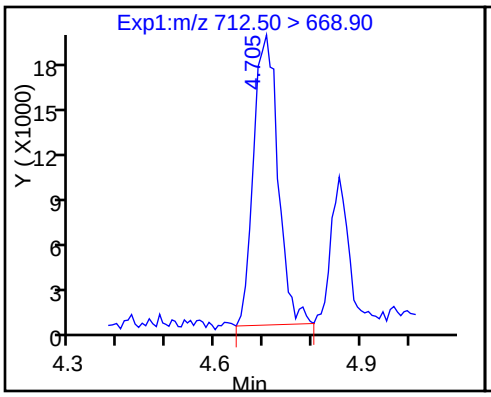
D 30 13C2 PFDoA



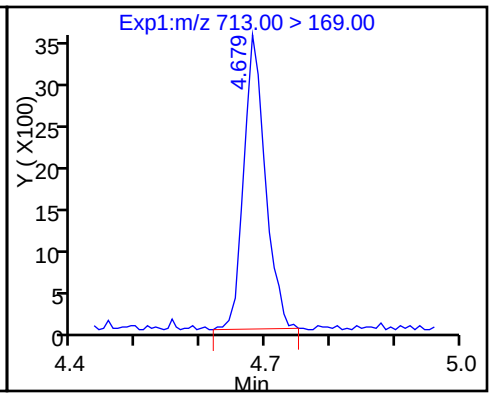
31 Perfluorotridecanoic acid (ND)



33 Perfluorotetradecanoic acid



33 Perfluorotetradecanoic acid



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-23931-1

SDG No.:

Client Sample ID: FB113016 | Lab Sample ID: 320-23931-6

Matrix: Water | Lab File ID: 16DEC2016C_022.d

Analysis Method: 537 (Modified) | Date Collected: 11/30/2016 15:35

Extraction Method: 3535 | Date Extracted: 12/05/2016 08:31

Sample wt/vol: 280.2(mL) | Date Analyzed: 12/16/2016 20:37

Con. Extract Vol.: 0.5(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 142751 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.00089	U	0.0022	0.00089	0.00041
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.0018	U	0.0022	0.0018	0.00088
307-24-4	Perfluorohexanoic acid (PFHxA)	0.0018	U	0.0022	0.0018	0.00070
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0018	U	0.0022	0.0018	0.00072
335-67-1	Perfluorooctanoic acid (PFOA)	0.0018	U	0.0022	0.0018	0.00067
375-95-1	Perfluorononanoic acid (PFNA)	0.0018	U	0.0022	0.0018	0.00058
335-76-2	Perfluorodecanoic acid (PFDA)	0.00089	U	0.0022	0.00089	0.00039
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0018	U	0.0022	0.0018	0.00067
307-55-1	Perfluorododecanoic acid (PFDoA)	0.0018	U	0.0022	0.0018	0.00052
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.0018	U	0.0022	0.0018	0.00049
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.00041	J	0.0022	0.00089	0.00036
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0018	U Q	0.0022	0.0018	0.00082
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.0018	U	0.0022	0.0018	0.00078
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0027	U	0.0036	0.0027	0.0011
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.0027	U	0.0036	0.0027	0.0011
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.0018	U	0.0022	0.0018	0.00057

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Client Sample ID: FB113016 Lab Sample ID: 320-23931-6

Matrix: Water Lab File ID: 16DEC2016C_022.d

Analysis Method: 537 (Modified) Date Collected: 11/30/2016 15:35

Extraction Method: 3535 Date Extracted: 12/05/2016 08:31

Sample wt/vol: 280.2(mL) Date Analyzed: 12/16/2016 20:37

Con. Extract Vol.: 0.5(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 142751 Units: ug/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	55		25-150
STL00992	13C4 PFBA	106		25-150
STL00993	13C2 PFHxA	105		25-150
STL00990	13C4 PFOA	110		25-150
STL00995	13C5 PFNA	109		25-150
STL00996	13C2 PFDA	115		25-150
STL00997	13C2 PFUnA	116		25-150
STL00998	13C2 PFDoA	104		25-150
STL00994	18O2 PFHxS	102		25-150
STL00991	13C4 PFOS	102		25-150
STL01893	13C5-PFPeA	113		25-150
STL01892	13C4-PFHpA	111		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_022.d
Lims ID: 320-23931-A-6-A
Client ID: FB113016
Sample Type: Client
Inject. Date: 16-Dec-2016 20:37:43 ALS Bottle#: 38 Worklist Smp#: 22
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-23931-a-6-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 18-Dec-2016 17:59:51 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK028

First Level Reviewer: chandrasenas Date: 18-Dec-2016 17:48:38

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	1.573	1.582	-0.009		18405480	52.9		106	933287	
1 Perfluorobutyric acid										
212.90 > 169.00	1.581	1.582	-0.001	1.000	20536	0.0653			81.8	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.858	1.858	0.0	1.000	32400	0.1090			135	
D 4 13C5-PFPeA										
267.90 > 223.00	1.858	1.858	0.0		15066980	56.6		113	912788	
D 6 13C2 PFHxA										
315.00 > 270.00	2.145	2.153	-0.008		12810077	52.3		105	797384	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.145	2.153	-0.008	1.000	11474	0.0482			240	
D 11 13C4-PFHpA										
367.00 > 322.00	2.489	2.500	-0.011		12552877	55.5		111	1104259	
D 10 18O2 PFHxS										
403.00 > 84.00	2.497	2.508	-0.011		15735978	48.1		102	754258	
D 14 13C4 PFOA										
417.00 > 372.00	2.846	2.855	-0.009		12683473	55.1		110	754072	
D 19 13C5 PFNA										
468.00 > 423.00	3.226	3.227	-0.001		9642527	54.3		109	1023555	
D 17 13C4 PFOS										
503.00 > 80.00	3.217	3.227	-0.010		12136250	48.8		102	734757	
D 21 13C8 FOSA										
506.00 > 78.00	3.548	3.558	-0.010		10590323	27.6		55.1	569451	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.565	3.583	-0.018	1.000	4143	0.0242			140	
D 23 13C2 PFDA										
515.00 > 470.00	3.573	3.583	-0.010		9051517	57.5		115	555738	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.905	3.893	0.012	1.000	365	0.002462				
D 27 13C2 PFUnA										
565.00 > 520.00	3.897	3.902	-0.006		6786777	57.9		116	486213	
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.905	3.911	-0.006	1.000	20738	0.1598			489	
D 30 13C2 PFDoA										
615.00 > 570.00	4.188	4.198	-0.010		5788472	52.2		104	205327	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.714	4.702	0.012	1.000	41661	0.2271			71.2	
713.00 > 169.00	4.679	4.702	-0.023	0.993	5615		7.42(0.00-0.00)		2318	

Report Date: 18-Dec-2016 17:59:59 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_022.d

Injection Date: 16-Dec-2016 20:37:43 Instrument ID: A8_N

Lims ID: 320-23931-A-6-A Lab Sample ID: 320-23931-6

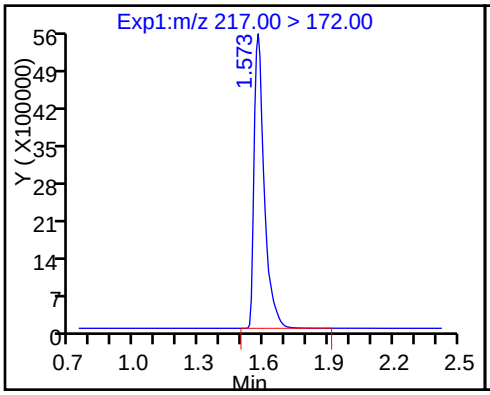
Client ID: FB113016

Operator ID: A8-PC\A8 ALS Bottle#: 38 Worklist Smp#: 22

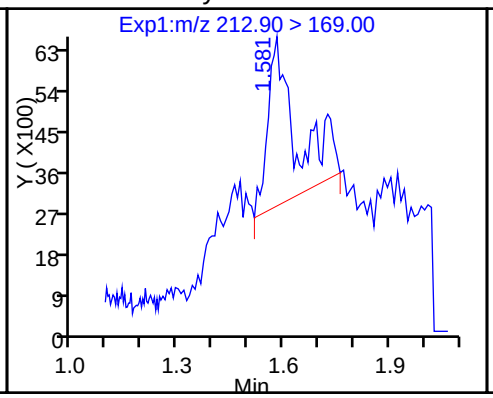
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

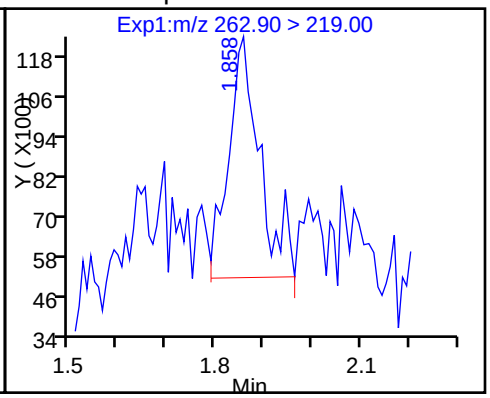
D 2 13C4 PFBA



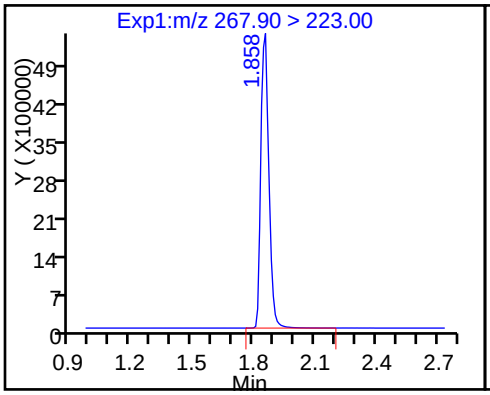
1 Perfluorobutyric acid



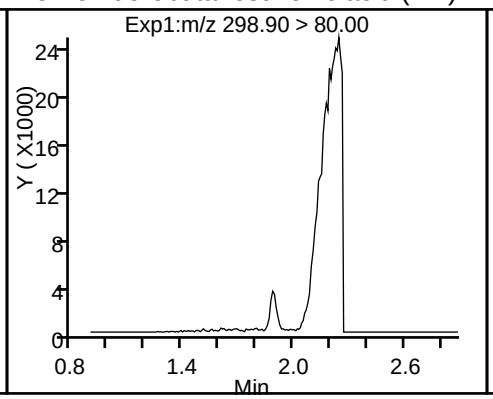
3 Perfluoropentanoic acid



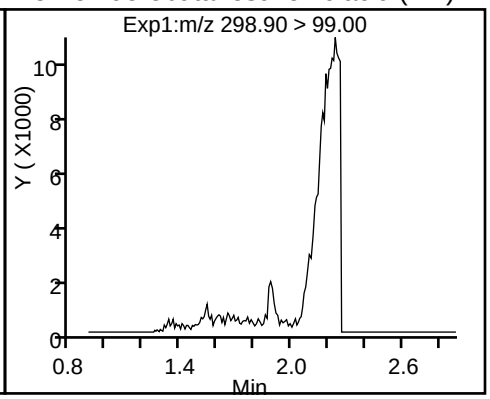
D 4 13C5-PFPeA



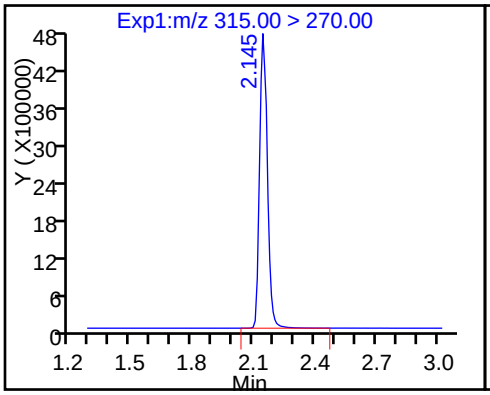
5 Perfluorobutanesulfonic acid (ND)



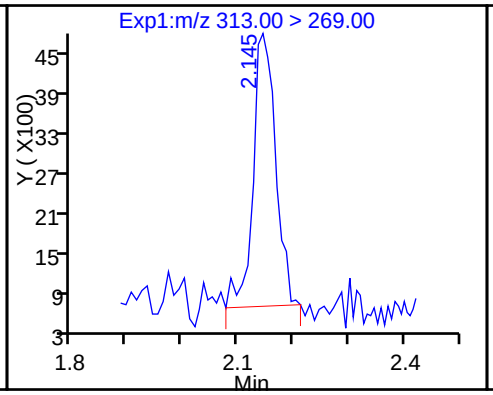
5 Perfluorobutanesulfonic acid (ND)



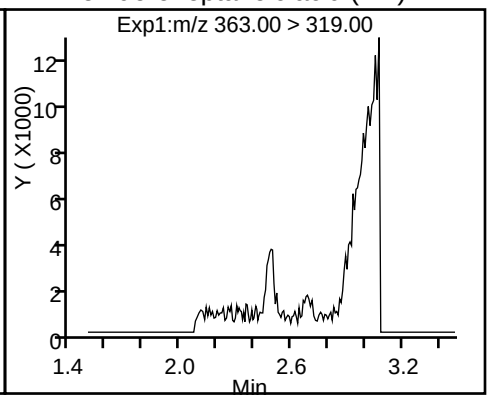
D 6 13C2 PFHxA



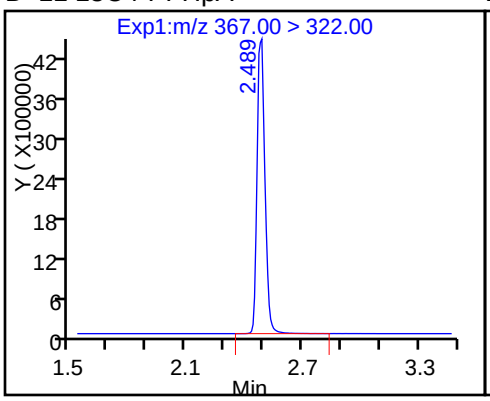
7 Perfluorohexanoic acid



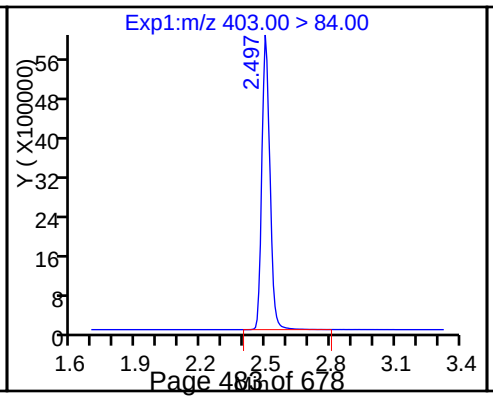
12 Perfluoroheptanoic acid (ND)



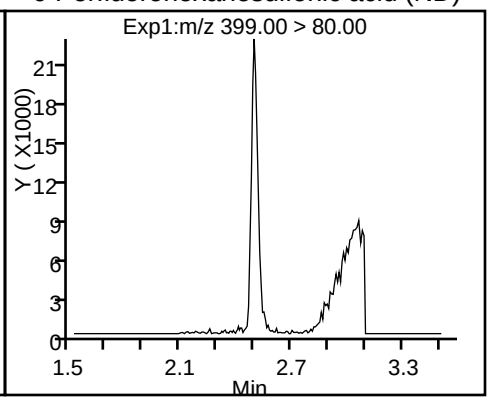
D 11 13C4-PFHpA



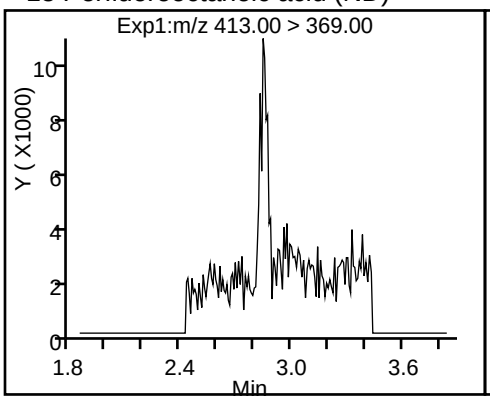
D 10 18O2 PFHxS



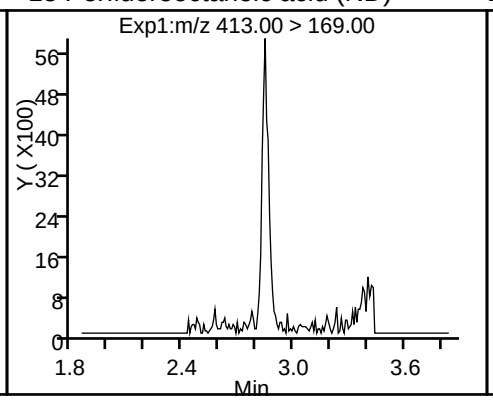
9 Perfluorohexanesulfonic acid (ND)



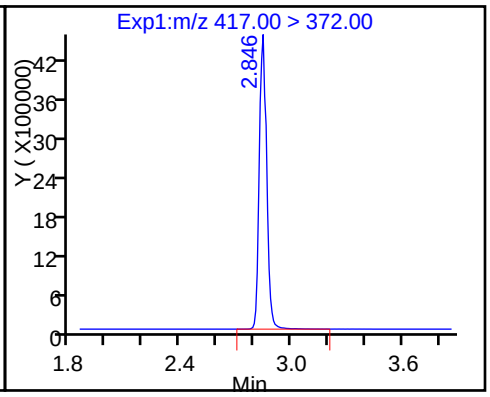
15 Perfluorooctanoic acid (ND)



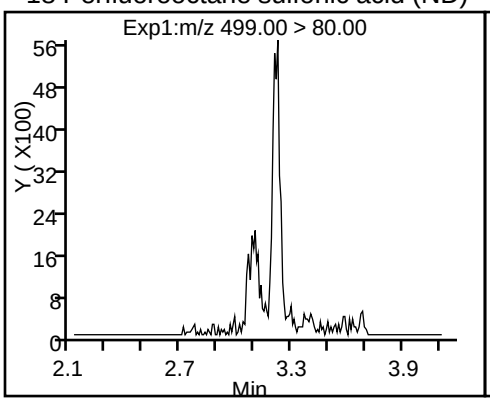
15 Perfluorooctanoic acid (ND)



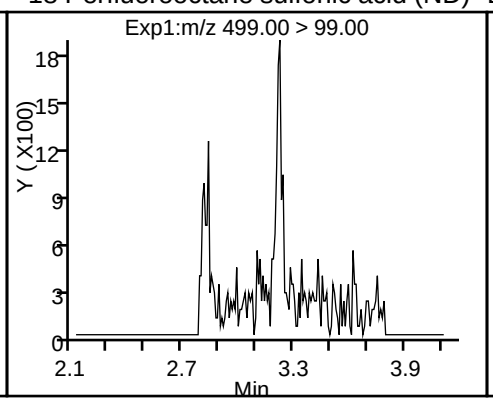
D 14 13C4 PFOA



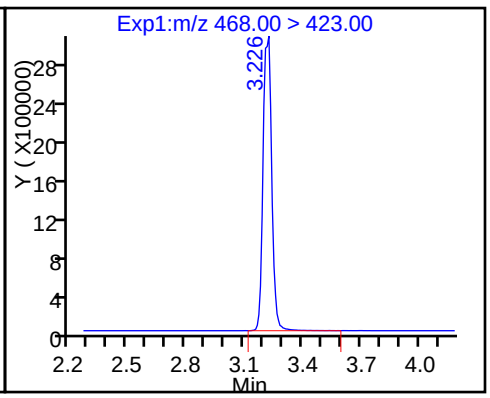
18 Perfluorooctane sulfonic acid (ND)



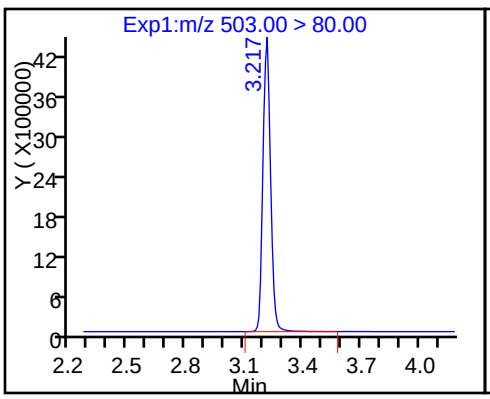
18 Perfluorooctane sulfonic acid (ND)



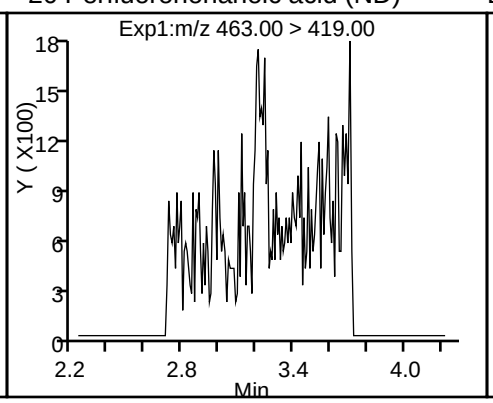
D 19 13C5 PFNA



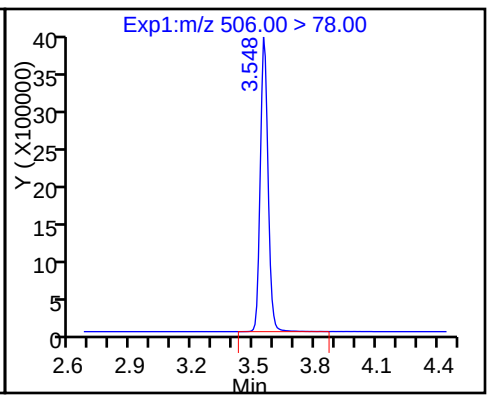
D 17 13C4 PFOS



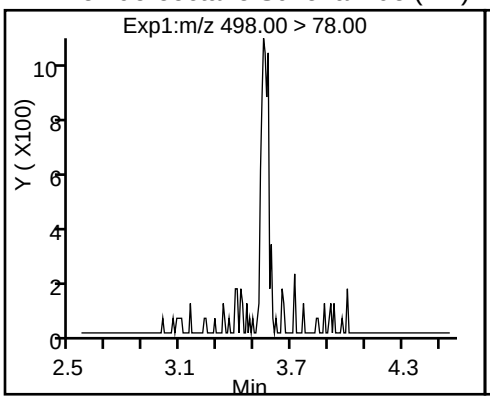
20 Perfluorononanoic acid (ND)



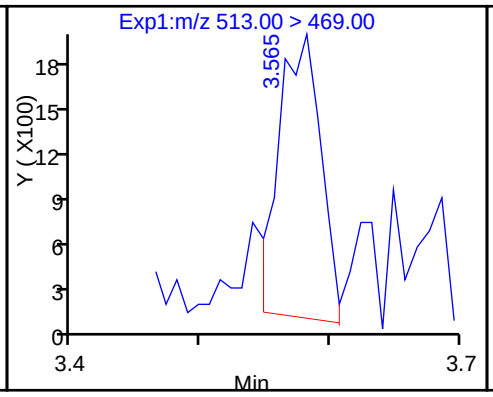
D 21 13C8 FOSA



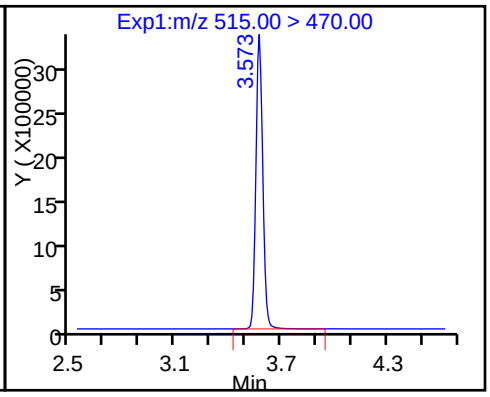
22 Perfluorooctane Sulfonamide (ND)



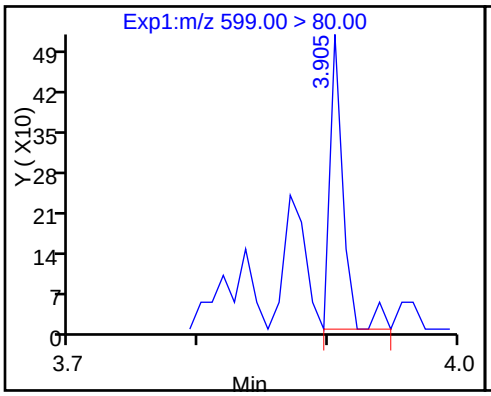
24 Perfluorodecanoic acid



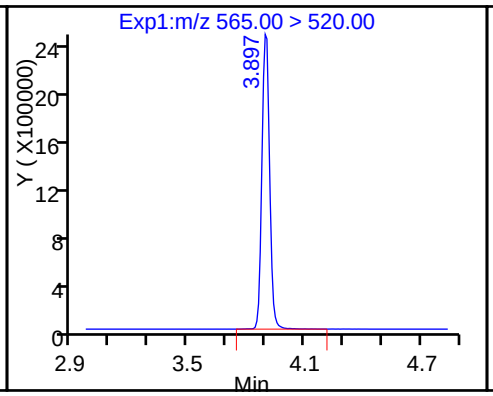
D 23 13C2 PFDA



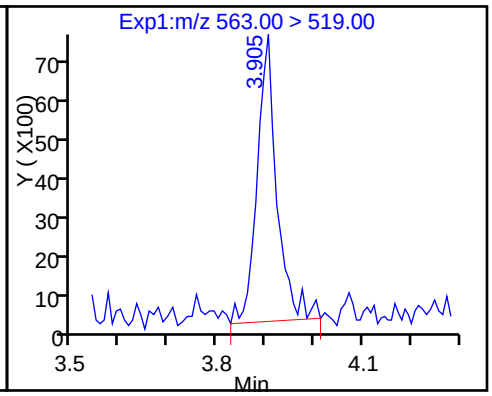
26 Perfluorodecane Sulfonic acid



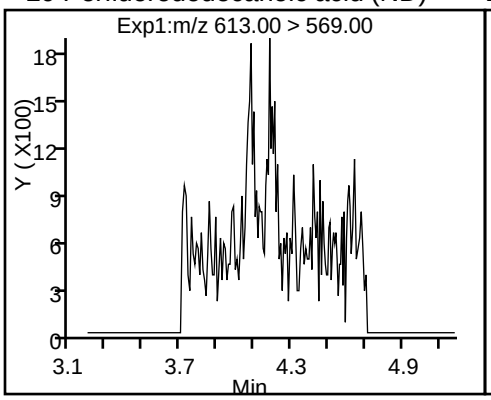
D 27 13C2 PFUnA



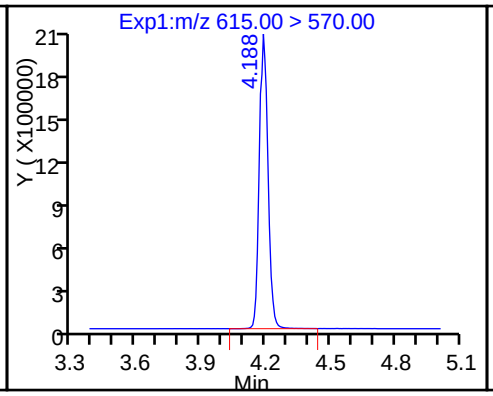
28 Perfluoroundecanoic acid



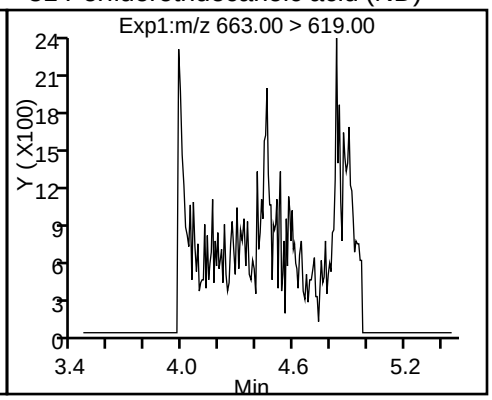
29 Perfluorododecanoic acid (ND)



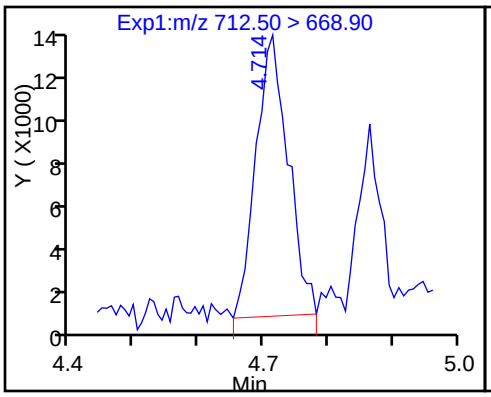
D 30 13C2 PFDoA



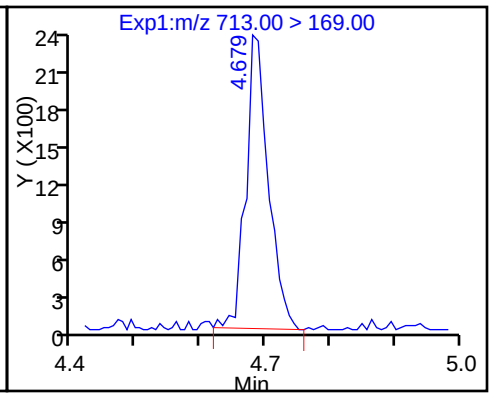
31 Perfluorotridecanoic acid (ND)



33 Perfluorotetradecanoic acid



33 Perfluorotetradecanoic acid



FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1 Analy Batch No.: 142379

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/15/2016 12:29 Calibration End Date: 12/15/2016 14:18 Calibration ID: 27089

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-142379/4	15DEC2016B_004.d
Level 2	IC 320-142379/13	15DEC2016BB_013.d
Level 3	IC 320-142379/5	15DEC2016B_005.d
Level 4	IC 320-142379/14	15DEC2016B_014.d
Level 5	IC 320-142379/6	15DEC2016B_006.d
Level 6	IC 320-142379/15	15DEC2016B_015.d
Level 7	IC 320-142379/7	15DEC2016B_007.d
Level 8	IC 320-142379/16	15DEC2016B_016.d
Level 9	IC 320-142379/8	15DEC2016B_008.d
Level 10	IC 320-142379/17	15DEC2016B_017.d
Level 11	IC 320-142379/9	15DEC2016B_009.d
Level 12	IC 320-142379/18	15DEC2016B_018.d

ANALYTE	LVL 1 LVL 11	LVL 2 LVL 12	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7	LVL 8	LVL 9	LVL 10	RT WINDOW	AVG RT
Perfluorobutanoic acid (PFBA)	1.542 1.537		1.530		1.534		1.534		1.533		1.285 - 1.785	1.535
Perfluoropentanoic acid (PFPeA)	1.810 1.813		1.805		1.810		1.810		1.810		1.560 - 2.060	1.810
Perfluorobutanesulfonic acid (PFBS)	1.849 1.852		1.844		1.849		1.849		1.848		1.668 - 2.028	1.849
Perfluorohexanoic acid (PFHxA)	2.097 2.096		2.092		2.097		2.093		2.098		1.846 - 2.346	2.096
Perfluorohexanesulfonic acid (PFHxS)	+++++ 2.444		2.445		2.364		2.440		2.446		2.181 - 2.681	2.428
Perfluoroheptanoic acid (PFHpA)	2.430 2.426		2.430		2.432		2.426		2.424		2.178 - 2.678	2.428
6:2FTS		+++++ 2.769		2.761		2.768		2.767		2.767	2.518 - 3.018	2.766
Perfluorooctanoic acid (PFOA)	+++++ 2.783		2.781		2.783		2.785		2.782		2.533 - 3.033	2.783
Perfluoroheptanesulfonic Acid (PFHpS)	2.790 2.791		2.789		2.792		2.785		2.791		2.540 - 3.040	2.790
Perfluorooctanesulfonic acid (PFOS)	+++++ 2.977		3.149		3.153		3.129		3.151		2.868 - 3.368	3.112
Perfluorononanoic acid (PFNA)	3.159 3.160		3.157		3.153		3.153		3.151		2.905 - 3.405	3.156
Perfluorooctane Sulfonamide (FOSA)	3.490 3.491		3.489		3.492		3.492		3.490		3.241 - 3.741	3.491
Perfluorodecanoic acid (PFDA)	3.515 3.516		3.506		3.509		3.509		3.507		3.260 - 3.760	3.510
8:2FTS		3.511 3.516		3.502		3.511		3.511		3.512	3.261 - 3.761	3.511

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1 Analy Batch No.: 142379

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/15/2016 12:29 Calibration End Date: 12/15/2016 14:18 Calibration ID: 27089

ANALYTE	LVL 1 LVL 11	LVL 2 LVL 12	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7	LVL 8	LVL 9	LVL 10	RT WINDOW	AVG RT
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)		3.684 3.680		3.673		3.683		3.683		3.684	3.431 - 3.931	3.681
Perfluorodecanesulfonic acid (PFDS)	3.826 3.819		3.824		3.819		3.827		3.818		3.572 - 4.072	3.822
Perfluoroundecanoic acid (PFUnA)	3.834 3.845		3.833		3.837		3.844		3.844		3.589 - 4.089	3.840
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)		3.865 3.853		3.855		3.847		3.847		3.857	3.604 - 4.104	3.854
MeFOSA		3.998 4.004		3.997		3.997		3.997		3.999	3.749 - 4.249	3.999
Perfluorododecanoic acid (PFDoA)	4.141 4.136		4.133		4.136		4.135		4.135		3.886 - 4.386	4.136
N-EtFOSA-M		4.187 4.193		4.179		4.186		4.186		4.189	3.937 - 4.437	4.187
Perfluorotridecanoic Acid (PFTriA)	4.404 4.407		4.396		4.398		4.398		4.398		4.150 - 4.650	4.400
Perfluorotetradecanoic acid (PFTeA)	4.643 4.635		4.643		4.645		4.644		4.645		4.392 - 4.892	4.643
Perfluoro-n-hexadecanoic acid (PFHxDA)	+++++ 5.060		5.058		5.059		5.059		5.059		4.809 - 5.309	5.059
Perfluoro-n-octadecanoic acid (PFODA)	5.413 5.414		5.413		5.414		5.413		5.413		5.164 - 5.664	5.413
13C4 PFBA	1.534 1.537		1.530		1.534		1.534		1.533		1.284 - 1.784	1.534
13C5-PFPeA	1.810 1.813		1.805		1.810		1.810		1.810		1.560 - 2.060	1.810
13C2 PFHxA	2.097 2.096		2.092		2.097		2.102		2.098		1.847 - 2.347	2.097
13C4-PFHpA	2.430 2.426		2.423		2.425		2.426		2.424		2.176 - 2.676	2.426
18O2 PFHxS	2.452 2.444		2.445		2.447		2.440		2.446		2.196 - 2.696	2.446
M2-6:2FTS		2.760 2.776		2.761		2.768		2.767		2.767	2.517 - 3.017	2.767
13C4 PFOA	2.782 2.783		2.781		2.783		2.785		2.782		2.533 - 3.033	2.783
13C4 PFOS	3.151 3.152		3.149		3.153		3.153		3.151		2.901 - 3.401	3.152
13C5 PFNA	3.159 3.152		3.149		3.153		3.153		3.151		2.903 - 3.403	3.153
13C8 FOSA	3.490 3.491		3.489		3.484		3.484		3.490		3.238 - 3.738	3.488
13C2 PFDA	3.515 3.508		3.514		3.509		3.517		3.516		3.263 - 3.763	3.513

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1 Analy Batch No.: 142379

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/15/2016 12:29 Calibration End Date: 12/15/2016 14:18 Calibration ID: 27089

ANALYTE	LVL 1 LVL 11	LVL 2 LVL 12	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7	LVL 8	LVL 9	LVL 10	RT WINDOW	AVG RT
M2-8:2FTS		3.511 3.516		3.511		3.511		3.511		3.520	3.263 - 3.763	3.513
d3-NMeFOSAA		3.684 3.680		3.673		3.673		3.673		3.675	3.426 - 3.926	3.676
13C2 PFUnA	3.843 3.845		3.842		3.845		3.835		3.844		3.592 - 4.092	3.842
d5-NEtFOSAA		3.848 3.845		3.838		3.838		3.838		3.848	3.592 - 4.092	3.843
d-N-MeFOSA-M		3.988 3.995		3.987		3.987		3.997		3.999	3.742 - 4.242	3.992
13C2 PFDoA	4.134 4.129		4.133		4.129		4.135		4.135		3.882 - 4.382	4.133
d-N-EtFOSA-M		4.180 4.186		4.172		4.179		4.179		4.182	3.930 - 4.430	4.180
13C2-PFTeDA	4.643 4.635		4.633		4.645		4.644		4.645		4.391 - 4.891	4.641
13C2-PFHxDA	5.058 5.060		5.047		5.059		5.059		5.059		4.807 - 5.307	5.057

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1 Analy Batch No.: 142379

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/15/2016 12:29 Calibration End Date: 12/15/2016 14:18 Calibration ID: 27089

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-142379/4	15DEC2016B_004.d
Level 2	IC 320-142379/13	15DEC2016BB_013.d
Level 3	IC 320-142379/5	15DEC2016B_005.d
Level 4	IC 320-142379/14	15DEC2016B_014.d
Level 5	IC 320-142379/6	15DEC2016B_006.d
Level 6	IC 320-142379/15	15DEC2016B_015.d
Level 7	IC 320-142379/7	15DEC2016B_007.d
Level 8	IC 320-142379/16	15DEC2016B_016.d
Level 9	IC 320-142379/8	15DEC2016B_008.d
Level 10	IC 320-142379/17	15DEC2016B_017.d
Level 11	IC 320-142379/9	15DEC2016B_009.d
Level 12	IC 320-142379/18	15DEC2016B_018.d

ANALYTE	CF				CURVE TYPE	COEFFICIENT			#	MIN CF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 5 LVL 9	LVL 2 LVL 6 LVL 10	LVL 3 LVL 7 LVL 11	LVL 4 LVL 8 LVL 12		B	M1	M2								
13C4 PFBA	365277 360742 345484		364028 351708 299221		Ave		347743.167				7.2		50.0			
13C5-PFPeA	282426 281261 261073		281354 272343 217976		Ave		266072.353				9.4		50.0			
13C2 PFHxA	253106 254198 247986		256296 252164 206910		Ave		245109.910				7.7		50.0			
13C4-PFHpA	244814 245211 216032		244964 235764 171281		Ave		226344.393				12.9		50.0			
18O2 PFHxS	341723 342975 323020		340234 339593 274309		Ave		326975.747				8.2		50.0			
M2-6:2FTS		112694 117279 110718		107543 136249 117410	Ave		116982.140				8.7		50.0			
13C4 PFOA	250090 252701 222856		252554 236364 167605		Ave		230361.637				14.3		50.0			

Note: The m1 coefficient is the same as Ave CF for an Ave curve type.

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1 Analy Batch No.: 142379

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/15/2016 12:29 Calibration End Date: 12/15/2016 14:18 Calibration ID: 27089

ANALYTE	CF				CURVE TYPE	COEFFICIENT			#	MIN CF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 5 LVL 9	LVL 2 LVL 6 LVL 10	LVL 3 LVL 7 LVL 11	LVL 4 LVL 8 LVL 12		B	M1	M2								
13C4 PFOS	256822 261188 249930		260657 254876 209612		Ave		248847.249				7.9		50.0			
13C5 PFNA	189110 195552 171630		190741 184721 134367		Ave		177686.923				12.8		50.0			
13C8 FOSA	407109 400699 376084		404776 394065 322114		Ave		384141.077				8.4		50.0			
13C2 PFDA	168454 164694 153437		169609 162695 124922		Ave		157301.833				10.7		50.0			
M2-8:2FTS		100584 111541 99917		96024 124933 111666	Ave		107444.339				10.0		50.0			
d3-NMeFOSAA		72700 80292 68450		71182 87583 71744	Ave		75324.9433				9.6		50.0			
13C2 PFUnA	127043 125252 113156		124385 124531 89132		Ave		117249.927				12.5		50.0			
d5-NEtFOSAA		77796 84707 69727		75140 88209 74518	Ave		78349.4833				8.8		50.0			
d-N-MeFOSA-M		86501 102439 90246		92791 105280 93163	Ave		95069.8233				7.6		50.0			
13C2 PFDoA	116302 115598 108083		116442 116336 92982		Ave		110957.213				8.5		50.0			
d-N-EtFOSA-M		75857 91238 82985		82198 93456 88971	Ave		85784.0067				7.7		50.0			
13C2-PFTeDA	239125 244965 219010		237709 233101 190415		Ave		227387.480				8.8		50.0			
13C2-PFHxDA	131492 130859 120547		133987 126716 103803		Ave		124567.543				9.0		50.0			

Note: The m1 coefficient is the same as Ave CF for an Ave curve type.

FORM VI

CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1 Analy Batch No.: 142379

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/15/2016 12:29 Calibration End Date: 12/15/2016 14:18 Calibration ID: 27089

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10		B	M1	M2								
Perfluorobutanoic acid (PFBA)	310962 213818	334546	310647	308231	310088	AveID		0.8537				9.1		35.0			
Perfluoropentanoic acid (PFPeA)	304642 171455	288512	287573	263221	271648	AveID		0.9868				10.7		35.0			
Perfluorobutanesulfonic acid (PFBS)	490041 286903	557732	479895	487779	500362	AveID		1.4170				14.1		50.0			
Perfluorohexanoic acid (PFHxA)	252858 166120	246488	239458	230141	236657	AveID		0.9288				7.3		35.0			
Perfluorohexanesulfonic acid (PFHxS)	+++++ 253974	363991	382940	335246	339121	AveID		1.0300				7.4		35.0			
Perfluoroheptanoic acid (PFHpA)	258208 151171	237386	237734	215989	235022	AveID		0.9788				5.9		35.0			
6:2FTS	85456	+++++ 89174	127446	112813	109001	AveID		0.8914				15.8		35.0			
Perfluorooctanoic acid (PFOA)	+++++ 153922	255488	254861	228712	247908	AveID		1.0031				6.0		35.0			
Perfluoroheptanesulfonic Acid (PFHpS)	283576 201995	315862	279184	286553	283857	AveID		1.1019				8.2		50.0			
Perfluorooctanesulfonic acid (PFOS)	+++++ 215911	272566	237468	253058	247933	AveID		0.9945				6.4		35.0			
Perfluorononanoic acid (PFNA)	180132 123966	178149	188341	164925	180502	AveID		0.9518				2.7		35.0			
Perfluorooctane Sulfonamide (FOSA)	391498 239019	399542	381363	354739	397863	AveID		0.9327				10.5		35.0			

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI

CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1 Analy Batch No.: 142379

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/15/2016 12:29 Calibration End Date: 12/15/2016 14:18 Calibration ID: 27089

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10		B	M1	M2								
Perfluorodecanoic acid (PFDA)	164274 113084	158337	155537	146490	154381	AveID		0.9438				3.1		35.0			
8:2FTS	83185	83106 84092	116095	79051	100536	AveID		0.8473				12.1		35.0			
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	57133	59646 64621	85412	57389	74839	AveID		0.8846				15.4		35.0			
Perfluorodecanesulfonic acid (PFDS)	143714 124235	159960	145051	150246	147895	AveID		0.5840				4.8		50.0			
Perfluoroundecanoic acid (PFUnA)	130000 84265	121036	119189	108755	109942	AveID		0.9563				4.9		35.0			
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	53544	59930 59690	75946	53623	68286	AveID		0.7929				15.1		35.0			
MeFOSA	68699	72138 80570	97349	70049	88147	AveID		0.8376				13.3		35.0			
Perfluorododecanoic acid (PFDoA)	105614 87129	111590	103481	101460	101274	AveID		0.9180				3.5		35.0			
N-EtFOSA-M	65375	61986 78901	90659	62962	85286	AveID		0.8640				13.9		35.0			
Perfluorotridecanoic Acid (PFTriA)	106640 80194	104393	109461	99013	105018	AveID		0.9069				2.9		50.0			
Perfluorotetradecanoic acid (PFTeA)	197042 136554	183949	187123	172910	180115	AveID		1.5848				4.6		50.0			
Perfluoro-n-hexadecanoic acid (PFHxDA)	+++++ 88775	113395	173261	106364	119906	L1ID	0.5185	0.9555							1.0000		0.9900
Perfluoro-n-octadecanoic acid (PFODA)	123098 91965	122262	114997	117393	116752	AveID		1.0304				3.9		50.0			

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1 Analy Batch No.: 142379

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/15/2016 12:29 Calibration End Date: 12/15/2016 14:18 Calibration ID: 27089

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-142379/4	15DEC2016B_004.d
Level 2	IC 320-142379/13	15DEC2016BB_013.d
Level 3	IC 320-142379/5	15DEC2016B_005.d
Level 4	IC 320-142379/14	15DEC2016B_014.d
Level 5	IC 320-142379/6	15DEC2016B_006.d
Level 6	IC 320-142379/15	15DEC2016B_015.d
Level 7	IC 320-142379/7	15DEC2016B_007.d
Level 8	IC 320-142379/16	15DEC2016B_016.d
Level 9	IC 320-142379/8	15DEC2016B_008.d
Level 10	IC 320-142379/17	15DEC2016B_017.d
Level 11	IC 320-142379/9	15DEC2016B_009.d
Level 12	IC 320-142379/18	15DEC2016B_018.d

ANALYTE	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
		LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10
13C4 PFBA	Ave	18263829 14961055	17585378	18201393	17274187	18037108	50.0 50.0	50.0	50.0	50.0	50.0
13C5-PFPeA	Ave	14121285 10898820	13617158	14067714	13053659	14063070	50.0 50.0	50.0	50.0	50.0	50.0
13C2 PFHxA	Ave	12655304 10345480	12608210	12814780	12399280	12709919	50.0 50.0	50.0	50.0	50.0	50.0
13C4-PFHpA	Ave	12240718 8564025	11788221	12248222	10801604	12260528	50.0 50.0	50.0	50.0	50.0	50.0
18O2 PFHxS	Ave	16163510 12974829	16062766	16093048	15278828	16222736	47.3 47.3	47.3	47.3	47.3	47.3
M2-6:2FTS	Ave	5570739	5352965 5576967	6471813	5108306	5259120	47.5	47.5 47.5	47.5	47.5	47.5
13C4 PFOA	Ave	12504504 8380251	11818203	12627691	11142777	12635065	50.0 50.0	50.0	50.0	50.0	50.0
13C4 PFOS	Ave	12276070 10019454	12183062	12459383	11946650	12484772	47.8 47.8	47.8	47.8	47.8	47.8

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1 Analy Batch No.: 142379

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/15/2016 12:29 Calibration End Date: 12/15/2016 14:18 Calibration ID: 27089

ANALYTE	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
		LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10
13C5 PFNA	Ave	9455492 6718354	9236073	9537045	8581504	9777609	50.0 50.0	50.0	50.0	50.0	50.0
13C8 FOSA	Ave	20355431 16105707	19703272	20238792	18804188	20034933	50.0 50.0	50.0	50.0	50.0	50.0
13C2 PFDA	Ave	8422718 6246112	8134734	8480447	7671861	8234678	50.0 50.0	50.0	50.0	50.0	50.0
M2-8:2FTS	Ave	5342826	4817997 5348797	5984276	4599569	4786038	47.9	47.9 47.9	47.9	47.9	47.9
d3-NMeFOSAA	Ave	4014623	3634985 3587176	4379131	3559083	3422485	50.0	50.0 50.0	50.0	50.0	50.0
13C2 PFUnA	Ave	6352135 4456593	6226562	6219248	5657823	6262617	50.0 50.0	50.0	50.0	50.0	50.0
d5-NEtFOSAA	Ave	4235352	3889792 3725902	4410456	3757014	3486329	50.0	50.0 50.0	50.0	50.0	50.0
d-N-MeFOSA-M	Ave	5121953	4325034 4658153	5263980	4639527	4512300	50.0	50.0 50.0	50.0	50.0	50.0
13C2 PFDoA	Ave	5815120 4649092	5816809	5822114	5404154	5779875	50.0 50.0	50.0	50.0	50.0	50.0
d-N-EtFOSA-M	Ave	4561882	3792851 4448546	4672820	4109875	4149228	50.0	50.0 50.0	50.0	50.0	50.0
13C2-PFTeDA	Ave	11956257 9520749	11655048	11885446	10950502	12248242	50.0 50.0	50.0	50.0	50.0	50.0
13C2-PFHxDA	Ave	6574607 5190172	6335821	6699329	6027362	6542972	50.0 50.0	50.0	50.0	50.0	50.0

Curve Type Legend:
Ave = Average

FORM VI

RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1 Analy Batch No.: 142379

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/15/2016 12:29 Calibration End Date: 12/15/2016 14:18 Calibration ID: 27089

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-142379/4	15DEC2016B_004.d
Level 2	IC 320-142379/13	15DEC2016BB_013.d
Level 3	IC 320-142379/5	15DEC2016B_005.d
Level 4	IC 320-142379/14	15DEC2016B_014.d
Level 5	IC 320-142379/6	15DEC2016B_006.d
Level 6	IC 320-142379/15	15DEC2016B_015.d
Level 7	IC 320-142379/7	15DEC2016B_007.d
Level 8	IC 320-142379/16	15DEC2016B_016.d
Level 9	IC 320-142379/8	15DEC2016B_008.d
Level 10	IC 320-142379/17	15DEC2016B_017.d
Level 11	IC 320-142379/9	15DEC2016B_009.d
Level 12	IC 320-142379/18	15DEC2016B_018.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10
Perfluorobutanoic acid (PFBA)		AveID	155481 42763611	6690917	310647	15411527	1550440	0.500 200	20.0	1.00	50.0	5.00
Perfluoropentanoic acid (PFPeA)		AveID	152321 34291076	5770240	287573	13161065	1358239	0.500 200	20.0	1.00	50.0	5.00
Perfluorobutanesulfonic acid (PFBS)		AveID	216598 50724469	9860707	424227	21559838	2211602	0.442 177	17.7	0.884	44.2	4.42
Perfluorohexanoic acid (PFHxA)		AveID	126429 33223923	4929766	239458	11507044	1183286	0.500 200	20.0	1.00	50.0	5.00
Perfluorohexanesulfonic acid (PFHxS)		AveID	+++++ 46223186	6624638	348475	15253691	1543002	+++++ 182	18.2	0.910	45.5	4.55
Perfluoroheptanoic acid (PFHpA)		AveID	129104 30234194	4747711	237734	10799449	1175112	0.500 200	20.0	1.00	50.0	5.00
6:2FTS		AveID	405060	+++++ 16907459	2416384	106947	5166665	4.74	+++++ 190	19.0	0.948	47.4
Perfluorooctanoic acid (PFOA)		AveID	+++++ 30784387	5109766	254861	11435583	1239541	+++++ 200	20.0	1.00	50.0	5.00

RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1 Analy Batch No.: 142379

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/15/2016 12:29 Calibration End Date: 12/15/2016 14:18 Calibration ID: 27089

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10
Perfluoroheptanesulfonic Acid (PFHpS)		AveID	134982 38459925	6014021	265783	13639927	1351160	0.476 190	19.0	0.952	47.6	4.76
Perfluorooctanesulfonic acid (PFOS)		AveID	+++++ 40073141	5058824	220370	11741891	1150410	+++++ 186	18.6	0.928	46.4	4.64
Perfluorononanoic acid (PFNA)		AveID	90066 24793148	3562981	188341	8246252	902512	0.500 200	20.0	1.00	50.0	5.00
Perfluorooctane Sulfonamide (FOSA)		AveID	195749 47803717	7990835	381363	17736944	1989314	0.500 200	20.0	1.00	50.0	5.00
Perfluorodecanoic acid (PFDA)		AveID	82137 22616781	3166735	155537	7324495	771905	0.500 200	20.0	1.00	50.0	5.00
8:2FTS		AveID	398457	39808 16111959	2224381	75731	4815680	4.79	0.479 192	19.2	0.958	47.9
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)		AveID	285665	29823 12924122	1708231	57389	3741936	5.00	0.500 200	20.0	1.00	50.0
Perfluorodecanesulfonic acid (PFDS)		AveID	69270 23952412	3084031	139829	7241868	712852	0.482 193	19.3	0.964	48.2	4.82
Perfluoroundecanoic acid (PFUnA)		AveID	65000 16852945	2420719	119189	5437764	549708	0.500 200	20.0	1.00	50.0	5.00
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)		AveID	267721	29965 11938061	1518918	53623	3414301	5.00	0.500 200	20.0	1.00	50.0
MeFOSA		AveID	343493	36069 16114020	1946985	70049	4407328	5.00	0.500 200	20.0	1.00	50.0
Perfluorododecanoic acid (PFDoA)		AveID	52807 17425873	2231794	103481	5072994	506369	0.500 200	20.0	1.00	50.0	5.00
N-EtFOSA-M		AveID	326877	30993 15780196	1813178	62962	4264314	5.00	0.500 200	20.0	1.00	50.0

FORM VI

RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1 Analy Batch No.: 142379

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 12/15/2016 12:29 Calibration End Date: 12/15/2016 14:18 Calibration ID: 27089

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10
Perfluorotridecanoic Acid (PFTriA)		AveID	53320 16038809	2087859	109461	4950651	525090	0.500 200	20.0	1.00	50.0	5.00
Perfluorotetradecanoic acid (PFTeA)		AveID	98521 27310864	3678976	187123	8645519	900575	0.500 200	20.0	1.00	50.0	5.00
Perfluoro-n-hexadecanoic acid (PFHxDA)		L1ID	+++++ 17754908	2267892	173261	5318207	599529	+++++ 200	20.0	1.00	50.0	5.00
Perfluoro-n-octadecanoic acid (PFODA)		AveID	61549 18392980	2445236	114997	5869666	583761	0.500 200	20.0	1.00	50.0	5.00

Curve Type Legend:

AveID = Average isotope dilution
L1ID = Linear 1/conc IsoDil

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_004.d
Lims ID: IC L1
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 15-Dec-2016 12:29:18 ALS Bottle#: 37 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L1_b
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub6

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 16-Dec-2016 14:34:11 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 15-Dec-2016 13:48:59

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.534	1.534	0.0		18263829	52.5		105	1469089	
1 Perfluorobutyric acid										
212.90 > 169.00	1.542	1.535	0.007	1.000	155481	0.4986		99.7	1121	
D 4 13C5-PFPeA										
267.90 > 223.00	1.810	1.810	0.0		14121285	53.1		106	1079323	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.810	1.810	0.0	1.000	152321	0.5465		109	1332	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.849	1.848	0.001	1.000	216598	0.4473		101		
298.90 > 99.00	1.849	1.848	0.001	1.000	87630		2.47(0.00-0.00)	101		
7 Perfluorohexanoic acid										
313.00 > 269.00	2.097	2.096	0.001	1.000	126429	0.5378		108	4416	
D 6 13C2 PFHxA										
315.00 > 270.00	2.097	2.097	0.0		12655304	51.6		103	589404	
D 11 13C4-PFHpA										
367.00 > 322.00	2.430	2.426	0.004		12240718	54.1		108	647338	
12 Perfluoroheptanoic acid										M
363.00 > 319.00	2.430	2.428	0.002	1.000	129104	0.5388		108	1246	M
9 Perfluorohexanesulfonic acid										M
399.00 > 80.00	2.444	2.431	0.013	1.000	204063	0.5798		127		M
D 10 18O2 PFHxS										
403.00 > 84.00	2.452	2.446	0.006		16163510	49.4		105	1405328	
D 14 13C4 PFOA										
417.00 > 372.00	2.782	2.783	-0.001		12504504	54.3		109	532215	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooctanoic acid										
413.00 > 369.00	2.782	2.783	-0.001	1.000	145696	0.5807		116	1257	
413.00 > 169.00	2.790	2.783	0.007	1.003	87089		1.67(0.90-1.10)	116	4416	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.790	2.790	0.0	1.000	134982	0.4770		100		
18 Perfluorooctane sulfonic acid										M
499.00 > 80.00	3.151	3.118	0.033	1.000	116569	0.4564		98.4	7996	M
499.00 > 99.00	3.159	3.118	0.041	1.003	24244		4.81(0.90-1.10)	98.4	1329	M
D 17 13C4 PFOS										
503.00 > 80.00	3.151	3.151	0.0		12276070	49.3		103	1128009	
D 19 13C5 PFNA										
468.00 > 423.00	3.159	3.153	0.006		9455492	53.2		106	520740	
20 Perfluorononanoic acid										
463.00 > 419.00	3.159	3.155	0.004	1.000	90066	0.5004		100	1349	
D 21 13C8 FOSA										
506.00 > 78.00	3.490	3.488	0.002		20355431	53.0		106	727464	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.490	3.491	-0.001	1.000	195749	0.5155		103	25454	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.515	3.510	0.005	1.000	82137	0.5166		103	2772	
D 23 13C2 PFDA										
515.00 > 470.00	3.515	3.513	0.002		8422718	53.5		107	284895	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.826	3.822	0.004	1.000	69270	0.4619		95.8		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.834	3.839	-0.005	1.000	65000	0.5350		107	1918	
D 27 13C2 PFUnA										
565.00 > 520.00	3.843	3.842	0.001		6352135	54.2		108	398643	
D 30 13C2 PFDoA										
615.00 > 570.00	4.134	4.132	0.002		5815120	52.4		105	205155	
29 Perfluorododecanoic acid										M
613.00 > 569.00	4.141	4.136	0.005	1.000	52807	0.4946		98.9	1204	M
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.404	4.400	0.004	1.000	53320	0.5055		101	1256	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.643	4.641	0.002		11956257	52.6		105	663687	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.643	4.642	0.001	1.000	98521	0.5345		107	1284	
713.00 > 169.00	4.633	4.642	-0.009	0.998	17902		5.50(0.00-0.00)	107	7022	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.058	5.057	0.001		6574607	52.8		106	132486	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.058	5.059	-0.001	1.000	125860	0.5899		118	92.5	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.413	5.414	-0.001	1.000	61549	0.5136		103	54.0	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LCPFC-L1_00022 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 14:34:12 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_004.d

Injection Date: 15-Dec-2016 12:29:18 Instrument ID: A8_N

Lims ID: IC L1

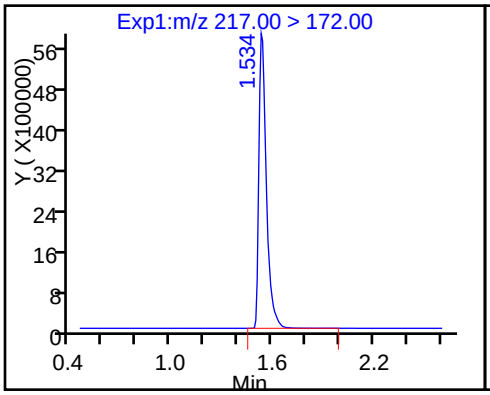
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 37 Worklist Smp#: 4

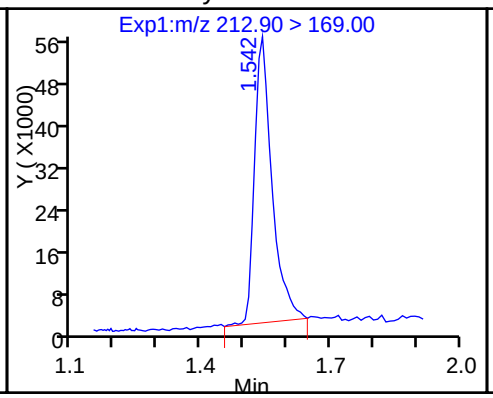
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

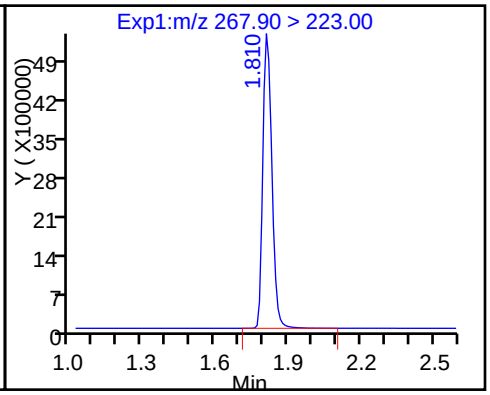
D 2 13C4 PFBA



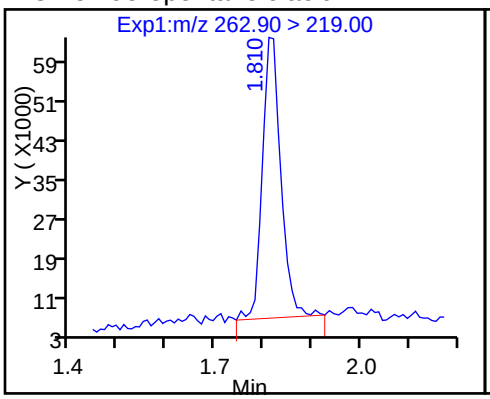
1 Perfluorobutyric acid



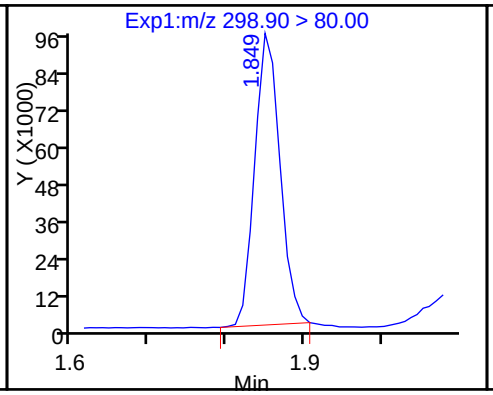
D 4 13C5-PFPeA



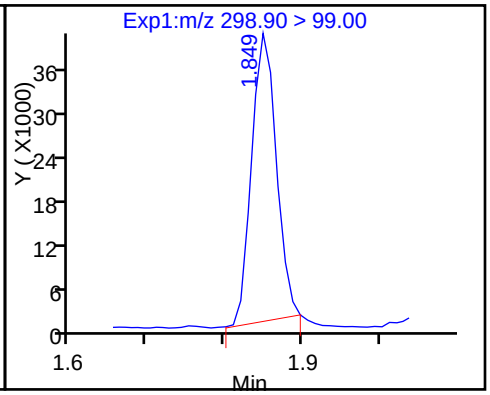
3 Perfluoropentanoic acid



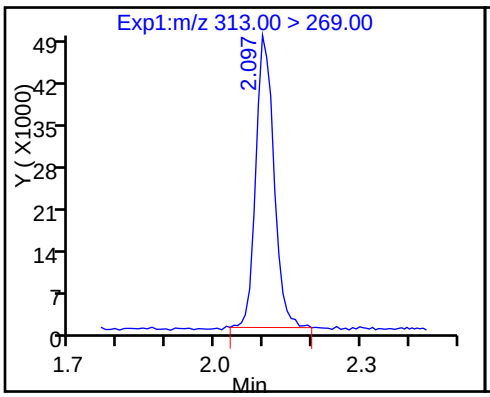
5 Perfluorobutanesulfonic acid



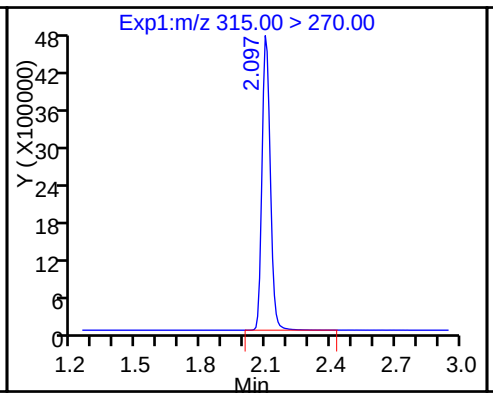
5 Perfluorobutanesulfonic acid



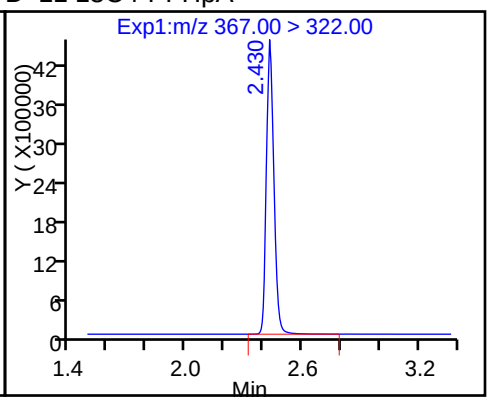
7 Perfluorohexanoic acid



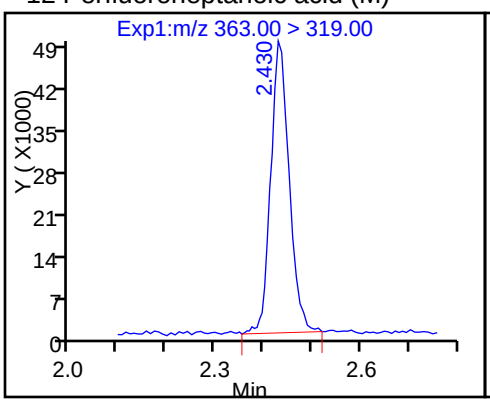
D 6 13C2 PFHxA



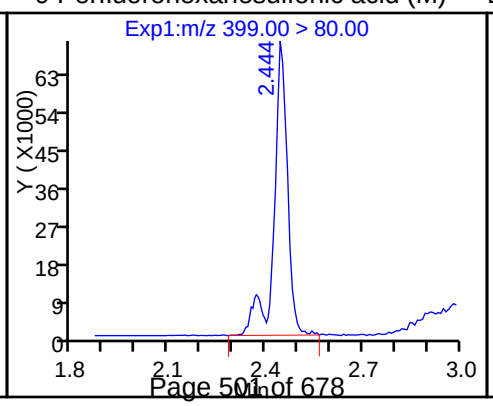
D 11 13C4-PFHpA



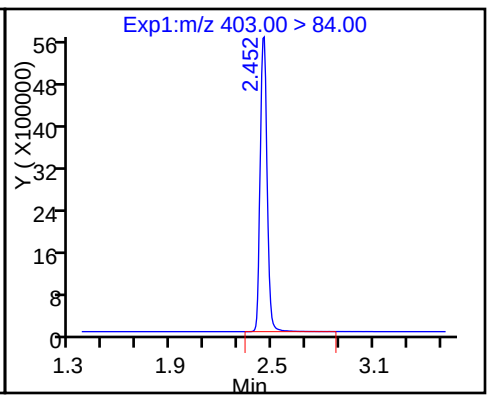
12 Perfluoroheptanoic acid (M)



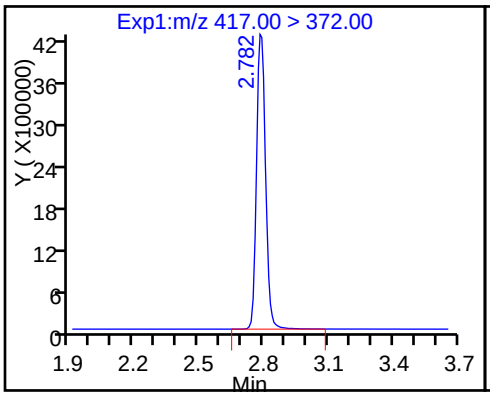
9 Perfluorohexanesulfonic acid (M)



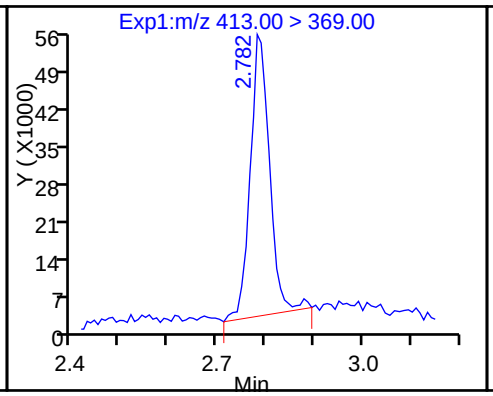
D 10 18O2 PFHxS



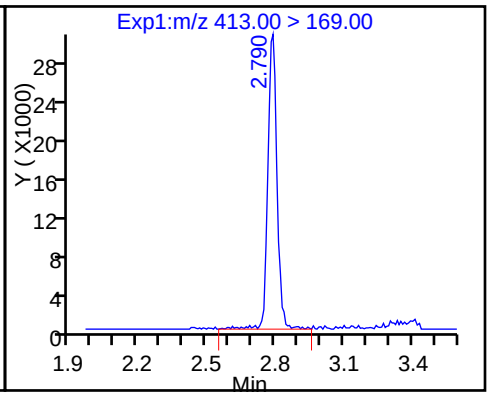
D 14 13C4 PFOA



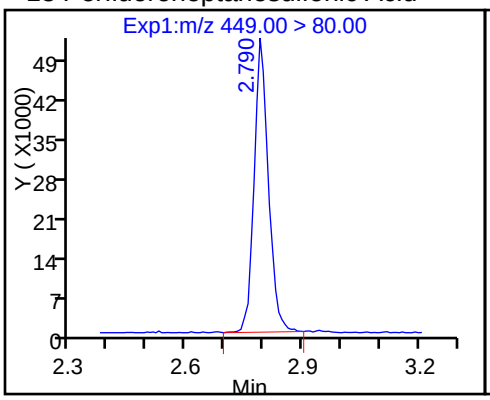
15 Perfluorooctanoic acid



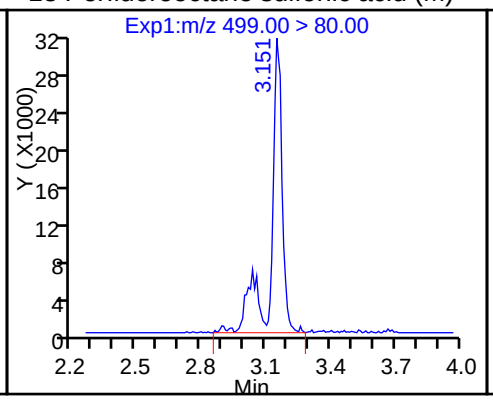
15 Perfluorooctanoic acid



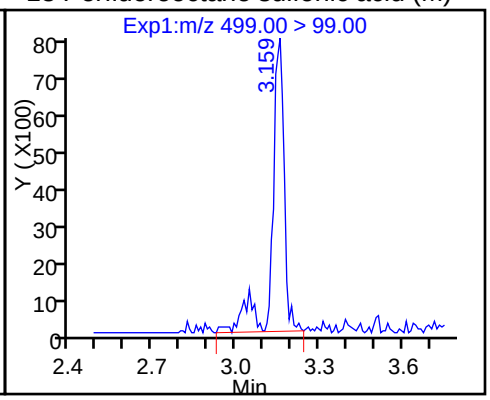
13 Perfluoroheptanesulfonic Acid



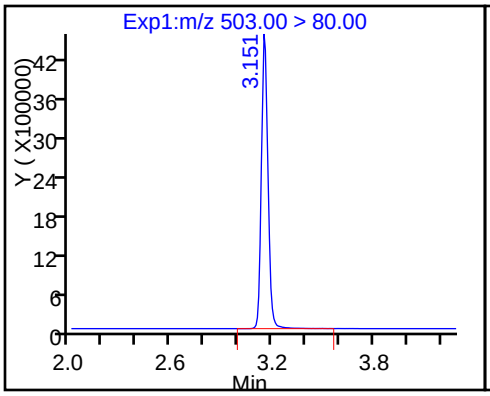
18 Perfluorooctane sulfonic acid (M)



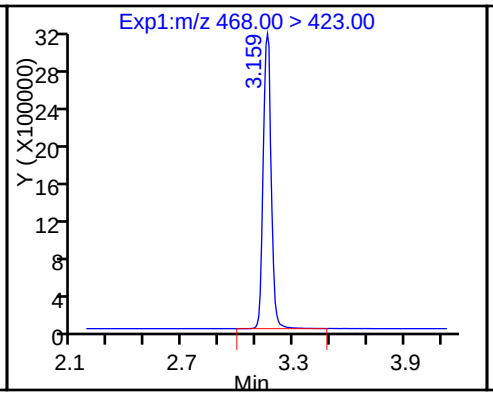
18 Perfluorooctane sulfonic acid (M)



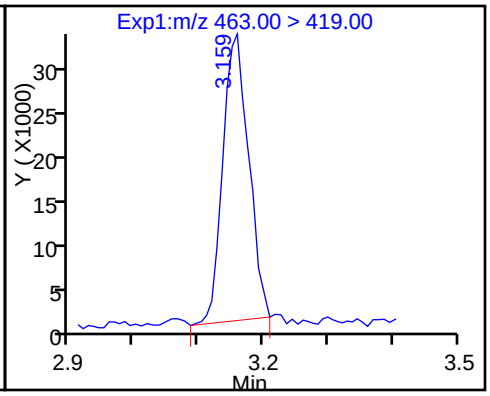
D 17 13C4 PFOS



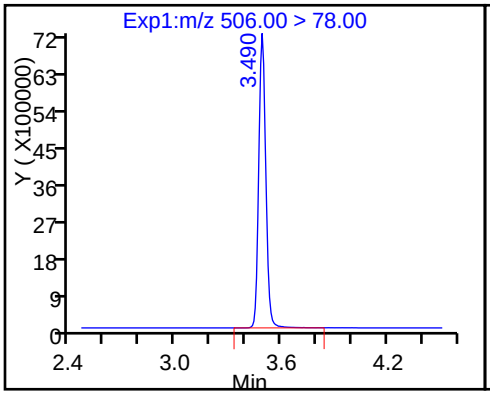
D 19 13C5 PFNA



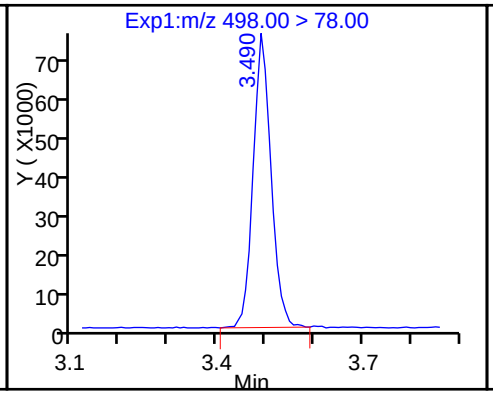
20 Perfluorononanoic acid



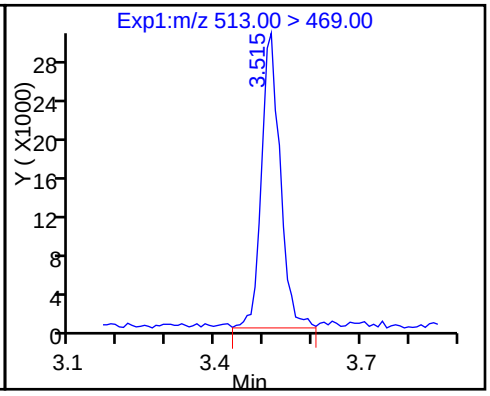
D 21 13C8 FOSA



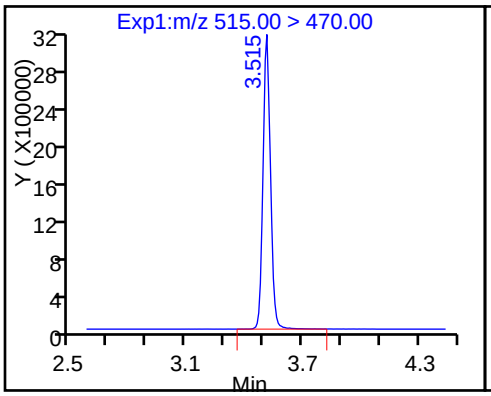
22 Perfluorooctane Sulfonamide



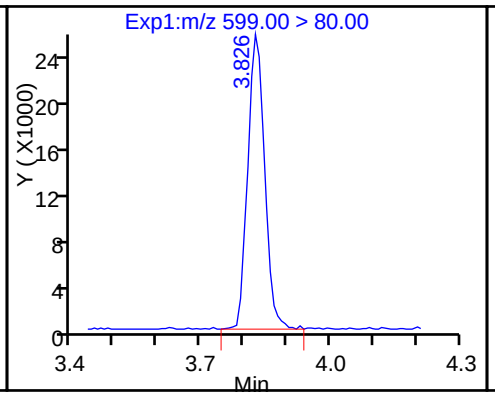
24 Perfluorodecanoic acid



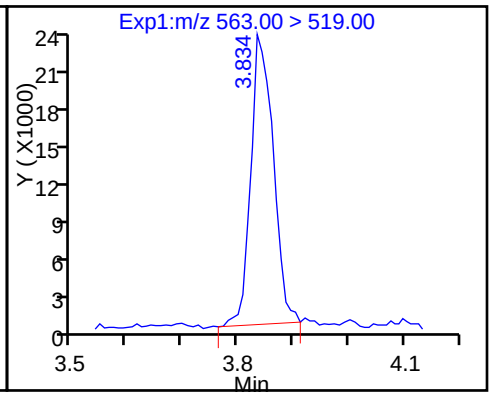
D 23 13C2 PFDA



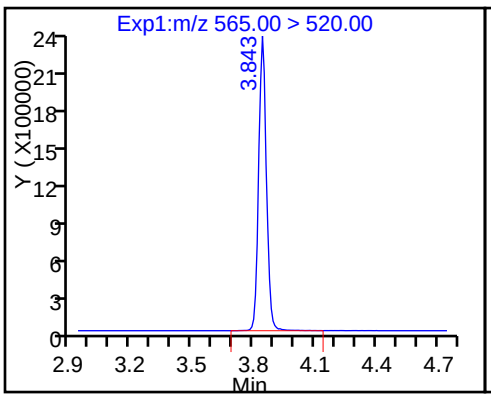
26 Perfluorodecane Sulfonic acid



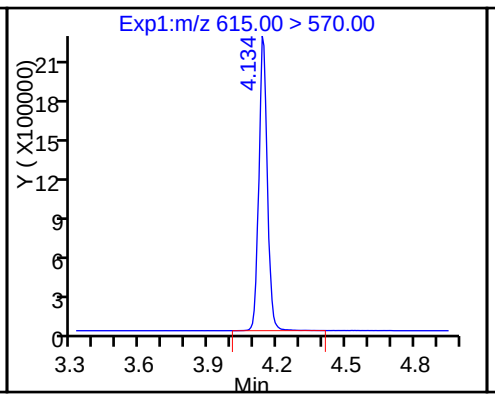
28 Perfluoroundecanoic acid



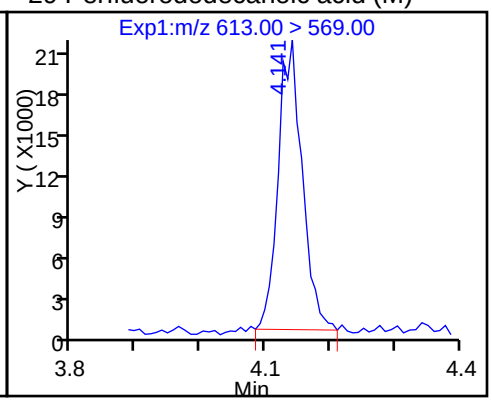
D 27 13C2 PFUnA



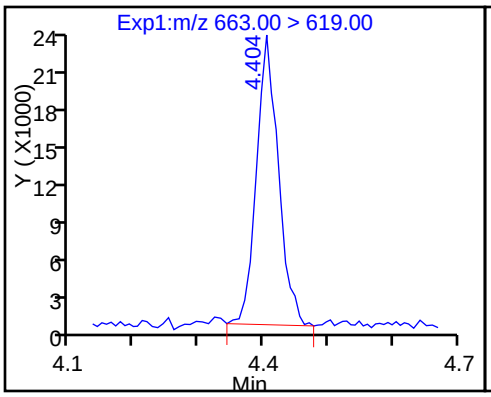
D 30 13C2 PFDoA



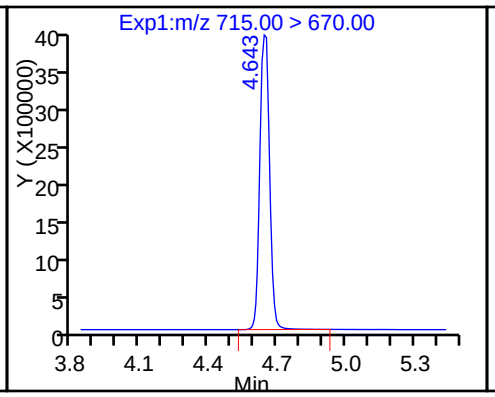
29 Perfluorododecanoic acid (M)



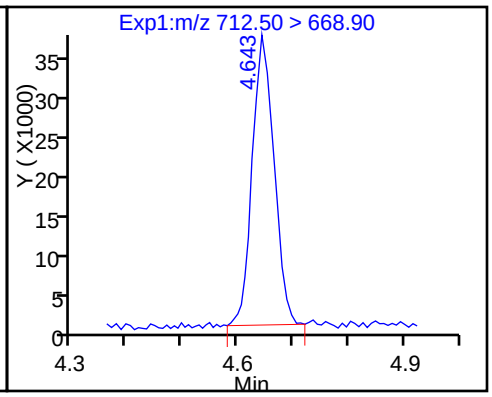
31 Perfluorotridecanoic acid



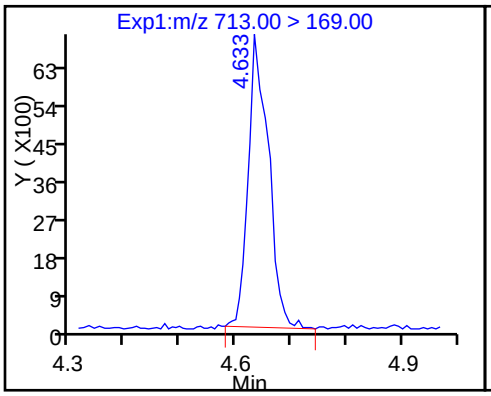
D 32 13C2-PFTeDA



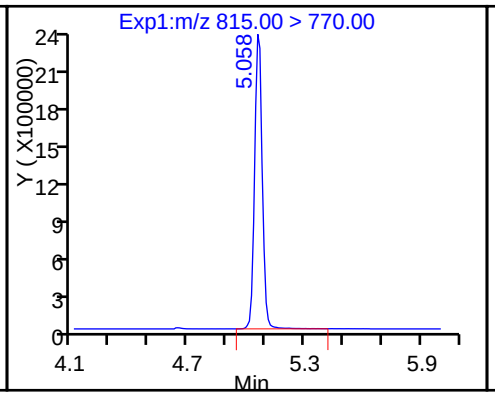
33 Perfluorotetradecanoic acid



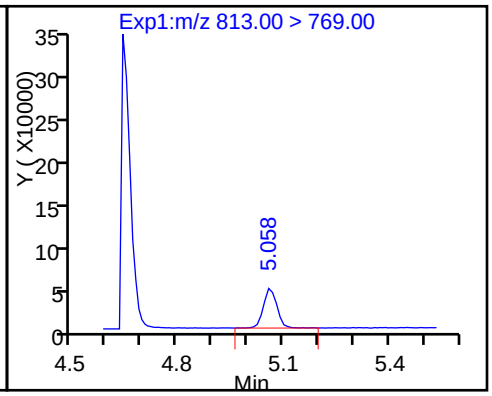
33 Perfluorotetradecanoic acid



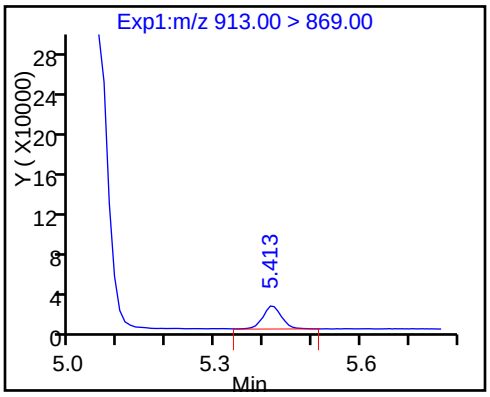
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

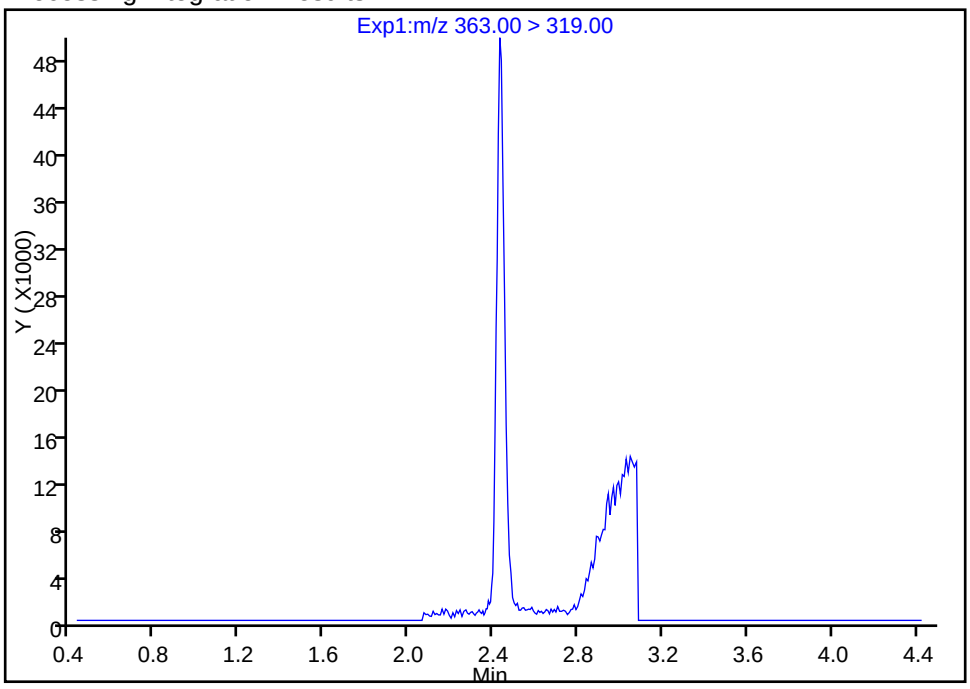
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_004.d				
Injection Date:	15-Dec-2016 12:29:18	Instrument ID:	A8_N		
Lims ID:	IC L1				
Client ID:					
Operator ID:	A8-PC\A8	ALS Bottle#:	37	Worklist Smp#:	4
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

12 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

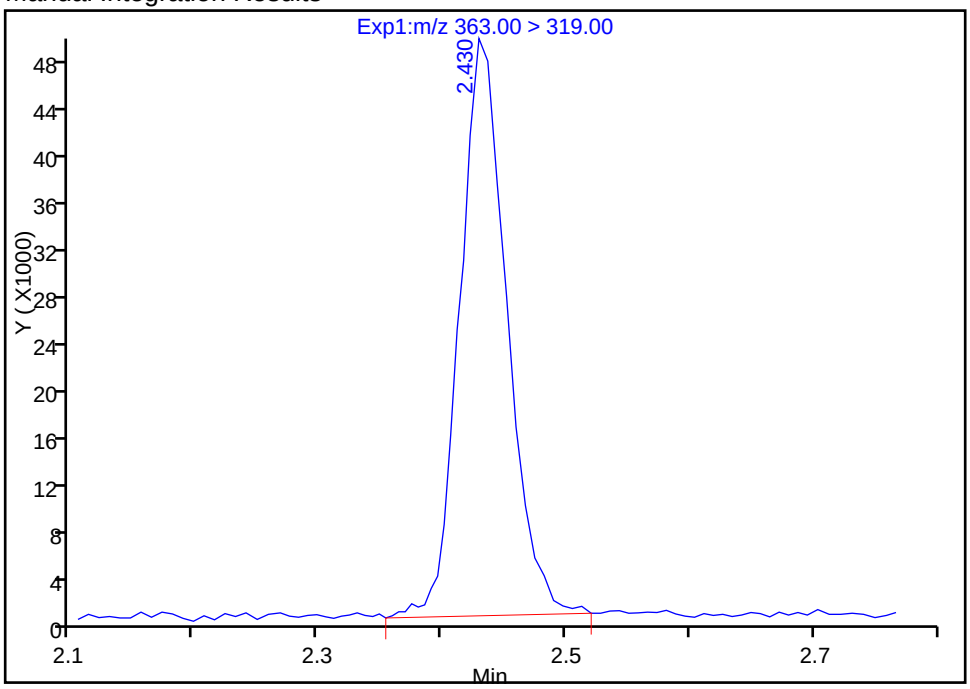
Not Detected
Expected RT: 2.43

Processing Integration Results



Manual Integration Results

RT: 2.43
Area: 129104
Amount: 0.538766
Amount Units: ng/ml



Reviewer: chandrasenas, 15-Dec-2016 13:48:59
Audit Action: Manually Integrated Audit Reason: Assign Peak

TestAmerica Sacramento

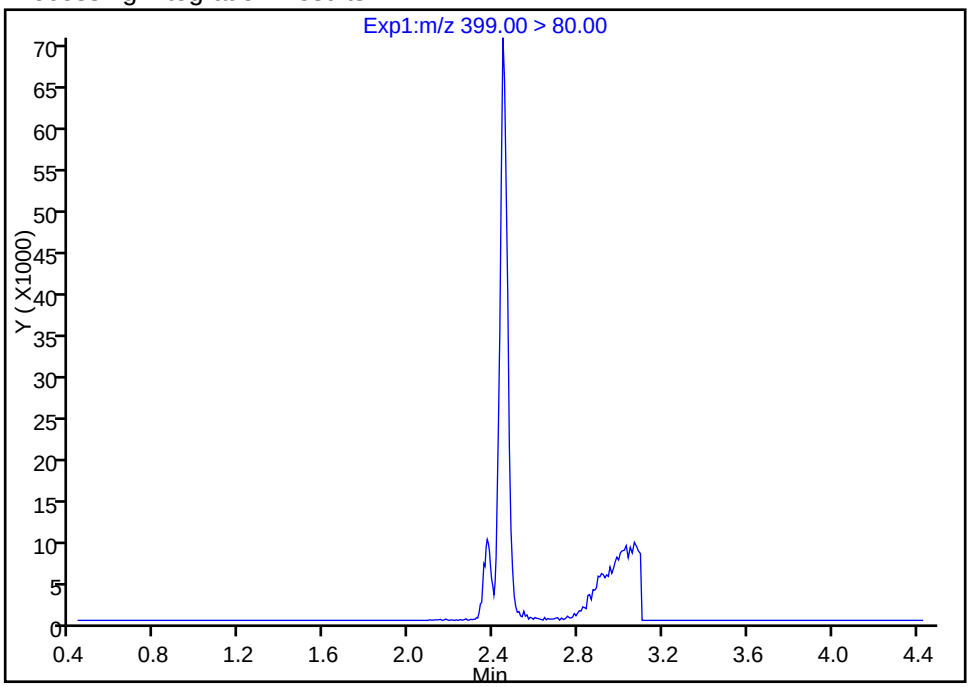
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_004.d
Injection Date: 15-Dec-2016 12:29:18 Instrument ID: A8_N
Lims ID: IC L1
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 37 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

9 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

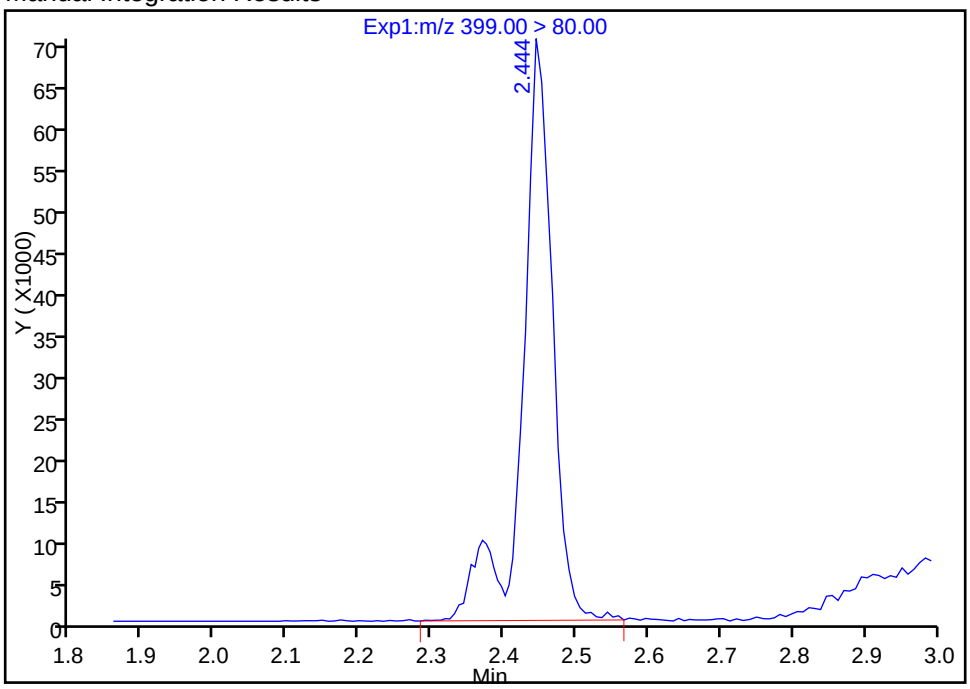
Not Detected
Expected RT: 2.43

Processing Integration Results



Manual Integration Results

RT: 2.44
Area: 204063
Amount: 0.579783
Amount Units: ng/ml



Reviewer: chandrasenas, 15-Dec-2016 13:48:59
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

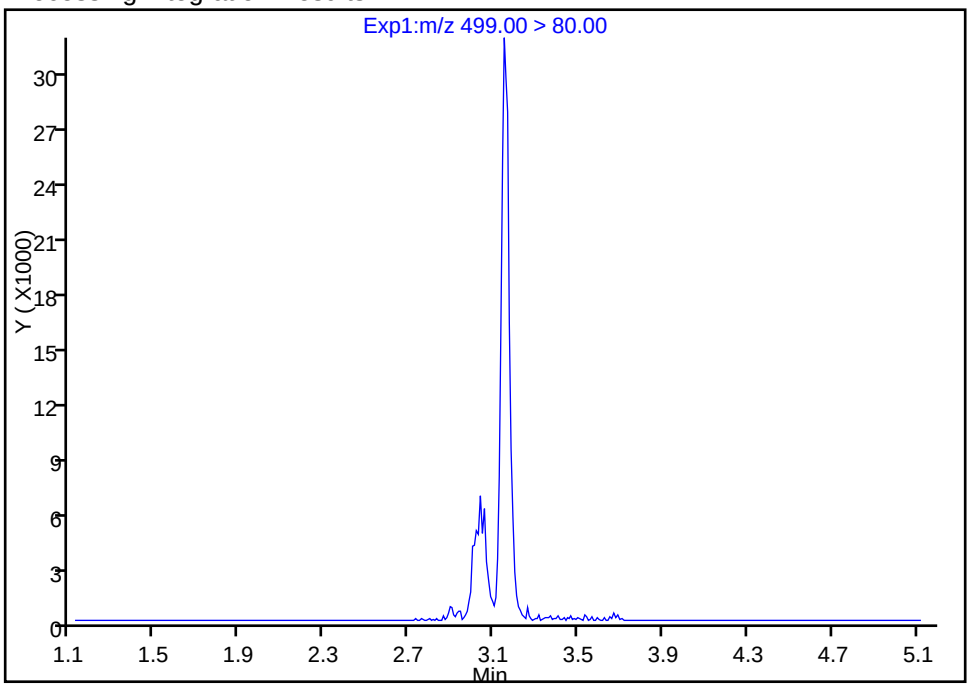
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_004.d				
Injection Date:	15-Dec-2016 12:29:18	Instrument ID:	A8_N		
Lims ID:	IC L1				
Client ID:					
Operator ID:	A8-PC\A8	ALS Bottle#:	37	Worklist Smp#:	4
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

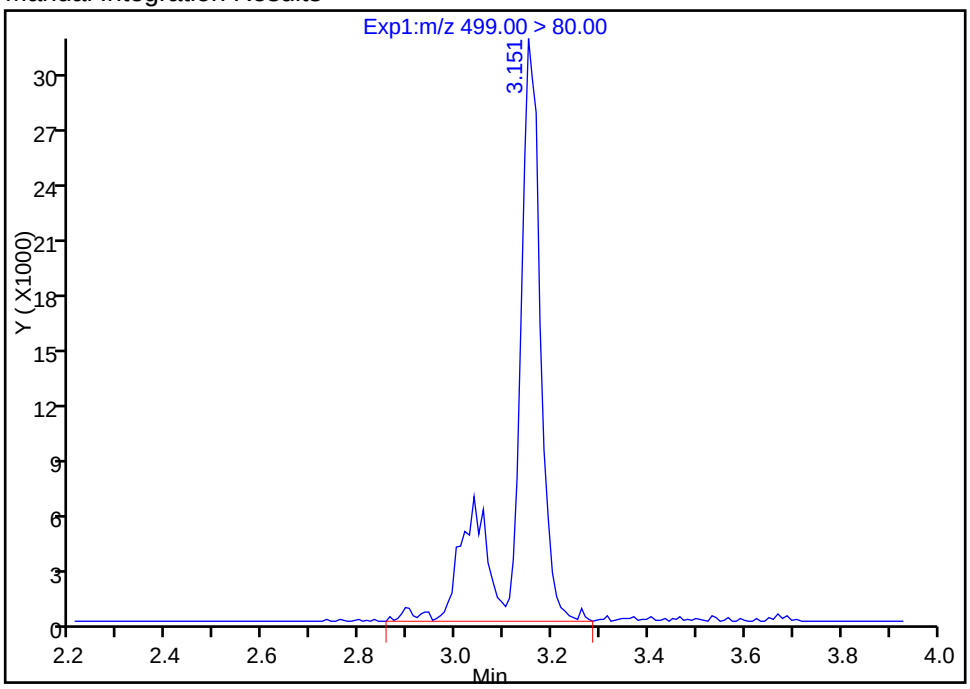
Processing Integration Results

Not Detected
Expected RT: 3.12



Manual Integration Results

RT: 3.15
Area: 116569
Amount: 0.456423
Amount Units: ng/ml



Reviewer: chandrasenas, 15-Dec-2016 13:48:59
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

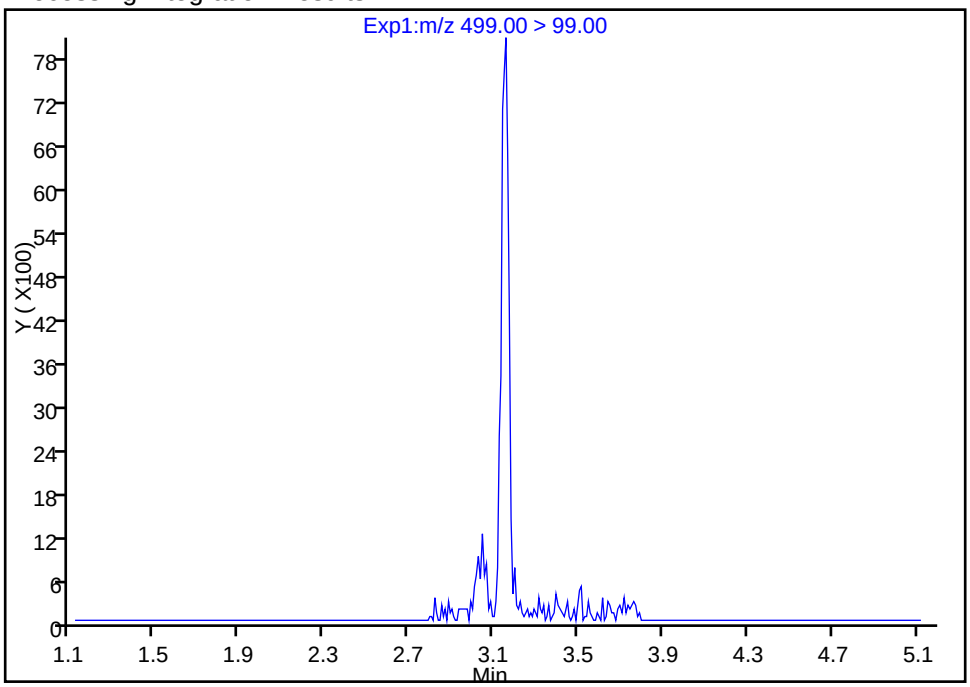
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_004.d
Injection Date: 15-Dec-2016 12:29:18 Instrument ID: A8_N
Lims ID: IC L1
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 37 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

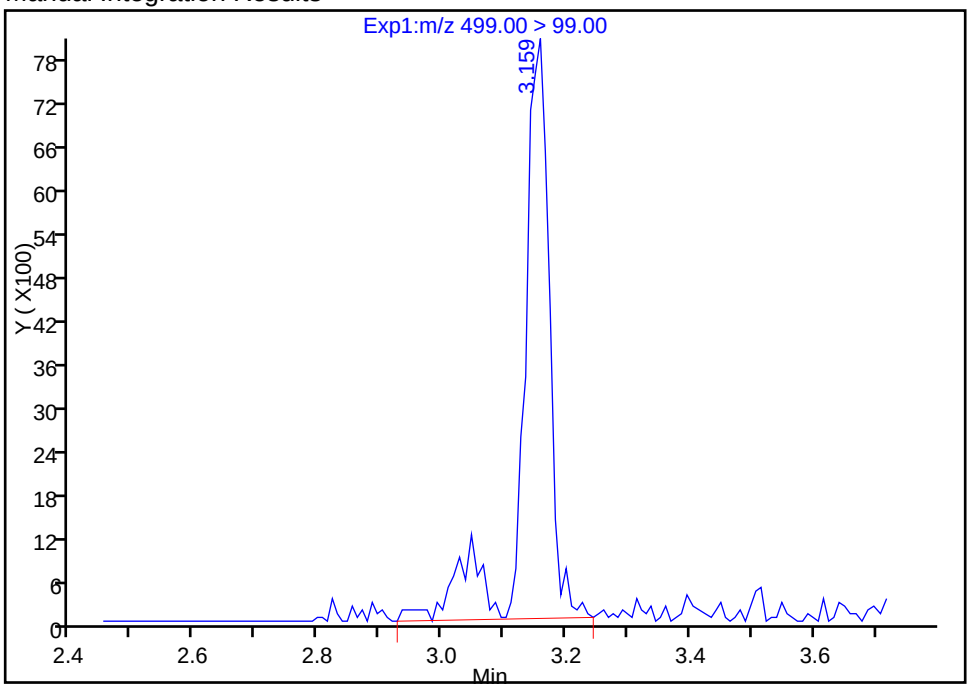
Processing Integration Results

Not Detected
Expected RT: 3.12



Manual Integration Results

RT: 3.16
Area: 24244
Amount: 0.456423
Amount Units: ng/ml



Reviewer: chandrasenas, 15-Dec-2016 13:48:59
Audit Action: Manually Integrated Audit Reason: Assign Peak

TestAmerica Sacramento

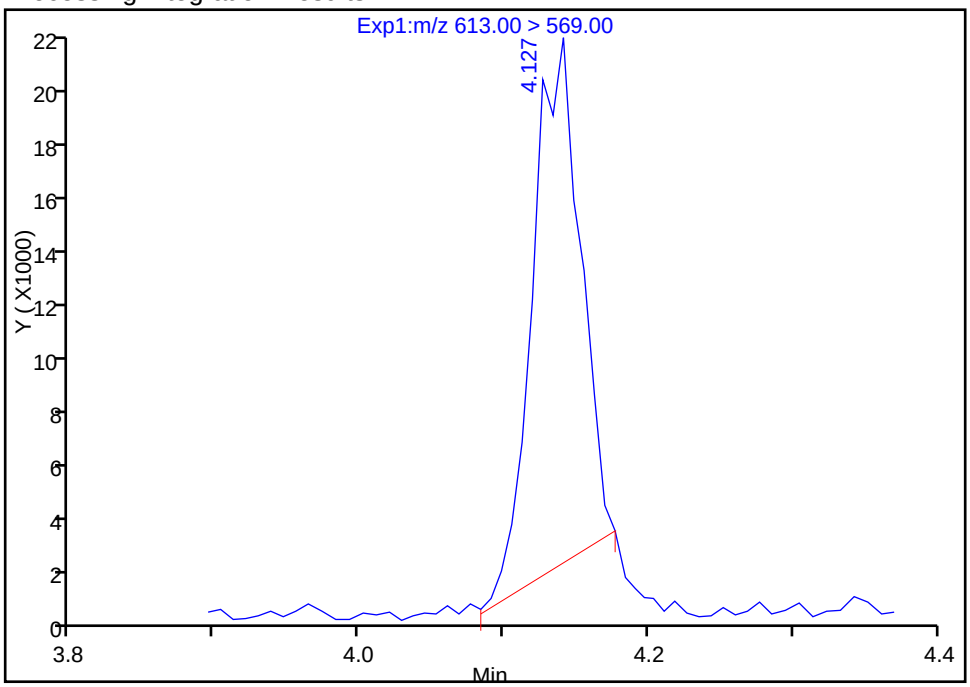
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_004.d
Injection Date: 15-Dec-2016 12:29:18 Instrument ID: A8_N
Lims ID: IC L1
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 37 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

29 Perfluorododecanoic acid, CAS: 307-55-1

Signal: 1

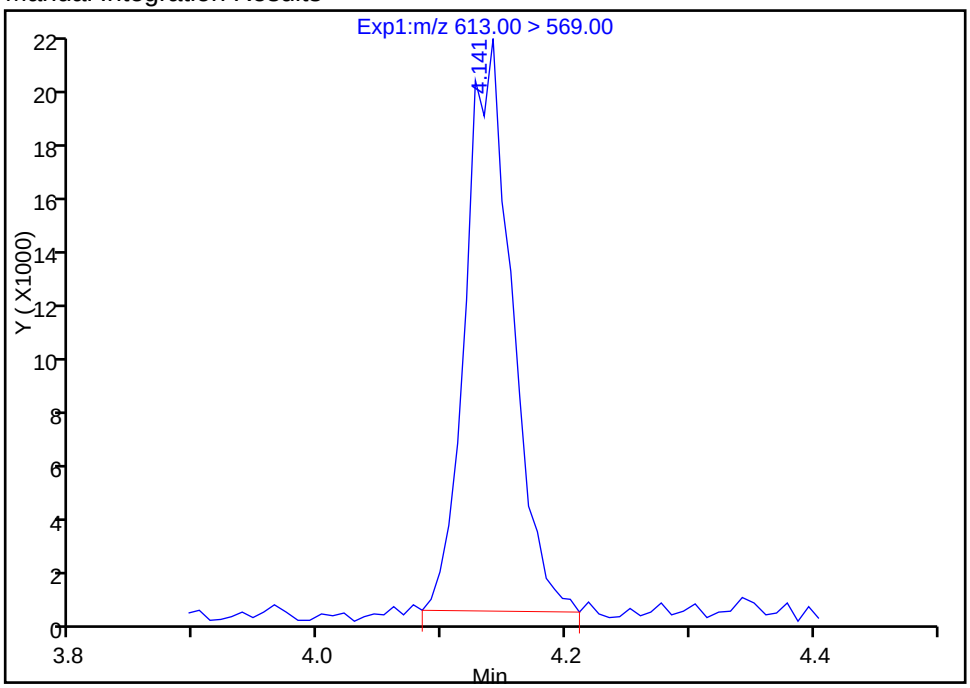
Processing Integration Results

RT: 4.13
Area: 43489
Amount: 0.419548
Amount Units: ng/ml



Manual Integration Results

RT: 4.14
Area: 52807
Amount: 0.494620
Amount Units: ng/ml



Reviewer: chandrasenas, 15-Dec-2016 13:48:59
Audit Action: Manually Integrated Audit Reason: Incomplete Integration

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_005.d
Lims ID: IC L2
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 15-Dec-2016 12:36:48 ALS Bottle#: 38 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L2_b
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub6

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 16-Dec-2016 14:34:15 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 15-Dec-2016 13:50:02

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.530	1.534	-0.004		18201393	52.3		105	1000291	
1 Perfluorobutyric acid										
212.90 > 169.00	1.530	1.535	-0.005	1.000	310647	1.00		100.0	2583	
D 4 13C5-PFPeA										
267.90 > 223.00	1.805	1.810	-0.005		14067714	52.9		106	1093447	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.805	1.810	-0.005	1.000	287573	1.04		104	2935	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.844	1.848	-0.004	1.000	424227	0.8800		99.5		
298.90 > 99.00	1.844	1.848	-0.004	1.000	171864		2.47(0.00-0.00)	99.5		
7 Perfluorohexanoic acid										
313.00 > 269.00	2.092	2.096	-0.004	1.000	239458	1.01		101	6854	
D 6 13C2 PFHxA										
315.00 > 270.00	2.092	2.097	-0.005		12814780	52.3		105	582538	
D 11 13C4-PFHpA										
367.00 > 322.00	2.423	2.426	-0.003		12248222	54.1		108	431068	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.430	2.428	0.002	1.000	237734	0.99		99.1	1884	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.445	2.431	0.014	1.000	348475	0.99		109		
D 10 18O2 PFHxS										
403.00 > 84.00	2.445	2.446	-0.001		16093048	49.2		104	960828	
D 14 13C4 PFOA										
417.00 > 372.00	2.781	2.783	-0.002		12627691	54.8		110	657205	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooctanoic acid										
413.00 > 369.00	2.781	2.783	-0.002	1.000	254861	1.01		101	2003	
413.00 > 169.00	2.781	2.783	-0.002	1.000	159259		1.60(0.90-1.10)	101	7007	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.789	2.790	-0.001	1.000	265783	0.9254		97.2		
18 Perfluorooctane sulfonic acid										M
499.00 > 80.00	3.149	3.118	0.031	1.000	220370	0.8502		91.6	15877	M
499.00 > 99.00	3.157	3.118	0.039	1.003	52990		4.16(0.90-1.10)	91.6	5530	M
D 17 13C4 PFOS										
503.00 > 80.00	3.149	3.151	-0.002		12459383	50.1		105	1105467	
D 19 13C5 PFNA										
468.00 > 423.00	3.149	3.153	-0.004		9537045	53.7		107	472742	
20 Perfluorononanoic acid										
463.00 > 419.00	3.157	3.155	0.002	1.000	188341	1.04		104	2906	
D 21 13C8 FOSA										
506.00 > 78.00	3.489	3.488	0.001		20238792	52.7		105	766772	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.489	3.491	-0.002	1.000	381363	1.01		101	46576	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.506	3.510	-0.004	1.000	155537	0.9716		97.2	5243	
D 23 13C2 PFDA										
515.00 > 470.00	3.514	3.513	0.001		8480447	53.9		108	439565	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.824	3.822	0.002	1.000	139829	0.9186		95.3		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.833	3.839	-0.006	1.000	119189	1.00		100	2937	
D 27 13C2 PFUnA										
565.00 > 520.00	3.842	3.842	0.0		6219248	53.0		106	280274	
D 30 13C2 PFDoA										
615.00 > 570.00	4.133	4.132	0.001		5822114	52.5		105	270055	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.133	4.136	-0.003	1.000	103481	0.9681		96.8	2745	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.396	4.400	-0.004	1.000	109461	1.04		104	2155	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.633	4.641	-0.008		11885446	52.3		105	710542	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.643	4.642	0.001	1.000	187123	1.01		101	2896	
713.00 > 169.00	4.633	4.642	-0.009	0.998	31916		5.86(0.00-0.00)	101	12057	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.047	5.057	-0.010		6699329	53.8		108	126940	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.058	5.059	-0.001	1.000	173261	1.01		101	135	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.413	5.414	-0.001	1.000	114997	0.9585		95.8	91.0	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LCPFC-L2_00023 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 14:34:16 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_005.d

Injection Date: 15-Dec-2016 12:36:48 Instrument ID: A8_N

Lims ID: IC L2

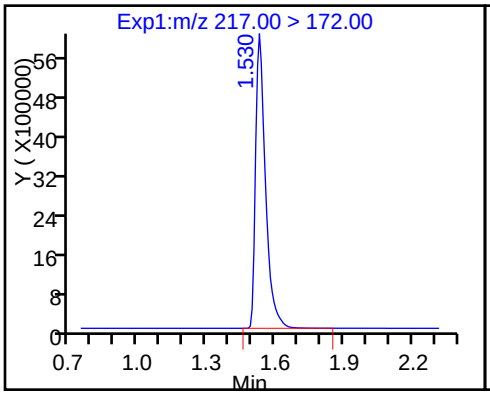
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 38 Worklist Smp#: 5

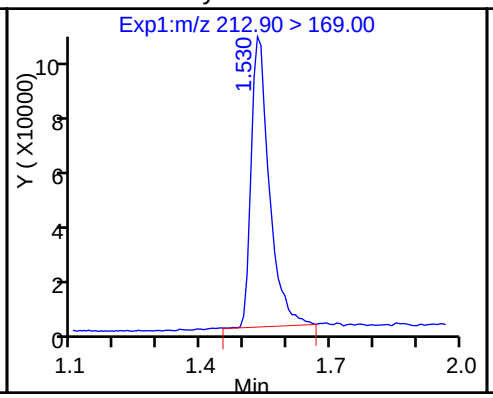
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

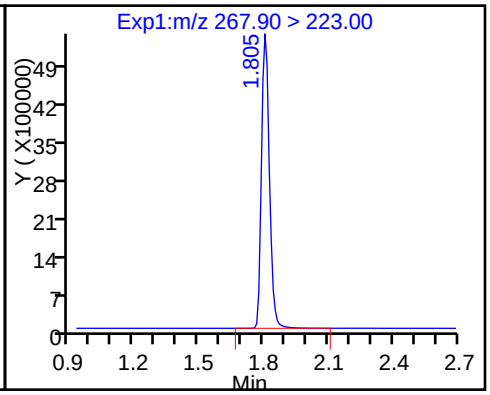
D 2 13C4 PFBA



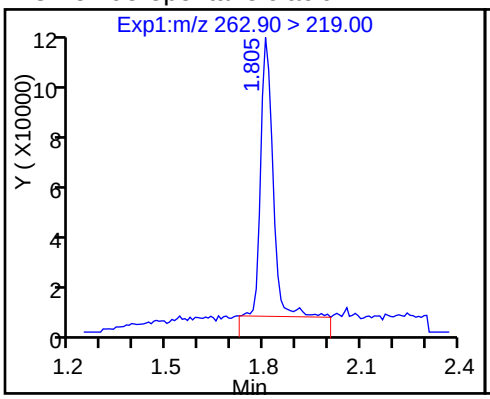
1 Perfluorobutyric acid



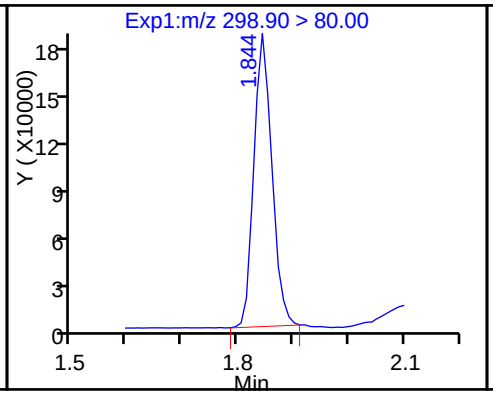
D 4 13C5-PFPeA



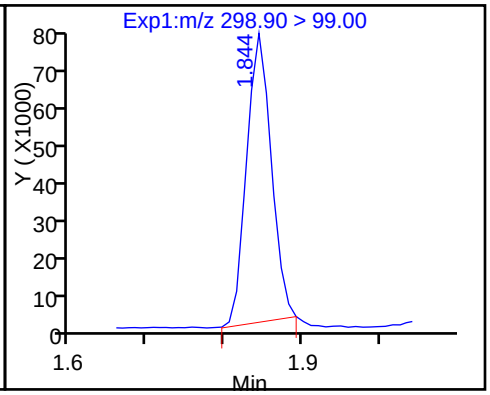
3 Perfluoropentanoic acid



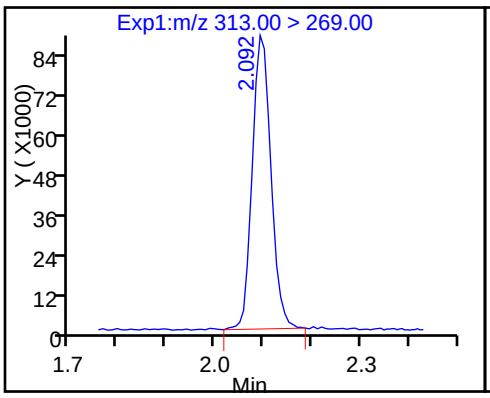
5 Perfluorobutanesulfonic acid



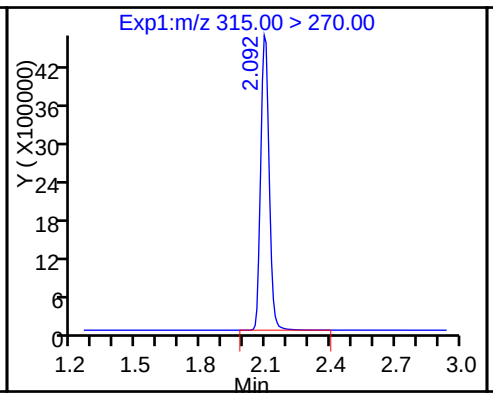
5 Perfluorobutanesulfonic acid



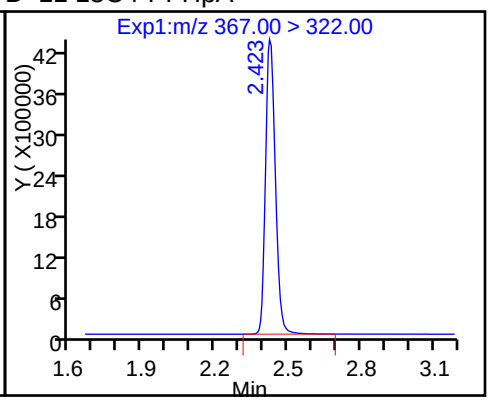
7 Perfluorohexanoic acid



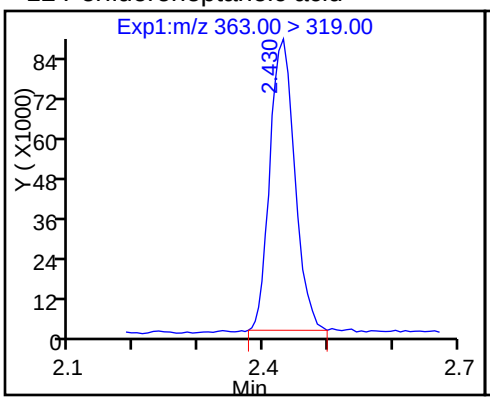
D 6 13C2 PFHxA



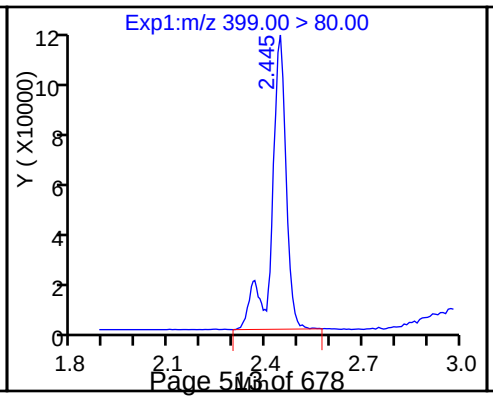
D 11 13C4-PFHpA



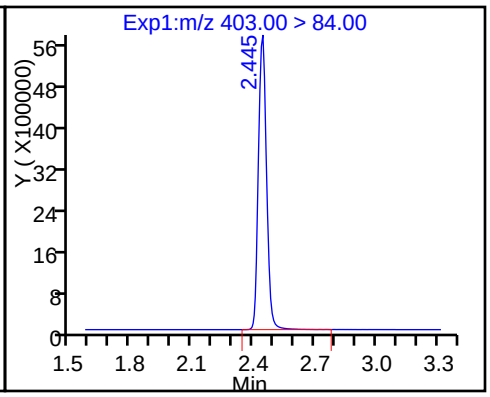
12 Perfluoroheptanoic acid



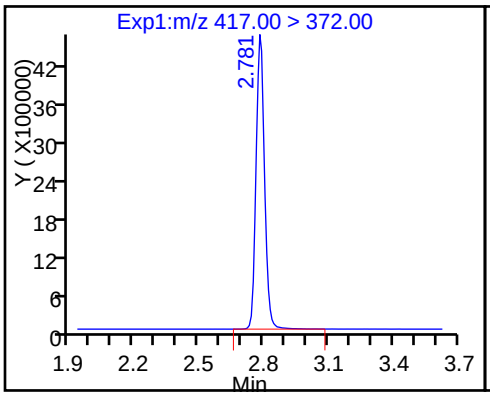
9 Perfluorohexanesulfonic acid



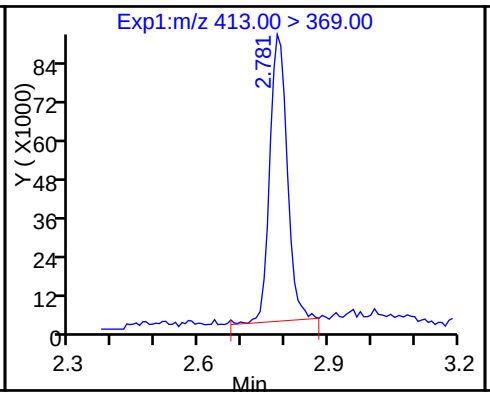
D 10 18O2 PFHxS



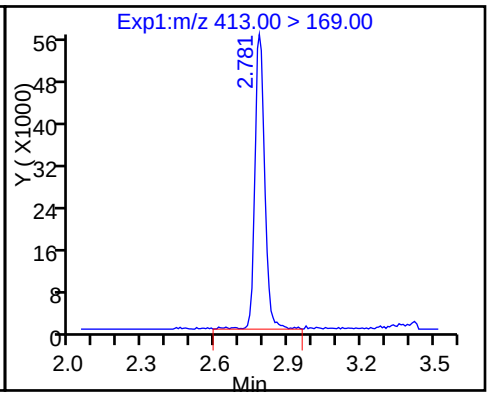
D 14 13C4 PFOA



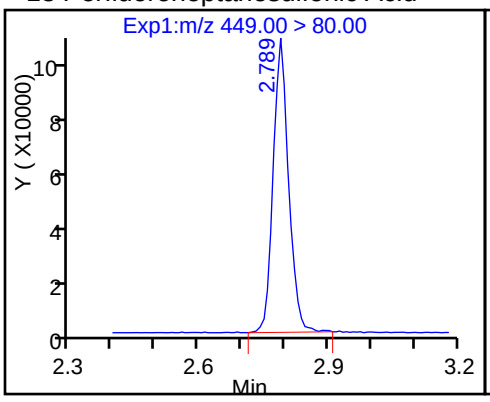
15 Perfluorooctanoic acid



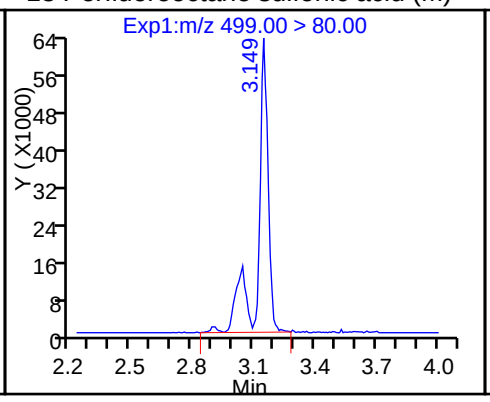
15 Perfluorooctanoic acid



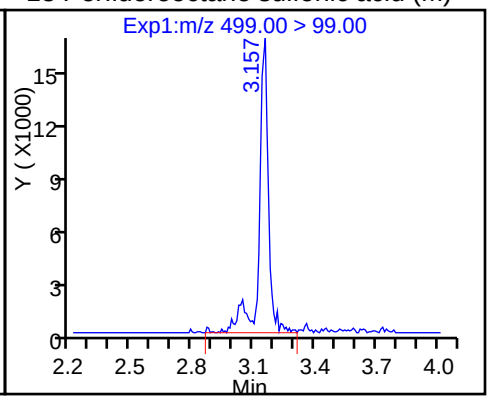
13 Perfluoroheptanesulfonic Acid



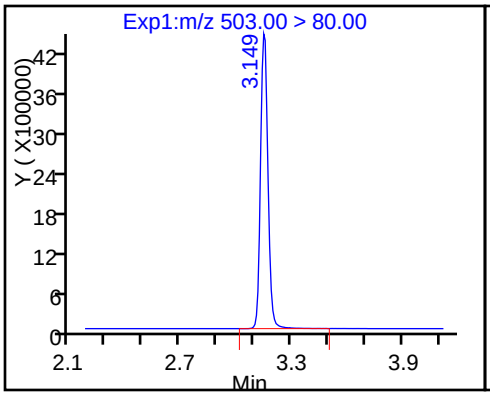
18 Perfluorooctane sulfonic acid (M)



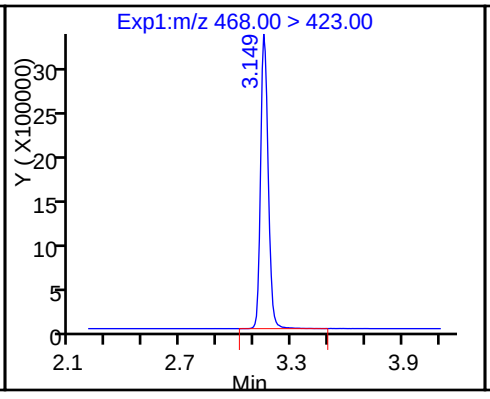
18 Perfluorooctane sulfonic acid (M)



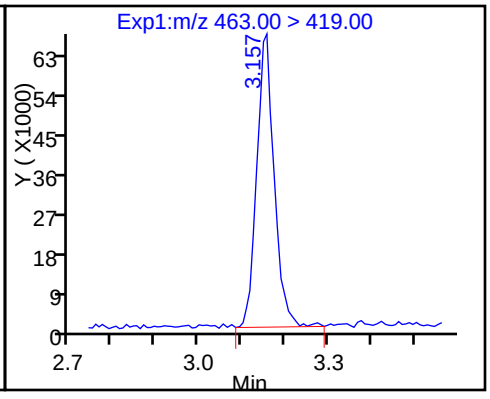
D 17 13C4 PFOS



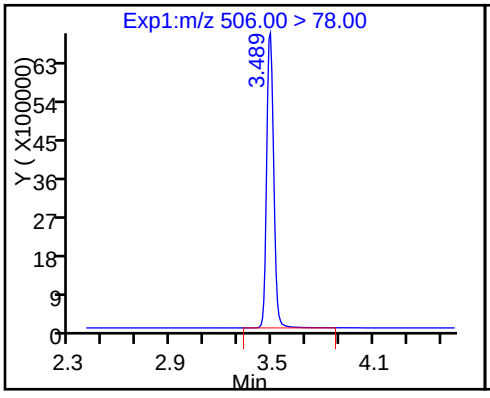
D 19 13C5 PFNA



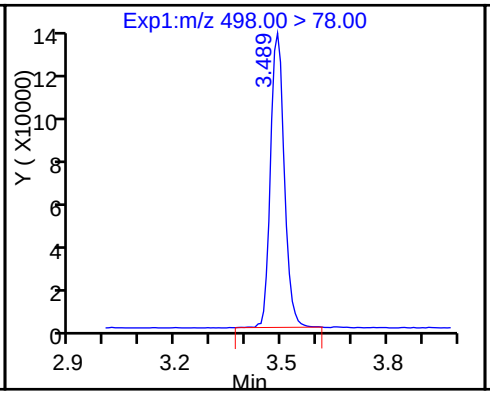
20 Perfluorononanoic acid



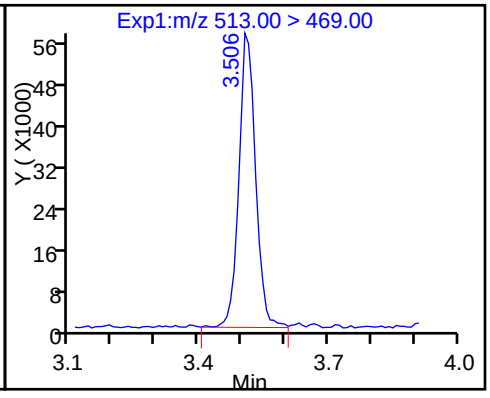
D 21 13C8 FOSA



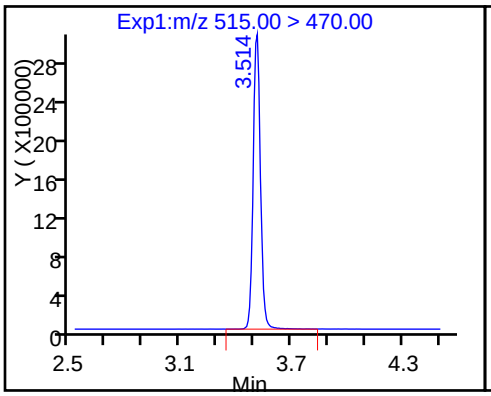
22 Perfluorooctane Sulfonamide



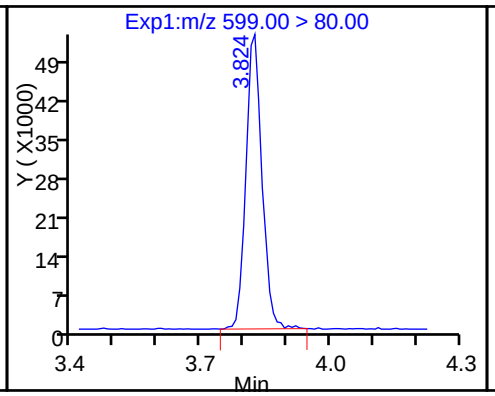
24 Perfluorodecanoic acid



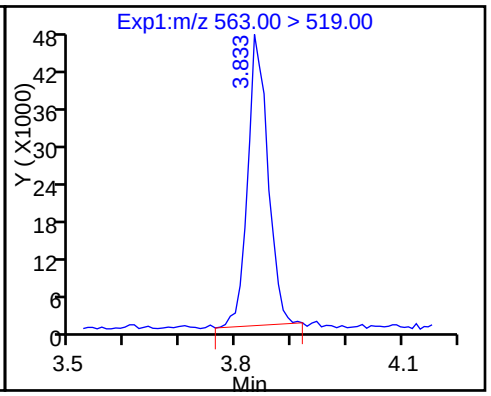
D 23 13C2 PFDA



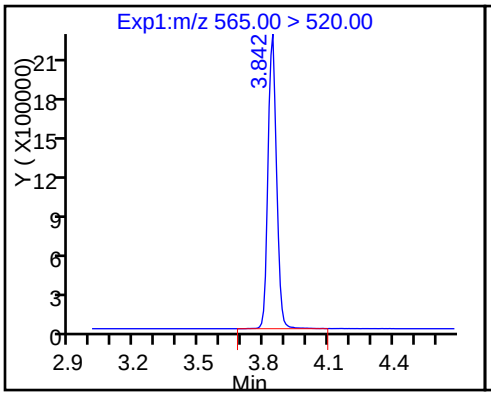
26 Perfluorodecane Sulfonic acid



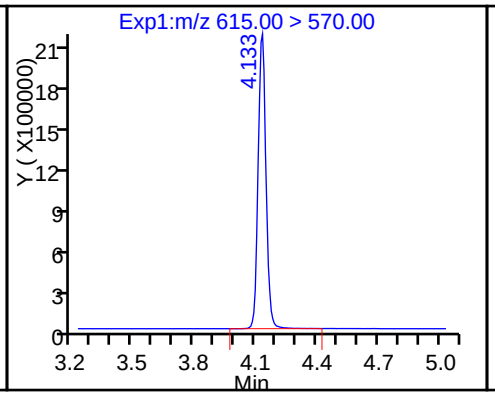
28 Perfluoroundecanoic acid



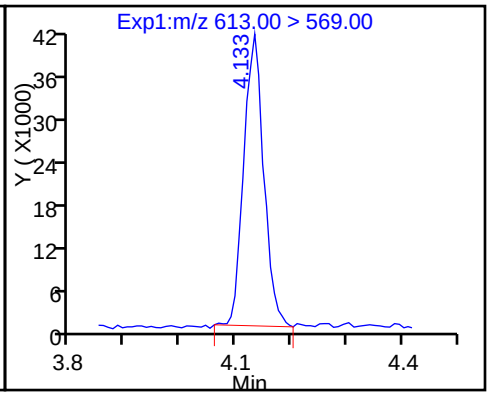
D 27 13C2 PFUnA



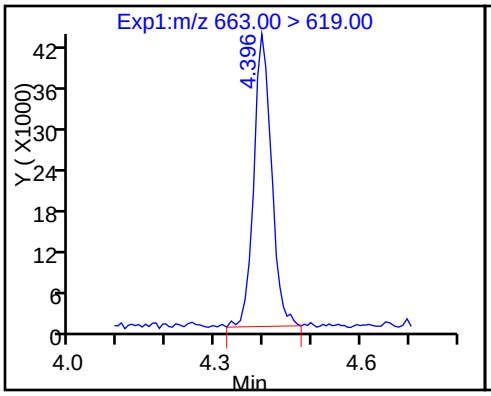
D 30 13C2 PFDoA



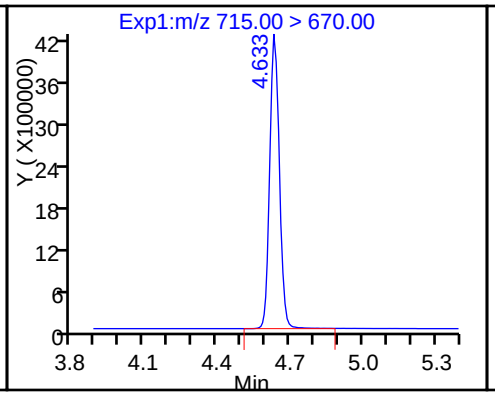
29 Perfluorododecanoic acid



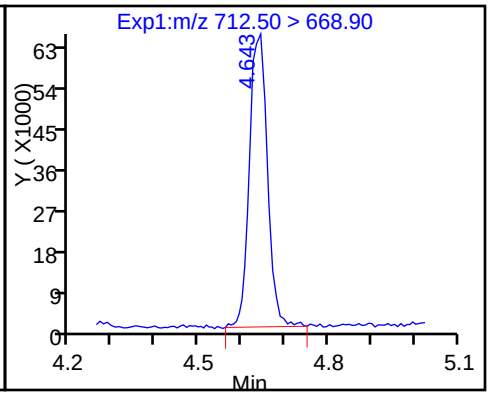
31 Perfluorotridecanoic acid



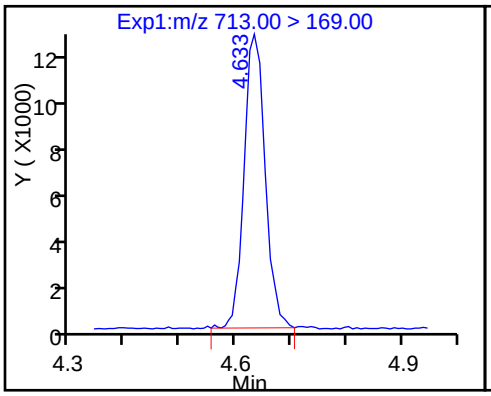
D 32 13C2-PFTeDA



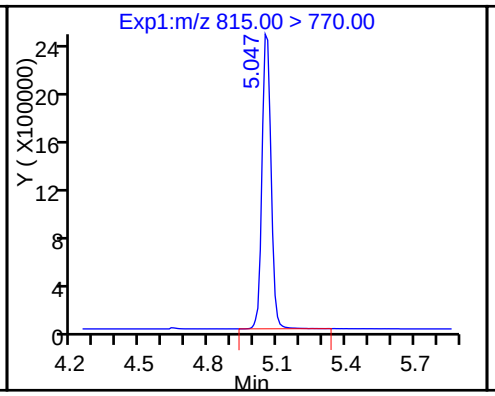
33 Perfluorotetradecanoic acid



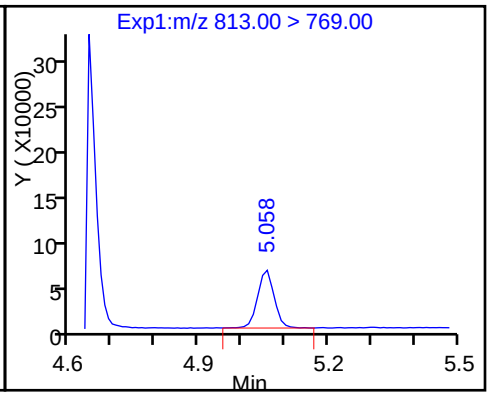
33 Perfluorotetradecanoic acid



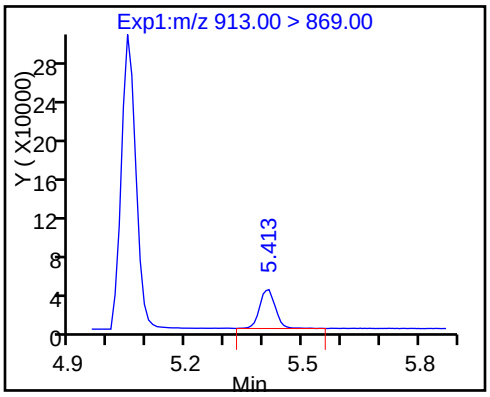
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

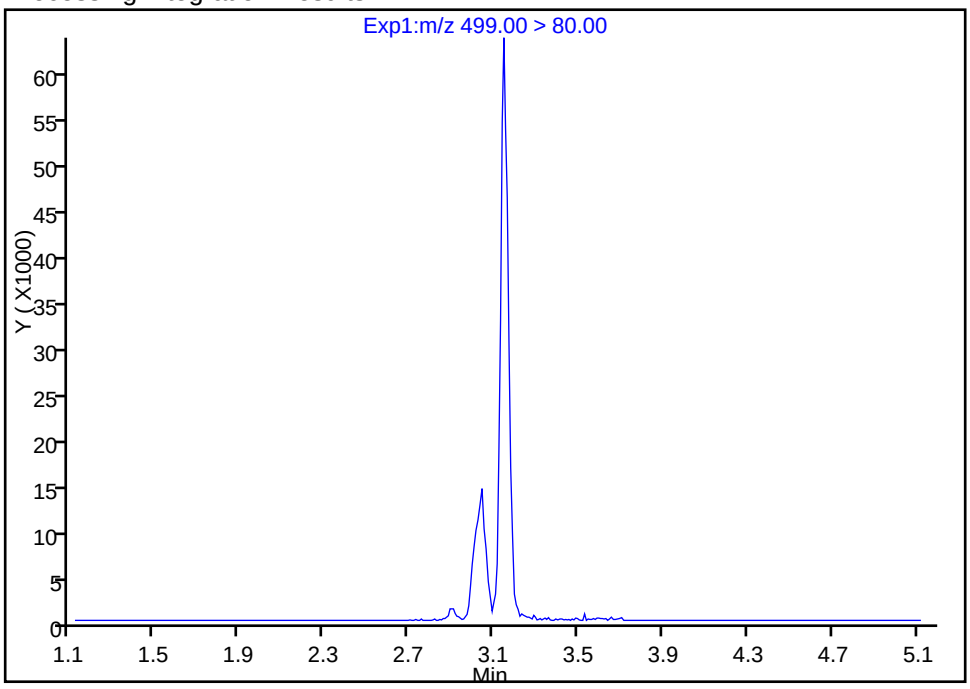
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_005.d
Injection Date: 15-Dec-2016 12:36:48 Instrument ID: A8_N
Lims ID: IC L2
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 38 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

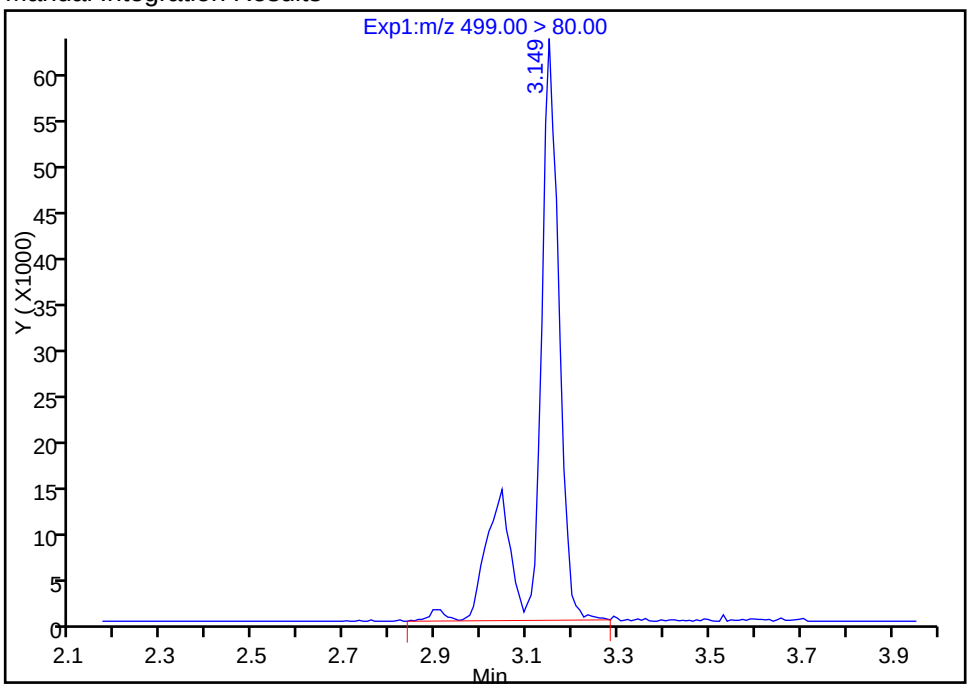
Not Detected
Expected RT: 3.12

Processing Integration Results



Manual Integration Results

RT: 3.15
Area: 220370
Amount: 0.850158
Amount Units: ng/ml



Reviewer: chandrasenas, 15-Dec-2016 13:50:02
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

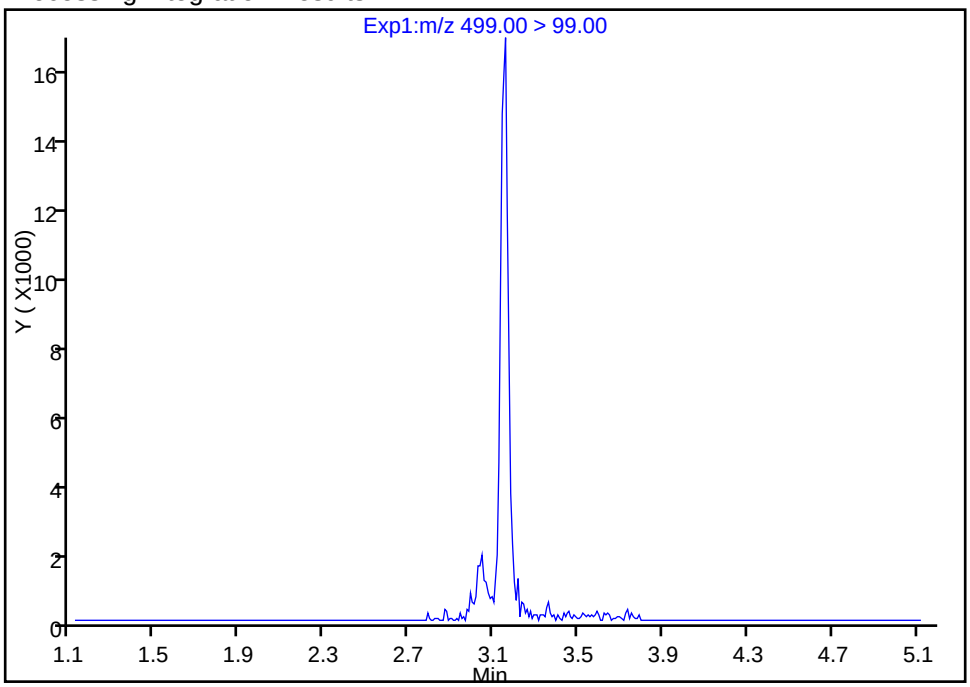
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_005.d
Injection Date: 15-Dec-2016 12:36:48 Instrument ID: A8_N
Lims ID: IC L2
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 38 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

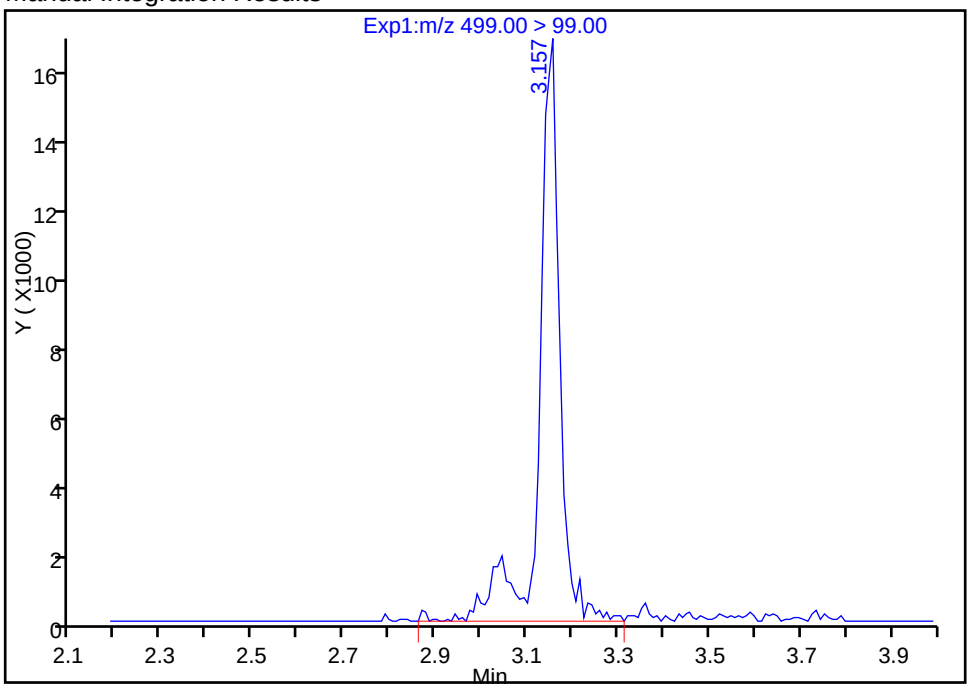
Processing Integration Results

Not Detected
Expected RT: 3.12



Manual Integration Results

RT: 3.16
Area: 52990
Amount: 0.850158
Amount Units: ng/ml



Reviewer: chandrasenas, 15-Dec-2016 13:50:02
Audit Action: Manually Integrated Audit Reason: Assign Peak

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_006.d
Lims ID: IC L3
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 15-Dec-2016 12:44:16 ALS Bottle#: 39 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L3_b
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub6

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 16-Dec-2016 14:34:18 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 15-Dec-2016 13:50:22

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.534	1.534	0.0		18037108	51.9		104	828248	
1 Perfluorobutyric acid										
212.90 > 169.00	1.534	1.535	-0.001	1.000	1550440	5.03		101	13427	
D 4 13C5-PFPeA										
267.90 > 223.00	1.810	1.810	0.0		14063070	52.9		106	1078697	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.810	1.810	0.0	1.000	1358239	4.89		97.9	15178	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.849	1.848	0.001	1.000	2211602	4.55		103		
298.90 > 99.00	1.849	1.848	0.001	1.000	918055		2.41(0.00-0.00)	103		
7 Perfluorohexanoic acid										
313.00 > 269.00	2.097	2.096	0.001	1.000	1183286	5.01		100	39266	
D 6 13C2 PFHxA										
315.00 > 270.00	2.097	2.097	0.0		12709919	51.9		104	753338	
D 11 13C4-PFHpA										
367.00 > 322.00	2.425	2.426	-0.001		12260528	54.2		108	1467079	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.432	2.428	0.004	1.000	1175112	4.90		97.9	8914	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.364	2.431	-0.067	1.000	1543002	4.37		96.0		
D 10 18O2 PFHxS										
403.00 > 84.00	2.447	2.446	0.001		16222736	49.6		105	651458	
D 14 13C4 PFOA										
417.00 > 372.00	2.783	2.783	0.0		12635065	54.8		110	746410	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooctanoic acid										
413.00 > 369.00	2.783	2.783	0.0	1.000	1239541	4.89		97.8	9812	
413.00 > 169.00	2.783	2.783	0.0	1.000	731249		1.70(0.90-1.10)	97.8	28264	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.792	2.790	0.002	1.000	1351160	4.69		98.6		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.153	3.118	0.035	1.000	1150410	4.43		95.5	65030	
499.00 > 99.00	3.153	3.118	0.035	1.000	246751		4.66(0.90-1.10)	95.5	15530	
D 17 13C4 PFOS										
503.00 > 80.00	3.153	3.151	0.002		12484772	50.2		105	473035	
D 19 13C5 PFNA										
468.00 > 423.00	3.153	3.153	0.0		9777609	55.0		110	653324	
20 Perfluorononanoic acid										
463.00 > 419.00	3.153	3.155	-0.002	1.000	902512	4.85		97.0	13825	
D 21 13C8 FOSA										
506.00 > 78.00	3.484	3.488	-0.004		20034933	52.2		104	309657	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.492	3.491	0.001	1.000	1989314	5.32		106	140153	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.509	3.510	-0.001	1.000	771905	4.97		99.3	27905	
D 23 13C2 PFDA										
515.00 > 470.00	3.509	3.513	-0.004		8234678	52.3		105	259288	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.819	3.822	-0.003	1.000	712852	4.67		97.0		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.837	3.839	-0.002	1.000	549708	4.59		91.8	14816	
D 27 13C2 PFUnA										
565.00 > 520.00	3.845	3.842	0.003		6262617	53.4		107	379922	
D 30 13C2 PFDoA										
615.00 > 570.00	4.129	4.132	-0.003		5779875	52.1		104	227122	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.136	4.136	0.0	1.000	506369	4.77		95.4	11299	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.398	4.400	-0.002	1.000	525090	5.01		100	10475	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.645	4.641	0.004		12248242	53.9		108	1049274	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.645	4.642	0.003	1.000	900575	4.92		98.3	12522	
713.00 > 169.00	4.635	4.642	-0.007	0.998	149199		6.04(0.00-0.00)	98.3	58819	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.059	5.057	0.002		6542972	52.5		105	140605	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.059	5.059	0.0	1.000	599529	4.89		97.7	502	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.414	5.414	0.0	1.000	583761	4.90		98.0	536	

Reagents:

LCPFC-L3_00020 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 14:34:19 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_006.d

Injection Date: 15-Dec-2016 12:44:16 Instrument ID: A8_N

Lims ID: IC L3

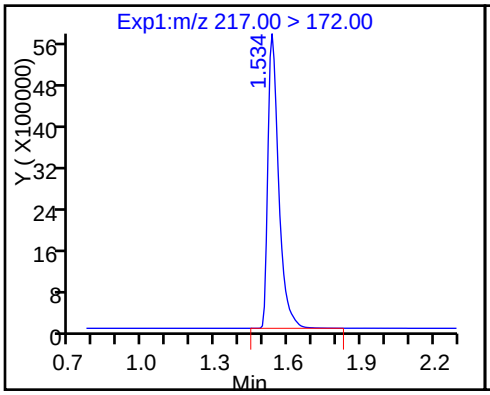
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 39 Worklist Smp#: 6

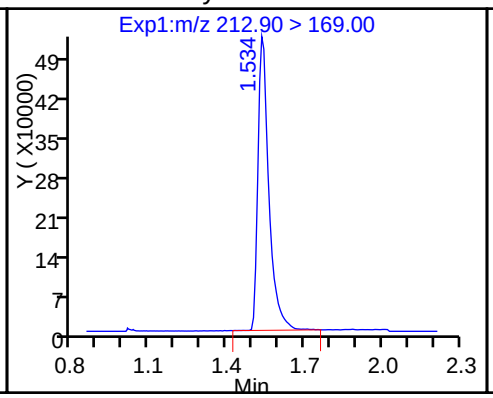
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

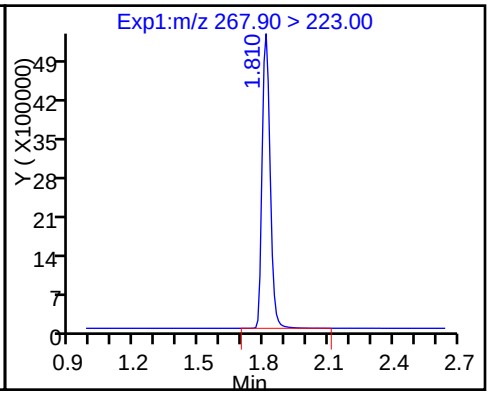
D 2 13C4 PFBA



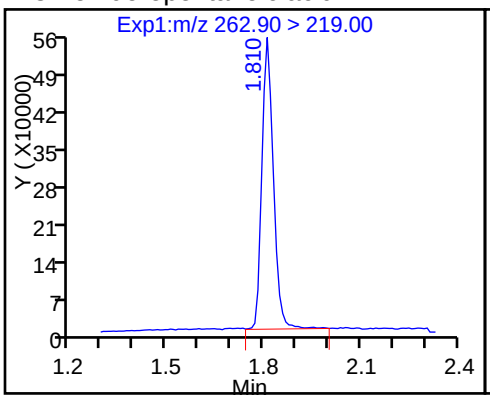
1 Perfluorobutyric acid



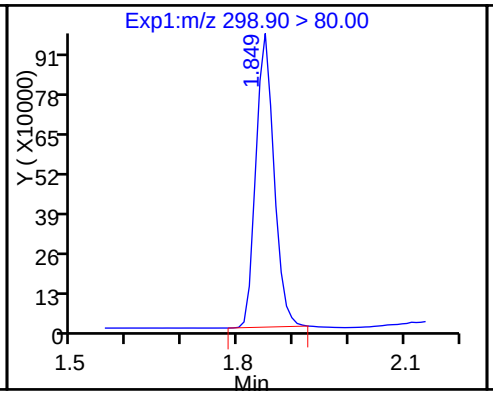
D 4 13C5-PFPeA



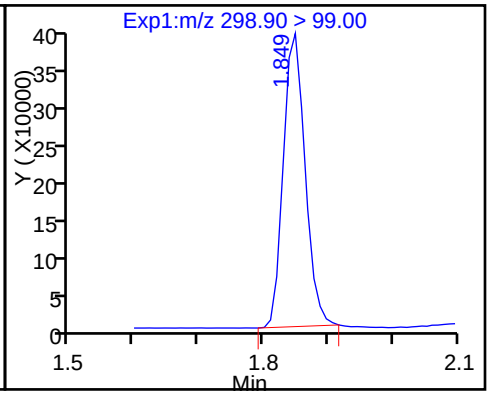
3 Perfluoropentanoic acid



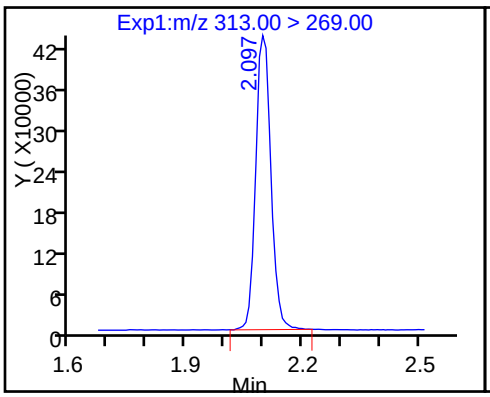
5 Perfluorobutanesulfonic acid



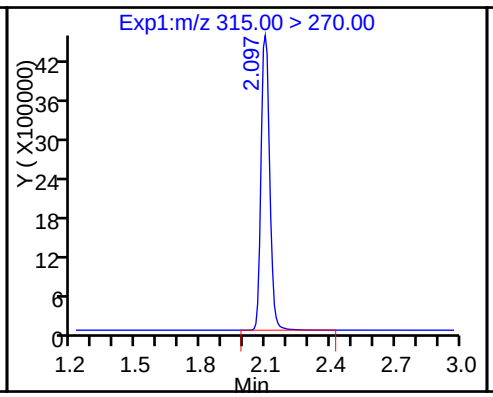
5 Perfluorobutanesulfonic acid



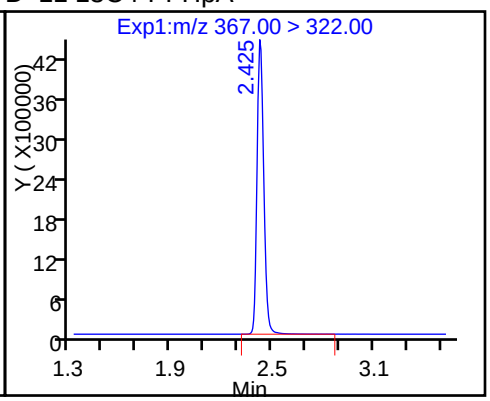
7 Perfluorohexanoic acid



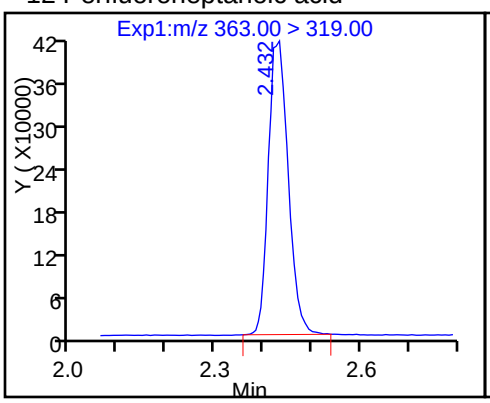
D 6 13C2 PFHxA



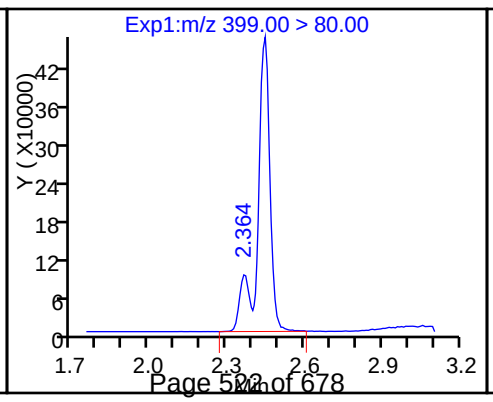
D 11 13C4-PFHpA



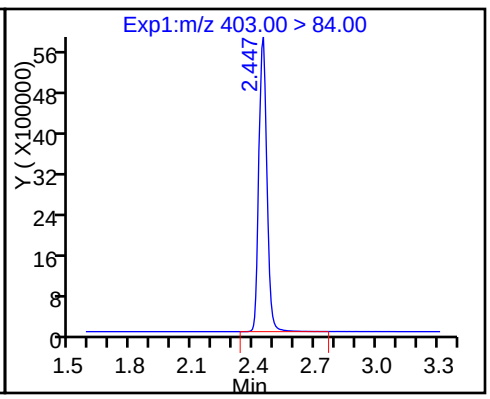
12 Perfluoroheptanoic acid



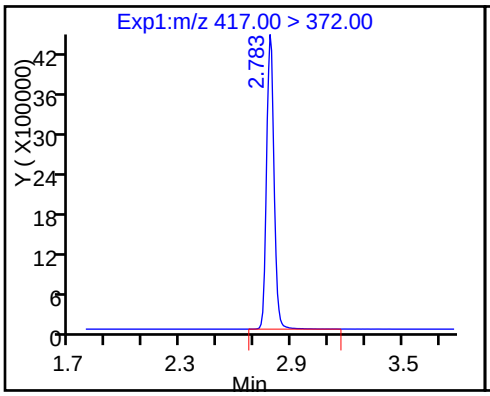
9 Perfluorohexanesulfonic acid



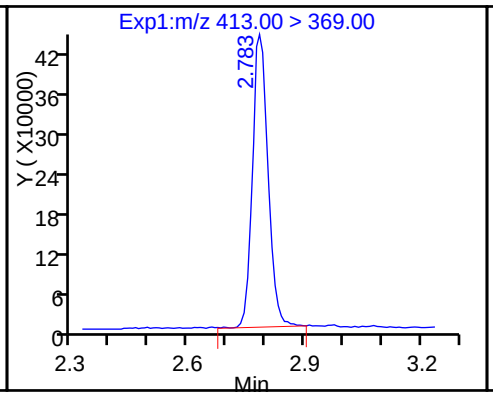
D 10 18O2 PFHxS



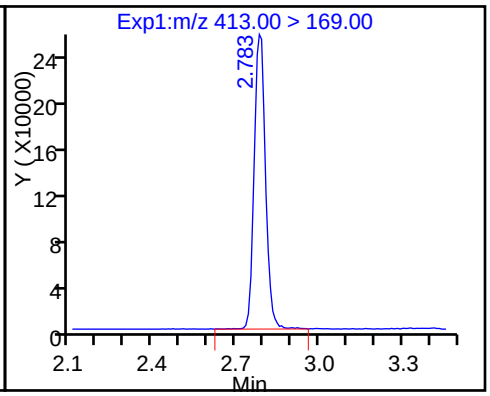
D 14 13C4 PFOA



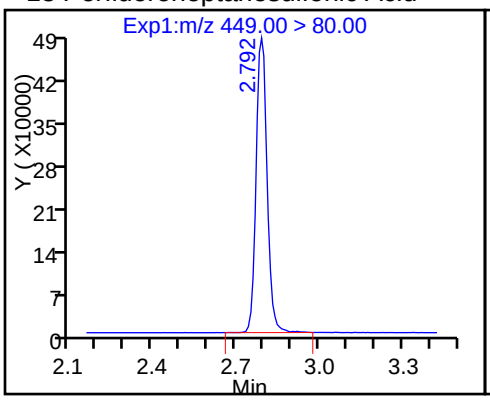
15 Perfluorooctanoic acid



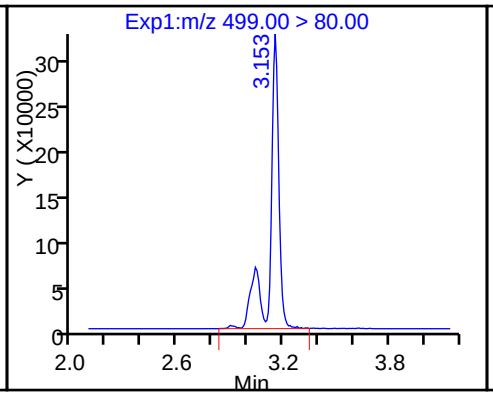
15 Perfluorooctanoic acid



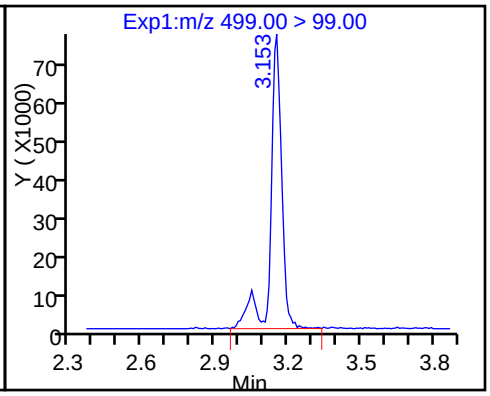
13 Perfluoroheptanesulfonic Acid



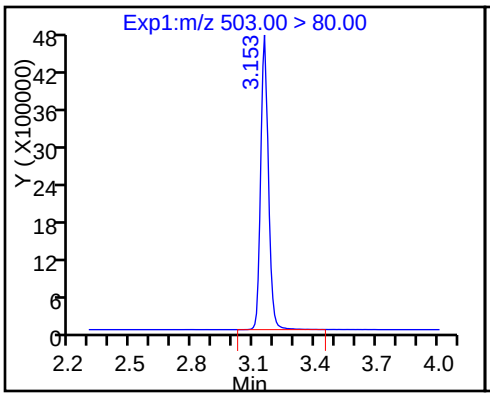
18 Perfluorooctane sulfonic acid



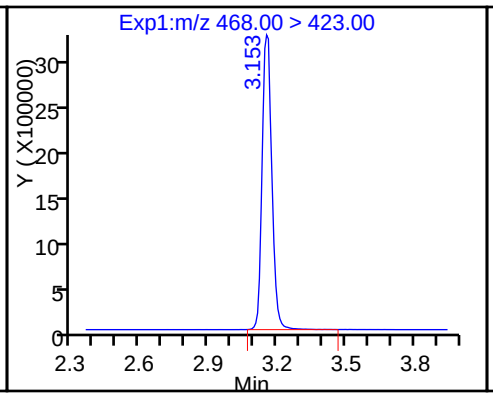
18 Perfluorooctane sulfonic acid



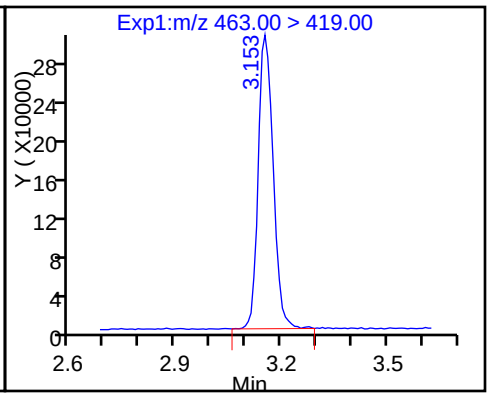
D 17 13C4 PFOS



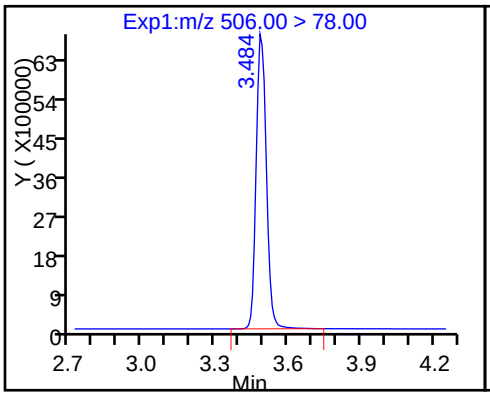
D 19 13C5 PFNA



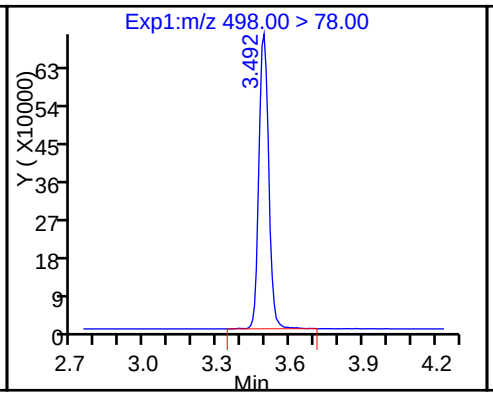
20 Perfluorononanoic acid



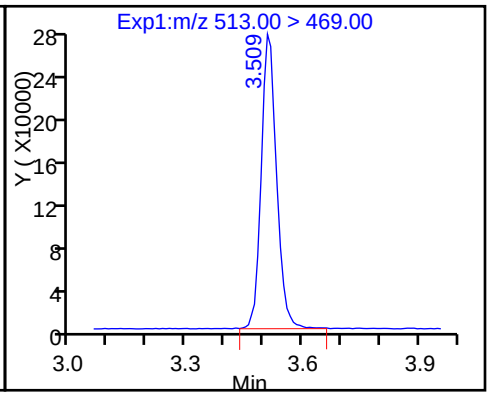
D 21 13C8 FOSA



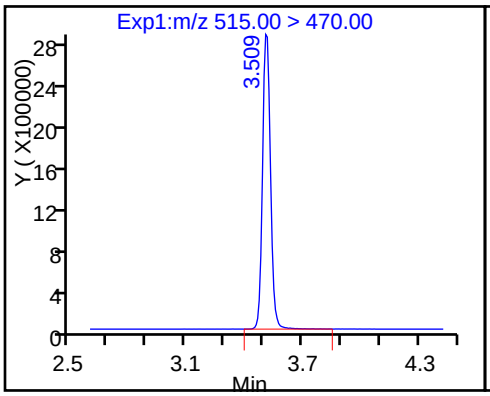
22 Perfluorooctane Sulfonamide



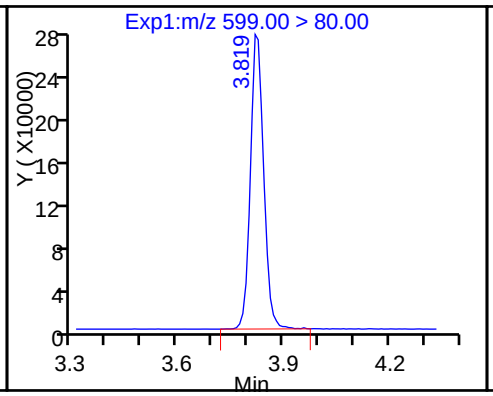
24 Perfluorodecanoic acid



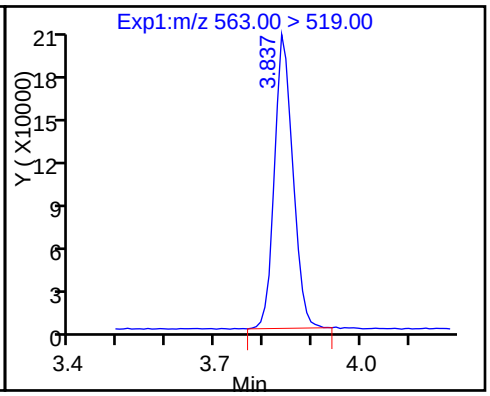
D 23 13C2 PFDA



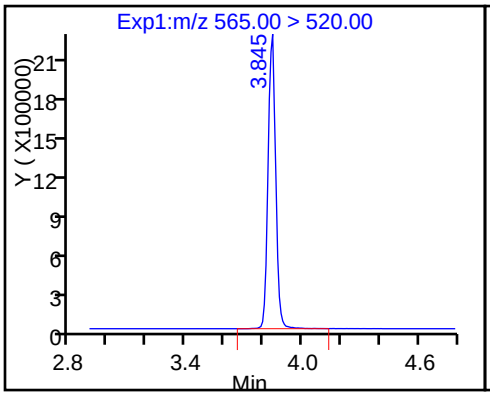
26 Perfluorodecane Sulfonic acid



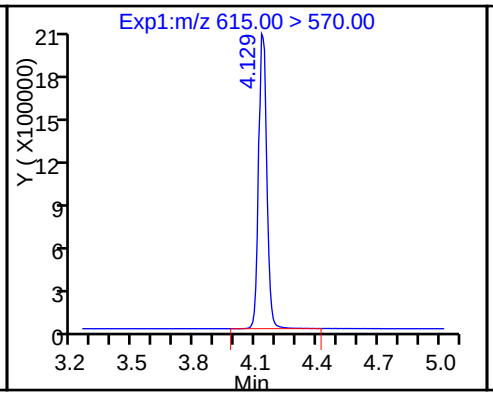
28 Perfluoroundecanoic acid



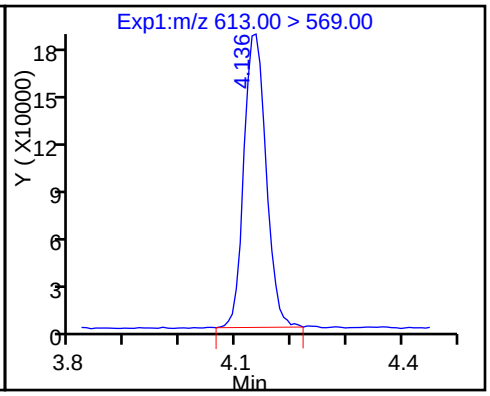
D 27 13C2 PFUnA



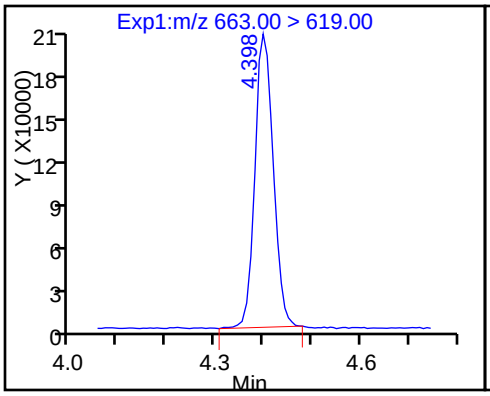
D 30 13C2 PFDoA



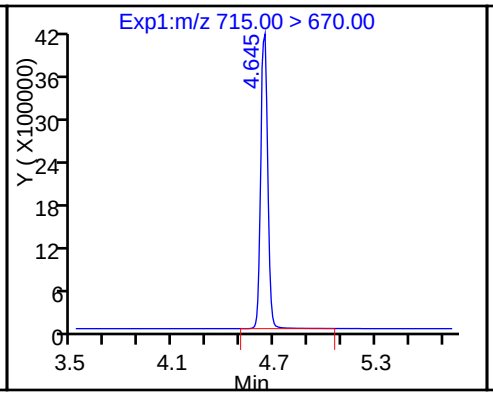
29 Perfluorododecanoic acid



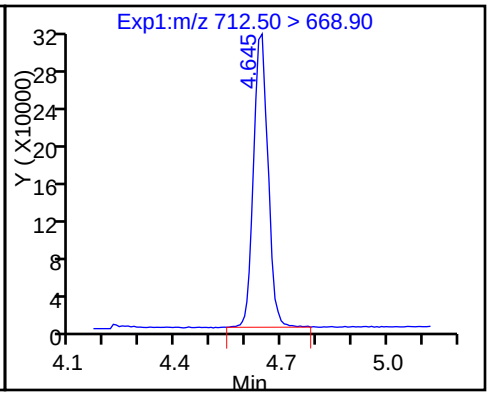
31 Perfluorotridecanoic acid



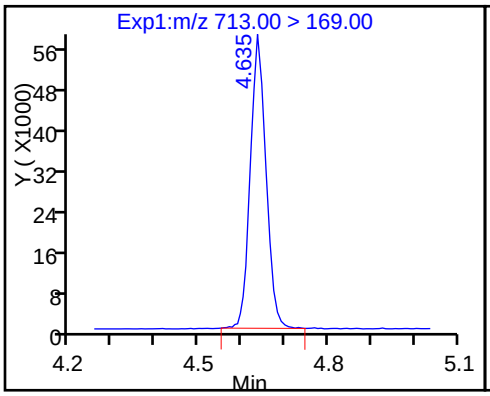
D 32 13C2-PFTeDA



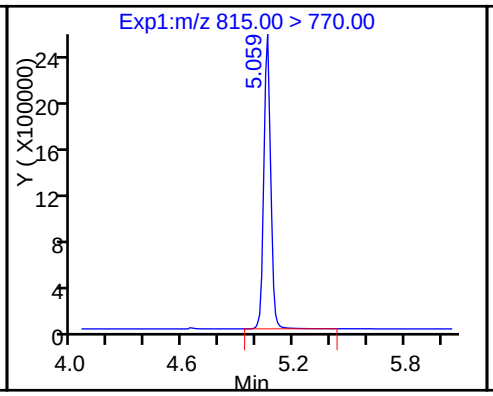
33 Perfluorotetradecanoic acid



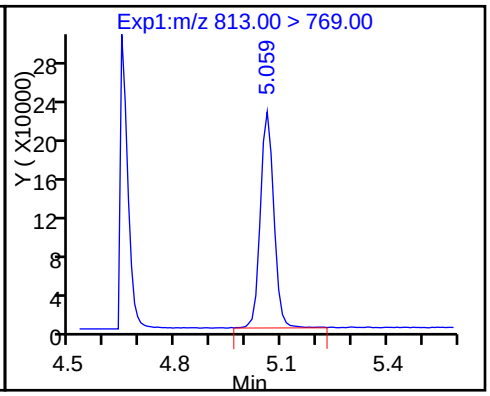
33 Perfluorotetradecanoic acid



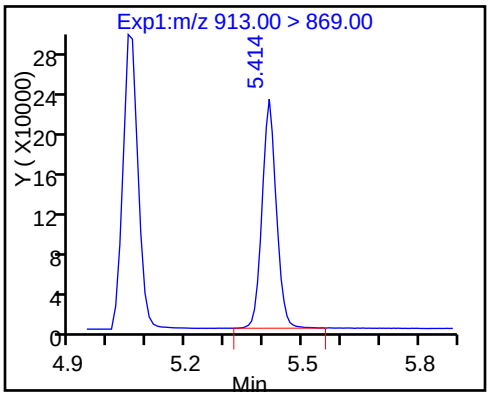
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_007.d
Lims ID: IC L4
Client ID:
Sample Type: IC Calib Level: 4
Inject. Date: 15-Dec-2016 12:51:47 ALS Bottle#: 40 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L4_b
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub6

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 16-Dec-2016 14:34:21 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 15-Dec-2016 13:46:14

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.534	1.534	0.0		17585378	50.6		101	1140977	
1 Perfluorobutyric acid										
212.90 > 169.00	1.534	1.535	-0.001	1.000	6690917	22.3		111	52374	
D 4 13C5-PFPeA										
267.90 > 223.00	1.810	1.810	0.0		13617158	51.2		102	860552	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.810	1.810	0.0	1.000	5770240	21.5		107	61088	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.849	1.848	0.001	1.000	9860707	20.5		116		
298.90 > 99.00	1.849	1.848	0.001	1.000	4111615		2.40(0.00-0.00)	116		
7 Perfluorohexanoic acid										
313.00 > 269.00	2.093	2.096	-0.003	1.000	4929766	21.0		105	144495	
D 6 13C2 PFHxA										
315.00 > 270.00	2.102	2.097	0.005		12608210	51.4		103	627430	
D 11 13C4-PFHpA										
367.00 > 322.00	2.426	2.426	0.0		11788221	52.1		104	459454	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.426	2.428	-0.002	1.000	4747711	20.6		103	44179	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.440	2.431	0.009	1.000	6624638	18.9		104		
D 10 18O2 PFHxS										
403.00 > 84.00	2.440	2.446	-0.006		16062766	49.1		104	697379	
D 14 13C4 PFOA										
417.00 > 372.00	2.785	2.783	0.002		11818203	51.3		103	403727	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooctanoic acid										
413.00 > 369.00	2.785	2.783	0.002	1.000	5109766	21.6		108	40900	
413.00 > 169.00	2.785	2.783	0.002	1.000	3083663		1.66(0.90-1.10)	108	124075	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.785	2.790	-0.005	1.000	6014021	21.4		112		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.129	3.118	0.011	1.000	5058824	20.0		108	109804	
499.00 > 99.00	3.153	3.118	0.035	1.008	1125313		4.50(0.90-1.10)	108	92390	
D 17 13C4 PFOS										
503.00 > 80.00	3.153	3.151	0.002		12183062	49.0		102	250792	
D 19 13C5 PFNA										
468.00 > 423.00	3.153	3.153	0.0		9236073	52.0		104	341338	
20 Perfluorononanoic acid										
463.00 > 419.00	3.153	3.155	-0.002	1.000	3562981	20.3		101	53054	
D 21 13C8 FOSA										
506.00 > 78.00	3.484	3.488	-0.004		19703272	51.3		103	612200	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.492	3.491	0.001	1.000	7990835	21.7		109	298669	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.509	3.510	-0.001	1.000	3166735	20.6		103	81817	
D 23 13C2 PFDA										
515.00 > 470.00	3.517	3.513	0.004		8134734	51.7		103	195073	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.827	3.822	0.005	1.000	3084031	20.7		107		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.844	3.839	0.005	1.000	2420719	20.3		102	65024	
D 27 13C2 PFUnA										
565.00 > 520.00	3.835	3.842	-0.007		6226562	53.1		106	471162	
D 30 13C2 PFDoA										
615.00 > 570.00	4.135	4.132	0.003		5816809	52.4		105	222845	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.135	4.136	-0.001	1.000	2231794	20.9		104	47124	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.398	4.400	-0.002	1.000	2087859	19.8		98.9	37986	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.644	4.641	0.003		11655048	51.3		103	471362	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.644	4.642	0.002	1.000	3678976	20.0		99.8	48461	
713.00 > 169.00	4.635	4.642	-0.007	0.998	596997		6.16(0.00-0.00)	99.8	56132	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.059	5.057	0.002		6335821	50.9		102	120381	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.059	5.059	0.0	1.000	2267892	19.9		99.3	1990	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.413	5.414	-0.001	1.000	2445236	20.4		102	2369	

Reagents:

LCPFC-L4_00024 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 14:34:22 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_007.d

Injection Date: 15-Dec-2016 12:51:47 Instrument ID: A8_N

Lims ID: IC L4

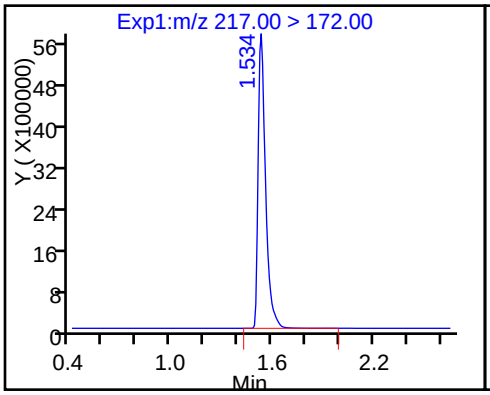
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 40 Worklist Smp#: 7

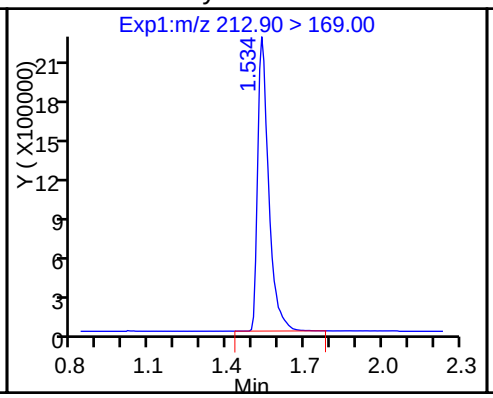
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

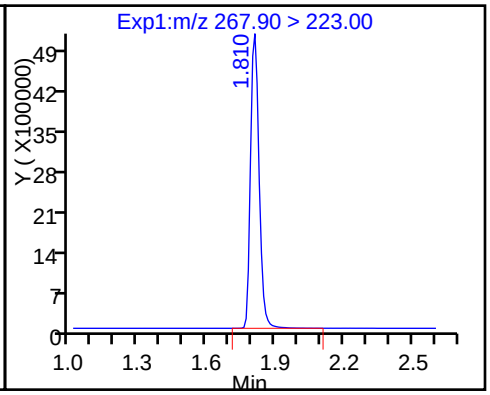
D 2 13C4 PFBA



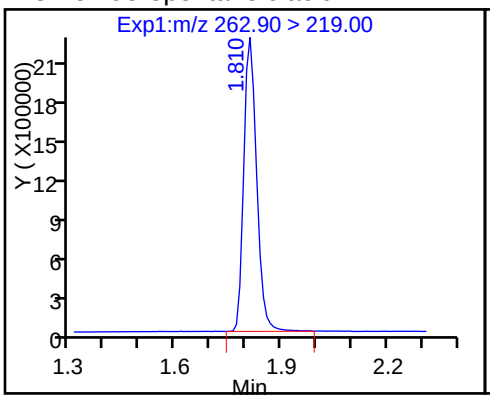
1 Perfluorobutyric acid



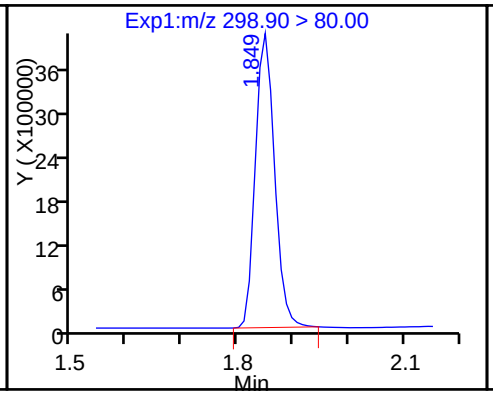
D 4 13C5-PFPeA



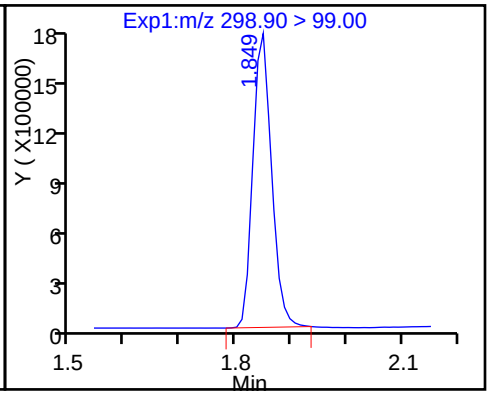
3 Perfluoropentanoic acid



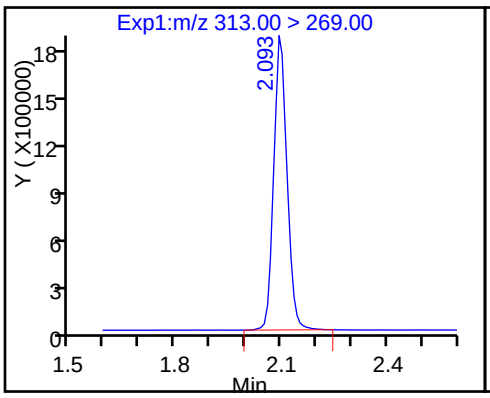
5 Perfluorobutanesulfonic acid



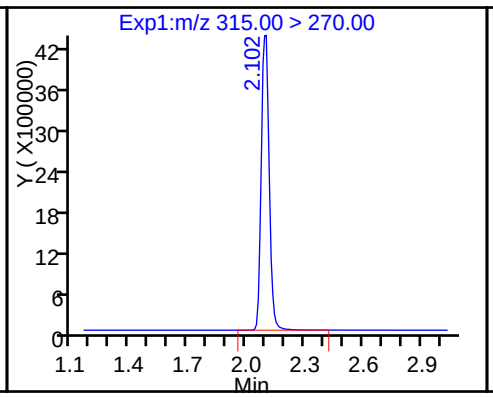
5 Perfluorobutanesulfonic acid



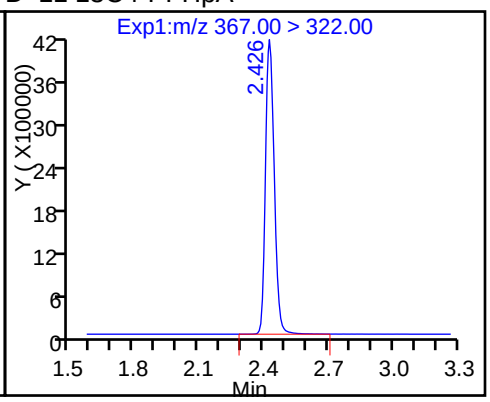
7 Perfluorohexanoic acid



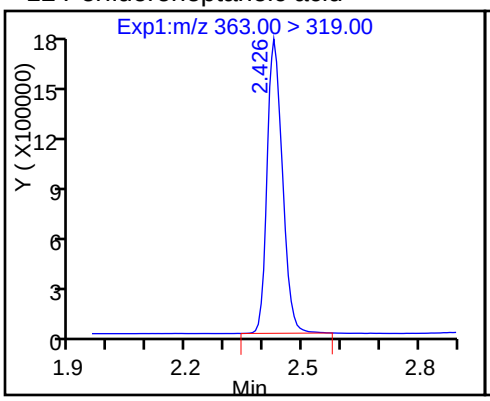
D 6 13C2 PFHxA



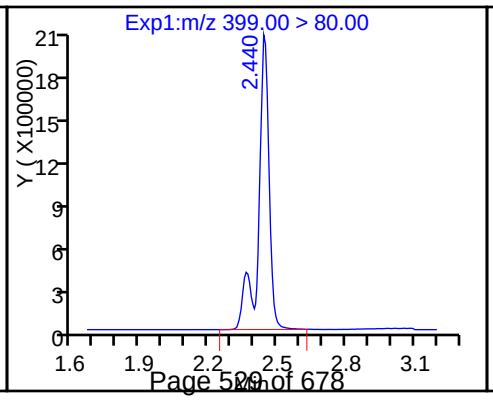
D 11 13C4-PFHpA



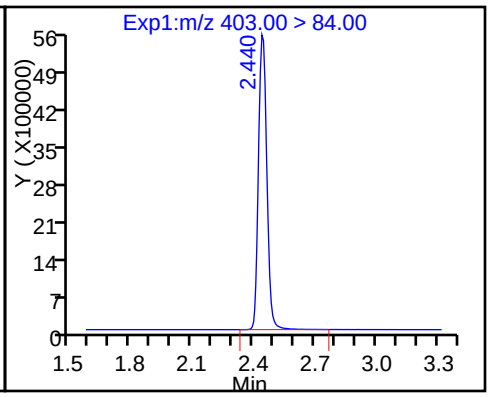
12 Perfluoroheptanoic acid



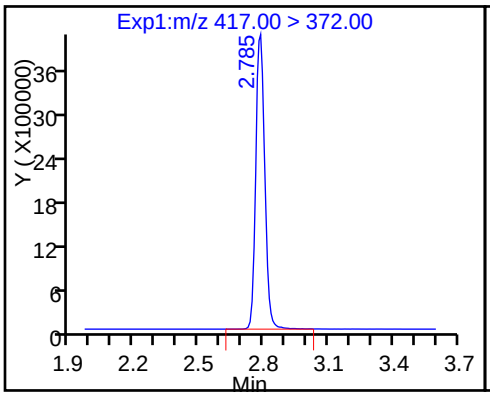
9 Perfluorohexanesulfonic acid



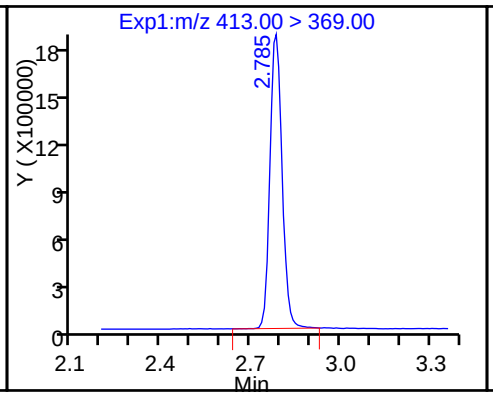
D 10 18O2 PFHxS



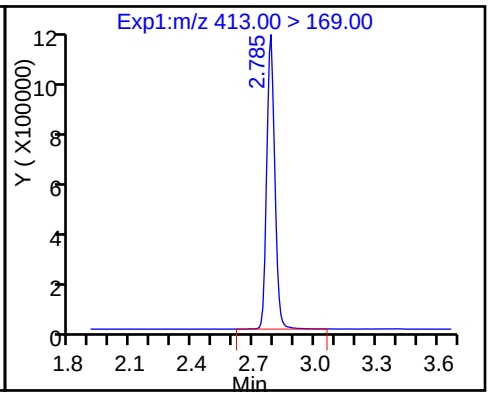
D 14 13C4 PFOA



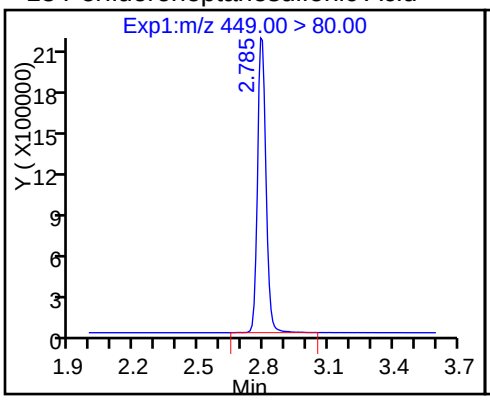
15 Perfluorooctanoic acid



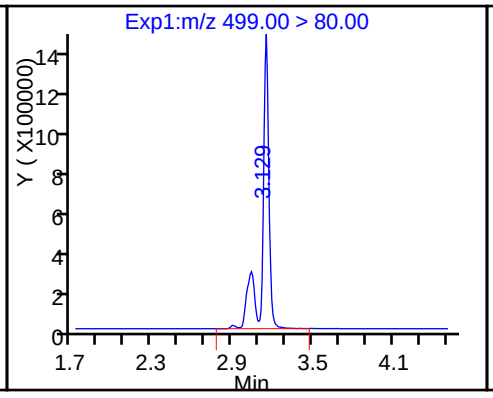
15 Perfluorooctanoic acid



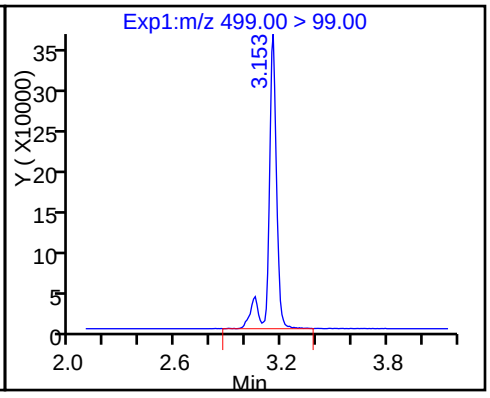
13 Perfluoroheptanesulfonic Acid



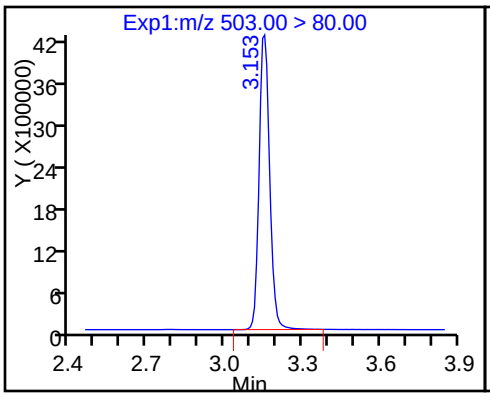
18 Perfluorooctane sulfonic acid



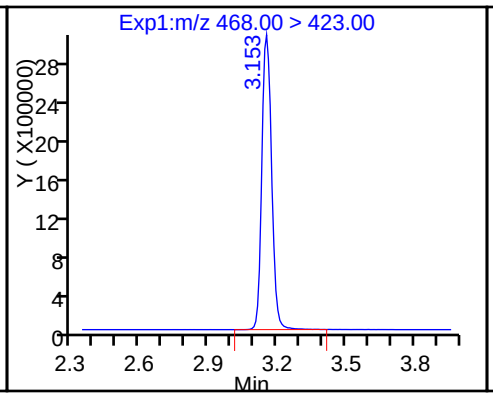
18 Perfluorooctane sulfonic acid



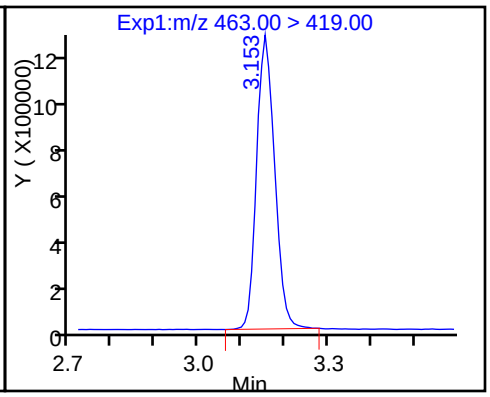
D 17 13C4 PFOS



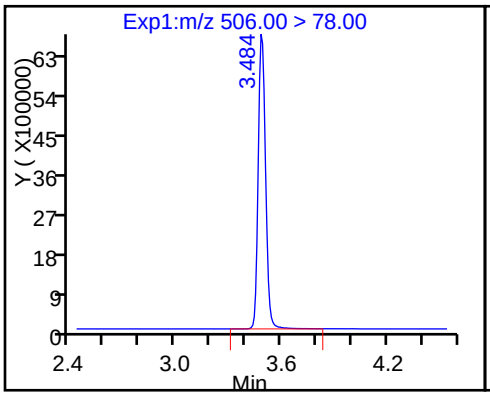
D 19 13C5 PFNA



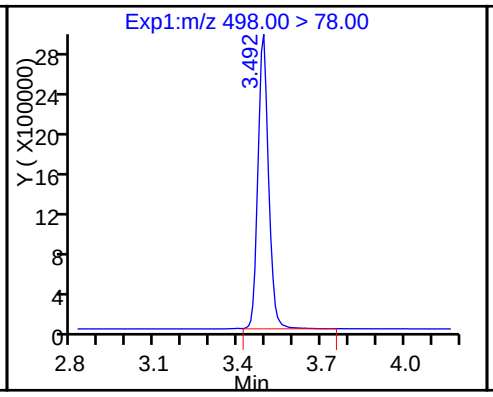
20 Perfluorononanoic acid



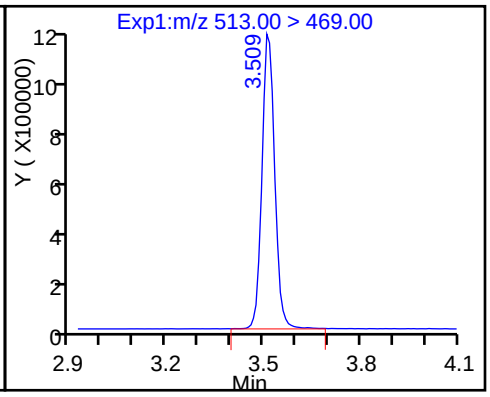
D 21 13C8 FOSA



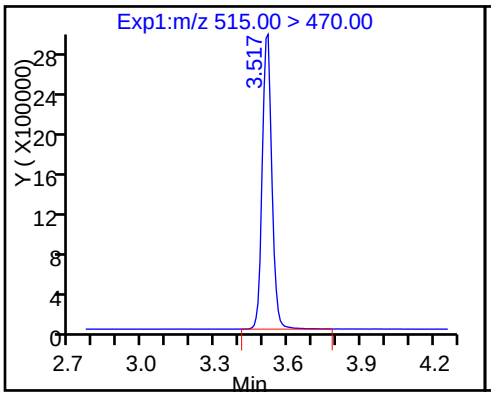
22 Perfluorooctane Sulfonamide



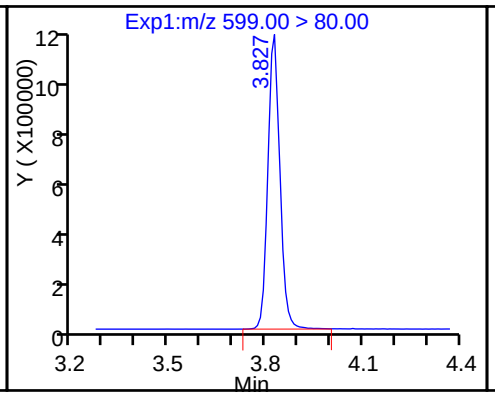
24 Perfluorodecanoic acid



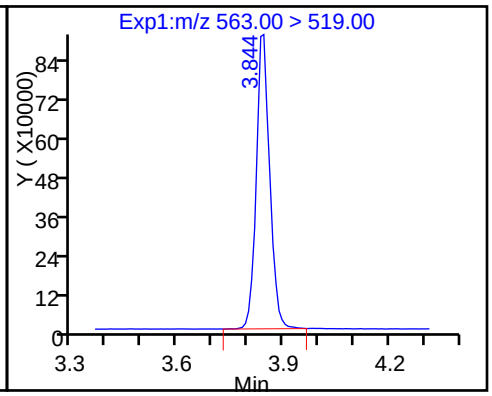
D 23 13C2 PFDA



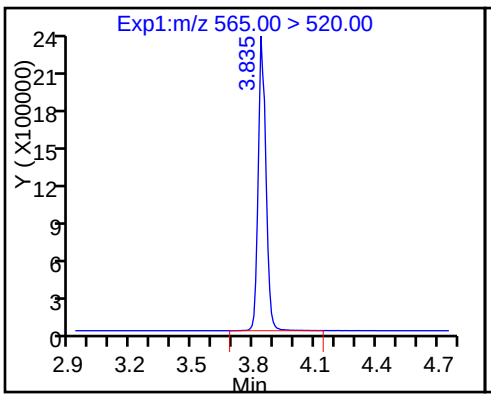
26 Perfluorodecane Sulfonic acid



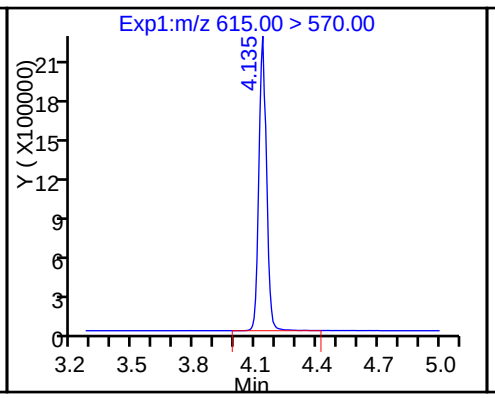
28 Perfluoroundecanoic acid



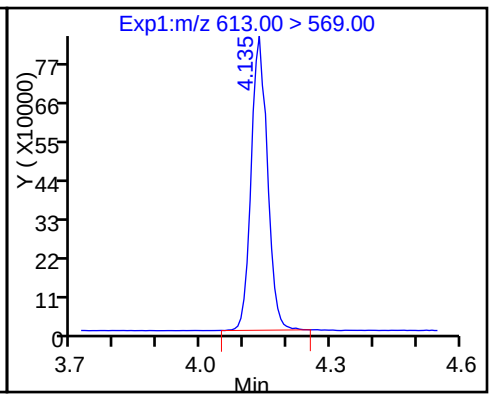
D 27 13C2 PFUnA



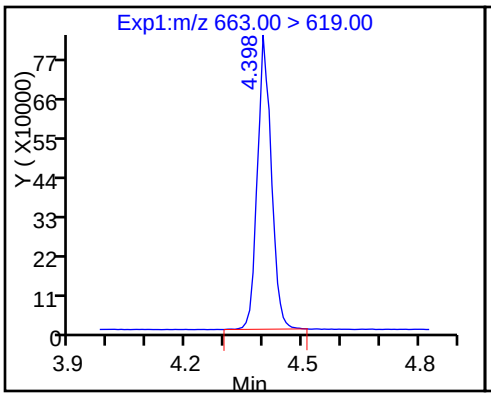
D 30 13C2 PFDoA



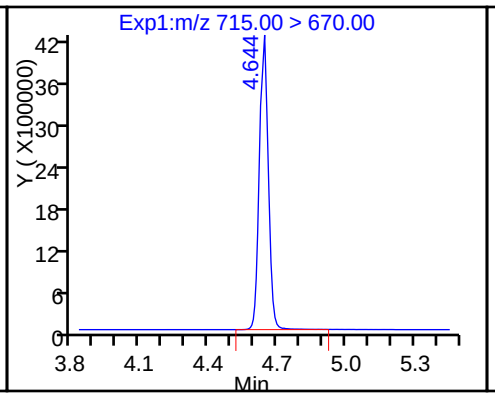
29 Perfluorododecanoic acid



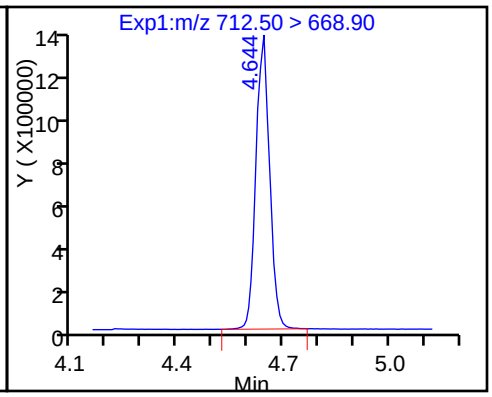
31 Perfluorotridecanoic acid



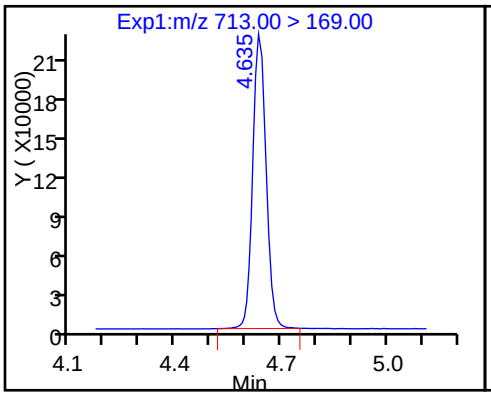
D 32 13C2-PFTeDA



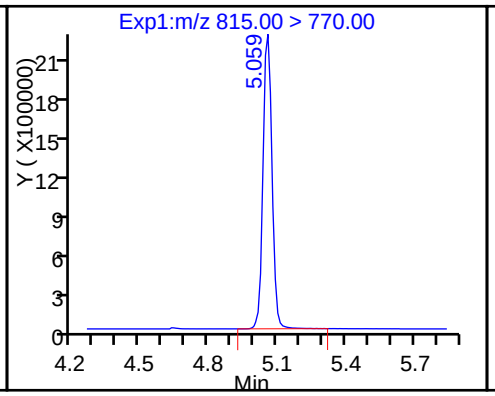
33 Perfluorotetradecanoic acid



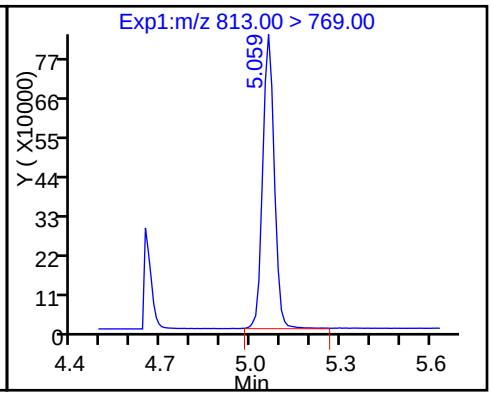
33 Perfluorotetradecanoic acid



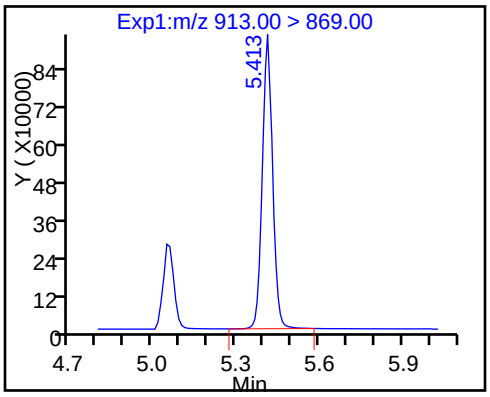
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_008.d
Lims ID: IC L5
Client ID:
Sample Type: IC Calib Level: 5
Inject. Date: 15-Dec-2016 12:59:16 ALS Bottle#: 41 Worklist Smp#: 8
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L5_b
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub6

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 16-Dec-2016 14:34:24 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 15-Dec-2016 13:51:06

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.533	1.534	-0.001		17274187	49.7		99.4	927175	
1 Perfluorobutyric acid										
212.90 > 169.00	1.533	1.535	-0.002	1.000	15411527	52.3		105	124871	
D 4 13C5-PFPeA										
267.90 > 223.00	1.810	1.810	0.0		13053659	49.1		98.1	1261104	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.810	1.810	0.0	1.000	13161065	51.1		102	158308	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.848	1.848	0.0	1.000	21559838	47.1		107		
298.90 > 99.00	1.848	1.848	0.0	1.000	10128422		2.13(0.00-0.00)	107		
7 Perfluorohexanoic acid										
313.00 > 269.00	2.098	2.096	0.002	1.000	11507044	50.0		99.9	330809	
D 6 13C2 PFHxA										
315.00 > 270.00	2.098	2.097	0.001		12399280	50.6		101	688050	
D 11 13C4-PFHpA										
367.00 > 322.00	2.424	2.426	-0.002		10801604	47.7		95.4	530896	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.424	2.428	-0.004	1.000	10799449	51.1		102	85838	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.446	2.431	0.015	1.000	15253691	45.8		101		
D 10 18O2 PFHxS										
403.00 > 84.00	2.446	2.446	0.0		15278828	46.7		98.8	1046737	
D 14 13C4 PFOA										
417.00 > 372.00	2.782	2.783	-0.001		11142777	48.4		96.7	755641	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooctanoic acid										
413.00 > 369.00	2.782	2.783	-0.001	1.000	11435583	51.2		102	92940	
413.00 > 169.00	2.782	2.783	-0.001	1.000	6849991		1.67(0.90-1.10)	102	293728	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.791	2.790	0.001	1.000	13639927	49.5		104		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.151	3.118	0.033	1.000	11741891	47.2		102	399791	
499.00 > 99.00	3.151	3.118	0.033	1.000	2632984		4.46(0.90-1.10)	102	139087	
D 17 13C4 PFOS										
503.00 > 80.00	3.151	3.151	0.0		11946650	48.0		100	237614	
D 19 13C5 PFNA										
468.00 > 423.00	3.151	3.153	-0.002		8581504	48.3		96.6	574194	
20 Perfluorononanoic acid										
463.00 > 419.00	3.151	3.155	-0.004	1.000	8246252	50.5		101	123521	
D 21 13C8 FOSA										
506.00 > 78.00	3.490	3.488	0.002		18804188	49.0		97.9	642404	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.490	3.491	-0.001	1.000	17736944	50.6		101	676782	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.507	3.510	-0.003	1.000	7324495	50.6		101	172410	
D 23 13C2 PFDA										
515.00 > 470.00	3.516	3.513	0.003		7671861	48.8		97.5	212001	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.818	3.822	-0.004	1.000	7241868	49.6		103		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.844	3.839	0.005	1.000	5437764	50.3		101	105822	
D 27 13C2 PFUnA										
565.00 > 520.00	3.844	3.842	0.002		5657823	48.3		96.5	259964	
D 30 13C2 PFDoA										
615.00 > 570.00	4.135	4.132	0.003		5404154	48.7		97.4	211794	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.135	4.136	-0.001	1.000	5072994	51.1		102	98593	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.398	4.400	-0.002	1.000	4950651	50.5		101	84213	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.645	4.641	0.004		10950502	48.2		96.3	504805	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.645	4.642	0.003	1.000	8645519	50.5		101	145963	
713.00 > 169.00	4.635	4.642	-0.007	0.998	1380699		6.26(0.00-0.00)	101	249413	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.059	5.057	0.002		6027362	48.4		96.8	112750	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.059	5.059	0.0	1.000	5318207	51.0		102	4484	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.413	5.414	-0.001	1.000	5869666	52.7		105	5549	

Reagents:

LCPFC-L5_00022 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 14:34:25 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_008.d

Injection Date: 15-Dec-2016 12:59:16 Instrument ID: A8_N

Lims ID: IC L5

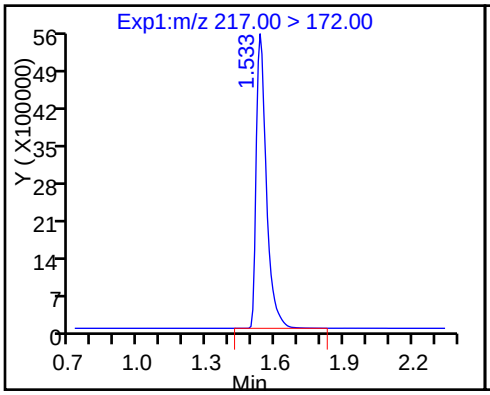
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 41 Worklist Smp#: 8

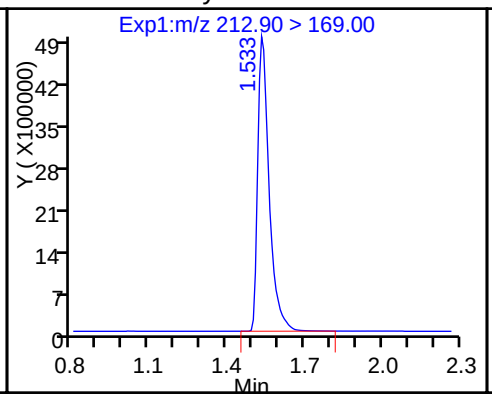
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

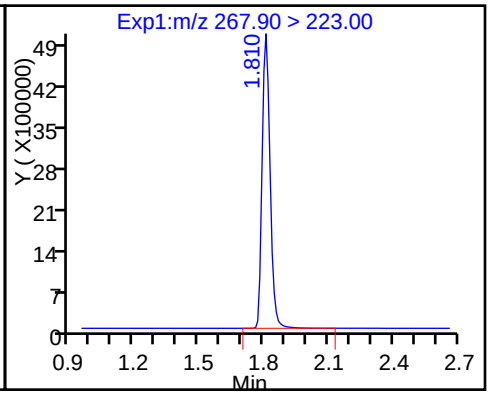
D 2 13C4 PFBA



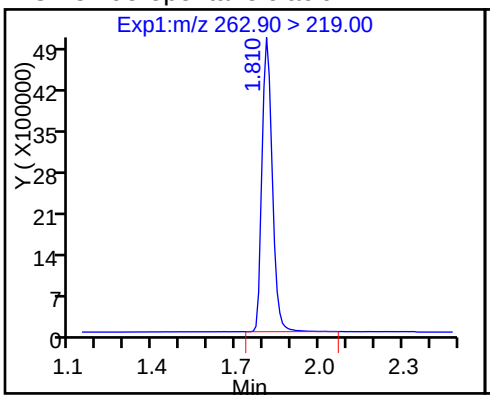
1 Perfluorobutyric acid



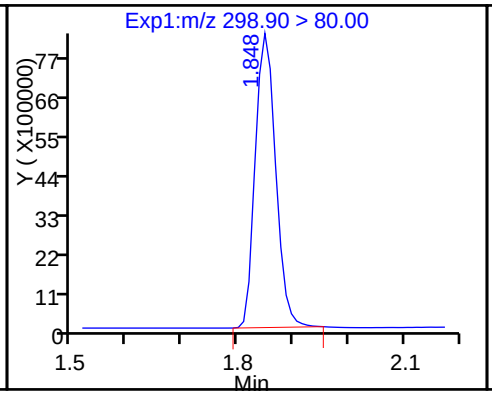
D 4 13C5-PFPeA



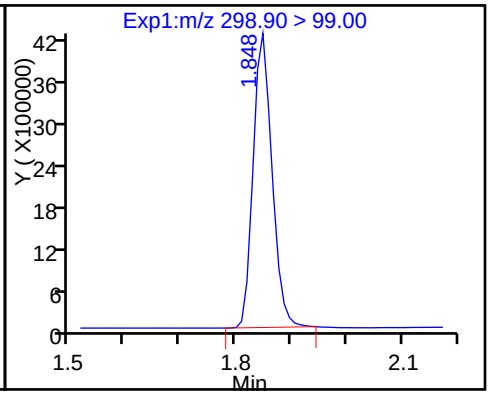
3 Perfluoropentanoic acid



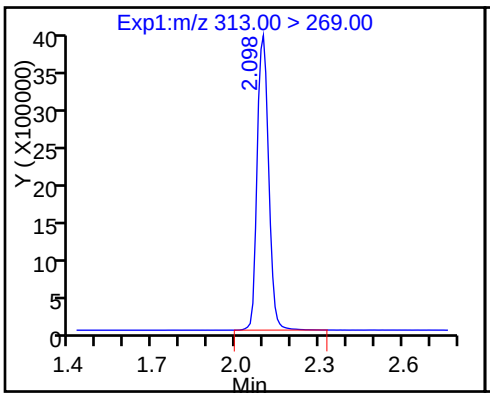
5 Perfluorobutanesulfonic acid



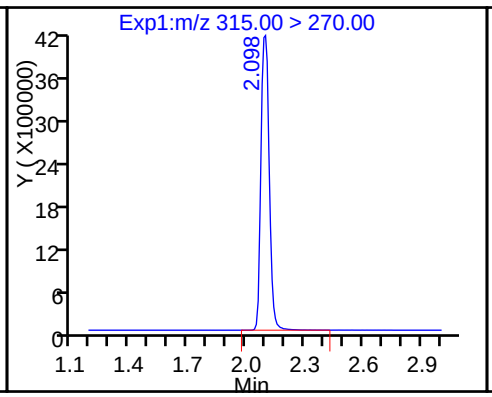
5 Perfluorobutanesulfonic acid



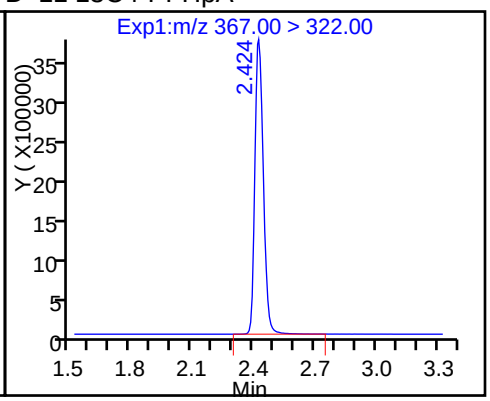
7 Perfluorohexanoic acid



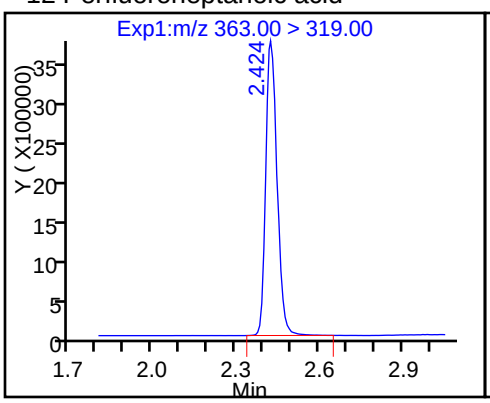
D 6 13C2 PFHxA



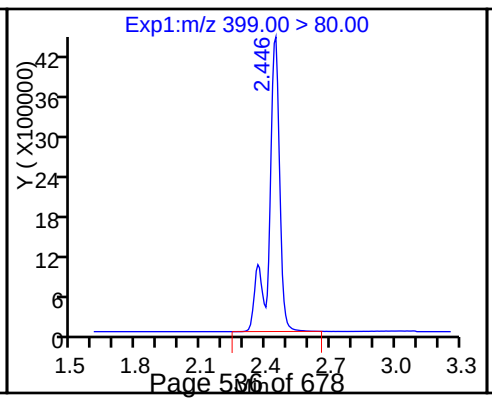
D 11 13C4-PFHpA



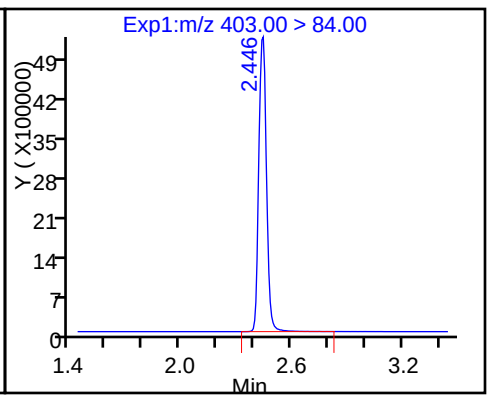
12 Perfluoroheptanoic acid



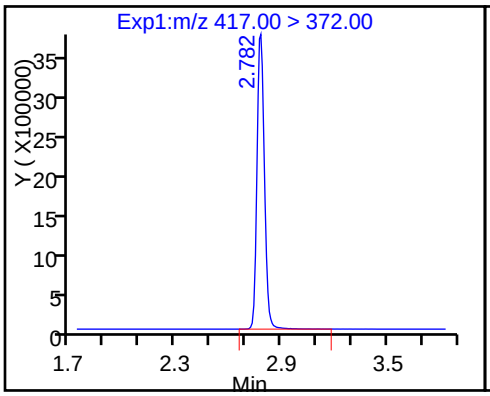
9 Perfluorohexanesulfonic acid



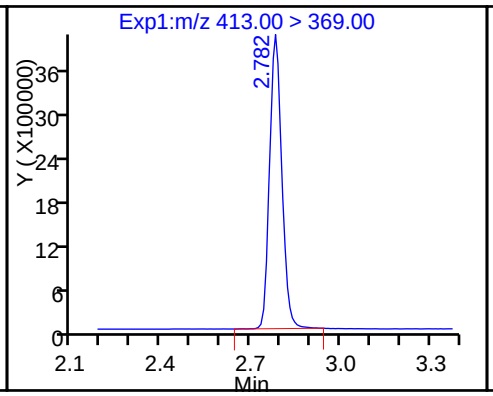
D 10 18O2 PFHxS



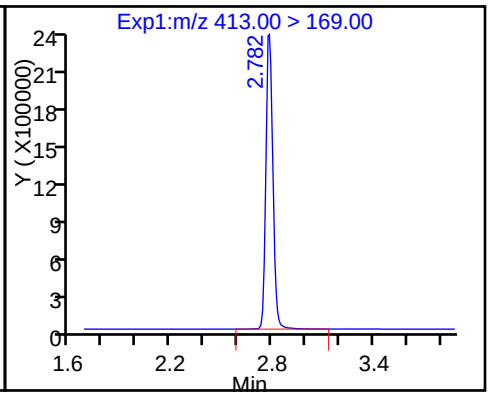
D 14 13C4 PFOA



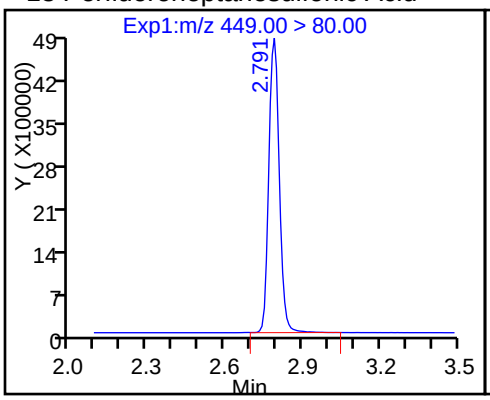
15 Perfluorooctanoic acid



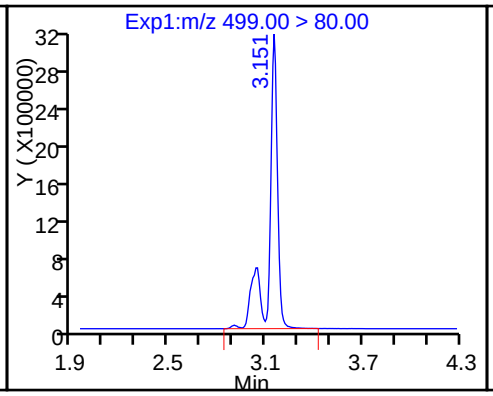
15 Perfluorooctanoic acid



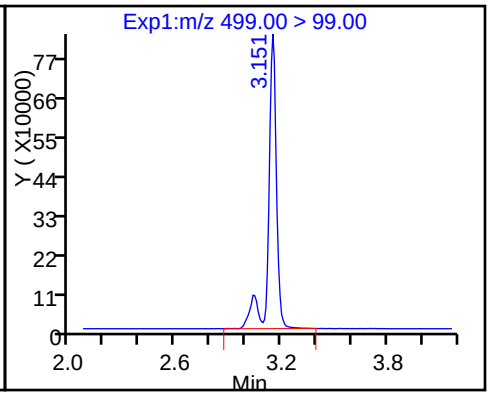
13 Perfluoroheptanesulfonic Acid



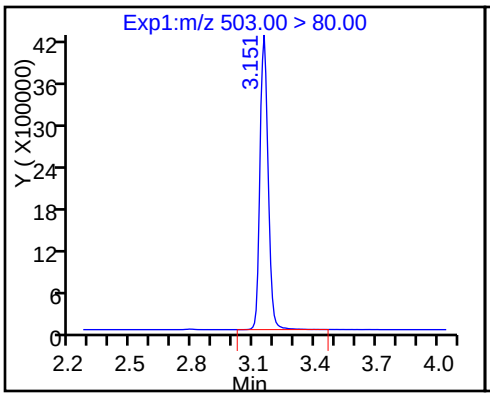
18 Perfluorooctane sulfonic acid



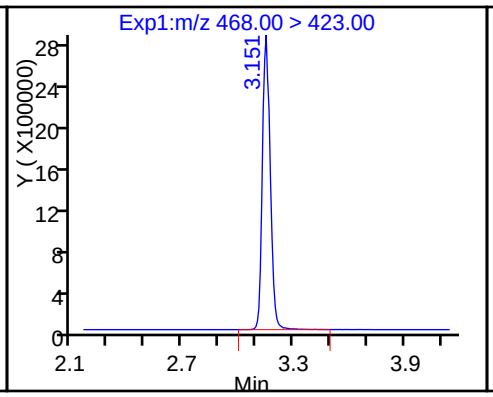
18 Perfluorooctane sulfonic acid



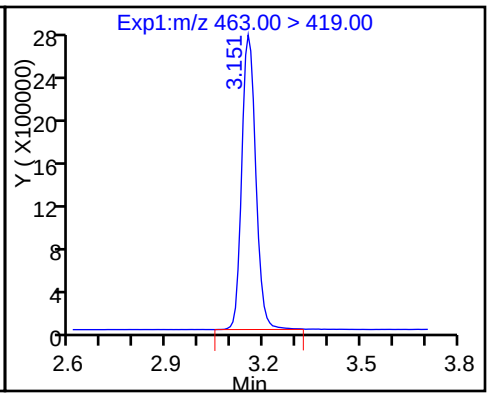
D 17 13C4 PFOS



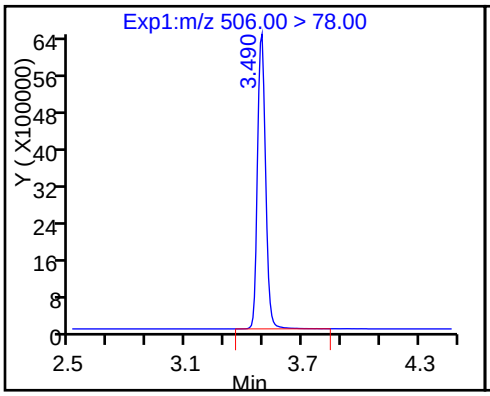
D 19 13C5 PFNA



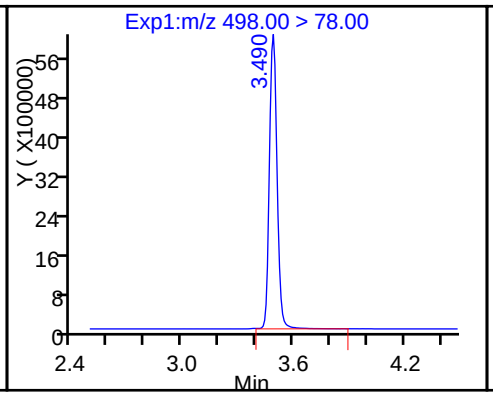
20 Perfluorononanoic acid



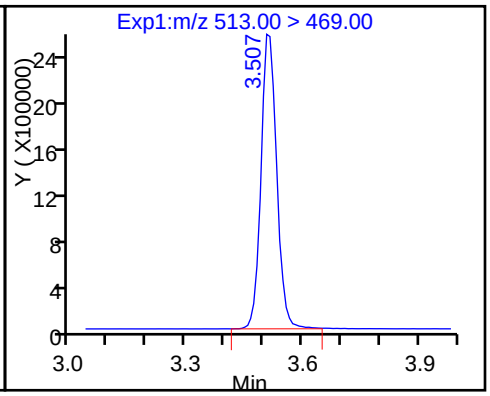
D 21 13C8 FOSA



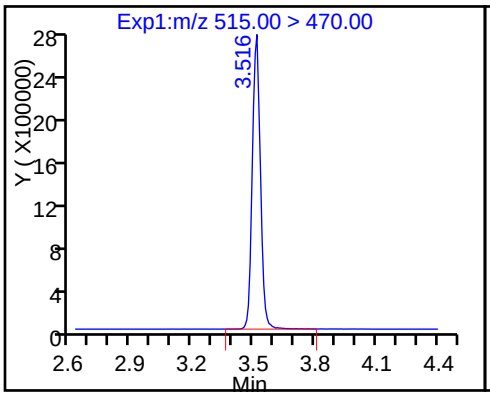
22 Perfluorooctane Sulfonamide



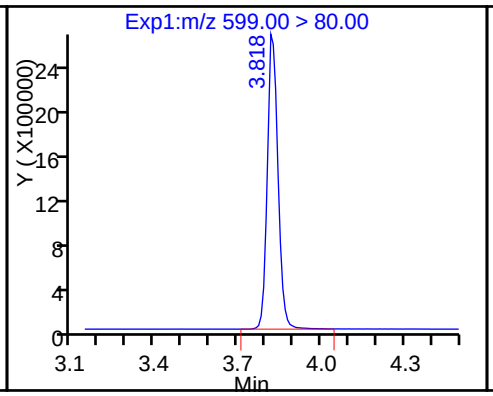
24 Perfluorodecanoic acid



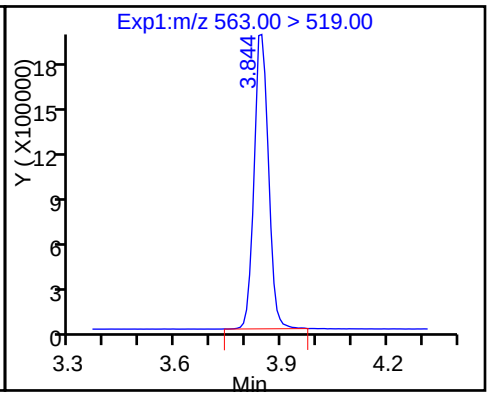
D 23 13C2 PFDA



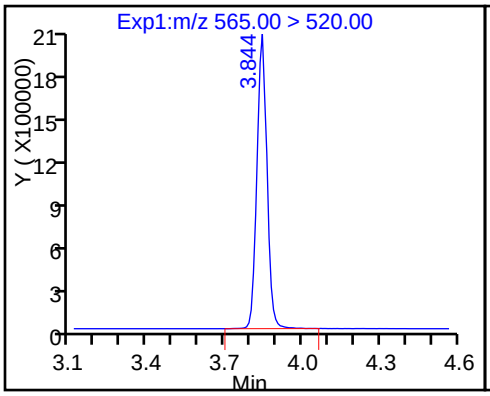
26 Perfluorodecane Sulfonic acid



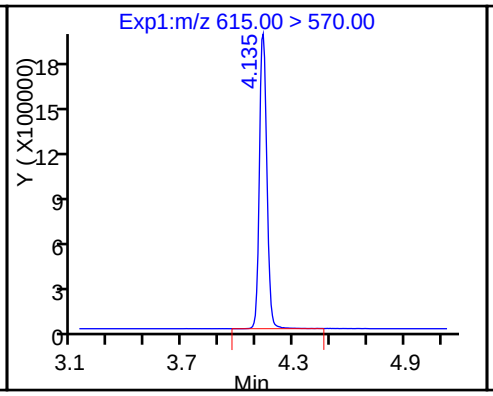
28 Perfluoroundecanoic acid



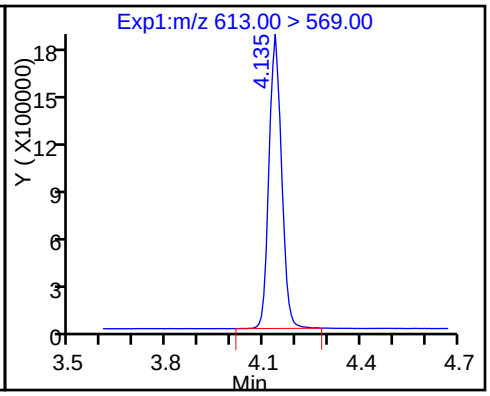
D 27 13C2 PFUnA



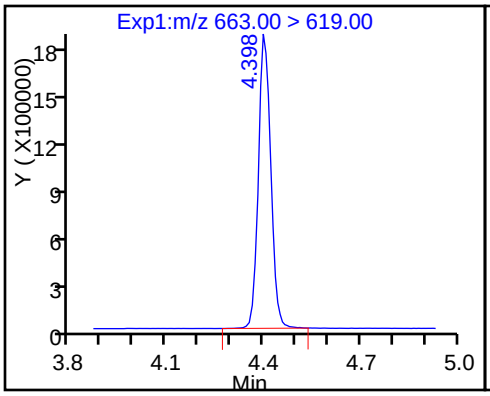
D 30 13C2 PFDoA



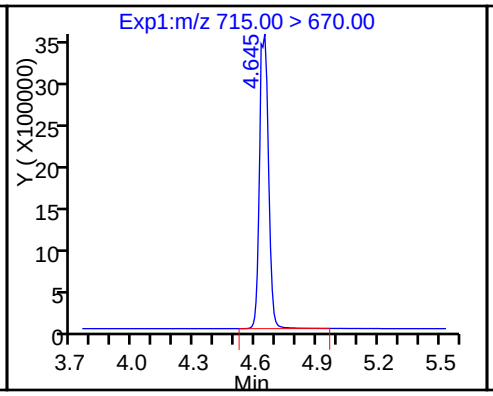
29 Perfluorododecanoic acid



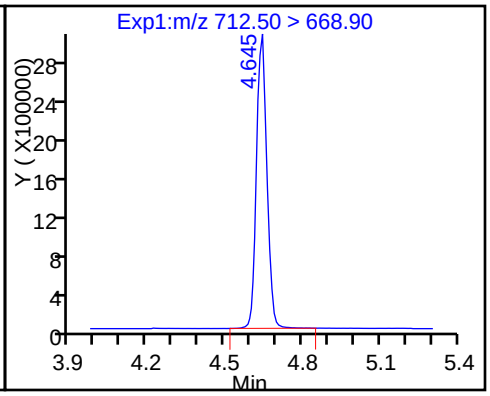
31 Perfluorotridecanoic acid



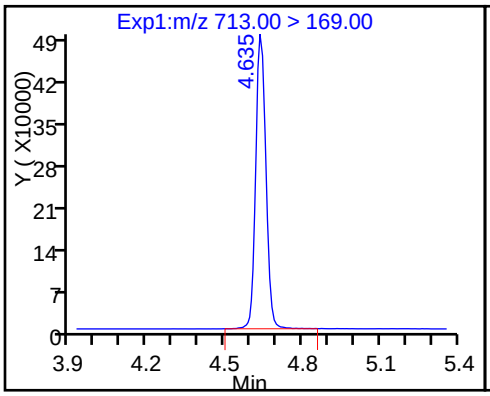
D 32 13C2-PFTeDA



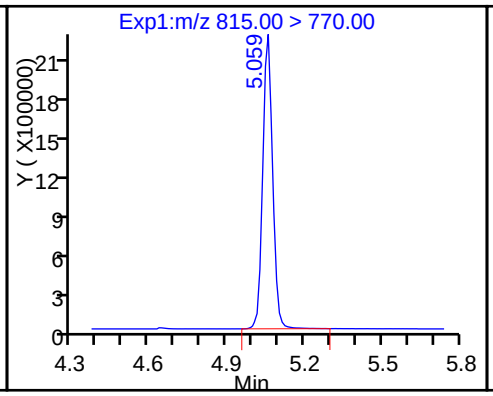
33 Perfluorotetradecanoic acid



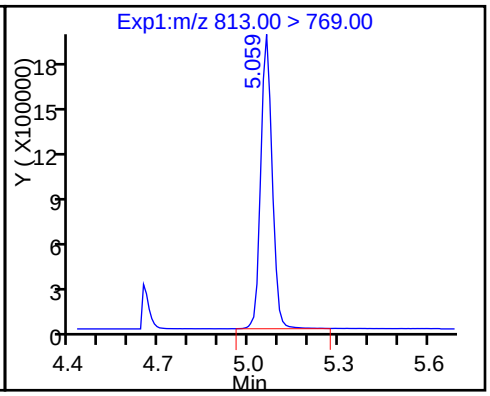
33 Perfluorotetradecanoic acid



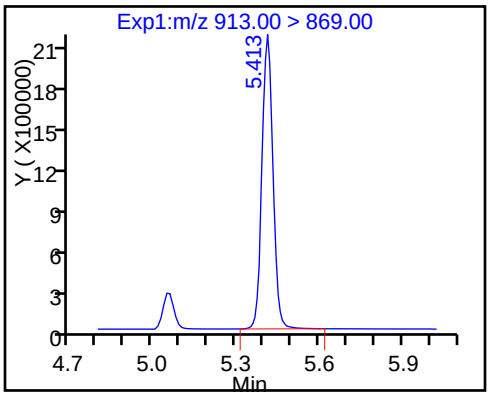
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_009.d
Lims ID: IC L6
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 15-Dec-2016 13:06:46 ALS Bottle#: 42 Worklist Smp#: 9
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L6_b
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub6

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 16-Dec-2016 14:34:27 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 15-Dec-2016 13:51:28

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.537	1.534	0.003		14961055	43.0		86.0	920014	
1 Perfluorobutyric acid										
212.90 > 169.00	1.537	1.535	0.002	1.000	42763611	167.4		83.7	246189	
D 4 13C5-PFPeA										
267.90 > 223.00	1.813	1.810	0.003		10898820	41.0		81.9	1007026	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.813	1.810	0.003	1.000	34291076	159.4		79.7	297823	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.852	1.848	0.004	1.000	50724469	130.5		73.8		
298.90 > 99.00	1.842	1.848	-0.006	0.995	28243355		1.80(0.00-0.00)	73.8		
7 Perfluorohexanoic acid										
313.00 > 269.00	2.096	2.096	0.0	1.000	33223923	172.9		86.4	549724	
D 6 13C2 PFHxA										
315.00 > 270.00	2.096	2.097	-0.001		10345480	42.2		84.4	508201	
D 11 13C4-PFHpA										
367.00 > 322.00	2.426	2.426	0.0		8564025	37.8		75.7	487796	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.426	2.428	-0.002	1.000	30234194	180.3		90.2	213534	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.444	2.431	0.013	1.000	46223186	163.6		89.9		
D 10 18O2 PFHxS										
403.00 > 84.00	2.444	2.446	-0.002		12974829	39.7		83.9	628886	
D 14 13C4 PFOA										
417.00 > 372.00	2.783	2.783	0.0		8380251	36.4		72.8	402245	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooctanoic acid										
413.00 > 369.00	2.783	2.783	0.0	1.000	30784387	183.1		91.5	229181	
413.00 > 169.00	2.783	2.783	0.0	1.000	20338648		1.51(0.90-1.10)	91.5	70063	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.791	2.790	0.001	1.000	38459925	166.5		87.5		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.977	3.118	-0.141	1.000	40073141	192.2		104	5896	
499.00 > 99.00	3.152	3.118	0.034	1.059	9632026		4.16(0.90-1.10)	104	407968	
D 17 13C4 PFOS										
503.00 > 80.00	3.152	3.151	0.001		10019454	40.3		84.2	105595	
D 19 13C5 PFNA										
468.00 > 423.00	3.152	3.153	-0.001		6718354	37.8		75.6	515582	
20 Perfluorononanoic acid										
463.00 > 419.00	3.160	3.155	0.005	1.000	24793148	193.9		96.9	307568	
D 21 13C8 FOSA										
506.00 > 78.00	3.491	3.488	0.003		16105707	41.9		83.9	486146	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.491	3.491	0.0	1.000	47803717	159.1		79.6	542400	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.516	3.510	0.006	1.000	22616781	191.8		95.9	376094	
D 23 13C2 PFDA										
515.00 > 470.00	3.508	3.513	-0.005		6246112	39.7		79.4	243806	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.819	3.822	-0.004	1.000	23952412	195.7		101		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.845	3.839	0.006	1.000	16852945	197.7		98.9	570796	
D 27 13C2 PFUnA										
565.00 > 520.00	3.845	3.842	0.003		4456593	38.0		76.0	208308	
D 30 13C2 PFDoA										
615.00 > 570.00	4.129	4.132	-0.003		4649092	41.9		83.8	168499	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.136	4.136	0.0	1.000	17425873	204.2		102	228085	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.407	4.400	0.007	1.000	16038809	190.2		95.1	237459	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.635	4.641	-0.006		9520749	41.9		83.7	374846	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.635	4.642	-0.007	1.000	27310864	185.3		92.7	329988	
713.00 > 169.00	4.635	4.642	-0.007	1.000	4963804		5.50(0.00-0.00)	92.7	195544	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.060	5.057	0.003		5190172	41.7		83.3	150380	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.060	5.059	0.001	1.000	17754908	199.3		99.6	19037	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.414	5.414	0.0	1.000	18392980	192.0		96.0	19845	

Reagents:

LCPFC-L6_00020 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 14:34:28 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_009.d

Injection Date: 15-Dec-2016 13:06:46 Instrument ID: A8_N

Lims ID: IC L6

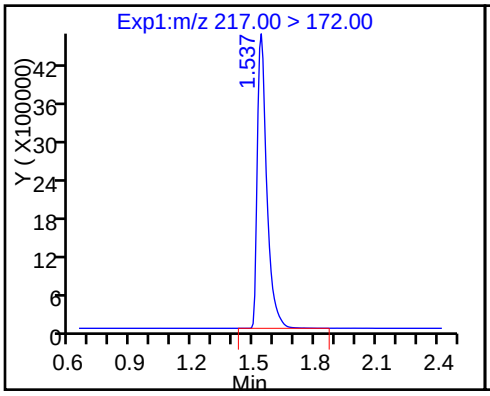
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 42 Worklist Smp#: 9

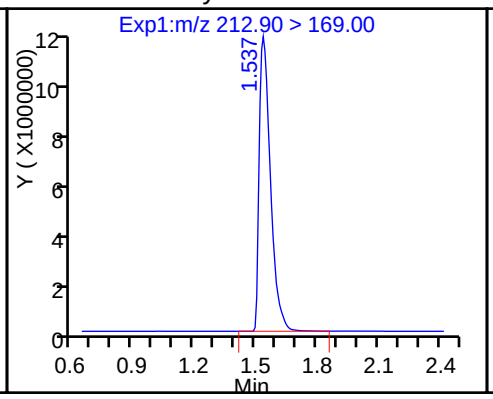
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

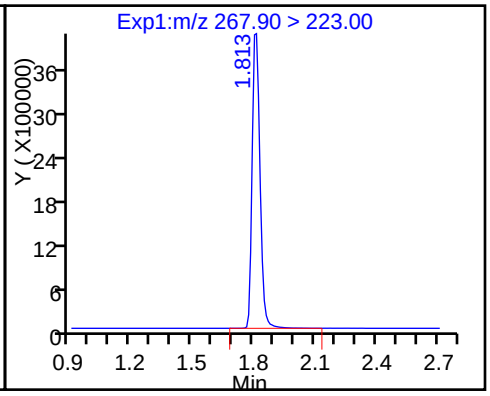
D 2 13C4 PFBA



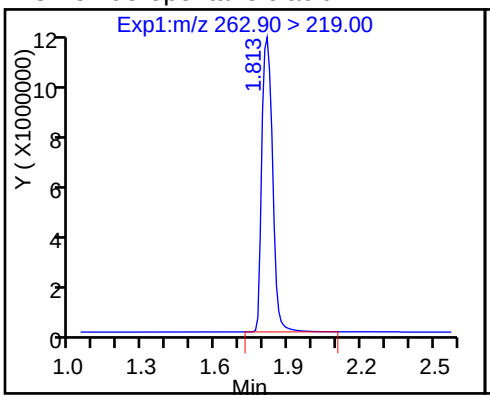
1 Perfluorobutyric acid



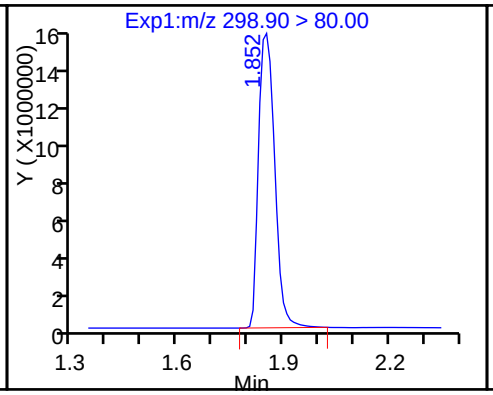
D 4 13C5-PFPeA



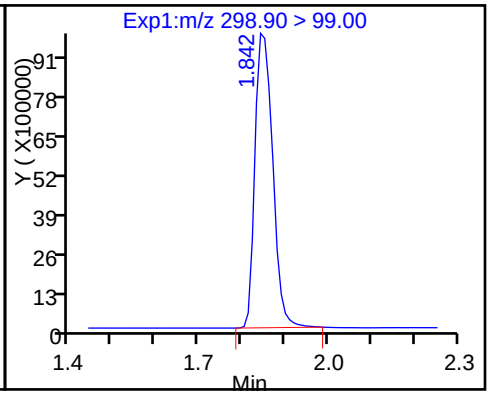
3 Perfluoropentanoic acid



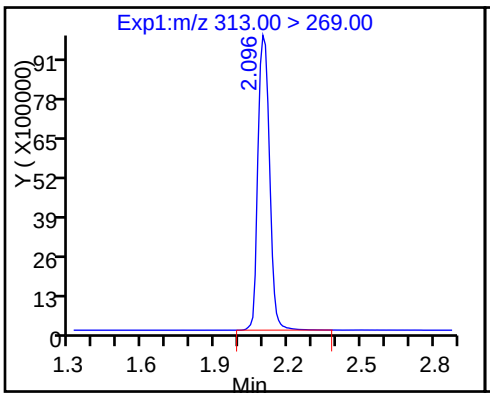
5 Perfluorobutanesulfonic acid



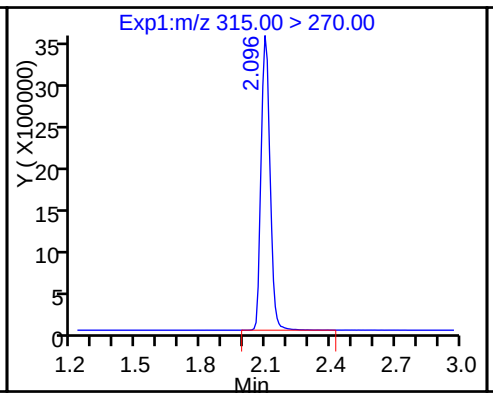
5 Perfluorobutanesulfonic acid



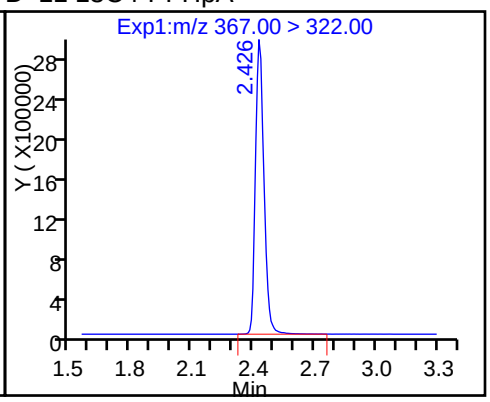
7 Perfluorohexanoic acid



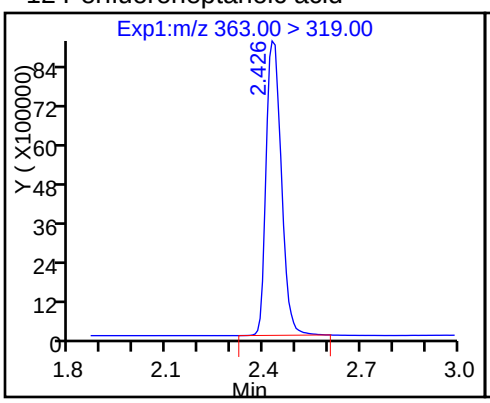
D 6 13C2 PFHxA



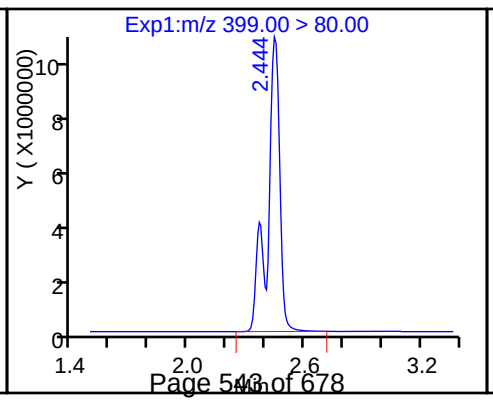
D 11 13C4-PFHpA



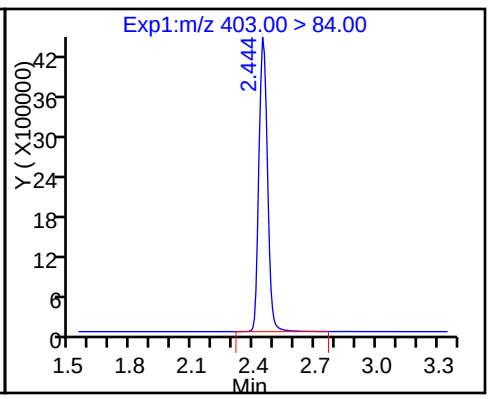
12 Perfluoroheptanoic acid



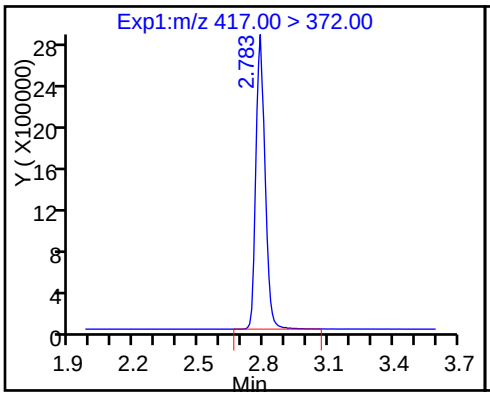
9 Perfluorohexanesulfonic acid



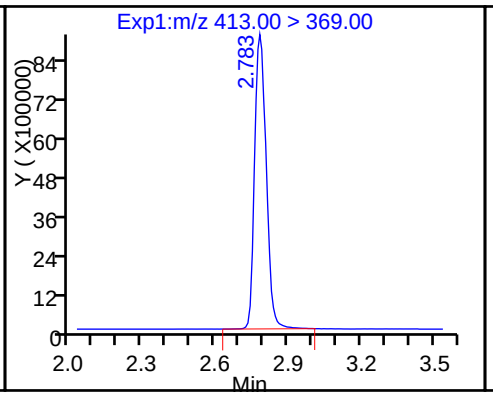
D 10 18O2 PFHxS



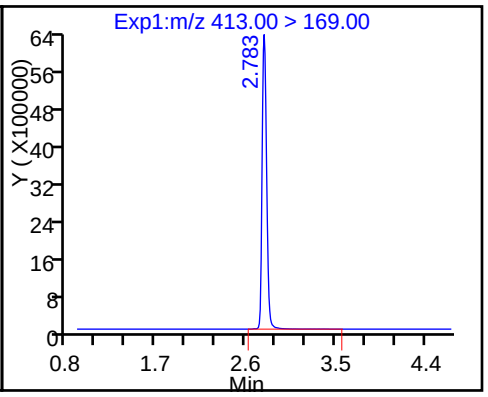
D 14 13C4 PFOA



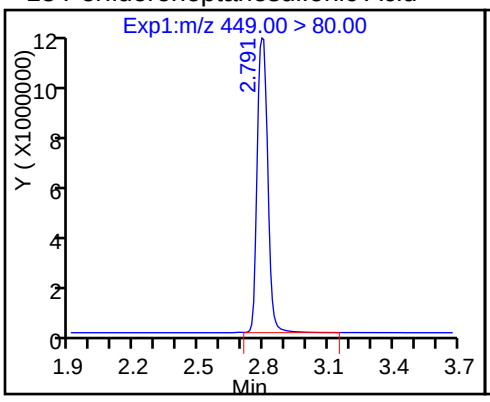
15 Perfluorooctanoic acid



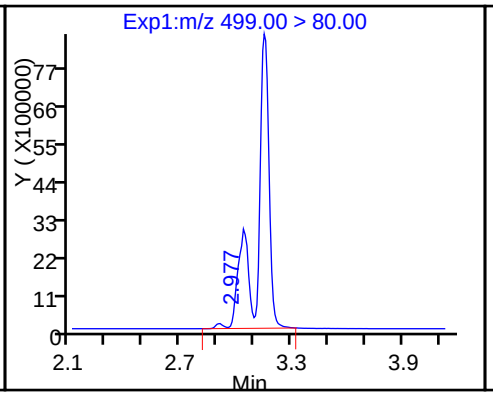
15 Perfluorooctanoic acid



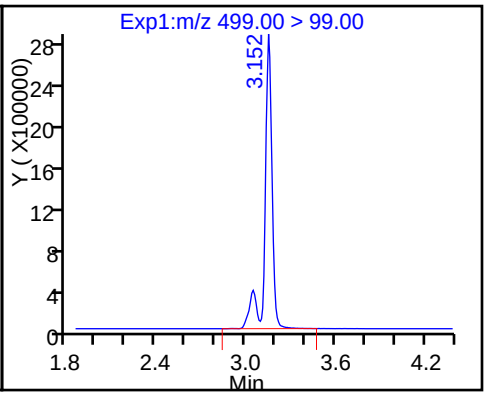
13 Perfluoroheptanesulfonic Acid



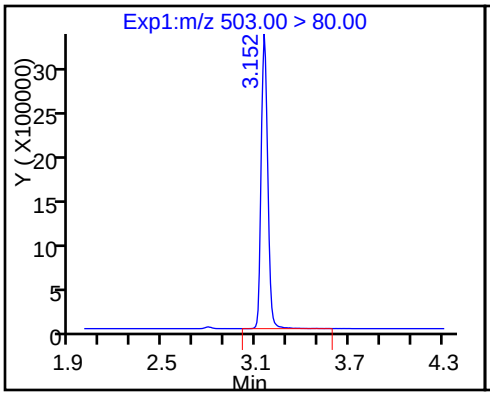
18 Perfluorooctane sulfonic acid



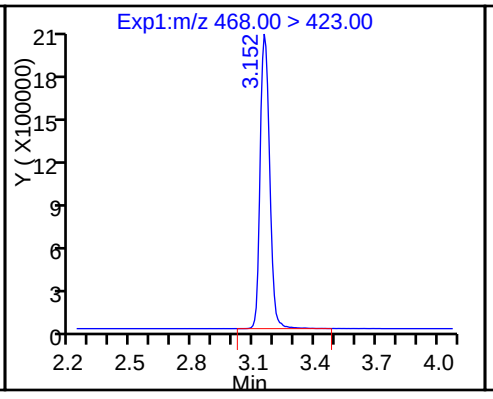
18 Perfluorooctane sulfonic acid



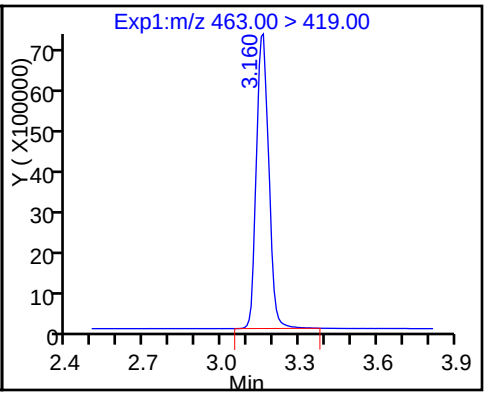
D 17 13C4 PFOS



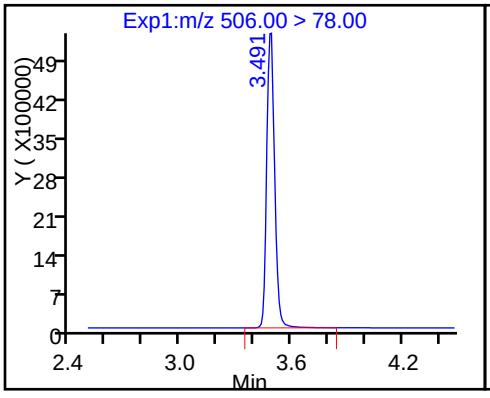
D 19 13C5 PFNA



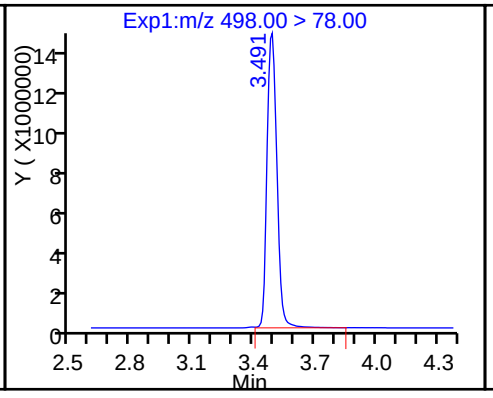
20 Perfluorononanoic acid



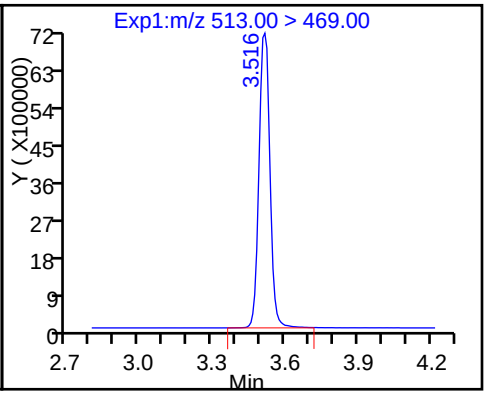
D 21 13C8 FOSA



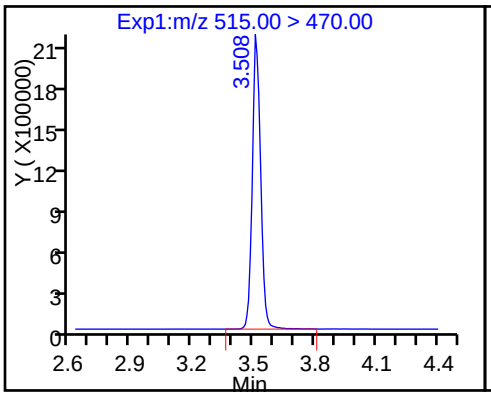
22 Perfluorooctane Sulfonamide



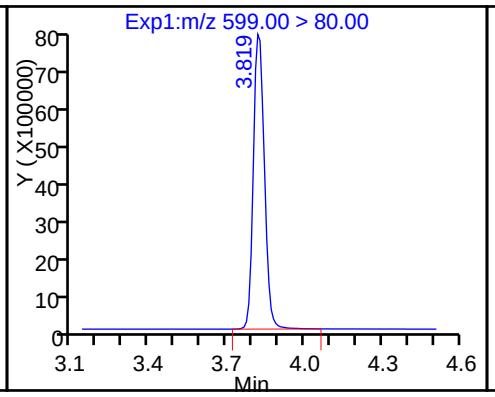
24 Perfluorodecanoic acid



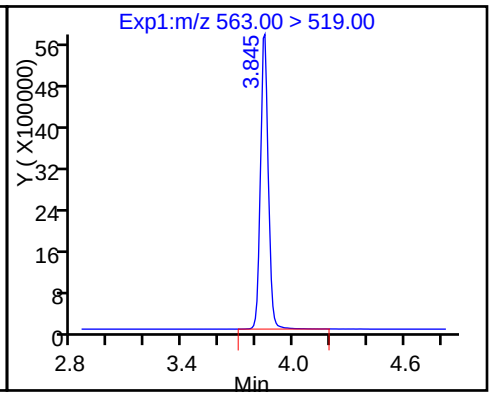
D 23 13C2 PFDA



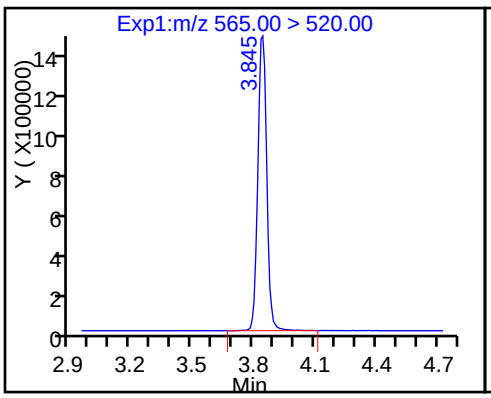
26 Perfluorodecane Sulfonic acid



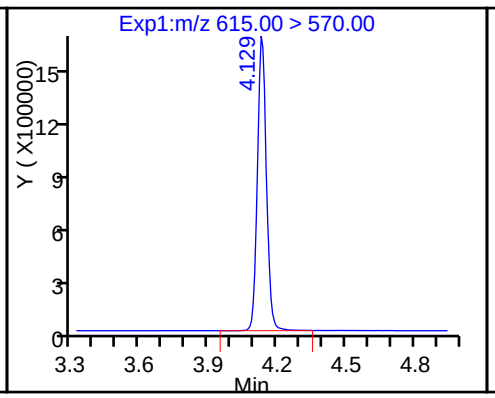
28 Perfluoroundecanoic acid



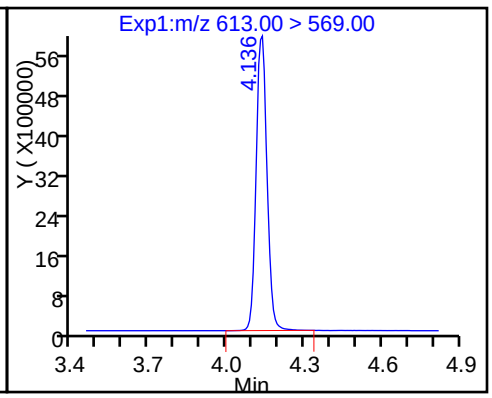
D 27 13C2 PFUnA



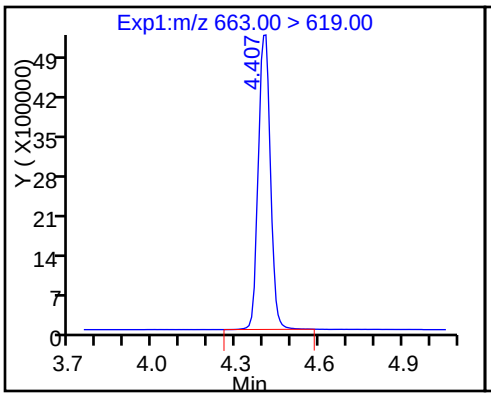
D 30 13C2 PFDoA



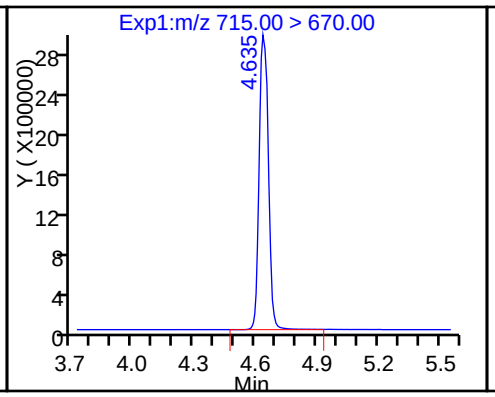
29 Perfluorododecanoic acid



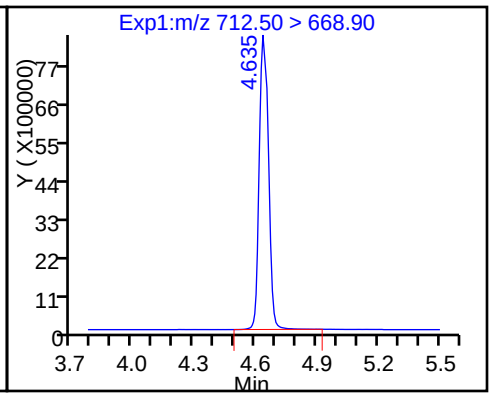
31 Perfluorotridecanoic acid



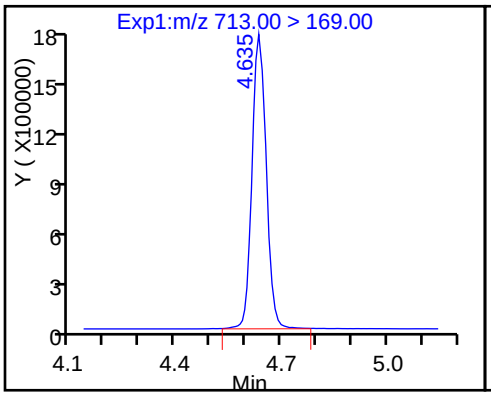
D 32 13C2-PFTeDA



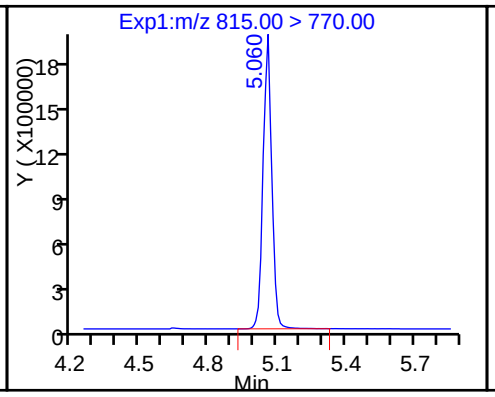
33 Perfluorotetradecanoic acid



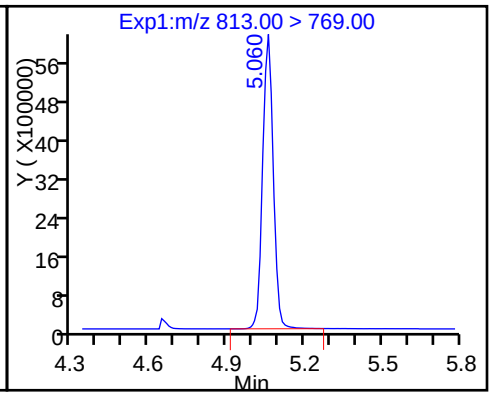
33 Perfluorotetradecanoic acid



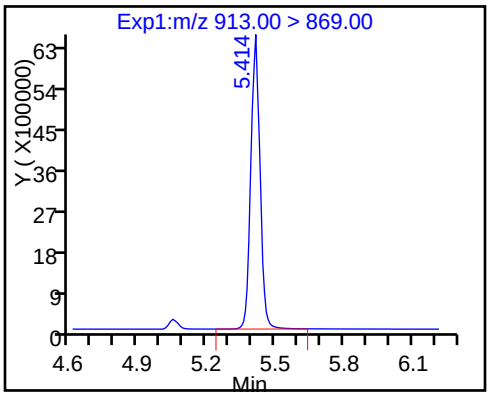
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016BB_013.d
Lims ID: IC L1 Add-on
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 15-Dec-2016 13:41:05 ALS Bottle#: 46 Worklist Smp#: 13
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L1 ADD ON
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub6

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 16-Dec-2016 14:34:44 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 15-Dec-2016 16:37:58

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 M2-6:2FTS										
429.00 > 409.00	2.760	2.767	-0.007		5352965	45.8		96.3		
48 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.776	2.768	0.008	1.000	48011	0.4779		101		
43 Sodium 1H,1H,2H,2H-perfluorooctane										
527.00 > 507.00	3.511	3.511	0.0	1.000	39808	0.4671		97.5		
D 42 M2-8:2FTS										
529.00 > 509.00	3.511	3.513	-0.002		4817997	44.8		93.6		
D 45 d3-NMeFOSAA										
573.00 > 419.00	3.684	3.676	0.008		3634985	48.3		96.5		
44 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.684	3.681	0.003	1.000	29823	0.4637		92.7		
D 46 d5-NEtFOSAA										
589.00 > 419.00	3.848	3.842	0.006		3889792	49.6		99.3		
49 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.865	3.854	0.011	1.005	29965	0.4858		97.2		
D 52 d-N-MeFOSA-M										
515.00 > 169.00	3.988	3.992	-0.004		4325034	45.5		91.0		
54 MeFOSA										
512.00 > 169.00	3.998	3.999	-0.001	1.000	36069	0.4978		99.6		
D 51 d-N-EtFOSA-M										
531.00 > 169.00	4.180	4.180	0.0		3792851	44.2		88.4		
53 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.187	4.187	0.0	1.000	30993	0.4729		94.6		

Reagents:

LCPFC2-L1_00002 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 14:34:45 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016BB_013.d

Injection Date: 15-Dec-2016 13:41:05 Instrument ID: A8_N

Lims ID: IC L1 Add-on

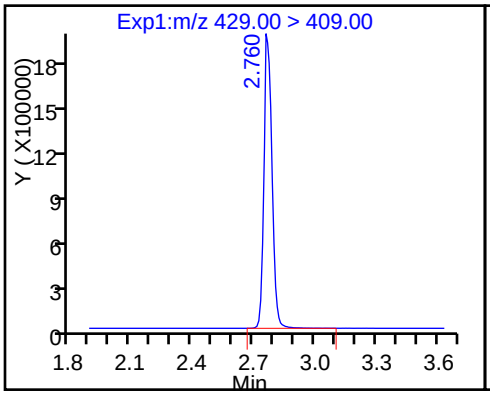
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 46 Worklist Smp#: 13

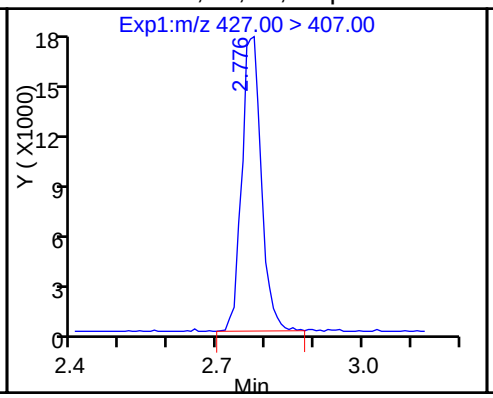
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

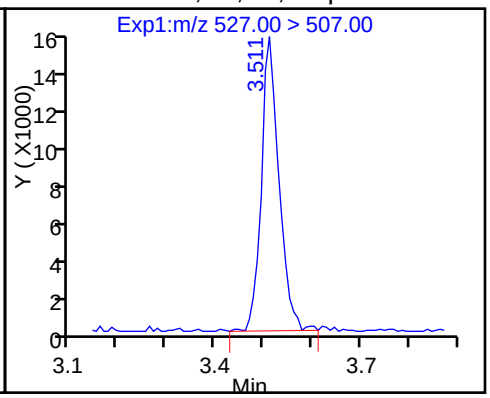
D 47 M2-6:2FTS



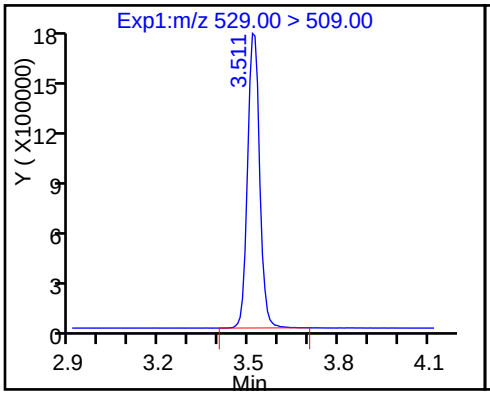
48 Sodium 1H,1H,2H,2H-perfluorooctane



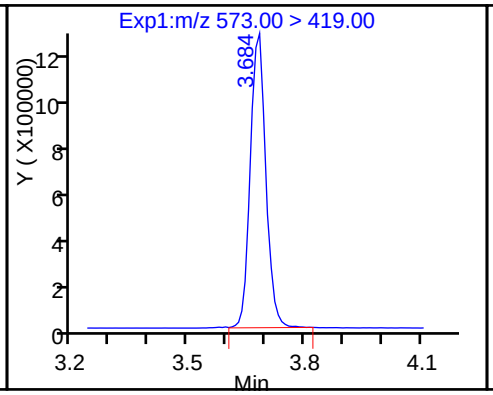
43 Sodium 1H,1H,2H,2H-perfluorooctane



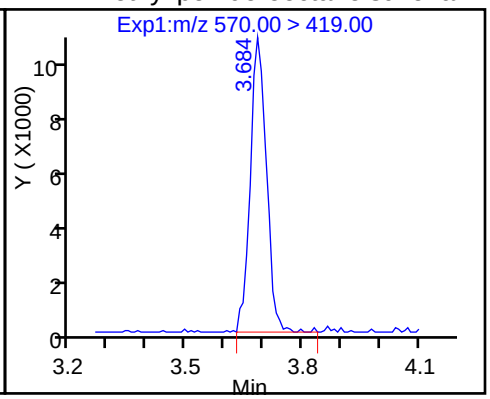
D 42 M2-8:2FTS



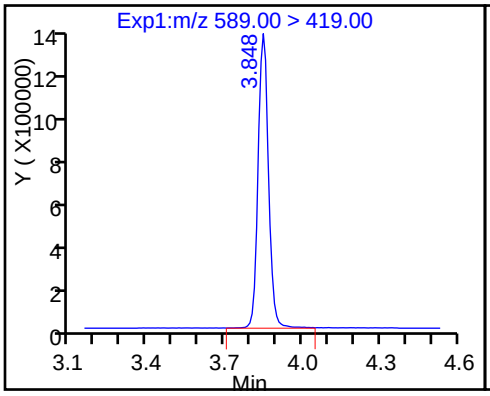
D 45 d3-NMeFOSAA



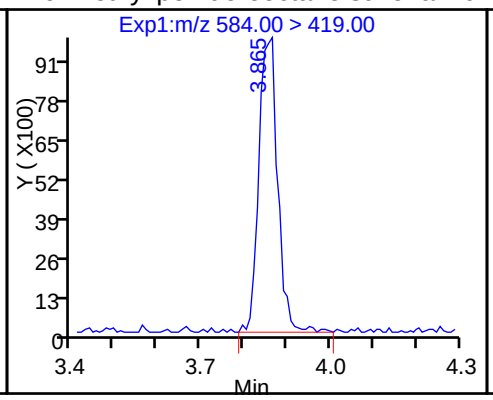
44 N-methyl perfluorooctane sulfonami



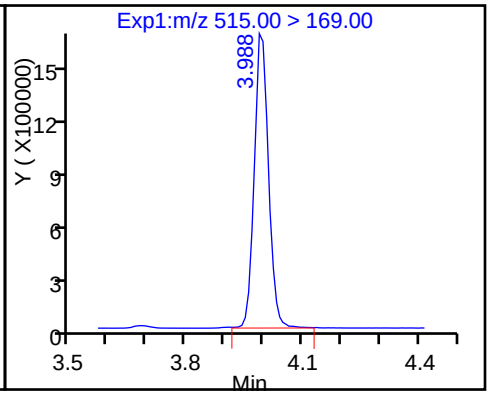
D 46 d5-NEtFOSAA



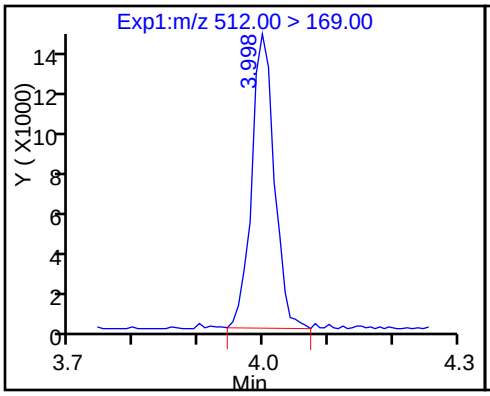
49 N-ethyl perfluorooctane sulfonamid



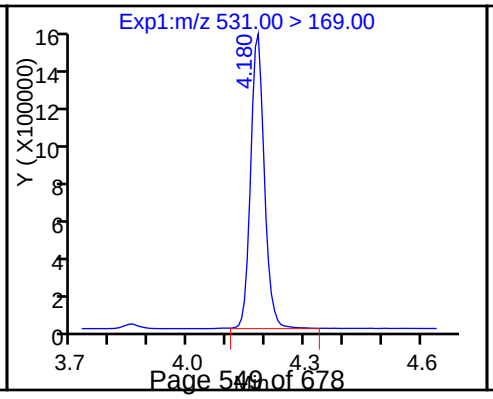
D 52 d-N-MeFOSA-M



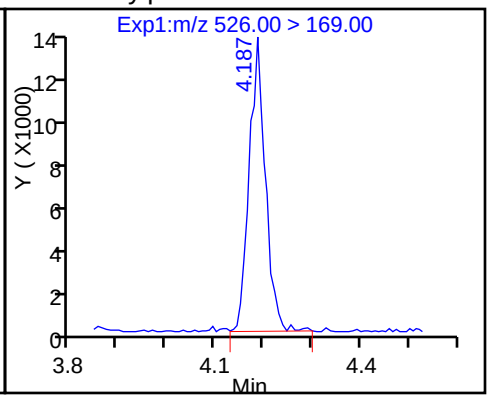
54 MeFOSA



D 51 d-N-EtFOSA-M



53 N-ethylperfluoro-1-octanesulfonami



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_014.d
Lims ID: IC L2 Add-on
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 15-Dec-2016 13:48:34 ALS Bottle#: 47 Worklist Smp#: 14
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L2 ADD ON
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub6

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 16-Dec-2016 14:34:46 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 15-Dec-2016 16:38:07

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 M2-6:2FTS										
429.00 > 409.00	2.761	2.767	-0.006		5108306	43.7		91.9		
48 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.761	2.768	-0.007	1.000	106947	1.12		118		
43 Sodium 1H,1H,2H,2H-perfluorooctane										
527.00 > 507.00	3.502	3.511	-0.009	0.998	75731	0.9308		97.2		
D 42 M2-8:2FTS										
529.00 > 509.00	3.511	3.513	-0.002		4599569	42.8		89.4		
D 45 d3-NMeFOSAA										
573.00 > 419.00	3.673	3.676	-0.003		3559083	47.2		94.5		
44 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.673	3.681	-0.008	1.000	57389	0.9114		91.1		
D 46 d5-NEtFOSAA										
589.00 > 419.00	3.838	3.842	-0.004		3757014	48.0		95.9		
49 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.855	3.854	0.001	1.005	53623	0.9000		90.0		
D 52 d-N-MeFOSA-M										
515.00 > 169.00	3.987	3.992	-0.005		4639527	48.8		97.6		
54 MeFOSA										
512.00 > 169.00	3.997	3.999	-0.002	1.000	70049	0.9013		90.1		
D 51 d-N-EtFOSA-M										
531.00 > 169.00	4.172	4.180	-0.008		4109875	47.9		95.8		
53 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.179	4.187	-0.008	1.000	62962	0.8865		88.7		

Reagents:

LCPFC2-L2_00002 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 14:34:47 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_014.d

Injection Date: 15-Dec-2016 13:48:34 Instrument ID: A8_N

Lims ID: IC L2 Add-on

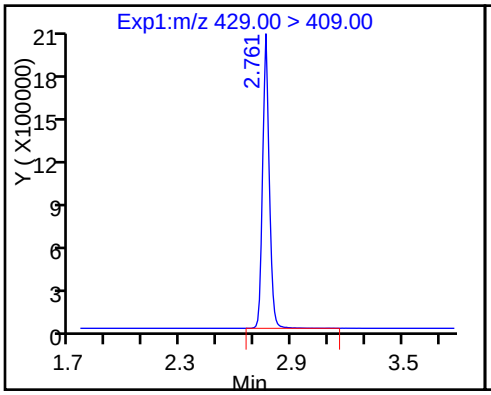
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 47 Worklist Smp#: 14

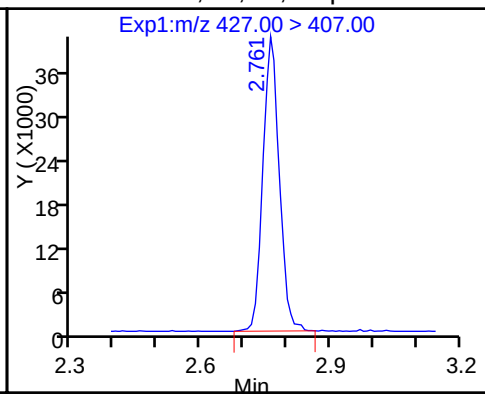
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

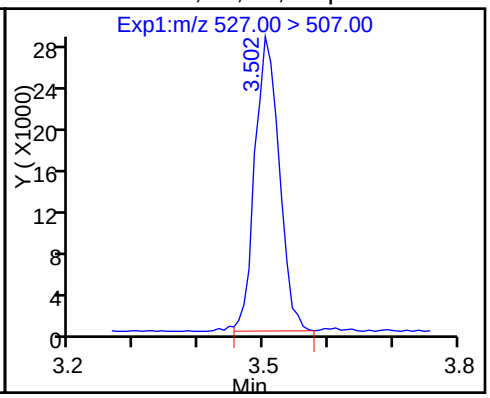
D 47 M2-6:2FTS



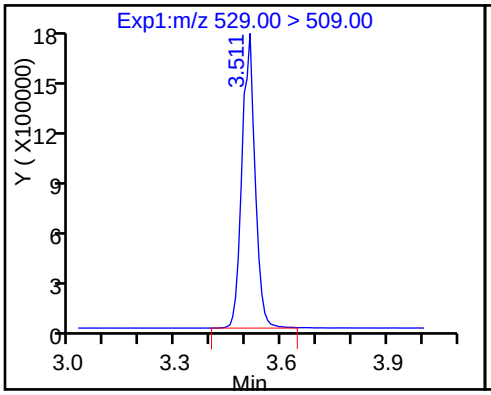
48 Sodium 1H,1H,2H,2H-perfluorooctane



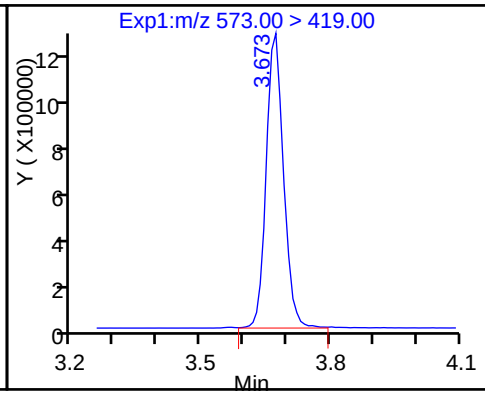
43 Sodium 1H,1H,2H,2H-perfluorooctane



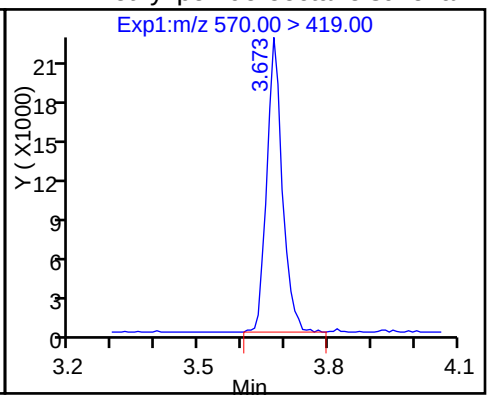
D 42 M2-8:2FTS



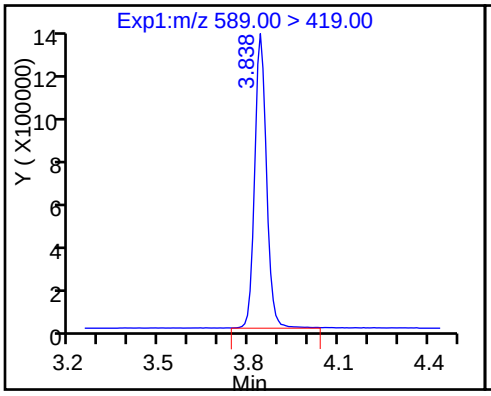
D 45 d3-NMeFOSAA



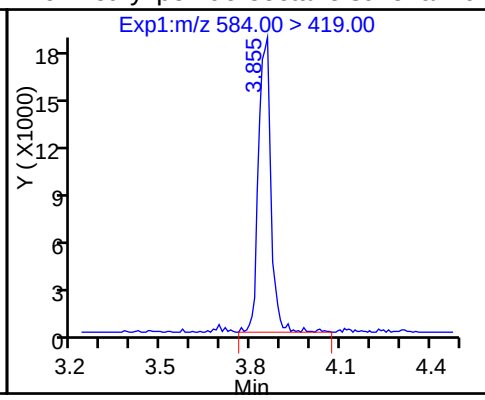
44 N-methyl perfluorooctane sulfonami



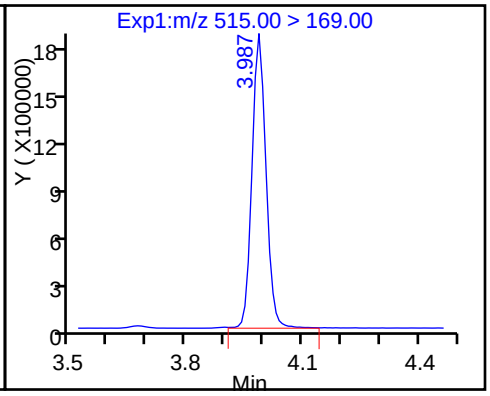
D 46 d5-NEtFOSAA



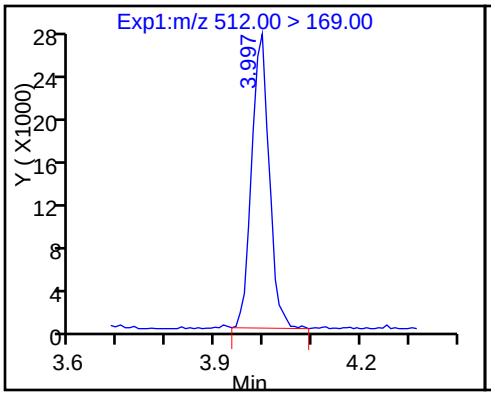
49 N-ethyl perfluorooctane sulfonamid



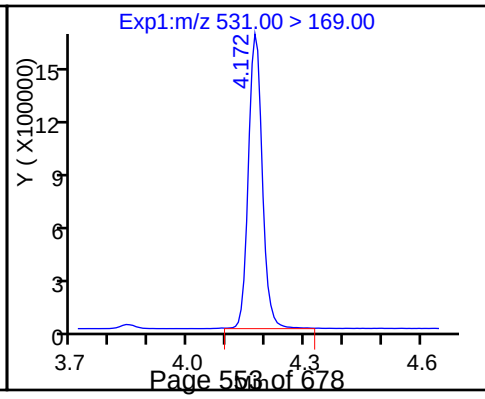
D 52 d-N-MeFOSA-M



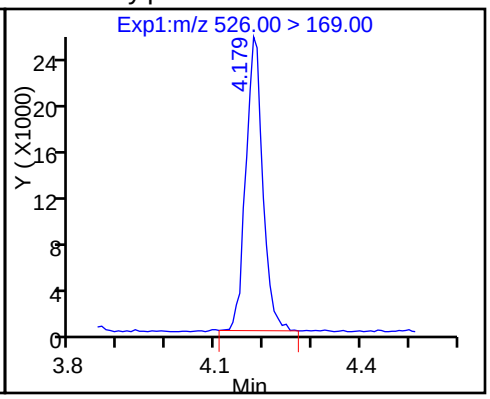
54 MeFOSA



D 51 d-N-EtFOSA-M



53 N-ethylperfluoro-1-octanesulfonami



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_015.d
Lims ID: IC L3 Add-on
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 15-Dec-2016 13:56:03 ALS Bottle#: 48 Worklist Smp#: 15
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L3 ADD ON
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub6

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 16-Dec-2016 14:34:48 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 15-Dec-2016 16:38:17

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 M2-6:2FTS										
429.00 > 409.00	2.768	2.767	0.001		5570739	47.6		100		
48 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.768	2.768	0.0	1.000	405060	3.87		81.7		
43 Sodium 1H,1H,2H,2H-perfluorooctane										
527.00 > 507.00	3.511	3.511	0.0	1.000	398457	4.22		88.0		
D 42 M2-8:2FTS										
529.00 > 509.00	3.511	3.513	-0.002		5342826	49.7		104		
D 45 d3-NMeFOSAA										
573.00 > 419.00	3.673	3.676	-0.003		4014623	53.3		107		
44 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.683	3.681	0.002	1.003	285665	4.02		80.4		
D 46 d5-NEtFOSAA										
589.00 > 419.00	3.838	3.842	-0.004		4235352	54.1		108		
49 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.847	3.854	-0.007	1.002	267721	3.99		79.7		
D 52 d-N-MeFOSA-M										
515.00 > 169.00	3.987	3.992	-0.005		5121953	53.9		108		
54 MeFOSA										
512.00 > 169.00	3.997	3.999	-0.002	1.000	343493	4.00		80.1		
D 51 d-N-EtFOSA-M										
531.00 > 169.00	4.179	4.180	-0.001		4561882	53.2		106		
53 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.186	4.187	-0.001	1.000	326877	4.15		82.9		

Reagents:

LCPFC2-L3_00002 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 14:34:48 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_015.d

Injection Date: 15-Dec-2016 13:56:03 Instrument ID: A8_N

Lims ID: IC L3 Add-on

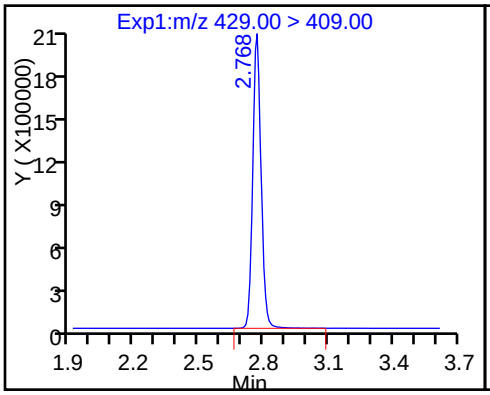
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 48 Worklist Smp#: 15

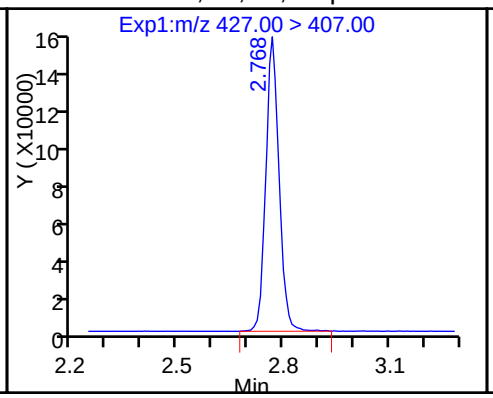
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

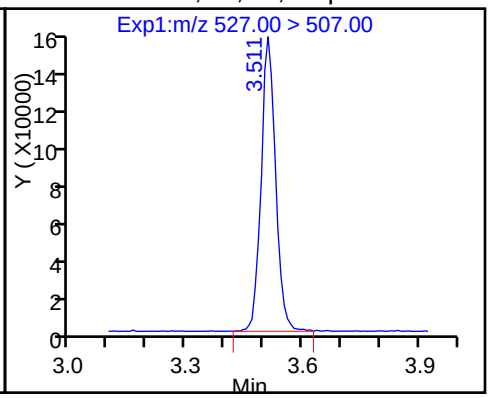
D 47 M2-6:2FTS



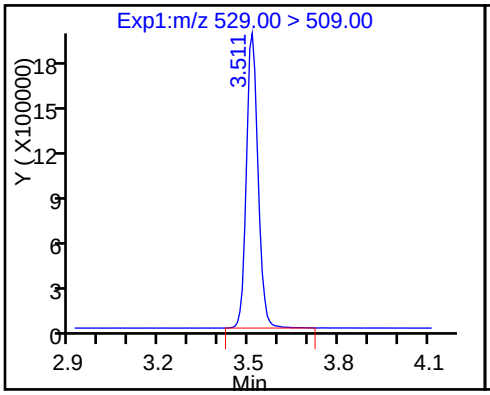
48 Sodium 1H,1H,2H,2H-perfluorooctane



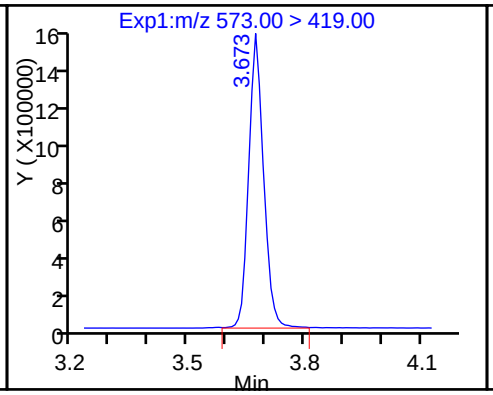
43 Sodium 1H,1H,2H,2H-perfluorooctane



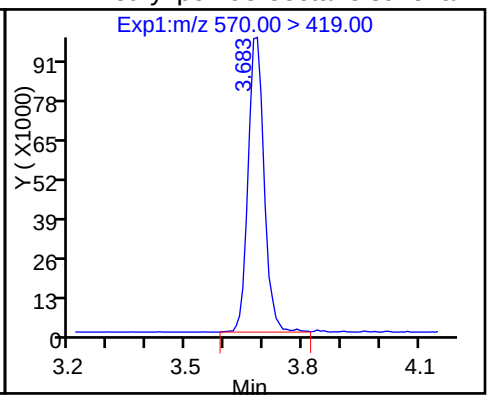
D 42 M2-8:2FTS



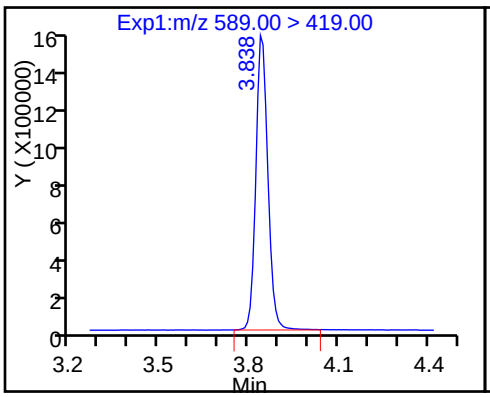
D 45 d3-NMeFOSAA



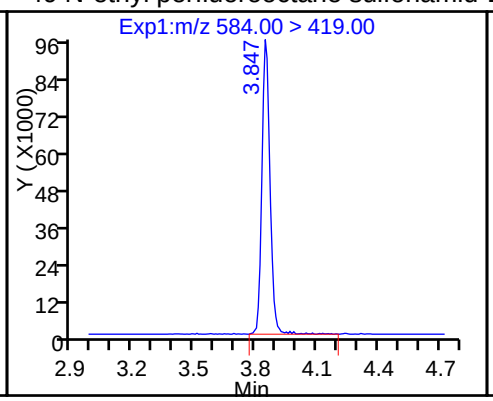
44 N-methyl perfluorooctane sulfonami



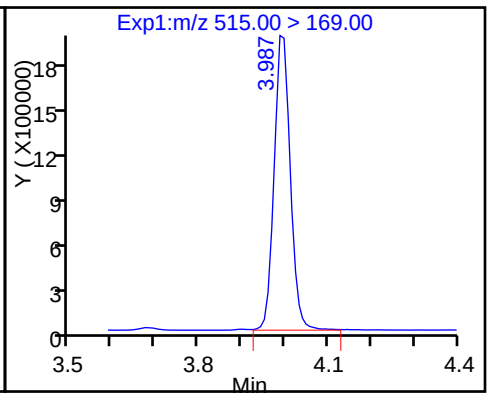
D 46 d5-NEtFOSAA



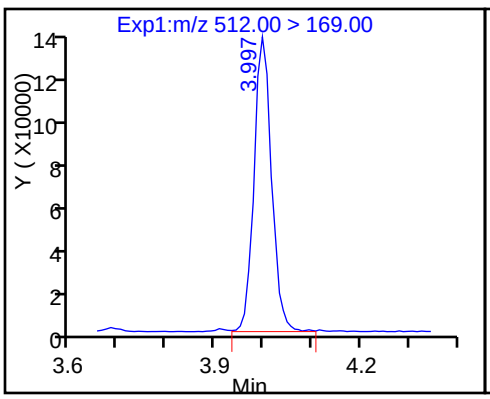
49 N-ethyl perfluorooctane sulfonamid



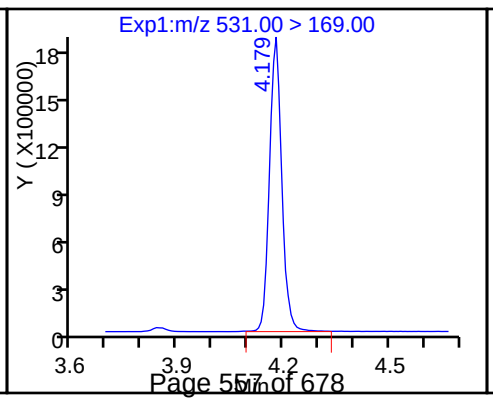
D 52 d-N-MeFOSA-M



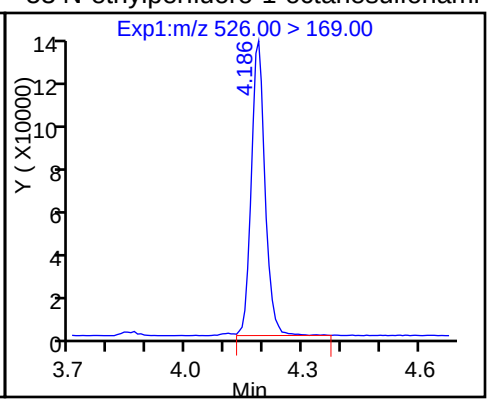
54 MeFOSA



D 51 d-N-EtFOSA-M



53 N-ethylperfluoro-1-octanesulfonami



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_016.d
Lims ID: IC L4 Add-on
Client ID:
Sample Type: IC Calib Level: 4
Inject. Date: 15-Dec-2016 14:03:33 ALS Bottle#: 49 Worklist Smp#: 16
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L4 ADD ON
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub6

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 16-Dec-2016 14:34:49 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 15-Dec-2016 16:37:50

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 M2-6:2FTS										
429.00 > 409.00	2.767	2.767	0.0		6471813	55.3		116		
48 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.767	2.768	-0.001	1.000	2416384	19.9		105		
43 Sodium 1H,1H,2H,2H-perfluorooctane										
527.00 > 507.00	3.511	3.511	0.0	1.000	2224381	21.0		110		
D 42 M2-8:2FTS										
529.00 > 509.00	3.511	3.513	-0.002		5984276	55.7		116		
D 45 d3-NMeFOSAA										
573.00 > 419.00	3.673	3.676	-0.003		4379131	58.1		116		
44 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.683	3.681	0.002	1.003	1708231	22.0		110		
D 46 d5-NEtFOSAA										
589.00 > 419.00	3.838	3.842	-0.004		4410456	56.3		113		
49 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.847	3.854	-0.007	1.002	1518918	21.7		109		
D 52 d-N-MeFOSA-M										
515.00 > 169.00	3.997	3.992	0.005		5263980	55.4		111		
54 MeFOSA										
512.00 > 169.00	3.997	3.999	-0.002	1.000	1946985	22.1		110		
D 51 d-N-EtFOSA-M										
531.00 > 169.00	4.179	4.180	-0.001		4672820	54.5		109		
53 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.186	4.187	-0.001	1.000	1813178	22.5		112		

Reagents:

LCPFC2-L4_00003 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 14:34:50 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_016.d

Injection Date: 15-Dec-2016 14:03:33 Instrument ID: A8_N

Lims ID: IC L4 Add-on

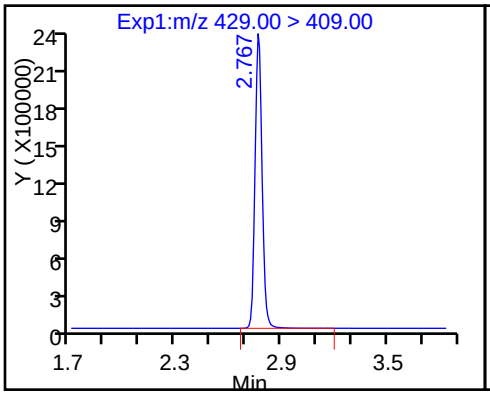
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 49 Worklist Smp#: 16

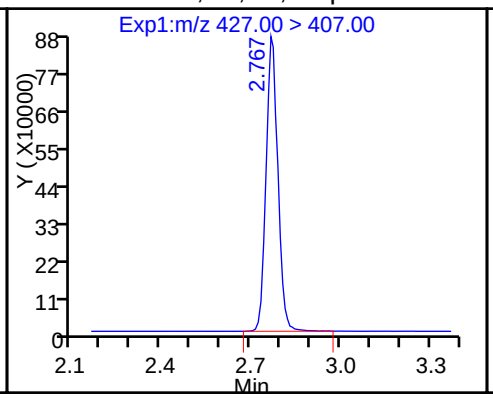
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

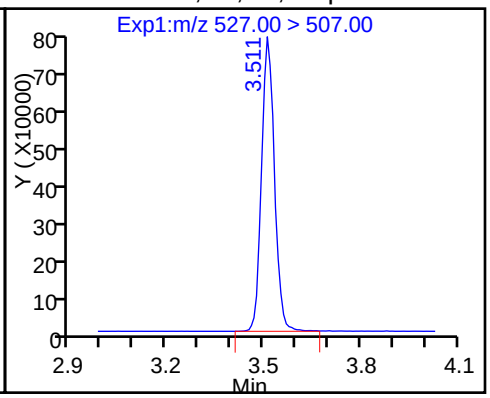
D 47 M2-6:2FTS



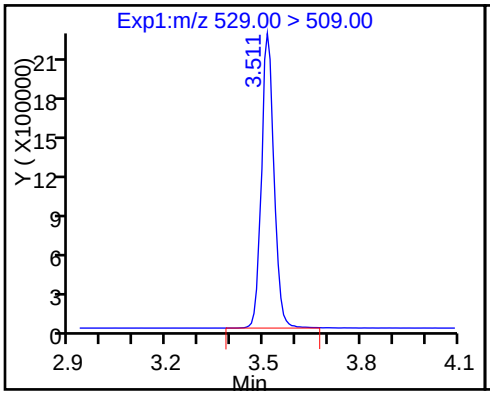
48 Sodium 1H,1H,2H,2H-perfluorooctane



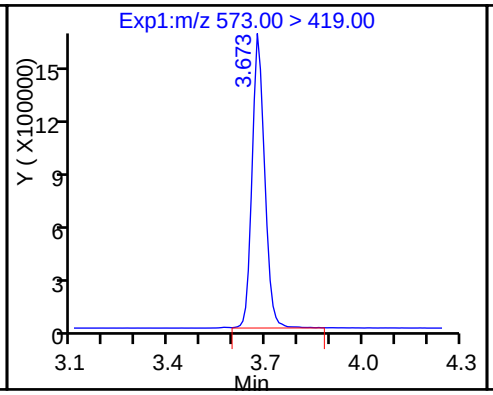
43 Sodium 1H,1H,2H,2H-perfluorooctane



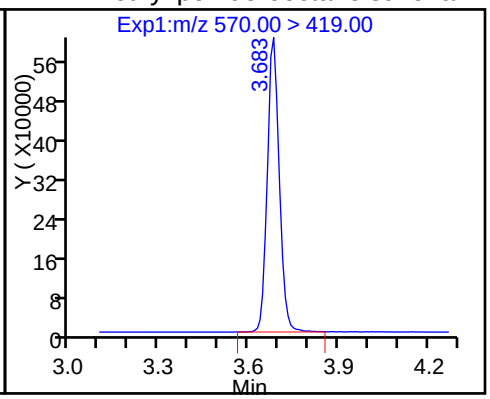
D 42 M2-8:2FTS



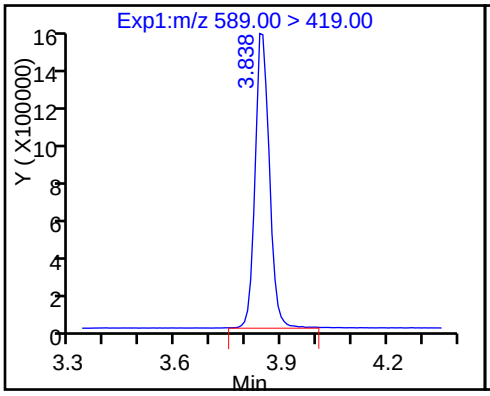
D 45 d3-NMeFOSAA



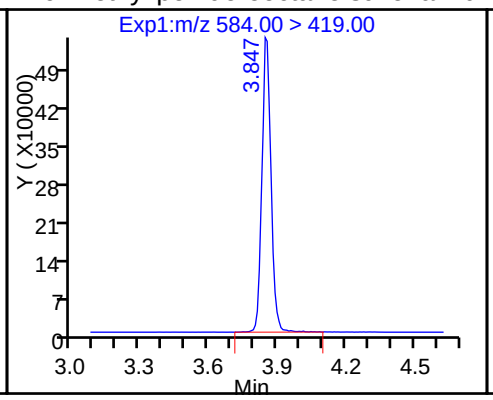
44 N-methyl perfluorooctane sulfonami



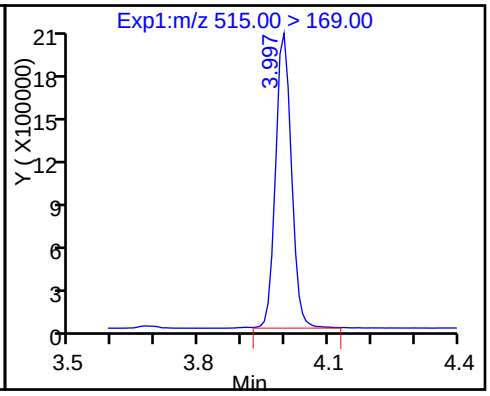
D 46 d5-NEtFOSAA



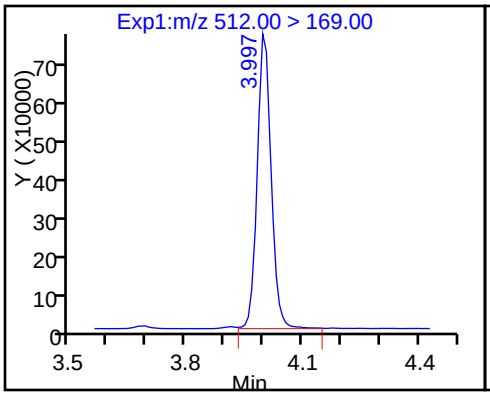
49 N-ethyl perfluorooctane sulfonamid



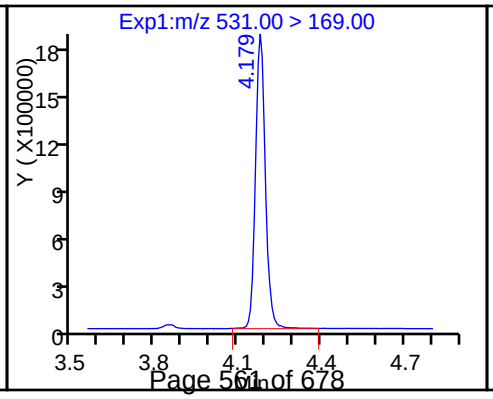
D 52 d-N-MeFOSA-M



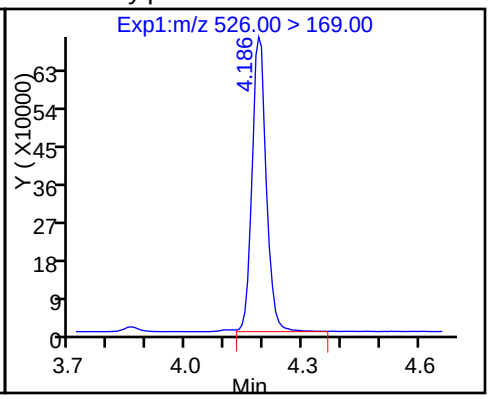
54 MeFOSA



D 51 d-N-EtFOSA-M



53 N-ethylperfluoro-1-octanesulfonami



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_017.d
Lims ID: IC L5 Add-on
Client ID:
Sample Type: IC Calib Level: 5
Inject. Date: 15-Dec-2016 14:11:03 ALS Bottle#: 50 Worklist Smp#: 17
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L5 ADD ON
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub6

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 16-Dec-2016 14:34:51 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 15-Dec-2016 16:38:32

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 M2-6:2FTS										
429.00 > 409.00	2.767	2.767	0.0		5259120	45.0		94.6		
48 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.767	2.768	-0.001	1.000	5166665	52.3		110		
43 Sodium 1H,1H,2H,2H-perfluorooctane										
527.00 > 507.00	3.512	3.511	0.001	0.998	4815680	56.9		119		
D 42 M2-8:2FTS										
529.00 > 509.00	3.520	3.513	0.007		4786038	44.5		93.0		
D 45 d3-NMeFOSAA										
573.00 > 419.00	3.675	3.676	-0.001		3422485	45.4		90.9		
44 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.684	3.681	0.003	1.003	3741936	61.8		124		
D 46 d5-NEtFOSAA										
589.00 > 419.00	3.848	3.842	0.006		3486329	44.5		89.0		
49 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.857	3.854	0.003	1.002	3414301	61.8		124		
D 52 d-N-MeFOSA-M										
515.00 > 169.00	3.999	3.992	0.007		4512300	47.5		94.9		
54 MeFOSA										
512.00 > 169.00	3.999	3.999	0.0	1.000	4407328	58.3		117		
D 51 d-N-EtFOSA-M										
531.00 > 169.00	4.182	4.180	0.002		4149228	48.4		96.7		
53 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.189	4.187	0.002	1.000	4264314	59.5		119		

Reagents:

LCPFC2-L5_00002 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 14:34:51 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_017.d

Injection Date: 15-Dec-2016 14:11:03 Instrument ID: A8_N

Lims ID: IC L5 Add-on

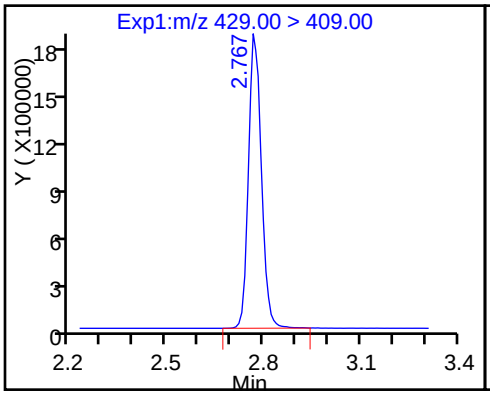
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 50 Worklist Smp#: 17

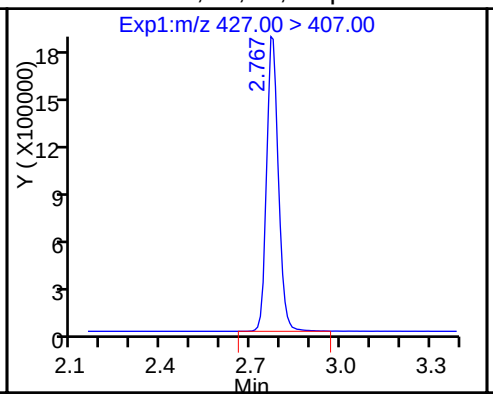
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

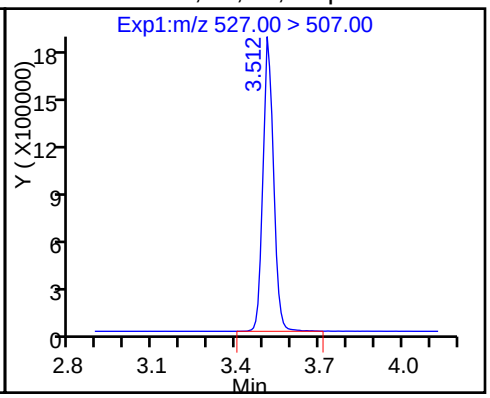
D 47 M2-6:2FTS



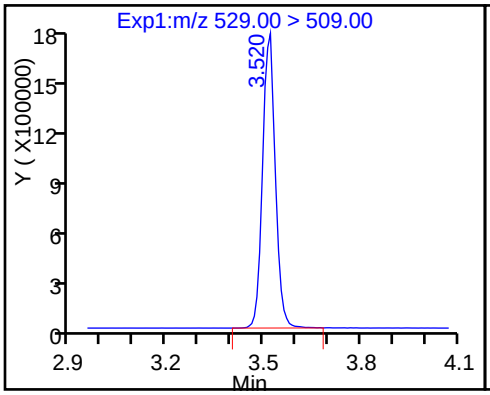
48 Sodium 1H,1H,2H,2H-perfluorooctane



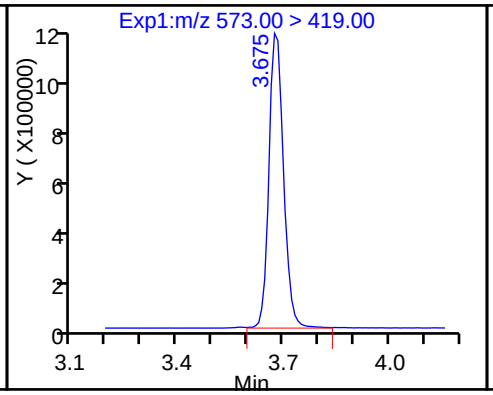
43 Sodium 1H,1H,2H,2H-perfluorooctane



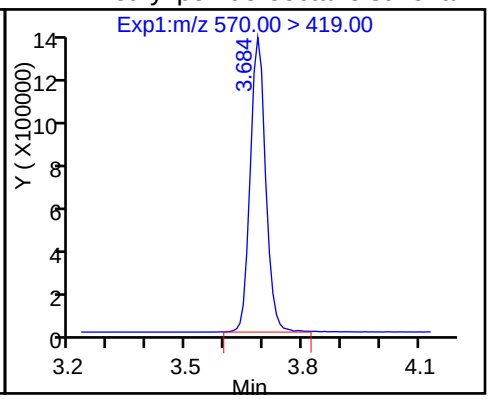
D 42 M2-8:2FTS



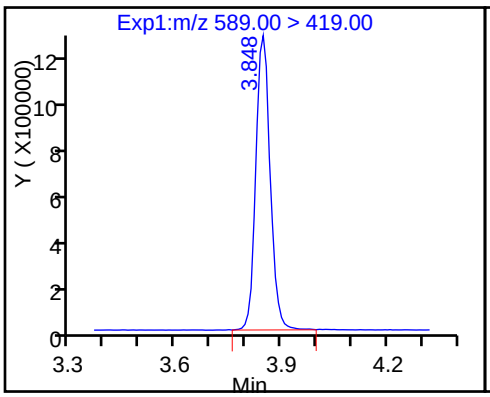
D 45 d3-NMeFOSAA



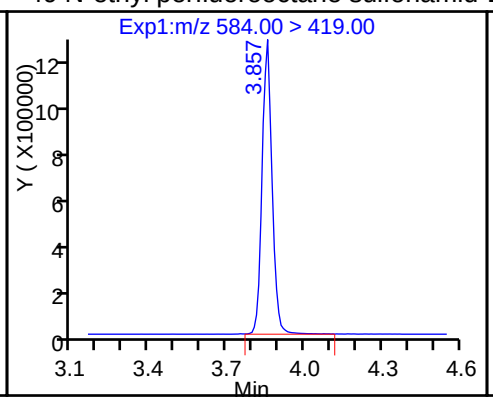
44 N-methyl perfluorooctane sulfonami



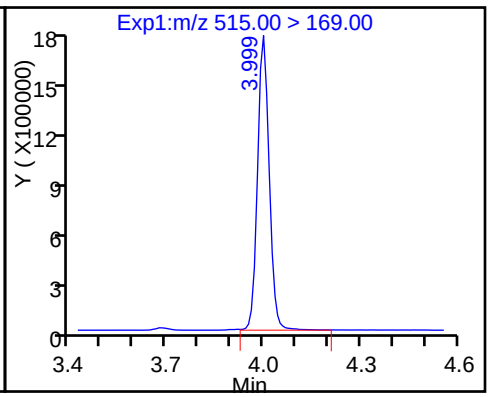
D 46 d5-NEtFOSAA



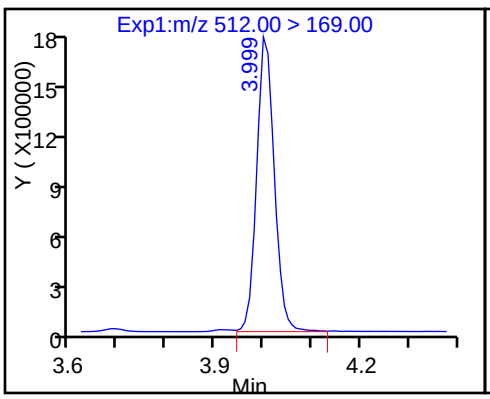
49 N-ethyl perfluorooctane sulfonamid



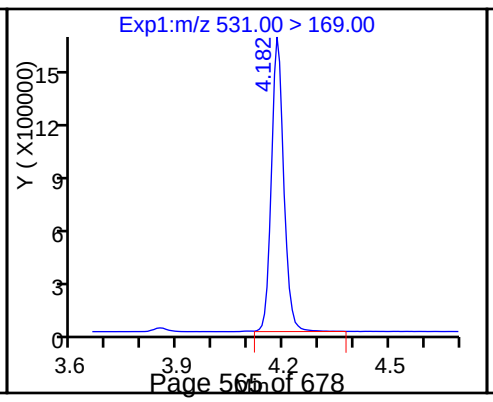
D 52 d-N-MeFOSA-M



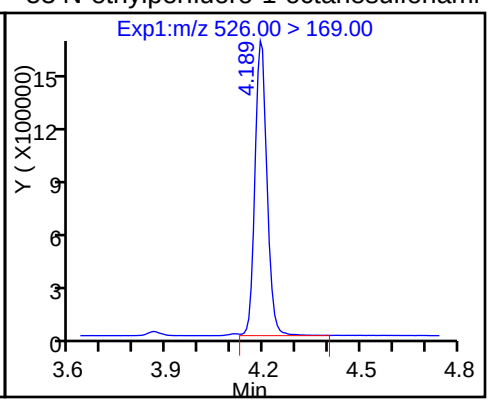
54 MeFOSA



D 51 d-N-EtFOSA-M



53 N-ethylperfluoro-1-octanesulfonami



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d
Lims ID: IC L6 Add-on
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 15-Dec-2016 14:18:33 ALS Bottle#: 51 Worklist Smp#: 18
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L6 ADD ON
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub6

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 16-Dec-2016 14:34:52 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 15-Dec-2016 16:38:39

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 M2-6:2FTS										
429.00 > 409.00	2.776	2.767	0.009		5576967	47.7		100		
48 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.769	2.768	0.001	1.000	16907459	161.5		85.2		
43 Sodium 1H,1H,2H,2H-perfluorooctane										
527.00 > 507.00	3.516	3.511	0.005	1.000	16111959	170.3		88.9		
D 42 M2-8:2FTS										
529.00 > 509.00	3.516	3.513	0.003		5348797	49.8		104		
D 45 d3-NMeFOSAA										
573.00 > 419.00	3.680	3.676	0.004		3587176	47.6		95.2		
44 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.680	3.681	-0.001	1.000	12924122	203.6		102		
D 46 d5-NEtFOSAA										
589.00 > 419.00	3.845	3.842	0.003		3725902	47.6		95.1		
49 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.853	3.854	-0.001	1.002	11938061	202.0		101		
D 52 d-N-MeFOSA-M										
515.00 > 169.00	3.995	3.992	0.003		4658153	49.0		98.0		
54 MeFOSA										
512.00 > 169.00	4.004	3.999	0.005	1.000	16114020	206.5		103		
D 51 d-N-EtFOSA-M										
531.00 > 169.00	4.186	4.180	0.006		4448546	51.9		104		
53 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.193	4.187	0.006	1.000	15780196	205.3		103		

Reagents:

LCPFC2-L6_00002 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 14:34:53 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Injection Date: 15-Dec-2016 14:18:33 Instrument ID: A8_N

Lims ID: IC L6 Add-on

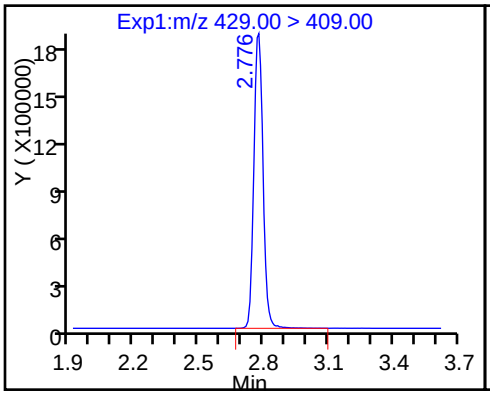
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 51 Worklist Smp#: 18

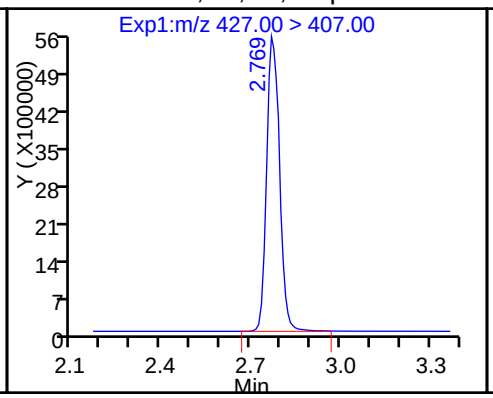
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

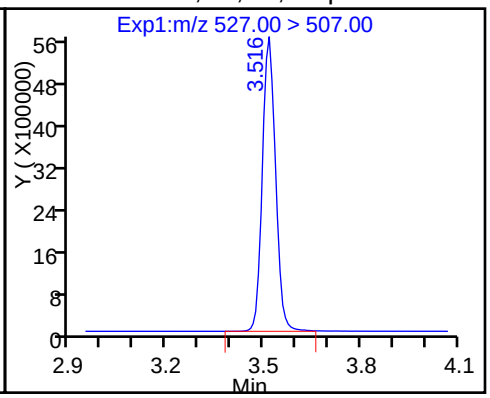
D 47 M2-6:2FTS



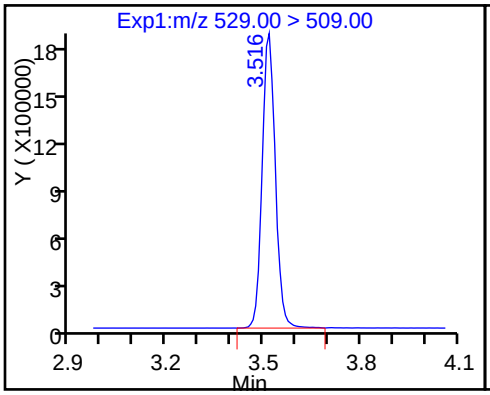
48 Sodium 1H,1H,2H,2H-perfluorooctane



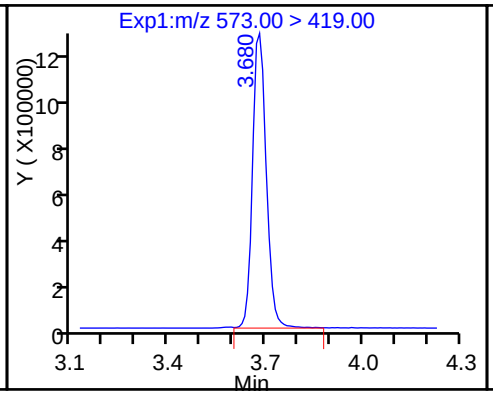
43 Sodium 1H,1H,2H,2H-perfluorooctane



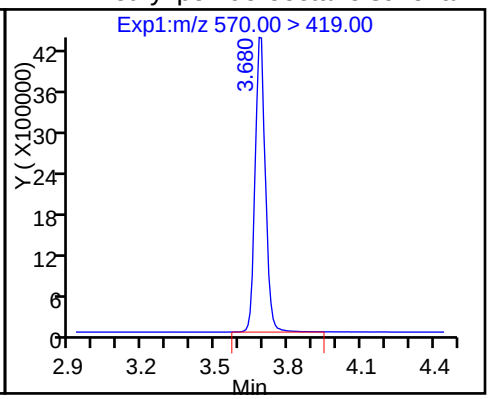
D 42 M2-8:2FTS



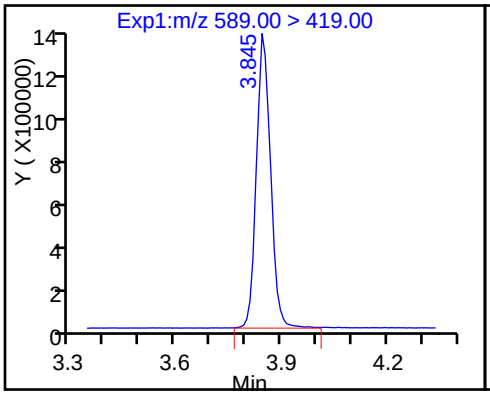
D 45 d3-NMeFOSAA



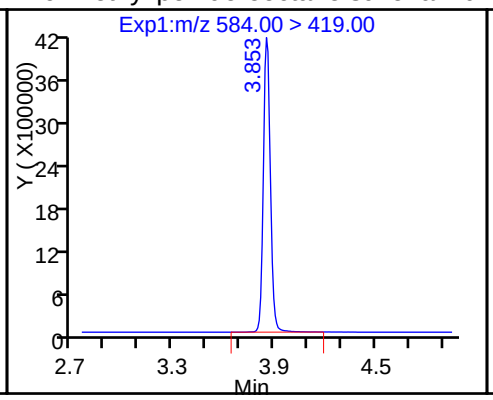
44 N-methyl perfluorooctane sulfonami



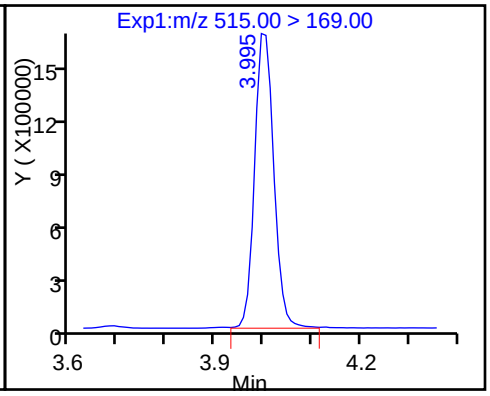
D 46 d5-NEtFOSAA



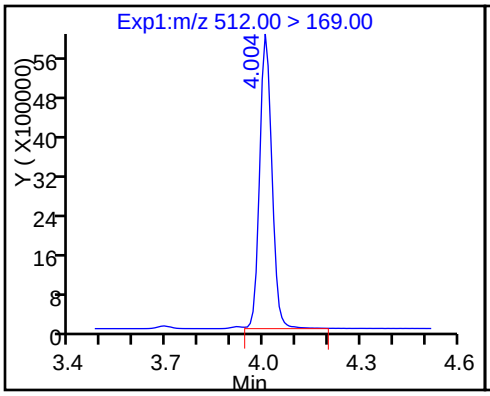
49 N-ethyl perfluorooctane sulfonamid



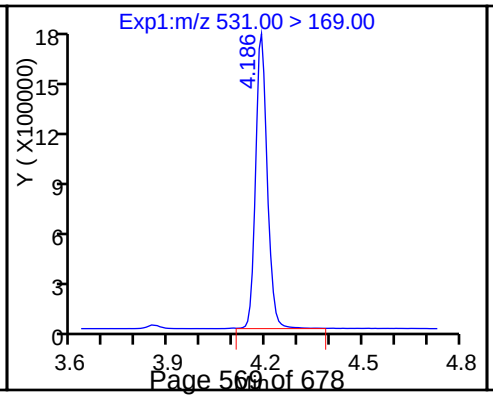
D 52 d-N-MeFOSA-M



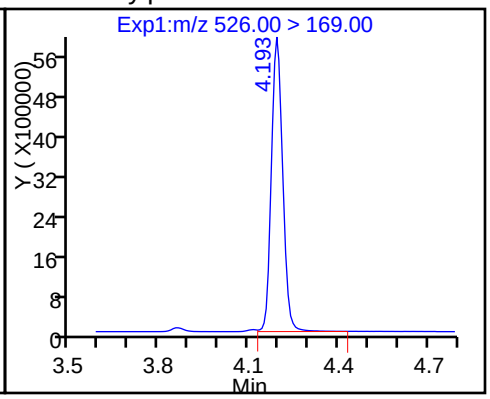
54 MeFOSA



D 51 d-N-EtFOSA-M



53 N-ethylperfluoro-1-octanesulfonami



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Lab Sample ID: ICV 320-142379/11 Calibration Date: 12/15/2016 13:21

Instrument ID: A8_N Calib Start Date: 12/15/2016 12:29

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/15/2016 14:18

Lab File ID: 15DEC2016B_011.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.8537	0.8479		49.7	50.0	-0.7	25.0
Perfluoropentanoic acid (PFPeA)	AveID	0.9868	0.9654		48.9	50.0	-2.2	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.417	1.478		46.2	44.3	4.3	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9288	0.9123		49.1	50.0	-1.8	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9788	0.9679		49.4	50.0	-1.1	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.030	0.9556		43.8	47.3	-7.2	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.003	1.000		49.9	50.0	-0.3	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.102	1.160		50.1	47.6	5.2	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9518	0.9360		49.2	50.0	-1.7	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	0.9945	0.9040		43.4	47.8	-9.1	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9327	0.9182		49.2	50.0	-1.5	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9438	0.9109		48.3	50.0	-3.5	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.5840	0.5921		48.9	48.3	1.4	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9563	0.9285		48.5	50.0	-2.9	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9180	0.8958		48.8	50.0	-2.4	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9069	0.9189		50.7	50.0	1.3	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.585	1.555		49.1	50.0	-1.9	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		0.9309		48.2	50.0	-3.7	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.030	0.8547		41.5	50.0	-17.0	25.0
13C4 PFBA	Ave	347743	335296		48.2	50.0	-3.6	50.0
13C5-PFPeA	Ave	266072	251719		47.3	50.0	-5.4	50.0
13C2 PFHxA	Ave	245110	240514		49.1	50.0	-1.9	50.0
13C4-PFHpA	Ave	226344	215455		47.6	50.0	-4.8	50.0
18O2 PFHxS	Ave	326976	320282		46.3	47.3	-2.0	50.0
13C4 PFOA	Ave	230362	219488		47.6	50.0	-4.7	50.0
13C4 PFOS	Ave	248847	244549		47.0	47.8	-1.7	50.0
13C5 PFNA	Ave	177687	171464		48.2	50.0	-3.5	50.0
13C8 FOSA	Ave	384141	381142		49.6	50.0	-0.8	50.0
13C2 PFDA	Ave	157302	151370		48.1	50.0	-3.8	50.0
13C2 PFUnA	Ave	117250	116265		49.6	50.0	-0.8	50.0
13C2 PFDoA	Ave	110957	105818		47.7	50.0	-4.6	50.0
13C2-PFTeDA	Ave	227387	214066		47.1	50.0	-5.9	50.0
13C2-PFHxDA	Ave	124568	118207		47.4	50.0	-5.1	50.0

FORM VII 537 (Modified)

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_011.d
Lims ID: ICV
Client ID:
Sample Type: ICV
Inject. Date: 15-Dec-2016 13:21:44 ALS Bottle#: 44 Worklist Smp#: 11
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: ICV_b
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist:

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 16-Dec-2016 14:41:15 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 15-Dec-2016 13:56:27

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.533	1.534	-0.001		16764776	48.2		96.4	1068457	
1 Perfluorobutyric acid										
212.90 > 169.00	1.541	1.535	0.006	1.000	14214515	49.7			107570	
D 4 13C5-PFPeA										
267.90 > 223.00	1.810	1.810	0.0		12585925	47.3		94.6	1186150	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.810	1.810	0.0	1.000	12149802	48.9			115067	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.848	1.848	0.0	1.000	20951066	46.2				
298.90 > 99.00	1.848	1.848	0.0	1.000	9653760		2.17(0.00-0.00)			
7 Perfluorohexanoic acid										
313.00 > 269.00	2.100	2.096	0.004	1.000	10971106	49.1			243419	
D 6 13C2 PFHxA										
315.00 > 270.00	2.100	2.097	0.003		12025693	49.1		98.1	480449	
D 11 13C4-PFHpA										
367.00 > 322.00	2.425	2.426	-0.001		10772772	47.6		95.2	728689	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.433	2.428	0.005	1.000	10426957	49.4			97176	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.449	2.431	0.018	1.000	14462013	43.8				
D 10 18O2 PFHxS										
403.00 > 84.00	2.449	2.446	0.003		15149334	46.3		98.0	878432	
D 14 13C4 PFOA										
417.00 > 372.00	2.785	2.783	0.002		10974392	47.6		95.3	756643	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooctanoic acid										
413.00 > 369.00	2.785	2.783	0.002	1.000	10976634	49.9			90975	
413.00 > 169.00	2.793	2.783	0.010	1.003	6473539		1.70(0.90-1.10)		241007	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.793	2.790	0.003	1.000	13497259	50.1				
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.162	3.118	0.044	1.000	10556247	43.4			368282	
499.00 > 99.00	3.154	3.118	0.036	0.997	2582918		4.09(0.90-1.10)		118191	
D 17 13C4 PFOS										
503.00 > 80.00	3.162	3.151	0.011		11689450	47.0		98.3	325285	
D 19 13C5 PFNA										
468.00 > 423.00	3.162	3.153	0.009		8573219	48.2		96.5	485749	
20 Perfluorononanoic acid										
463.00 > 419.00	3.162	3.155	0.007	1.000	8024621	49.2			123355	
D 21 13C8 FOSA										
506.00 > 78.00	3.495	3.488	0.007		19057117	49.6		99.2	610709	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.495	3.491	0.004	1.000	17498900	49.2			383568	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.520	3.510	0.010	1.000	6894043	48.3			189508	
D 23 13C2 PFDA										
515.00 > 470.00	3.520	3.513	0.007		7568491	48.1		96.2	377092	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.830	3.822	0.008	1.000	6986242	48.9				
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.848	3.839	0.009	1.000	5397748	48.5			115044	
D 27 13C2 PFUnA										
565.00 > 520.00	3.848	3.842	0.006		5813248	49.6		99.2	413801	
D 30 13C2 PFDoA										
615.00 > 570.00	4.139	4.132	0.007		5290885	47.7		95.4	272661	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.139	4.136	0.003	1.000	4739775	48.8			99907	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.411	4.400	0.011	1.000	4861713	50.7			113110	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.642	4.641	0.001		10703301	47.1		94.1	614243	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.652	4.642	0.010	1.000	8229099	49.1			142471	
713.00 > 169.00	4.642	4.642	0.0	0.998	1339943		6.14(0.00-0.00)		99778	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.058	5.057	0.001		5910325	47.4		94.9	128290	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.058	5.059	-0.001	1.000	4925242	48.2			4012	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.421	5.414	0.007	1.000	4522136	41.5			4448	

Reagents:

LCPFCIC_00020 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 14:41:15 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_011.d

Injection Date: 15-Dec-2016 13:21:44 Instrument ID: A8_N

Lims ID: ICV

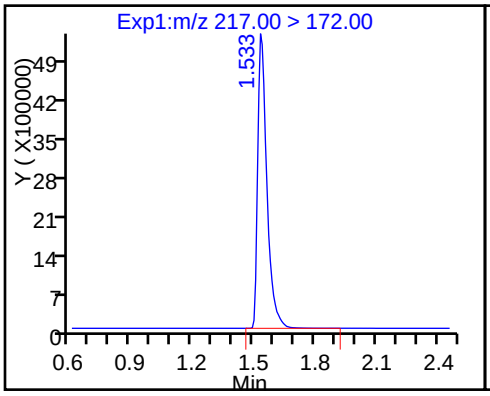
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 44 Worklist Smp#: 11

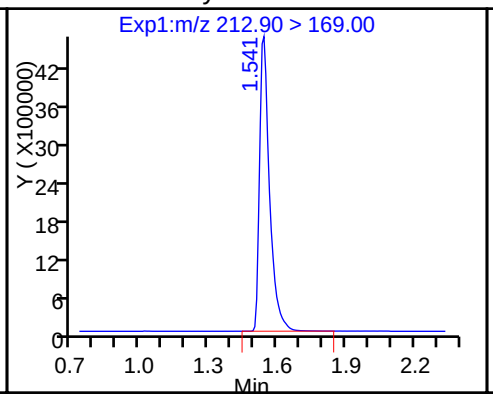
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

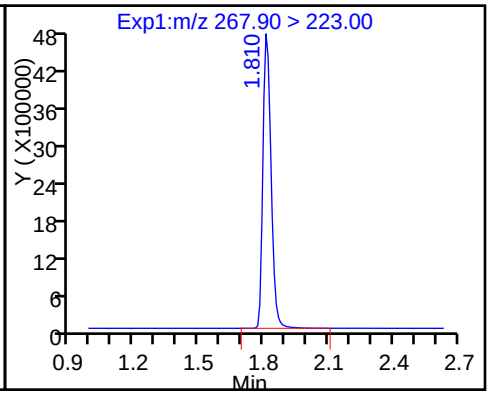
D 2 13C4 PFBA



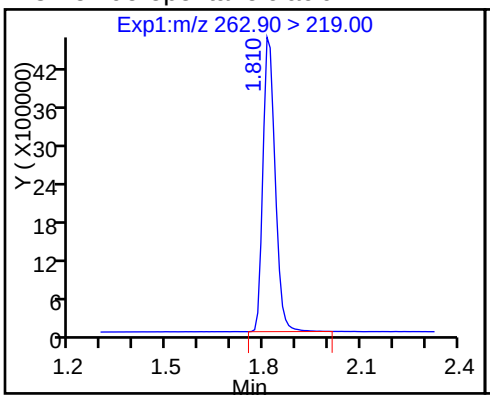
1 Perfluorobutyric acid



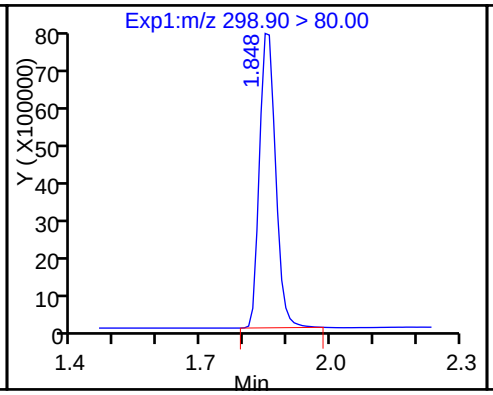
D 4 13C5-PFPeA



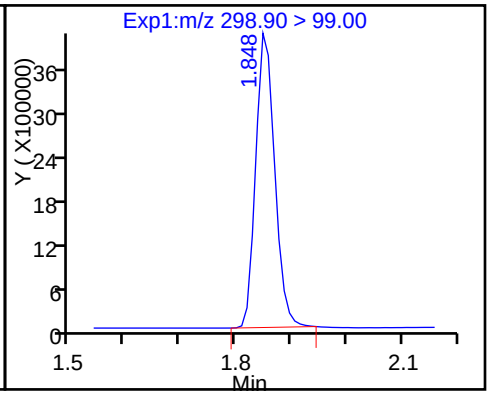
3 Perfluoropentanoic acid



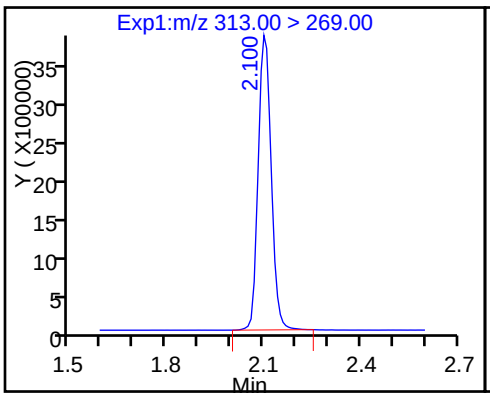
5 Perfluorobutanesulfonic acid



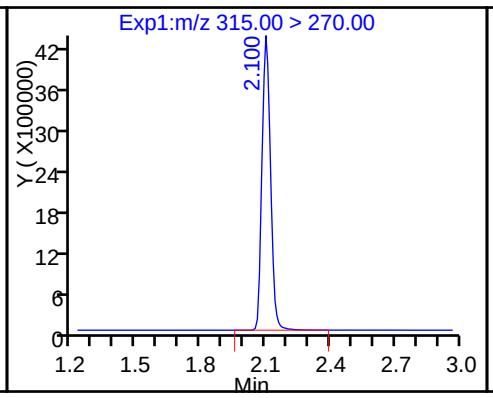
5 Perfluorobutanesulfonic acid



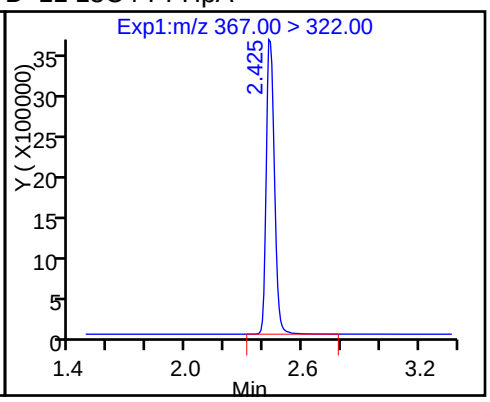
7 Perfluorohexanoic acid



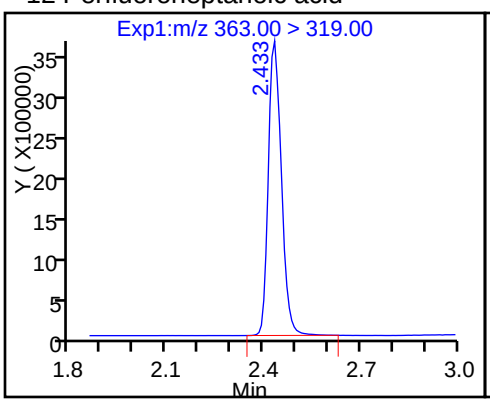
D 6 13C2 PFHxA



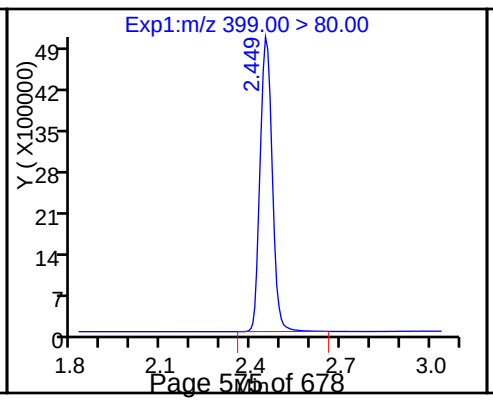
D 11 13C4-PFHpA



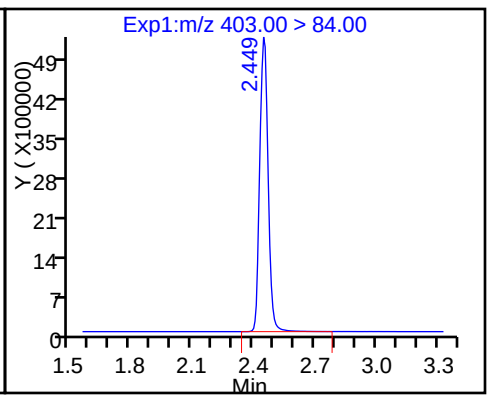
12 Perfluoroheptanoic acid



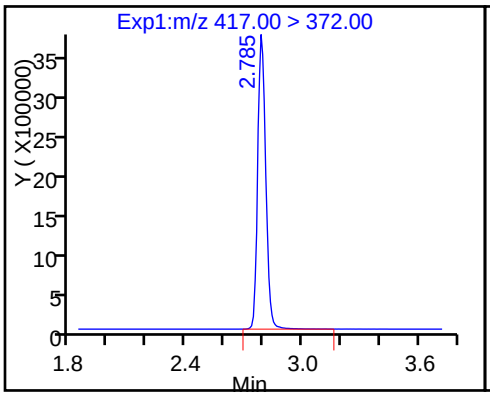
9 Perfluorohexanesulfonic acid



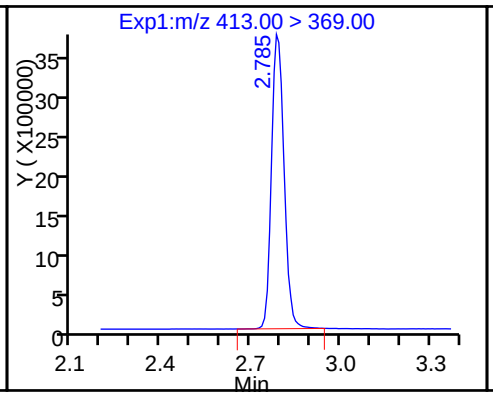
D 10 18O2 PFHxS



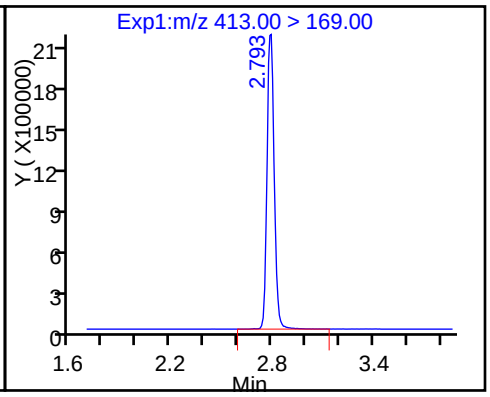
D 14 13C4 PFOA



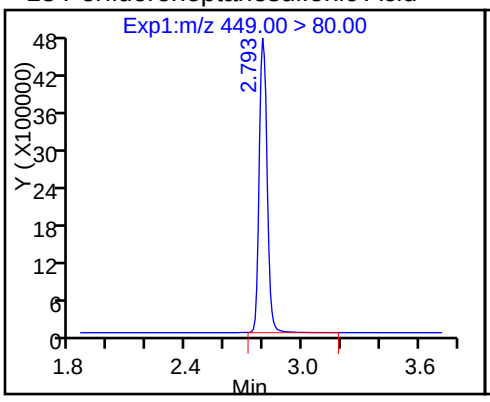
15 Perfluorooctanoic acid



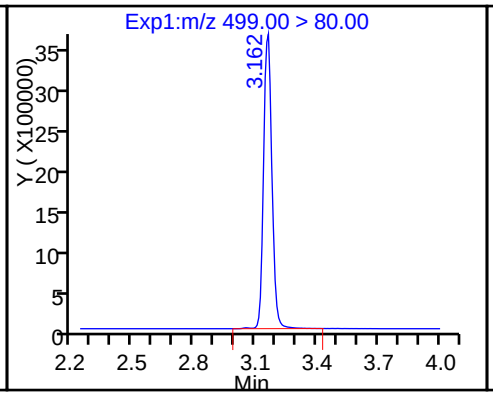
15 Perfluorooctanoic acid



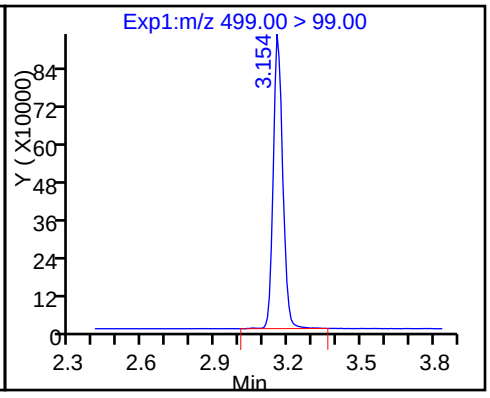
13 Perfluoroheptanesulfonic Acid



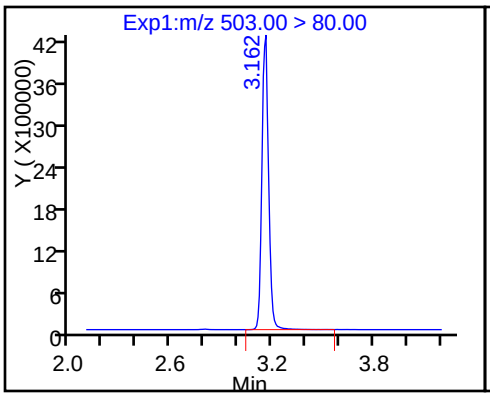
18 Perfluorooctane sulfonic acid



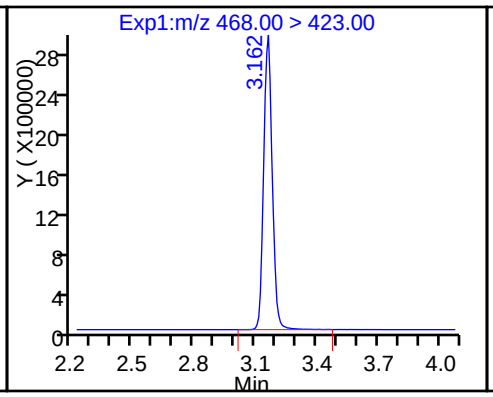
18 Perfluorooctane sulfonic acid



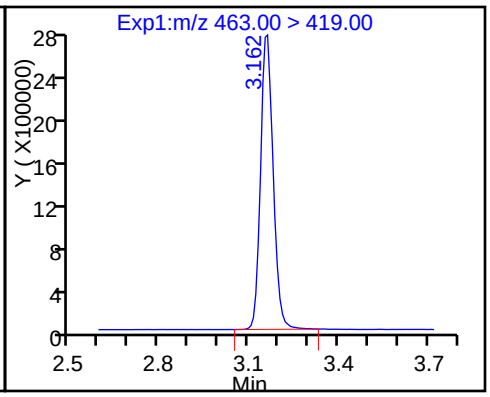
D 17 13C4 PFOS



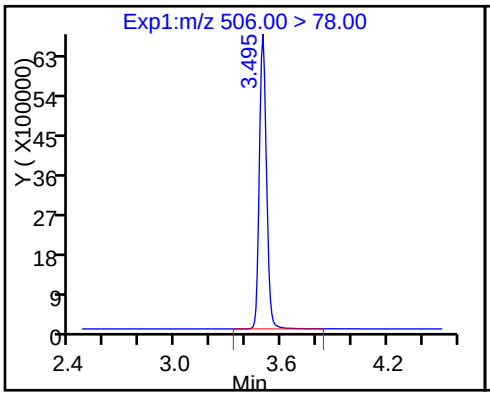
D 19 13C5 PFNA



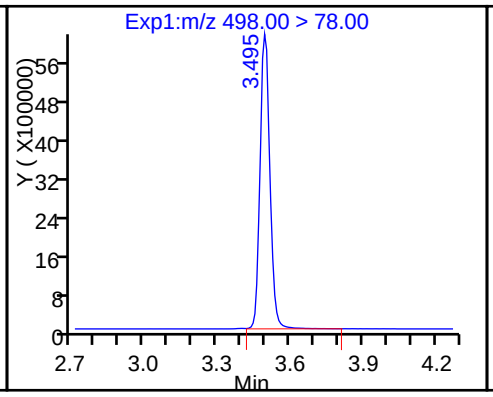
20 Perfluorononanoic acid



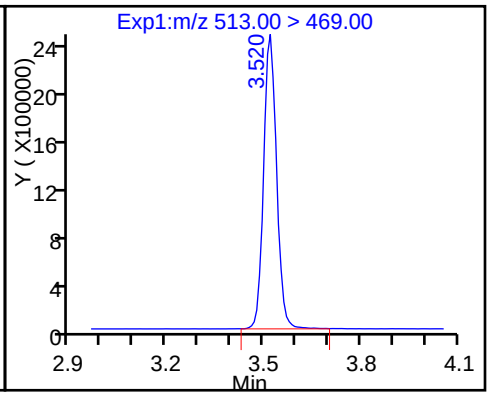
D 21 13C8 FOSA



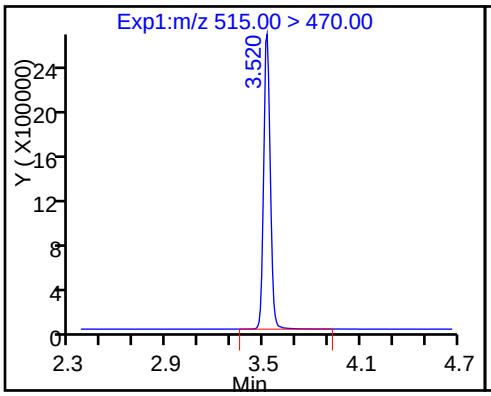
22 Perfluorooctane Sulfonamide



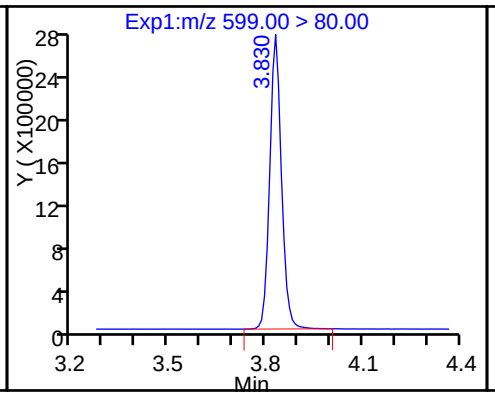
24 Perfluorodecanoic acid



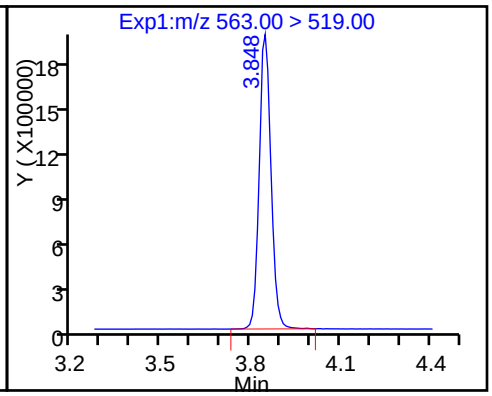
D 23 13C2 PFDA



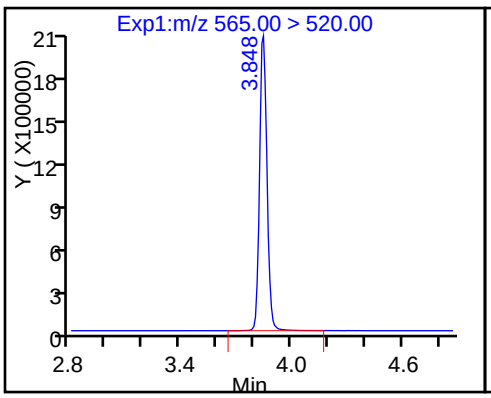
26 Perfluorodecane Sulfonic acid



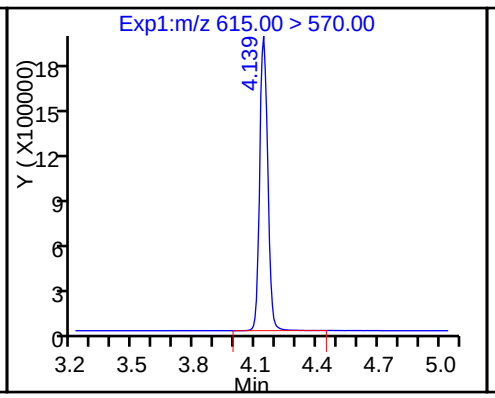
28 Perfluoroundecanoic acid



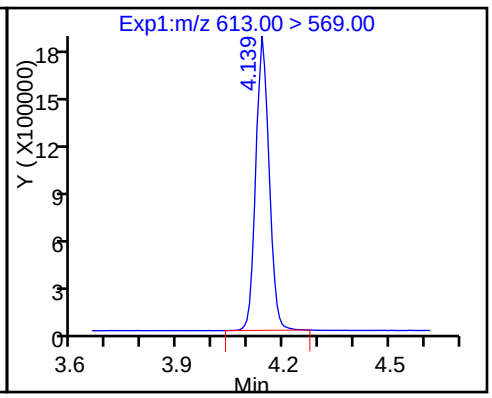
D 27 13C2 PFUnA



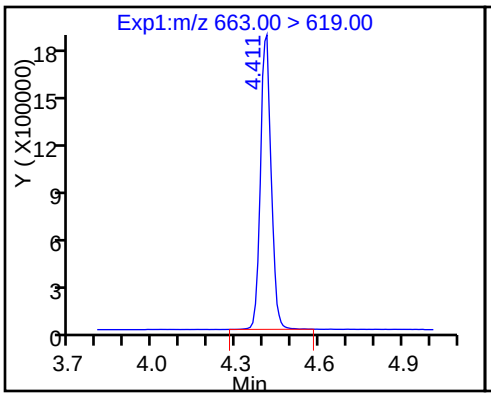
D 30 13C2 PFDoA



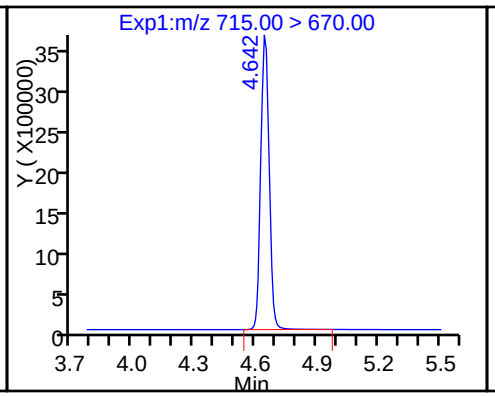
29 Perfluorododecanoic acid



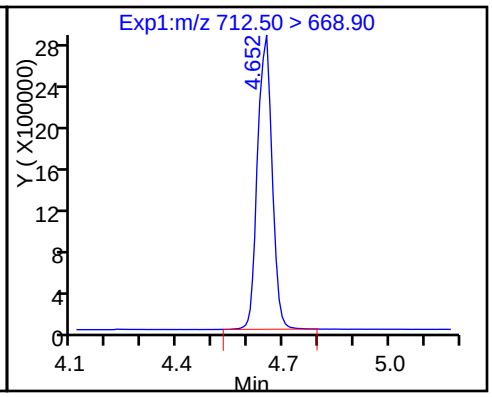
31 Perfluorotridecanoic acid



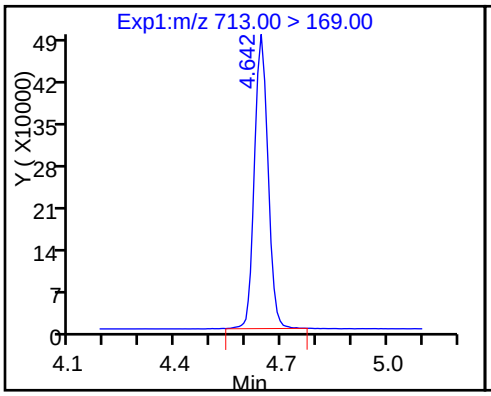
D 32 13C2-PFTeDA



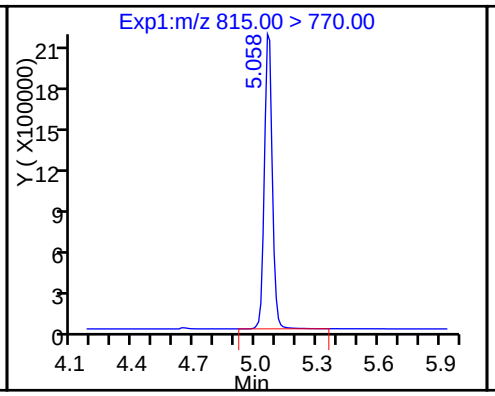
33 Perfluorotetradecanoic acid



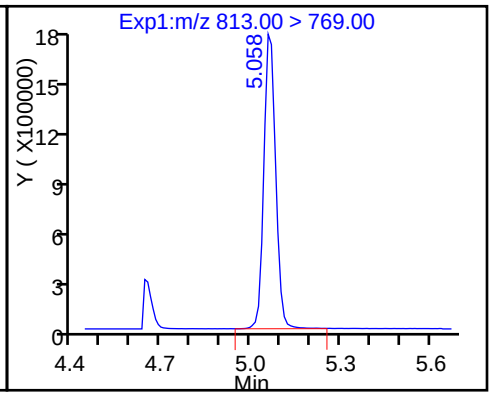
33 Perfluorotetradecanoic acid



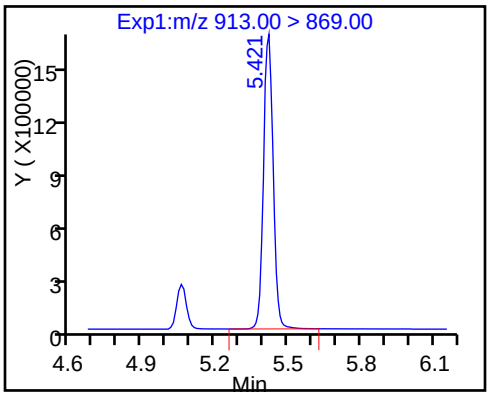
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Lab Sample ID: CCV 320-142571/4 Calibration Date: 12/16/2016 10:23

Instrument ID: A8_N Calib Start Date: 12/15/2016 12:29

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/15/2016 14:18

Lab File ID: 16DEC2016A_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	0.8537	0.8622		1.01	1.00	1.0	50.0
Perfluoropentanoic acid (PFPeA)	AveID	0.9868	1.049		1.06	1.00	6.3	50.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.417	1.423		0.888	0.884	0.5	50.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9288	0.9078		0.977	1.00	-2.3	50.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9788	0.9636		0.984	1.00	-1.6	50.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.030	1.116		0.986	0.910	8.4	50.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.102	1.053		0.909	0.952	-4.5	50.0
Perfluorooctanoic acid (PFOA)	AveID	1.003	1.073		1.07	1.00	7.0	50.0
Perfluorononanoic acid (PFNA)	AveID	0.9518	0.9456		0.994	1.00	-0.6	50.0
Perfluorooctanesulfonic acid (PFOS)	AveID	0.9945	0.9280		0.866	0.928	-6.7	50.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9327	0.9465		1.01	1.00	1.5	50.0
Perfluorodecanoic acid (PFDA)	AveID	0.9438	0.9040		0.958	1.00	-4.2	50.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.5840	0.6119		1.01	0.964	4.8	50.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9563	0.9903		1.04	1.00	3.6	50.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9180	0.8819		0.961	1.00	-3.9	50.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9069	0.7992		0.881	1.00	-11.9	50.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.585	1.924		1.21	1.00	21.4	50.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		1.721		1.20	1.00	20.3	50.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.030	1.124		1.09	1.00	9.1	50.0
13C4 PFBA	Ave	347743	351306		50.5	50.0	1.0	50.0
13C5-PFPeA	Ave	266072	280609		52.7	50.0	5.5	50.0
13C2 PFHxA	Ave	245110	256291		52.3	50.0	4.6	50.0
13C4-PFHpA	Ave	226344	231480		51.1	50.0	2.3	50.0
18O2 PFHxS	Ave	326976	312827		45.3	47.3	-4.3	50.0
13C4 PFOA	Ave	230362	240945		52.3	50.0	4.6	50.0
13C4 PFOS	Ave	248847	245399		47.1	47.8	-1.4	50.0
13C5 PFNA	Ave	177687	174548		49.1	50.0	-1.8	50.0
13C8 FOSA	Ave	384141	416037		54.2	50.0	8.3	50.0
13C2 PFDA	Ave	157302	168574		53.6	50.0	7.2	50.0
13C2 PFUnA	Ave	117250	124386		53.0	50.0	6.1	50.0
13C2 PFDoA	Ave	110957	116679		52.6	50.0	5.2	50.0
13C2-PFTeDA	Ave	227387	254344		55.9	50.0	11.9	50.0
13C2-PFHxDA	Ave	124568	149310		59.9	50.0	19.9	50.0

FORM VII 537 (Modified)

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161216-37932.b\16DEC2016A_002.d
Lims ID: CCV L2
Client ID:
Sample Type: CCVL
Inject. Date: 16-Dec-2016 10:23:18 ALS Bottle#: 38 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L2
Misc. Info.: Plate: 1 Rack: 1
Operator ID: A8-PC\A8 Instrument ID: A8_N
Sublist: chrom-A8_N*sub5

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161216-37932.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 16-Dec-2016 15:49:37 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 16-Dec-2016 14:29:50

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
1 Perfluorobutyric acid										
212.90 > 169.00	1.607	1.606	0.001	1.000	302902	1.01		101	2474	
D 2 13C4 PFBA										
217.00 > 172.00	1.599	1.606	-0.007		17565315	50.5		101	866076	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.897	1.897	0.0	1.000	294297	1.06		106	2755	
D 4 13C5-PFPeA										
267.90 > 223.00	1.888	1.897	-0.009		14030435	52.7		105	1255780	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.926	1.935	-0.009	1.000	393624	0.8880		100		
298.90 > 99.00	1.926	1.935	-0.009	1.000	165281		2.38(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.195	2.198	-0.003		12814553	52.3		105	782638	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.195	2.198	-0.003	1.000	232669	0.9774		97.7	8322	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.559	2.483	0.076	1.000	317736	0.9861		108		
D 11 13C4-PFHpA										
367.00 > 322.00	2.536	2.541	-0.004		11574024	51.1		102	991176	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.544	2.541	0.004	1.000	223051	0.9844		98.4	3086	
D 10 18O2 PFHxS										
403.00 > 84.00	2.559	2.556	0.003		14796729	45.3		95.7	2677196	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.918	2.908	0.010	1.000	258512	1.07		107	1784	
413.00 > 169.00	2.910	2.908	0.002	0.997	154761		1.67(0.90-1.10)		8352	
D 14 13C4 PFOA										
417.00 > 372.00	2.910	2.908	0.002		12047249	52.3		105	1428755	

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	2.910	2.916	-0.006	1.000	245887	0.9093		95.5		
D 17 13C4 PFOS										
503.00 > 80.00	3.283	3.280	0.002		11730050	47.1		98.6	501134	
18 Perfluorooctane sulfonic acid										M
499.00 > 80.00	3.290	3.280	0.010	1.000	211342	0.8660		93.3	18713	M
499.00 > 99.00	3.283	3.280	0.002	0.998	49645		4.26(0.90-1.10)		3734	M
D 19 13C5 PFNA										
468.00 > 423.00	3.290	3.288	0.002		8727391	49.1		98.2	599988	
20 Perfluorononanoic acid										
463.00 > 419.00	3.290	3.288	0.002	1.000	165059	0.99		99.4	3619	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.599	3.598	0.001	1.000	393764	1.01		101	35223	
D 21 13C8 FOSA										
506.00 > 78.00	3.591	3.598	-0.007		20801841	54.2		108	471659	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.641	3.648	-0.007	1.000	152391	0.9578		95.8	5207	
D 23 13C2 PFDA										
515.00 > 470.00	3.650	3.648	0.002		8428699	53.6		107	260747	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.955	3.951	0.004	1.000	144764	1.01		105		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.973	3.969	0.004	1.000	123173	1.04		104	2615	
D 27 13C2 PFUnA										
565.00 > 520.00	3.973	3.978	-0.005		6219308	53.0		106	243473	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.271	4.271	0.0	1.000	102894	0.9606		96.1	1129	
D 30 13C2 PFDoA										
615.00 > 570.00	4.271	4.262	0.009		5833967	52.6		105	216296	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.536	4.530	0.006	1.000	93253	0.8813		88.1	130	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.780	4.768	0.012	1.000	224469	1.21		121	110	
713.00 > 169.00	4.780	4.768	0.012	1.000	39049		5.75(0.00-0.00)		7170	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.780	4.768	0.012		12717194	55.9		112	786052	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.209	5.191	0.018	1.000	200813	1.20		120	323	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.198	5.191	0.007		7465499	59.9		120	169315	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.576	5.561	0.015	1.000	131139	1.09		109	338	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LCPFC-L2_00023 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 15:49:37 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161216-37932.b\16DEC2016A_002.d

Injection Date: 16-Dec-2016 10:23:18 Instrument ID: A8_N

Lims ID: CCV L2

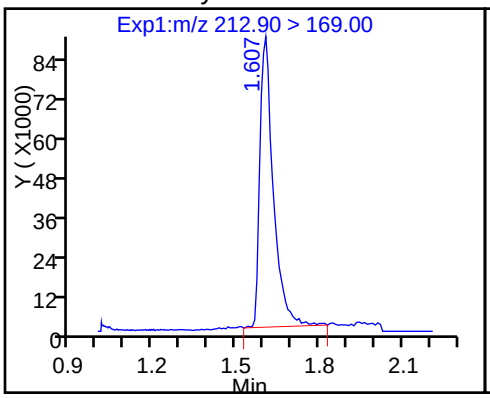
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 38 Worklist Smp#: 4

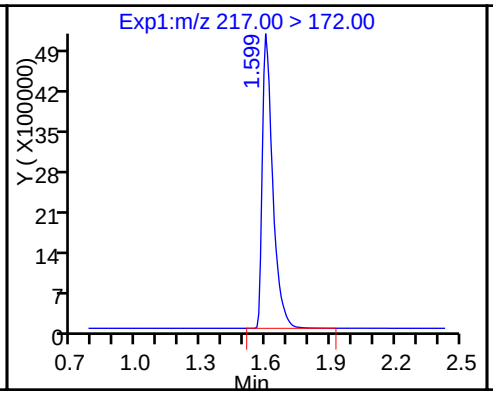
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

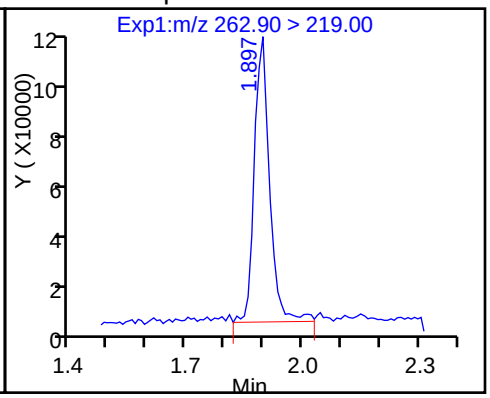
1 Perfluorobutyric acid



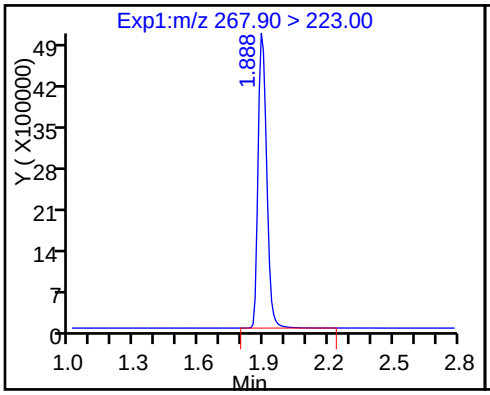
D 2 13C4 PFBA



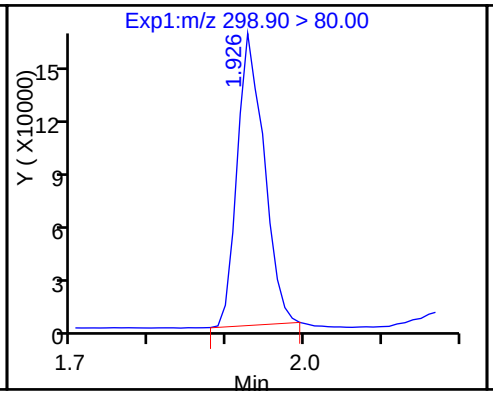
3 Perfluoropentanoic acid



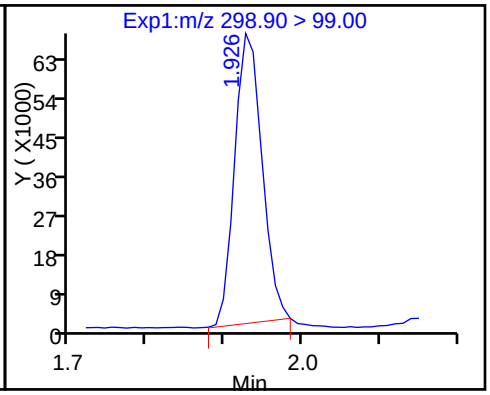
D 4 13C5-PFPeA



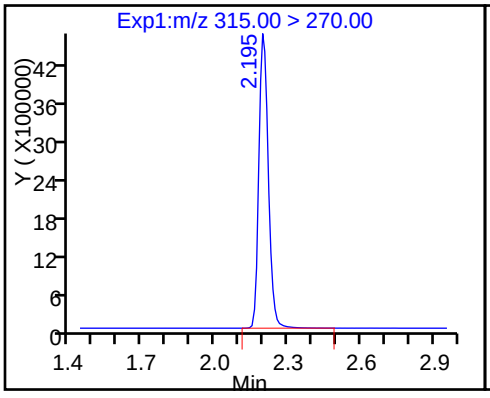
5 Perfluorobutanesulfonic acid



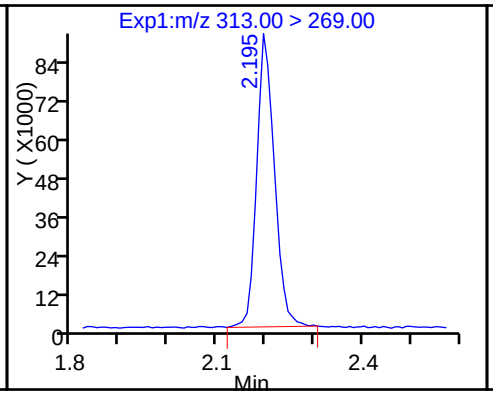
5 Perfluorobutanesulfonic acid



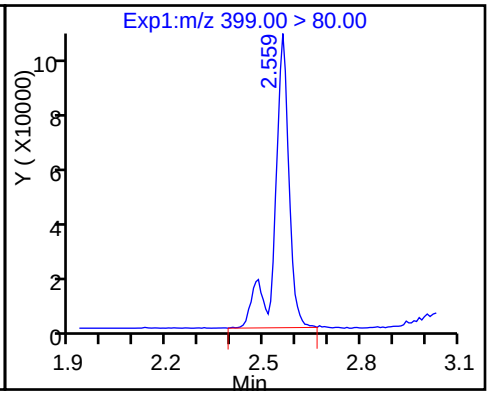
D 6 13C2 PFHxA



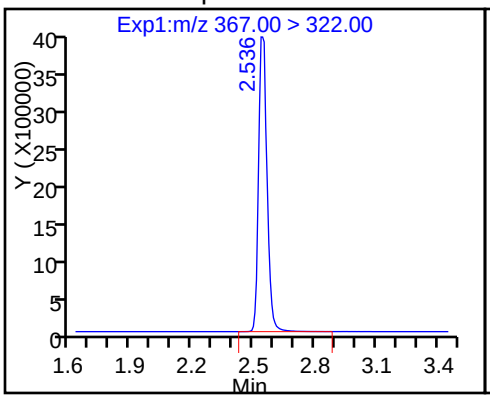
7 Perfluorohexanoic acid



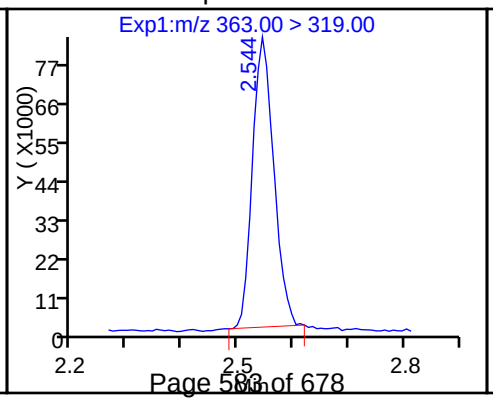
9 Perfluorohexanesulfonic acid



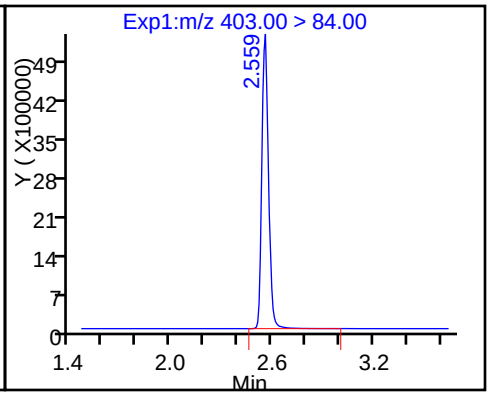
D 11 13C4-PFHpA



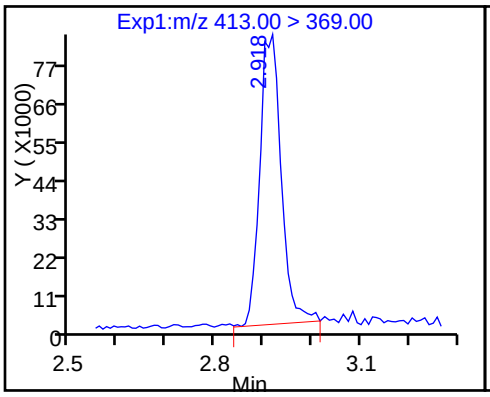
12 Perfluoroheptanoic acid



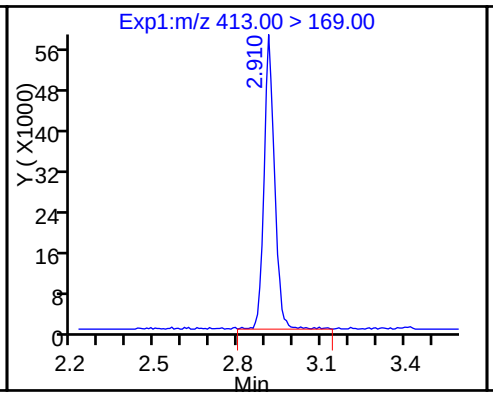
D 10 18O2 PFHxS



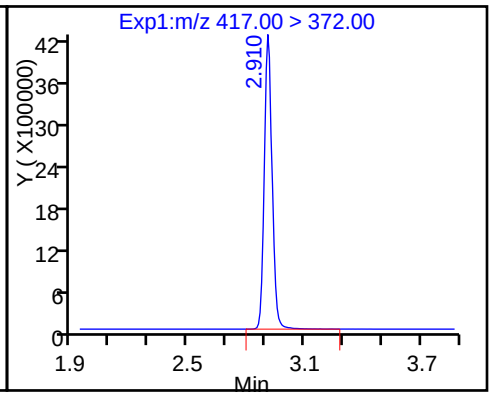
15 Perfluorooctanoic acid



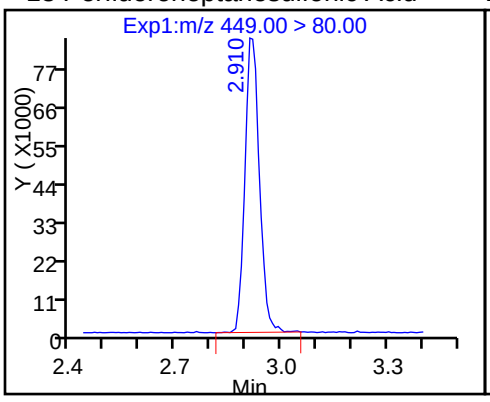
15 Perfluorooctanoic acid



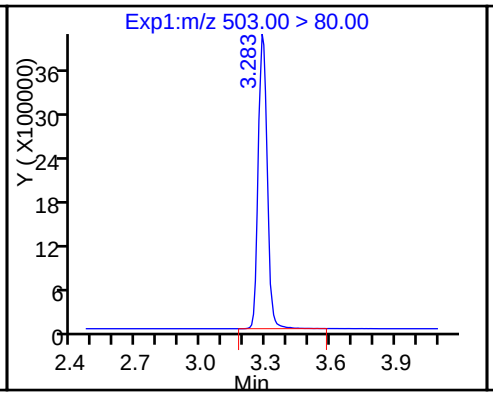
D 14 13C4 PFOA



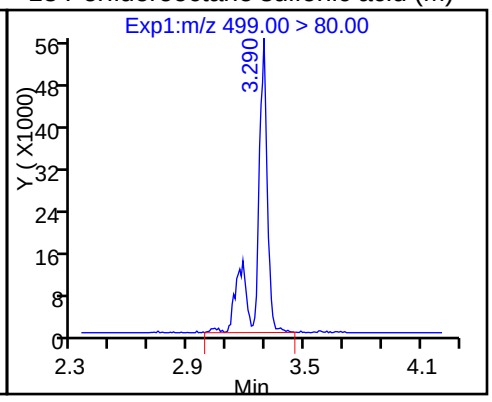
13 Perfluoroheptanesulfonic Acid



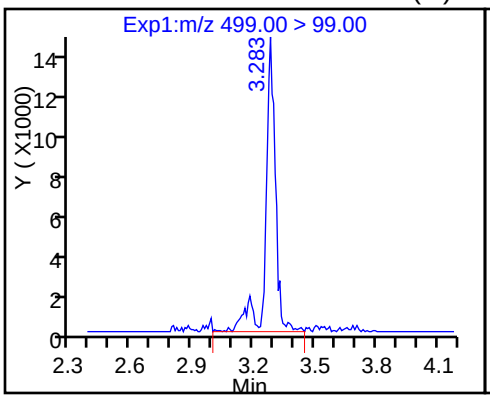
D 17 13C4 PFOS



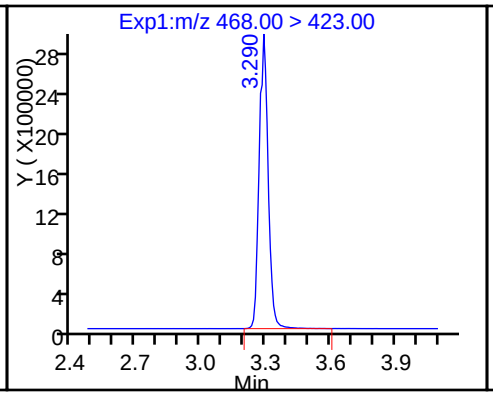
18 Perfluorooctane sulfonic acid (M)



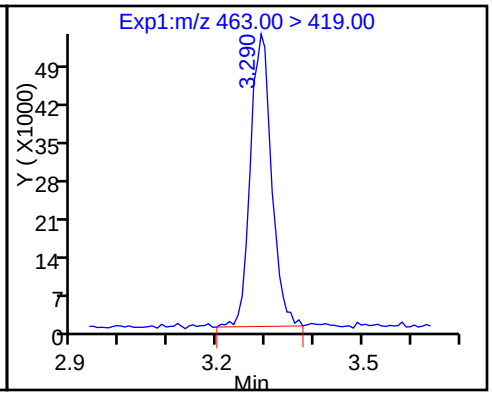
18 Perfluorooctane sulfonic acid (M)



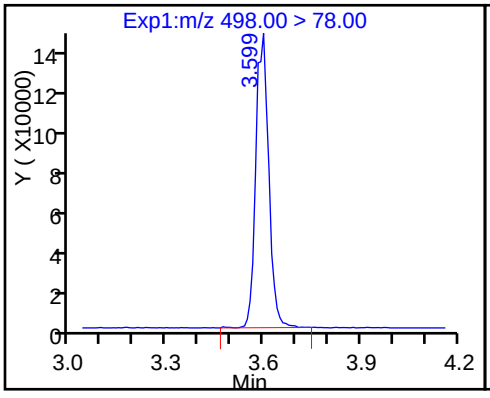
D 19 13C5 PFNA



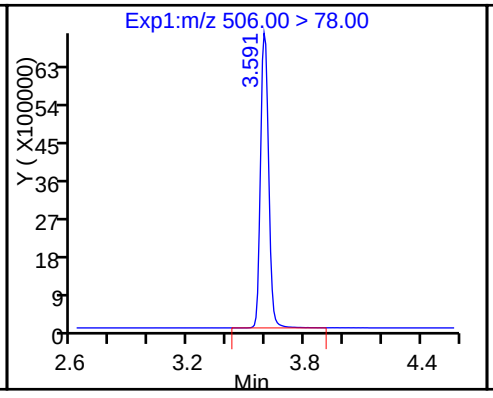
20 Perfluorononanoic acid



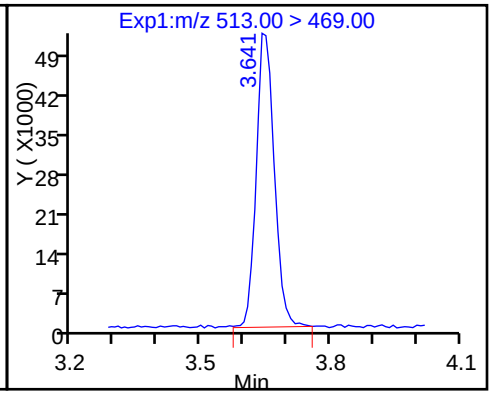
22 Perfluorooctane Sulfonamide



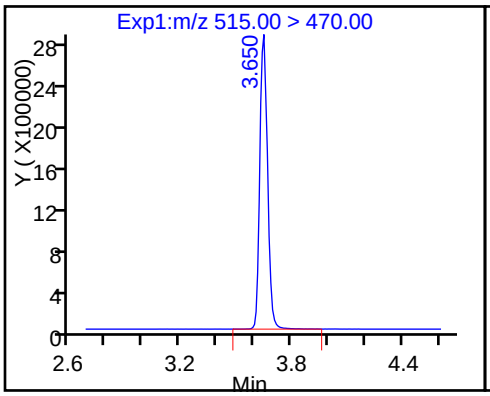
D 21 13C8 FOSA



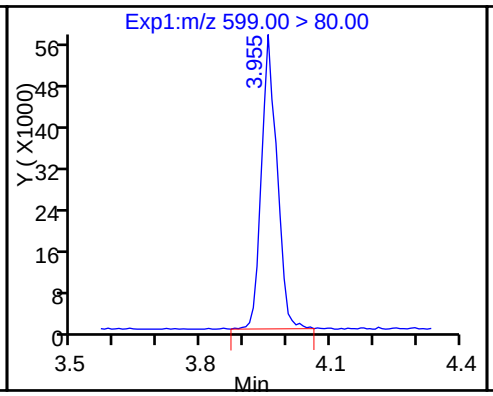
24 Perfluorodecanoic acid



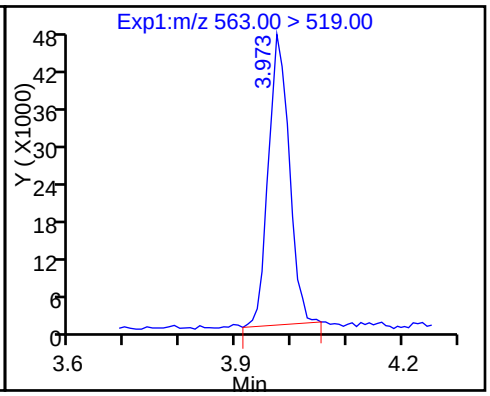
D 23 13C2 PFDA



26 Perfluorodecane Sulfonic acid



28 Perfluoroundecanoic acid



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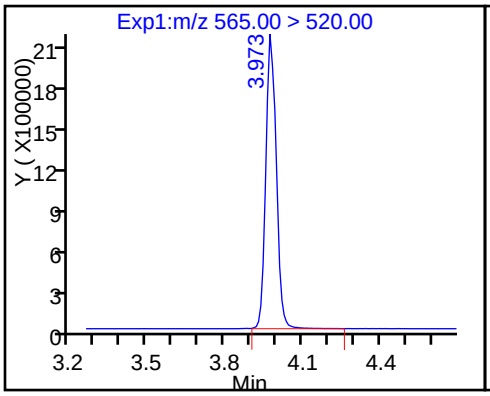
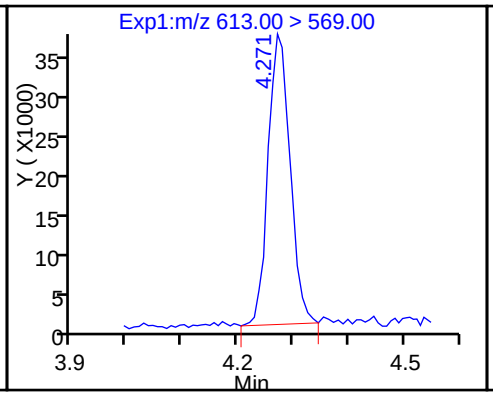
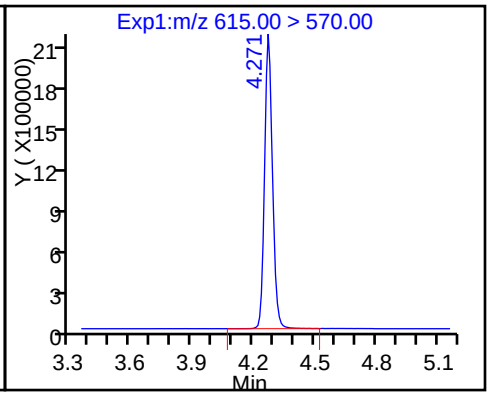


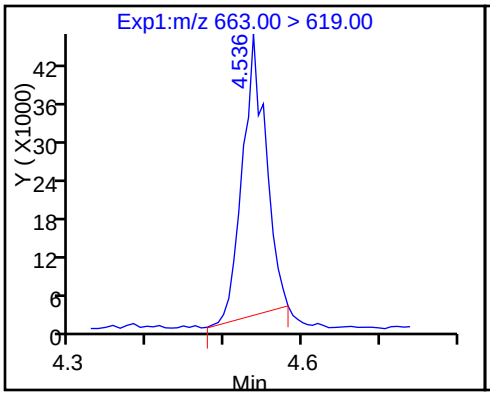
29 Perfluorododecanoic acid



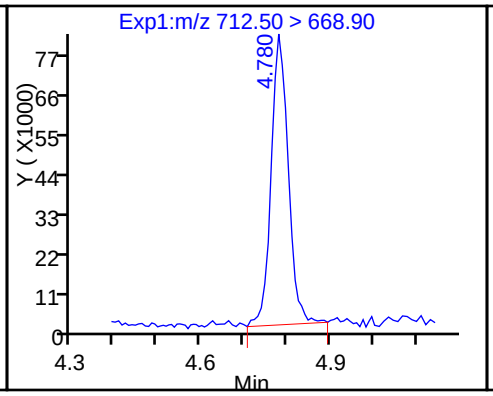
D 30 13C2 PFDoA



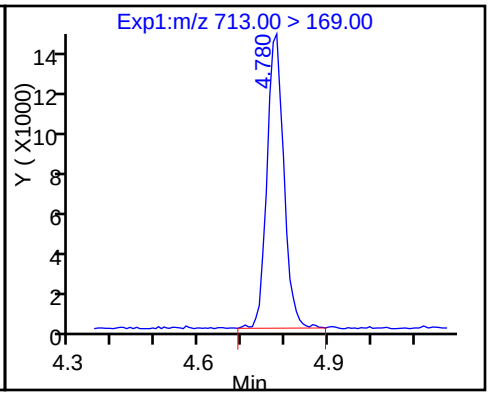
31 Perfluorotridecanoic acid



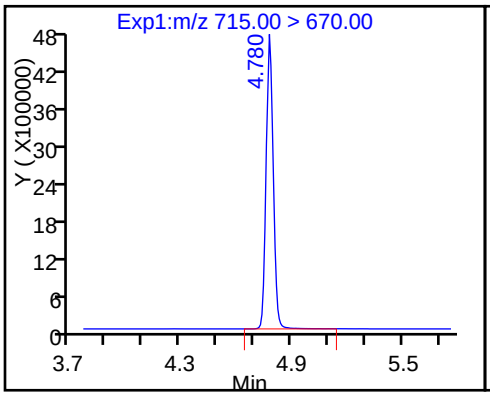
33 Perfluorotetradecanoic acid



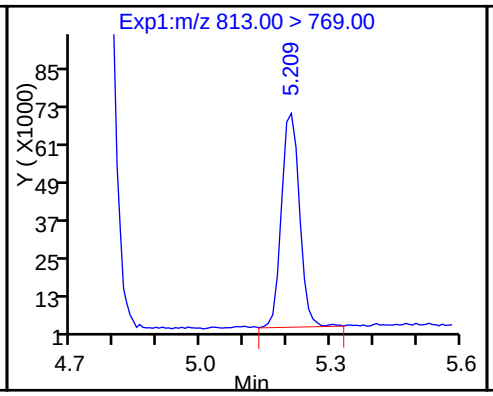
33 Perfluorotetradecanoic acid



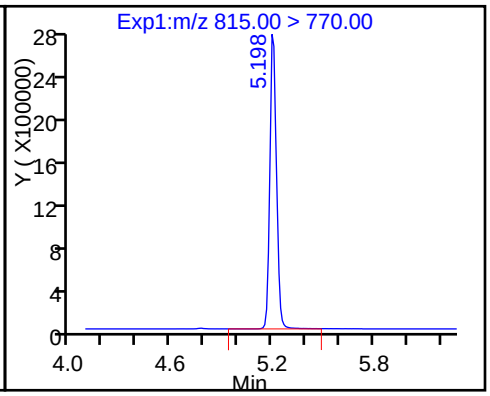
D 32 13C2-PFTeDA



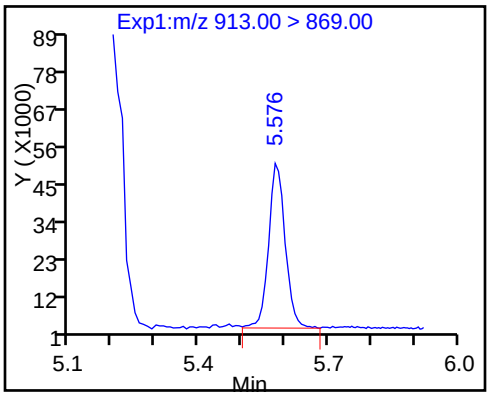
35 Perfluorohexadecanoic acid



D 34 13C2-PFHxDA



36 Perfluorooctadecanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

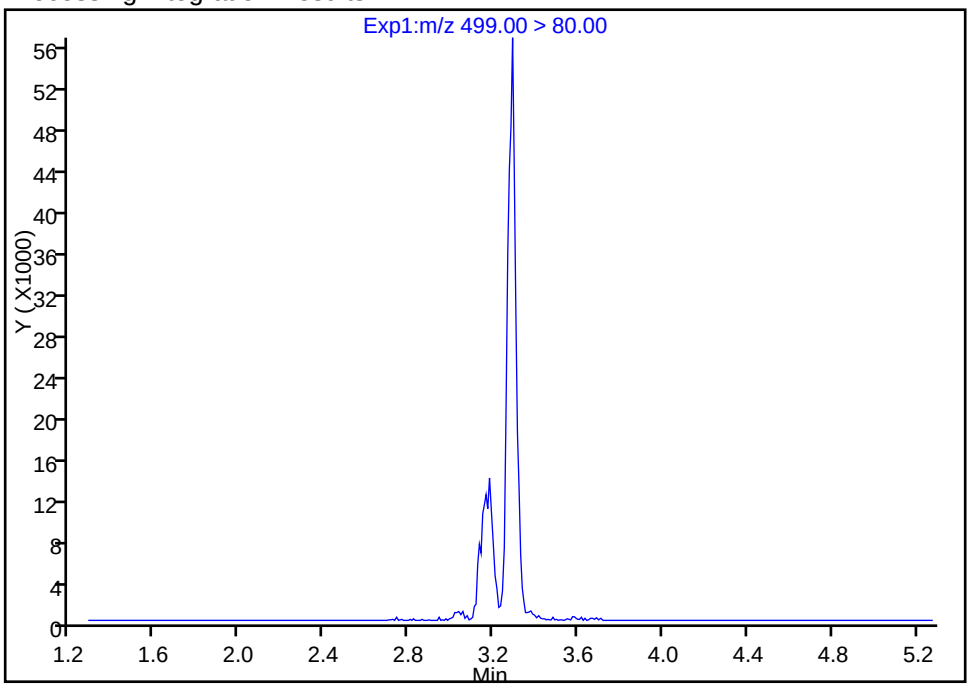
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161216-37932.b\16DEC2016A_002.d
Injection Date: 16-Dec-2016 10:23:18 Instrument ID: A8_N
Lims ID: CCV L2
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 38 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

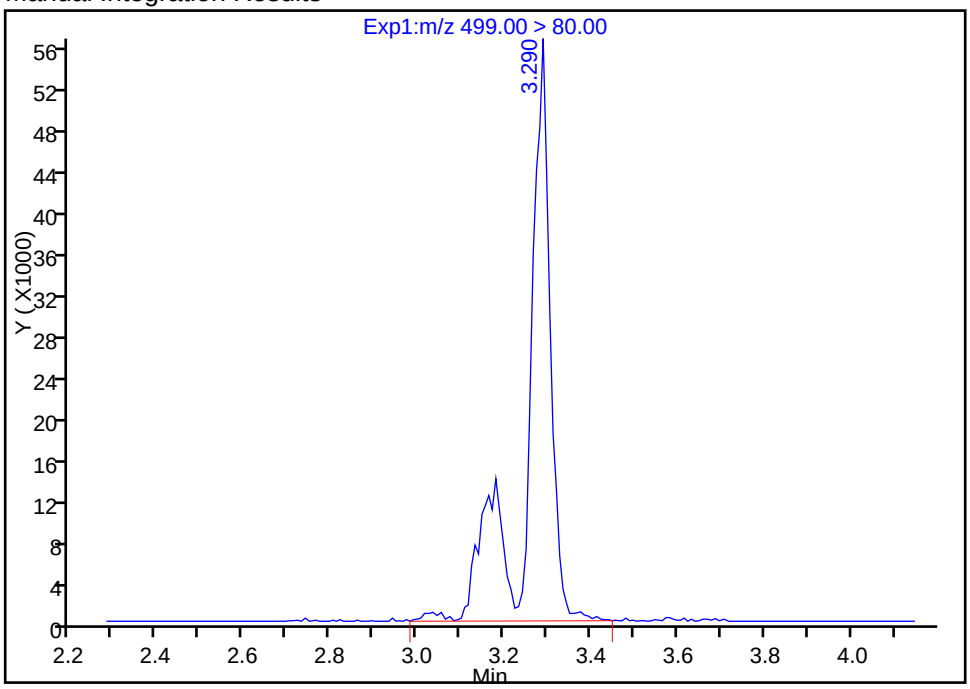
Processing Integration Results

Not Detected
Expected RT: 3.28



Manual Integration Results

RT: 3.29
Area: 211342
Amount: 0.866023
Amount Units: ng/ml



Reviewer: chandrasenas, 16-Dec-2016 14:29:50
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

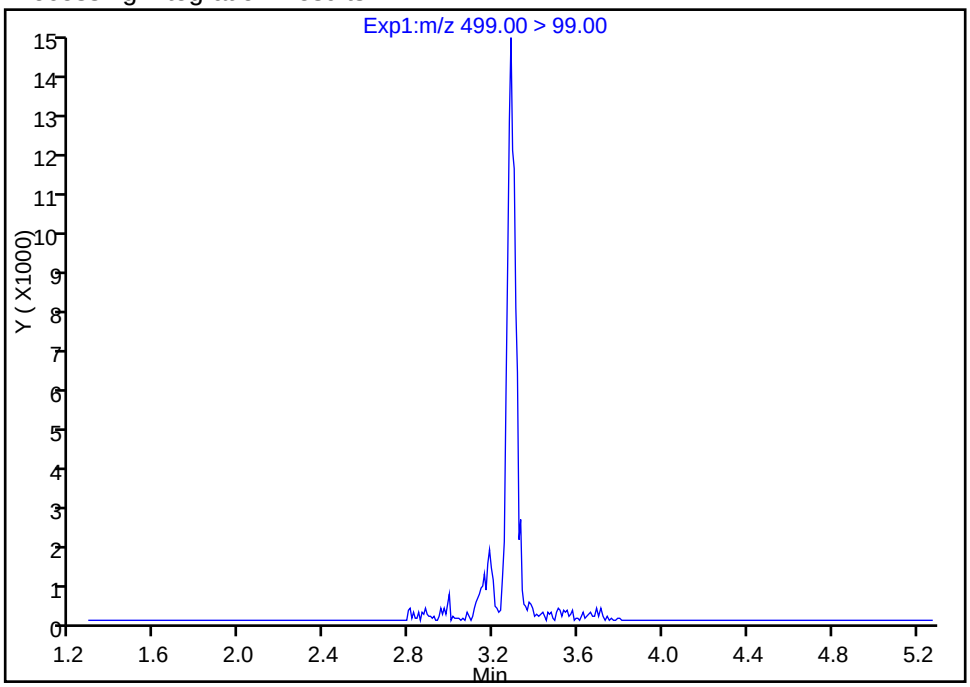
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161216-37932.b\16DEC2016A_002.d
Injection Date: 16-Dec-2016 10:23:18 Instrument ID: A8_N
Lims ID: CCV L2
Client ID:
Operator ID: A8-PC\A8 ALS Bottle#: 38 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

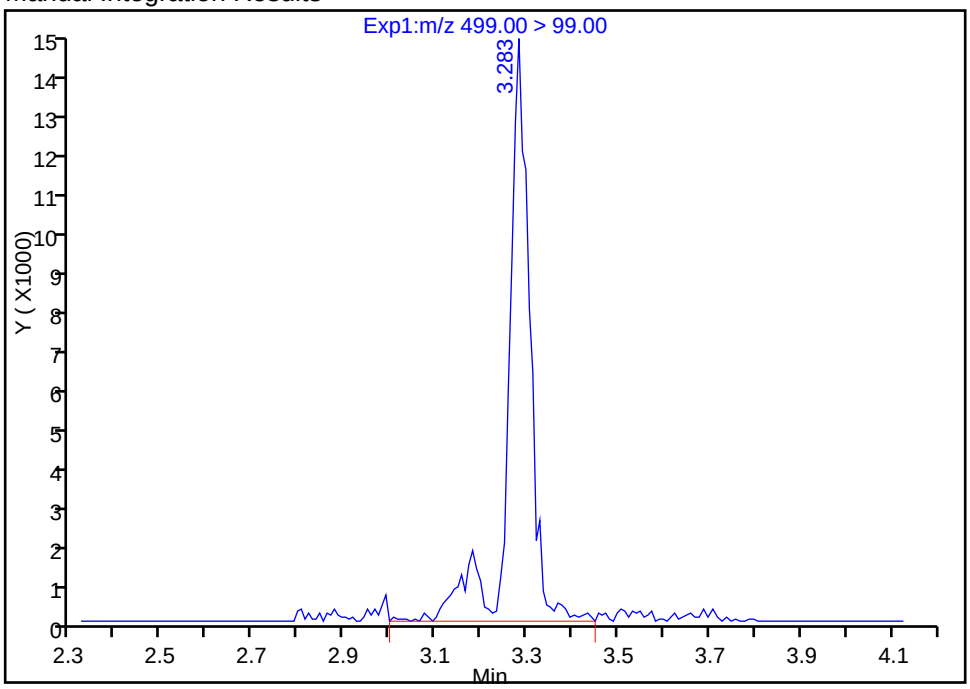
Processing Integration Results

Not Detected
Expected RT: 3.28



Manual Integration Results

RT: 3.28
Area: 49645
Amount: 0.866023
Amount Units: ng/ml



Reviewer: chandrasenas, 16-Dec-2016 14:29:50
Audit Action: Manually Integrated Audit Reason: Assign Peak

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Lab Sample ID: CCV 320-142751/2 Calibration Date: 12/16/2016 18:07

Instrument ID: A8_N Calib Start Date: 12/15/2016 12:29

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/15/2016 14:18

Lab File ID: 16DEC2016C_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	0.8537	0.9085		53.2	50.0	6.4	25.0
Perfluoropentanoic acid (PFPeA)	AveID	0.9868	1.002		50.8	50.0	1.5	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.417	1.614		50.4	44.2	13.9	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9288	0.9228		49.7	50.0	-0.6	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.030	1.053		46.5	45.5	2.3	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9788	0.9427		48.2	50.0	-3.7	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.003	1.015		50.6	50.0	1.2	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.102	1.203		52.0	47.6	9.2	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	0.9945	1.043		48.7	46.4	4.9	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9518	0.9759		51.3	50.0	2.5	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9327	0.9190		49.3	50.0	-1.5	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9438	0.9278		49.2	50.0	-1.7	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.5840	0.6212		51.3	48.2	6.4	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9563	0.9668		50.6	50.0	1.1	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9180	0.9702		52.8	50.0	5.7	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9069	0.8942		49.3	50.0	-1.4	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.585	1.686		53.2	50.0	6.4	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		0.9292		48.1	50.0	-3.9	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.030	0.8924		43.3	50.0	-13.4	25.0
13C4 PFBA	Ave	347743	324815		46.7	50.0	-6.6	50.0
13C5-PFPeA	Ave	266072	250452		47.1	50.0	-5.9	50.0
13C2 PFHxA	Ave	245110	230926		47.1	50.0	-5.8	50.0
13C4-PFHpA	Ave	226344	204941		45.3	50.0	-9.5	50.0
18O2 PFHxS	Ave	326976	295951		42.8	47.3	-9.5	50.0
13C4 PFOA	Ave	230362	205127		44.5	50.0	-11.0	50.0
13C4 PFOS	Ave	248847	231691		44.5	47.8	-6.9	50.0
13C5 PFNA	Ave	177687	154726		43.5	50.0	-12.9	50.0
13C8 FOSA	Ave	384141	371623		48.4	50.0	-3.3	50.0
13C2 PFDA	Ave	157302	140694		44.7	50.0	-10.6	50.0
13C2 PFUnA	Ave	117250	105626		45.0	50.0	-9.9	50.0
13C2 PFDoA	Ave	110957	101100		45.6	50.0	-8.9	50.0
13C2-PFTeDA	Ave	227387	197360		43.4	50.0	-13.2	50.0
13C2-PFHxDA	Ave	124568	107085		43.0	50.0	-14.0	50.0

FORM VII 537 (Modified)

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_002.d
Lims ID: CCV L5
Client ID:
Sample Type: CCV
Inject. Date: 16-Dec-2016 18:07:45 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*sub5

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 18-Dec-2016 17:57:38 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK028

First Level Reviewer: chandrasenas Date: 18-Dec-2016 17:27:02

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.582	1.582	0.0		16240726	46.7		93.4	824263	
1 Perfluorobutyric acid										
212.90 > 169.00	1.582	1.582	0.0	1.000	14754745	53.2		106	110916	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.858	1.858	0.0	1.000	12545897	50.8		102	106094	
D 4 13C5-PFPeA										
267.90 > 223.00	1.858	1.858	0.0		12522619	47.1		94.1	902879	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.896	1.896	0.0	1.000	21116511	50.4		114		
298.90 > 99.00	1.896	1.896	0.0	1.000	9675442		2.18(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.155	2.155	0.0		11546297	47.1		94.2	686659	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.164	2.164	0.0	1.000	10655163	49.7		99.4	371119	
D 11 13C4-PFHpA										
367.00 > 322.00	2.494	2.494	0.0		10247037	45.3		90.5	943509	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.502	2.502	0.0	1.000	9660067	48.2		96.3	108131	
D 10 18O2 PFHxS										
403.00 > 84.00	2.510	2.510	0.0		13998483	42.8		90.5	1658012	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.433	2.433	0.0	1.000	14185189	46.5		102		
15 Perfluorooctanoic acid										
413.00 > 369.00	2.858	2.858	0.0	1.000	10409558	50.6		101	88116	
413.00 > 169.00	2.858	2.858	0.0	1.000	6531849		1.59(0.90-1.10)		276851	
D 14 13C4 PFOA										
417.00 > 372.00	2.858	2.858	0.0		10256344	44.5		89.0	506698	

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	2.866	2.866	0.0	1.000	13265190	52.0		109		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.115	3.115	0.0	1.000	11216848	48.7		105	115970	
499.00 > 99.00	3.123	3.115	0.008	1.003	2387102		4.70(0.90-1.10)		32026	
D 19 13C5 PFNA										
468.00 > 423.00	3.230	3.230	0.0		7736293	43.5		87.1	369229	
D 17 13C4 PFOS										
503.00 > 80.00	3.230	3.230	0.0		11074827	44.5		93.1	278664	
20 Perfluorononanoic acid										
463.00 > 419.00	3.239	3.239	0.0	1.000	7549557	51.3		103	117198	
D 21 13C8 FOSA										
506.00 > 78.00	3.561	3.561	0.0		18581143	48.4		96.7	538663	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.561	3.561	0.0	1.000	17075700	49.3		98.5	665756	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.586	3.586	0.0	1.000	6526565	49.2		98.3	246564	
D 23 13C2 PFDA										
515.00 > 470.00	3.595	3.595	0.0		7034714	44.7		89.4	174967	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.899	3.899	0.0	1.000	6936847	51.3		106		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.916	3.916	0.0	1.000	5106006	50.6		101	105918	
D 27 13C2 PFUnA										
565.00 > 520.00	3.907	3.907	0.0		5281284	45.0		90.1	279901	
D 30 13C2 PFDoA										
615.00 > 570.00	4.203	4.203	0.0		5055012	45.6		91.1	129750	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.203	4.203	0.0	1.000	4904575	52.8		106	80208	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.467	4.467	0.0	1.000	4520371	49.3		98.6	92825	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.711	4.711	0.0		9868020	43.4		86.8	901399	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.711	4.711	0.0	1.000	8525230	53.2		106	6408	
713.00 > 169.00	4.702	4.711	-0.009	0.998	1367702		6.23(0.00-0.00)		167536	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.112	5.112	0.0	1.000	4696863	48.1		96.1	5864	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.123	5.123	0.0		5354260	43.0		86.0	108597	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.471	5.471	0.0	1.000	4510902	43.3		86.6	7951	

Reagents:

LCPFC-L5_00022 Amount Added: 1.00 Units: mL

Report Date: 18-Dec-2016 17:57:39 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_002.d

Injection Date: 16-Dec-2016 18:07:45 Instrument ID: A8_N

Lims ID: CCV L5

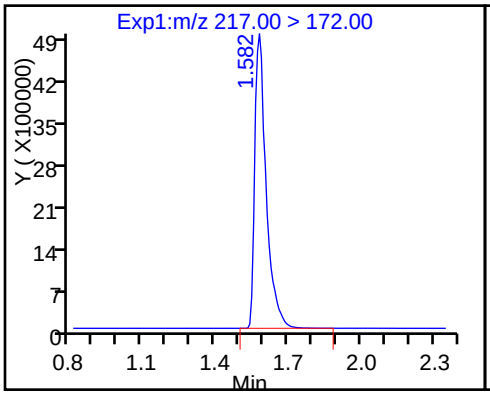
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 41 Worklist Smp#: 2

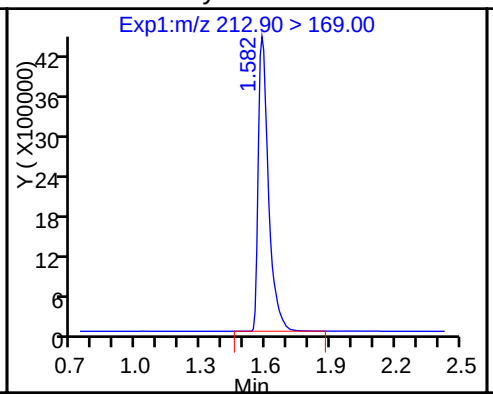
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

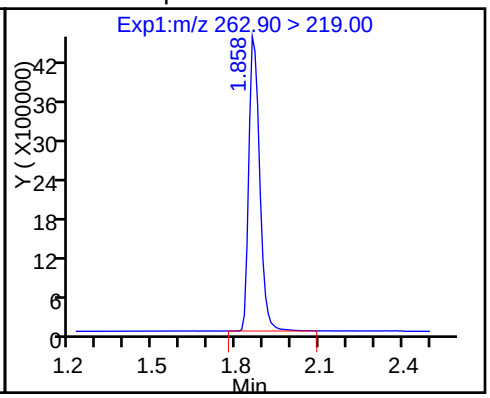
D 2 13C4 PFBA



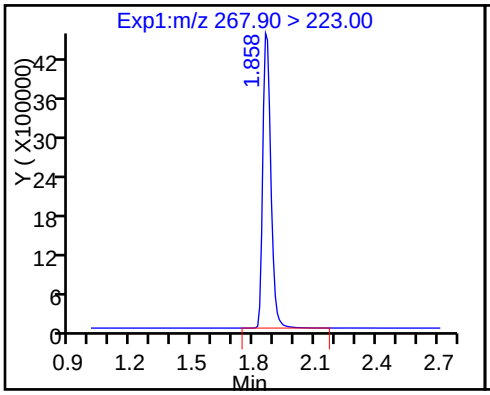
1 Perfluorobutyric acid



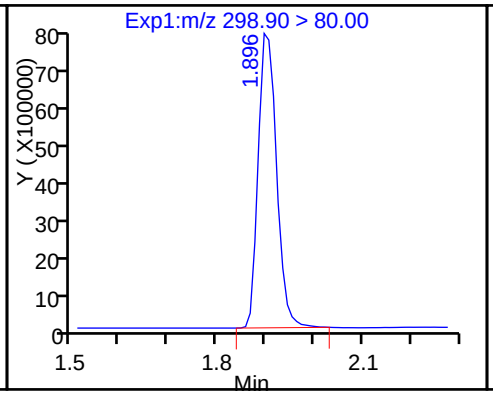
3 Perfluoropentanoic acid



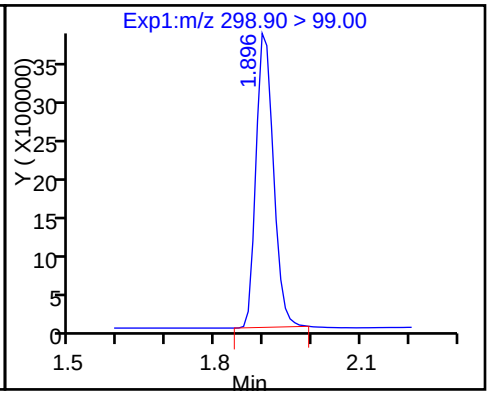
D 4 13C5-PFPeA



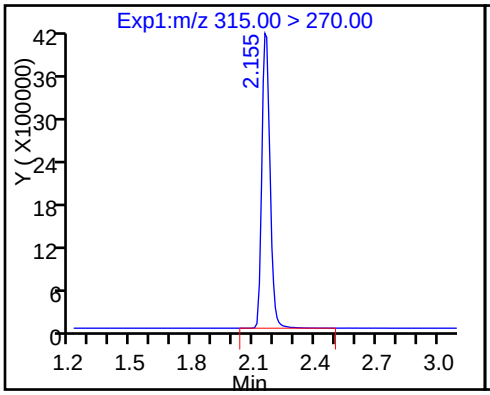
5 Perfluorobutanesulfonic acid



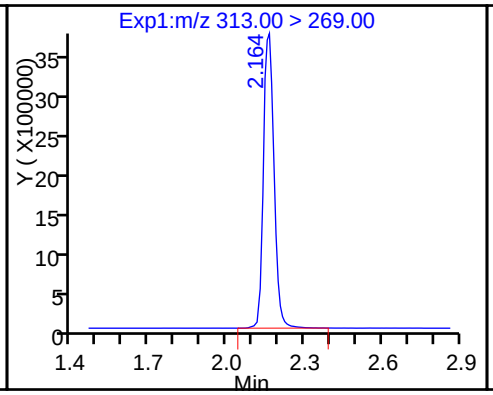
5 Perfluorobutanesulfonic acid



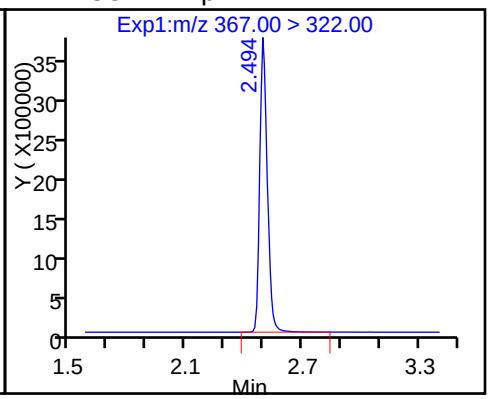
D 6 13C2 PFHxA



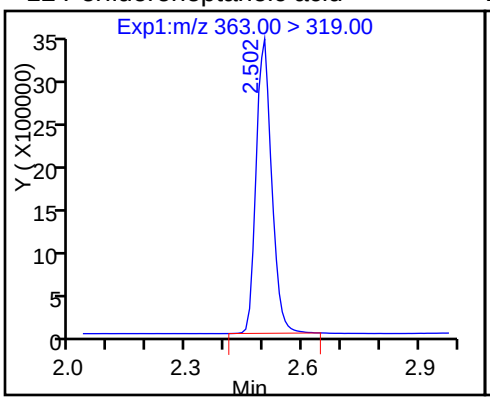
7 Perfluorohexanoic acid



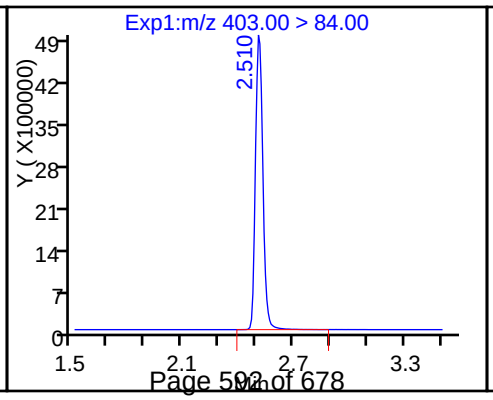
D 11 13C4-PFHpA



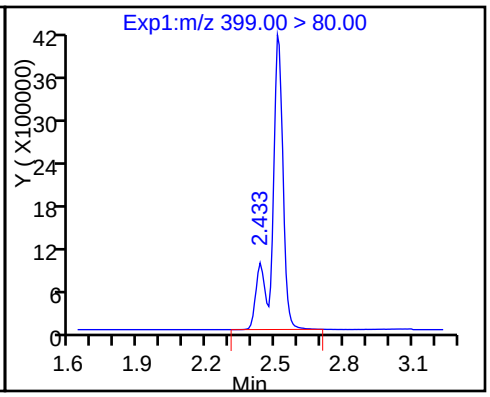
12 Perfluoroheptanoic acid



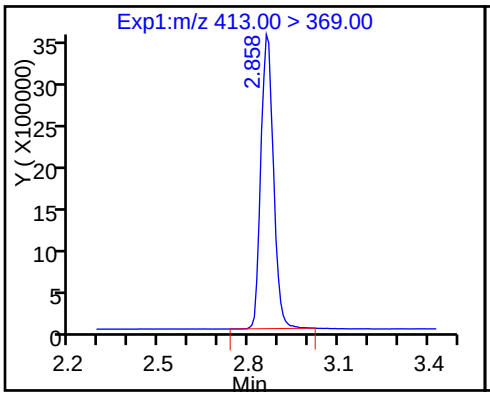
D 10 18O2 PFHxS



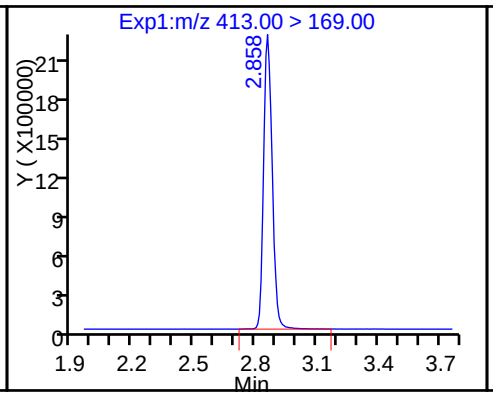
9 Perfluorohexanesulfonic acid



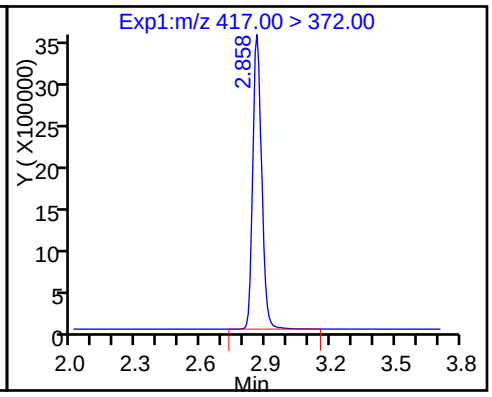
15 Perfluorooctanoic acid



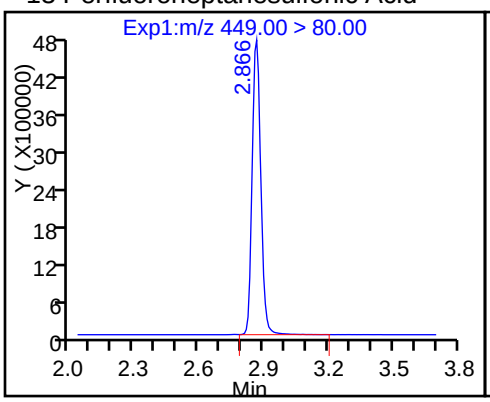
15 Perfluorooctanoic acid



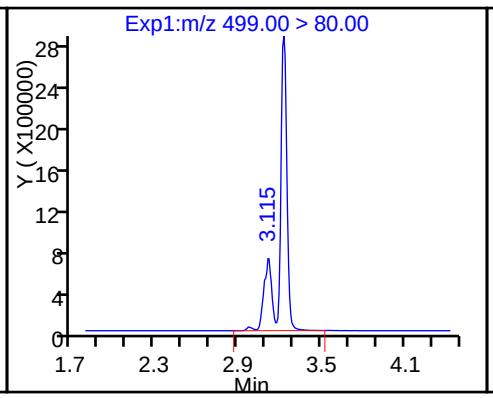
D 14 13C4 PFOA



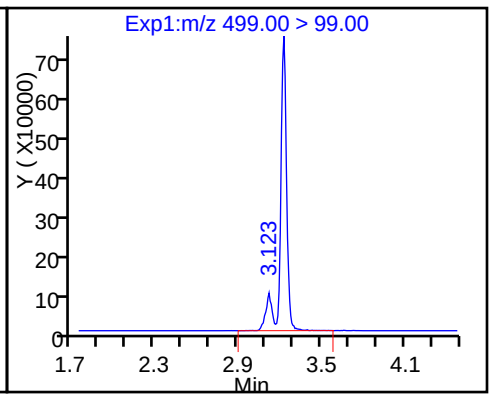
13 Perfluoroheptanesulfonic Acid



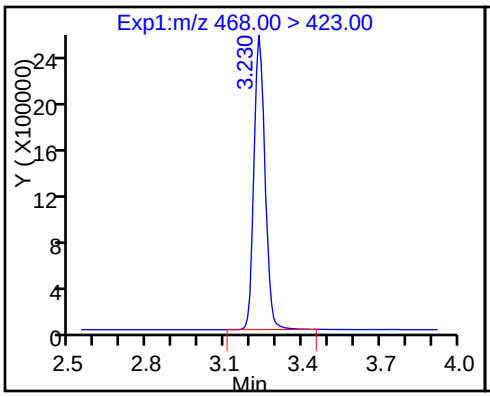
18 Perfluorooctane sulfonic acid



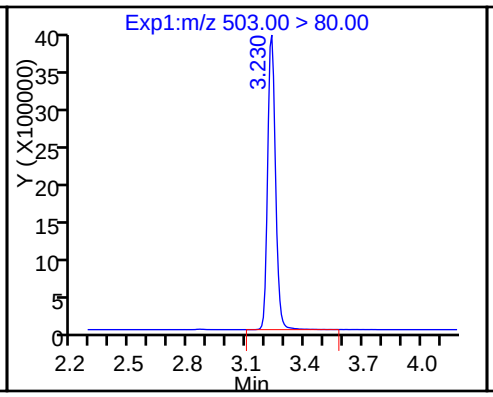
18 Perfluorooctane sulfonic acid



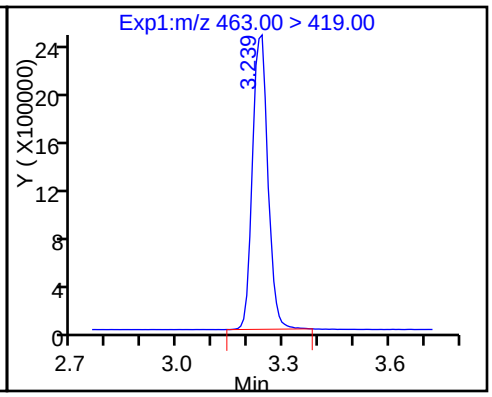
D 19 13C5 PFNA



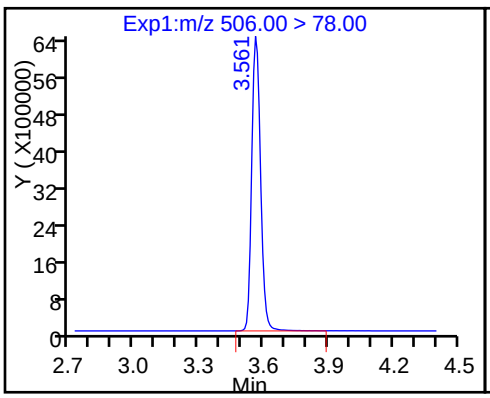
D 17 13C4 PFOS



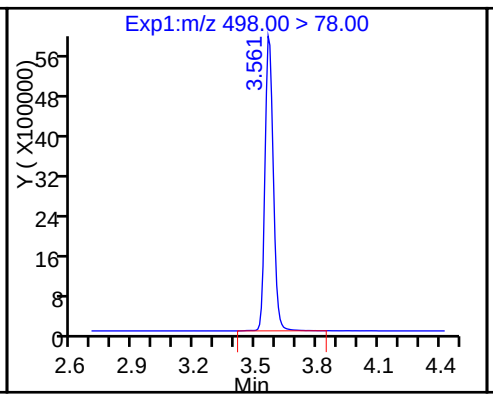
20 Perfluorononanoic acid



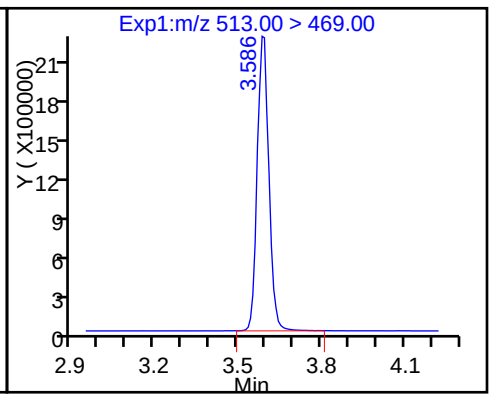
D 21 13C8 FOSA



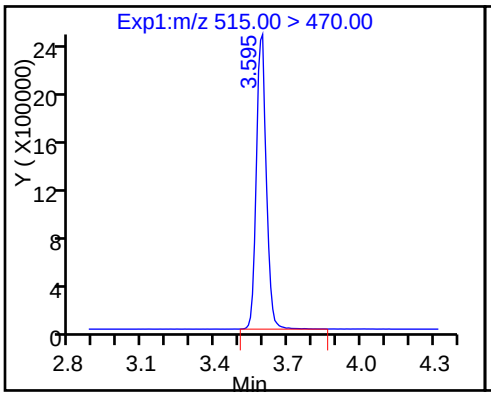
22 Perfluorooctane Sulfonamide



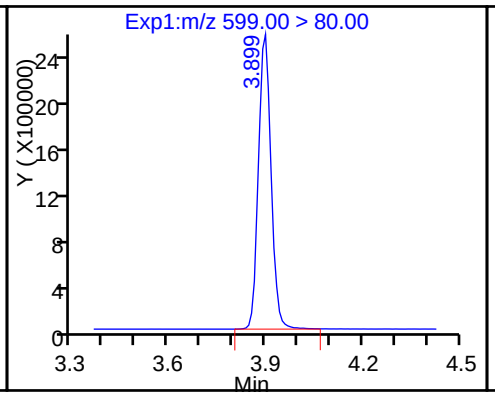
24 Perfluorodecanoic acid



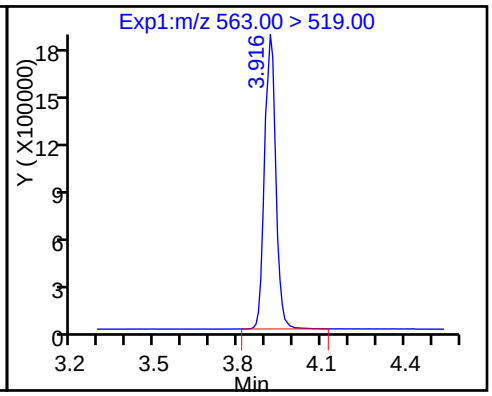
D 23 13C2 PFDA



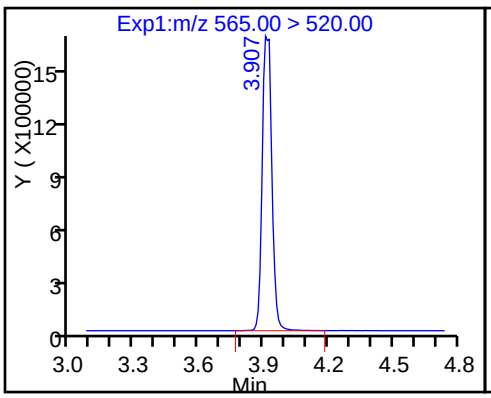
26 Perfluorodecane Sulfonic acid



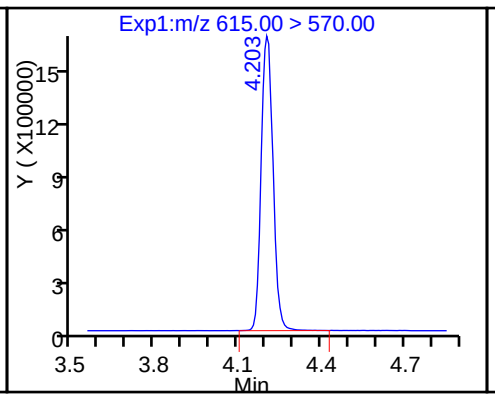
28 Perfluoroundecanoic acid



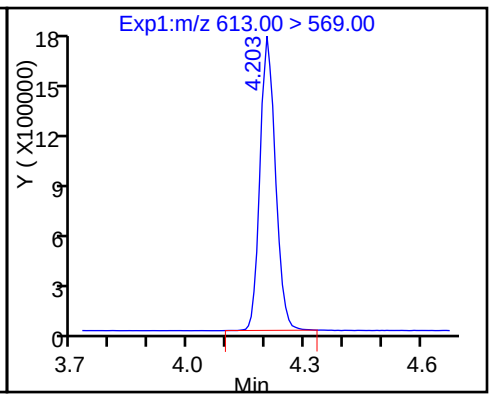
D 27 13C2 PFUnA



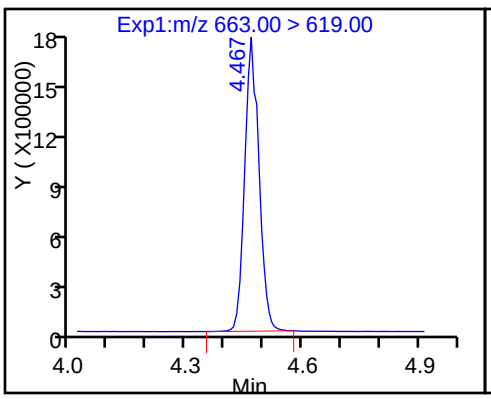
D 30 13C2 PFDoA



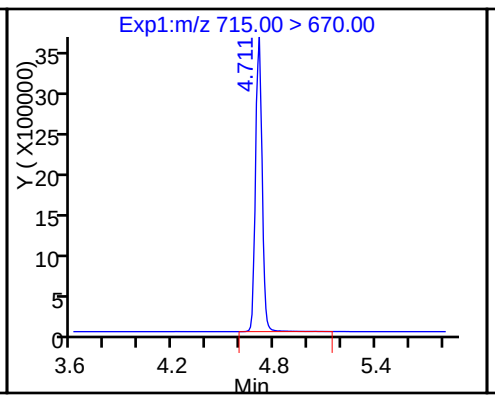
29 Perfluorododecanoic acid



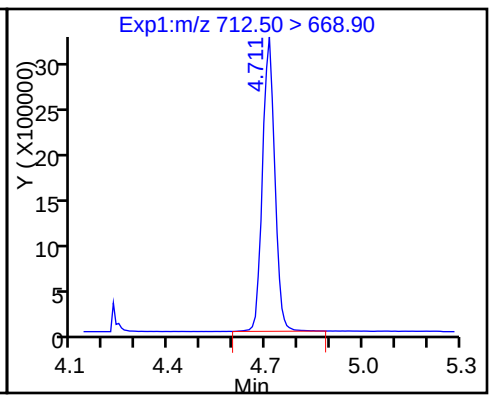
31 Perfluorotridecanoic acid



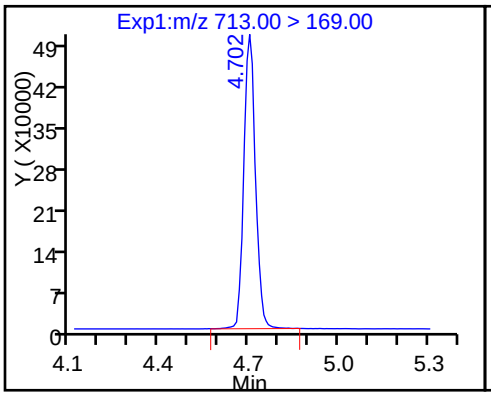
D 32 13C2-PFTeDA



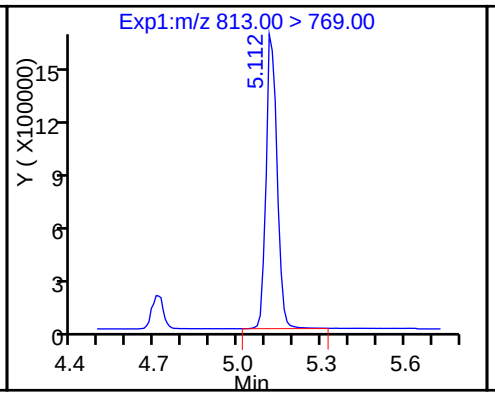
33 Perfluorotetradecanoic acid



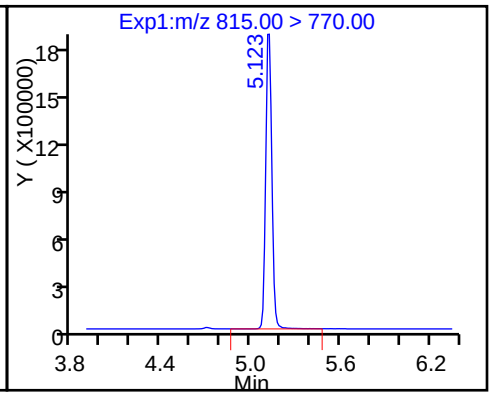
33 Perfluorotetradecanoic acid



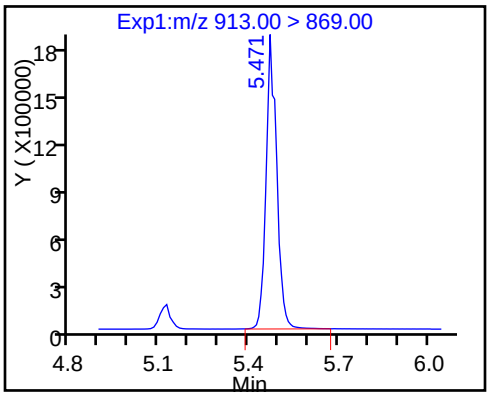
35 Perfluorohexadecanoic acid



D 34 13C2-PFHxDA



36 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Lab Sample ID: CCV 320-142751/16 Calibration Date: 12/16/2016 19:52

Instrument ID: A8_N Calib Start Date: 12/15/2016 12:29

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/15/2016 14:18

Lab File ID: 16DEC2016C_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	0.8537	0.9548		22.4	20.0	11.8	25.0
Perfluoropentanoic acid (PFPeA)	AveID	0.9868	1.073		21.7	20.0	8.7	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.417	1.776		22.2	17.7	25.4*	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9288	0.9731		21.0	20.0	4.8	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9788	1.019		20.8	20.0	4.1	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.030	1.089		19.2	18.2	5.7	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.003	1.082		21.6	20.0	7.9	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.102	1.190		20.6	19.0	8.0	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	0.9945	1.056		19.7	18.6	6.2	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9518	0.9911		20.8	20.0	4.1	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9327	1.016		21.8	20.0	9.0	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9438	0.9656		20.5	20.0	2.3	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.5840	0.6357		21.0	19.3	8.9	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9563	0.9822		20.5	20.0	2.7	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9180	0.9649		21.0	20.0	5.1	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9069	0.9016		19.9	20.0	-0.6	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.585	1.621		20.5	20.0	2.3	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		0.9609		19.5	20.0	-2.3	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.030	0.8947		17.4	20.0	-13.2	25.0
13C4 PFBA	Ave	347743	360400		51.8	50.0	3.6	50.0
13C5-PFPeA	Ave	266072	283229		53.2	50.0	6.4	50.0
13C2 PFHxA	Ave	245110	246990		50.4	50.0	0.8	50.0
13C4-PFHpA	Ave	226344	221132		48.8	50.0	-2.3	50.0
18O2 PFHxS	Ave	326976	320169		46.3	47.3	-2.1	50.0
13C4 PFOA	Ave	230362	234925		51.0	50.0	2.0	50.0
13C4 PFOS	Ave	248847	253815		48.8	47.8	2.0	50.0
13C5 PFNA	Ave	177687	177532		50.0	50.0	-0.0	50.0
13C8 FOSA	Ave	384141	400610		52.1	50.0	4.3	50.0
13C2 PFDA	Ave	157302	161562		51.4	50.0	2.7	50.0
13C2 PFUnA	Ave	117250	122223		52.1	50.0	4.2	50.0
13C2 PFDoA	Ave	110957	117459		52.9	50.0	5.9	50.0
13C2-PFTeDA	Ave	227387	218087		48.0	50.0	-4.1	50.0
13C2-PFHxDA	Ave	124568	122332		49.1	50.0	-1.8	50.0

FORM VII 537 (Modified)

Report Date: 18-Dec-2016 17:59:49 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_016.d
Lims ID: CCV L4
Client ID:
Sample Type: CCV
Inject. Date: 16-Dec-2016 19:52:44 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*sub5

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 18-Dec-2016 17:59:48 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK028

First Level Reviewer: chandrasenas Date: 18-Dec-2016 17:41:53

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.582	1.582	0.0		18019986	51.8		104	1088146	
1 Perfluorobutyric acid										
212.90 > 169.00	1.582	1.582	0.0	1.000	6882219	22.4		112	50376	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.858	1.858	0.0	1.000	6076718	21.7		109	56110	
D 4 13C5-PFPeA										
267.90 > 223.00	1.858	1.858	0.0		14161437	53.2		106	886419	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.896	1.896	0.0	1.000	10054296	22.2		125		
298.90 > 99.00	1.896	1.896	0.0	1.000	4252000		2.36(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.153	2.153	0.0		12349497	50.4		101	1144813	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.153	2.153	0.0	1.000	4807048	21.0		105	162675	
D 11 13C4-PFHpA										
367.00 > 322.00	2.500	2.500	0.0		11056609	48.8		97.7	627047	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.492	2.492	0.0	1.000	4506482	20.8		104	50900	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.515	2.515	0.0	1.000	6342778	19.2		106		
D 10 18O2 PFHxS										
403.00 > 84.00	2.508	2.508	0.0		15143997	46.3		97.9	1392624	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.847	2.847	0.0	1.000	5085458	21.6		108	44457	
413.00 > 169.00	2.847	2.847	0.0	1.000	3057250		1.66(0.90-1.10)		150757	
D 14 13C4 PFOA										
417.00 > 372.00	2.855	2.855	0.0		11746274	51.0		102	671824	

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	2.855	2.855	0.0	1.000	5750999	20.6		108		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.120	3.120	0.0	1.000	4973857	19.7		106	49208	
499.00 > 99.00	3.227	3.120	0.107	1.034	1062375		4.68(0.90-1.10)		65572	
D 19 13C5 PFNA										
468.00 > 423.00	3.227	3.227	0.0		8876620	50.0		99.9	997107	
D 17 13C4 PFOS										
503.00 > 80.00	3.227	3.227	0.0		12132354	48.8		102	423026	
20 Perfluorononanoic acid										
463.00 > 419.00	3.227	3.227	0.0	1.000	3519195	20.8		104	60854	
D 21 13C8 FOSA										
506.00 > 78.00	3.558	3.558	0.0		20030484	52.1		104	695501	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.558	3.558	0.0	1.000	8143123	21.8		109	298280	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.583	3.583	0.0	1.000	3120158	20.5		102	93913	
D 23 13C2 PFDA										
515.00 > 470.00	3.583	3.583	0.0		8078109	51.4		103	240628	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.893	3.893	0.0	1.000	3110617	21.0		109		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.911	3.911	0.0	1.000	2401012	20.5		103	56175	
D 27 13C2 PFUnA										
565.00 > 520.00	3.902	3.902	0.0		6111153	52.1		104	353504	
D 30 13C2 PFDoA										
615.00 > 570.00	4.198	4.198	0.0		5872931	52.9		106	223924	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.192	4.192	0.0	1.000	2266617	21.0		105	49272	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.459	4.459	0.0	1.000	2117899	19.9		99.4	33142	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.693	4.693	0.0		10904346	48.0		95.9	403485	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.702	4.702	0.0	1.000	3807671	20.5		102	2604	
713.00 > 169.00	4.693	4.702	-0.009	0.998	610917		6.23(0.00-0.00)		112709	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.110	5.110	0.0	1.000	2257383	19.5		97.7	2143	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.110	5.110	0.0		6116579	49.1		98.2	116276	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.467	5.467	0.0	1.000	2101776	17.4		86.8	3271	

Reagents:

LCPFC-L4_00024 Amount Added: 1.00 Units: mL

Report Date: 18-Dec-2016 17:59:49 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_016.d

Injection Date: 16-Dec-2016 19:52:44 Instrument ID: A8_N

Lims ID: CCV L4

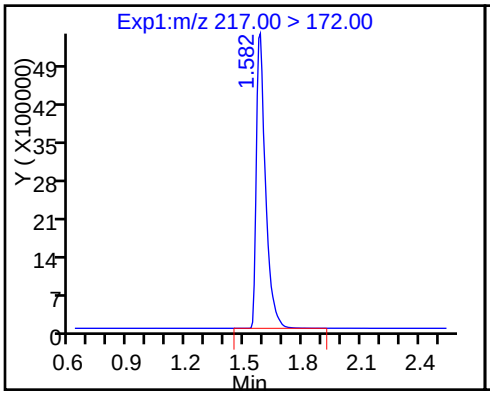
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 40 Worklist Smp#: 16

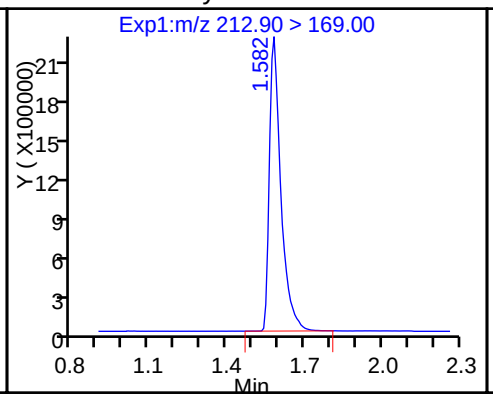
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

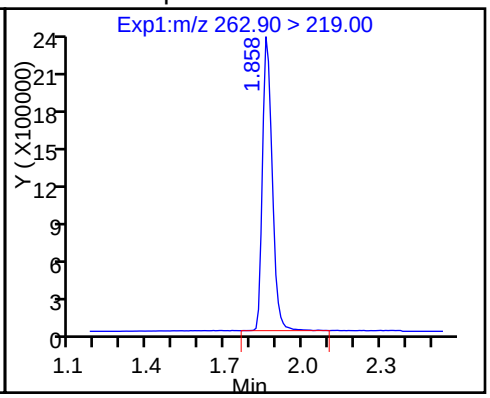
D 2 13C4 PFBA



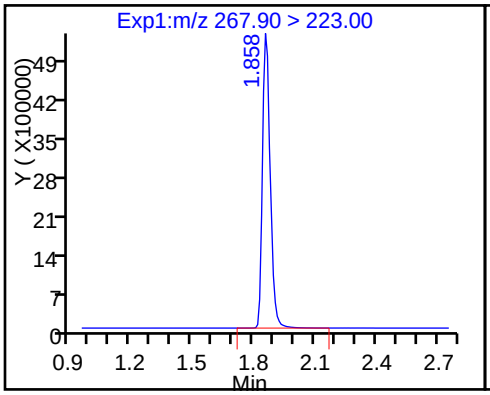
1 Perfluorobutyric acid



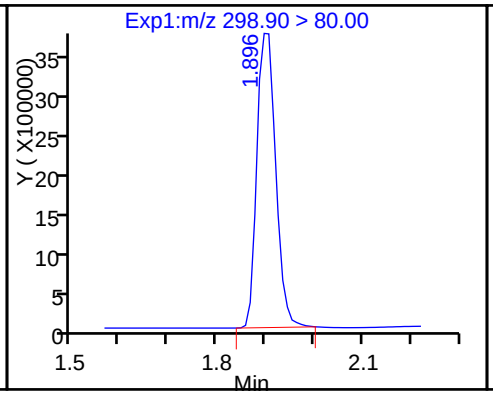
3 Perfluoropentanoic acid



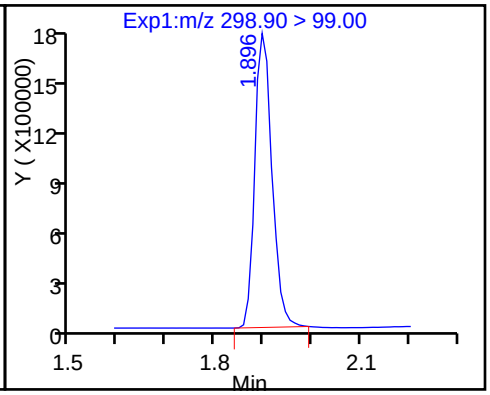
D 4 13C5-PFPeA



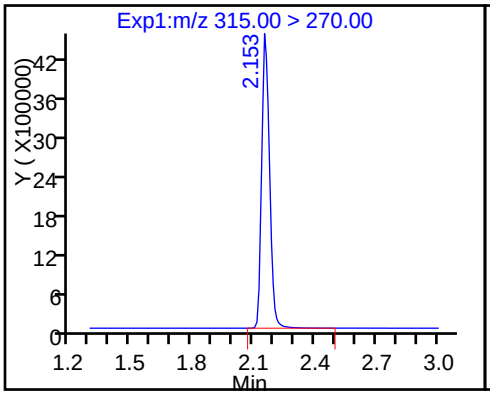
5 Perfluorobutanesulfonic acid



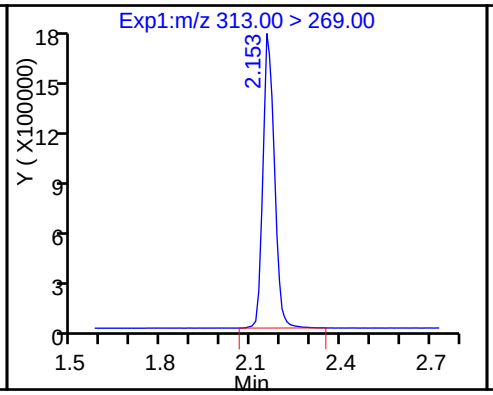
5 Perfluorobutanesulfonic acid



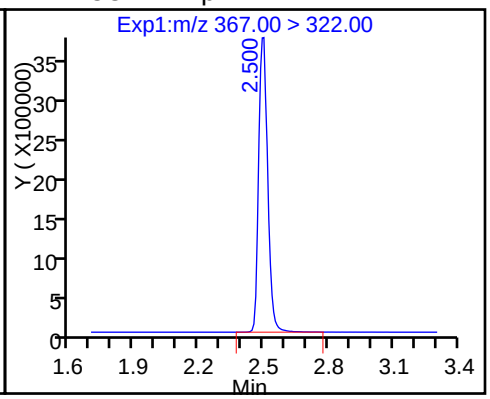
D 6 13C2 PFHxA



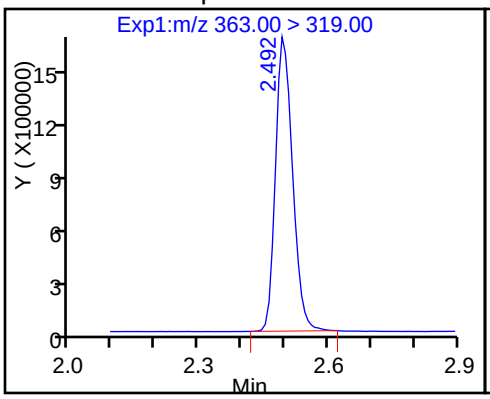
7 Perfluorohexanoic acid



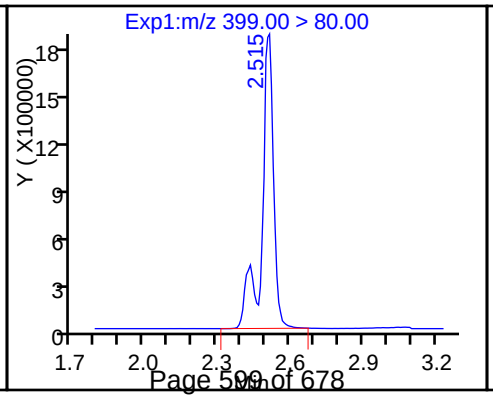
D 11 13C4-PFHpA



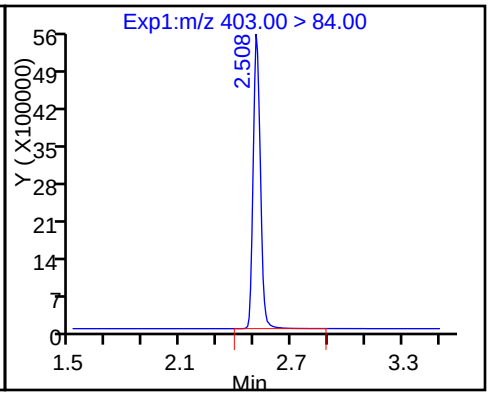
12 Perfluoroheptanoic acid



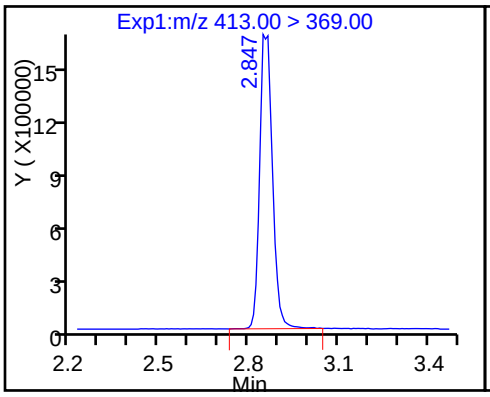
9 Perfluorohexanesulfonic acid



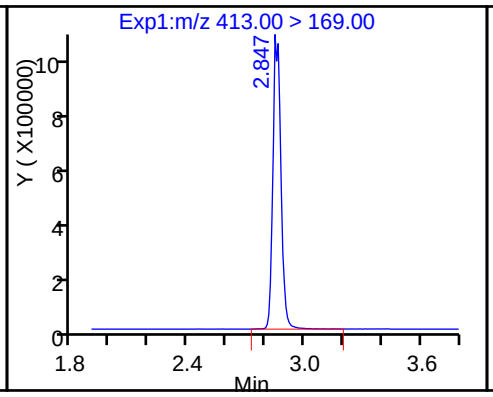
D 10 18O2 PFHxS



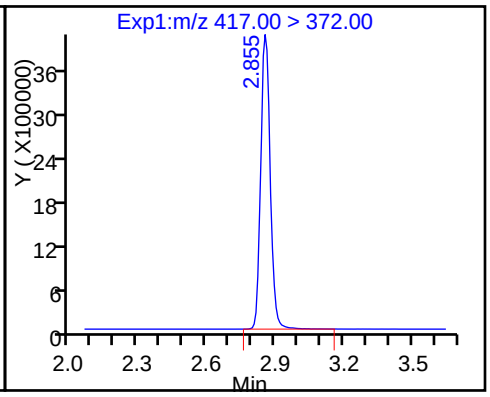
15 Perfluorooctanoic acid



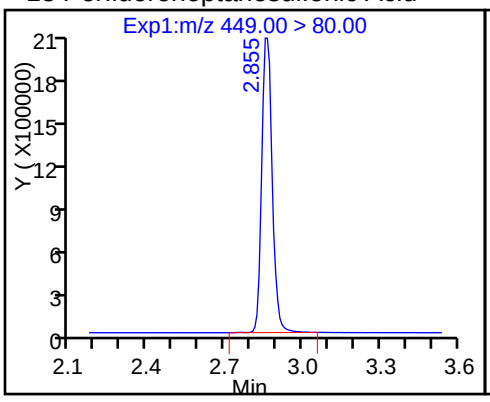
15 Perfluorooctanoic acid



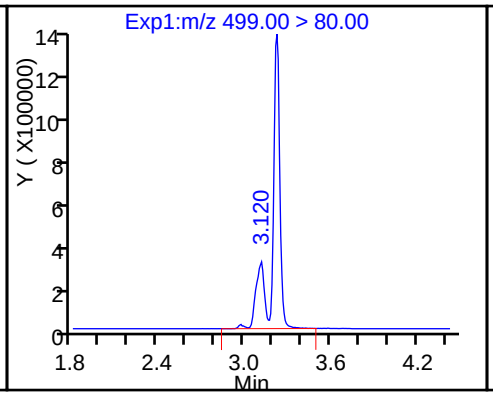
D 14 13C4 PFOA



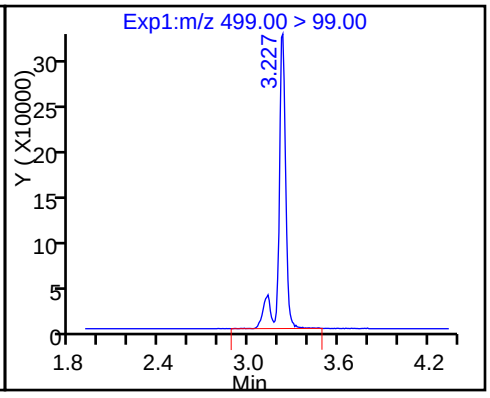
13 Perfluoroheptanesulfonic Acid



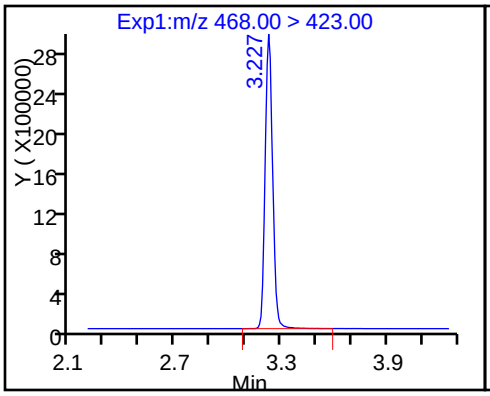
18 Perfluorooctane sulfonic acid



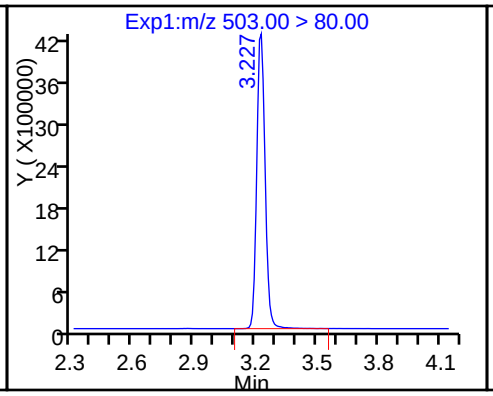
18 Perfluorooctane sulfonic acid



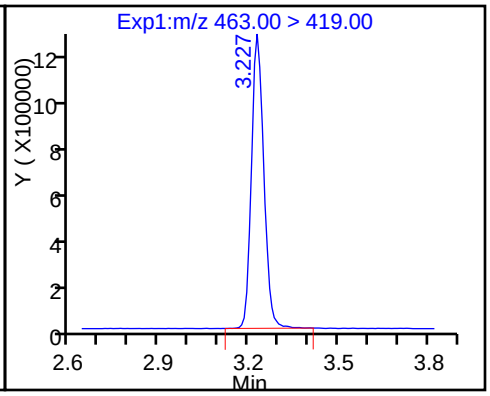
D 19 13C5 PFNA



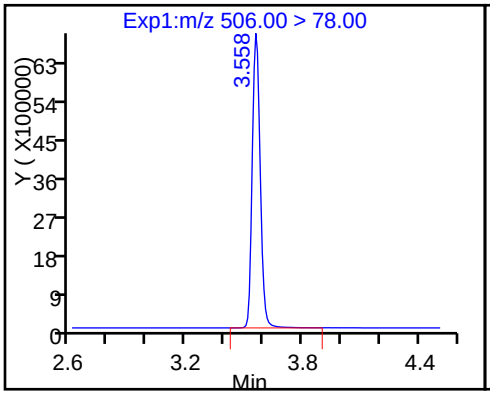
D 17 13C4 PFOS



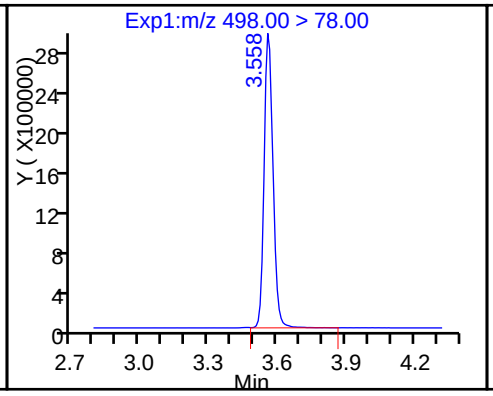
20 Perfluorononanoic acid



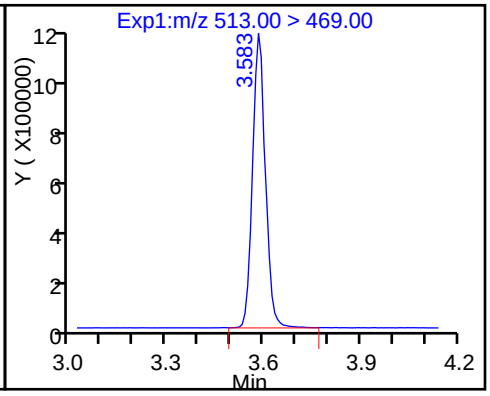
D 21 13C8 FOSA



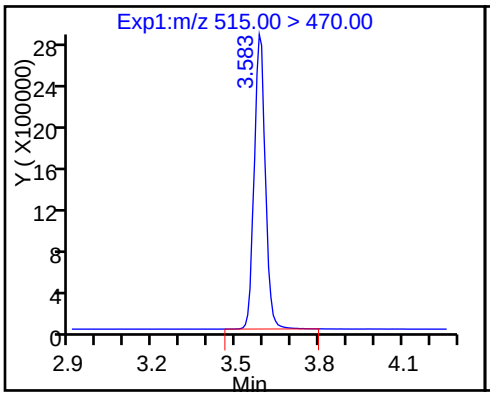
22 Perfluorooctane Sulfonamide



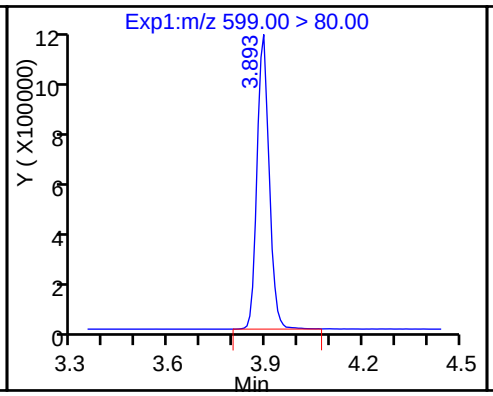
24 Perfluorodecanoic acid



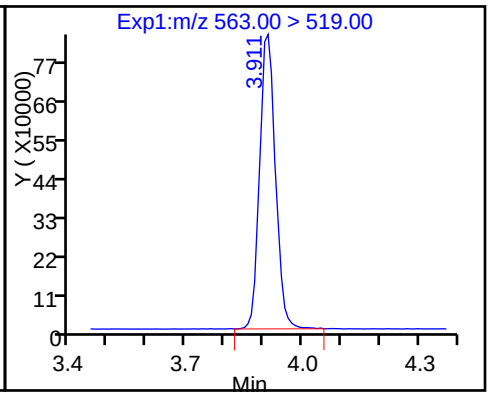
D 23 13C2 PFDA



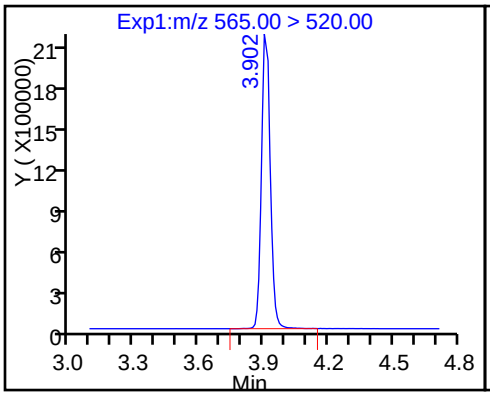
26 Perfluorodecane Sulfonic acid



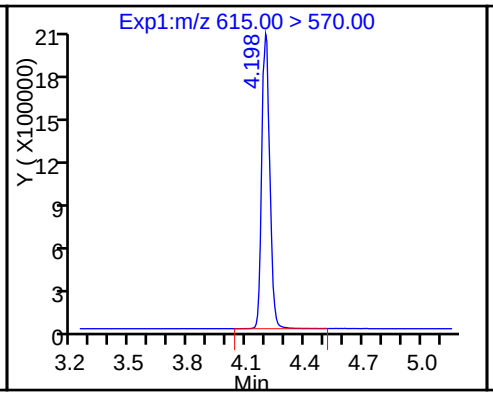
28 Perfluoroundecanoic acid



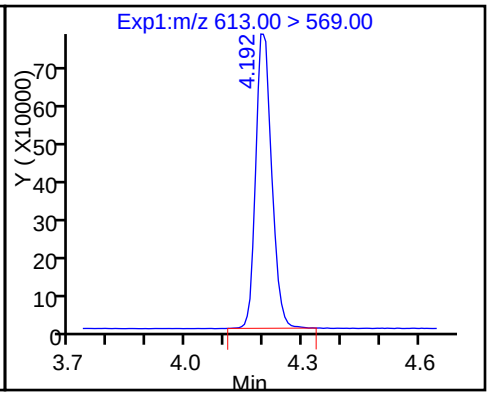
D 27 13C2 PFUnA



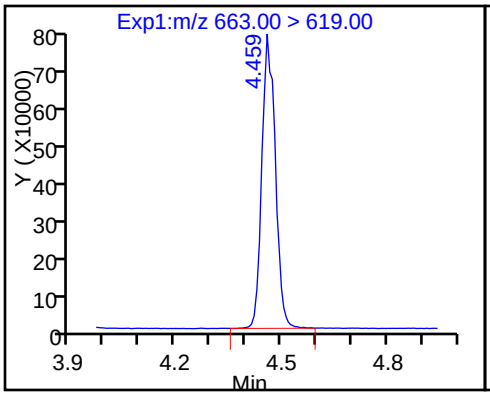
D 30 13C2 PFDoA



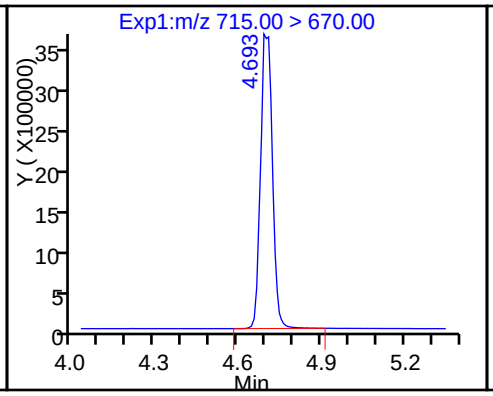
29 Perfluorododecanoic acid



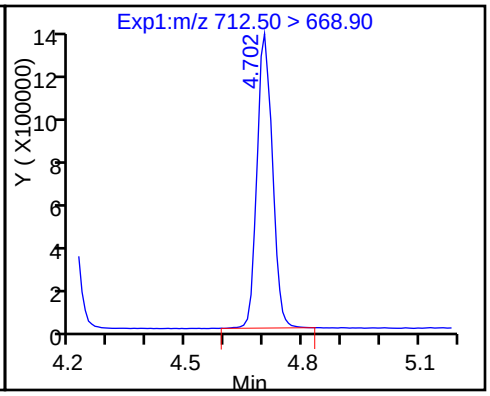
31 Perfluorotridecanoic acid



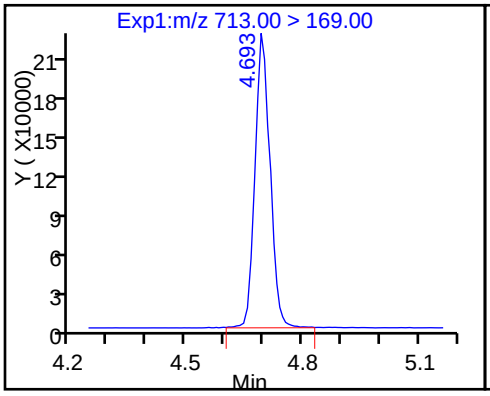
D 32 13C2-PFTeDA



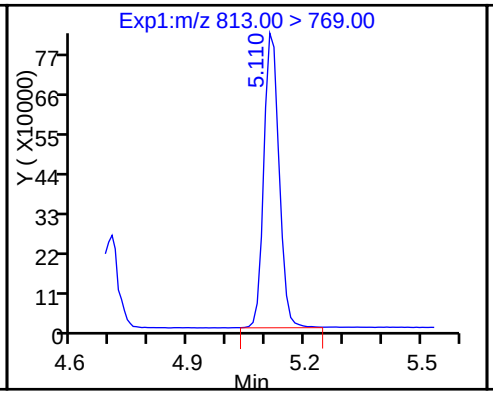
33 Perfluorotetradecanoic acid



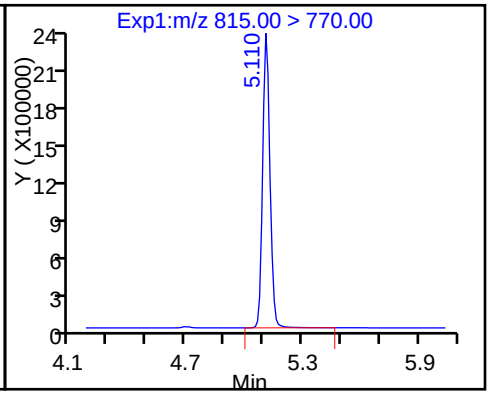
33 Perfluorotetradecanoic acid



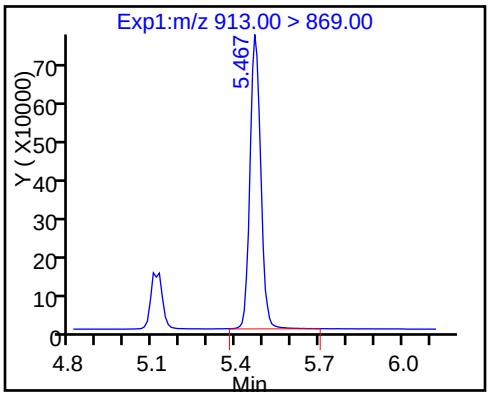
35 Perfluorohexadecanoic acid



D 34 13C2-PFHxDA



36 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Lab Sample ID: CCV 320-142751/30 Calibration Date: 12/16/2016 21:37

Instrument ID: A8_N Calib Start Date: 12/15/2016 12:29

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/15/2016 14:18

Lab File ID: 16DEC2016C_030.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.8537	0.9032		52.9	50.0	5.8	25.0
Perfluoropentanoic acid (PFPeA)	AveID	0.9868	1.021		51.7	50.0	3.4	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.417	1.664		51.9	44.2	17.4	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9288	0.9342		50.3	50.0	0.6	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9788	0.9850		50.3	50.0	0.6	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.030	1.043		46.1	45.5	1.2	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.003	1.025		51.1	50.0	2.1	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.102	1.153		49.8	47.6	4.6	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	0.9945	1.019		47.5	46.4	2.5	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9518	0.9610		50.5	50.0	1.0	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9327	0.9315		49.9	50.0	-0.1	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9438	0.9404		49.8	50.0	-0.4	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.5840	0.6134		50.6	48.2	5.0	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9563	0.9631		50.4	50.0	0.7	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9180	0.9374		51.1	50.0	2.1	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9069	0.8916		49.2	50.0	-1.7	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.585	1.626		51.3	50.0	2.6	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		0.9217		47.7	50.0	-4.7	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.030	0.8905		43.2	50.0	-13.6	25.0
13C4 PFBA	Ave	347743	318215		45.8	50.0	-8.5	50.0
13C5-PFPeA	Ave	266072	247913		46.6	50.0	-6.8	50.0
13C2 PFHxA	Ave	245110	216743		44.2	50.0	-11.6	50.0
13C4-PFHpA	Ave	226344	195615		43.2	50.0	-13.6	50.0
18O2 PFHxS	Ave	326976	288302		41.7	47.3	-11.8	50.0
13C4 PFOA	Ave	230362	206361		44.8	50.0	-10.4	50.0
13C4 PFOS	Ave	248847	231237		44.4	47.8	-7.1	50.0
13C5 PFNA	Ave	177687	159201		44.8	50.0	-10.4	50.0
13C8 FOSA	Ave	384141	357609		46.5	50.0	-6.9	50.0
13C2 PFDA	Ave	157302	137232		43.6	50.0	-12.8	50.0
13C2 PFUnA	Ave	117250	108324		46.2	50.0	-7.6	50.0
13C2 PFDoA	Ave	110957	103195		46.5	50.0	-7.0	50.0
13C2-PFTeDA	Ave	227387	200272		44.0	50.0	-11.9	50.0
13C2-PFHxDA	Ave	124568	107048		43.0	50.0	-14.1	50.0

FORM VII 537 (Modified)

Report Date: 18-Dec-2016 18:04:12 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_030.d
Lims ID: CCV L5
Client ID:
Sample Type: CCV
Inject. Date: 16-Dec-2016 21:37:42 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*sub5

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 18-Dec-2016 18:04:11 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK028

First Level Reviewer: chandrasenas Date: 18-Dec-2016 17:57:11

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	1.566	1.566	0.0		15910772	45.8		91.5	814543	
1 Perfluorobutyric acid										
212.90 > 169.00	1.574	1.574	0.0	1.000	14370412	52.9		106	97607	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.849	1.849	0.0	1.000	12653910	51.7		103	108460	
D 4 13C5-PFPeA										
267.90 > 223.00	1.849	1.849	0.0		12395627	46.6		93.2	1594868	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.887	1.887	0.0	1.000	21204838	51.9		117		
298.90 > 99.00	1.887	1.887	0.0	1.000	9872913		2.15(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.151	2.151	0.0		10837135	44.2		88.4	967241	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.151	2.151	0.0	1.000	10123731	50.3		101	299407	
D 11 13C4-PFHpA										
367.00 > 322.00	2.475	2.475	0.0		9780756	43.2		86.4	869057	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.483	2.483	0.0	1.000	9634294	50.3		101	90313	
D 10 18O2 PFHxS										
403.00 > 84.00	2.498	2.498	0.0		13636691	41.7		88.2	835242	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.498	2.498	0.0	1.000	13675234	46.1		101		
15 Perfluorooctanoic acid										
413.00 > 369.00	2.837	2.837	0.0	1.000	10572389	51.1		102	101495	
413.00 > 169.00	2.845	2.837	0.008	1.003	6511708		1.62(0.90-1.10)		266840	
D 14 13C4 PFOA										
417.00 > 372.00	2.845	2.845	0.0		10318036	44.8		89.6	699122	

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	12692330	49.8		105		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.093	3.093	0.0	1.000	10933220	47.5		102	63686	
499.00 > 99.00	3.206	3.093	0.113	1.037	2379112		4.60(0.90-1.10)		122478	
D 19 13C5 PFNA										
468.00 > 423.00	3.215	3.215	0.0		7960030	44.8		89.6	873300	
D 17 13C4 PFOS										
503.00 > 80.00	3.215	3.215	0.0		11053115	44.4		92.9	223559	
20 Perfluorononanoic acid										
463.00 > 419.00	3.215	3.215	0.0	1.000	7649196	50.5		101	141580	
D 21 13C8 FOSA										
506.00 > 78.00	3.546	3.546	0.0		17880474	46.5		93.1	700486	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.546	3.546	0.0	1.000	16654695	49.9		99.9	388619	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.563	3.563	0.0	1.000	6452680	49.8		99.6	184331	
D 23 13C2 PFDA										
515.00 > 470.00	3.571	3.571	0.0		6861617	43.6		87.2	238400	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.878	3.878	0.0	1.000	6836829	50.6		105		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.887	3.887	0.0	1.000	5216144	50.4		101	105648	
D 27 13C2 PFUnA										
565.00 > 520.00	3.895	3.895	0.0		5416222	46.2		92.4	315280	
D 30 13C2 PFDoA										
615.00 > 570.00	4.177	4.177	0.0		5159766	46.5		93.0	227299	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.184	4.184	0.0	1.000	4836845	51.1		102	115903	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.450	4.450	0.0	1.000	4600585	49.2		98.3	95754	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.690	4.690	0.0		10013595	44.0		88.1	508011	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.690	4.690	0.0	1.000	8390116	51.3		103	38509	
713.00 > 169.00	4.681	4.690	-0.009	0.998	1353019		6.20(0.00-0.00)		128567	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.102	5.102	0.0	1.000	4755736	47.7		95.3	5640	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.102	5.102	0.0		5352377	43.0		85.9	99891	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.452	5.452	0.0	1.000	4595000	43.2		86.4	7368	

Reagents:

LCPFC-L5_00022 Amount Added: 1.00 Units: mL

Report Date: 18-Dec-2016 18:04:12 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_030.d

Injection Date: 16-Dec-2016 21:37:42 Instrument ID: A8_N

Lims ID: CCV L5

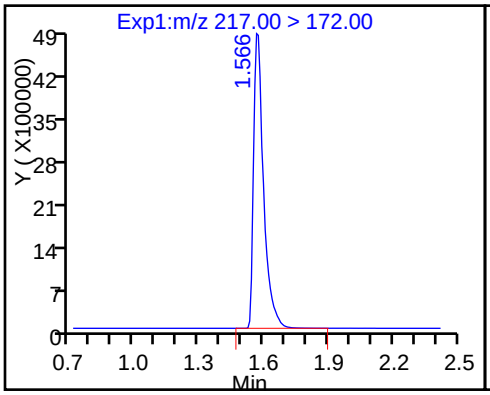
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 41 Worklist Smp#: 30

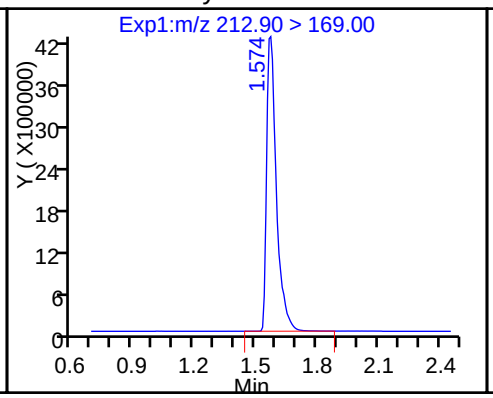
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

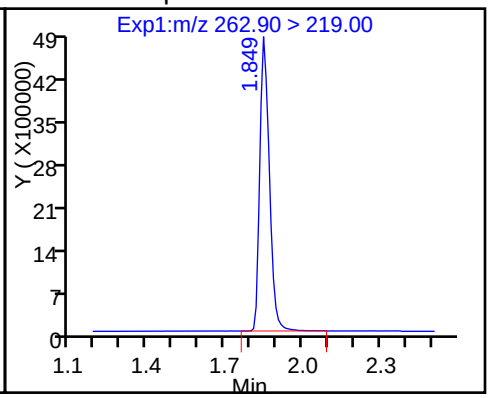
D 2 13C4 PFBA



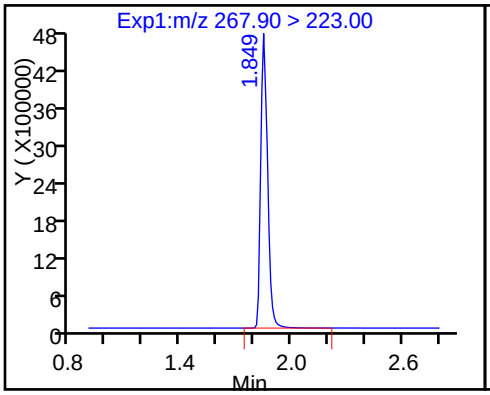
1 Perfluorobutyric acid



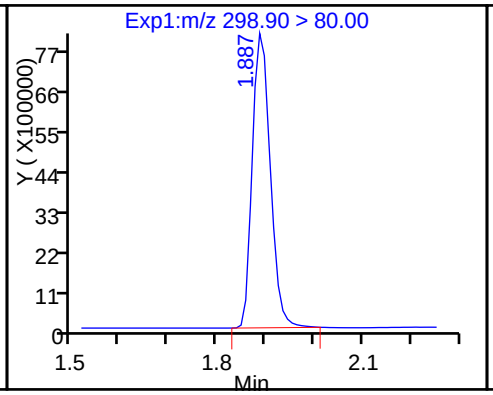
3 Perfluoropentanoic acid



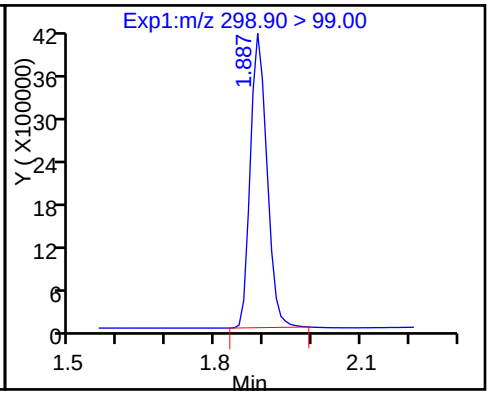
D 4 13C5-PFPeA



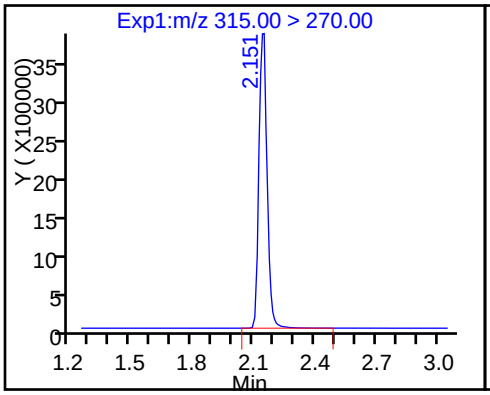
5 Perfluorobutanesulfonic acid



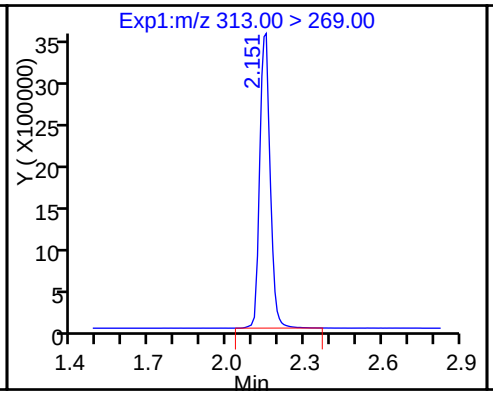
5 Perfluorobutanesulfonic acid



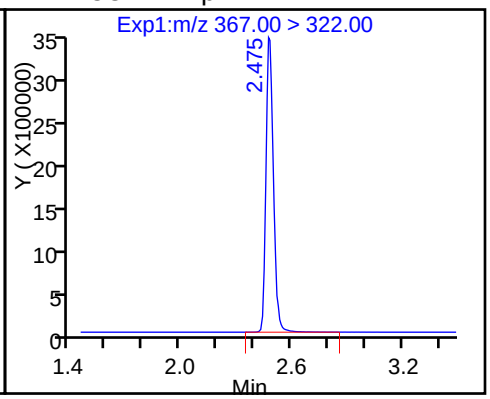
D 6 13C2 PFHxA



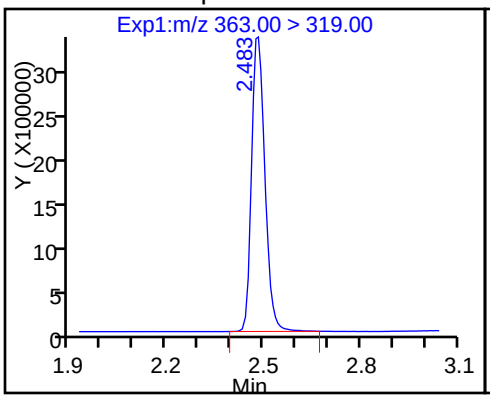
7 Perfluorohexanoic acid



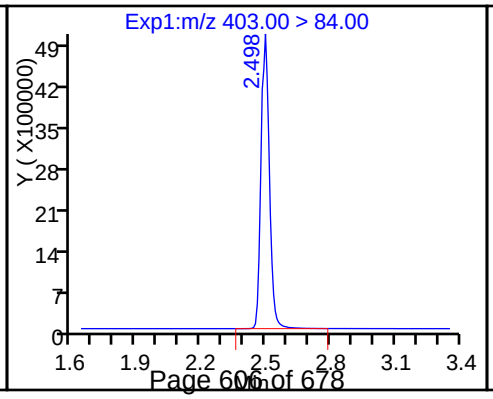
D 11 13C4-PFHpA



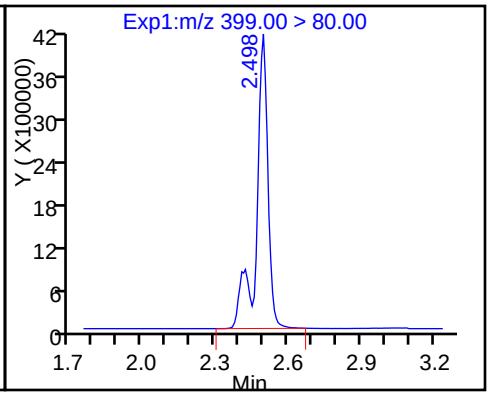
12 Perfluoroheptanoic acid



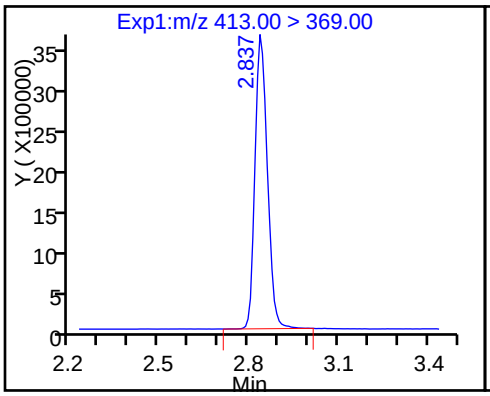
D 10 18O2 PFHxS



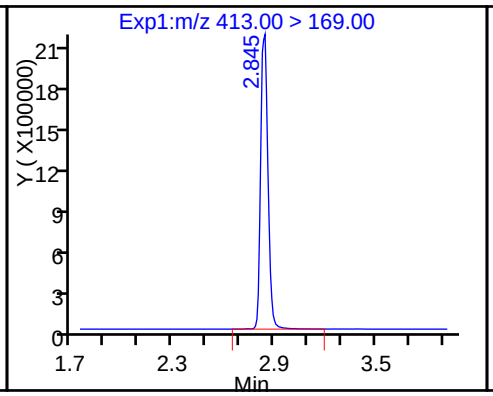
9 Perfluorohexanesulfonic acid



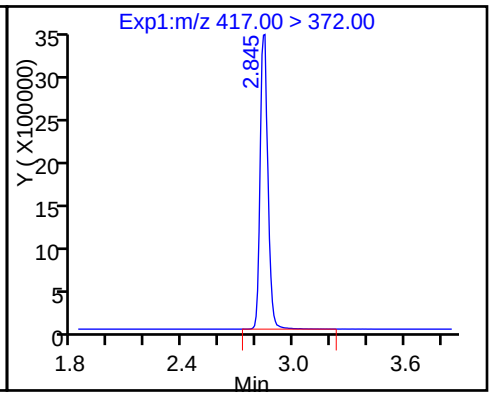
15 Perfluorooctanoic acid



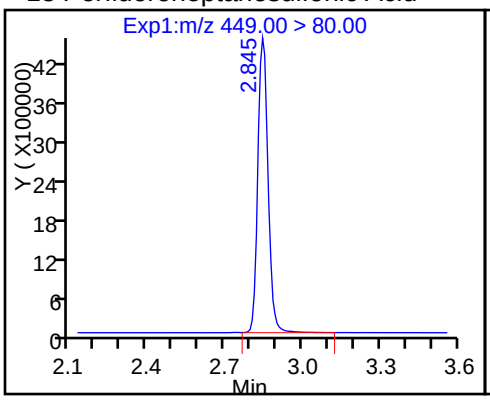
15 Perfluorooctanoic acid



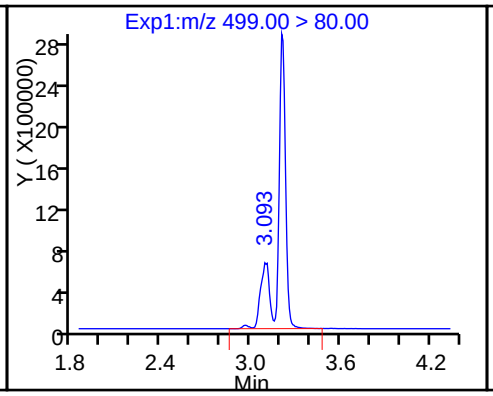
D 14 13C4 PFOA



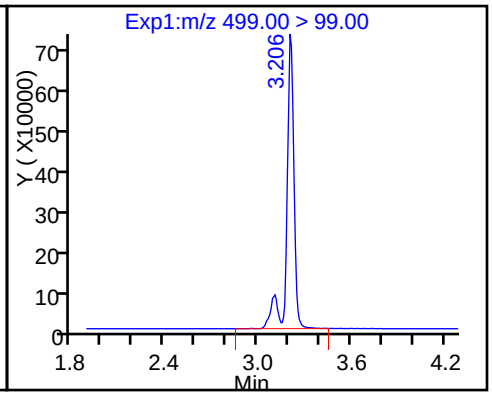
13 Perfluoroheptanesulfonic Acid



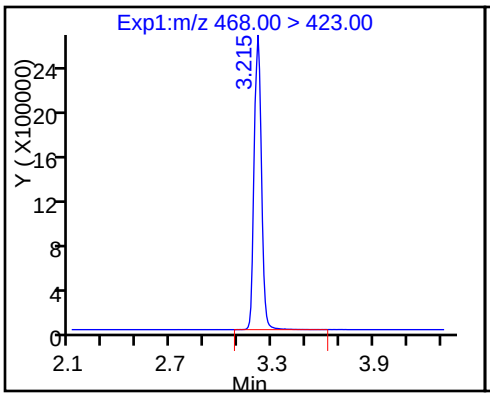
18 Perfluorooctane sulfonic acid



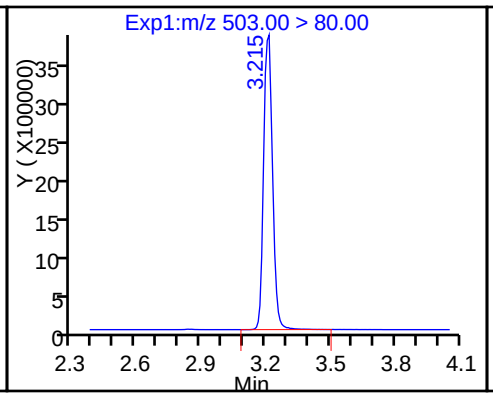
18 Perfluorooctane sulfonic acid



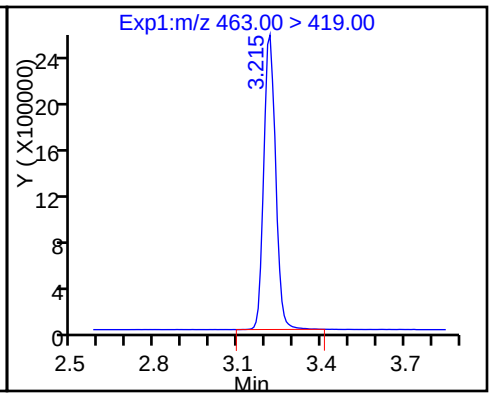
D 19 13C5 PFNA



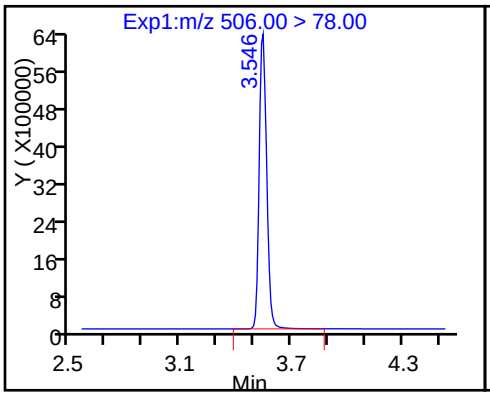
D 17 13C4 PFOS



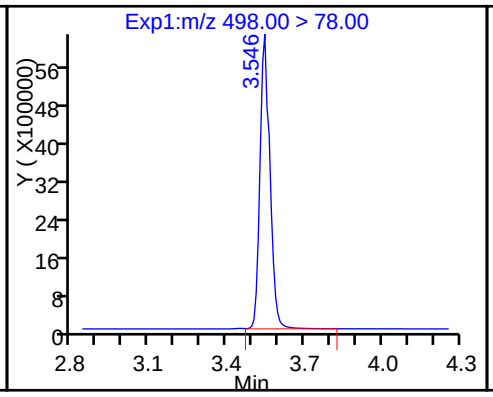
20 Perfluorononanoic acid



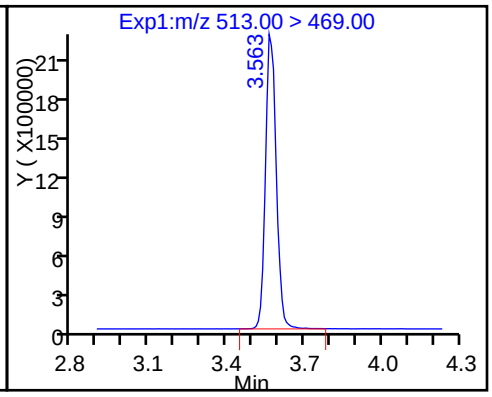
D 21 13C8 FOSA



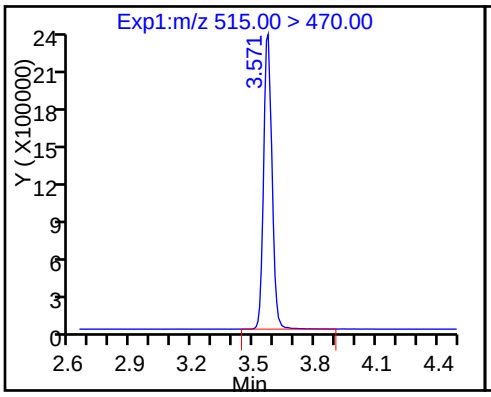
22 Perfluorooctane Sulfonamide



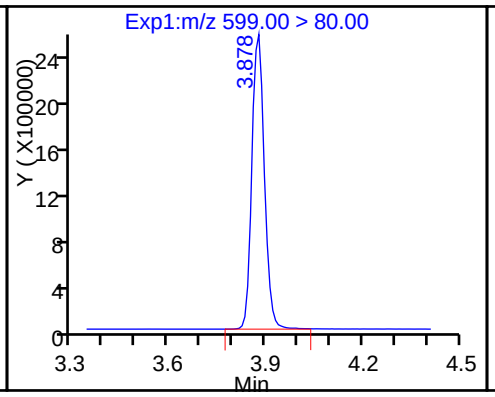
24 Perfluorodecanoic acid



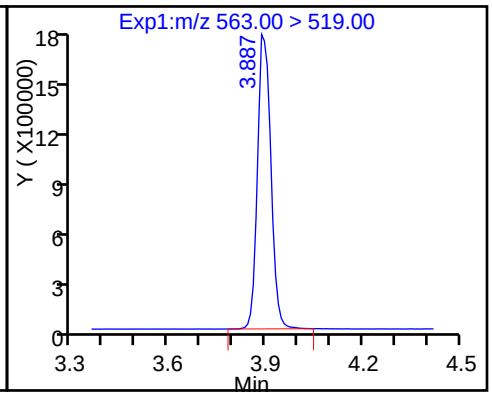
D 23 13C2 PFDA



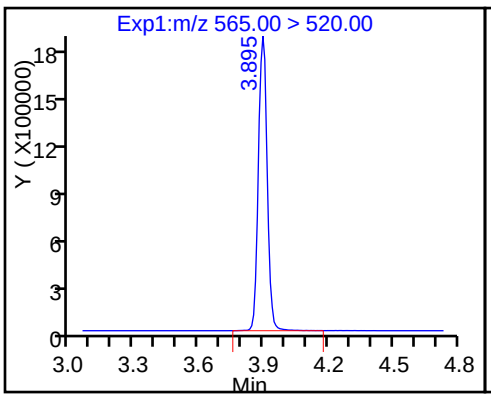
26 Perfluorodecane Sulfonic acid



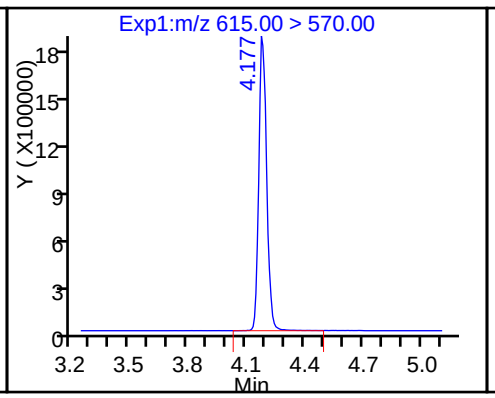
28 Perfluoroundecanoic acid



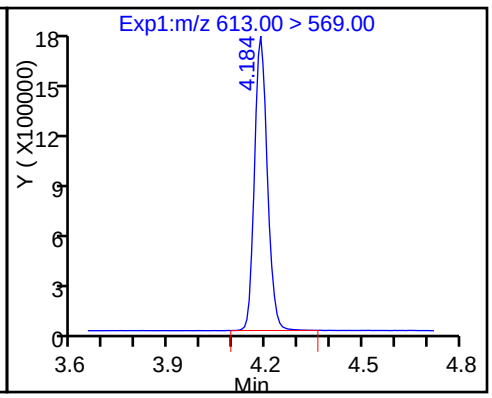
D 27 13C2 PFUnA



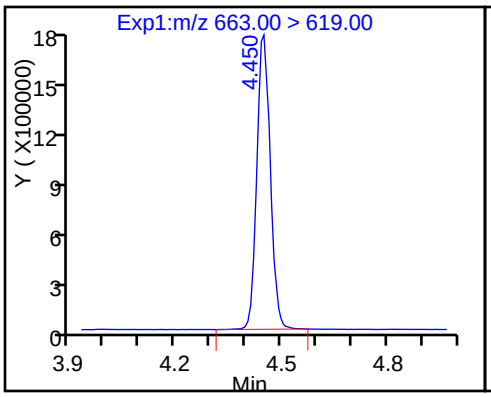
D 30 13C2 PFDoA



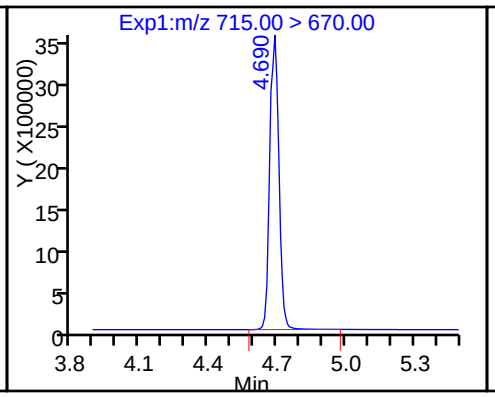
29 Perfluorododecanoic acid



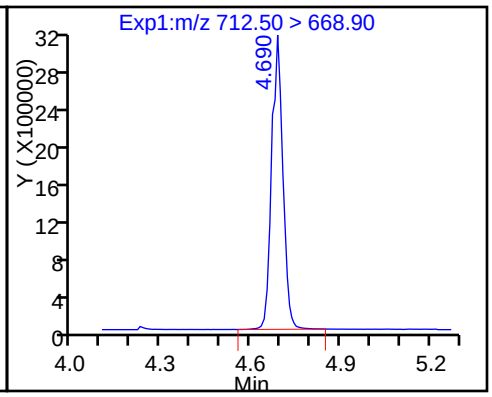
31 Perfluorotridecanoic acid



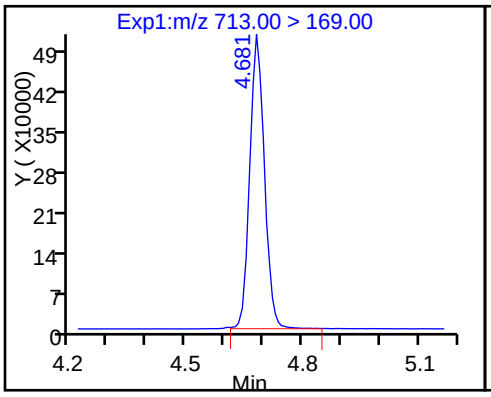
D 32 13C2-PFTeDA



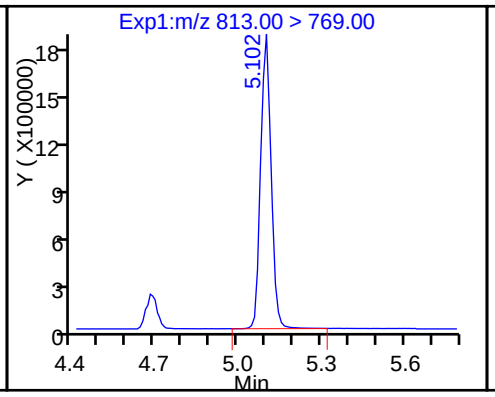
33 Perfluorotetradecanoic acid



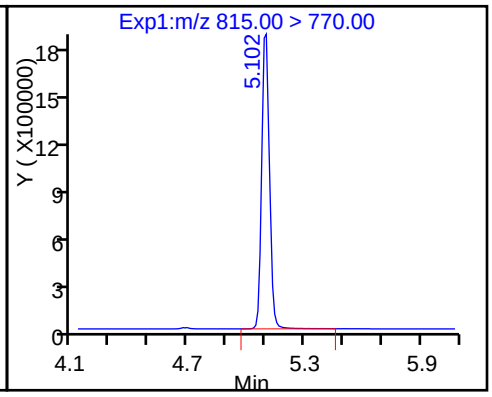
33 Perfluorotetradecanoic acid



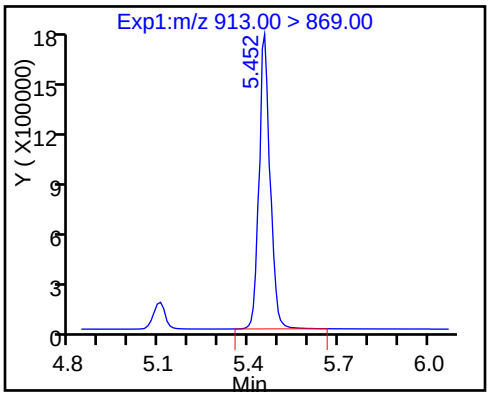
35 Perfluorohexadecanoic acid



D 34 13C2-PFHxDA



36 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Lab Sample ID: CCV 320-143259/2 Calibration Date: 12/20/2016 17:37

Instrument ID: A8_N Calib Start Date: 12/15/2016 12:29

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/15/2016 14:18

Lab File ID: 20DEC2016C_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	0.8537	0.9097		53.3	50.0	6.6	25.0
Perfluoropentanoic acid (PFPeA)	AveID	0.9868	1.004		50.9	50.0	1.8	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.417	1.618		50.5	44.2	14.2	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9288	0.9314		50.1	50.0	0.3	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9788	0.9642		49.3	50.0	-1.5	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.030	1.058		46.8	45.5	2.8	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.003	1.026		51.1	50.0	2.3	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.102	1.174		50.7	47.6	6.5	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	0.9945	1.041		48.6	46.4	4.7	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9518	0.9644		50.7	50.0	1.3	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9327	0.9498		50.9	50.0	1.8	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9438	0.9730		51.5	50.0	3.1	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.5840	0.6216		51.3	48.2	6.4	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9563	0.9409		49.2	50.0	-1.6	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9180	0.9518		51.8	50.0	3.7	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9069	0.9067		50.0	50.0	-0.0	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.585	1.651		52.1	50.0	4.2	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		0.8939		46.2	50.0	-7.6	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.030	0.8921		43.3	50.0	-13.4	25.0
13C4 PFBA	Ave	347743	320397		46.1	50.0	-7.9	50.0
13C5-PFPeA	Ave	266072	242203		45.5	50.0	-9.0	50.0
13C2 PFHxA	Ave	245110	214945		43.8	50.0	-12.3	50.0
13C4-PFHpA	Ave	226344	194545		43.0	50.0	-14.0	50.0
18O2 PFHxS	Ave	326976	288898		41.8	47.3	-11.6	50.0
13C4 PFOA	Ave	230362	202169		43.9	50.0	-12.2	50.0
13C4 PFOS	Ave	248847	226278		43.5	47.8	-9.1	50.0
13C5 PFNA	Ave	177687	155059		43.6	50.0	-12.7	50.0
13C8 FOSA	Ave	384141	355226		46.2	50.0	-7.5	50.0
13C2 PFDA	Ave	157302	135820		43.2	50.0	-13.7	50.0
13C2 PFUnA	Ave	117250	100704		42.9	50.0	-14.1	50.0
13C2 PFDoA	Ave	110957	96448		43.5	50.0	-13.1	50.0
13C2-PFTeDA	Ave	227387	189221		41.6	50.0	-16.8	50.0
13C2-PFHxDA	Ave	124568	99464		39.9	50.0	-20.2	50.0

FORM VII 537 (Modified)

Report Date: 21-Dec-2016 10:21:01 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161221-38078.b\20DEC2016C_002.d
Lims ID: CCV L5
Client ID:
Sample Type: CCV
Inject. Date: 20-Dec-2016 17:37:14 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*sub5

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161221-38078.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 21-Dec-2016 10:21:00 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK025

First Level Reviewer: chandrasenas Date: 21-Dec-2016 09:16:41

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	1.558	1.558	0.0		16019833	46.1		92.1	1312012	
1 Perfluorobutyric acid										
212.90 > 169.00	1.566	1.566	0.0	1.000	14572607	53.3		107	86389	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.839	1.839	0.0	1.000	12162418	50.9		102	148465	
D 4 13C5-PFPeA										
267.90 > 223.00	1.839	1.839	0.0		12110147	45.5		91.0	1157753	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.878	1.878	0.0	1.000	20656060	50.5		114		
298.90 > 99.00	1.878	1.878	0.0	1.000	9551416		2.16(0.00-0.00)			
7 Perfluorohexanoic acid										
313.00 > 269.00	2.135	2.135	0.0	1.000	10009932	50.1		100	281851	
D 6 13C2 PFHxA										
315.00 > 270.00	2.135	2.135	0.0		10747252	43.8		87.7	800299	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.472	2.472	0.0	1.000	9378580	49.3		98.5	117620	
D 11 13C4-PFHpA										
367.00 > 322.00	2.480	2.480	0.0		9727255	43.0		86.0	692787	
D 10 18O2 PFHxS										
403.00 > 84.00	2.487	2.487	0.0		13664873	41.8		88.4	4983589	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.495	2.495	0.0	1.000	13911971	46.8		103		
15 Perfluorooctanoic acid										
413.00 > 369.00	2.835	2.835	0.0	1.000	10369198	51.1		102	99492	
413.00 > 169.00	2.835	2.835	0.0	1.000	6365207		1.63(0.90-1.10)		320824	
D 14 13C4 PFOA										
417.00 > 372.00	2.835	2.835	0.0		10108464	43.9		87.8	510500	

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	2.844	2.844	0.0	1.000	12641244	50.7		107		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.099	3.099	0.0	1.000	10932752	48.6		105	72911	
499.00 > 99.00	3.204	3.099	0.105	1.034	2363705		4.63(0.90-1.10)		123612	
D 17 13C4 PFOS										
503.00 > 80.00	3.204	3.204	0.0		10816069	43.5		90.9	249392	
20 Perfluorononanoic acid										
463.00 > 419.00	3.213	3.213	0.0	1.000	7476816	50.7		101	101920	
D 19 13C5 PFNA										
468.00 > 423.00	3.213	3.213	0.0		7752959	43.6		87.3	645115	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.536	3.536	0.0	1.000	16869344	50.9		102	543058	
D 21 13C8 FOSA										
506.00 > 78.00	3.536	3.536	0.0		17761277	46.2		92.5	705579	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.570	3.570	0.0	1.000	6607325	51.5		103	186040	
D 23 13C2 PFDA										
515.00 > 470.00	3.570	3.570	0.0		6791017	43.2		86.3	209346	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.877	3.877	0.0	1.000	6779011	51.3		106		
D 27 13C2 PFUnA										
565.00 > 520.00	3.895	3.895	0.0		5035175	42.9		85.9	252762	
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.895	3.895	0.0	1.000	4737634	49.2		98.4	128396	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.182	4.182	0.0	1.000	4589867	51.8		104	90422	
D 30 13C2 PFDoA										
615.00 > 570.00	4.182	4.182	0.0		4822423	43.5		86.9	171975	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.449	4.449	0.0	1.000	4372668	50.0		100.0	81518	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.689	4.689	0.0		9461025	41.6		83.2	689768	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.698	4.698	0.0	1.000	7964194	52.1		104	22813	
713.00 > 169.00	4.680	4.698	-0.018	0.996	1257863		6.33(0.00-0.00)		158469	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.101	5.101	0.0	1.000	4310935	46.2		92.4	3498	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.101	5.101	0.0		4973204	39.9		79.8	72071	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.459	5.459	0.0	1.000	4302060	43.3		86.6	4682	

Reagents:

LCPFC-L5_00022 Amount Added: 1.00 Units: mL

Report Date: 21-Dec-2016 10:21:01 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161221-38078.b\20DEC2016C_002.d

Injection Date: 20-Dec-2016 17:37:14 Instrument ID: A8_N

Lims ID: CCV L5

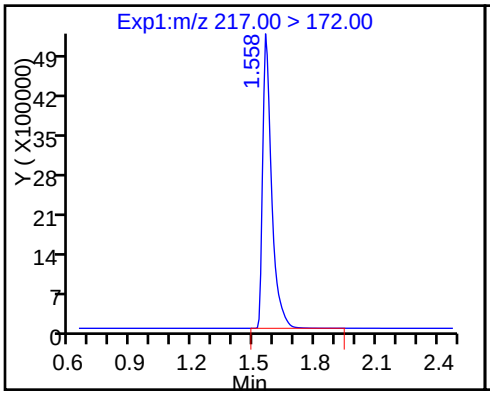
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 41 Worklist Smp#: 2

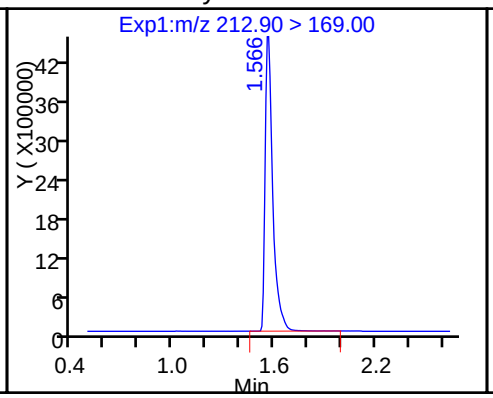
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

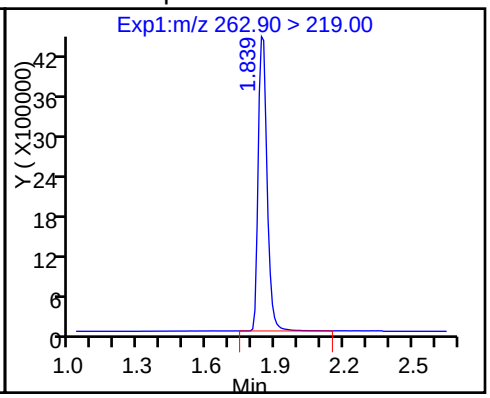
D 2 13C4 PFBA



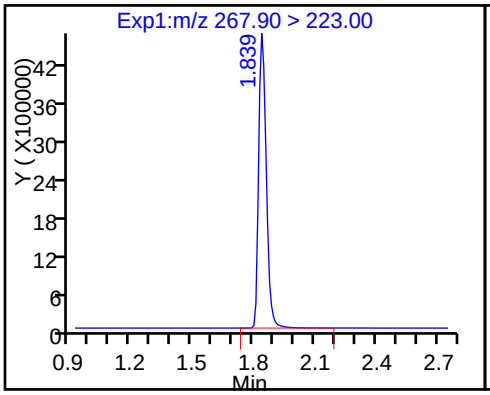
1 Perfluorobutyric acid



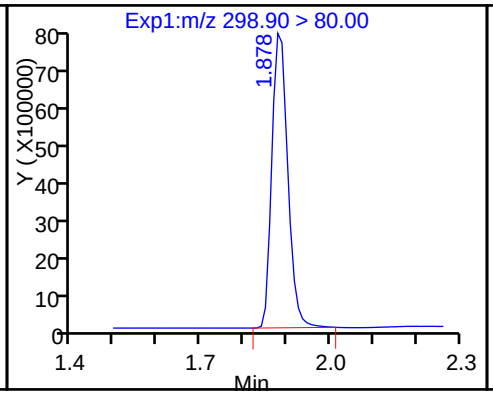
3 Perfluoropentanoic acid



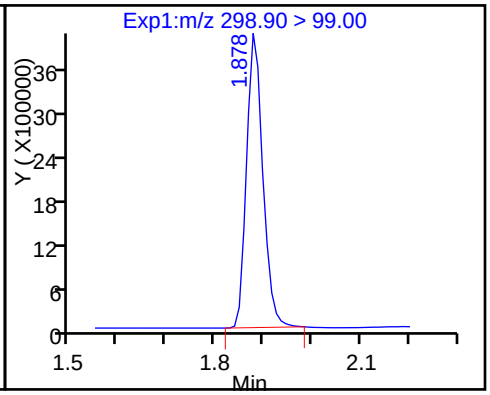
D 4 13C5-PFPeA



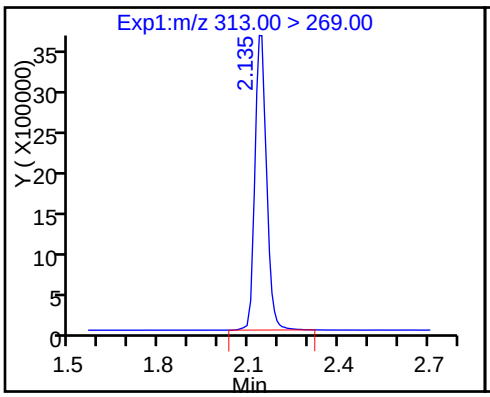
5 Perfluorobutanesulfonic acid



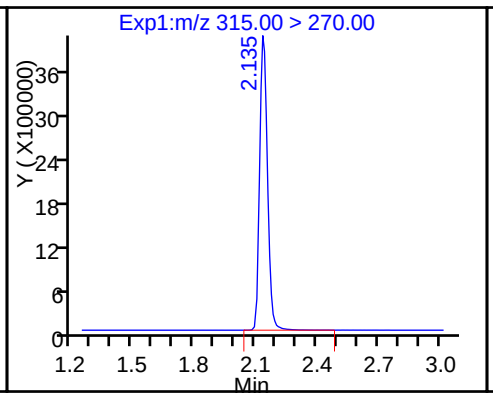
5 Perfluorobutanesulfonic acid



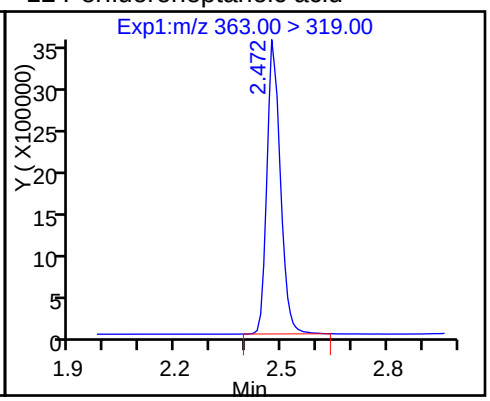
7 Perfluorohexanoic acid



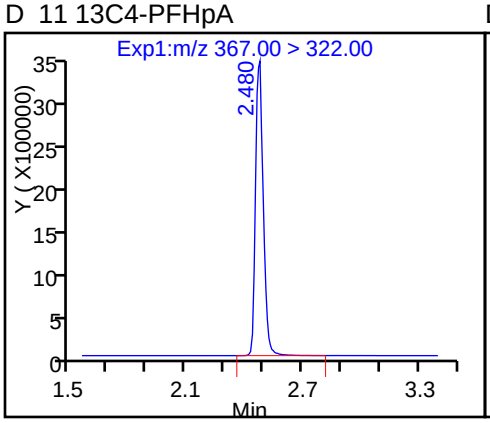
D 6 13C2 PFHxA



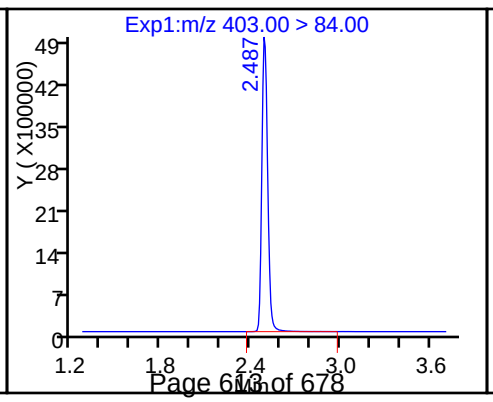
12 Perfluoroheptanoic acid



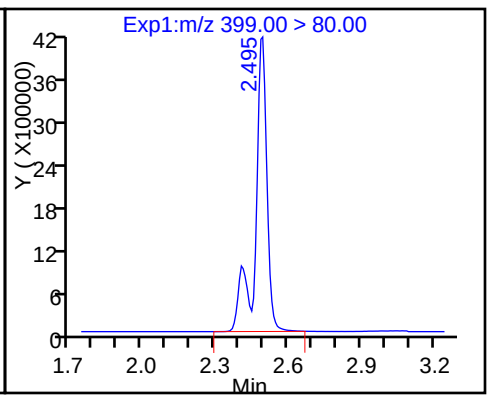
D 11 13C4-PFHpA



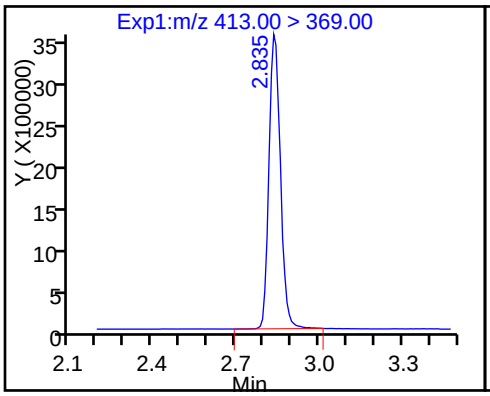
D 10 18O2 PFHxS



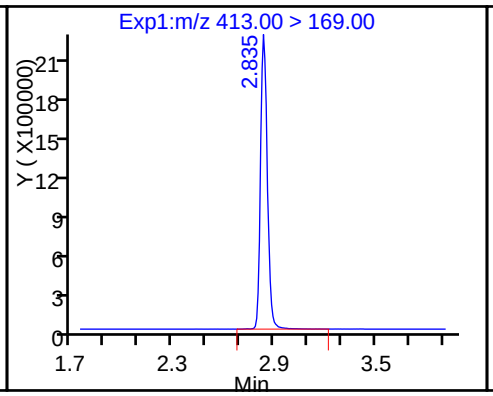
9 Perfluorohexanesulfonic acid



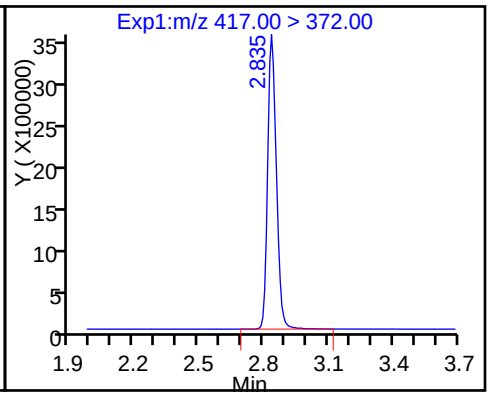
15 Perfluorooctanoic acid



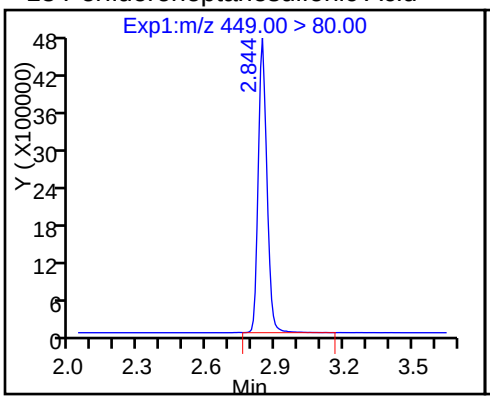
15 Perfluorooctanoic acid



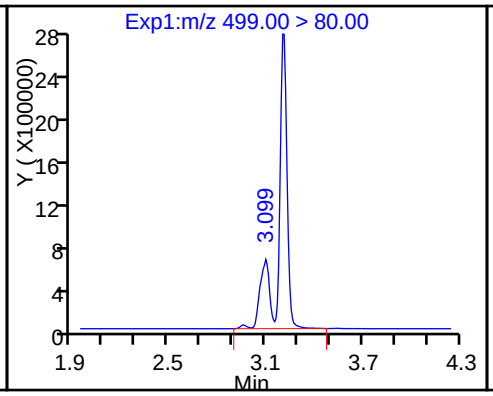
D 14 13C4 PFOA



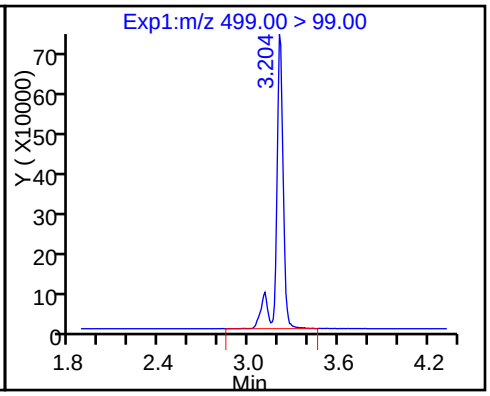
13 Perfluoroheptanesulfonic Acid



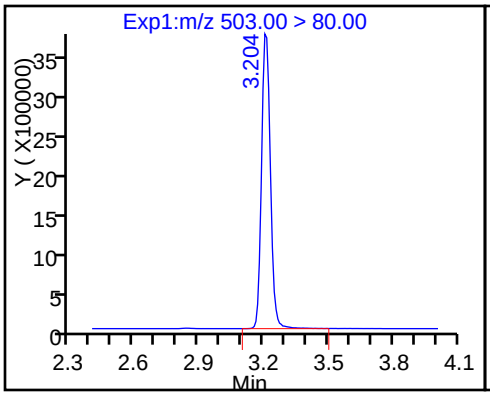
18 Perfluorooctane sulfonic acid



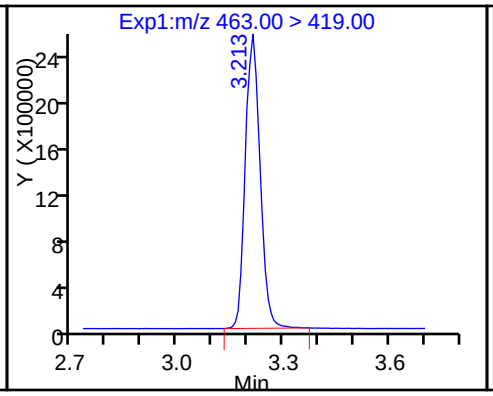
18 Perfluorooctane sulfonic acid



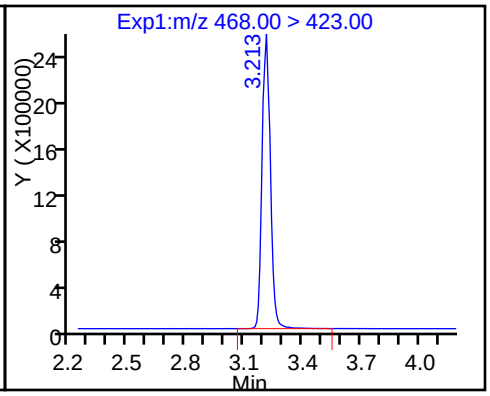
D 17 13C4 PFOS



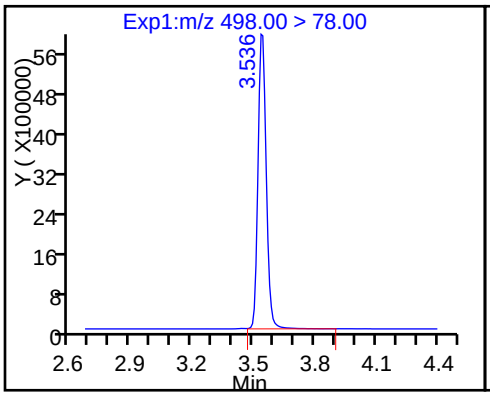
20 Perfluorononanoic acid



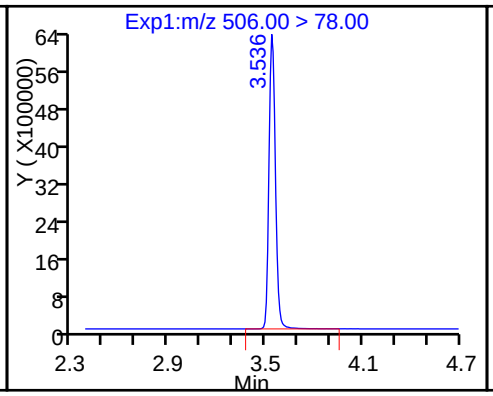
D 19 13C5 PFNA



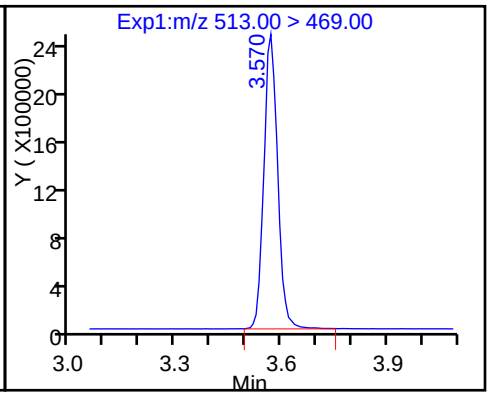
22 Perfluorooctane Sulfonamide



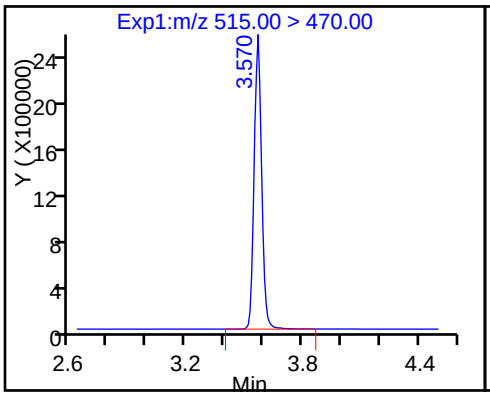
D 21 13C8 FOSA



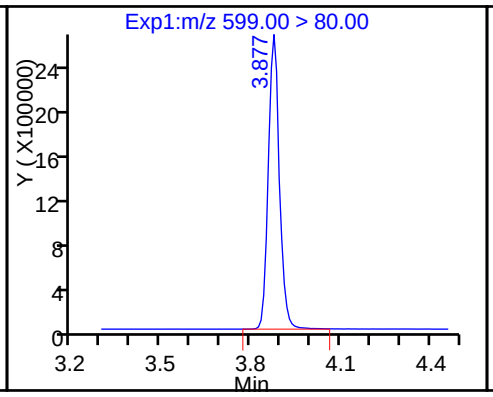
24 Perfluorodecanoic acid



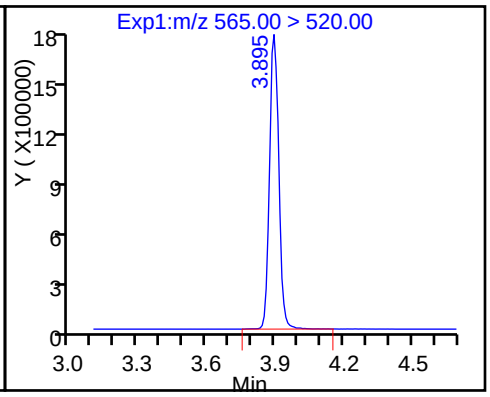
D 23 13C2 PFDA



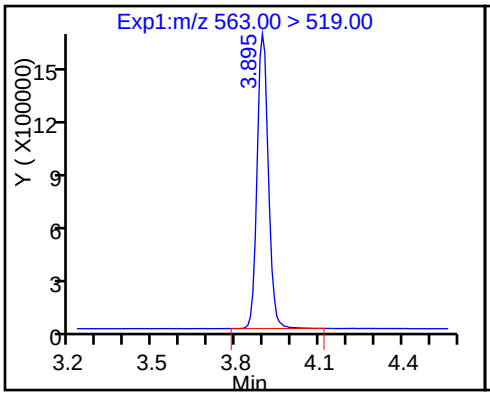
26 Perfluorodecane Sulfonic acid



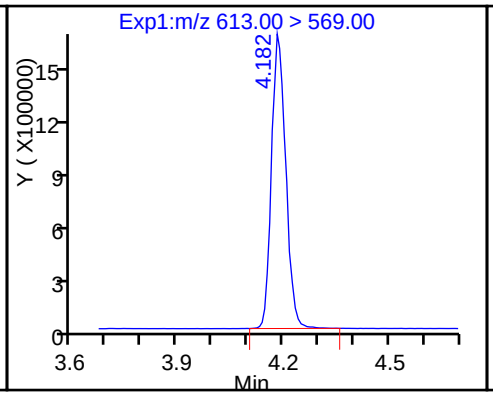
D 27 13C2 PFUnA



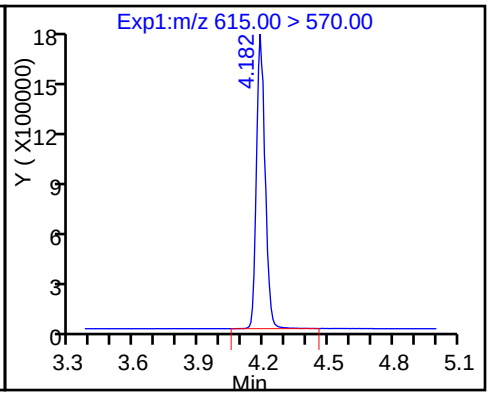
28 Perfluoroundecanoic acid



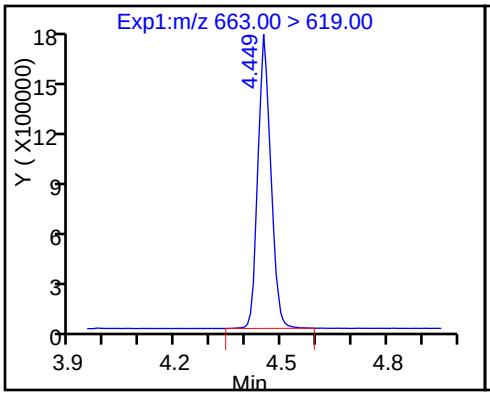
29 Perfluorododecanoic acid



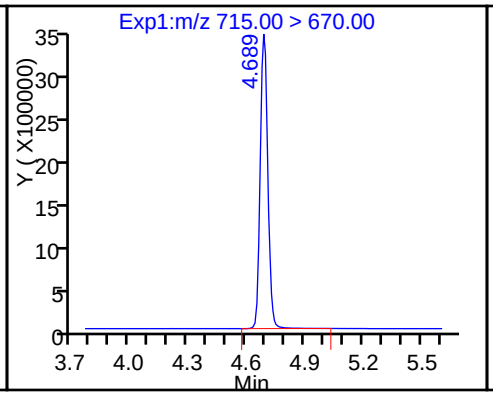
D 30 13C2 PFDoA



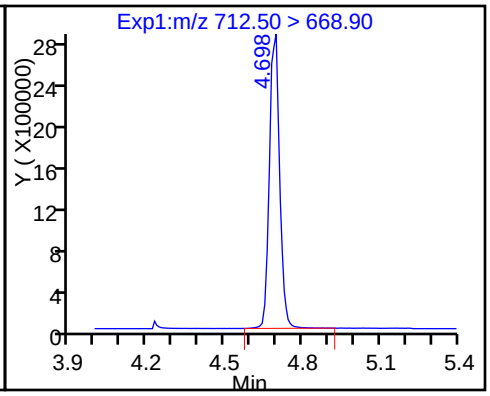
31 Perfluorotridecanoic acid



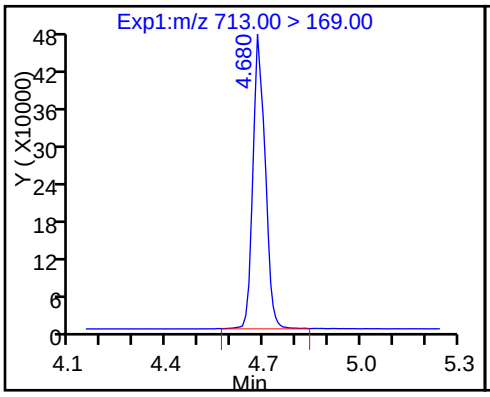
D 32 13C2-PFTeDA



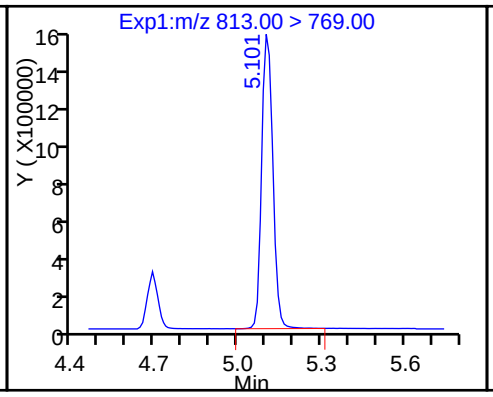
33 Perfluorotetradecanoic acid



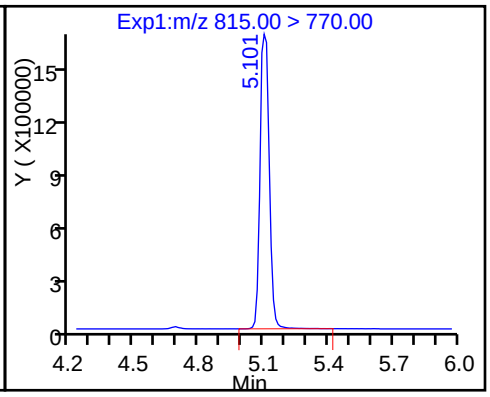
33 Perfluorotetradecanoic acid



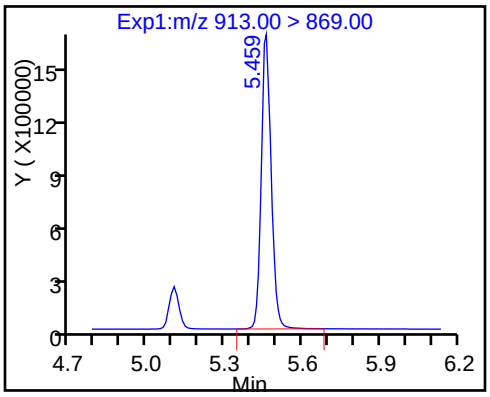
35 Perfluorohexadecanoic acid



D 34 13C2-PFHxDA



36 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Lab Sample ID: CCV 320-143259/16 Calibration Date: 12/20/2016 19:22

Instrument ID: A8_N Calib Start Date: 12/15/2016 12:29

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/15/2016 14:18

Lab File ID: 20DEC2016C_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	0.8537	0.9590		22.5	20.0	12.3	25.0
Perfluoropentanoic acid (PFPeA)	AveID	0.9868	1.068		21.6	20.0	8.2	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.417	1.724		21.5	17.7	21.6	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9288	0.9571		20.6	20.0	3.0	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9788	1.004		20.5	20.0	2.5	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.030	1.090		19.3	18.2	5.8	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.003	1.087		21.7	20.0	8.4	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.102	1.227		21.2	19.0	11.4	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	0.9945	1.054		19.7	18.6	5.9	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9518	0.9827		20.6	20.0	3.2	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9327	0.9851		21.1	20.0	5.6	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9438	0.9234		19.6	20.0	-2.2	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.5840	0.6330		20.9	19.3	8.4	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9563	0.9824		20.5	20.0	2.7	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9180	0.9503		20.7	20.0	3.5	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9069	0.9342		20.6	20.0	3.0	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.585	1.681		21.2	20.0	6.1	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		0.9342		19.0	20.0	-5.1	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.030	0.8734		17.0	20.0	-15.2	25.0
13C4 PFBA	Ave	347743	344175		49.5	50.0	-1.0	50.0
13C5-PFPeA	Ave	266072	262067		49.2	50.0	-1.5	50.0
13C2 PFHxA	Ave	245110	231525		47.2	50.0	-5.5	50.0
13C4-PFHpA	Ave	226344	216174		47.8	50.0	-4.5	50.0
18O2 PFHxS	Ave	326976	312022		45.1	47.3	-4.6	50.0
13C4 PFOA	Ave	230362	221448		48.1	50.0	-3.9	50.0
13C4 PFOS	Ave	248847	243480		46.8	47.8	-2.2	50.0
13C5 PFNA	Ave	177687	174025		49.0	50.0	-2.1	50.0
13C8 FOSA	Ave	384141	373456		48.6	50.0	-2.8	50.0
13C2 PFDA	Ave	157302	156863		49.9	50.0	-0.3	50.0
13C2 PFUnA	Ave	117250	114936		49.0	50.0	-2.0	50.0
13C2 PFDoA	Ave	110957	104629		47.1	50.0	-5.7	50.0
13C2-PFTeDA	Ave	227387	205290		45.1	50.0	-9.7	50.0
13C2-PFHxDA	Ave	124568	106704		42.8	50.0	-14.3	50.0

FORM VII 537 (Modified)

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161221-38078.b\20DEC2016C_016.d
Lims ID: CCV L4
Client ID:
Sample Type: CCV
Inject. Date: 20-Dec-2016 19:22:25 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*sub5

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161221-38078.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 21-Dec-2016 10:24:07 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK025

First Level Reviewer: chandrasenas Date: 21-Dec-2016 10:20:21

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	1.550	0.0		17208744	49.5		99.0	1120258	
1 Perfluorobutyric acid										
212.90 > 169.00	1.558	1.558	0.0	1.000	6601262	22.5		112	39345	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.840	1.840	0.0	1.000	5596154	21.6		108	54379	
D 4 13C5-PFPeA										
267.90 > 223.00	1.840	1.840	0.0		13103338	49.2		98.5	1611932	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.868	1.868	0.0	1.000	9508652	21.5		122		
298.90 > 99.00	1.868	1.868	0.0	1.000	4144281		2.29(0.00-0.00)			
7 Perfluorohexanoic acid										
313.00 > 269.00	2.129	2.129	0.0	1.000	4431756	20.6		103	139263	
D 6 13C2 PFHxA										
315.00 > 270.00	2.129	2.129	0.0		11576262	47.2		94.5	920045	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.485	2.485	0.0	1.000	6188691	19.3		106		
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.470	2.470	0.0	1.000	4338838	20.5		103	52179	
D 11 13C4-PFHpA										
367.00 > 322.00	2.470	2.470	0.0		10808685	47.8		95.5	818025	
D 10 18O2 PFHxS										
403.00 > 84.00	2.485	2.485	0.0		14758638	45.1		95.4	678779	
D 14 13C4 PFOA										
417.00 > 372.00	2.831	2.831	0.0		11072395	48.1		96.1	958315	

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	2.823	2.823	0.0	1.000	4814977	21.7		108	41267	
413.00 > 169.00	2.831	2.823	0.008	1.003	2946005		1.63(0.90-1.10)		130443	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.831	2.831	0.0	1.000	5689759	21.2		111		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.096	3.096	0.0	1.000	4760814	19.7		106	54636	
499.00 > 99.00	3.201	3.096	0.105	1.034	1042526		4.57(0.90-1.10)		55600	
D 17 13C4 PFOS										
503.00 > 80.00	3.201	3.201	0.0		11638340	46.8		97.8	403343	
20 Perfluorononanoic acid										
463.00 > 419.00	3.201	3.201	0.0	1.000	3420211	20.6		103	55807	
D 19 13C5 PFNA										
468.00 > 423.00	3.201	3.201	0.0		8701261	49.0		97.9	602525	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.533	3.533	0.0	1.000	7357794	21.1		106	389487	
D 21 13C8 FOSA										
506.00 > 78.00	3.533	3.533	0.0		18672787	48.6		97.2	732866	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.558	3.558	0.0	1.000	2896888	19.6		97.8	106380	
D 23 13C2 PFDA										
515.00 > 470.00	3.558	3.558	0.0		7843132	49.9		99.7	225832	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.863	3.863	0.0	1.000	2971680	20.9		108		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.889	3.889	0.0	1.000	2258155	20.5		103	66565	
D 27 13C2 PFUnA										
565.00 > 520.00	3.881	3.881	0.0		5746794	49.0		98.0	416320	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.176	4.176	0.0	1.000	1988602	20.7		104	43342	
D 30 13C2 PFDoA										
615.00 > 570.00	4.176	4.176	0.0		5231462	47.1		94.3	215052	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.441	4.441	0.0	1.000	1954950	20.6		103	34185	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.688	4.688	0.0	1.000	3517788	21.2		106	17111	
713.00 > 169.00	4.671	4.688	-0.017	0.996	568250		6.19(0.00-0.00)		65678	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.679	4.679	0.0		10264494	45.1		90.3	1247972	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.101	5.101	0.0	1.000	1954816	19.0		94.9	1525	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.101	5.101	0.0		5335210	42.8		85.7	79161	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.452	5.452	0.0	1.000	1827580	17.0		84.8	1996	

Reagents:

LCPFC-L4_00024 Amount Added: 1.00 Units: mL

Report Date: 21-Dec-2016 10:24:07 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161221-38078.b\20DEC2016C_016.d

Injection Date: 20-Dec-2016 19:22:25 Instrument ID: A8_N

Lims ID: CCV L4

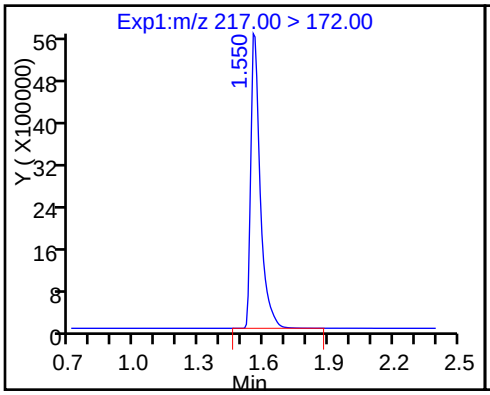
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 40 Worklist Smp#: 16

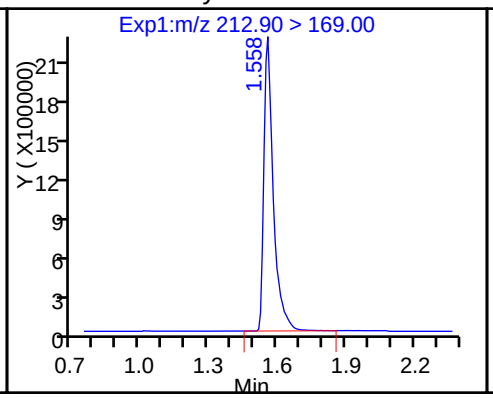
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

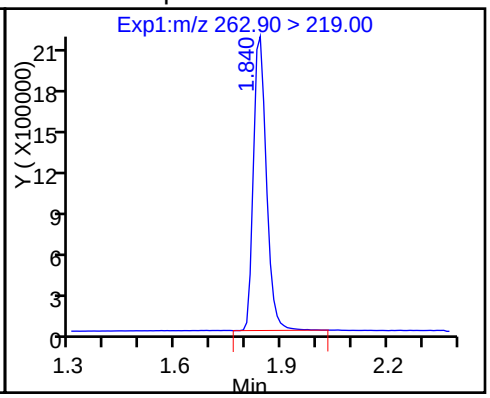
D 2 13C4 PFBA



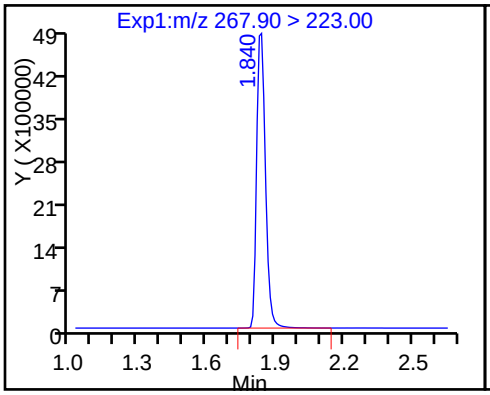
1 Perfluorobutyric acid



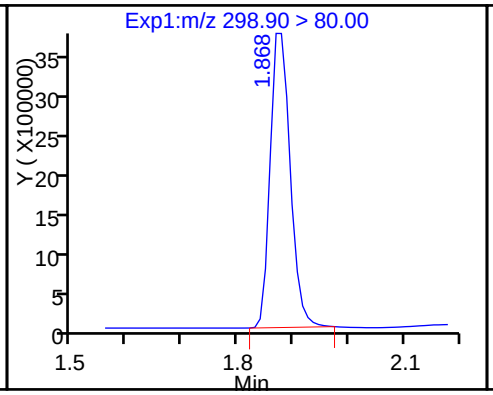
3 Perfluoropentanoic acid



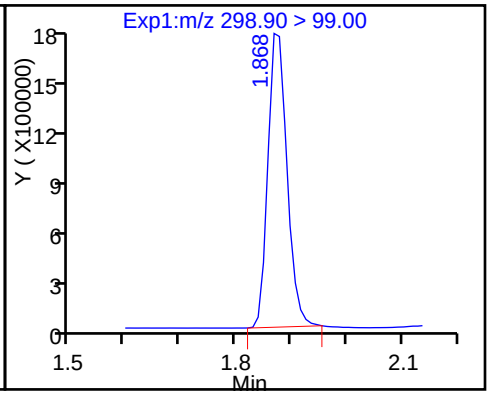
D 4 13C5-PFPeA



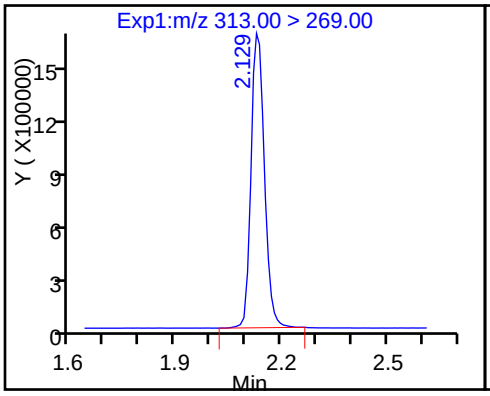
5 Perfluorobutanesulfonic acid



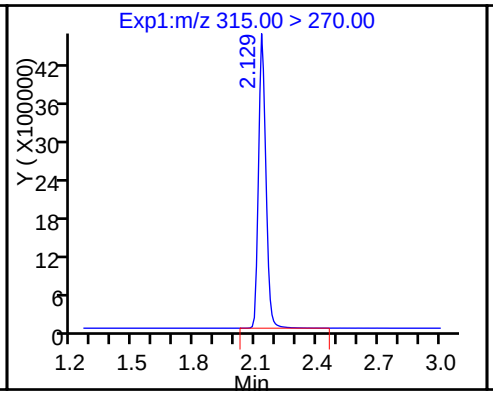
5 Perfluorobutanesulfonic acid



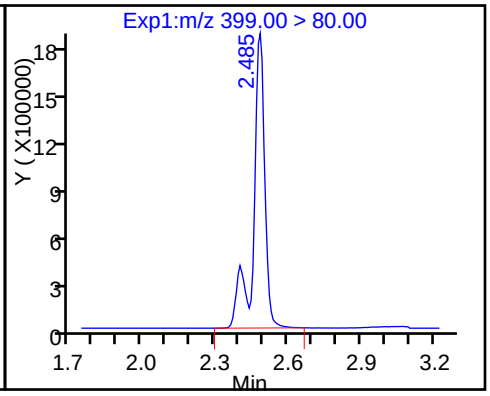
7 Perfluorohexanoic acid



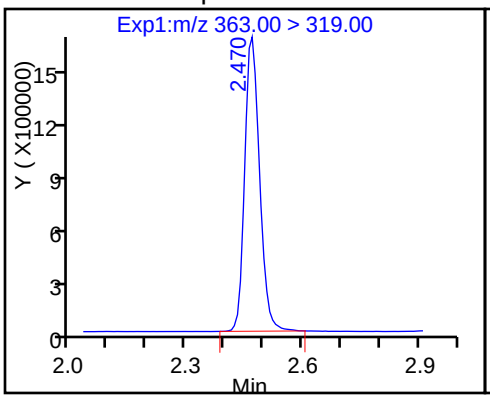
D 6 13C2 PFHxA



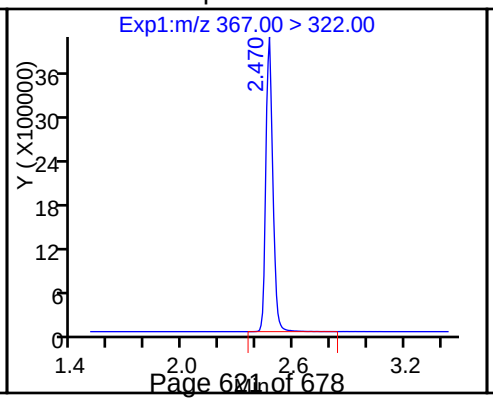
9 Perfluorohexanesulfonic acid



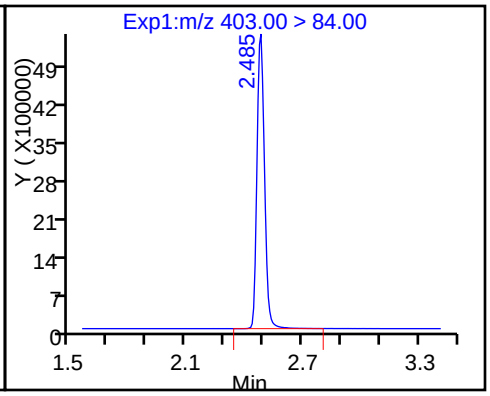
12 Perfluoroheptanoic acid



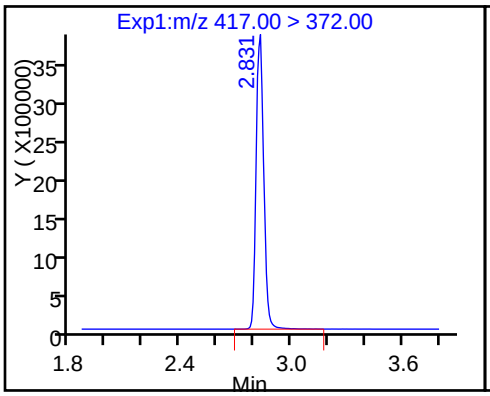
D 11 13C4-PFHpA



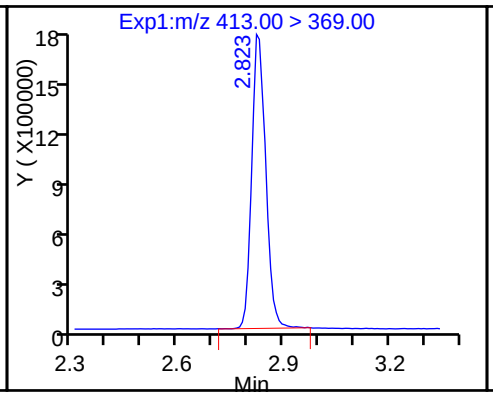
D 10 18O2 PFHxS



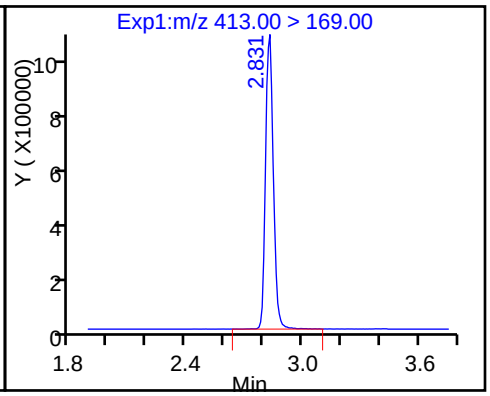
D 14 13C4 PFOA



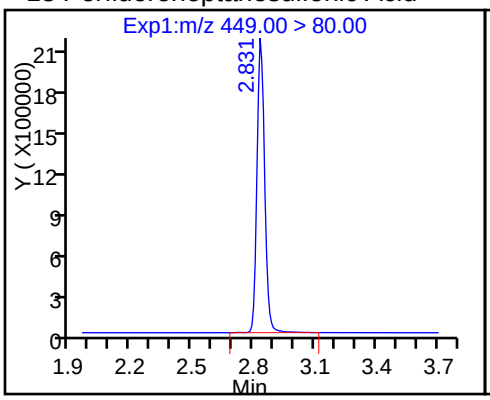
15 Perfluorooctanoic acid



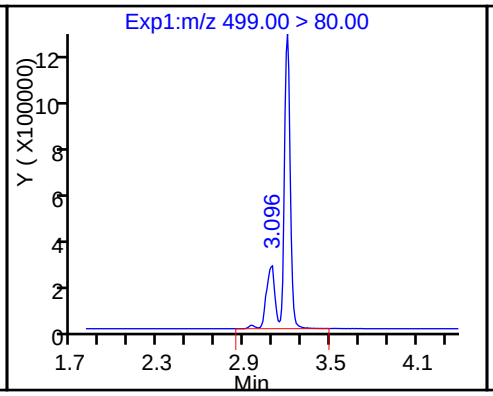
15 Perfluorooctanoic acid



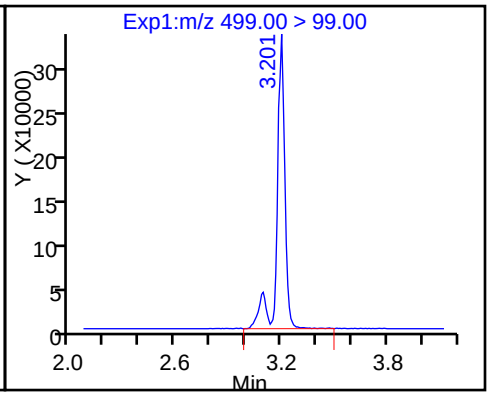
13 Perfluoroheptanesulfonic Acid



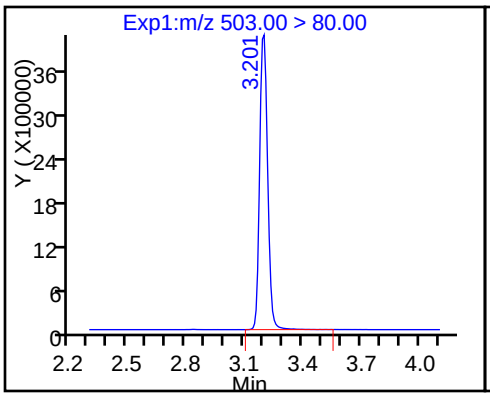
18 Perfluorooctane sulfonic acid



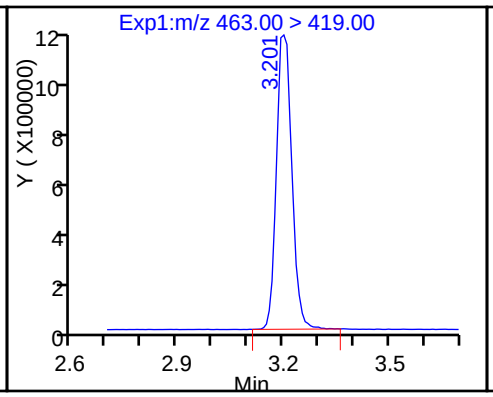
18 Perfluorooctane sulfonic acid



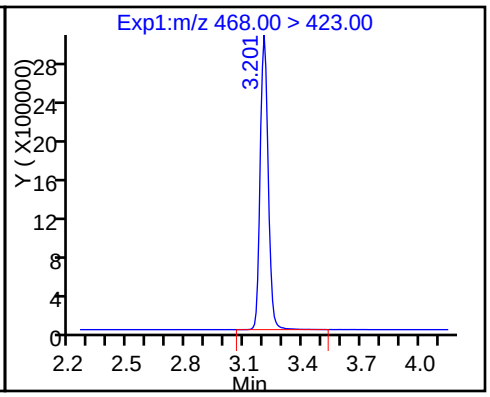
D 17 13C4 PFOS



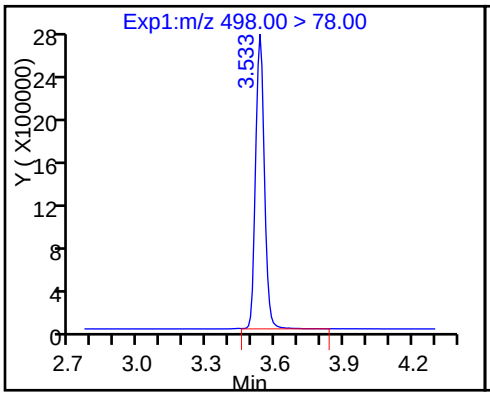
20 Perfluorononanoic acid



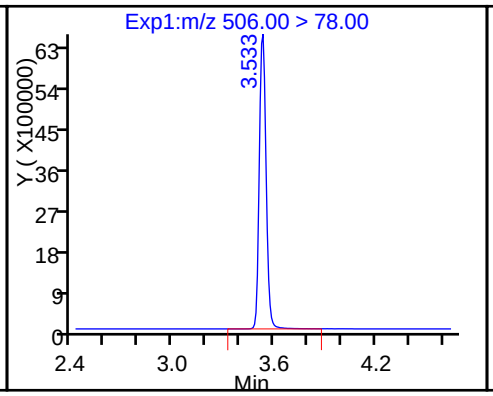
D 19 13C5 PFNA



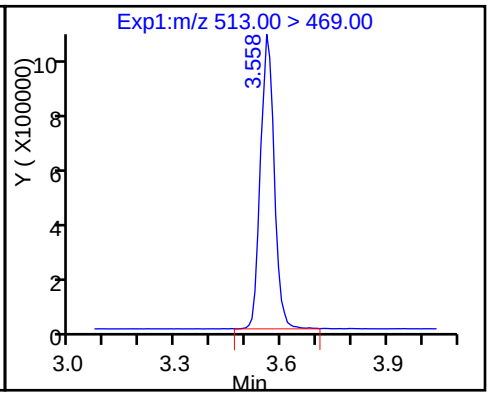
22 Perfluorooctane Sulfonamide



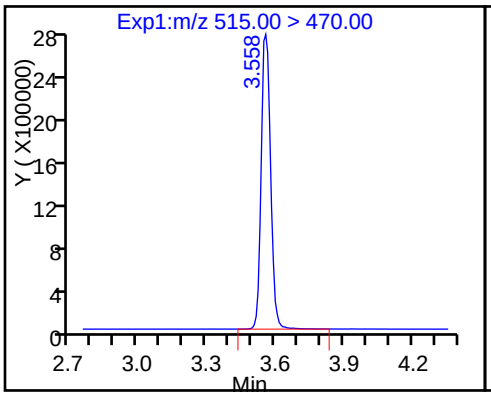
D 21 13C8 FOSA



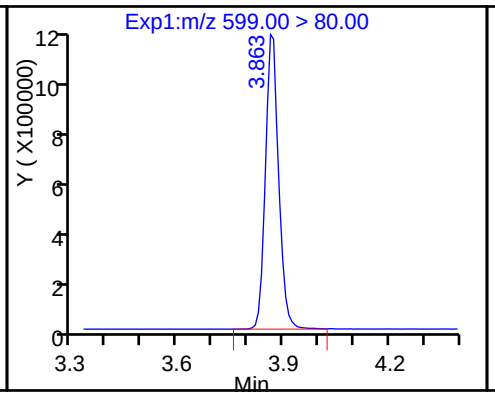
24 Perfluorodecanoic acid



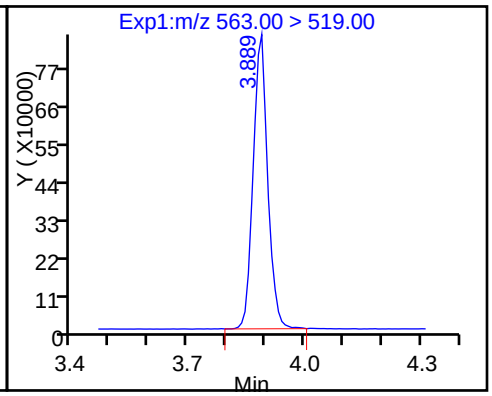
D 23 13C2 PFDA



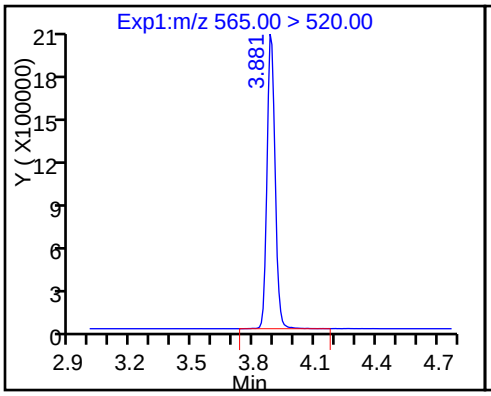
26 Perfluorodecane Sulfonic acid



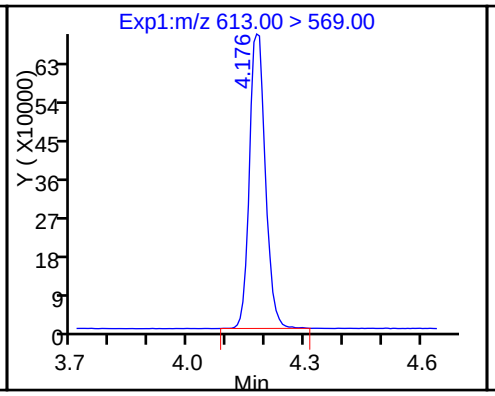
28 Perfluoroundecanoic acid



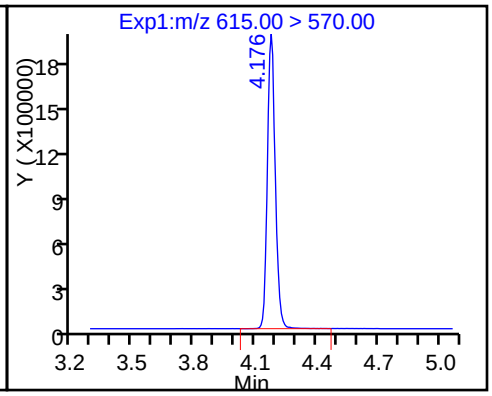
D 27 13C2 PFUnA



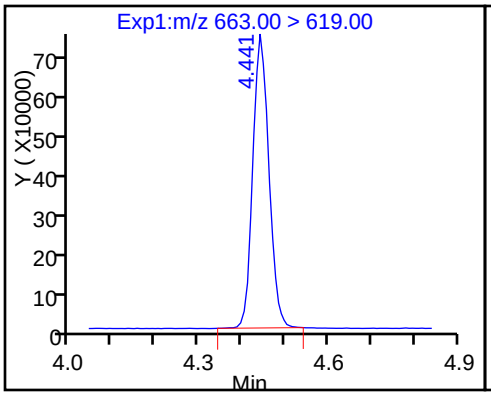
29 Perfluorododecanoic acid



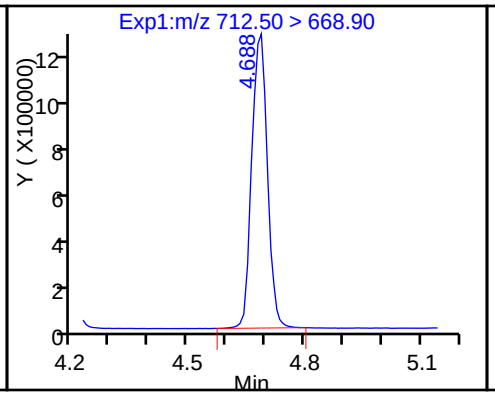
D 30 13C2 PFDoA



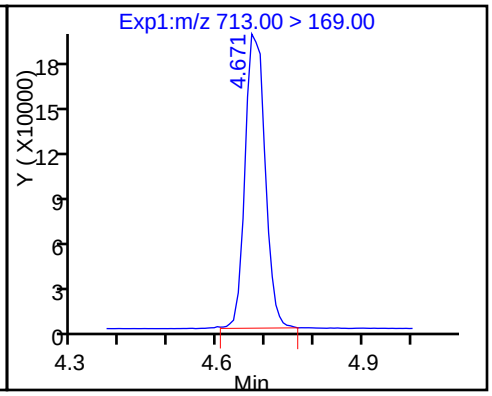
31 Perfluorotridecanoic acid



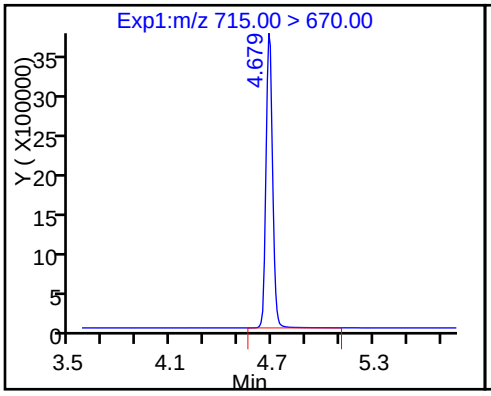
33 Perfluorotetradecanoic acid



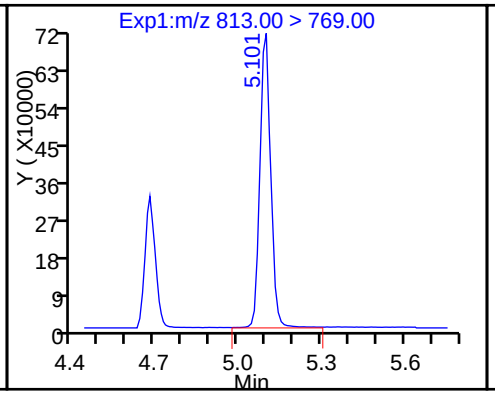
33 Perfluorotetradecanoic acid



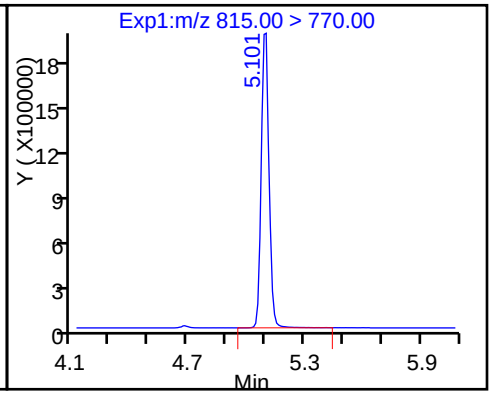
D 32 13C2-PFTeDA



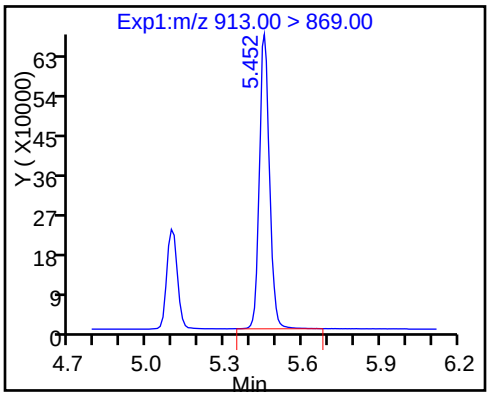
35 Perfluorohexadecanoic acid



D 34 13C2-PFHxDA



36 Perfluorooctadecanoic acid



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-23931-1

SDG No.:

Client Sample ID: | Lab Sample ID: MB 320-140536/1-A

Matrix: Water | Lab File ID: 16DEC2016C_005.d

Analysis Method: 537 (Modified) | Date Collected:

Extraction Method: 3535 | Date Extracted: 12/05/2016 08:31

Sample wt/vol: 250(mL) | Date Analyzed: 12/16/2016 18:30

Con. Extract Vol.: 0.5(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 142751 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.0010	U	0.0025	0.0010	0.00046
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.0020	U	0.0025	0.0020	0.00099
307-24-4	Perfluorohexanoic acid (PFHxA)	0.0020	U	0.0025	0.0020	0.00079
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0020	U	0.0025	0.0020	0.00080
335-67-1	Perfluorooctanoic acid (PFOA)	0.0020	U	0.0025	0.0020	0.00075
375-95-1	Perfluorononanoic acid (PFNA)	0.0020	U	0.0025	0.0020	0.00065
335-76-2	Perfluorodecanoic acid (PFDA)	0.0010	U	0.0025	0.0010	0.00044
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0020	U	0.0025	0.0020	0.00075
307-55-1	Perfluorododecanoic acid (PFDoA)	0.0020	U	0.0025	0.0020	0.00058
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.0020	U	0.0025	0.0020	0.00055
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.000656	J	0.0025	0.0010	0.00040
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0020	U	0.0025	0.0020	0.00092
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.0020	U	0.0025	0.0020	0.00087
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0030	U	0.0040	0.0030	0.0013
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.0030	U	0.0040	0.0030	0.0012
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.0020	U	0.0025	0.0020	0.00064

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-23931-1

SDG No.:

Client Sample ID: | Lab Sample ID: MB 320-140536/1-A

Matrix: Water | Lab File ID: 16DEC2016C_005.d

Analysis Method: 537 (Modified) | Date Collected:

Extraction Method: 3535 | Date Extracted: 12/05/2016 08:31

Sample wt/vol: 250(mL) | Date Analyzed: 12/16/2016 18:30

Con. Extract Vol.: 0.5(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 142751 | Units: ug/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	100		25-150
STL00992	13C4 PFBA	112		25-150
STL00993	13C2 PFHxA	109		25-150
STL00990	13C4 PFOA	116		25-150
STL00995	13C5 PFNA	109		25-150
STL00996	13C2 PFDA	111		25-150
STL00997	13C2 PFUnA	115		25-150
STL00998	13C2 PFDoA	111		25-150
STL00994	18O2 PFHxS	105		25-150
STL00991	13C4 PFOS	102		25-150
STL01893	13C5-PFPeA	118		25-150
STL01892	13C4-PFHpA	112		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_005.d
Lims ID: MB 320-140536/1-A
Client ID:
Sample Type: MB
Inject. Date: 16-Dec-2016 18:30:12 ALS Bottle#: 25 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: mb 320-140536/1-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 18-Dec-2016 17:57:40 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK028

First Level Reviewer: chandrasenas Date: 18-Dec-2016 17:27:37

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	1.574	1.582	-0.008		19559860	56.2		112	950919	
1 Perfluorobutyric acid										
212.90 > 169.00	1.606	1.582	0.024	1.000	68726	0.2058			326	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.859	1.858	0.001	1.000	32564	0.1055			198	
D 4 13C5-PFPeA										
267.90 > 223.00	1.859	1.858	0.001		15642661	58.8		118	826864	
D 6 13C2 PFHxA										
315.00 > 270.00	2.149	2.155	-0.006		13419469	54.7		109	535944	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.157	2.164	-0.007	1.000	12414	0.0498			243	
D 11 13C4-PFHpA										
367.00 > 322.00	2.493	2.494	-0.002		12647763	55.9		112	1494554	
D 10 18O2 PFHxS										
403.00 > 84.00	2.508	2.510	-0.002		16212802	49.6		105	968948	
D 47 M2-6:2FTS										
429.00 > 409.00	2.839	2.822	0.017		2135	0.0183		0.0		
48 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.823	2.822	0.001	1.000	7921	NR				
D 14 13C4 PFOA										
417.00 > 372.00	2.856	2.858	-0.002		13332539	57.9		116	1118894	
D 19 13C5 PFNA										
468.00 > 423.00	3.227	3.230	-0.003		9698401	54.6		109	834170	
D 17 13C4 PFOS										
503.00 > 80.00	3.219	3.230	-0.011		12164460	48.9		102	692606	
D 21 13C8 FOSA										
506.00 > 78.00	3.558	3.561	-0.003		19211223	50.0		100	565183	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.558	3.561	-0.003	1.000	24698	0.0689			2517	
43 Sodium 1H,1H,2H,2H-perfluorooctane										
527.00 > 507.00	3.575	3.570	0.005	1.000	521	NR				
D 42 M2-8:2FTS										
529.00 > 509.00	3.575	3.570	0.005		2006	0.0187		0.0		
24 Perfluorodecanoic acid										
513.00 > 469.00	3.592	3.586	0.006	1.000	6461	0.0392			184	
D 23 13C2 PFDA										
515.00 > 470.00	3.583	3.595	-0.012		8722258	55.4		111	269787	
D 45 d3-NMeFOSAA										
573.00 > 419.00	3.740	3.731	0.009		15279	0.2028		0.0		
44 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.750	3.740	0.010	1.003	4104	NR				
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.891	3.899	-0.008	1.000	5244	0.0353				
D 46 d5-NEtFOSAA										
589.00 > 419.00	3.900	3.899	0.001		27779	0.3546		0.0		
D 27 13C2 PFUnA										
565.00 > 520.00	3.909	3.907	0.002		6741385	57.5		115	346546	
49 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.900	3.908	-0.008	1.000	7263	NR				
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.909	3.916	-0.007	1.000	19724	0.1530			578	
D 52 d-N-MeFOSA-M										
515.00 > 169.00	4.043	4.050	-0.007		3701	0.0389		0.0		
D 30 13C2 PFDoA										
615.00 > 570.00	4.200	4.203	-0.003		6151519	55.4		111	157918	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.193	4.203	-0.010	1.000	12398	0.1098			280	
D 51 d-N-EtFOSA-M										
531.00 > 169.00	4.239	4.233	0.006		3487	0.0406		0.0		
53 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.247	4.242	0.005	1.000	546	NR				
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.460	4.467	-0.007	1.000	15321	0.1373			187	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.702	4.711	-0.009		14912291	65.6		131	1362688	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.711	4.711	0.0	1.000	63957	0.3280			41.0	
713.00 > 169.00	4.694	4.711	-0.017	0.996	11085		5.77(0.00-0.00)		4654	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.111	5.112	-0.001	1.000	87579	0.1459			140	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.122	5.123	-0.001		6560285	52.7		105	133381	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.469	5.471	-0.002	1.000	8789	0.0693			11.7	

QC Flag Legend

Processing Flags

NR - Missing Quant Standard

Report Date: 18-Dec-2016 17:57:44 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_005.d

Injection Date: 16-Dec-2016 18:30:12 Instrument ID: A8_N

Lims ID: MB 320-140536/1-A

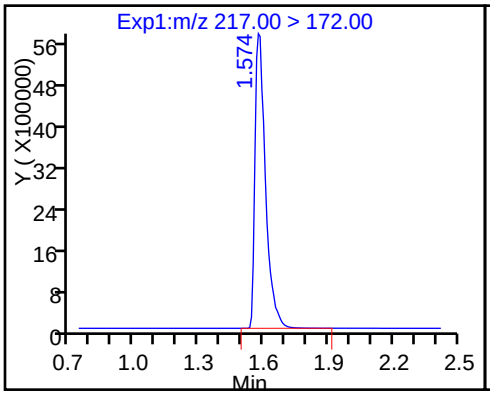
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 25 Worklist Smp#: 5

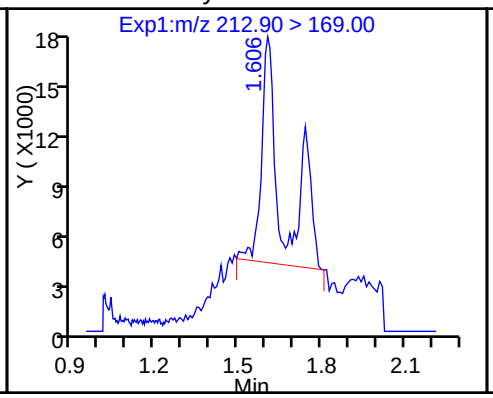
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

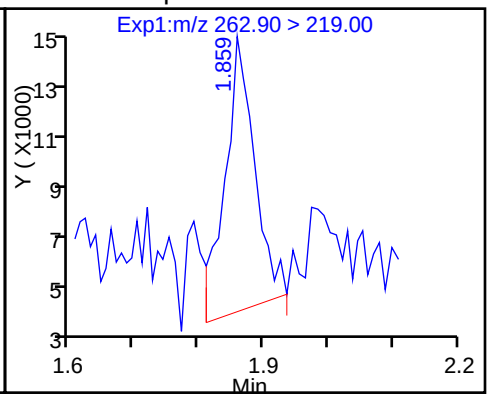
D 2 13C4 PFBA



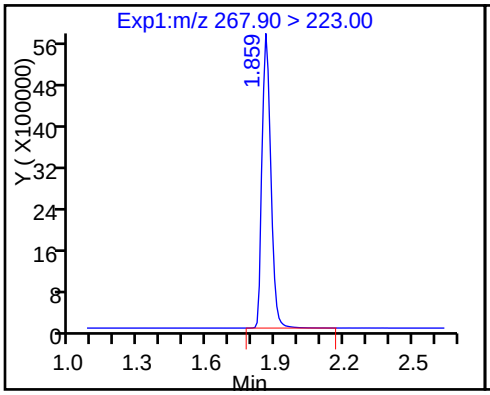
1 Perfluorobutyric acid



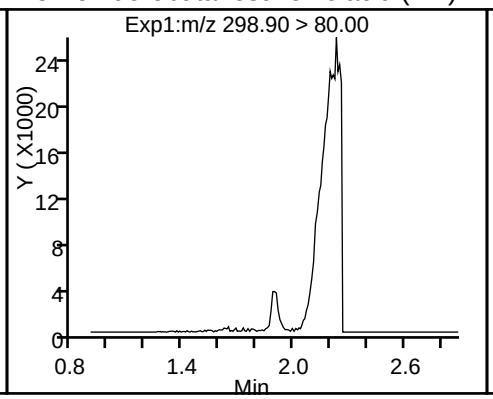
3 Perfluoropentanoic acid



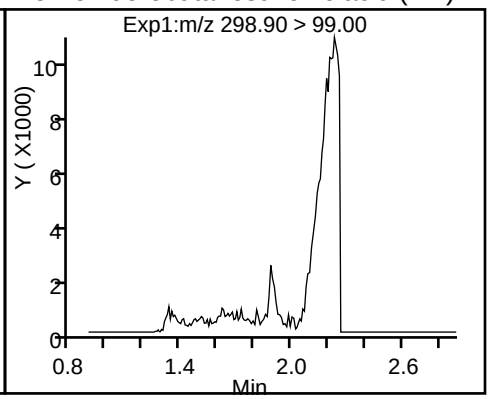
D 4 13C5-PFPeA



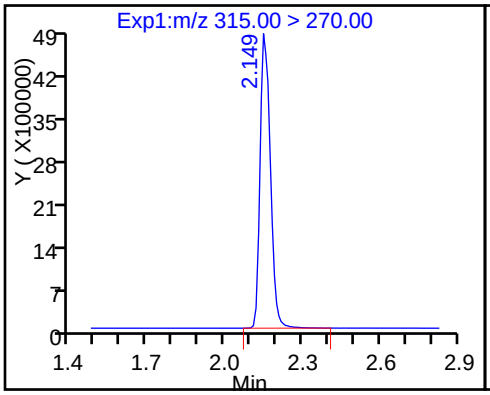
5 Perfluorobutanesulfonic acid (ND)



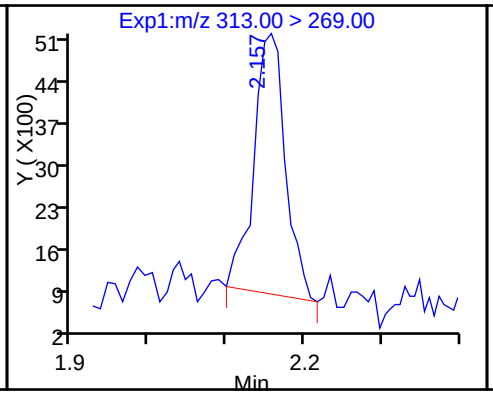
5 Perfluorobutanesulfonic acid (ND)



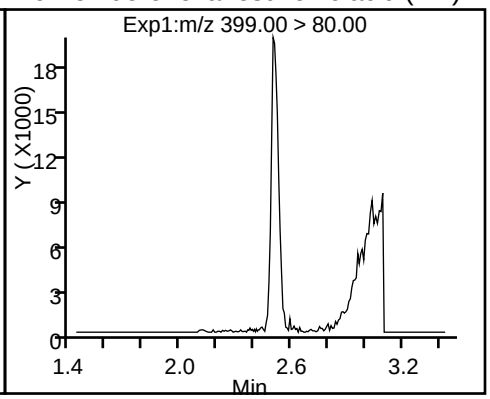
D 6 13C2 PFHxA



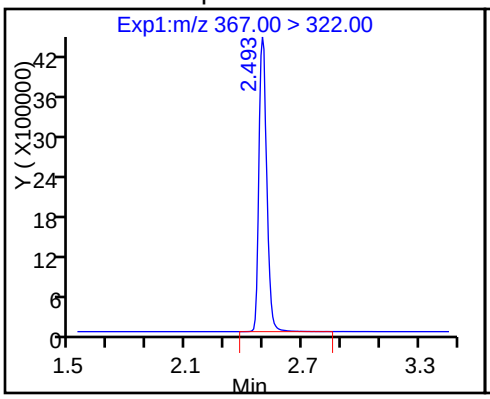
7 Perfluorohexanoic acid



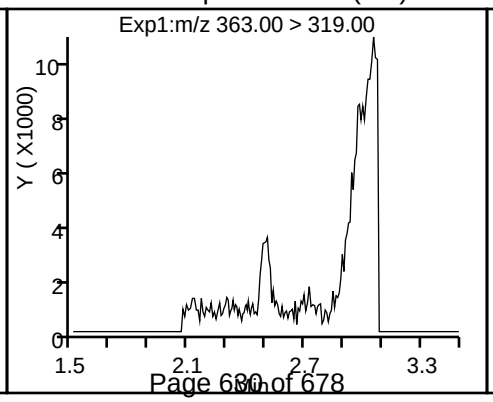
9 Perfluorohexanesulfonic acid (ND)



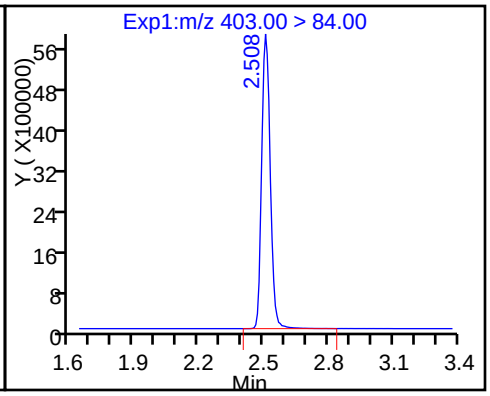
D 11 13C4-PFHpA



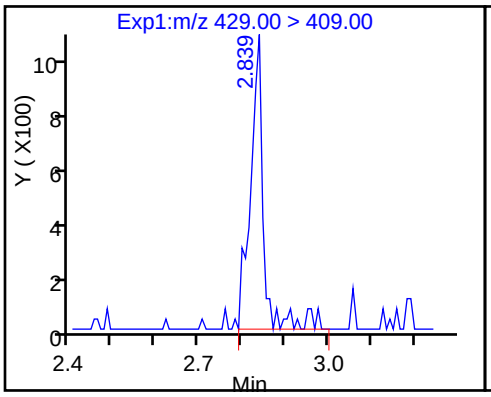
12 Perfluoroheptanoic acid (ND)



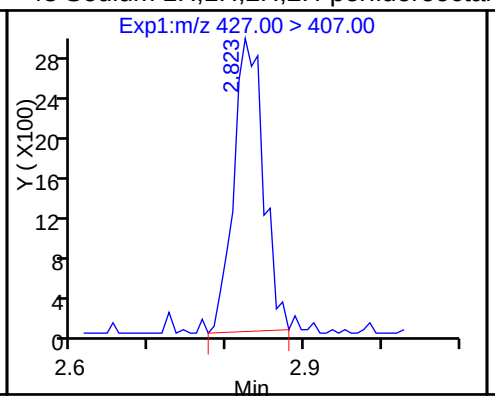
D 10 18O2 PFHxS



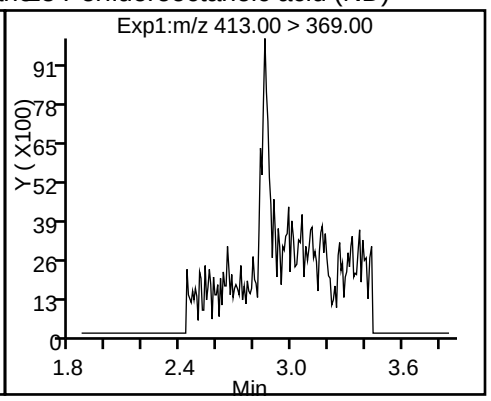
D 47 M2-6:2FTS



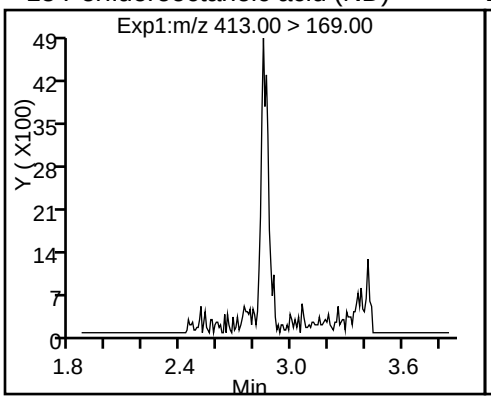
48 Sodium 1H,1H,2H,2H-perfluorooctane



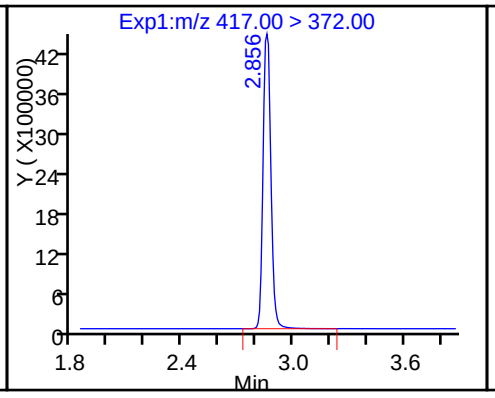
15 Perfluorooctanoic acid (ND)



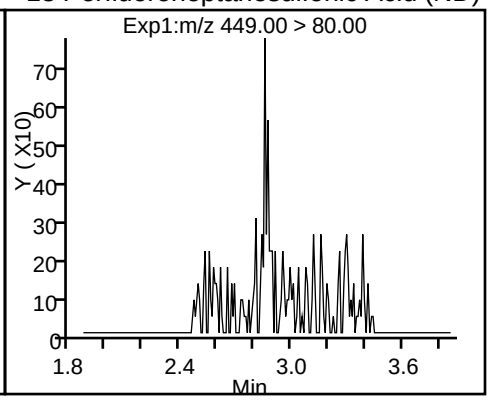
15 Perfluorooctanoic acid (ND)



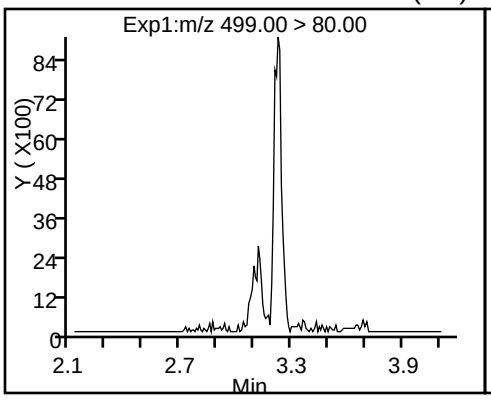
D 14 13C4 PFOA



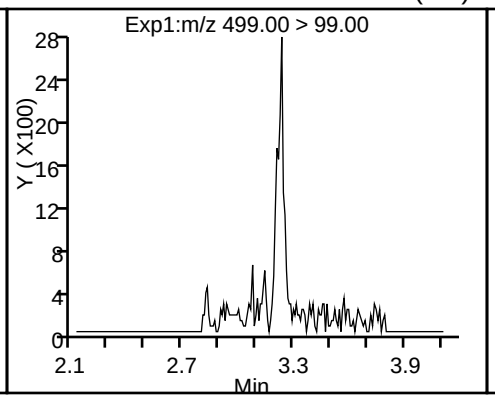
13 Perfluoroheptanesulfonic Acid (ND)



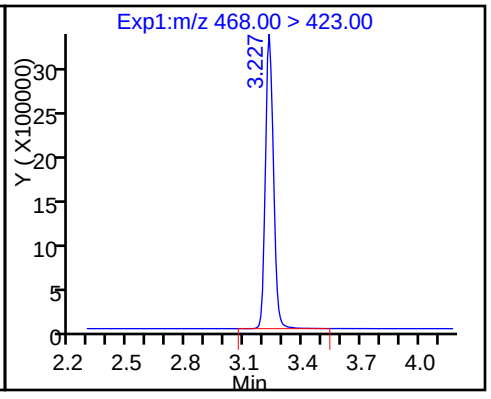
18 Perfluorooctane sulfonic acid (ND)



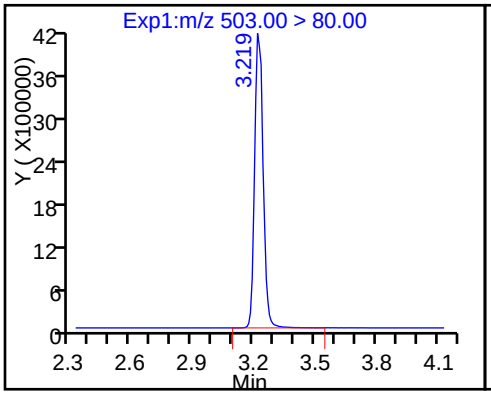
18 Perfluorooctane sulfonic acid (ND)



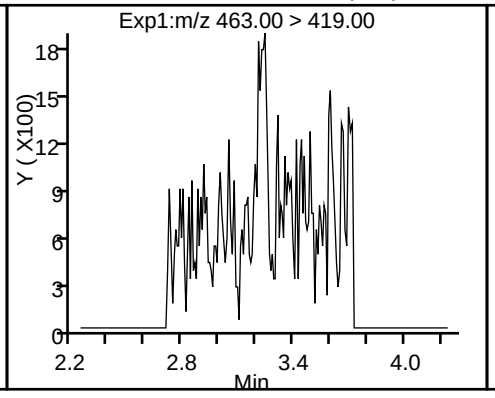
D 19 13C5 PFNA



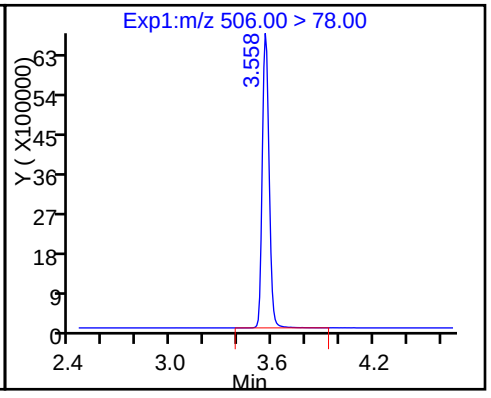
D 17 13C4 PFOS



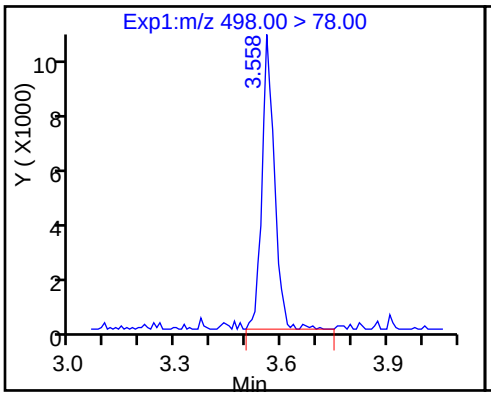
20 Perfluorononanoic acid (ND)



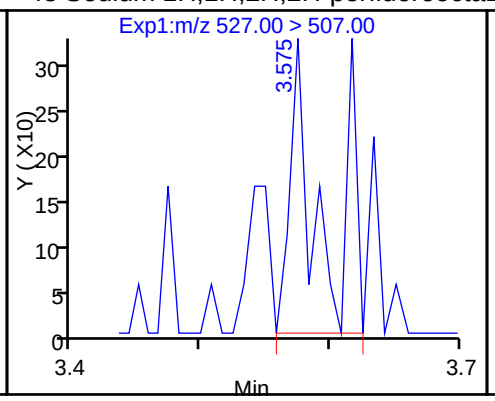
D 21 13C8 FOSA



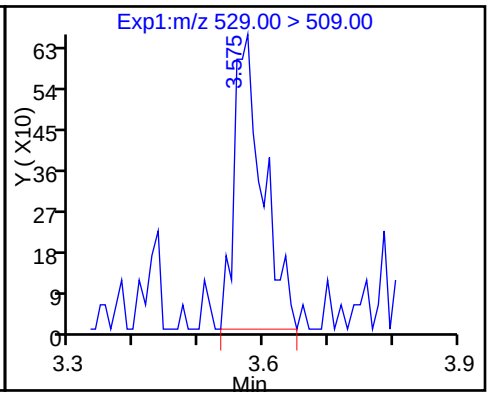
22 Perfluorooctane Sulfonamide



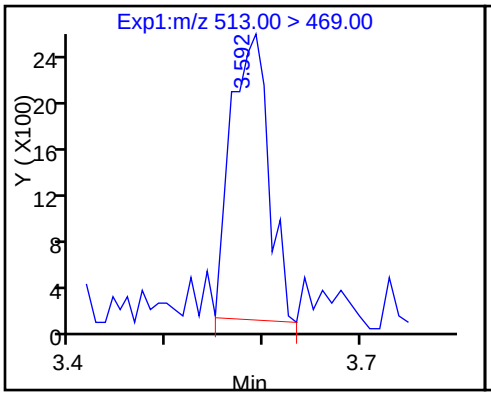
43 Sodium 1H,1H,2H,2H-perfluorooctane



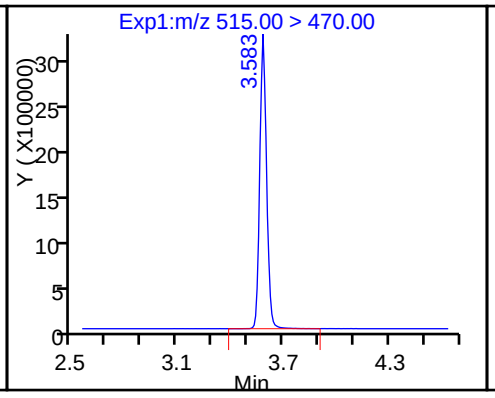
D 42 M2-8:2FTS



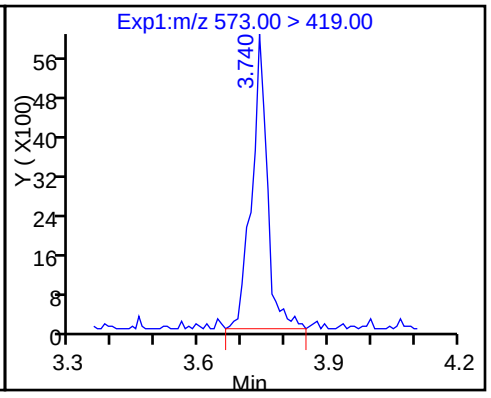
24 Perfluorodecanoic acid



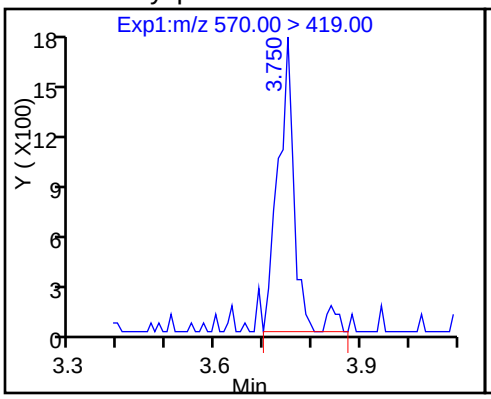
D 23 13C2 PFDA



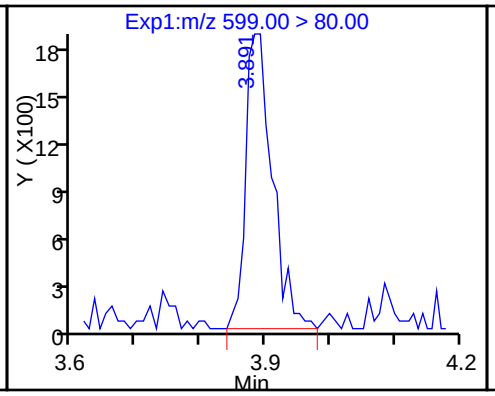
D 45 d3-NMeFOSAA



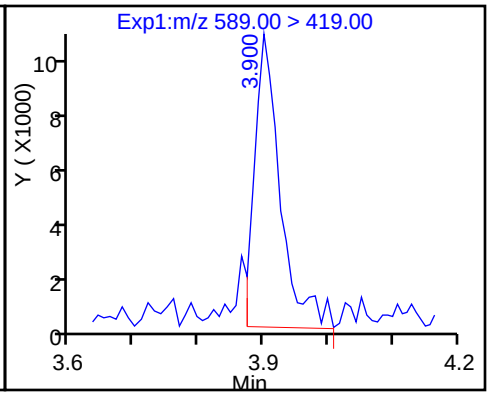
44 N-methyl perfluorooctane sulfonami



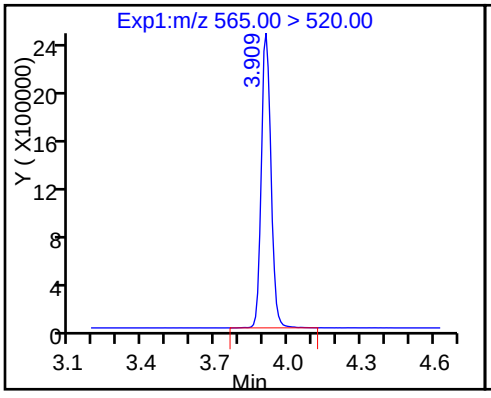
26 Perfluorodecane Sulfonic acid



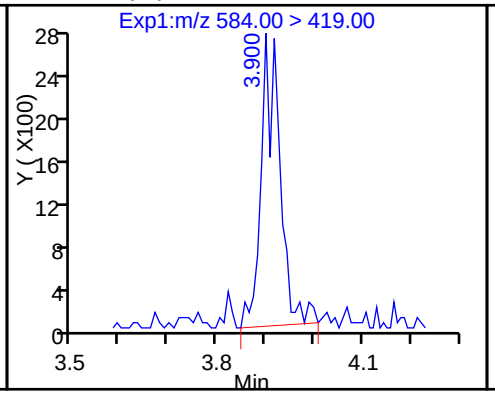
D 46 d5-NEtFOSAA



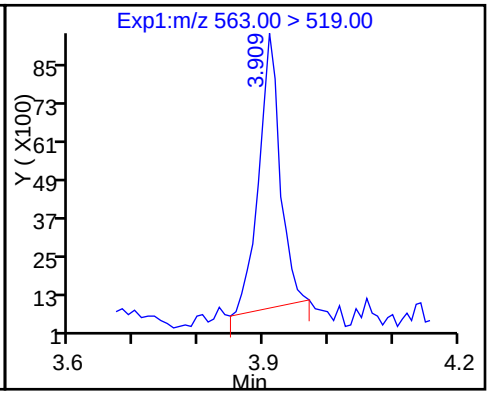
D 27 13C2 PFUnA



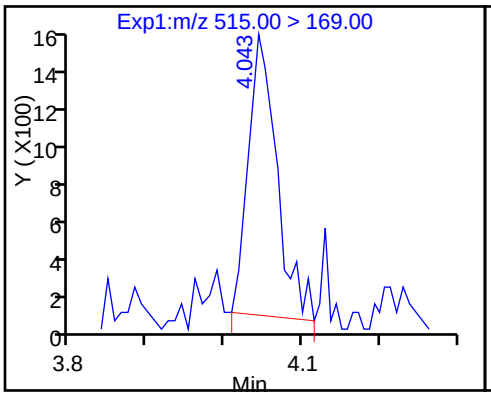
49 N-ethyl perfluorooctane sulfonamid



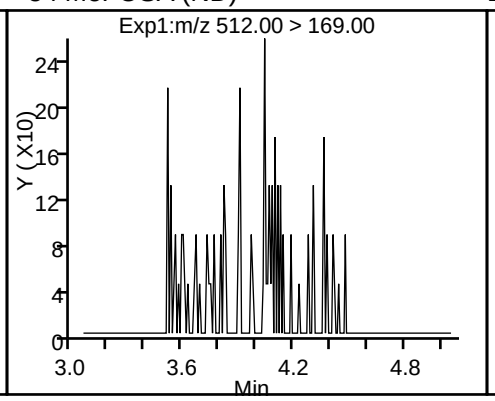
28 Perfluoroundecanoic acid



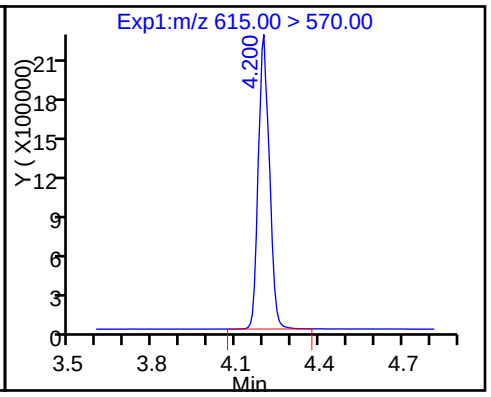
D 52 d-N-MeFOSA-M



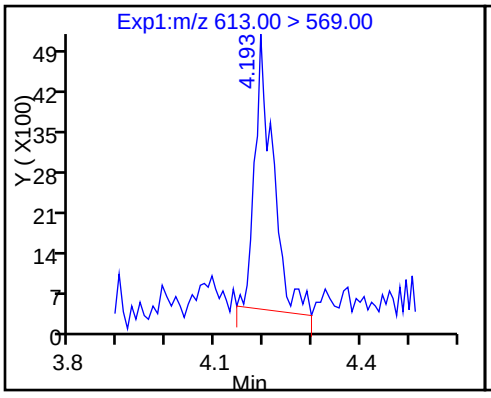
54 MeFOSA (ND)



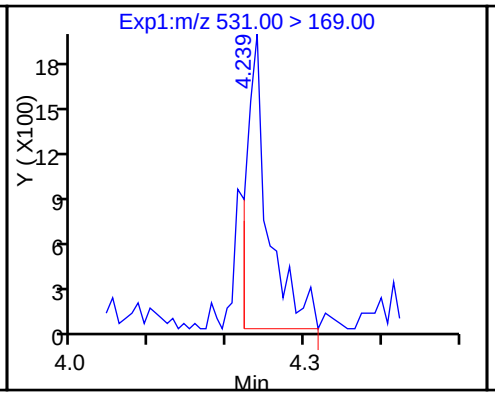
D 30 13C2 PFDoA



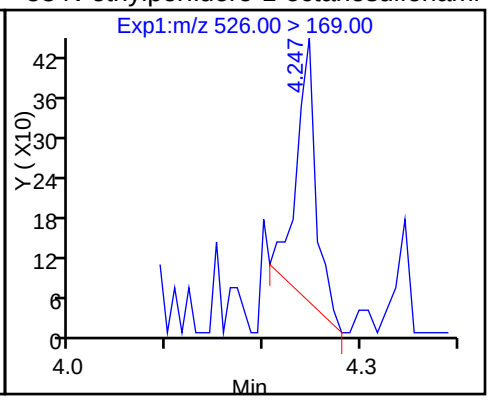
29 Perfluorododecanoic acid



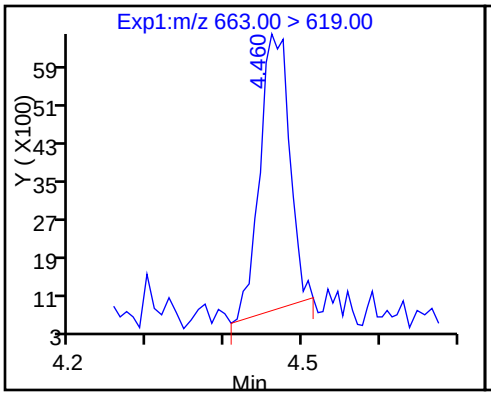
D 51 d-N-EtFOSA-M



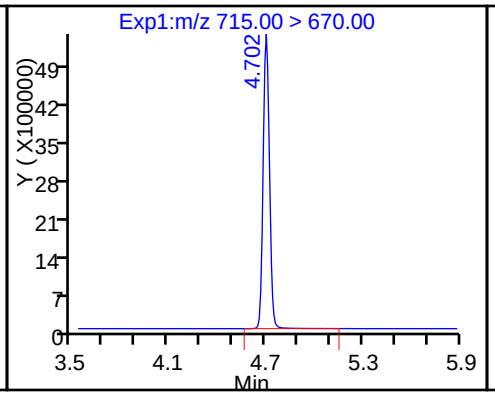
53 N-ethylperfluoro-1-octanesulfonami



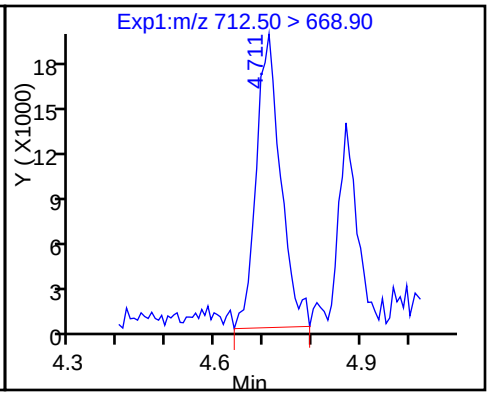
31 Perfluorotridecanoic acid



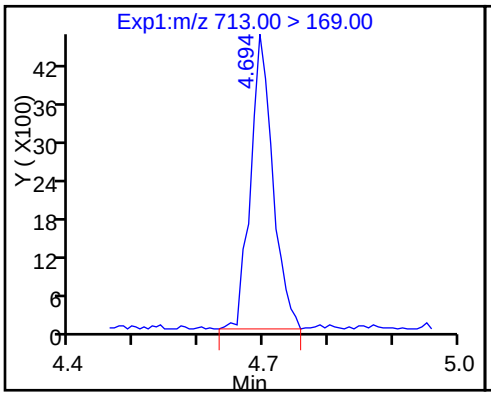
D 32 13C2-PFTeDA



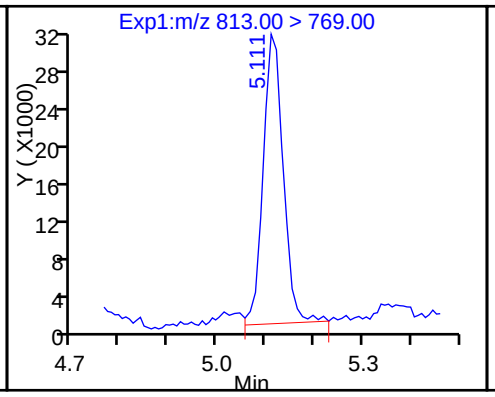
33 Perfluorotetradecanoic acid



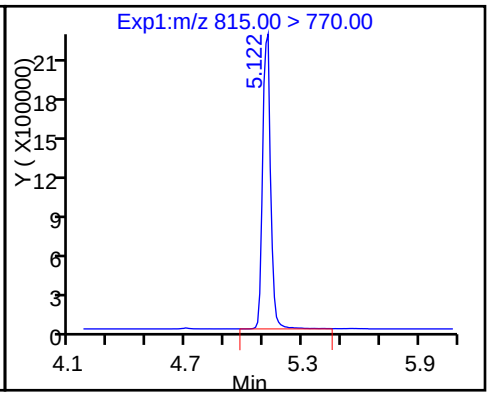
33 Perfluorotetradecanoic acid



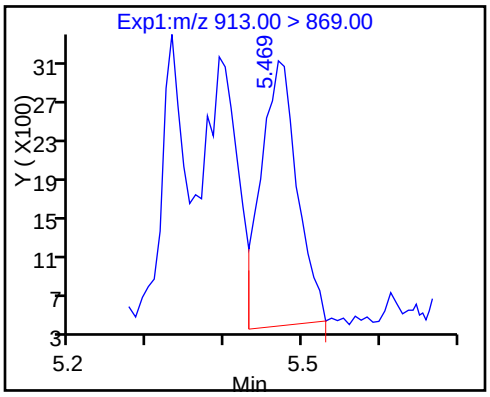
35 Perfluorohexadecanoic acid



D 34 13C2-PFHxDA



36 Perfluorooctadecanoic acid



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-23931-1

SDG No.:

Client Sample ID: | Lab Sample ID: LCS 320-140536/2-A

Matrix: Water | Lab File ID: 16DEC2016C_006.d

Analysis Method: 537 (Modified) | Date Collected:

Extraction Method: 3535 | Date Extracted: 12/05/2016 08:31

Sample wt/vol: 250(mL) | Date Analyzed: 12/16/2016 18:37

Con. Extract Vol.: 0.5(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 142751 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.0446		0.0025	0.0010	0.00046
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.0431		0.0025	0.0020	0.00099
307-24-4	Perfluorohexanoic acid (PFHxA)	0.0427		0.0025	0.0020	0.00079
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0443		0.0025	0.0020	0.00080
335-67-1	Perfluorooctanoic acid (PFOA)	0.0425		0.0025	0.0020	0.00075
375-95-1	Perfluorononanoic acid (PFNA)	0.0428		0.0025	0.0020	0.00065
335-76-2	Perfluorodecanoic acid (PFDA)	0.0420		0.0025	0.0010	0.00044
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0410		0.0025	0.0020	0.00075
307-55-1	Perfluorododecanoic acid (PFDoA)	0.0422		0.0025	0.0020	0.00058
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.0436		0.0025	0.0020	0.00055
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.0557		0.0025	0.0010	0.00040
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0464		0.0025	0.0020	0.00092
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.0375		0.0025	0.0020	0.00087
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0398		0.0040	0.0030	0.0013
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.0412		0.0040	0.0030	0.0012
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.0445		0.0025	0.0020	0.00064

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-23931-1

SDG No.:

Client Sample ID: | Lab Sample ID: LCS 320-140536/2-A

Matrix: Water | Lab File ID: 16DEC2016C_006.d

Analysis Method: 537 (Modified) | Date Collected:

Extraction Method: 3535 | Date Extracted: 12/05/2016 08:31

Sample wt/vol: 250(mL) | Date Analyzed: 12/16/2016 18:37

Con. Extract Vol.: 0.5(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 142751 | Units: ug/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	90		25-150
STL00992	13C4 PFBA	106		25-150
STL00993	13C2 PFHxA	103		25-150
STL00990	13C4 PFOA	103		25-150
STL00995	13C5 PFNA	103		25-150
STL00996	13C2 PFDA	104		25-150
STL00997	13C2 PFUnA	104		25-150
STL00998	13C2 PFDoA	107		25-150
STL00994	18O2 PFHxS	97		25-150
STL00991	13C4 PFOS	99		25-150
STL01893	13C5-PFPeA	109		25-150
STL01892	13C4-PFHpA	102		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_006.d
Lims ID: LCS 320-140536/2-A
Client ID:
Sample Type: LCS
Inject. Date: 16-Dec-2016 18:37:42 ALS Bottle#: 26 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: lcs 320-140536/2-a
Misc. Info.: Plate: 1 Rack: 2
Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 18-Dec-2016 17:57:40 Calib Date: 15-Dec-2016 14:18:33
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1 : Det: EXP1
Process Host: XAWRK028

First Level Reviewer: chandrasenas Date: 18-Dec-2016 17:27:56

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	1.582	0.0		18389320	52.9		106	917574	
1 Perfluorobutyric acid										
212.90 > 169.00	1.582	1.582	0.0	1.000	7007122	22.3		112	55582	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.858	1.858	0.0	1.000	6199007	21.6		108	47966	
D 4 13C5-PFPeA										
267.90 > 223.00	1.868	1.858	0.010		14564444	54.7		109	1678666	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.896	1.896	0.0	1.000	10425428	23.2		131		
298.90 > 99.00	1.896	1.896	0.0	1.000	4415290		2.36(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.155	2.155	0.0		12569897	51.3		103	888806	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.155	2.164	-0.009	1.000	4990056	21.4		107	142842	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.506	2.433	0.073	1.000	6122274	18.7		103		
D 11 13C4-PFHpA										
367.00 > 322.00	2.498	2.494	0.004		11541421	51.0		102	825827	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.498	2.502	-0.004	1.000	5005270	22.2		111	52361	
D 10 18O2 PFHxS										
403.00 > 84.00	2.506	2.510	-0.004		15013039	45.9		97.1	1378047	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.854	2.858	-0.004	1.000	5064631	21.2		106	46975	
413.00 > 169.00	2.854	2.858	-0.004	1.000	3129880		1.62(0.90-1.10)		154787	
D 14 13C4 PFOA										
417.00 > 372.00	2.854	2.858	-0.004		11889539	51.6		103	2017281	

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	2.862	2.866	-0.004	1.000	5607115	20.7		109		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.118	3.115	0.003	1.000	4865808	19.9		107	57594	
499.00 > 99.00	3.225	3.115	0.110	1.034	1032370		4.71(0.90-1.10)		103992	
D 19 13C5 PFNA										
468.00 > 423.00	3.225	3.230	-0.005		9122612	51.3		103	762484	
D 17 13C4 PFOS										
503.00 > 80.00	3.225	3.230	-0.005		11750191	47.2		98.8	463895	
20 Perfluorononanoic acid										
463.00 > 419.00	3.225	3.239	-0.014	1.000	3719381	21.4		107	73124	
D 21 13C8 FOSA										
506.00 > 78.00	3.565	3.561	0.004		17278317	45.0		90.0	503834	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.556	3.561	-0.005	1.000	7178236	22.3		111	187210	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.581	3.586	-0.005	1.000	3237951	21.0		105	102755	
D 23 13C2 PFDA										
515.00 > 470.00	3.581	3.595	-0.014		8174372	52.0		104	284307	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.891	3.899	-0.008	1.000	2955627	20.6		107		
D 27 13C2 PFUnA										
565.00 > 520.00	3.917	3.907	0.010		6116801	52.2		104	414310	
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.917	3.916	0.001	1.000	2398461	20.5		103	49616	
D 30 13C2 PFDoA										
615.00 > 570.00	4.202	4.203	-0.001		5924429	53.4		107	215870	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.202	4.203	-0.001	1.000	2292380	21.1		105	54764	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.471	4.467	0.004	1.000	2343702	21.8		109	39835	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.698	4.711	-0.013		14686506	64.6		129	722298	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.698	4.711	-0.013	1.000	5225598	27.8		139	6130	
713.00 > 169.00	4.698	4.711	-0.013	1.000	885252		5.90(0.00-0.00)		112861	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.114	5.112	0.002	1.000	2115780	18.1		90.5	4622	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.114	5.123	-0.009		5582988	44.8		89.6	172368	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.471	5.471	0.0	1.000	2173117	17.8		89.0	4270	

Report Date: 18-Dec-2016 17:57:46 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_006.d

Injection Date: 16-Dec-2016 18:37:42 Instrument ID: A8_N

Lims ID: LCS 320-140536/2-A

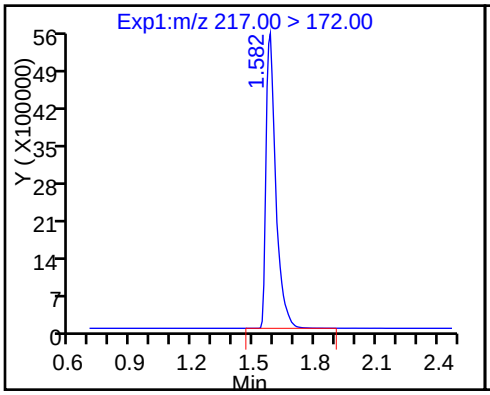
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 26 Worklist Smp#: 6

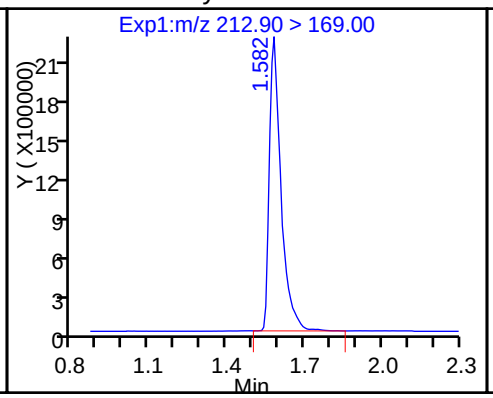
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

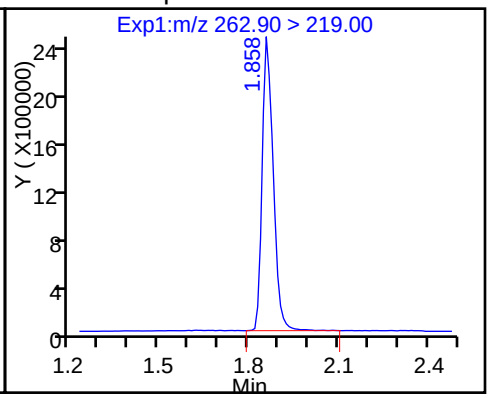
D 2 13C4 PFBA



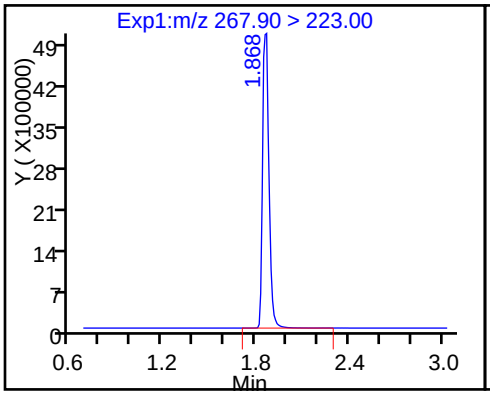
1 Perfluorobutyric acid



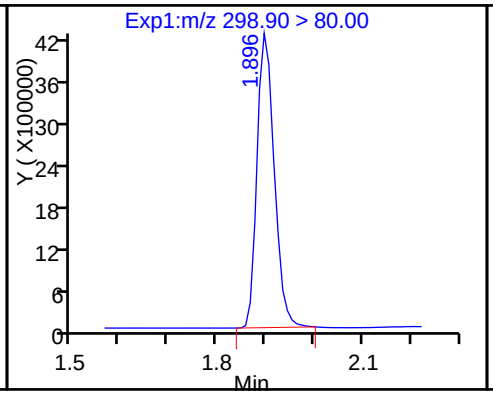
3 Perfluoropentanoic acid



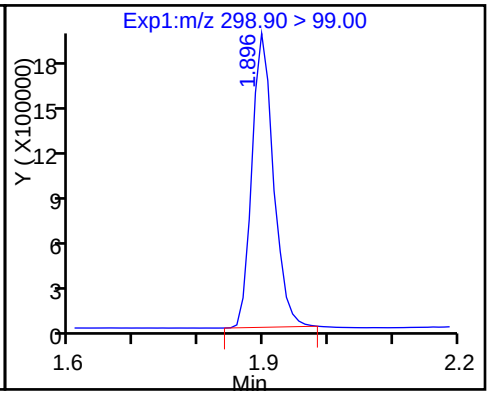
D 4 13C5-PFPeA



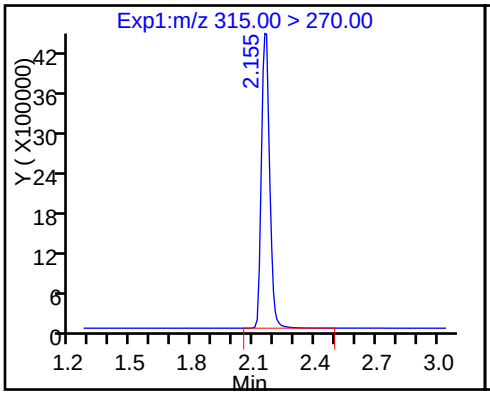
5 Perfluorobutanesulfonic acid



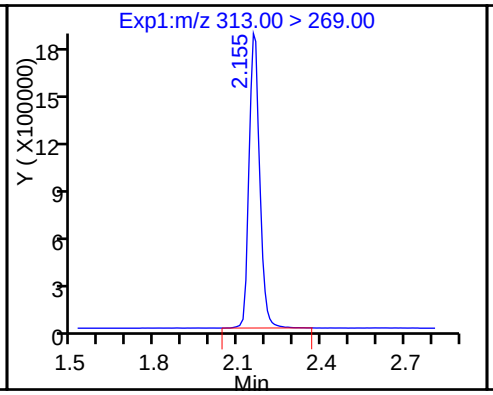
5 Perfluorobutanesulfonic acid



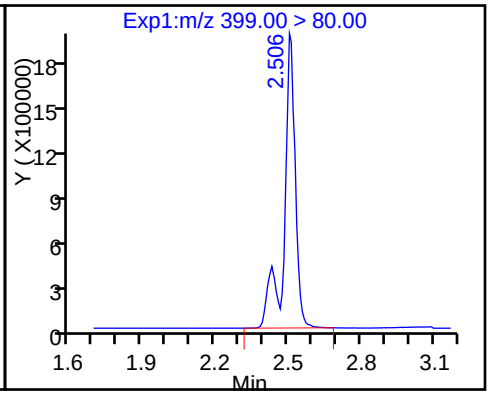
D 6 13C2 PFHxA



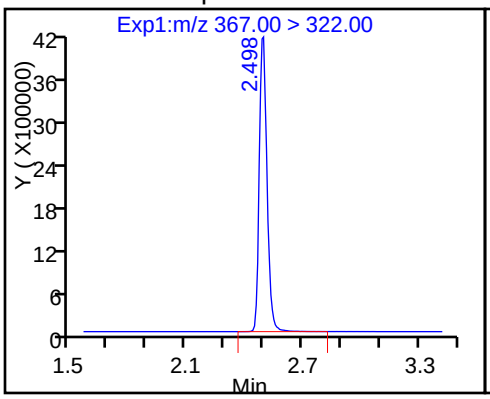
7 Perfluorohexanoic acid



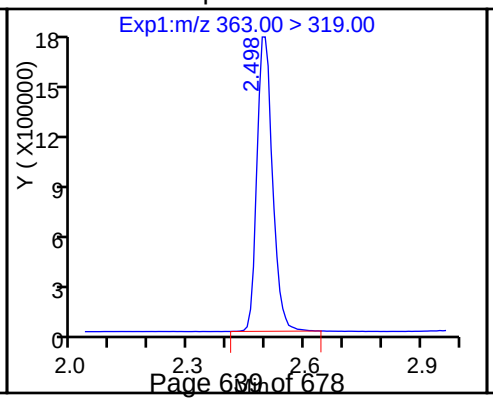
9 Perfluorohexanesulfonic acid



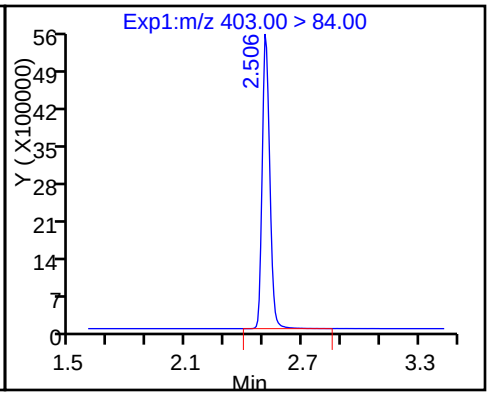
D 11 13C4-PFHpA



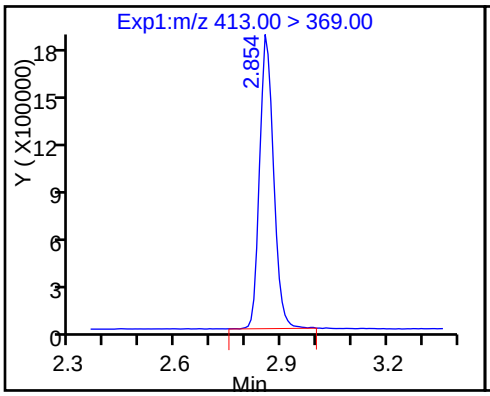
12 Perfluoroheptanoic acid



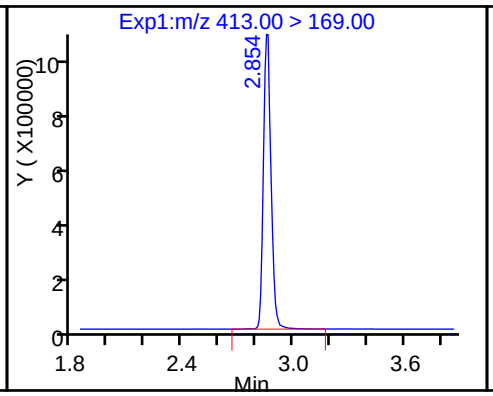
D 10 18O2 PFHxS



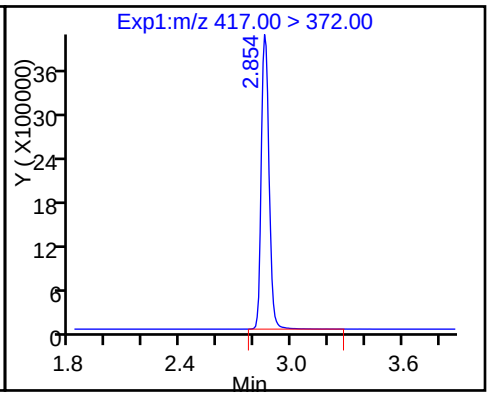
15 Perfluorooctanoic acid



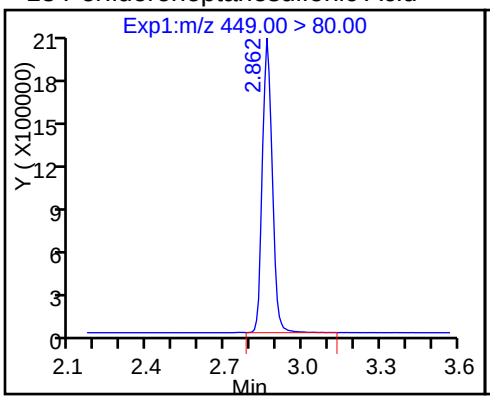
15 Perfluorooctanoic acid



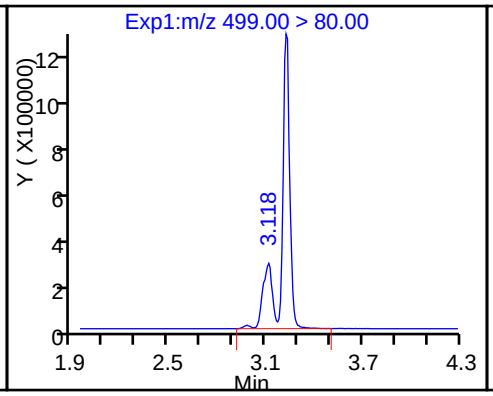
D 14 13C4 PFOA



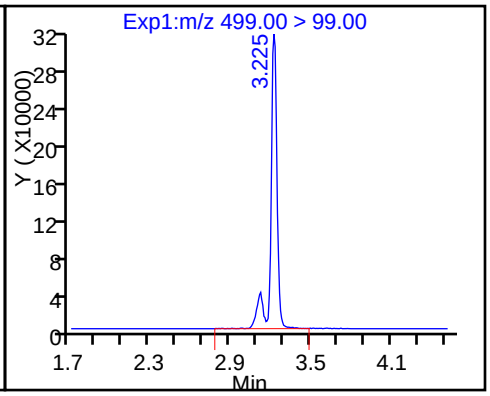
13 Perfluoroheptanesulfonic Acid



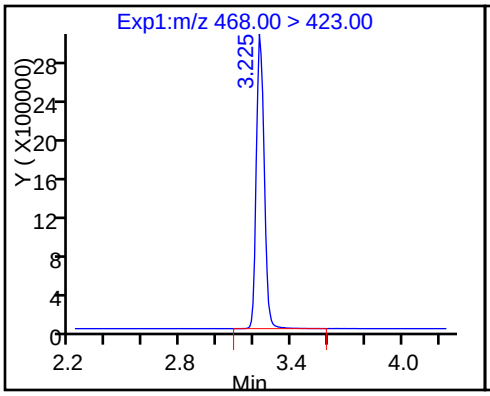
18 Perfluorooctane sulfonic acid



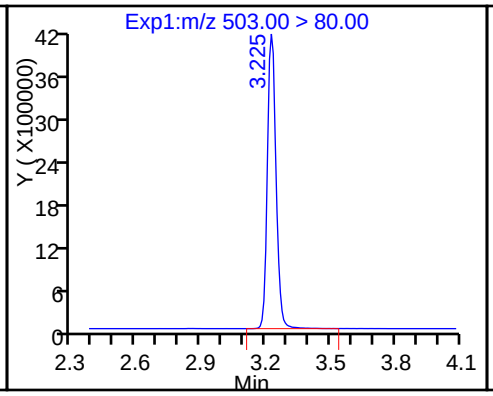
18 Perfluorooctane sulfonic acid



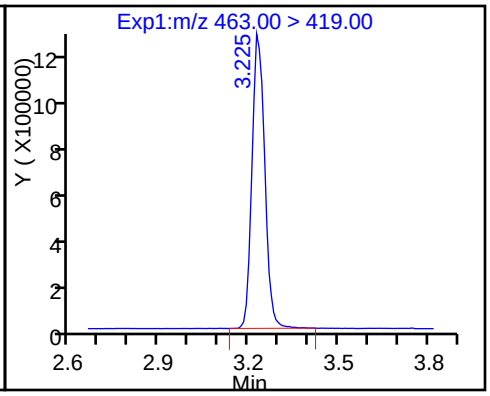
D 19 13C5 PFNA



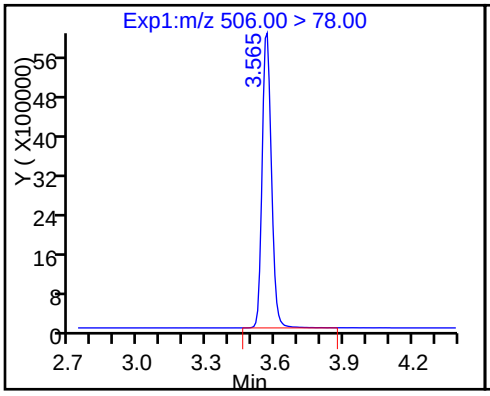
D 17 13C4 PFOS



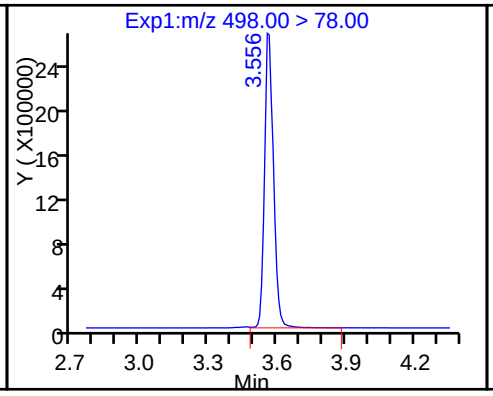
20 Perfluorononanoic acid



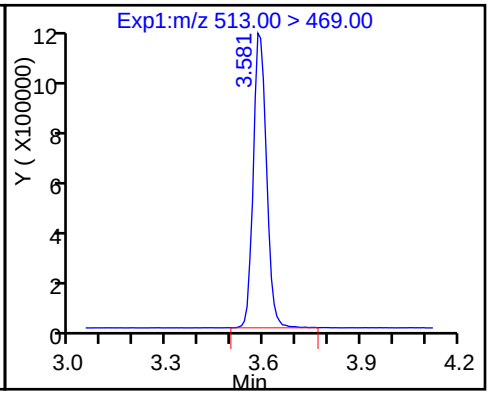
D 21 13C8 FOSA



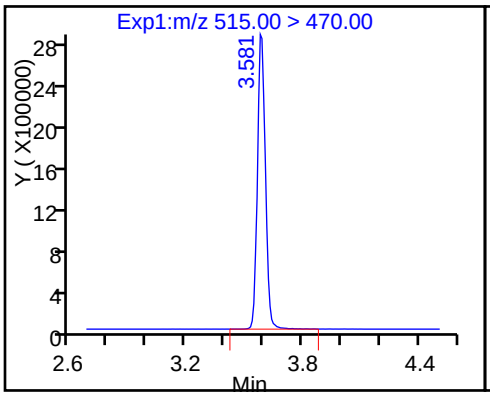
22 Perfluorooctane Sulfonamide



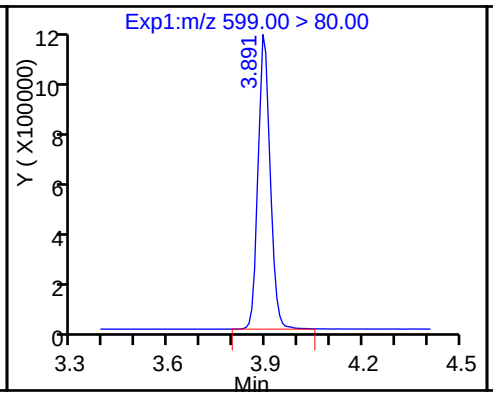
24 Perfluorodecanoic acid



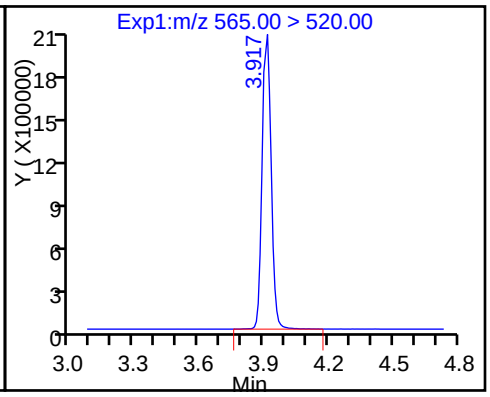
D 23 13C2 PFDA



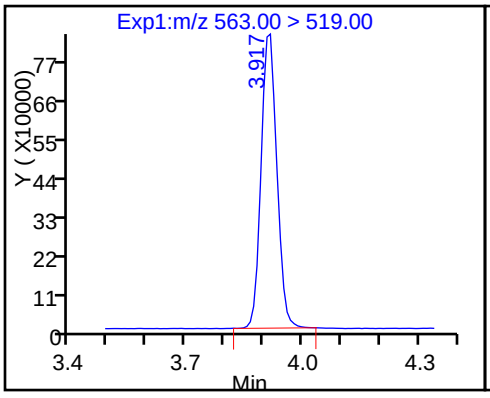
26 Perfluorodecane Sulfonic acid



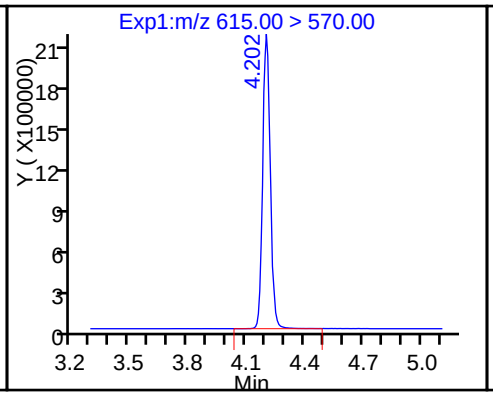
D 27 13C2 PFUnA



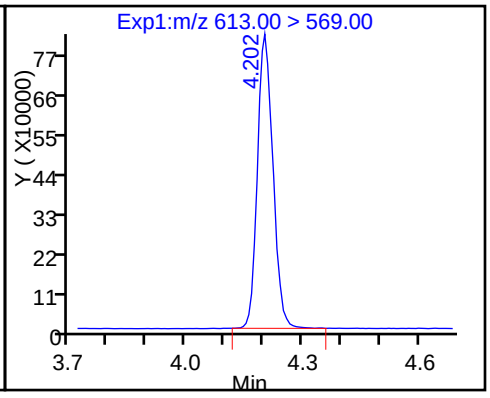
28 Perfluoroundecanoic acid



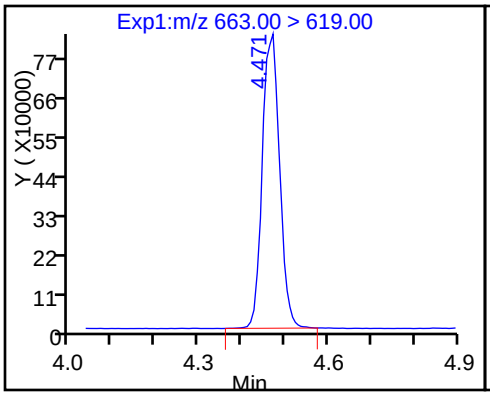
D 30 13C2 PFDoA



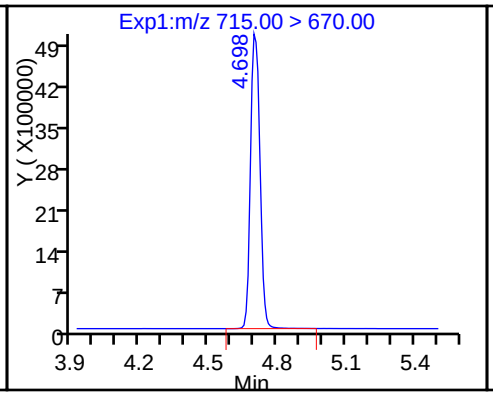
29 Perfluorododecanoic acid



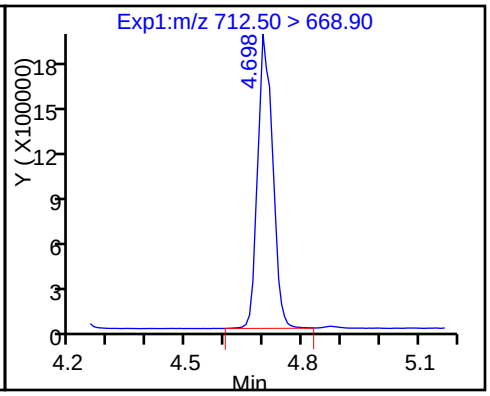
31 Perfluorotridecanoic acid



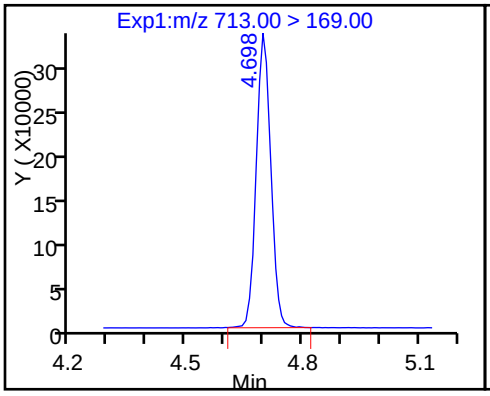
D 32 13C2-PFTeDA



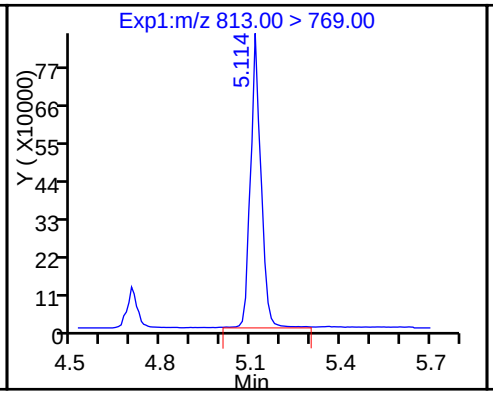
33 Perfluorotetradecanoic acid



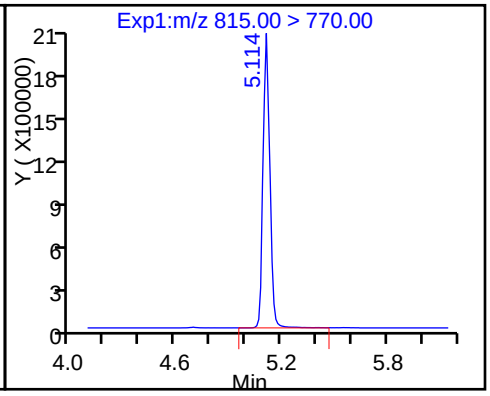
33 Perfluorotetradecanoic acid



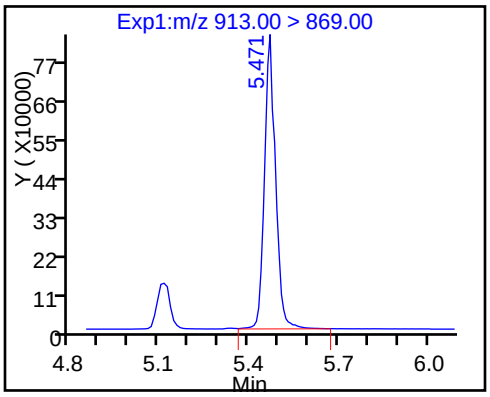
35 Perfluorohexadecanoic acid



D 34 13C2-PFHxDA



36 Perfluorooctadecanoic acid



LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Instrument ID: A8_N Start Date: 12/15/2016 12:06

Analysis Batch Number: 142379 End Date: 12/15/2016 19:54

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
RB 320-142379/1 CCB		12/15/2016 12:06	1		Acquity 2.1(mm)
RB 320-142379/2 CCB		12/15/2016 12:14	1		Acquity 2.1(mm)
RB 320-142379/3 CCB		12/15/2016 12:21	1		Acquity 2.1(mm)
IC 320-142379/4		12/15/2016 12:29	1	15DEC2016B_004.d	Acquity 2.1(mm)
IC 320-142379/5		12/15/2016 12:36	1	15DEC2016B_005.d	Acquity 2.1(mm)
IC 320-142379/6		12/15/2016 12:44	1	15DEC2016B_006.d	Acquity 2.1(mm)
IC 320-142379/7		12/15/2016 12:51	1	15DEC2016B_007.d	Acquity 2.1(mm)
IC 320-142379/8		12/15/2016 12:59	1	15DEC2016B_008.d	Acquity 2.1(mm)
IC 320-142379/9		12/15/2016 13:06	1	15DEC2016B_009.d	Acquity 2.1(mm)
ICB 320-142379/10		12/15/2016 13:14	1		Acquity 2.1(mm)
ICV 320-142379/11		12/15/2016 13:21	1	15DEC2016B_011.d	Acquity 2.1(mm)
IC 320-142379/13		12/15/2016 13:41	1	15DEC2016BB_013.d	Acquity 2.1(mm)
IC 320-142379/14		12/15/2016 13:48	1	15DEC2016B_014.d	Acquity 2.1(mm)
IC 320-142379/15		12/15/2016 13:56	1	15DEC2016B_015.d	Acquity 2.1(mm)
IC 320-142379/16		12/15/2016 14:03	1	15DEC2016B_016.d	Acquity 2.1(mm)
IC 320-142379/17		12/15/2016 14:11	1	15DEC2016B_017.d	Acquity 2.1(mm)
IC 320-142379/18		12/15/2016 14:18	1	15DEC2016B_018.d	Acquity 2.1(mm)
ICB 320-142379/19		12/15/2016 14:26	1		Acquity 2.1(mm)
ICV 320-142379/20		12/15/2016 14:33	1		Acquity 2.1(mm)
RB 320-142379/21 CCB		12/15/2016 14:41	1		Acquity 2.1(mm)
CCV 320-142379/24		12/15/2016 15:46	1		Acquity 2.1(mm)
RB 320-142379/25 CCB		12/15/2016 15:54	1		Acquity 2.1(mm)
ZZZZZ		12/15/2016 16:01	1		Acquity 2.1(mm)
CCV 320-142379/27		12/15/2016 16:09	1		Acquity 2.1(mm)
RB 320-142379/28 CCB		12/15/2016 16:16	1		Acquity 2.1(mm)
ZZZZZ		12/15/2016 16:24	1		Acquity 2.1(mm)
ZZZZZ		12/15/2016 16:31	1		Acquity 2.1(mm)
ZZZZZ		12/15/2016 16:39	1		Acquity 2.1(mm)
ZZZZZ		12/15/2016 16:46	1		Acquity 2.1(mm)
ZZZZZ		12/15/2016 16:54	1		Acquity 2.1(mm)
ZZZZZ		12/15/2016 17:01	1		Acquity 2.1(mm)
ZZZZZ		12/15/2016 17:09	1		Acquity 2.1(mm)
ZZZZZ		12/15/2016 17:16	1		Acquity 2.1(mm)
ZZZZZ		12/15/2016 17:24	1		Acquity 2.1(mm)
RB 320-142379/44 CCB		12/15/2016 19:47	1		Acquity 2.1(mm)
CCV 320-142379/42		12/15/2016 19:54	1		Acquity 2.1(mm)

537 (Modified)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Instrument ID: A8_N Start Date: 12/16/2016 10:15

Analysis Batch Number: 142571 End Date: 12/16/2016 10:30

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
RB 320-142571/3 CCB		12/16/2016 10:15	1		Acquity 2.1(mm)
CCV 320-142571/4 CCVL		12/16/2016 10:23	1	16DEC2016A_002.d	Acquity 2.1(mm)
CCV 320-142571/5 CCVL		12/16/2016 10:30	1		Acquity 2.1(mm)

537 (Modified)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Instrument ID: A8_N Start Date: 12/16/2016 18:00

Analysis Batch Number: 142751 End Date: 12/16/2016 21:52

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
RB 320-142751/1 CCB		12/16/2016 18:00	1		Acquity 2.1(mm)
CCV 320-142751/2		12/16/2016 18:07	1	16DEC2016C_002.d	Acquity 2.1(mm)
CCV 320-142751/3		12/16/2016 18:15	1		Acquity 2.1(mm)
RB 320-142751/4 CCB		12/16/2016 18:22	1		Acquity 2.1(mm)
MB 320-140536/1-A		12/16/2016 18:30	1	16DEC2016C_005.d	Acquity 2.1(mm)
LCS 320-140536/2-A		12/16/2016 18:37	1	16DEC2016C_006.d	Acquity 2.1(mm)
ZZZZZ		12/16/2016 18:45	1		Acquity 2.1(mm)
ZZZZZ		12/16/2016 18:52	1		Acquity 2.1(mm)
ZZZZZ		12/16/2016 19:00	1		Acquity 2.1(mm)
ZZZZZ		12/16/2016 19:07	1		Acquity 2.1(mm)
ZZZZZ		12/16/2016 19:15	1		Acquity 2.1(mm)
ZZZZZ		12/16/2016 19:22	1		Acquity 2.1(mm)
320-23931-1		12/16/2016 19:30	1	16DEC2016C_013.d	Acquity 2.1(mm)
320-23931-2		12/16/2016 19:37	1	16DEC2016C_014.d	Acquity 2.1(mm)
RB 320-142751/15 CCB		12/16/2016 19:45	1		Acquity 2.1(mm)
CCV 320-142751/16		12/16/2016 19:52	1	16DEC2016C_016.d	Acquity 2.1(mm)
CCV 320-142751/17		12/16/2016 20:00	1		Acquity 2.1(mm)
RB 320-142751/18 CCB		12/16/2016 20:07	1		Acquity 2.1(mm)
320-23931-3		12/16/2016 20:15	1	16DEC2016C_019.d	Acquity 2.1(mm)
320-23931-4		12/16/2016 20:22	1	16DEC2016C_020.d	Acquity 2.1(mm)
320-23931-5		12/16/2016 20:30	1	16DEC2016C_021.d	Acquity 2.1(mm)
320-23931-6		12/16/2016 20:37	1	16DEC2016C_022.d	Acquity 2.1(mm)
ZZZZZ		12/16/2016 20:45	1		Acquity 2.1(mm)
ZZZZZ		12/16/2016 20:52	1		Acquity 2.1(mm)
ZZZZZ		12/16/2016 21:00	1		Acquity 2.1(mm)
ZZZZZ		12/16/2016 21:07	1		Acquity 2.1(mm)
ZZZZZ		12/16/2016 21:15	1		Acquity 2.1(mm)
ZZZZZ		12/16/2016 21:22	1		Acquity 2.1(mm)
RB 320-142751/29 CCB		12/16/2016 21:30	1		Acquity 2.1(mm)
CCV 320-142751/30		12/16/2016 21:37	1	16DEC2016C_030.d	Acquity 2.1(mm)
CCV 320-142751/31		12/16/2016 21:45	1		Acquity 2.1(mm)
RB 320-142751/32 CCB		12/16/2016 21:52	1		Acquity 2.1(mm)

537 (Modified)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Instrument ID: A8_N Start Date: 12/20/2016 17:29

Analysis Batch Number: 143259 End Date: 12/20/2016 20:29

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
RB 320-143259/1 CCB		12/20/2016 17:29	1		Acquity 2.1(mm)
CCV 320-143259/2		12/20/2016 17:37	1	20DEC2016C_002.d	Acquity 2.1(mm)
CCV 320-143259/3		12/20/2016 17:44	1		Acquity 2.1(mm)
RB 320-143259/4 CCB		12/20/2016 17:52	1		Acquity 2.1(mm)
ZZZZZ		12/20/2016 17:59	1		Acquity 2.1(mm)
ZZZZZ		12/20/2016 18:07	1		Acquity 2.1(mm)
ZZZZZ		12/20/2016 18:14	100		Acquity 2.1(mm)
320-23931-2 DL		12/20/2016 18:22	100	20DEC2016C_008.d	Acquity 2.1(mm)
ZZZZZ		12/20/2016 18:29	100		Acquity 2.1(mm)
320-23931-1 DL		12/20/2016 18:37	50	20DEC2016C_010.d	Acquity 2.1(mm)
ZZZZZ		12/20/2016 18:44	1		Acquity 2.1(mm)
320-23931-3 RA		12/20/2016 18:52	1	20DEC2016C_012.d	Acquity 2.1(mm)
320-23931-4 RA		12/20/2016 18:59	1	20DEC2016C_013.d	Acquity 2.1(mm)
320-23931-5 RA		12/20/2016 19:07	1	20DEC2016C_014.d	Acquity 2.1(mm)
RB 320-143259/15 CCB		12/20/2016 19:14	1		Acquity 2.1(mm)
CCV 320-143259/16		12/20/2016 19:22	1	20DEC2016C_016.d	Acquity 2.1(mm)
CCV 320-143259/17		12/20/2016 19:29	1		Acquity 2.1(mm)
RB 320-143259/18 CCB		12/20/2016 19:37	1		Acquity 2.1(mm)
ZZZZZ		12/20/2016 19:44	1		Acquity 2.1(mm)
ZZZZZ		12/20/2016 19:52	1		Acquity 2.1(mm)
ZZZZZ		12/20/2016 19:59	1		Acquity 2.1(mm)
RB 320-143259/22 CCB		12/20/2016 20:07	1		Acquity 2.1(mm)
CCV 320-143259/23		12/20/2016 20:14	1		Acquity 2.1(mm)
CCV 320-143259/24		12/20/2016 20:22	1		Acquity 2.1(mm)
RB 320-143259/25 CCB		12/20/2016 20:29	1		Acquity 2.1(mm)

537 (Modified)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Batch Number: 140536 Batch Start Date: 12/05/16 08:28 Batch Analyst: Arauz, Horacio J

Batch Method: 3535 Batch End Date: 12/06/16 14:30

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	LCMPFCSU 00046	LCPFCSP 00070
MB 320-140536/1		3535, 537 (Modified)				250 mL	0.5 mL	25 uL	
LCS 320-140536/2		3535, 537 (Modified)				250 mL	0.5 mL	25 uL	20 uL
320-23931-B-1	608D132MW-LF-1116	3535, 537 (Modified)	T	291.44 g	26.94 g	264.5 mL	0.5 mL	25 uL	
320-23931-A-2	608D33MW-LF-1116	3535, 537 (Modified)	T	287.40 g	27.19 g	260.2 mL	0.5 mL	25 uL	
320-23931-A-3	61301MW-LF-1116	3535, 537 (Modified)	T	292.42 g	26.95 g	265.5 mL	0.5 mL	25 uL	
320-23931-A-4	613D41MW-LF-1116	3535, 537 (Modified)	T	292.31 g	26.61 g	265.7 mL	0.5 mL	25 uL	
320-23931-A-5	613D39MW-LF-1116	3535, 537 (Modified)	T	304.37 g	26.73 g	277.6 mL	0.5 mL	25 uL	
320-23931-A-6	FB113016	3535, 537 (Modified)	T	307.13 g	26.94 g	280.2 mL	0.5 mL	25 uL	

Batch Notes	
Balance ID	QA-070
Batch Comment	0.1N NAOH/H2O 758321
H2O ID	12-05-16
Hexane ID	0000146278
Manifold ID	5, 6
Methanol ID	789822
Pipette ID	MD05306
Analyst ID - Reagent Drop	HJA
Analyst ID - SU Reagent Drop	HJA
Analyst ID - SU Reagent Drop Witness	NSH
Solvent Lot #	794501
Solvent Name	0.3% NH4OH/MeOH
SOP Number	WS-LC-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.

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Batch Number: 140536 Batch Start Date: 12/05/16 08:28 Batch Analyst: Arauz, Horacio J

Batch Method: 3535 Batch End Date: 12/06/16 14:30

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

West Sacramento

HPLC/LCMS Data Review Checklist

Job Number(s): 23884; 23931; 23966; 23990 (23996 12/21/2016 new) Work List ID(s): 37972; 38078; 38075

Extraction Batch: 140536; 142964; 140852 Analysis Batch(es): 142751; 143259; 143248; 143249

Delivery Rank 4 Due Date: 12/6/16; 12/7/16

A. Calibration/Instrument Run QC	1st Level	2nd Level	N/A
1. ICAL locked in Chrom and TALS? ICAL Batch# 142379; 142380	✓	✓	
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: 12/21/16

2nd Level Reviewer: [signature] Date: 12/21/2016

NCMs: 73213; 73518; 73522; 73521; 73519; 73525; 73526; 73527; 73535
73571

TestAmerica Laboratories
Worklist QC Batch Report

Worklist Name: 16DEC2016D_PFC Worklist Number: 37972
Instrument Name: A8_N Chrom Method: A8_N
Data Directory: \\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b
QC Batching: Disabled Limit Group Batching: Enabled

QC Batch: 1	LC PFC_DOD ICAL Raw Batch: 142751	LC PFC ICAL Raw Batch: 142752	LC PFAS ICAL Raw Batch: 142753
# 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 MB 320-140536/1-A	# 5 MB 320-140536/1-A		
# 6 LCS 320-140536/2-A	# 6 LCS 320-140536/2-A		
# 7 320-23884-A-1-A	# 7 320-23884-A-1-A		
# 8 320-23884-A-2-A	# 8 320-23884-A-2-A 100x		
# 9 320-23884-A-3-A	# 9 320-23884-A-3-A 100x, 10x, RA	RI all that are not ND PFBS	CCV high Samples ND NCM 73518
#10 320-23884-A-3-B MS	#10 320-23884-A-3-B MS		
#11 320-23884-A-3-C MSD	#11 320-23884-A-3-C MSD		
#12 320-23884-A-4-A	#12 320-23884-A-4-A		
#13 320-23931-B-1-A	#13 320-23931-B-1-A 50x		
#14 320-23931-A-2-A	#14 320-23931-A-2-A 100x, 10x		
#15 RB	#15 RB	#15 RB	#15 RB
#16 CCV L4	#16 CCV L4	#16 CCV L4 high PFBS	#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
#19 320-23931-A-3-A	#19 320-23931-A-3-A		Eflag NCM 73522
#20 320-23931-A-4-A	#20 320-23931-A-4-A		
#21 320-23931-A-5-A	#21 320-23931-A-5-A		MS/MSD
#22 320-23931-A-6-A	#22 320-23931-A-6-A NO RI	ND	inconsistency
#23 320-23996-A-1-A	#23 320-23996-A-1-A		NCM 73519
#24 320-23996-A-2-A	#24 320-23996-A-2-A NO RI	ND	
#25 320-23996-A-3-A	#25 320-23996-A-3-A		LDA low NCM 73521
#26 320-23996-A-4-A	#26 320-23996-A-4-A 100x, 10x		
#27 320-23996-A-5-A	#27 320-23996-A-5-A		
#28 320-23996-A-6-A	#28 320-23996-A-6-A NO RI	ND	
#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

CCVL2 142571
ICV 142379
Tune NCM 73213

TestAmerica Laboratories
Worklist QC Batch Report

Worklist Name: 20DEC2016C_PFC Worklist Number: 38078
Instrument Name: A8_N Chrom Method: A8_N
Data Directory: \\ChromNa\Sacramento\ChromData\A8_N\20161221-38078.b
QC Batching: Disabled Limit Group Batching: Enabled

QC Batch: 1	LC PFC_DOD ICAL Raw Batch: 143259	LC PFC ICAL Raw Batch: 143260	LC PFAS ICAL Raw Batch: 143261
# 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 MB 320-140536/1-A Δ	# 5 MB 320-140536/1-A	FOSA IDA low NCM 73525	
# 6 LCS 320-140536/2-A Δ	# 6 LCS 320-140536/2-A	IDA high NCM 73526	
# 7 320-23884-A-2-A	# 7 320-23884-A-2-A		
# 8 320-23931-A-2-A	# 8 320-23931-A-2-A	RL NCM 73527	
# 9 320-23996-A-4-A	# 9 320-23996-A-4-A		
#10 320-23931-B-1-A	#10 320-23931-B-1-A	100xEfog NCM 73535	
#11 320-23884-A-1-A	#11 320-23884-A-1-A		
#12 320-23931-A-3-A	#12 320-23931-A-3-A		
#13 320-23931-A-4-A	#13 320-23931-A-4-A		
#14 320-23931-A-5-A	#14 320-23931-A-5-A		
#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
#19 320-23996-A-1-A	#19 320-23996-A-1-A		
#20 320-23996-A-3-A	#20 320-23996-A-3-A		
#21 320-23996-A-5-A	#21 320-23996-A-5-A		
#22 RB	#22 RB	#22 RB	#22 RB
#23 CCV L5	#23 CCV L5	#23 CCV L5	#23 CCV L5
#24 CCV L5 Add-on	#24 CCV L5 Add-on	#24 CCV L5 Add-on	#24 CCV L5 Add-on
#25 RB	#25 RB	#25 RB	#25 RB

CCVL2 143143
ICV 142379

TestAmerica Laboratories
Worklist QC Batch Report

Worklist Name: 20DEC2016B_PFC Worklist Number: 38075
Instrument Name: A8_N Chrom Method: A8_N
Data Directory: \\ChromNa\Sacramento\ChromData\A8_N\20161221-38075.b
QC Batching: Disabled Limit Group Batching: Enabled

QC Batch: 1	LC PFC_DOD ICAL Raw Batch: 143248	LC PFC ICAL Raw Batch: 143249	LC PFAS ICAL Raw Batch: 143250
# 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
# 5 320-23990-A-1-A		# 5 320-23990-A-1-A	# 5 320-23990-A-1-A
# 6 320-23990-A-2-A		# 6 320-23990-A-2-A	# 6 320-23990-A-2-A
# 7 320-23990-A-4-A		# 7 320-23990-A-4-A	# 7 320-23990-A-4-A
# 8 320-23990-A-5-A		# 8 320-23990-A-5-A	# 8 320-23990-A-5-A
# 9 320-23990-A-6-A		# 9 320-23990-A-6-A	# 9 320-23990-A-6-A
#10 320-23990-A-7-A		#10 320-23990-A-7-A	#10 320-23990-A-7-A
#11 320-23990-A-8-A		#11 320-23990-A-8-A	#11 320-23990-A-8-A
#12 320-23990-A-9-A		#12 320-23990-A-9-A	#12 320-23990-A-9-A
#13 320-23990-A-13-A		#13 320-23990-A-13-A	#13 320-23990-A-13-A
#14 320-23990-A-15-A		#14 320-23990-A-15-A	#14 320-23990-A-15-A
#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
#19 320-23990-A-16-A		#19 320-23990-A-16-A	#19 320-23990-A-16-A
#20 320-23990-A-3-A		#20 320-23990-A-3-A	#20 320-23990-A-3-A
#21 320-23990-A-14-A		#21 320-23990-A-14-A	#21 320-23990-A-14-A
#22 320-23990-A-3-A		#22 320-23990-A-3-A	#22 320-23990-A-3-A
#23 RB	#23 RB	#23 RB	#23 RB
#24 320-23990-A-5-A		#24 320-23990-A-5-A	#24 320-23990-A-5-A
#25 RB	#25 RB	#25 RB	#25 RB
#26 320-23990-A-9-A		#26 320-23990-A-9-A	#26 320-23990-A-9-A
#27 RB	#27 RB	#27 RB	#27 RB
#28 320-23990-A-10-A	MS/MSD %R high NCM 73523	#28 320-23990-A-10-A	#28 320-23990-A-10-A
#29 320-23990-A-14-A		#29 320-23990-A-14-A	#29 320-23990-A-14-A
#30 RB	#30 RB	#30 RB	#30 RB
#31 CCV L4	#31 CCV L4	#31 CCV L4	#31 CCV L4
#32 RB	#32 RB	#32 RB	#32 RB
#33 MB 320-142964/1-A	#33 MB 320-142964/1-A		
#34 LCS 320-142964/2-A	#34 LCS 320-142964/2-A	IDA high NCM 73531	
#35 320-23884-B-3-A	#35 320-23884-B-3-A		
#36 320-23884-B-3-B MS	#36 320-23884-B-3-B MS	RL NCM 73533	
#37 320-23884-B-3-C MSD	#37 320-23884-B-3-C MSD		
#38 RB	#38 RB	#38 RB	#38 RB
#39 CCV L5	#39 CCV L5	#39 CCV L5	#39 CCV L5
#40 RB	#40 RB	#40 RB	#40 RB

CCV L2 143143 143144
ICV 142379 142380

FOSA IDA low
NCM 73524

16

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

DL 12/20/16

Batch Number: 320-140536 Analyst: Arauz, Horacio J Batch Open: 12/5/2016 8:28:00AM

Method Code: 320-3535_IVWT-320 Batch End: 12/6/2016 2:30:00PM

Solid-Phase Extraction (SPE)

RX 142324 142751 AG 12/13/16 12/15/16

	Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmnt FinAmnt	PHs Rcvd	PHs Adj1	PHs Adj2	Due Date	Analytical TAT	Dlv Rank	Comments	Output Sample Lab ID
1	MB~320-140536/1 N/A	N/A		250 mL				N/A	N/A	N/A	RI CCV PFBS	MB 320-140536/1-A
				0.5 mL								
2	LCS~320-140536/2 N/A	N/A		250 mL				N/A	N/A	N/A	RI	LCS 320-140536/2-A
				0.5 mL								
3	320-23884-A-1 (PFC_IDA_DOD5)	N/A (320-23884-1)	293.79 g	267.1 mL				12/6/16	12_Days	4	RI	320-23884-A-1-A
			26.65 g	0.5 mL								
	320-23884-A-2 (PFC_IDA_DOD5)	N/A (320-23884-1)	300.27 g	273.4 mL				12/6/16	12_Days	4	See NCM, unsual color. 100X	320-23884-A-2-A
			26.89 g	0.5 mL								
	320-23884-A-3 (PFC_IDA_DOD5)	N/A (320-23884-1)	304.67 g	277.8 mL				12/6/16	12_Days	4	100X, 10X, RA	320-23884-A-3-A
			26.86 g	0.5 mL								
6	320-23884-A-3~MS (PFC_IDA_DOD5)	N/A (320-23884-1)	303.71 g	276.2 mL				12/6/16	12_Days	4	See NCM, unsual color.	320-23884-A-3-B MS
			27.47 g	0.5 mL								
7	320-23884-A-3~MSD (PFC_IDA_DOD5)	N/A (320-23884-1)	298.35 g	271.2 mL				12/6/16	12_Days	4		320-23884-A-3-C MSD
			27.11 g	0.5 mL								
8	320-23884-A-4 (PFC_IDA_DOD5)	N/A (320-23884-1)	320.76 g	294.1 mL				12/6/16	12_Days	4		320-23884-A-4-A
			26.63 g	0.5 mL								
9	320-23931-B-1 (PFC_IDA_DOD5)	N/A (320-23931-1)	291.44 g	264.5 mL				12/7/16	12_Days	4	50X	320-23931-B-1-A
			26.94 g	0.5 mL								
10	320-23931-A-2 (PFC_IDA_DOD5)	N/A (320-23931-1)	287.40 g	260.2 mL				12/7/16	12_Days	4	100X, 10X	320-23931-A-2-A
			27.19 g	0.5 mL								

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-140536 Analyst: Arauz, Horacio J Batch Open: 12/5/2016 8:28:00AM

Method Code: 320-3535_IVWT-320 Batch End: 12/6/2016 2:30:00PM

11	320-23931-A-3 (PFC_IDA_DOD5)	N/A (320-23931-1)	292.42 g 26.95 g	265.5 mL 0.5 mL				12/7/16	12_Days	4	RI PFBS	
12	320-23931-A-4 (PFC_IDA_DOD5)	N/A (320-23931-1)	292.31 g 26.61 g	265.7 mL 0.5 mL				12/7/16	12_Days	4		
13	320-23931-A-5 (PFC_IDA_DOD5)	N/A (320-23931-1)	304.37 g 26.73 g	277.6 mL 0.5 mL				12/7/16	12_Days	4		
14	320-23931-A-6 (PFC_IDA_DOD5)	N/A (320-23931-1)	307.13 g 26.94 g	280.2 mL 0.5 mL				12/7/16	12_Days	4	No RI	
15	320-23996-A-1 (PFC_IDA_DOD5)	N/A (320-23996-1)	283.78 g 26.62 g	257.2 mL 0.5 mL				12/8/16	12_Days	4		
	320-23996-A-2 (PFC_IDA_DOD5)	N/A (320-23996-1)	292.01 g 26.77 g	265.2 mL 0.5 mL				12/8/16	12_Days	4	No RI	
	320-23996-A-3 (PFC_IDA_DOD5)	N/A (320-23996-1)	302.98 g 26.82 g	276.2 mL 0.5 mL				12/8/16	12_Days	4		
18	320-23996-A-4 (PFC_IDA_DOD5)	N/A (320-23996-1)	299.19 g 26.82 g	272.4 mL 0.5 mL				12/8/16	12_Days	4	100X, 10X	
19	320-23996-A-5 (PFC_IDA_DOD5)	N/A (320-23996-1)	298.09 g 26.83 g	271.3 mL 0.5 mL				12/8/16	12_Days	4		
20	320-23996-A-6 (PFC_IDA_DOD5)	N/A (320-23996-1)	281.55 g 27.39 g	254.2 mL 0.5 mL				12/8/16	12_Days	4	No RI	

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-140536 Analyst: Arauz, Horacio J Batch Open: 12/5/2016 8:28:00AM

Method Code: 320-3535_IVWT-320 Batch End:

Batch Notes

Manifold ID	5, 6
Methanol ID	789822
Hexane ID	0000146278
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	12-05-16
Pipette ID	MD05306
Solvent Name	0.3% NH4OH/MeOH
Solvent Lot #	794501
Analyst ID - Reagent Drop	HJA
Analyst ID - SU Reagent Drop	HJA
Analyst ID - SU Reagent Drop Witness	NSH
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: 320-140536 Analyst: Arauz, Horacio J Batch Open: 12/5/2016 8:28:00AM

Method Code: 320-3535_IVWT-320 Batch End:

SOP Number	WS-LC-0025
Batch Comment	0.1N NAOH/H2O 758321

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-140536 Analyst: Arauz, Horacio J Batch Open: 12/5/2016 8:28:00AM

Method Code: 320-3535_IVWT-320 Batch End:

Comments

320-23884-A-1	Method Comments:	Caution AFFF DOD site-Screen, Follow QSM strictly. NO Variances accepted.
320-23884-A-2	Method Comments:	Caution AFFF DOD site-Screen, Follow QSM strictly. NO Variances accepted.
320-23884-A-3	Method Comments:	Caution AFFF DOD site-Screen, Follow QSM strictly. NO Variances accepted.
320-23884-A-3~MS	Method Comments:	Caution AFFF DOD site-Screen, Follow QSM strictly. NO Variances accepted.
320-23884-A-3~MSD	Method Comments:	Caution AFFF DOD site-Screen, Follow QSM strictly. NO Variances accepted.
320-23884-A-4	Method Comments:	Caution AFFF DOD site-Screen, Follow QSM strictly. NO Variances accepted.
320-23931-B-1	Method Comments:	Caution AFFF DOD site-Screen, Follow QSM strictly. NO Variances accepted.
320-23931-A-2	Method Comments:	Caution AFFF DOD site-Screen, Follow QSM strictly. NO Variances accepted.
320-23931-A-3	Method Comments:	Caution AFFF DOD site-Screen, Follow QSM strictly. NO Variances accepted.
320-23931-A-4	Method Comments:	Caution AFFF DOD site-Screen, Follow QSM strictly. NO Variances accepted.
320-23931-A-5	Method Comments:	Caution AFFF DOD site-Screen, Follow QSM strictly. NO Variances accepted.
320-23931-A-6	Method Comments:	Caution AFFF DOD site-Screen, Follow QSM strictly. NO Variances accepted.
320-23996-A-1	Method Comments:	Caution AFFF DOD site-Screen, Follow QSM strictly. NO Variances accepted.
320-23996-A-2	Method Comments:	Caution AFFF DOD site-Screen, Follow QSM strictly. NO Variances accepted.
320-23996-A-3	Method Comments:	Caution AFFF DOD site-Screen, Follow QSM strictly. NO Variances accepted.
320-23996-A-4	Method Comments:	Caution AFFF DOD site-Screen, Follow QSM strictly. NO Variances accepted.
320-23996-A-5	Method Comments:	Caution AFFF DOD site-Screen, Follow QSM strictly. NO Variances accepted.
320-23996-A-6	Method Comments:	Caution AFFF DOD site-Screen, Follow QSM strictly. NO Variances accepted.

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-140536 Analyst: Arauz, Horacio J Batch Open: 12/5/2016 8:28:00AM

Method Code: 320-3535_IVWT-320 Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-140536/1	LCMPFCSU_00046	25 uL	0.5 mL	HJA 12-5-16	NSH 12-5-16
LCS 320-140536/2	LCMPFCSU_00046	25 uL	0.5 mL		
LCS 320-140536/2	LCPFCSP_00070	20 uL	0.5 mL		
320-23884-A-1	LCMPFCSU_00046	25 uL	0.5 mL		
320-23884-A-2	LCMPFCSU_00046	25 uL	0.5 mL		
320-23884-A-3	LCMPFCSU_00046	25 uL	0.5 mL		
320-23884-A-3 MS	LCMPFCSU_00046	25 uL	0.5 mL		
320-23884-A-3 MS	LCPFCSP_00070	20 uL	0.5 mL		
320-23884-A-3 MSD	LCMPFCSU_00046	25 uL	0.5 mL		
320-23884-A-3 MSD	LCPFCSP_00070	20 uL	0.5 mL		
320-23884-A-4	LCMPFCSU_00046	25 uL	0.5 mL		
320-23931-B-1	LCMPFCSU_00046	25 uL	0.5 mL		
320-23931-A-2	LCMPFCSU_00046	25 uL	0.5 mL		
320-23931-A-3	LCMPFCSU_00046	25 uL	0.5 mL		
320-23931-A-4	LCMPFCSU_00046	25 uL	0.5 mL		
320-23931-A-5	LCMPFCSU_00046	25 uL	0.5 mL		
320-23931-A-6	LCMPFCSU_00046	25 uL	0.5 mL		
320-23996-A-1	LCMPFCSU_00046	25 uL	0.5 mL		

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-140536 Analyst: Arauz, Horacio J Batch Open: 12/5/2016 8:28:00AM

Method Code: 320-3535_IVWT-320 Batch End:

320-23996-A-2	LCMPFCSU_00046	25 uL	0.5 mL	HJA 12-5-16	NSH 12-5-16
320-23996-A-3	LCMPFCSU_00046	25 uL	0.5 mL		
320-23996-A-4	LCMPFCSU_00046	25 uL	0.5 mL		
320-23996-A-5	LCMPFCSU_00046	25 uL	0.5 mL		
320-23996-A-6	LCMPFCSU_00046	25 uL	0.5 mL		

Other Reagents:

Reagent	Amount/Units	Lot#:

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sacramento
Preparation Data Review Checklist

Preparation Batch Number(s): 320-140536 Test: PFC-L

Earliest Holding Time: 12-13-16

Sample List Tab	1st Level Reviewer	2nd Level Reviewer
Samples identified to the correct method	✓	✓
All necessary NCMs filed (including holding time)	HSA 12-6-16 NA ✓	✓
Method/sample/login/QAS checked and correct	✓	✓
Worksheet Tab	**1st Level Reviewer**	**2nd Level Reviewer**
All samples properly preserved	NA	NA
Weights in anticipated range and not targeted	✓	✓
All additional test requirements performed, documented, and uploaded to TALS correctly (e.g. final amount, initial amount, turbidity, and Cl Check)	✓	✓
The pH is transcribed correctly in TALS	NA	NA
All additional information transcribed into TALS is correct and raw data is attached	✓	✓
Comments are transcribed correctly in TALS	✓	✓
Reagents Tab	**1st Level Reviewer**	**2nd Level Reviewer**
All necessary reagents not expired and entered into TALS	✓	✓
All spike amounts correct and added to necessary samples and QC	✓	✓
Batch Information	**1st Level Reviewer**	**2nd Level Reviewer**
Date and time accurate and entered into TALS correctly	✓	✓
All necessary 'batch information' complete and entered into TALS correctly	✓	✓

1st Level Reviewer: HSA Date: 12-6-16

2nd Level Reviewer: VPM Date: 12/06/16

Comments:

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Test America – Sacramento

Sample Dilution Record

Method ID PFC-IDA-DOD5 **Job #** 23931; 23884; 23996

Analyst (Print Name) Shyhara Chandrasena **Analyst Initials** SBC

Date 12/20/16

Sample#	Original F.V. (uL)	Aliquot (uL)	Dilution F.V. (uL)	Dilution Factor
23884-2	500	40	400	10X
23931-1		200	1000	50X
-2		40	400	10X
-2		100	1000	100X
23996-4		40	400	10X
-4		100	1000	100X
23884-2		100	1000	100X

Comments:

C:\Users\phomsophat\AppData\Local\Microsoft\Windows\Temporary Internet Files\OLK708B\QA-747_SampleDilutionRecord.doc
10/20/16 RBH

32 RX

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

AS 12/20/16

Batch Number: 320-142964

Analyst: Marchenko, Veronika P

Batch Open: 12/19/2016 2:29:00PM

Method Code: 320-3535_PFC-320

Batch End: 12/20/16 14:02

Solid-Phase Extraction (SPE)

	Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmnt FinAmnt	PHs Rcvd	PHs Adj1	PHs Adj2	Due Date	Analytical TAT	Dlv Rank	Comments	Output Sample Lab ID
1	MB~320-142964/1 N/A	N/A		250 mL				N/A	N/A	N/A		MB 320-142964/1-A
				0.5 mL								
2	LCS~320-142964/2 N/A	N/A		250 mL				N/A	N/A	N/A		LCS 320-142964/2-A
				0.5 mL								
3	320-23884-B-3 (PFC_IDA_DOD5)	N/A (320-23884-1)	307.60 g	280.8 mL				12/6/16	12_Days	4		320-23884-B-3-A
			26.78 g	0.5 mL								
4	320-23884-B-3~MS (PFC_IDA_DOD5)	N/A (320-23884-1)	300.14 g	270 mL				12/6/16	12_Days	4		320-23884-B-3-B MS
			30.13 g	0.5 mL								
5	320-23884-B-3~MSD (PFC_IDA_DOD5)	N/A (320-23884-1)	304.86 g	277.9 mL				12/6/16	12_Days	4		320-23884-B-3-C MSD
			26.92 g	0.5 mL								

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-142964 | Analyst: Marchenko, Veronika P | Batch Open: 12/19/2016 2:29:00PM

Method Code: 320-3535_PFC-320 | Batch End:

Batch Notes

Manifold ID	9
Methanol ID	798085
Hexane ID	0000135581
Sodium Hydroxide ID	NA
First Start time	NA
First End time	NA
SPE Cartridge Type	WAX 150mg
Solid Phase Extraction Disk ID	002836112A
Balance ID	QA-070
H2O ID	12/15/16
Pipette ID	MD05306
Solvent Name	0.3% NH4OH/MeOH
Solvent Lot #	800649
Analyst ID - Reagent Drop	VPM
Analyst ID - SU Reagent Drop	VPM
Analyst ID - SU Reagent Drop Witness	DM
Acid Name	NA
Acid ID	NA
Reagent ID	NA
Reagent Lot Number	NA
SOP Number	WS-LC-0025

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-142964 Analyst: Marchenko, Veronika P Batch Open: 12/19/2016 2:29:00PM

Method Code: 320-3535_PFC-320 Batch End:

Batch Comment 0.1N NaOH/H2O: 794893

Comments

320-23884-B-3

Method Comments: Caution AFFF DOD site-Screen, Follow QSM strictly. NO Variances accepted.
Rework Comments: MS/MSD did not match the parent

320-23884-B-3~MS

Method Comments: Caution AFFF DOD site-Screen, Follow QSM strictly. NO Variances accepted.
Rework Comments: MS/MSD did not match the parent

320-23884-B-3~MSD

Method Comments: Caution AFFF DOD site-Screen, Follow QSM strictly. NO Variances accepted.
Rework Comments: MS/MSD did not match the parent

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-142964 Analyst: Marchenko, Veronika P Batch Open: 12/19/2016 2:29:00PM

Method Code: 320-3535_PFC-320 Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-142964/1	LCMPFCSU_00046	25 uL	~~1.0mL~~ 0.5mL	VPM 12/19/16	OM 12/19/16
LCS 320-142964/2	LCMPFCSU_00046	25 uL			
LCS 320-142964/2	LCPFCSP_00073	20 uL			
320-23884-B-3	LCMPFCSU_00046	25 uL			
320-23884-B-3 MS	LCMPFCSU_00046	25 uL			
320-23884-B-3 MS	LCPFCSP_00073	20 uL			
320-23884-B-3 MSD	LCMPFCSU_00046	25 uL			
320-23884-B-3 MSD	LCPFCSP_00073	20 uL			

Other Reagents:

Reagent	Amount/Units	Lot#:

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-142964 Analyst: Marchenko, Veronika P Batch Open: 12/19/2016 2:29:00PM

Method Code: 320-3535_PFC-320 Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-142964/1	LCMPFCSU_00046	25 uL	0.5 mL		
LCS 320-142964/2	LCMPFCSU_00046	25 uL	0.5 mL		
LCS 320-142964/2	LCPFCSP_00073	20 uL	0.5 mL		
320-23884-B-3	LCMPFCSU_00046	25 uL	0.5 mL		
320-23884-B-3 MS	LCMPFCSU_00046	25 uL	0.5 mL		
320-23884-B-3 MS	LCPFCSP_00073	20 uL	0.5 mL		
320-23884-B-3 MSD	LCMPFCSU_00046	25 uL	0.5 mL		
320-23884-B-3 MSD	LCPFCSP_00073	20 uL	0.5 mL		

Other Reagents:

Reagent	Amount/Units	Lot#:

TestAmerica
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Sacramento
Preparation Data Review Checklist

Preparation Batch Number(s): 142964 Test: PFC_IDA_0005 (L) RX

Earliest Holding Time: 12/06/16 (3535-IVWT)
12/13/16 3535-PFC

Sample List Tab	1st Level Reviewer	2nd Level Reviewer
Samples identified to the correct method	✓	✓
All necessary NCMs filed (including holding time)	✓	✓
Method/sample/login/QAS checked and correct	✓	✓
Worksheet Tab	**1st Level Reviewer**	**2nd Level Reviewer**
All samples properly preserved	NA	NA
Weights in anticipated range and not targeted	✓	✓
All additional test requirements performed, documented, and uploaded to TALS correctly (e.g. final amount, initial amount, turbidity, and Cl Check)	✓	✓
The pH is transcribed correctly in TALS	NA	NA
All additional information transcribed into TALS is correct and raw data is attached	✓	✓
Comments are transcribed correctly in TALS	✓	✓
Reagents Tab	**1st Level Reviewer**	**2nd Level Reviewer**
All necessary reagents not expired and entered into TALS	✓	✓
All spike amounts correct and added to necessary samples and QC	✓	
Batch Information	**1st Level Reviewer**	**2nd Level Reviewer**
Date and time accurate and entered into TALS correctly	✓	✓
All necessary 'batch information' complete and entered into TALS correctly	✓	✓

1st Level Reviewer: VM Date: 12/20/16

2nd Level Reviewer: ERW Date: 12/20/16

Comments: _____

18

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-140852 Analyst: Winchester, Ethan R Batch Open: 12/6/2016 3:23:00PM

Method Code: 320-3535_IVWT-320 Batch End: 12:00 12/7/16

AB 12/18/16

DL AB 12/20/16

Solid-Phase Extraction (SPE)

case 3 21-39

case 3 1-28

	Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmnt FinAmnt	PHs Rcvd	PHs Adj1	PHs Adj2	Due Date	Analytical TAT	Dlv Rank	Comments	Output Sample Lab ID
1	MB-320-140852/1 N/A	N/A		250 mL				N/A	N/A	N/A		MB 320-140852/1-A
				0.5 mL								
2	LCS-320-140852/2 N/A	N/A		250 mL				N/A	N/A	N/A		LCS 320-140852/2-A
				0.5 mL								
3	LCSD-320-140852/3 N/A	N/A		250 mL				N/A	N/A	N/A		LCSD 320-140852/3-A
				0.5 mL								
	320-23990-A-1 (PFC_IDA)	N/A (320-23990-1)	312.46 g	285.1 mL				12/6/16	8_Days	4	100x PFOS	320-23990-A-1-A
			27.35 g	0.5 mL								
	320-23990-A-2 (PFC_IDA)	N/A (320-23990-1)	293.21 g	265.2 mL				12/6/16	8_Days	4	Observations brown vpm 12/07/16 100x, 10x	320-23990-A-2-A
			28.06 g	0.5 mL								
6	320-23990-A-3 (PFC_IDA)	N/A (320-23990-1)	269.51 g	242.9 mL				12/6/16	8_Days	4	10x PFOS RA	320-23990-A-3-A
			26.57 g	0.5 mL								
7	320-23990-A-4 (PFC_IDA)	N/A (320-23990-1)	282.00 g	253.6 mL				12/6/16	8_Days	4	100x, 10x yellow	320-23990-A-4-A
			28.44 g	0.5 mL								
8	320-23990-A-5 (PFC_IDA)	N/A (320-23990-1)	281.36 g	254.9 mL				12/6/16	8_Days	4	100x, 10x RA (PFNA)	320-23990-A-5-A
			26.47 g	0.5 mL								
9	320-23990-A-6 (PFC_IDA)	N/A (320-23990-1)	278.20 g	250.2 mL				12/6/16	8_Days	4	yellow 100x, 10x	320-23990-A-6-A
			28.00 g	0.5 mL								
10	320-23990-A-7 (PFC_IDA)	N/A (320-23990-1)	286.51 g	258.9 mL				12/6/16	8_Days	4	brown 100x, 10x	320-23990-A-7-A
			27.66 g	0.5 mL								

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-140852 Analyst: Winchester, Ethan R Batch Open: 12/6/2016 3:23:00PM

Method Code: 320-3535_IVWT-320 Batch End:

11	320-23990-A-8 (PFC_IDA)	N/A (320-23990-1)	295.26 g 28.12 g	267.1 mL 0.5 mL				12/6/16	8_Days	4	yellow 100x, 10x	
12	320-23990-A-9 (PFC_IDA)	N/A (320-23990-1)	296.37 g 27.15 g	269.2 mL 0.5 mL				12/6/16	8_Days	4	100x, 10x, RA	
13	320-23990-A-10 (PFC_IDA)	N/A (320-23990-1)	284.61 g 26.65 g	258 mL 0.5 mL				12/6/16	8_Days	4	RA	
14	320-23990-A-11 (PFC_IDA)	N/A (320-23990-1)	296.92 g 26.92 g	270 mL 0.5 mL				12/6/16	8_Days	4		
15	320-23990-A-12 (PFC_IDA)	N/A (320-23990-1)	315.87 g 27.07 g	288.8 mL 0.5 mL				12/6/16	8_Days	4		
	320-23990-A-13 (PFC_IDA)	N/A (320-23990-1)	292.66 g 26.43 g	266.2 mL 0.5 mL				12/6/16	8_Days	4	100x, 10x	
	320-23990-A-14 (PFC_IDA)	N/A (320-23990-1)	291.16 g 26.84 g	264.3 mL 0.5 mL				12/6/16	8_Days	4	10x, RA	
18	320-23990-A-15 (PFC_IDA)	N/A (320-23990-1)	272.66 g 27.16 g	245.5 mL 0.5 mL				12/6/16	8_Days	4	100x, 10x	
19	320-23990-A-16 (PFC_IDA)	N/A (320-23990-1)	293.96 g 27.17 g	266.8 mL 0.5 mL				12/6/16	8_Days	4	100x, 10x	

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-140852 Analyst: Winchester, Ethan R Batch Open: 12/6/2016 3:23:00PM

Method Code: 320-3535_IVWT-320 Batch End:

Batch Notes

Manifold ID	5,6
Methanol ID	789820
Hexane ID	00001462
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	002836112
H2O ID	12/05/16
Pipette ID	MD05306
Solvent Name	0.3% NH4OH/MeOH
Solvent Lot #	794501
Analyst ID - Reagent Drop	ERW
Analyst ID - SU Reagent Drop	ERW
Analyst ID - SU Reagent Drop Witness	NSH
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: 320-140852 Analyst: Winchester, Ethan R Batch Open: 12/6/2016 3:23:00PM

Method Code: 320-3535_IVWT-320 Batch End:

SOP Number	WS-LC-0025
Batch Comment	0.1N NaOH/H2O: 794893

Comments

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-140852 Analyst: Winchester, Ethan R Batch Open: 12/6/2016 3:23:00PM

Method Code: 320-3535_IVWT-320 Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-140852/1	LCMPFCSU_00046	25 uL	0.5 mL	ERW 12/6/16	NSH 12-6-16
LCS 320-140852/2	LCMPFCSU_00046	25 uL	0.5 mL		
LCS 320-140852/2	LCPFCSP_00070	20 uL	0.5 mL		
LCSD 320-140852/3	LCMPFCSU_00046	25 uL	0.5 mL		
LCSD 320-140852/3	LCPFCSP_00070	20 uL	0.5 mL		
320-23990-A-1	LCMPFCSU_00046	25 uL	0.5 mL		
320-23990-A-2	LCMPFCSU_00046	25 uL	0.5 mL		
320-23990-A-3	LCMPFCSU_00046	25 uL	0.5 mL		
320-23990-A-4	LCMPFCSU_00046	25 uL	0.5 mL		
320-23990-A-5	LCMPFCSU_00046	25 uL	0.5 mL		
320-23990-A-6	LCMPFCSU_00046	25 uL	0.5 mL		
320-23990-A-7	LCMPFCSU_00046	25 uL	0.5 mL		
320-23990-A-8	LCMPFCSU_00046	25 uL	0.5 mL		
320-23990-A-9	LCMPFCSU_00046	25 uL	0.5 mL		
320-23990-A-10	LCMPFCSU_00046	25 uL	0.5 mL		
320-23990-A-11	LCMPFCSU_00046	25 uL	0.5 mL		
320-23990-A-12	LCMPFCSU_00046	25 uL	0.5 mL		
320-23990-A-13	LCMPFCSU_00046	25 uL	0.5 mL		

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-140852 Analyst: Winchester, Ethan R Batch Open: 12/6/2016 3:23:00PM

Method Code: 320-3535_IVWT-320 Batch End:

320-23990-A-14	LCMPFCSU_00046	25 uL	0.5 mL	ERU 12/6/16	NSH 12-6-16
320-23990-A-15	LCMPFCSU_00046	25 uL	0.5 mL	↓	↓
320-23990-A-16	LCMPFCSU_00046	25 uL	0.5 mL		

Other Reagents:

Reagent	Amount/Units	Lot#:

TestAmerica
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Sacramento
Preparation Data Review Checklist

Preparation Batch Number(s): 140852 Test: PFC-IDA (LL)

Earliest Holding Time: 12/07/16

Sample List Tab	1st Level Reviewer	2nd Level Reviewer
Samples identified to the correct method	✓	✓
All necessary NCMs filed (including holding time)	NA ✓	✓
Method/sample/login/QAS checked and correct VPM 12/07/16	✓	✓
Worksheet Tab	**1st Level Reviewer**	**2nd Level Reviewer**
All samples properly preserved	NA	NA
Weights in anticipated range and not targeted	✓	✓
All additional test requirements performed, documented, and uploaded to TALS correctly (e.g. final amount, initial amount, turbidity, and 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	**1st Level Reviewer**	**2nd Level Reviewer**
All necessary reagents not expired and entered into TALS	✓	✓
All spike amounts correct and added to necessary samples and QC	✓	✓
Batch Information	**1st Level Reviewer**	**2nd Level Reviewer**
Date and time accurate and entered into TALS correctly	✓	✓
All necessary 'batch information' complete and entered into TALS correctly	✓	✓

1st Level Reviewer: VPM Date: 12/07/16

2nd Level Reviewer: NSH Date: 12-7-16

Comments: _____

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Test America – Sacramento

Sample Dilution Record

Method ID PFC-IDA **Job #** 23990

Analyst (Print Name) Shyhara Chandrasena **Analyst Initials** SBC

Date 12/19/16

Sample#	Original F.V. (uL)	Aliquot (uL)	Dilution F.V. (uL)	Dilution Factor
1	500	100	1000	10x
2		100	1000	
SBC 12/20/16 3 4		100	1000	
5		30	300	
6		100	1000	
7		100	1000	
8		100	1000	
9		30	300	
13		100	1000	
15		100	1000	
16		100	1000	
1		100	1000	100x
2				
4				
5				
6				
7				
8				
9				
13				
15				
16				
3		30	300	10x
14		30	300	10x

Comments:

C:\Users\phomsophat\AppData\Local\Microsoft\Windows\Temporary Internet Files\OLK708B\QA-747_SampleDilutionRecord.doc
10/20/16 RBH

Shipping and Receiving Documents

RESOLUTION CONSULTANTS

CHAIN OF CUSTODY AND ANALYTICAL REQUEST RECORD

COC No. EJB113016 | Page 1 of 1

Project Name: PFAs Groundwater Investigation | PO No. 21529 | Project No. 98331.279.Phase FIFS

Site Location: NAS Dallas | **Sample Analysis Requested** (*Enter number of containers for each test*)

CTO No. JM73 | RC Project Manager: Tom Wilborn

Sampler/Site Phone#

Lab Name: Test America Sacramento | Turnaround Time(specify): 21-Day

Lab ID	Sample ID (sys_samp_code)	Location ID (sys_loc_code)	Date (mm/dd/yy)	Time (Military) (hhmm)	Matrix Code (1)	Sample Type (2)	Field Filtered (Y/N)	(3)→ Total No. of Containers	* PFAs by EPA 537 Modified	Extra Volume for MS/MSD	HOLD
	608D132MW-LF-1116	608D132MW	11/30/16	0940	WG	N	N	2	X		
	608D33MW-LF-1116	608D33MW		1100	WG	N	N	2	X		
	61301MW-LF-1116	61301MW		1245	WG	N	N	2	X		
	613D41MW-LF-1116	613D41MW		1355	WG	N	N	2	X		
	613D39MW-LF-1116	613D39MW	11/30/16	1520	WG	N	N	2	X		
	FB113016	—	11/30/16	1535	WQ	FB	N	2	X		

320-23931 Chain of Custody

Field **Comments:** TRRP Reporting no Preservative

Lab **Comments:** *Modified 7-Day Hold (PFAs)

Sample Shipment and Delivery Details

Number of coolers in shipment: 1

Samples Iced?(check) Yes ✓ No

Method of Shipment: Fed Ex 0.4°C

Airbill No:

Date Shipped: 11/30/16

Relinquished by (signature)	Date	Time	Received by (signature)	Date	Time
1	11/30/16	1645	1	12/1/16	0950
2			2		
3			3		

(1) AA=Ambient air, **AQ**=Air quality control, **ASB**=Asbestos, **CK**=Caulk, **DS**=Storm drain sediment, **GS**=Soil gas, **IC**=IDW Concrete, **IDD**=IDW Solid, **IDS**=IDW soil, **IDW**=IDW Water, **LF**=Free Product, **MA**=Mastic, **PC**=Paint Chips, **SC**=Cement/Concrete, **SE**=Sediment, **SL**=Sludge, **SO**=Soil, **SQ**=Soil/Solid quality control, **SSD**=Subsurface sediment, **SU**=Surface soil (<6 in), **SW**=Swab or wipe, **TA**=Animal tissue, **TP**=Plant tissue, **TQ**=Tissue quality control, **WG**=Ground water, **WL**=Leachate, **WO**=Ocean water, **WP**=Drinking water, **WQ**=Water quality control, **WR**=Ground water effluent, **WS**=Surface water, **WU**=Storm water, **WW**=Waste water

(2) Sample Type: AB=Ambient Blk, **EB**=Equipment Blk, **FB**=Field Blk, **FD**=Field Duplicate Sample, **IDW**=Investigative-Derived Waste, **MIS**=Incremental Sampling Methodology, **N**=Normal Environmental Sample, **TB**=Trip Blk

(3) Preservative added: HA=Hydrochloric Acid, **NI**=Nitric Acid, **SH**=Sodium Hydroxide, **SA**=Sulfuric Acid, **ME**=Methanol, **SB**=sodium bisulfate, **ST**=Sodium Thiosulfate, If **NO preservative** added leave blank

Rev 5/12

Login Sample Receipt Checklist

Client: EnSafe, Inc.

Job Number: 320-23931-1

Login Number: 23931
List Number: 1
Creator: Turpen, Troy

List Source: TestAmerica Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	ESS Seal
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

DODCMD_ID	INSTALLATION_ID	SDG	SITE_NAME	NORM_SITE_NAME	LOCATION_NAME	LOCATION_TYPE_DESC	COORD_X	COORD_Y	CONTRACT_ID	DO_CTO_NUMBER	CONTR_NAME	SAMPLE_NAME	SAMPLE_MATRIX_DESC	SAMPLE_TYPE_DESC	COLLECT_DATE	ANALYTICAL_METHOD	ANALYTICAL_METHOD_GRP_DESC	RES_META_ID
SOUTHEAST	DALLAS_NAS	320-23931-1	ASB 0ZONEA		61301MW	Monitoring well	2441386.359	6957584.543	N6247011D8013	JM37	RESOLUTION CONSULTANTS	61301MW-LF-1116	Ground water	Normal (Regular)	30-Nov-16	537_MOD	Perfluoroalkyl Compounds	20170918061901.00
SOUTHEAST	DALLAS_NAS	320-23931-1	ASB 0ZONEA		608D33MW	Monitoring well	2441385.104	6957906.804	N6247011D8013	JM37	RESOLUTION CONSULTANTS	608D33MW-LF-1116	Ground water	Normal (Regular)	30-Nov-16	537_MOD	Perfluoroalkyl Compounds	20170918061901.00
SOUTHEAST	DALLAS_NAS	320-23931-1	ASB 0ZONEA		613D41MW	Monitoring well	2441170.111	6957563.429	N6247011D8013	JM37	RESOLUTION CONSULTANTS	613D41MW-LF-1116	Ground water	Normal (Regular)	30-Nov-16	537_MOD	Perfluoroalkyl Compounds	20170918061901.00
SOUTHEAST	DALLAS_NAS	320-23931-1	SWMU 00017	SWMU 00017	613D39MW	Monitoring well	2441054.157	6957529.367	N6247011D8013	JM37	RESOLUTION CONSULTANTS	613D39MW-LF-1116	Ground water	Normal (Regular)	30-Nov-16	537_MOD	Perfluoroalkyl Compounds	20170918061901.00
SOUTHEAST	DALLAS_NAS	320-23931-1	SWMU 00021	SWMU 00021	608D132MW	Monitoring well	2441497.908	6957799.041	N6247011D8013	JM37	RESOLUTION CONSULTANTS	608D132MW-LF-1116	Ground water	Normal (Regular)	30-Nov-16	537_MOD	Perfluoroalkyl Compounds	20170918061901.00
SOUTHEAST	DALLAS_NAS	320-23931-1							N6247011D8013	JM37	RESOLUTION CONSULTANTS	FB113016	Water for QC samples	QC Sample	30-Nov-16	537_MOD	Perfluoroalkyl Compounds	20170918061901.00