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Naval Facilities Engineering Command

Groundwater Sample Results, Level 2 Laboratory Report, Level 4 Laboratory Report, Electronic Data Deliverable, Data Validation Report, Sample Location Report, SDG J249611

Bay Head Road Annex
NSWC Annapolis
Maryland

December 2020

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TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

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TestAmerica Job ID: 320-24961-1

Client Project/Site: Former Bay Head Road Annex (RFP JU06-01)

For:
AECOM Technical Services Inc.
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Attn: Devon Chicoine

Authorized for release by:
1/17/2017 4:24:44 PM

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LINKS

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The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Qualifiers

LCMS

Qualifier	Qualifier Description
U	Undetected at the Limit of Detection.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
M	Manual integrated compound.

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)

Job ID: 320-24961-1

Laboratory: TestAmerica Sacramento

Narrative

CASE NARRATIVE

Client: AECOM Technical Services Inc.

Project: Former Bay Head Road Annex (RFP JU06-01)

Report Number: 320-24961-1

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.

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

RECEIPT
The samples were received on 01/12/2017; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 3.2 C.

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

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-146325.

Due to the excessive amount of sediment in the sample bottles, the aqueous portion of these samples was decanted to new bottles prior to spiking and the extraction.

DPT-GW-EB-26-22 (320-24961-1), DPT-GW-EB-26-33 (320-24961-2), DPT-17-26-GW-29-33 (320-24961-3), DPT-17-26-GW-18-22 (320-24961-4), DPT-GW-EB-27-22 (320-24961-5), DPT-GW-EB-27-33 (320-24961-6), DPT-TB-011117 (320-24961-7),

Job ID: 320-24961-1 (Continued)

Laboratory: TestAmerica Sacramento (Continued)

DPT-17-27-GW-29-33 (320-24961-8) and DPT-17-27-GW-18-22 (320-24961-9)

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

Detection Summary

Client: AECOM Technical Services Inc.
Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-24961-1

Client Sample ID: DPT-GW-EB-26-22 — Lab Sample ID: 320-24961-1

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.00081	J M	0.0026	0.00078	ug/L	1		537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS)	0.020		0.0042	0.0013	ug/L	1		537 (Modified)	Total/NA

Client Sample ID: DPT-GW-EB-26-33 — Lab Sample ID: 320-24961-2

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.00090	J M	0.0026	0.00077	ug/L	1		537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS)	0.0013	J M	0.0041	0.0013	ug/L	1		537 (Modified)	Total/NA

Client Sample ID: DPT-17-26-GW-29-33 — Lab Sample ID: 320-24961-3

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.0016	J	0.0024	0.00072	ug/L	1		537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS)	0.0083		0.0038	0.0012	ug/L	1		537 (Modified)	Total/NA

Client Sample ID: DPT-17-26-GW-18-22 — Lab Sample ID: 320-24961-4

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.0059	M	0.0025	0.00074	ug/L	1		537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.0011	J M	0.0025	0.00091	ug/L	1		537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS)	0.0083		0.0040	0.0013	ug/L	1		537 (Modified)	Total/NA

Client Sample ID: DPT-GW-EB-27-22 — Lab Sample ID: 320-24961-5

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctane Sulfonate (PFOS)	0.0029	J M	0.0040	0.0013	ug/L	1		537 (Modified)	Total/NA

Client Sample ID: DPT-GW-EB-27-33 — Lab Sample ID: 320-24961-6

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.00075	J M	0.0024	0.00072	ug/L	1		537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS)	0.0074	M	0.0038	0.0012	ug/L	1		537 (Modified)	Total/NA

Client Sample ID: DPT-TB-011117 — Lab Sample ID: 320-24961-7

No Detections.

Client Sample ID: DPT-17-27-GW-29-33 — Lab Sample ID: 320-24961-8

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctane Sulfonate (PFOS)	0.0026	J M	0.0040	0.0013	ug/L	1		537 (Modified)	Total/NA

Client Sample ID: DPT-17-27-GW-18-22 — Lab Sample ID: 320-24961-9

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: AECOM Technical Services Inc.
Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-24961-1

Client Sample ID: DPT-GW-EB-26-22

Lab Sample ID: 320-24961-1
Date Collected: 01/11/17 10:15
Matrix: Water
Date Received: 01/12/17 10:30

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.00081	J M	0.0026	0.00078	ug/L		01/13/17 12:50	01/16/17 14:26	1
Perfluorobutanesulfonic acid (PFBS)	0.0021	U	0.0026	0.00096	ug/L		01/13/17 12:50	01/16/17 14:26	1
Perfluorooctane Sulfonate (PFOS)	0.020		0.0042	0.0013	ug/L		01/13/17 12:50	01/16/17 14:26	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*57*		*25 - 150*	*01/13/17 12:50*	*01/16/17 14:26*	*1*
18O2 PFHxS	*102*		*25 - 150*	*01/13/17 12:50*	*01/16/17 14:26*	*1*
13C4 PFOS	*102*		*25 - 150*	*01/13/17 12:50*	*01/16/17 14:26*	*1*

Client Sample ID: DPT-GW-EB-26-33

Lab Sample ID: 320-24961-2
Date Collected: 01/11/17 10:30
Matrix: Water
Date Received: 01/12/17 10:30

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.00090	J M	0.0026	0.00077	ug/L		01/13/17 12:50	01/16/17 14:34	1
Perfluorobutanesulfonic acid (PFBS)	0.0021	U M	0.0026	0.00095	ug/L		01/13/17 12:50	01/16/17 14:34	1
Perfluorooctane Sulfonate (PFOS)	0.0013	J M	0.0041	0.0013	ug/L		01/13/17 12:50	01/16/17 14:34	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*62*		*25 - 150*	*01/13/17 12:50*	*01/16/17 14:34*	*1*
18O2 PFHxS	*129*		*25 - 150*	*01/13/17 12:50*	*01/16/17 14:34*	*1*
13C4 PFOS	*130*		*25 - 150*	*01/13/17 12:50*	*01/16/17 14:34*	*1*

Client Sample ID: DPT-17-26-GW-29-33

Lab Sample ID: 320-24961-3
Date Collected: 01/11/17 12:00
Matrix: Water
Date Received: 01/12/17 10:30

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.0016	J	0.0024	0.00072	ug/L		01/13/17 12:50	01/16/17 14:41	1
Perfluorobutanesulfonic acid (PFBS)	0.0019	U	0.0024	0.00088	ug/L		01/13/17 12:50	01/16/17 14:41	1
Perfluorooctane Sulfonate (PFOS)	0.0083		0.0038	0.0012	ug/L		01/13/17 12:50	01/16/17 14:41	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*95*		*25 - 150*	*01/13/17 12:50*	*01/16/17 14:41*	*1*
18O2 PFHxS	*118*		*25 - 150*	*01/13/17 12:50*	*01/16/17 14:41*	*1*
13C4 PFOS	*116*		*25 - 150*	*01/13/17 12:50*	*01/16/17 14:41*	*1*

Client Sample ID: DPT-17-26-GW-18-22

Lab Sample ID: 320-24961-4
Date Collected: 01/11/17 12:30
Matrix: Water
Date Received: 01/12/17 10:30

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.0059	M	0.0025	0.00074	ug/L		01/13/17 12:50	01/16/17 14:49	1
Perfluorobutanesulfonic acid (PFBS)	0.0011	J M	0.0025	0.00091	ug/L		01/13/17 12:50	01/16/17 14:49	1
Perfluorooctane Sulfonate (PFOS)	0.0083		0.0040	0.0013	ug/L		01/13/17 12:50	01/16/17 14:49	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*53*		*25 - 150*	*01/13/17 12:50*	*01/16/17 14:49*	*1*
18O2 PFHxS	*122*		*25 - 150*	*01/13/17 12:50*	*01/16/17 14:49*	*1*

Client Sample ID: DPT-17-26-GW-18-22 — Lab Sample ID: 320-24961-4

Date Collected: 01/11/17 12:30 **Matrix: Water**
Date Received: 01/12/17 10:30

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

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFOS	125		25 - 150	01/13/17 12:50	01/16/17 14:49	1

Client Sample ID: DPT-GW-EB-27-22 — Lab Sample ID: 320-24961-5

Date Collected: 01/11/17 13:40 **Matrix: Water**
Date Received: 01/12/17 10:30

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.0020	U	0.0025	0.00074	ug/L		01/13/17 12:50	01/16/17 14:56	1
Perfluorobutanesulfonic acid (PFBS)	0.0020	U	0.0025	0.00091	ug/L		01/13/17 12:50	01/16/17 14:56	1
Perfluorooctane Sulfonate (PFOS)	**0.0029**	**J M**	0.0040	0.0013	ug/L		01/13/17 12:50	01/16/17 14:56	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFOA	107		25 - 150	01/13/17 12:50	01/16/17 14:56	1
18O2 PFHxS	129		25 - 150	01/13/17 12:50	01/16/17 14:56	1
13C4 PFOS	129		25 - 150	01/13/17 12:50	01/16/17 14:56	1

Client Sample ID: DPT-GW-EB-27-33 — Lab Sample ID: 320-24961-6

Date Collected: 01/11/17 13:45 **Matrix: Water**
Date Received: 01/12/17 10:30

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	**0.00075**	**J M**	0.0024	0.00072	ug/L		01/13/17 12:50	01/16/17 15:04	1
Perfluorobutanesulfonic acid (PFBS)	0.0019	U	0.0024	0.00088	ug/L		01/13/17 12:50	01/16/17 15:04	1
Perfluorooctane Sulfonate (PFOS)	**0.0074**	**M**	0.0038	0.0012	ug/L		01/13/17 12:50	01/16/17 15:04	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFOA	91		25 - 150	01/13/17 12:50	01/16/17 15:04	1
18O2 PFHxS	107		25 - 150	01/13/17 12:50	01/16/17 15:04	1
13C4 PFOS	111		25 - 150	01/13/17 12:50	01/16/17 15:04	1

Client Sample ID: DPT-TB-011117 — Lab Sample ID: 320-24961-7

Date Collected: 01/11/17 13:50 **Matrix: Water**
Date Received: 01/12/17 10:30

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.0018	U	0.0023	0.00069	ug/L		01/13/17 12:50	01/16/17 15:11	1
Perfluorobutanesulfonic acid (PFBS)	0.0018	U	0.0023	0.00085	ug/L		01/13/17 12:50	01/16/17 15:11	1
Perfluorooctane Sulfonate (PFOS)	0.0028	U	0.0037	0.0012	ug/L		01/13/17 12:50	01/16/17 15:11	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFOA	119		25 - 150	01/13/17 12:50	01/16/17 15:11	1
18O2 PFHxS	116		25 - 150	01/13/17 12:50	01/16/17 15:11	1
13C4 PFOS	114		25 - 150	01/13/17 12:50	01/16/17 15:11	1

Client Sample Results

Client: AECOM Technical Services Inc.
Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-24961-1

Client Sample ID: DPT-17-27-GW-29-33

Lab Sample ID: 320-24961-8
Date Collected: 01/11/17 14:55
Matrix: Water
Date Received: 01/12/17 10:30

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.0020	U	0.0025	0.00075	ug/L		01/13/17 12:50	01/16/17 15:41	1
Perfluorobutanesulfonic acid (PFBS)	0.0020	U	0.0025	0.00092	ug/L		01/13/17 12:50	01/16/17 15:41	1
Perfluorooctane Sulfonate (PFOS)	**0.0026**	**J M**	0.0040	0.0013	ug/L		01/13/17 12:50	01/16/17 15:41	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*70*		*25 - 150*	*01/13/17 12:50*	*01/16/17 15:41*	*1*
18O2 PFHxS	*125*		*25 - 150*	*01/13/17 12:50*	*01/16/17 15:41*	*1*
13C4 PFOS	*124*		*25 - 150*	*01/13/17 12:50*	*01/16/17 15:41*	*1*

Client Sample ID: DPT-17-27-GW-18-22

Lab Sample ID: 320-24961-9
Date Collected: 01/11/17 15:15
Matrix: Water
Date Received: 01/12/17 10:30

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.0020	U	0.0025	0.00075	ug/L		01/13/17 12:50	01/16/17 15:49	1
Perfluorobutanesulfonic acid (PFBS)	0.0020	U	0.0025	0.00092	ug/L		01/13/17 12:50	01/16/17 15:49	1
Perfluorooctane Sulfonate (PFOS)	0.0030	U M	0.0040	0.0013	ug/L		01/13/17 12:50	01/16/17 15:49	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*68*		*25 - 150*	*01/13/17 12:50*	*01/16/17 15:49*	*1*
18O2 PFHxS	*124*		*25 - 150*	*01/13/17 12:50*	*01/16/17 15:49*	*1*
13C4 PFOS	*125*		*25 - 150*	*01/13/17 12:50*	*01/16/17 15:49*	*1*

Isotope Dilution Summary

Client: AECOM Technical Services Inc.
Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-24961-1

Method: 537 (Modified) - Perfluorinated Hydrocarbons

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

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	3C4 PFOA (25-150)	8O2 PFHx (25-150)	3C4 PFOS (25-150)					
320-24961-1	DPT-GW-EB-26-22	57	102	102					
320-24961-2	DPT-GW-EB-26-33	62	129	130					
320-24961-3	DPT-17-26-GW-29-33	95	118	116					
320-24961-4	DPT-17-26-GW-18-22	53	122	125					
320-24961-5	DPT-GW-EB-27-22	107	129	129					
320-24961-6	DPT-GW-EB-27-33	91	107	111					
320-24961-7	DPT-TB-011117	119	116	114					
320-24961-8	DPT-17-27-GW-29-33	70	125	124					
320-24961-9	DPT-17-27-GW-18-22	68	124	125					
LCS 320-146325/2-A	Lab Control Sample	116	122	123					
LCSD 320-146325/3-A	Lab Control Sample Dup	117	125	125					
MB 320-146325/1-A	Method Blank	120	123	123					

Surrogate Legend

13C4 PFOA = 13C4 PFOA
18O2 PFHxS = 18O2 PFHxS
13C4 PFOS = 13C4 PFOS

QC Sample Results

Client: AECOM Technical Services Inc.
Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-24961-1

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Lab Sample ID: MB 320-146325/1-A
Matrix: Water
Analysis Batch: 146533

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 146325

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.0020	U	0.0025	0.00075	ug/L		01/13/17 12:50	01/16/17 14:04	1
Perfluorobutanesulfonic acid (PFBS)	0.0020	U	0.0025	0.00092	ug/L		01/13/17 12:50	01/16/17 14:04	1
Perfluorooctane Sulfonate (PFOS)	0.0030	U	0.0040	0.0013	ug/L		01/13/17 12:50	01/16/17 14:04	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*120*		*25 - 150*	*01/13/17 12:50*	*01/16/17 14:04*	*1*
18O2 PFHxS	*123*		*25 - 150*	*01/13/17 12:50*	*01/16/17 14:04*	*1*
13C4 PFOS	*123*		*25 - 150*	*01/13/17 12:50*	*01/16/17 14:04*	*1*

Lab Sample ID: LCS 320-146325/2-A
Matrix: Water
Analysis Batch: 146533

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 146325

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorooctanoic acid (PFOA)	0.0400	0.0411		ug/L		103	60 - 140
Perfluorobutanesulfonic acid (PFBS)	0.0354	0.0423		ug/L		120	50 - 150
Perfluorooctane Sulfonate (PFOS)	0.0371	0.0402		ug/L		108	60 - 140

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C4 PFOA	*116*		*25 - 150*
18O2 PFHxS	*122*		*25 - 150*
13C4 PFOS	*123*		*25 - 150*

Lab Sample ID: LCSD 320-146325/3-A
Matrix: Water
Analysis Batch: 146533

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 146325

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorooctanoic acid (PFOA)	0.0400	0.0421		ug/L		105	60 - 140	2	30
Perfluorobutanesulfonic acid (PFBS)	0.0354	0.0432		ug/L		122	50 - 150	2	30
Perfluorooctane Sulfonate (PFOS)	0.0371	0.0415		ug/L		112	60 - 140	3	30

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C4 PFOA	*117*		*25 - 150*
18O2 PFHxS	*125*		*25 - 150*
13C4 PFOS	*125*		*25 - 150*

QC Association Summary

Client: AECOM Technical Services Inc.
Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-24961-1

LCMS

Prep Batch: 146325

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-24961-1	DPT-GW-EB-26-22	Total/NA	Water	3535	
320-24961-2	DPT-GW-EB-26-33	Total/NA	Water	3535	
320-24961-3	DPT-17-26-GW-29-33	Total/NA	Water	3535	
320-24961-4	DPT-17-26-GW-18-22	Total/NA	Water	3535	
320-24961-5	DPT-GW-EB-27-22	Total/NA	Water	3535	
320-24961-6	DPT-GW-EB-27-33	Total/NA	Water	3535	
320-24961-7	DPT-TB-011117	Total/NA	Water	3535	
320-24961-8	DPT-17-27-GW-29-33	Total/NA	Water	3535	
320-24961-9	DPT-17-27-GW-18-22	Total/NA	Water	3535	
MB 320-146325/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-146325/2-A	Lab Control Sample	Total/NA	Water	3535	
LCSD 320-146325/3-A	Lab Control Sample Dup	Total/NA	Water	3535	

Analysis Batch: 146533

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-24961-1	DPT-GW-EB-26-22	Total/NA	Water	537 (Modified)	146325
320-24961-2	DPT-GW-EB-26-33	Total/NA	Water	537 (Modified)	146325
320-24961-3	DPT-17-26-GW-29-33	Total/NA	Water	537 (Modified)	146325
320-24961-4	DPT-17-26-GW-18-22	Total/NA	Water	537 (Modified)	146325
320-24961-5	DPT-GW-EB-27-22	Total/NA	Water	537 (Modified)	146325
320-24961-6	DPT-GW-EB-27-33	Total/NA	Water	537 (Modified)	146325
320-24961-7	DPT-TB-011117	Total/NA	Water	537 (Modified)	146325
320-24961-8	DPT-17-27-GW-29-33	Total/NA	Water	537 (Modified)	146325
320-24961-9	DPT-17-27-GW-18-22	Total/NA	Water	537 (Modified)	146325
MB 320-146325/1-A	Method Blank	Total/NA	Water	537 (Modified)	146325
LCS 320-146325/2-A	Lab Control Sample	Total/NA	Water	537 (Modified)	146325
LCSD 320-146325/3-A	Lab Control Sample Dup	Total/NA	Water	537 (Modified)	146325

Lab Chronicle

Client: AECOM Technical Services Inc.
Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-24961-1

Client Sample ID: DPT-GW-EB-26-22 — Lab Sample ID: 320-24961-1

Date Collected: 01/11/17 10:15 — **Matrix: Water**
Date Received: 01/12/17 10:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			238.4 mL	0.5 mL	146325	01/13/17 12:50	NS1	TAL SAC
Total/NA	Analysis	537 (Modified)		1			146533	01/16/17 14:26	SBC	TAL SAC

Client Sample ID: DPT-GW-EB-26-33 — Lab Sample ID: 320-24961-2

Date Collected: 01/11/17 10:30 — **Matrix: Water**
Date Received: 01/12/17 10:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			241.7 mL	0.5 mL	146325	01/13/17 12:50	NS1	TAL SAC
Total/NA	Analysis	537 (Modified)		1			146533	01/16/17 14:34	SBC	TAL SAC

Client Sample ID: DPT-17-26-GW-29-33 — Lab Sample ID: 320-24961-3

Date Collected: 01/11/17 12:00 — **Matrix: Water**
Date Received: 01/12/17 10:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			260.2 mL	0.5 mL	146325	01/13/17 12:50	NS1	TAL SAC
Total/NA	Analysis	537 (Modified)		1			146533	01/16/17 14:41	SBC	TAL SAC

Client Sample ID: DPT-17-26-GW-18-22 — Lab Sample ID: 320-24961-4

Date Collected: 01/11/17 12:30 — **Matrix: Water**
Date Received: 01/12/17 10:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			251.7 mL	0.5 mL	146325	01/13/17 12:50	NS1	TAL SAC
Total/NA	Analysis	537 (Modified)		1			146533	01/16/17 14:49	SBC	TAL SAC

Client Sample ID: DPT-GW-EB-27-22 — Lab Sample ID: 320-24961-5

Date Collected: 01/11/17 13:40 — **Matrix: Water**
Date Received: 01/12/17 10:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			252.3 mL	0.5 mL	146325	01/13/17 12:50	NS1	TAL SAC
Total/NA	Analysis	537 (Modified)		1			146533	01/16/17 14:56	SBC	TAL SAC

Client Sample ID: DPT-GW-EB-27-33 — Lab Sample ID: 320-24961-6

Date Collected: 01/11/17 13:45 — **Matrix: Water**
Date Received: 01/12/17 10:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			260.7 mL	0.5 mL	146325	01/13/17 12:50	NS1	TAL SAC
Total/NA	Analysis	537 (Modified)		1			146533	01/16/17 15:04	SBC	TAL SAC

Lab Chronicle

Client: AECOM Technical Services Inc.
Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-24961-1

Client Sample ID: DPT-TB-011117 — Lab Sample ID: 320-24961-7

Date Collected: 01/11/17 13:50 — **Matrix: Water**
Date Received: 01/12/17 10:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			271.2 mL	0.5 mL	146325	01/13/17 12:50	NS1	TAL SAC
Total/NA	Analysis	537 (Modified)		1			146533	01/16/17 15:11	SBC	TAL SAC

Client Sample ID: DPT-17-27-GW-29-33 — Lab Sample ID: 320-24961-8

Date Collected: 01/11/17 14:55 — **Matrix: Water**
Date Received: 01/12/17 10:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			250.8 mL	0.5 mL	146325	01/13/17 12:50	NS1	TAL SAC
Total/NA	Analysis	537 (Modified)		1			146533	01/16/17 15:41	SBC	TAL SAC

Client Sample ID: DPT-17-27-GW-18-22 — Lab Sample ID: 320-24961-9

Date Collected: 01/11/17 15:15 — **Matrix: Water**
Date Received: 01/12/17 10:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			249.9 mL	0.5 mL	146325	01/13/17 12:50	NS1	TAL SAC
Total/NA	Analysis	537 (Modified)		1			146533	01/16/17 15:49	SBC	TAL SAC

Laboratory References:

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

Certification Summary

Client: AECOM Technical Services Inc.
Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-24961-1

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

Method Summary

Client: AECOM Technical Services Inc.
Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-24961-1

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: AECOM Technical Services Inc.
Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-24961-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-24961-1	DPT-GW-EB-26-22	Water	01/11/17 10:15	01/12/17 10:30
320-24961-2	DPT-GW-EB-26-33	Water	01/11/17 10:30	01/12/17 10:30
320-24961-3	DPT-17-26-GW-29-33	Water	01/11/17 12:00	01/12/17 10:30
320-24961-4	DPT-17-26-GW-18-22	Water	01/11/17 12:30	01/12/17 10:30
320-24961-5	DPT-GW-EB-27-22	Water	01/11/17 13:40	01/12/17 10:30
320-24961-6	DPT-GW-EB-27-33	Water	01/11/17 13:45	01/12/17 10:30
320-24961-7	DPT-TB-011117	Water	01/11/17 13:50	01/12/17 10:30
320-24961-8	DPT-17-27-GW-29-33	Water	01/11/17 14:55	01/12/17 10:30
320-24961-9	DPT-17-27-GW-18-22	Water	01/11/17 15:15	01/12/17 10:30

TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Phone (916) 373-5600 Fax (916) 372-1059

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: MIKE GLINSKI	Lab PM: Kellmann, Jill	Carrier Tracking No(s):	COC No: 320-13948-3196.1
Client Contact: Claire Mitchell	Phone: (786) 374-8935	E-Mail: jill.kellmann@testamericainc.com	8066-1822-6725	Page: Page 1 of 1
Company: AECOM Technical Services Inc.				Job #:
Address: 3101 Wilson Blvd. Suite 900	Due Date Requested:			
City: Arlington	TAT Requested (days): 5			
State, Zip: VA, 22201				
Phone: (703) 549-8728	PO #: 60444465.FI.WS			
Email: claire.mitchell@aecom.com	WO #:			
Project Name: Former Bay Head Road Annex (RFP JU06-01)	Project #: 32007449			
Site: DPT - 26/27	SSOW#:			

Analysis Requested

320-24961 Chain of Custody

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA
M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=wasteoil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	PFOA	PFOS	PFBS	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N		
DPT-GW-EB-26-22	01/11/17	1015	G	Water	N	N	✓	✓	✓	2	
DPT-GW-EB-26-33		1030	G	Water	N	N	✓	✓	✓	2	
DPT-17-26-GW-29-33		1200	G	Water	N	N	✓	✓	✓	2	(DPT-17-26-GW-29-33)
DPT-17-26-GW-18-22		1230	G	Water	N	N	✓	✓	✓	2	(DPT-17-26-GW-18-22)
DPT-GW-EB-27-22		1340	G	Water	N	N	✓	✓	✓	2	
DPT-GW-EB-27-33		1345	G	Water	N	N	✓	✓	✓	2	
DPT-TB-011117		1350	G	Water	N	N	✓	✓	✓	2	
DPT-17-27-GW-29-33		1455	G	Water	N	N	✓	✓	✓	2	
DPT-17-27-GW-18-22		1515	G	Water	N	N	✓	✓	✓	2	
				Water							
				Water							

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
AECOM	01/11/17 1700		TRANSFER TO FEDEX	01/11/17 1700	
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
				1/12/17 0930	TAS
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: 3.2°C ice

Login Sample Receipt Checklist

Client: AECOM Technical Services Inc.

Job Number: 320-24961-1

Login Number: 24961
List Number: 1
Creator: Nelson, Kym D

List Source: TestAmerica Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	851492
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

ANALYTICAL REPORT

Job Number: 320-24961-1

Job Description: Former Bay Head Road Annex (RFP JU06-01)

For:
AECOM Technical Services Inc.
3101 Wilson Blvd.
Suite 900
Arlington, VA 22201

Attention: Devon Chicoine

Approved for release.
Jill Kellmann
Manager of Project Management
1/17/2017 4:25 PM

Jill Kellmann, Manager of Project Management
880 Riverside Parkway, West Sacramento, CA, 95605
(916)374-4402
jill.kellmann@testamericainc.com
01/17/2017

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Qualifiers

LCMS

Qualifier	Qualifier Description
U	Undetected at the Limit of Detection.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
M	Manual integrated compound.

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: AECOM Technical Services Inc.

Project: Former Bay Head Road Annex (RFP JU06-01)

Report Number: 320-24961-1

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.

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

RECEIPT
The samples were received on 01/12/2017; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 3.2 C.

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

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-146325.

Due to the excessive amount of sediment in the sample bottles, the aqueous portion of these samples was decanted to new bottles prior to spiking and the extraction.

DPT-GW-EB-26-22 (320-24961-1), DPT-GW-EB-26-33 (320-24961-2), DPT-17-26-GW-29-33 (320-24961-3), DPT-17-26-GW-18-22 (320-24961-4), DPT-GW-EB-27-22 (320-24961-5), DPT-GW-EB-27-33 (320-24961-6), DPT-TB-011117 (320-24961-7), DPT-17-27-GW-29-33 (320-24961-8) and DPT-17-27-GW-18-22 (320-24961-9)

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

Detection Summary

Client: AECOM Technical Services Inc.
Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-24961-1

Client Sample ID: DPT-GW-EB-26-22 — Lab Sample ID: 320-24961-1

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.00081	J M	0.0026	0.00078	ug/L	1		537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS)	0.020		0.0042	0.0013	ug/L	1		537 (Modified)	Total/NA

Client Sample ID: DPT-GW-EB-26-33 — Lab Sample ID: 320-24961-2

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.00090	J M	0.0026	0.00077	ug/L	1		537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS)	0.0013	J M	0.0041	0.0013	ug/L	1		537 (Modified)	Total/NA

Client Sample ID: DPT-17-26-GW-29-33 — Lab Sample ID: 320-24961-3

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.0016	J	0.0024	0.00072	ug/L	1		537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS)	0.0083		0.0038	0.0012	ug/L	1		537 (Modified)	Total/NA

Client Sample ID: DPT-17-26-GW-18-22 — Lab Sample ID: 320-24961-4

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.0059	M	0.0025	0.00074	ug/L	1		537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.0011	J M	0.0025	0.00091	ug/L	1		537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS)	0.0083		0.0040	0.0013	ug/L	1		537 (Modified)	Total/NA

Client Sample ID: DPT-GW-EB-27-22 — Lab Sample ID: 320-24961-5

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctane Sulfonate (PFOS)	0.0029	J M	0.0040	0.0013	ug/L	1		537 (Modified)	Total/NA

Client Sample ID: DPT-GW-EB-27-33 — Lab Sample ID: 320-24961-6

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.00075	J M	0.0024	0.00072	ug/L	1		537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS)	0.0074	M	0.0038	0.0012	ug/L	1		537 (Modified)	Total/NA

Client Sample ID: DPT-TB-011117 — Lab Sample ID: 320-24961-7

No Detections.

Client Sample ID: DPT-17-27-GW-29-33 — Lab Sample ID: 320-24961-8

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctane Sulfonate (PFOS)	0.0026	J M	0.0040	0.0013	ug/L	1		537 (Modified)	Total/NA

Client Sample ID: DPT-17-27-GW-18-22 — Lab Sample ID: 320-24961-9

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample ID: DPT-GW-EB-26-22 — Lab Sample ID: 320-24961-1

Date Collected: 01/11/17 10:15 **Matrix: Water**
Date Received: 01/12/17 10:30

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	**0.00081**	**J M**	0.0026	0.00078	ug/L		01/13/17 12:50	01/16/17 14:26	1
Perfluorobutanesulfonic acid (PFBS)	0.0021	U	0.0026	0.00096	ug/L		01/13/17 12:50	01/16/17 14:26	1
Perfluorooctane Sulfonate (PFOS)	**0.020**		0.0042	0.0013	ug/L		01/13/17 12:50	01/16/17 14:26	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*57*		*25 - 150*	*01/13/17 12:50*	*01/16/17 14:26*	*1*
18O2 PFHxS	*102*		*25 - 150*	*01/13/17 12:50*	*01/16/17 14:26*	*1*
13C4 PFOS	*102*		*25 - 150*	*01/13/17 12:50*	*01/16/17 14:26*	*1*

Client Sample ID: DPT-GW-EB-26-33 — Lab Sample ID: 320-24961-2

Date Collected: 01/11/17 10:30 **Matrix: Water**
Date Received: 01/12/17 10:30

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	**0.00090**	**J M**	0.0026	0.00077	ug/L		01/13/17 12:50	01/16/17 14:34	1
Perfluorobutanesulfonic acid (PFBS)	0.0021	U M	0.0026	0.00095	ug/L		01/13/17 12:50	01/16/17 14:34	1
Perfluorooctane Sulfonate (PFOS)	**0.0013**	**J M**	0.0041	0.0013	ug/L		01/13/17 12:50	01/16/17 14:34	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*62*		*25 - 150*	*01/13/17 12:50*	*01/16/17 14:34*	*1*
18O2 PFHxS	*129*		*25 - 150*	*01/13/17 12:50*	*01/16/17 14:34*	*1*
13C4 PFOS	*130*		*25 - 150*	*01/13/17 12:50*	*01/16/17 14:34*	*1*

Client Sample ID: DPT-17-26-GW-29-33 — Lab Sample ID: 320-24961-3

Date Collected: 01/11/17 12:00 **Matrix: Water**
Date Received: 01/12/17 10:30

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	**0.0016**	**J**	0.0024	0.00072	ug/L		01/13/17 12:50	01/16/17 14:41	1
Perfluorobutanesulfonic acid (PFBS)	0.0019	U	0.0024	0.00088	ug/L		01/13/17 12:50	01/16/17 14:41	1
Perfluorooctane Sulfonate (PFOS)	**0.0083**		0.0038	0.0012	ug/L		01/13/17 12:50	01/16/17 14:41	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*95*		*25 - 150*	*01/13/17 12:50*	*01/16/17 14:41*	*1*
18O2 PFHxS	*118*		*25 - 150*	*01/13/17 12:50*	*01/16/17 14:41*	*1*
13C4 PFOS	*116*		*25 - 150*	*01/13/17 12:50*	*01/16/17 14:41*	*1*

Client Sample ID: DPT-17-26-GW-18-22 — Lab Sample ID: 320-24961-4

Date Collected: 01/11/17 12:30 **Matrix: Water**
Date Received: 01/12/17 10:30

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	**0.0059**	**M**	0.0025	0.00074	ug/L		01/13/17 12:50	01/16/17 14:49	1
Perfluorobutanesulfonic acid (PFBS)	**0.0011**	**J M**	0.0025	0.00091	ug/L		01/13/17 12:50	01/16/17 14:49	1
Perfluorooctane Sulfonate (PFOS)	**0.0083**		0.0040	0.0013	ug/L		01/13/17 12:50	01/16/17 14:49	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*53*		*25 - 150*	*01/13/17 12:50*	*01/16/17 14:49*	*1*
18O2 PFHxS	*122*		*25 - 150*	*01/13/17 12:50*	*01/16/17 14:49*	*1*

Client Sample ID: DPT-17-26-GW-18-22 — Lab Sample ID: 320-24961-4

Date Collected: 01/11/17 12:30 **Matrix: Water**
Date Received: 01/12/17 10:30

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

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFOS	125		25 - 150	01/13/17 12:50	01/16/17 14:49	1

Client Sample ID: DPT-GW-EB-27-22 — Lab Sample ID: 320-24961-5

Date Collected: 01/11/17 13:40 **Matrix: Water**
Date Received: 01/12/17 10:30

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.0020	U	0.0025	0.00074	ug/L		01/13/17 12:50	01/16/17 14:56	1
Perfluorobutanesulfonic acid (PFBS)	0.0020	U	0.0025	0.00091	ug/L		01/13/17 12:50	01/16/17 14:56	1
Perfluorooctane Sulfonate (PFOS)	**0.0029**	**J M**	0.0040	0.0013	ug/L		01/13/17 12:50	01/16/17 14:56	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFOA	107		25 - 150	01/13/17 12:50	01/16/17 14:56	1
18O2 PFHxS	129		25 - 150	01/13/17 12:50	01/16/17 14:56	1
13C4 PFOS	129		25 - 150	01/13/17 12:50	01/16/17 14:56	1

Client Sample ID: DPT-GW-EB-27-33 — Lab Sample ID: 320-24961-6

Date Collected: 01/11/17 13:45 **Matrix: Water**
Date Received: 01/12/17 10:30

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	**0.00075**	**J M**	0.0024	0.00072	ug/L		01/13/17 12:50	01/16/17 15:04	1
Perfluorobutanesulfonic acid (PFBS)	0.0019	U	0.0024	0.00088	ug/L		01/13/17 12:50	01/16/17 15:04	1
Perfluorooctane Sulfonate (PFOS)	**0.0074**	**M**	0.0038	0.0012	ug/L		01/13/17 12:50	01/16/17 15:04	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFOA	91		25 - 150	01/13/17 12:50	01/16/17 15:04	1
18O2 PFHxS	107		25 - 150	01/13/17 12:50	01/16/17 15:04	1
13C4 PFOS	111		25 - 150	01/13/17 12:50	01/16/17 15:04	1

Client Sample ID: DPT-TB-011117 — Lab Sample ID: 320-24961-7

Date Collected: 01/11/17 13:50 **Matrix: Water**
Date Received: 01/12/17 10:30

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.0018	U	0.0023	0.00069	ug/L		01/13/17 12:50	01/16/17 15:11	1
Perfluorobutanesulfonic acid (PFBS)	0.0018	U	0.0023	0.00085	ug/L		01/13/17 12:50	01/16/17 15:11	1
Perfluorooctane Sulfonate (PFOS)	0.0028	U	0.0037	0.0012	ug/L		01/13/17 12:50	01/16/17 15:11	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFOA	119		25 - 150	01/13/17 12:50	01/16/17 15:11	1
18O2 PFHxS	116		25 - 150	01/13/17 12:50	01/16/17 15:11	1
13C4 PFOS	114		25 - 150	01/13/17 12:50	01/16/17 15:11	1

Client Sample Results

Client: AECOM Technical Services Inc.
Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-24961-1

Client Sample ID: DPT-17-27-GW-29-33

Lab Sample ID: 320-24961-8
Date Collected: 01/11/17 14:55
Matrix: Water
Date Received: 01/12/17 10:30

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.0020	U	0.0025	0.00075	ug/L		01/13/17 12:50	01/16/17 15:41	1
Perfluorobutanesulfonic acid (PFBS)	0.0020	U	0.0025	0.00092	ug/L		01/13/17 12:50	01/16/17 15:41	1
Perfluorooctane Sulfonate (PFOS)	**0.0026**	**J M**	0.0040	0.0013	ug/L		01/13/17 12:50	01/16/17 15:41	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*70*		*25 - 150*	*01/13/17 12:50*	*01/16/17 15:41*	*1*
18O2 PFHxS	*125*		*25 - 150*	*01/13/17 12:50*	*01/16/17 15:41*	*1*
13C4 PFOS	*124*		*25 - 150*	*01/13/17 12:50*	*01/16/17 15:41*	*1*

Client Sample ID: DPT-17-27-GW-18-22

Lab Sample ID: 320-24961-9
Date Collected: 01/11/17 15:15
Matrix: Water
Date Received: 01/12/17 10:30

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.0020	U	0.0025	0.00075	ug/L		01/13/17 12:50	01/16/17 15:49	1
Perfluorobutanesulfonic acid (PFBS)	0.0020	U	0.0025	0.00092	ug/L		01/13/17 12:50	01/16/17 15:49	1
Perfluorooctane Sulfonate (PFOS)	0.0030	U M	0.0040	0.0013	ug/L		01/13/17 12:50	01/16/17 15:49	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*68*		*25 - 150*	*01/13/17 12:50*	*01/16/17 15:49*	*1*
18O2 PFHxS	*124*		*25 - 150*	*01/13/17 12:50*	*01/16/17 15:49*	*1*
13C4 PFOS	*125*		*25 - 150*	*01/13/17 12:50*	*01/16/17 15:49*	*1*

Default Detection Limits

Client: AECOM Technical Services Inc.
Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-24961-1

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Prep: 3535

Analyte	LOQ	DL	Units	Method
Perfluorobutanesulfonic acid (PFBS)	0.0025	0.00092	ug/L	537 (Modified)
Perfluorooctane Sulfonate (PFOS)	0.0040	0.0013	ug/L	537 (Modified)
Perfluorooctanoic acid (PFOA)	0.0025	0.00075	ug/L	537 (Modified)

Isotope Dilution Summary

Client: AECOM Technical Services Inc.
Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-24961-1

Method: 537 (Modified) - Perfluorinated Hydrocarbons

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

		Percent Isotope Dilution Recovery (Acceptance Limits)		
Lab Sample ID	**Client Sample ID**	**3C4 PFOA (25-150)**	**18O2 PFHxS (25-150)**	**13C4 PFOS (25-150)**
320-24961-1	DPT-GW-EB-26-22	57	102	102
320-24961-2	DPT-GW-EB-26-33	62	129	130
320-24961-3	DPT-17-26-GW-29-33	95	118	116
320-24961-4	DPT-17-26-GW-18-22	53	122	125
320-24961-5	DPT-GW-EB-27-22	107	129	129
320-24961-6	DPT-GW-EB-27-33	91	107	111
320-24961-7	DPT-TB-011117	119	116	114
320-24961-8	DPT-17-27-GW-29-33	70	125	124
320-24961-9	DPT-17-27-GW-18-22	68	124	125
LCS 320-146325/2-A	Lab Control Sample	116	122	123
LCSD 320-146325/3-A	Lab Control Sample Dup	117	125	125
MB 320-146325/1-A	Method Blank	120	123	123

Surrogate Legend

13C4 PFOA = 13C4 PFOA
18O2 PFHxS = 18O2 PFHxS
13C4 PFOS = 13C4 PFOS

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Lab Sample ID: MB 320-146325/1-A **Client Sample ID: Method Blank**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 146533 **Prep Batch: 146325**

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.0020	U	0.0025	0.00075	ug/L		01/13/17 12:50	01/16/17 14:04	1
Perfluorobutanesulfonic acid (PFBS)	0.0020	U	0.0025	0.00092	ug/L		01/13/17 12:50	01/16/17 14:04	1
Perfluorooctane Sulfonate (PFOS)	0.0030	U	0.0040	0.0013	ug/L		01/13/17 12:50	01/16/17 14:04	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*120*		*25 - 150*	*01/13/17 12:50*	*01/16/17 14:04*	*1*
18O2 PFHxS	*123*		*25 - 150*	*01/13/17 12:50*	*01/16/17 14:04*	*1*
13C4 PFOS	*123*		*25 - 150*	*01/13/17 12:50*	*01/16/17 14:04*	*1*

Lab Sample ID: LCS 320-146325/2-A **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 146533 **Prep Batch: 146325**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorooctanoic acid (PFOA)	0.0400	0.0411		ug/L		103	60 - 140
Perfluorobutanesulfonic acid (PFBS)	0.0354	0.0423		ug/L		120	50 - 150
Perfluorooctane Sulfonate (PFOS)	0.0371	0.0402		ug/L		108	60 - 140

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C4 PFOA	*116*		*25 - 150*
18O2 PFHxS	*122*		*25 - 150*
13C4 PFOS	*123*		*25 - 150*

Lab Sample ID: LCSD 320-146325/3-A **Client Sample ID: Lab Control Sample Dup**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 146533 **Prep Batch: 146325**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorooctanoic acid (PFOA)	0.0400	0.0421		ug/L		105	60 - 140	2	30
Perfluorobutanesulfonic acid (PFBS)	0.0354	0.0432		ug/L		122	50 - 150	2	30
Perfluorooctane Sulfonate (PFOS)	0.0371	0.0415		ug/L		112	60 - 140	3	30

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C4 PFOA	*117*		*25 - 150*
18O2 PFHxS	*125*		*25 - 150*
13C4 PFOS	*125*		*25 - 150*

QC Association Summary

Client: AECOM Technical Services Inc. TestAmerica Job ID: 320-24961-1
Project/Site: Former Bay Head Road Annex (RFP JU06-01)

LCMS

Prep Batch: 146325

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-24961-1	DPT-GW-EB-26-22	Total/NA	Water	3535	
320-24961-2	DPT-GW-EB-26-33	Total/NA	Water	3535	
320-24961-3	DPT-17-26-GW-29-33	Total/NA	Water	3535	
320-24961-4	DPT-17-26-GW-18-22	Total/NA	Water	3535	
320-24961-5	DPT-GW-EB-27-22	Total/NA	Water	3535	
320-24961-6	DPT-GW-EB-27-33	Total/NA	Water	3535	
320-24961-7	DPT-TB-011117	Total/NA	Water	3535	
320-24961-8	DPT-17-27-GW-29-33	Total/NA	Water	3535	
320-24961-9	DPT-17-27-GW-18-22	Total/NA	Water	3535	
MB 320-146325/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-146325/2-A	Lab Control Sample	Total/NA	Water	3535	
LCSD 320-146325/3-A	Lab Control Sample Dup	Total/NA	Water	3535	

Analysis Batch: 146533

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-24961-1	DPT-GW-EB-26-22	Total/NA	Water	537 (Modified)	146325
320-24961-2	DPT-GW-EB-26-33	Total/NA	Water	537 (Modified)	146325
320-24961-3	DPT-17-26-GW-29-33	Total/NA	Water	537 (Modified)	146325
320-24961-4	DPT-17-26-GW-18-22	Total/NA	Water	537 (Modified)	146325
320-24961-5	DPT-GW-EB-27-22	Total/NA	Water	537 (Modified)	146325
320-24961-6	DPT-GW-EB-27-33	Total/NA	Water	537 (Modified)	146325
320-24961-7	DPT-TB-011117	Total/NA	Water	537 (Modified)	146325
320-24961-8	DPT-17-27-GW-29-33	Total/NA	Water	537 (Modified)	146325
320-24961-9	DPT-17-27-GW-18-22	Total/NA	Water	537 (Modified)	146325
MB 320-146325/1-A	Method Blank	Total/NA	Water	537 (Modified)	146325
LCS 320-146325/2-A	Lab Control Sample	Total/NA	Water	537 (Modified)	146325
LCSD 320-146325/3-A	Lab Control Sample Dup	Total/NA	Water	537 (Modified)	146325

Lab Chronicle

Client: AECOM Technical Services Inc.
Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-24961-1

Client Sample ID: DPT-GW-EB-26-22 — Lab Sample ID: 320-24961-1

Date Collected: 01/11/17 10:15
Date Received: 01/12/17 10:30
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			146325	01/13/17 12:50	NS1	TAL SAC
Total/NA	Analysis	537 (Modified)		1	146533	01/16/17 14:26	SBC	TAL SAC

Client Sample ID: DPT-GW-EB-26-33 — Lab Sample ID: 320-24961-2

Date Collected: 01/11/17 10:30
Date Received: 01/12/17 10:30
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			146325	01/13/17 12:50	NS1	TAL SAC
Total/NA	Analysis	537 (Modified)		1	146533	01/16/17 14:34	SBC	TAL SAC

Client Sample ID: DPT-17-26-GW-29-33 — Lab Sample ID: 320-24961-3

Date Collected: 01/11/17 12:00
Date Received: 01/12/17 10:30
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			146325	01/13/17 12:50	NS1	TAL SAC
Total/NA	Analysis	537 (Modified)		1	146533	01/16/17 14:41	SBC	TAL SAC

Client Sample ID: DPT-17-26-GW-18-22 — Lab Sample ID: 320-24961-4

Date Collected: 01/11/17 12:30
Date Received: 01/12/17 10:30
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			146325	01/13/17 12:50	NS1	TAL SAC
Total/NA	Analysis	537 (Modified)		1	146533	01/16/17 14:49	SBC	TAL SAC

Client Sample ID: DPT-GW-EB-27-22 — Lab Sample ID: 320-24961-5

Date Collected: 01/11/17 13:40
Date Received: 01/12/17 10:30
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			146325	01/13/17 12:50	NS1	TAL SAC
Total/NA	Analysis	537 (Modified)		1	146533	01/16/17 14:56	SBC	TAL SAC

Client Sample ID: DPT-GW-EB-27-33 — Lab Sample ID: 320-24961-6

Date Collected: 01/11/17 13:45
Date Received: 01/12/17 10:30
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			146325	01/13/17 12:50	NS1	TAL SAC
Total/NA	Analysis	537 (Modified)		1	146533	01/16/17 15:04	SBC	TAL SAC

Lab Chronicle

Client: AECOM Technical Services Inc.
Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-24961-1

Client Sample ID: DPT-TB-011117 — Lab Sample ID: 320-24961-7

Date Collected: 01/11/17 13:50 — **Matrix: Water**
Date Received: 01/12/17 10:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			146325	01/13/17 12:50	NS1	TAL SAC
Total/NA	Analysis	537 (Modified)		1	146533	01/16/17 15:11	SBC	TAL SAC

Client Sample ID: DPT-17-27-GW-29-33 — Lab Sample ID: 320-24961-8

Date Collected: 01/11/17 14:55 — **Matrix: Water**
Date Received: 01/12/17 10:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			146325	01/13/17 12:50	NS1	TAL SAC
Total/NA	Analysis	537 (Modified)		1	146533	01/16/17 15:41	SBC	TAL SAC

Client Sample ID: DPT-17-27-GW-18-22 — Lab Sample ID: 320-24961-9

Date Collected: 01/11/17 15:15 — **Matrix: Water**
Date Received: 01/12/17 10:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			146325	01/13/17 12:50	NS1	TAL SAC
Total/NA	Analysis	537 (Modified)		1	146533	01/16/17 15:49	SBC	TAL SAC

Laboratory References:

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

Certification Summary

Client: AECOM Technical Services Inc.
Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-24961-1

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

Method Summary

Client: AECOM Technical Services Inc.
Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-24961-1

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: AECOM Technical Services Inc.
Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-24961-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-24961-1	DPT-GW-EB-26-22	Water	01/11/17 10:15	01/12/17 10:30
320-24961-2	DPT-GW-EB-26-33	Water	01/11/17 10:30	01/12/17 10:30
320-24961-3	DPT-17-26-GW-29-33	Water	01/11/17 12:00	01/12/17 10:30
320-24961-4	DPT-17-26-GW-18-22	Water	01/11/17 12:30	01/12/17 10:30
320-24961-5	DPT-GW-EB-27-22	Water	01/11/17 13:40	01/12/17 10:30
320-24961-6	DPT-GW-EB-27-33	Water	01/11/17 13:45	01/12/17 10:30
320-24961-7	DPT-TB-011117	Water	01/11/17 13:50	01/12/17 10:30
320-24961-8	DPT-17-27-GW-29-33	Water	01/11/17 14:55	01/12/17 10:30
320-24961-9	DPT-17-27-GW-18-22	Water	01/11/17 15:15	01/12/17 10:30

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24961-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 145640

Lab Sample ID: IC 320-145640/4 Client Sample ID:

Date Analyzed: 01/09/17 13:31 Lab File ID: 09JAN2017A_004.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	1.92	Incomplete Integration	chandrasenas	01/09/17 14:56
Perfluorohexanesulfonic acid (PFHxS)	2.53	Assign Peak	chandrasenas	01/09/17 14:56
Perfluorooctane Sulfonate (PFOS)	3.24	Assign Peak	chandrasenas	01/09/17 14:56

Lab Sample ID: IC 320-145640/5 Client Sample ID:

Date Analyzed: 01/09/17 13:38 Lab File ID: 09JAN2017A_005.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	1.92	Incomplete Integration	chandrasenas	01/09/17 14:58
Perfluorooctane Sulfonate (PFOS)	3.24	Assign Peak	chandrasenas	01/09/17 14:58

537 (Modified)

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24961-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 146533

Lab Sample ID: CCV 320-146533/4 CCVL Client Sample ID:

Date Analyzed: 01/16/17 13:41 Lab File ID: 16JAN2017_002.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctane Sulfonate (PFOS)	3.35	Assign Peak	westendorfc	01/16/17 14:23

Lab Sample ID: 320-24961-1 Client Sample ID: DPT-GW-EB-26-22

Date Analyzed: 01/16/17 14:26 Lab File ID: 16JAN2017_008.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.92	Baseline	westendorfc	01/16/17 15:02

Lab Sample ID: 320-24961-2 Client Sample ID: DPT-GW-EB-26-33

Date Analyzed: 01/16/17 14:34 Lab File ID: 16JAN2017_009.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	1.94	Assign Peak	westendorfc	01/16/17 15:03
Perfluorooctanoic acid (PFOA)	2.93	Baseline	westendorfc	01/16/17 15:03
Perfluorooctane Sulfonate (PFOS)	3.17	Assign Peak	westendorfc	01/16/17 15:03

Lab Sample ID: 320-24961-4 Client Sample ID: DPT-17-26-GW-18-22

Date Analyzed: 01/16/17 14:49 Lab File ID: 16JAN2017_011.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	1.93	Baseline	chandrasenas	01/17/17 09:43
Perfluorooctanoic acid (PFOA)	2.91	Baseline	chandrasenas	01/17/17 09:43

537 (Modified)

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24961-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 146533

Lab Sample ID: 320-24961-5 Client Sample ID: DPT-GW-EB-27-22

Date Analyzed: 01/16/17 14:56 Lab File ID: 16JAN2017_012.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctane Sulfonate (PFOS)	3.29	Assign Peak	chandrasenas	01/17/17 09:44

Lab Sample ID: 320-24961-6 Client Sample ID: DPT-GW-EB-27-33

Date Analyzed: 01/16/17 15:04 Lab File ID: 16JAN2017_013.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.90	Wrong peak	chandrasenas	01/17/17 09:45
Perfluorooctane Sulfonate (PFOS)	3.27	Baseline	chandrasenas	01/17/17 09:45

Lab Sample ID: 320-24961-8 Client Sample ID: DPT-17-27-GW-29-33

Date Analyzed: 01/16/17 15:41 Lab File ID: 16JAN2017_018.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctane Sulfonate (PFOS)	3.14	Assign Peak	chandrasenas	01/17/17 09:47

Lab Sample ID: 320-24961-9 Client Sample ID: DPT-17-27-GW-18-22

Date Analyzed: 01/16/17 15:49 Lab File ID: 16JAN2017_019.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctane Sulfonate (PFOS)	3.27	Assign Peak	chandrasenas	01/17/17 09:48

537 (Modified)

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24961-1

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	Perfluorobutyric acid	0.5 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.442 ng/mL
							Perfluorodecanoic acid	0.5 ng/mL

Lab Name: TestAmerica Sacramento Job No.: 320-24961-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorododecanoic acid	0.5 ng/mL
							Perfluorodecane Sulfonic acid	0.482 ng/mL
							Perfluoroheptanoic acid	0.5 ng/mL
							Perfluoroheptanesulfonic Acid	0.476 ng/mL
							Perfluorohexanoic acid	0.5 ng/mL
							Perfluorohexadecanoic acid	0.5 ng/mL
							Perfluorohexanesulfonic acid	0.455 ng/mL
							Perfluorononanoic acid	0.5 ng/mL
							Perfluorooctanoic acid (PFOA)	0.5 ng/mL
							Perfluorooctadecanoic acid	0.5 ng/mL
							Perfluorooctane Sulfonate (PFOS)	0.464 ng/mL
							Perfluorooctane Sulfonamide	0.5 ng/mL
							Perfluoropentanoic acid	0.5 ng/mL
							Perfluorotetradecanoic acid	0.5 ng/mL
							Perfluorotridecanoic acid	0.5 ng/mL
							Perfluoroundecanoic acid	0.5 ng/mL
.LCMPFCSU_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	Perfluorobutyric acid	0.1 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-24961-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorobutanesulfonic acid (PFBS)	0.0884 ug/mL
							Perfluorodecanoic acid	0.1 ug/mL
							Perfluorododecanoic acid	0.1 ug/mL
							Perfluorodecane Sulfonic acid	0.0964 ug/mL
							Perfluoroheptanoic acid	0.1 ug/mL
							Perfluoroheptanesulfonic Acid	0.0952 ug/mL
							Perfluorohexanoic acid	0.1 ug/mL
							Perfluorohexadecanoic acid	0.1 ug/mL
							Perfluorohexanesulfonic acid	0.091 ug/mL
							Perfluorononanoic acid	0.1 ug/mL
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL
							Perfluorooctadecanoic acid	0.1 ug/mL
							Perfluorooctane Sulfonate (PFOS)	0.0928 ug/mL
							Perfluorooctane Sulfonamide	0.1 ug/mL
							Perfluoropentanoic acid	0.1 ug/mL
							Perfluorotetradecanoic acid	0.1 ug/mL
							Perfluorotridecanoic acid	0.1 ug/mL
							Perfluoroundecanoic acid	0.1 ug/mL
..LCPFCSP_00070	05/15/17	11/15/16	Methanol, Lot 090285	10000 uL	LCPFBA_00005	100 uL	Perfluorobutyric acid	0.5 ug/mL
					LCPFBS_00005	100 uL	Perfluorobutanesulfonic acid (PFBS)	0.442 ug/mL
					LCPFDA_00005	100 uL	Perfluorodecanoic acid	0.5 ug/mL
					LCPFDoA_00005	100 uL	Perfluorododecanoic acid	0.5 ug/mL
					LCPFDS_00006	100 uL	Perfluorodecane Sulfonic acid	0.482 ug/mL
					LCPFHpA_00005	100 uL	Perfluoroheptanoic acid	0.5 ug/mL
					LCPFHpS_00009	100 uL	Perfluoroheptanesulfonic Acid	0.476 ug/mL
					LCPFHxA_00004	100 uL	Perfluorohexanoic acid	0.5 ug/mL
					LCPFHxDA_00006	100 uL	Perfluorohexadecanoic acid	0.5 ug/mL
					LCPFHxS-br_00002	100 uL	Perfluorohexanesulfonic acid	0.455 ug/mL
					LCPFNA_00005	100 uL	Perfluorononanoic acid	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	Perfluorooctane Sulfonate (PFOS)	0.464 ug/mL
					LCPFOSA_00006	100 uL	Perfluorooctane Sulfonamide	0.5 ug/mL
					LCPFPeA_00005	100 uL	Perfluoropentanoic acid	0.5 ug/mL
					LCPFTeDA_00004	100 uL	Perfluorotetradecanoic acid	0.5 ug/mL
					LCPFTrDA_00004	100 uL	Perfluorotridecanoic acid	0.5 ug/mL
					LCPFUdA_00005	100 uL	Perfluoroundecanoic acid	0.5 ug/mL
...LCPFBA_00005	05/27/21	Wellington Laboratories, Lot PFBA0516			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
...LCPFBS_00005	03/15/21	Wellington Laboratories, Lot LPFBS0316			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
...LCPFDA_00005	07/02/20	Wellington Laboratories, Lot PFDA0615			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
...LCPFDoA_00005	01/30/20	Wellington Laboratories, Lot PFDoA0115			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
...LCPFDS_00006	05/24/21	Wellington Laboratories, Lot LPFDS0516			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
...LCPFHpA_00005	01/22/21	Wellington Laboratories, Lot PFHpA0116			(Purchased Reagent)		Perfluoroheptanoic acid	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24961-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...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	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	45.5 ug/mL
...LCPFNA_00005	10/23/20	Wellington Laboratories, Lot PFNA1015			(Purchased Reagent)		Perfluorononanoic acid	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)		Perfluorooctane Sulfonate (PFOS)	46.4 ug/mL
...LCPFOSA_00006	09/02/17	Wellington Laboratories, Lot FOSA0815I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
...LCPFPeA_00005	01/30/20	Wellington Laboratories, Lot PFPeA0115			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
...LCPFTeDA_00004	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
...LCPFTrDA_00004	12/10/18	Wellington Laboratories, Lot PFTrDA1213			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
...LCPFUdA_00005	08/19/20	Wellington Laboratories, Lot PFUdA0815			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
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
							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	Perfluorobutyric acid	1 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.884 ng/mL
							Perfluorodecanoic acid	1 ng/mL
							Perfluorododecanoic acid	1 ng/mL
							Perfluorodecane Sulfonic acid	0.964 ng/mL
							Perfluoroheptanoic acid	1 ng/mL
							Perfluoroheptanesulfonic Acid	0.952 ng/mL
							Perfluorohexanoic acid	1 ng/mL
							Perfluorohexadecanoic acid	1 ng/mL
							Perfluorohexanesulfonic acid	0.91 ng/mL
							Perfluorononanoic acid	1 ng/mL
							Perfluorooctanoic acid (PFOA)	1 ng/mL
							Perfluorooctadecanoic acid	1 ng/mL
							Perfluorooctane Sulfonate (PFOS)	0.928 ng/mL
							Perfluorooctane Sulfonamide	1 ng/mL
							Perfluoropentanoic acid	1 ng/mL
							Perfluorotetradecanoic acid	1 ng/mL
							Perfluorotridecanoic acid	1 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24961-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluoroundecanoic acid	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
					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	Perfluorobutyric acid	0.1 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0884 ug/mL
							Perfluorodecanoic acid	0.1 ug/mL
							Perfluorododecanoic acid	0.1 ug/mL
							Perfluorodecane Sulfonic acid	0.0964 ug/mL
							Perfluoroheptanoic acid	0.1 ug/mL
							Perfluoroheptanesulfonic Acid	0.0952 ug/mL
							Perfluorohexanoic acid	0.1 ug/mL
							Perfluorohexadecanoic acid	0.1 ug/mL
							Perfluorohexanesulfonic acid	0.091 ug/mL
							Perfluorononanoic acid	0.1 ug/mL
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL
							Perfluorooctadecanoic acid	0.1 ug/mL
							Perfluorooctane Sulfonate (PFOS)	0.0928 ug/mL
							Perfluorooctane Sulfonamide	0.1 ug/mL
							Perfluoropentanoic acid	0.1 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-24961-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorotetradecanoic acid	0.1 ug/mL
							Perfluorotridecanoic acid	0.1 ug/mL
							Perfluoroundecanoic acid	0.1 ug/mL
..LCPFCSP_00070	05/15/17	11/15/16	Methanol, Lot 090285	10000 uL	LCPFBA_00005	100 uL	Perfluorobutyric acid	0.5 ug/mL
					LCPFBS_00005	100 uL	Perfluorobutanesulfonic acid (PFBS)	0.442 ug/mL
					LCPFDA_00005	100 uL	Perfluorodecanoic acid	0.5 ug/mL
					LCPFDoA_00005	100 uL	Perfluorododecanoic acid	0.5 ug/mL
					LCPFDS_00006	100 uL	Perfluorodecane Sulfonic acid	0.482 ug/mL
					LCPFHpA_00005	100 uL	Perfluoroheptanoic acid	0.5 ug/mL
					LCPFHpS_00009	100 uL	Perfluoroheptanesulfonic Acid	0.476 ug/mL
					LCPFHxA_00004	100 uL	Perfluorohexanoic acid	0.5 ug/mL
					LCPFHxDA_00006	100 uL	Perfluorohexadecanoic acid	0.5 ug/mL
					LCPFHxS-br_00002	100 uL	Perfluorohexanesulfonic acid	0.455 ug/mL
					LCPFNA_00005	100 uL	Perfluorononanoic acid	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	Perfluorooctane Sulfonate (PFOS)	0.464 ug/mL
					LCPFOSA_00006	100 uL	Perfluorooctane Sulfonamide	0.5 ug/mL
					LCPFPeA_00005	100 uL	Perfluoropentanoic acid	0.5 ug/mL
					LCPFTeDA_00004	100 uL	Perfluorotetradecanoic acid	0.5 ug/mL
					LCPFTrDA_00004	100 uL	Perfluorotridecanoic acid	0.5 ug/mL
					LCPFUdA_00005	100 uL	Perfluoroundecanoic acid	0.5 ug/mL
...LCPFBA_00005	05/27/21	Wellington Laboratories, Lot PFBA0516			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
...LCPFBS_00005	03/15/21	Wellington Laboratories, Lot LPFBS0316			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
...LCPFDA_00005	07/02/20	Wellington Laboratories, Lot PFDA0615			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
...LCPFDoA_00005	01/30/20	Wellington Laboratories, Lot PFDoA0115			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
...LCPFDS_00006	05/24/21	Wellington Laboratories, Lot LPFDS0516			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
...LCPFHpA_00005	01/22/21	Wellington Laboratories, Lot PFHpA0116			(Purchased Reagent)		Perfluoroheptanoic acid	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	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	45.5 ug/mL
...LCPFNA_00005	10/23/20	Wellington Laboratories, Lot PFNA1015			(Purchased Reagent)		Perfluorononanoic acid	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)		Perfluorooctane Sulfonate (PFOS)	46.4 ug/mL
...LCPFOSA_00006	09/02/17	Wellington Laboratories, Lot FOSA0815I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
...LCPFPeA_00005	01/30/20	Wellington Laboratories, Lot PFPeA0115			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
...LCPFTeDA_00004	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
...LCPFTrDA_00004	12/10/18	Wellington Laboratories, Lot PFTrDA1213			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
...LCPFUdA_00005	08/19/20	Wellington Laboratories, Lot PFUdA0815			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
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

Lab Name: TestAmerica Sacramento Job No.: 320-24961-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							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	Perfluorobutyric acid	5 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	4.42 ng/mL
							Perfluorodecanoic acid	5 ng/mL
							Perfluorododecanoic acid	5 ng/mL
							Perfluorodecane Sulfonic acid	4.82 ng/mL
							Perfluoroheptanoic acid	5 ng/mL
							Perfluoroheptanesulfonic Acid	4.76 ng/mL
							Perfluorohexanoic acid	5 ng/mL
							Perfluorohexadecanoic acid	5 ng/mL
							Perfluorohexanesulfonic acid	4.55 ng/mL
							Perfluorononanoic acid	5 ng/mL
							Perfluorooctanoic acid (PFOA)	5 ng/mL
							Perfluorooctadecanoic acid	5 ng/mL
							Perfluorooctane Sulfonate (PFOS)	4.64 ng/mL
							Perfluorooctane Sulfonamide	5 ng/mL
							Perfluoropentanoic acid	5 ng/mL
							Perfluorotetradecanoic acid	5 ng/mL
							Perfluorotridecanoic acid	5 ng/mL
							Perfluoroundecanoic acid	5 ng/mL
.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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24961-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..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	Perfluorobutyric acid	0.1 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0884 ug/mL
							Perfluorodecanoic acid	0.1 ug/mL
							Perfluorododecanoic acid	0.1 ug/mL
							Perfluorodecane Sulfonic acid	0.0964 ug/mL
							Perfluoroheptanoic acid	0.1 ug/mL
							Perfluoroheptanesulfonic Acid	0.0952 ug/mL
							Perfluorohexanoic acid	0.1 ug/mL
							Perfluorohexadecanoic acid	0.1 ug/mL
							Perfluorohexanesulfonic acid	0.091 ug/mL
							Perfluorononanoic acid	0.1 ug/mL
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL
							Perfluorooctadecanoic acid	0.1 ug/mL
							Perfluorooctane Sulfonate (PFOS)	0.0928 ug/mL
							Perfluorooctane Sulfonamide	0.1 ug/mL
							Perfluoropentanoic acid	0.1 ug/mL
							Perfluorotetradecanoic acid	0.1 ug/mL
							Perfluorotridecanoic acid	0.1 ug/mL
							Perfluoroundecanoic acid	0.1 ug/mL
..LCPFCSP_00070	05/15/17	11/15/16	Methanol, Lot 090285	10000 uL	LCPFBA_00005	100 uL	Perfluorobutyric acid	0.5 ug/mL
					LCPFBS_00005	100 uL	Perfluorobutanesulfonic acid (PFBS)	0.442 ug/mL
					LCPFDA_00005	100 uL	Perfluorodecanoic acid	0.5 ug/mL
					LCPFDoA_00005	100 uL	Perfluorododecanoic acid	0.5 ug/mL
					LCPFDS_00006	100 uL	Perfluorodecane Sulfonic acid	0.482 ug/mL
					LCPFHpA_00005	100 uL	Perfluoroheptanoic acid	0.5 ug/mL
					LCPFHpS_00009	100 uL	Perfluoroheptanesulfonic Acid	0.476 ug/mL
					LCPFHxA_00004	100 uL	Perfluorohexanoic acid	0.5 ug/mL
					LCPFHxDA_00006	100 uL	Perfluorohexadecanoic acid	0.5 ug/mL
					LCPFHxS-br_00002	100 uL	Perfluorohexanesulfonic acid	0.455 ug/mL
					LCPFNA_00005	100 uL	Perfluorononanoic acid	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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24961-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFOS-br_00002	100 uL	Perfluorooctane Sulfonate (PFOS)	0.464 ug/mL
					LCPFOSA_00006	100 uL	Perfluorooctane Sulfonamide	0.5 ug/mL
					LCPFPeA_00005	100 uL	Perfluoropentanoic acid	0.5 ug/mL
					LCPFTeDA_00004	100 uL	Perfluorotetradecanoic acid	0.5 ug/mL
					LCPFTrDA_00004	100 uL	Perfluorotridecanoic acid	0.5 ug/mL
					LCPFUdA_00005	100 uL	Perfluoroundecanoic acid	0.5 ug/mL
...LCPFBA_00005	05/27/21	Wellington Laboratories, Lot PFBA0516			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
...LCPFBS_00005	03/15/21	Wellington Laboratories, Lot LPFBS0316			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
...LCPFDA_00005	07/02/20	Wellington Laboratories, Lot PFDA0615			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
...LCPFDoA_00005	01/30/20	Wellington Laboratories, Lot PFDoA0115			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
...LCPFDS_00006	05/24/21	Wellington Laboratories, Lot LPFDS0516			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
...LCPFHpA_00005	01/22/21	Wellington Laboratories, Lot PFHpA0116			(Purchased Reagent)		Perfluoroheptanoic acid	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	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	45.5 ug/mL
...LCPFNA_00005	10/23/20	Wellington Laboratories, Lot PFNA1015			(Purchased Reagent)		Perfluorononanoic acid	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)		Perfluorooctane Sulfonate (PFOS)	46.4 ug/mL
...LCPFOSA_00006	09/02/17	Wellington Laboratories, Lot FOSA0815I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
...LCPFPeA_00005	01/30/20	Wellington Laboratories, Lot PFPeA0115			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
...LCPFTeDA_00004	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
...LCPFTrDA_00004	12/10/18	Wellington Laboratories, Lot PFTrDA1213			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
...LCPFUdA_00005	08/19/20	Wellington Laboratories, Lot PFUdA0815			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
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	Perfluorobutyric acid	20 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	17.68 ng/mL
							Perfluorodecanoic acid	20 ng/mL
							Perfluorododecanoic acid	20 ng/mL
							Perfluorodecane Sulfonic acid	19.28 ng/mL

Lab Name: TestAmerica Sacramento Job No.: 320-24961-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluoroheptanoic acid	20 ng/mL
							Perfluoroheptanesulfonic Acid	19.04 ng/mL
							Perfluorohexanoic acid	20 ng/mL
							Perfluorohexadecanoic acid	20 ng/mL
							Perfluorohexanesulfonic acid	18.2 ng/mL
							Perfluorononanoic acid	20 ng/mL
							Perfluorooctanoic acid (PFOA)	20 ng/mL
							Perfluorooctadecanoic acid	20 ng/mL
							Perfluorooctane Sulfonate (PFOS)	18.56 ng/mL
							Perfluorooctane Sulfonamide	20 ng/mL
							Perfluoropentanoic acid	20 ng/mL
							Perfluorotetradecanoic acid	20 ng/mL
							Perfluorotridecanoic acid	20 ng/mL
							Perfluoroundecanoic acid	20 ng/mL
.LCMPFCSU_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	Perfluorobutyric acid	1 ug/mL
					LCPFBS_00005	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00005	200 uL	Perfluorodecanoic acid	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24961-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFDoA_00005	200 uL	Perfluorododecanoic acid	1 ug/mL
					LCPFDS_00006	200 uL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00006	200 uL	Perfluoroheptanoic acid	1 ug/mL
					LCPFHpS_00009	200 uL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00005	200 uL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00006	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00002	200 uL	Perfluorohexanesulfonic acid	0.91 ug/mL
					LCPFNA_00006	200 uL	Perfluorononanoic acid	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	Perfluorooctane Sulfonate (PFOS)	0.928 ug/mL
					LCPFOSA_00008	200 uL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00005	200 uL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00005	200 uL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00005	200 uL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00005	200 uL	Perfluoroundecanoic acid	1 ug/mL
..LCPFBA_00005	05/27/21	Wellington Laboratories, Lot PFBA0516			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
..LCPFBS_00005	03/15/21	Wellington Laboratories, Lot LPFBS0316			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00005	07/02/20	Wellington Laboratories, Lot PFDA0615			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
..LCPFDoA_00005	01/30/20	Wellington Laboratories, Lot PFDoA0115			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
..LCPFDS_00006	05/24/21	Wellington Laboratories, Lot LPFDS0516			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
..LCPFHpA_00006	01/22/21	Wellington Laboratories, Lot PFHpA0116			(Purchased Reagent)		Perfluoroheptanoic acid	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	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	45.5 ug/mL
..LCPFNA_00006	10/23/20	Wellington Laboratories, Lot PFNA1015			(Purchased Reagent)		Perfluorononanoic acid	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)		Perfluorooctane Sulfonate (PFOS)	46.4 ug/mL
..LCPFOSA_00008	09/02/17	Wellington Laboratories, Lot FOSA0815I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
..LCPFPeA_00005	01/30/20	Wellington Laboratories, Lot PFPeA0115			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFTeDA_00005	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
..LCPFTrDA_00005	02/12/21	Wellington Laboratories, Lot PFTrDA0216			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
..LCPFUdA_00005	08/19/20	Wellington Laboratories, Lot PFUdA0815			(Purchased Reagent)		Perfluoroundecanoic acid	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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24961-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							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	Perfluorobutyric acid	50 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	44.2 ng/mL
							Perfluorodecanoic acid	50 ng/mL
							Perfluorododecanoic acid	50 ng/mL
							Perfluorodecane Sulfonic acid	48.2 ng/mL
							Perfluoroheptanoic acid	50 ng/mL
							Perfluoroheptanesulfonic Acid	47.6 ng/mL
							Perfluorohexanoic acid	50 ng/mL
							Perfluorohexadecanoic acid	50 ng/mL
							Perfluorohexanesulfonic acid	45.5 ng/mL
							Perfluorononanoic acid	50 ng/mL
							Perfluorooctanoic acid (PFOA)	50 ng/mL
							Perfluorooctadecanoic acid	50 ng/mL
							Perfluorooctane Sulfonate (PFOS)	46.4 ng/mL
							Perfluorooctane Sulfonamide	50 ng/mL
							Perfluoropentanoic acid	50 ng/mL
							Perfluorotetradecanoic acid	50 ng/mL
							Perfluorotridecanoic acid	50 ng/mL
							Perfluoroundecanoic acid	50 ng/mL
.LCMPFCSU_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.: 320-24961-1

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	Perfluorobutyric acid	1 ug/mL
					LCPFBS_00005	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00005	200 uL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00005	200 uL	Perfluorododecanoic acid	1 ug/mL
					LCPFDS_00006	200 uL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00006	200 uL	Perfluoroheptanoic acid	1 ug/mL
					LCPFHpS_00009	200 uL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00005	200 uL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00006	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00002	200 uL	Perfluorohexanesulfonic acid	0.91 ug/mL
					LCPFNA_00006	200 uL	Perfluorononanoic acid	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	Perfluorooctane Sulfonate (PFOS)	0.928 ug/mL
					LCPFOSA_00008	200 uL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00005	200 uL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00005	200 uL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00005	200 uL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00005	200 uL	Perfluoroundecanoic acid	1 ug/mL
..LCPFBA_00005	05/27/21	Wellington Laboratories, Lot PFBA0516			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
..LCPFBS_00005	03/15/21	Wellington Laboratories, Lot LPFBS0316			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00005	07/02/20	Wellington Laboratories, Lot PFDA0615			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
..LCPFDoA_00005	01/30/20	Wellington Laboratories, Lot PFDoA0115			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
..LCPFDS_00006	05/24/21	Wellington Laboratories, Lot LPFDS0516			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
..LCPFHpA_00006	01/22/21	Wellington Laboratories, Lot PFHpA0116			(Purchased Reagent)		Perfluoroheptanoic acid	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	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	45.5 ug/mL
..LCPFNA_00006	10/23/20	Wellington Laboratories, Lot PFNA1015			(Purchased Reagent)		Perfluorononanoic acid	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)		Perfluorooctane Sulfonate (PFOS)	46.4 ug/mL
..LCPFOSA_00008	09/02/17	Wellington Laboratories, Lot FOSA0815I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
..LCPFPeA_00005	01/30/20	Wellington Laboratories, Lot PFPeA0115			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFTeDA_00005	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
..LCPFTrDA_00005	02/12/21	Wellington Laboratories, Lot PFTrDA0216			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
..LCPFUdA_00005	08/19/20	Wellington Laboratories, Lot PFUdA0815			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24961-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
LCPFC-L6_00020	06/14/17	12/15/16	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00047	250 uL	13C2-PFHxDA	50 ng/mL
							13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5-PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							18O2 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	50 ng/mL
					LCPFCSP_00074	1000 uL	Perfluorobutyric acid	200 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	176.8 ng/mL
							Perfluorodecanoic acid	200 ng/mL
							Perfluorododecanoic acid	200 ng/mL
							Perfluorodecane Sulfonic acid	192.8 ng/mL
							Perfluoroheptanoic acid	200 ng/mL
							Perfluoroheptanesulfonic Acid	190.4 ng/mL
							Perfluorohexanoic acid	200 ng/mL
							Perfluorohexadecanoic acid	200 ng/mL
							Perfluorohexanesulfonic acid	182 ng/mL
							Perfluorononanoic acid	200 ng/mL
							Perfluorooctanoic acid (PFOA)	200 ng/mL
							Perfluorooctadecanoic acid	200 ng/mL
							Perfluorooctane Sulfonate (PFOS)	185.6 ng/mL
							Perfluorooctane Sulfonamide	200 ng/mL
							Perfluoropentanoic acid	200 ng/mL
							Perfluorotetradecanoic acid	200 ng/mL
							Perfluorotridecanoic acid	200 ng/mL
							Perfluoroundecanoic acid	200 ng/mL
.LCMPFCSU_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

Lab Name: TestAmerica Sacramento Job No.: 320-24961-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					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	Perfluorobutyric acid	1 ug/mL
					LCPFBS_00005	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00005	200 uL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00005	200 uL	Perfluorododecanoic acid	1 ug/mL
					LCPFDS_00006	200 uL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00006	200 uL	Perfluoroheptanoic acid	1 ug/mL
					LCPFHpS_00009	200 uL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00005	200 uL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00006	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00002	200 uL	Perfluorohexanesulfonic acid	0.91 ug/mL
					LCPFNA_00006	200 uL	Perfluorononanoic acid	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	Perfluorooctane Sulfonate (PFOS)	0.928 ug/mL
					LCPFOSA_00008	200 uL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00005	200 uL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00005	200 uL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00005	200 uL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00005	200 uL	Perfluoroundecanoic acid	1 ug/mL
..LCPFBA_00005	05/27/21	Wellington Laboratories, Lot PFBA0516			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
..LCPFBS_00005	03/15/21	Wellington Laboratories, Lot LPFBS0316			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00005	07/02/20	Wellington Laboratories, Lot PFDA0615			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
..LCPFDoA_00005	01/30/20	Wellington Laboratories, Lot PFDoA0115			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
..LCPFDS_00006	05/24/21	Wellington Laboratories, Lot LPFDS0516			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
..LCPFHpA_00006	01/22/21	Wellington Laboratories, Lot PFHpA0116			(Purchased Reagent)		Perfluoroheptanoic acid	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	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	45.5 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24961-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFNA_00006	10/23/20	Wellington Laboratories, Lot PFNA1015			(Purchased Reagent)		Perfluorononanoic acid	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)		Perfluorooctane Sulfonate (PFOS)	46.4 ug/mL
..LCPFOSA_00008	09/02/17	Wellington Laboratories, Lot FOSA0815I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
..LCPFPeA_00005	01/30/20	Wellington Laboratories, Lot PFPeA0115			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFTeDA_00005	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
..LCPFTrDA_00005	02/12/21	Wellington Laboratories, Lot PFTrDA0216			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
..LCPFUdA_00005	08/19/20	Wellington Laboratories, Lot PFUdA0815			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC2-L1_00004	03/26/17	01/06/17	MeOH/H2O, Lot 104453	5 mL	LCMPFC2SU_00010	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_00023	25 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.474 ng/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.479 ng/mL
							N-ethylperfluoro-1-octanesulfo namide	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_00010	03/26/17	09/26/16	Methanol, Lot 104453	50000 uL	LCd-NEtFOSA-M_00003	1000 uL	d-N-EtFOSA-M	1 ug/mL
					LCd-NMeFOSA-M_00003	1000 uL	d-N-MeFOSA-M	1 ug/mL
					LCd3-NMeFOSAA_00003	1000 uL	d3-NMeFOSAA	1 ug/mL
					LCd5-NEtFOSAA_00003	1000 uL	d5-NEtFOSAA	1 ug/mL
					LCM2-6:FTS_00003	1000 uL	M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS_00003	1000 uL	M2-8:2FTS	0.958 ug/mL
..LCd-NEtFOSA-M_00003	06/10/21	WELLINGTON, Lot dNEtFOSA0616M			(Purchased Reagent)		d-N-EtFOSA-M	50 ug/mL
..LCd-NMeFOSA-M_00003	06/10/21	WELLINGTON, Lot dNMeFOSA0616M			(Purchased Reagent)		d-N-MeFOSA-M	50 ug/mL
..LCd3-NMeFOSAA_00003	05/31/21	WELLINGTON, Lot d3NMeFOSAA0516			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00003	08/02/21	WELLINGTON, Lot d5NEtFOSAA0716			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00003	01/08/21	WELLINGTON, Lot M262FTS0116			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00003	01/08/21	WELLINGTON, Lot M282FTS0116			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
.LCPFC2SP_00023	06/28/17	01/05/17	Methanol, Lot 104453	5000 uL	LCPFC2SP_00020	1000 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.0948 ug/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.0958 ug/mL
							N-ethylperfluoro-1-octanesulfo namide	0.1 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-24961-1

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	0.1 ug/mL
							MeFOSA	0.1 ug/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
..LCPFC2SP_00020	06/28/17	12/28/16	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-octanesulfo namide	0.5 ug/mL
					LCN-EtFOSAA_00002	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
					LCN-MeFOSA-M_00002	100 uL	MeFOSA	0.5 ug/mL
					LCN-MeFOSAA_00003	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
...LC6:2FTS_00002	06/25/21	WELLINGTON, Lot 62FTS0616			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
...LC8:2FTS_00002	10/23/20	WELLINGTON, Lot 82FTS1015			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	47.9 ug/mL
...LCN-EtFOSA-M_00003	05/24/21	WELLINGTON, Lot NEtFOSA0516M			(Purchased Reagent)		N-ethylperfluoro-1-octanesulfo namide	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-L2_00003	03/26/17	01/06/17	MeOH/H2O, Lot 104453	5 mL	LCMPFC2SU_00010	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_00023	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-octanesulfo namide	1 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	1 ng/mL
							MeFOSA	1 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	1 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24961-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LCMPFC2SU_00010	03/26/17	09/26/16	Methanol, Lot 104453	50000 uL	LCd-NEtFOSA-M_00003	1000 uL	d-N-EtFOSA-M	1 ug/mL
					LCd-NMeFOSA-M_00003	1000 uL	d-N-MeFOSA-M	1 ug/mL
					LCd3-NMeFOSAA_00003	1000 uL	d3-NMeFOSAA	1 ug/mL
					LCd5-NEtFOSAA_00003	1000 uL	d5-NEtFOSAA	1 ug/mL
					LCM2-6:FTS_00003	1000 uL	M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS_00003	1000 uL	M2-8:2FTS	0.958 ug/mL
..LCd-NEtFOSA-M_00003	06/10/21	WELLINGTON, Lot dNEtFOSA0616M			(Purchased Reagent)		d-N-EtFOSA-M	50 ug/mL
..LCd-NMeFOSA-M_00003	06/10/21	WELLINGTON, Lot dNMeFOSA0616M			(Purchased Reagent)		d-N-MeFOSA-M	50 ug/mL
..LCd3-NMeFOSAA_00003	05/31/21	WELLINGTON, Lot d3NMeFOSAA0516			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00003	08/02/21	WELLINGTON, Lot d5NEtFOSAA0716			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00003	01/08/21	WELLINGTON, Lot M262FTS0116			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00003	01/08/21	WELLINGTON, Lot M282FTS0116			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
.LCPFC2SP_00023	06/28/17	01/05/17	Methanol, Lot 104453	5000 uL	LCPFC2SP_00020	1000 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.0948 ug/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.0958 ug/mL
							N-ethylperfluoro-1-octanesulfo namide	0.1 ug/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
							MeFOSA	0.1 ug/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
..LCPFC2SP_00020	06/28/17	12/28/16	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-octanesulfo namide	0.5 ug/mL
					LCN-EtFOSAA_00002	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
					LCN-MeFOSA-M_00002	100 uL	MeFOSA	0.5 ug/mL
					LCN-MeFOSAA_00003	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
...LC6:2FTS_00002	06/25/21	WELLINGTON, Lot 62FTS0616			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
...LC8:2FTS_00002	10/23/20	WELLINGTON, Lot 82FTS1015			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	47.9 ug/mL
...LCN-EtFOSA-M_00003	05/24/21	WELLINGTON, Lot NEtFOSA0516M			(Purchased Reagent)		N-ethylperfluoro-1-octanesulfo namide	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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24961-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LCN-MeFOSAA_00003	01/20/21	WELLINGTON, Lot NMeFOSAA0116			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCPFC2-L3_00003	03/26/17	01/06/17	MeOH/H2O, Lot 104453	5 mL	LCMPFC2SU_00010	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_00023	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-octanesulfo namide	5 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	5 ng/mL
							MeFOSA	5 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	5 ng/mL
.LCMPFC2SU_00010	03/26/17	09/26/16	Methanol, Lot 104453	50000 uL	LCd-NEtFOSA-M_00003	1000 uL	d-N-EtFOSA-M	1 ug/mL
					LCd-NMeFOSA-M_00003	1000 uL	d-N-MeFOSA-M	1 ug/mL
					LCd3-NMeFOSAA_00003	1000 uL	d3-NMeFOSAA	1 ug/mL
					LCd5-NEtFOSAA_00003	1000 uL	d5-NEtFOSAA	1 ug/mL
					LCM2-6:FTS_00003	1000 uL	M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS_00003	1000 uL	M2-8:2FTS	0.958 ug/mL
..LCd-NEtFOSA-M_00003	06/10/21	WELLINGTON, Lot dNEtFOSA0616M			(Purchased Reagent)		d-N-EtFOSA-M	50 ug/mL
..LCd-NMeFOSA-M_00003	06/10/21	WELLINGTON, Lot dNMeFOSA0616M			(Purchased Reagent)		d-N-MeFOSA-M	50 ug/mL
..LCd3-NMeFOSAA_00003	05/31/21	WELLINGTON, Lot d3NMeFOSAA0516			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00003	08/02/21	WELLINGTON, Lot d5NEtFOSAA0716			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00003	01/08/21	WELLINGTON, Lot M262FTS0116			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00003	01/08/21	WELLINGTON, Lot M282FTS0116			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
.LCPFC2SP_00023	06/28/17	01/05/17	Methanol, Lot 104453	5000 uL	LCPFC2SP_00020	1000 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.0948 ug/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.0958 ug/mL
							N-ethylperfluoro-1-octanesulfo namide	0.1 ug/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
							MeFOSA	0.1 ug/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
..LCPFC2SP_00020	06/28/17	12/28/16	Methanol, Lot 104453	10000 uL	LC6:2FTS_00002	100 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.474 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24961-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LC8:2FTS_00002	100 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.479 ug/mL
					LCN-EtFOSA-M_00003	100 uL	N-ethylperfluoro-1-octanesulfonamide	0.5 ug/mL
					LCN-EtFOSAA_00002	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
					LCN-MeFOSA-M_00002	100 uL	MeFOSA	0.5 ug/mL
					LCN-MeFOSAA_00003	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
...LC6:2FTS_00002	06/25/21	WELLINGTON, Lot 62FTS0616			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
...LC8:2FTS_00002	10/23/20	WELLINGTON, Lot 82FTS1015			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	47.9 ug/mL
...LCN-EtFOSA-M_00003	05/24/21	WELLINGTON, Lot NEtFOSA0516M			(Purchased Reagent)		N-ethylperfluoro-1-octanesulfonamide	50 ug/mL
...LCN-EtFOSAA_00002	01/20/21	WELLINGTON, Lot NEtFOSAA0116			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
...LCN-MeFOSA-M_00002	05/24/21	WELLINGTON, Lot NMeFOSA0714M			(Purchased Reagent)		MeFOSA	50 ug/mL
...LCN-MeFOSAA_00003	01/20/21	WELLINGTON, Lot NMeFOSAA0116			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCPFC2-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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24961-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCd-NMeFOSA-M_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-octanesulfo namide	0.5 ug/mL
					LCN-EtFOSAA_00002	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
					LCN-MeFOSA-M_00002	100 uL	MeFOSA	0.5 ug/mL
					LCN-MeFOSAA_00003	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
..LC6:2FTS_00002	06/25/21	WELLINGTON, Lot 62FTS0616			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
..LC8:2FTS_00002	10/23/20	WELLINGTON, Lot 82FTS1015			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	47.9 ug/mL
..LCN-EtFOSA-M_00003	05/24/21	WELLINGTON, Lot NEtFOSA0516M			(Purchased Reagent)		N-ethylperfluoro-1-octanesulfo namide	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_00005	03/26/17	01/06/17	MeOH/H2O, Lot 104453	5 mL	LCMPFC2SU_00010	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_00020	500 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ng/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	47.9 ng/mL
							N-ethylperfluoro-1-octanesulfo namide	50 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	50 ng/mL
							MeFOSA	50 ng/mL

Lab Name: TestAmerica Sacramento Job No.: 320-24961-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							N-methyl perfluorooctane sulfonamidoacetic acid	50 ng/mL
.LCMPFC2SU_00010	03/26/17	09/26/16	Methanol, Lot 104453	50000 uL	LCd-NEtFOSA-M_00003	1000 uL	d-N-EtFOSA-M	1 ug/mL
					LCd-NMeFOSA-M_00003	1000 uL	d-N-MeFOSA-M	1 ug/mL
					LCd3-NMeFOSAA_00003	1000 uL	d3-NMeFOSAA	1 ug/mL
					LCd5-NEtFOSAA_00003	1000 uL	d5-NEtFOSAA	1 ug/mL
					LCM2-6:FTS_00003	1000 uL	M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS_00003	1000 uL	M2-8:2FTS	0.958 ug/mL
..LCd-NEtFOSA-M_00003	06/10/21	WELLINGTON, Lot dNEtFOSA0616M			(Purchased Reagent)		d-N-EtFOSA-M	50 ug/mL
..LCd-NMeFOSA-M_00003	06/10/21	WELLINGTON, Lot dNMeFOSA0616M			(Purchased Reagent)		d-N-MeFOSA-M	50 ug/mL
..LCd3-NMeFOSAA_00003	05/31/21	WELLINGTON, Lot d3NMeFOSAA0516			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00003	08/02/21	WELLINGTON, Lot d5NEtFOSAA0716			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00003	01/08/21	WELLINGTON, Lot M262FTS0116			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00003	01/08/21	WELLINGTON, Lot M282FTS0116			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
.LCPFC2SP_00020	06/28/17	12/28/16	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-octanesulfo namide	0.5 ug/mL
					LCN-EtFOSAA_00002	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
					LCN-MeFOSA-M_00002	100 uL	MeFOSA	0.5 ug/mL
					LCN-MeFOSAA_00003	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
..LC6:2FTS_00002	06/25/21	WELLINGTON, Lot 62FTS0616			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
..LC8:2FTS_00002	10/23/20	WELLINGTON, Lot 82FTS1015			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	47.9 ug/mL
..LCN-EtFOSA-M_00003	05/24/21	WELLINGTON, Lot NEtFOSA0516M			(Purchased Reagent)		N-ethylperfluoro-1-octanesulfo namide	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-L6_00003	03/26/17	01/06/17	MeOH/H2O, Lot 104453	5 mL	LCMPFC2SU_00010	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_00020	2000 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	189.6 ng/mL

Lab Name: TestAmerica Sacramento Job No.: 320-24961-1

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)	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_00010	03/26/17	09/26/16	Methanol, Lot 104453	50000 uL	LCd-NEtFOSA-M_00003	1000 uL	d-N-EtFOSA-M	1 ug/mL
					LCd-NMeFOSA-M_00003	1000 uL	d-N-MeFOSA-M	1 ug/mL
					LCd3-NMeFOSAA_00003	1000 uL	d3-NMeFOSAA	1 ug/mL
					LCd5-NEtFOSAA_00003	1000 uL	d5-NEtFOSAA	1 ug/mL
					LCM2-6:FTS_00003	1000 uL	M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS_00003	1000 uL	M2-8:2FTS	0.958 ug/mL
..LCd-NEtFOSA-M_00003	06/10/21	WELLINGTON, Lot dNEtFOSA0616M			(Purchased Reagent)		d-N-EtFOSA-M	50 ug/mL
..LCd-NMeFOSA-M_00003	06/10/21	WELLINGTON, Lot dNMeFOSA0616M			(Purchased Reagent)		d-N-MeFOSA-M	50 ug/mL
..LCd3-NMeFOSAA_00003	05/31/21	WELLINGTON, Lot d3NMeFOSAA0516			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00003	08/02/21	WELLINGTON, Lot d5NEtFOSAA0716			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00003	01/08/21	WELLINGTON, Lot M262FTS0116			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00003	01/08/21	WELLINGTON, Lot M282FTS0116			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
.LCPFC2SP_00020	06/28/17	12/28/16	Methanol, Lot 104453	10000 uL	LC6:2FTS_00002	100 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.474 ug/mL
					LC8:2FTS_00002	100 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.479 ug/mL
					LCN-EtFOSA-M_00003	100 uL	N-ethylperfluoro-1-octanesulfonamide	0.5 ug/mL
					LCN-EtFOSAA_00002	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
					LCN-MeFOSA-M_00002	100 uL	MeFOSA	0.5 ug/mL
					LCN-MeFOSAA_00003	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
..LC6:2FTS_00002	06/25/21	WELLINGTON, Lot 62FTS0616			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
..LC8:2FTS_00002	10/23/20	WELLINGTON, Lot 82FTS1015			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	47.9 ug/mL
..LCN-EtFOSA-M_00003	05/24/21	WELLINGTON, Lot NEtFOSA0516M			(Purchased Reagent)		N-ethylperfluoro-1-octanesulfonamide	50 ug/mL
..LCN-EtFOSAA_00002	01/20/21	WELLINGTON, Lot NEtFOSAA0116			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCN-MeFOSA-M_00002	05/24/21	WELLINGTON, Lot NMeFOSA0714M			(Purchased Reagent)		MeFOSA	50 ug/mL
..LCN-MeFOSAA_00003	01/20/21	WELLINGTON, Lot NMeFOSAA0116			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCPFCIC_00020	03/01/17	12/01/16	MeOH/H2O, Lot 09285	5 mL	LCMPFCSU_00046	250 uL	13C2-PFHxDA	50 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24961-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							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
							Perfluorooctane Sulfonate (PFOS)	47.75 ng/mL
							Perfluorooctanoic acid (PFOA)	50 ng/mL
.LCMPFCSU_00046	03/01/17	11/03/16	Methanol, Lot Baker 144541	50000 uL	LCM2PFHxDA_00008	1000 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00007	1000 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00007	1000 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00008	1000 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00011	1000 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00008	1000 uL	13C4 PFBA	1 ug/mL
					LCMPFDA_00011	1000 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00008	1000 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00012	1000 uL	13C2 PFHxA	1 ug/mL
					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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24961-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LCPFACMXB_00007	11/06/20	Wellington Laboratories, Lot PFACMXB1115			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1.77 ug/mL
							Perfluorooctane Sulfonate (PFOS)	1.91 ug/mL
							Perfluorooctanoic acid (PFOA)	2 ug/mL
LCPFCSP_00073	05/28/17	11/28/16	Methanol, Lot 090285	10000 uL	LCPFBA_00005	100 uL	Perfluorobutyric acid	0.5 ug/mL
					LCPFBS_00005	100 uL	Perfluorobutane Sulfonate	0.442 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.442 ug/mL
					LCPFDA_00005	100 uL	Perfluorodecanoic acid	0.5 ug/mL
					LCPFDoA_00005	100 uL	Perfluorododecanoic acid	0.5 ug/mL
					LCPFDS_00006	100 uL	Perfluorodecane Sulfonate	0.482 ug/mL
							Perfluorodecane Sulfonic acid	0.482 ug/mL
					LCPFHpA_00006	100 uL	Perfluoroheptanoic acid	0.5 ug/mL
					LCPFHpS_00009	100 uL	Perfluoroheptane Sulfonate	0.476 ug/mL
							Perfluoroheptanesulfonic Acid	0.476 ug/mL
					LCPFHxA_00005	100 uL	Perfluorohexanoic acid	0.5 ug/mL
					LCPFHxDA_00006	100 uL	Perfluorohexadecanoic acid	0.5 ug/mL
					LCPFHxS-br_00002	100 uL	Perfluorohexane Sulfonate	0.455 ug/mL
							Perfluorohexanesulfonic acid	0.455 ug/mL
					LCPFNA_00006	100 uL	Perfluorononanoic acid	0.5 ug/mL
					LCPFOA_00006	100 uL	Perfluorooctanoic acid (PFOA)	0.5 ug/mL
					LCPFODA_00006	100 uL	Perfluorooctadecanoic acid	0.5 ug/mL
					LCPFOS-br_00002	100 uL	Perfluorooctane Sulfonate (PFOS)	0.464 ug/mL
					LCPFOSA_00008	100 uL	Perfluorooctane Sulfonamide	0.5 ug/mL
					LCPFPeA_00005	100 uL	Perfluoropentanoic acid	0.5 ug/mL
					LCPFTeDA_00005	100 uL	Perfluorotetradecanoic acid	0.5 ug/mL
					LCPFTrDA_00005	100 uL	Perfluorotridecanoic acid	0.5 ug/mL
					LCPFUdA_00005	100 uL	Perfluoroundecanoic acid	0.5 ug/mL
.LCPFBA_00005	05/27/21	Wellington Laboratories, Lot PFBA0516			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
.LCPFBS_00005	03/15/21	Wellington Laboratories, Lot LPFBS0316			(Purchased Reagent)		Perfluorobutane Sulfonate	44.2 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
.LCPFDA_00005	07/02/20	Wellington Laboratories, Lot PFDA0615			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
.LCPFDoA_00005	01/30/20	Wellington Laboratories, Lot PFDoA0115			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
.LCPFDS_00006	05/24/21	Wellington Laboratories, Lot LPFDS0516			(Purchased Reagent)		Perfluorodecane Sulfonate	48.2 ug/mL
							Perfluorodecane Sulfonic acid	48.2 ug/mL
.LCPFHpA_00006	01/22/21	Wellington Laboratories, Lot PFHpA0116			(Purchased Reagent)		Perfluoroheptanoic acid	50 ug/mL
.LCPFHpS_00009	11/06/20	Wellington Laboratories, Lot LPFHpS1115			(Purchased Reagent)		Perfluoroheptane Sulfonate	47.6 ug/mL
							Perfluoroheptanesulfonic Acid	47.6 ug/mL
.LCPFHxA_00005	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid	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	45.5 ug/mL
.LCPFNA_00006	10/23/20	Wellington Laboratories, Lot PFNA1015			(Purchased Reagent)		Perfluorononanoic acid	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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24961-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LCPFOS-br_00002	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctane Sulfonate (PFOS)	46.4 ug/mL
.LCPFOSA_00008	09/02/17	Wellington Laboratories, Lot FOSA0815I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
.LCPFPeA_00005	01/30/20	Wellington Laboratories, Lot PFPeA0115			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
.LCPFTeDA_00005	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
.LCPFTrDA_00005	02/12/21	Wellington Laboratories, Lot PFTrDA0216			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
.LCPFUdA_00005	08/19/20	Wellington Laboratories, Lot PFUdA0815			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL

Reagent

LC6:2FTS_00002

R: 8/23/16 SBC

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

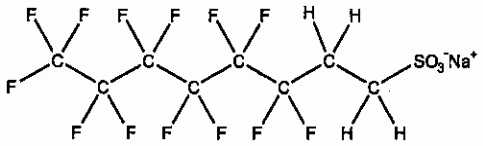
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

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

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

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: $C_8H_4F_{13}SO_3Na$ **MOLECULAR WEIGHT:** 450.15

CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt) **SOLVENT(S):** Methanol

47.4 ± 2.4 µg/ml (6:2FTS anion)

CHEMICAL PURITY: >98%

LAST TESTED: (mm/dd/yyyy) 06/25/2016

EXPIRY DATE: (mm/dd/yyyy) 06/25/2021

RECOMMENDED STORAGE: Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

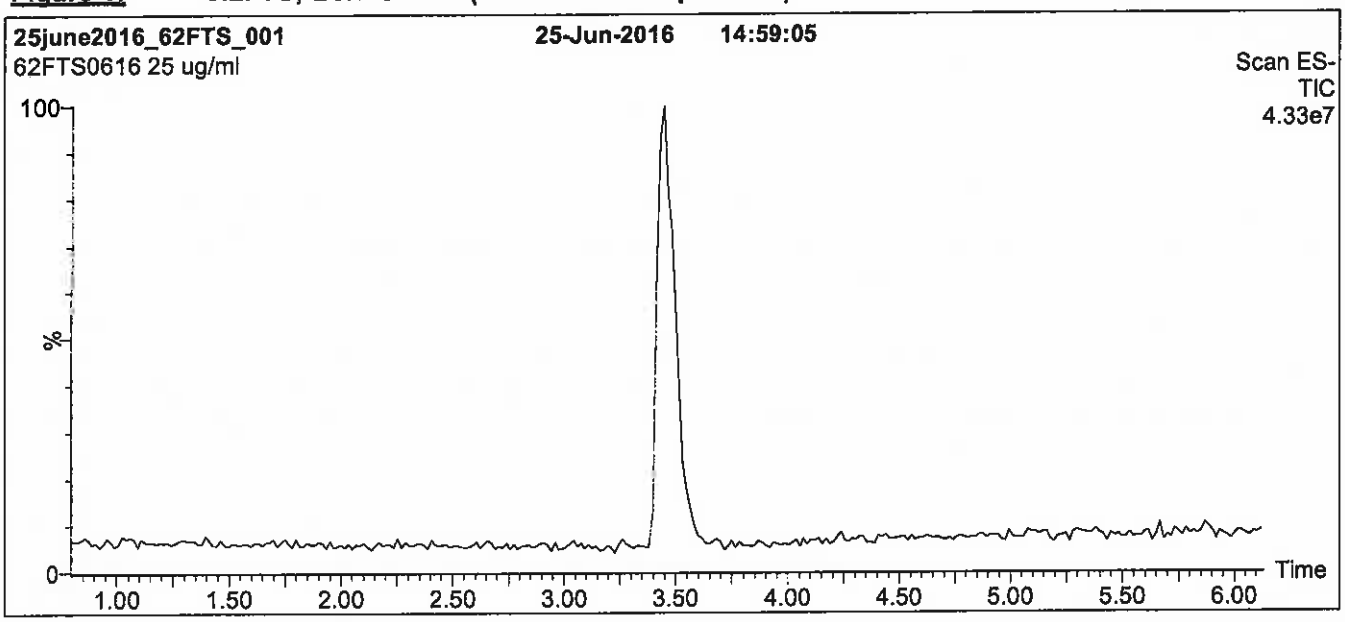
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

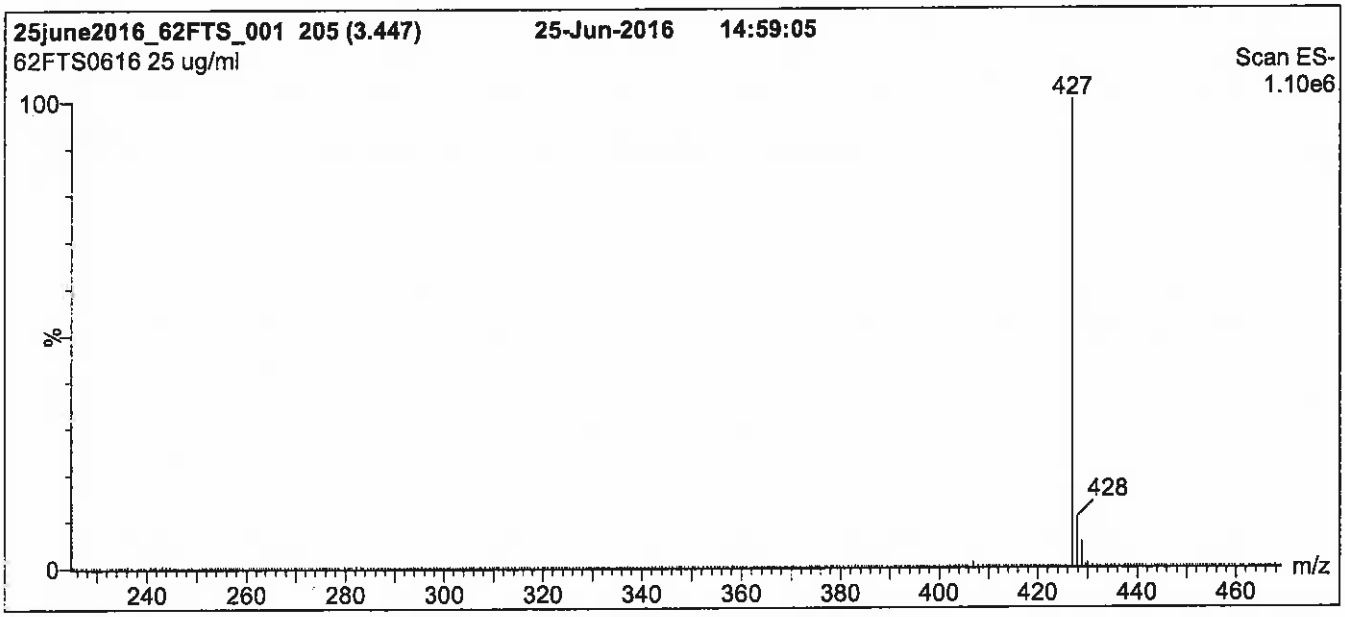
CALA

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: **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

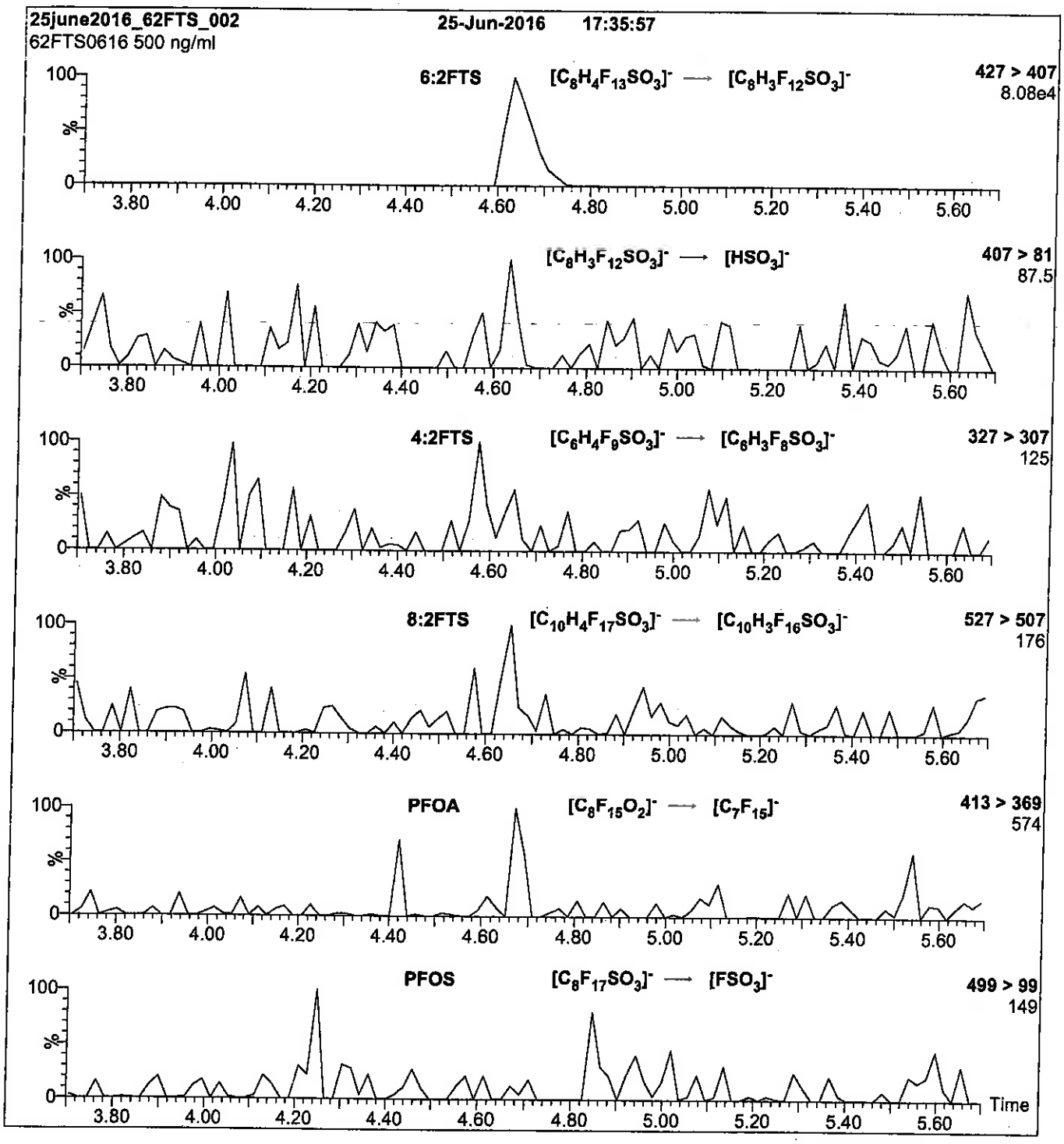
Flow: 300 µl/min

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_00002

R: 8/23/16 SBC

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

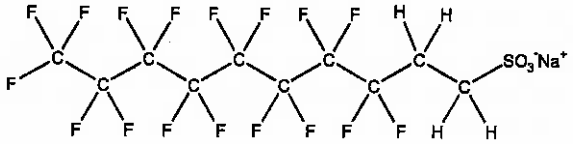
WELLINGTON LABORATORIES

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

INTENDED USE:

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

HAZARDS:

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HOMOGENEITY:

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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

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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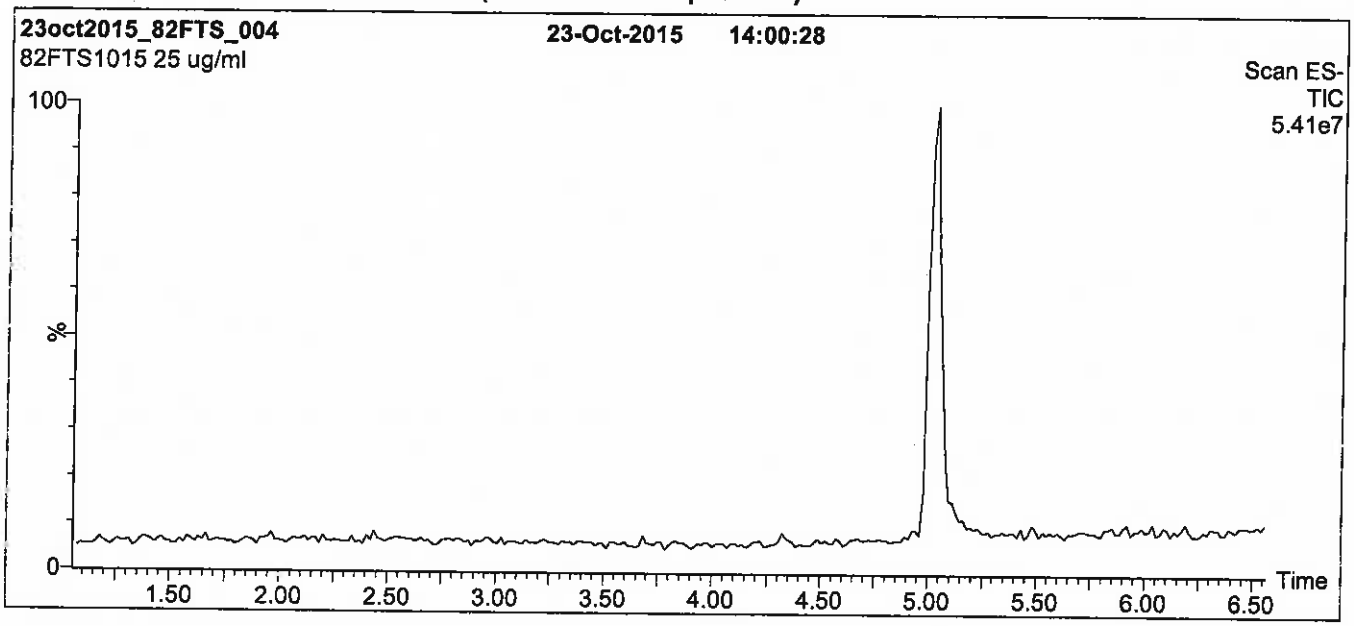
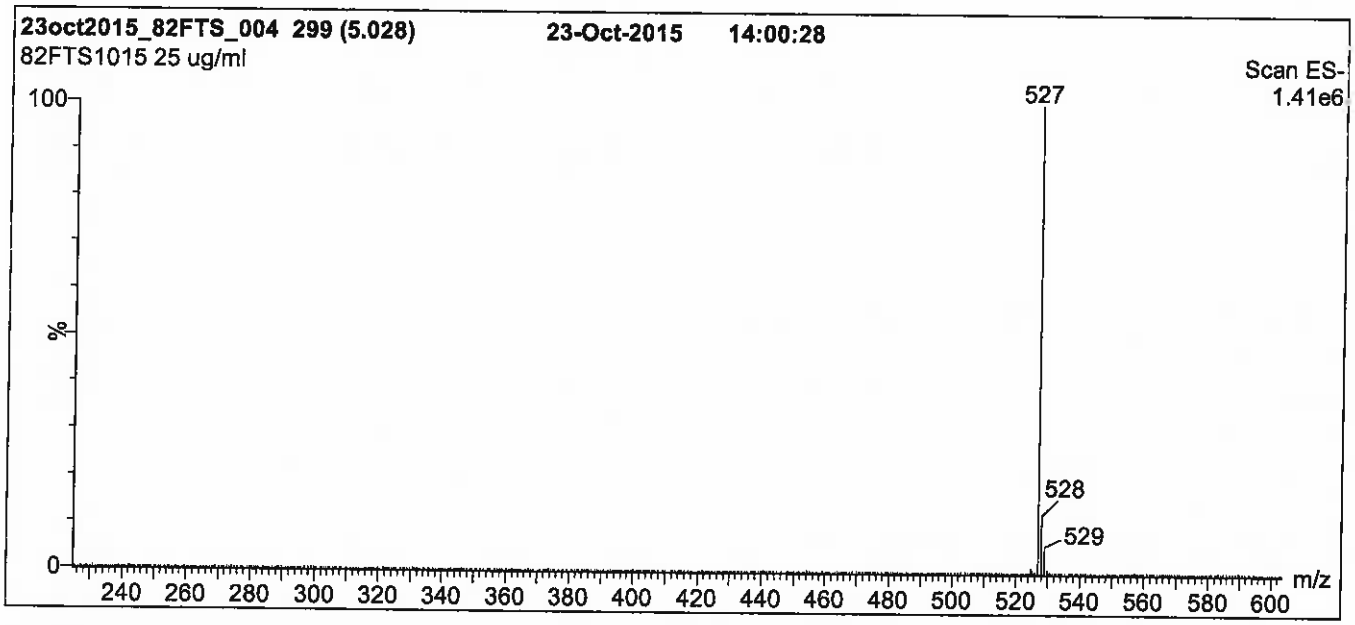
Figure 1: **8:2FTS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 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

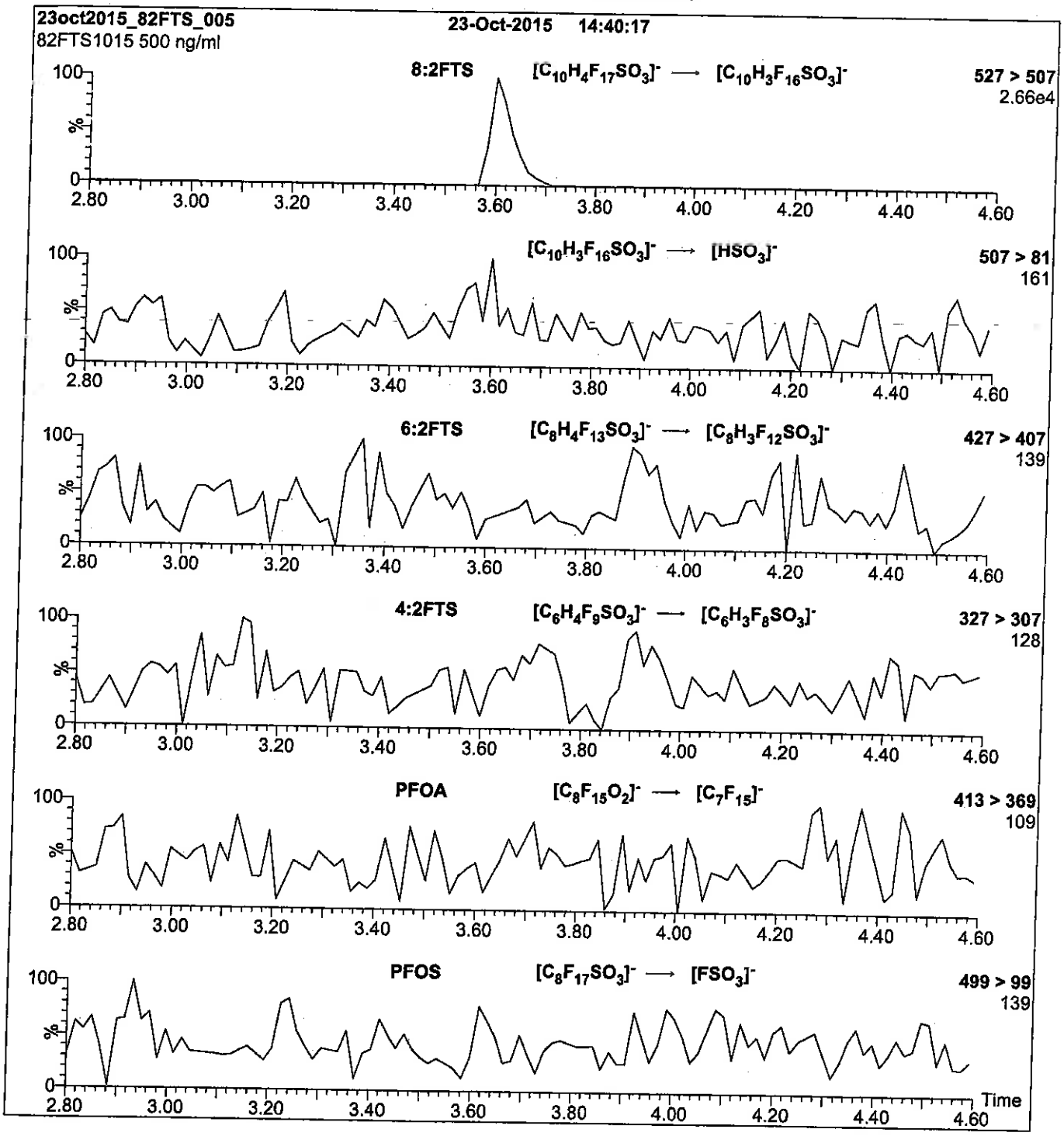
Flow: 300 µl/min

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_00002

R: 7/6/16 CBW

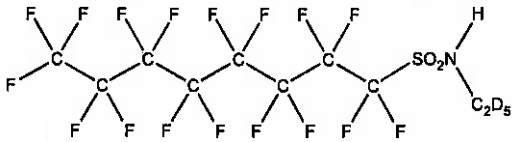
671571
ID: LCd-NEtFOSA-M_00002
Exp: 03/10/19 Prpd: CBW
d-N-EtFOSA-M

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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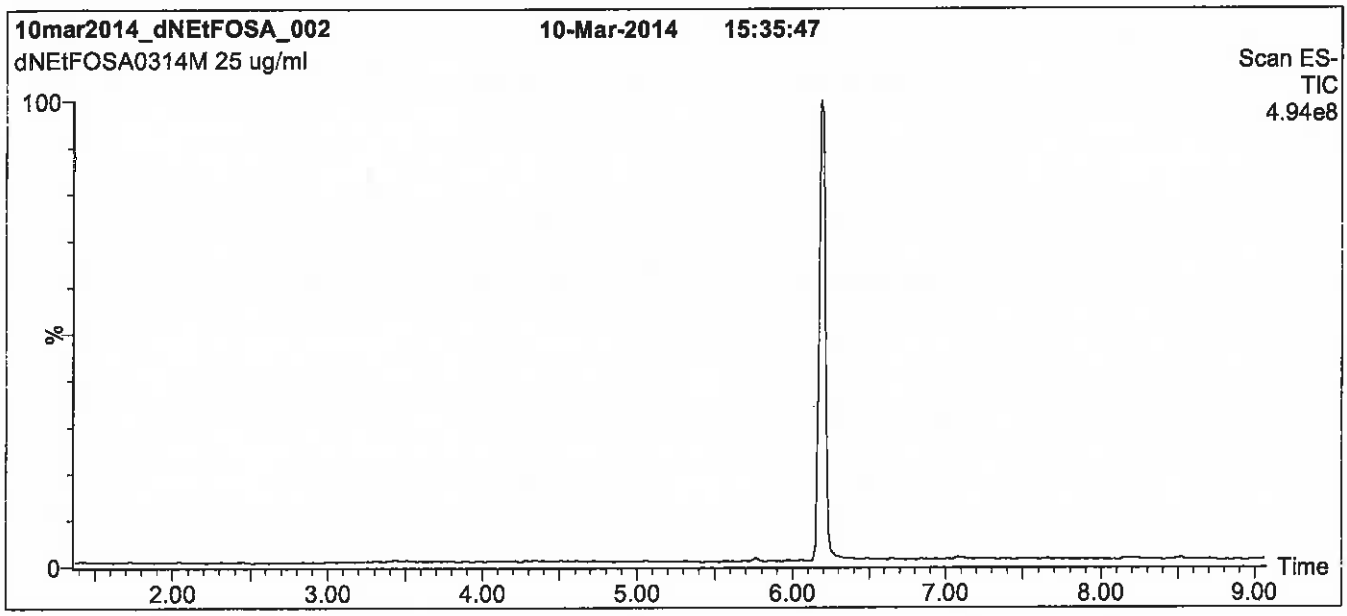
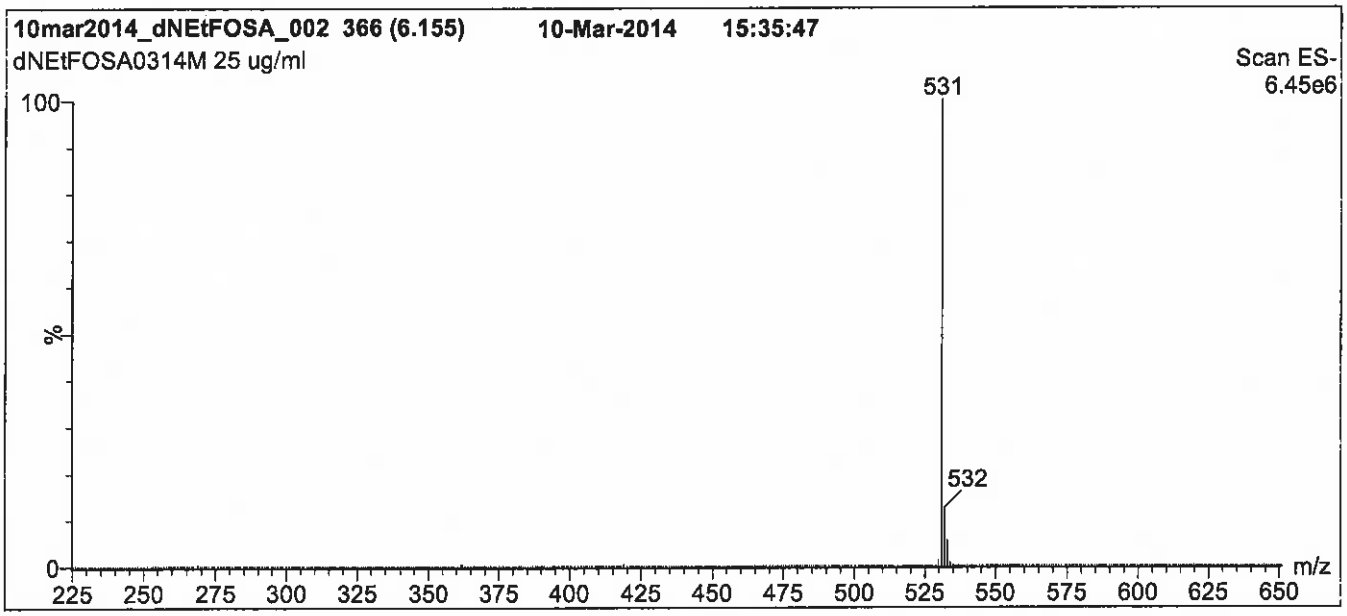
CALA

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

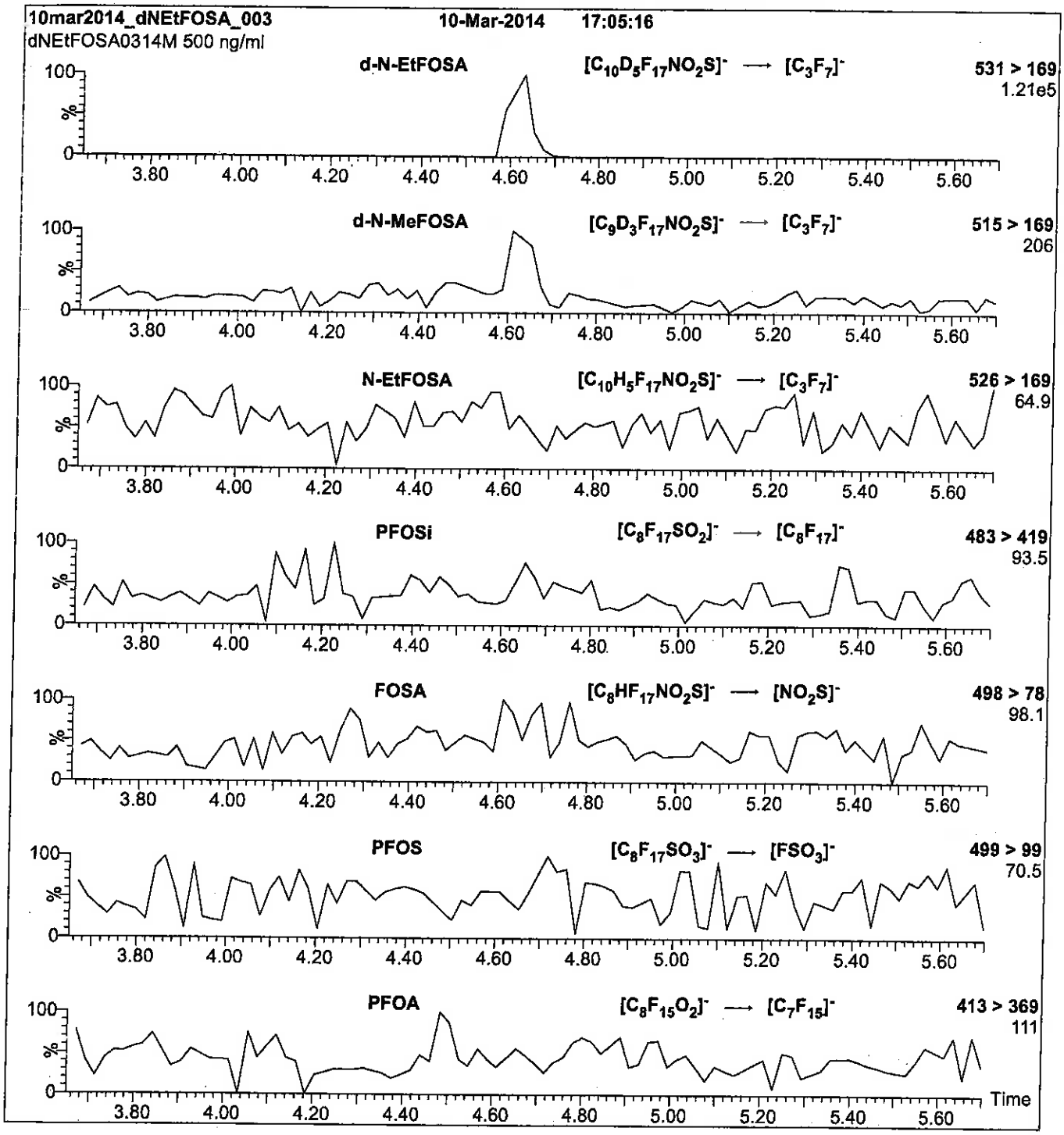
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 950 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCd-NEtFOSA-M_00003

R: 9/9/16 SBC

728302
ID: LCd-NEtFOSA-M_00003
Exp: 06/10/21 Prpd: SBC
d-N-EtFOSA-M

WELLINGTON LABORATORIES

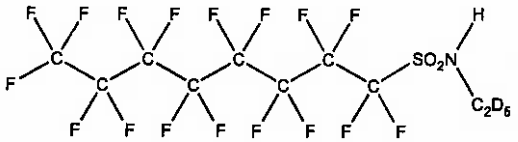
CERTIFICATE OF ANALYSIS DOCUMENTATION

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

LOT NUMBER: dNEtFOSA0616M

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)	06/10/2016		
EXPIRY DATE: (mm/dd/yyyy)	06/10/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.5% of N-methyl-d_3-perfluoro-1-octanesulfonamide (d-N-MeFOSA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 07/14/2016 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

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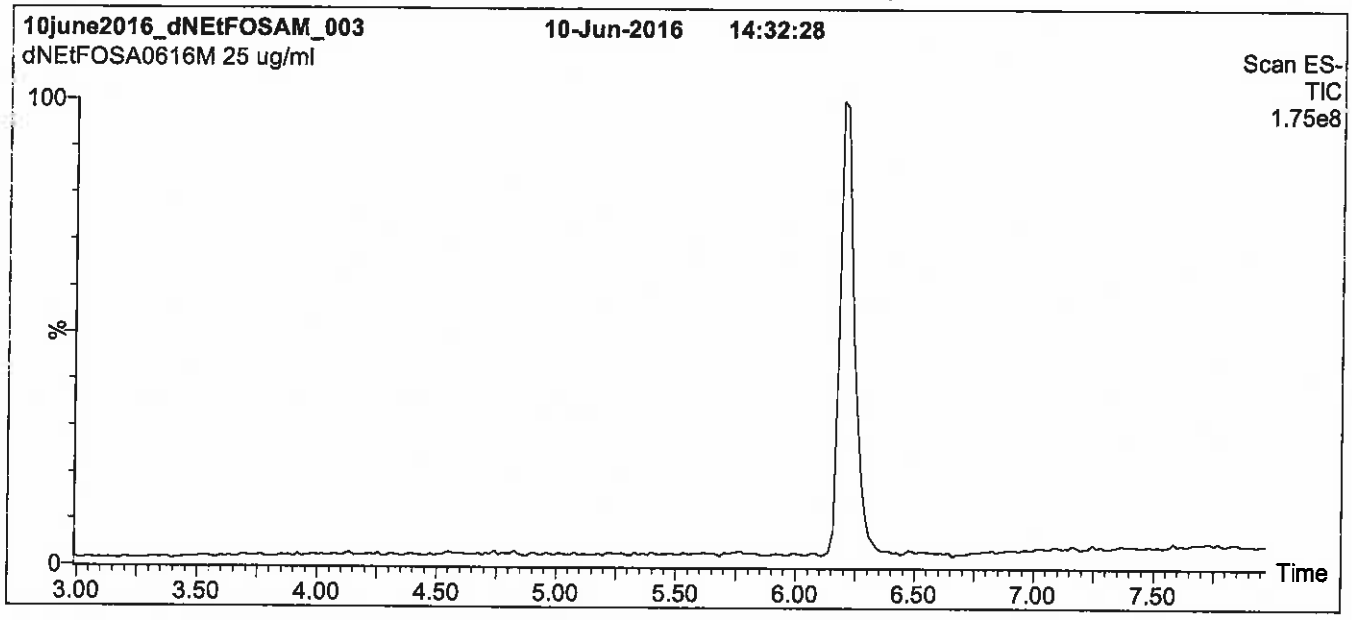
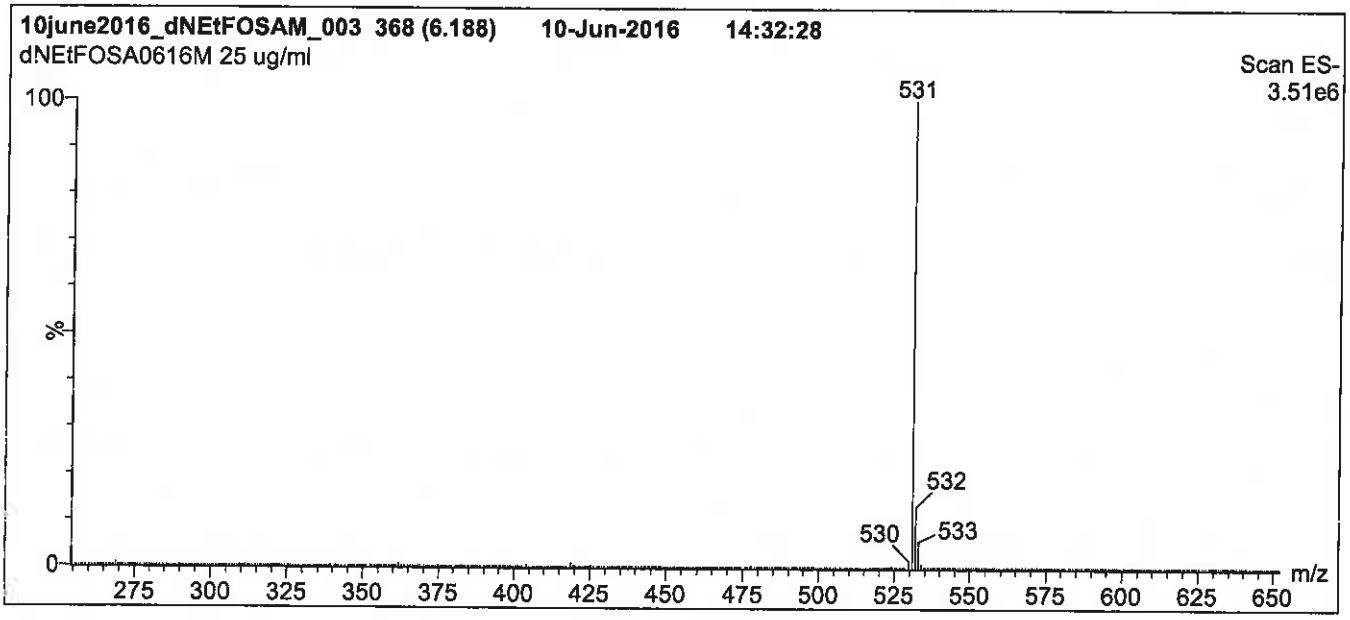
Figure 1: d-N-EtFOSA-M; LC/MS Data (TIC and Mass Spectrum)





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

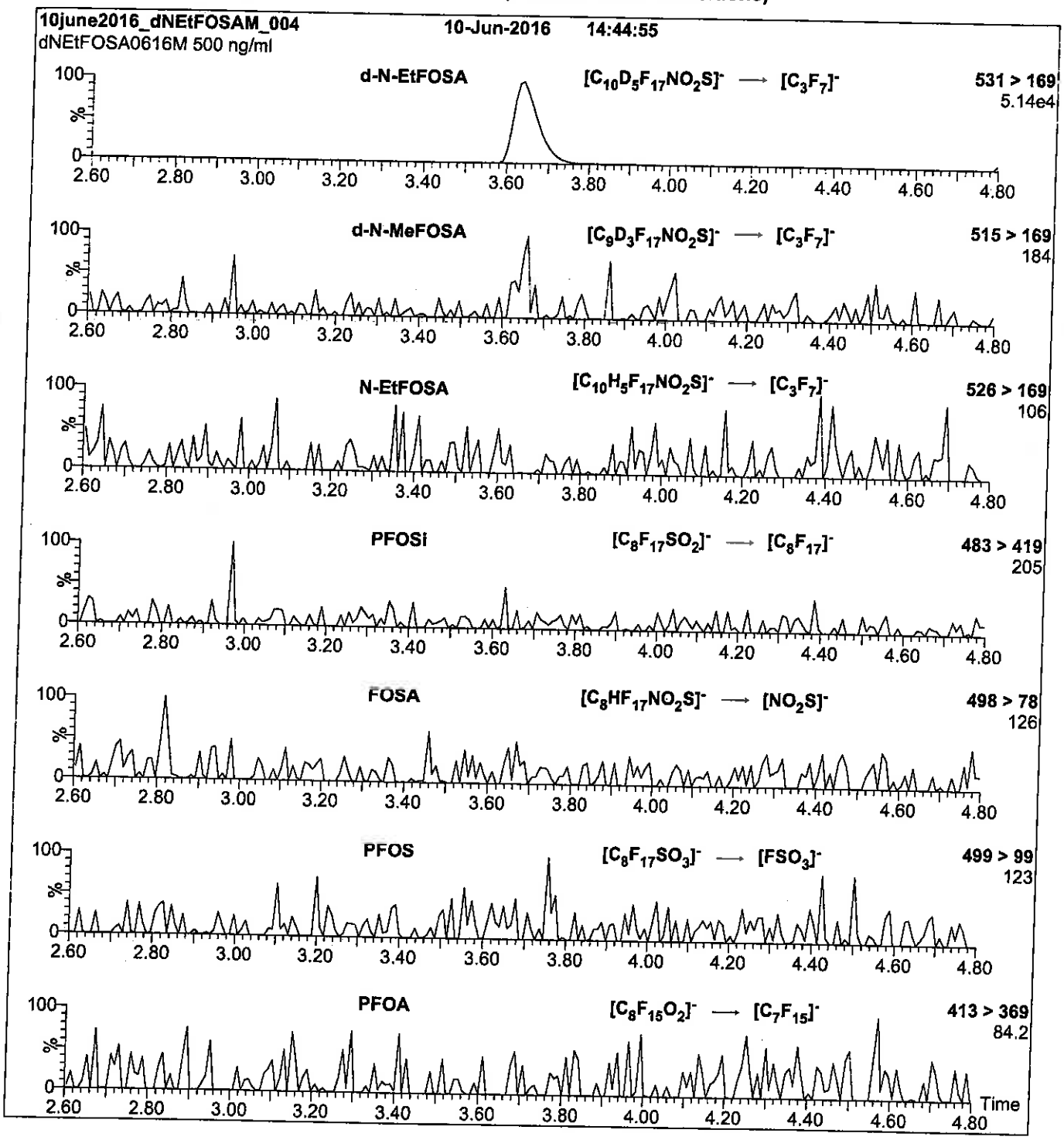
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

Figure 2: d-N-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) = 3.39e-3
Collision Energy (eV) = 25

Reagent

LCd-NMeFOSA-M_00002

R: 7/6/16 CBW

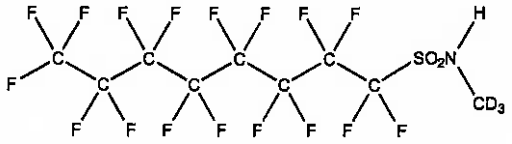
671625
ID: LCd-NMeFOSA-M_00002
Exp: 06/13/21 Prpd: CBW
d-N-MeFOSA-M

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

STRUCTURE:
CAS #: Not available



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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

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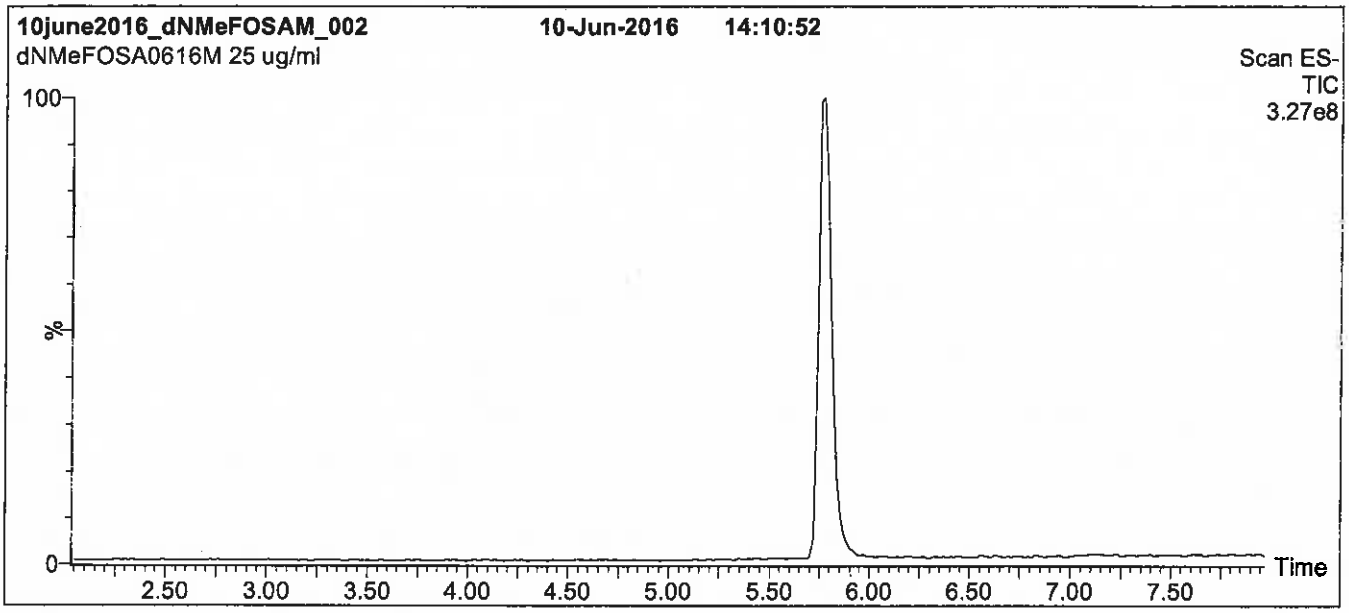
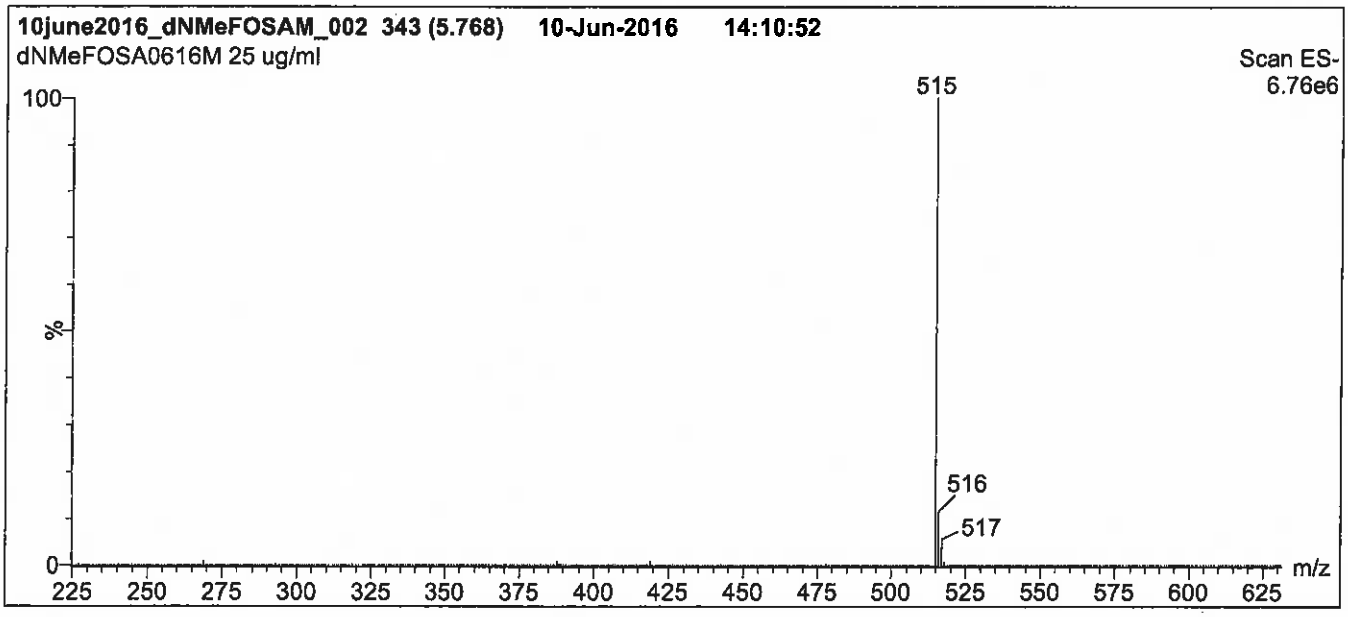
Figure 1: **d-N-MeFOSA-M; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

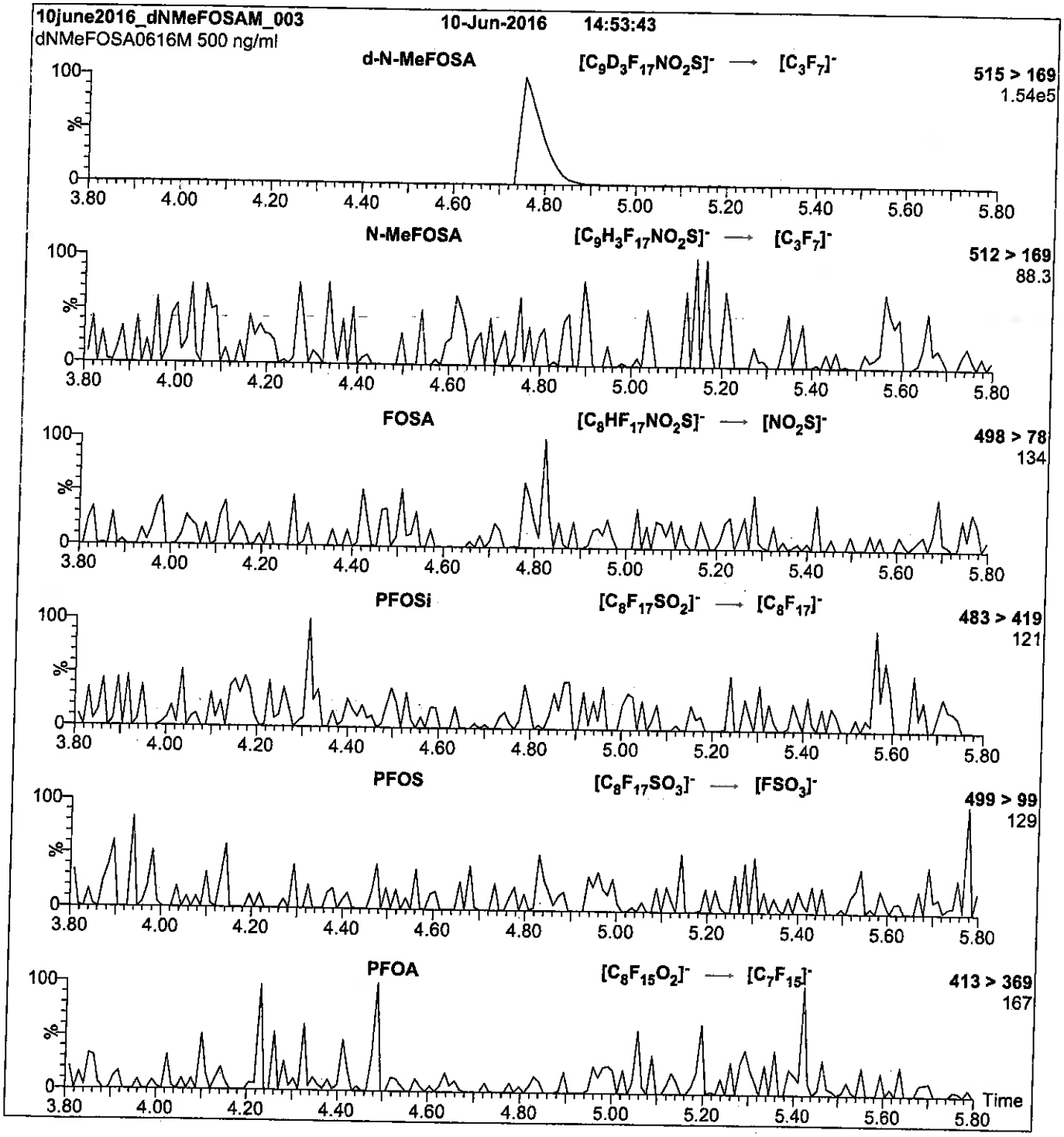
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCd-NMeFOSA-M_00003

R: 9/9/16 SBC

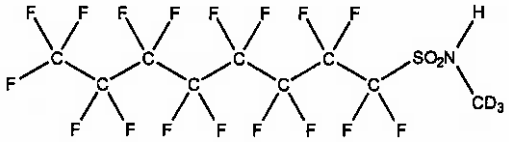
728303
ID: LCd-NMeFOSA-M_00003
Exp: 06/10/21 Prpd: SBC
d-N-MeFOSA-M

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

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

STRUCTURE:
CAS #: Not available



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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

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CALA

ANAB ACCREDITED ISO 34 REFERENCE MATERIAL PRODUCER

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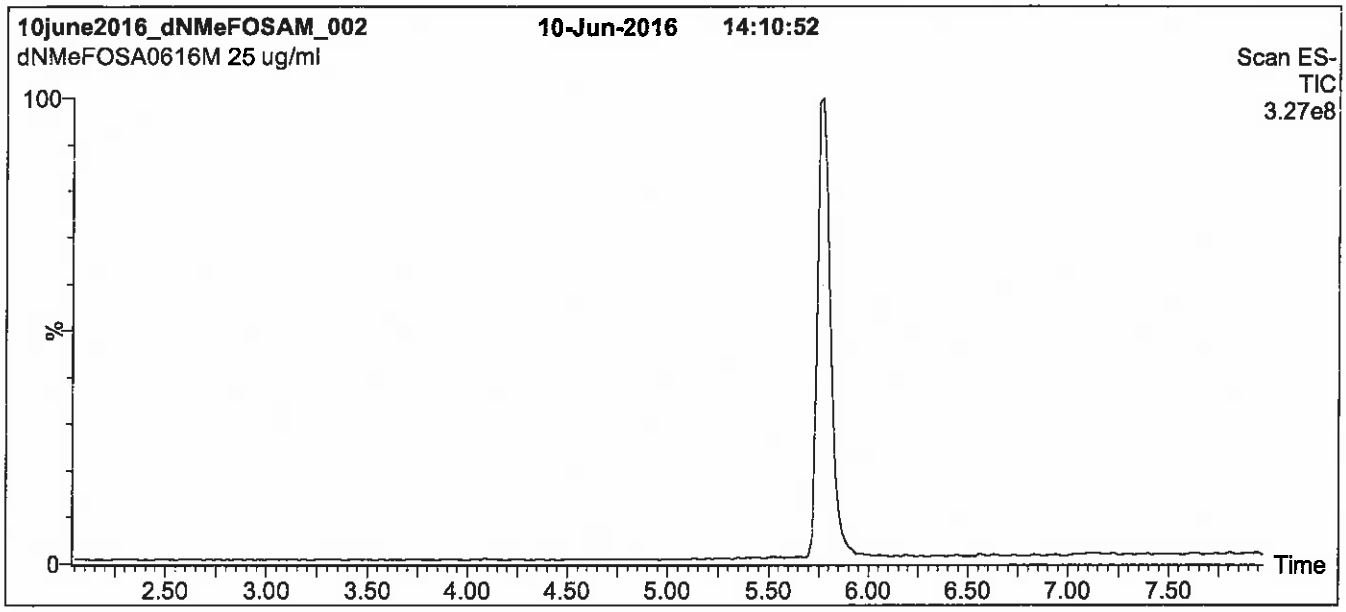
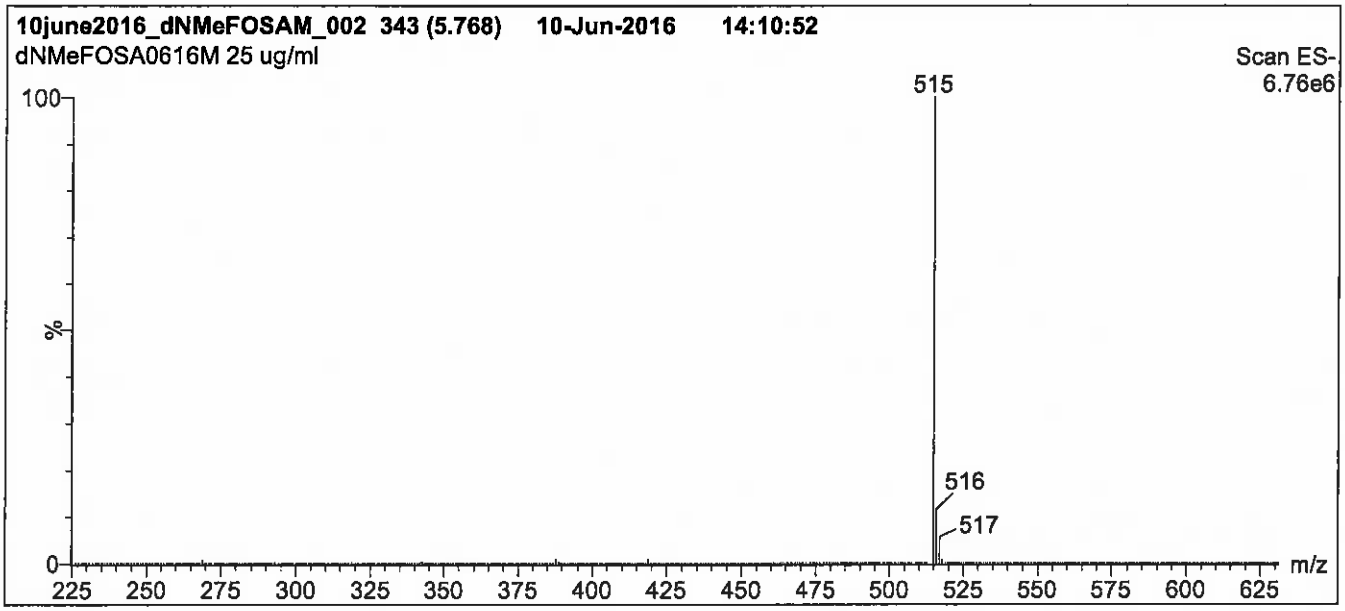
Figure 1: **d-N-MeFOSA-M; LC/MS Data (TIC and Mass Spectrum)**





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

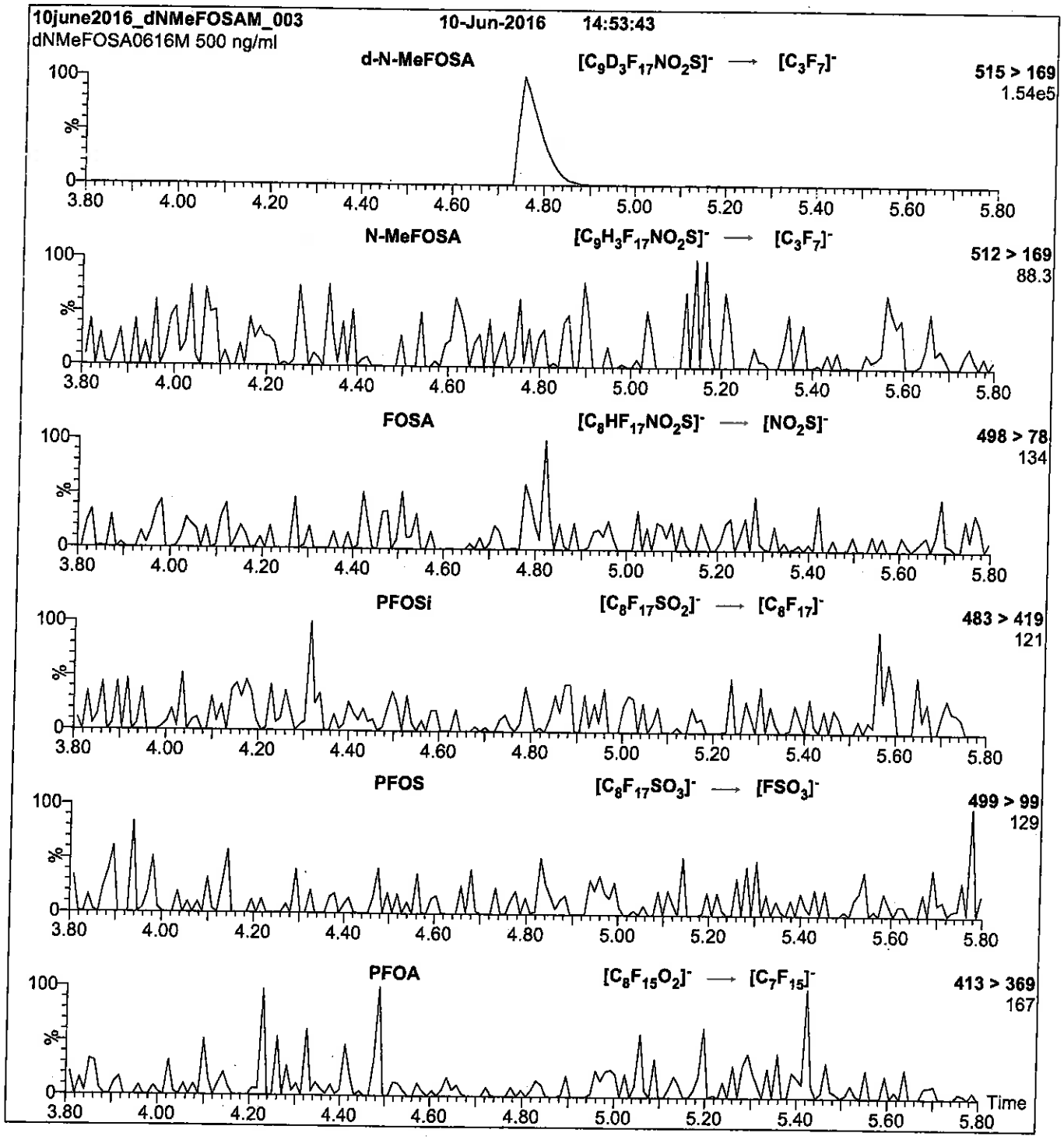
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml d-N-MeFOSA-M)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.39e-3 Collision Energy (eV) = 25
Flow:	300 µl/min	

Reagent

LCd3-NMeFOSAA_00002

R: 7/6/16 CBW

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

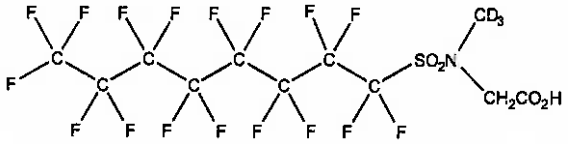
WELLINGTON LABORATORIES

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)

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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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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

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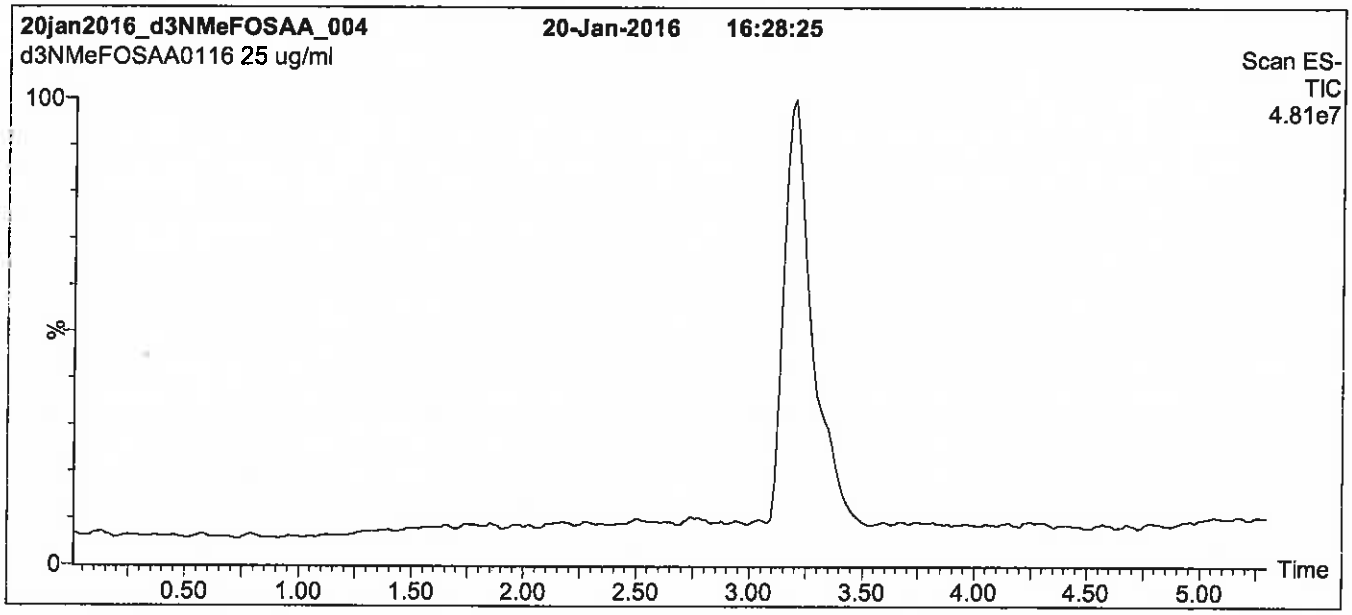
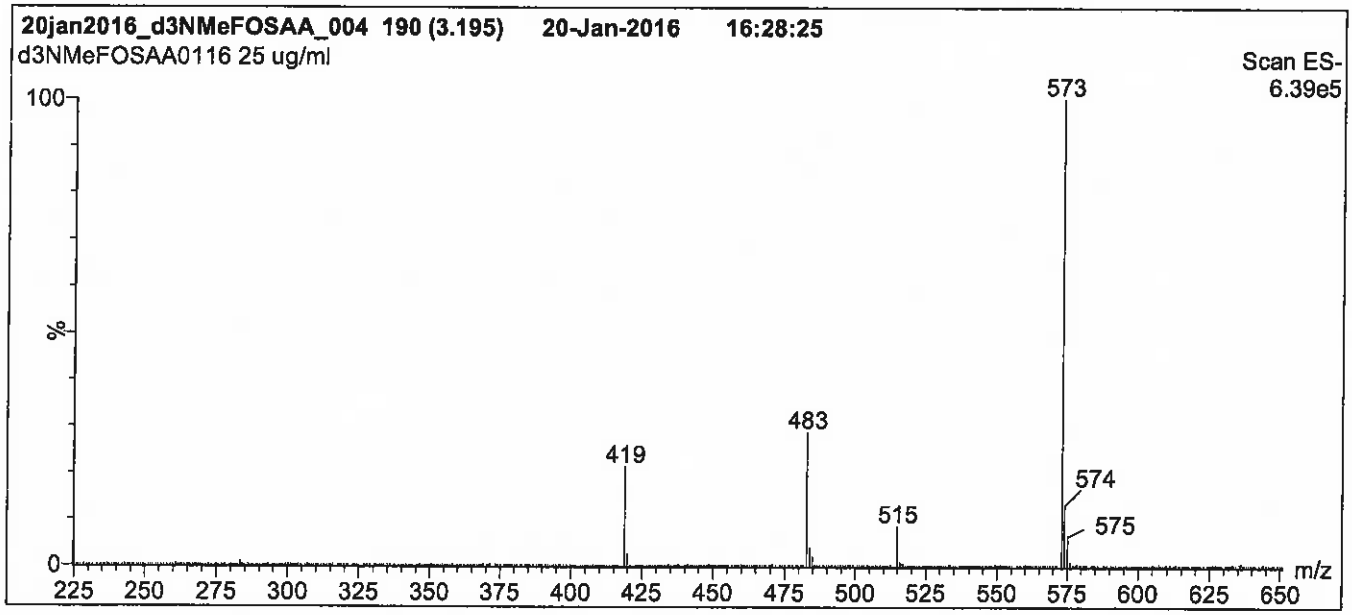
Figure 1: **d3-N-MeFOSAA; LC/MS Data (TIC and Mass Spectrum)**





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

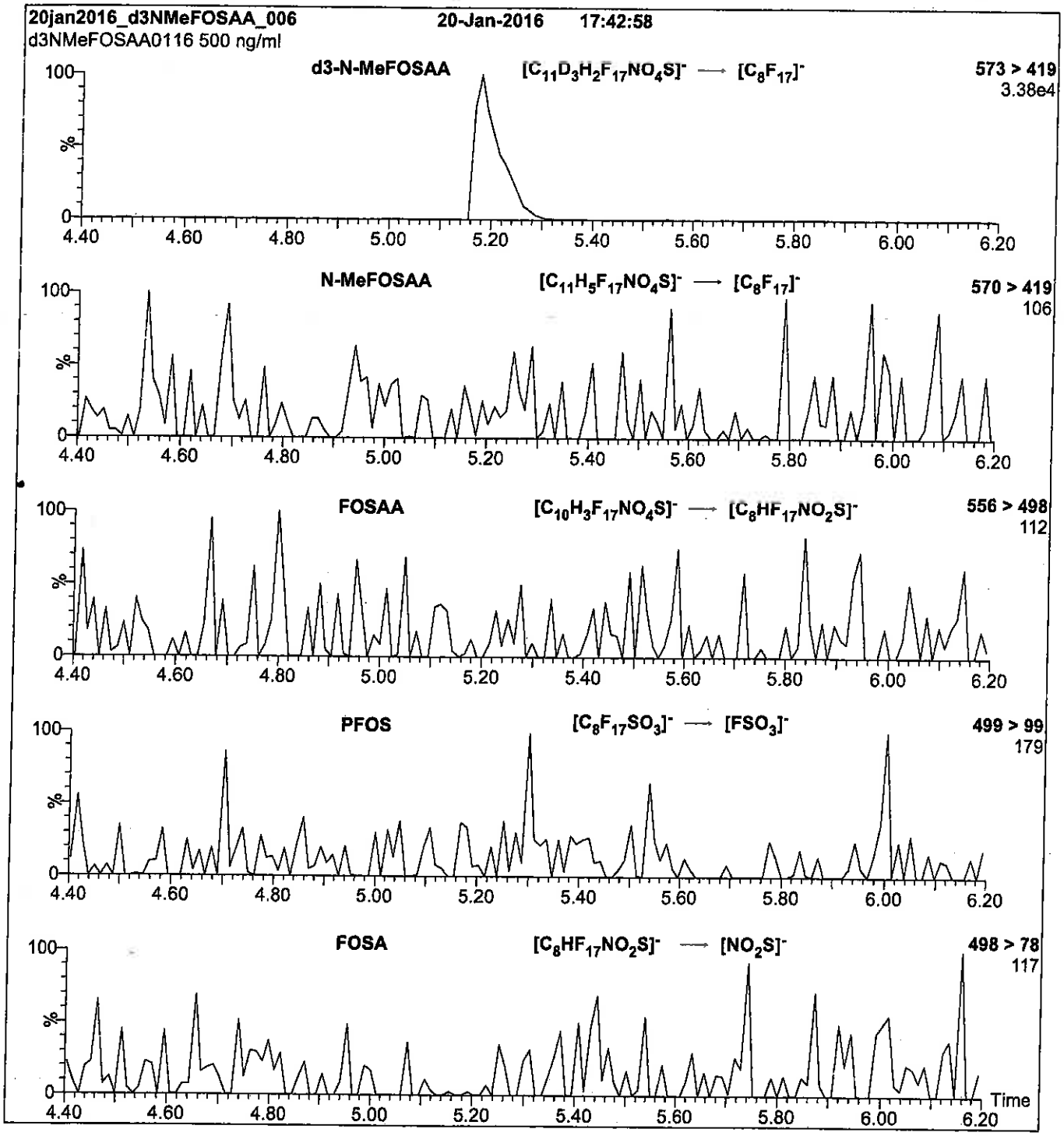
Flow: 300 µl/min

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

LCd3-NMeFOSAA_00003

R: 9/9/16 SBC

7283C0
ID: LCd3-NMeFOSAA_00003
Exp: 05/31/21 Prpd: SBC
d3-N-MeFOSAA

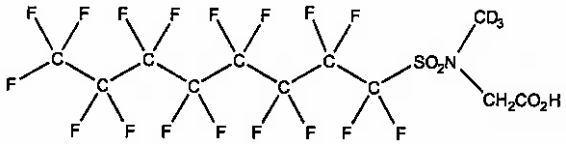
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: d3-N-MeFOSAA **LOT NUMBER:** d3NMeFOSAA0516

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) 05/31/2016

EXPIRY DATE: (mm/dd/yyyy) 05/31/2021

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.
- Contains ~ 1% of branched isomer.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 06/01/2016 (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.

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CALA

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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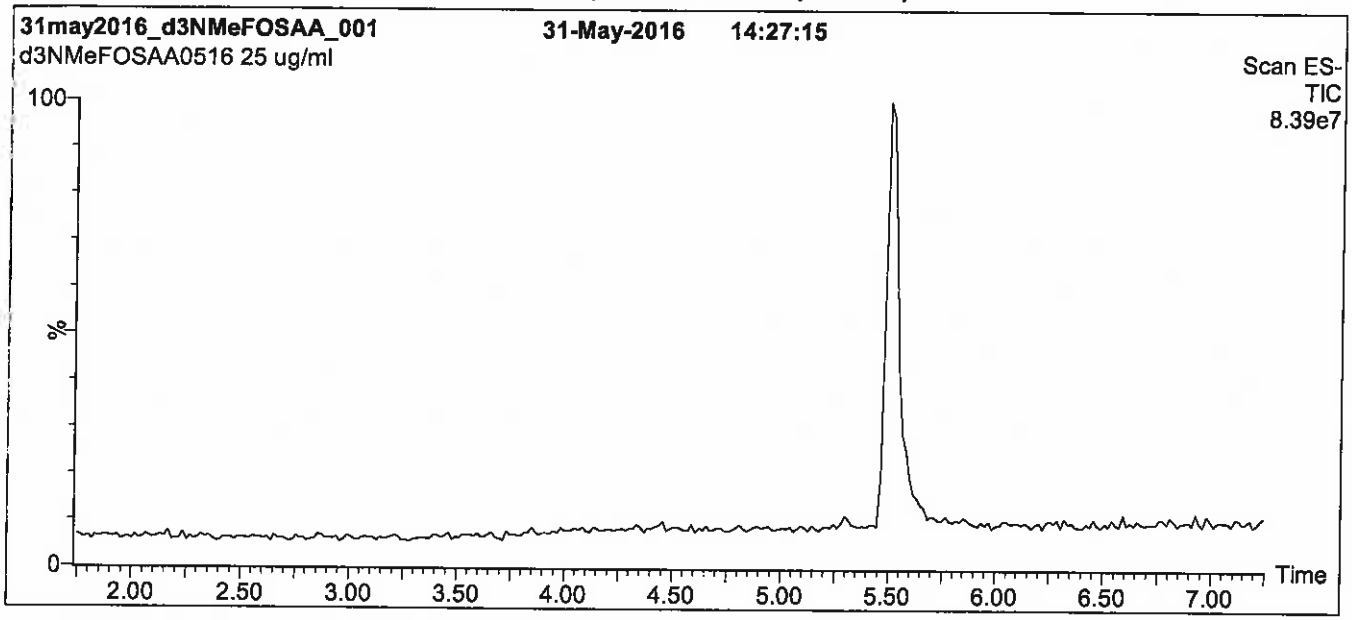
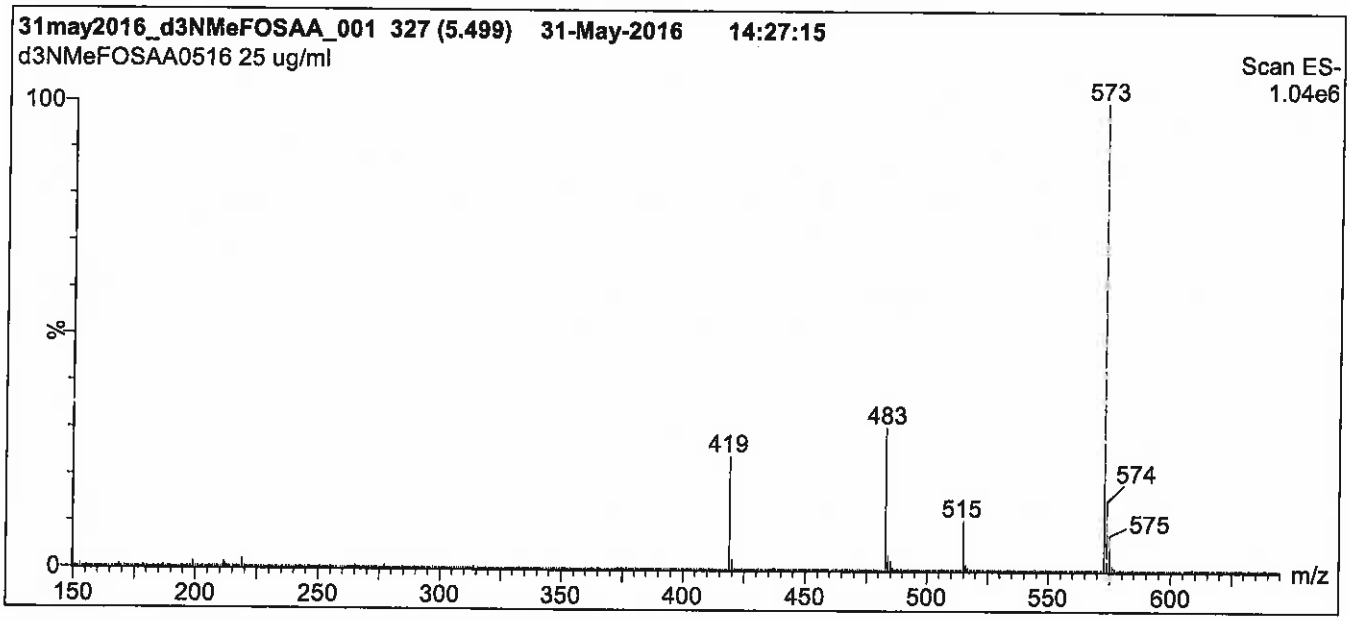
Figure 1: **d3-N-MeFOSAA; LC/MS Data (TIC and Mass Spectrum)**





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: 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

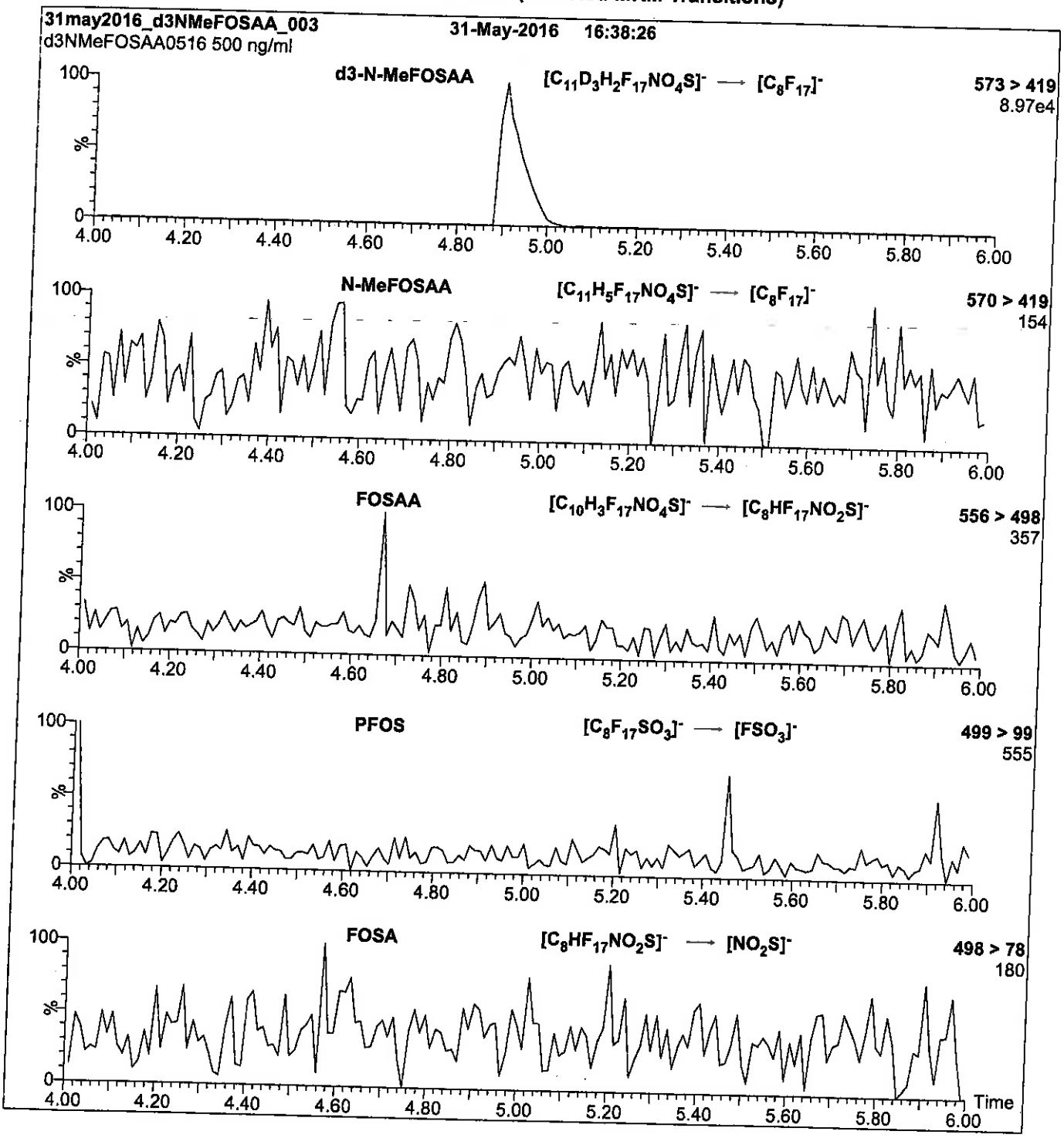
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 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)	**MS Parameters**	
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.43e-3 Collision Energy (eV) = 25	
Flow:	300 µl/min		

Reagent

LCd5-NEtFOSAA_00002

R: 7/6/16 CBW

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

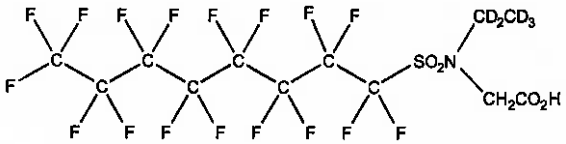
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

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

STRUCTURE: **CAS #:** Not available



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

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

CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥98% $^2H_6$

LAST TESTED: (mm/dd/yyyy) 12/07/2015

EXPIRY DATE: (mm/dd/yyyy) 12/07/2020

RECOMMENDED STORAGE: Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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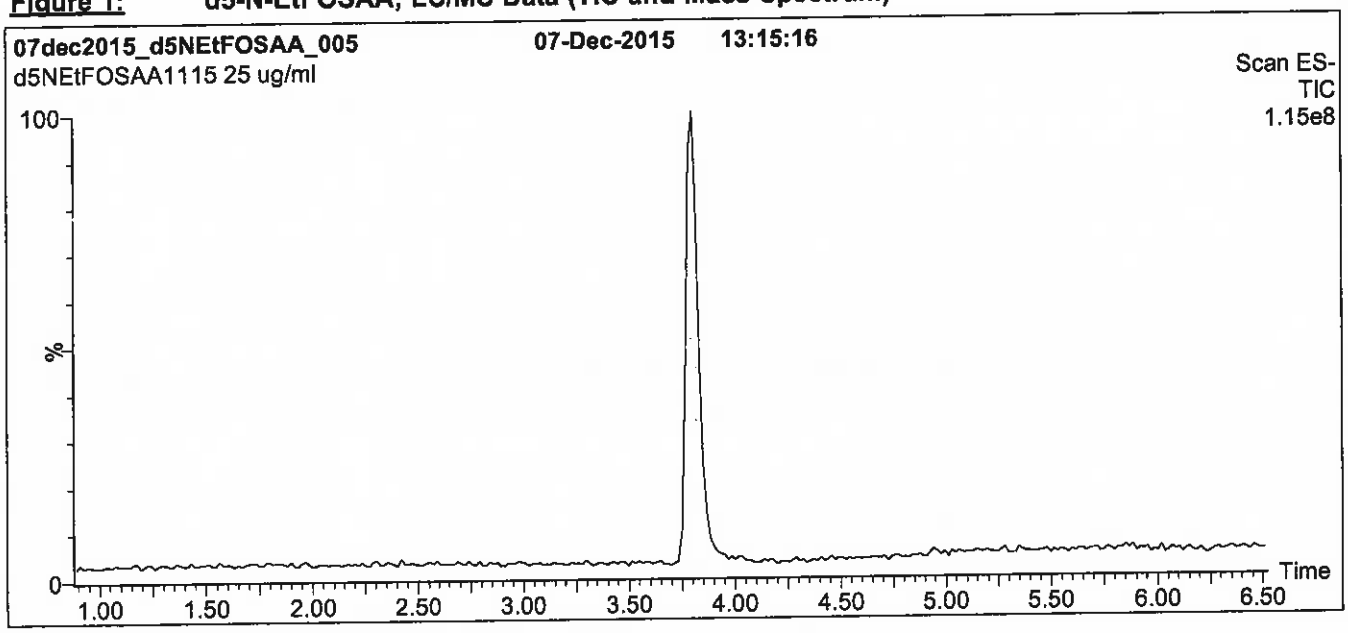
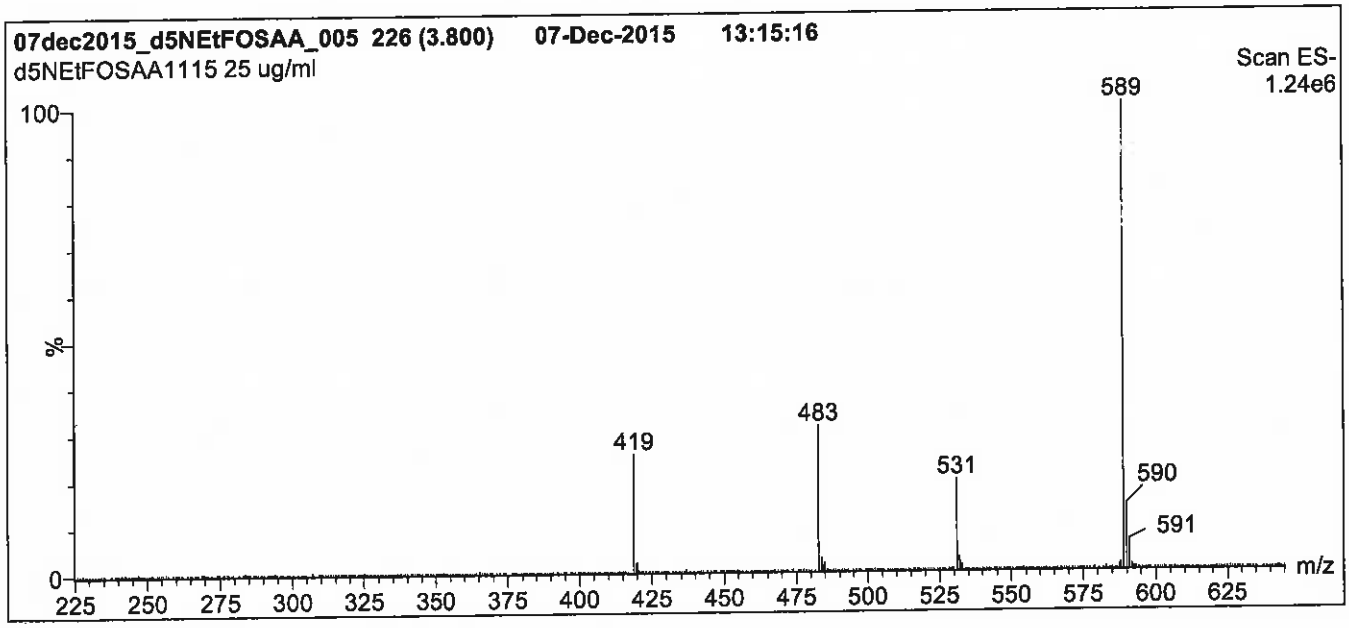
Figure 1: **d5-N-EtFOSAA; LC/MS Data (TIC and Mass Spectrum)**





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

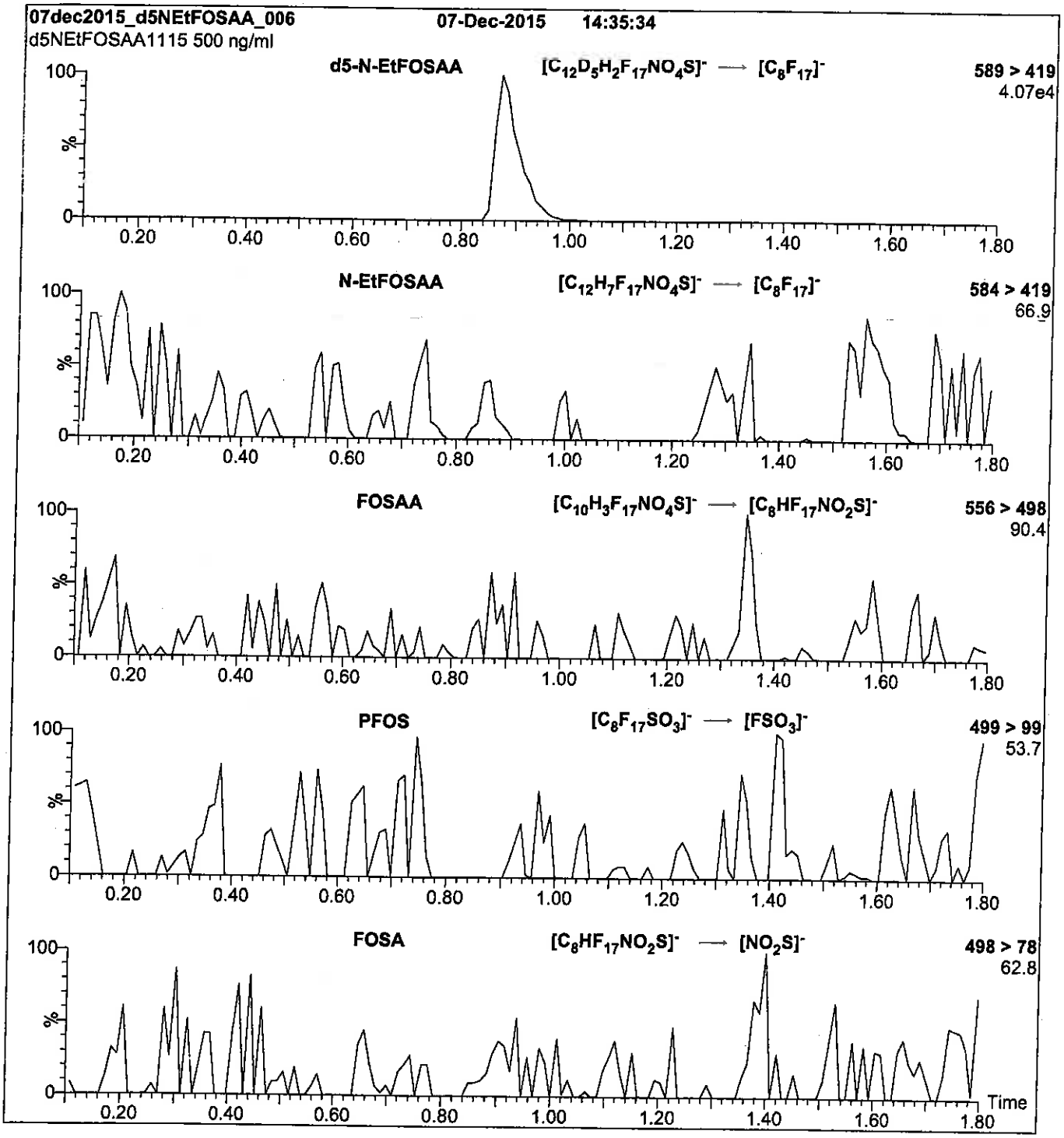
Flow: 300 µl/min

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)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.43e-3 Collision Energy (eV) = 25
Flow:	300 µl/min	

Reagent

LCd5-NEtFOSAA_00003

R: 9/9/16 SBC

728301
ID: LCd5-NEtFOSAA_00003
Exp: 08/02/21 Prpd: SBC
d5-N-EtFOSAA

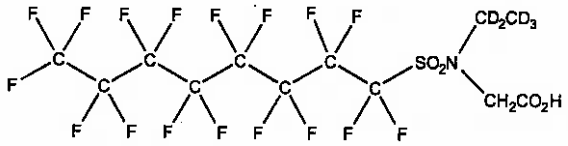
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: d5-N-EtFOSAA **LOT NUMBER:** d5NEtFOSAA0716

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

STRUCTURE: **CAS #:** Not available



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LAST TESTED: (mm/dd/yyyy) 08/02/2016

EXPIRY DATE: (mm/dd/yyyy) 08/02/2021

RECOMMENDED STORAGE: Refrigerate ampoule

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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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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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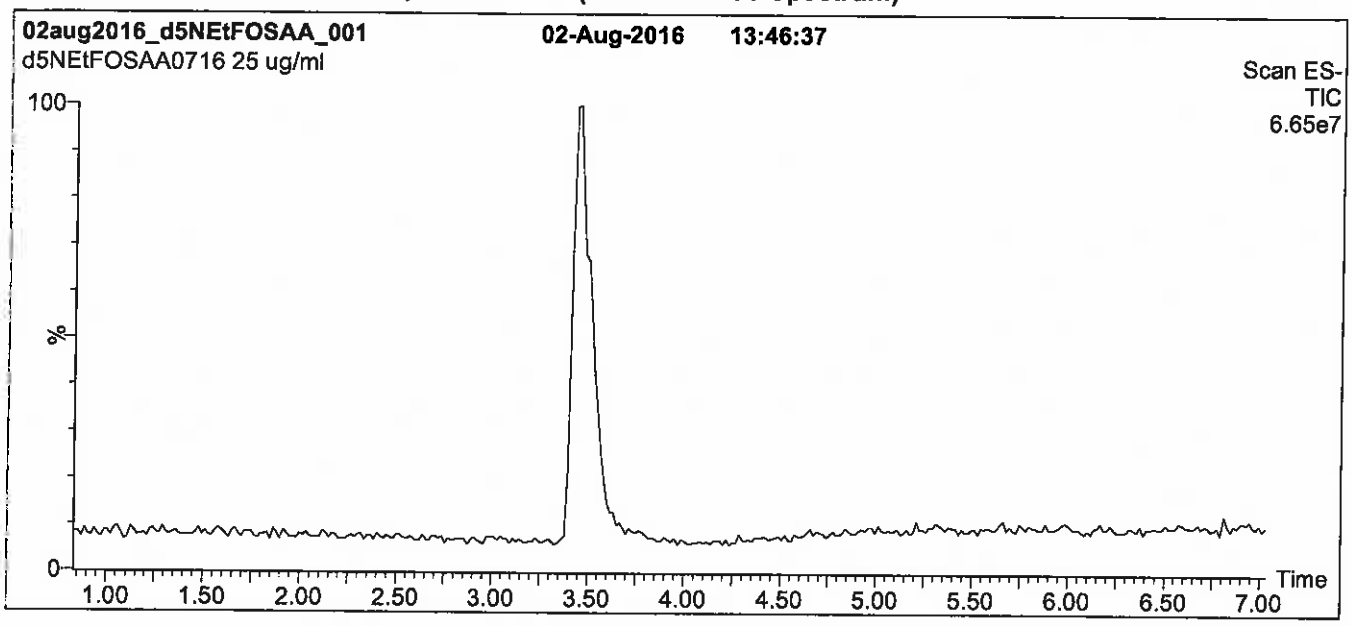
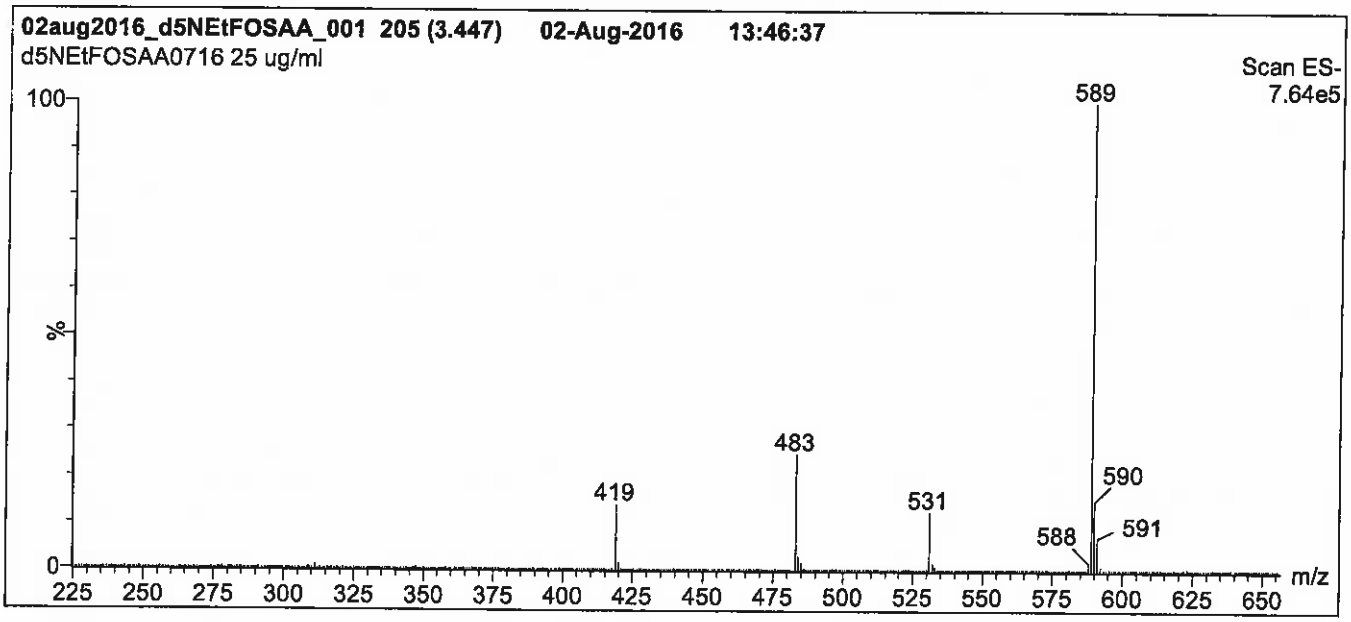
Figure 1: d5-N-EtFOSAA; LC/MS Data (TIC and Mass Spectrum)





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 7.5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

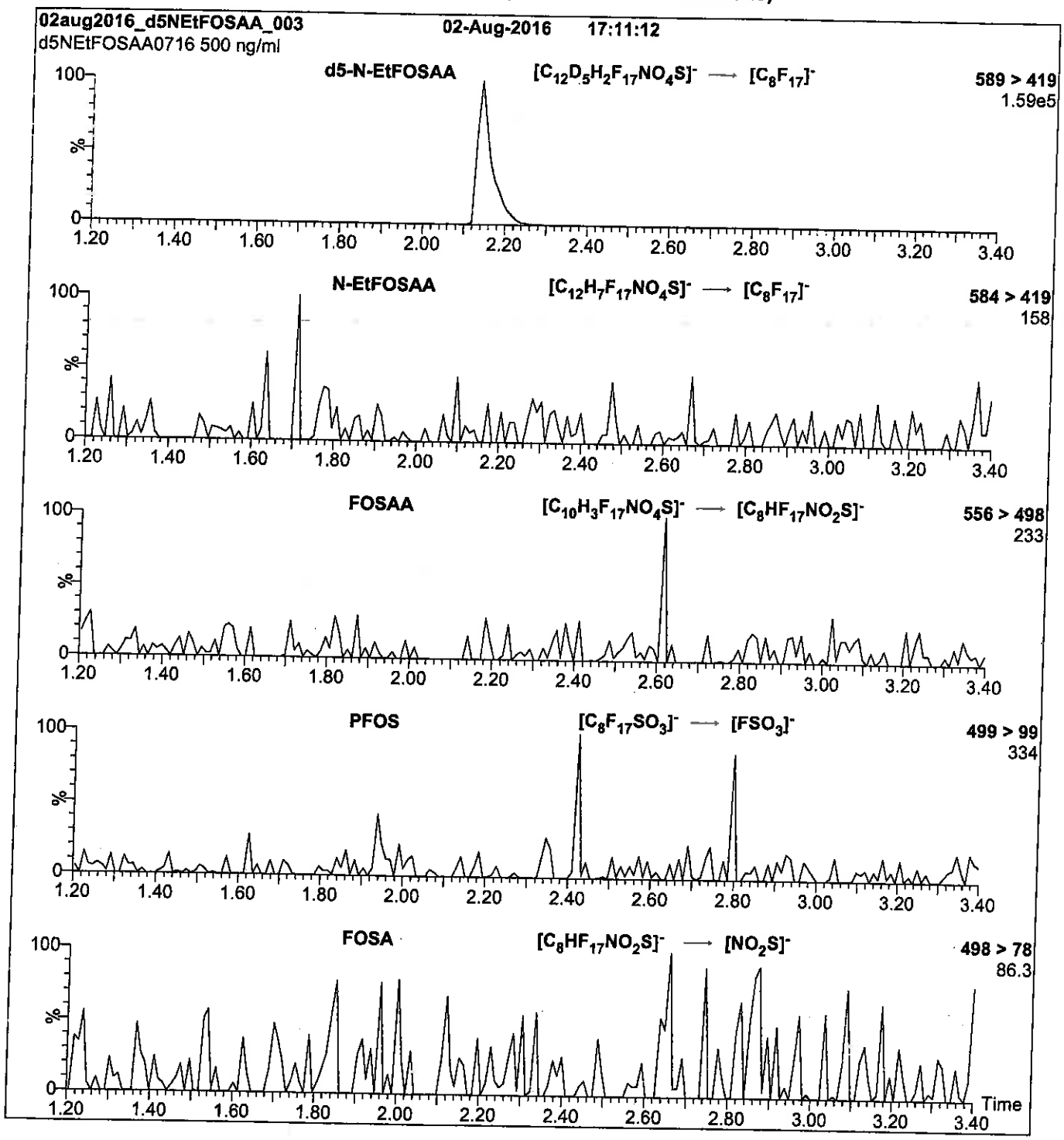
Flow: 350 µl/min

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)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.43e-3 Collision Energy (eV) = 25
Flow:	300 µl/min	

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

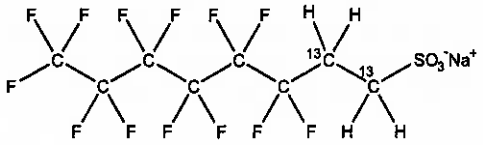
WELLINGTON LABORATORIES

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
LAST TESTED: (mm/dd/yyyy)	01/08/2016		(1,2-$^{13}C_2$)
EXPIRY DATE: (mm/dd/yyyy)	01/08/2021		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- The native 6:2FTS 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).

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

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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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.

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CALA

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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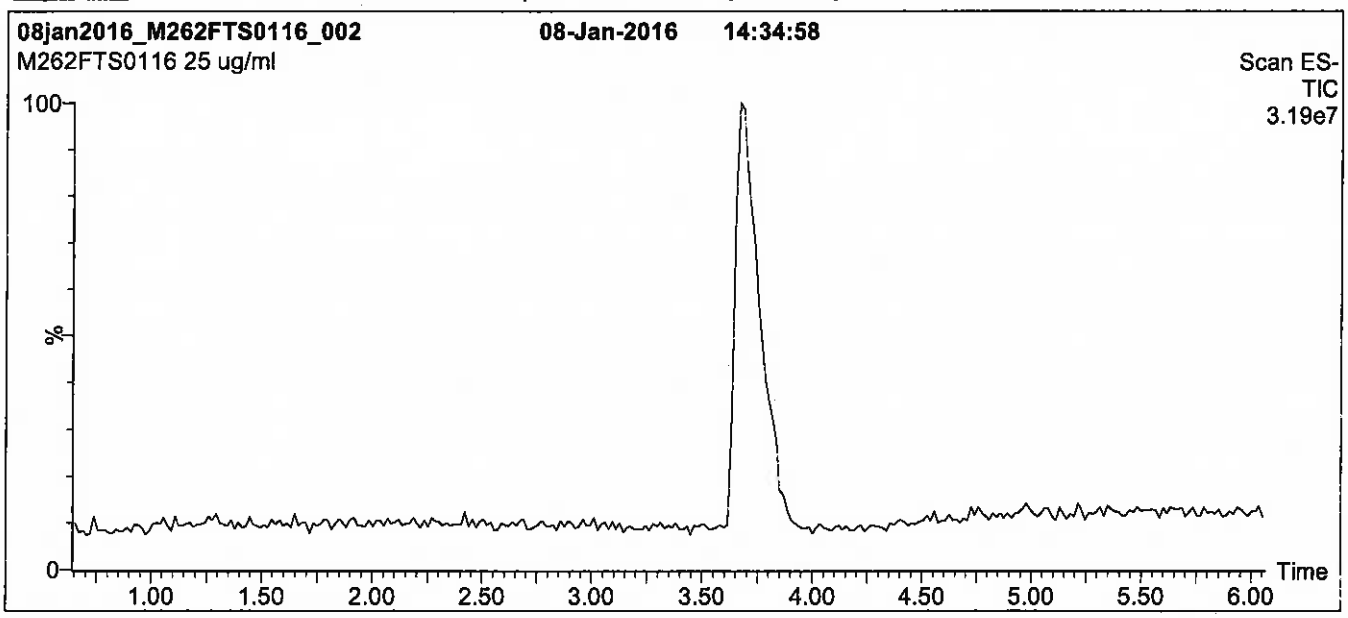

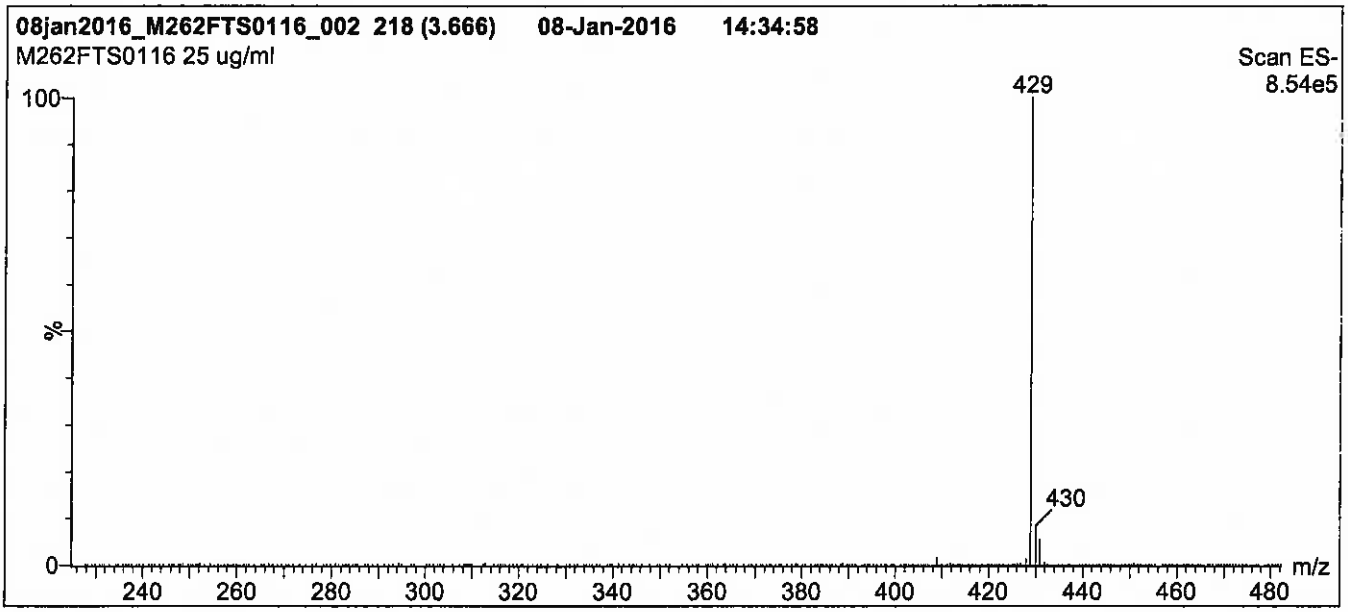

Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
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Ramp to 90% organic over 7 min
and hold for 2 min before returning
to initial conditions in 0.5 min.
Time: 10 min

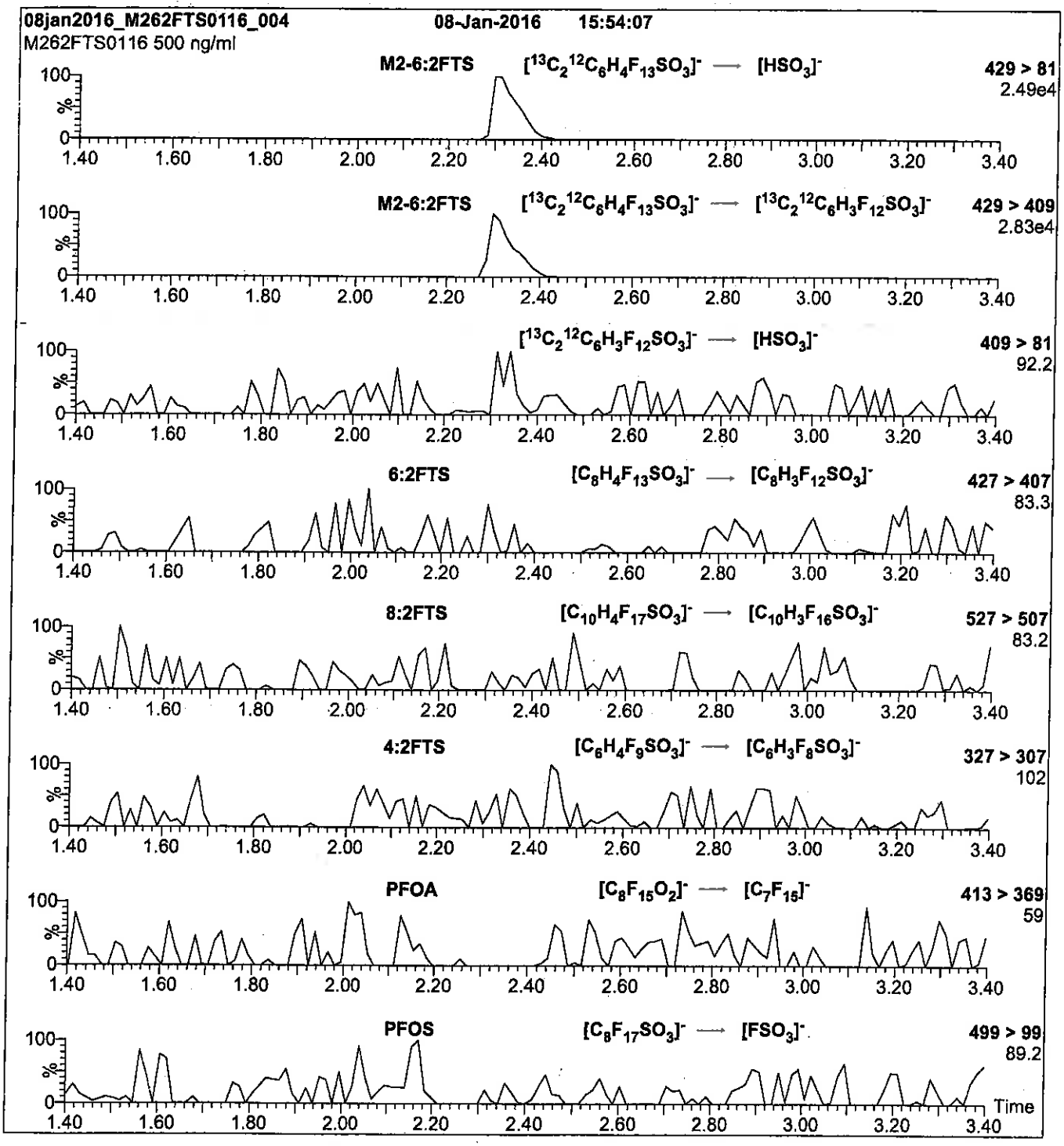
Flow: 300 µl/min

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

LCM2-6:FTS_00003

R: 9/9/16 SBC

728304
ID: LCM2-6:FTS_00003
Exp: 01/08/21 Prpd: SBC
M2-6:2FTS

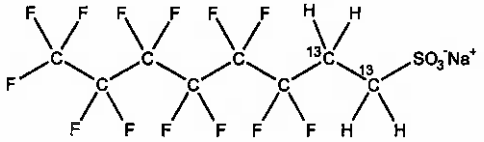
WELLINGTON LABORATORIES

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

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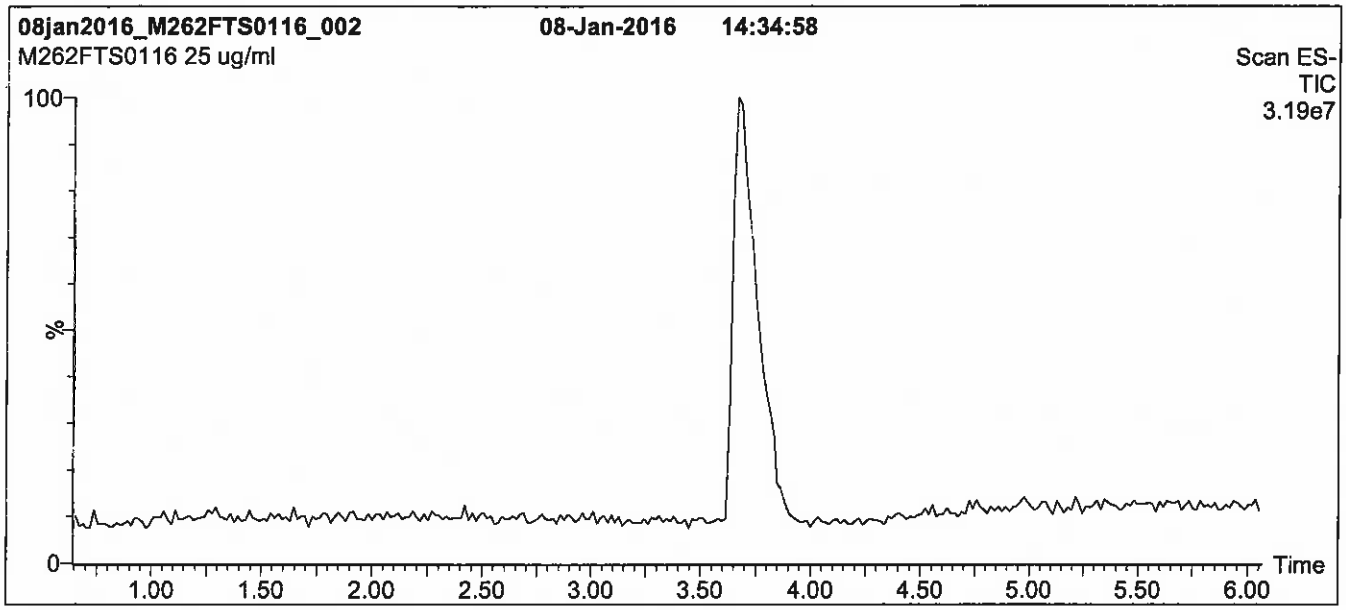
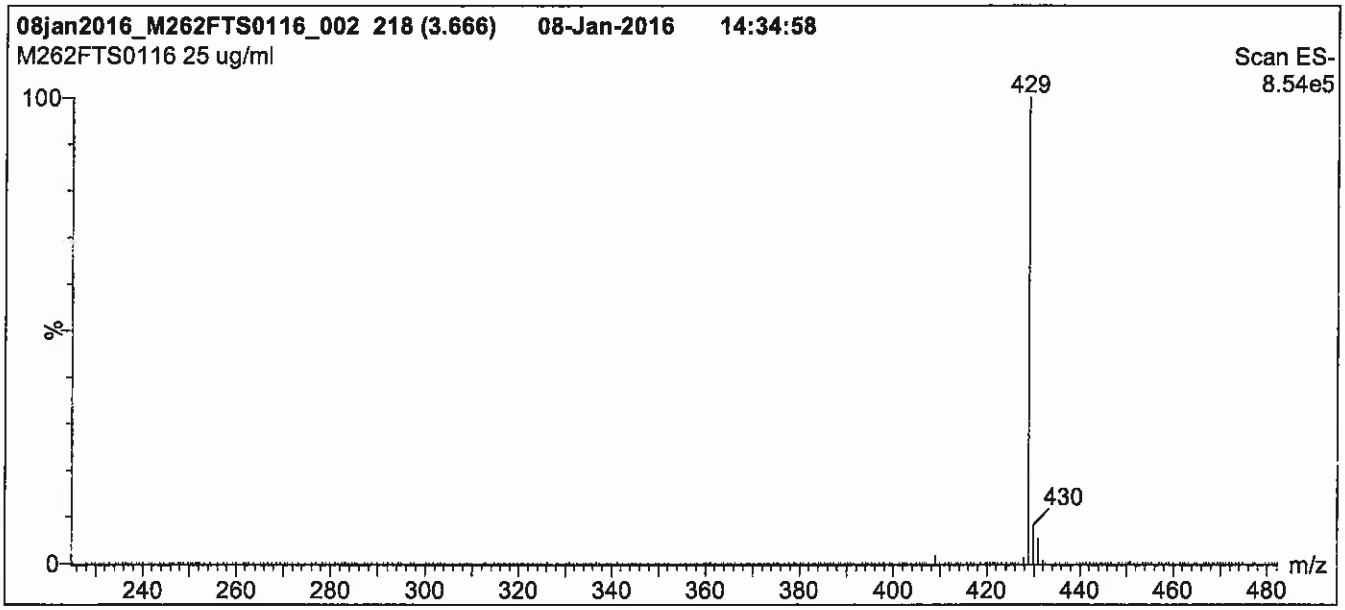




Conditions for Figure 1:

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

Chromatographic Conditions

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

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

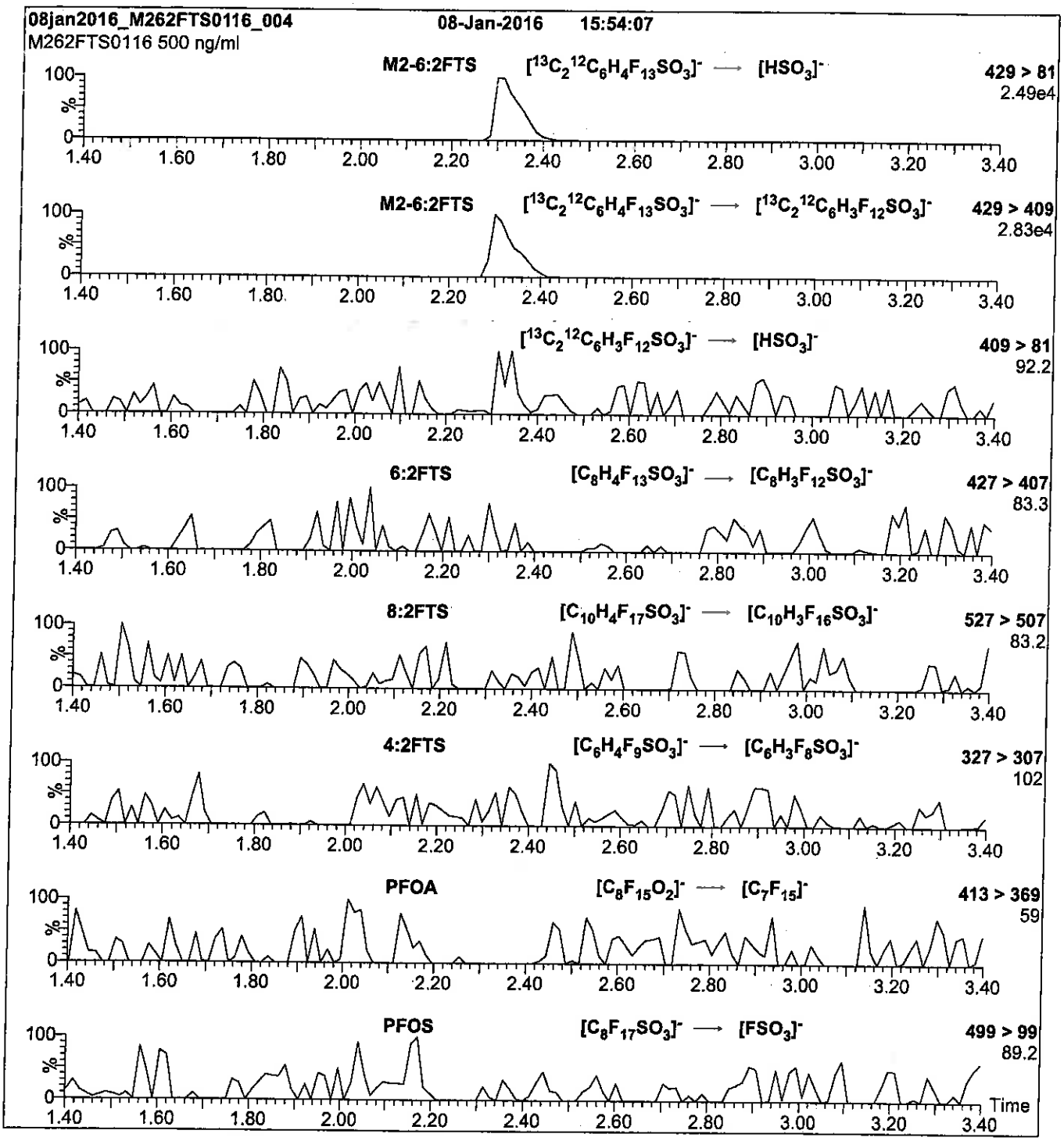
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCM2-8:2FTS_00002

R: 7/6/16 cw

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

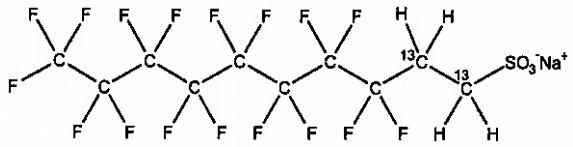
WELLINGTON LABORATORIES

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) **SOLVENT(S):** Methanol
47.9 ± 2.4 µg/ml (M2-8:2FTS anion)

CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99% ^{13}C (1,2-$^{13}C_2$)

LAST TESTED: (mm/dd/yyyy) 01/08/2016

EXPIRY DATE: (mm/dd/yyyy) 01/08/2021

RECOMMENDED STORAGE: Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

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CALA

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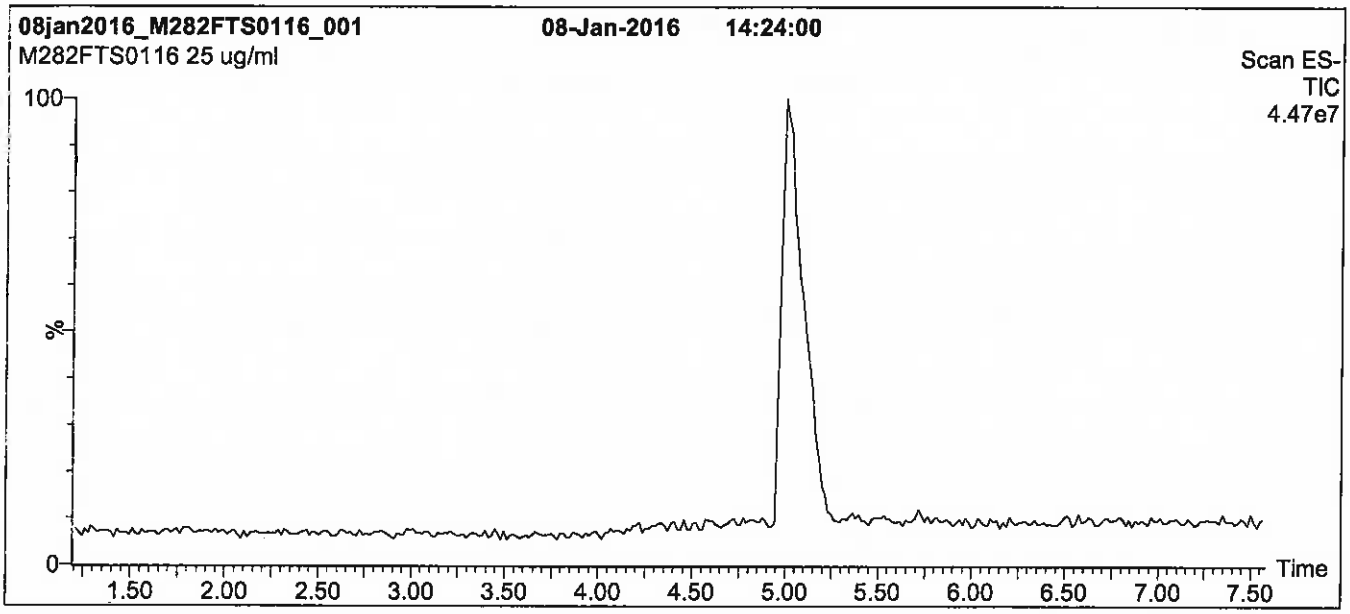
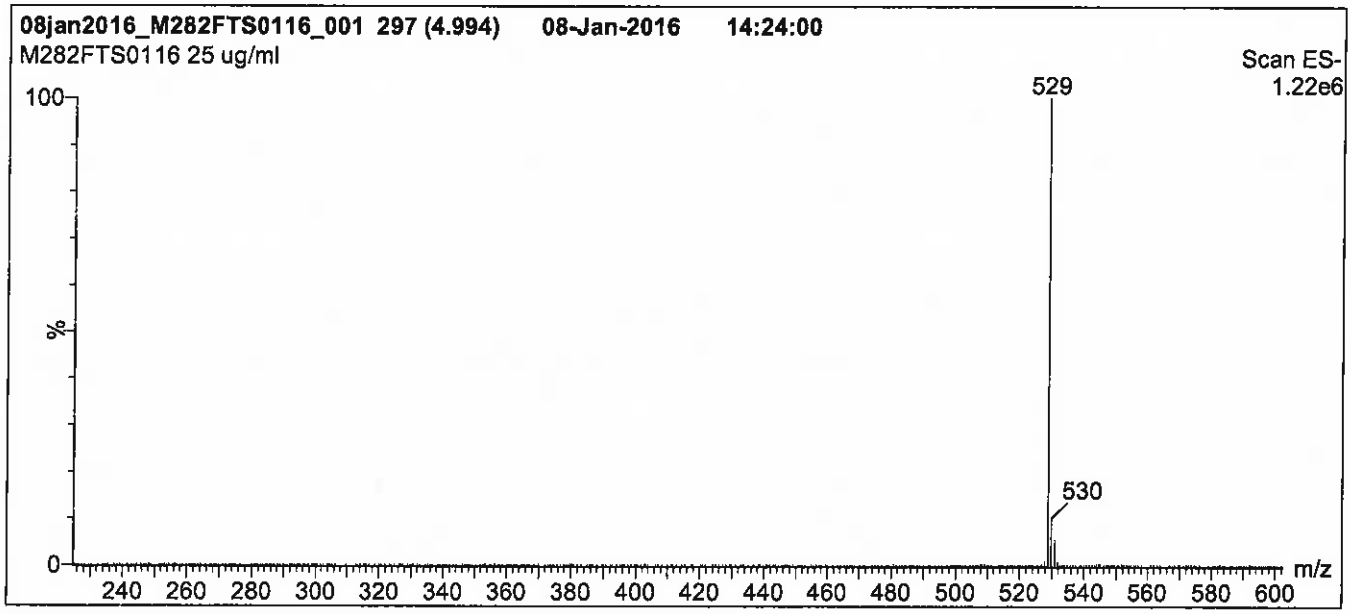
Figure 1: **M2-8:2FTS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

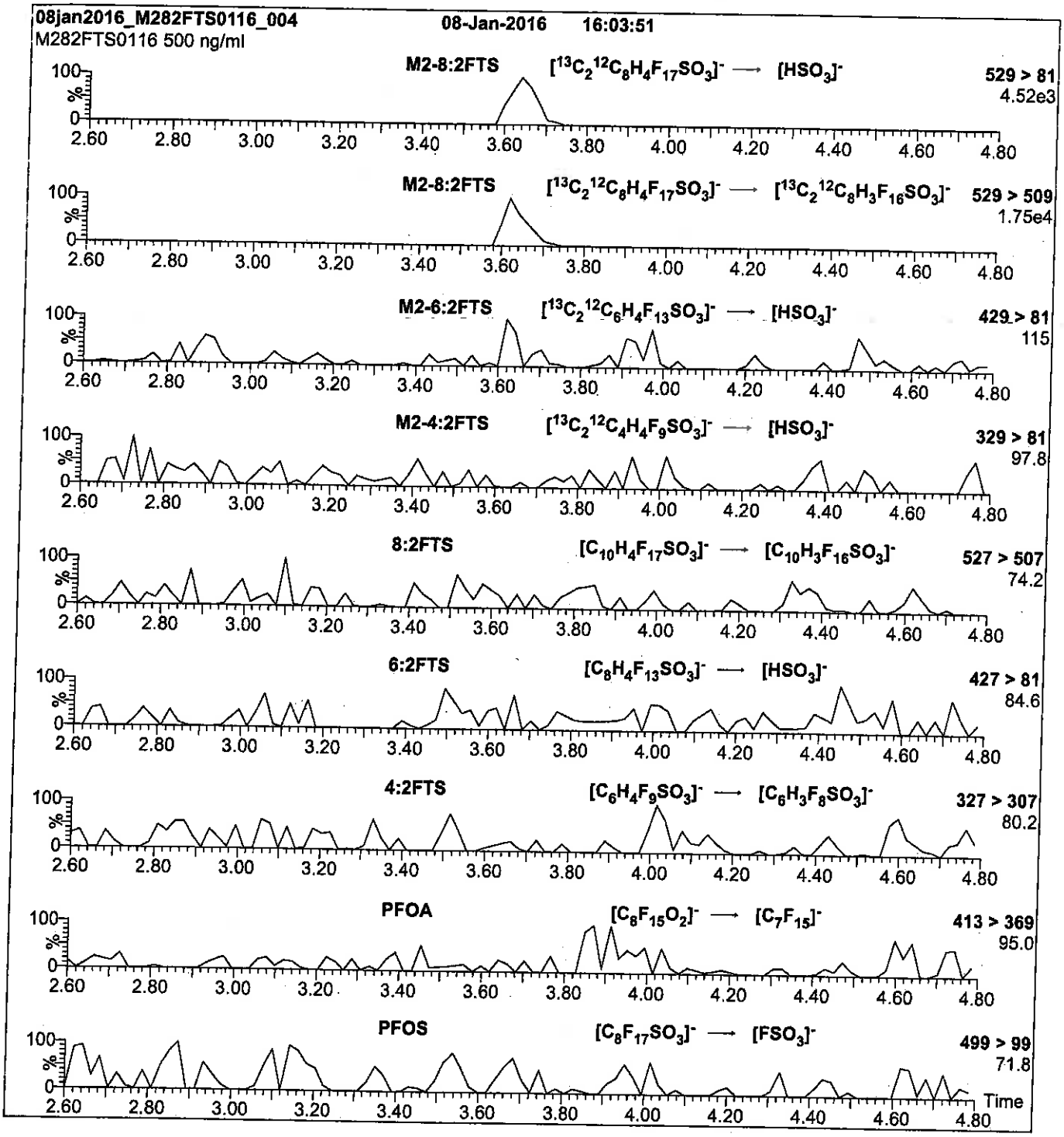
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml M2-8:2FTS)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.20e-3 Collision Energy (eV) = 30
Flow:	300 µl/min	

Reagent

LCM2PFHxDA_00008

R: SBC 9/22/16

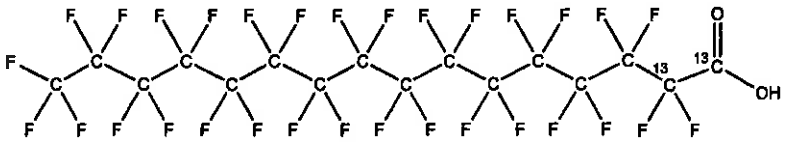
739512
ID: LCM2PFHxDA_00008
Exp: 01/07/21 Prpd: SBC
13C2-PFHxDA at 50ug/mL

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-$^{13}C_2$)
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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

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

CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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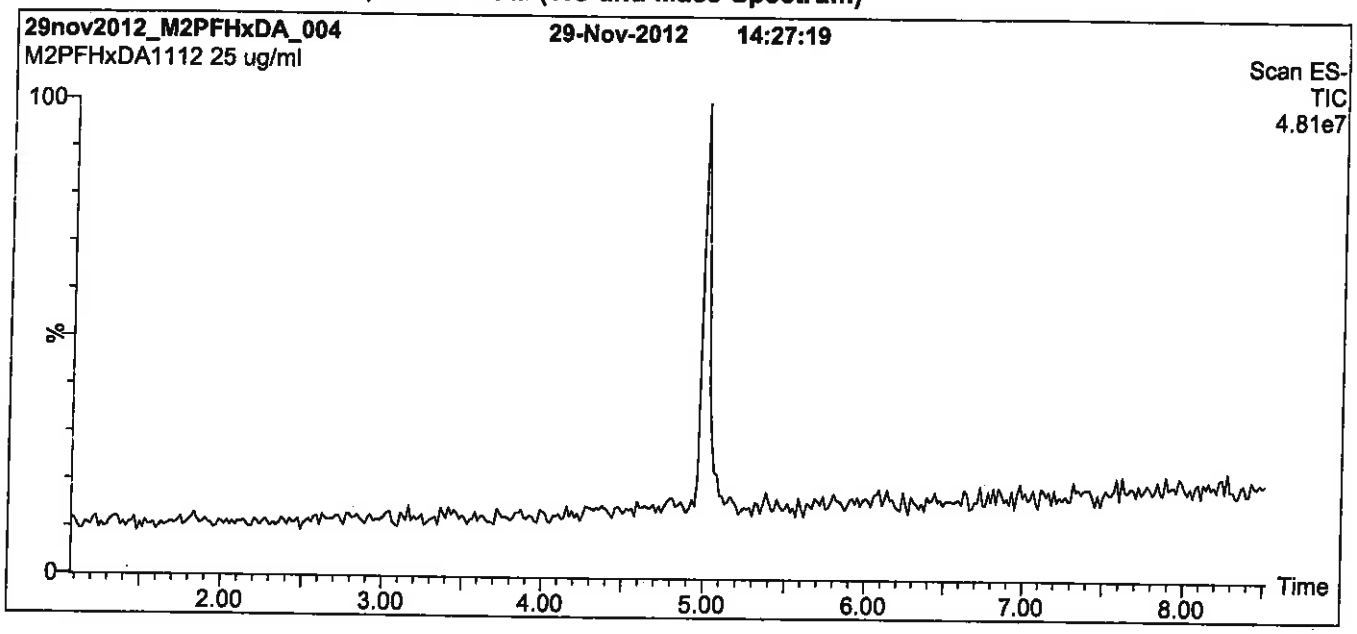
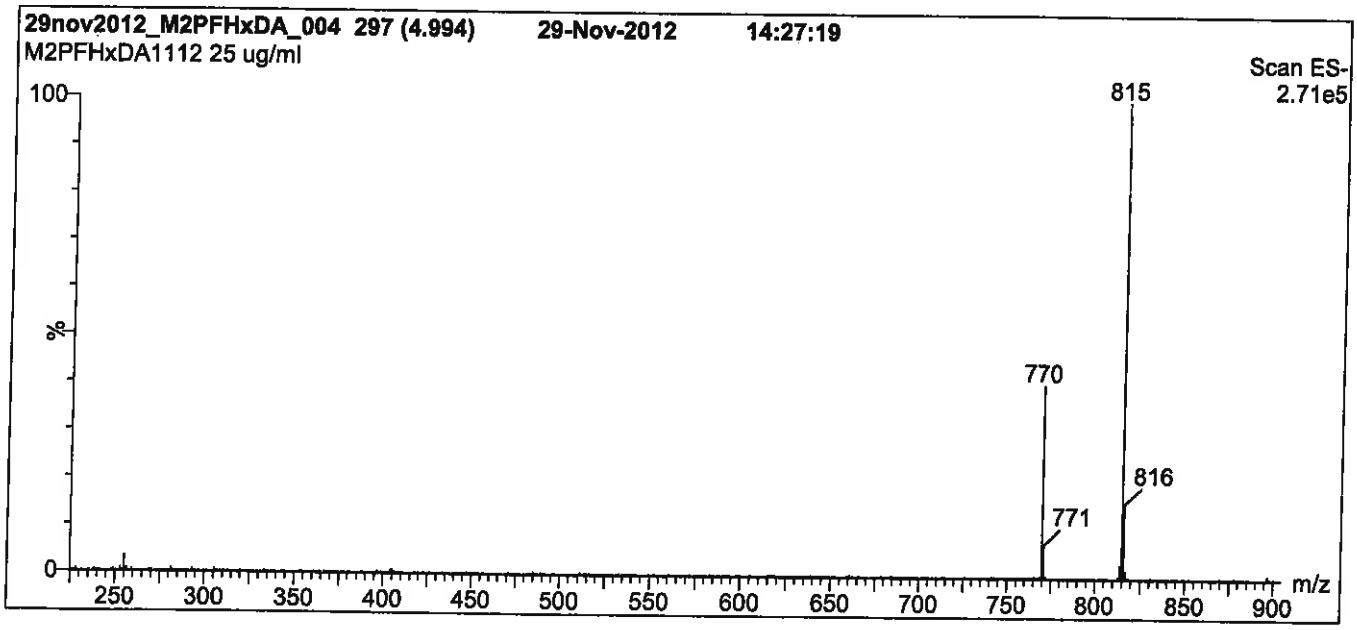
Figure 1: **M2PFHxDA; LC/MS Data (TIC and Mass Spectrum)**





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

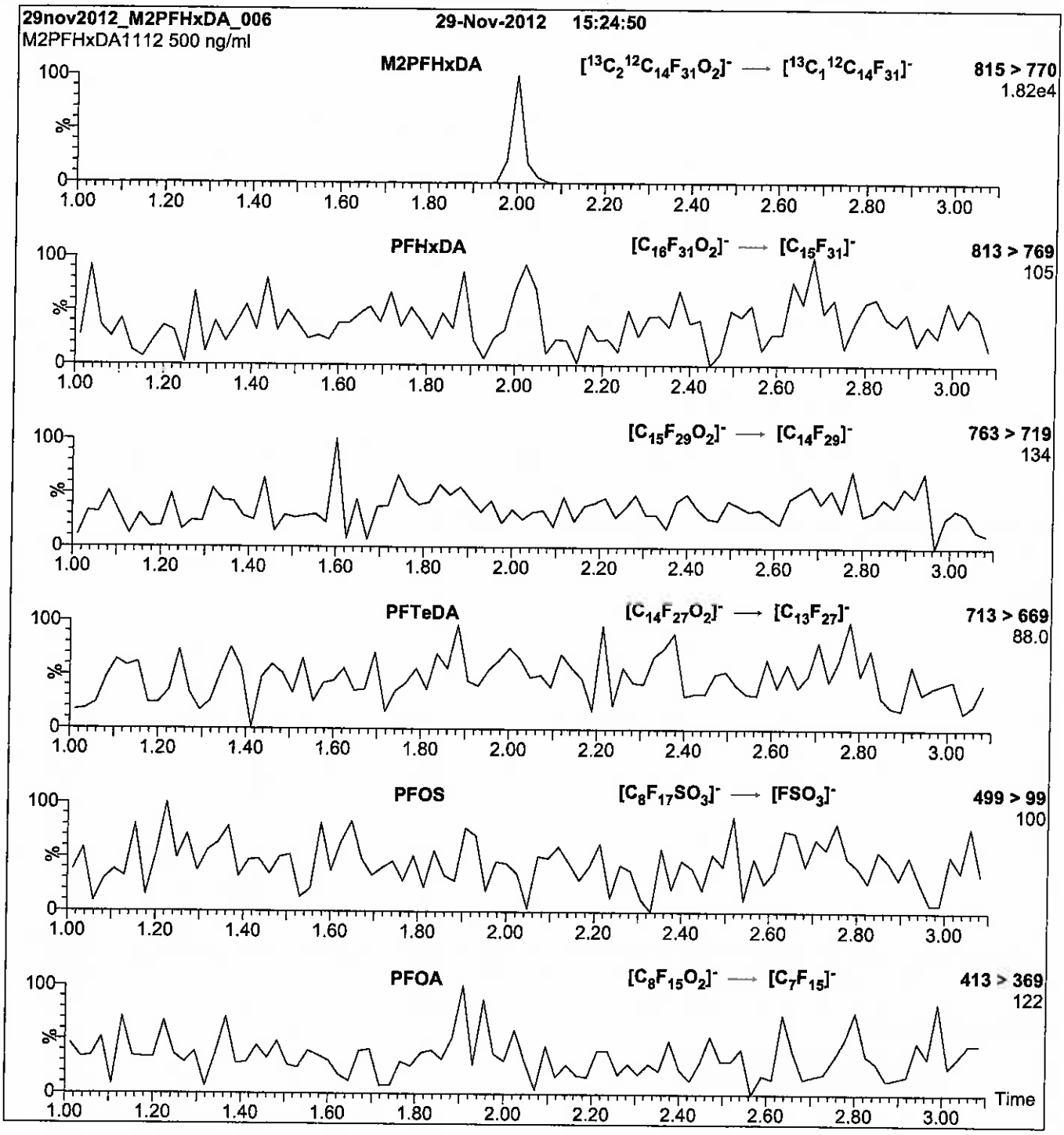
Flow: 300 µl/min

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)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.39e-3 Collision Energy (eV) = 15
Flow:	300 µl/min	

Reagent

LCM2PFTeDA_00007

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

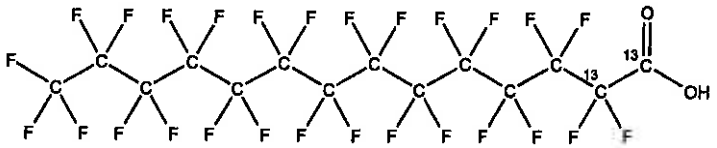
739563
ID: LCM2PFTeDA_00007
Exp: 12/07/20 Prpd: SBC
13C2-PFTeDA at 50ug/mL

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



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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 12/08/2015 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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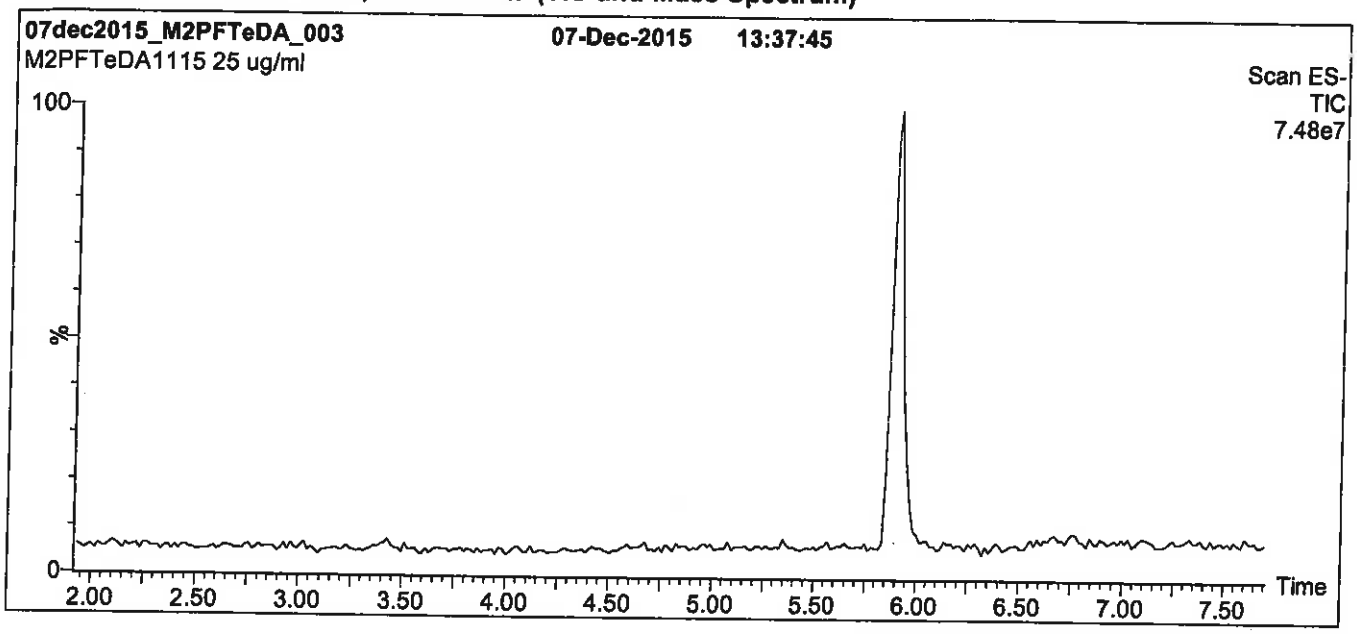
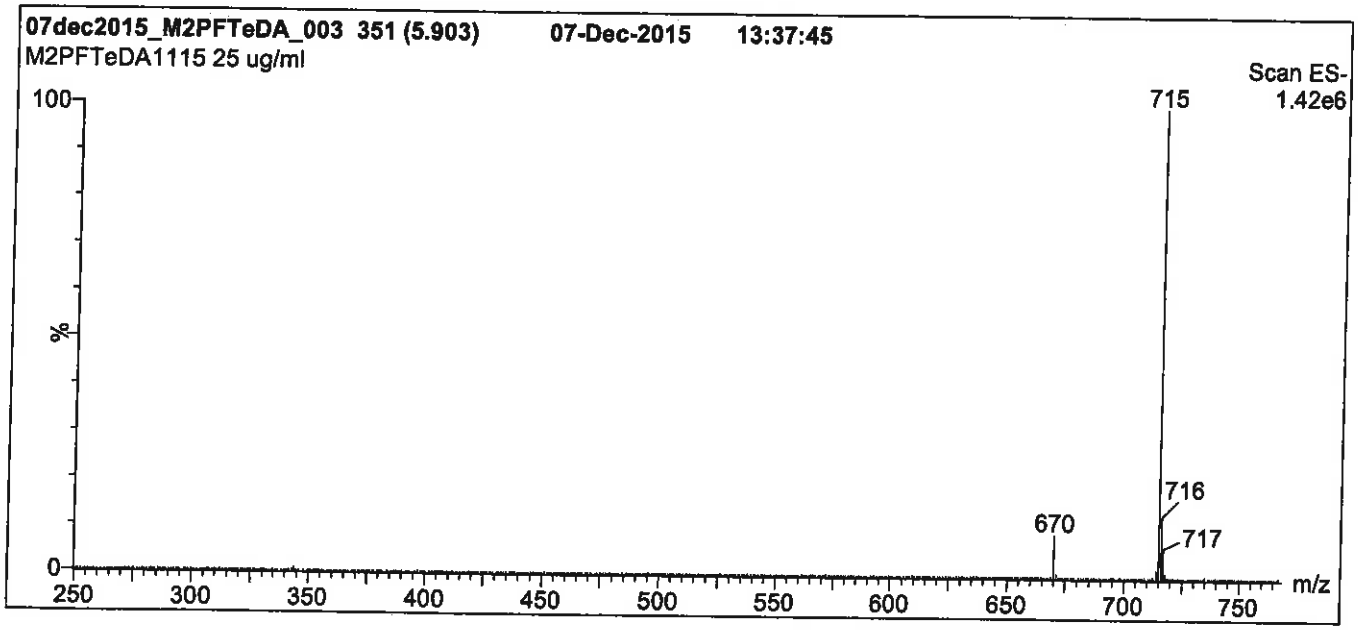
Figure 1: **M2PFTeDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

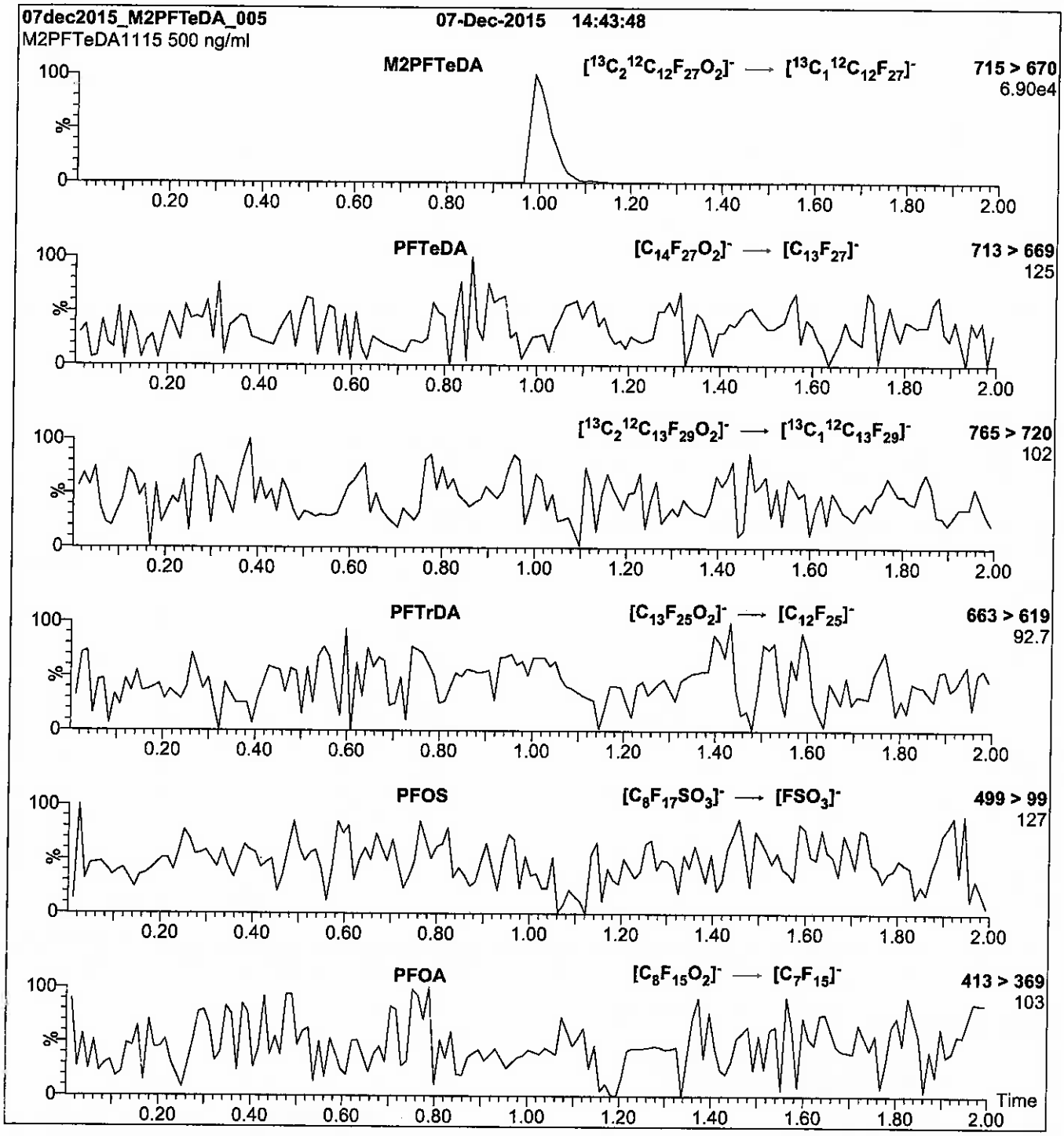
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1250 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCM4PFHPA_00007

R: SBC 2/22/16

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

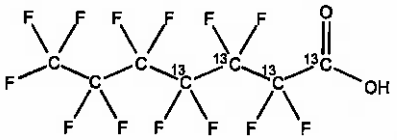
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

Scanned 10/14/16 SBC

PRODUCT CODE: M4PFHpA
LOT NUMBER: M4PFHpA0516
COMPOUND: Perfluoro-n-[1,2,3,4-$^{13}C_4$]heptanoic acid

STRUCTURE:
CAS #: Not available



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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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HAZARDS:

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CALA Testing

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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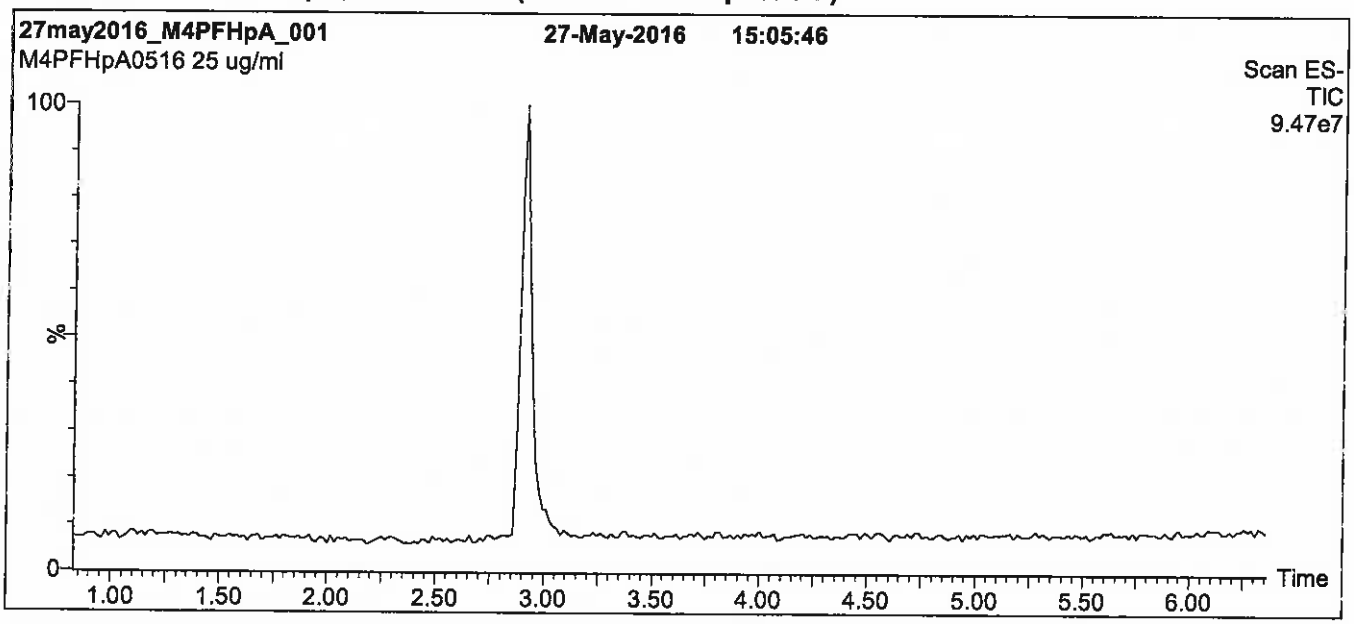
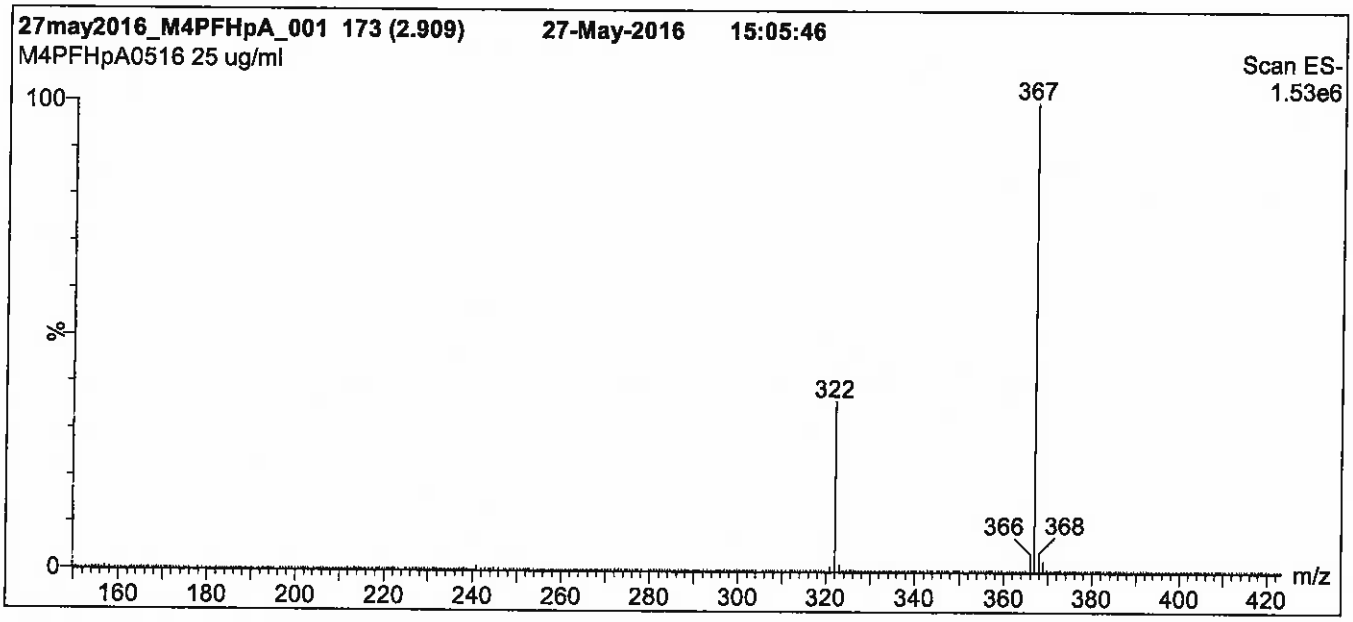
Figure 1: **M4PFHpA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

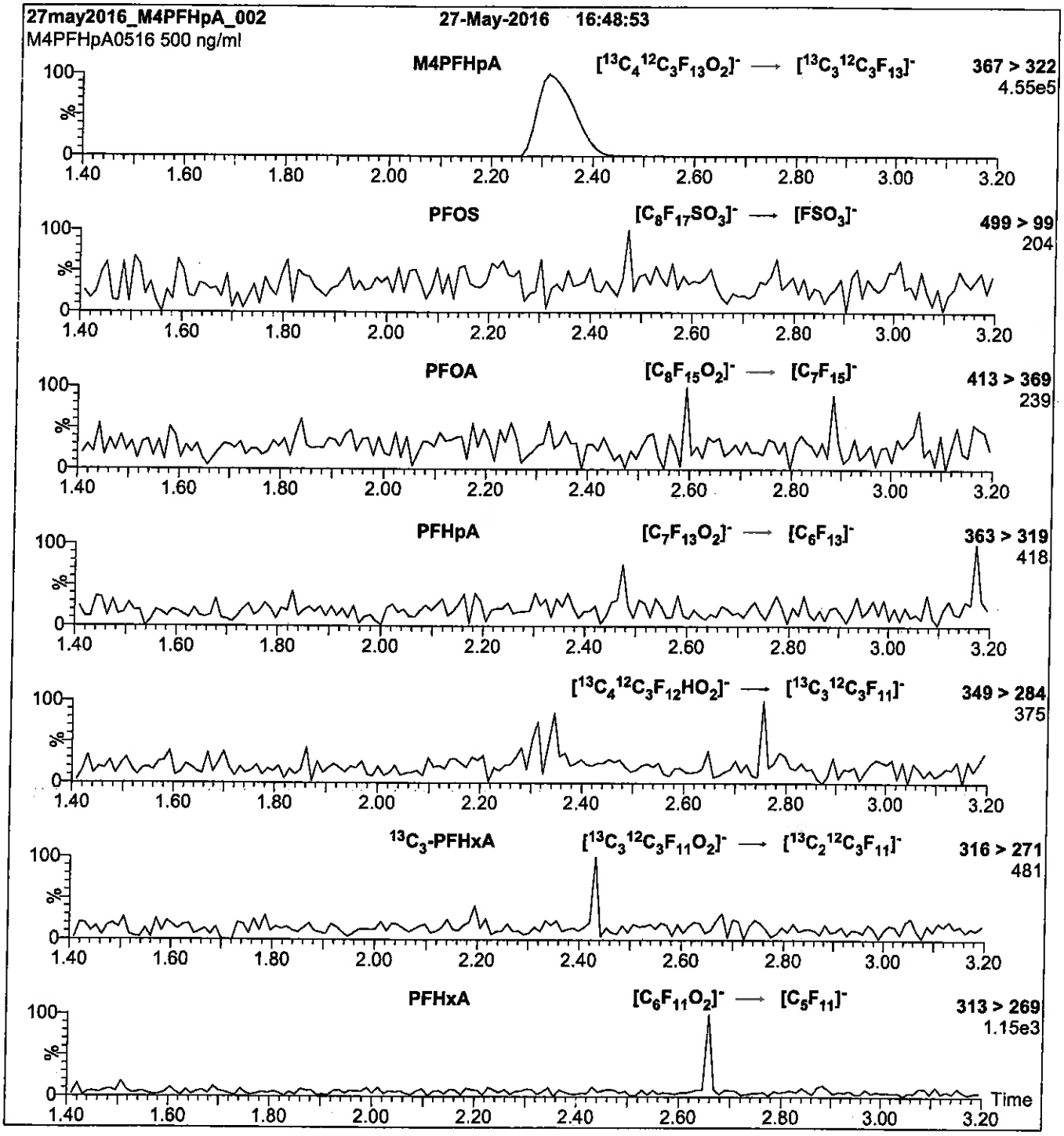
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml M4PFHpA)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.35e-3 Collision Energy (eV) = 11
Flow:	300 µl/min	

Reagent

LCM5PFPEA_00008

R: SBC 9/22/16

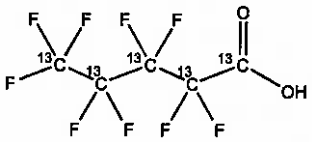
739590
ID: LCM5PFPEA_00008
Exp: 05/22/20 Prpd: SBC
13C5-Perfluoropentanoic a

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:

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:

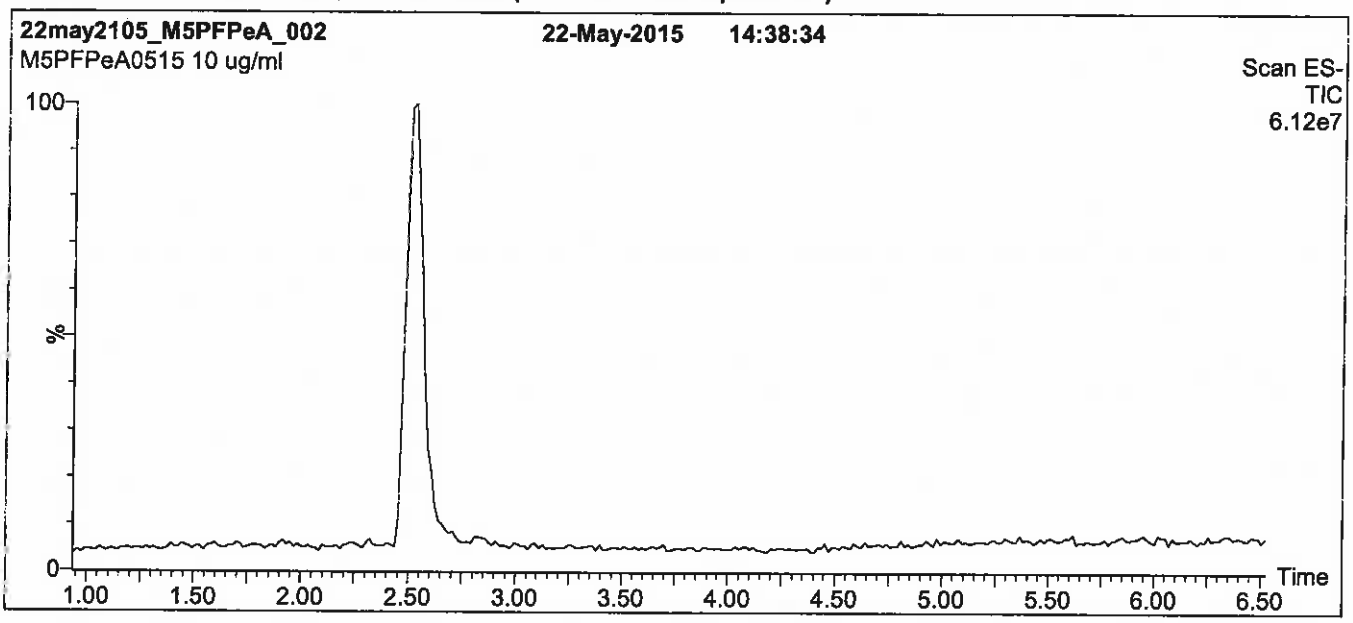
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

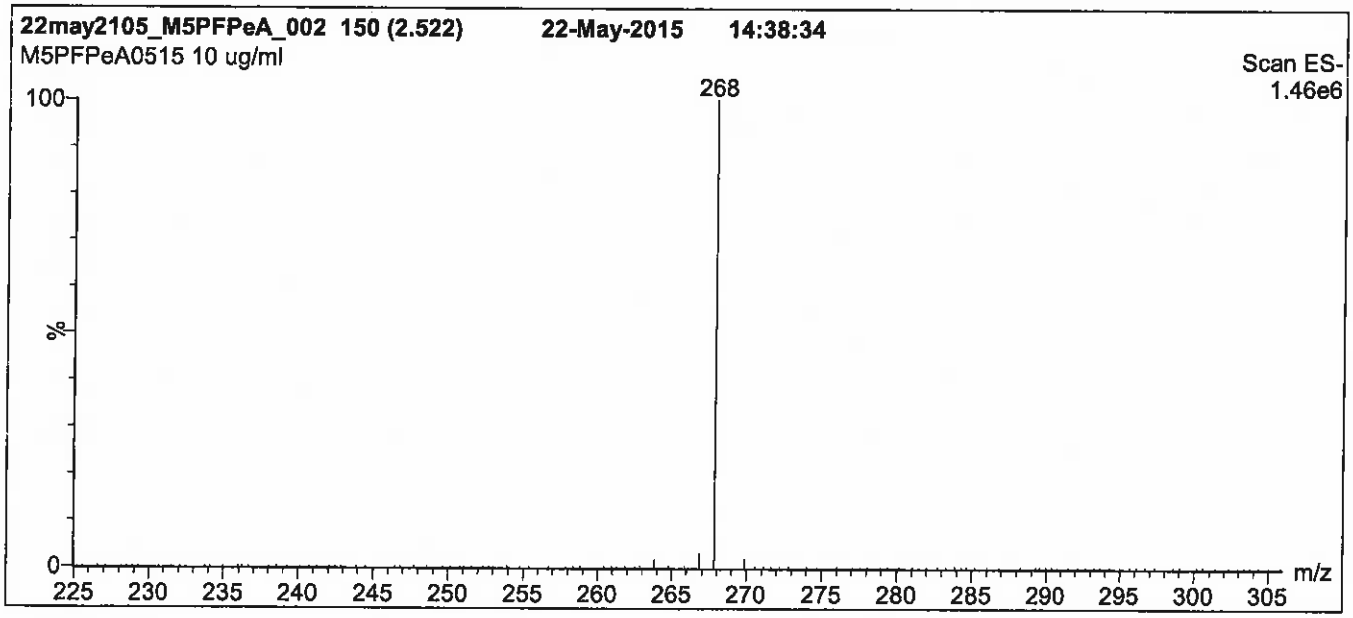
CALA

ANAB ACCREDITED 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: **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

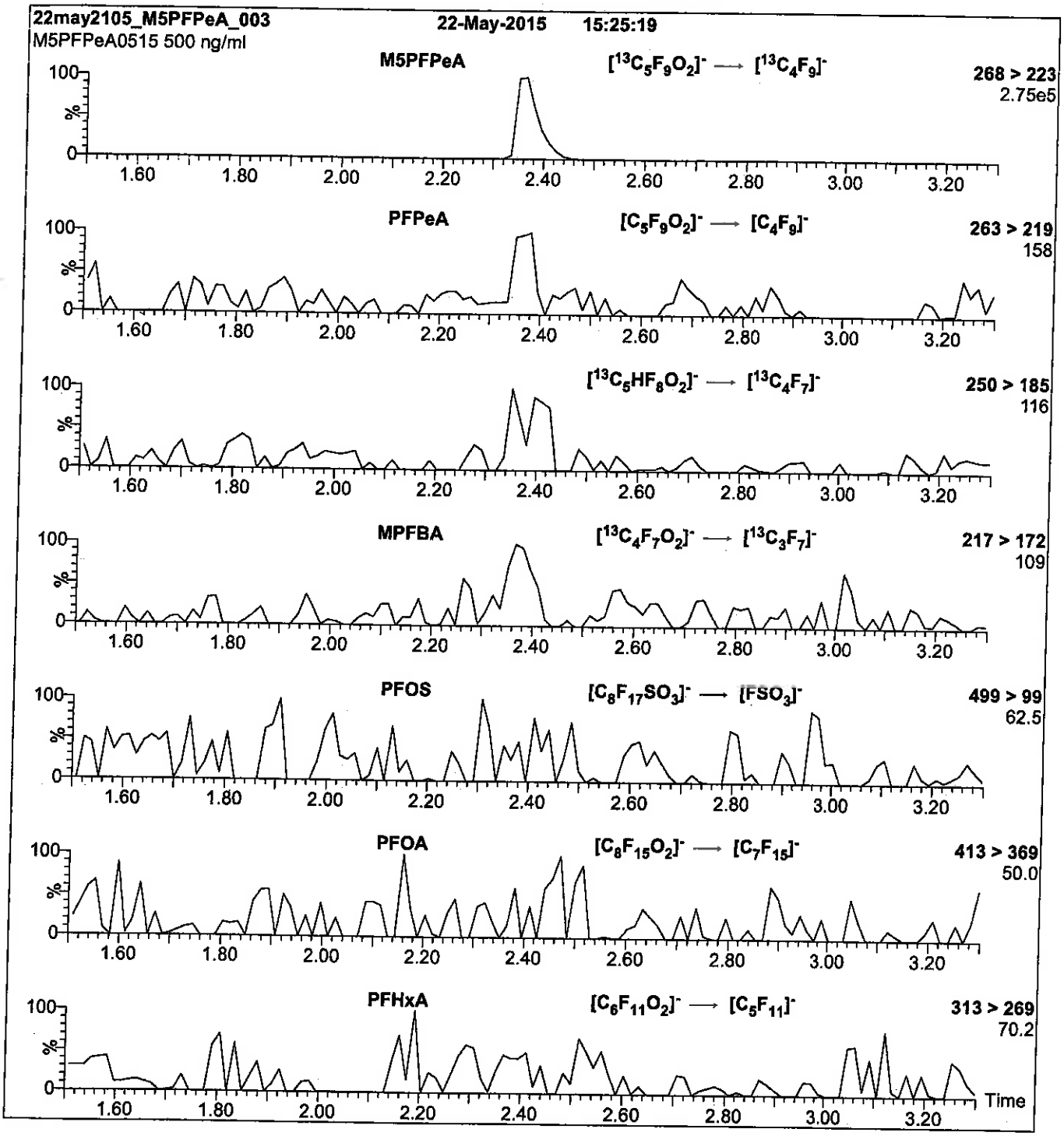
Flow: 300 µl/min

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)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.35e-3 Collision Energy (eV) = 9
Flow:	300 µl/min	

Reagent

LCM8FOSA_00011

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

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

WELLINGTON LABORATORIES

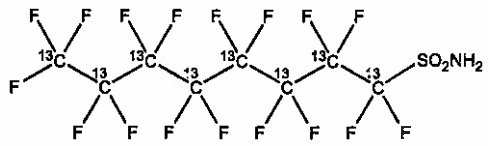
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M8FOSA-I
COMPOUND: Perfluoro-1-[$^{13}C_8$]octanesulfonamide

LOT NUMBER: M8FOSA1215I

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_8H_2F_{17}NO_2S$
CONCENTRATION: 50 ± 2.5 µg/ml
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 12/22/2015
EXPIRY DATE: (mm/dd/yyyy) 12/22/2017
RECOMMENDED STORAGE: Refrigerate ampoule

MOLECULAR WEIGHT: 507.09
SOLVENT(S): Isopropanol
ISOTOPIC PURITY: ≥99% ^{13}C ($^{13}C_8$)

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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

HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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

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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.

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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.

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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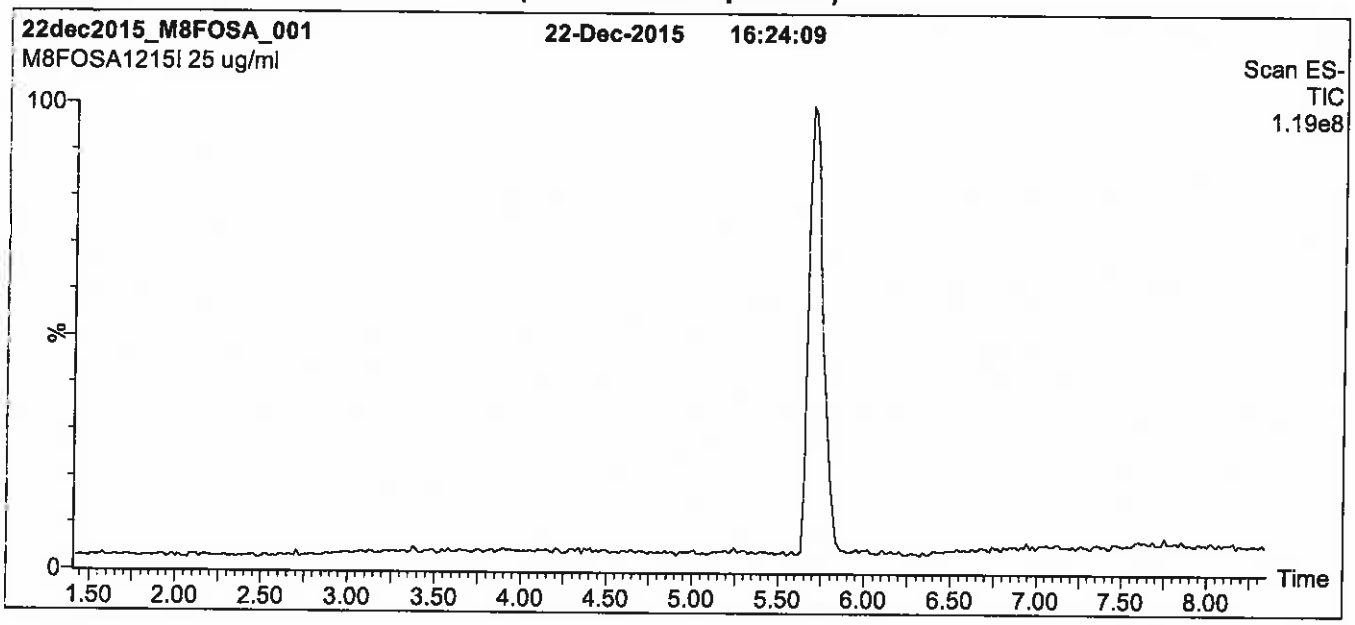
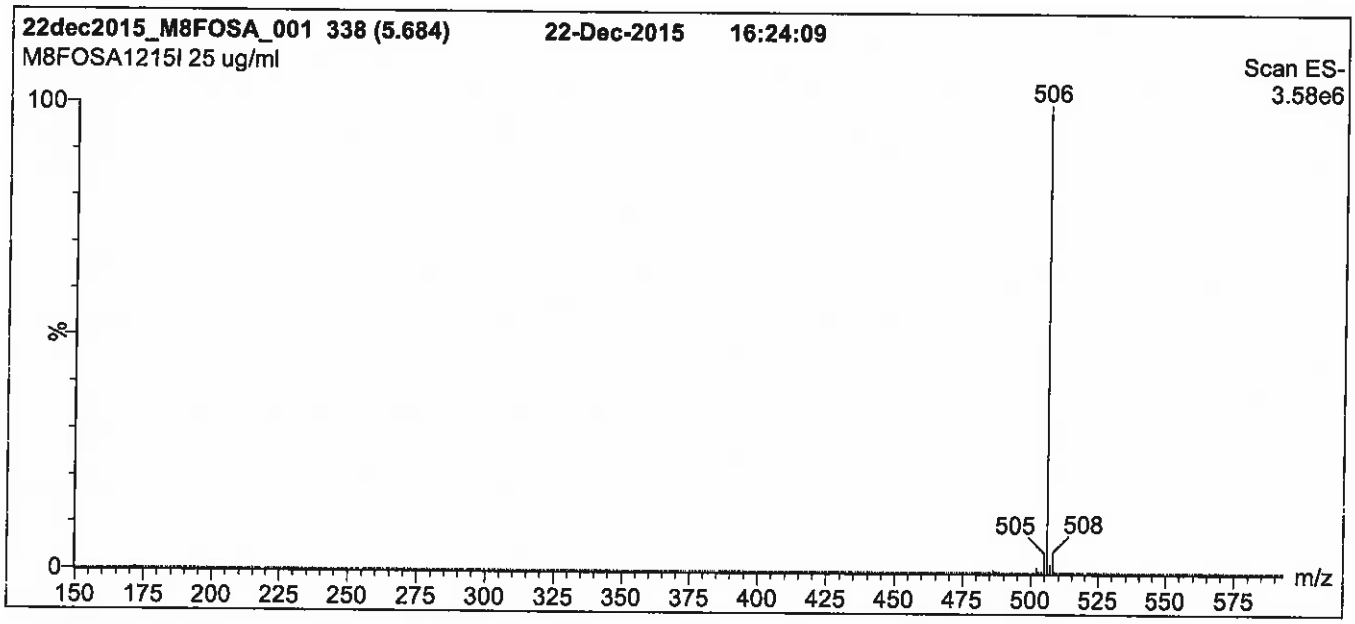
CALA

ANAB ACCREDITED

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield 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

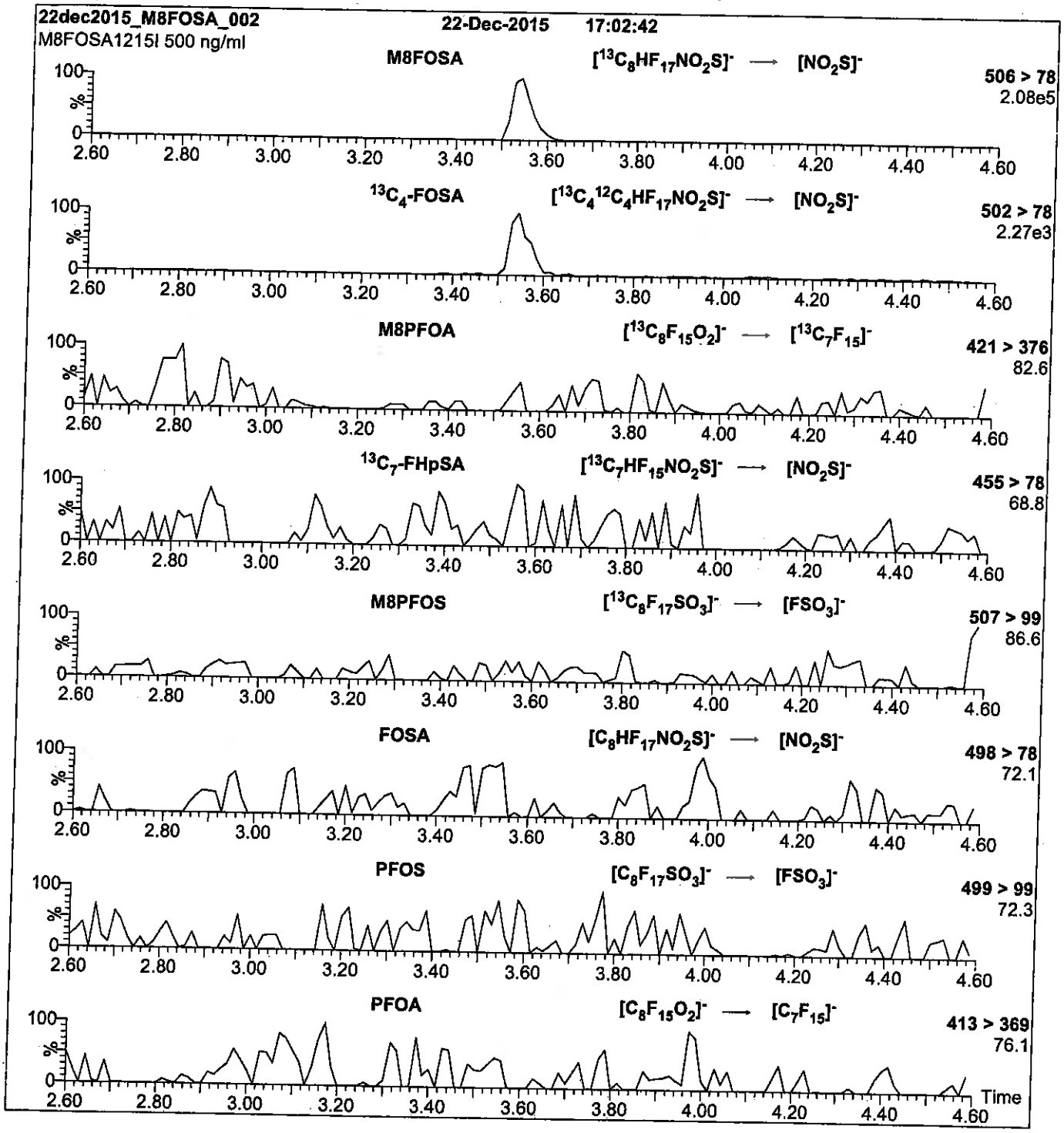
Flow: 300 µl/min

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)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.39e-3 Collision Energy (eV) = 30
Flow:	300 µl/min	

Reagent

LCMPFBA_00008

R: SBC 9/22/16

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

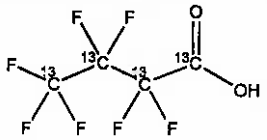
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

Scanned 10/14/16 SR

PRODUCT CODE: MPFBA
LOT NUMBER: MPFBA0516
COMPOUND: Perfluoro-n-[1,2,3,4-$^{13}C_4$]butanoic acid

STRUCTURE:
CAS #: Not available



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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 05/30/2016 (mm/dd/yyyy)

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

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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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TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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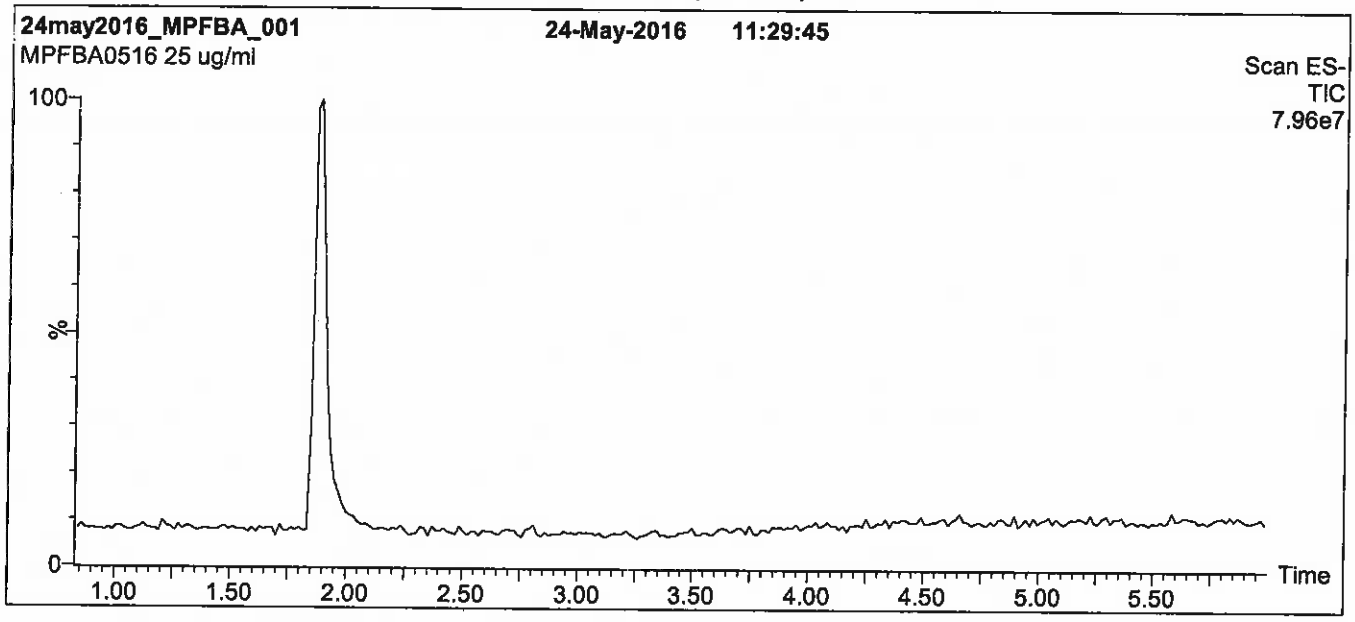
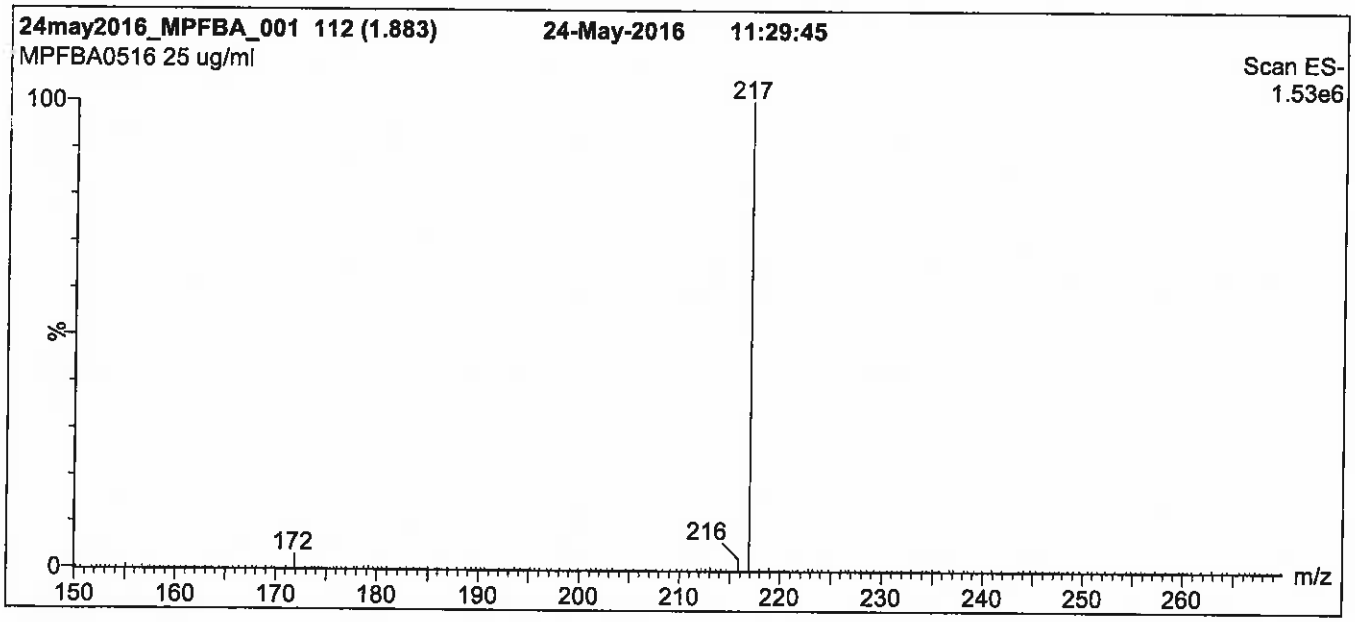
CALA

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

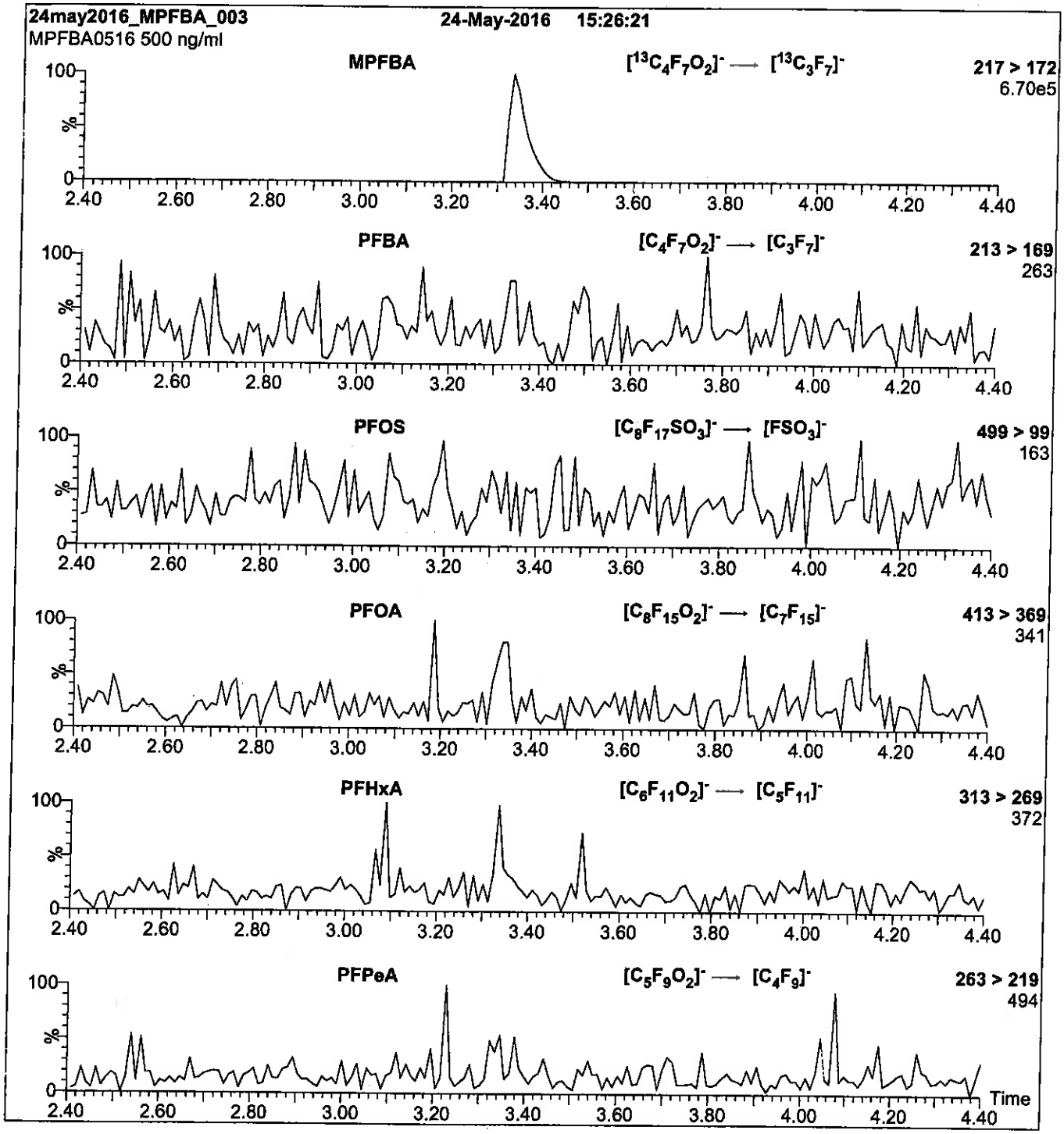
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

MS Parameters

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

Reagent

LCMPFDA_00011

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

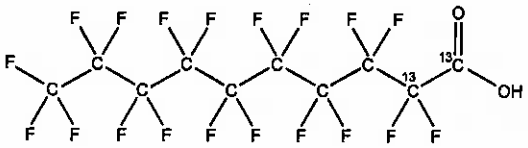
739609
ID: LCMPFDA_00011
Exp: 08/19/20 Prpd: SBC
13C2-Perfluorodecanoic a

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFDA
LOT NUMBER: MPFDA0815
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]decanoic acid

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_8HF_{19}O_2$
MOLECULAR WEIGHT: 516.07
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol, Water (<1%)
CHEMICAL PURITY: >98%
ISOTOPIC PURITY: ≥99% ^{13}C (1,2-$^{13}C_2$)
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: 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:

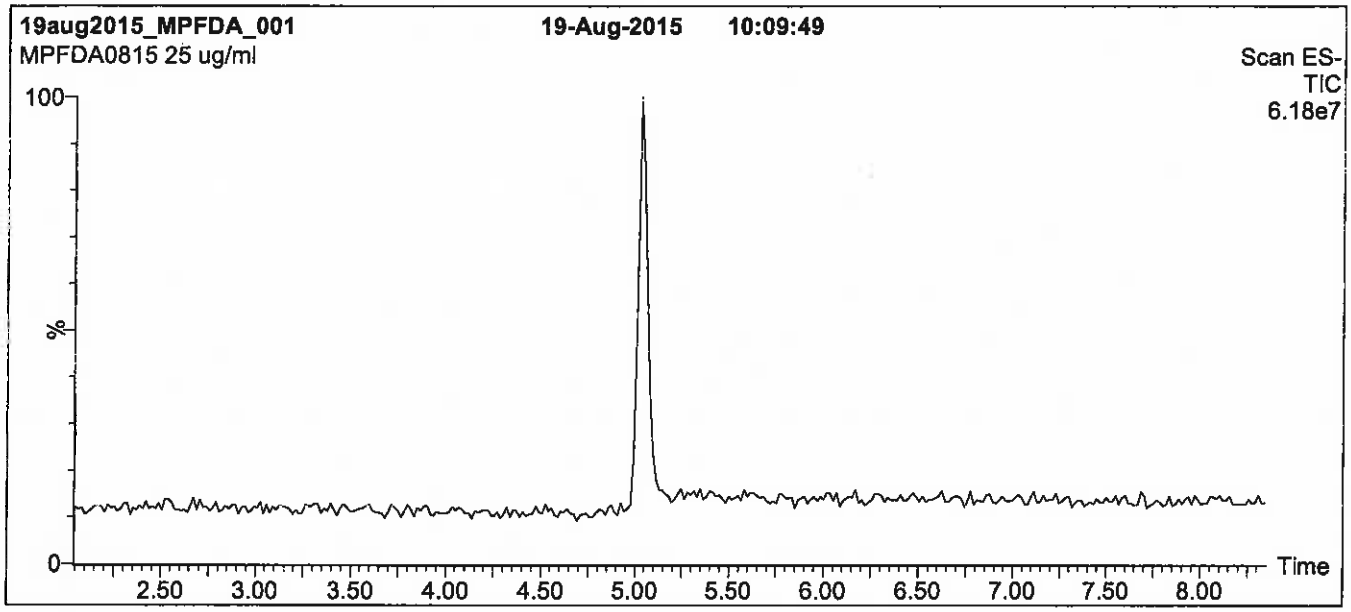
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

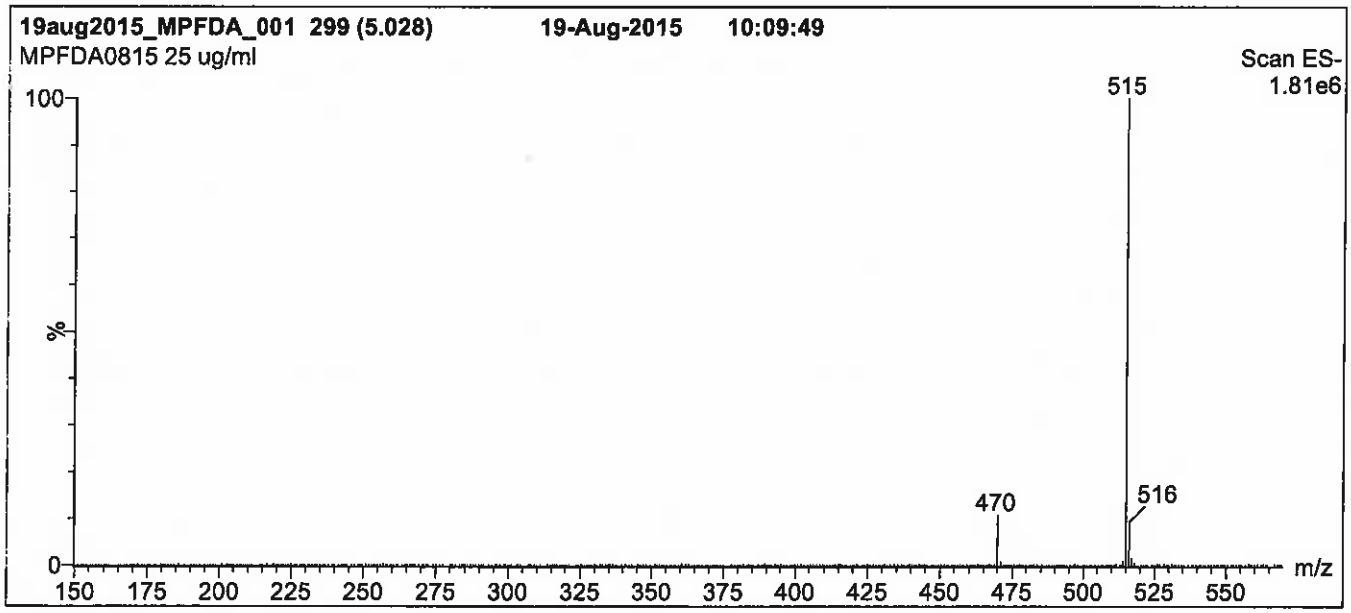
CALA Testing Accreditation Inc. A1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

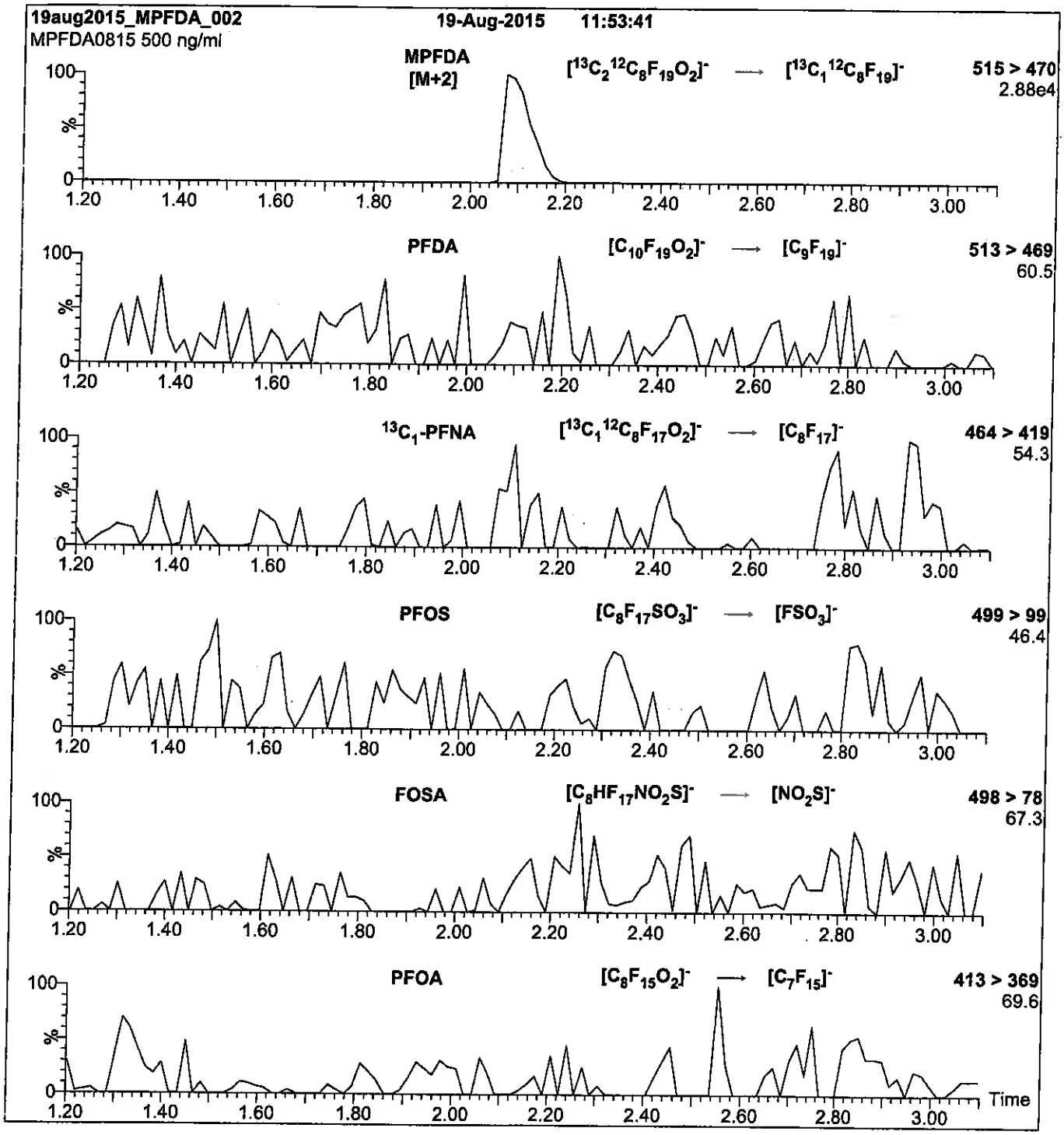
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml MPFDA)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.35e-3 Collision Energy (eV) = 13
Flow:	300 µl/min	

Reagent

LCMPFDoA_00008

R: SBC 9/22/16

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

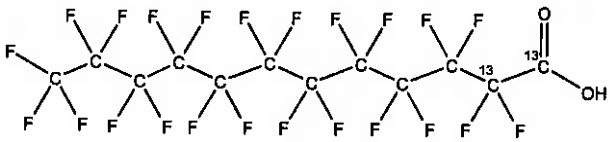
WELLINGTON LABORATORIES

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-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy) 04/08/2016
EXPIRY DATE: (mm/dd/yyyy) 04/08/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 04/15/2016 (mm/dd/yyyy)

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

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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

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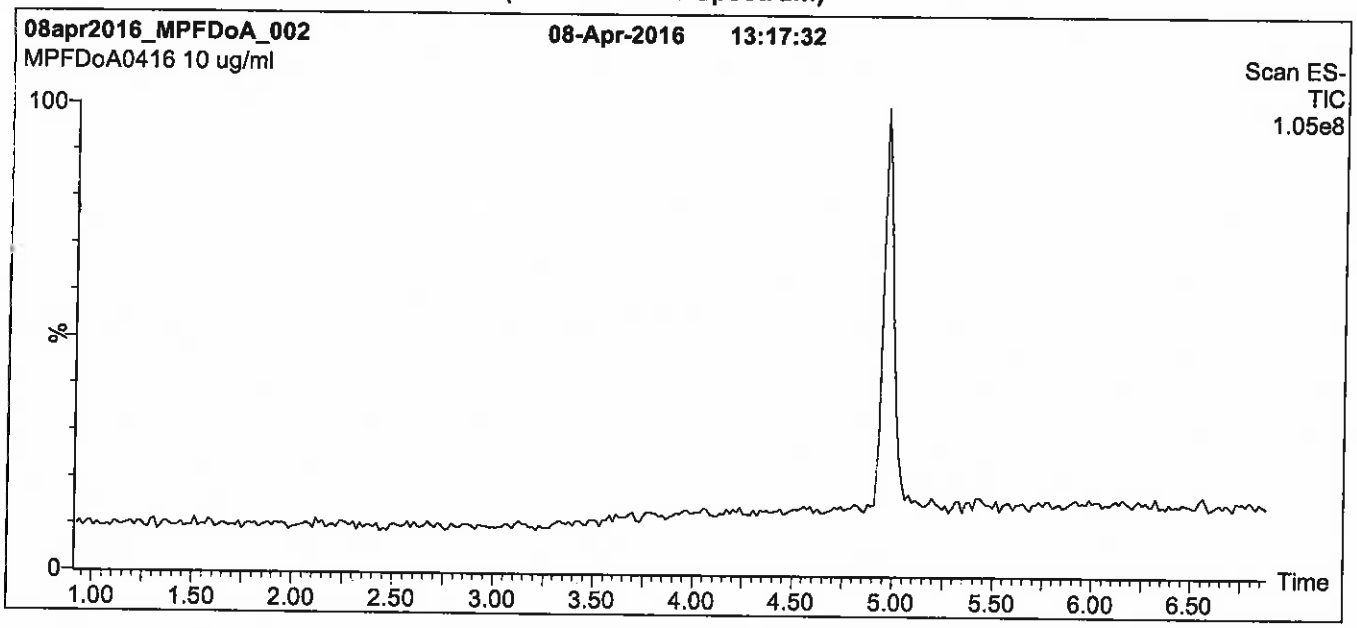
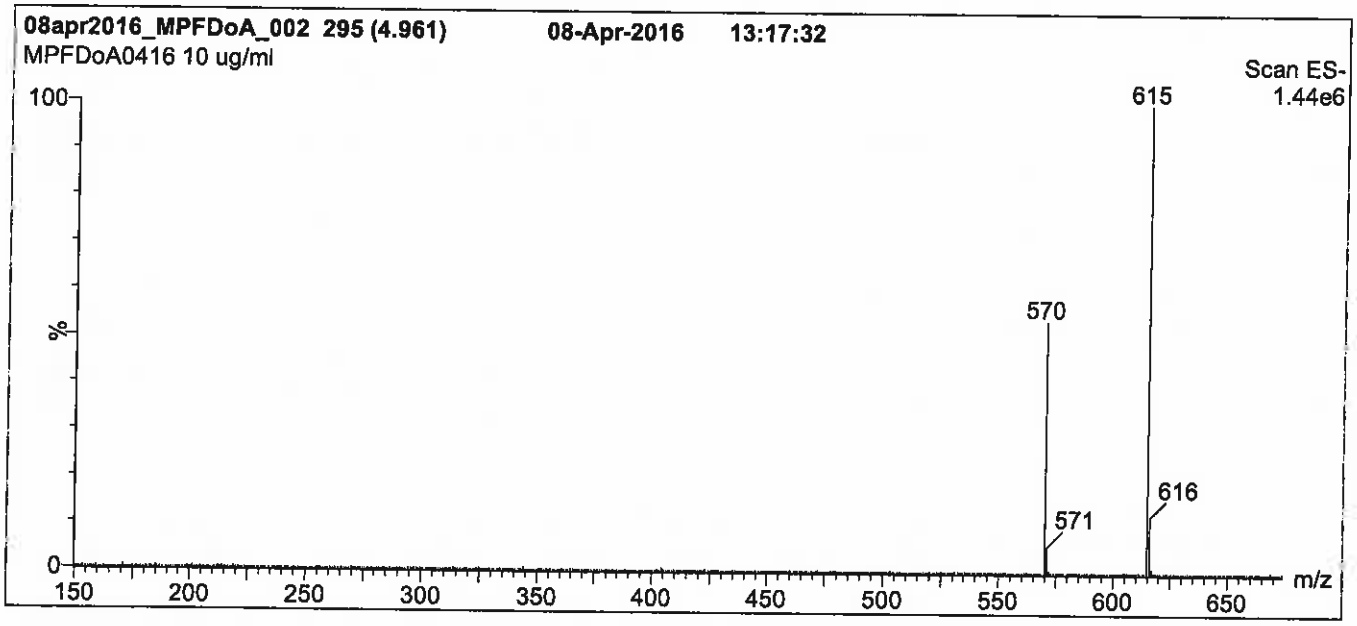
Figure 1: **MPFDoA; LC/MS Data (TIC and Mass Spectrum)**





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

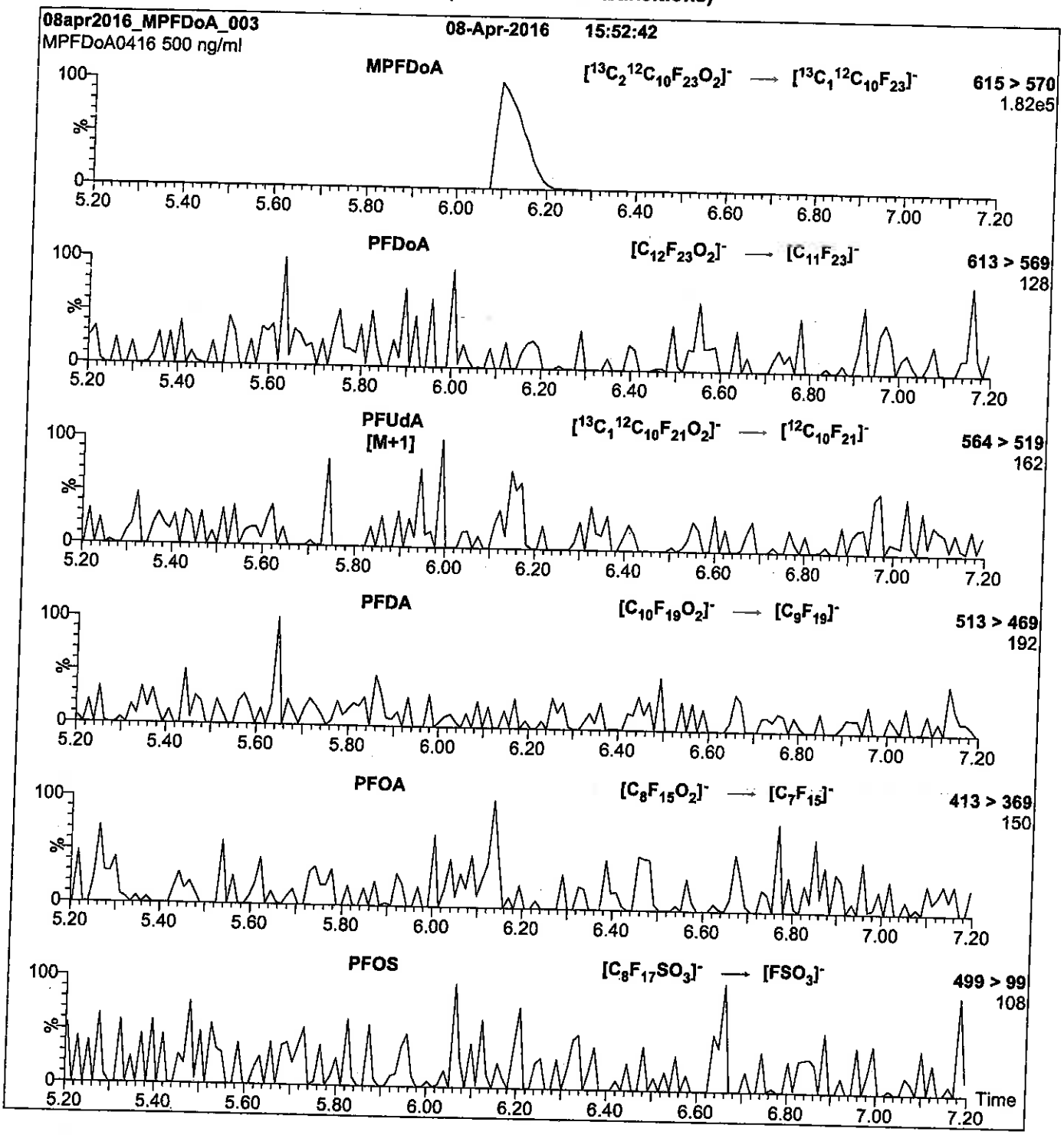
Flow: 300 µl/min

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 SR R: SBC 9/22/16

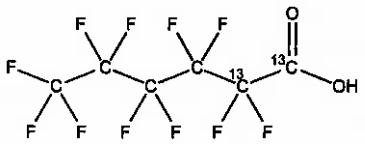
739612
ID: LCMPFHxA_00012
Exp: 04/08/21 Prpd: SBC
13C2-Perfluorohexanoic ac

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFHxA
LOT NUMBER: MPFHxA0416
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]hexanoic acid

STRUCTURE:
CAS #: Not available



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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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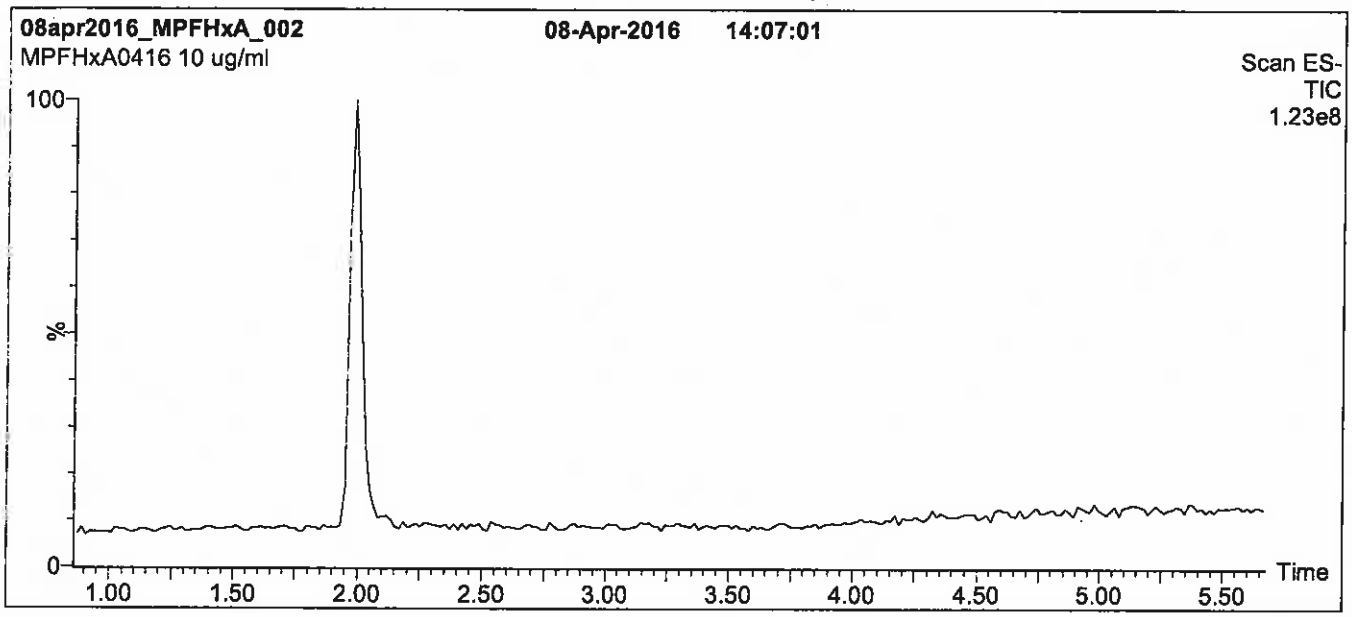
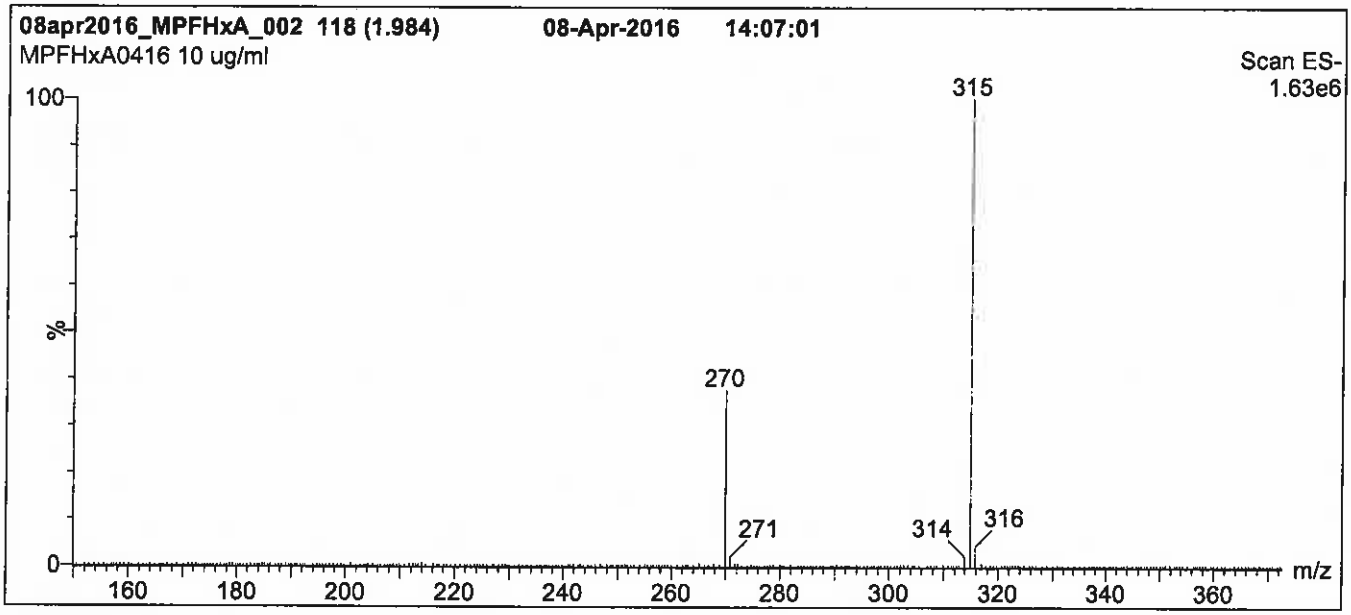
Figure 1: **MPFHxA; LC/MS Data (TIC and Mass Spectrum)**





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

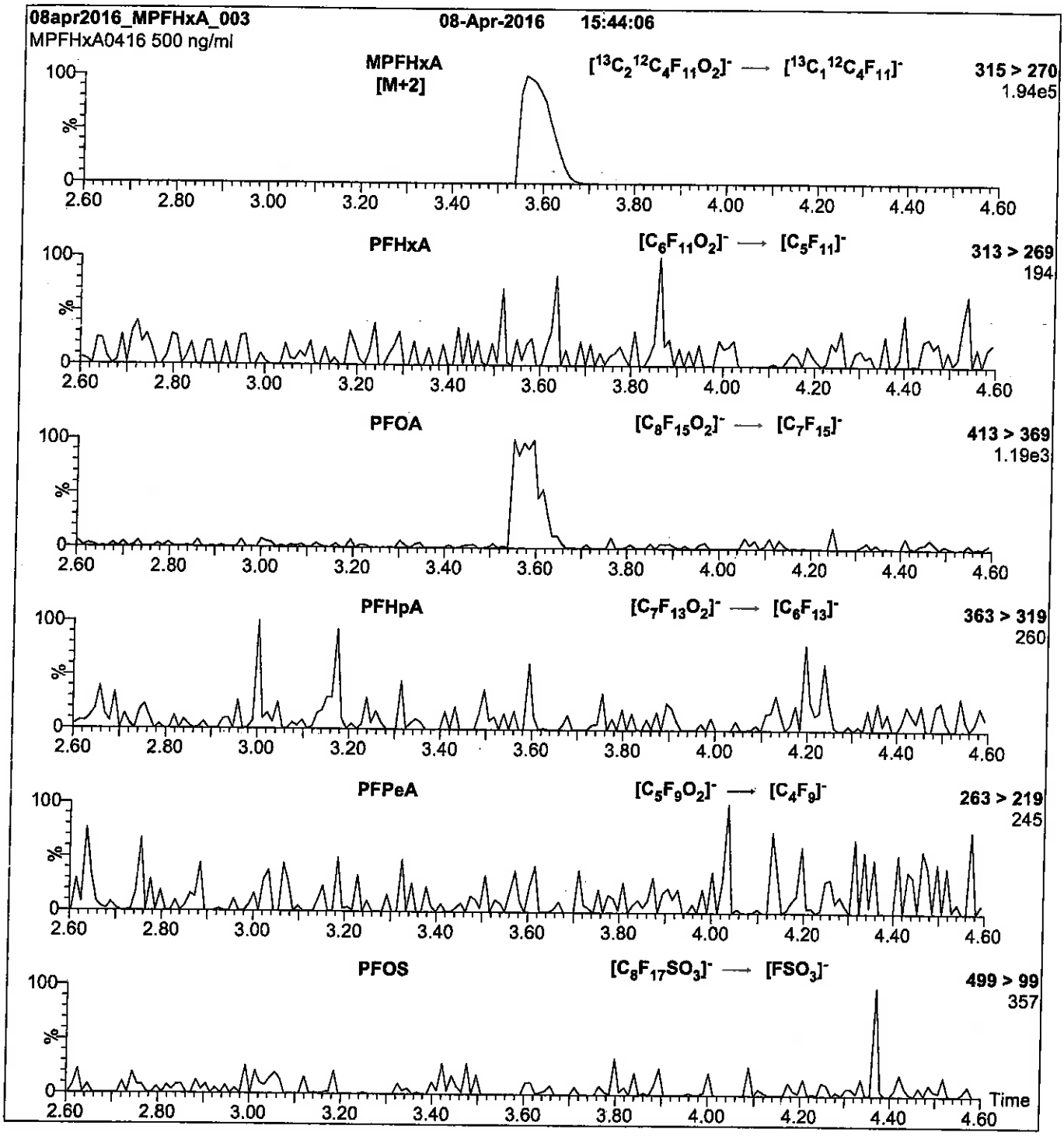
Flow: 300 µl/min

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

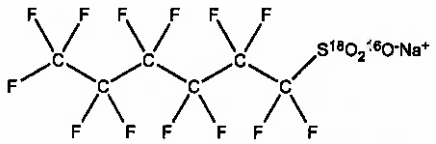
WELLINGTON LABORATORIES

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
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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:

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:

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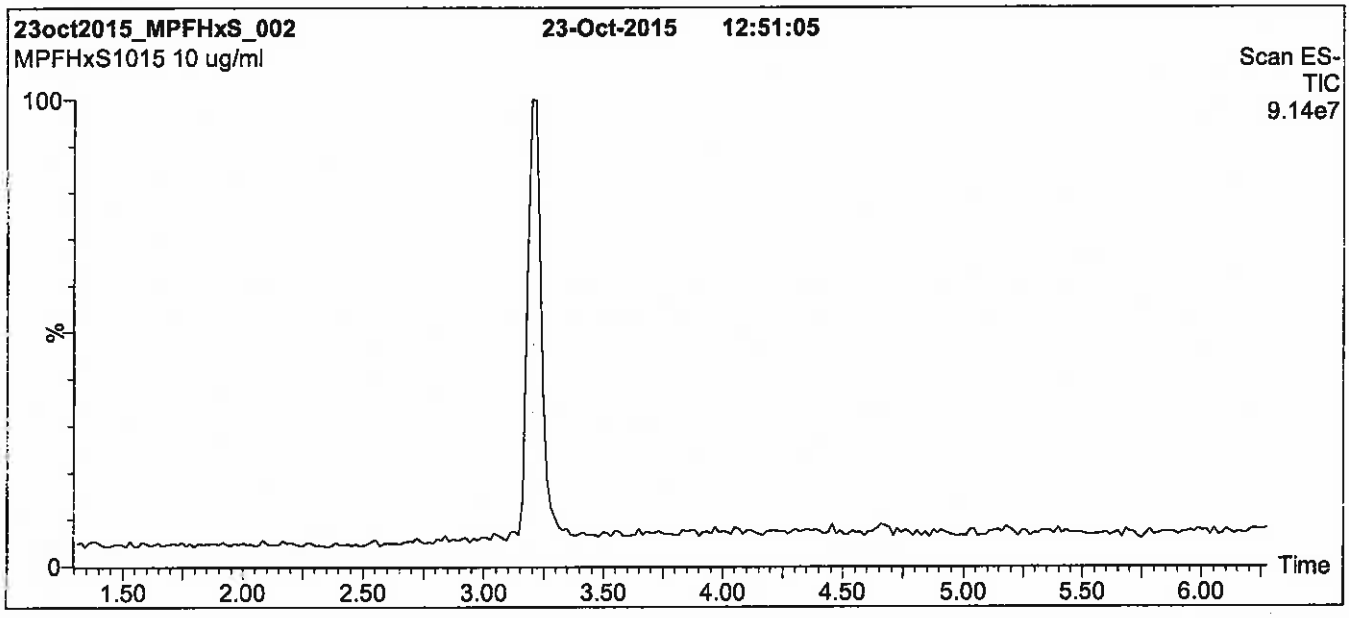
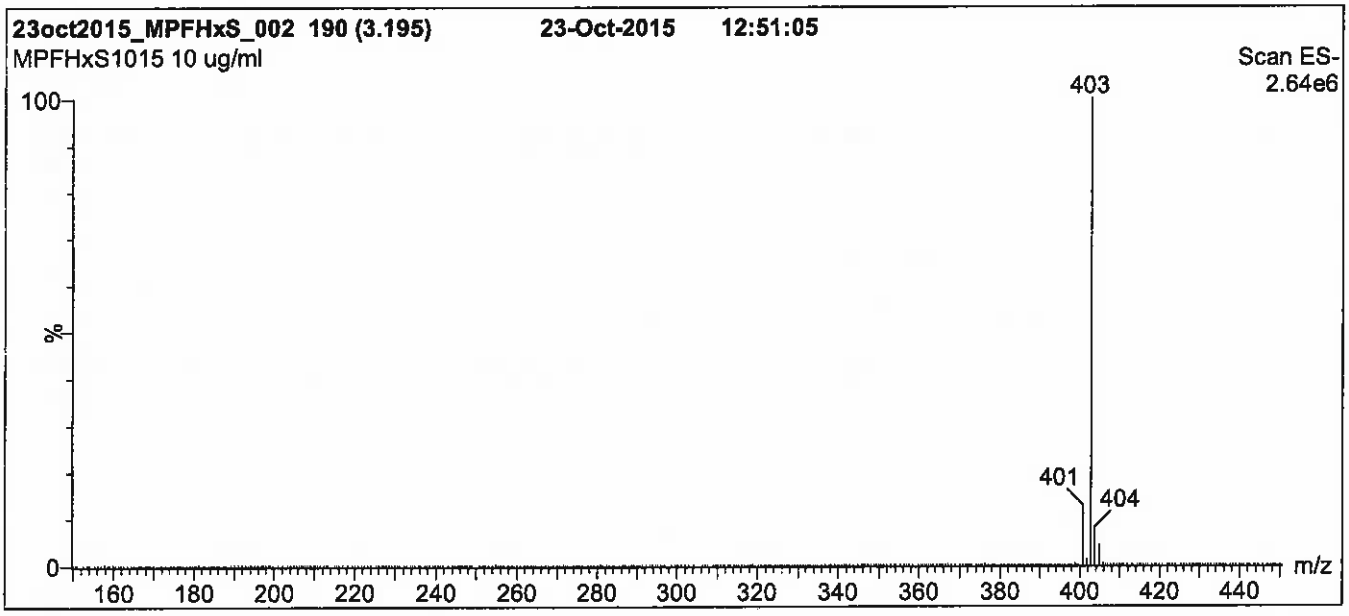
For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

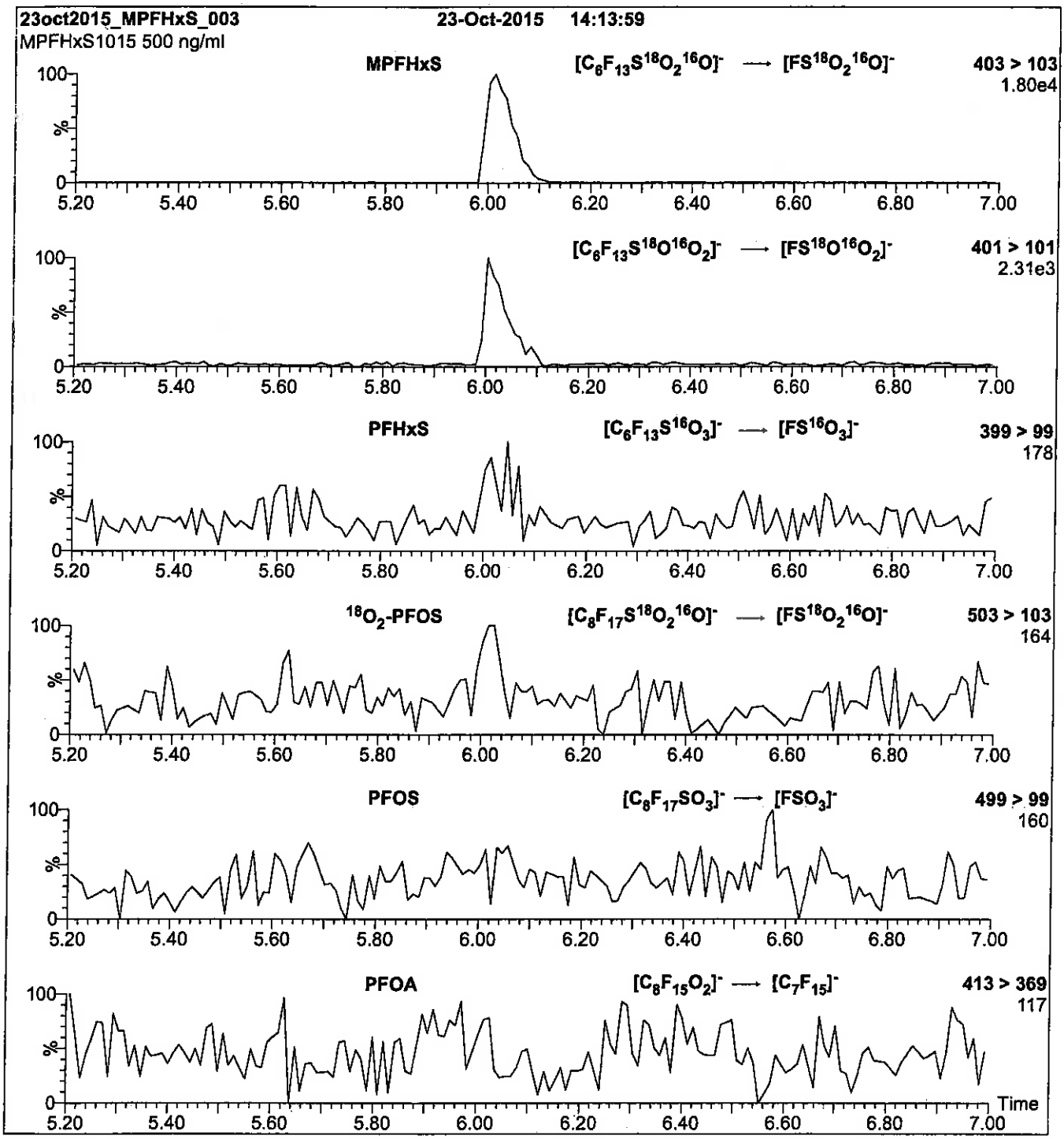
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCMPFNA_00008

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

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

WELLINGTON LABORATORIES

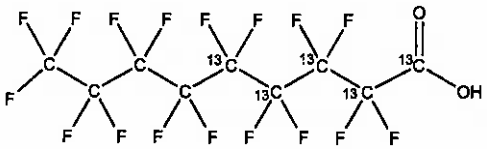
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFNA
COMPOUND: Perfluoro-n-[1,2,3,4,5-$^{13}C_5$]nonanoic acid

LOT NUMBER: MPFNA0414

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_5{}^{12}C_4HF_{17}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 469.04
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
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

ISOTOPIC PURITY: ≥99% ^{13}C (1,2,3,4,5-$^{13}C_5$)

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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HAZARDS:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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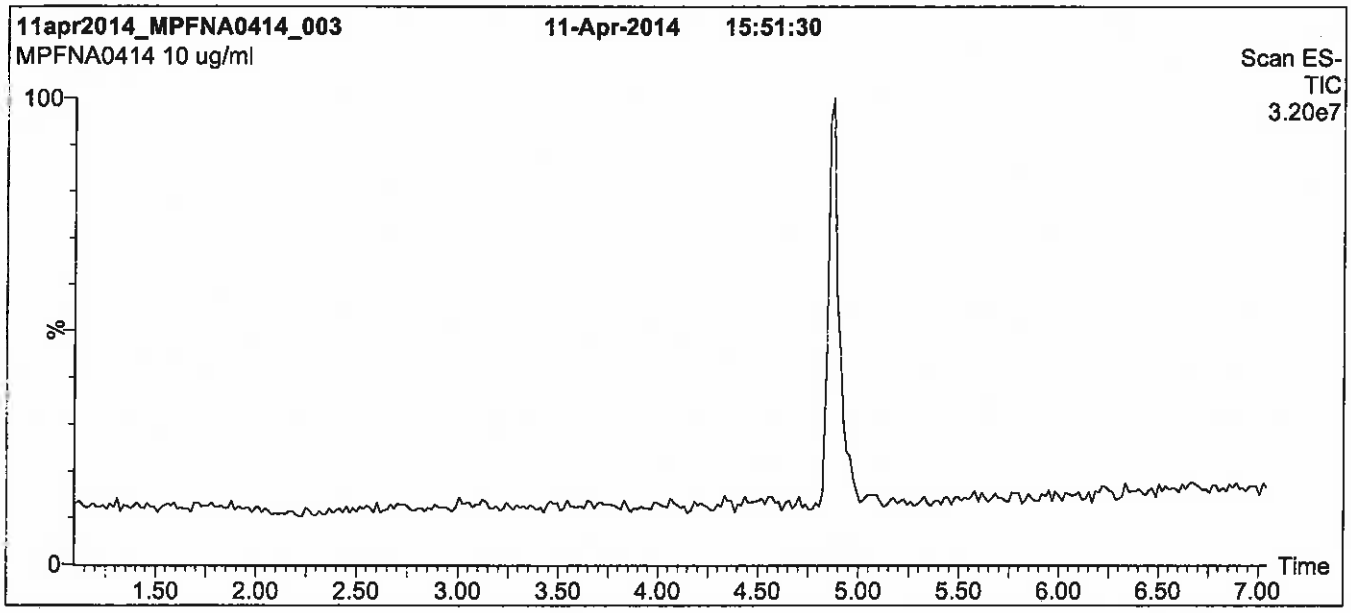
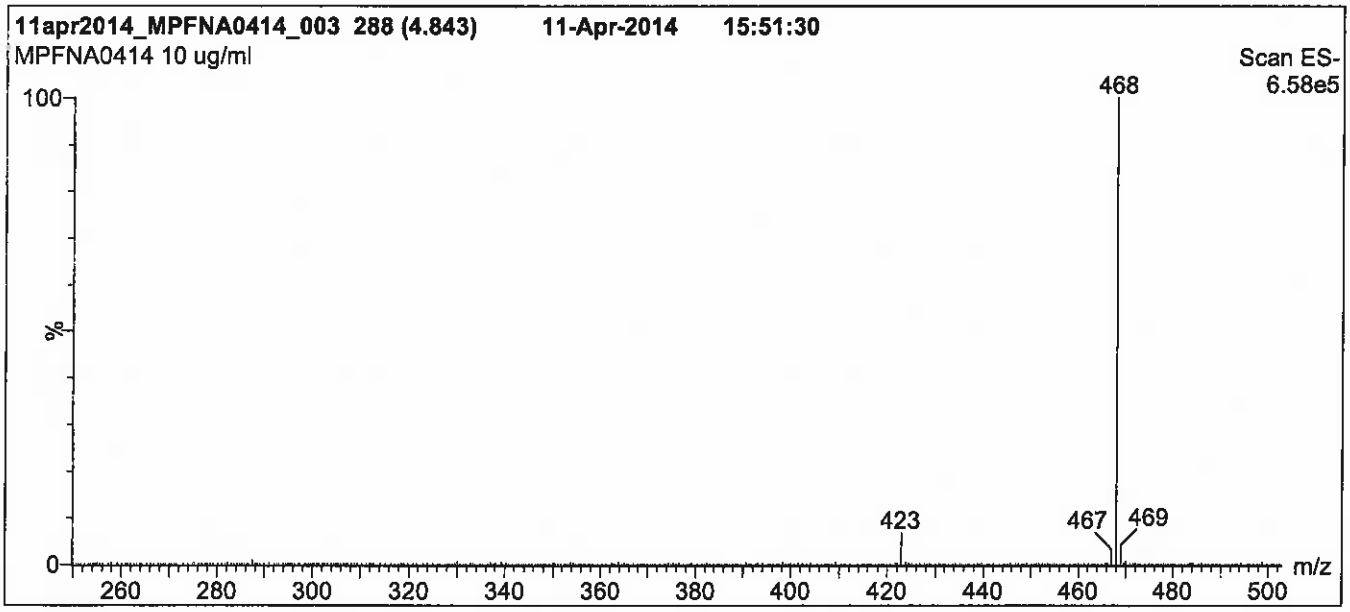
Figure 1: **MPFNA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

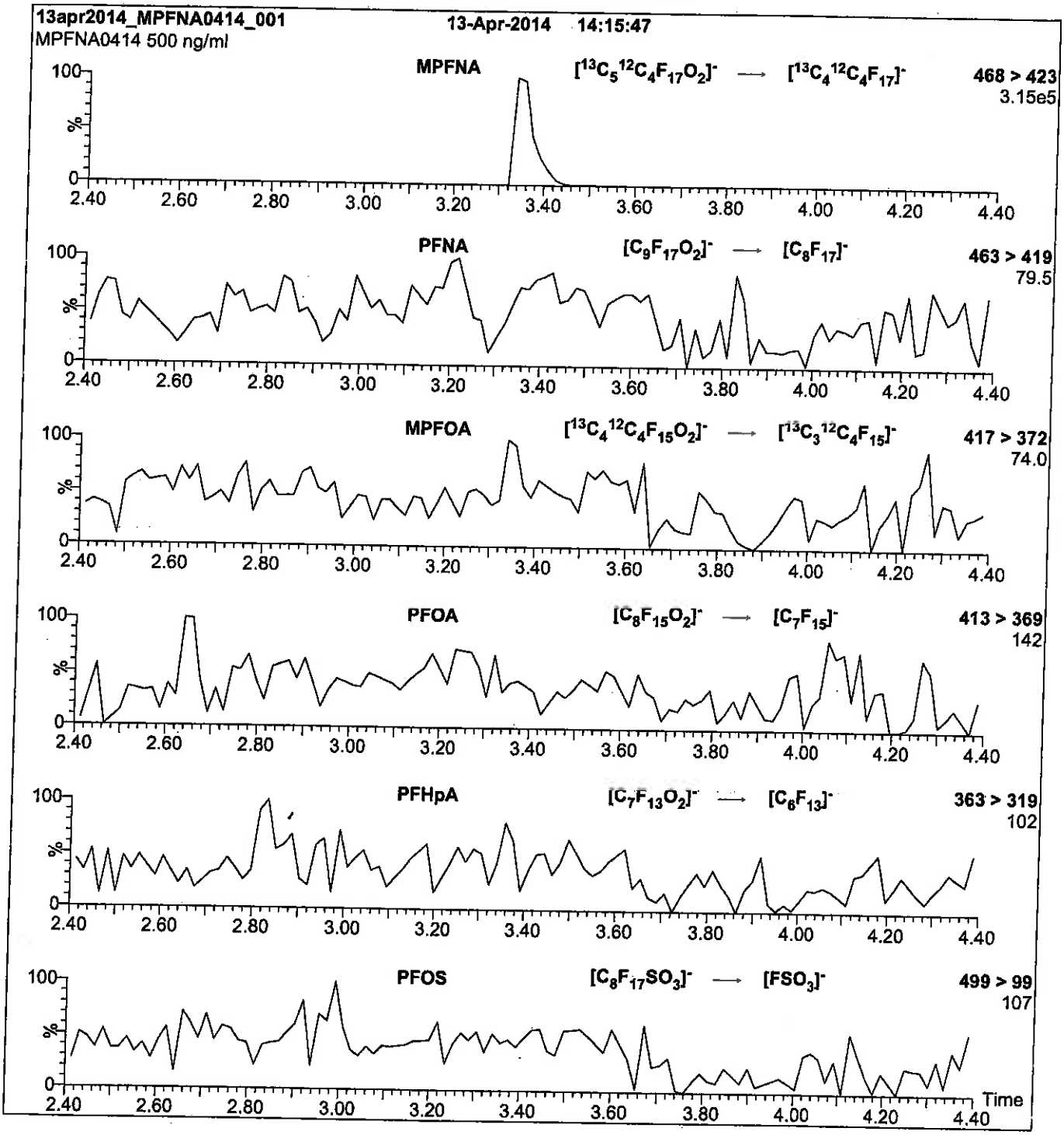
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCMPFOA_00012

R: SBC 9/22/16

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

WELLINGTON LABORATORIES

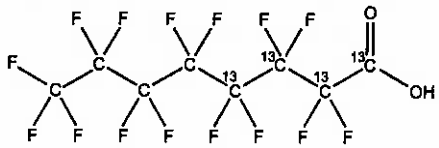
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFOA
COMPOUND: Perfluoro-n-[1,2,3,4-$^{13}C_4$]octanoic acid

LOT NUMBER: MPFOA0116

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_4{}^{12}C_4HF_{15}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

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

MOLECULAR WEIGHT: 418.04
SOLVENT(S): Methanol
Water (<1%)

ISOTOPIC PURITY: ≥99% ^{13}C
(1,2,3,4-$^{13}C_4$)

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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HAZARDS:

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17025 REFERENCE MATERIAL PRODUCER

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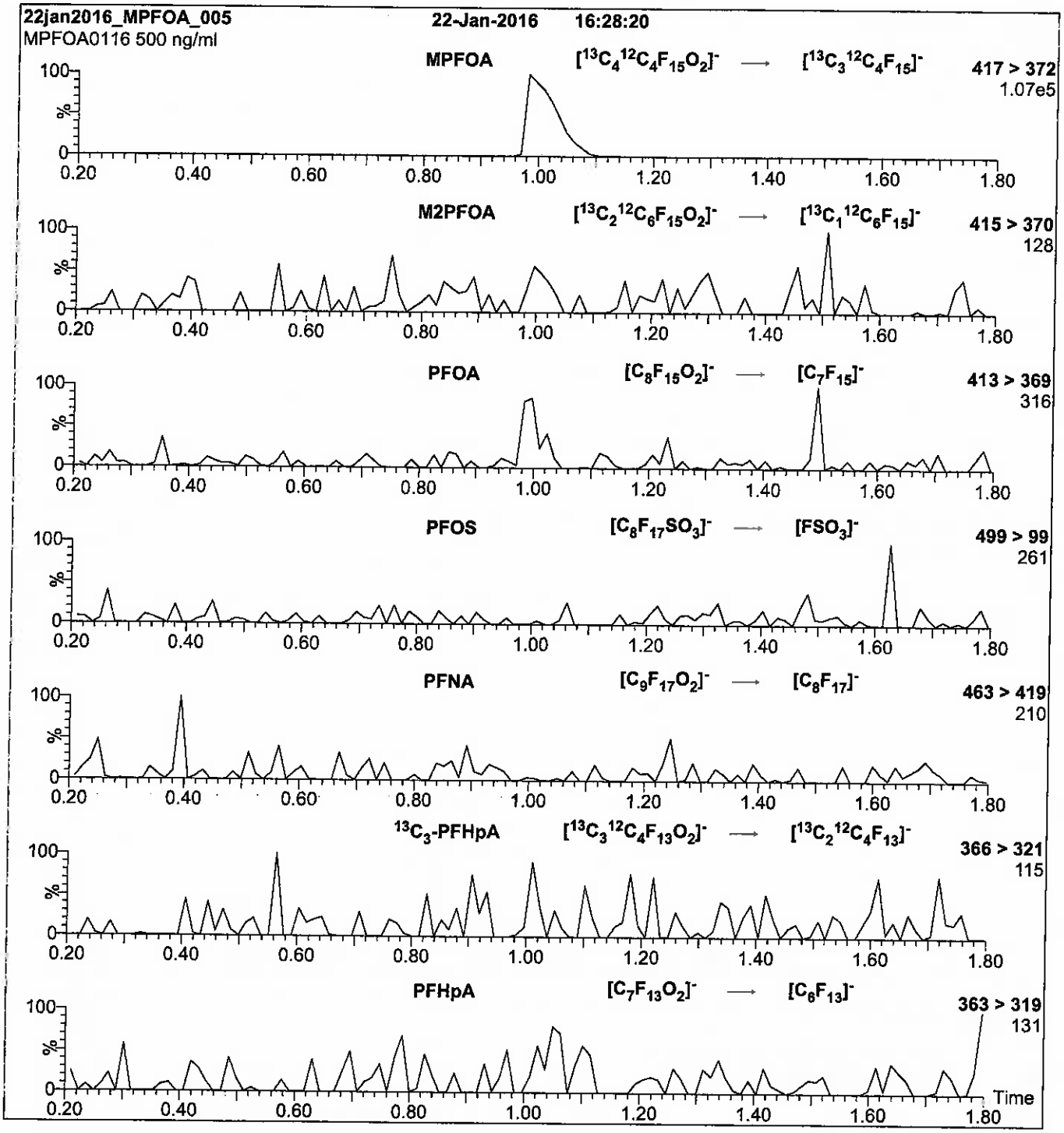
Figure 2: **MPFOA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

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

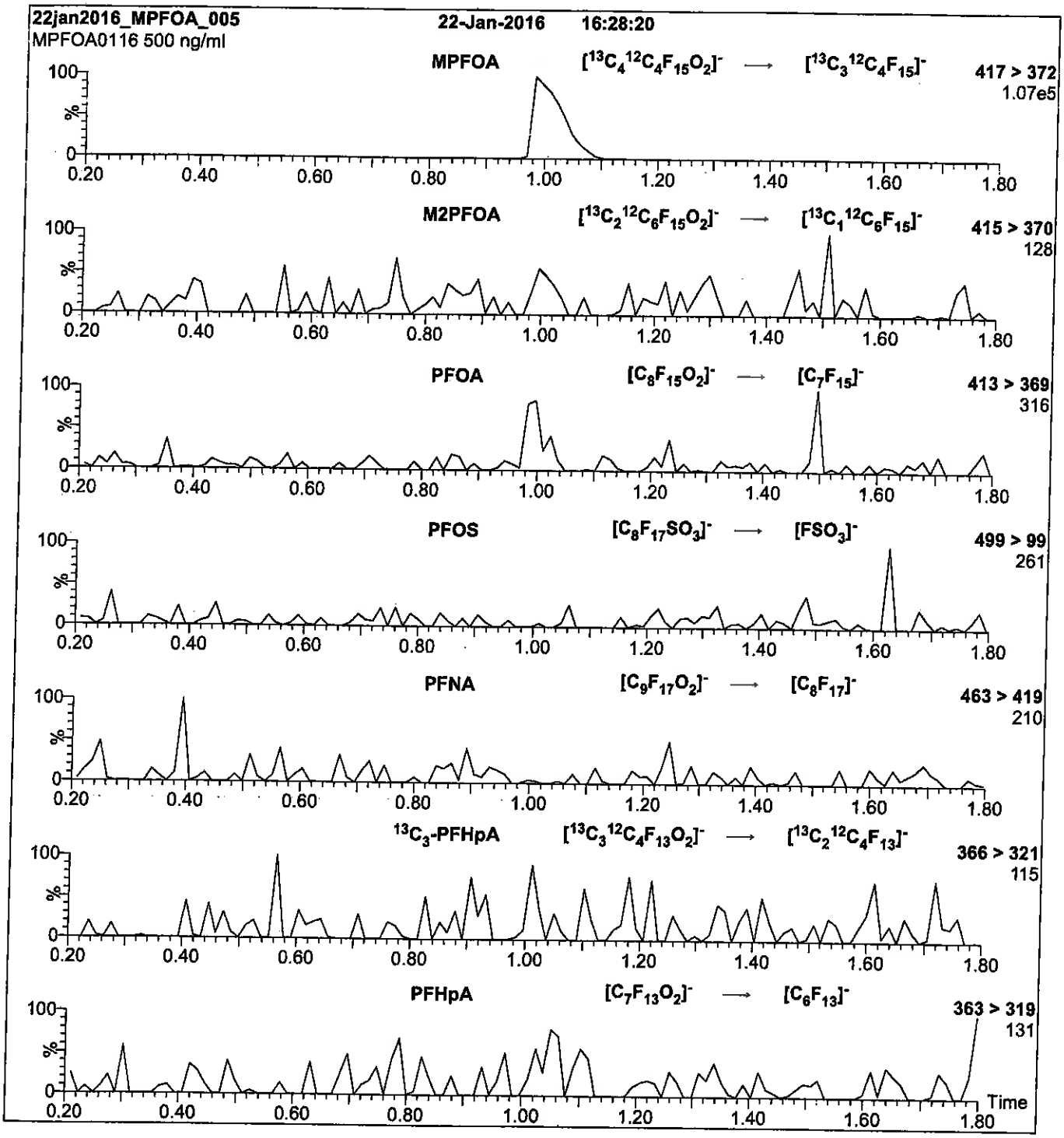
Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

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

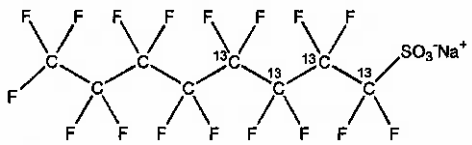
WELLINGTON LABORATORIES

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) **SOLVENT(S):** Methanol
47.8 ± 2.4 µg/ml (MPFOS anion)

CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99% ^{13}C (1,2,3,4-$^{13}C_4$)

LAST TESTED: (mm/dd/yyyy) 08/03/2016

EXPIRY DATE: (mm/dd/yyyy) 08/03/2021

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

ANAB ACCREDITED

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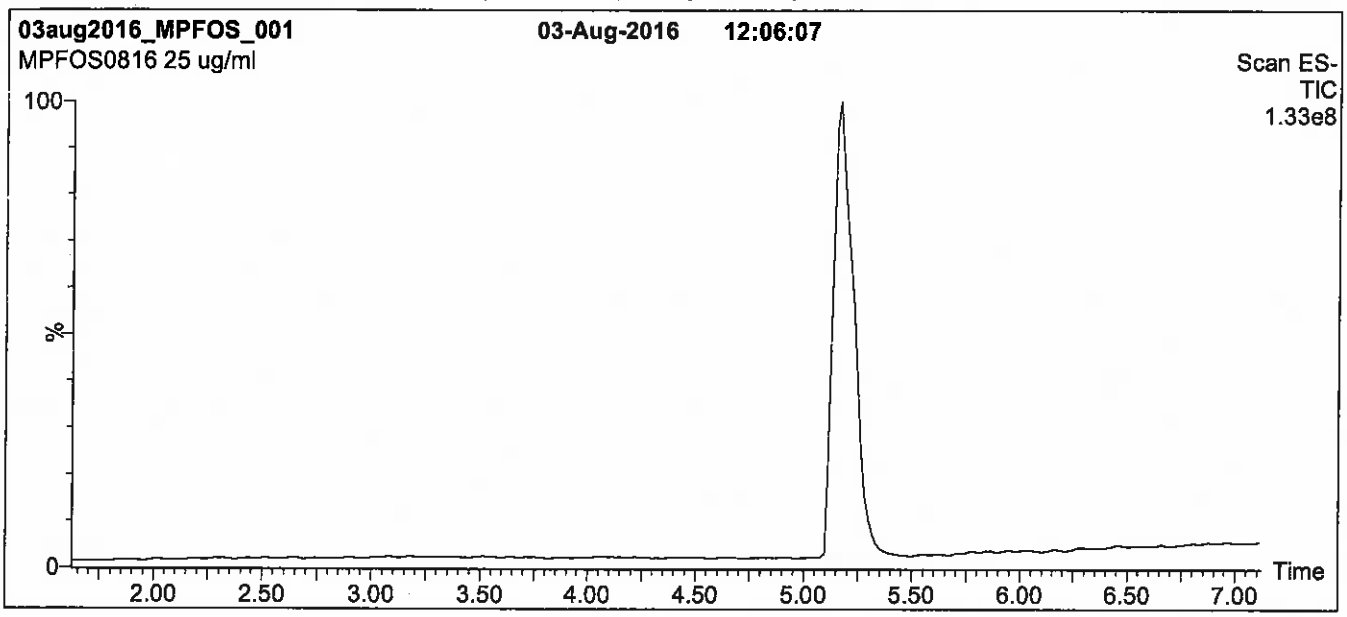
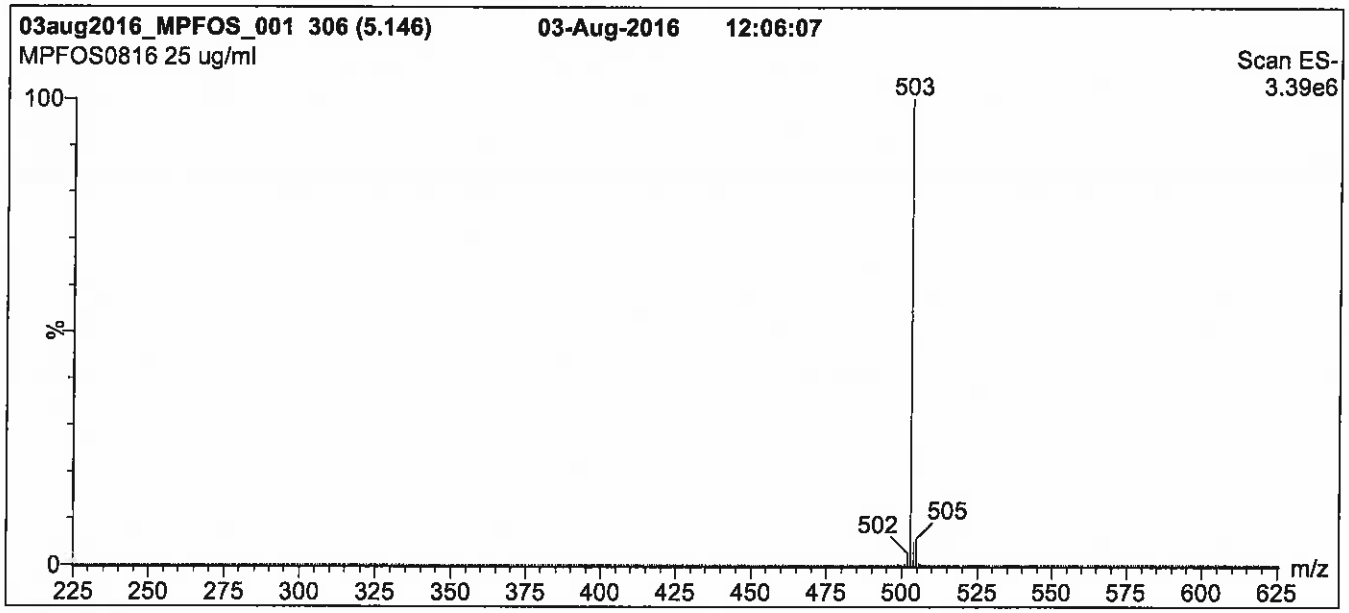
Figure 1: **MPFOS; LC/MS Data (TIC and Mass Spectrum)**





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

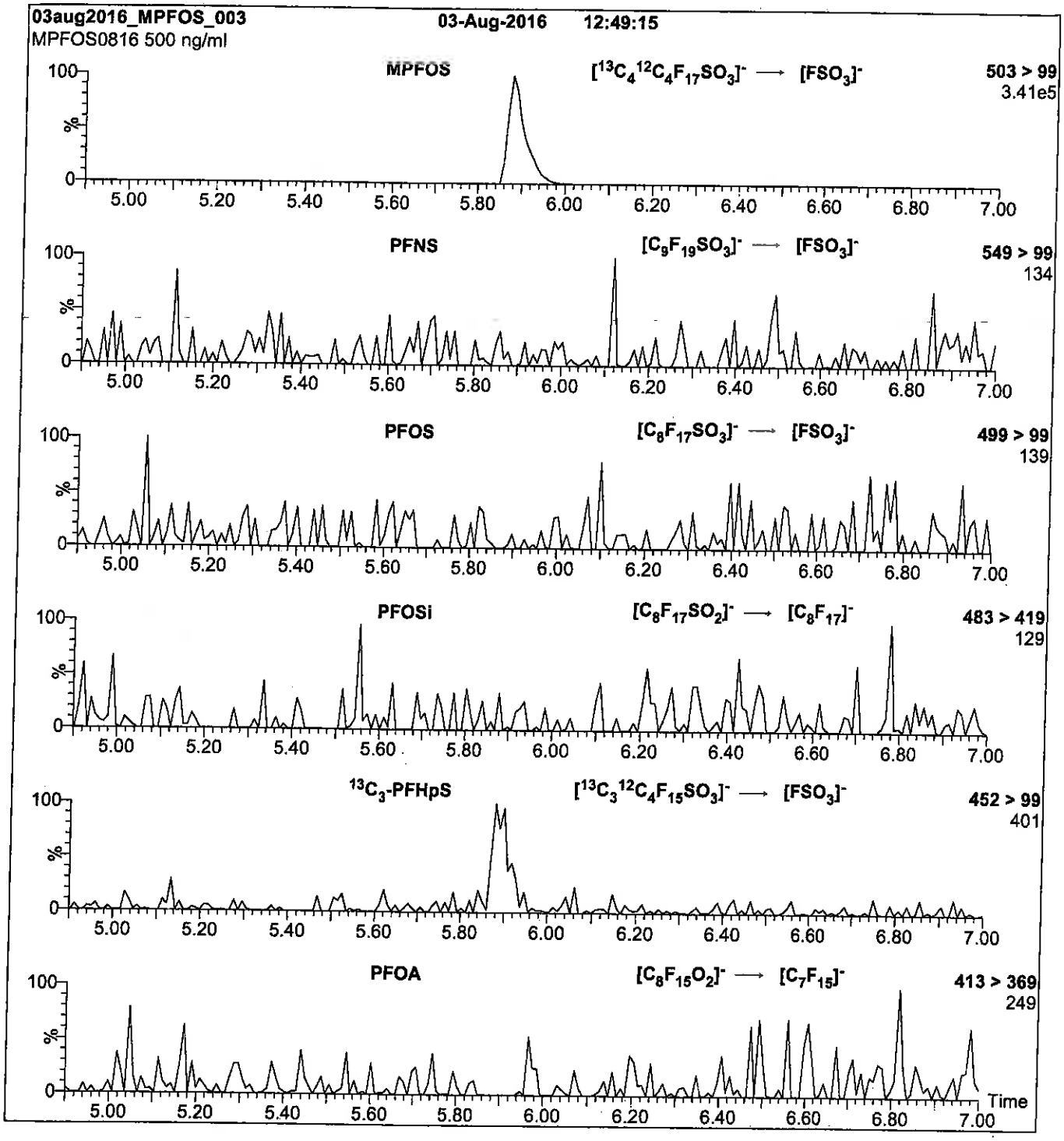
Flow: 300 µl/min

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

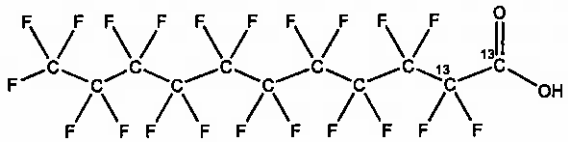
WELLINGTON LABORATORIES

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

INTENDED USE:

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HAZARDS:

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

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

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

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:

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

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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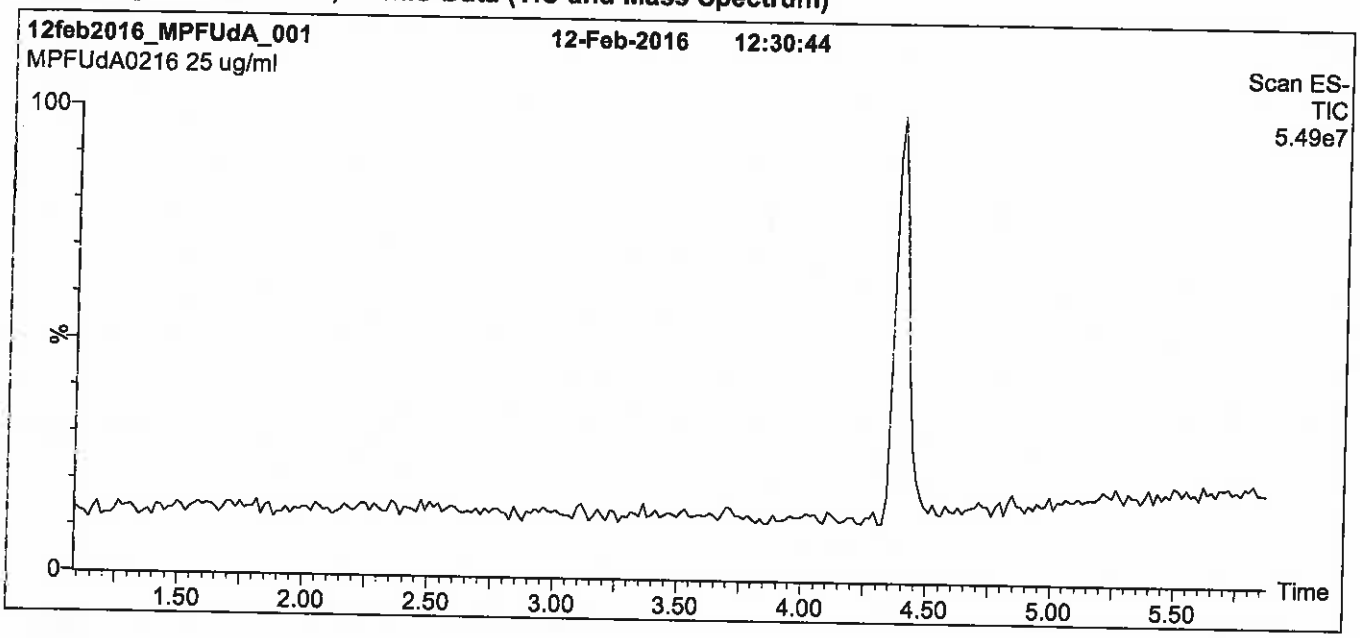

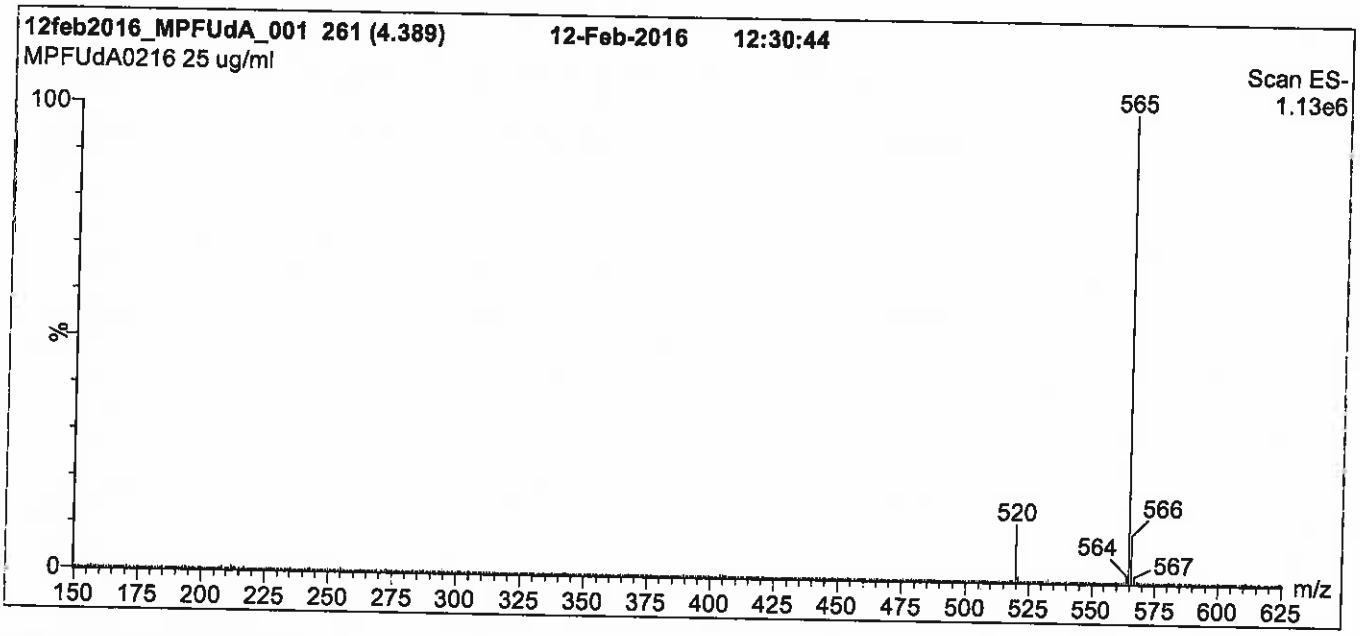

Conditions for Figure 1:

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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: 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

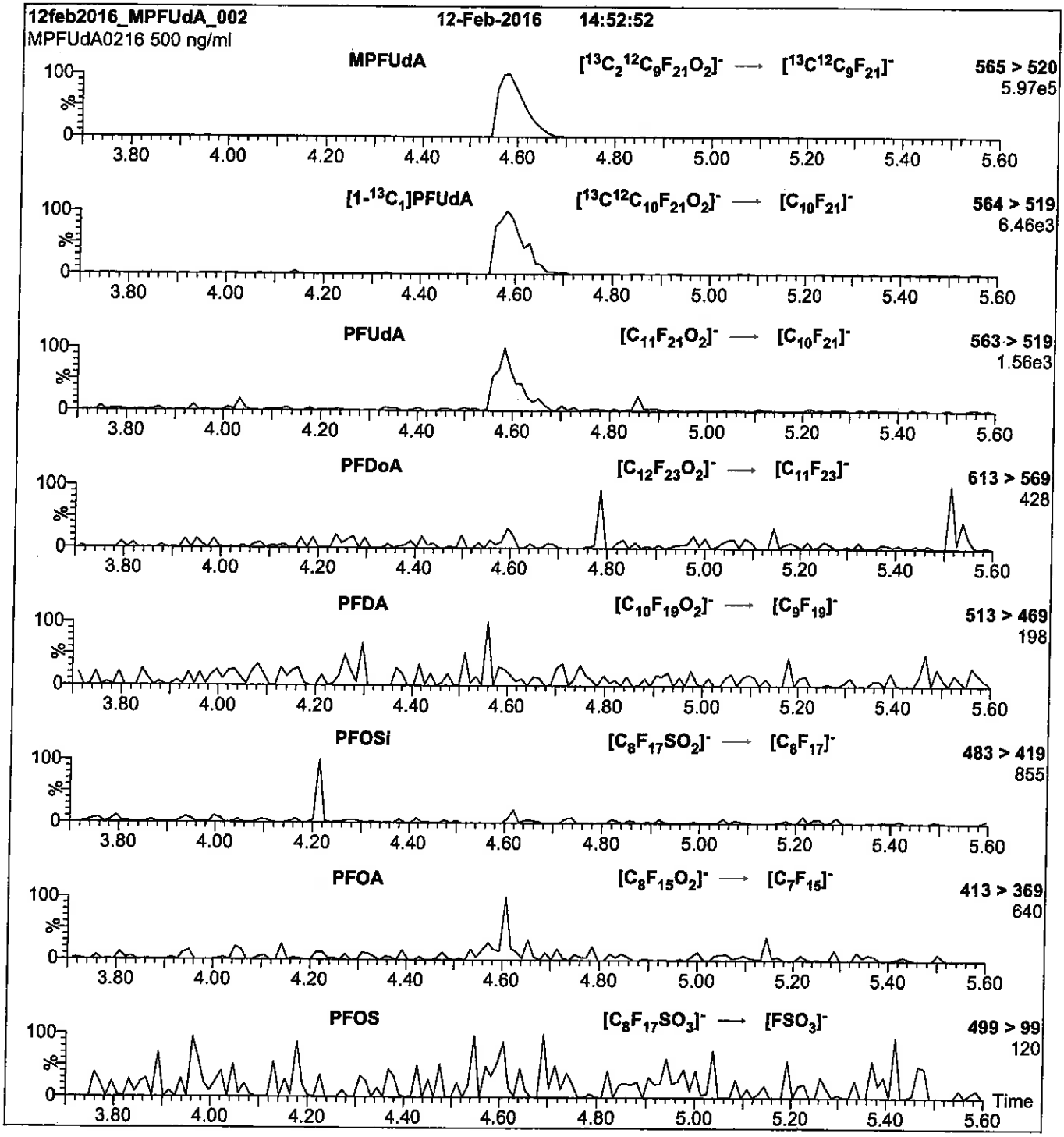
Flow: 300 µl/min

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_00003

R: 8/23/16 SBC

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

WELLINGTON LABORATORIES

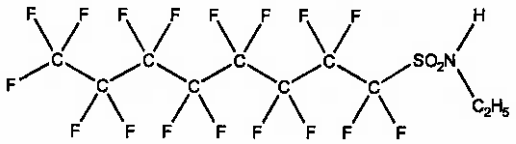
CERTIFICATE OF ANALYSIS DOCUMENTATION

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

LOT NUMBER: NEtFOSA0516M

STRUCTURE:

CAS #: 4151-50-2



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

MOLECULAR WEIGHT: 527.20
SOLVENT(S): Methanol

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 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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HOMOGENEITY:

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

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

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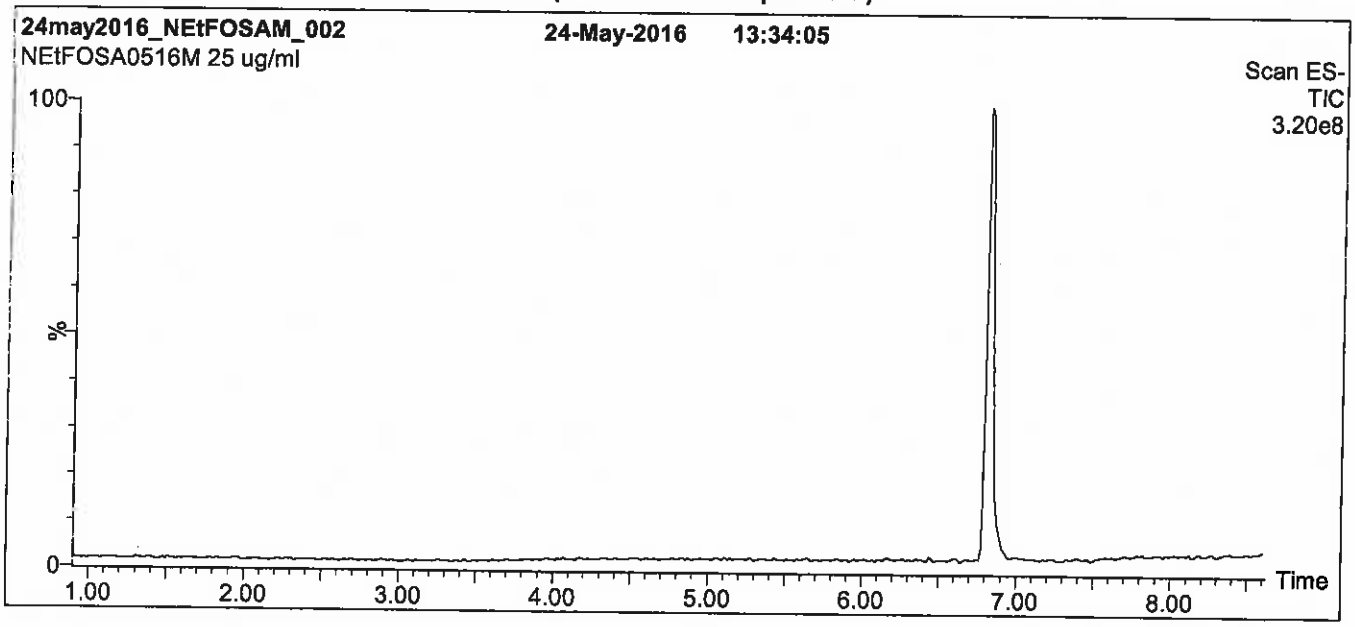
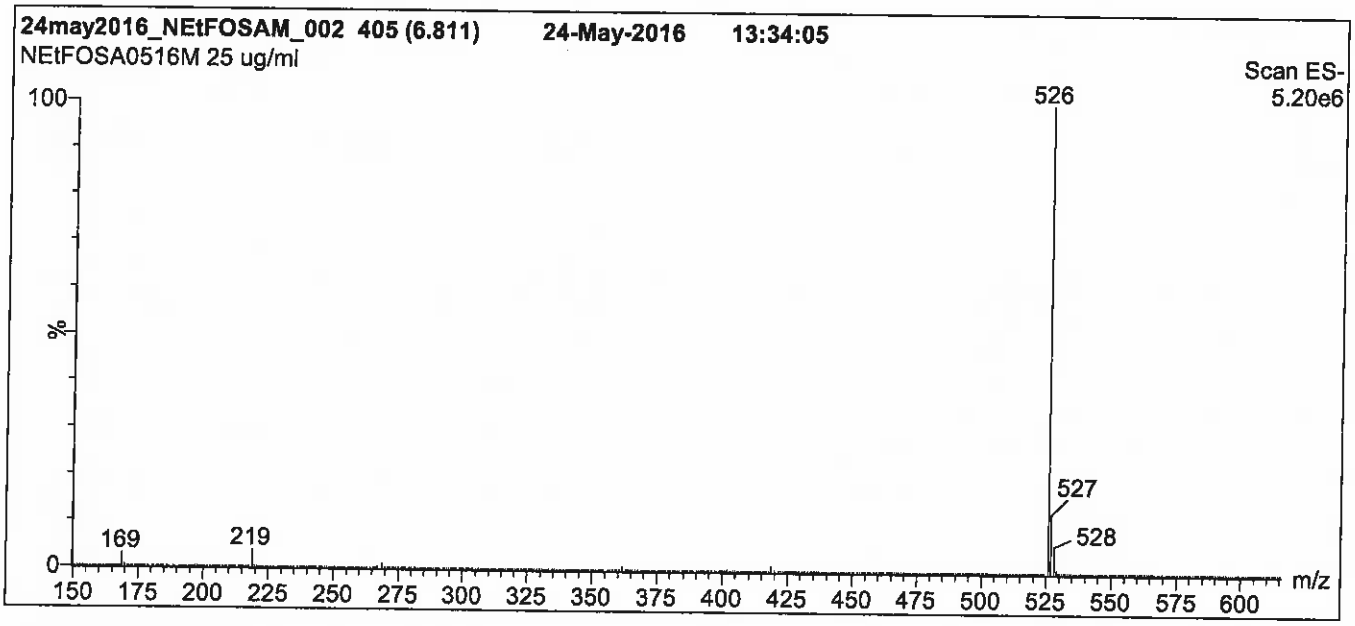
Figure 1: **N-EtFOSA-M; LC/MS Data (TIC and Mass Spectrum)**





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

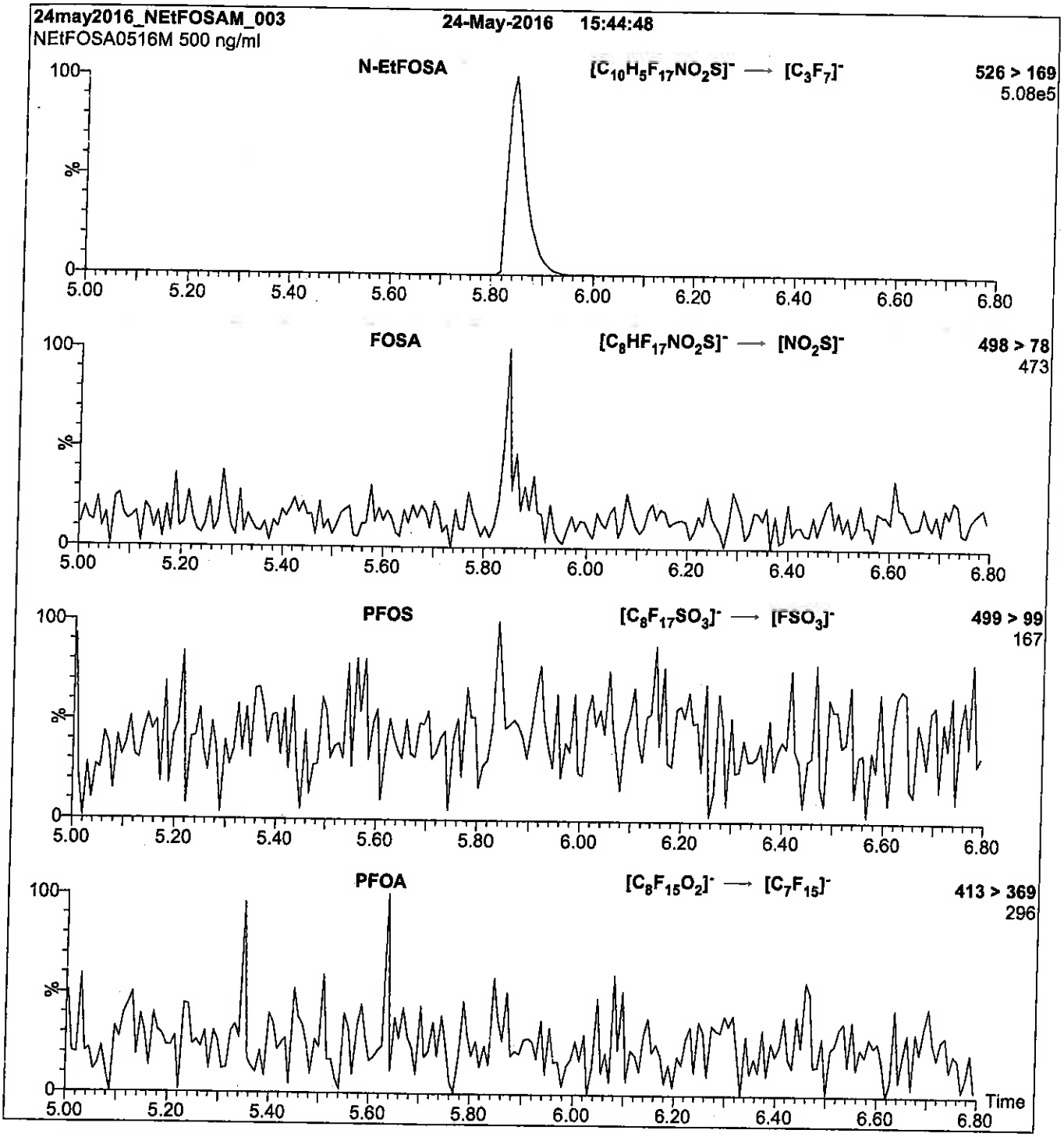
Flow: 300 µl/min

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_00002

R: 8/23/16 SBC

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

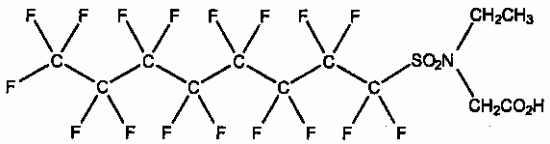
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: N-EtFOSAA **LOT NUMBER:** NEtFOSAA0116

COMPOUND: N-ethylperfluoro-1-octanesulfonamidoacetic acid

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



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

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

CHEMICAL PURITY: >98%

LAST TESTED: (mm/dd/yyyy) 01/20/2016

EXPIRY DATE: (mm/dd/yyyy) 01/20/2021

RECOMMENDED STORAGE: Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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CALA

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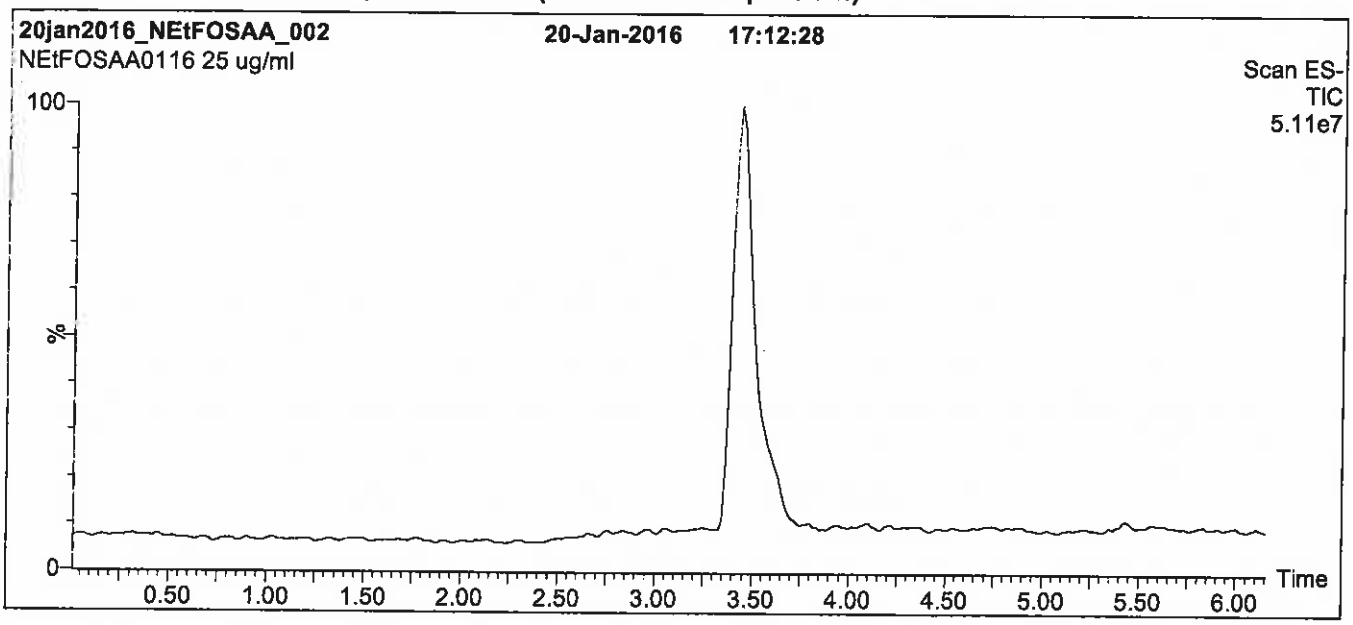
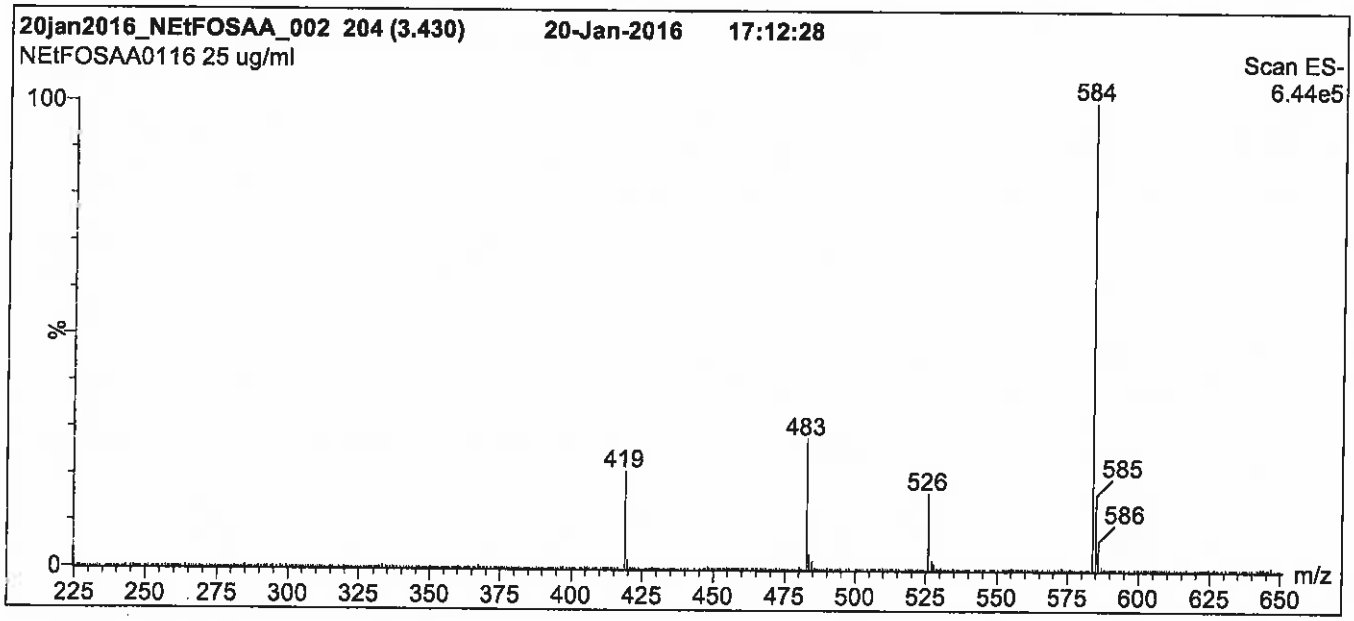
Figure 1: **N-EtFOSAA; LC/MS Data (TIC and Mass Spectrum)**





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Mobile phase: Gradient
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(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

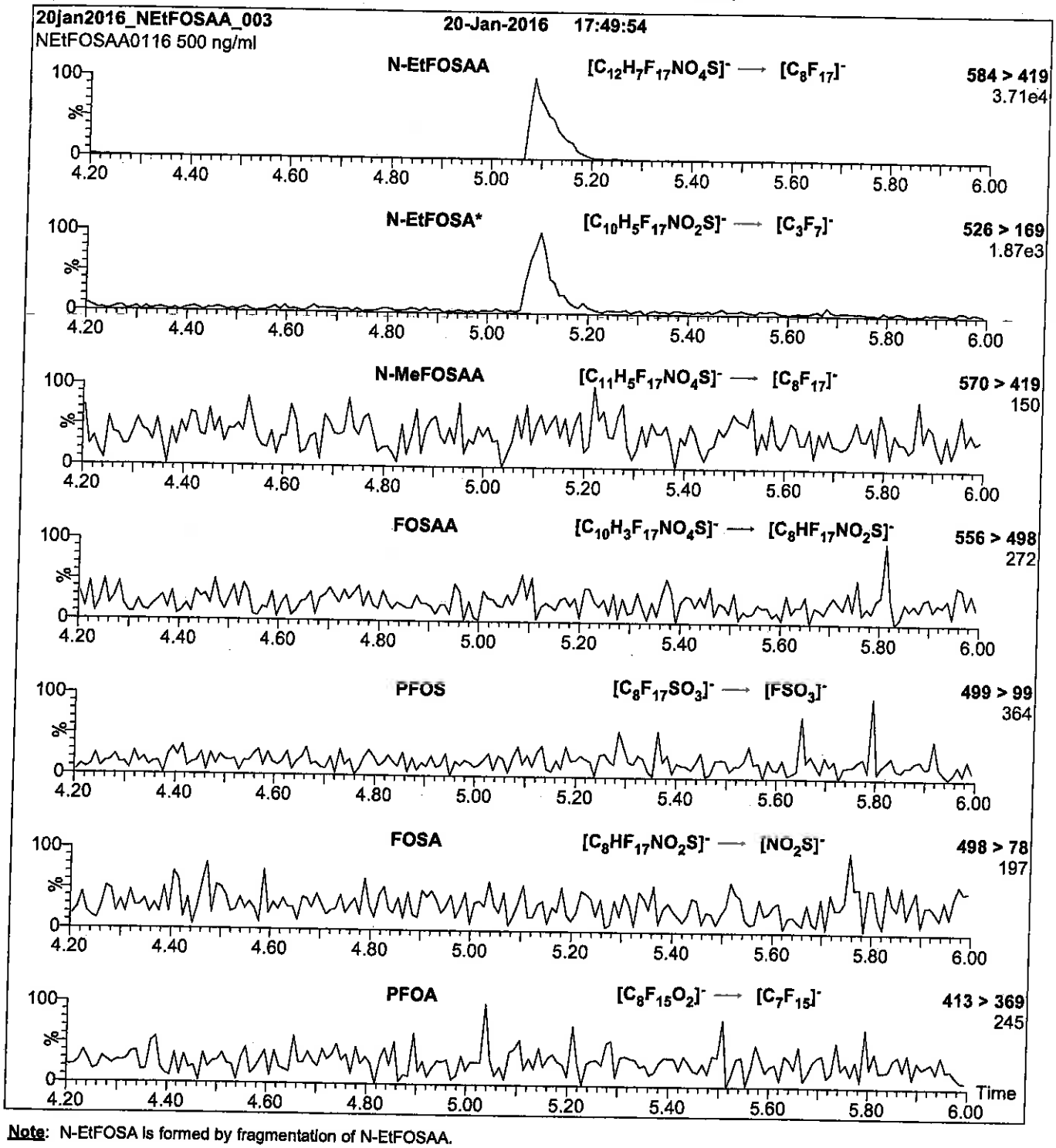
Flow: 300 µl/min

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_00002

R: 8/23/16 SBC

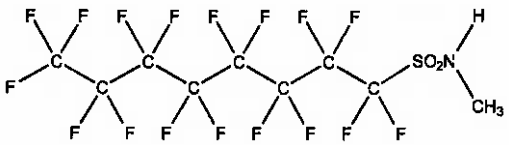
715564
ID: LCN-MeFOSA-M_00002
Exp: 05/24/21 Prpd: SBC
N-MeFOSA-M

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: N-MeFOSA-M
COMPOUND: N-methylperfluoro-1-octanesulfonamide
LOT NUMBER: NMeFOSA0516M

STRUCTURE:
CAS #: 31506-32-8



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

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UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

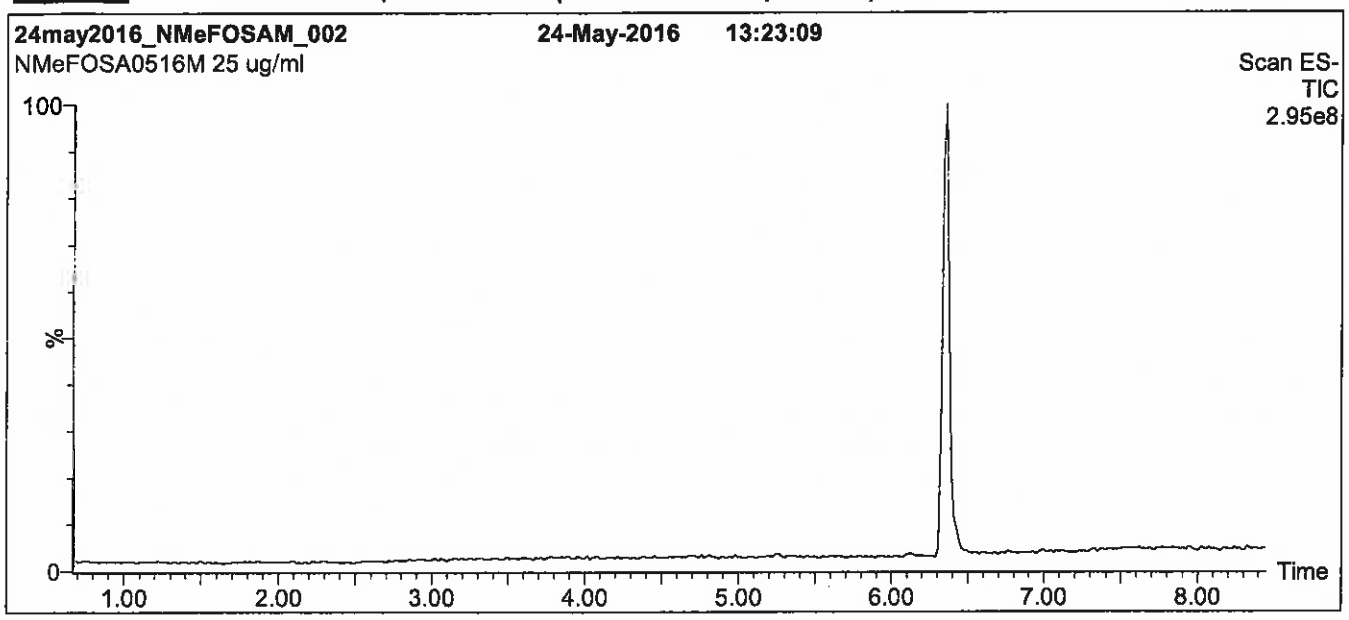
At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

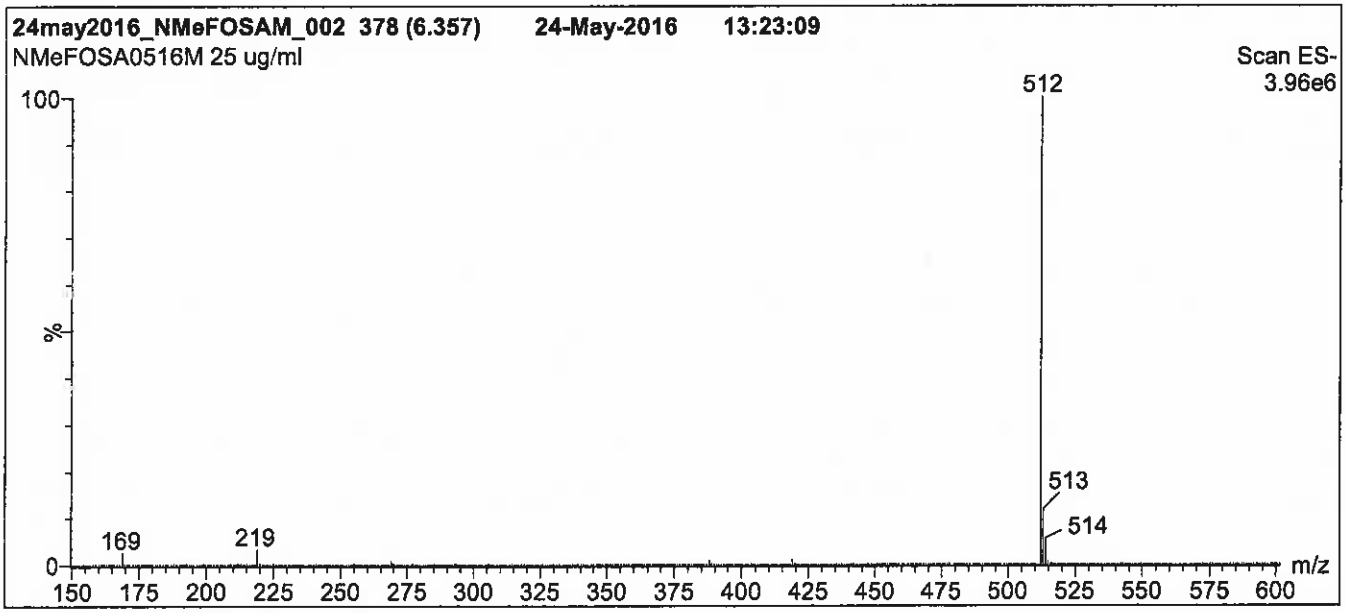
QUALITY MANAGEMENT:

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

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

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





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **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

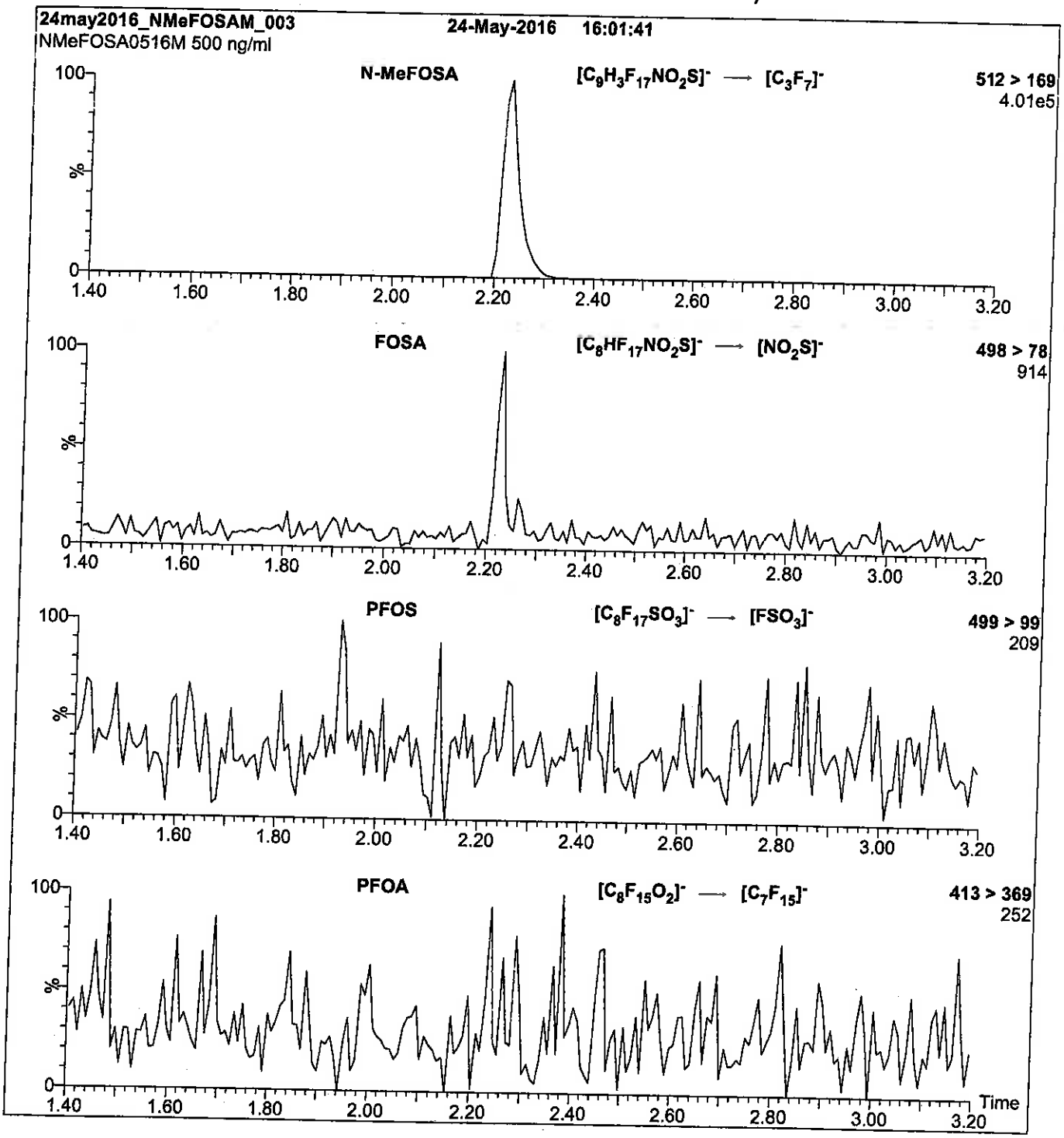
Flow: 300 µl/min

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)	**MS Parameters**
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)	Collision Gas (mbar) = 3.54e-3 Collision Energy (eV) = 30
Flow:	300 µl/min	

Reagent

LCN-MeFOSAA_00003

R: 8/23/16 SBC

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

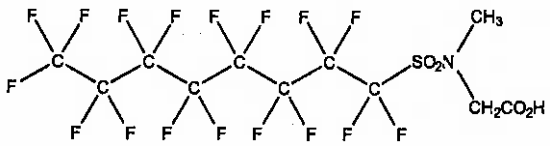
WELLINGTON LABORATORIES

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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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.

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:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA Testing

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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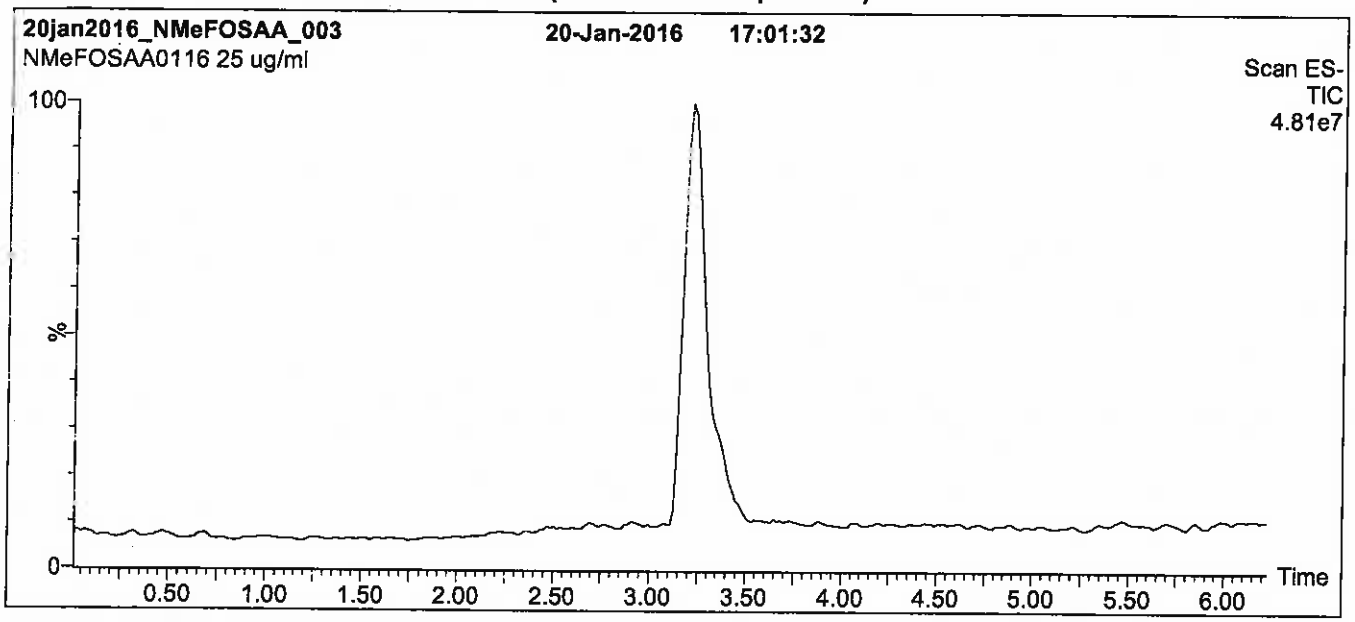
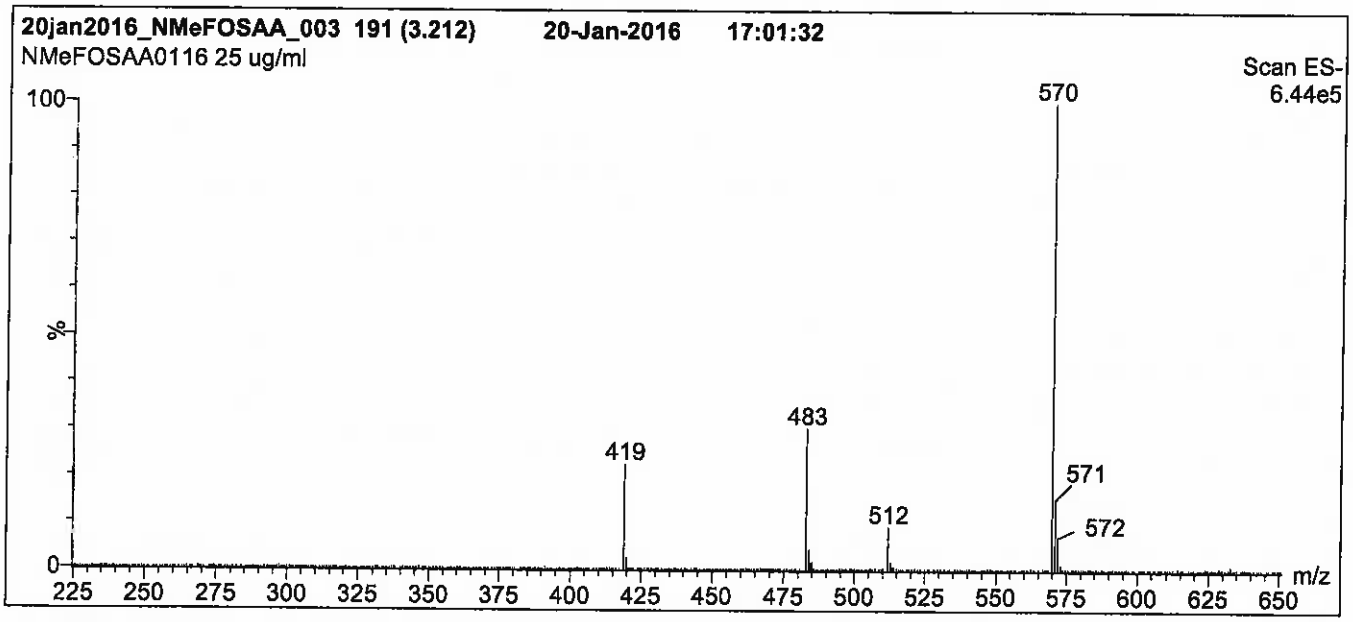
Figure 1: **N-MeFOSAA; LC/MS Data (TIC and Mass Spectrum)**





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

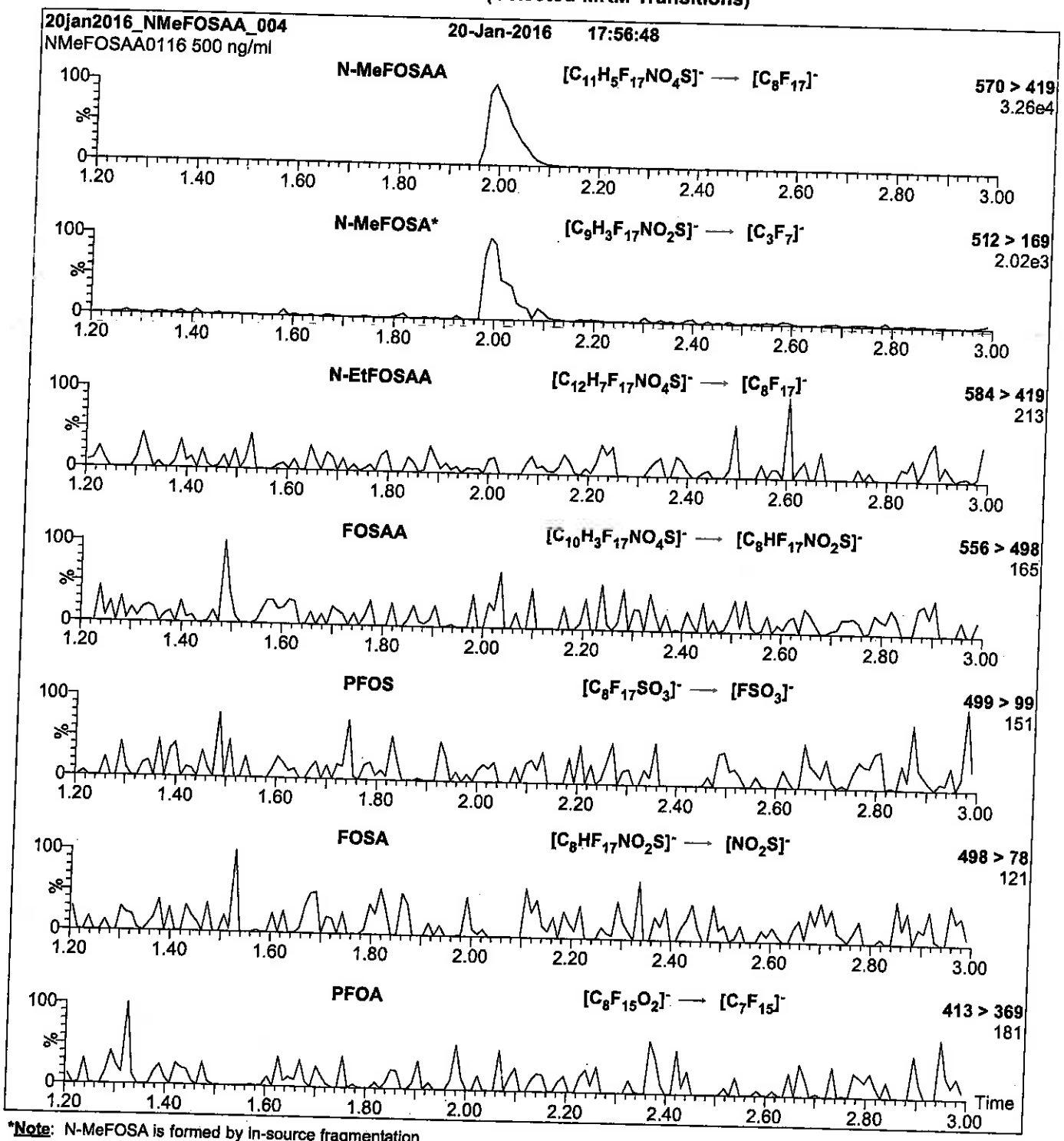
Flow: 300 µl/min

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

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HOMOGENEITY:

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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

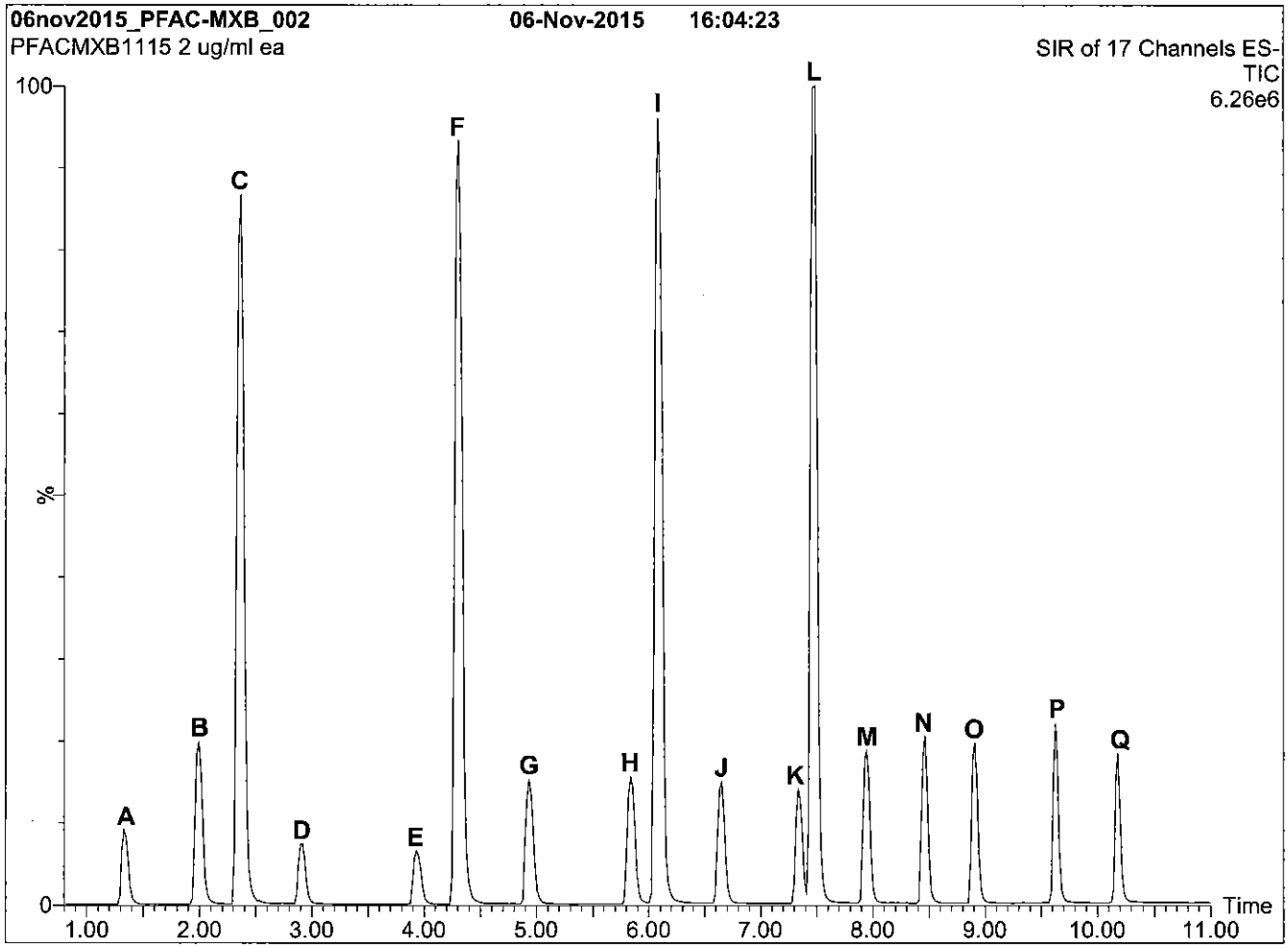
Table A: **PFAC-MXB; Components and Concentrations (ng/ml, ± 5% in Methanol / Water (<1%))**

Name	Abbreviation	Concentration (ng/ml)	Peak Assignment In Figure 1
Perfluoro-n-butanoic acid	PFBA	2000	A
Perfluoro-n-pentanoic acid	PFPeA	2000	B
Perfluoro-n-hexanoic acid	PFHxA	2000	D
Perfluoro-n-heptanoic acid	PFHpA	2000	E
Perfluoro-n-octanoic acid	PFOA	2000	G
Perfluoro-n-nonanoic acid	PFNA	2000	H
Perfluoro-n-decanoic acid	PFDA	2000	J
Perfluoro-n-undecanoic acid	PFUdA	2000	K
Perfluoro-n-dodecanoic acid	PFDoA	2000	M
Perfluoro-n-tridecanoic acid	PFTrDA	2000	N
Perfluoro-n-tetradecanoic acid	PFTeDA	2000	O
Perfluoro-n-hexadecanoic acid	PFHxDA	2000	P
Perfluoro-n-octadecanoic acid	PFODA	2000	Q

Name	Abbreviation	Concentration (ng/ml)		Peak Assignment in Figure 1
		as the salt	as the anion	
Potassium perfluoro-1-butanesulfonate	L-PFBS	2000	1770	C
Sodium perfluoro-1-hexanesulfonate	L-PFHxS	2000	1890	F
Sodium perfluoro-1-octanesulfonate	L-PFOS	2000	1910	I
Sodium perfluoro-1-decanesulfonate	L-PFDS	2000	1930	L

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

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

Time: 12 min

Flow: 300 µl/min

MS Parameters

Experiment: SIR of 17 Channels

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

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

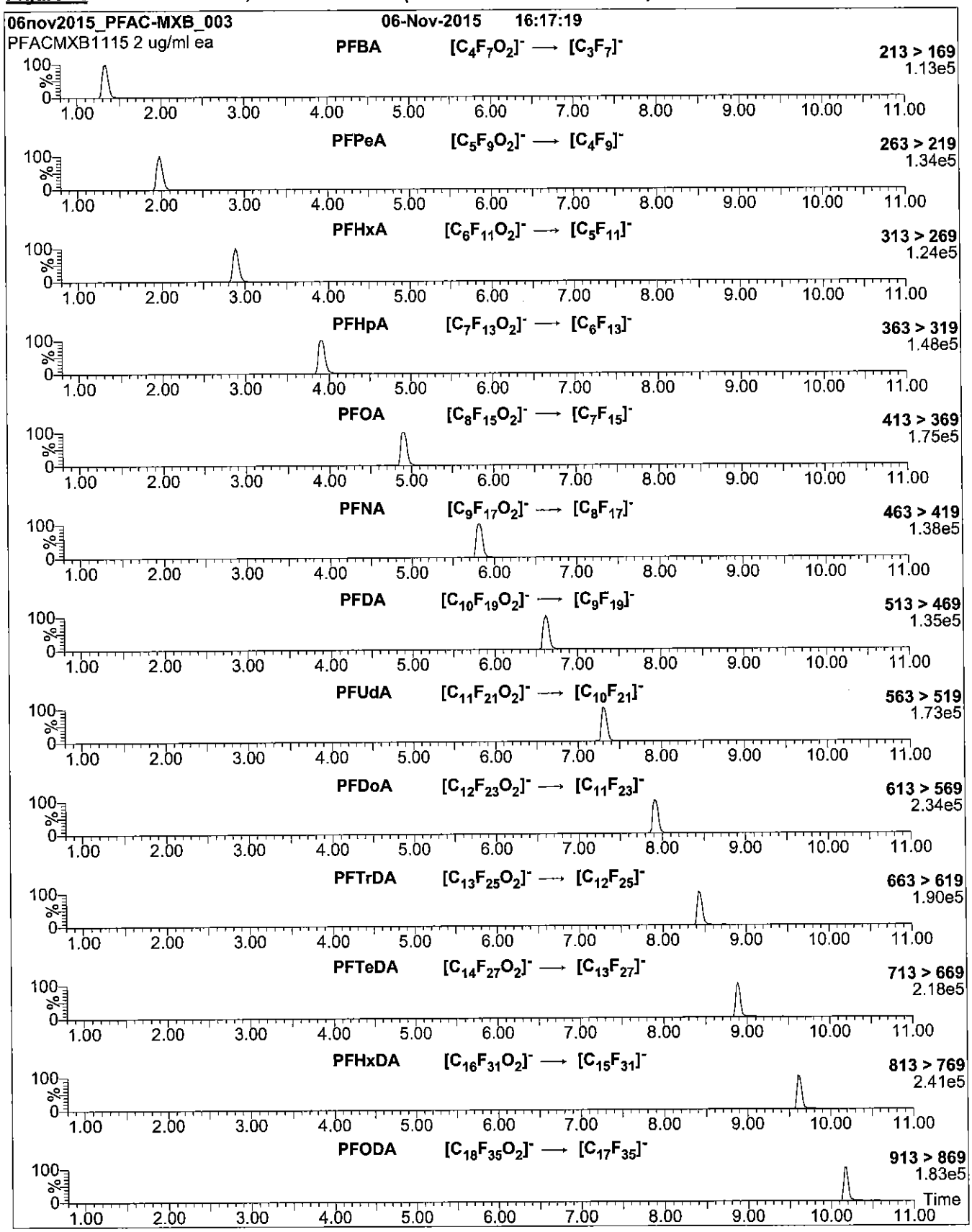
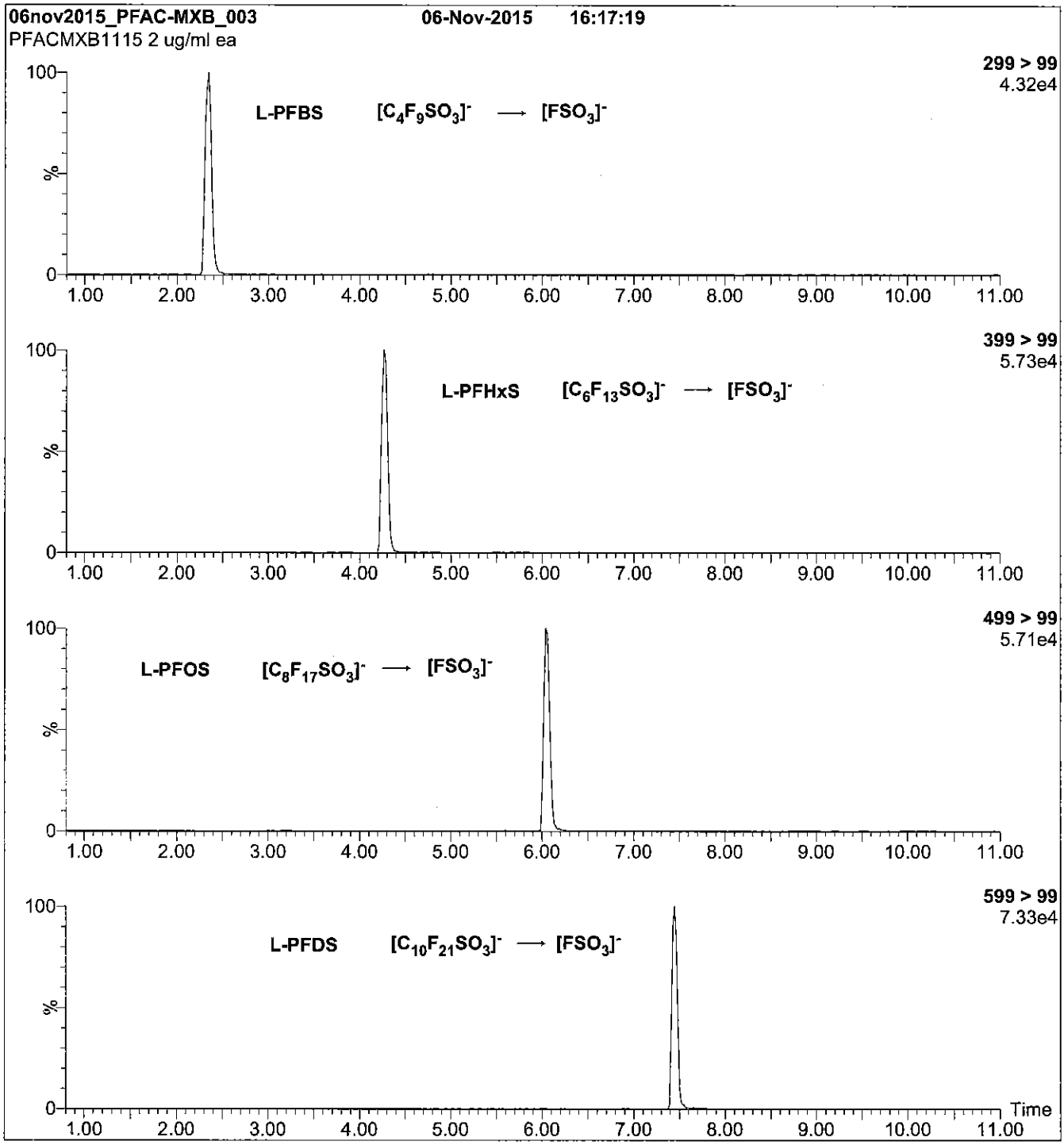


Figure 3: **PFAC-MXB; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figures 2 and 3:

Injection: on-column (PFAC-MXB)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

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

Reagent

LCPFBA_00005

Scanned 10/16/14

R: SBC 9/13/16

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

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

WELLINGTON LABORATORIES

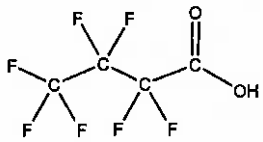
CERTIFICATE OF ANALYSIS DOCUMENTATION

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

LOT NUMBER: PFBA0516

STRUCTURE:

CAS #: 375-22-4



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

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

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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

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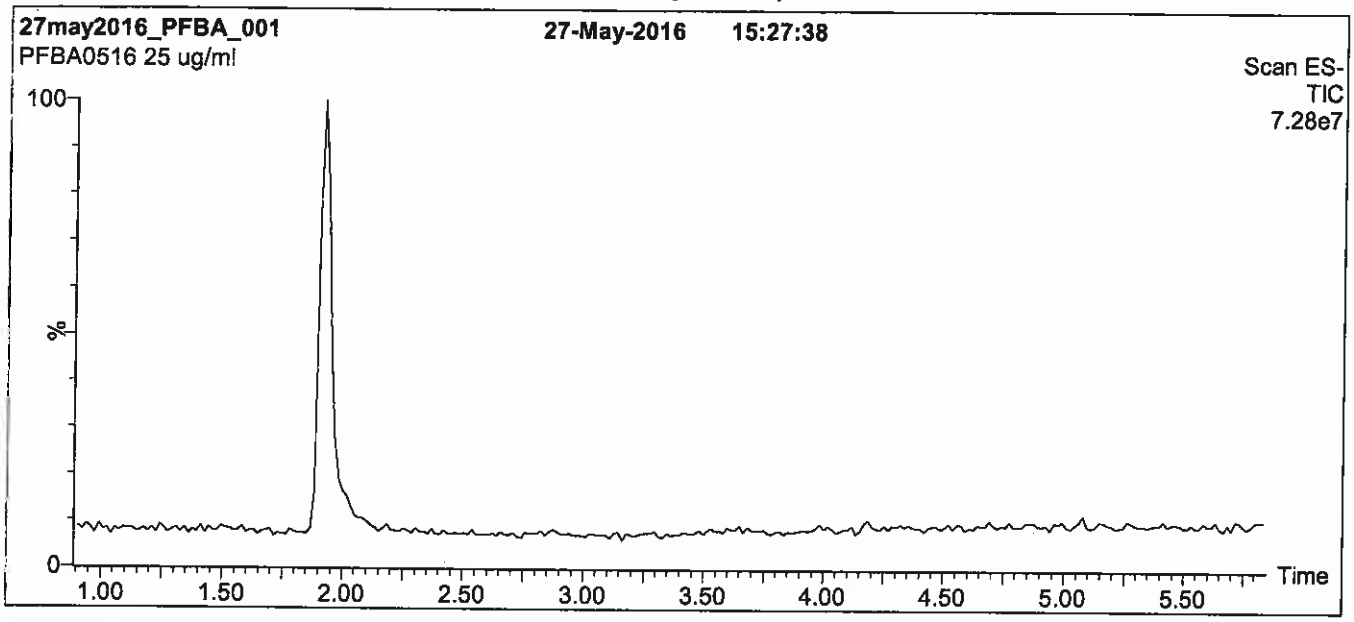
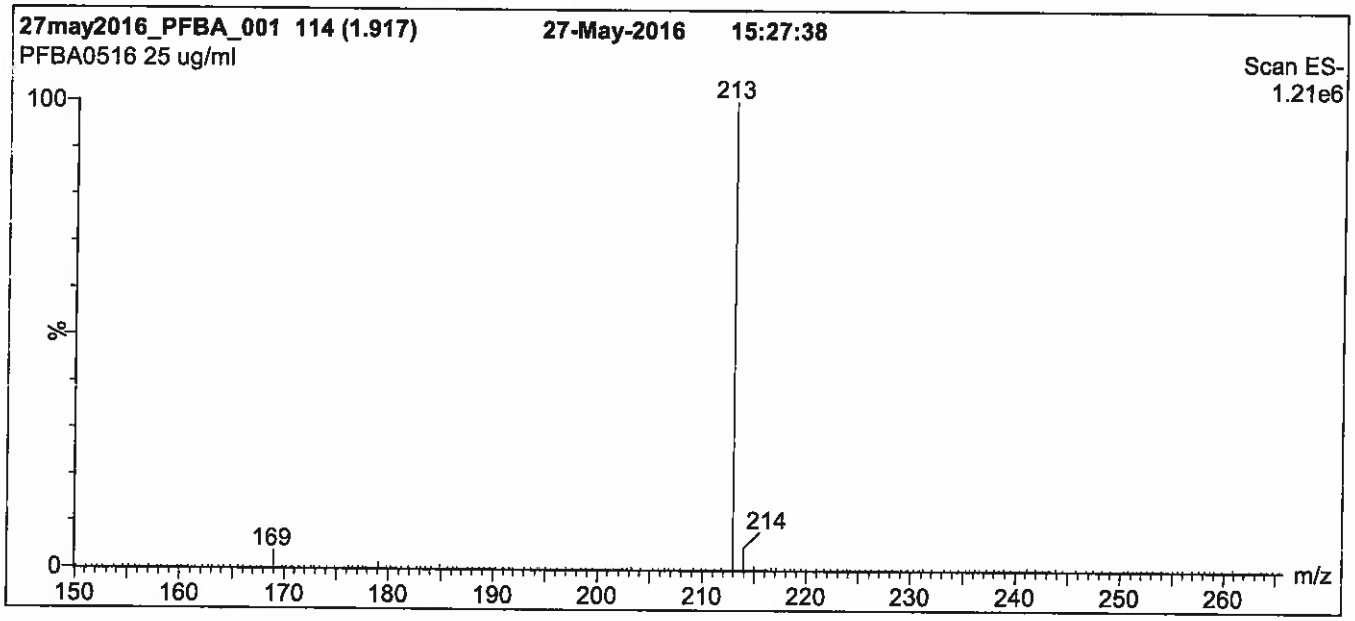
Figure 1: **PFBA; LC/MS Data (TIC and Mass Spectrum)**





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

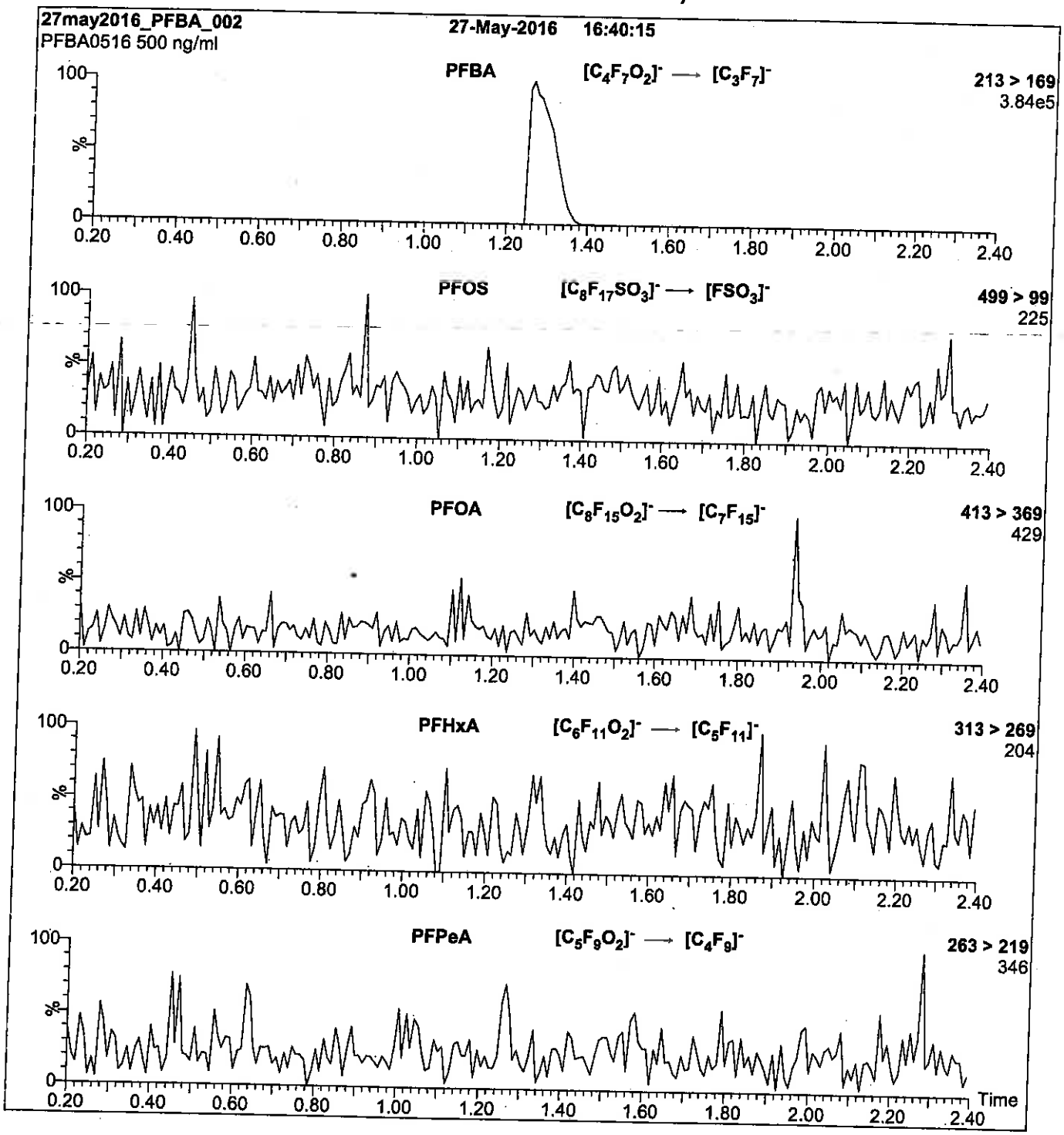
Flow: 300 µl/min

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

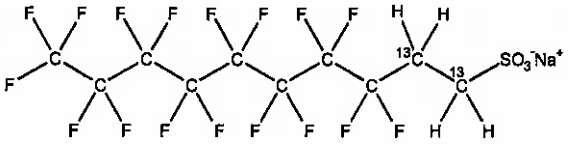
WELLINGTON LABORATORIES

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) 47.9 ± 2.4 µg/ml (M2-8:2FTS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	01/08/2016		
EXPIRY DATE: (mm/dd/yyyy)	01/08/2021		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- The native 8:2FTS contains 4.22% of ^{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

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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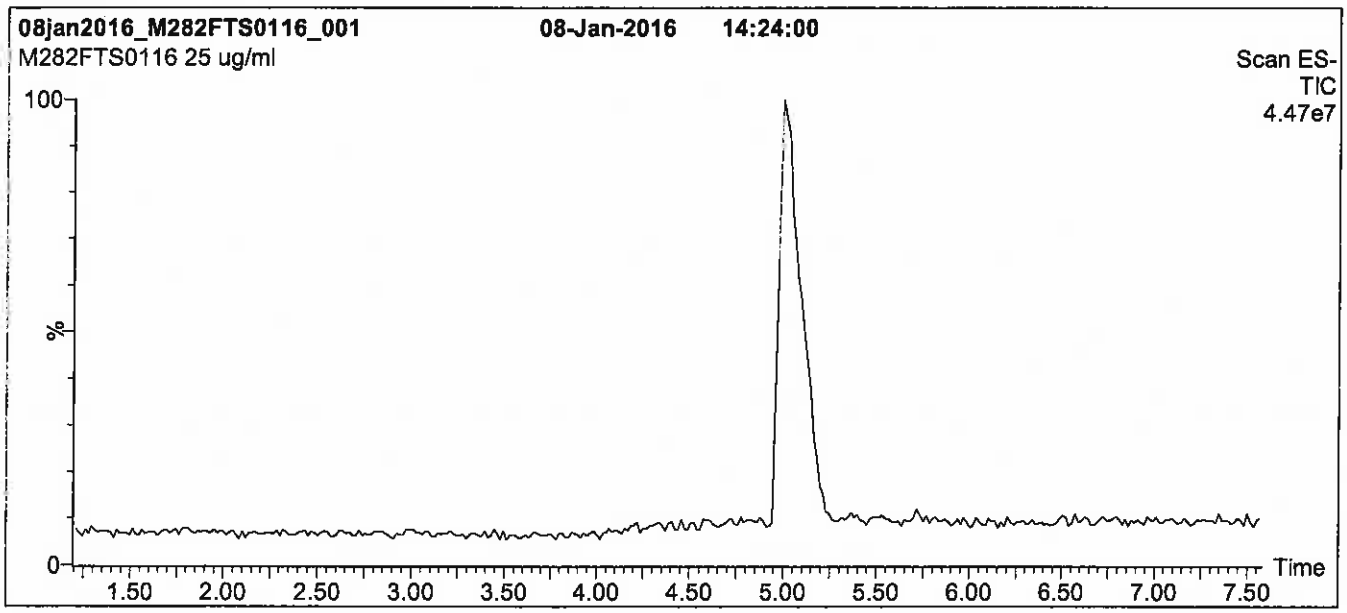
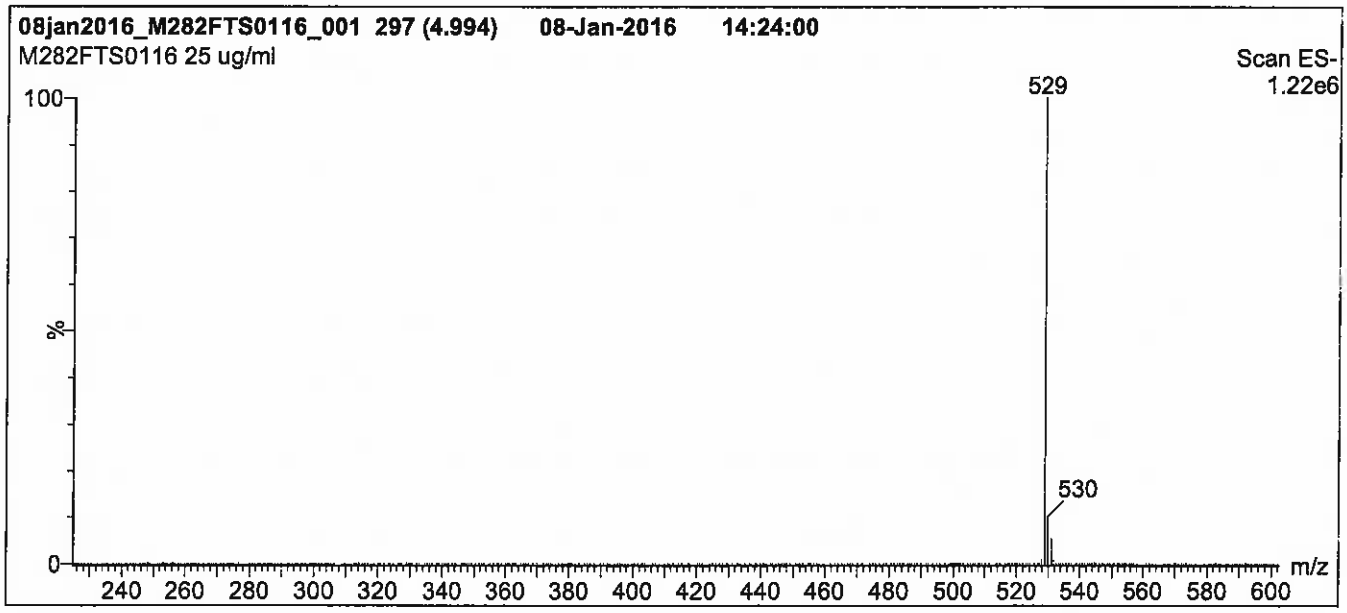
Figure 1: **M2-8:2FTS; LC/MS Data (TIC and Mass Spectrum)**





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

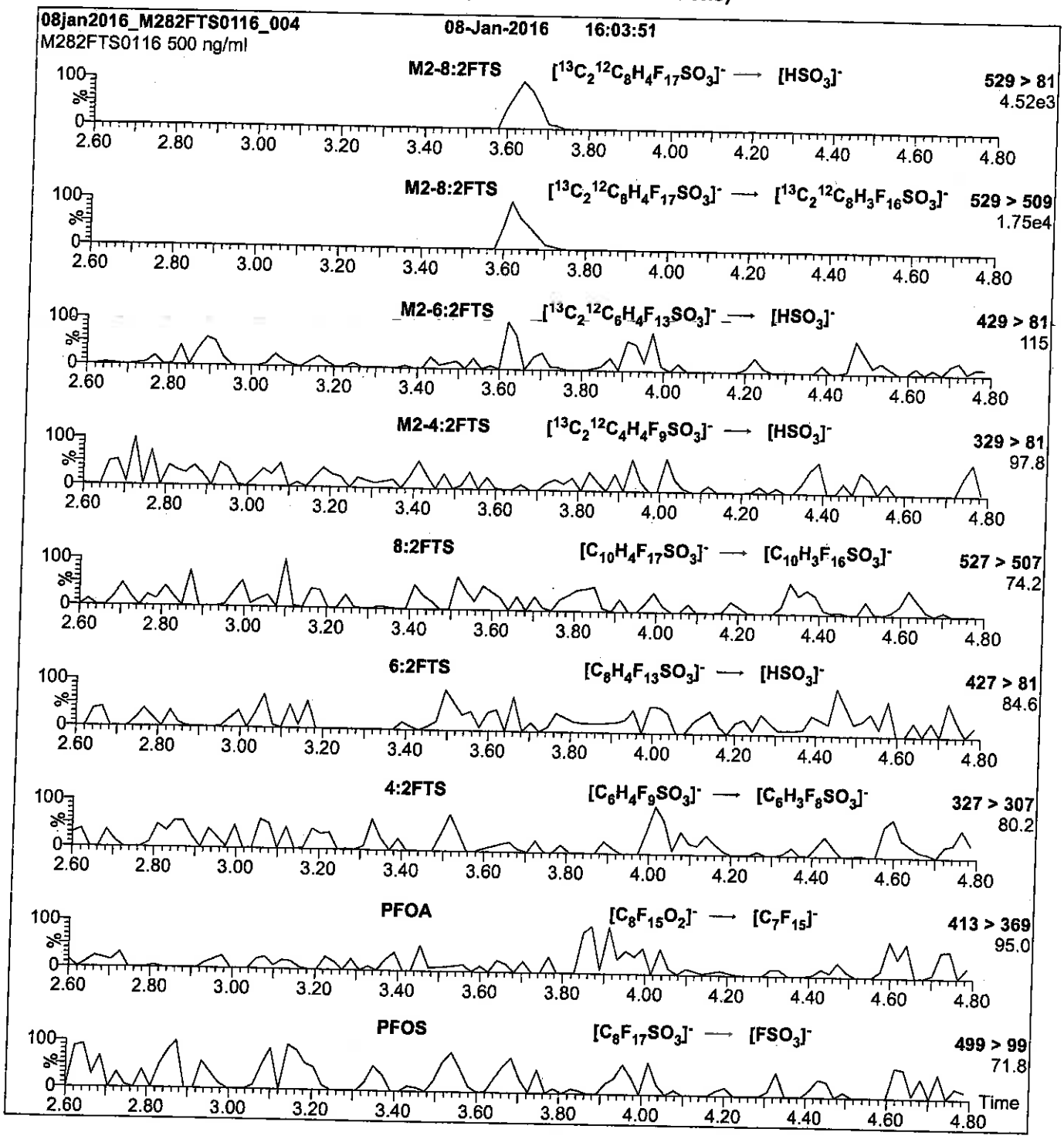
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (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

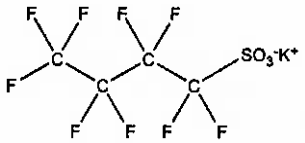
730512
ID: LCPFBS_00006
Exp: 03/15/21 Prpd: SBC
PF-1-butanesulfonate K sa

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: L-PFBS
COMPOUND: Potassium perfluoro-1-butanesulfonate
LOT NUMBER: LPFBS0316

STRUCTURE:
CAS #: 29420-49-3



MOLECULAR FORMULA: $C_4F_9SO_3K$
MOLECULAR WEIGHT: 338.19
CONCENTRATION: 50.0 ± 2.5 µg/ml (K salt)
44.2 ± 2.2 µg/ml (PFBS anion)
SOLVENT(S): Methanol
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 03/15/2016
EXPIRY DATE: (mm/dd/yyyy) 03/15/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 03/21/2016 (mm/dd/yyyy)

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

ANAB ACCREDITED ISO 17025 REFERENCE MATERIAL PRODUCER

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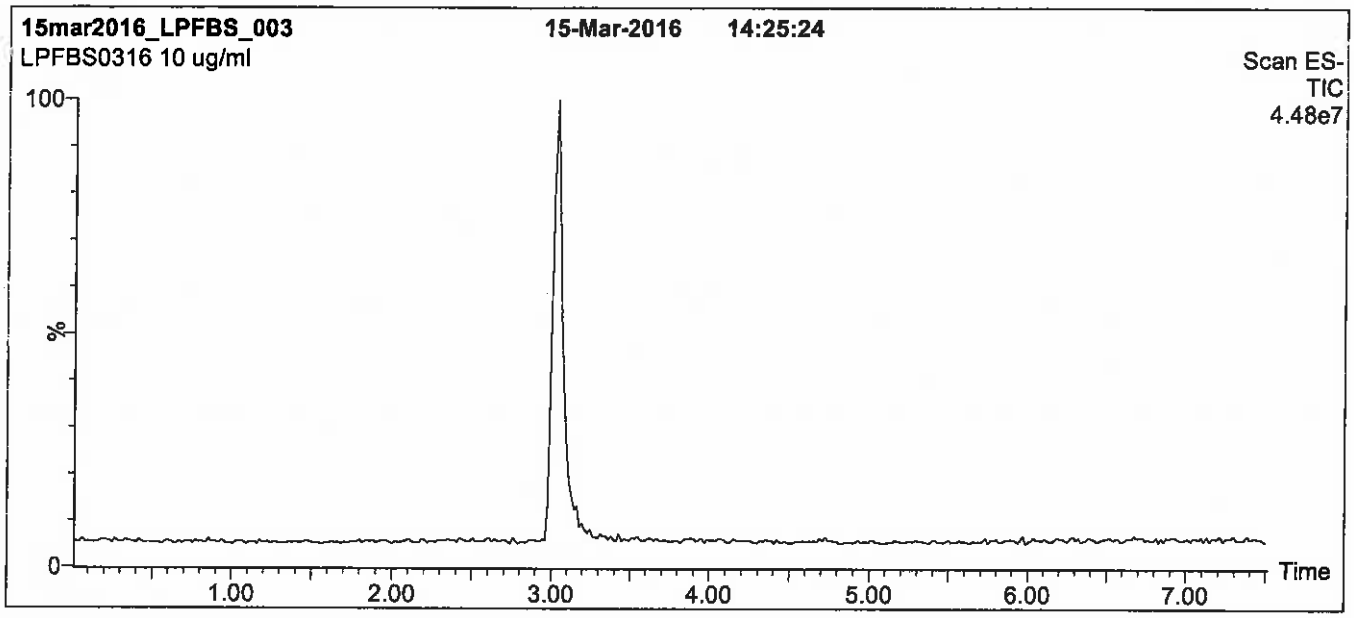
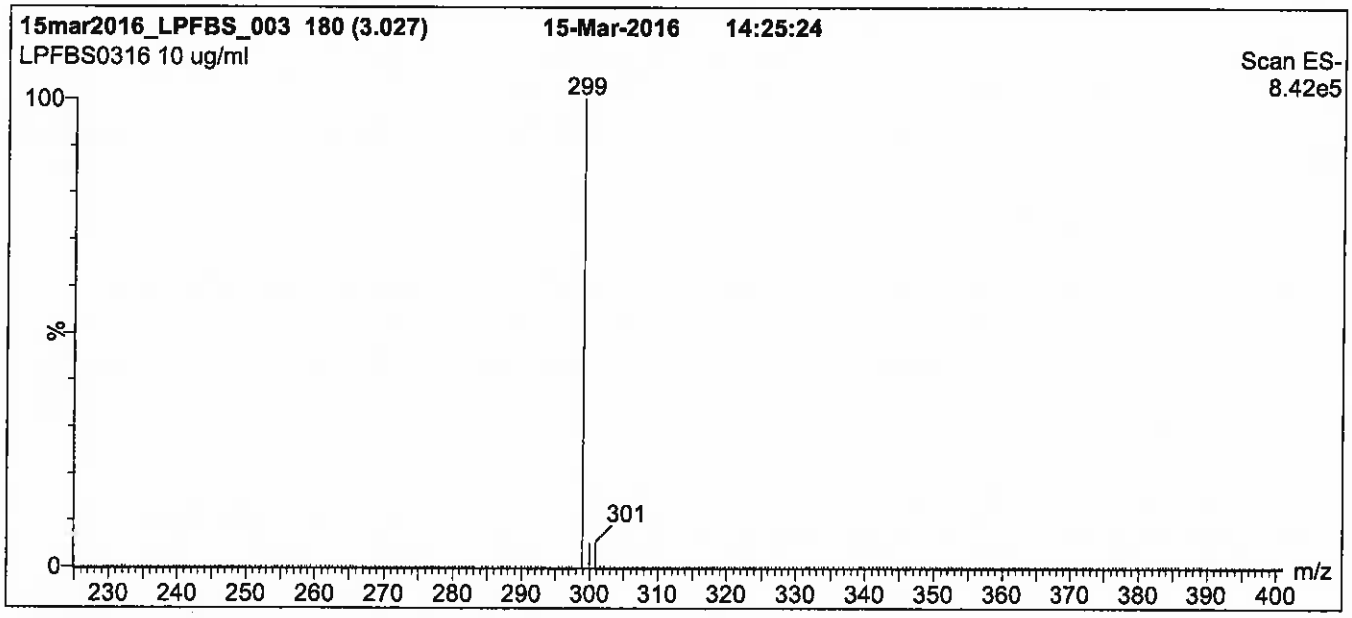
Figure 1: **L-PFBS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

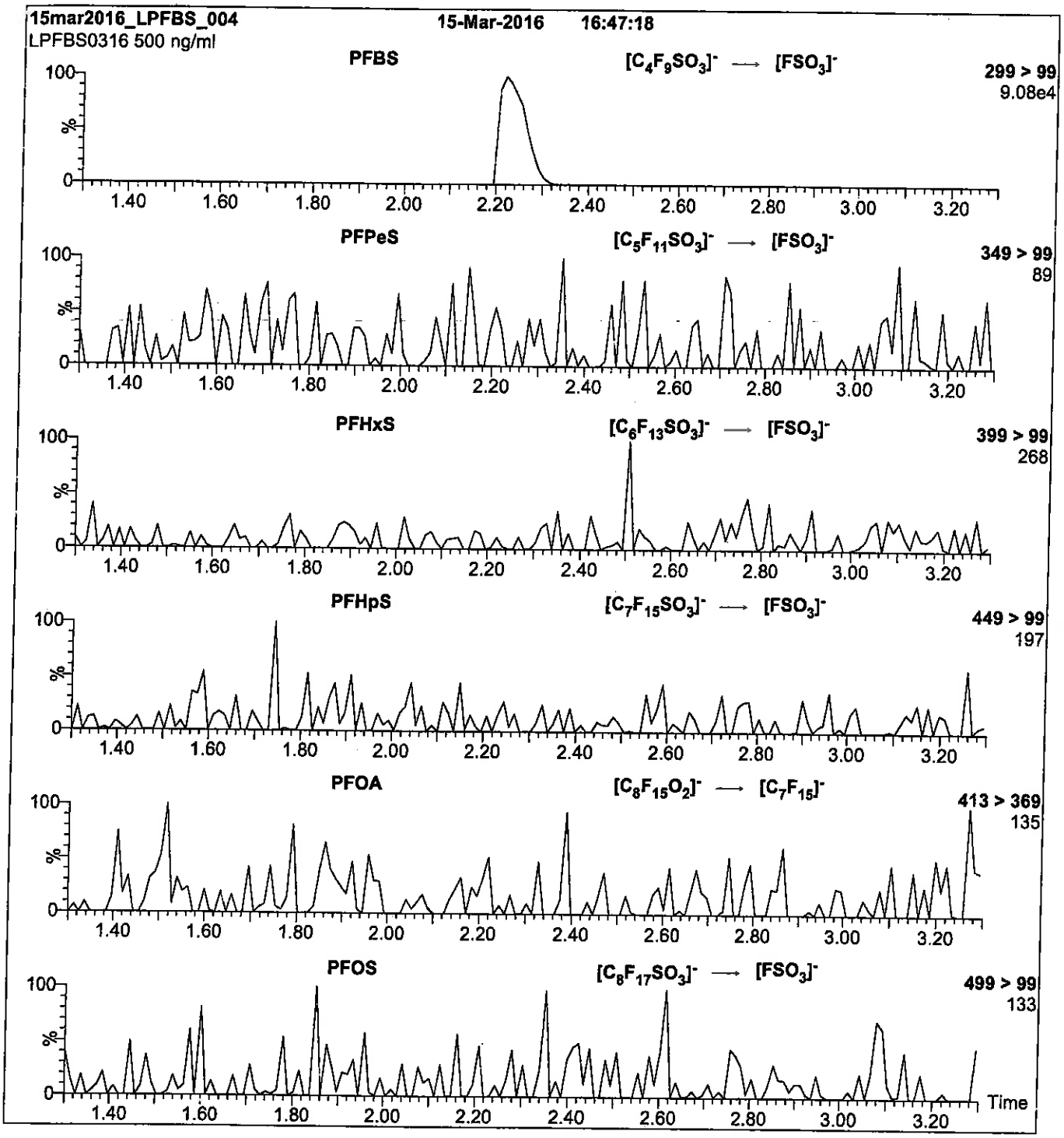
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCPFDA_00005

R: 7/6/16 CBW

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

WELLINGTON LABORATORIES

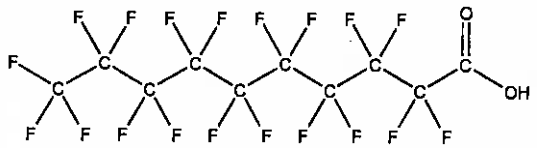
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFDA
COMPOUND: Perfluoro-n-decanoic acid

LOT NUMBER: PFDA0615

STRUCTURE:

CAS #: 335-76-2



MOLECULAR FORMULA: $C_{10}HF_{19}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 514.08
SOLVENT(S): Methanol
Water (<1%)

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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 07/24/2015 (mm/dd/yyyy)

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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:

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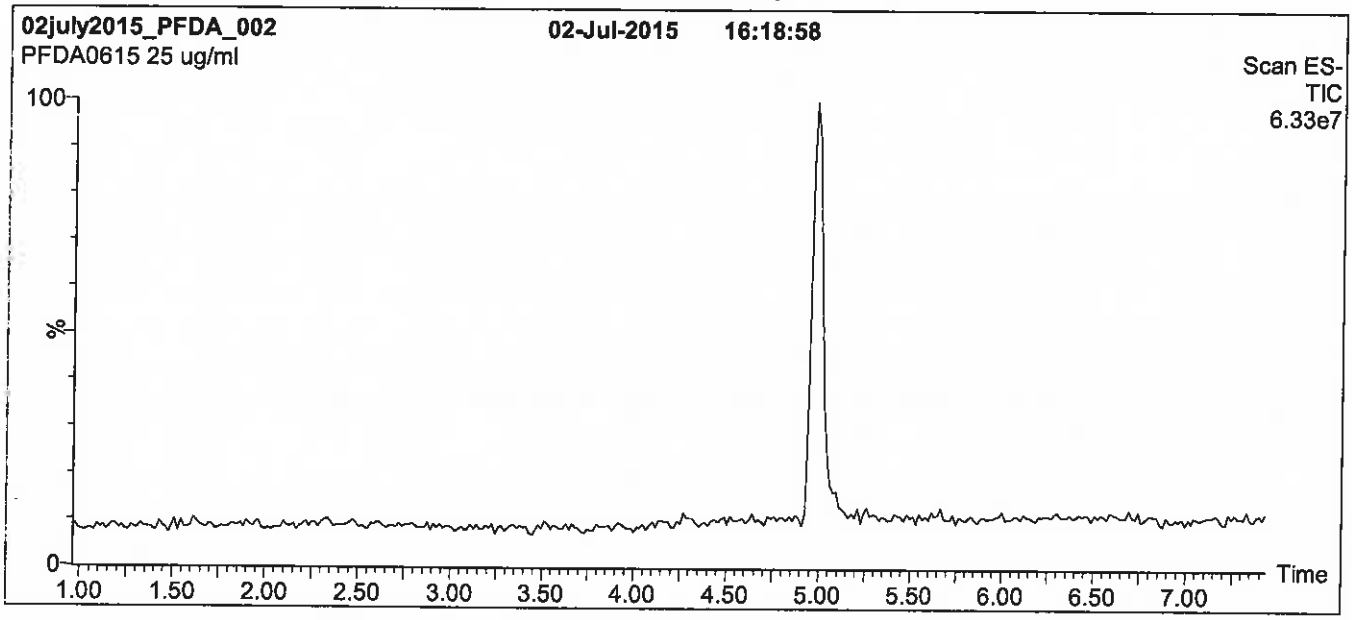
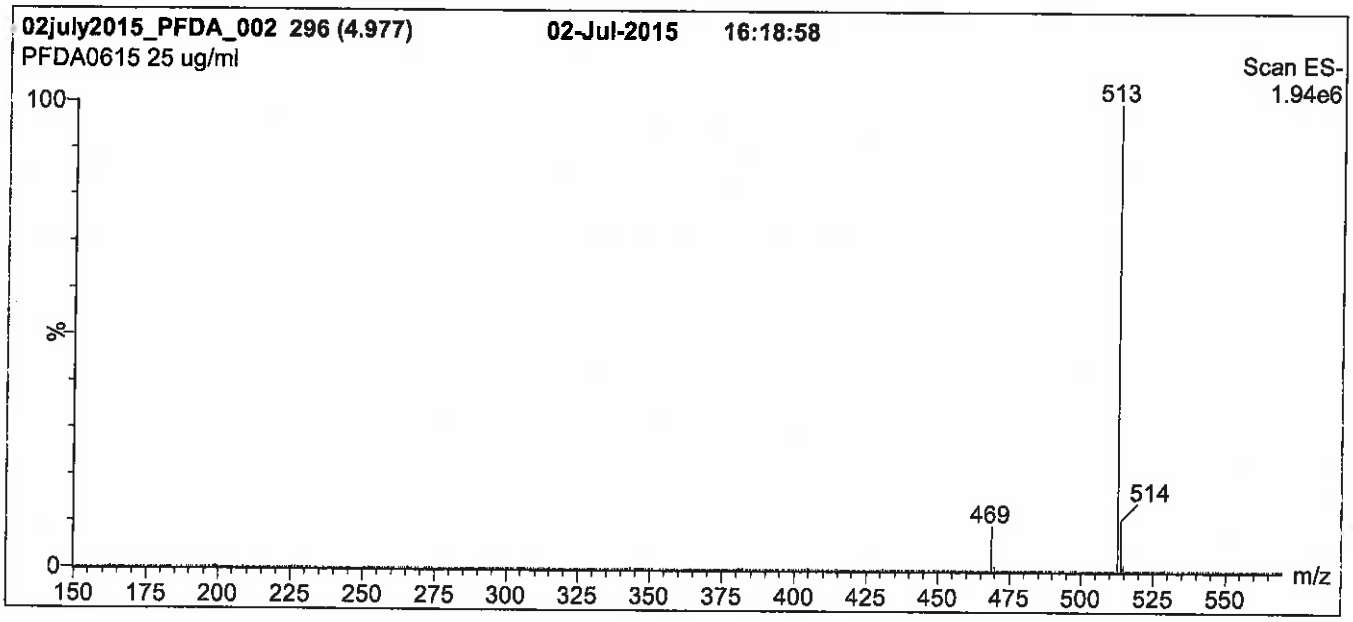
Figure 1: **PFDA; LC/MS Data (TIC and Mass Spectrum)**





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

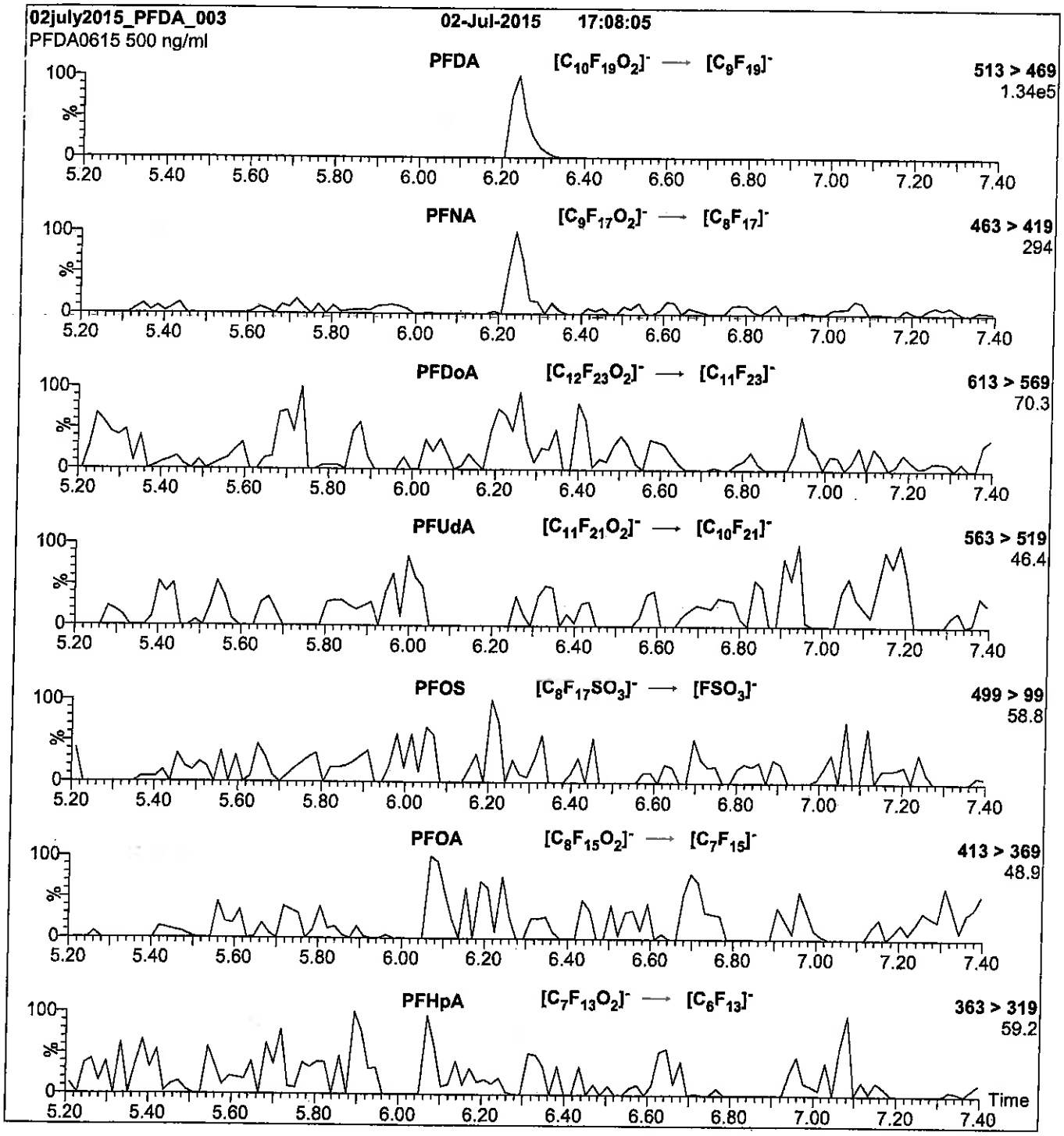
Flow: 300 µl/min

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

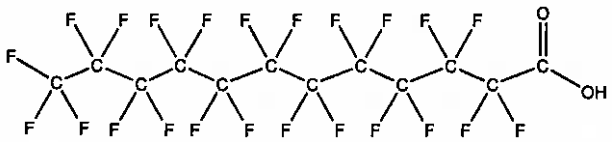
671601
ID: LCPFDoA_00005
Exp: 01/30/20 Prpd: CBW
PF-n-dodecanoic acid

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

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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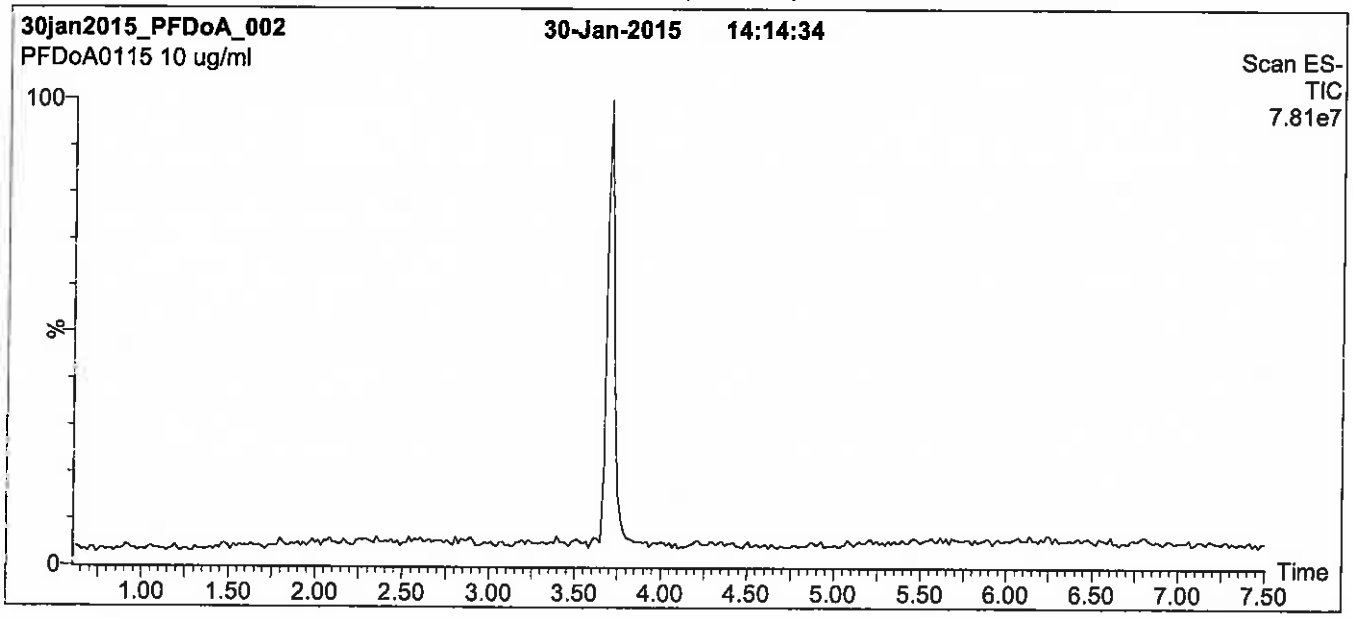
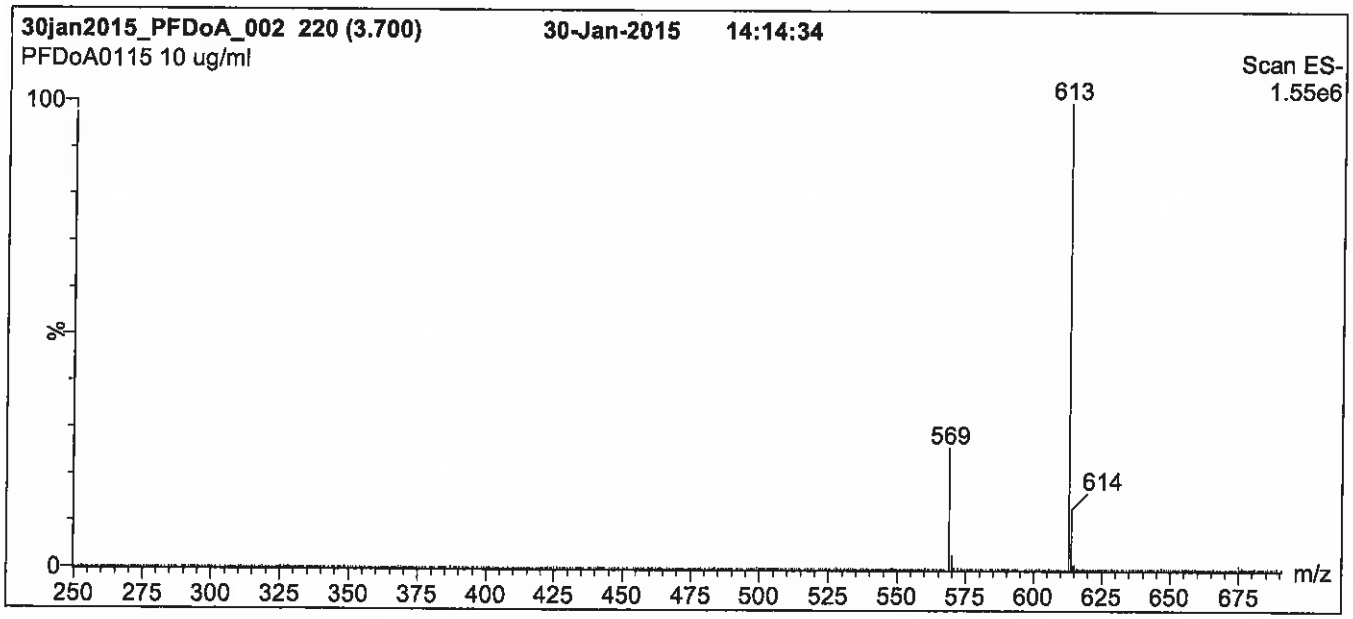




Conditions for Figure 1:

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

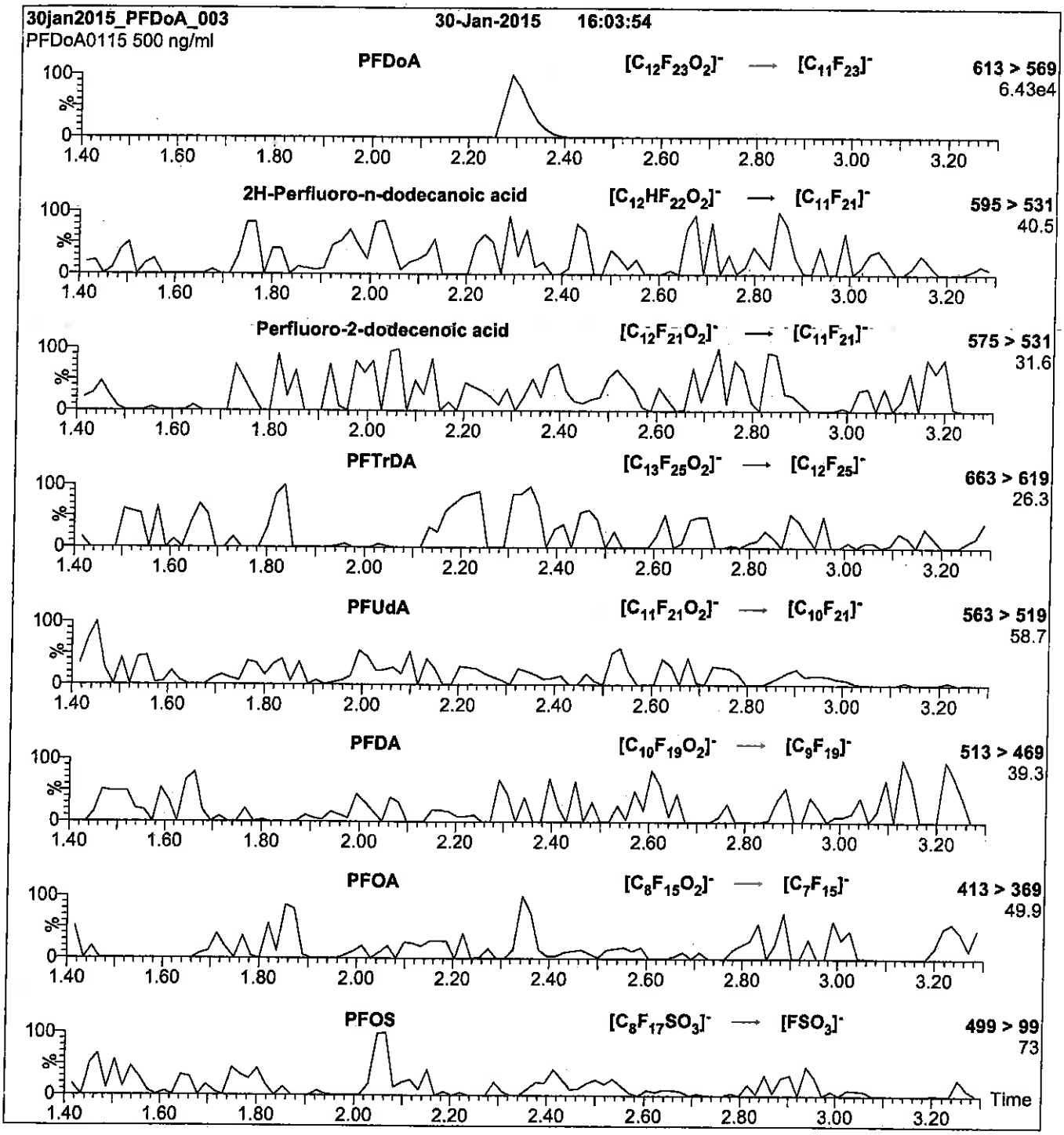
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1000 amu)

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

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



Conditions for Figure 2:

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

Reagent

LCPFHpA_00005

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

R: 4/7/16 CBW

WELLINGTON LABORATORIES

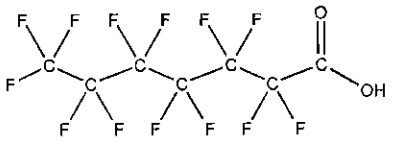
CERTIFICATE OF ANALYSIS DOCUMENTATION

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

LOT NUMBER: PFHpA0116

STRUCTURE:

CAS #: 375-85-9



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

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

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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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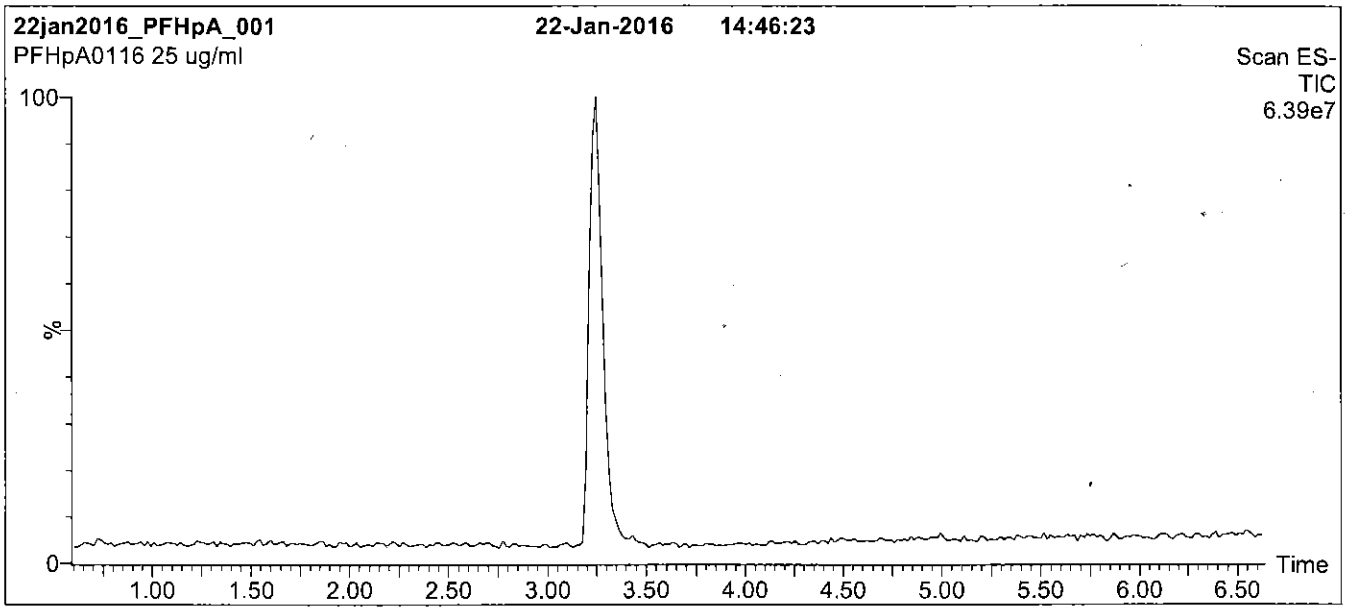
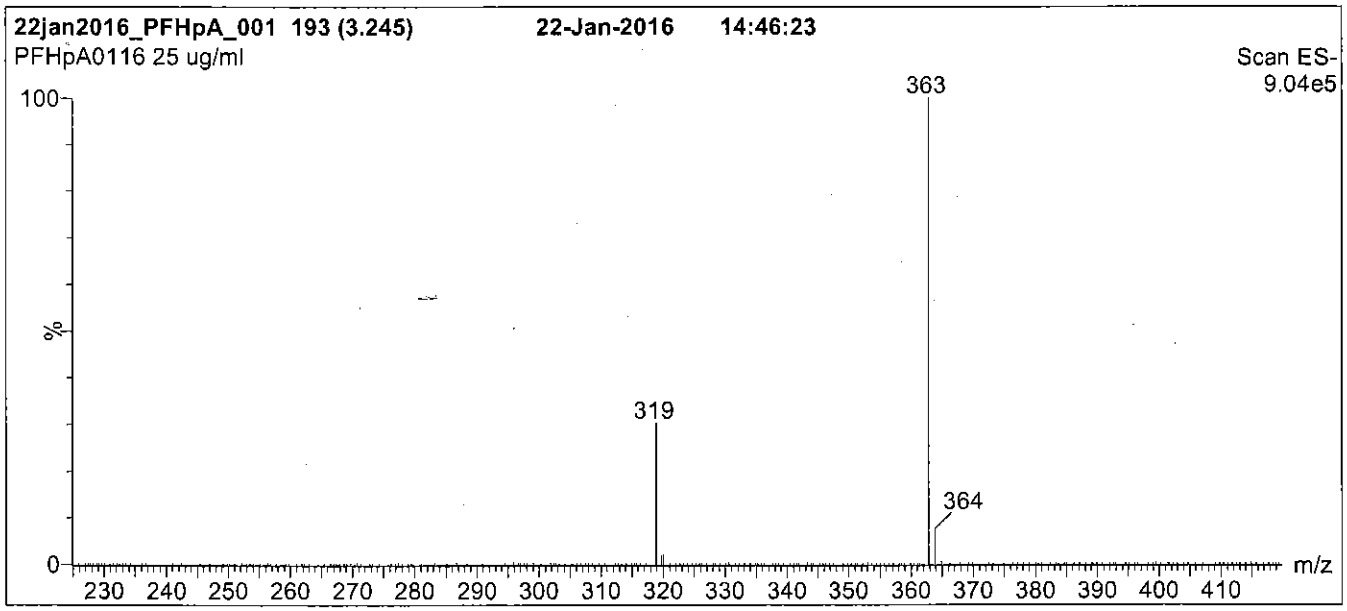




Conditions for Figure 1:

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

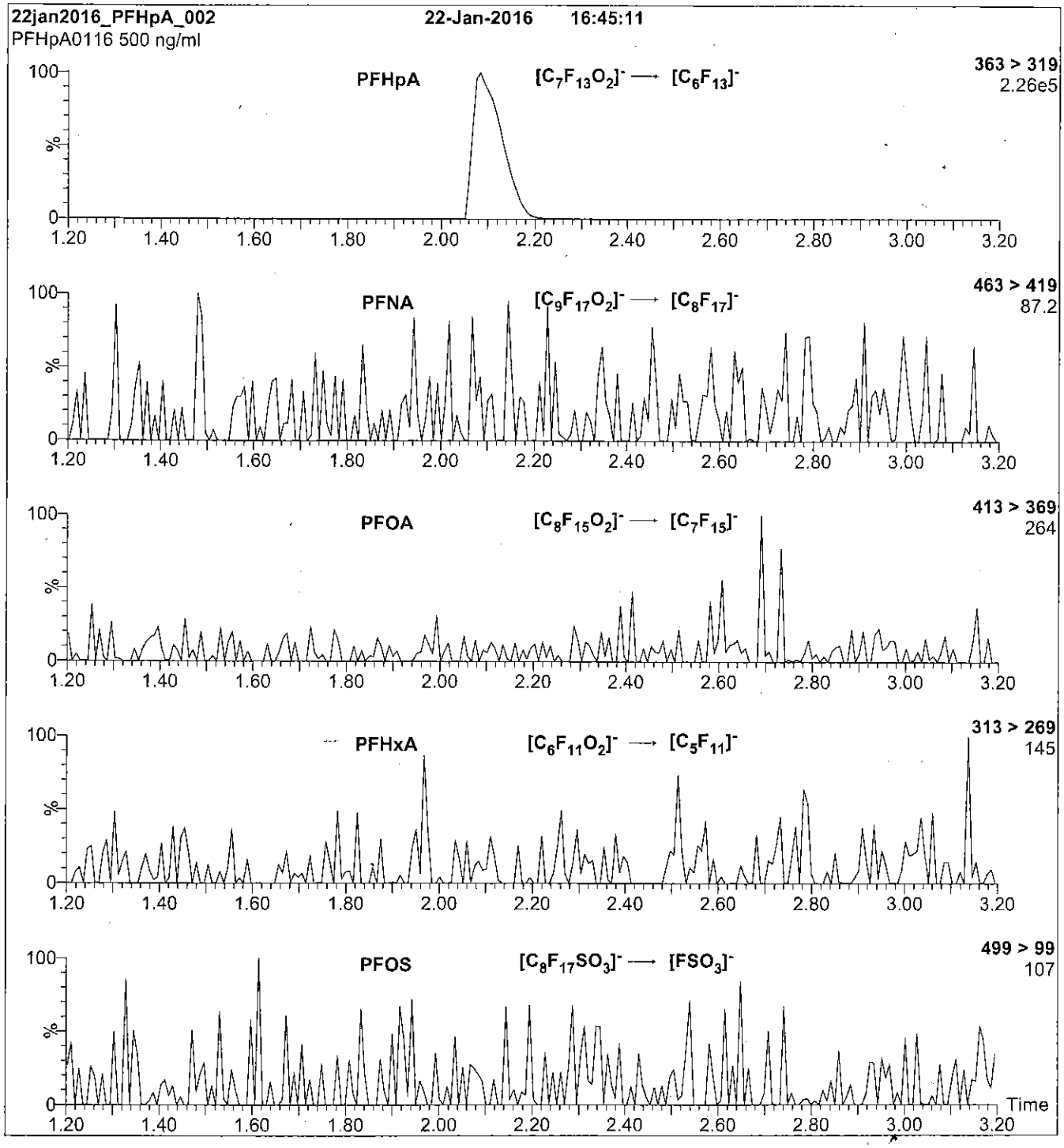
Flow: 300 µl/min

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

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

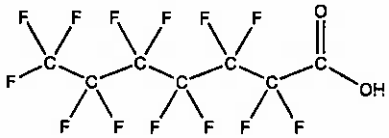
CERTIFICATE OF ANALYSIS DOCUMENTATION

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

LOT NUMBER: PFHpA0116

STRUCTURE:

CAS #: 375-85-9



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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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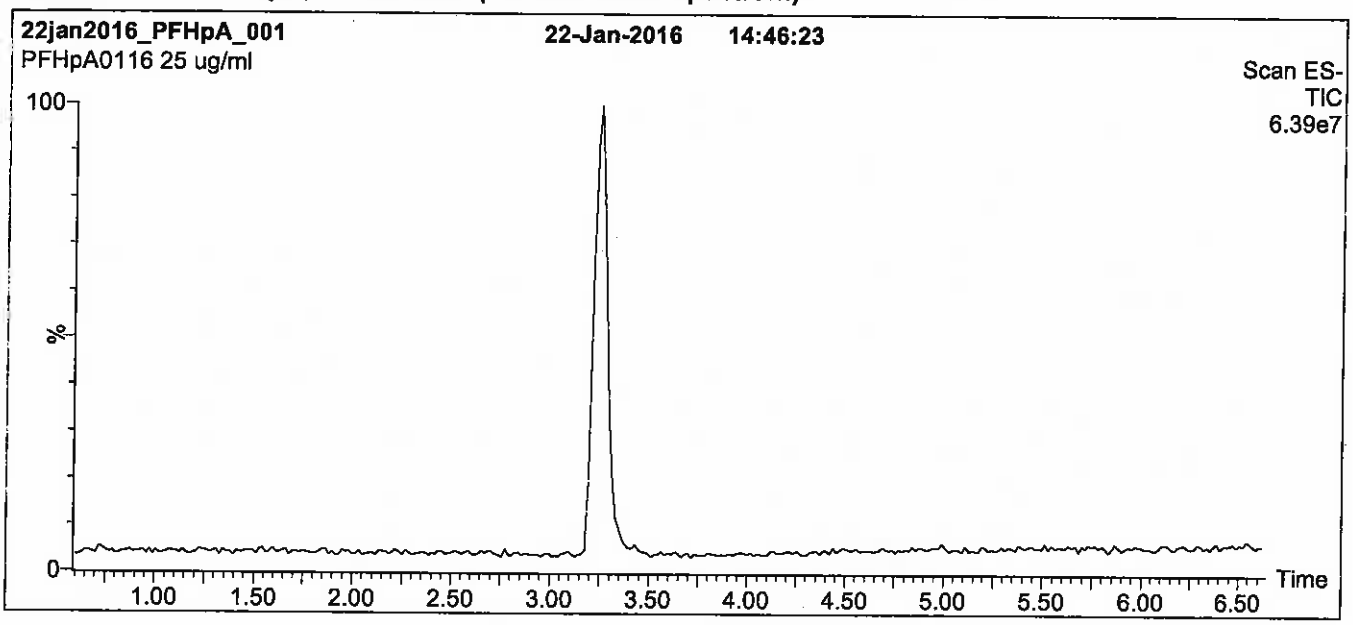
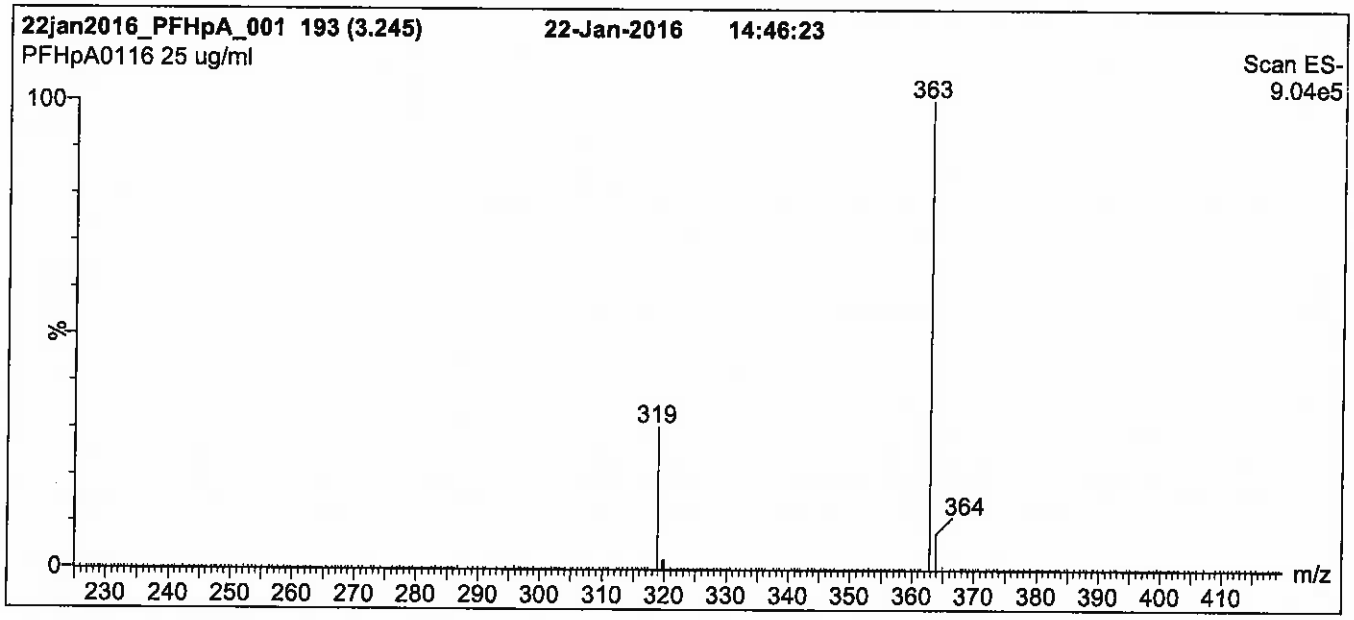
Figure 1: **PFHpA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

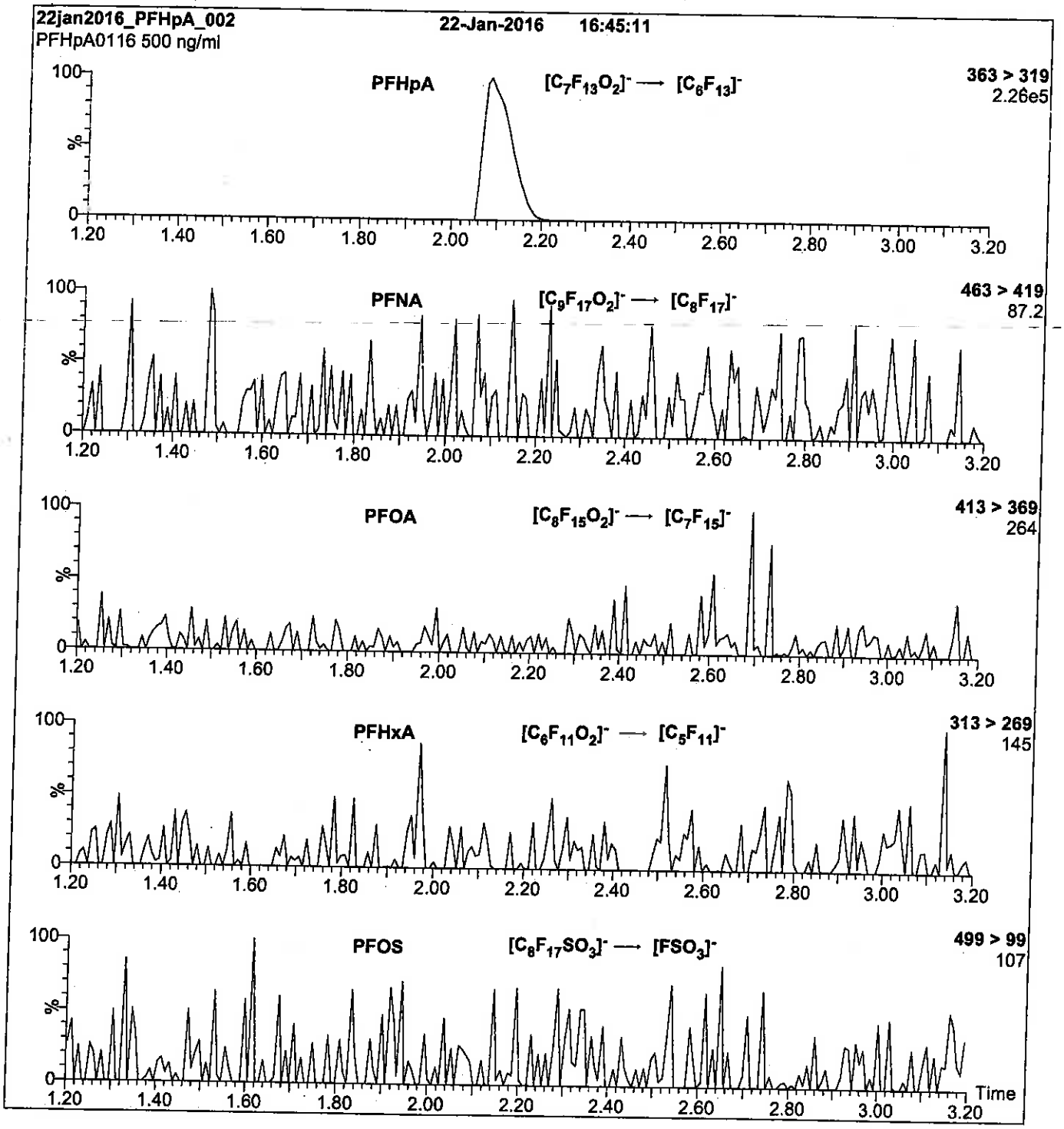
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

MS Parameters

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

Reagent

LCPFHpS_00009

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

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

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

WELLINGTON LABORATORIES

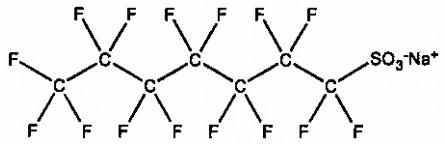
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: L-PFHpS
COMPOUND: Sodium perfluoro-1-heptanesulfonate

LOT NUMBER: LPFHpS1115

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $C_7F_{15}SO_3Na$
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt)
47.6 ± 2.4 µg/ml (PFHpS anion)
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 11/06/2015
EXPIRY DATE: (mm/dd/yyyy) 11/06/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

MOLECULAR WEIGHT: 472.10
SOLVENT(S): Methanol

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.1% of L-PFHxS ($C_6F_{13}SO_3Na$) and ~ 0.2% of L-PFOS ($C_8F_{17}SO_3Na$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 11/09/2015 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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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.

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CALA

ANAB ACCREDITED

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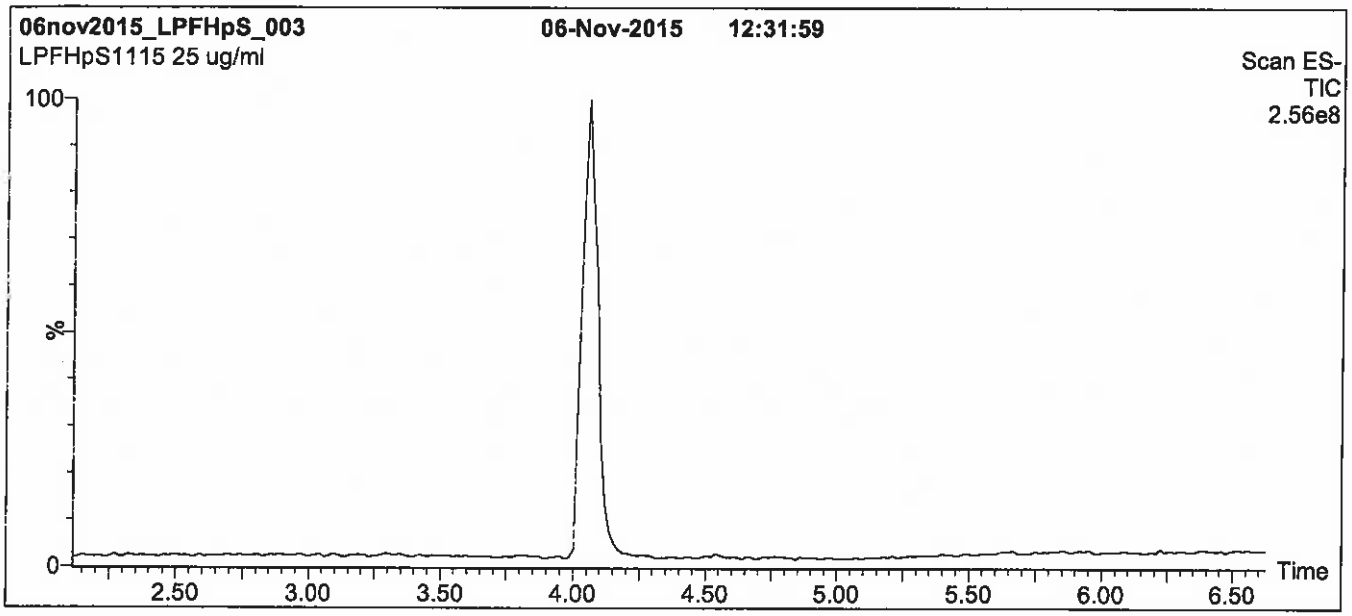
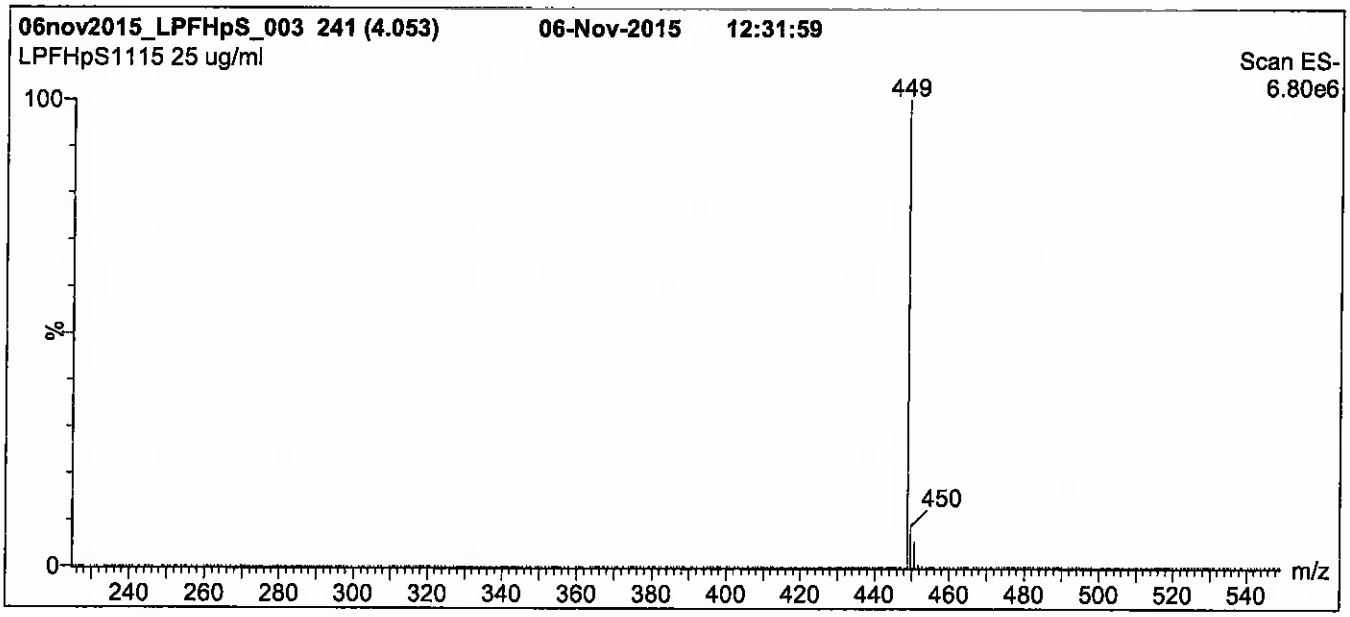




Conditions for Figure 1:

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

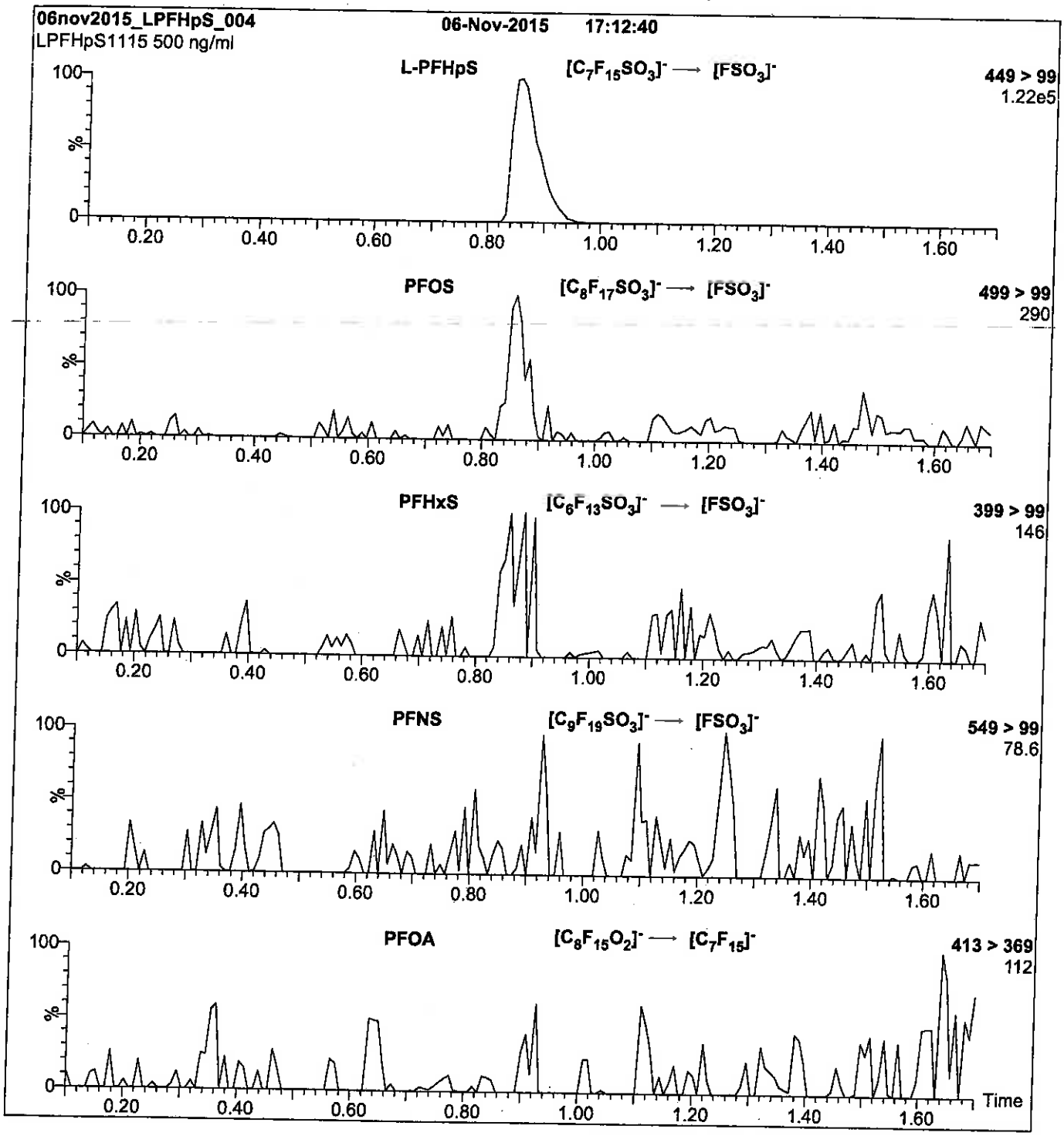
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCPFHxA_00004

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

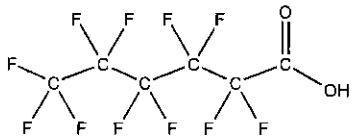
R: 4/7/16 CBW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFHxA
LOT NUMBER: PFHxA1215
COMPOUND: Perfluoro-n-hexanoic acid

STRUCTURE:
CAS #: 307-24-4



MOLECULAR FORMULA: $C_6HF_{11}O_2$
MOLECULAR WEIGHT: 314.05
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 12/22/2015
EXPIRY DATE: (mm/dd/yyyy) 12/22/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.2% of Perfluoro-n-pentanoic acid (PFPeA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 12/23/2015 (mm/dd/yyyy)

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

INTENDED USE:

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

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17025 REFERENCE MATERIAL PRODUCER

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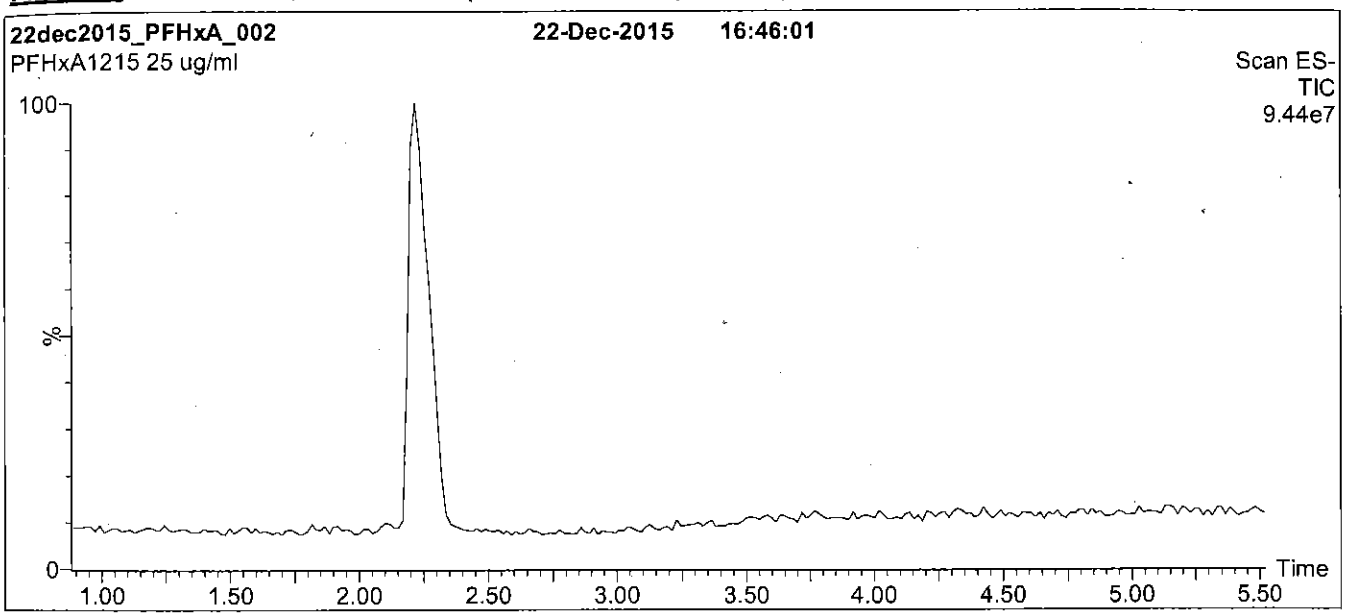
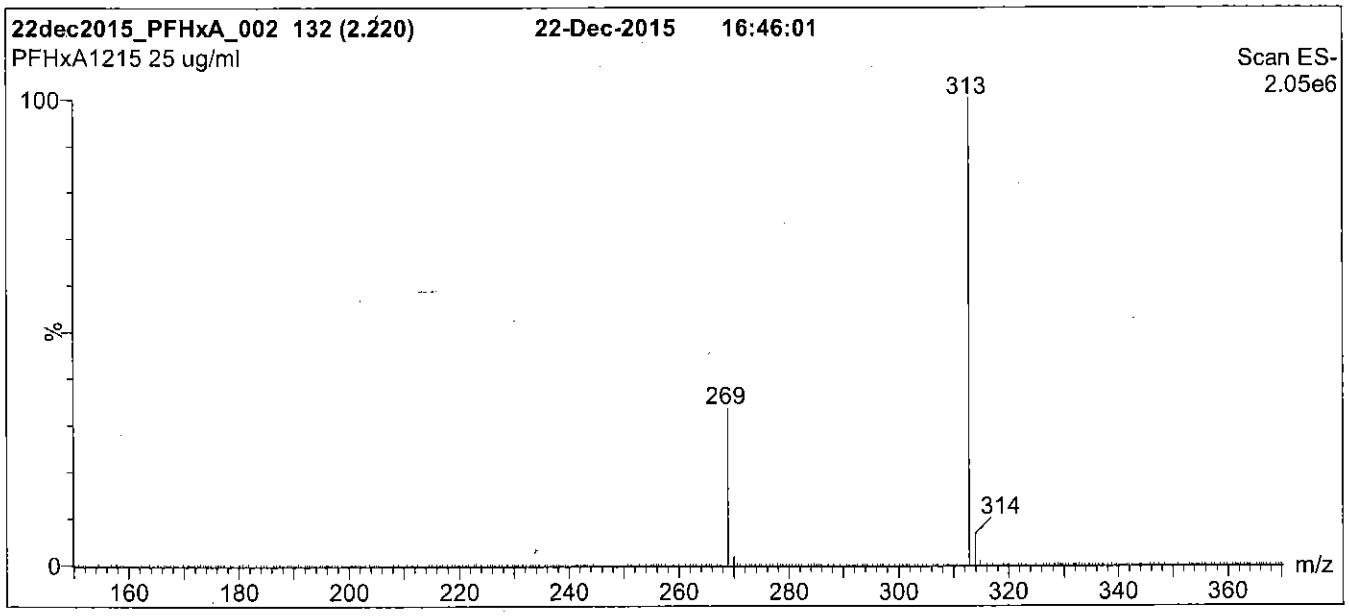




Conditions for Figure 1:

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

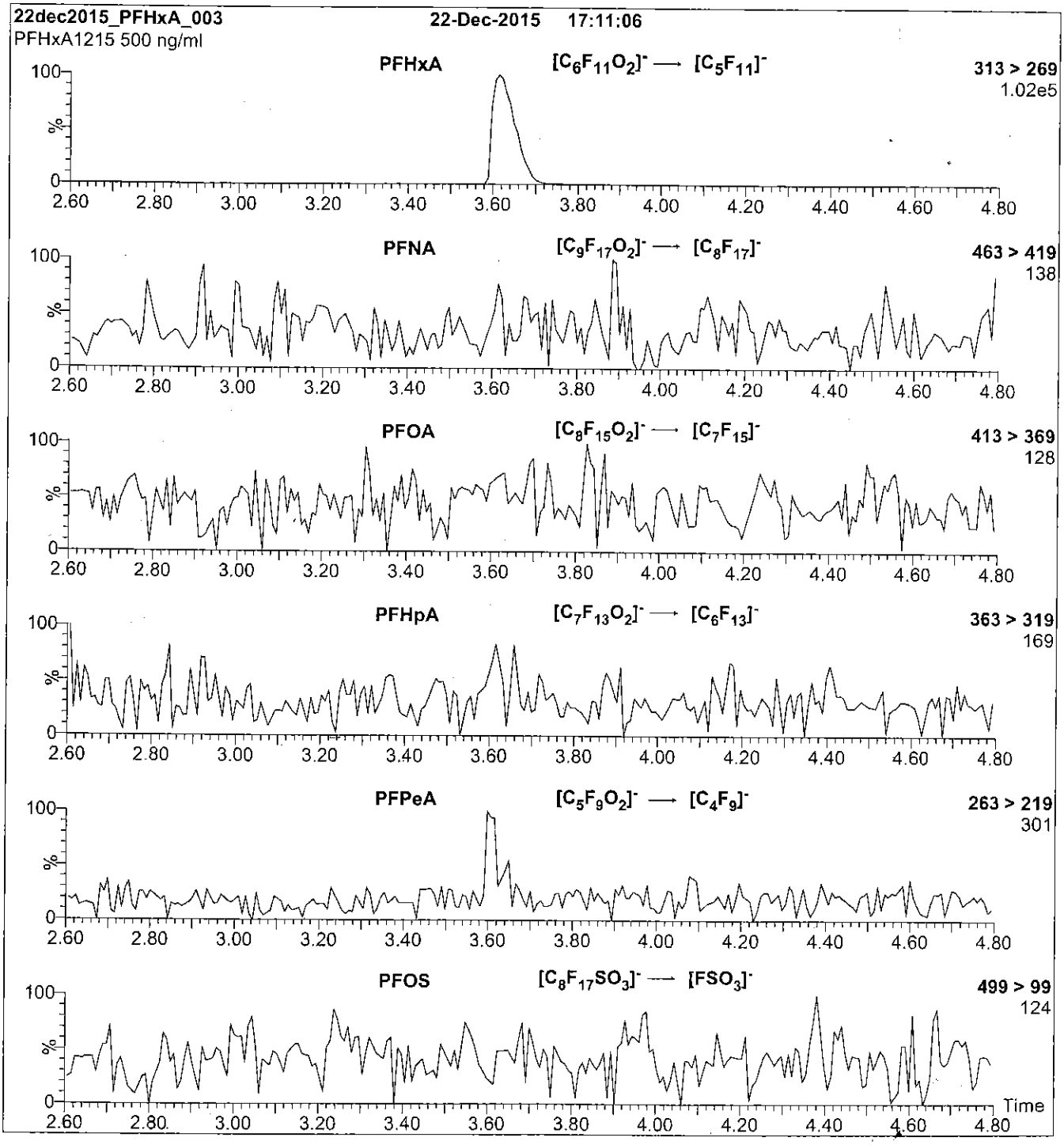
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCPFHxA_00005

R: SBC 9/13/16

730551
ID: LCPFHxA_00005
Exp: 12/22/20 Prpd: SBC
PF-n-hexanoic acid

730552
ID: LCPFHxA_00006
Exp: 12/22/20 Prpd: SBC
PF-n-hexanoic acid

WELLINGTON LABORATORIES

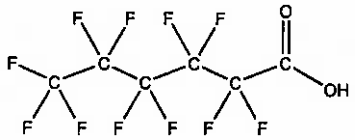
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFHxA
COMPOUND: Perfluoro-n-hexanoic acid

LOT NUMBER: PFHxA1215

STRUCTURE:

CAS #: 307-24-4



MOLECULAR FORMULA: $C_6HF_{11}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 314.05
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 12/22/2015
EXPIRY DATE: (mm/dd/yyyy) 12/22/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

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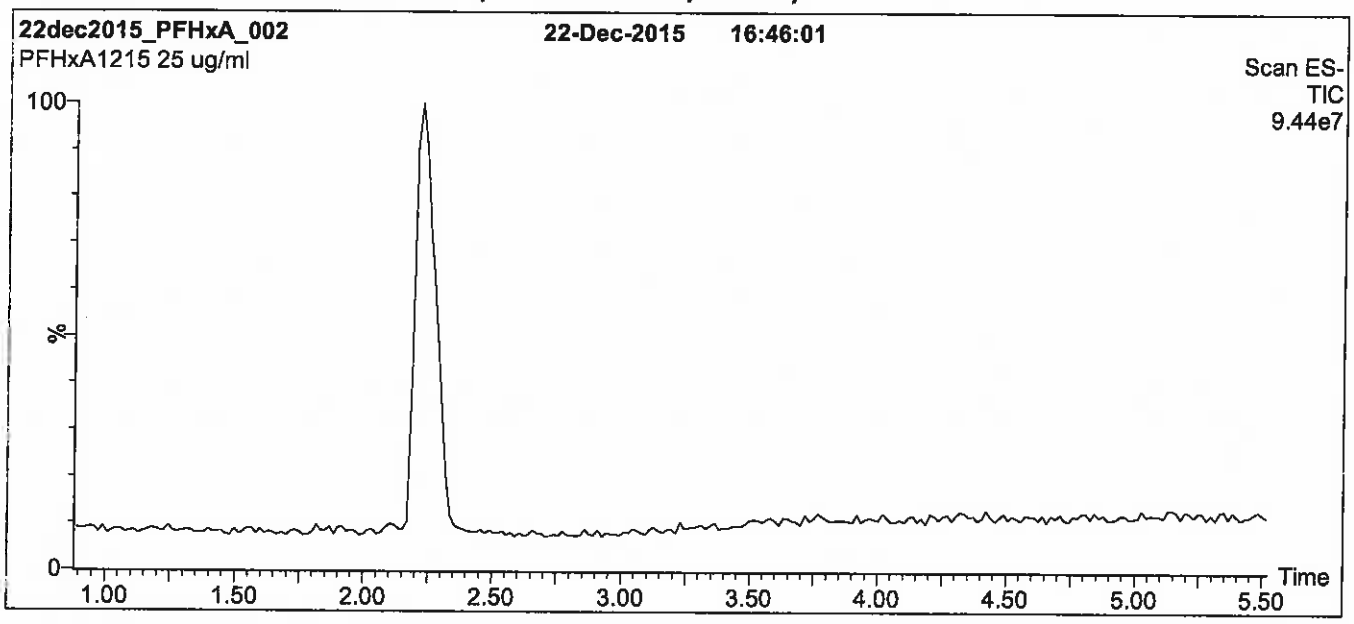
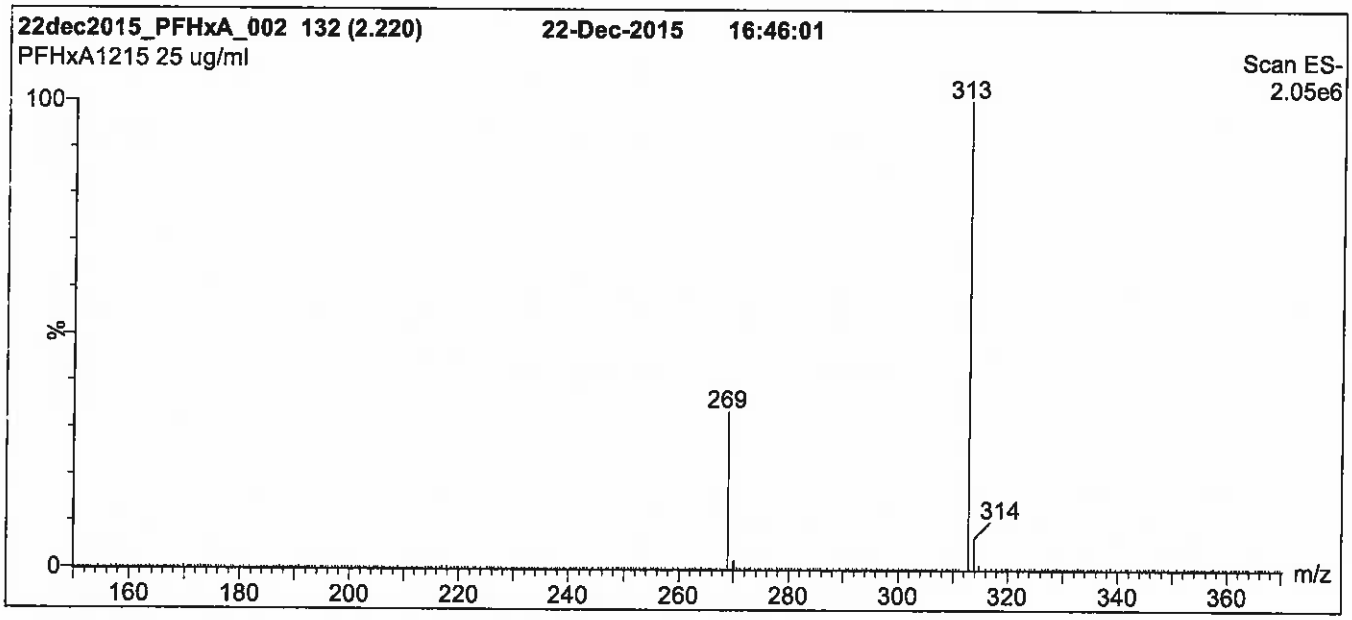
Figure 1: **PFHxA; LC/MS Data (TIC and Mass Spectrum)**





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

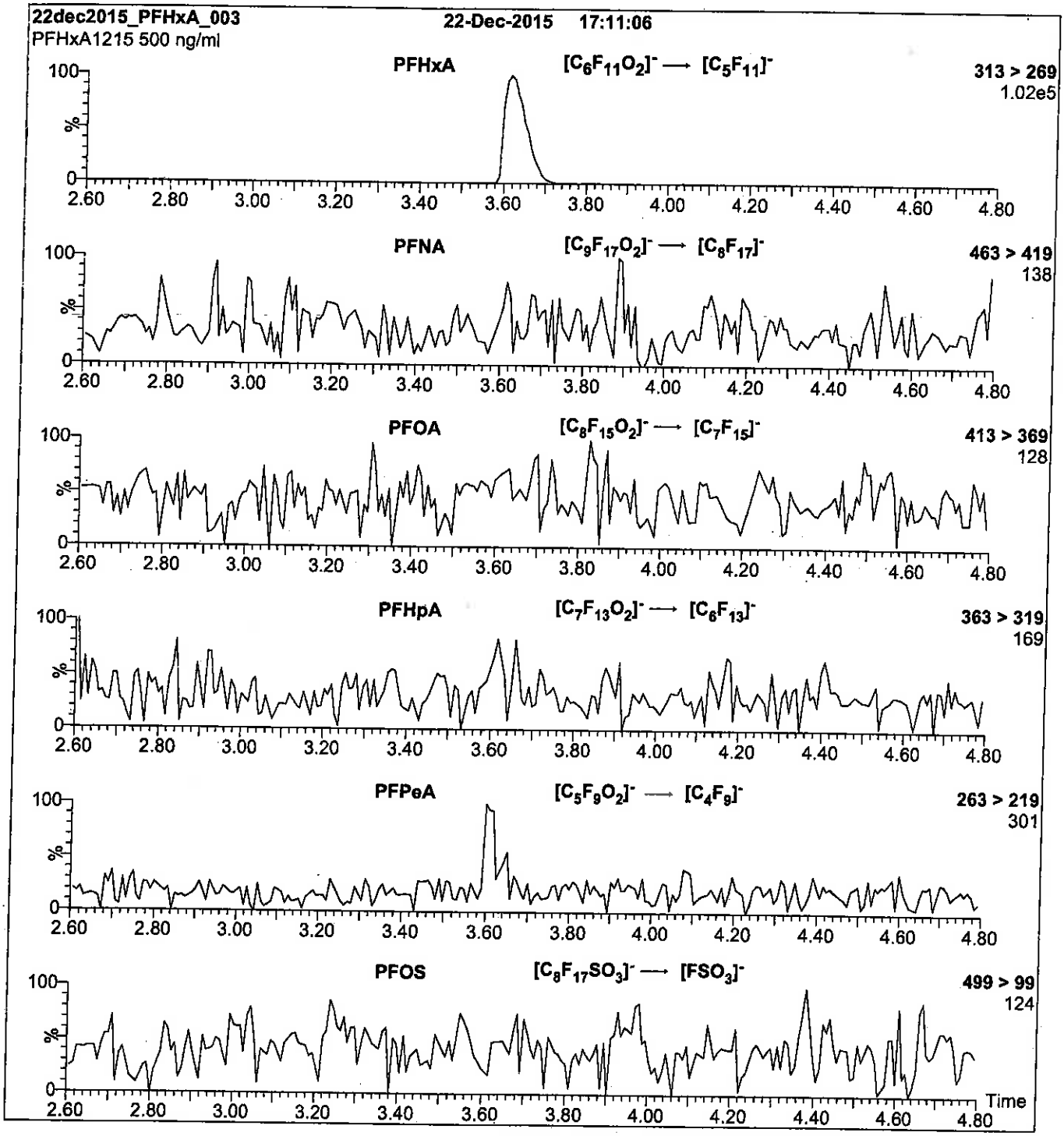
Flow: 300 µl/min

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 SR

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

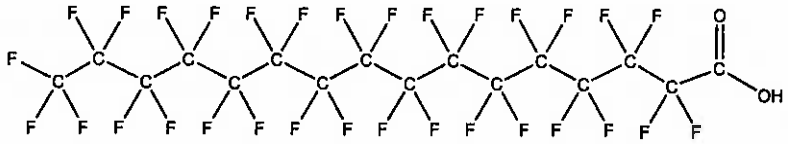
730631
ID: LCPFHxDA_00007
Exp: 05/25/21 Prpd: SBC
PFHxDA stock 50ug/mL

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 $x_1, x_2, \ldots x_n$ 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:

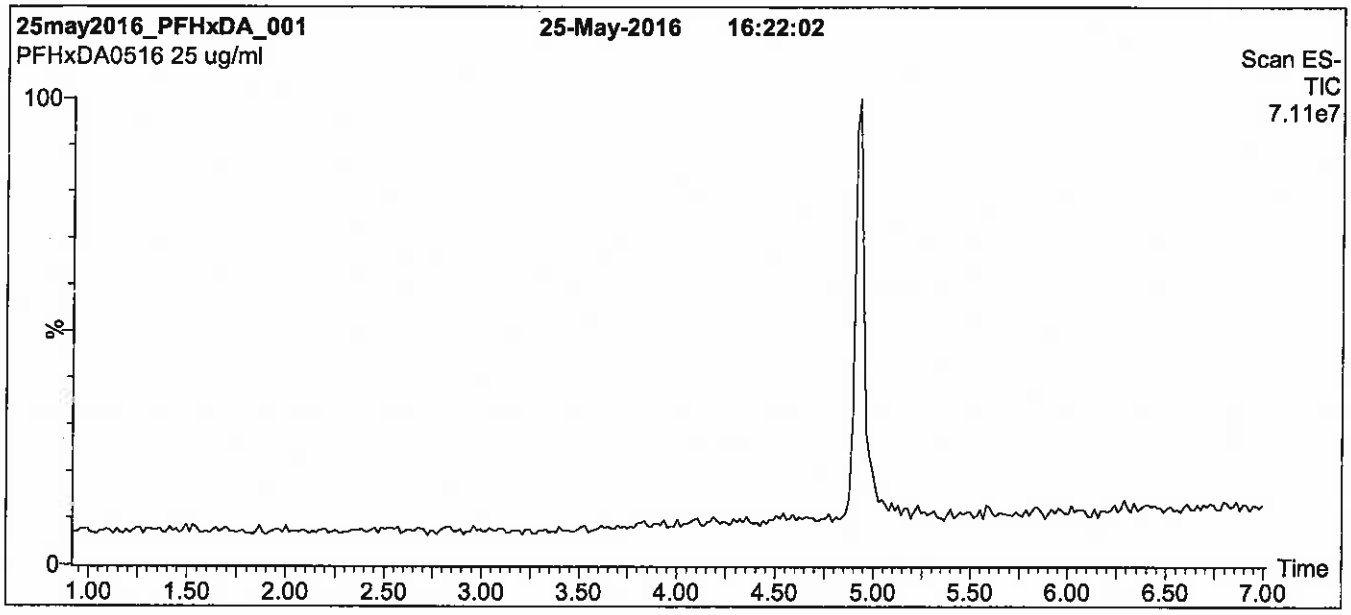
At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

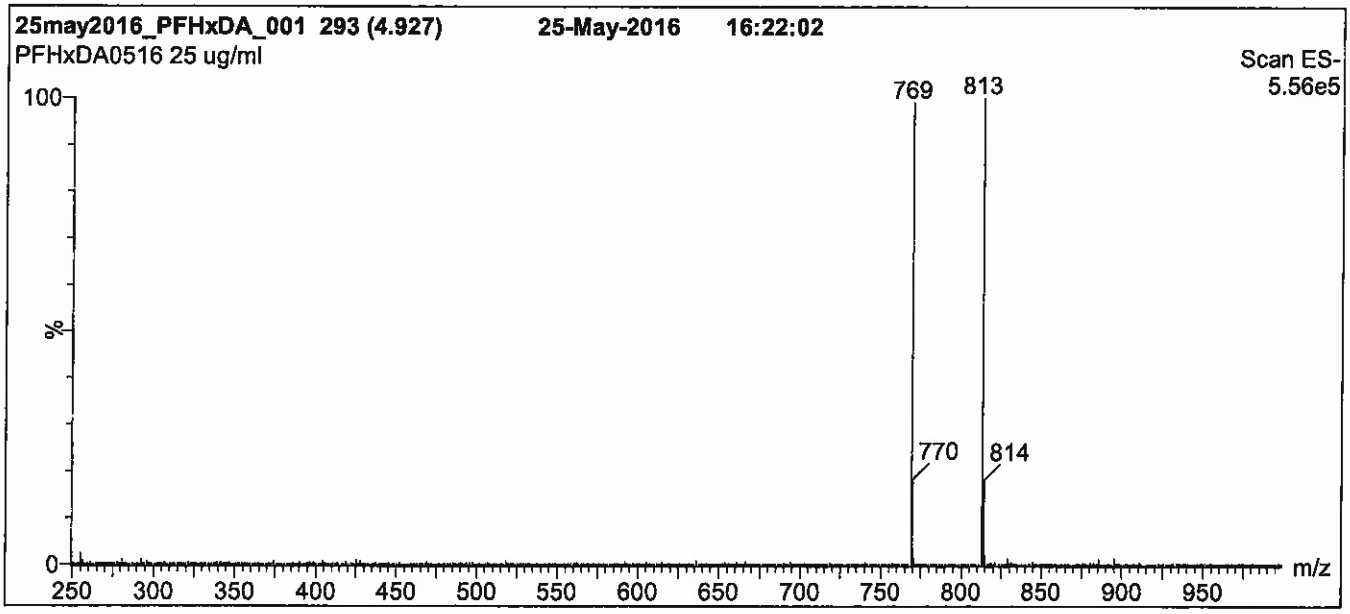
QUALITY MANAGEMENT:

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: **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

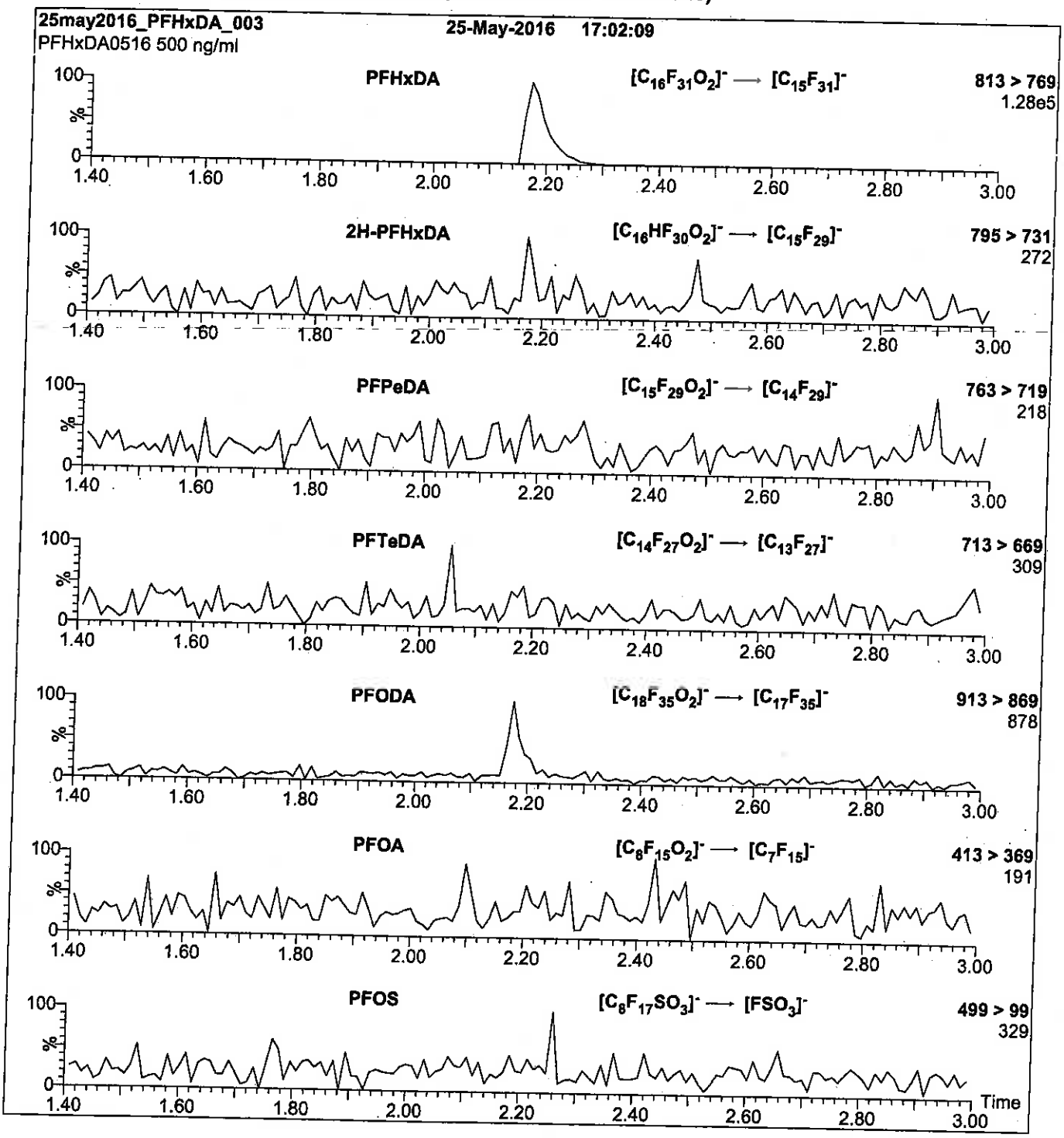
Flow: 300 µl/min

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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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

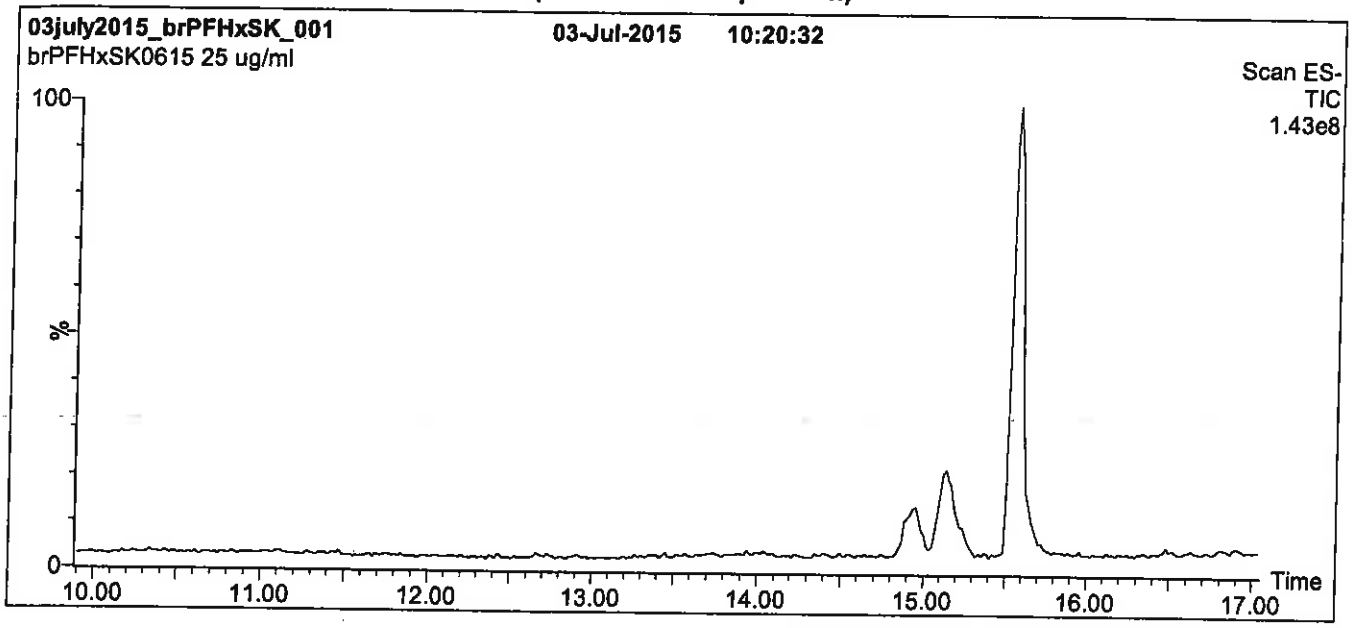
Table A: **br-PFHxSK; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

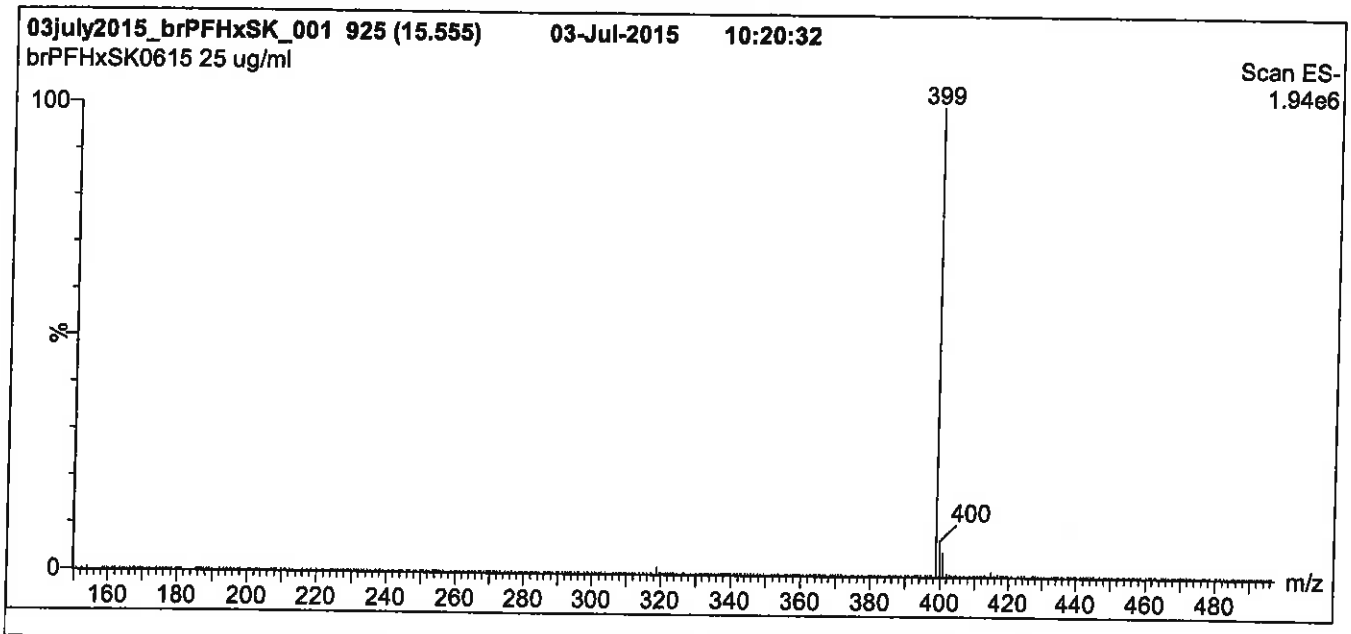
Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	Potassium perfluoro-1-hexanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	81.1
2	Potassium 1-trifluoromethylperfluoropentanesulfonate**	$CF_3CF_2CF_2CF_2CF(CF_3)CF_2SO_3^-K^+$	2.9
3	Potassium 2-trifluoromethylperfluoropentanesulfonate	$CF_3CF_2CF_2CF(CF_3)CF_2CF_2SO_3^-K^+$	1.4
4	Potassium 3-trifluoromethylperfluoropentanesulfonate	$CF_3CF_2CF(CF_3)CF_2CF_2CF_2SO_3^-K^+$	5.0
5	Potassium 4-trifluoromethylperfluoropentanesulfonate	$CF_3CF(CF_3)CF_2CF_2CF_2CF_2SO_3^-K^+$	8.9
6	Potassium 3,3-di(trifluoromethyl)perfluorobutanesulfonate	$CF_3C(CF_3)(CF_3)CF_2CF_2SO_3^-K^+$	0.2
7	Other Unidentified Isomers		0.5

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

Certified By: B.G. Chittim **Date:** 07/15/2015 (mm/dd/yyyy)

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 20% (80:20 MeOH:ACN) / 80% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 50% organic over 14 min. Ramp to 90% organic over 3 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 20 min

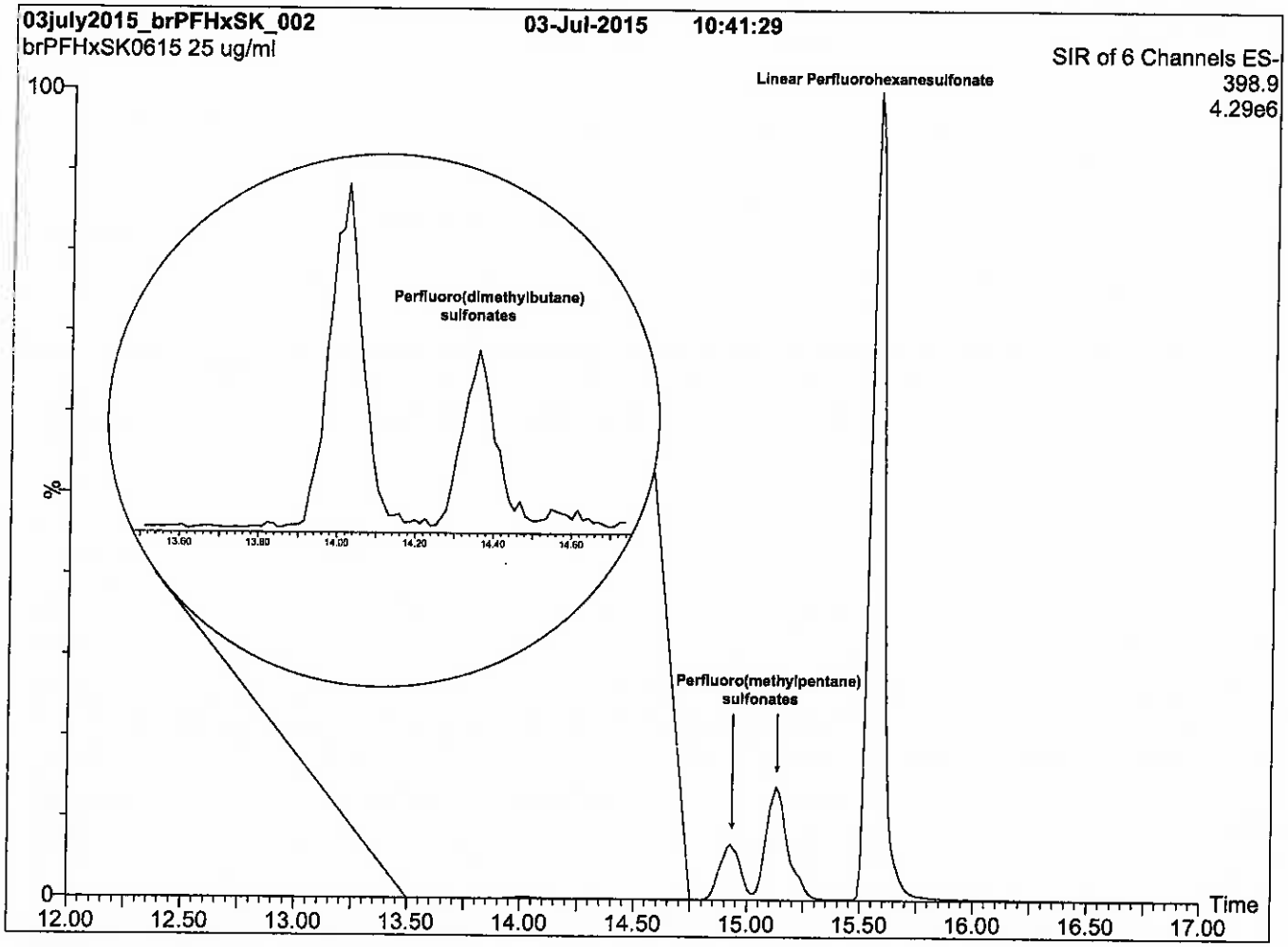
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

Figure 2: **br-PFHxSK; LC/MS Data**



Conditions for Figure 2:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 20% (80:20 MeOH:ACN) / 80% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 50% organic over 14 min. Ramp to 90% organic over 3 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 20 min

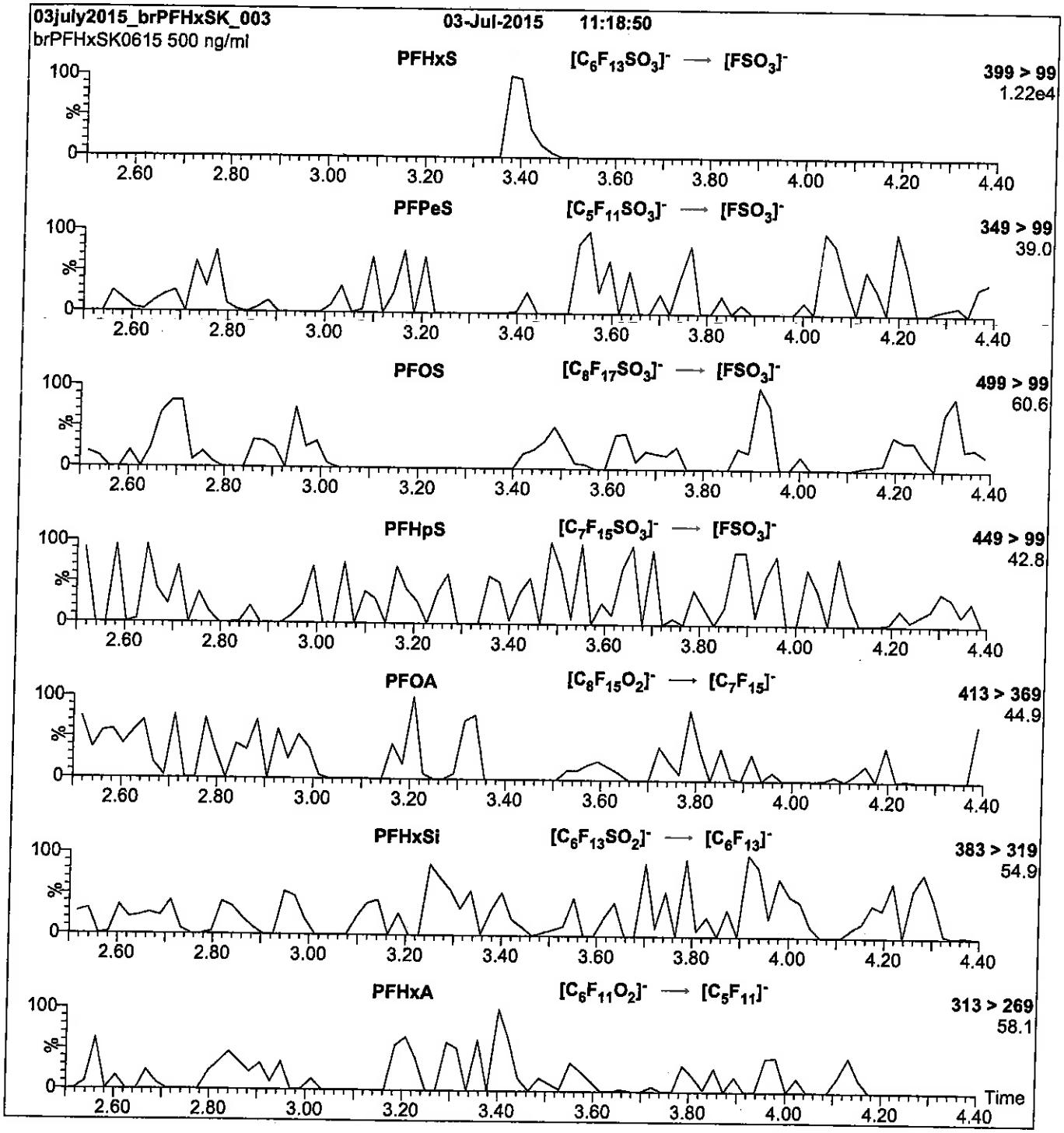
Flow: 300 µl/min

MS Parameters

Experiment: SIR (6 channels)

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

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



Conditions for Figure 3:

Injection: Direct loop injection
10 µl (500 ng/ml br-PFHxSK)

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCPFNA_00005

609703
ID: LCPFNA_00005
Exp: 10/23/20 Prpd: CBW
PF-n-nonanoic acid

R: 4/7/16 CBW

WELLINGTON LABORATORIES

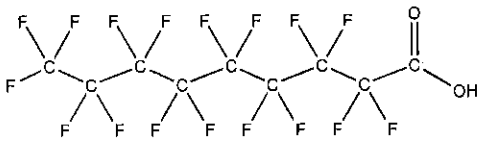
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFNA
COMPOUND: Perfluoro-n-nonanoic acid

LOT NUMBER: PFNA1015

STRUCTURE:

CAS #: 375-95-1



MOLECULAR FORMULA: $C_9HF_{17}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 464.08
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 10/23/2015
EXPIRY DATE: (mm/dd/yyyy) 10/23/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 10/30/2015 (mm/dd/yyyy)

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

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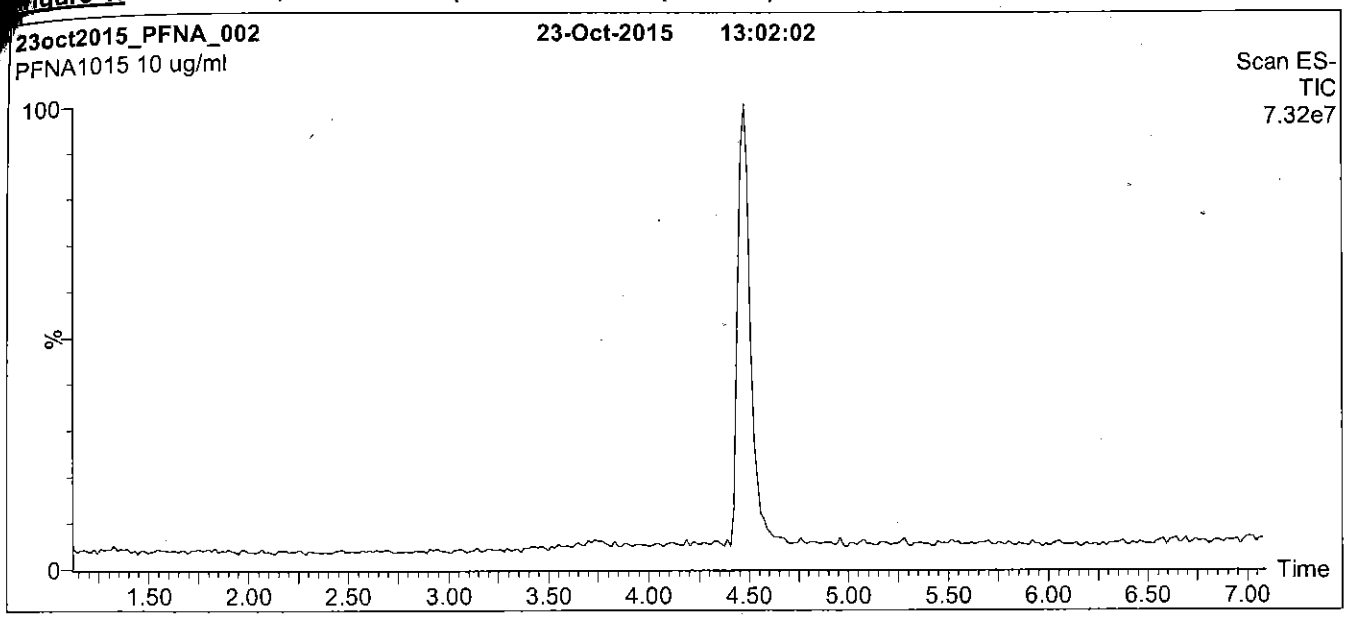
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

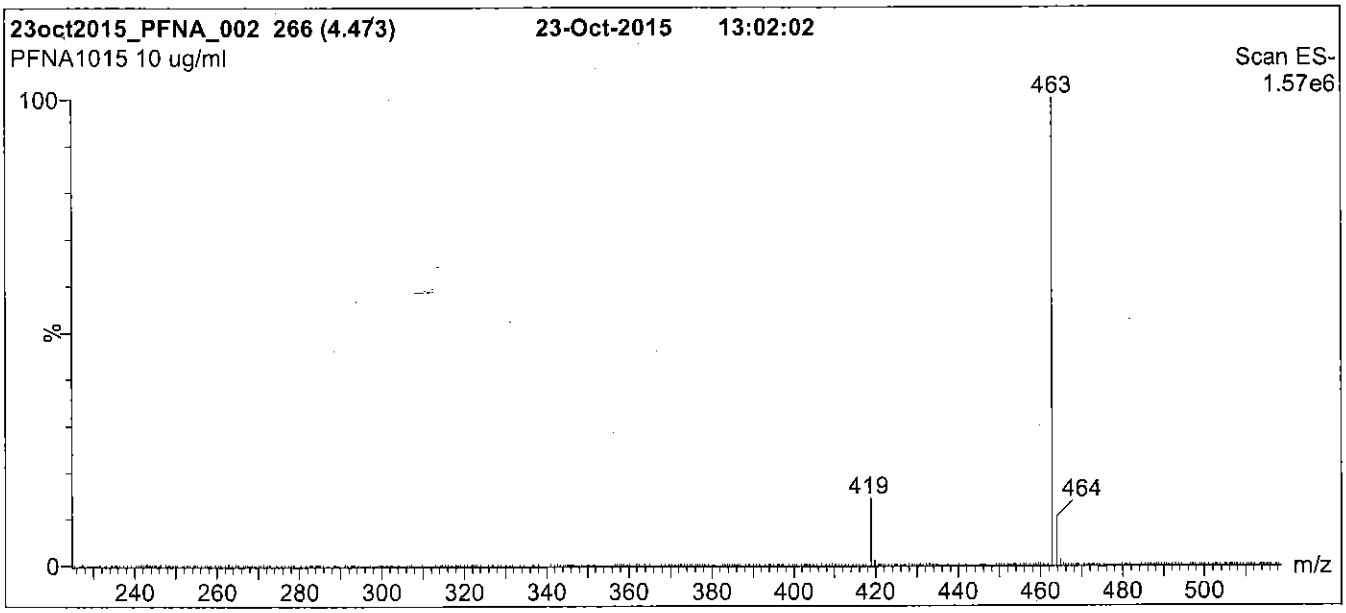
CALA Testing Accreditation No. A 1226

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

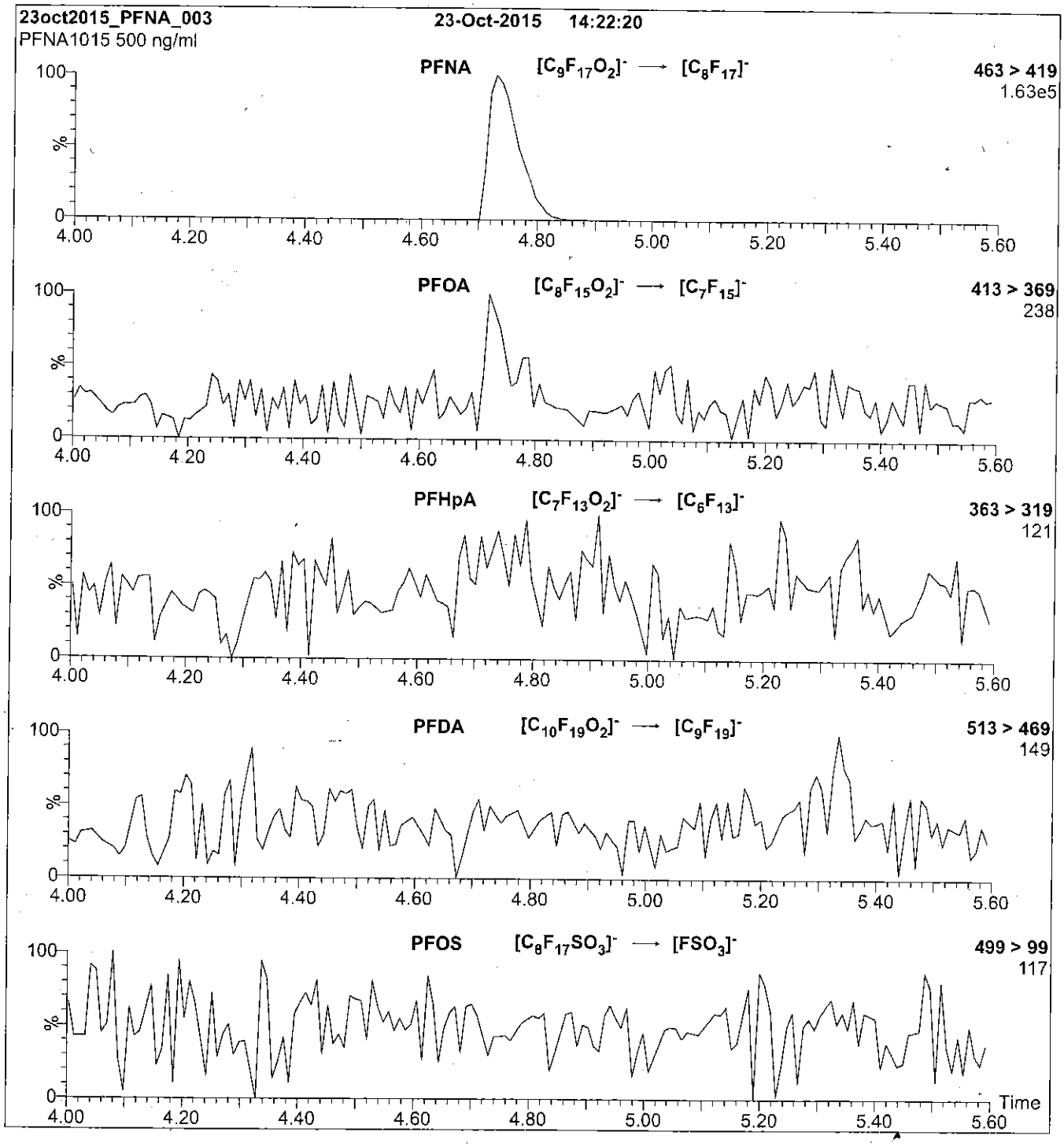
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCPFNA_00006

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

730559
ID: LCPFNA_00006
Exp: 10/23/20 Prpd: SBC
PF-n-nonanoic acid

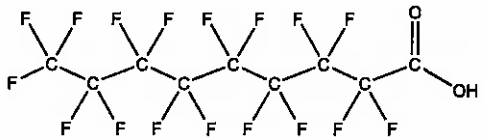
730560
ID: LCPFNA_00007
Exp: 10/23/20 Prpd: SBC
PF-n-nonanoic acid

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFNA
COMPOUND: Perfluoro-n-nonanoic acid
LOT NUMBER: PFNA1015

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:

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HAZARDS:

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

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

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

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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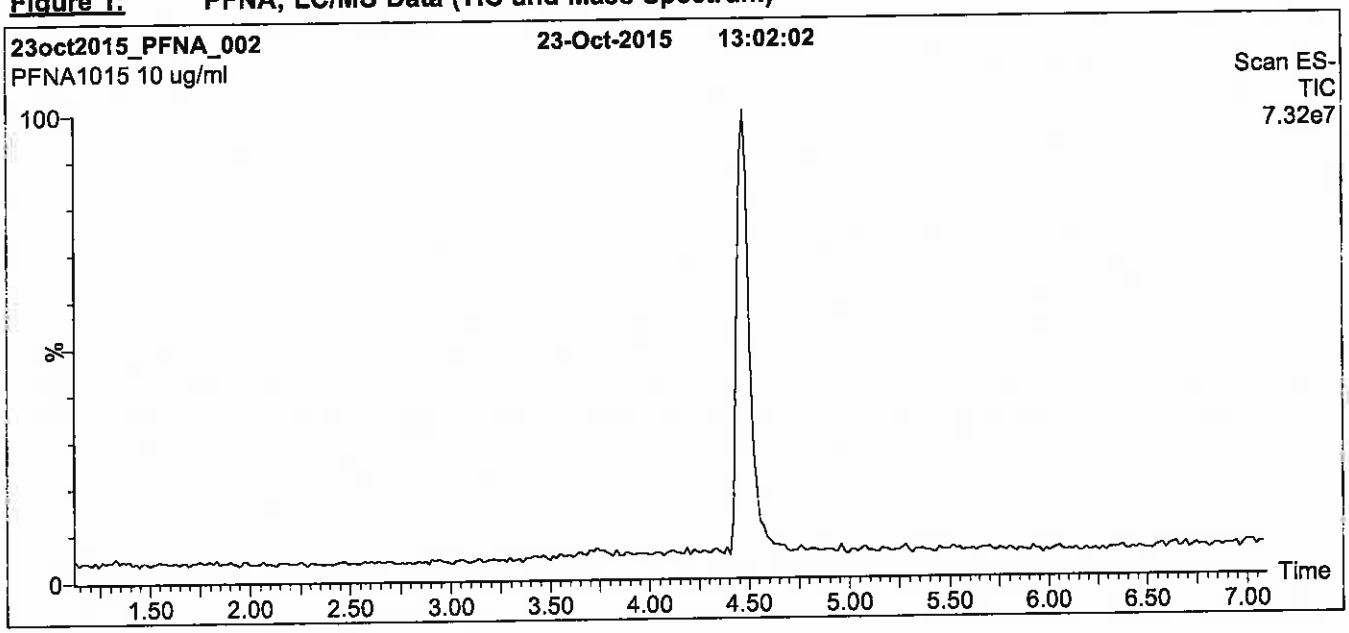
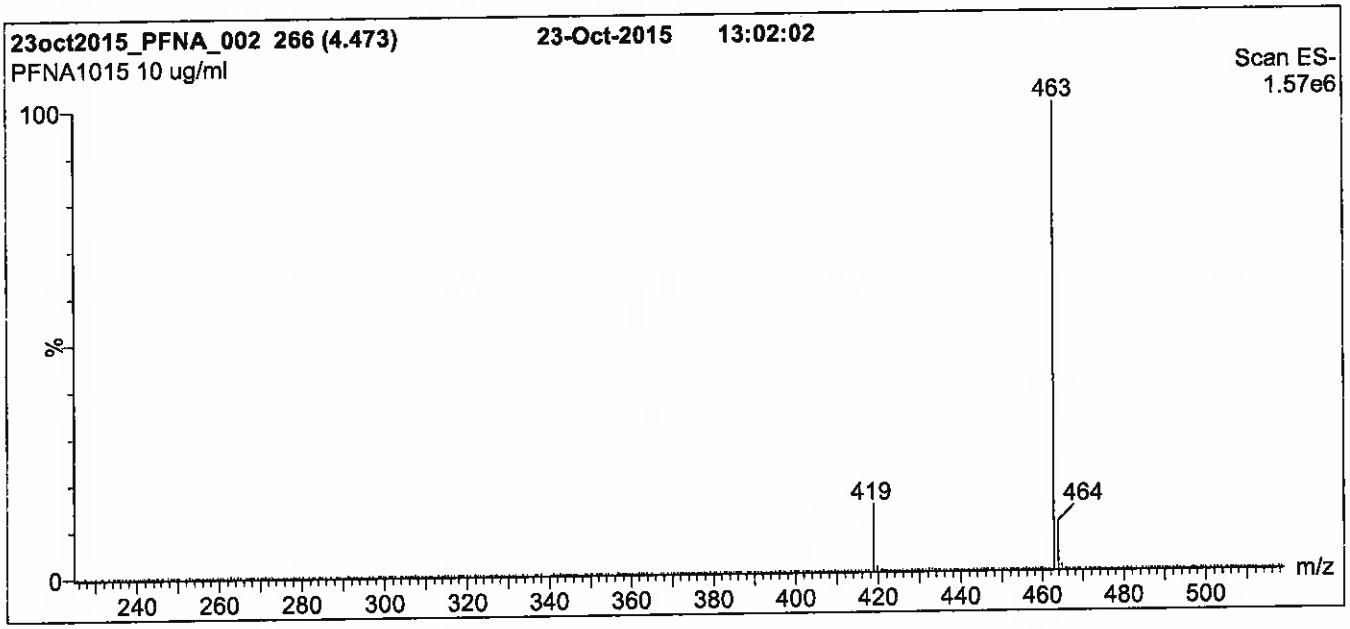




Conditions for Figure 1:

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

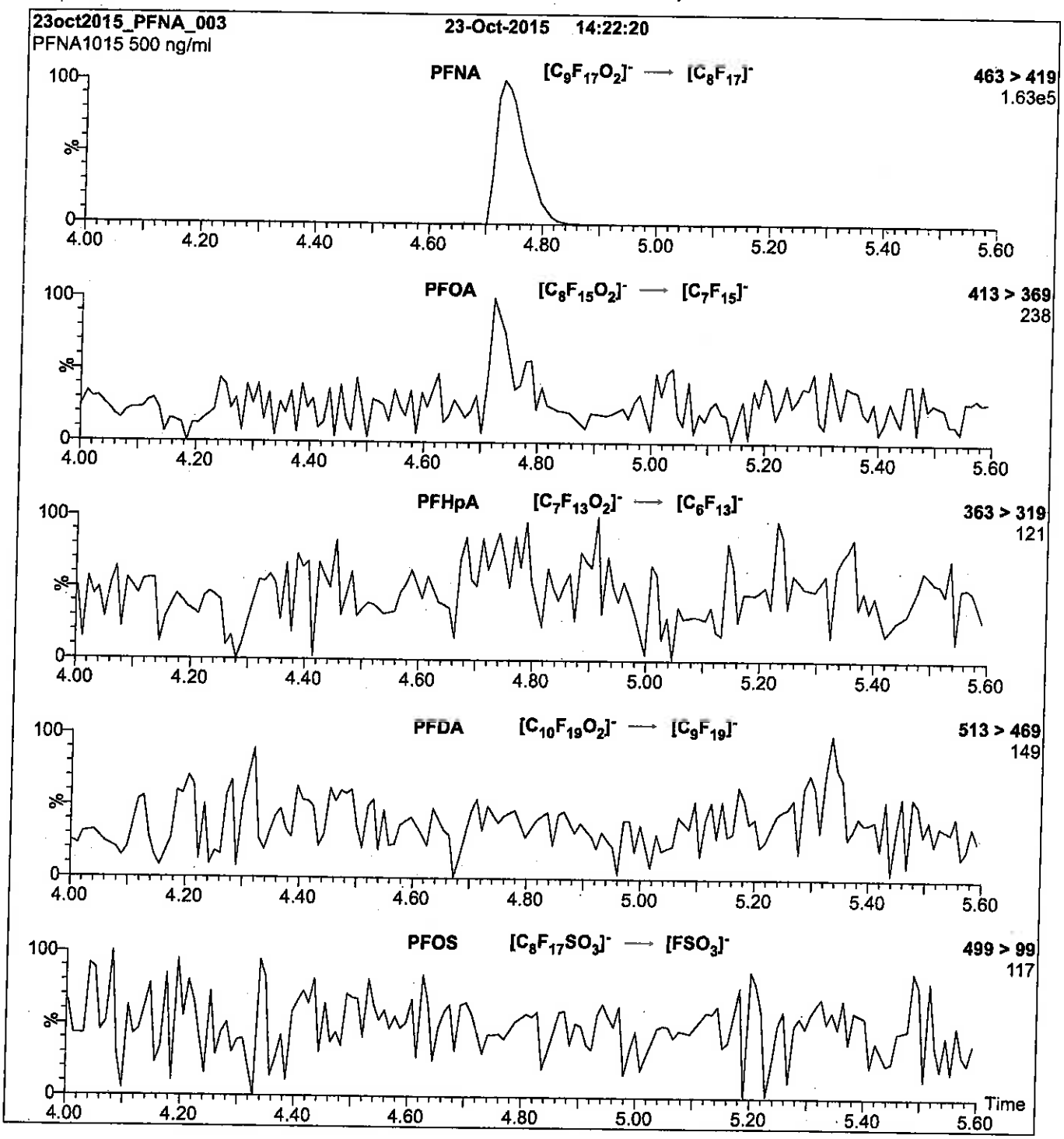
Flow: 300 µl/min

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)	**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) = 11
Flow:	300 µl/min	

Reagent

LCPFOA_00006

R-7/6/16 CBW

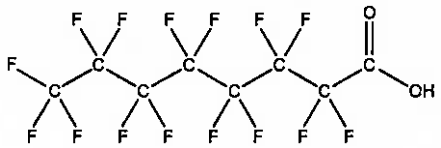
671577
ID: LCPFOA_00006
Exp: 11/06/20 Prpd: CBW
PF-n-octanoic acid

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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HOMOGENEITY:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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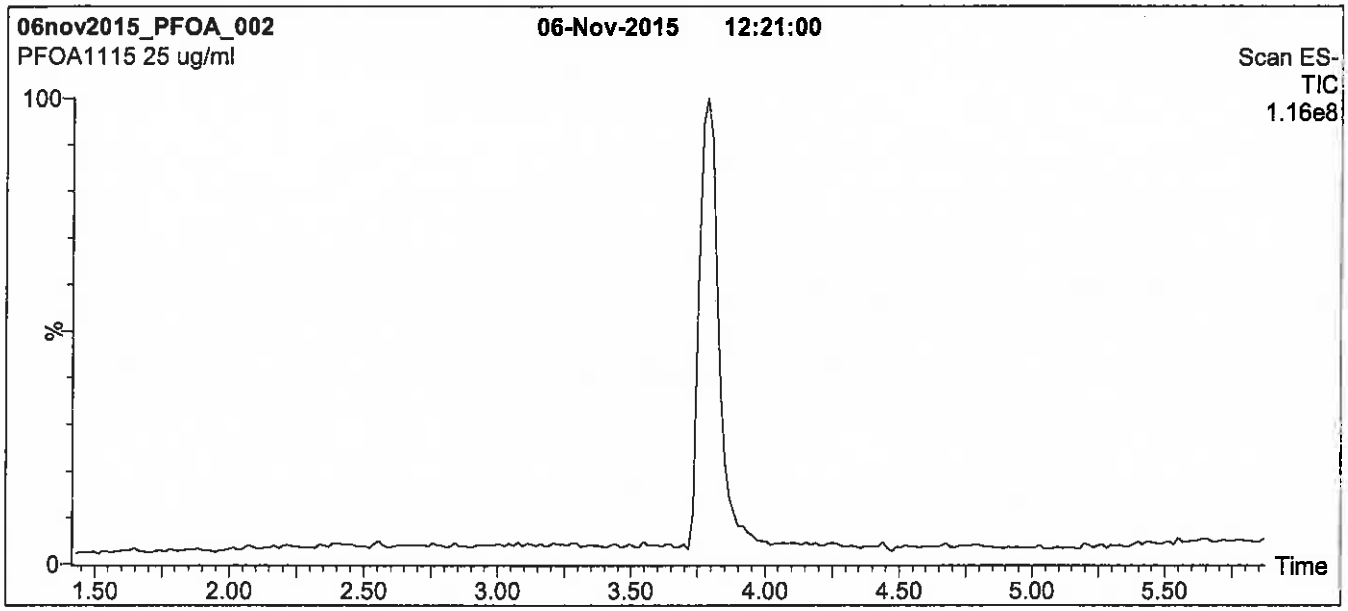
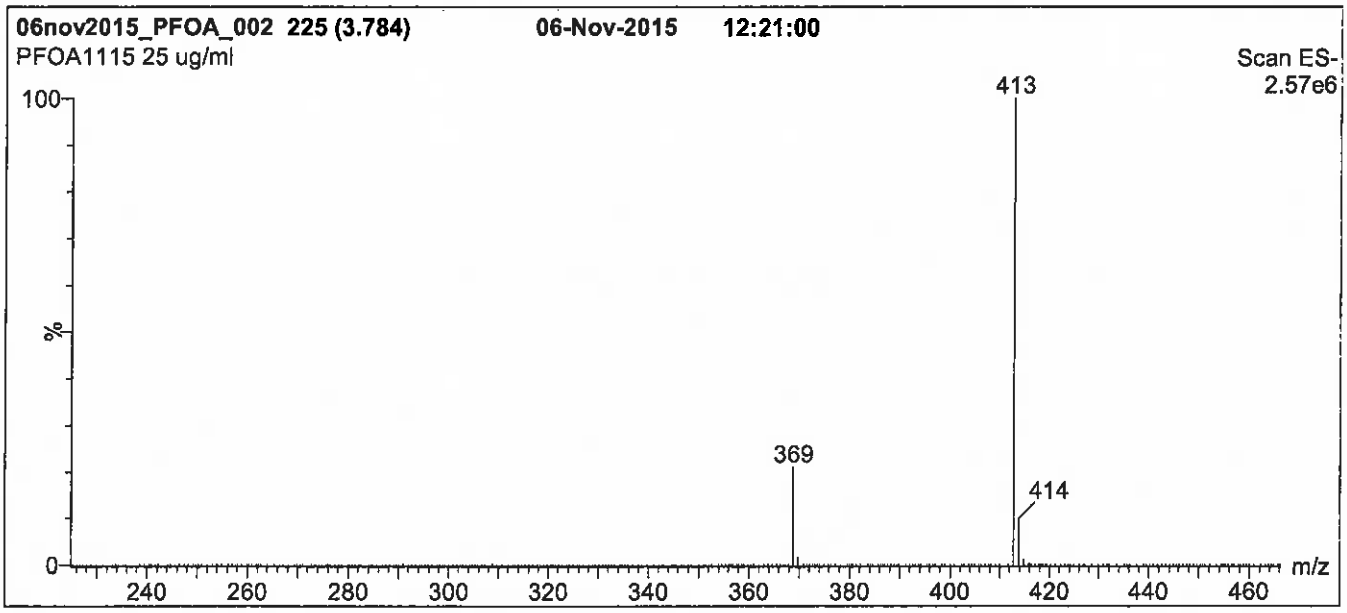
Figure 1: **PFOA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

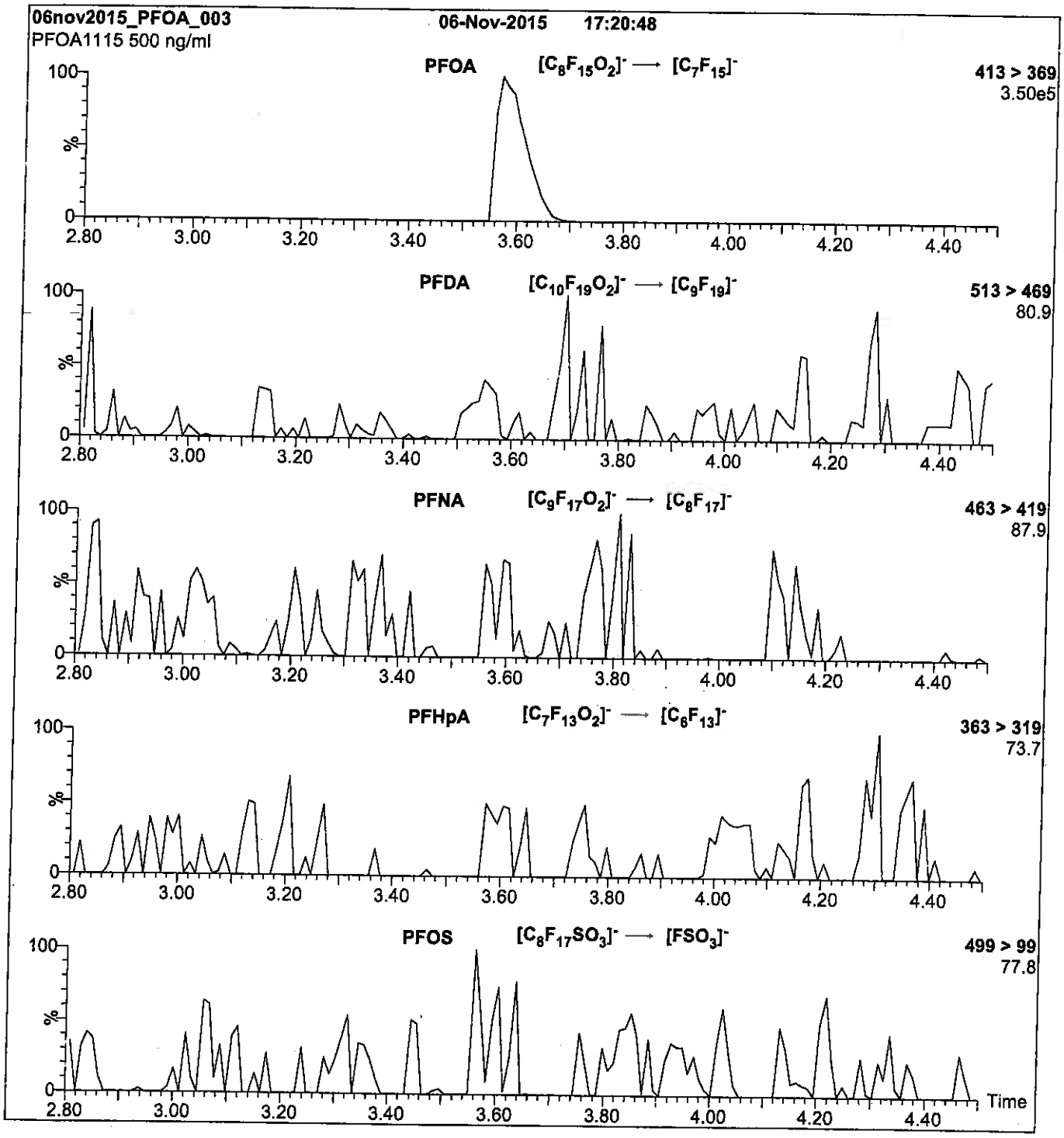
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.17e-3
Collision Energy (eV) = 10

Reagent

LCPFODA_00005

605234
ID: LCPFODA_00005
Exp: 01/30/20 Prpd: CBW
PFODA stock 50ug/mL

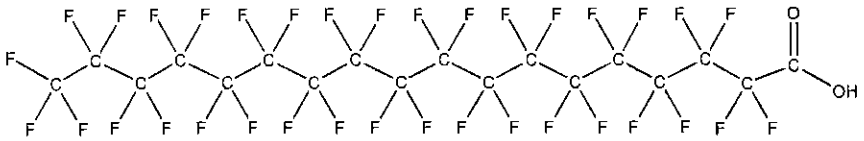
Rec. 3/29/16 JRB

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFODA
LOT NUMBER: PFODA0115
COMPOUND: Perfluoro-n-octadecanoic acid

STRUCTURE:
CAS #: 16517-11-6



MOLECULAR FORMULA: $C_{18}HF_{35}O_2$
MOLECULAR WEIGHT: 914.14
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

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

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Certified By: B.G. Chittim **Date:** 03/25/2015 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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CALA Testing Accreditation No. A1226

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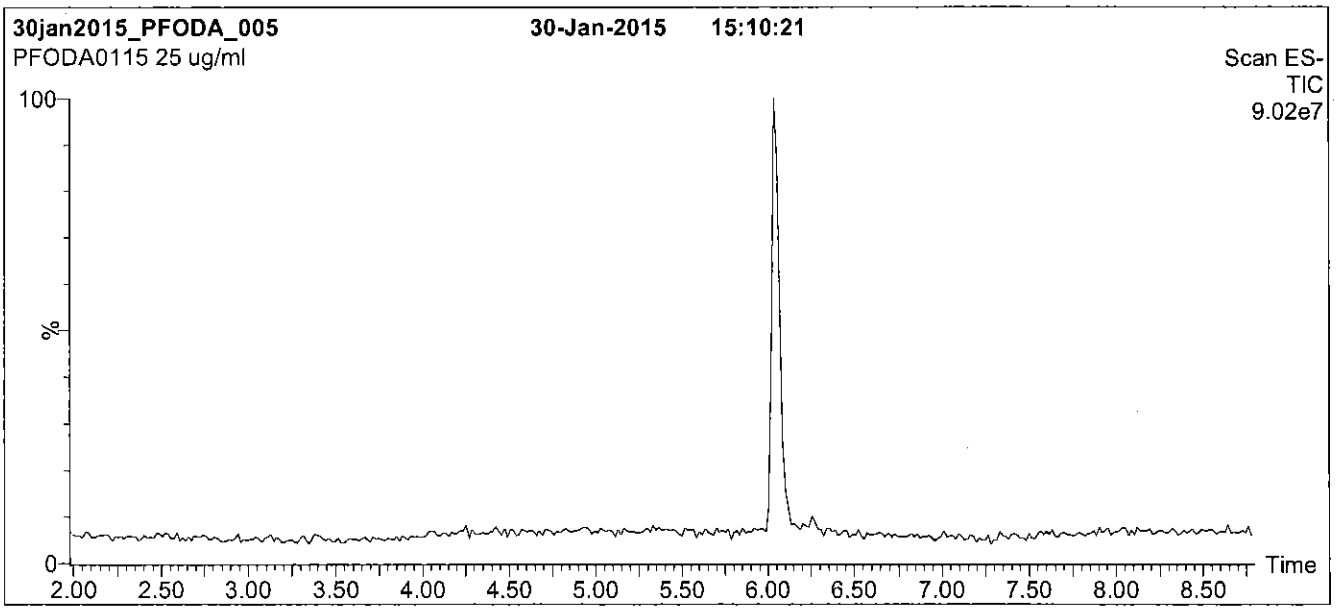

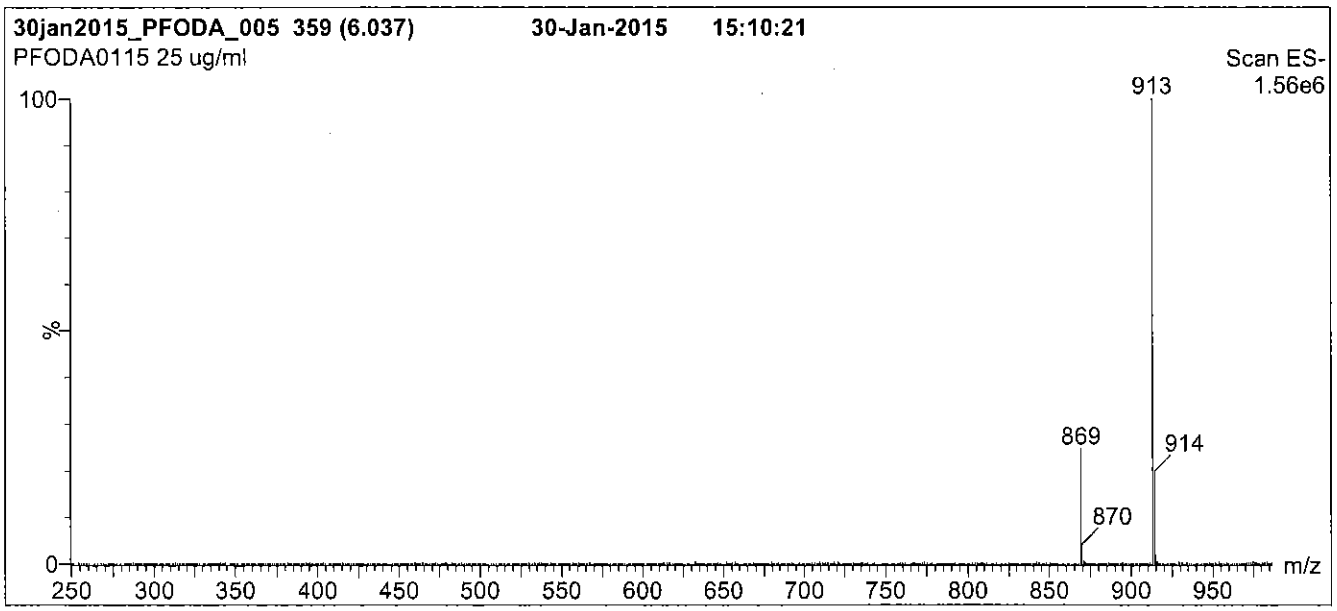

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Ramp to 90% organic over 7 min and hold for
1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

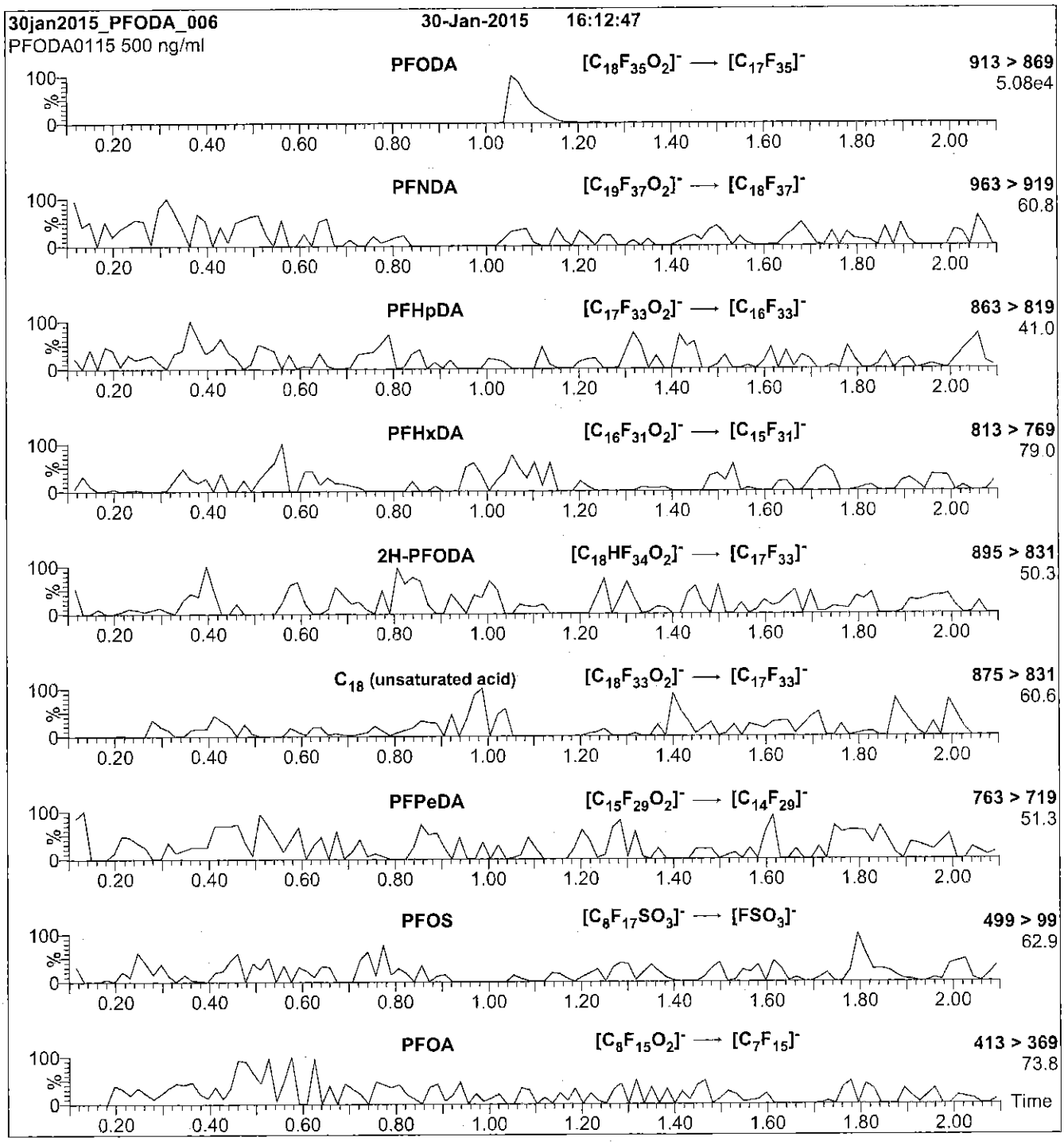
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1000 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 25.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 15

Reagent

LCPFODA_00006

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

730632
ID: LCPFODA_00006
Exp: 04/29/21 Prpd: SBC
PFODA stock 50ug/mL

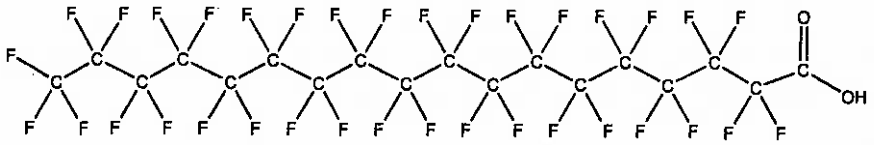
730633
ID: LCPFODA_00007
Exp: 04/29/21 Prpd: SBC
PFODA stock 50ug/mL

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFODA
LOT NUMBER: PFODA0416
COMPOUND: Perfluoro-n-octadecanoic acid

STRUCTURE:
CAS #: 16517-11-6



MOLECULAR FORMULA: $C_{18}HF_{35}O_2$
MOLECULAR WEIGHT: 914.14
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol, Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 04/29/2016
EXPIRY DATE: (mm/dd/yyyy) 04/29/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 05/20/2016 (mm/dd/yyyy)

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

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 Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17025 REFERENCE MATERIAL PRODUCER

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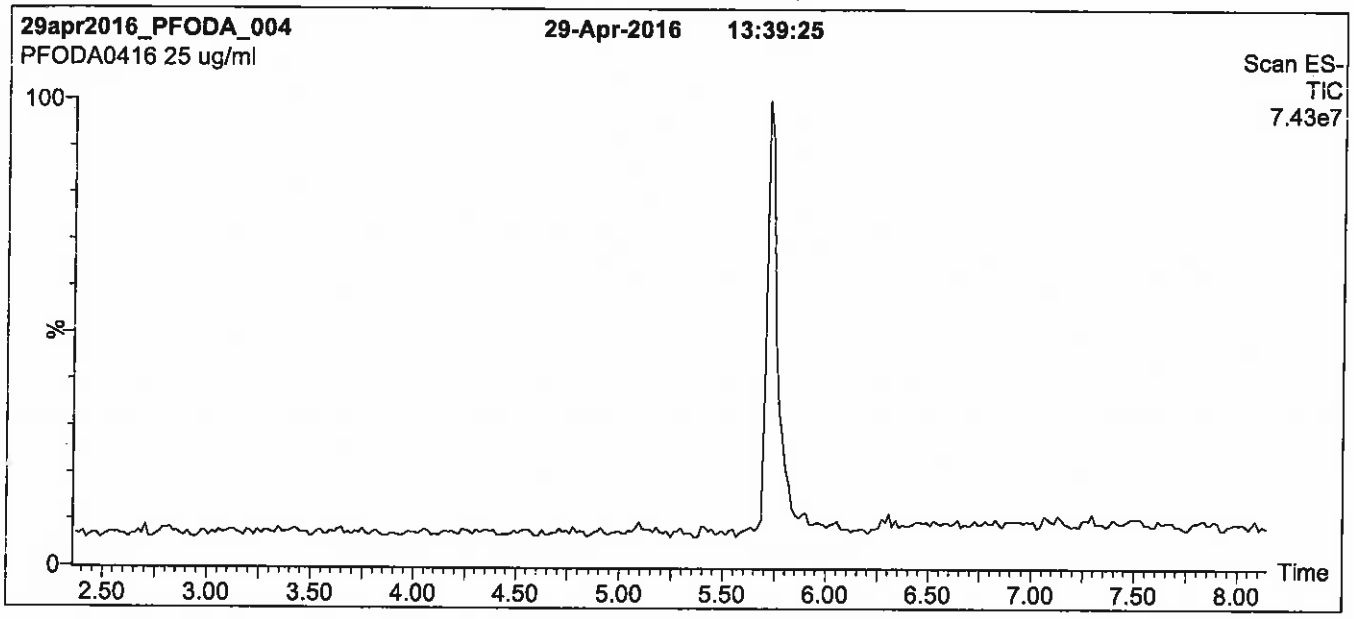
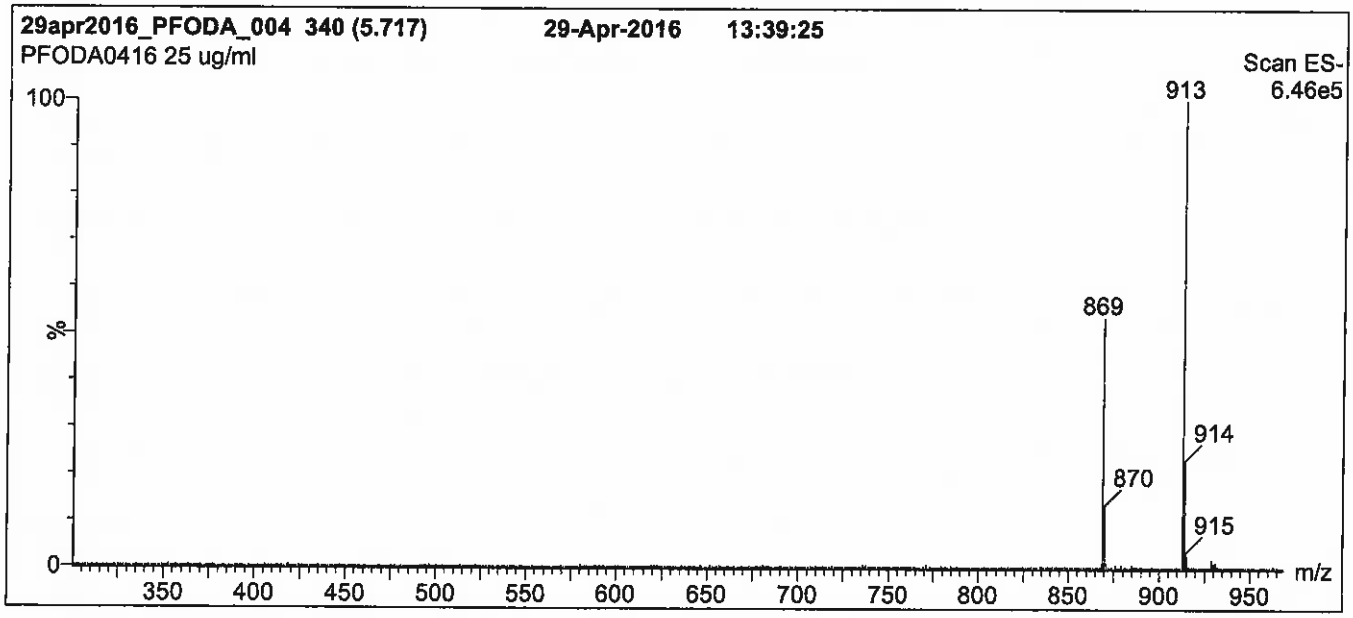
Figure 1: **PFODA; LC/MS Data (TIC and Mass Spectrum)**





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: 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

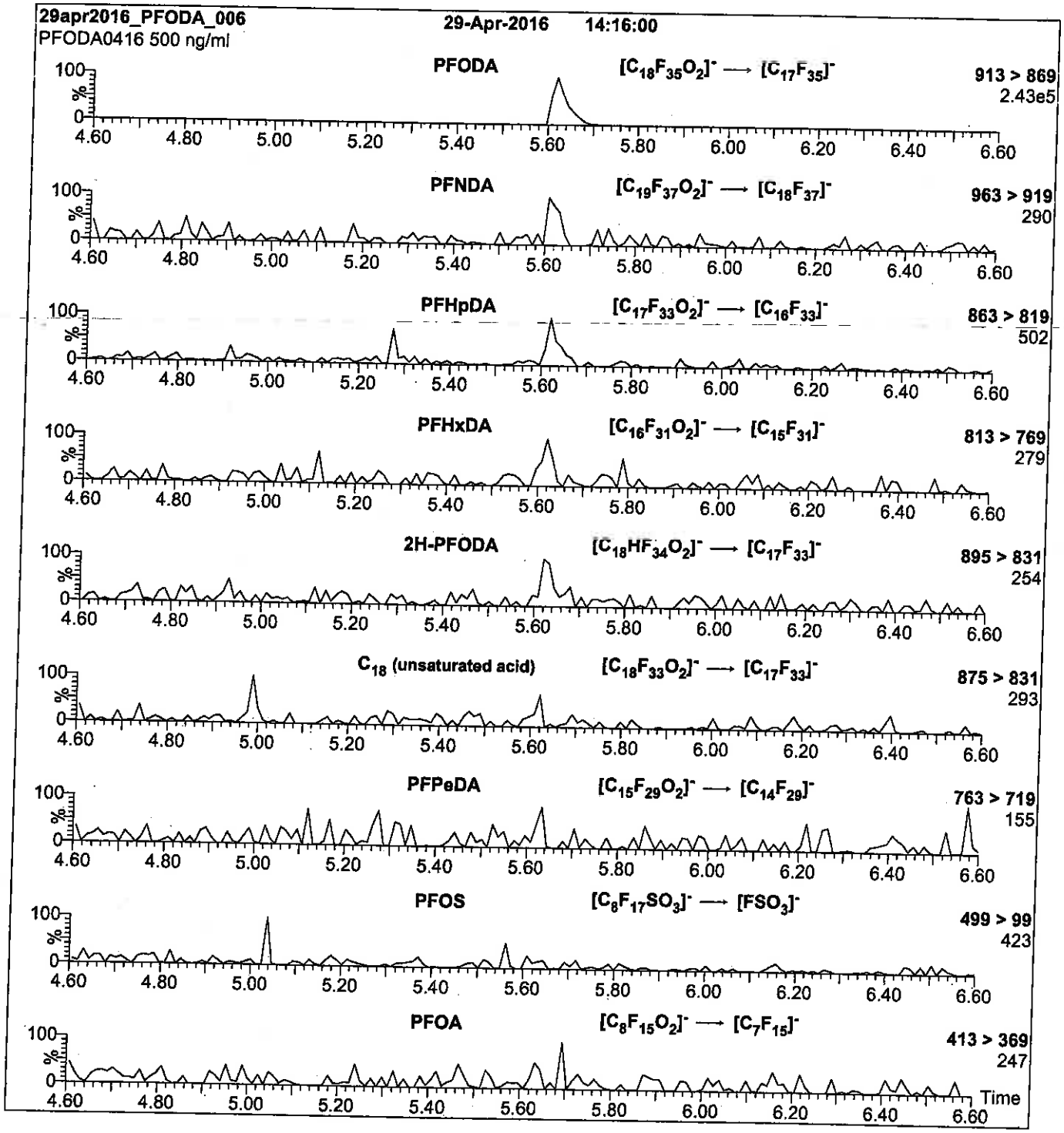
Flow: 300 µl/min

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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HOMOGENEITY:

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

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

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CALA Testing Accredited Laboratory No. A1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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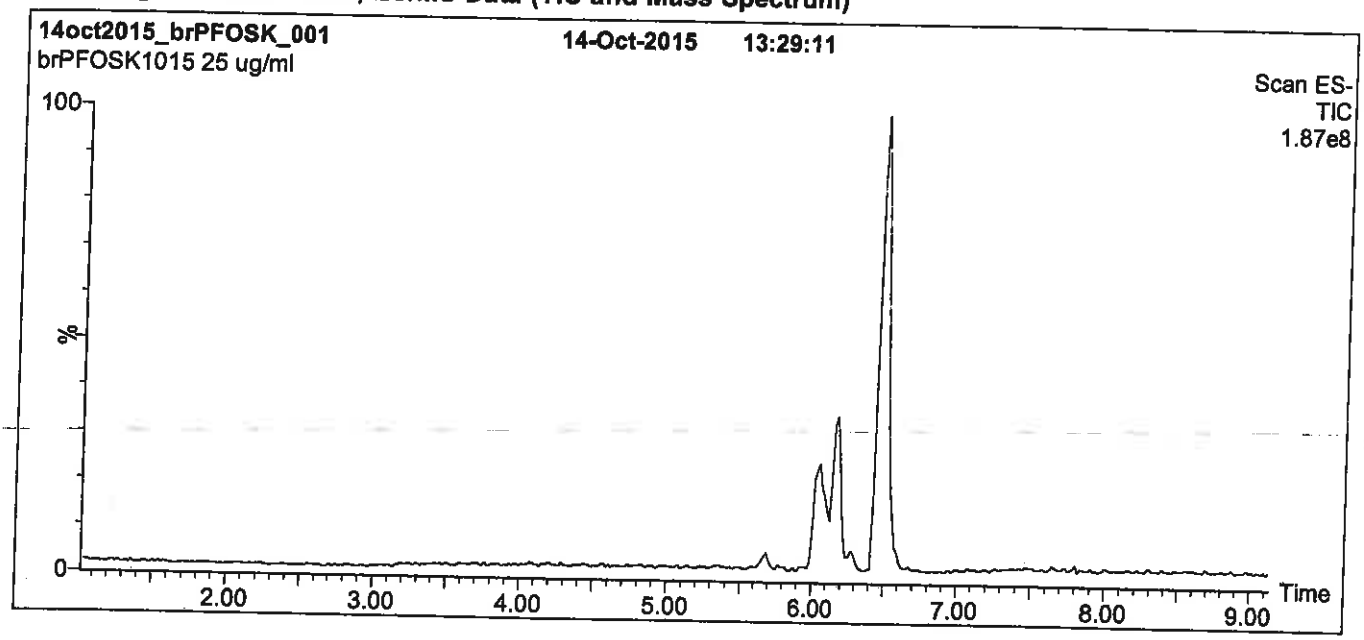
Table A: **br-PFOSK; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

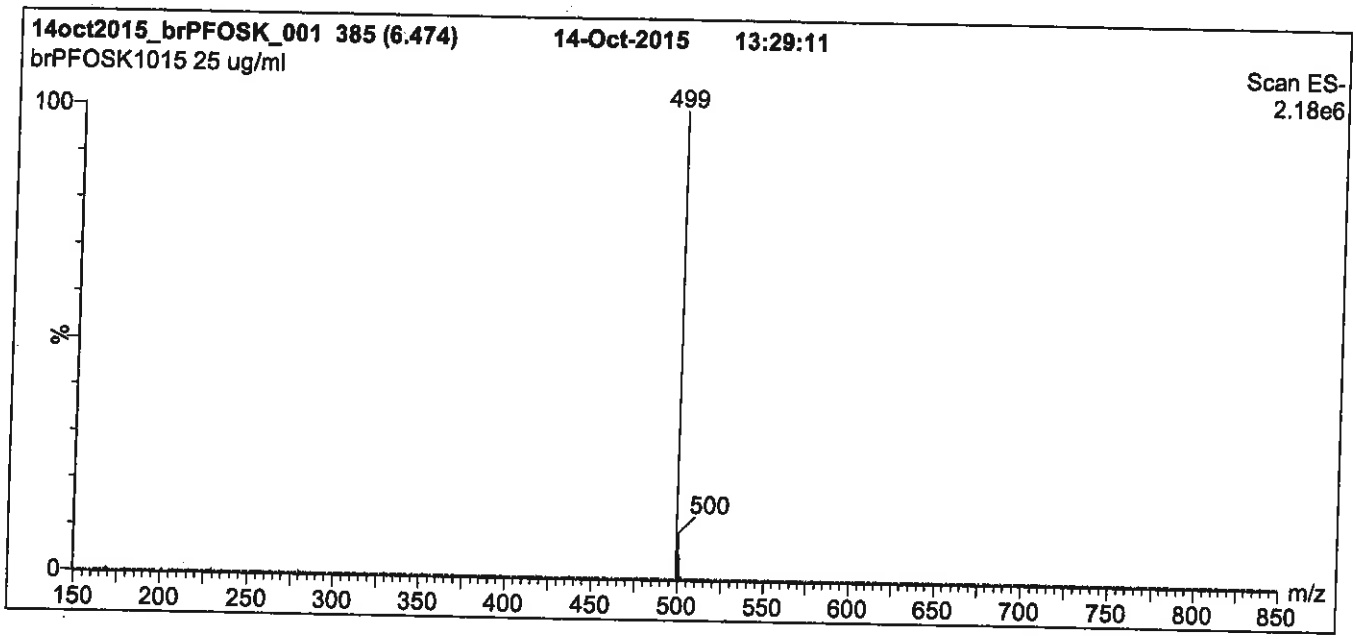
Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	Potassium perfluoro-1-octanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	78.8
2	Potassium 1-trifluoromethylperfluoroheptanesulfonate**	$CF_3CF_2CF_2CF_2CF_2CF_2CF(CF_3)SO_3^-K^+$	1.2
3	Potassium 2-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF(CF_3)CF_2SO_3^-K^+$	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	$CF_3-C(CF_3)_2CF_2CF_2CF_2CF_2SO_3^-K^+$	0.2
9	Potassium 4,4-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3CF_2-C(CF_3)_2-CF_2CF_2CF_2SO_3^-K^+$	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: B.G. Chittim **Date:** 10/15/2015 (mm/dd/yyyy)

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 45% (80:20 MeOH:ACN) / 55% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 12 min and hold for 2 min.
Return to initial conditions over 0.5 min.
Time: 16 min

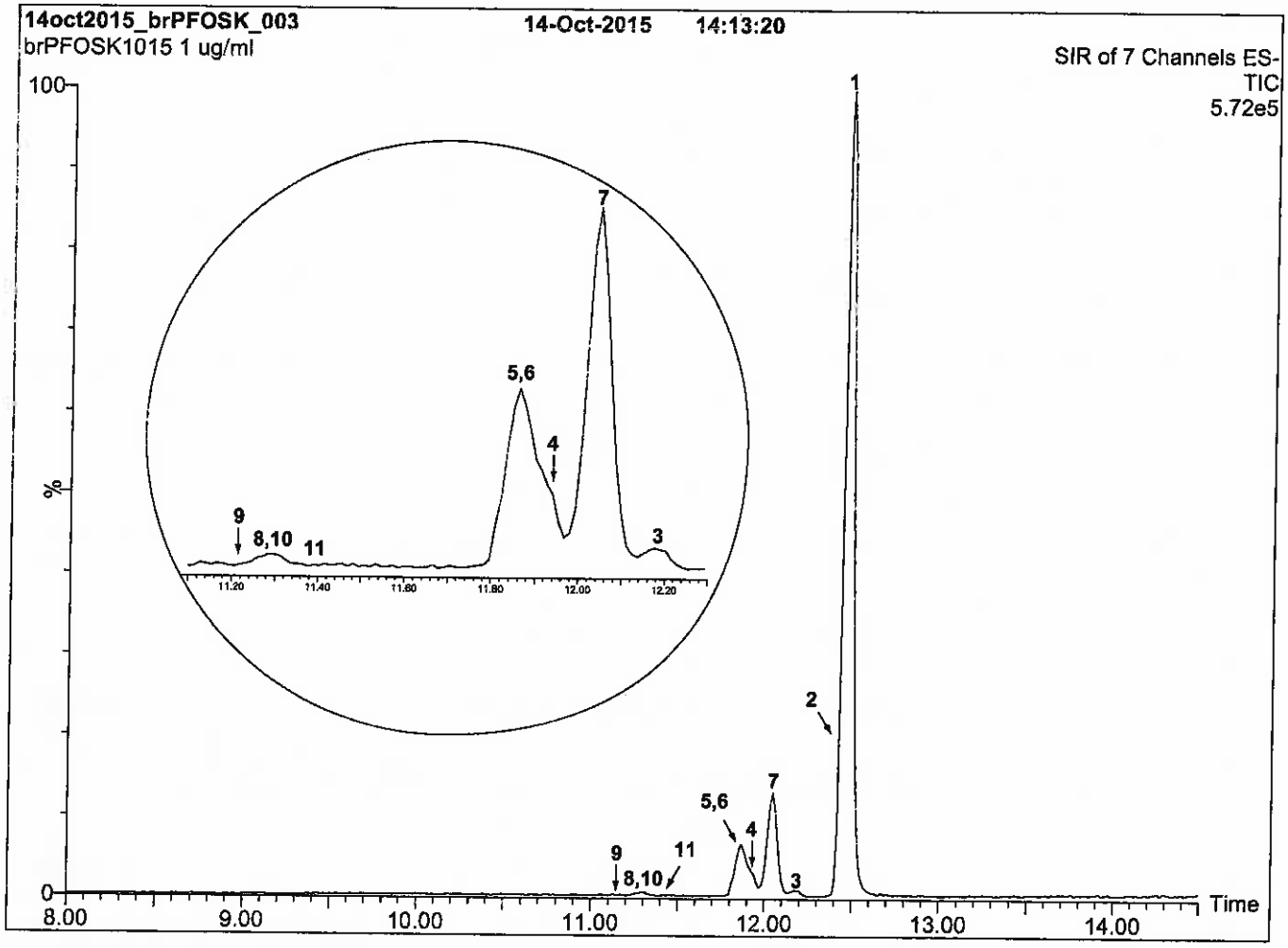
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 60.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **br-PFOSK; LC/MS Data (SIR)**



Conditions for Figure 2:

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

Chromatographic Conditions:

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

Injection: 1.0 µg/ml of br-PFOSK

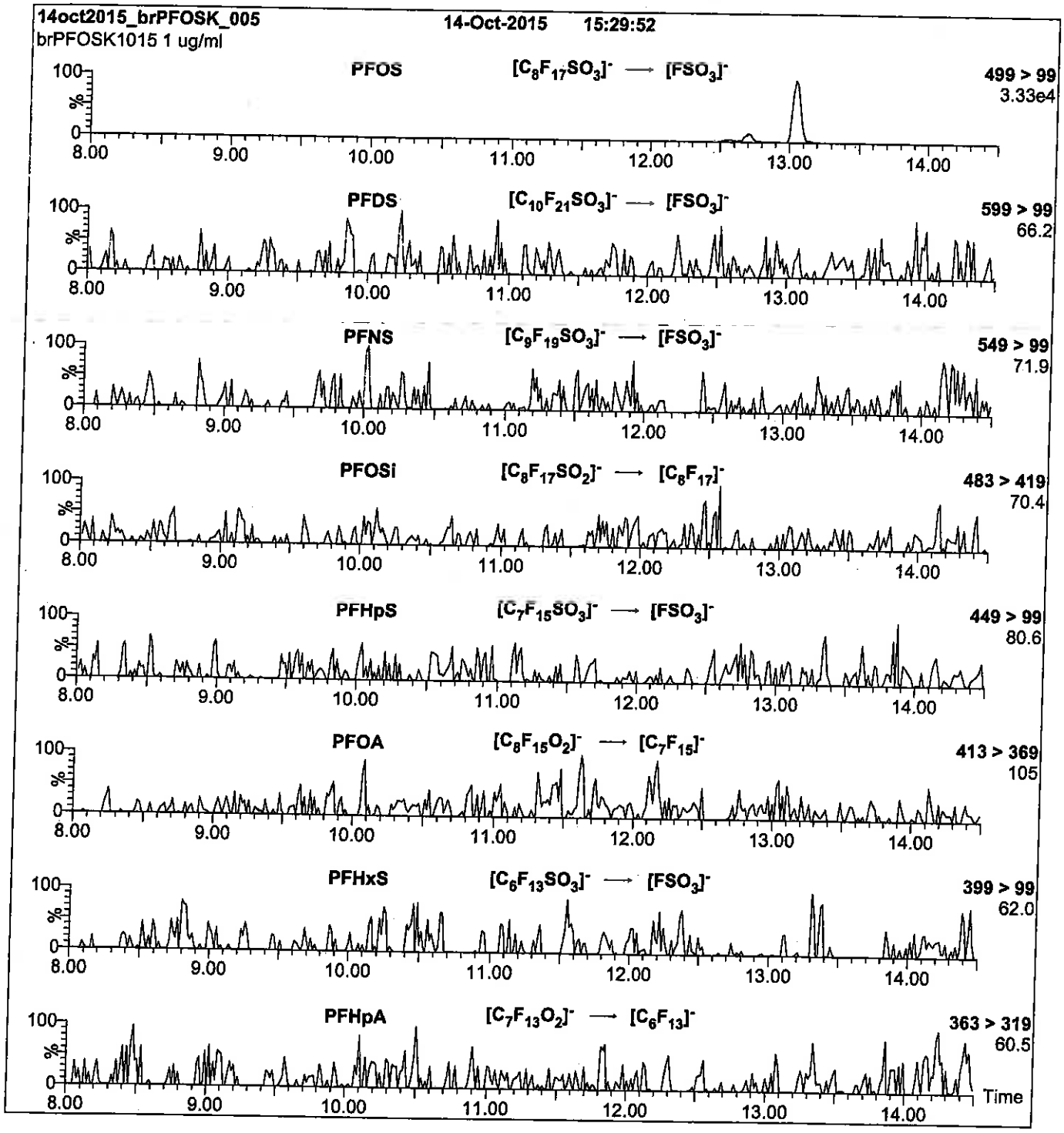
Mobile Phase: Gradient
45% (80:20 MeOH:ACN) / 55% H_2O (both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 15 min and hold for 3 min.
Return to initial conditions over 1 min.
Time: 20 min

Flow: 300 µl/min

MS Conditions:

SIR (ES^-)
Source = 110 °C
Desolvation = 325 °C
Cone Voltage = 60V

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



Conditions for Figure 3:

Injection: On-column

Mobile phase: Same as Figure 2

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.06e-3
Collision Energy (eV) = 11-50 (variable)

Reagent

LCPFOSA_00006

Rec 12/30/15 CW

WELLINGTON LABORATORIES

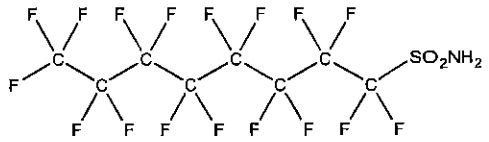
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: FOSA-I
COMPOUND: Perfluoro-1-octanesulfonamide

LOT NUMBER: FOSA0815I

STRUCTURE:

CAS #: 754-91-6



MOLECULAR FORMULA:	$C_8H_2F_{17}NO_2S$	**MOLECULAR WEIGHT:**	499.14
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Isopropanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	09/02/2015		
EXPIRY DATE: (mm/dd/yyyy)	09/02/2017		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 09/11/2015 (mm/dd/yyyy)

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

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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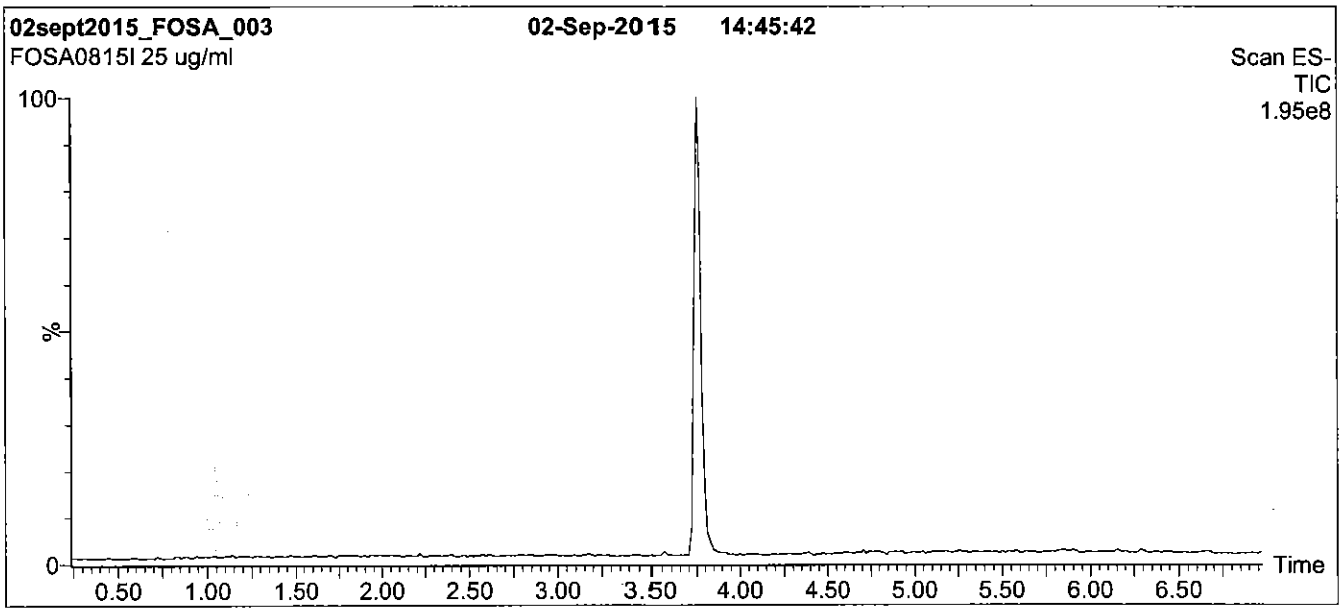
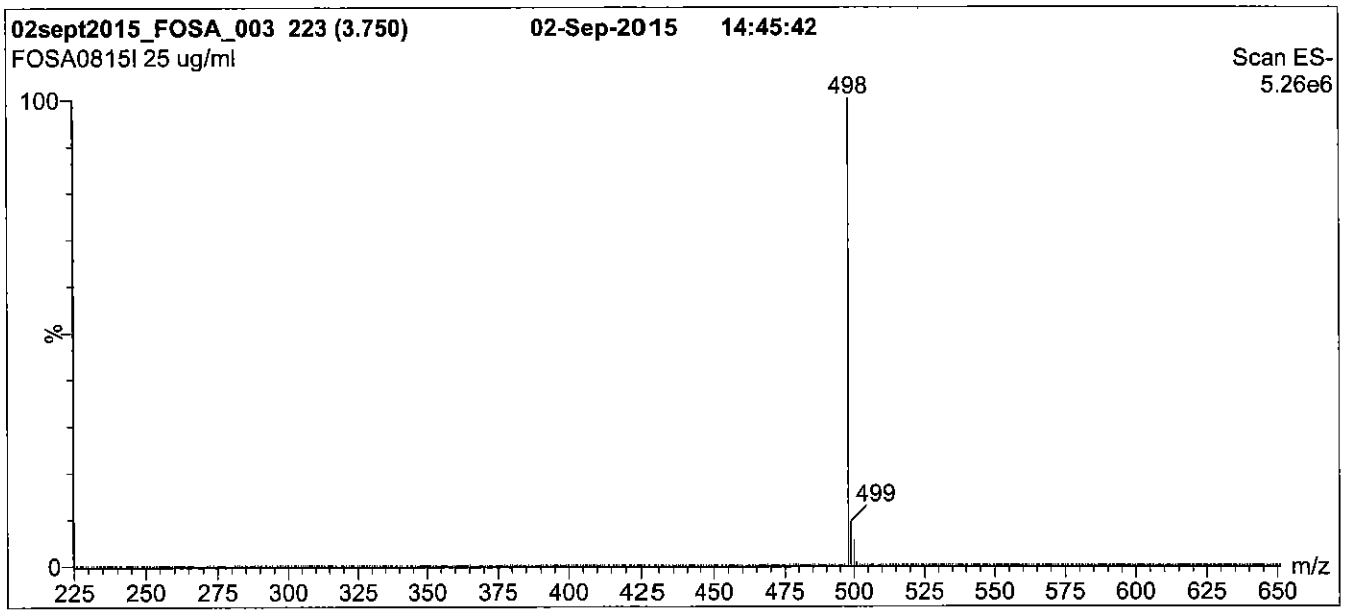
Figure 1: **FOSA-I; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

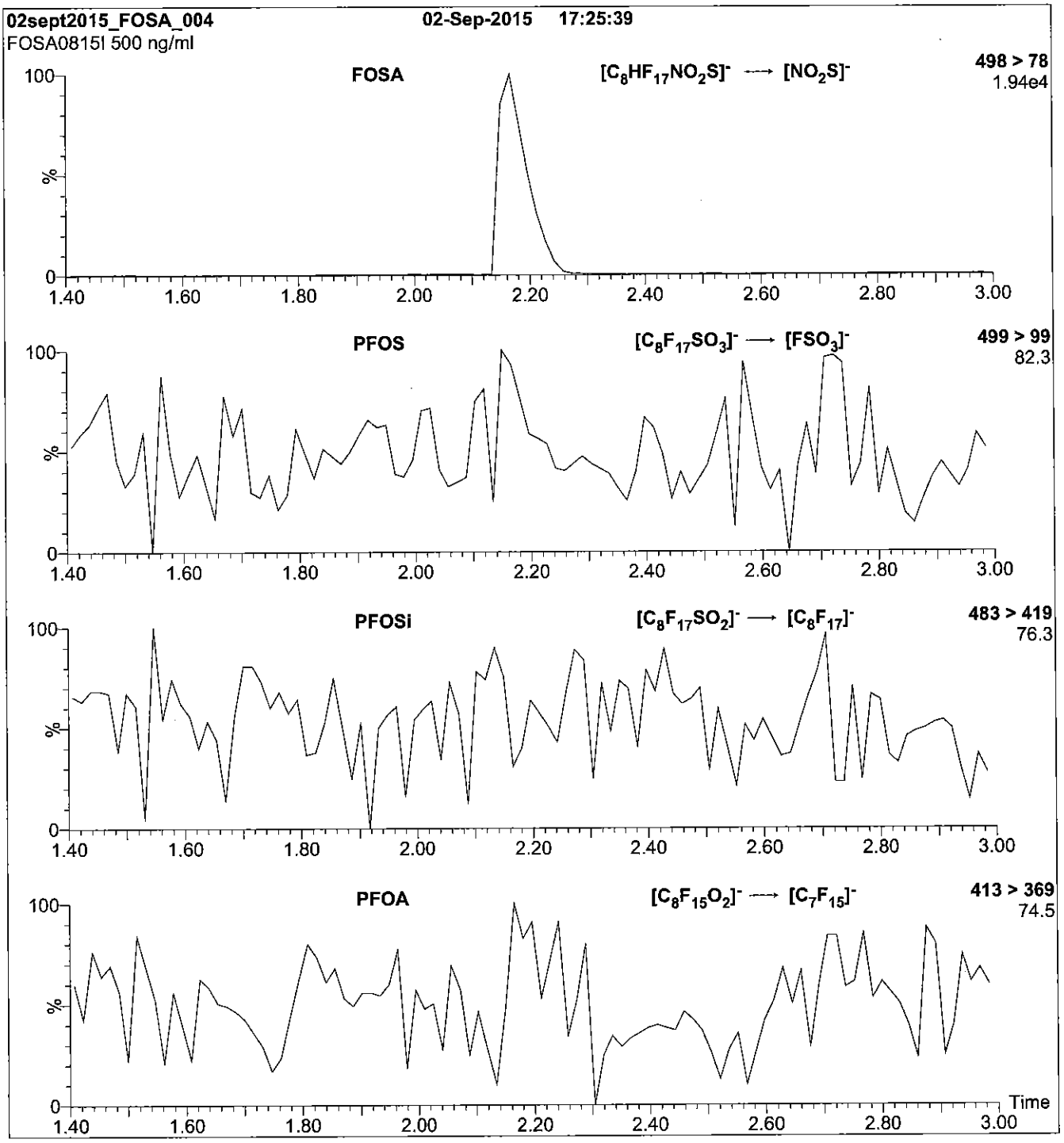
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCPFOSA_00008

Scanned 10/14/16

R: SBC 9/13/16

730534
ID: LCPFOSA_00009
Exp: 09/02/17 Prpd: SBC
PF-1-octanesulfonamide

730533
ID: LCPFOSA_00008
Exp: 09/02/17 Prpd: SBC
PF-1-octanesulfonamide

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

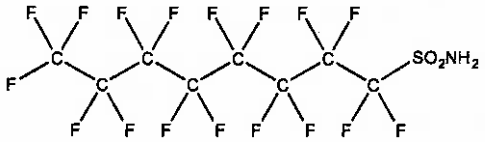
PRODUCT CODE: FOSA-I

LOT NUMBER: FOSA0815I

COMPOUND: Perfluoro-1-octanesulfonamide

STRUCTURE:

CAS #: 754-91-6



MOLECULAR FORMULA:	$C_8H_2F_{17}NO_2S$	**MOLECULAR WEIGHT:**	499.14
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Isopropanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	09/02/2015		
EXPIRY DATE: (mm/dd/yyyy)	09/02/2017		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

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:

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HOMOGENEITY:

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UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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

CALA Testing

ANAB ACCREDITED ISO 17025 REFERENCE MATERIAL PRODUCER

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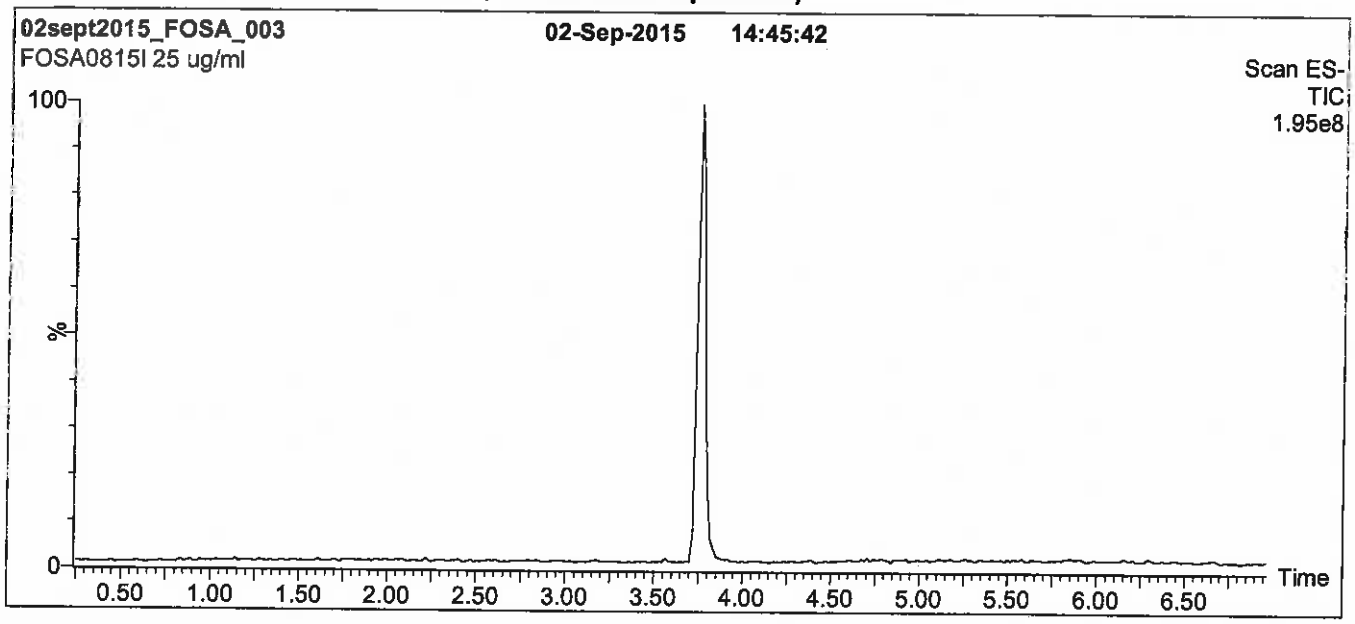
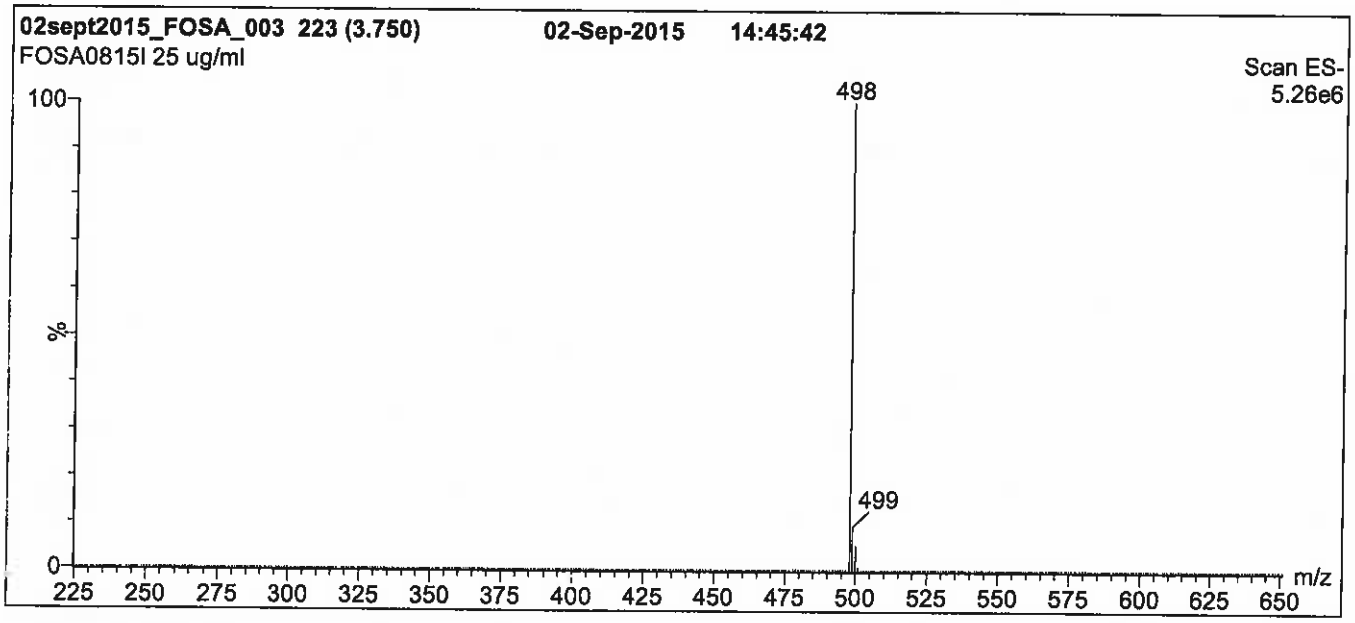
Figure 1: **FOSA-I; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

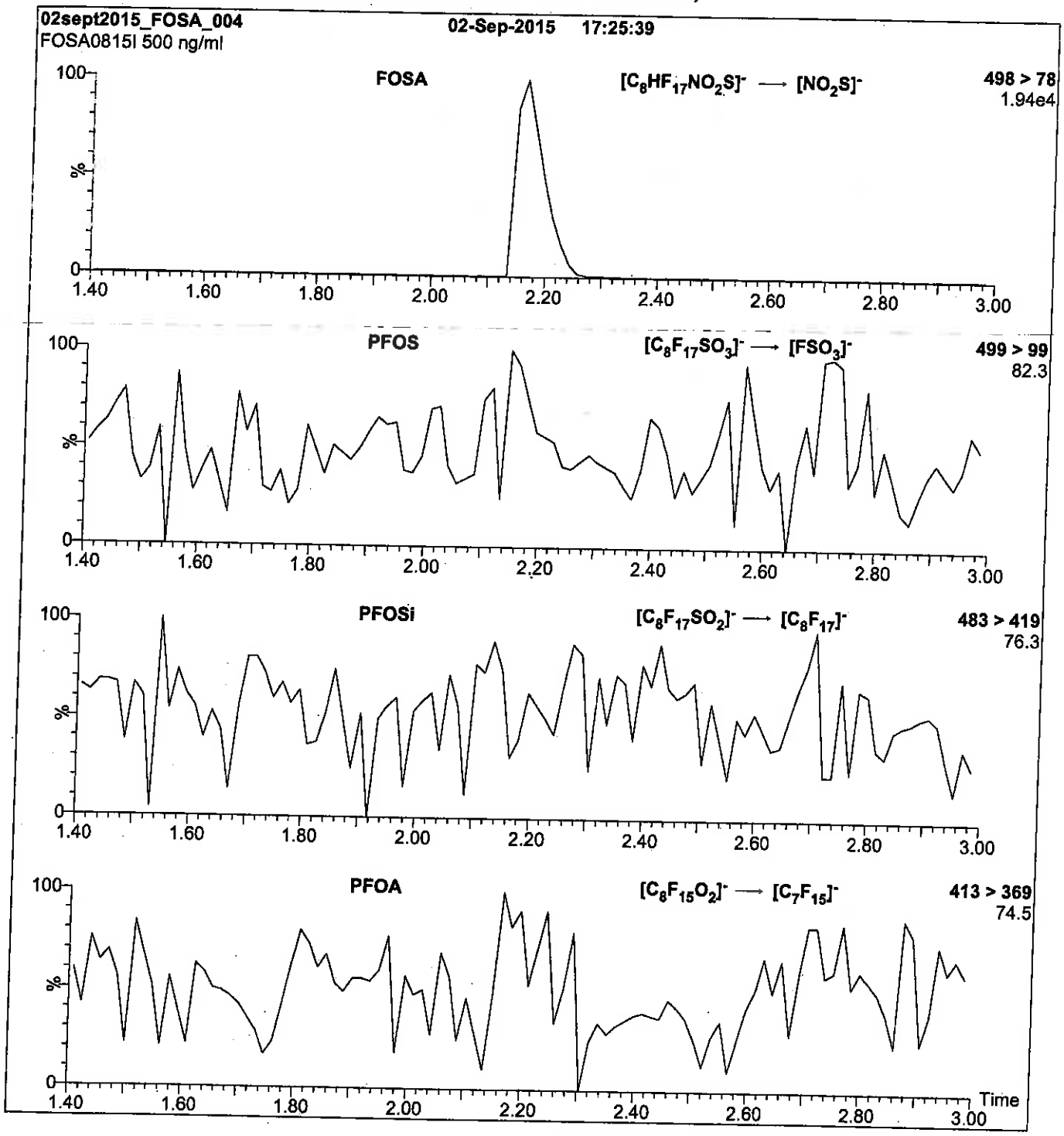
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCPFPeA_00005

R: 7/6/16 CBW

671579
ID: LCPFPeA_00005
Exp: 01/30/20 Prpd: CBW
PF-n-pentanoic acid

WELLINGTON LABORATORIES

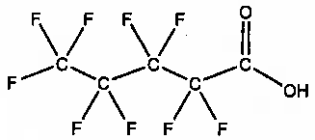
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFPeA
COMPOUND: Perfluoro-n-pentanoic acid

LOT NUMBER: PFPeA0115

STRUCTURE:

CAS #: 2706-90-3



MOLECULAR FORMULA: $C_5HF_9O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 264.05
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 01/30/2015
EXPIRY DATE: (mm/dd/yyyy) 01/30/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.3% of Perfluoro-n-heptanoic acid (PFHpA) and ~ 0.2% of $C_5H_2F_8O_2$ (hydrido - derivative) as measured by ^{19}F NMR.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 03/26/2015 (mm/dd/yyyy)

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

INTENDED USE:

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SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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

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TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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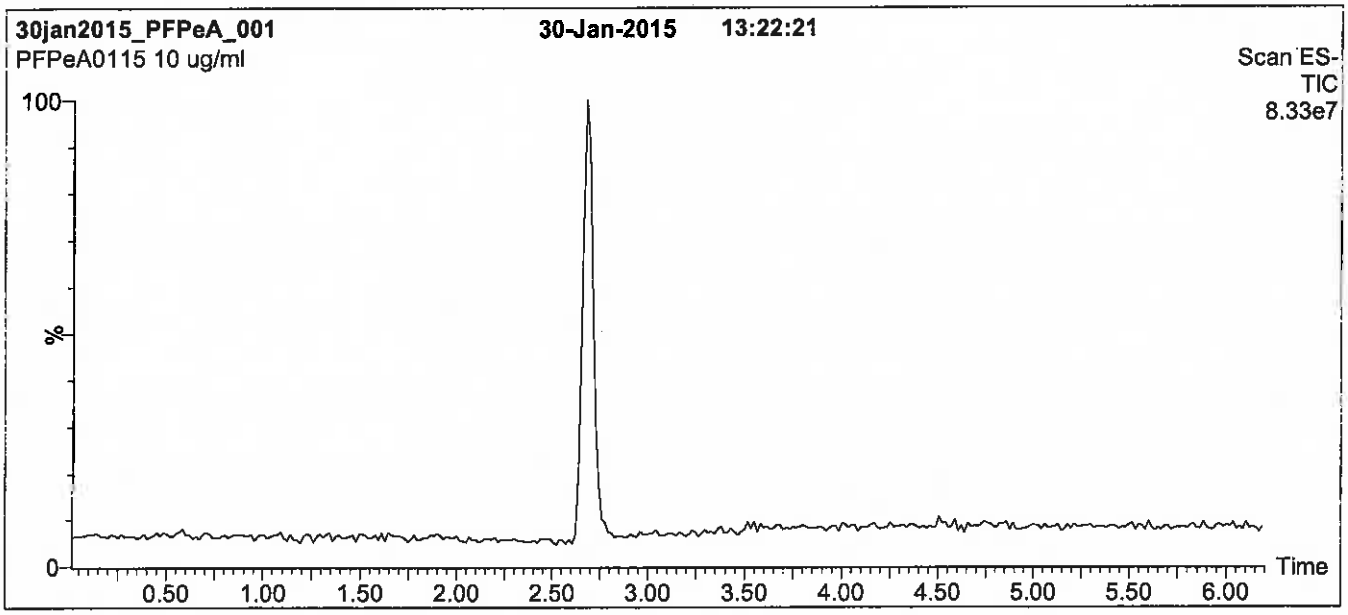
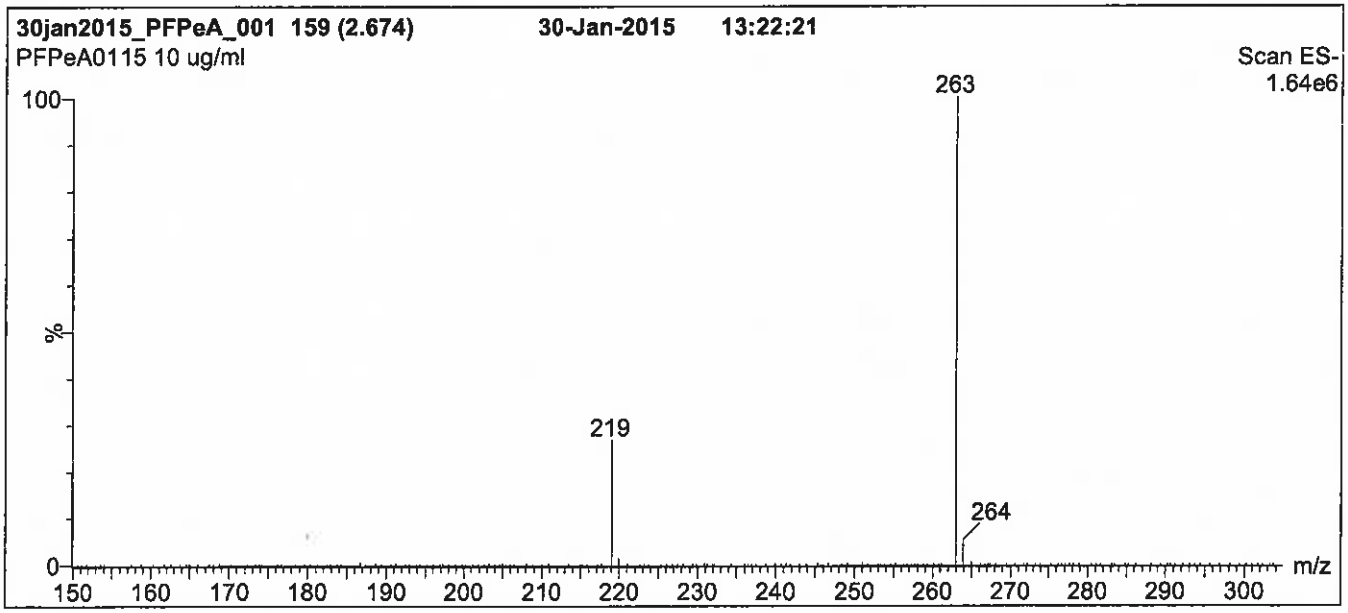
Figure 1: **PFPeA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 30% (80:20 MeOH:ACN) / 70% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1 min
before returning to initial conditions in 0.5 min.
Time: 10 min

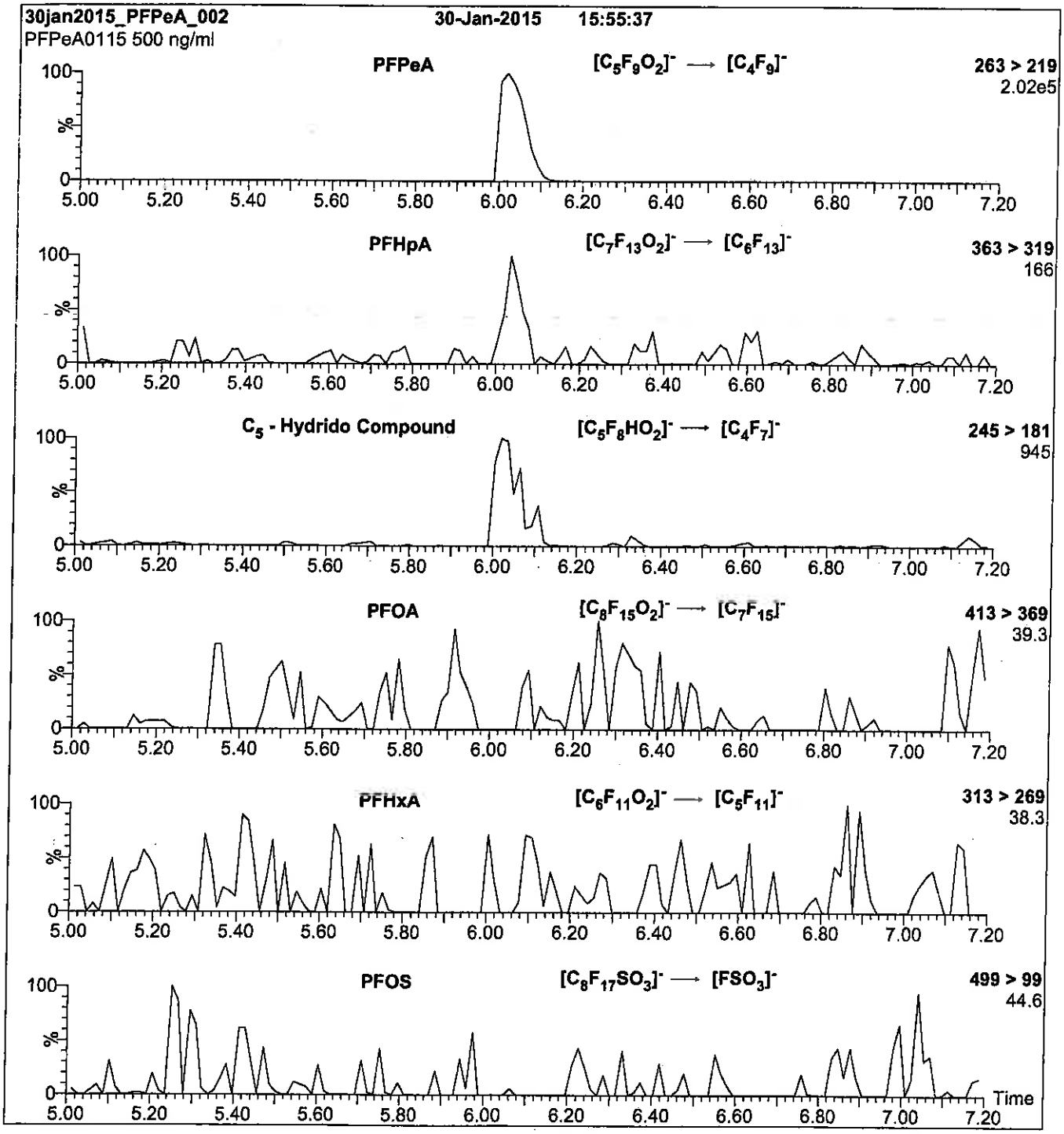
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCPFTeDA_00004

R: 4/7/16 CBW

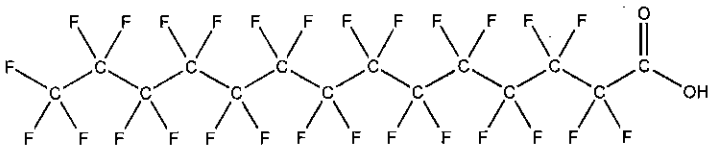
609696
ID: LCPFTeDA_00004
Exp: 12/09/20 Prpd: CBW
PF-n-tetradecanoic acid

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFTeDA
LOT NUMBER: PFTeDA1215
COMPOUND: Perfluoro-n-tetradecanoic acid

STRUCTURE:
CAS #: 376-06-7



MOLECULAR FORMULA: $C_{14}HF_{27}O_2$
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. A 1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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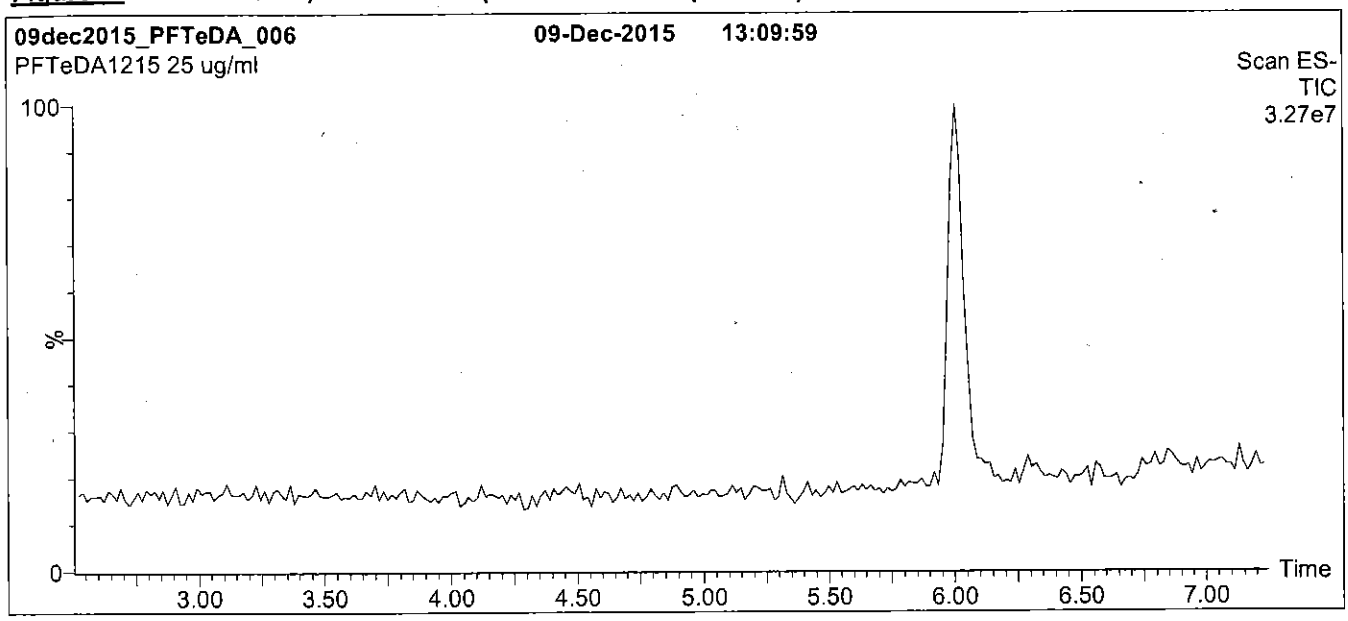
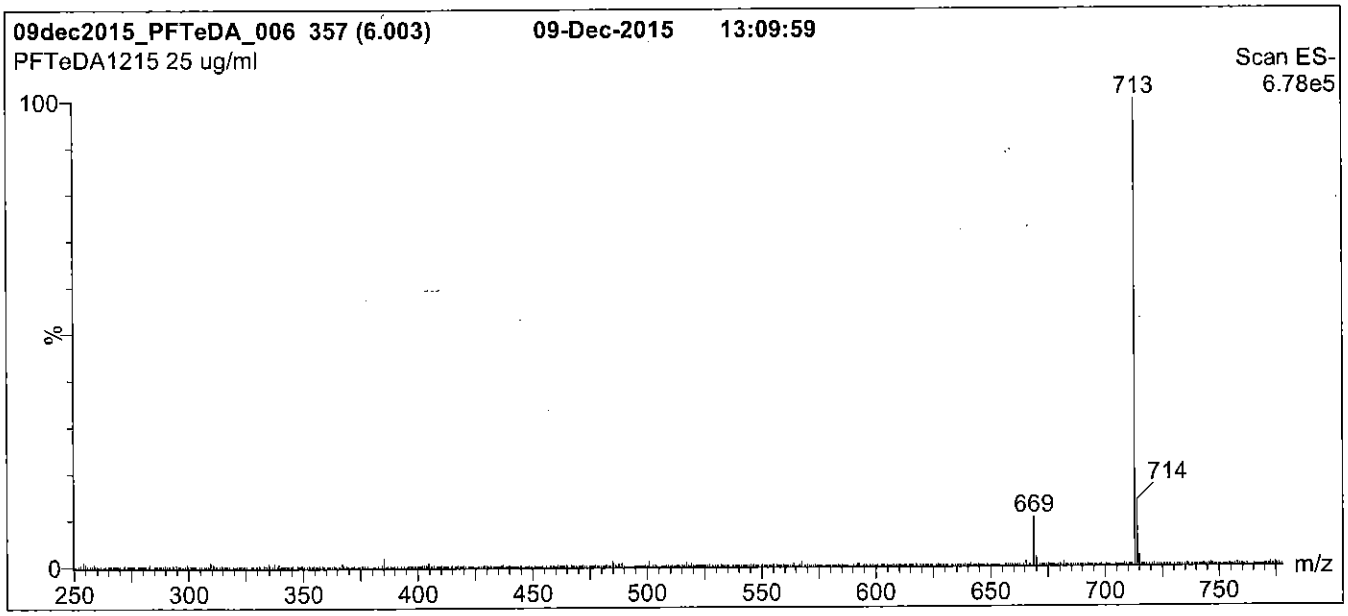
Figure 1: **PFTeDA; LC/MS Data (TIC and Mass Spectrum)**





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

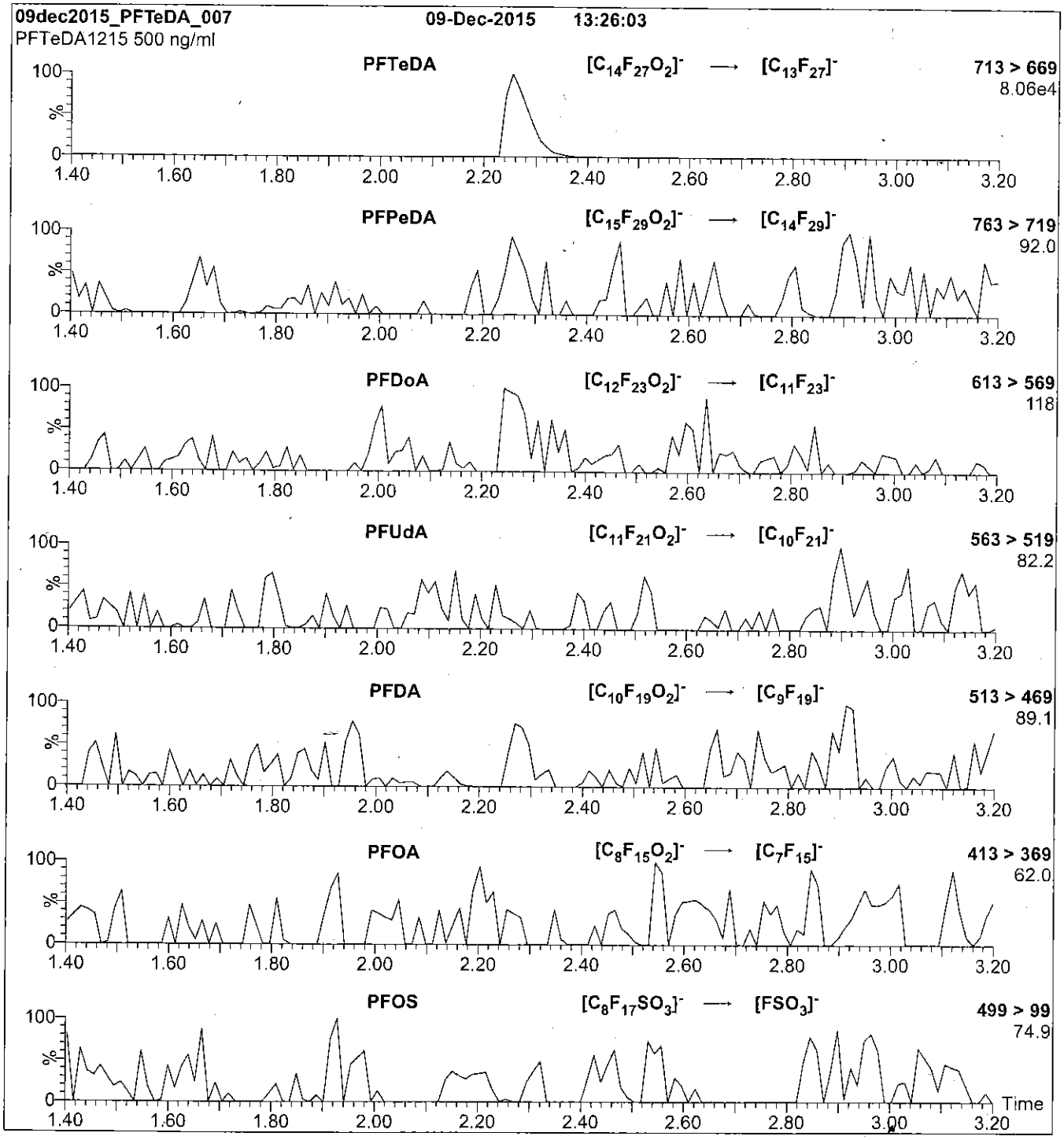
Flow: 300 µl/min

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

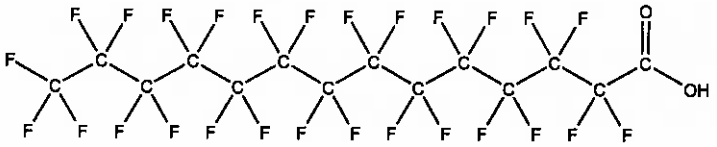
730645
ID: LCPFTeDA_00005
Exp: 12/09/20 Prpd: SBC
PF-n-tetradecanoic acid

730659
ID: LCPFTeDA_00006
Exp: 12/09/20 Prpd: SBC
PF-n-tetradecanoic acid

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFTeDA
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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

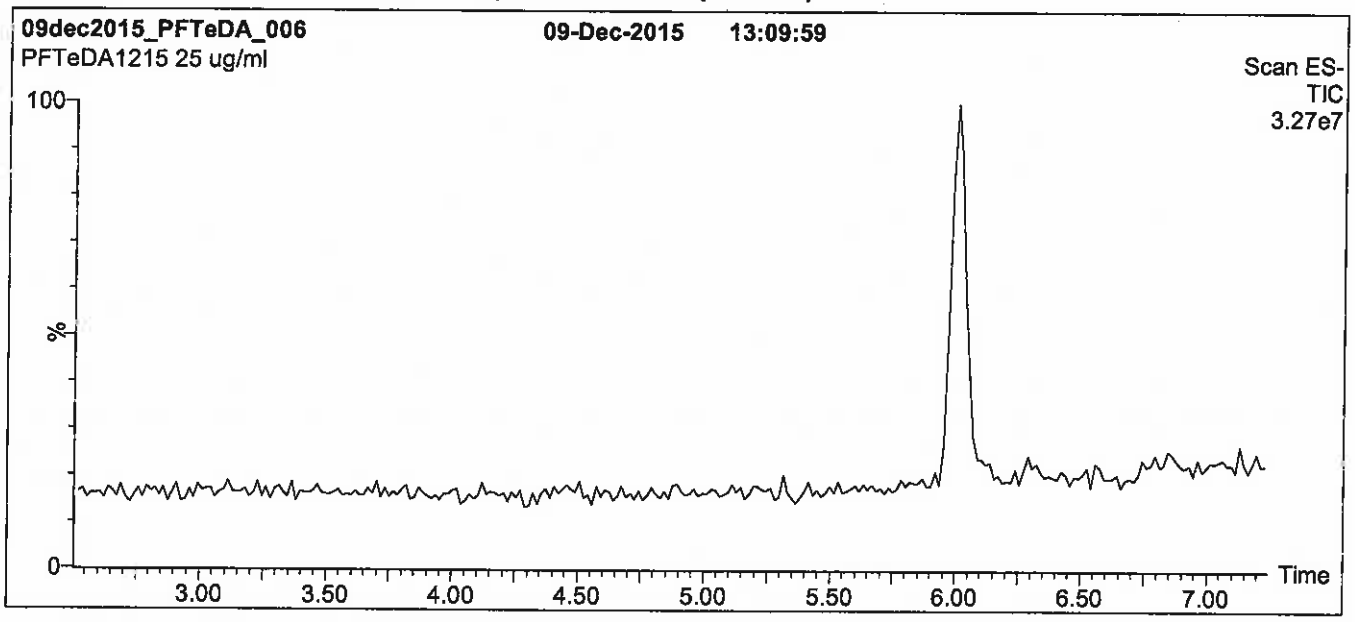
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

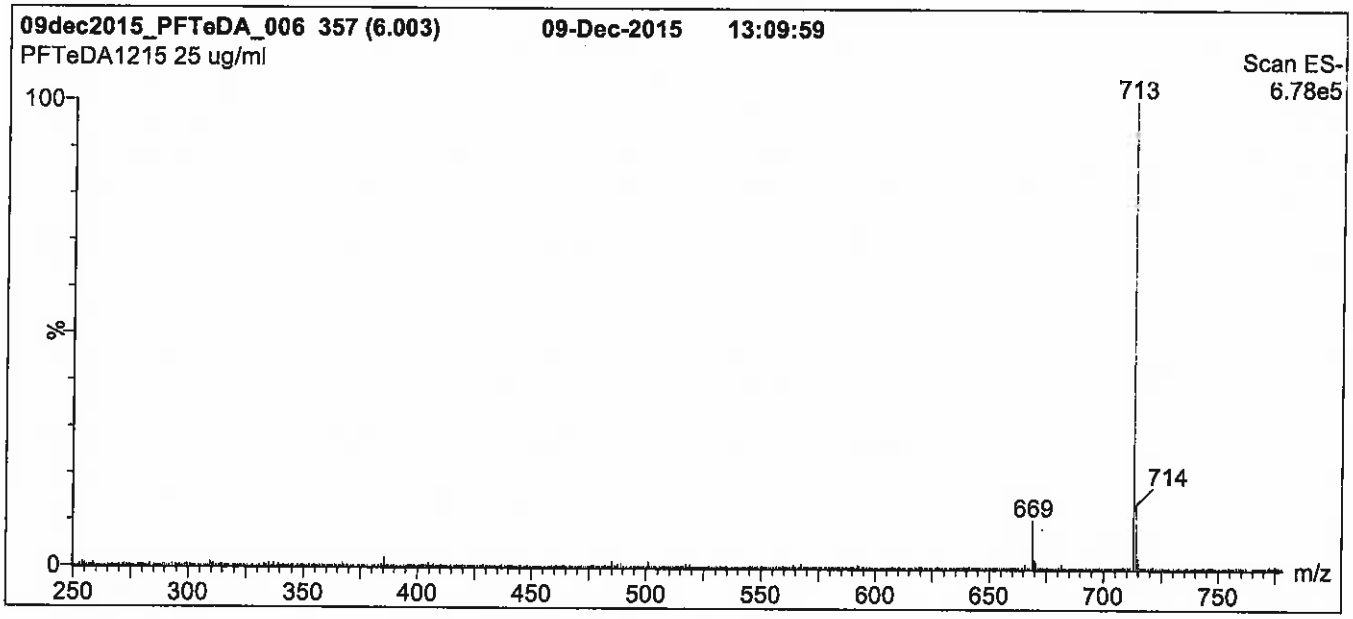
CALA

ANAB ACCREDITED

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

Figure 1: **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

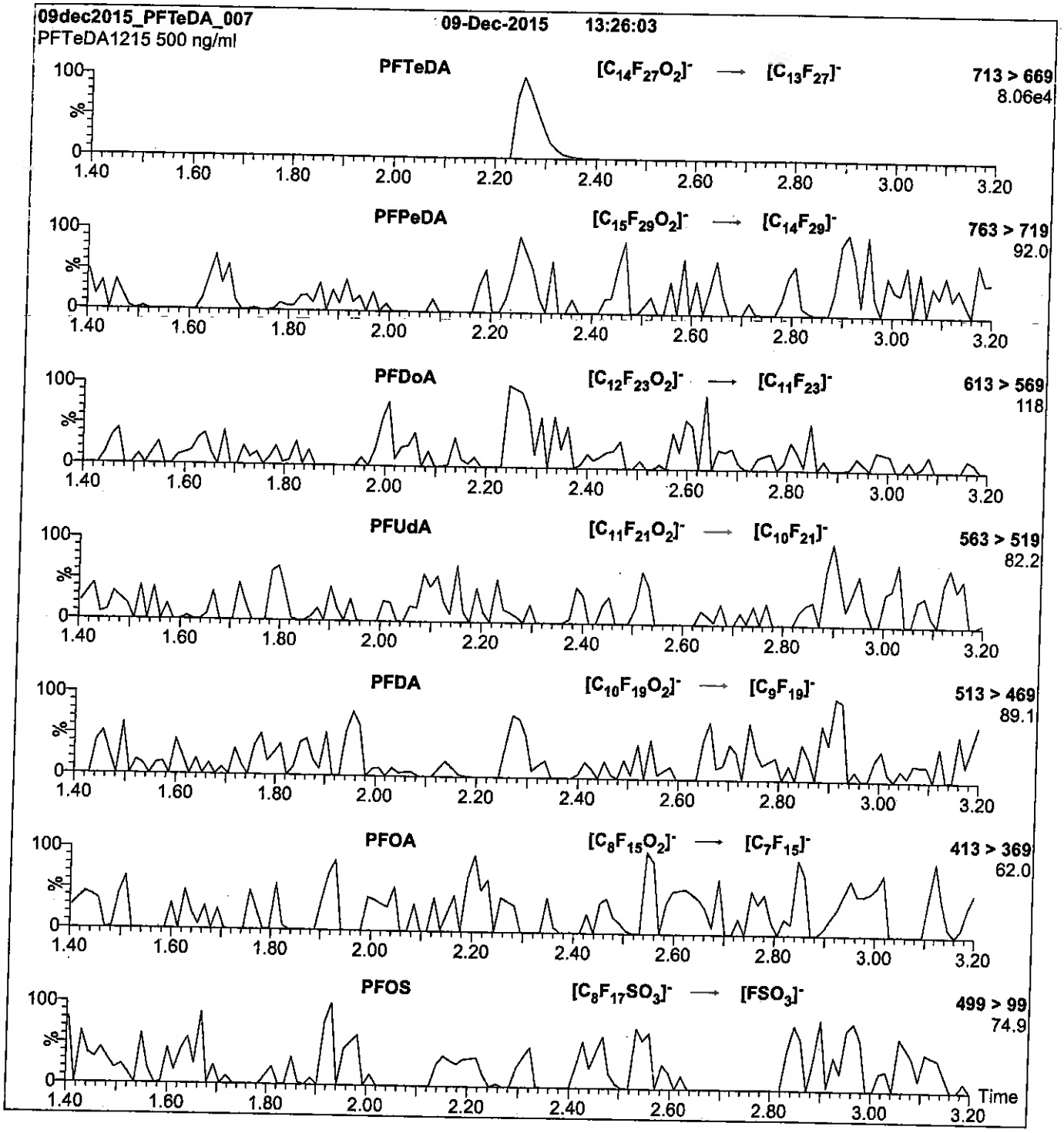
Flow: 300 µl/min

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

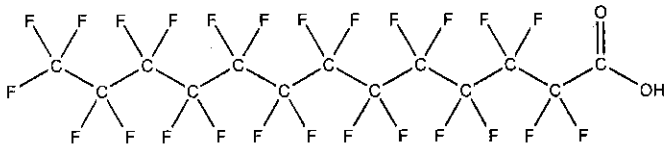
R: 4/7/16 CBW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFTrDA
LOT NUMBER: PFTrDA1213
COMPOUND: Perfluoro-n-tridecanoic acid

STRUCTURE:
CAS #: 72629-94-8



MOLECULAR FORMULA: $C_{13}HF_{25}O_2$
MOLECULAR WEIGHT: 664.11
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 12/10/2013
EXPIRY DATE: (mm/dd/yyyy) 12/10/2018
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.1% of PFUdA ($C_{11}HF_{21}O_2$); ~ 0.4% of PFDoA ($C_{12}HF_{23}O_2$), and ~ 0.1% of PFTeDA ($C_{14}HF_{27}O_2$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 03/25/2015 (mm/dd/yyyy)

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

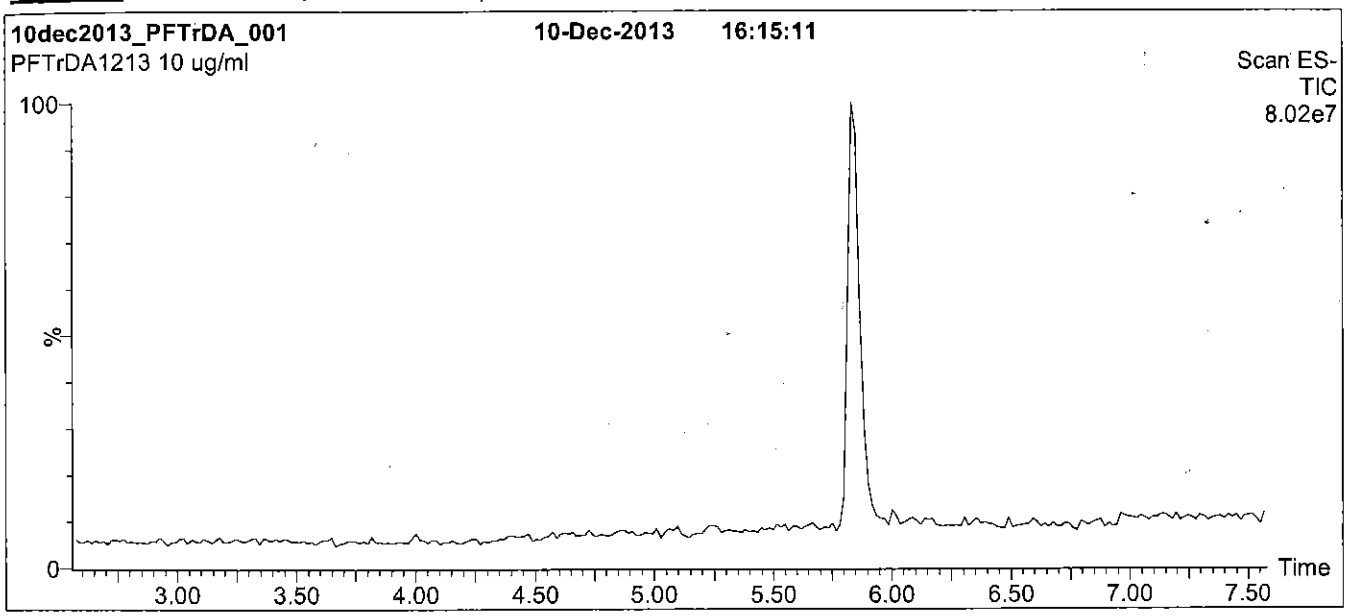
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

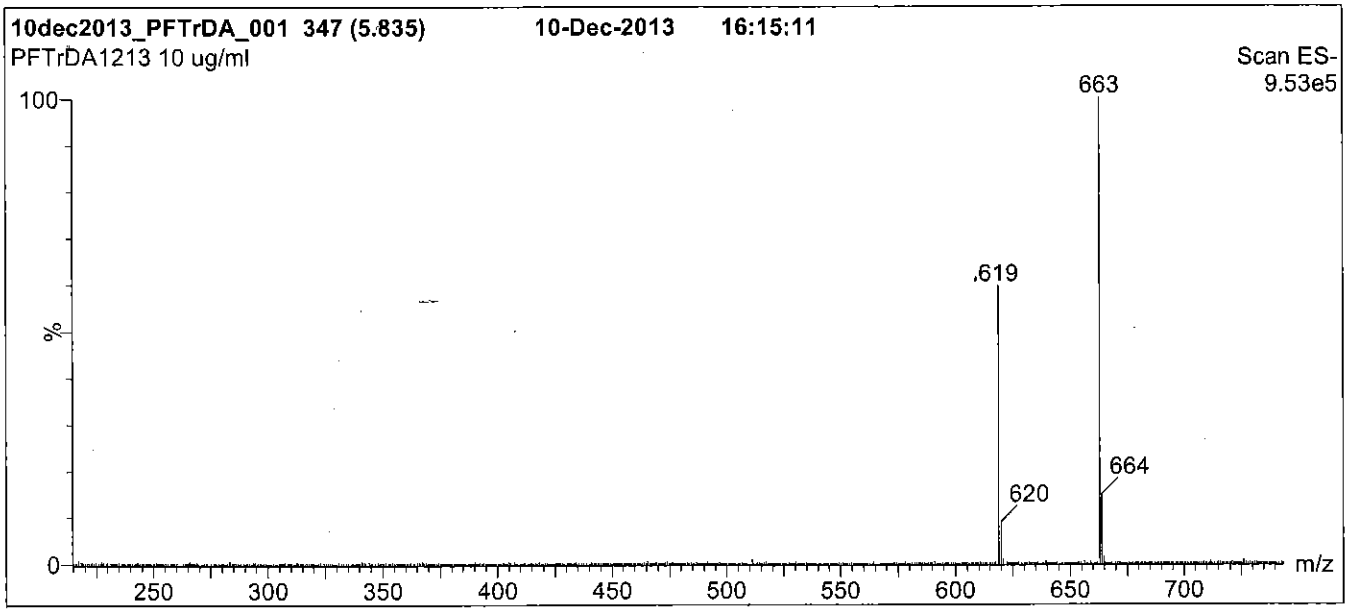
CALA Testing Accreditation No. A 1226

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: **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

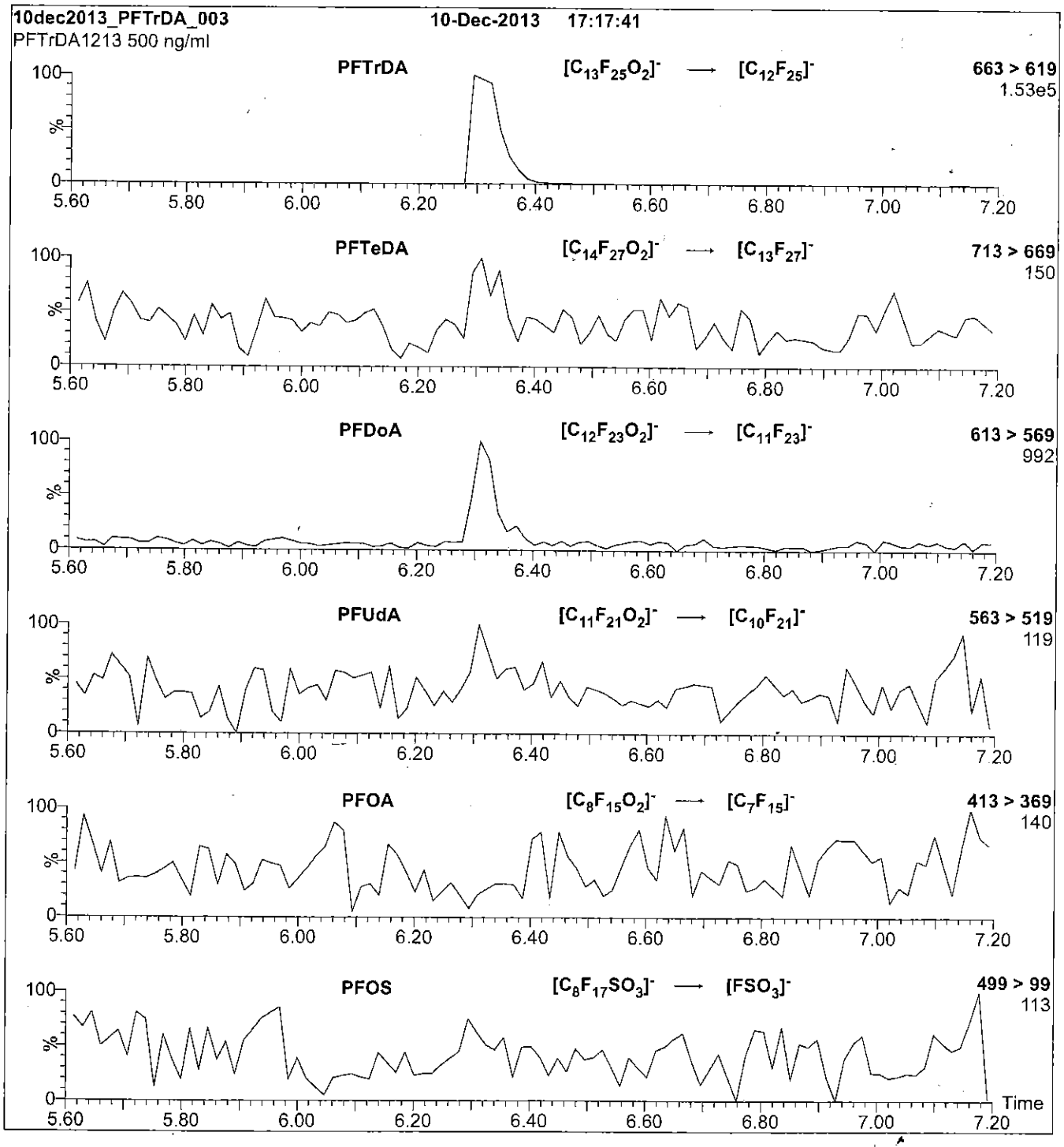
Flow: 300 µl/min

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

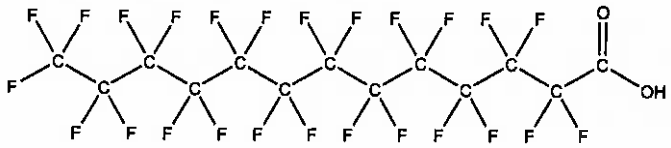
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFTrDA
COMPOUND: Perfluoro-n-tridecanoic acid

LOT NUMBER: PFTrDA0216

STRUCTURE:

CAS #: 72629-94-8



MOLECULAR FORMULA: $C_{13}HF_{25}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 664.11
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 02/12/2016
EXPIRY DATE: (mm/dd/yyyy) 02/12/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.1% of PFUdA ($C_{11}HF_{21}O_2$), ~ 0.4% of PFDoA ($C_{12}HF_{23}O_2$), and ~ 0.1% of PFTeDA ($C_{14}HF_{27}O_2$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 02/16/2016 (mm/dd/yyyy)

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

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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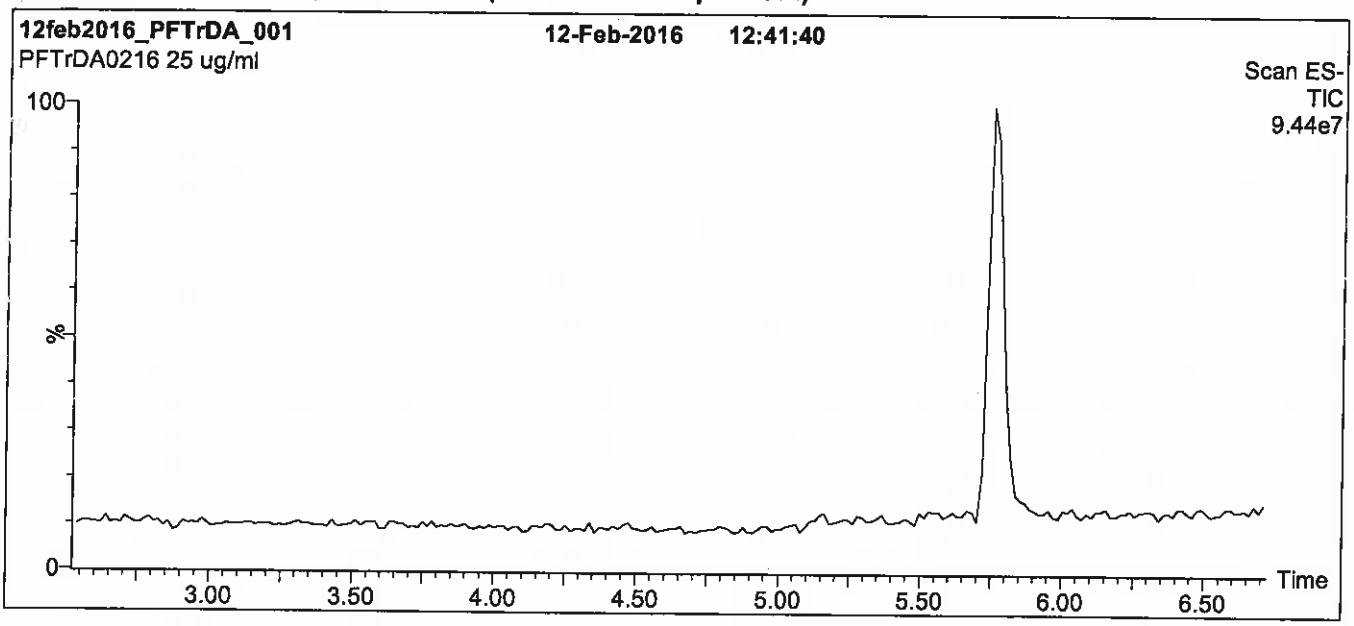
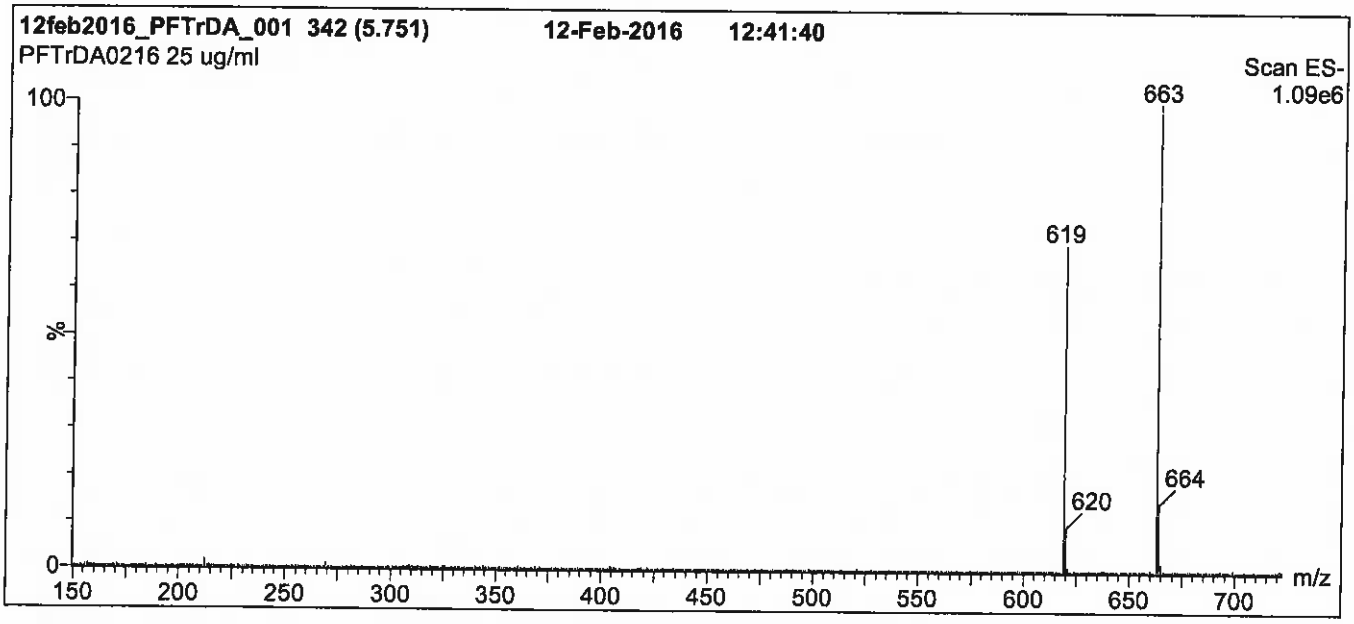




Conditions for Figure 1:

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: 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

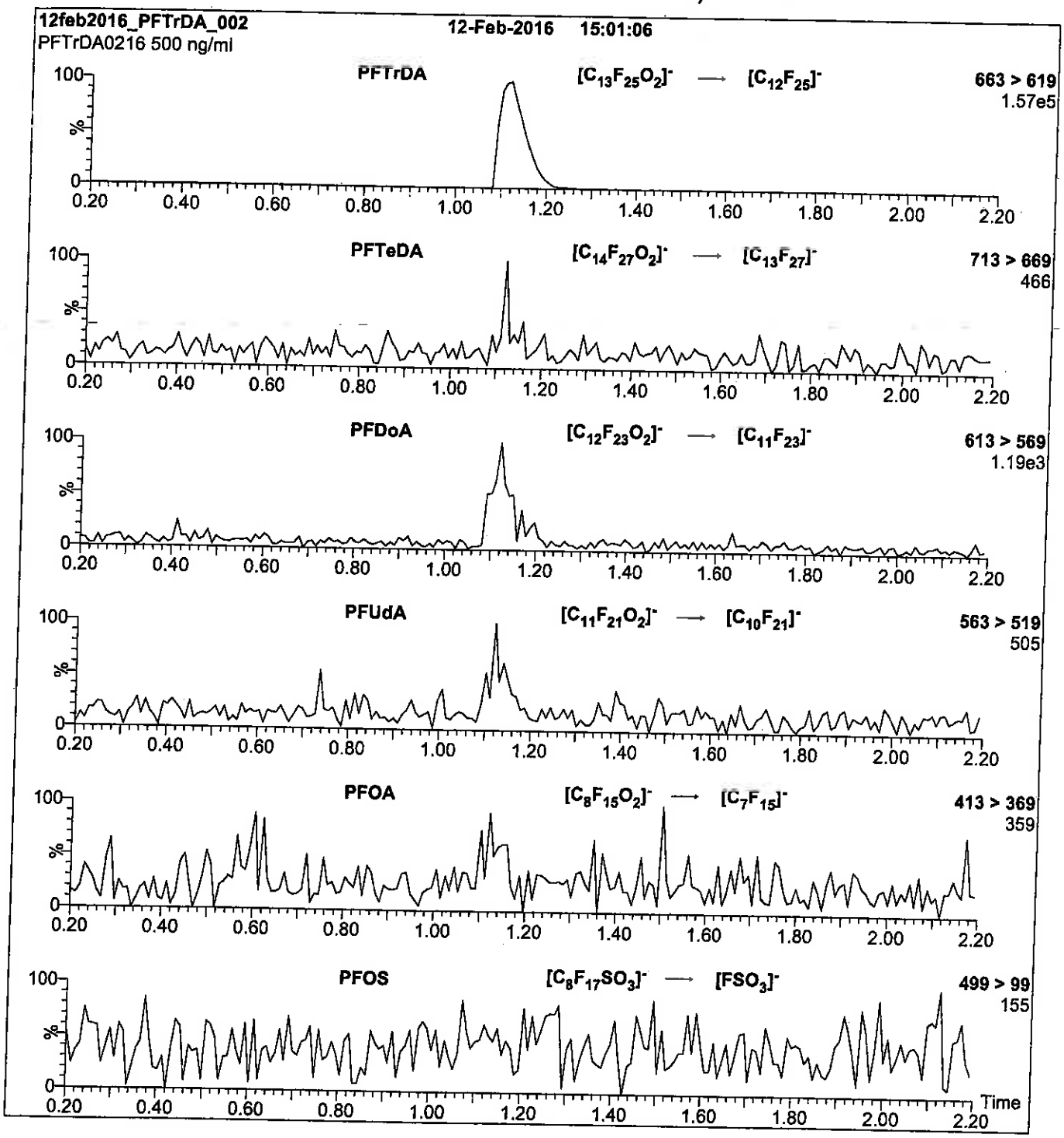
Flow: 300 µl/min

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

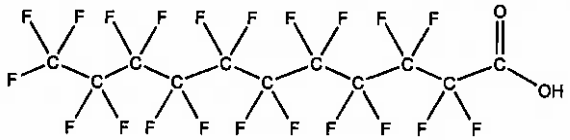
CERTIFICATE OF ANALYSIS DOCUMENTATION

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:

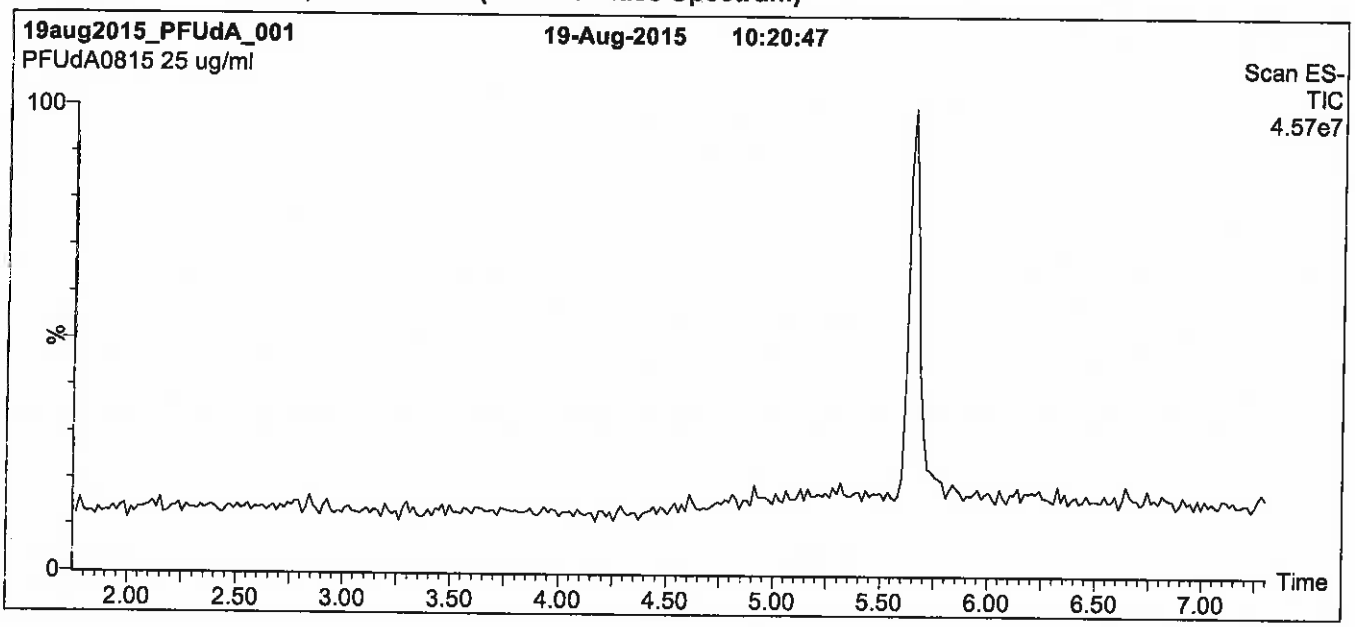
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

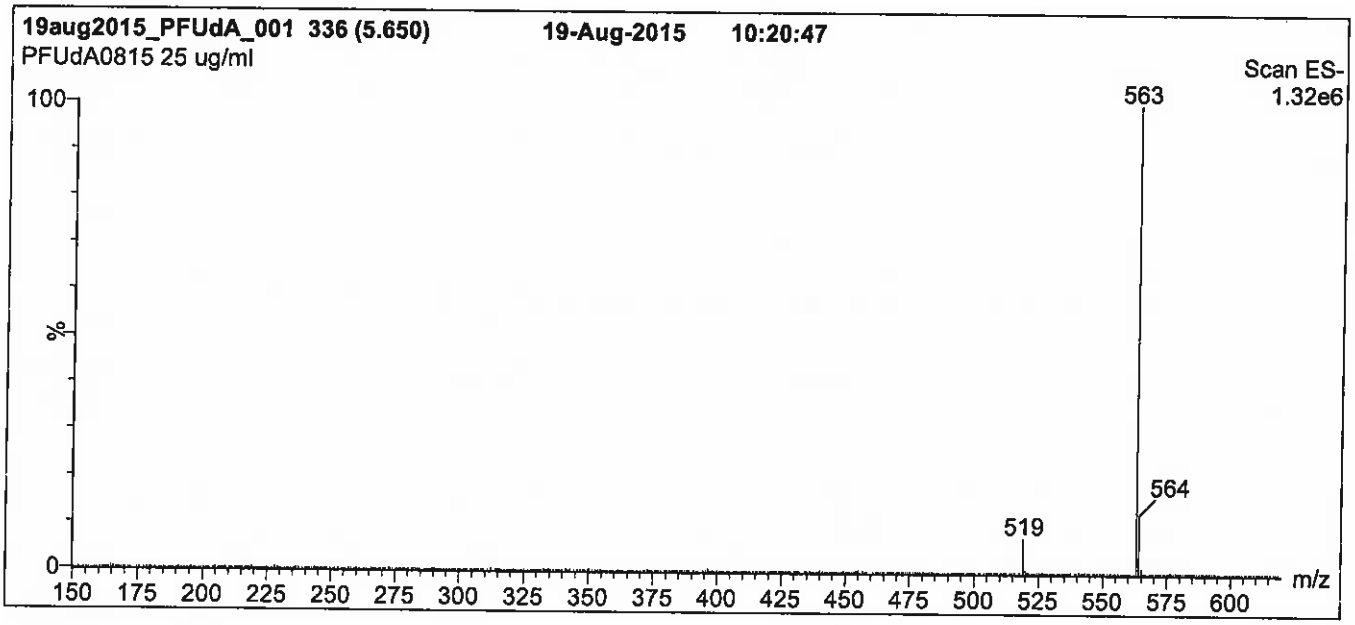
CALA

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

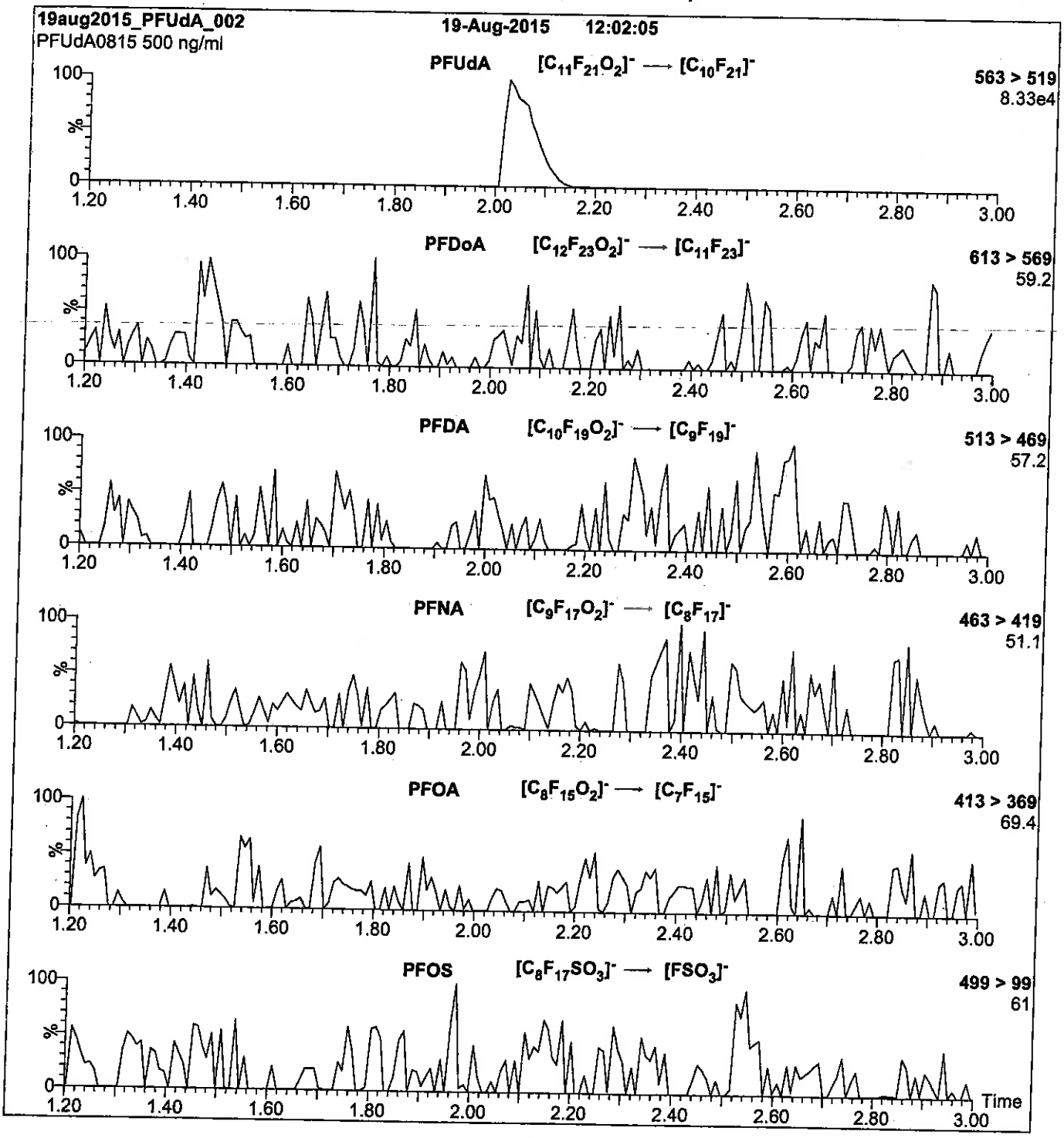
Flow: 300 µl/min

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.: 320-24961-1

SDG No.:

Matrix: Water Level: Low

GC Column (1): Acquity ID: 2.1 (mm)

Client Sample ID	Lab Sample ID	PFHxS #	PFOA #	PFOS #
DPT-GW-EB-26-22	320-24961-1	102	57	102
DPT-GW-EB-26-33	320-24961-2	129	62	130
DPT-17-26-GW-29-33	320-24961-3	118	95	116
DPT-17-26-GW-18-22	320-24961-4	122	53	125
DPT-GW-EB-27-22	320-24961-5	129	107	129
DPT-GW-EB-27-33	320-24961-6	107	91	111
DPT-TB-011117	320-24961-7	116	119	114
DPT-17-27-GW-29-33	320-24961-8	125	70	124
DPT-17-27-GW-18-22	320-24961-9	124	68	125
	MB 320-146325/1-A	123	120	123
	LCS 320-146325/2-A	122	116	123
	LCSD 320-146325/3-A	125	117	125

	QC LIMITS
PFHxS = 18O2 PFHxS	25-150
PFOA = 13C4 PFOA	25-150
PFOS = 13C4 PFOS	25-150

Column to be used to flag recovery values

FORM II 537 (Modified)

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-24961-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 16JAN2017_006.d

Lab ID: LCS 320-146325/2-A Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
Perfluorooctanoic acid (PFOA)	0.0400	0.0411	103	60-140	
Perfluorobutanesulfonic acid (PFBS)	0.0354	0.0423	120	50-150	
Perfluorooctane Sulfonate (PFOS)	0.0371	0.0402	108	60-140	
13C4 PFOA	0.100	0.116	116	25-150	
18O2 PFHxS	0.0946	0.115	122	25-150	
13C4 PFOS	0.0956	0.118	123	25-150	

Column to be used to flag recovery and RPD values

FORM III 537 (Modified)

FORM III
LCMS LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-24961-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 16JAN2017_007.d

Lab ID: LCSD 320-146325/3-A Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Perfluorooctanoic acid (PFOA)	0.0400	0.0421	105	2	30	60-140	
Perfluorobutanesulfonic acid (PFBS)	0.0354	0.0432	122	2	30	50-150	
Perfluorooctane Sulfonate (PFOS)	0.0371	0.0415	112	3	30	60-140	
13C4 PFOA	0.100	0.117	117			25-150	
18O2 PFHxS	0.0946	0.118	125			25-150	
13C4 PFOS	0.0956	0.119	125			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.: 320-24961-1

SDG No.:

Lab File ID: 16JAN2017_005.d Lab Sample ID: MB 320-146325/1-A

Matrix: Water Date Extracted: 01/13/2017 12:50

Instrument ID: A8_N Date Analyzed: 01/16/2017 14:04

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-146325/2-A	16JAN2017_006.d	01/16/2017 14:11
	LCSD 320-146325/3-A	16JAN2017_007.d	01/16/2017 14:19
DPT-GW-EB-26-22	320-24961-1	16JAN2017_008.d	01/16/2017 14:26
DPT-GW-EB-26-33	320-24961-2	16JAN2017_009.d	01/16/2017 14:34
DPT-17-26-GW-29-33	320-24961-3	16JAN2017_010.d	01/16/2017 14:41
DPT-17-26-GW-18-22	320-24961-4	16JAN2017_011.d	01/16/2017 14:49
DPT-GW-EB-27-22	320-24961-5	16JAN2017_012.d	01/16/2017 14:56
DPT-GW-EB-27-33	320-24961-6	16JAN2017_013.d	01/16/2017 15:04
DPT-TB-011117	320-24961-7	16JAN2017_014.d	01/16/2017 15:11
DPT-17-27-GW-29-33	320-24961-8	16JAN2017_018.d	01/16/2017 15:41
DPT-17-27-GW-18-22	320-24961-9	16JAN2017_019.d	01/16/2017 15:49

FORM IV 537 (Modified)

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-24961-1
SDG No.:
Client Sample ID: DPT-GW-EB-26-22
Lab Sample ID: 320-24961-1
Matrix: Water
Lab File ID: 16JAN2017_008.d
Analysis Method: 537 (Modified)
Date Collected: 01/11/2017 10:15
Extraction Method: 3535
Date Extracted: 01/13/2017 12:50
Sample wt/vol: 238.4(mL)
Date Analyzed: 01/16/2017 14:26
Con. Extract Vol.: 0.5(mL)
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: Acquity ID: 2.1(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 146533
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.00081	J M	0.0026	0.0021	0.00078
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0021	U	0.0026	0.0021	0.00096
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.020		0.0042	0.0031	0.0013

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	57		25-150
STL00994	18O2 PFHxS	102		25-150
STL00991	13C4 PFOS	102		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_008.d				
Lims ID:	320-24961-A-1-A				
Client ID:	DPT-GW-EB-26-22				
Sample Type:	Client				
Inject. Date:	16-Jan-2017 14:26:54	ALS Bottle#:	31	Worklist Smp#:	10
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Sample Info:	320-24961-a-1-a				
Misc. Info.:	Plate: 1 Rack: 3				
Operator ID:	A8-PC\A8	Instrument ID:	A8_N		

Method:	\\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\A8_N.m		
Limit Group:	LC PFC_DOD ICAL		
Last Update:	17-Jan-2017 09:48:55	Calib Date:	09-Jan-2017 15:16:24
Integrator:	Picker		
Quant Method:	Isotopic Dilution	Quant By:	Initial Calibration
Last ICal File:	\\ChromNA\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_018.d		

Column 1 :			Det: EXP1
Process Host:	XAWRK027		

First Level Reviewer: westendorfc		Date:	16-Jan-2017 15:02:42

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 10 18O2 PFHxS										
403.00 > 84.00	2.561	2.584	-0.023		15642135	48.2		102	555870	
D 14 13C4 PFOA										
417.00 > 372.00	2.912	2.944	-0.032		6841497	28.3		56.6	479638	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.920	2.952	-0.032	1.000	53287	0.3881			169	M
413.00 > 169.00	2.904	2.952	-0.048	0.994	36934		1.44(0.90-1.10)		22.9	M
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.285	3.217	0.068	1.000	2627851	9.76			53986	
499.00 > 99.00	3.285	3.217	0.068	1.000	926226		2.84(0.90-1.10)		2421	
D 17 13C4 PFOS										
503.00 > 80.00	3.292	3.321	-0.029		12706351	49.0		102	256849	

QC Flag Legend

Review Flags

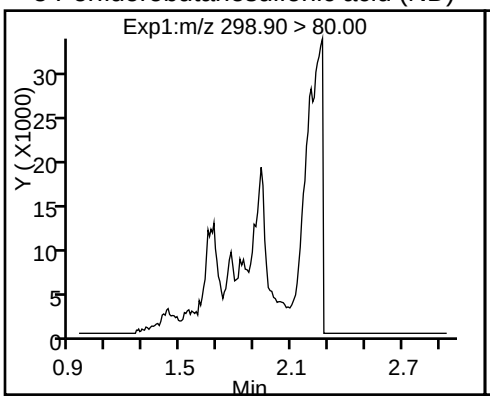
M - Manually Integrated

Report Date: 17-Jan-2017 09:49:03 Chrom Revision: 2.2 10-Jan-2017 11:26:10

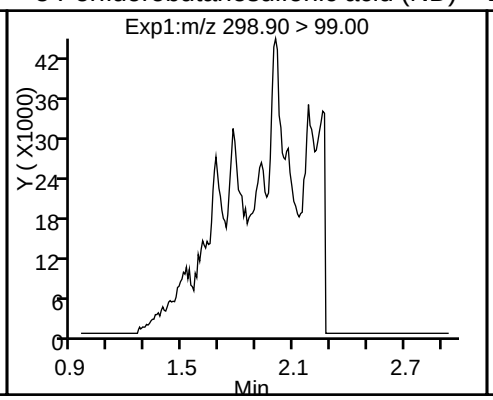
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_008.d				
Injection Date:	16-Jan-2017 14:26:54	Instrument ID:	A8_N		
Lims ID:	320-24961-A-1-A	Lab Sample ID:	320-24961-1		
Client ID:	DPT-GW-EB-26-22				
Operator ID:	A8-PC\A8	ALS Bottle#:	31	Worklist Smp#:	10
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		

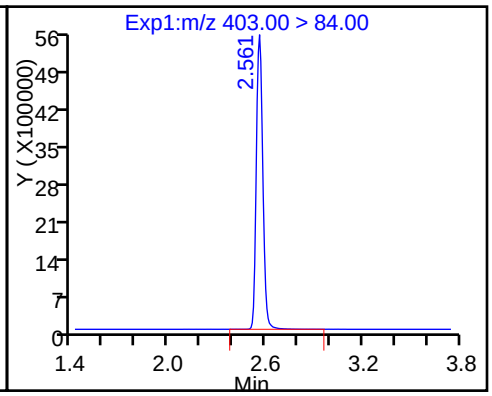
5 Perfluorobutanesulfonic acid (ND)



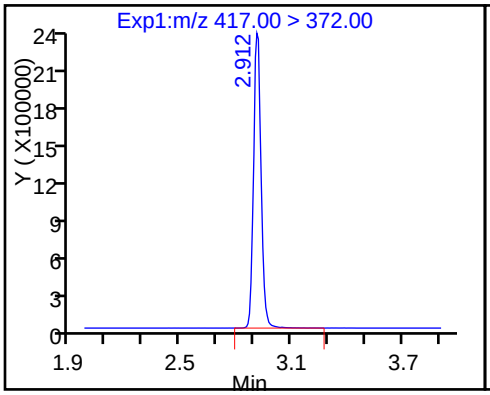
5 Perfluorobutanesulfonic acid (ND)



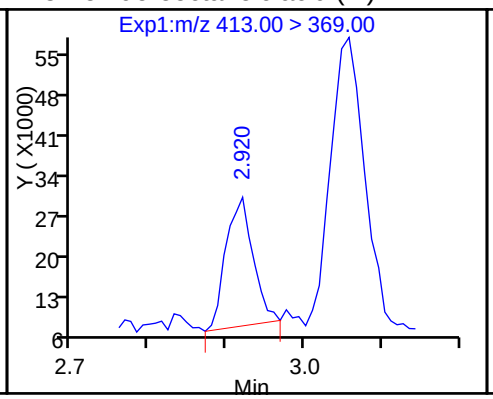
D 10 18O2 PFHxS



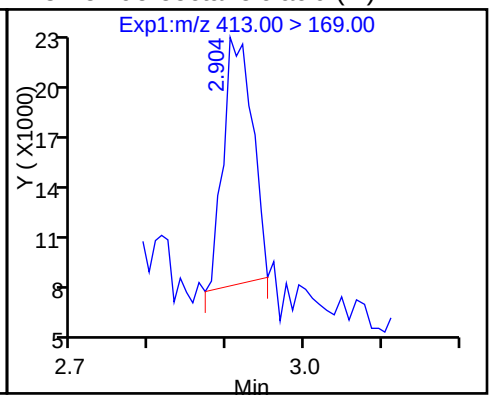
D 14 13C4 PFOA



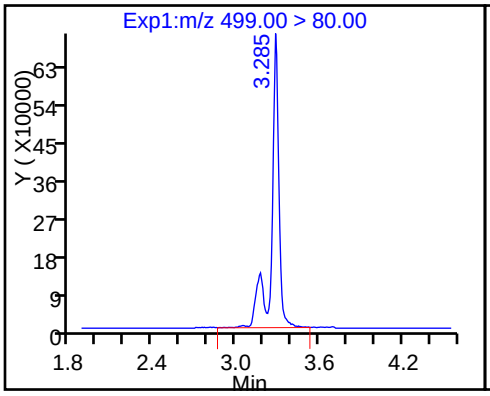
15 Perfluorooctanoic acid (M)



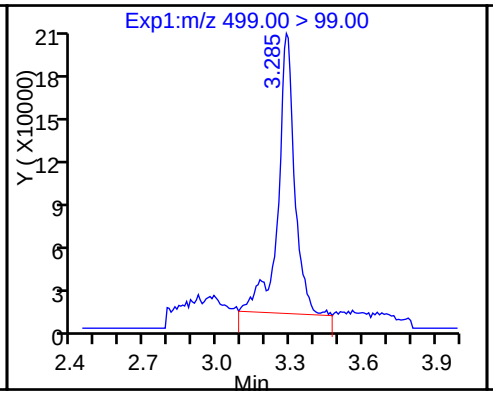
15 Perfluorooctanoic acid (M)



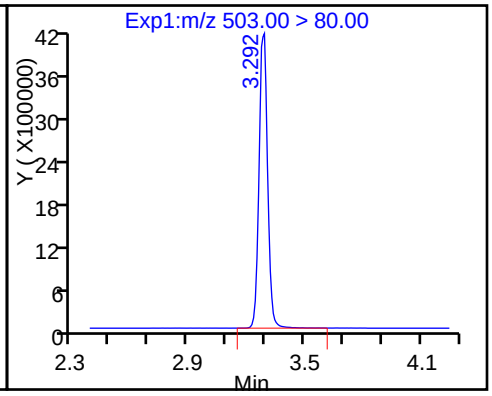
18 Perfluorooctane sulfonic acid



18 Perfluorooctane sulfonic acid



D 17 13C4 PFOS



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

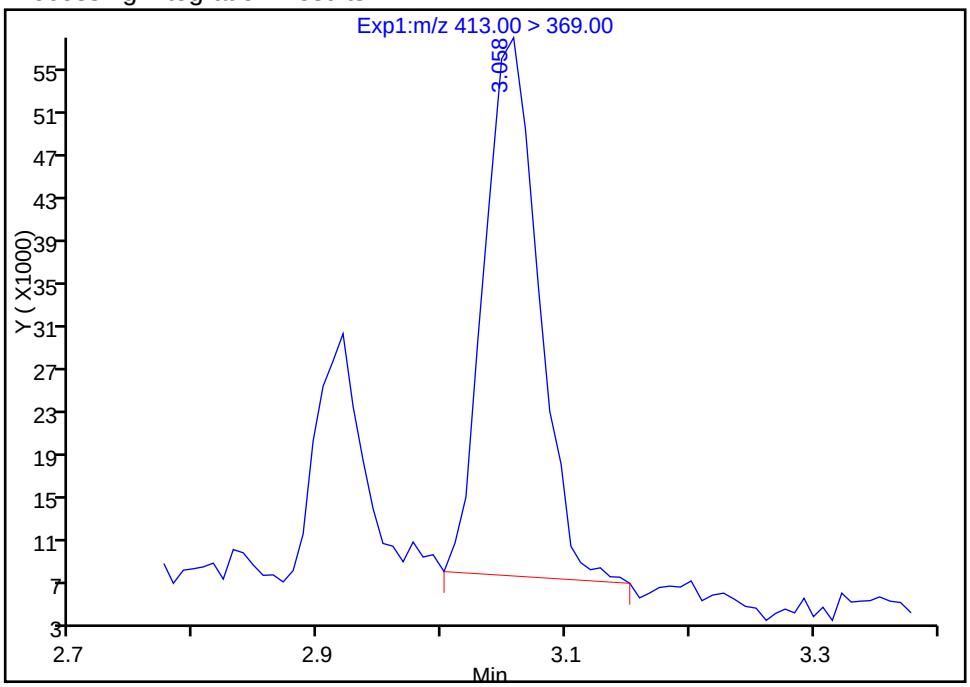
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_008.d				
Injection Date:	16-Jan-2017 14:26:54	Instrument ID:	A8_N		
Lims ID:	320-24961-A-1-A	Lab Sample ID:	320-24961-1		
Client ID:	DPT-GW-EB-26-22				
Operator ID:	A8-PC\A8	ALS Bottle#:	31	Worklist Smp#:	10
Injection Vol:	2.0 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

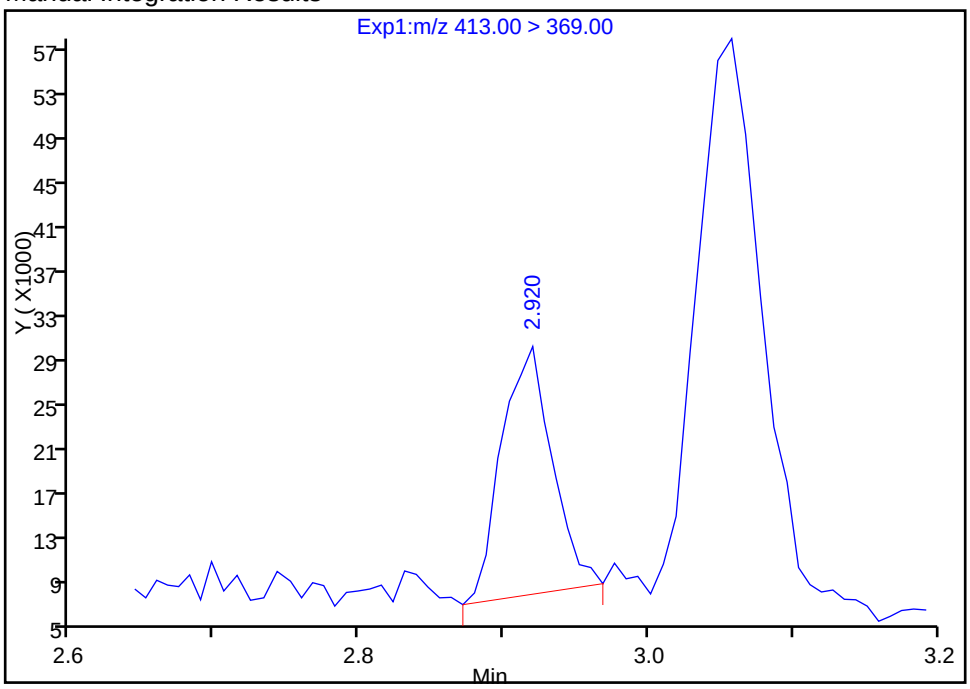
Processing Integration Results

RT: 3.06
Area: 151577
Amount: 1.103884
Amount Units: ng/ml



Manual Integration Results

RT: 2.92
Area: 53287
Amount: 0.388071
Amount Units: ng/ml



Reviewer: westendorfc, 16-Jan-2017 15:02:42

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

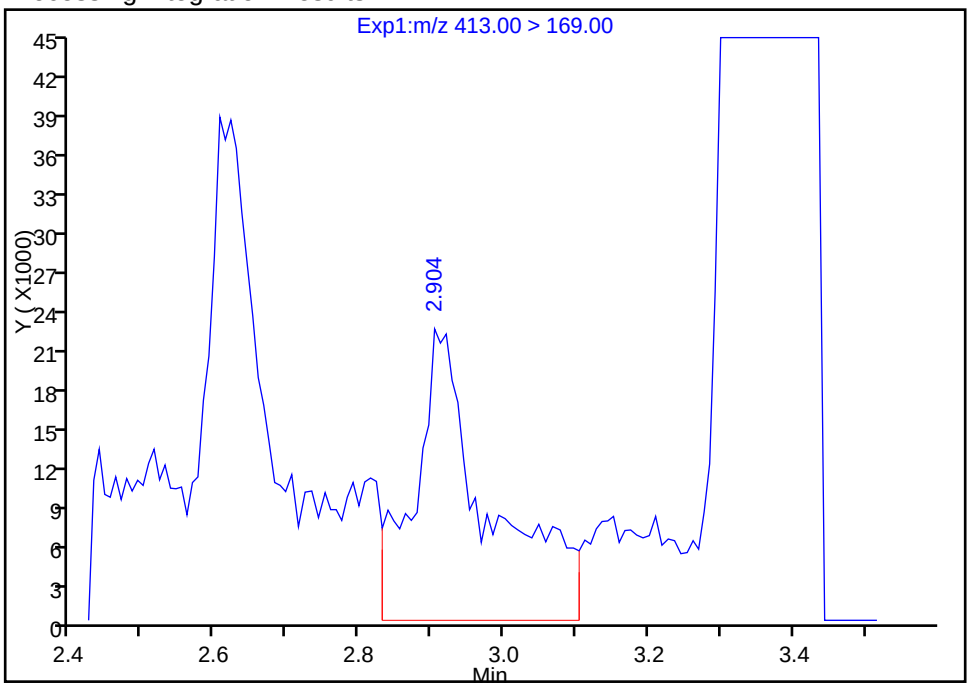
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_008.d				
Injection Date:	16-Jan-2017 14:26:54	Instrument ID:	A8_N		
Lims ID:	320-24961-A-1-A	Lab Sample ID:	320-24961-1		
Client ID:	DPT-GW-EB-26-22				
Operator ID:	A8-PC\A8	ALS Bottle#:	31	Worklist Smp#:	10
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

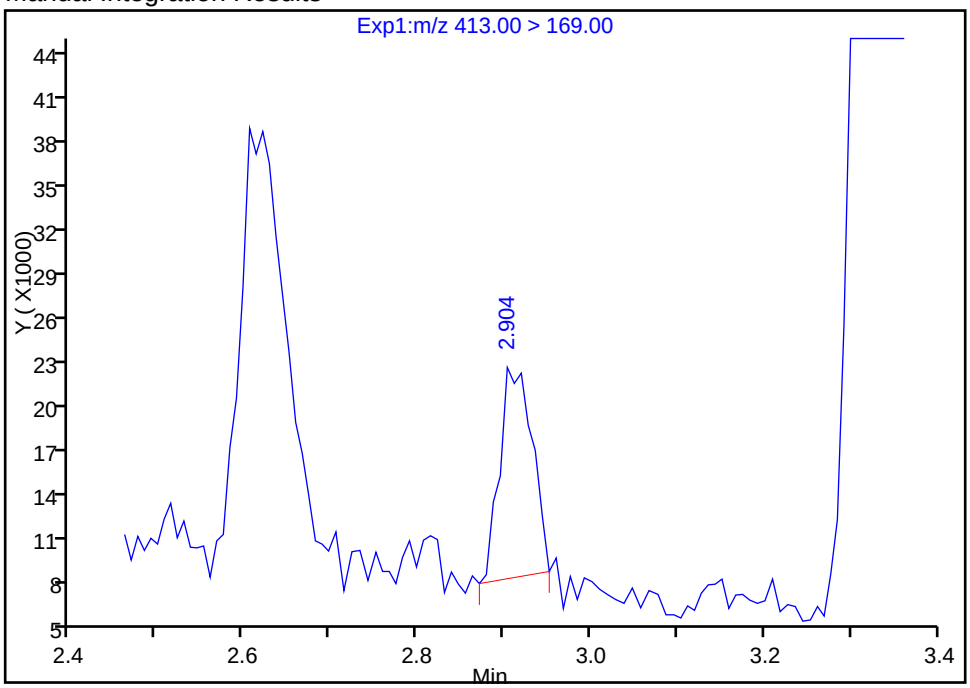
Processing Integration Results

RT: 2.90
Area: 157375
Amount: 1.103884
Amount Units: ng/ml



Manual Integration Results

RT: 2.90
Area: 36934
Amount: 0.388071
Amount Units: ng/ml



Reviewer: westendorfc, 16-Jan-2017 15:02:42
Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-24961-1

SDG No.:

Client Sample ID: DPT-GW-EB-26-33 | Lab Sample ID: 320-24961-2

Matrix: Water | Lab File ID: 16JAN2017_009.d

Analysis Method: 537 (Modified) | Date Collected: 01/11/2017 10:30

Extraction Method: 3535 | Date Extracted: 01/13/2017 12:50

Sample wt/vol: 241.7(mL) | Date Analyzed: 01/16/2017 14:34

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.: 146533 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.00090	J M	0.0026	0.0021	0.00077
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0021	U M	0.0026	0.0021	0.00095
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.0013	J M	0.0041	0.0031	0.0013

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	62		25-150
STL00994	18O2 PFHxS	129		25-150
STL00991	13C4 PFOS	130		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_009.d
Lims ID: 320-24961-A-2-A
Client ID: DPT-GW-EB-26-33
Sample Type: Client
Inject. Date: 16-Jan-2017 14:34:25 ALS Bottle#: 32 Worklist Smp#: 11
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-24961-a-2-a
Misc. Info.: Plate: 1 Rack: 3
Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 17-Jan-2017 09:48:55 Calib Date: 09-Jan-2017 15:16:24
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK027

First Level Reviewer: westendorfc Date: 16-Jan-2017 15:03:45

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										M
298.90 > 80.00	1.935	1.945	-0.010	1.000	84242	0.1327				M
298.90 > 99.00	1.935	1.945	-0.010	1.000	36247		2.32(0.00-0.00)			M
D 10 18O2 PFHxS										
403.00 > 84.00	2.569	2.584	-0.015		19829399	61.1		129	1127013	
D 14 13C4 PFOA										
417.00 > 372.00	2.922	2.944	-0.022		7560468	31.2		62.5	694971	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.930	2.952	-0.022	1.000	66305	0.4370			494	M
413.00 > 169.00	2.922	2.952	-0.030	0.997	50953		1.30(0.90-1.10)		607	M
18 Perfluorooctane sulfonic acid										M
499.00 > 80.00	3.171	3.217	-0.046	1.000	221568	0.6490			4592	M
499.00 > 99.00	3.289	3.217	0.072	1.037	31590		7.01(0.90-1.10)		488	M
D 17 13C4 PFOS										
503.00 > 80.00	3.297	3.321	-0.025		16115977	62.1		130	684907	

QC Flag Legend

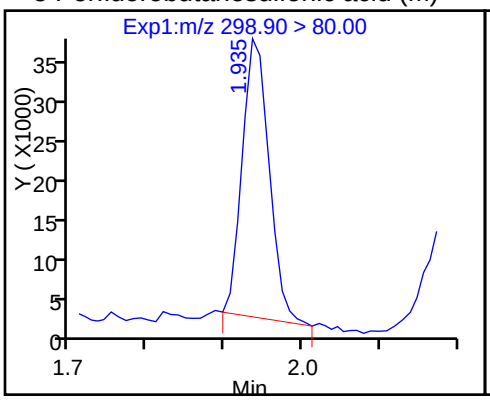
Review Flags
M - Manually Integrated

Report Date: 17-Jan-2017 09:49:04 Chrom Revision: 2.2 10-Jan-2017 11:26:10

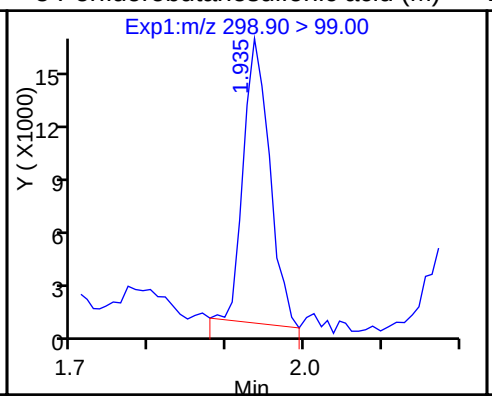
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_009.d				
Injection Date:	16-Jan-2017 14:34:25	Instrument ID:	A8_N		
Lims ID:	320-24961-A-2-A	Lab Sample ID:	320-24961-2		
Client ID:	DPT-GW-EB-26-33				
Operator ID:	A8-PC\A8	ALS Bottle#:	32	Worklist Smp#:	11
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		

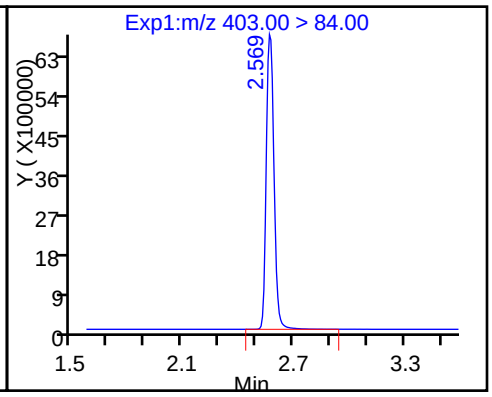
5 Perfluorobutanesulfonic acid (M)



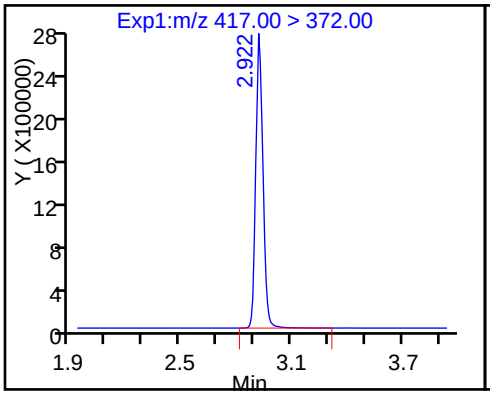
5 Perfluorobutanesulfonic acid (M)



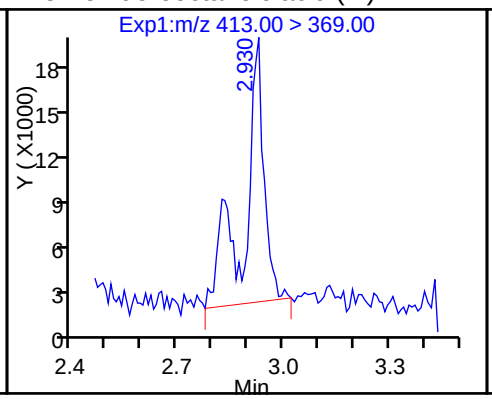
D 10 18O2 PFHxS



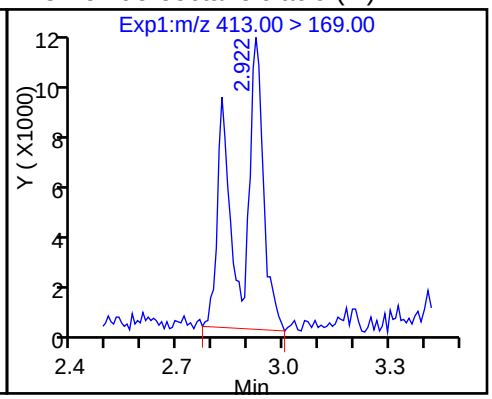
D 14 13C4 PFOA



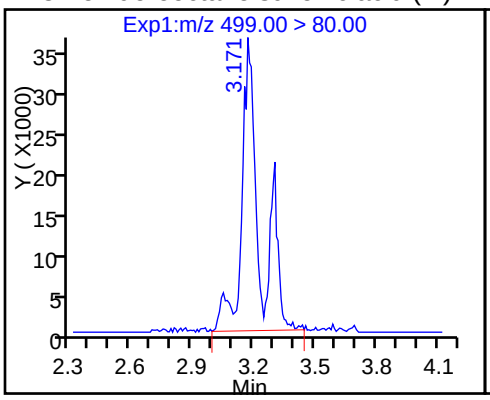
15 Perfluorooctanoic acid (M)



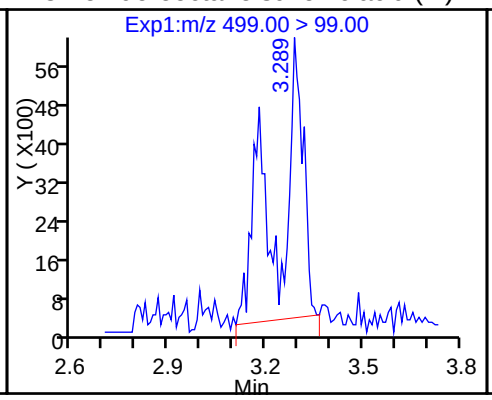
15 Perfluorooctanoic acid (M)



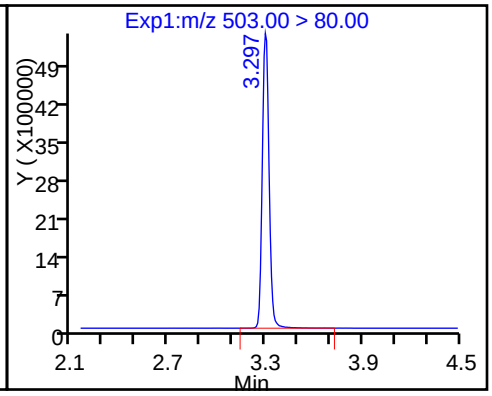
18 Perfluorooctane sulfonic acid (M)



18 Perfluorooctane sulfonic acid (M)



D 17 13C4 PFOS



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

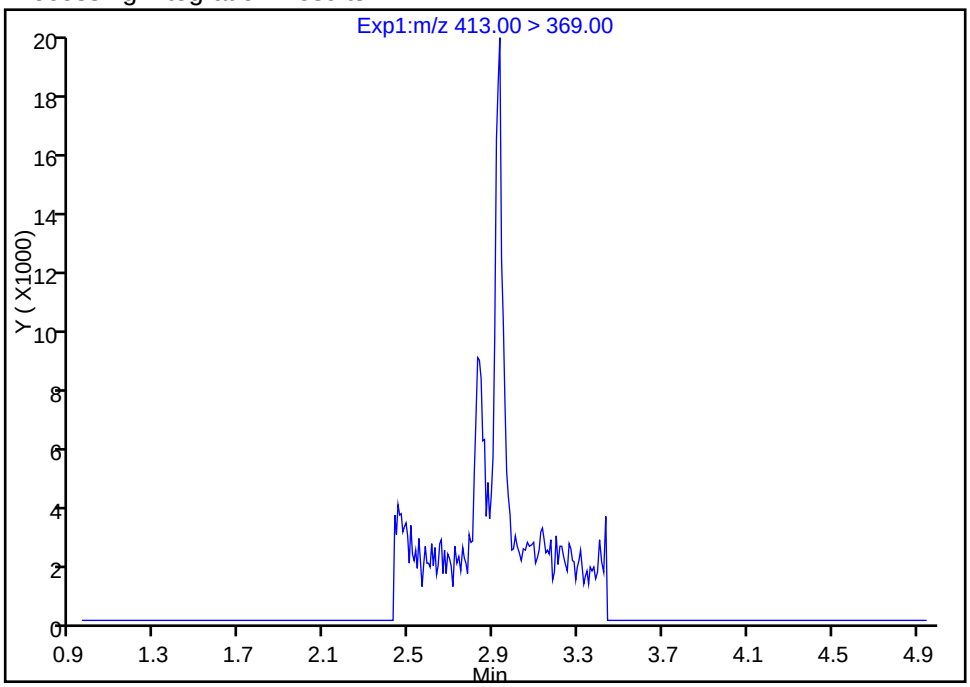
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_009.d				
Injection Date:	16-Jan-2017 14:34:25	Instrument ID:	A8_N		
Lims ID:	320-24961-A-2-A	Lab Sample ID:	320-24961-2		
Client ID:	DPT-GW-EB-26-33				
Operator ID:	A8-PC\A8	ALS Bottle#:	32	Worklist Smp#:	11
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

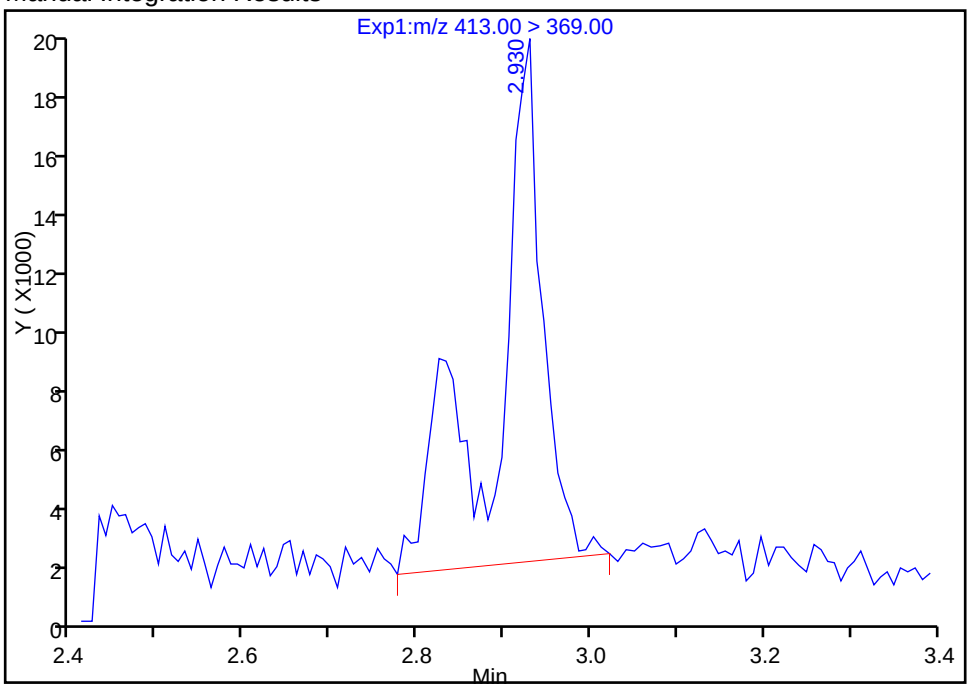
Processing Integration Results

Not Detected
Expected RT: 2.95



Manual Integration Results

RT: 2.93
Area: 66305
Amount: 0.436957
Amount Units: ng/ml



Reviewer: westendorfc, 16-Jan-2017 15:03:45
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

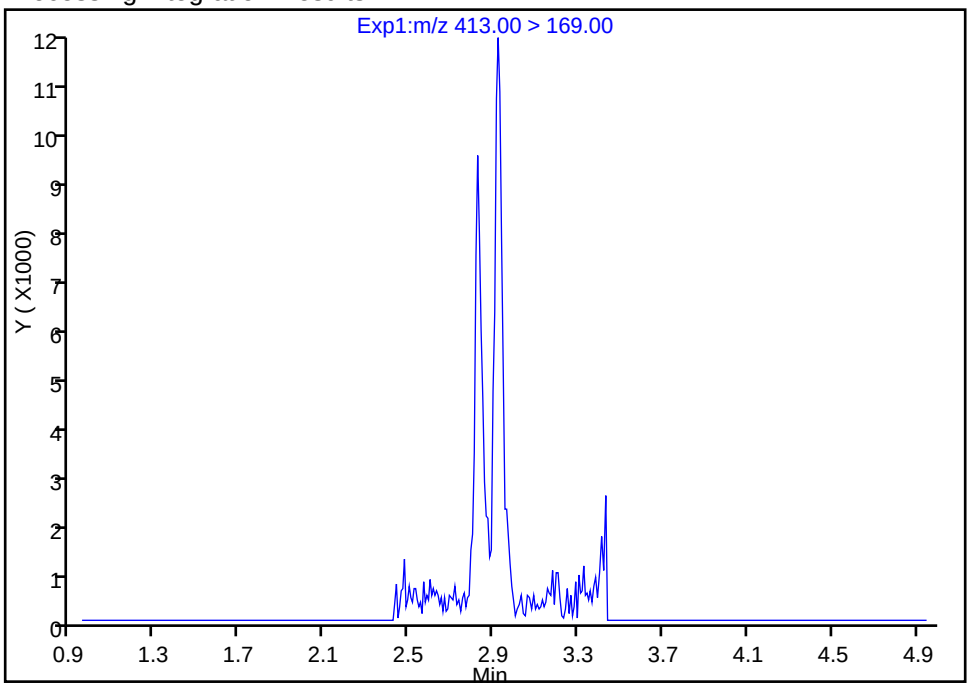
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_009.d				
Injection Date:	16-Jan-2017 14:34:25	Instrument ID:	A8_N		
Lims ID:	320-24961-A-2-A	Lab Sample ID:	320-24961-2		
Client ID:	DPT-GW-EB-26-33				
Operator ID:	A8-PC\A8	ALS Bottle#:	32	Worklist Smp#:	11
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

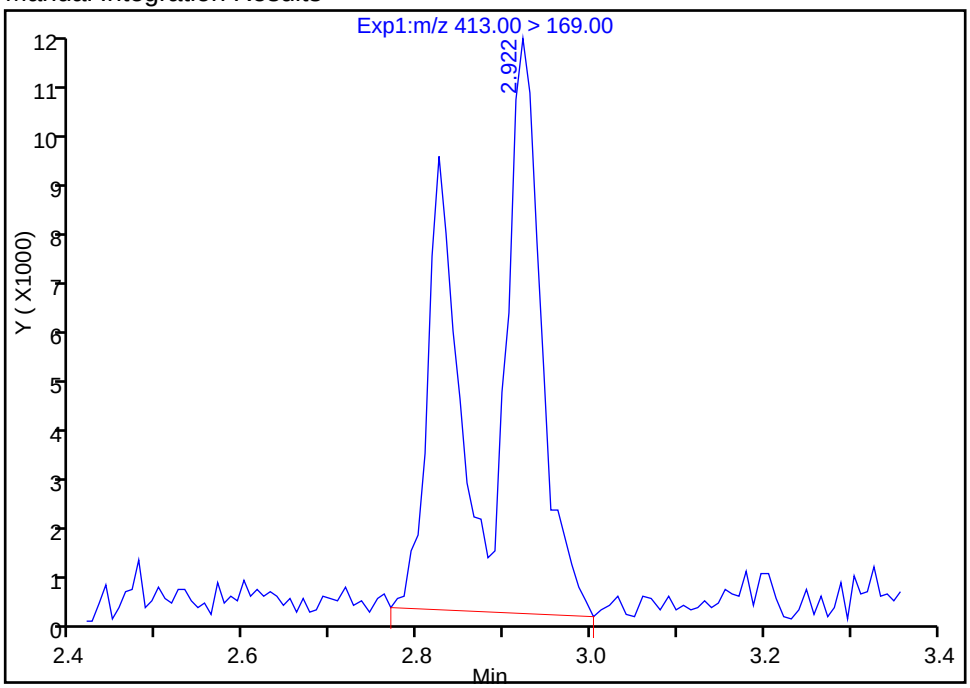
Processing Integration Results

Not Detected
Expected RT: 2.95



Manual Integration Results

RT: 2.92
Area: 50953
Amount: 0.436957
Amount Units: ng/ml



Reviewer: westendorfc, 16-Jan-2017 15:03:45
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

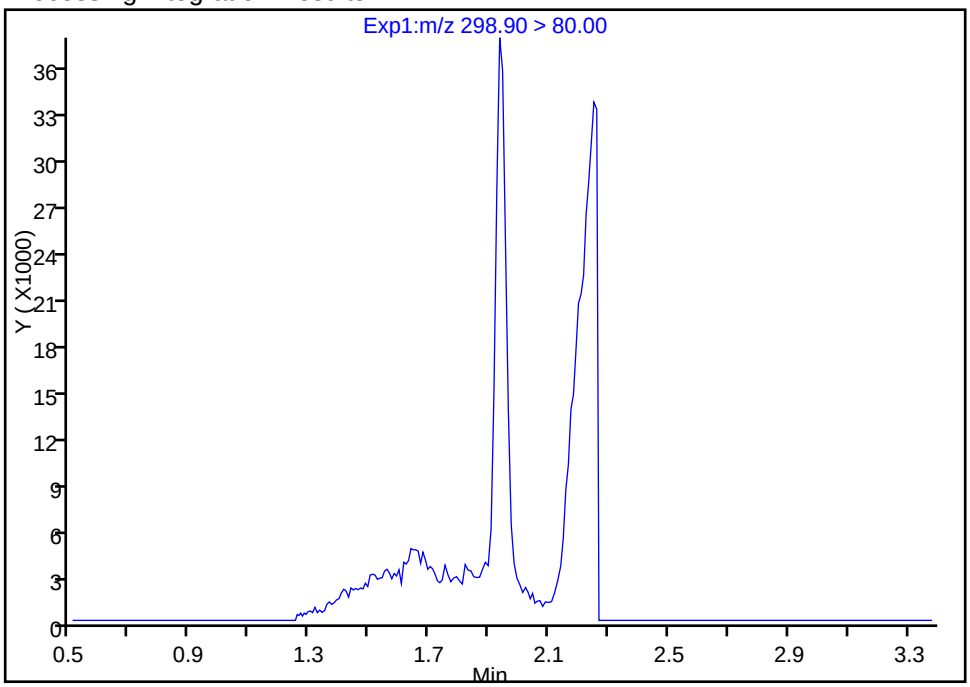
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_009.d				
Injection Date:	16-Jan-2017 14:34:25	Instrument ID:	A8_N		
Lims ID:	320-24961-A-2-A	Lab Sample ID:	320-24961-2		
Client ID:	DPT-GW-EB-26-33				
Operator ID:	A8-PC\A8	ALS Bottle#:	32	Worklist Smp#:	11
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 1

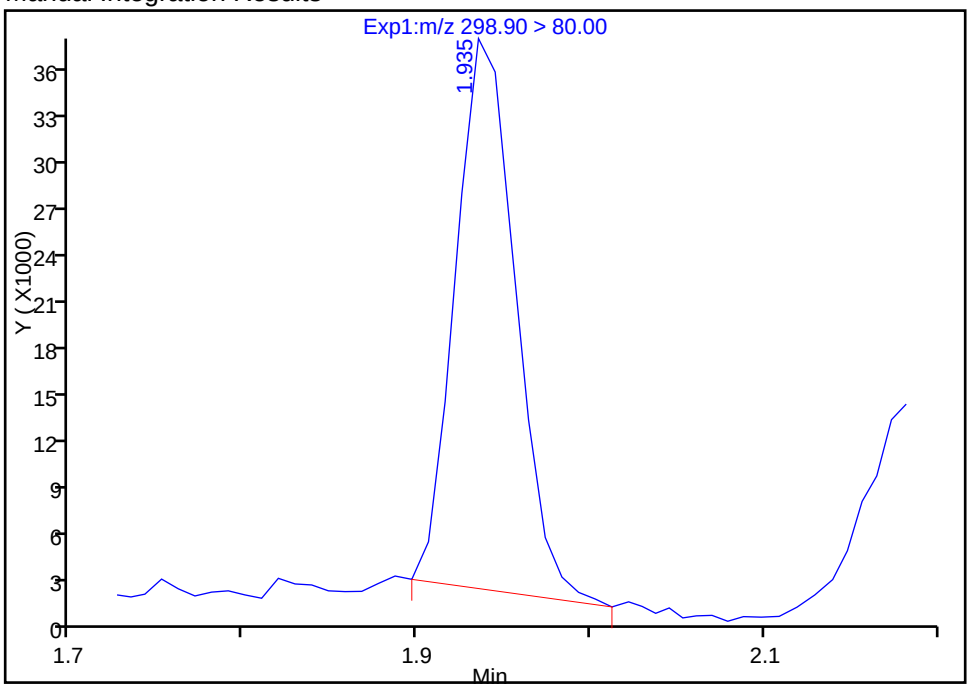
Not Detected
Expected RT: 1.94

Processing Integration Results



Manual Integration Results

RT: 1.94
Area: 84242
Amount: 0.132681
Amount Units: ng/ml



Reviewer: westendorfc, 16-Jan-2017 15:03:45
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

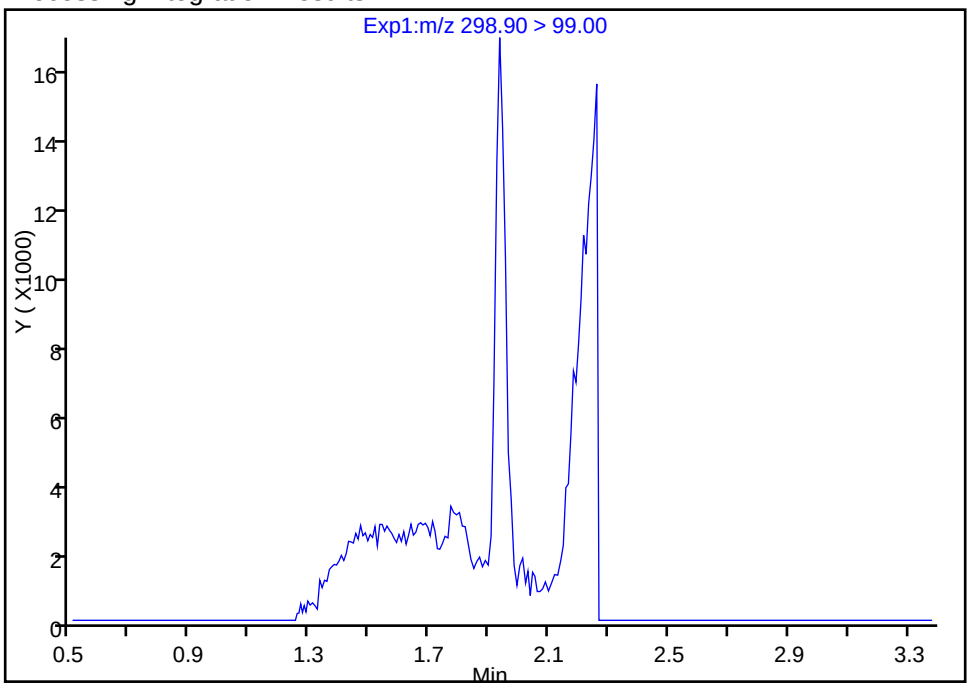
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_009.d				
Injection Date:	16-Jan-2017 14:34:25	Instrument ID:	A8_N		
Lims ID:	320-24961-A-2-A	Lab Sample ID:	320-24961-2		
Client ID:	DPT-GW-EB-26-33				
Operator ID:	A8-PC\A8	ALS Bottle#:	32	Worklist Smp#:	11
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 2

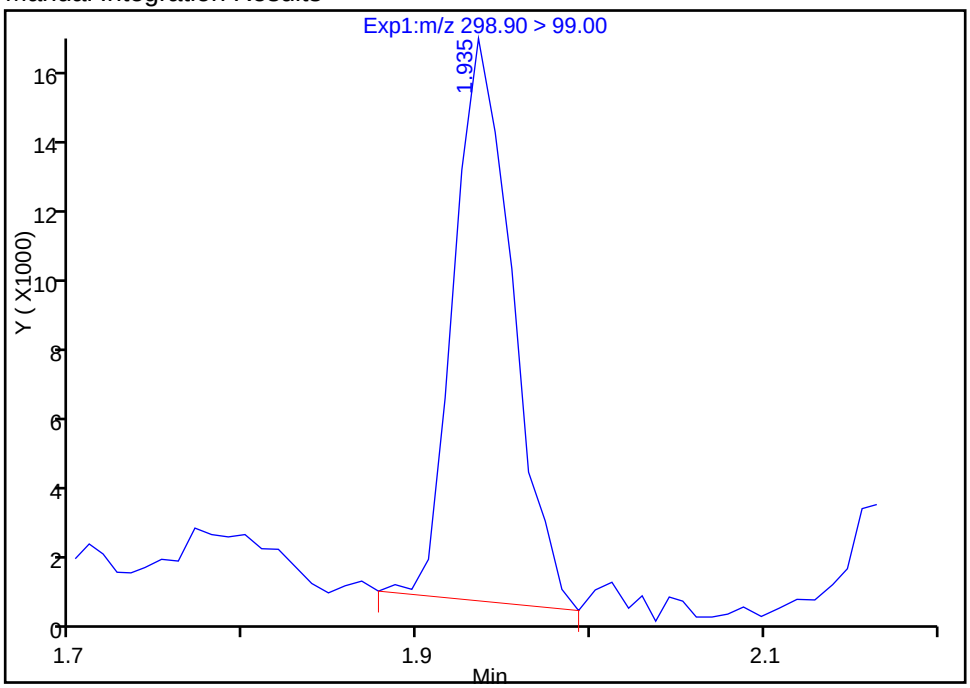
Processing Integration Results

Not Detected
Expected RT: 1.94



Manual Integration Results

RT: 1.94
Area: 36247
Amount: 0.132681
Amount Units: ng/ml



Reviewer: westendorfc, 16-Jan-2017 15:03:45
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

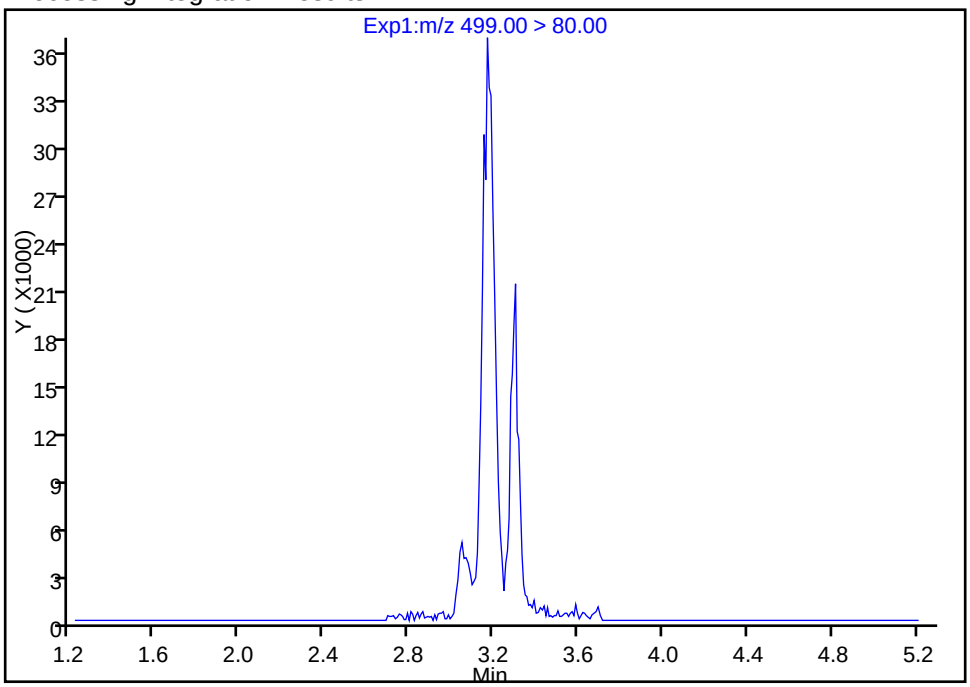
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_009.d				
Injection Date:	16-Jan-2017 14:34:25	Instrument ID:	A8_N		
Lims ID:	320-24961-A-2-A	Lab Sample ID:	320-24961-2		
Client ID:	DPT-GW-EB-26-33				
Operator ID:	A8-PC\A8	ALS Bottle#:	32	Worklist Smp#:	11
Injection Vol:	2.0 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

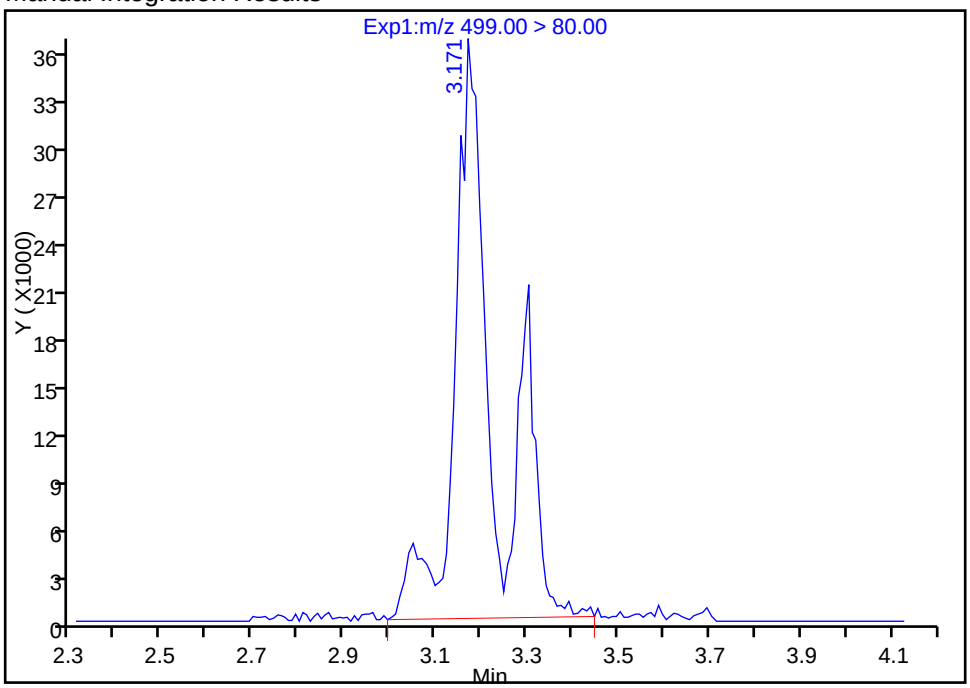
Processing Integration Results

Not Detected
Expected RT: 3.22



Manual Integration Results

RT: 3.17
Area: 221568
Amount: 0.648993
Amount Units: ng/ml



Reviewer: westendorfc, 16-Jan-2017 15:03:45
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

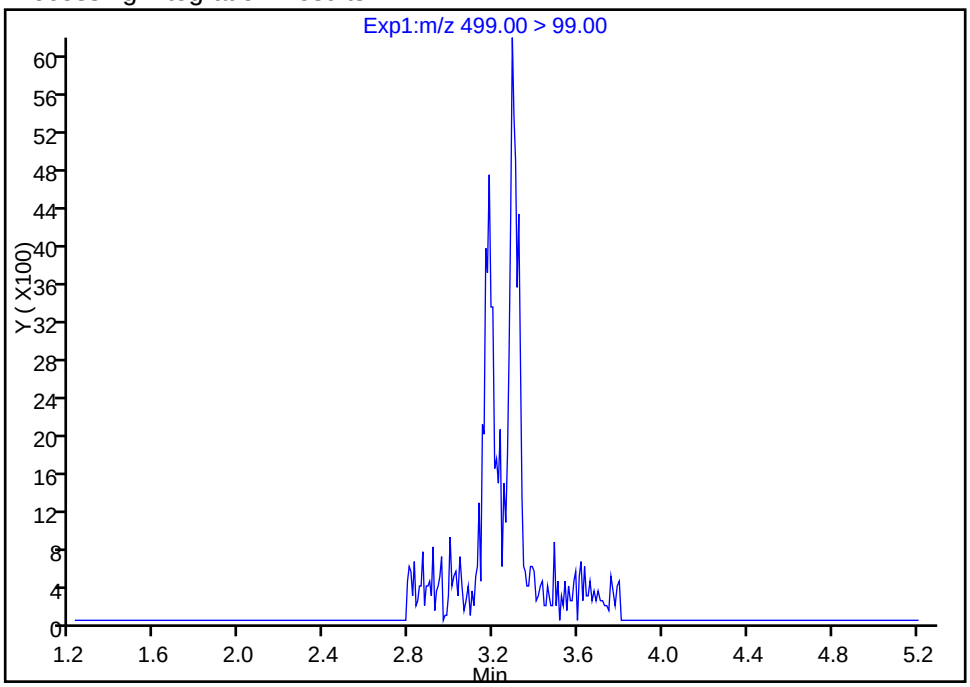
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_009.d				
Injection Date:	16-Jan-2017 14:34:25	Instrument ID:	A8_N		
Lims ID:	320-24961-A-2-A	Lab Sample ID:	320-24961-2		
Client ID:	DPT-GW-EB-26-33				
Operator ID:	A8-PC\A8	ALS Bottle#:	32	Worklist Smp#:	11
Injection Vol:	2.0 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

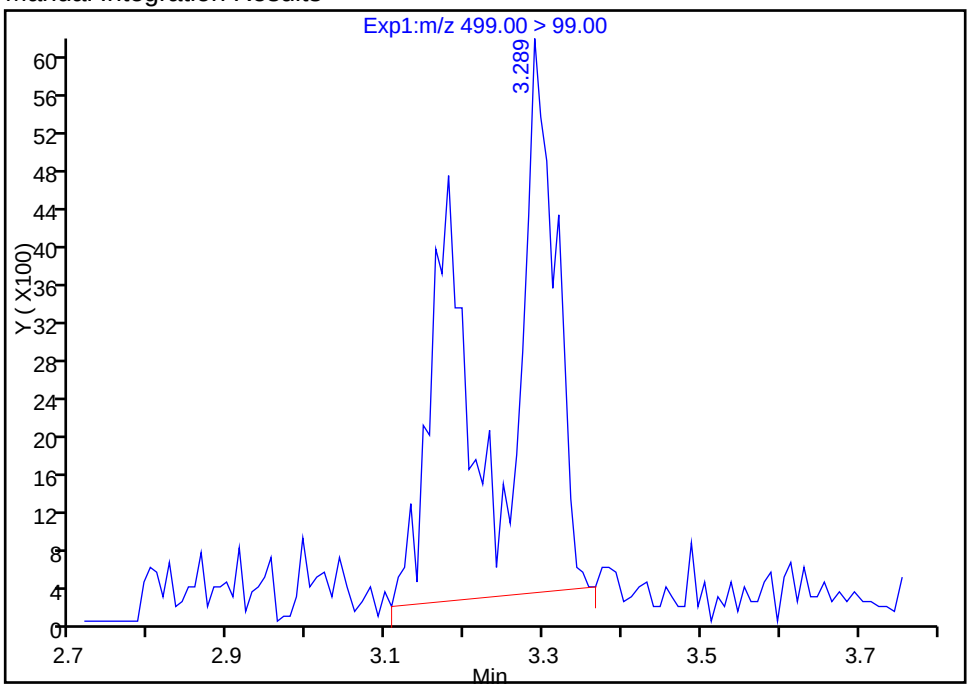
Processing Integration Results

Not Detected
Expected RT: 3.22



Manual Integration Results

RT: 3.29
Area: 31590
Amount: 0.648993
Amount Units: ng/ml



Reviewer: westendorfc, 16-Jan-2017 15:03:45
Audit Action: Manually Integrated Audit Reason: Assign Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-24961-1

SDG No.:

Client Sample ID: DPT-17-26-GW-29-33 | Lab Sample ID: 320-24961-3

Matrix: Water | Lab File ID: 16JAN2017_010.d

Analysis Method: 537 (Modified) | Date Collected: 01/11/2017 12:00

Extraction Method: 3535 | Date Extracted: 01/13/2017 12:50

Sample wt/vol: 260.2(mL) | Date Analyzed: 01/16/2017 14:41

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.: 146533 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.0016	J	0.0024	0.0019	0.00072
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0019	U	0.0024	0.0019	0.00088
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.0083		0.0038	0.0029	0.0012

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	95		25-150
STL00994	18O2 PFHxS	118		25-150
STL00991	13C4 PFOS	116		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_010.d
Lims ID: 320-24961-A-3-A
Client ID: DPT-17-26-GW-29-33
Sample Type: Client
Inject. Date: 16-Jan-2017 14:41:55 ALS Bottle#: 33 Worklist Smp#: 12
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-24961-a-3-a
Misc. Info.: Plate: 1 Rack: 3
Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 17-Jan-2017 09:48:55 Calib Date: 09-Jan-2017 15:16:24
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK027

First Level Reviewer: westendorfc Date: 16-Jan-2017 15:04:04

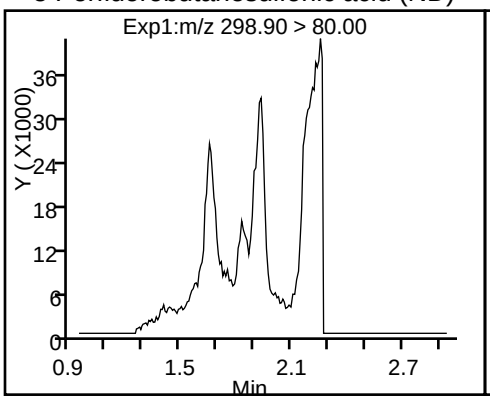
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 10 18O2 PFHxS										
403.00 > 84.00	2.569	2.584	-0.015		18049656	55.6		118	1576661	
D 14 13C4 PFOA										
417.00 > 372.00	2.920	2.944	-0.024		11526473	47.6		95.3	1026290	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.920	2.952	-0.032	1.000	195191	0.8437			1804	
413.00 > 169.00	2.912	2.952	-0.040	0.997	128870		1.51(0.90-1.10)		2512	
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.270	3.217	0.053	1.000	1315801	4.32			17692	
499.00 > 99.00	3.293	3.217	0.076	1.007	248485		5.30(0.90-1.10)		6285	
D 17 13C4 PFOS										
503.00 > 80.00	3.293	3.321	-0.028		14371377	55.4		116	295833	

Report Date: 17-Jan-2017 09:49:05 Chrom Revision: 2.2 10-Jan-2017 11:26:10

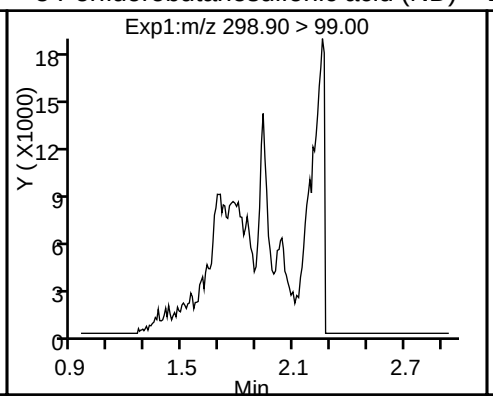
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_010.d				
Injection Date:	16-Jan-2017 14:41:55	Instrument ID:	A8_N		
Lims ID:	320-24961-A-3-A	Lab Sample ID:	320-24961-3		
Client ID:	DPT-17-26-GW-29-33				
Operator ID:	A8-PC\A8	ALS Bottle#:	33	Worklist Smp#:	12
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		

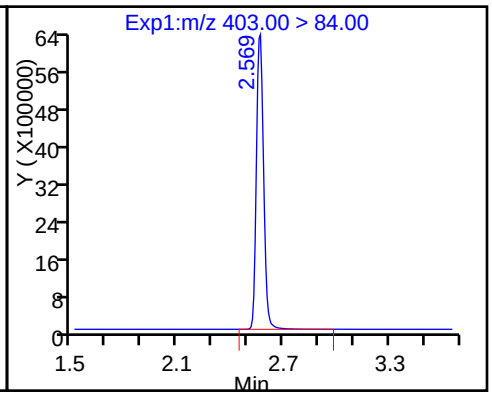
5 Perfluorobutanesulfonic acid (ND)



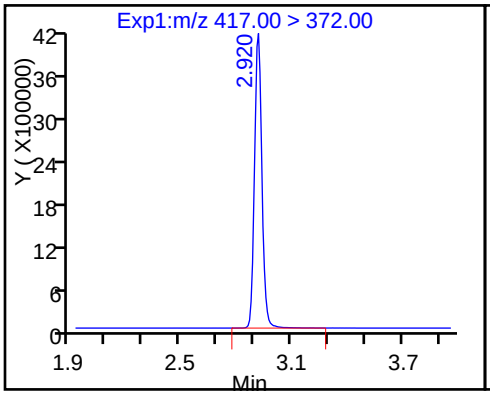
5 Perfluorobutanesulfonic acid (ND)



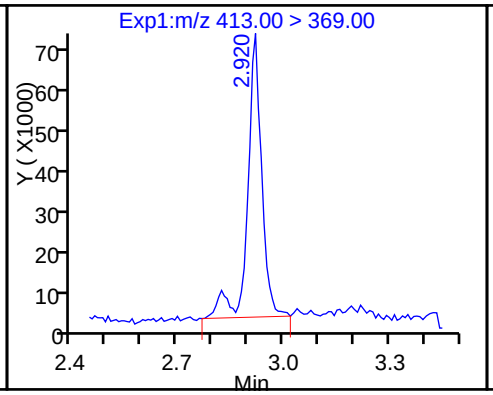
D 10 18O2 PFHxS



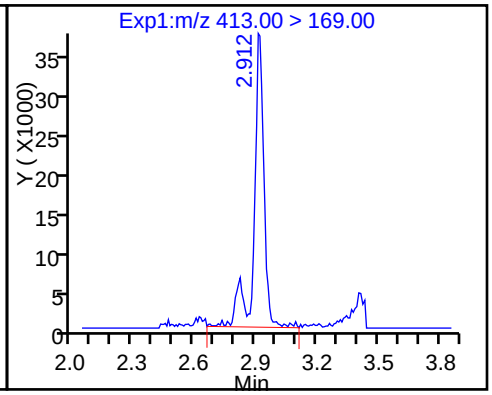
D 14 13C4 PFOA



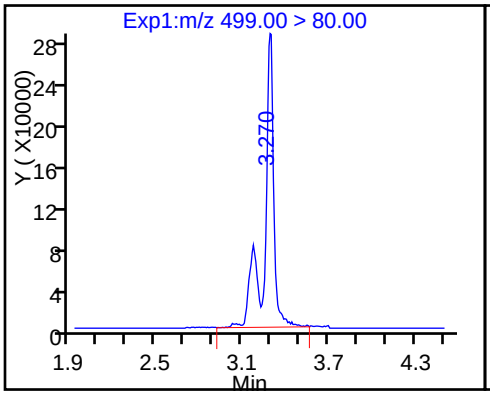
15 Perfluorooctanoic acid



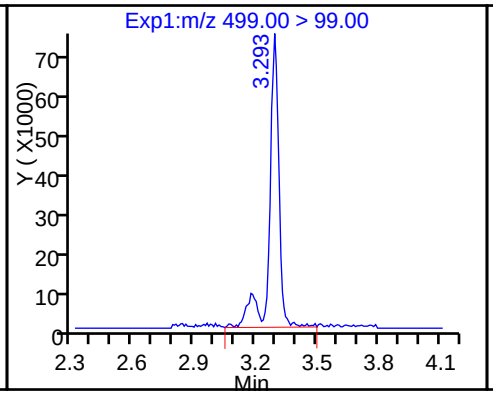
15 Perfluorooctanoic acid



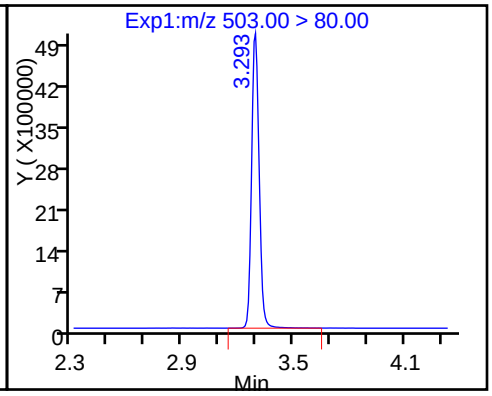
18 Perfluorooctane sulfonic acid



18 Perfluorooctane sulfonic acid



D 17 13C4 PFOS



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-24961-1
SDG No.:
Client Sample ID: DPT-17-26-GW-18-22
Lab Sample ID: 320-24961-4
Matrix: Water
Lab File ID: 16JAN2017_011.d
Analysis Method: 537 (Modified)
Date Collected: 01/11/2017 12:30
Extraction Method: 3535
Date Extracted: 01/13/2017 12:50
Sample wt/vol: 251.7(mL)
Date Analyzed: 01/16/2017 14:49
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.: 146533
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.0059	M	0.0025	0.0020	0.00074
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0011	J M	0.0025	0.0020	0.00091
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.0083		0.0040	0.0030	0.0013

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	53		25-150
STL00994	18O2 PFHxS	122		25-150
STL00991	13C4 PFOS	125		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_011.d
Lims ID: 320-24961-A-4-A
Client ID: DPT-17-26-GW-18-22
Sample Type: Client
Inject. Date: 16-Jan-2017 14:49:25 ALS Bottle#: 34 Worklist Smp#: 13
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-24961-a-4-a
Misc. Info.: Plate: 1 Rack: 3
Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 17-Jan-2017 09:48:55 Calib Date: 09-Jan-2017 15:16:24
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK027

First Level Reviewer: chandrasenas Date: 17-Jan-2017 09:43:36

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobutanesulfonic acid										M
298.90 > 80.00	1.925	1.945	-0.020	1.000	315912	0.5289				M
298.90 > 99.00	1.925	1.945	-0.020	1.000	147531		2.14(0.00-0.00)			M
D 10 18O2 PFHxS										
403.00 > 84.00	2.557	2.584	-0.027		18655306	57.5		122	715753	
D 14 13C4 PFOA										
417.00 > 372.00	2.910	2.944	-0.034		6462181	26.7		53.4	457580	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.910	2.952	-0.042	1.000	382198	2.95			2334	M
413.00 > 169.00	2.910	2.952	-0.042	1.000	238979		1.60(0.90-1.10)		901	M
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.165	3.217	-0.052	1.000	1363936	4.16			12273	
499.00 > 99.00	3.290	3.217	0.073	1.040	302776		4.50(0.90-1.10)		3051	
D 17 13C4 PFOS										
503.00 > 80.00	3.283	3.321	-0.038		15481362	59.6		125	303308	

QC Flag Legend

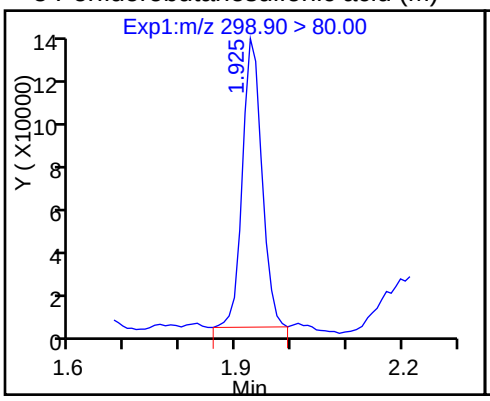
Review Flags
M - Manually Integrated

Report Date: 17-Jan-2017 09:49:06 Chrom Revision: 2.2 10-Jan-2017 11:26:10

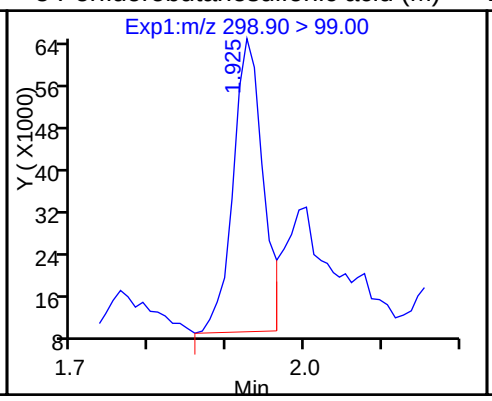
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_011.d				
Injection Date:	16-Jan-2017 14:49:25	Instrument ID:	A8_N		
Lims ID:	320-24961-A-4-A	Lab Sample ID:	320-24961-4		
Client ID:	DPT-17-26-GW-18-22				
Operator ID:	A8-PC\A8	ALS Bottle#:	34	Worklist Smp#:	13
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		

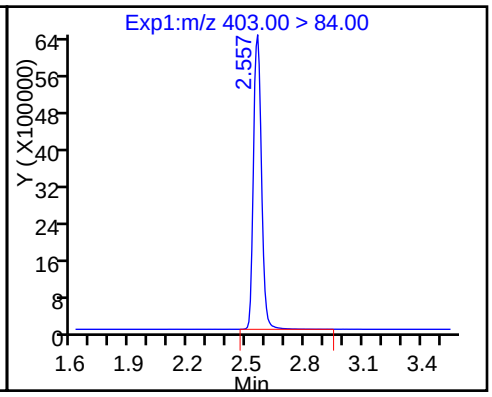
5 Perfluorobutanesulfonic acid (M)



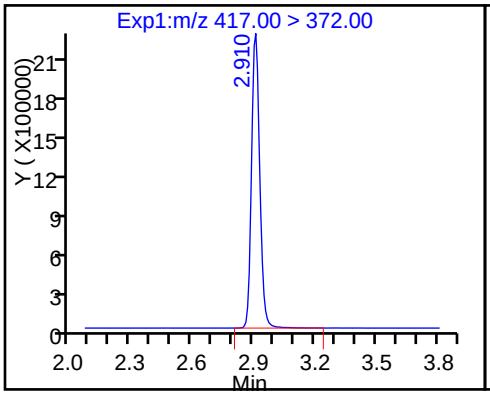
5 Perfluorobutanesulfonic acid (M)



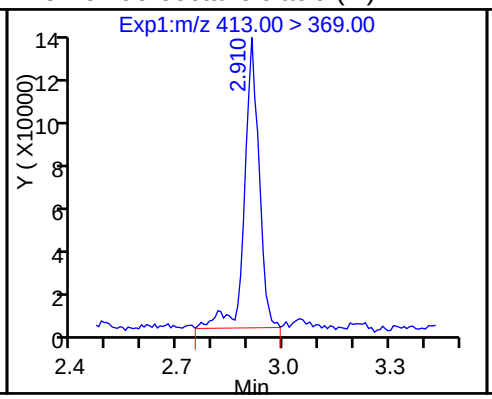
D 10 18O2 PFHxS



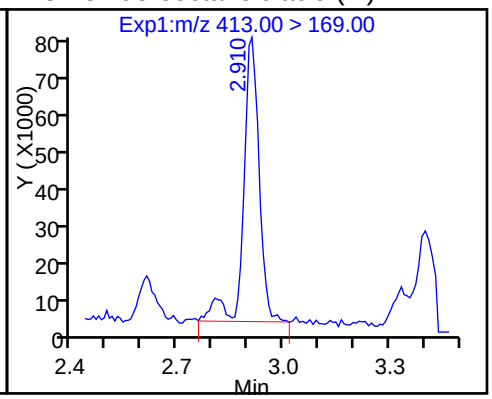
D 14 13C4 PFOA



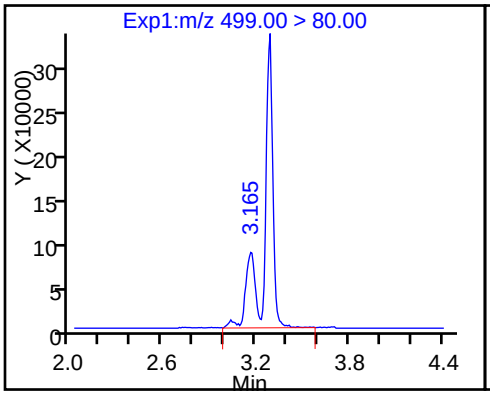
15 Perfluorooctanoic acid (M)



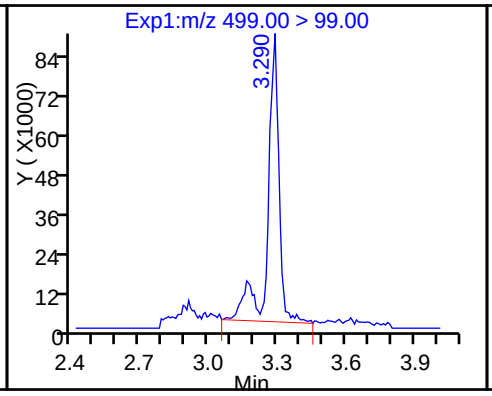
15 Perfluorooctanoic acid (M)



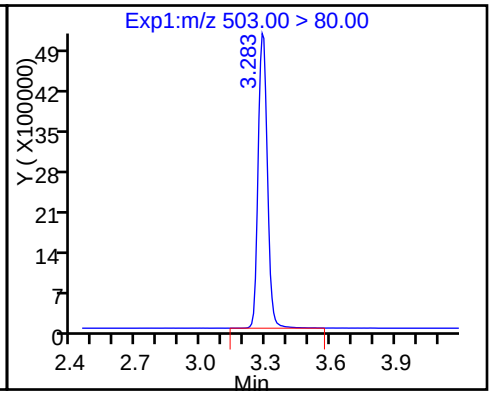
18 Perfluorooctane sulfonic acid



18 Perfluorooctane sulfonic acid



D 17 13C4 PFOS



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

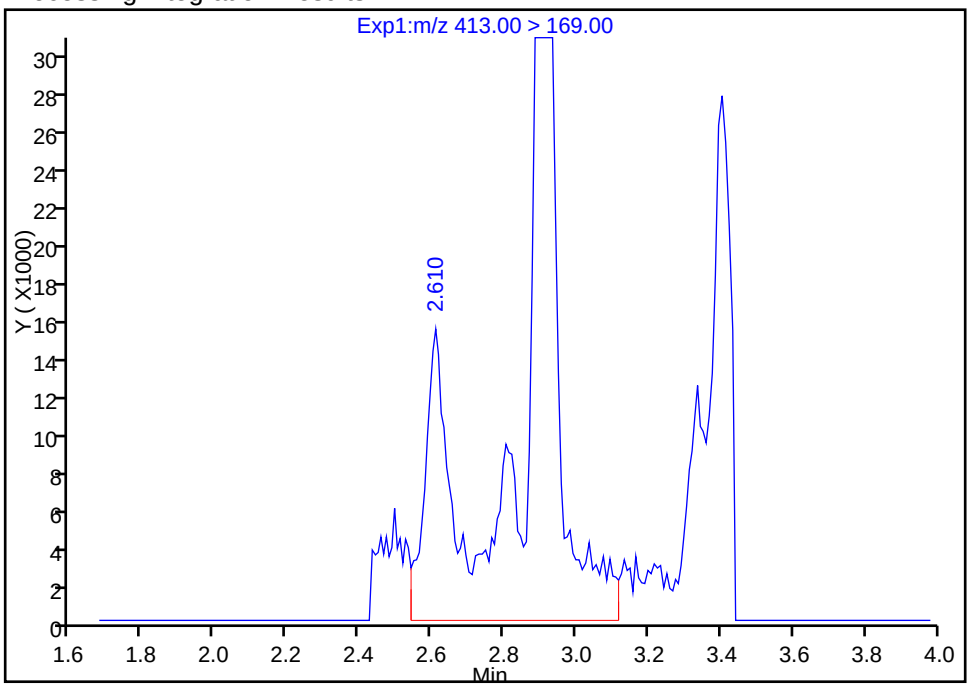
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_011.d				
Injection Date:	16-Jan-2017 14:49:25	Instrument ID:	A8_N		
Lims ID:	320-24961-A-4-A	Lab Sample ID:	320-24961-4		
Client ID:	DPT-17-26-GW-18-22				
Operator ID:	A8-PC\A8	ALS Bottle#:	34	Worklist Smp#:	13
Injection Vol:	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: 2

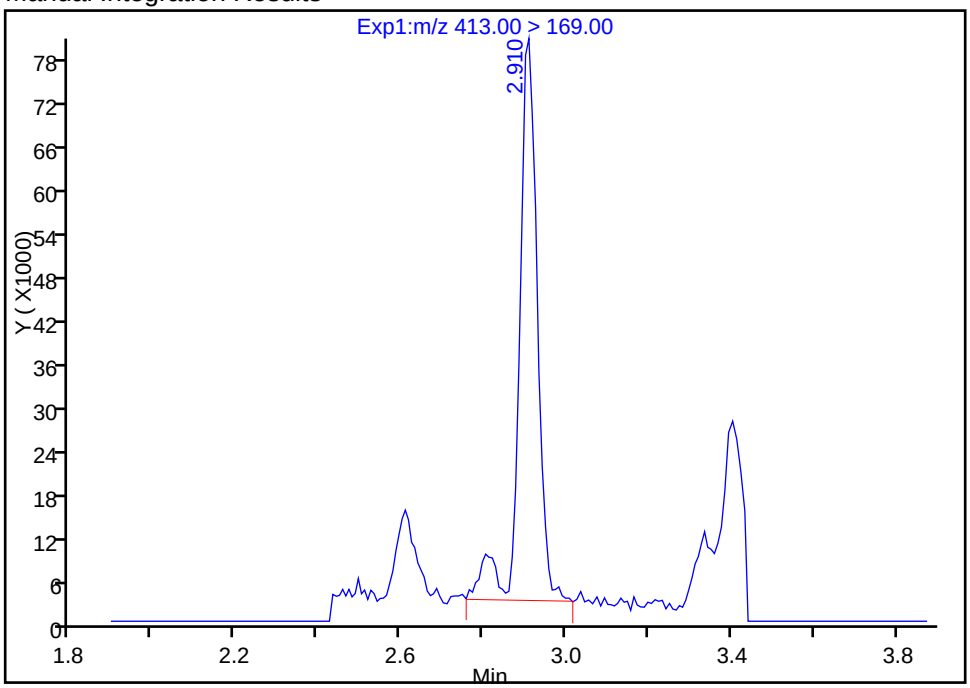
Processing Integration Results

RT: 2.61
Area: 380824
Amount: 2.971526
Amount Units: ng/ml



Manual Integration Results

RT: 2.91
Area: 238979
Amount: 2.946799
Amount Units: ng/ml



Reviewer: chandrasenas, 17-Jan-2017 09:43:36

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

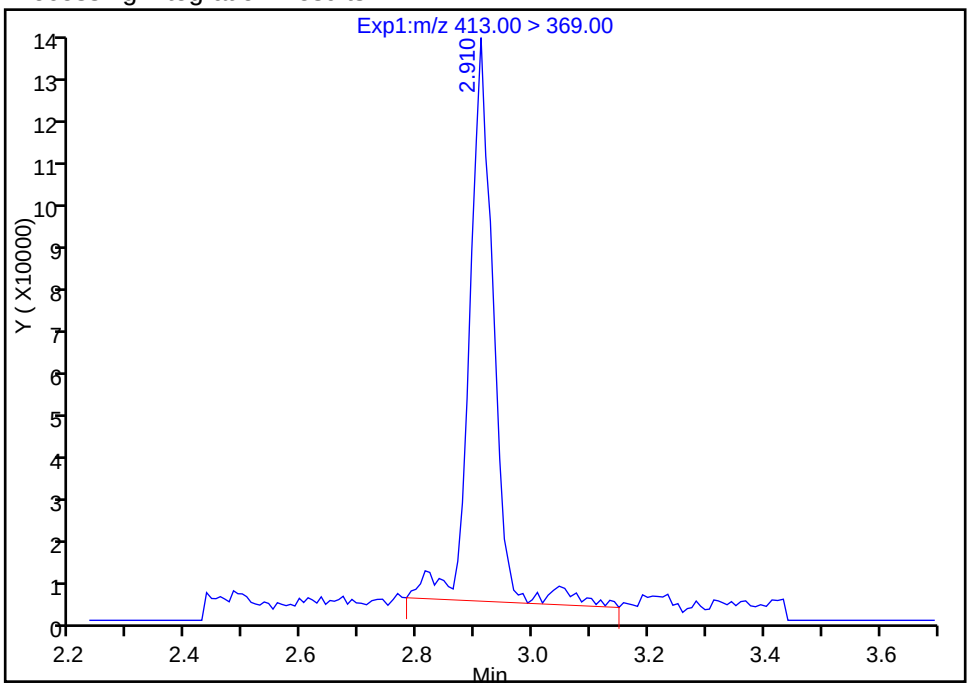
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_011.d				
Injection Date:	16-Jan-2017 14:49:25	Instrument ID:	A8_N		
Lims ID:	320-24961-A-4-A	Lab Sample ID:	320-24961-4		
Client ID:	DPT-17-26-GW-18-22				
Operator ID:	A8-PC\A8	ALS Bottle#:	34	Worklist Smp#:	13
Injection Vol:	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

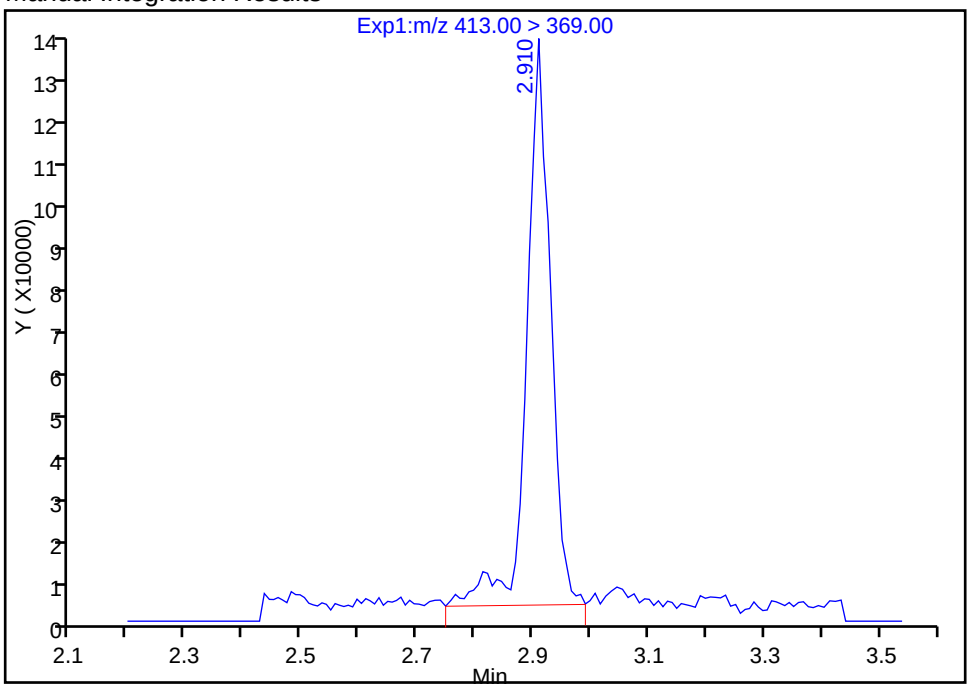
Processing Integration Results

RT: 2.91
Area: 385405
Amount: 2.971526
Amount Units: ng/ml



Manual Integration Results

RT: 2.91
Area: 382198
Amount: 2.946799
Amount Units: ng/ml



Reviewer: chandrasenas, 17-Jan-2017 09:43:36

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

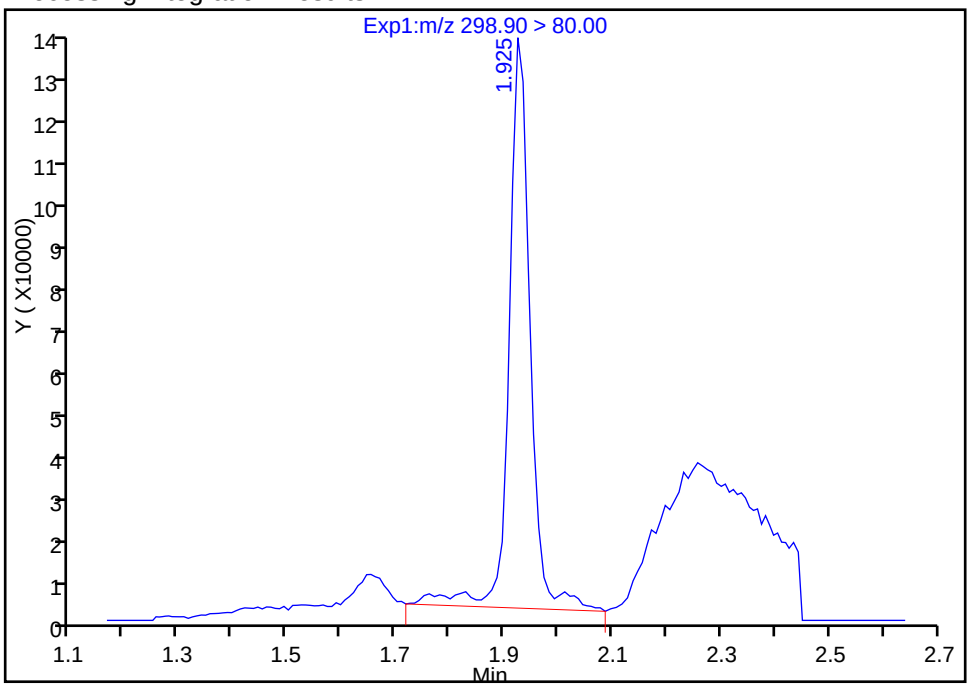
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_011.d				
Injection Date:	16-Jan-2017 14:49:25	Instrument ID:	A8_N		
Lims ID:	320-24961-A-4-A	Lab Sample ID:	320-24961-4		
Client ID:	DPT-17-26-GW-18-22				
Operator ID:	A8-PC\A8	ALS Bottle#:	34	Worklist Smp#:	13
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 1

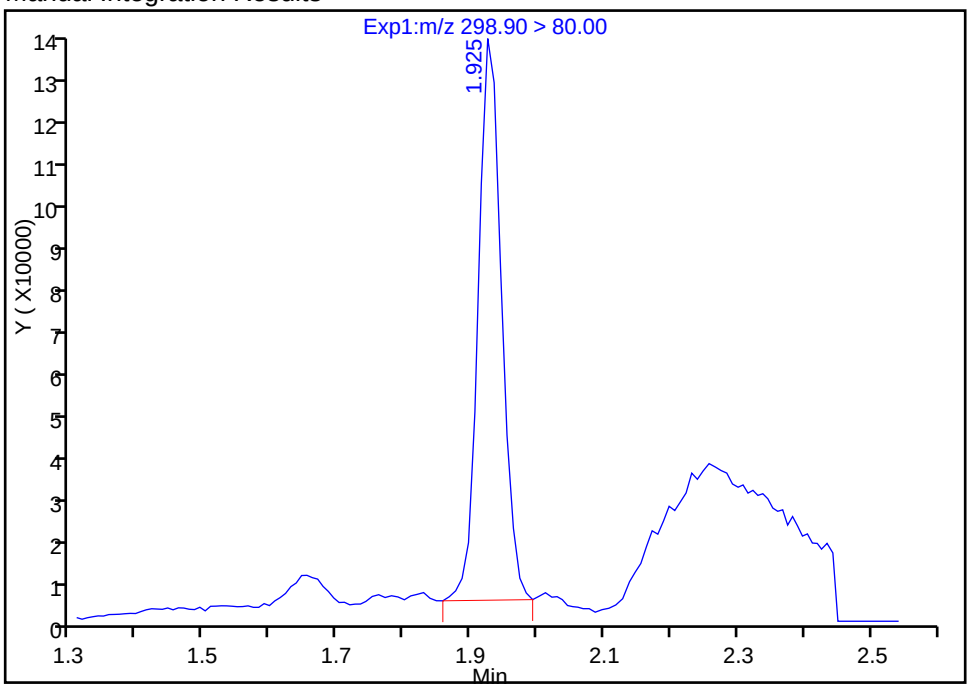
Processing Integration Results

RT: 1.93
Area: 359568
Amount: 0.601960
Amount Units: ng/ml



Manual Integration Results

RT: 1.93
Area: 315912
Amount: 0.528874
Amount Units: ng/ml



Reviewer: chandrasenas, 17-Jan-2017 09:43:36

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

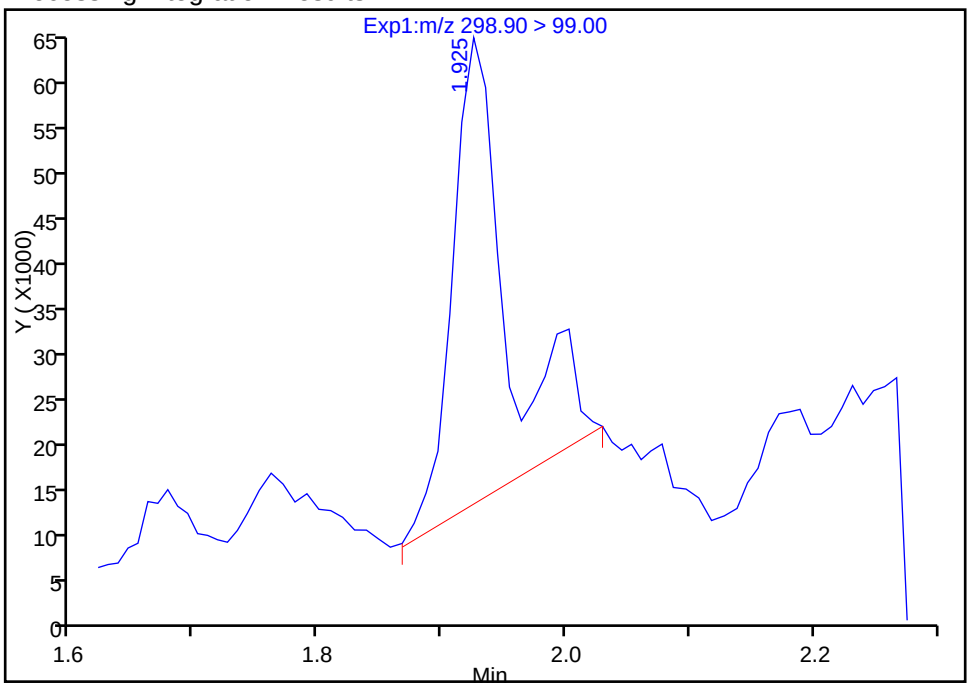
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_011.d				
Injection Date:	16-Jan-2017 14:49:25	Instrument ID:	A8_N		
Lims ID:	320-24961-A-4-A	Lab Sample ID:	320-24961-4		
Client ID:	DPT-17-26-GW-18-22				
Operator ID:	A8-PC\A8	ALS Bottle#:	34	Worklist Smp#:	13
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 2

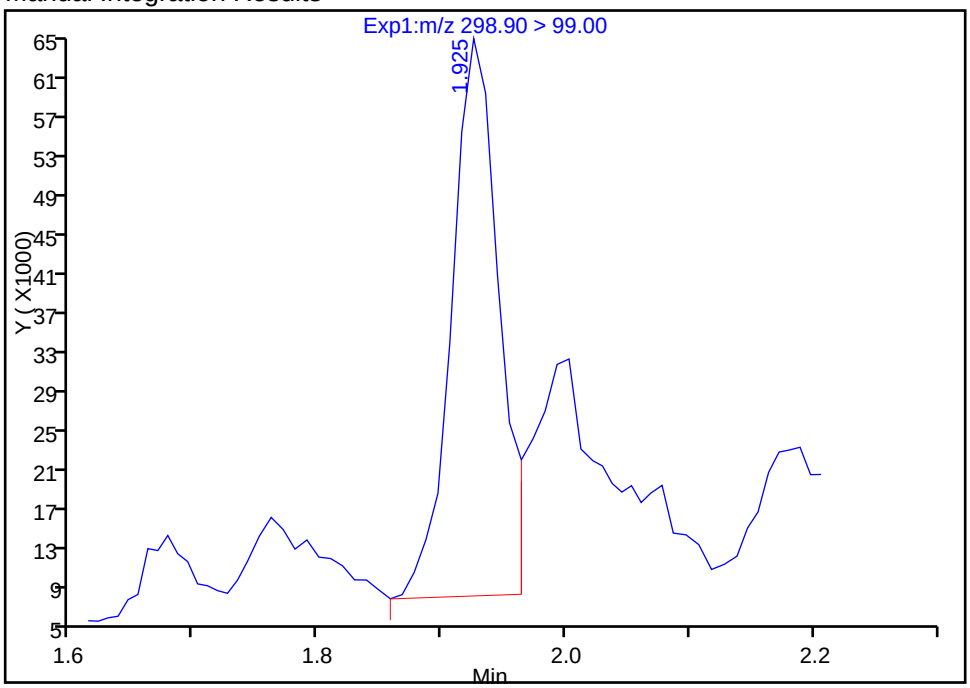
Processing Integration Results

RT: 1.93
Area: 154887
Amount: 0.601960
Amount Units: ng/ml



Manual Integration Results

RT: 1.93
Area: 147531
Amount: 0.528874
Amount Units: ng/ml



Reviewer: chandrasenas, 17-Jan-2017 09:43:36

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-24961-1
SDG No.:
Client Sample ID: DPT-GW-EB-27-22
Lab Sample ID: 320-24961-5
Matrix: Water
Lab File ID: 16JAN2017_012.d
Analysis Method: 537 (Modified)
Date Collected: 01/11/2017 13:40
Extraction Method: 3535
Date Extracted: 01/13/2017 12:50
Sample wt/vol: 252.3(mL)
Date Analyzed: 01/16/2017 14:56
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.: 146533
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.0020	U	0.0025	0.0020	0.00074
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0020	U	0.0025	0.0020	0.00091
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.0029	J M	0.0040	0.0030	0.0013

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	107		25-150
STL00994	18O2 PFHxS	129		25-150
STL00991	13C4 PFOS	129		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_012.d				
Lims ID:	320-24961-A-5-A				
Client ID:	DPT-GW-EB-27-22				
Sample Type:	Client				
Inject. Date:	16-Jan-2017 14:56:56	ALS Bottle#:	35	Worklist Smp#:	14
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Sample Info:	320-24961-a-5-a				
Misc. Info.:	Plate: 1 Rack: 3				
Operator ID:	A8-PC\A8	Instrument ID:	A8_N		

Method:	\\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\A8_N.m		
Limit Group:	LC PFC_DOD ICAL		
Last Update:	17-Jan-2017 09:48:55	Calib Date:	09-Jan-2017 15:16:24
Integrator:	Picker		
Quant Method:	Isotopic Dilution	Quant By:	Initial Calibration
Last ICal File:	\\ChromNA\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_018.d		

Column 1 :			Det: EXP1
Process Host:	XAWRK027		

First Level Reviewer: chandrasenas Date: 17-Jan-2017 09:44:04

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 10 18O2 PFHxS										
403.00 > 84.00	2.566	2.584	-0.018		19771794	60.9		129	1142042	
D 14 13C4 PFOA										
417.00 > 372.00	2.919	2.944	-0.025		12915829	53.4		107	905073	
18 Perfluorooctane sulfonic acid										M
499.00 > 80.00	3.285	3.217	0.068	1.000	497277	1.47			20304	
499.00 > 99.00	3.285	3.217	0.068	1.000	112385		4.42(0.90-1.10)		3041	M
D 17 13C4 PFOS										
503.00 > 80.00	3.292	3.321	-0.029		15992762	61.6		129	499667	

QC Flag Legend

Review Flags

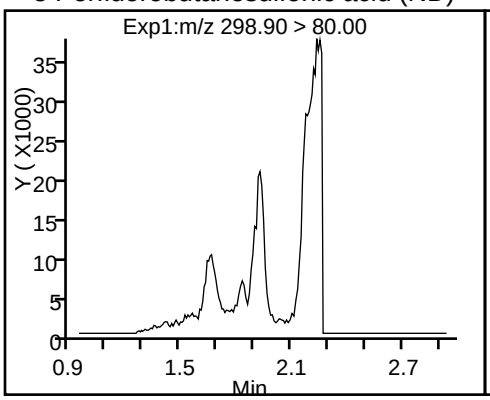
M - Manually Integrated

Report Date: 17-Jan-2017 09:49:07 Chrom Revision: 2.2 10-Jan-2017 11:26:10

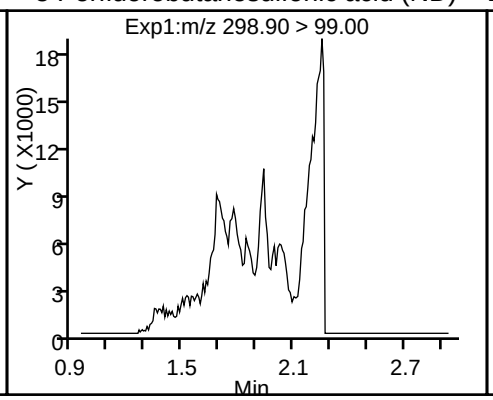
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_012.d				
Injection Date:	16-Jan-2017 14:56:56	Instrument ID:	A8_N		
Lims ID:	320-24961-A-5-A	Lab Sample ID:	320-24961-5		
Client ID:	DPT-GW-EB-27-22				
Operator ID:	A8-PC\A8	ALS Bottle#:	35	Worklist Smp#:	14
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		

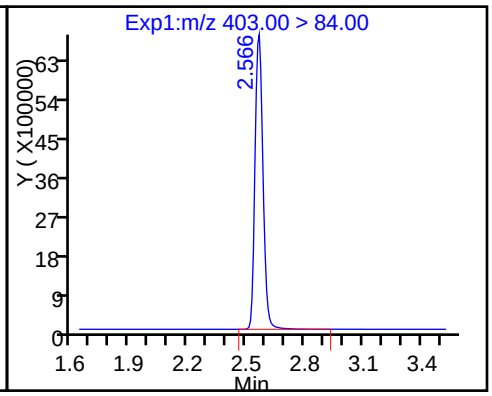
5 Perfluorobutanesulfonic acid (ND)



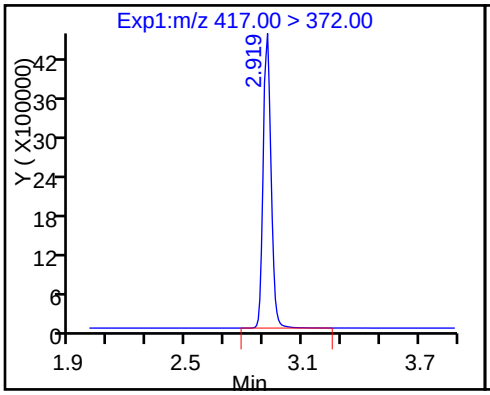
5 Perfluorobutanesulfonic acid (ND)



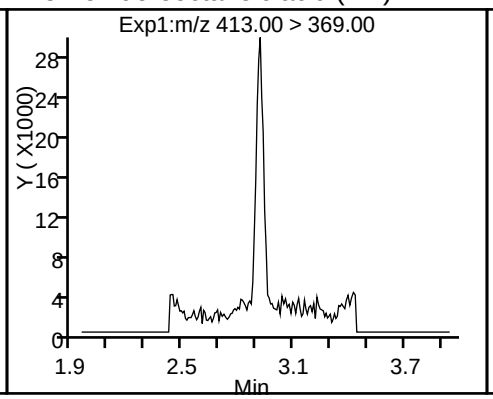
D 10 18O2 PFHxS



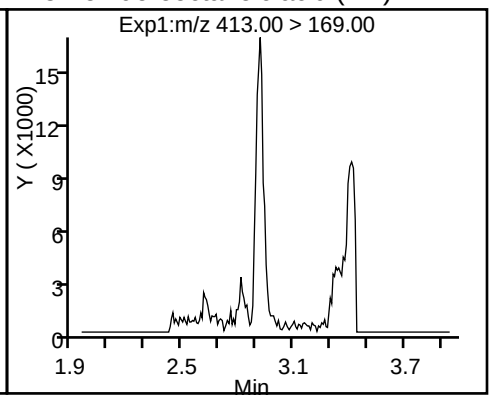
D 14 13C4 PFOA



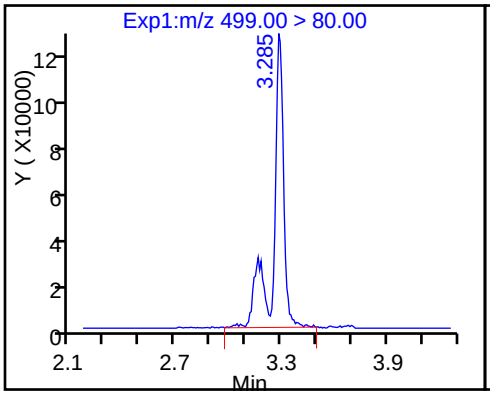
15 Perfluorooctanoic acid (ND)



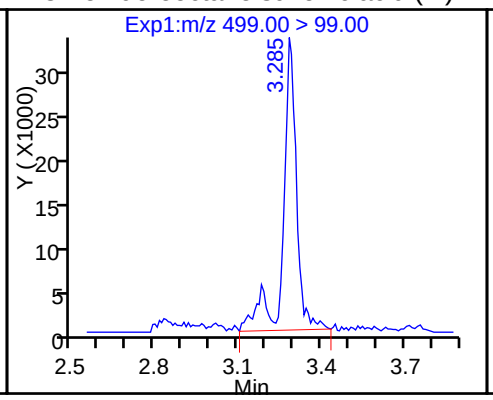
15 Perfluorooctanoic acid (ND)



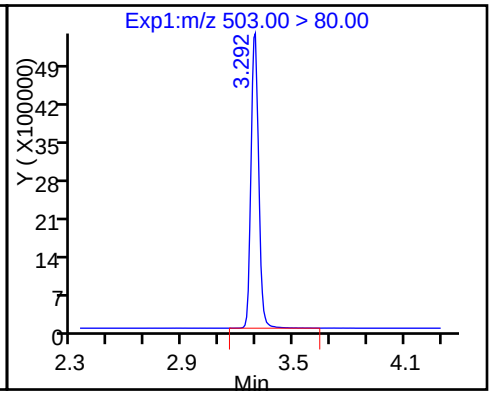
18 Perfluorooctane sulfonic acid



18 Perfluorooctane sulfonic acid (M)



D 17 13C4 PFOS



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

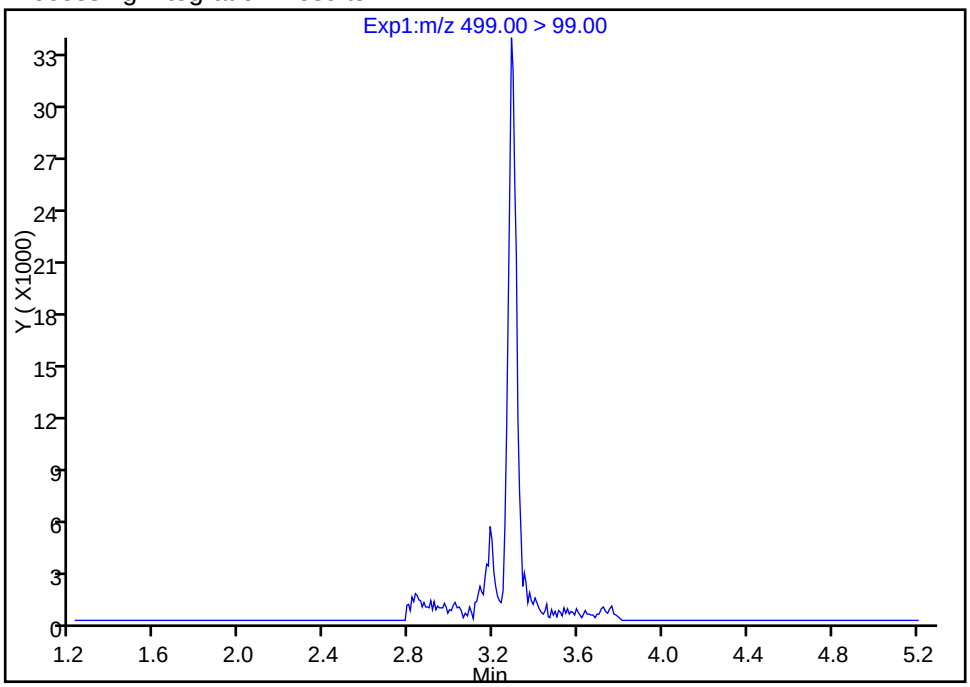
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_012.d				
Injection Date:	16-Jan-2017 14:56:56	Instrument ID:	A8_N		
Lims ID:	320-24961-A-5-A	Lab Sample ID:	320-24961-5		
Client ID:	DPT-GW-EB-27-22				
Operator ID:	A8-PC\A8	ALS Bottle#:	35	Worklist Smp#:	14
Injection Vol:	2.0 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: 2

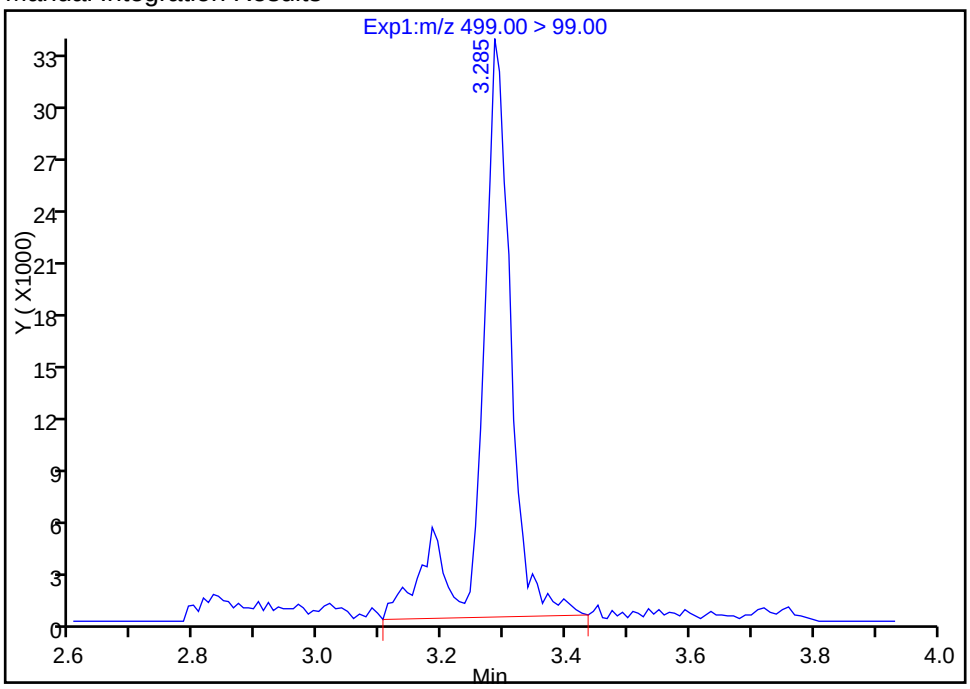
Processing Integration Results

RT: 3.22
Area: 0
Amount: 1.467792
Amount Units: ng/ml



Manual Integration Results

RT: 3.28
Area: 112385
Amount: 1.467792
Amount Units: ng/ml



Reviewer: chandrasenas, 17-Jan-2017 09:44:04

Audit Action: Manually Integrated Audit Reason: Assign Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-24961-1
SDG No.:
Client Sample ID: DPT-GW-EB-27-33
Lab Sample ID: 320-24961-6
Matrix: Water
Lab File ID: 16JAN2017_013.d
Analysis Method: 537 (Modified)
Date Collected: 01/11/2017 13:45
Extraction Method: 3535
Date Extracted: 01/13/2017 12:50
Sample wt/vol: 260.7(mL)
Date Analyzed: 01/16/2017 15:04
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.: 146533
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.00075	J M	0.0024	0.0019	0.00072
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0019	U	0.0024	0.0019	0.00088
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.0074	M	0.0038	0.0029	0.0012

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	91		25-150
STL00994	18O2 PFHxS	107		25-150
STL00991	13C4 PFOS	111		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_013.d				
Lims ID:	320-24961-A-6-A				
Client ID:	DPT-GW-EB-27-33				
Sample Type:	Client				
Inject. Date:	16-Jan-2017 15:04:25	ALS Bottle#:	36	Worklist Smp#:	15
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Sample Info:	320-24961-a-6-a				
Misc. Info.:	Plate: 1 Rack: 3				
Operator ID:	A8-PC\A8	Instrument ID:	A8_N		

Method:	\\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\A8_N.m		
Limit Group:	LC PFC_DOD ICAL		
Last Update:	17-Jan-2017 09:48:55	Calib Date:	09-Jan-2017 15:16:24
Integrator:	Picker		
Quant Method:	Isotopic Dilution	Quant By:	Initial Calibration
Last ICal File:	\\ChromNA\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_018.d		

Column 1 :			Det: EXP1
Process Host:	XAWRK027		

First Level Reviewer: chandrasenas Date: 17-Jan-2017 09:45:06

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 10 18O2 PFHxS										
403.00 > 84.00	2.547	2.584	-0.037		16379096	50.5		107	478015	
D 14 13C4 PFOA										
417.00 > 372.00	2.898	2.944	-0.046		10965171	45.3		90.6	627798	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.898	2.952	-0.054	1.000	86349	0.3924			241	M
413.00 > 169.00	2.898	2.952	-0.054	1.000	59992		1.44(0.90-1.10)		41.1	M
18 Perfluorooctane sulfonic acid										M
499.00 > 80.00	3.271	3.217	0.054	1.000	1130462	3.86			17400	
499.00 > 99.00	3.271	3.217	0.054	1.000	513408		2.20(0.90-1.10)		1469	M
D 17 13C4 PFOS										
503.00 > 80.00	3.271	3.321	-0.050		13810152	53.2		111	253886	

QC Flag Legend

Review Flags

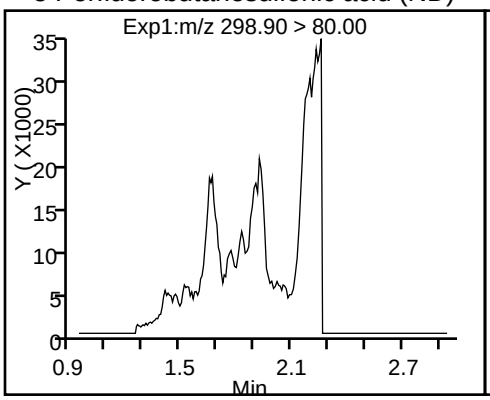
M - Manually Integrated

Report Date: 17-Jan-2017 09:49:08 Chrom Revision: 2.2 10-Jan-2017 11:26:10

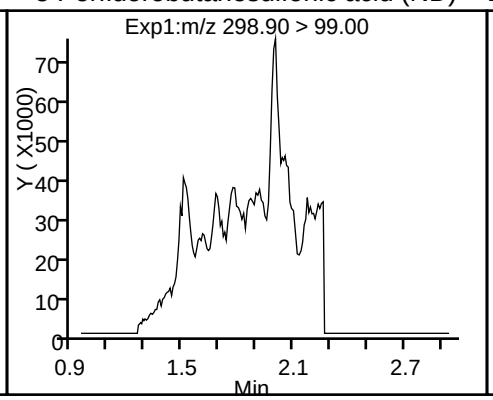
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_013.d				
Injection Date:	16-Jan-2017 15:04:25	Instrument ID:	A8_N		
Lims ID:	320-24961-A-6-A	Lab Sample ID:	320-24961-6		
Client ID:	DPT-GW-EB-27-33				
Operator ID:	A8-PC\A8	ALS Bottle#:	36	Worklist Smp#:	15
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		

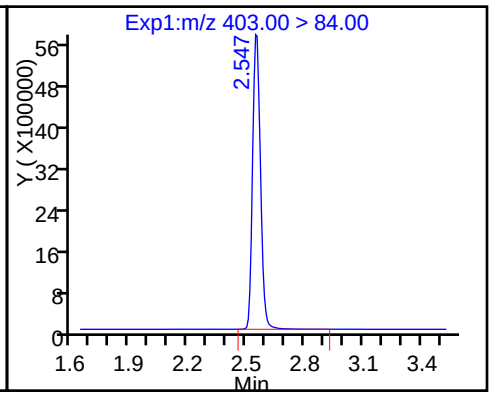
5 Perfluorobutanesulfonic acid (ND)



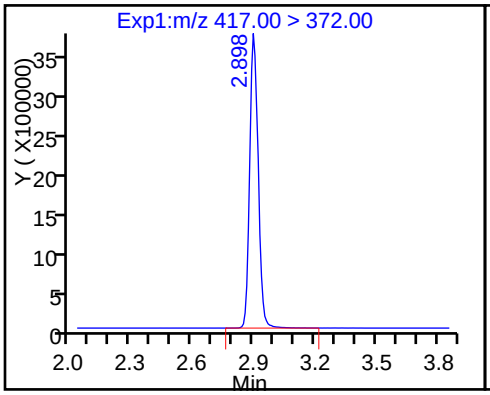
5 Perfluorobutanesulfonic acid (ND)



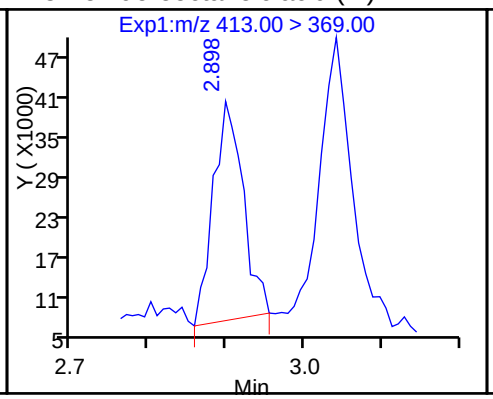
D 10 18O2 PFHxS



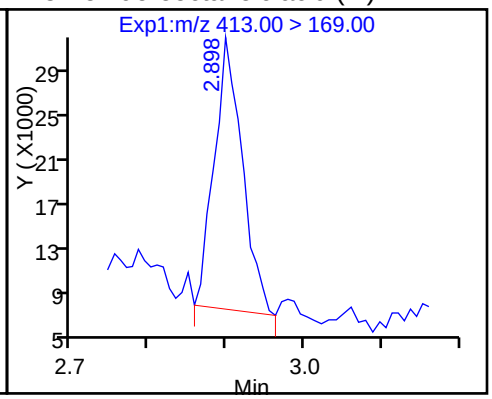
D 14 13C4 PFOA



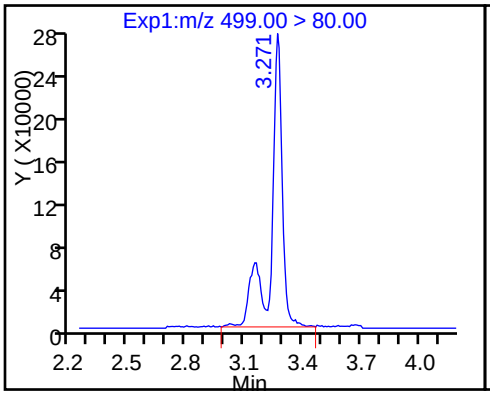
15 Perfluorooctanoic acid (M)



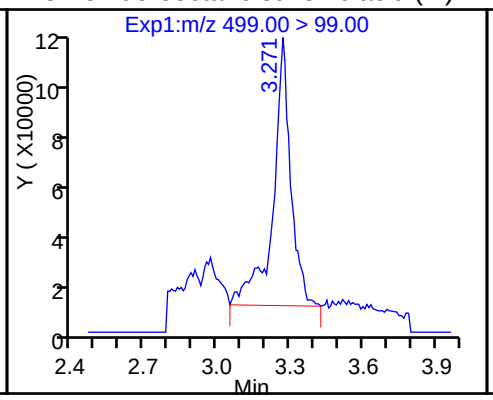
15 Perfluorooctanoic acid (M)



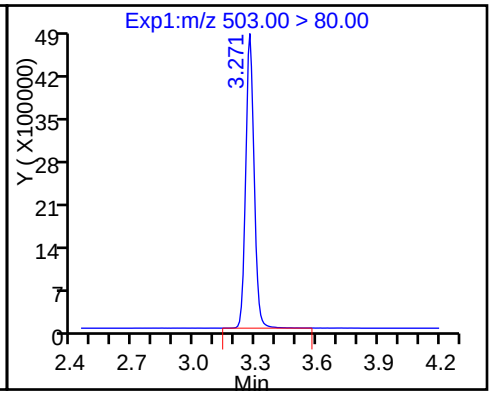
18 Perfluorooctane sulfonic acid



18 Perfluorooctane sulfonic acid (M)



D 17 13C4 PFOS



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

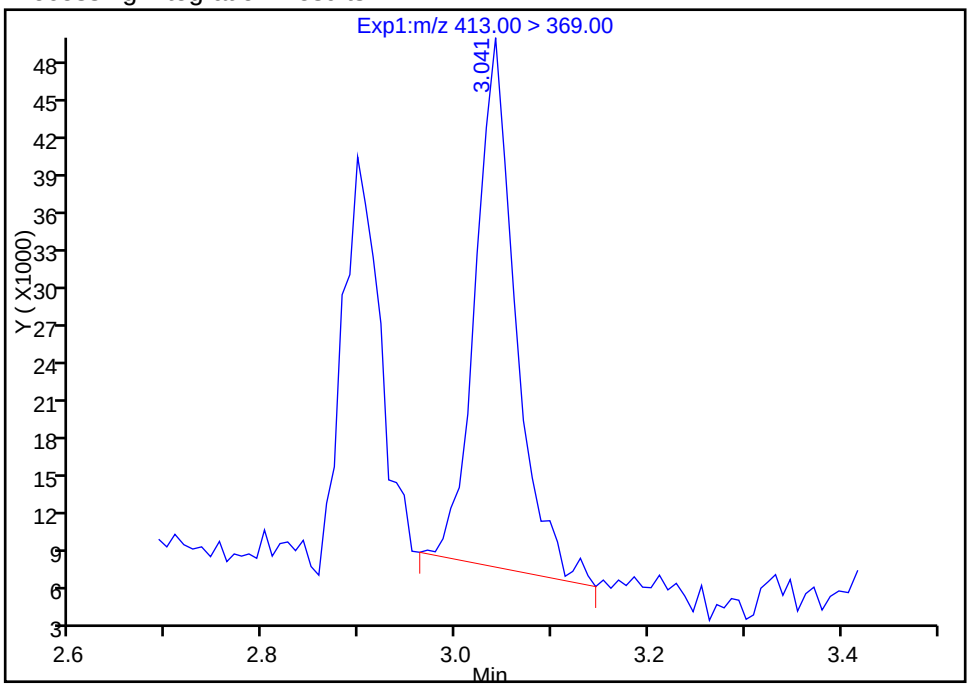
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_013.d				
Injection Date:	16-Jan-2017 15:04:25	Instrument ID:	A8_N		
Lims ID:	320-24961-A-6-A	Lab Sample ID:	320-24961-6		
Client ID:	DPT-GW-EB-27-33				
Operator ID:	A8-PC\A8	ALS Bottle#:	36	Worklist Smp#:	15
Injection Vol:	2.0 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

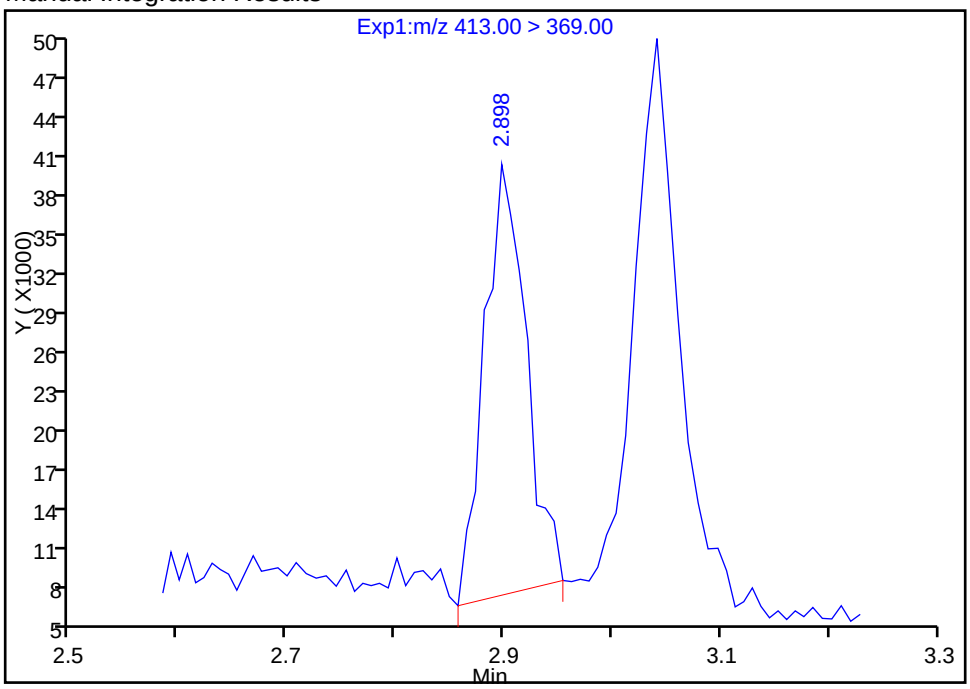
Processing Integration Results

RT: 3.04
Area: 120725
Amount: 0.548559
Amount Units: ng/ml



Manual Integration Results

RT: 2.90
Area: 86349
Amount: 0.392359
Amount Units: ng/ml



Reviewer: chandrasenas, 17-Jan-2017 09:45:06

Audit Action: Manually Integrated Audit Reason: Wrong peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

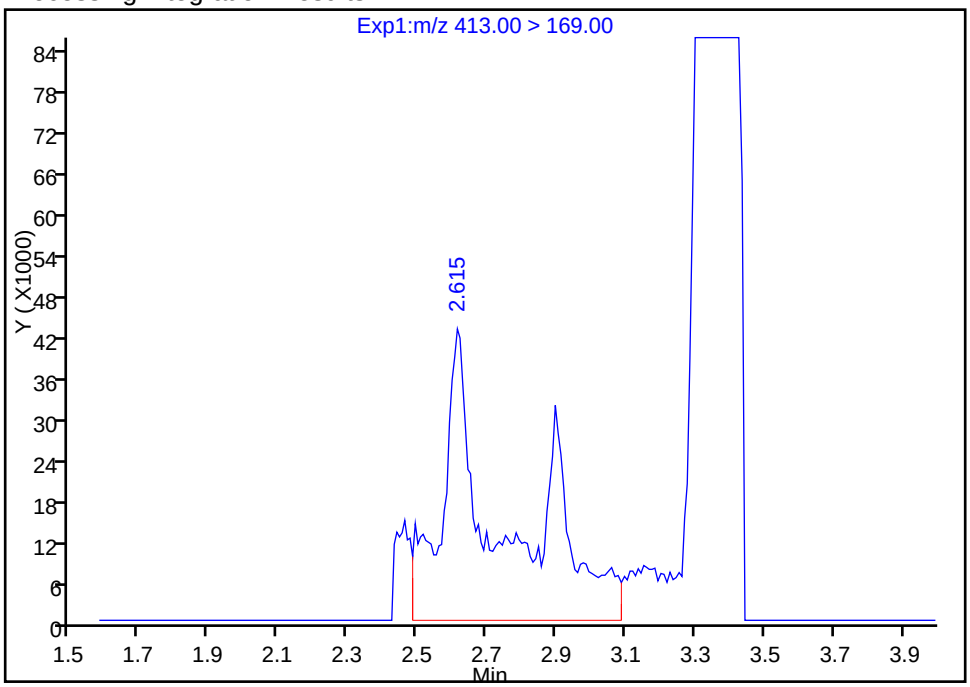
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_013.d				
Injection Date:	16-Jan-2017 15:04:25	Instrument ID:	A8_N		
Lims ID:	320-24961-A-6-A	Lab Sample ID:	320-24961-6		
Client ID:	DPT-GW-EB-27-33				
Operator ID:	A8-PC\A8	ALS Bottle#:	36	Worklist Smp#:	15
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

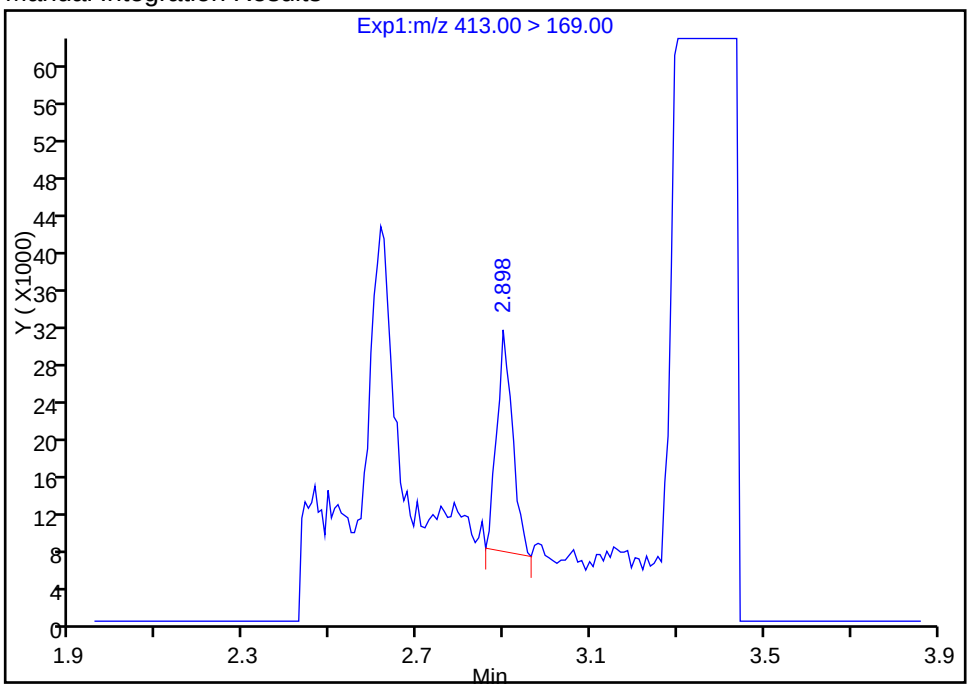
Processing Integration Results

RT: 2.62
Area: 504055
Amount: 0.548559
Amount Units: ng/ml



Manual Integration Results

RT: 2.90
Area: 59992
Amount: 0.392359
Amount Units: ng/ml



Reviewer: chandrasenas, 17-Jan-2017 09:45:06

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

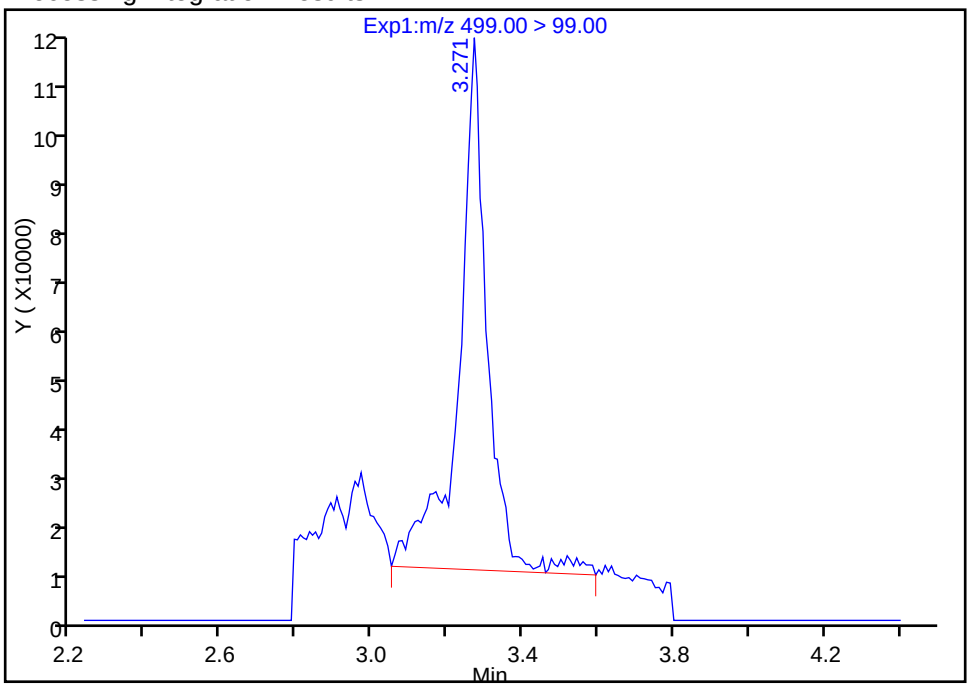
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_013.d				
Injection Date:	16-Jan-2017 15:04:25	Instrument ID:	A8_N		
Lims ID:	320-24961-A-6-A	Lab Sample ID:	320-24961-6		
Client ID:	DPT-GW-EB-27-33				
Operator ID:	A8-PC\A8	ALS Bottle#:	36	Worklist Smp#:	15
Injection Vol:	2.0 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

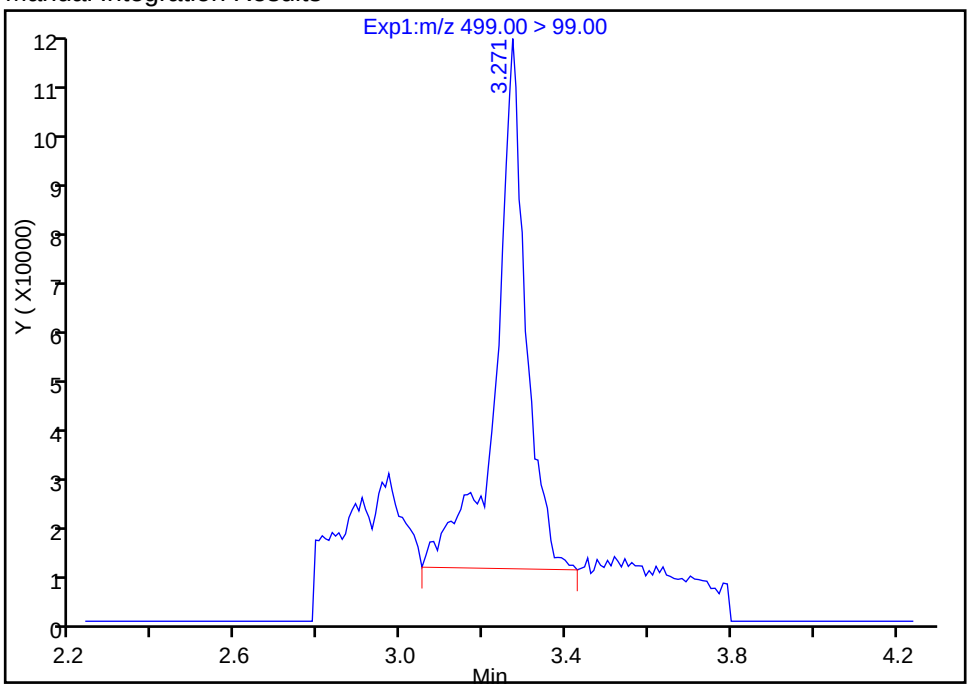
Processing Integration Results

RT: 3.27
Area: 538754
Amount: 3.864090
Amount Units: ng/ml



Manual Integration Results

RT: 3.27
Area: 513408
Amount: 3.864090
Amount Units: ng/ml



Reviewer: chandrasenas, 17-Jan-2017 09:45:06

Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-24961-1
SDG No.:
Client Sample ID: DPT-TB-011117
Lab Sample ID: 320-24961-7
Matrix: Water
Lab File ID: 16JAN2017_014.d
Analysis Method: 537 (Modified)
Date Collected: 01/11/2017 13:50
Extraction Method: 3535
Date Extracted: 01/13/2017 12:50
Sample wt/vol: 271.2(mL)
Date Analyzed: 01/16/2017 15:11
Con. Extract Vol.: 0.5(mL)
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: Acquity ID: 2.1(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 146533
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.0018	U	0.0023	0.0018	0.00069
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0018	U	0.0023	0.0018	0.00085
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.0028	U	0.0037	0.0028	0.0012

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	119		25-150
STL00994	18O2 PFHxS	116		25-150
STL00991	13C4 PFOS	114		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_014.d
Lims ID: 320-24961-A-7-A
Client ID: DPT-TB-011117
Sample Type: Client
Inject. Date: 16-Jan-2017 15:11:56 ALS Bottle#: 37 Worklist Smp#: 16
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-24961-a-7-a
Misc. Info.: Plate: 1 Rack: 3
Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 17-Jan-2017 09:48:55 Calib Date: 09-Jan-2017 15:16:24
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK027

First Level Reviewer: chandrasenas Date: 17-Jan-2017 09:45:23

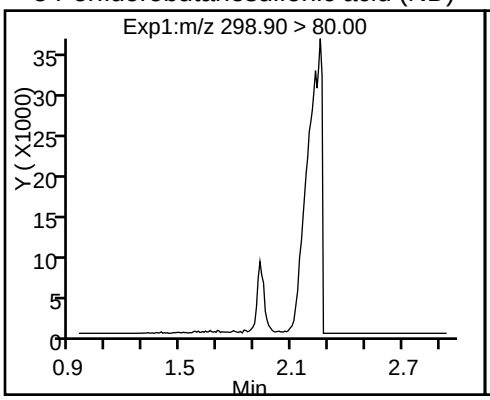
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 10 18O2 PFHxS										
403.00 > 84.00	2.553	2.584	-0.031		17831938	55.0		116	695836	
D 14 13C4 PFOA										
417.00 > 372.00	2.903	2.944	-0.041		14352786	59.3		119	695815	
D 17 13C4 PFOS										
503.00 > 80.00	3.277	3.321	-0.044		14145154	54.5		114	968775	

Report Date: 17-Jan-2017 09:49:10 Chrom Revision: 2.2 10-Jan-2017 11:26:10

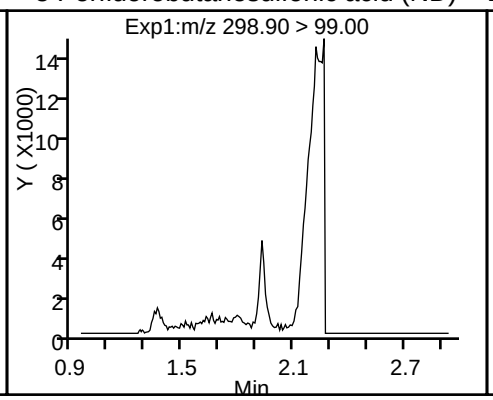
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_014.d				
Injection Date:	16-Jan-2017 15:11:56	Instrument ID:	A8_N		
Lims ID:	320-24961-A-7-A	Lab Sample ID:	320-24961-7		
Client ID:	DPT-TB-011117				
Operator ID:	A8-PC\A8	ALS Bottle#:	37	Worklist Smp#:	16
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		

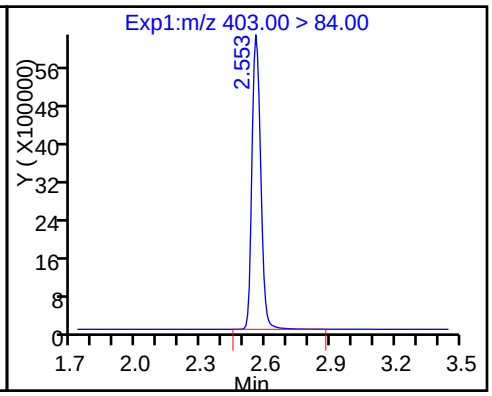
5 Perfluorobutanesulfonic acid (ND)



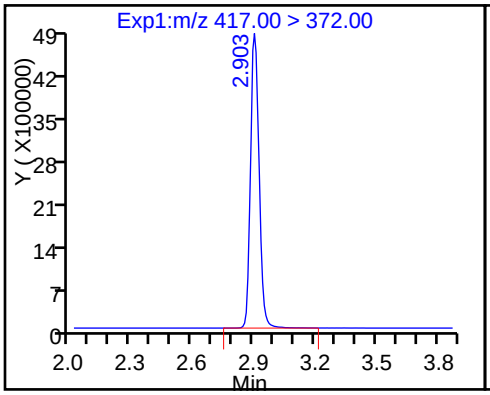
5 Perfluorobutanesulfonic acid (ND)



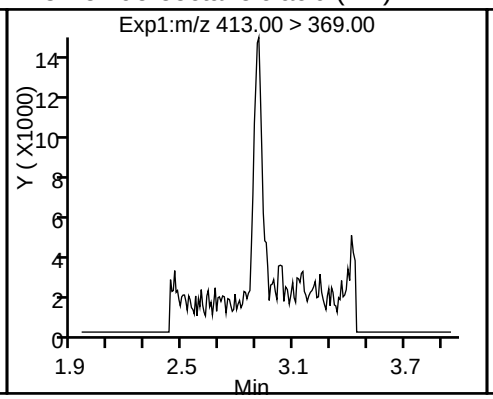
D 10 18O2 PFHxS



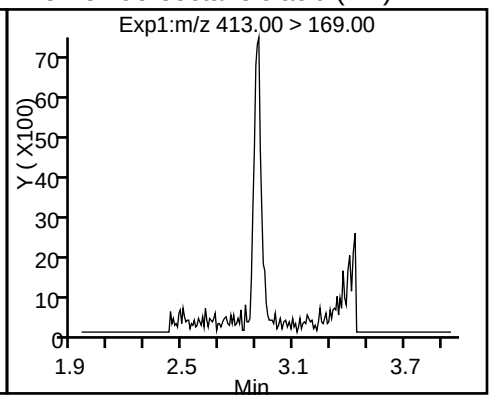
D 14 13C4 PFOA



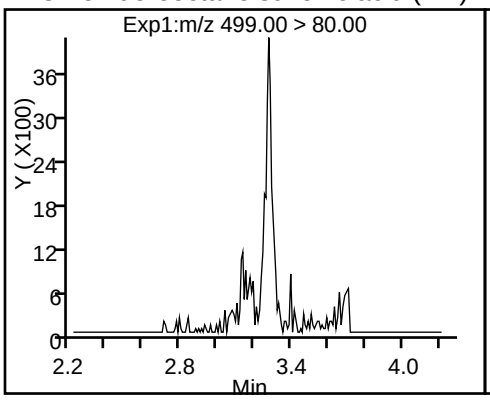
15 Perfluorooctanoic acid (ND)



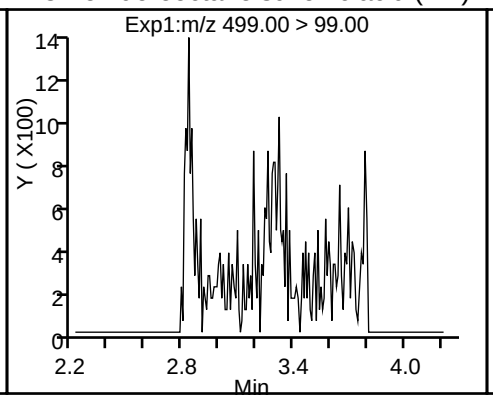
15 Perfluorooctanoic acid (ND)



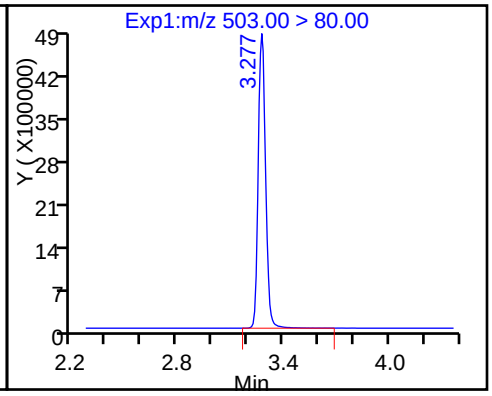
18 Perfluorooctane sulfonic acid (ND)



18 Perfluorooctane sulfonic acid (ND)



D 17 13C4 PFOS



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-24961-1
SDG No.:
Client Sample ID: DPT-17-27-GW-29-33
Lab Sample ID: 320-24961-8
Matrix: Water
Lab File ID: 16JAN2017_018.d
Analysis Method: 537 (Modified)
Date Collected: 01/11/2017 14:55
Extraction Method: 3535
Date Extracted: 01/13/2017 12:50
Sample wt/vol: 250.8(mL)
Date Analyzed: 01/16/2017 15:41
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.: 146533
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.0020	U	0.0025	0.0020	0.00075
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0020	U	0.0025	0.0020	0.00092
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.0026	J M	0.0040	0.0030	0.0013

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	70		25-150
STL00994	18O2 PFHxS	125		25-150
STL00991	13C4 PFOS	124		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_018.d				
Lims ID:	320-24961-A-8-A				
Client ID:	DPT-17-27-GW-29-33				
Sample Type:	Client				
Inject. Date:	16-Jan-2017 15:41:57	ALS Bottle#:	38	Worklist Smp#:	20
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Sample Info:	320-24961-a-8-a				
Misc. Info.:	Plate: 1 Rack: 3				
Operator ID:	A8-PC\A8	Instrument ID:	A8_N		

Method:	\\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\A8_N.m		
Limit Group:	LC PFC_DOD ICAL		
Last Update:	17-Jan-2017 09:54:24	Calib Date:	09-Jan-2017 15:16:24
Integrator:	Picker		
Quant Method:	Isotopic Dilution	Quant By:	Initial Calibration
Last ICal File:	\\ChromNA\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_018.d		

Column 1 :			Det: EXP1
Process Host:	XAWRK027		

First Level Reviewer: chandrasenas Date: 17-Jan-2017 09:47:41

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 10 18O2 PFHxS										
403.00 > 84.00	2.539	2.558	-0.019		19108539	58.9		125	950808	
D 14 13C4 PFOA										
417.00 > 372.00	2.890	2.903	-0.013		8484109	35.1		70.1	1014000	
18 Perfluorooctane sulfonic acid										M
499.00 > 80.00	3.137	3.276	-0.139	1.000	429766	1.32			5532	M
499.00 > 99.00	3.264	3.276	-0.012	1.040	77798		5.52(0.90-1.10)		662	M
D 17 13C4 PFOS										
503.00 > 80.00	3.264	3.276	-0.012		15347662	59.1		124	403490	

QC Flag Legend

Review Flags

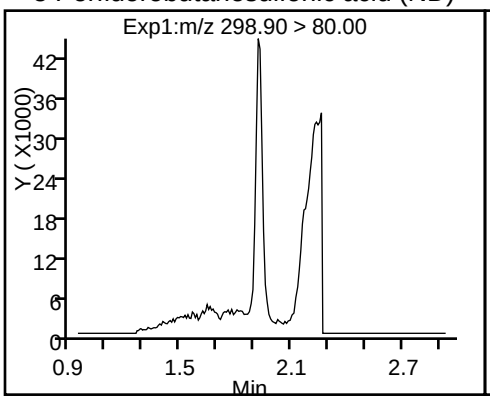
M - Manually Integrated

Report Date: 17-Jan-2017 09:54:28 Chrom Revision: 2.2 10-Jan-2017 11:26:10

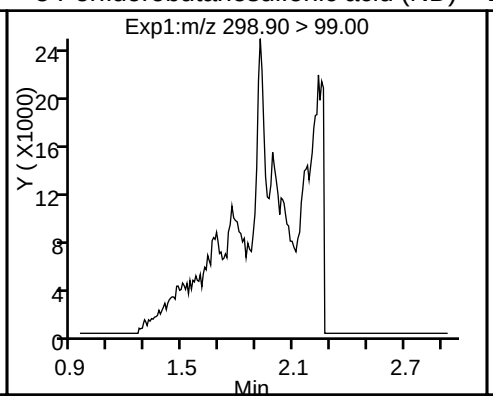
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_018.d				
Injection Date:	16-Jan-2017 15:41:57	Instrument ID:	A8_N		
Lims ID:	320-24961-A-8-A	Lab Sample ID:	320-24961-8		
Client ID:	DPT-17-27-GW-29-33				
Operator ID:	A8-PC\A8	ALS Bottle#:	38	Worklist Smp#:	20
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		

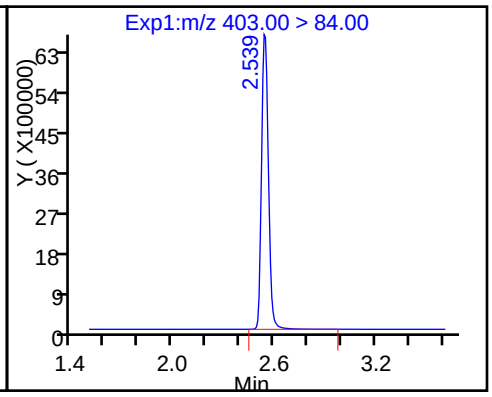
5 Perfluorobutanesulfonic acid (ND)



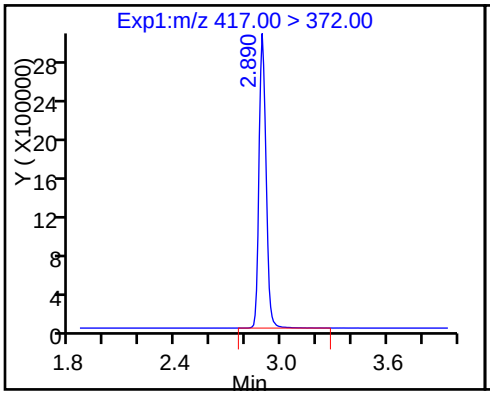
5 Perfluorobutanesulfonic acid (ND)



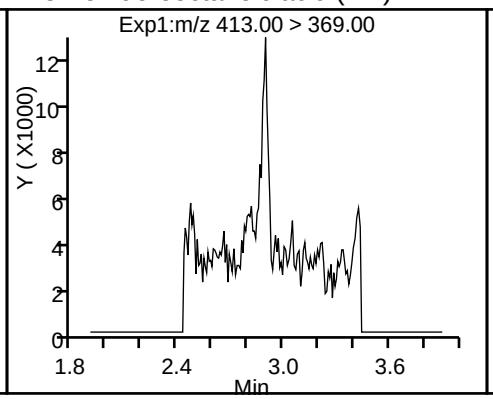
D 10 18O2 PFHxS



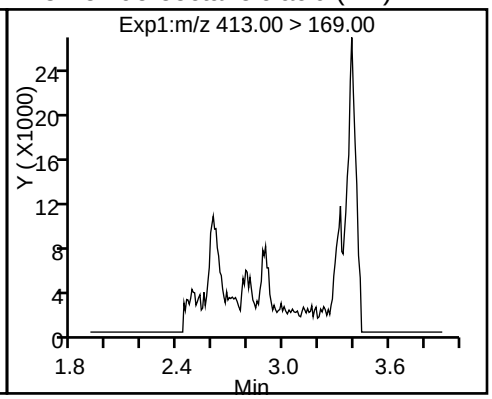
D 14 13C4 PFOA



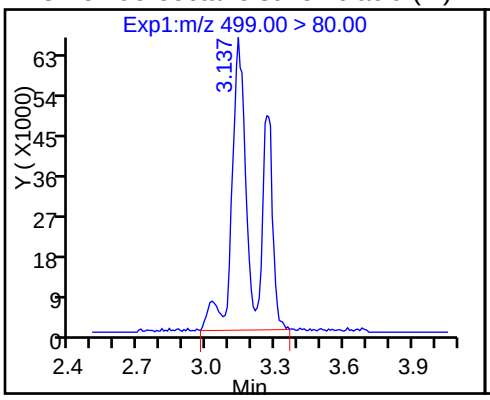
15 Perfluorooctanoic acid (ND)



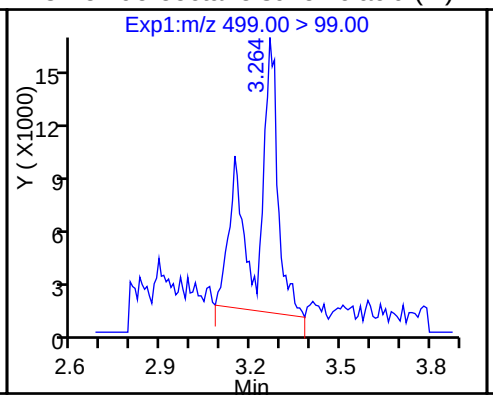
15 Perfluorooctanoic acid (ND)



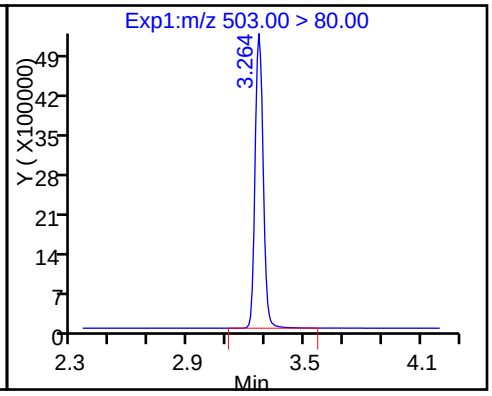
18 Perfluorooctane sulfonic acid (M)



18 Perfluorooctane sulfonic acid (M)



D 17 13C4 PFOS



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

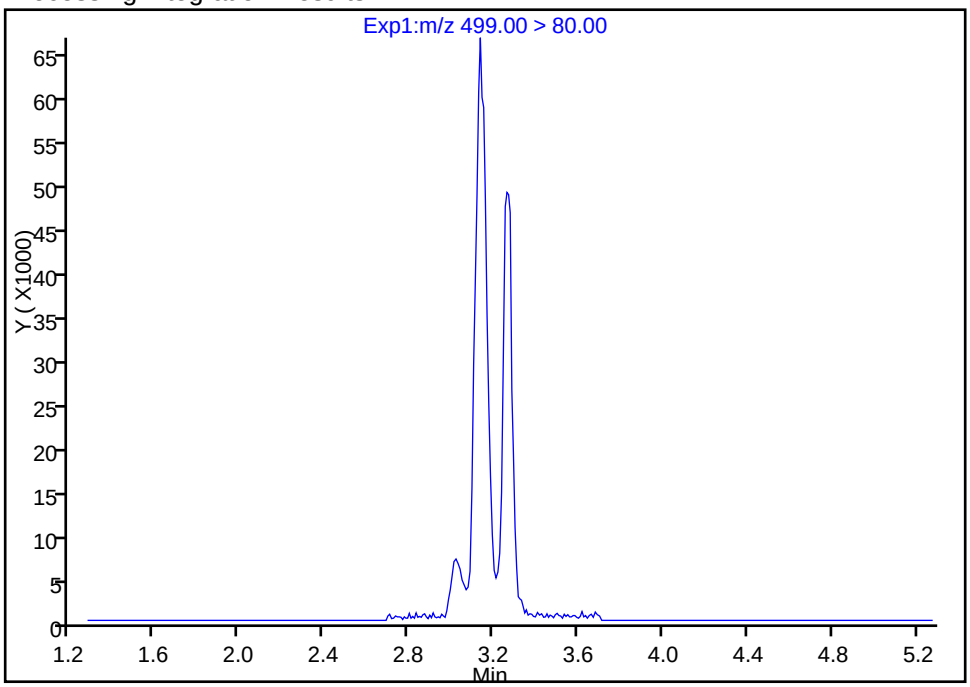
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_018.d				
Injection Date:	16-Jan-2017 15:41:57	Instrument ID:	A8_N		
Lims ID:	320-24961-A-8-A	Lab Sample ID:	320-24961-8		
Client ID:	DPT-17-27-GW-29-33				
Operator ID:	A8-PC\A8	ALS Bottle#:	38	Worklist Smp#:	20
Injection Vol:	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

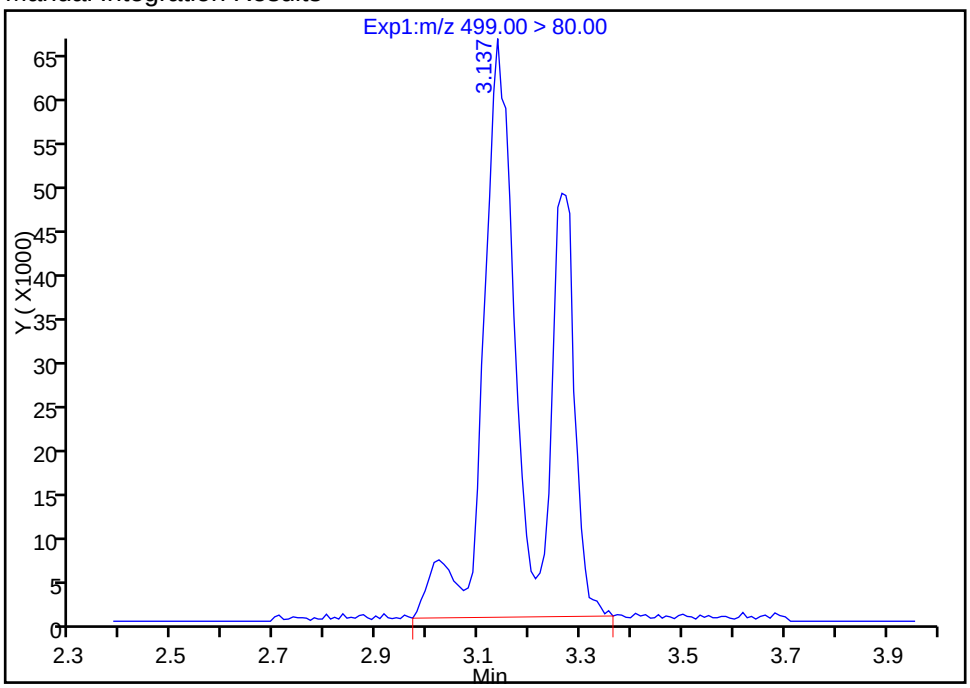
Processing Integration Results

Not Detected
Expected RT: 3.28



Manual Integration Results

RT: 3.14
Area: 429766
Amount: 1.321842
Amount Units: ng/ml



Reviewer: chandrasenas, 17-Jan-2017 09:47:41
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

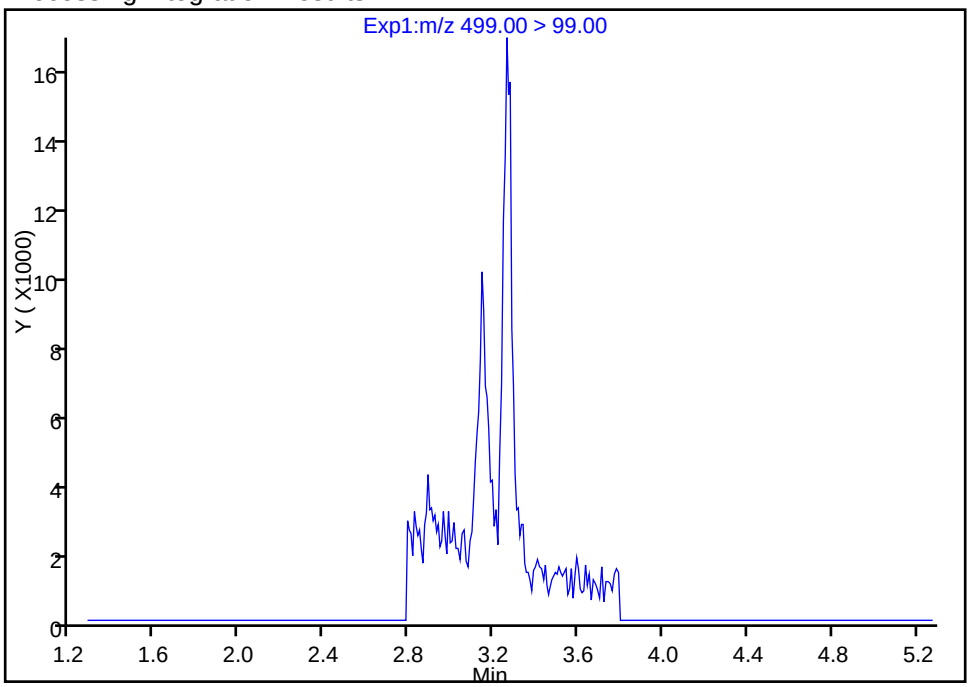
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_018.d				
Injection Date:	16-Jan-2017 15:41:57	Instrument ID:	A8_N		
Lims ID:	320-24961-A-8-A	Lab Sample ID:	320-24961-8		
Client ID:	DPT-17-27-GW-29-33				
Operator ID:	A8-PC\A8	ALS Bottle#:	38	Worklist Smp#:	20
Injection Vol:	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

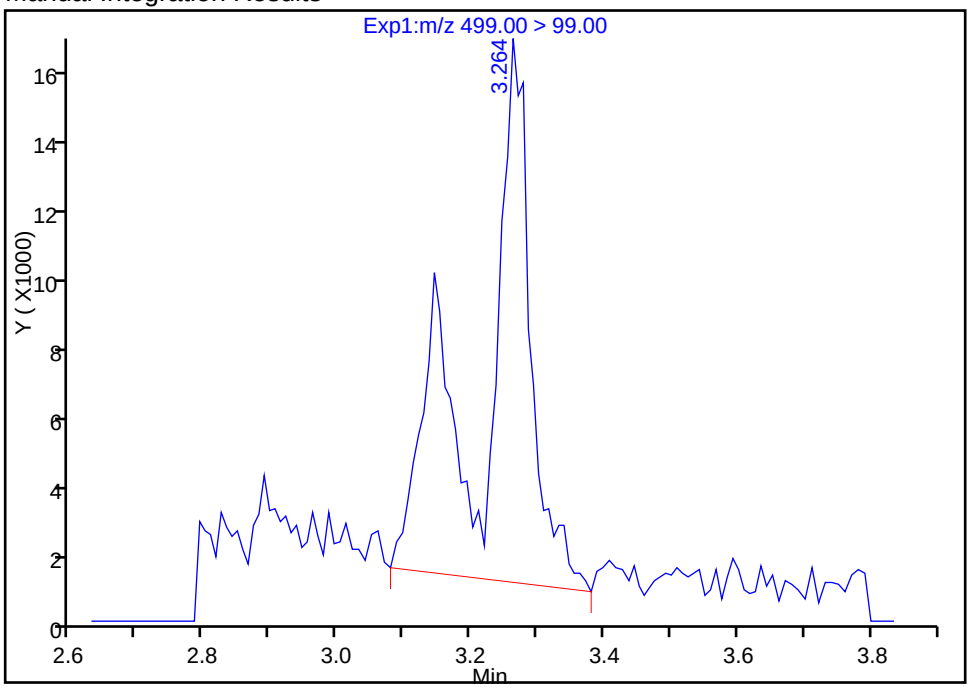
Processing Integration Results

Not Detected
Expected RT: 3.28



Manual Integration Results

RT: 3.26
Area: 77798
Amount: 1.321842
Amount Units: ng/ml



Reviewer: chandrasenas, 17-Jan-2017 09:47:41
Audit Action: Manually Integrated Audit Reason: Assign Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-24961-1
SDG No.:
Client Sample ID: DPT-17-27-GW-18-22
Lab Sample ID: 320-24961-9
Matrix: Water
Lab File ID: 16JAN2017_019.d
Analysis Method: 537 (Modified)
Date Collected: 01/11/2017 15:15
Extraction Method: 3535
Date Extracted: 01/13/2017 12:50
Sample wt/vol: 249.9(mL)
Date Analyzed: 01/16/2017 15:49
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.: 146533
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.0020	U	0.0025	0.0020	0.00075
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0020	U	0.0025	0.0020	0.00092
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.0030	U M	0.0040	0.0030	0.0013

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	68		25-150
STL00994	18O2 PFHxS	124		25-150
STL00991	13C4 PFOS	125		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_019.d
Lims ID: 320-24961-A-9-A
Client ID: DPT-17-27-GW-18-22
Sample Type: Client
Inject. Date: 16-Jan-2017 15:49:26 ALS Bottle#: 39 Worklist Smp#: 21
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-24961-a-9-a
Misc. Info.: Plate: 1 Rack: 3
Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 17-Jan-2017 09:54:24 Calib Date: 09-Jan-2017 15:16:24
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK027

First Level Reviewer: chandrasenas Date: 17-Jan-2017 09:48:32

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 10 18O2 PFHxS										
403.00 > 84.00	2.543	2.558	-0.015		19017766	58.6		124	1638505	
D 14 13C4 PFOA										
417.00 > 372.00	2.894	2.903	-0.009		8186836	33.8		67.7	758933	
18 Perfluorooctane sulfonic acid										M
499.00 > 80.00	3.267	3.276	-0.009	1.000	135671	0.4133			2584	M
499.00 > 99.00	3.267	3.276	-0.009	1.000	26120		5.19(0.90-1.10)		769	M
D 17 13C4 PFOS										
503.00 > 80.00	3.267	3.276	-0.009		15494745	59.7		125	461553	

QC Flag Legend

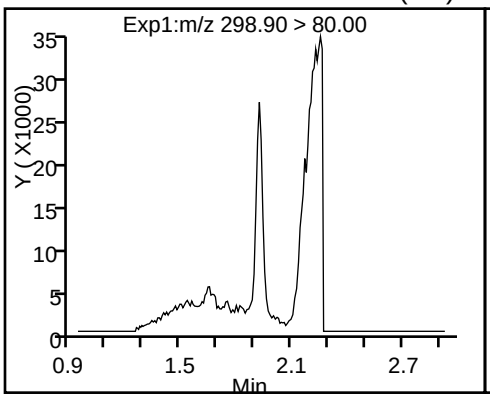
Review Flags
M - Manually Integrated

Report Date: 17-Jan-2017 09:54:29 Chrom Revision: 2.2 10-Jan-2017 11:26:10

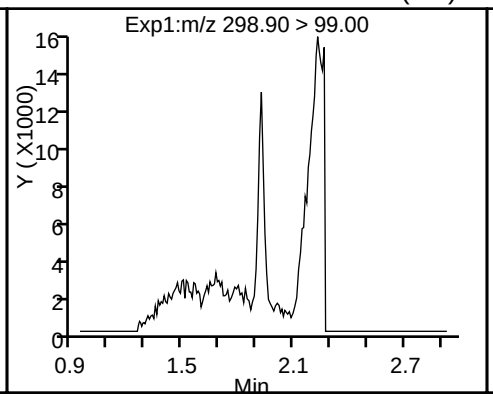
TestAmerica Sacramento

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_019.d				
Injection Date:	16-Jan-2017 15:49:26	Instrument ID:	A8_N		
Lims ID:	320-24961-A-9-A	Lab Sample ID:	320-24961-9		
Client ID:	DPT-17-27-GW-18-22				
Operator ID:	A8-PC\A8	ALS Bottle#:	39	Worklist Smp#:	21
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		

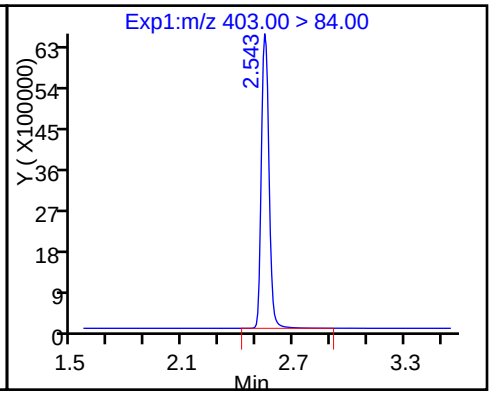
5 Perfluorobutanesulfonic acid (ND)



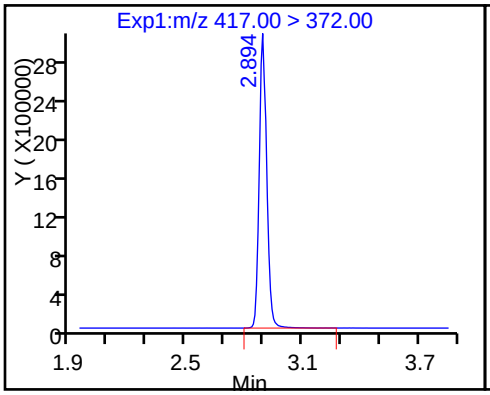
5 Perfluorobutanesulfonic acid (ND)



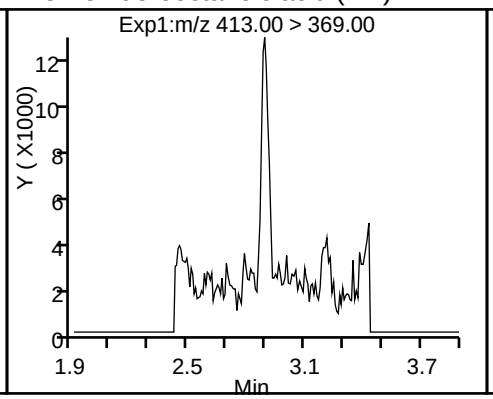
D 10 18O2 PFHxS



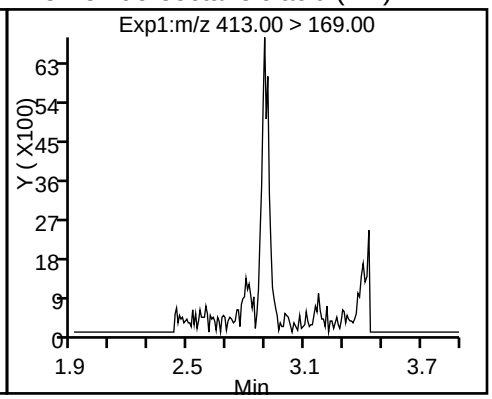
D 14 13C4 PFOA



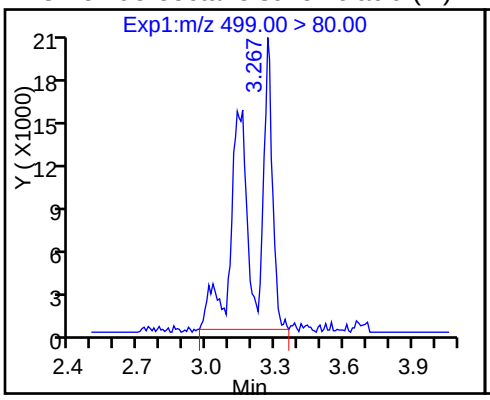
15 Perfluorooctanoic acid (ND)



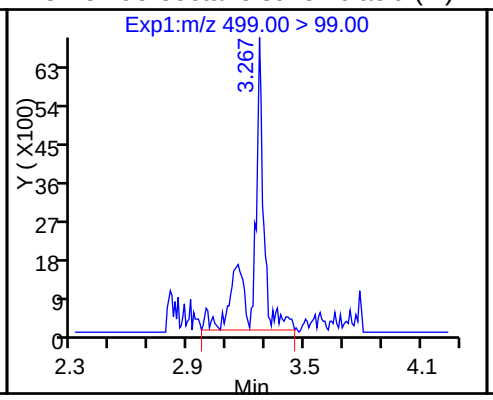
15 Perfluorooctanoic acid (ND)



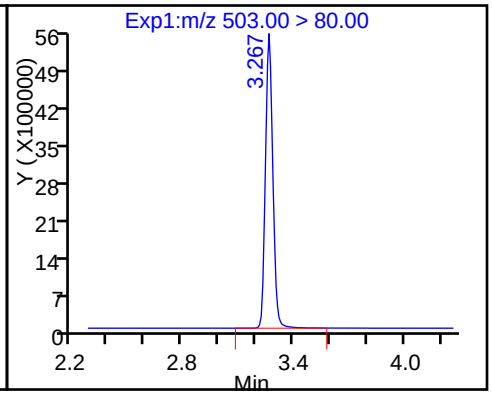
18 Perfluorooctane sulfonic acid (M)



18 Perfluorooctane sulfonic acid (M)



D 17 13C4 PFOS



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

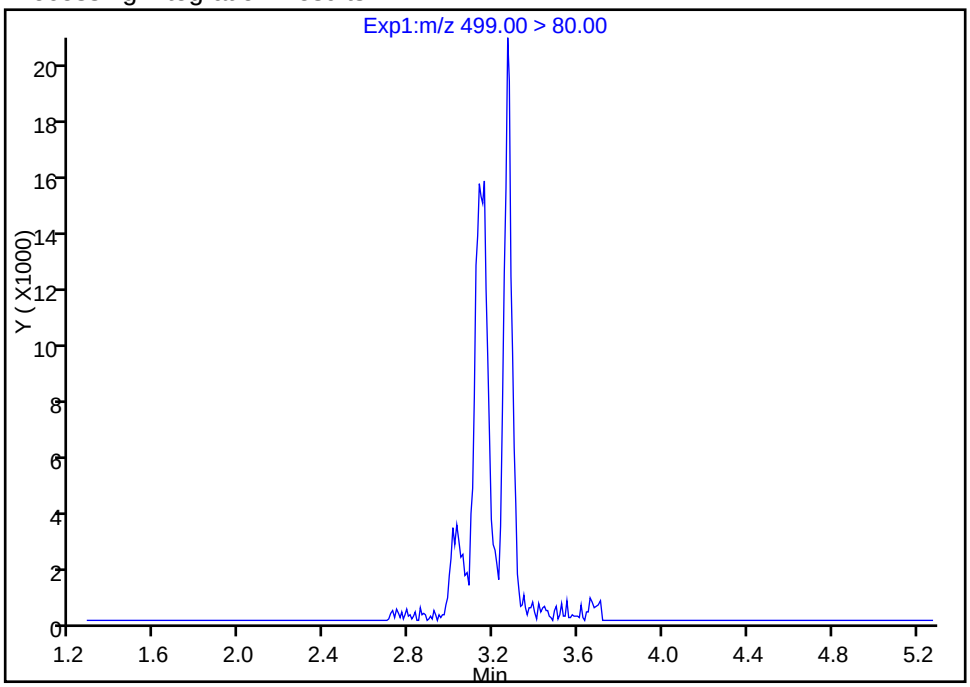
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_019.d				
Injection Date:	16-Jan-2017 15:49:26	Instrument ID:	A8_N		
Lims ID:	320-24961-A-9-A	Lab Sample ID:	320-24961-9		
Client ID:	DPT-17-27-GW-18-22				
Operator ID:	A8-PC\A8	ALS Bottle#:	39	Worklist Smp#:	21
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

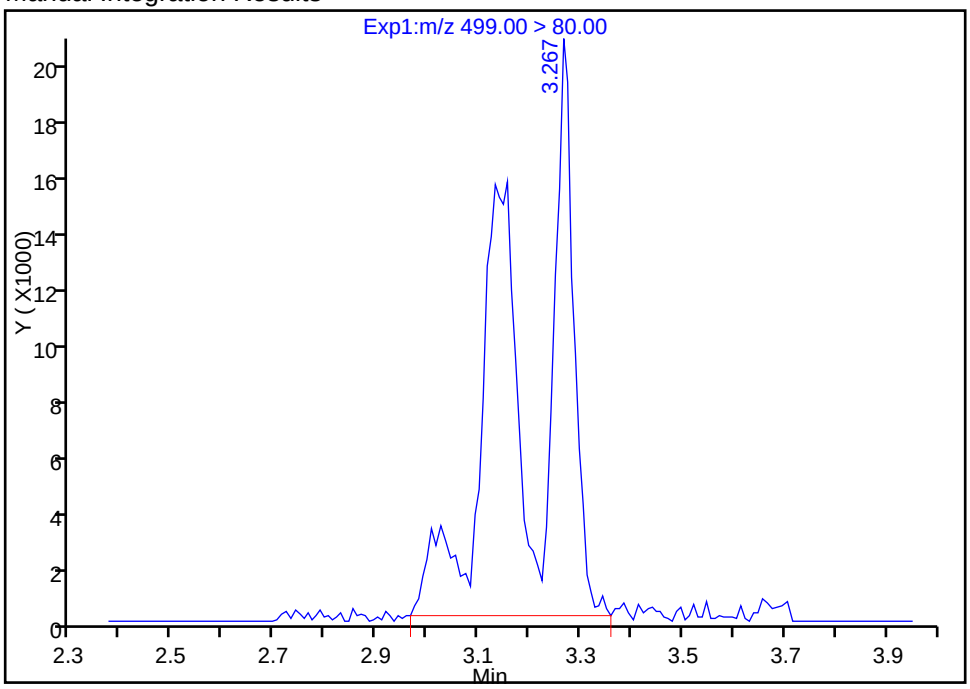
Processing Integration Results

Not Detected
Expected RT: 3.28



Manual Integration Results

RT: 3.27
Area: 135671
Amount: 0.413326
Amount Units: ng/ml



Reviewer: chandrasenas, 17-Jan-2017 09:48:32
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

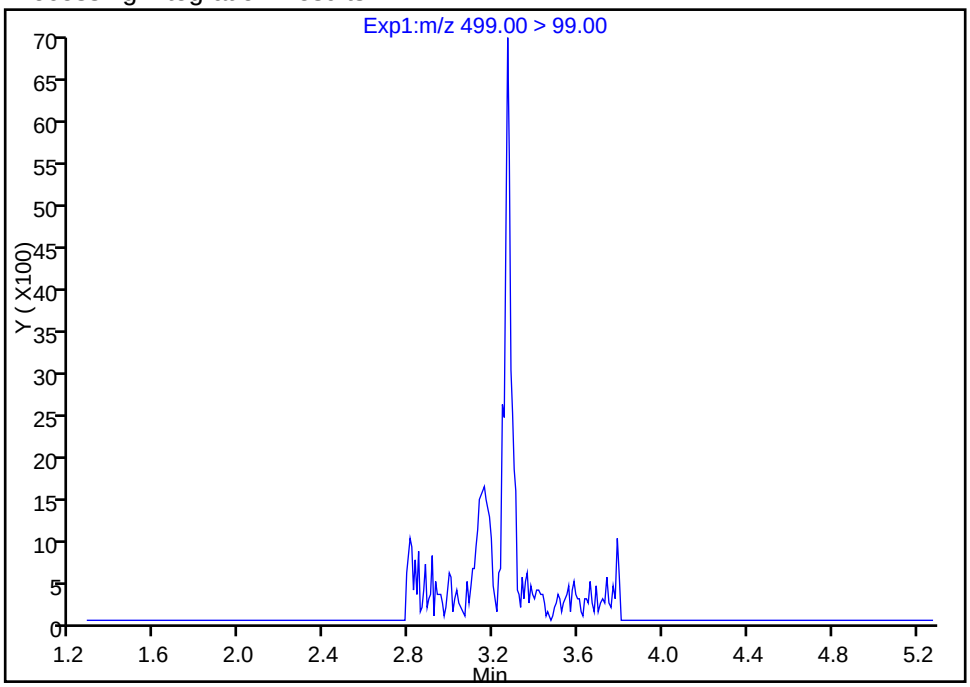
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_019.d				
Injection Date:	16-Jan-2017 15:49:26	Instrument ID:	A8_N		
Lims ID:	320-24961-A-9-A	Lab Sample ID:	320-24961-9		
Client ID:	DPT-17-27-GW-18-22				
Operator ID:	A8-PC\A8	ALS Bottle#:	39	Worklist Smp#:	21
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

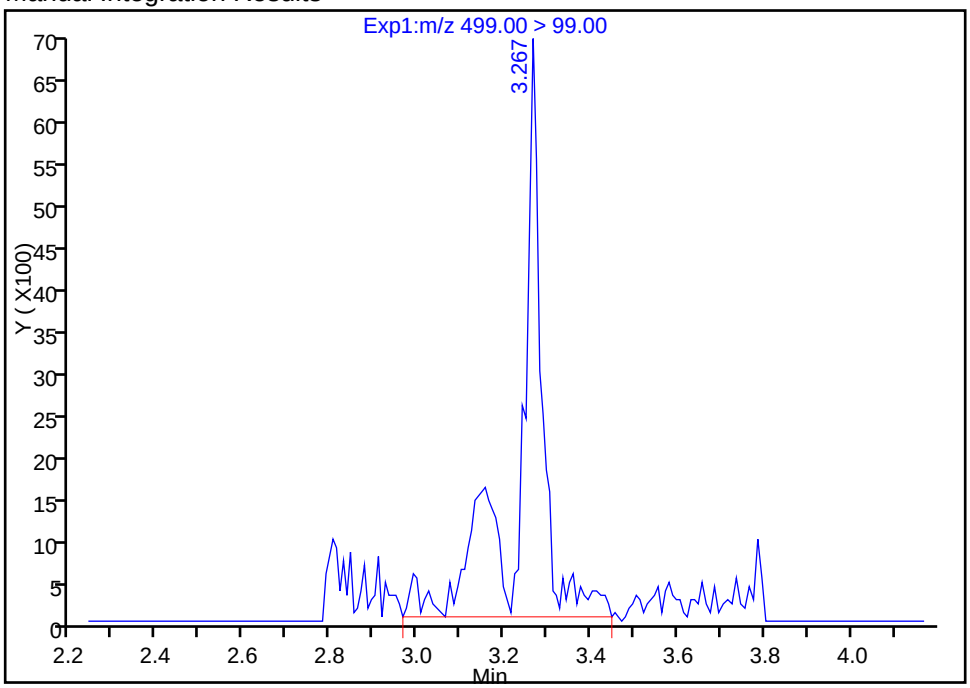
Processing Integration Results

Not Detected
Expected RT: 3.28



Manual Integration Results

RT: 3.27
Area: 26120
Amount: 0.413326
Amount Units: ng/ml



Reviewer: chandrasenas, 17-Jan-2017 09:48:32
Audit Action: Manually Integrated Audit Reason: Assign Peak

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24961-1 Analy Batch No.: 145640

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/09/2017 13:31 Calibration End Date: 01/09/2017 15:16 Calibration ID: 27505

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-145640/4	09JAN2017A_004.d
Level 2	IC 320-145640/13	09JAN2017A_013.d
Level 3	IC 320-145640/5	09JAN2017A_005.d
Level 4	IC 320-145640/14	09JAN2017A_014.d
Level 5	IC 320-145640/6	09JAN2017A_006.d
Level 6	IC 320-145640/15	09JAN2017A_015.d
Level 7	IC 320-145640/7	09JAN2017A_007.d
Level 8	IC 320-145640/16	09JAN2017A_016.d
Level 9	IC 320-145640/8	09JAN2017A_008.d
Level 10	IC 320-145640/17	09JAN2017A_017.d
Level 11	IC 320-145640/9	09JAN2017A_009.d
Level 12	IC 320-145640/18	09JAN2017A_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)	1.590 1.617		1.593		1.590		1.590		1.617		1.350 - 1.850	1.600
Perfluoropentanoic acid (PFPeA)	1.878 1.910		1.881		1.868		1.877		1.900		1.635 - 2.135	1.886
Perfluorobutanesulfonic acid (PFBS)	1.916 1.938		1.919		1.906		1.916		1.948		1.744 - 2.104	1.924
Perfluorohexanoic acid (PFHxA)	2.174 2.208		2.178		2.174		2.190		2.209		1.939 - 2.439	2.189
Perfluoroheptanoic acid (PFHpA)	2.513 2.553		2.516		2.514		2.538		2.547		2.280 - 2.780	2.530
Perfluorohexanesulfonic acid (PFHxS)	+++++ 2.570		2.531		2.529		2.553		2.569		2.297 - 2.797	2.550
Perfluorooctanoic acid (PFOA)	+++++ 2.917		2.872		2.862		2.904		2.913		2.641 - 3.141	2.894
6:2FTS		2.895 2.909		2.891		2.887		2.886		2.894	2.644 - 3.144	2.894
Perfluoroheptanesulfonic Acid (PFHpS)	2.879 2.917		2.880		2.878		2.912		2.921		2.648 - 3.148	2.898
Perfluorooctane Sulfonate (PFOS)	+++++ 3.168		3.237		3.235		3.168		3.282		2.981 - 3.481	3.218
Perfluorononanoic acid (PFNA)	3.235 3.286		3.237		3.243		3.286		3.282		3.011 - 3.511	3.262
Perfluorooctane Sulfonamide (FOSA)	3.549 3.599		3.559		3.548		3.602		3.591		3.324 - 3.824	3.575
Perfluorodecanoic acid (PFDA)	3.591 3.641		3.601		3.598		3.653		3.642		3.371 - 3.871	3.621
8:2FTS		3.635 3.655		3.630		3.635		3.632		3.644	3.389 - 3.889	3.639

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24961-1 Analy Batch No.: 145640

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/09/2017 13:31 Calibration End Date: 01/09/2017 15:16 Calibration ID: 27505

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)		3.810 3.830		3.797		3.802		3.798		3.811	3.558 - 4.058	3.808
Perfluorodecanesulfonic acid (PFDS)	3.900 3.955		3.910		3.908		3.956		3.945		3.679 - 4.179	3.929
Perfluoroundecanoic acid (PFUnA)	3.926 3.973		3.928		3.925		3.984		3.972		3.701 - 4.201	3.951
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)		3.986 3.997		3.971		3.976		3.963		3.986	3.730 - 4.230	3.980
MeFOSA		4.095 4.108		4.084		4.088		4.085		4.099	3.843 - 4.343	4.093
Perfluorododecanoic acid (PFDoA)	4.231 4.268		4.224		4.220		4.275		4.264		3.997 - 4.497	4.247
N-EtFOSA-M		4.274 4.303		4.279		4.274		4.271		4.288	4.032 - 4.532	4.282
Perfluorotridecanoic Acid (PFTriA)	4.496 4.530		4.498		4.494		4.543		4.532		4.266 - 4.766	4.516
Perfluorotetradecanoic acid (PFTeA)	4.738 4.776		4.748		4.734		4.780		4.771		4.508 - 5.008	4.758
Perfluoro-n-hexadecanoic acid (PFHxDA)	5.158 5.195		5.164		5.166		5.199		5.200		4.930 - 5.430	5.180
Perfluoro-n-octadecanoic acid (PFODA)	5.536 5.567		5.541		5.533		5.582		5.568		5.304 - 5.804	5.555
13C4 PFBA	1.590 1.617		1.593		1.590		1.590		1.609		1.348 - 1.848	1.598
13C5-PFPeA	1.878 1.900		1.881		1.868		1.877		1.900		1.634 - 2.134	1.884
13C2 PFHxA	2.174 2.208		2.178		2.165		2.190		2.209		1.937 - 2.437	2.187
13C4-PFHpA	2.513 2.553		2.516		2.514		2.538		2.547		2.280 - 2.780	2.530
18O2 PFHxS	2.528 2.570		2.538		2.529		2.553		2.569		2.298 - 2.798	2.548
13C4 PFOA	2.871 2.909		2.872		2.870		2.912		2.913		2.641 - 3.141	2.891
M2-6:2FTS		2.895 2.909		2.891		2.895		2.886		2.894	2.645 - 3.145	2.895
13C4 PFOS	3.235 3.286		3.245		3.235		3.286		3.282		3.011 - 3.511	3.262
13C5 PFNA	3.244 3.286		3.245		3.235		3.278		3.289		3.013 - 3.513	3.263
13C8 FOSA	3.549 3.599		3.550		3.540		3.593		3.591		3.320 - 3.820	3.570
13C2 PFDA	3.591 3.649		3.601		3.598		3.644		3.642		3.371 - 3.871	3.621

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24961-1 Analy Batch No.: 145640

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/09/2017 13:31 Calibration End Date: 01/09/2017 15:16 Calibration ID: 27505

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		3.635 3.655		3.630		3.627		3.632		3.644	3.387 - 3.887	3.637
d3-NMeFOSAA		3.802 3.821		3.797		3.802		3.789		3.811	3.554 - 4.054	3.804
13C2 PFUnA	3.935 3.983		3.928		3.925		3.975		3.972		3.703 - 4.203	3.953
d5-NEtFOSAA		3.967 3.988		3.961		3.967		3.963		3.977	3.720 - 4.220	3.971
d-N-MeFOSA-M		4.087 4.108		4.084		4.088		4.085		4.099	3.842 - 4.342	4.092
13C2 PFDoA	4.222 4.268		4.224		4.220		4.275		4.264		3.995 - 4.495	4.246
d-N-EtFOSA-M		4.274 4.293		4.270		4.274		4.271		4.288	4.028 - 4.528	4.278
13C2-PFTeDA	4.738 4.776		4.748		4.734		4.780		4.771		4.508 - 5.008	4.758
13C2-PFHxDA	5.158 5.195		5.164		5.155		5.199		5.200		4.929 - 5.429	5.179

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-24961-1 Analy Batch No.: 145640

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/09/2017 13:31 Calibration End Date: 01/09/2017 15:16 Calibration ID: 27505

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-145640/4	09JAN2017A_004.d
Level 2	IC 320-145640/13	09JAN2017A_013.d
Level 3	IC 320-145640/5	09JAN2017A_005.d
Level 4	IC 320-145640/14	09JAN2017A_014.d
Level 5	IC 320-145640/6	09JAN2017A_006.d
Level 6	IC 320-145640/15	09JAN2017A_015.d
Level 7	IC 320-145640/7	09JAN2017A_007.d
Level 8	IC 320-145640/16	09JAN2017A_016.d
Level 9	IC 320-145640/8	09JAN2017A_008.d
Level 10	IC 320-145640/17	09JAN2017A_017.d
Level 11	IC 320-145640/9	09JAN2017A_009.d
Level 12	IC 320-145640/18	09JAN2017A_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	362645 357766 350519		377473 367199 280701		Ave		349383.730				10.0		50.0			
13C5-PFPeA	295042 288686 271592		306164 289558 207771		Ave		276468.733				12.8		50.0			
13C2 PFHxA	271465 265303 258509		282399 271463 196771		Ave		257651.940				12.0		50.0			
13C4-PFHpA	240883 238762 215712		254138 235659 158307		Ave		223910.287				15.4		50.0			
18O2 PFHxS	336958 333848 325364		355044 342314 252855		Ave		324397.234				11.2		50.0			
13C4 PFOA	262172 261544 234218		276152 260165 157431		Ave		241947.147				18.0		50.0			
M2-6:2FTS		132786 139277 132400		131196 127709 137640	Ave		133501.189				3.2		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.: 320-24961-1 Analy Batch No.: 145640

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/09/2017 13:31 Calibration End Date: 01/09/2017 15:16 Calibration ID: 27505

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	266073 262899 261832		287416 274723 204482		Ave		259570.774				11.0		50.0			
13C5 PFNA	195834 196292 181781		203903 194164 128427		Ave		183400.100				15.2		50.0			
13C8 FOSA	424597 420196 413432		440588 423459 335535		Ave		409634.530				9.1		50.0			
13C2 PFDA	184332 182877 183143		198987 196601 134767		Ave		180117.890				12.9		50.0			
M2-8:2FTS		130538 134906 136734		134253 130519 142867	Ave		134969.447				3.4		50.0			
d3-NMeFOSAA		84601 84679 83313		81774 81257 74747	Ave		81728.4933				4.5		50.0			
13C2 PFUnA	148737 145408 132762		155175 145156 87893		Ave		135855.327				18.1		50.0			
d5-NEtFOSAA		90505 94905 90732		92353 91808 82867	Ave		90528.4800				4.5		50.0			
d-N-MeFOSA-M		102037 105510 105166		101818 102588 99141	Ave		102710.210				2.3		50.0			
13C2 PFDoA	137729 137577 131561		144520 131933 96728		Ave		130008.173				13.1		50.0			
d-N-EtFOSA-M		99462 103846 102661		98787 98952 96983	Ave		100115.133				2.6		50.0			
13C2-PFTeDA	256597 242075 251951		265545 247483 189775		Ave		242237.813				11.1		50.0			
13C2-PFHxDA	138069 131038 138461		148672 134763 110522		Ave		133587.420				9.5		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.: 320-24961-1 Analy Batch No.: 145640

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/09/2017 13:31 Calibration End Date: 01/09/2017 15:16 Calibration ID: 27505

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)	321442 213102	351826	326041	315880	311475	AveID		0.8732				7.5		35.0			
Perfluoropentanoic acid (PFPeA)	318206 169541	308193	299594	271790	277812	AveID		0.9834				9.6		35.0			
Perfluorobutanesulfonic acid (PFBS)	497052 293780	602784	533837	519994	529956	AveID		1.5145				13.2		50.0			
Perfluorohexanoic acid (PFHxA)	272454 160711	260257	258656	238099	247811	AveID		0.9250				6.7		35.0			
Perfluoroheptanoic acid (PFHpA)	247884 142563	238219	255074	211746	235932	AveID		0.9857				4.6		35.0			
Perfluorohexanesulfonic acid (PFHxS)	+++++ 243722	371698	411090	336575	333568	AveID		1.0482				7.3		35.0			
Perfluorooctanoic acid (PFOA)	+++++ 146821	276221	292893	236426	249321	AveID		1.0035				5.9		35.0			
6:2FTS	129435	103146 108222	123616	109986	119300	AveID		0.8666				9.0		35.0			
Perfluoroheptanesulfonic Acid (PFHpS)	295063 197198	331445	288623	292952	290660	AveID		1.0847				8.0		50.0			
Perfluorooctane Sulfonate (PFOS)	+++++ 218207	287477	272231	273007	252282	AveID		1.0126				5.4		35.0			
Perfluorononanoic acid (PFNA)	190330 119884	193409	193098	169749	183377	AveID		0.9528				2.7		35.0			
Perfluorooctane Sulfonamide (FOSA)	409156 243743	428417	427395	393623	421241	AveID		0.9377				11.3		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.: 320-24961-1 Analy Batch No.: 145640

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/09/2017 13:31 Calibration End Date: 01/09/2017 15:16 Calibration ID: 27505

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)	177296 124130	188884	176905	168082	169956	AveID		0.9300				3.0		35.0			
8:2FTS	131432	99674 113959	124558	112150	126130	AveID		0.8746				10.0		35.0			
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	81135	66742 76245	80086	70926	78113	AveID		0.9263				9.1		35.0			
Perfluorodecanesulfonic acid (PFDS)	160268 131313	183725	175301	181746	160031	AveID		0.6377				5.9		50.0			
Perfluoroundecanoic acid (PFUnA)	165508 86389	143352	152387	125415	126505	AveID		0.9800				8.0		35.0			
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	83469	66452 75623	80922	73837	78495	AveID		0.8454				7.8		35.0			
MeFOSA	92587	82638 91046	90909	76926	92545	AveID		0.8546				7.0		35.0			
Perfluorododecanoic acid (PFDoA)	124614 91759	127267	129775	122236	124185	AveID		0.9246				3.0		35.0			
N-EtFOSA-M	99256	83396 95471	96104	83275	99605	AveID		0.9272				7.3		35.0			
Perfluorotridecanoic Acid (PFTriA)	117046 87220	125097	129426	120205	115683	AveID		0.8916				4.5		50.0			
Perfluorotetradecanoic acid (PFTeA)	249342 150957	216958	239931	214630	211372	AveID		1.6406				5.9		50.0			
Perfluoro-n-hexadecanoic acid (PFHxDA)	282282 92900	120897	195362	121457	118024	L1ID	0.4283	0.9427							0.9990		0.9900
Perfluoro-n-octadecanoic acid (PFODA)	85714 85645	108503	115812	121787	102144	AveID		0.7999				13.5		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.: 320-24961-1 Analy Batch No.: 145640

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/09/2017 13:31 Calibration End Date: 01/09/2017 15:16 Calibration ID: 27505

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-145640/4	09JAN2017A_004.d
Level 2	IC 320-145640/13	09JAN2017A_013.d
Level 3	IC 320-145640/5	09JAN2017A_005.d
Level 4	IC 320-145640/14	09JAN2017A_014.d
Level 5	IC 320-145640/6	09JAN2017A_006.d
Level 6	IC 320-145640/15	09JAN2017A_015.d
Level 7	IC 320-145640/7	09JAN2017A_007.d
Level 8	IC 320-145640/16	09JAN2017A_016.d
Level 9	IC 320-145640/8	09JAN2017A_008.d
Level 10	IC 320-145640/17	09JAN2017A_017.d
Level 11	IC 320-145640/9	09JAN2017A_009.d
Level 12	IC 320-145640/18	09JAN2017A_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	18132250 14035072	18359938	18873649	17525932	17888278	50.0 50.0	50.0	50.0	50.0	50.0
13C5-PFPeA	Ave	14752095 10388559	14477908	15308194	13579579	14434285	50.0 50.0	50.0	50.0	50.0	50.0
13C2 PFHxA	Ave	13573271 9838566	13573169	14119971	12925450	13265155	50.0 50.0	50.0	50.0	50.0	50.0
13C4-PFHpA	Ave	12044155 7915336	11782960	12706919	10785607	11938109	50.0 50.0	50.0	50.0	50.0	50.0
18O2 PFHxS	Ave	15938128 11960026	16191475	16793586	15389703	15791017	47.3 47.3	47.3	47.3	47.3	47.3
13C4 PFOA	Ave	13108614 7871570	13008273	13807600	11710886	13077201	50.0 50.0	50.0	50.0	50.0	50.0
M2-6:2FTS	Ave	6615643	6307331 6537880	6066171	6231822	6288992	47.5	47.5 47.5	47.5	47.5	47.5
13C4 PFOS	Ave	12718288 9774256	13131755	13738465	12515576	12566558	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.: 320-24961-1 Analy Batch No.: 145640

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/09/2017 13:31 Calibration End Date: 01/09/2017 15:16 Calibration ID: 27505

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	9791676 6421370	9708212	10195149	9089040	9814583	50.0 50.0	50.0	50.0	50.0	50.0
13C8 FOSA	Ave	21229846 16776754	21172948	22029403	20671594	21009814	50.0 50.0	50.0	50.0	50.0	50.0
13C2 PFDA	Ave	9216579 6738351	9830069	9949364	9157145	9143859	50.0 50.0	50.0	50.0	50.0	50.0
M2-8:2FTS	Ave	6462002	6252767 6843326	6251863	6430713	6549548	47.9	47.9 47.9	47.9	47.9	47.9
d3-NMeFOSAA	Ave	4233937	4230030 3737345	4062854	4088717	4165665	50.0	50.0 50.0	50.0	50.0	50.0
13C2 PFUnA	Ave	7436843 4394648	7257815	7758756	6638123	7270413	50.0 50.0	50.0	50.0	50.0	50.0
d5-NEtFOSAA	Ave	4745262	4525254 4143372	4590414	4617663	4536579	50.0	50.0 50.0	50.0	50.0	50.0
d-N-MeFOSA-M	Ave	5275515	5101842 4957068	5129394	5090921	5258323	50.0	50.0 50.0	50.0	50.0	50.0
13C2 PFDoA	Ave	6886474 4836420	6596653	7225986	6578052	6878867	50.0 50.0	50.0	50.0	50.0	50.0
d-N-EtFOSA-M	Ave	5192294	4973124 4849132	4947581	4939370	5133039	50.0	50.0 50.0	50.0	50.0	50.0
13C2-PFTeDA	Ave	12829867 9488741	12374174	13277272	12597564	12103726	50.0 50.0	50.0	50.0	50.0	50.0
13C2-PFHxDA	Ave	6903453 5526087	6738129	7433624	6923040	6551893	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.: 320-24961-1 Analy Batch No.: 145640

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/09/2017 13:31 Calibration End Date: 01/09/2017 15:16 Calibration ID: 27505

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-145640/4	09JAN2017A_004.d
Level 2	IC 320-145640/13	09JAN2017A_013.d
Level 3	IC 320-145640/5	09JAN2017A_005.d
Level 4	IC 320-145640/14	09JAN2017A_014.d
Level 5	IC 320-145640/6	09JAN2017A_006.d
Level 6	IC 320-145640/15	09JAN2017A_015.d
Level 7	IC 320-145640/7	09JAN2017A_007.d
Level 8	IC 320-145640/16	09JAN2017A_016.d
Level 9	IC 320-145640/8	09JAN2017A_008.d
Level 10	IC 320-145640/17	09JAN2017A_017.d
Level 11	IC 320-145640/9	09JAN2017A_009.d
Level 12	IC 320-145640/18	09JAN2017A_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	160721 42620436	7036524	326041	15793993	1557377	0.500 200	20.0	1.00	50.0	5.00
Perfluoropentanoic acid (PFPeA)		AveID	159103 33908231	6163858	299594	13589501	1389061	0.500 200	20.0	1.00	50.0	5.00
Perfluorobutanesulfonic acid (PFBS)		AveID	219697 51940263	10657228	471912	22983717	2342406	0.442 177	17.7	0.884	44.2	4.42
Perfluorohexanoic acid (PFHxA)		AveID	136227 32142166	5205130	258656	11904967	1239056	0.500 200	20.0	1.00	50.0	5.00
Perfluoroheptanoic acid (PFHpA)		AveID	123942 28512549	4764388	255074	10587301	1179661	0.500 200	20.0	1.00	50.0	5.00
Perfluorohexanesulfonic acid (PFHxS)		AveID	+++++ 44357445	6764901	374092	15314165	1517736	+++++ 182	18.2	0.910	45.5	4.55
Perfluorooctanoic acid (PFOA)		AveID	+++++ 29364167	5524420	292893	11821302	1246605	+++++ 200	20.0	1.00	50.0	5.00
6:2FTS		AveID	613524	48891 20518891	2343760	104267	5654816	4.74	0.474 190	19.0	0.948	47.4

FORM VI

RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-24961-1 Analy Batch No.: 145640

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/09/2017 13:31 Calibration End Date: 01/09/2017 15:16 Calibration ID: 27505

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	140450 37546591	6310704	274769	13944527	1383541	0.476 190	19.0	0.952	47.6	4.76
Perfluorooctane Sulfonate (PFOS)		AveID	+++++ 40499129	5335568	252630	12667506	1170589	+++++ 186	18.6	0.928	46.4	4.64
Perfluorononanoic acid (PFNA)		AveID	95165 23976816	3868179	193098	8487460	916884	0.500 200	20.0	1.00	50.0	5.00
Perfluorooctane Sulfonamide (FOSA)		AveID	204578 48748543	8568333	427395	19681169	2106204	0.500 200	20.0	1.00	50.0	5.00
Perfluorodecanoic acid (PFDA)		AveID	88648 24825913	3777687	176905	8404103	849782	0.500 200	20.0	1.00	50.0	5.00
8:2FTS		AveID	629557	47744 21834494	2386530	107440	6041633	4.79	0.479 192	19.2	0.958	47.9
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)		AveID	405677	33371 15249090	1601725	70926	3905646	5.00	0.500 200	20.0	1.00	50.0
Perfluorodecanesulfonic acid (PFDS)		AveID	77249 25317110	3542226	168990	8760153	771350	0.482 193	19.3	0.964	48.2	4.82
Perfluoroundecanoic acid (PFUnA)		AveID	82754 17277703	2867030	152387	6270770	632525	0.500 200	20.0	1.00	50.0	5.00
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)		AveID	417343	33226 15124627	1618448	73837	3924762	5.00	0.500 200	20.0	1.00	50.0
MeFOSA		AveID	462937	41319 18209166	1818170	76926	4627255	5.00	0.500 200	20.0	1.00	50.0
Perfluorododecanoic acid (PFDoA)		AveID	62307 18351830	2545344	129775	6111819	620927	0.500 200	20.0	1.00	50.0	5.00
N-EtFOSA-M		AveID	496282	41698 19094248	1922089	83275	4980246	5.00	0.500 200	20.0	1.00	50.0

FORM VI

RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-24961-1 Analy Batch No.: 145640

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/09/2017 13:31 Calibration End Date: 01/09/2017 15:16 Calibration ID: 27505

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	58523 17443940	2501933	129426	6010249	578415	0.500 200	20.0	1.00	50.0	5.00
Perfluorotetradecanoic acid (PFTeA)		AveID	124671 30191429	4339153	239931	10731489	1056859	0.500 200	20.0	1.00	50.0	5.00
Perfluoro-n-hexadecanoic acid (PFHxDA)		L1ID	141141 18579953	2417937	195362	6072845	590121	0.500 200	20.0	1.00	50.0	5.00
Perfluoro-n-octadecanoic acid (PFODA)		AveID	42857 17128970	2170055	115812	6089373	510722	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\20170109-38635.b\09JAN2017A_004.d
Lims ID: IC L1
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 09-Jan-2017 13:31:26 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*sub11

Method: \\ChromNa\Sacramento\ChromData\A8_N\20170109-38635.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 09-Jan-2017 15:59:00 Calib Date: 09-Jan-2017 15:16:24
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: chandrasenas Date: 09-Jan-2017 14:56:07

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	1.590	1.598	-0.008		18132250	51.9		104	1382356	
1 Perfluorobutyric acid										
212.90 > 169.00	1.590	1.600	-0.010	1.000	160721	0.5075		102	1868	
D 4 13C5-PFPeA										
267.90 > 223.00	1.878	1.884	-0.006		14752095	53.4		107	1065279	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.878	1.885	-0.007	1.000	159103	0.5484		110	1492	
5 Perfluorobutanesulfonic acid										M
298.90 > 80.00	1.916	1.924	-0.008	1.000	219697	0.4305		97.4		
298.90 > 99.00	1.916	1.924	-0.008	1.000	92808		2.37(0.00-0.00)	97.4		M
D 6 13C2 PFHxA										
315.00 > 270.00	2.174	2.187	-0.013		13573271	52.7		105	853828	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.174	2.189	-0.015	1.000	136227	0.5425		108	4471	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.513	2.530	-0.017	1.000	123942	0.5220		104	1440	
D 11 13C4-PFHpA										
367.00 > 322.00	2.513	2.530	-0.017		12044155	53.8		108	2255476	
9 Perfluorohexanesulfonic acid										M
399.00 > 80.00	2.528	2.547	-0.019	1.000	200205	0.5668		125		M
D 10 18O2 PFHxS										
403.00 > 84.00	2.528	2.548	-0.020		15938128	49.1		104	5807172	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.879	2.891	-0.012	1.000	147695	0.5614		112	1200	
413.00 > 169.00	2.871	2.891	-0.020	0.997	87091		1.70(0.90-1.10)	112	4703	
D 14 13C4 PFOA										
417.00 > 372.00	2.871	2.891	-0.020		13108614	54.2		108	938688	

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	2.879	2.898	-0.019	1.000	140450	0.4866		102		
18 Perfluorooctane sulfonic acid										M
499.00 > 80.00	3.235	3.231	0.004	1.000	118830	0.4410		95.1	30943	M
499.00 > 99.00	3.235	3.231	0.004	1.000	27663		4.30(0.90-1.10)	95.1	0.0	M
D 17 13C4 PFOS										
503.00 > 80.00	3.235	3.261	-0.026		12718288	49.0		103	507473	
20 Perfluorononanoic acid										
463.00 > 419.00	3.235	3.261	-0.026	1.000	95165	0.5100		102	1775	
D 19 13C5 PFNA										
468.00 > 423.00	3.244	3.263	-0.019		9791676	53.4		107	810063	
D 21 13C8 FOSA										
506.00 > 78.00	3.549	3.570	-0.021		21229846	51.8		104	564941	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.549	3.574	-0.025	1.000	204578	0.5138		103	18640	
D 23 13C2 PFDA										
515.00 > 470.00	3.591	3.621	-0.030		9216579	51.2		102	255986	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.591	3.621	-0.030	1.000	88648	0.5171		103	2709	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.900	3.929	-0.029	1.000	77249	0.4553		94.5		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.926	3.951	-0.025	1.000	82754	0.5677		114	2860	
D 27 13C2 PFUnA										
565.00 > 520.00	3.935	3.953	-0.018		7436843	54.7		109	488041	
D 30 13C2 PFDoA										
615.00 > 570.00	4.222	4.245	-0.023		6886474	53.0		106	296330	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.231	4.247	-0.016	1.000	62307	0.4893		97.9	1367	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.496	4.516	-0.020	1.000	58523	0.4766		95.3	459	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.738	4.758	-0.020	1.000	124671	0.5518		110	48.2	
713.00 > 169.00	4.738	4.758	-0.020	1.000	21471		5.81(0.00-0.00)	110	7508	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.738	4.758	-0.020		12829867	53.0		106	513133	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.158	5.179	-0.021		6903453	51.7		103	106038	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.158	5.180	-0.022	1.000	141141	0.6327		127	94.5	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.536	5.554	-0.018	1.000	42857	0.3890		77.8	34.5	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LCPFC-L1_00022 Amount Added: 1.00 Units: mL

Report Date: 09-Jan-2017 15:59:00 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_004.d

Injection Date: 09-Jan-2017 13:31:26 Instrument ID: A8_N

Lims ID: IC L1

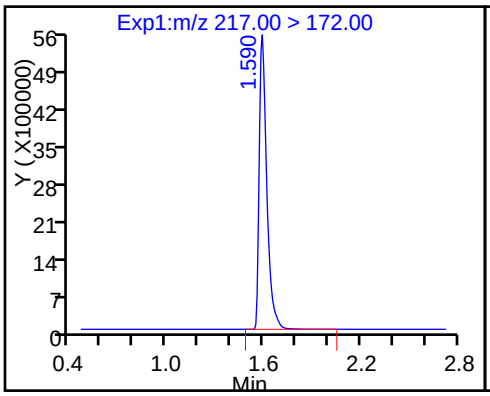
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 37 Worklist Smp#: 4

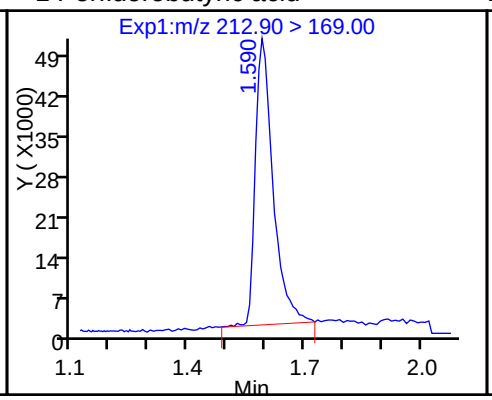
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

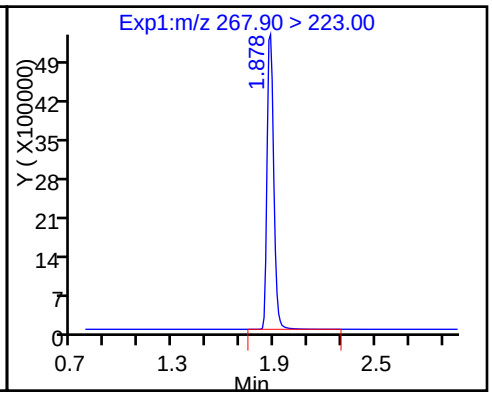
D 2 13C4 PFBA



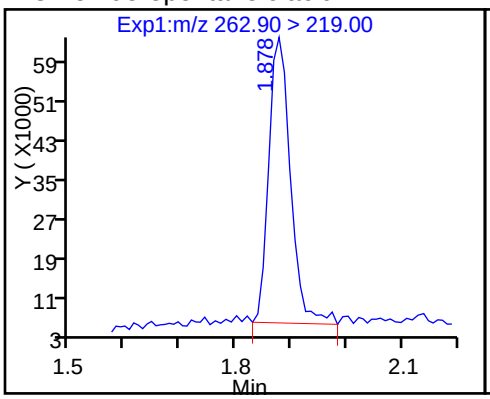
1 Perfluorobutyric acid



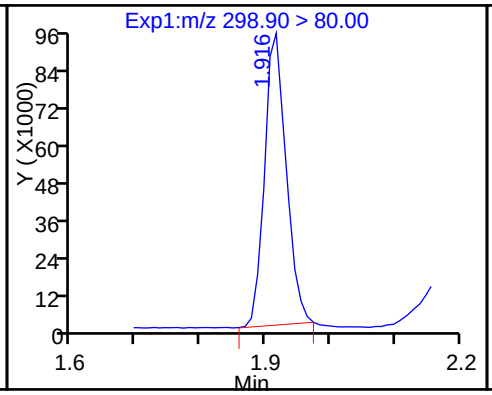
D 4 13C5-PFPeA



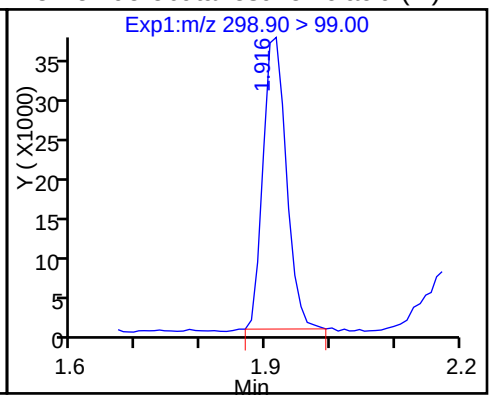
3 Perfluoropentanoic acid



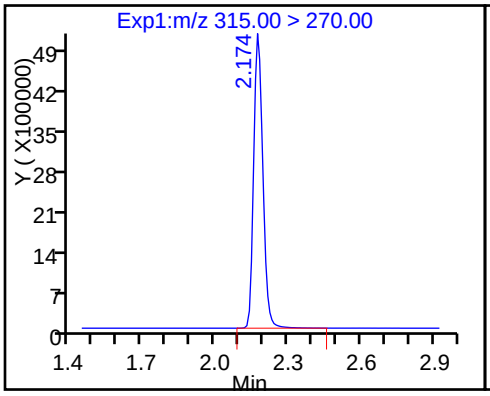
5 Perfluorobutanesulfonic acid



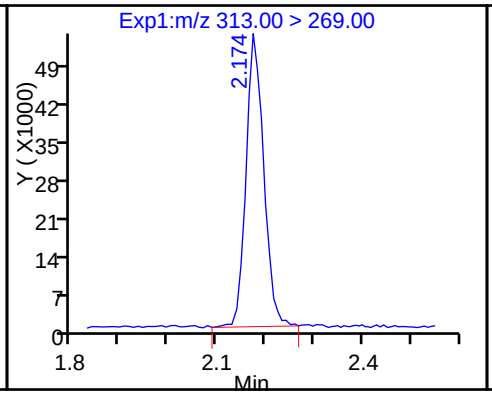
5 Perfluorobutanesulfonic acid (M)



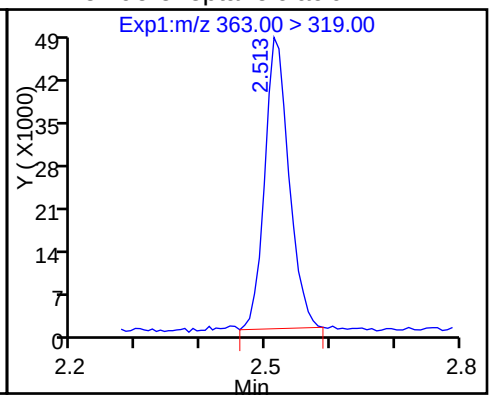
D 6 13C2 PFHxA



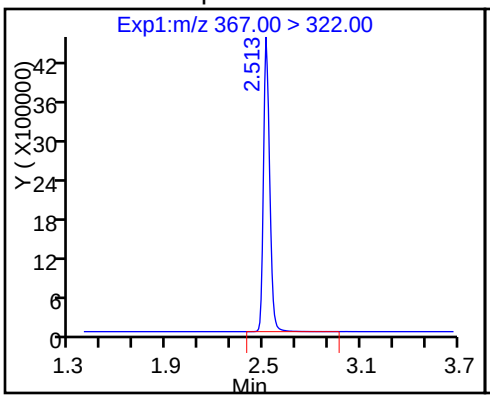
7 Perfluorohexanoic acid



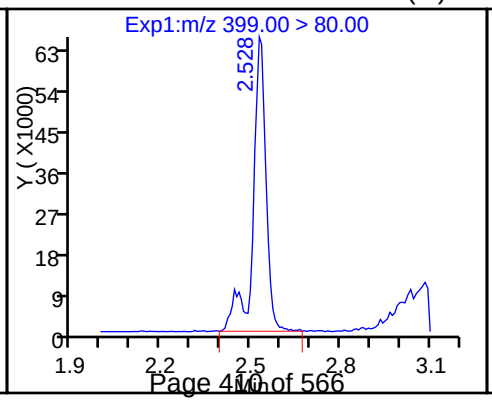
12 Perfluoroheptanoic acid



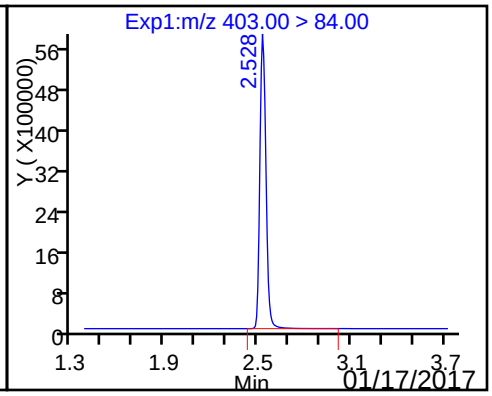
D 11 13C4-PFHpA



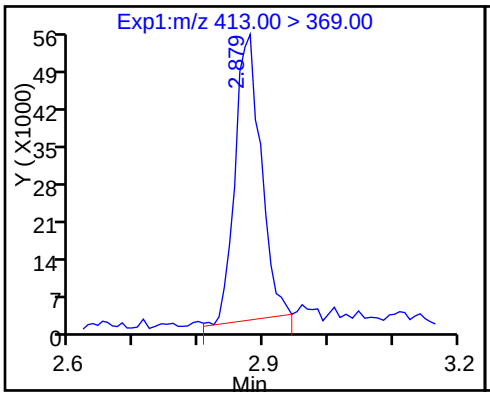
9 Perfluorohexanesulfonic acid (M)



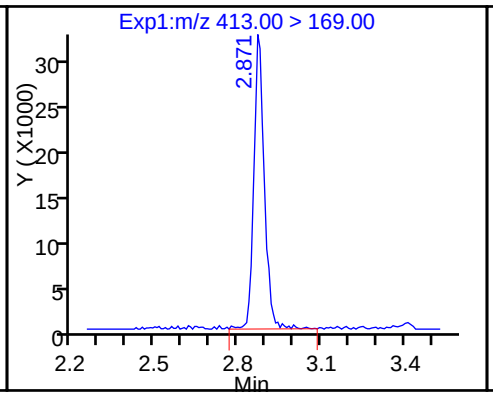
D 10 18O2 PFHxS



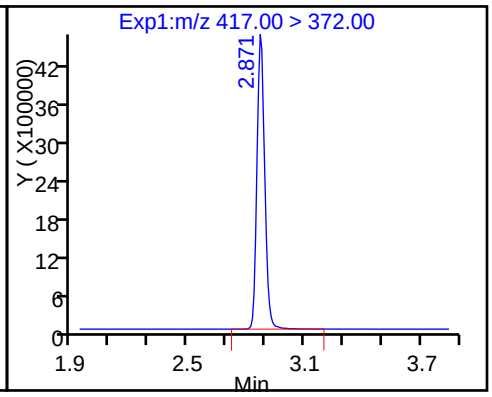
15 Perfluorooctanoic acid



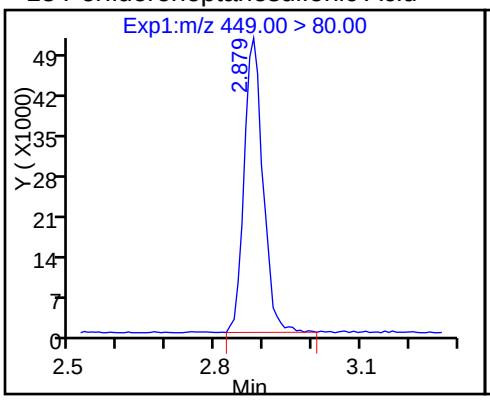
15 Perfluorooctanoic acid



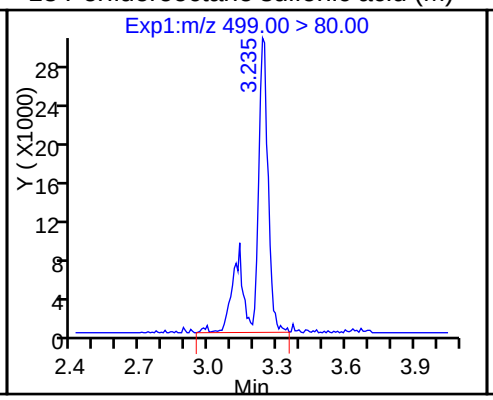
D 14 13C4 PFOA



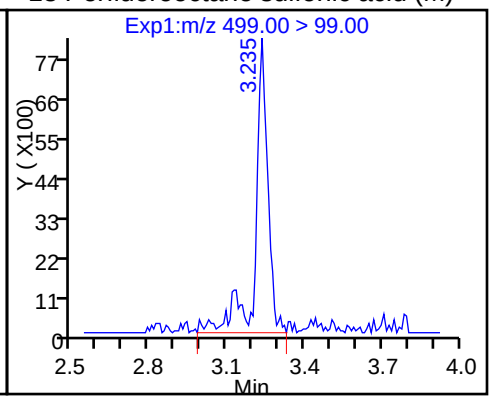
13 Perfluoroheptanesulfonic Acid



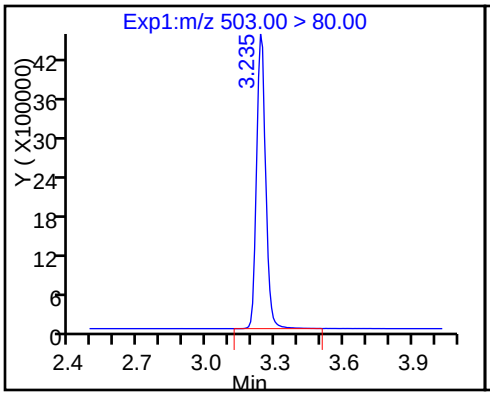
18 Perfluorooctane sulfonic acid (M)



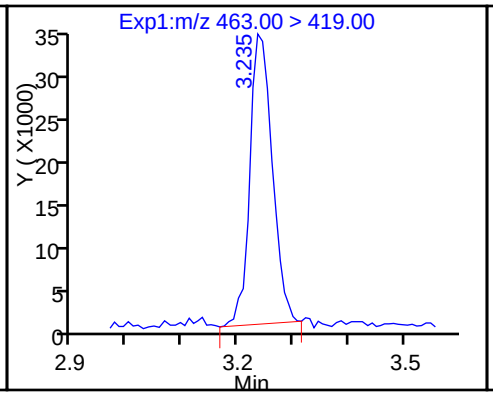
18 Perfluorooctane sulfonic acid (M)



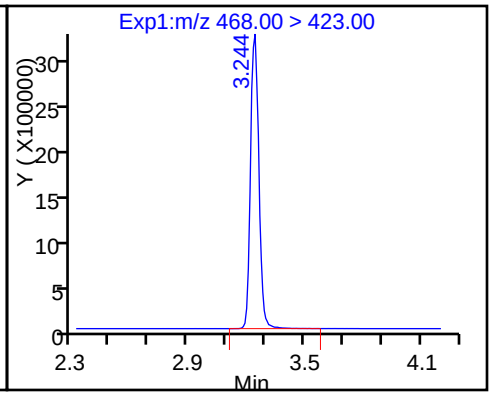
D 17 13C4 PFOS



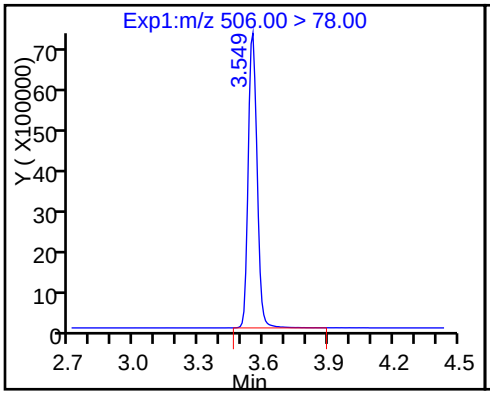
20 Perfluorononanoic acid



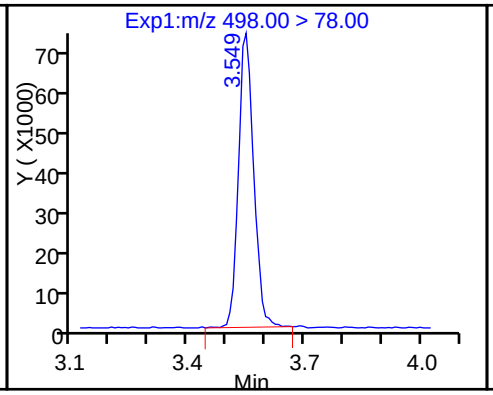
D 19 13C5 PFNA



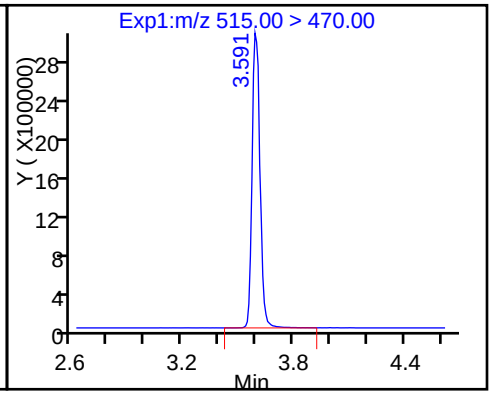
D 21 13C8 FOSA



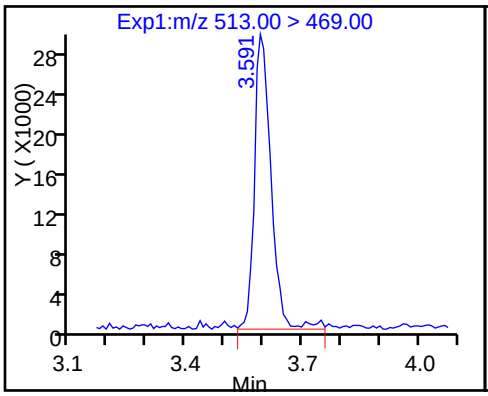
22 Perfluorooctane Sulfonamide



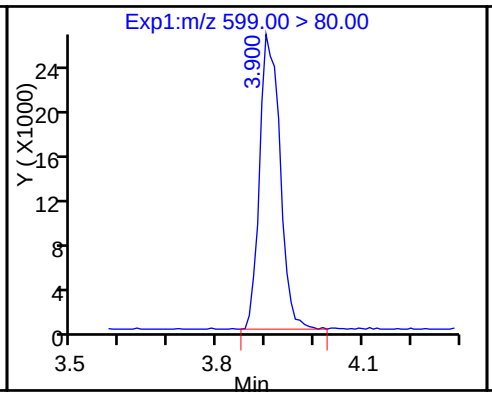
D 23 13C2 PFDA



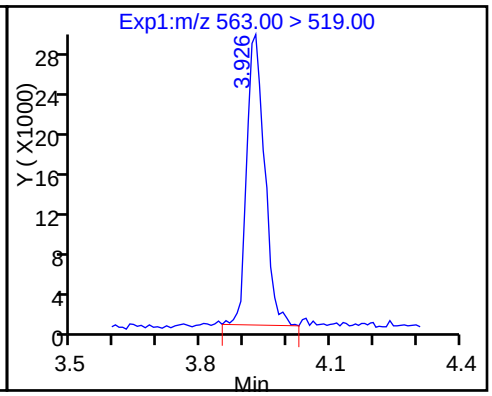
24 Perfluorodecanoic acid



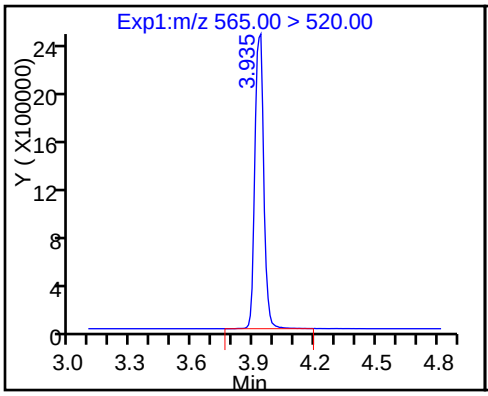
26 Perfluorodecane Sulfonic acid



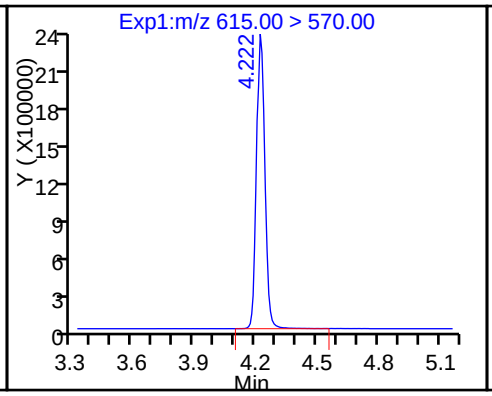
28 Perfluoroundecanoic acid



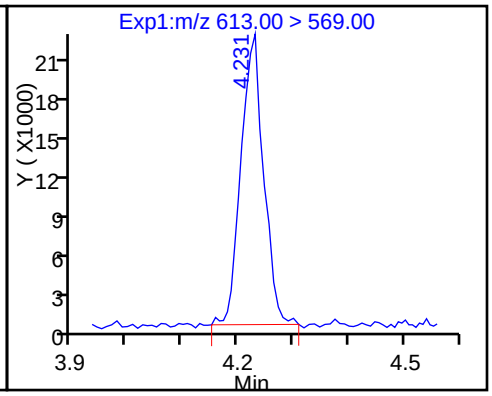
D 27 13C2 PFUnA



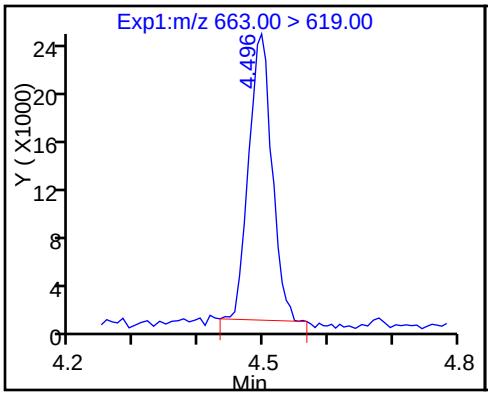
D 30 13C2 PFDoA



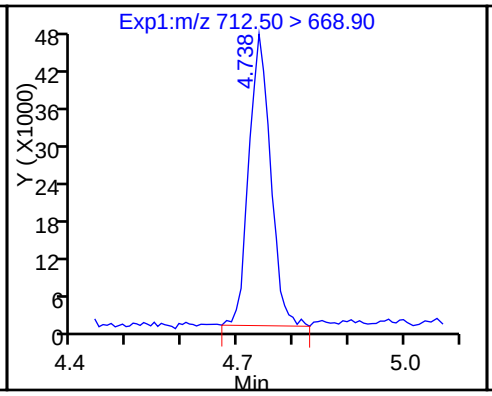
29 Perfluorododecanoic acid



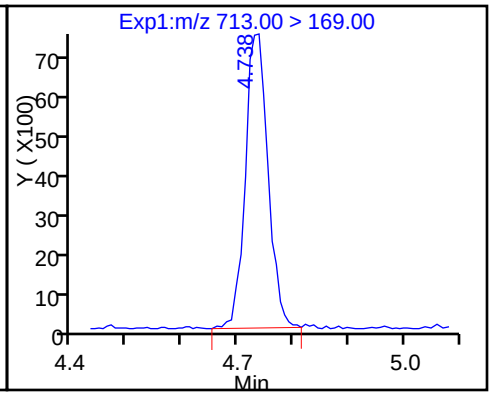
31 Perfluorotridecanoic acid



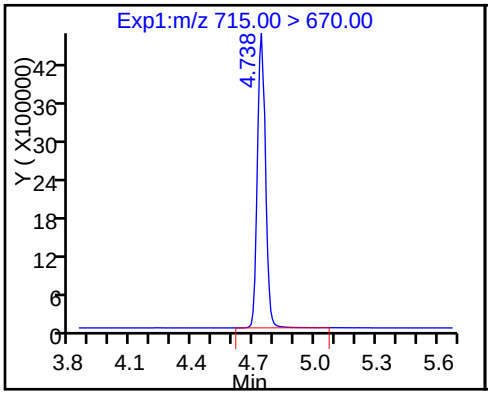
33 Perfluorotetradecanoic acid



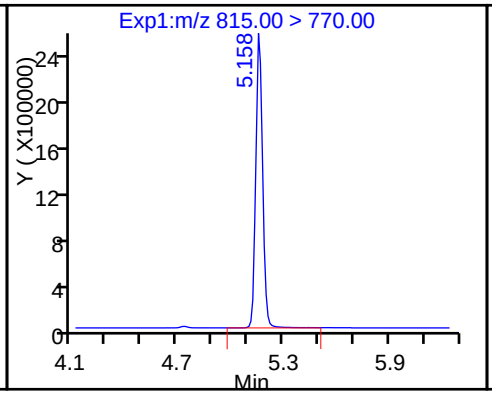
33 Perfluorotetradecanoic acid



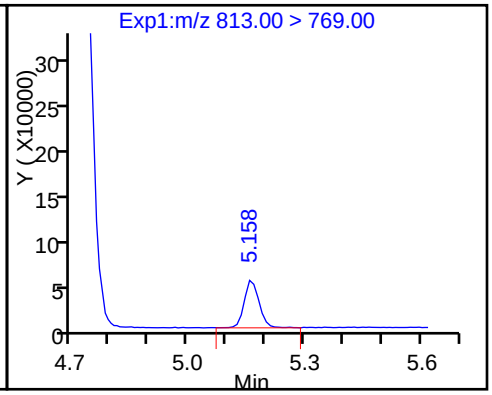
D 32 13C2-PFTeDA



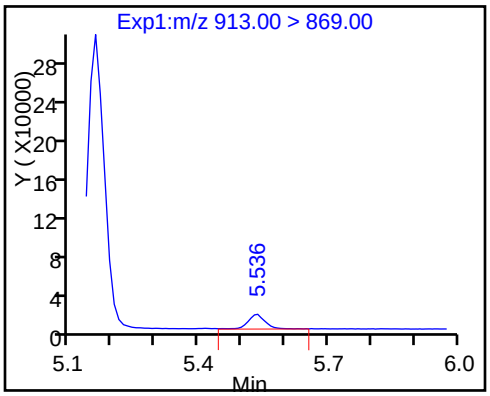
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

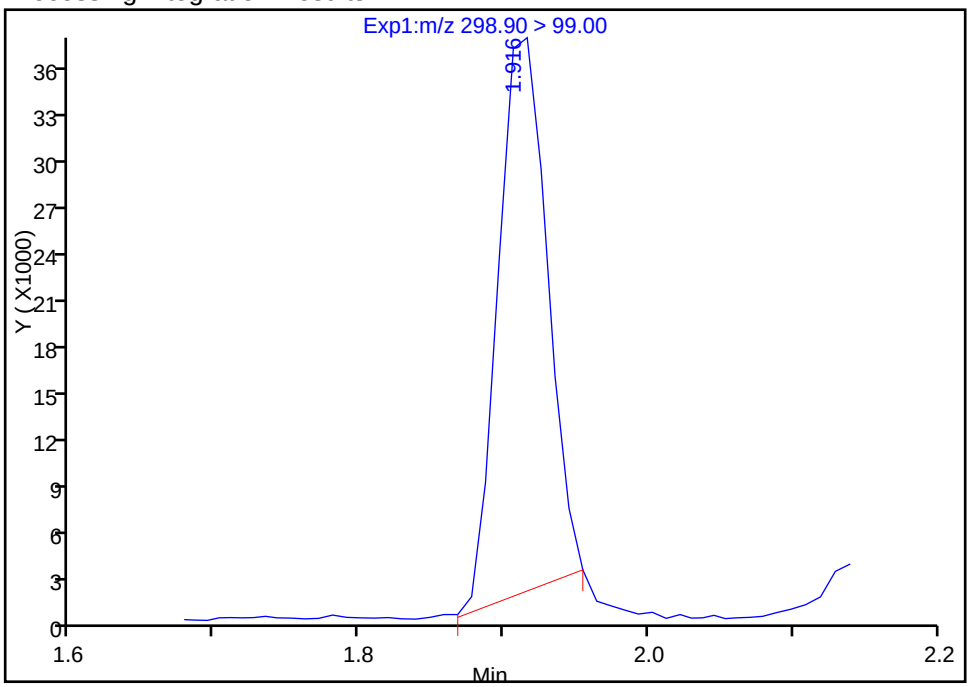
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_004.d				
Injection Date:	09-Jan-2017 13:31:26	Instrument ID:	A8_N		
Lims ID:	IC L1				
Client ID:					
Operator ID:	A8-PC\A8	ALS Bottle#:	37	Worklist Smp#:	4
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 2

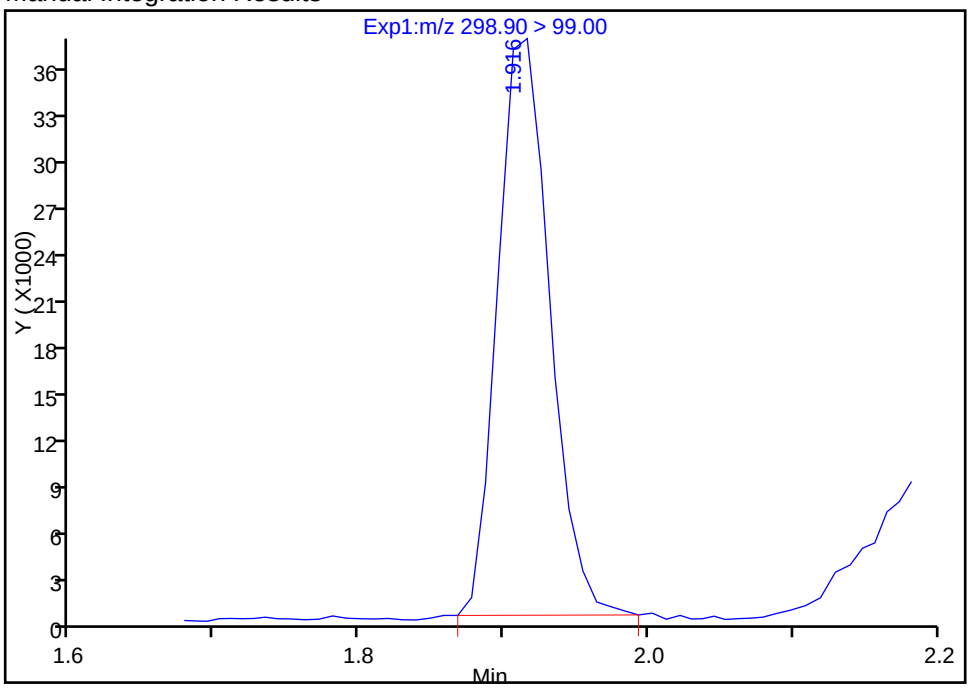
Processing Integration Results

RT: 1.92
Area: 84125
Amount: 0.430502
Amount Units: ng/ml



Manual Integration Results

RT: 1.92
Area: 92808
Amount: 0.430502
Amount Units: ng/ml



Reviewer: chandrasenas, 09-Jan-2017 14:56:07

Audit Action: Manually Integrated Audit Reason: Incomplete Integration

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

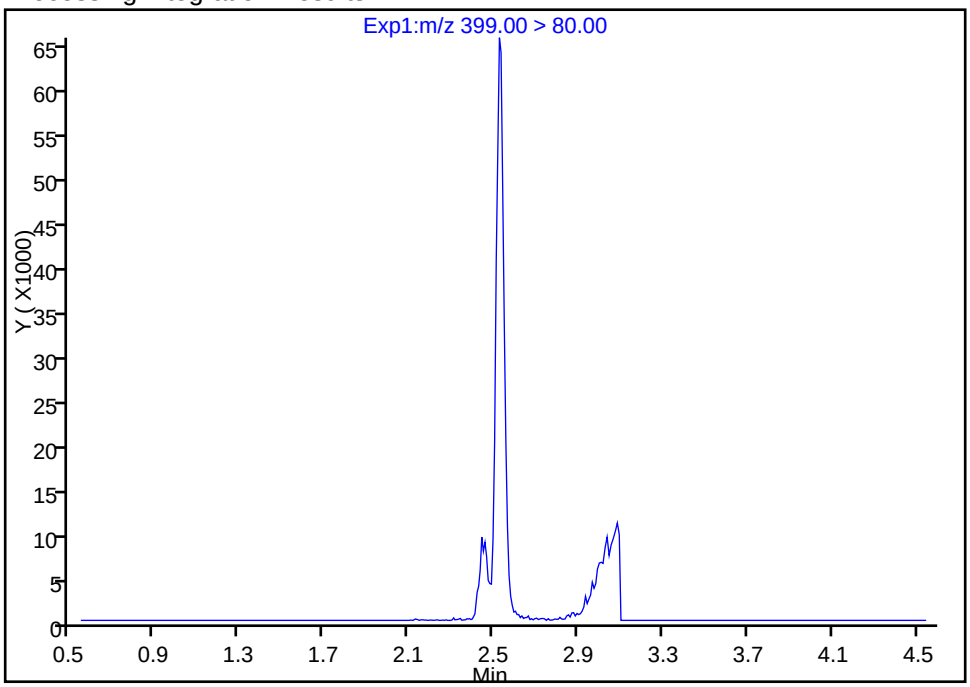
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_004.d				
Injection Date:	09-Jan-2017 13:31:26	Instrument ID:	A8_N		
Lims ID:	IC L1				
Client ID:					
Operator ID:	A8-PC\A8	ALS Bottle#:	37	Worklist Smp#:	4
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

9 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

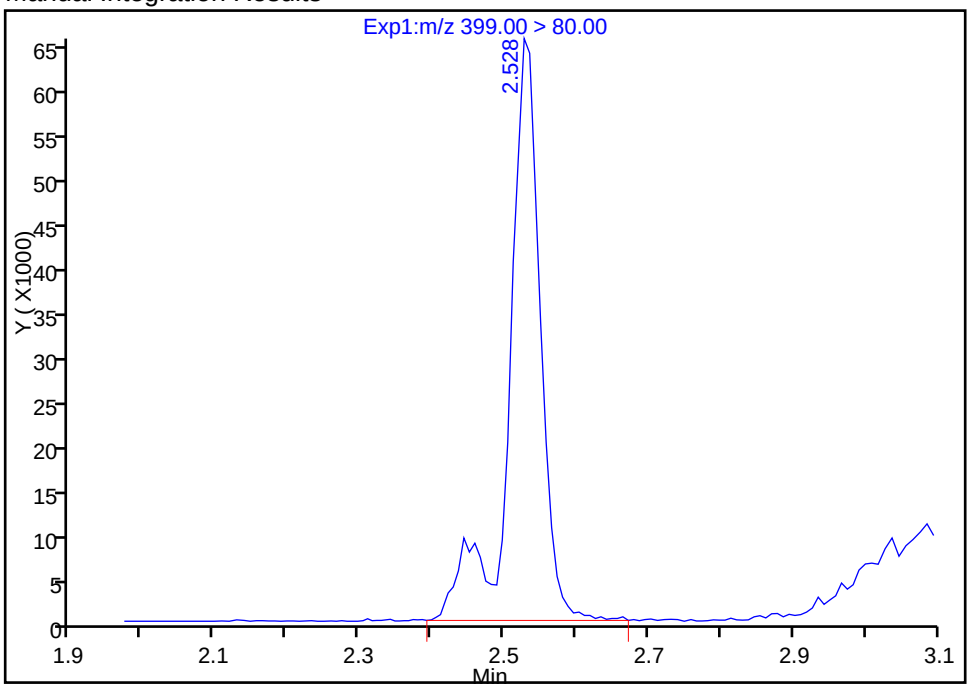
Processing Integration Results

Not Detected
Expected RT: 2.55



Manual Integration Results

RT: 2.53
Area: 200205
Amount: 0.566811
Amount Units: ng/ml



Reviewer: chandrasenas, 09-Jan-2017 14:56:07
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

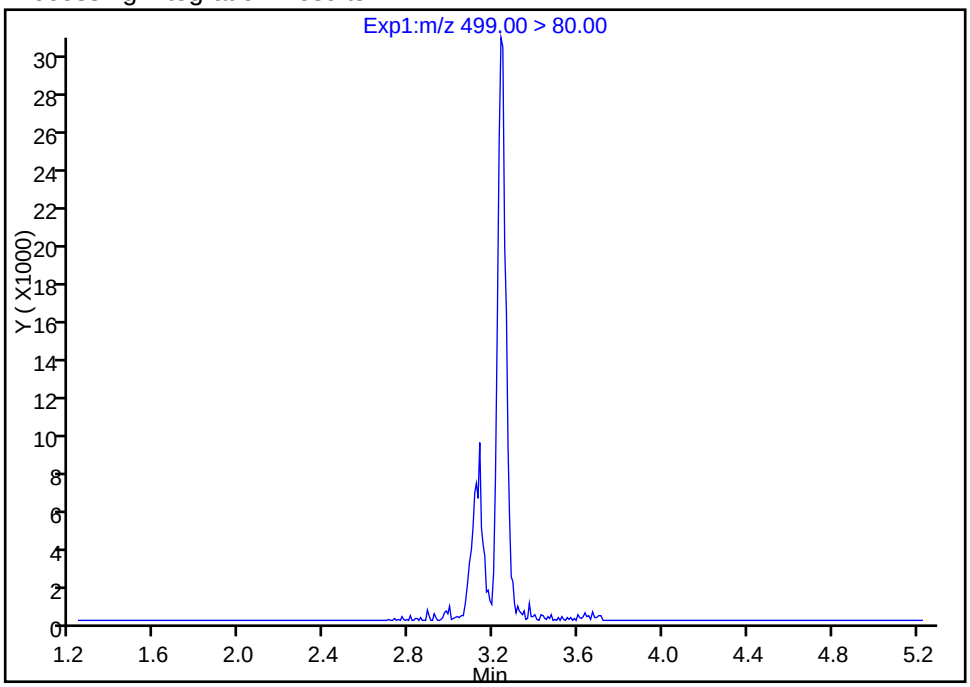
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_004.d				
Injection Date:	09-Jan-2017 13:31:26	Instrument ID:	A8_N		
Lims ID:	IC L1				
Client ID:					
Operator ID:	A8-PC\A8	ALS Bottle#:	37	Worklist Smp#:	4
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

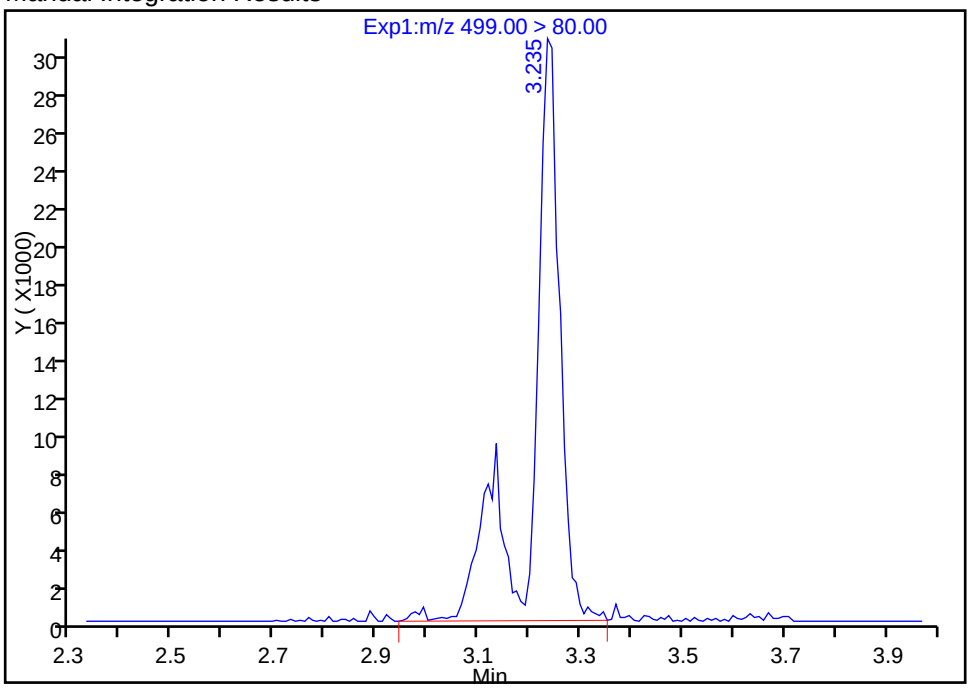
Processing Integration Results

Not Detected
Expected RT: 3.23



Manual Integration Results

RT: 3.24
Area: 118830
Amount: 0.441049
Amount Units: ng/ml



Reviewer: chandrasenas, 09-Jan-2017 14:56:07
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

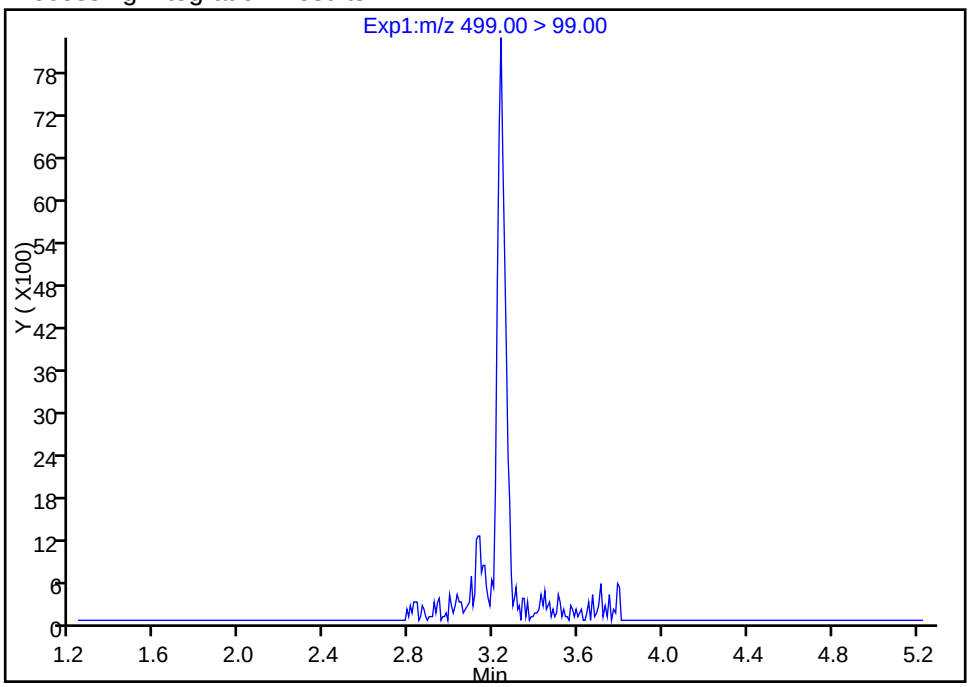
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_004.d				
Injection Date:	09-Jan-2017 13:31:26	Instrument ID:	A8_N		
Lims ID:	IC L1				
Client ID:					
Operator ID:	A8-PC\A8	ALS Bottle#:	37	Worklist Smp#:	4
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

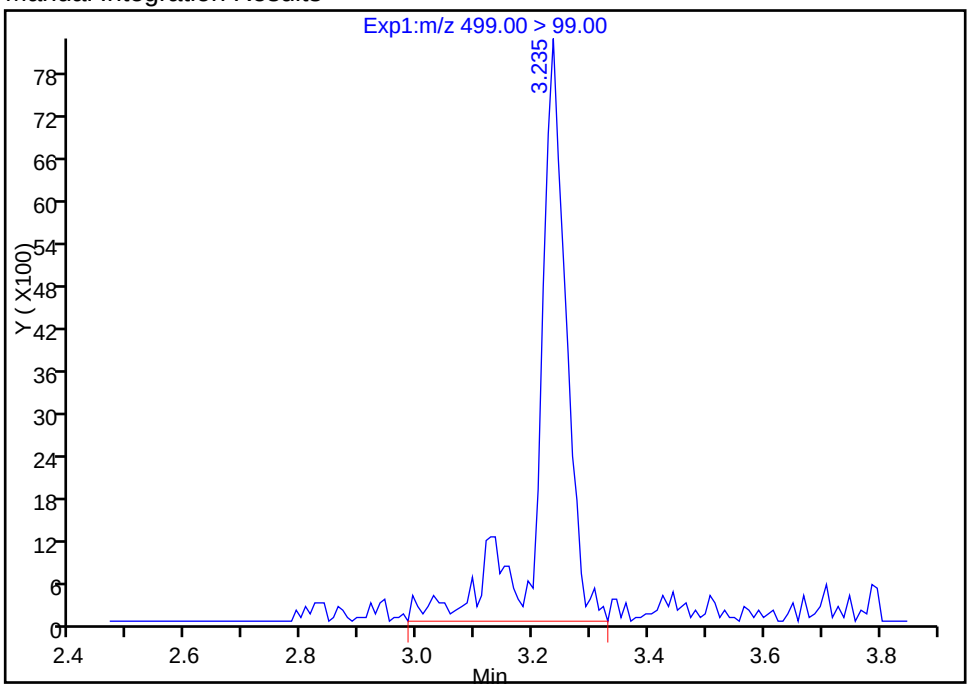
Processing Integration Results

Not Detected
Expected RT: 3.23



Manual Integration Results

RT:	3.24
Area:	27663
Amount:	0.441049
Amount Units:	ng/ml



Reviewer: chandrasenas, 09-Jan-2017 14:56:07

Audit Action: Manually Integrated Audit Reason: Assign Peak

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_005.d
Lims ID: IC L2
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 09-Jan-2017 13:38:55 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*sub11

Method: \\ChromNa\Sacramento\ChromData\A8_N\20170109-38635.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 09-Jan-2017 15:59:02 Calib Date: 09-Jan-2017 15:16:24
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: chandrasenas Date: 09-Jan-2017 14:58:35

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	1.593	1.598	-0.005		18873649	54.0		108	1418639	
1 Perfluorobutyric acid										
212.90 > 169.00	1.593	1.600	-0.007	1.000	326041	0.9892		98.9	4253	
D 4 13C5-PFPeA										
267.90 > 223.00	1.881	1.884	-0.003		15308194	55.4		111	783178	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.881	1.885	-0.004	1.000	299594	1.00		99.5	2486	
5 Perfluorobutanesulfonic acid										M
298.90 > 80.00	1.919	1.924	-0.005	1.000	471912	0.8776		99.3		
298.90 > 99.00	1.919	1.924	-0.005	1.000	200260		2.36(0.00-0.00)	99.3		M
D 6 13C2 PFHxA										
315.00 > 270.00	2.178	2.187	-0.009		14119971	54.8		110	1053125	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.178	2.189	-0.011	1.000	258656	0.99		99.0	10729	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.516	2.530	-0.014	1.000	255074	1.02		102	2861	
D 11 13C4-PFHpA										
367.00 > 322.00	2.516	2.530	-0.014		12706919	56.8		114	2245039	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.531	2.547	-0.016	1.000	374092	1.01		110		
D 10 18O2 PFHxS										
403.00 > 84.00	2.538	2.548	-0.010		16793586	51.8		109	1486496	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.872	2.891	-0.019	1.000	292893	1.06		106	2912	
413.00 > 169.00	2.880	2.891	-0.011	1.003	170104		1.72(0.90-1.10)	106	9002	
D 14 13C4 PFOA										
417.00 > 372.00	2.872	2.891	-0.019		13807600	57.1		114	813859	

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	2.880	2.898	-0.018	1.000	274769	0.8813		92.6		
18 Perfluorooctane sulfonic acid										M
499.00 > 80.00	3.237	3.221	0.016	1.000	252630	0.8680		93.5	16904	M
499.00 > 99.00	3.245	3.221	0.024	1.003	56605		4.46(0.90-1.10)	93.5	2633	M
D 17 13C4 PFOS										
503.00 > 80.00	3.245	3.261	-0.016		13738465	52.9		111	600012	
20 Perfluorononanoic acid										
463.00 > 419.00	3.237	3.261	-0.024	1.000	193098	0.99		99.4	3287	
D 19 13C5 PFNA										
468.00 > 423.00	3.245	3.263	-0.018		10195149	55.6		111	663894	
D 21 13C8 FOSA										
506.00 > 78.00	3.550	3.570	-0.020		22029403	53.8		108	755664	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.559	3.574	-0.015	1.000	427395	1.03		103	39073	
D 23 13C2 PFDA										
515.00 > 470.00	3.601	3.621	-0.020		9949364	55.2		110	263867	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.601	3.621	-0.020	1.000	176905	0.9560		95.6	5846	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.910	3.929	-0.019	1.000	168990	0.9220		95.6		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.928	3.951	-0.023	1.000	152387	1.00		100	4478	
D 27 13C2 PFUnA										
565.00 > 520.00	3.928	3.953	-0.025		7758756	57.1		114	399964	
D 30 13C2 PFDoA										
615.00 > 570.00	4.224	4.245	-0.021		7225986	55.6		111	282253	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.224	4.247	-0.023	1.000	129775	0.9712		97.1	2795	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.498	4.516	-0.018	1.000	129426	1.00		100	834	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.748	4.758	-0.010	1.000	239931	1.01		101	79.9	
713.00 > 169.00	4.731	4.758	-0.027	0.997	40162		5.97(0.00-0.00)	101	14153	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.748	4.758	-0.010		13277272	54.8		110	473083	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.164	5.179	-0.015		7433624	55.6		111	106599	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.164	5.180	-0.016	1.000	195362	0.9796		98.0	130	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.541	5.554	-0.013	1.000	115812	1.00		100	80.4	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LCPFC-L2_00023 Amount Added: 1.00 Units: mL

Report Date: 09-Jan-2017 15:59:03 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_005.d

Injection Date: 09-Jan-2017 13:38:55 Instrument ID: A8_N

Lims ID: IC L2

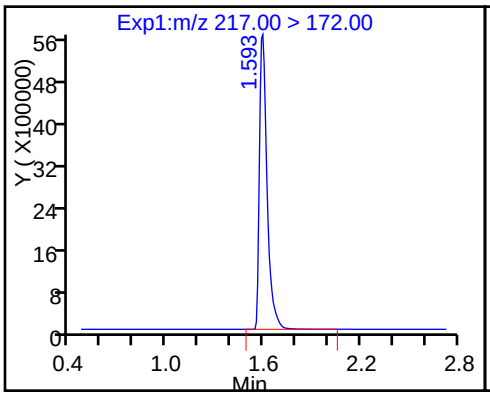
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 38 Worklist Smp#: 5

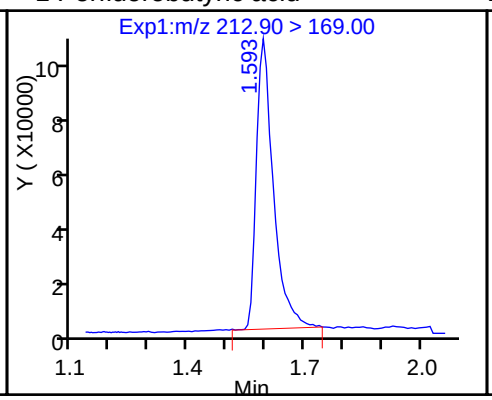
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

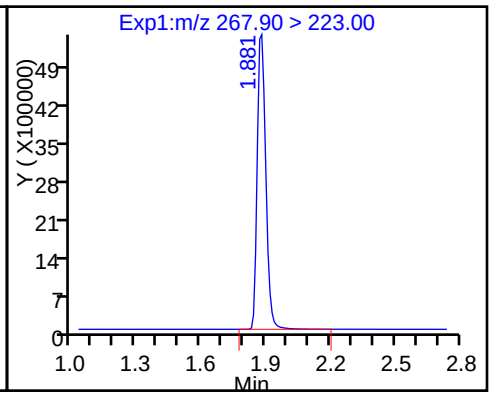
D 2 13C4 PFBA



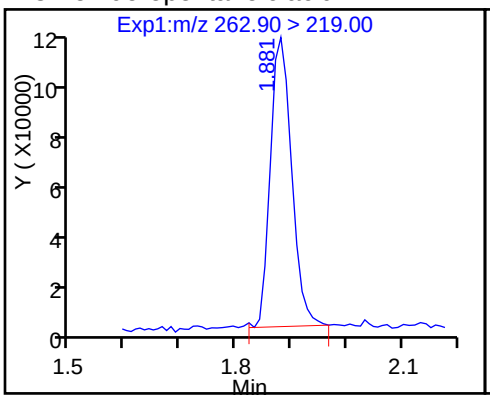
1 Perfluorobutyric acid



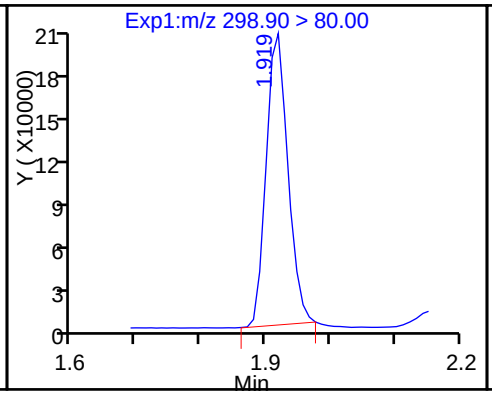
D 4 13C5-PFPeA



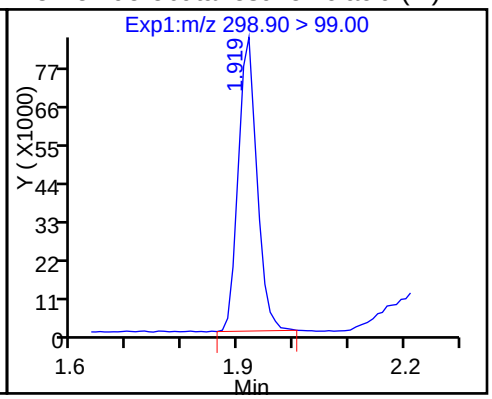
3 Perfluoropentanoic acid



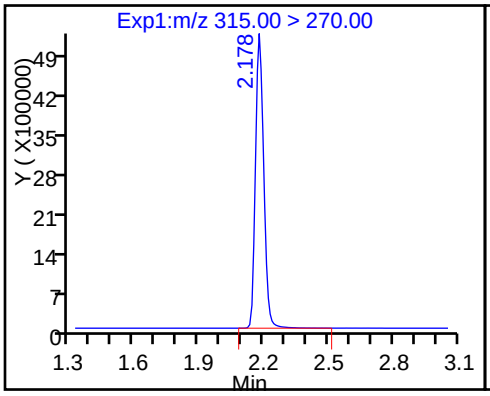
5 Perfluorobutanesulfonic acid



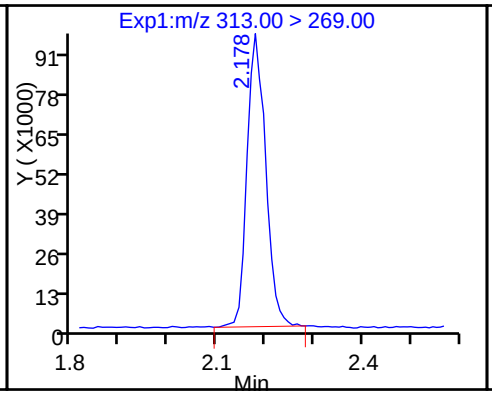
5 Perfluorobutanesulfonic acid (M)



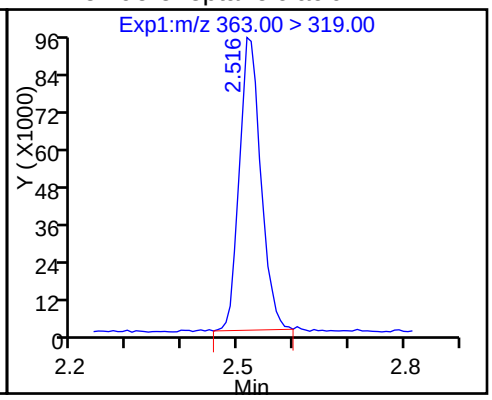
D 6 13C2 PFHxA



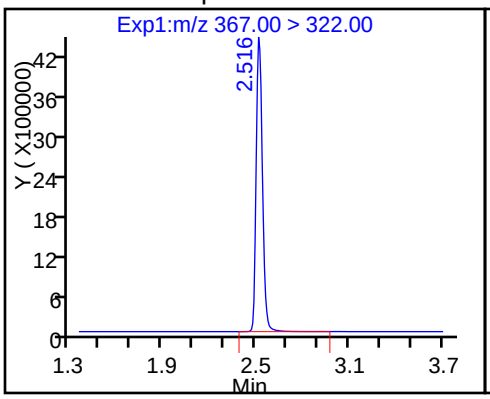
7 Perfluorohexanoic acid



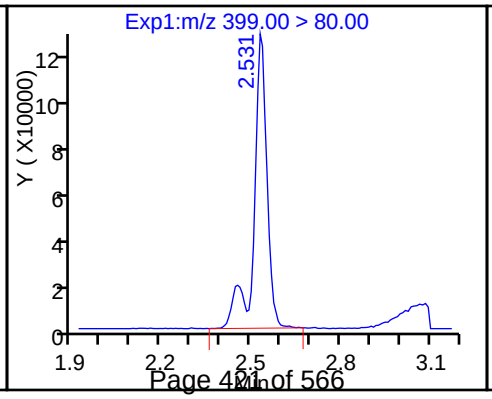
12 Perfluoroheptanoic acid



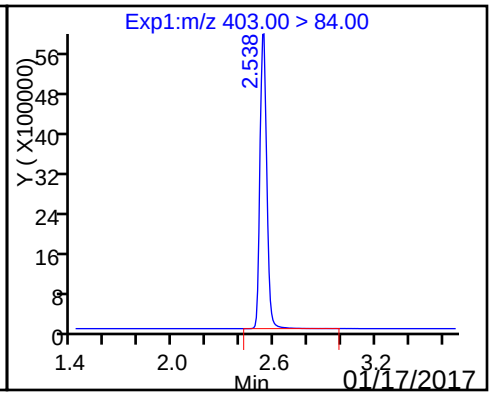
D 11 13C4-PFHpA



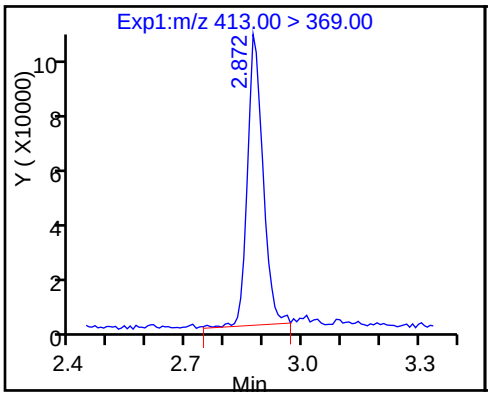
9 Perfluorohexanesulfonic acid



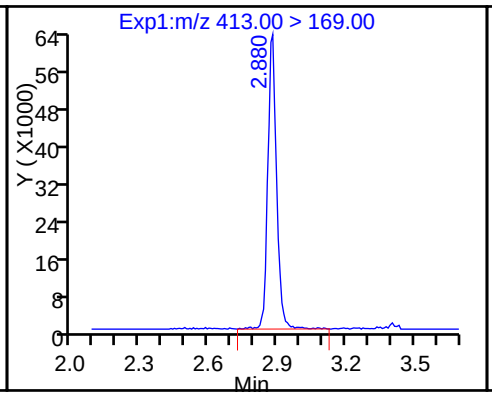
D 10 18O2 PFHxS



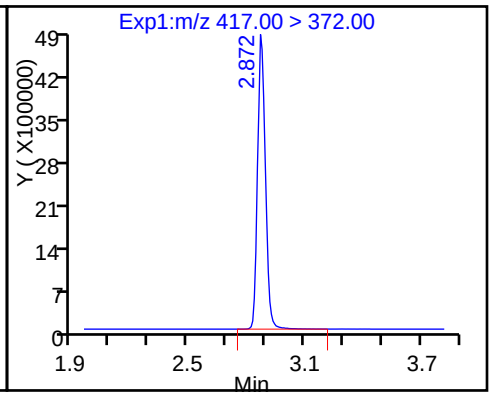
15 Perfluorooctanoic acid



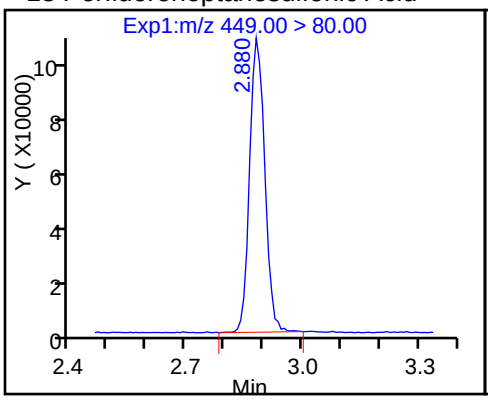
15 Perfluorooctanoic acid



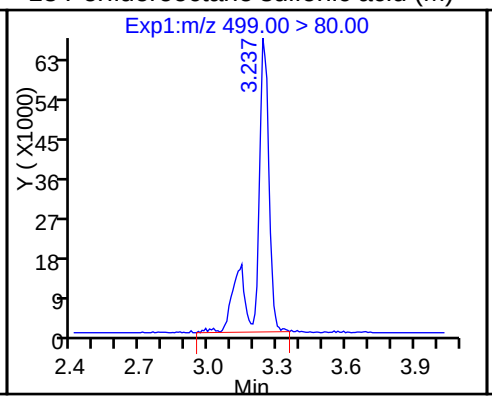
D 14 13C4 PFOA



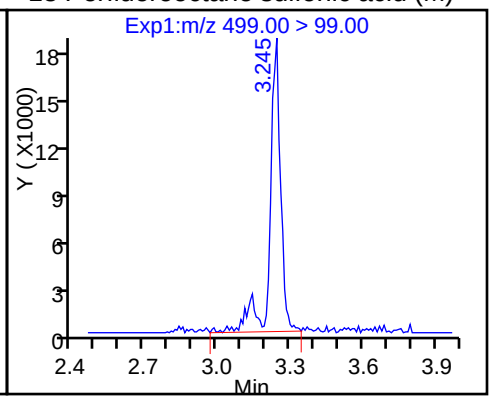
13 Perfluoroheptanesulfonic Acid



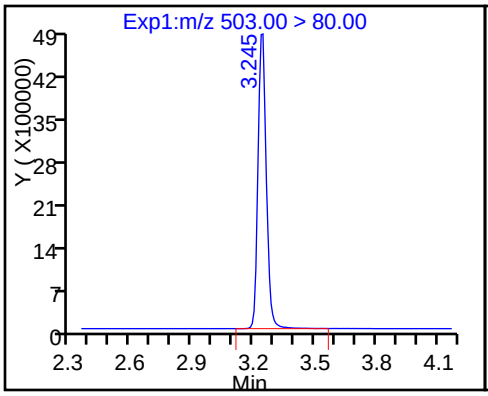
18 Perfluorooctane sulfonic acid (M)



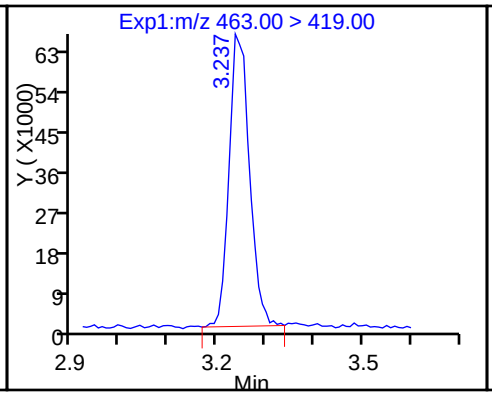
18 Perfluorooctane sulfonic acid (M)



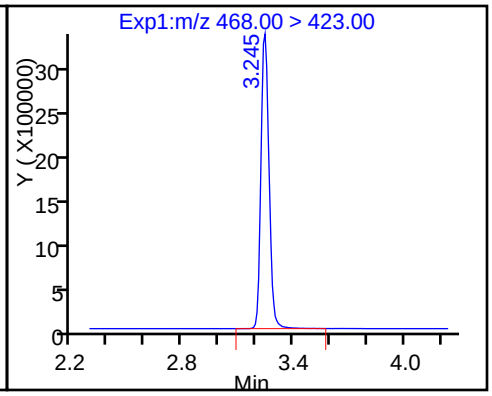
D 17 13C4 PFOS



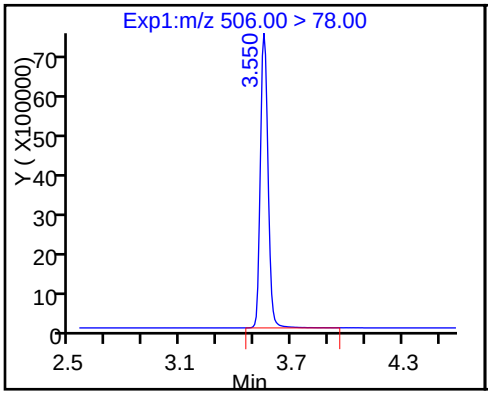
20 Perfluorononanoic acid



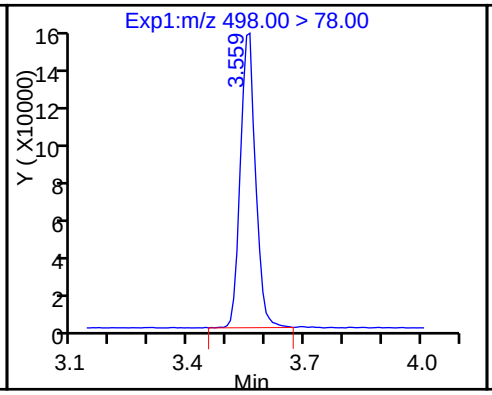
D 19 13C5 PFNA



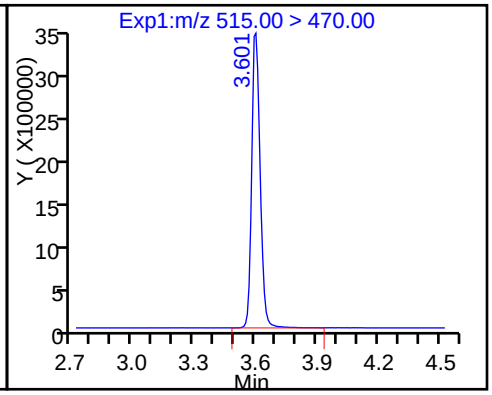
D 21 13C8 FOSA



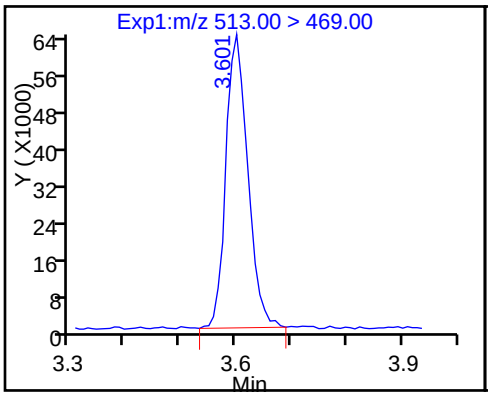
22 Perfluorooctane Sulfonamide



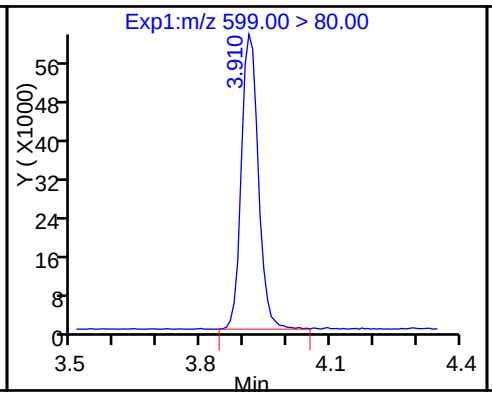
D 23 13C2 PFDA



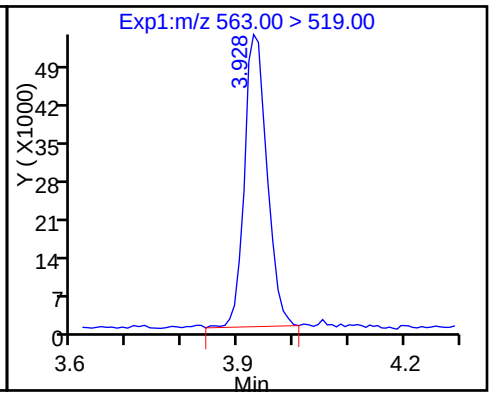
24 Perfluorodecanoic acid



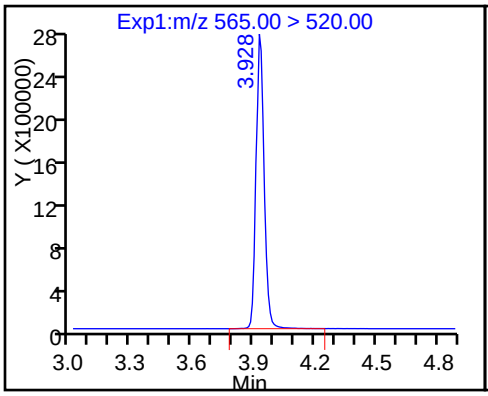
26 Perfluorodecane Sulfonic acid



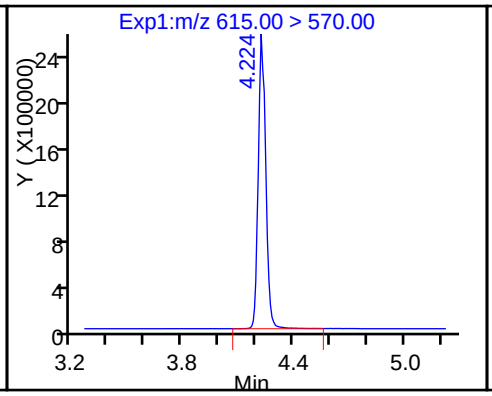
28 Perfluoroundecanoic acid



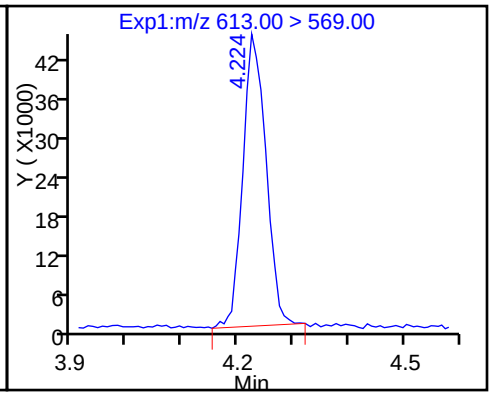
D 27 13C2 PFUnA



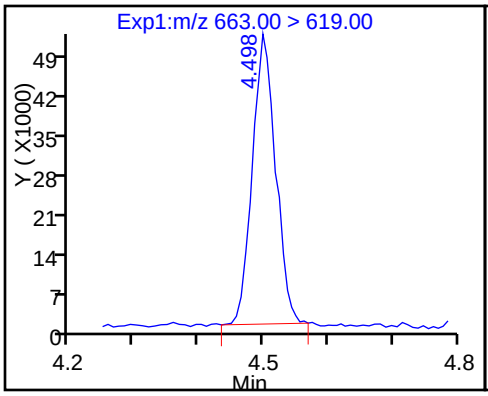
D 30 13C2 PFDoA



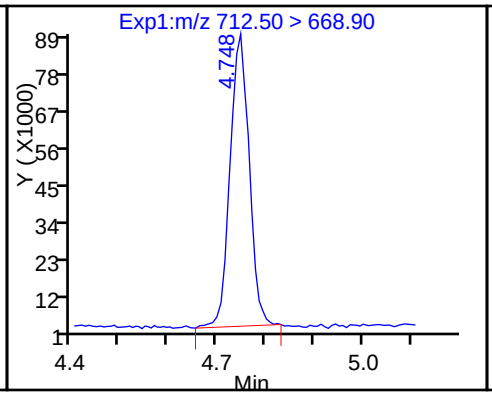
29 Perfluorododecanoic acid



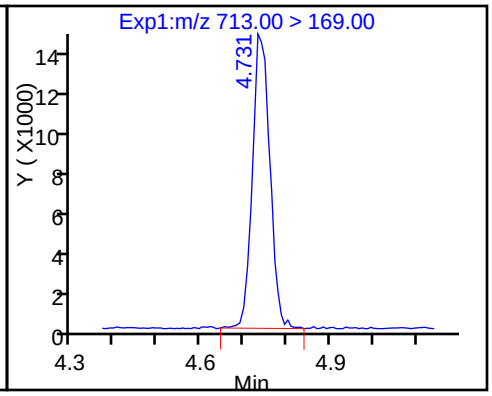
31 Perfluorotridecanoic acid



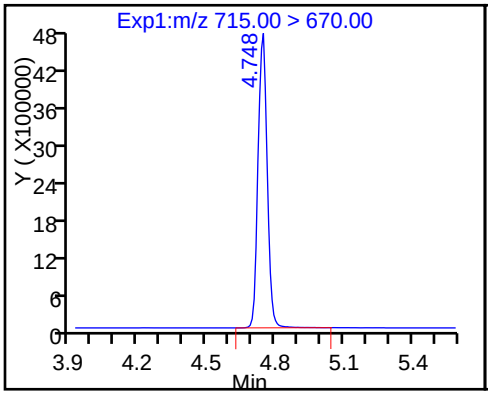
33 Perfluorotetradecanoic acid



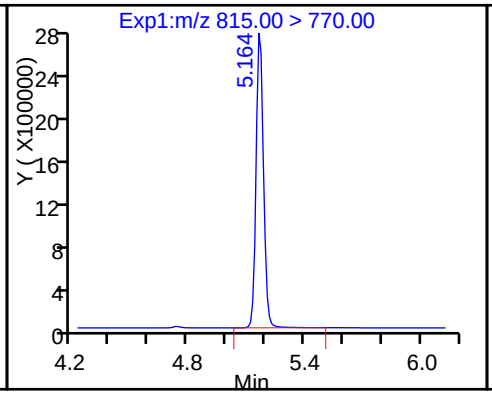
33 Perfluorotetradecanoic acid



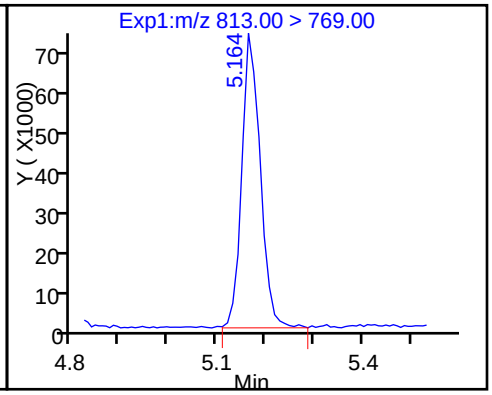
D 32 13C2-PFTeDA



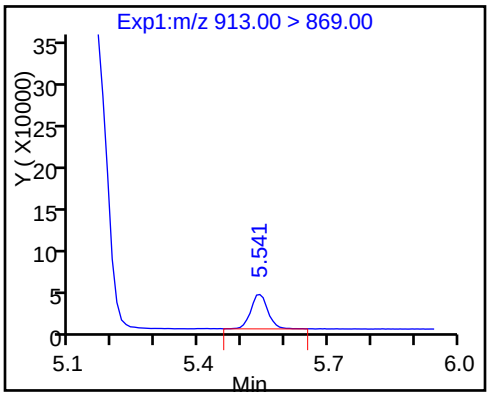
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

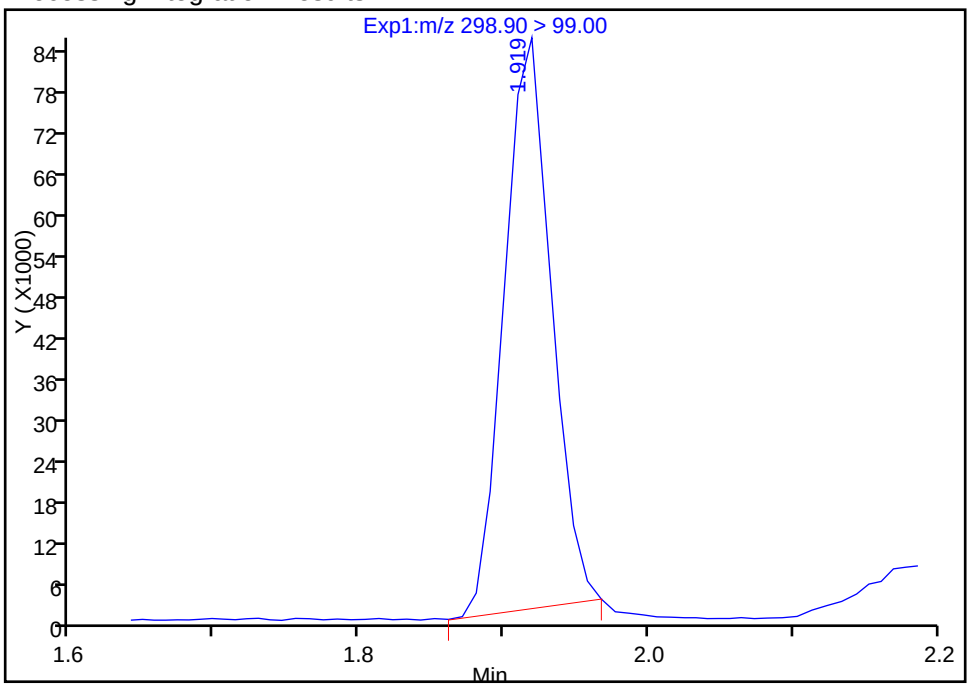
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_005.d				
Injection Date:	09-Jan-2017 13:38:55	Instrument ID:	A8_N		
Lims ID:	IC L2				
Client ID:					
Operator ID:	A8-PC\A8	ALS Bottle#:	38	Worklist Smp#:	5
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 2

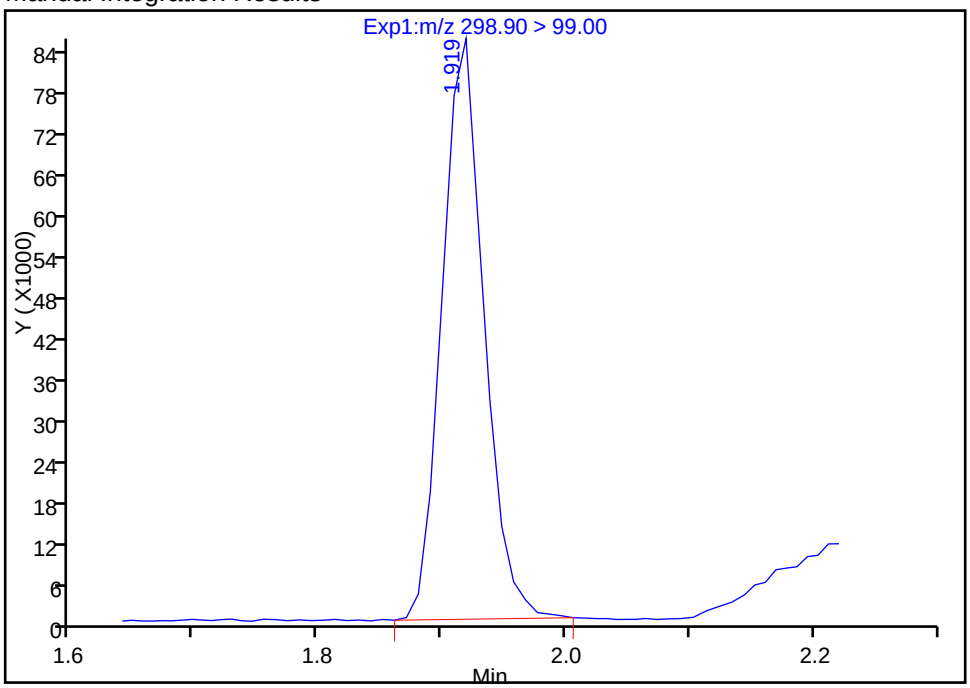
Processing Integration Results

RT: 1.92
Area: 190207
Amount: 0.877620
Amount Units: ng/ml



Manual Integration Results

RT: 1.92
Area: 200260
Amount: 0.877620
Amount Units: ng/ml



Reviewer: chandrasenas, 09-Jan-2017 14:58:35

Audit Action: Manually Integrated Audit Reason: Incomplete Integration

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

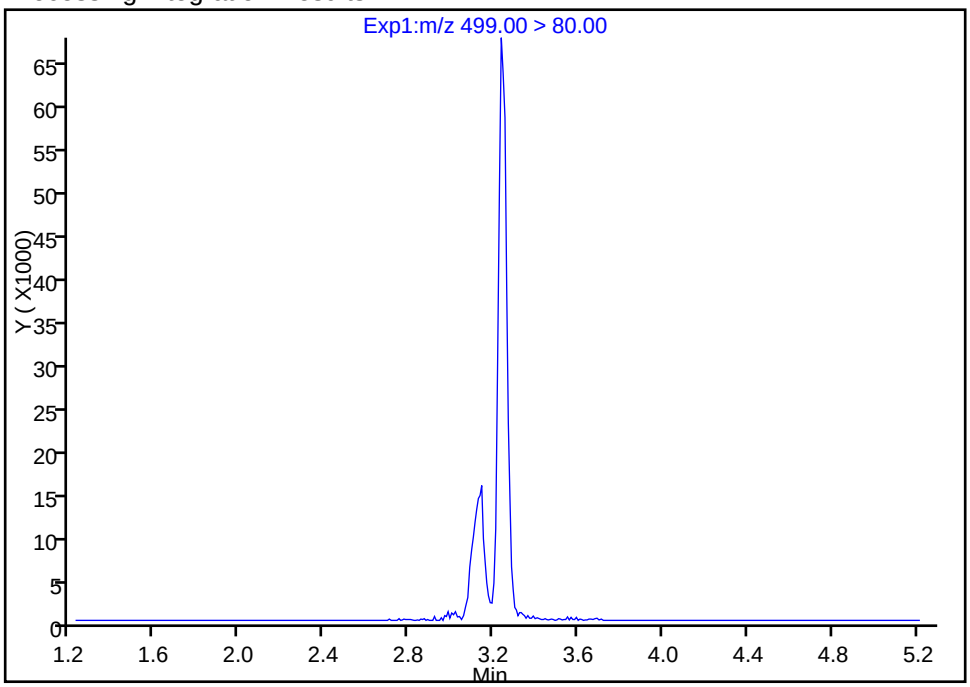
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_005.d				
Injection Date:	09-Jan-2017 13:38:55	Instrument ID:	A8_N		
Lims ID:	IC L2				
Client ID:					
Operator ID:	A8-PC\A8	ALS Bottle#:	38	Worklist Smp#:	5
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

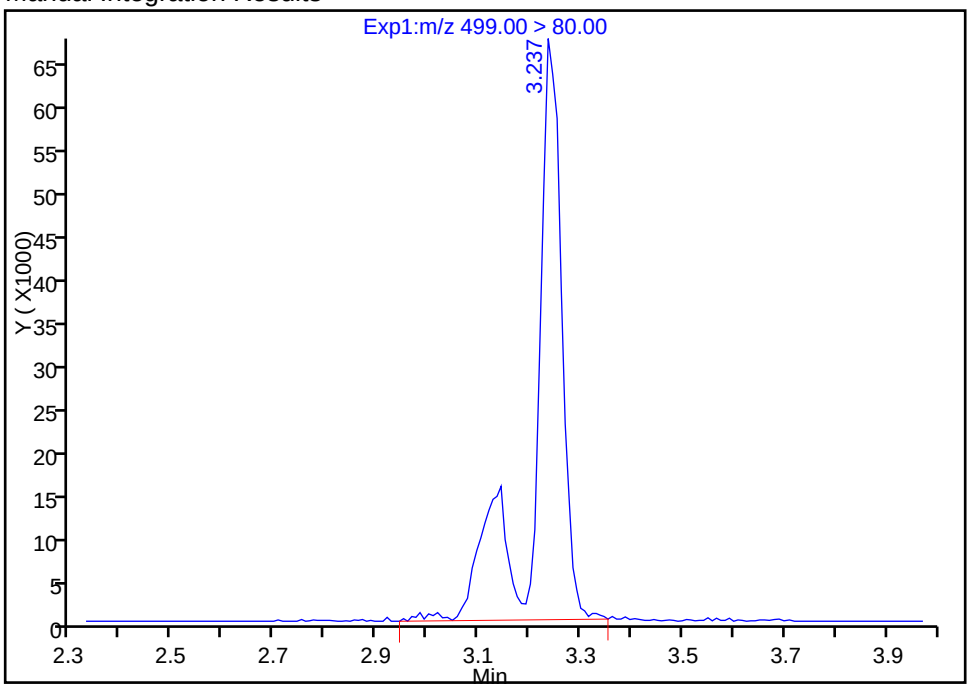
Processing Integration Results

Not Detected
Expected RT: 3.22



Manual Integration Results

RT: 3.24
Area: 252630
Amount: 0.868033
Amount Units: ng/ml



Reviewer: chandrasenas, 09-Jan-2017 14:58:35
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

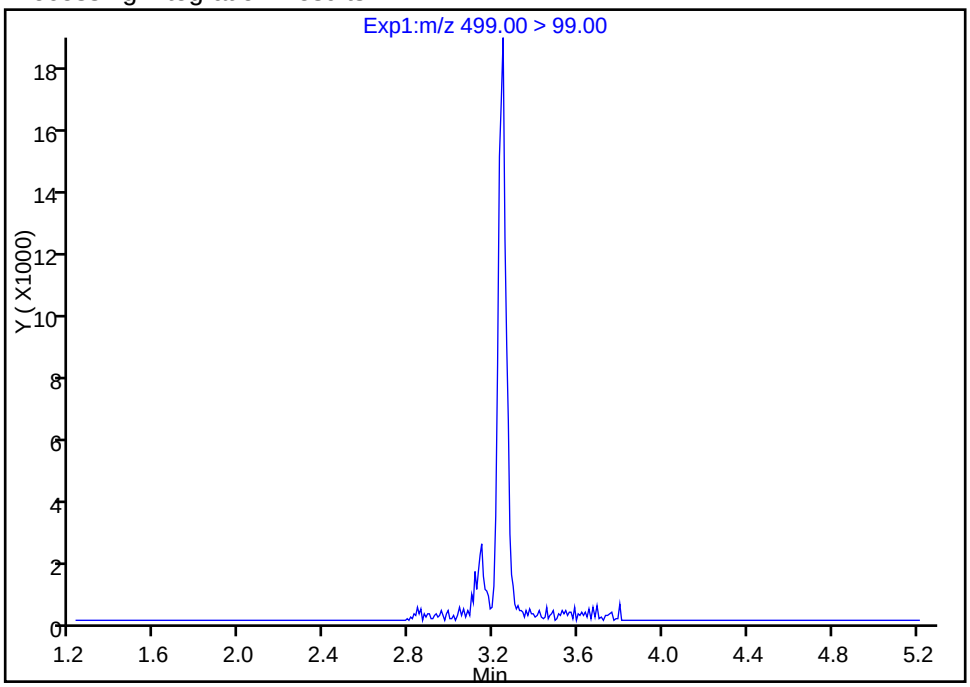
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_005.d				
Injection Date:	09-Jan-2017 13:38:55	Instrument ID:	A8_N		
Lims ID:	IC L2				
Client ID:					
Operator ID:	A8-PC\A8	ALS Bottle#:	38	Worklist Smp#:	5
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

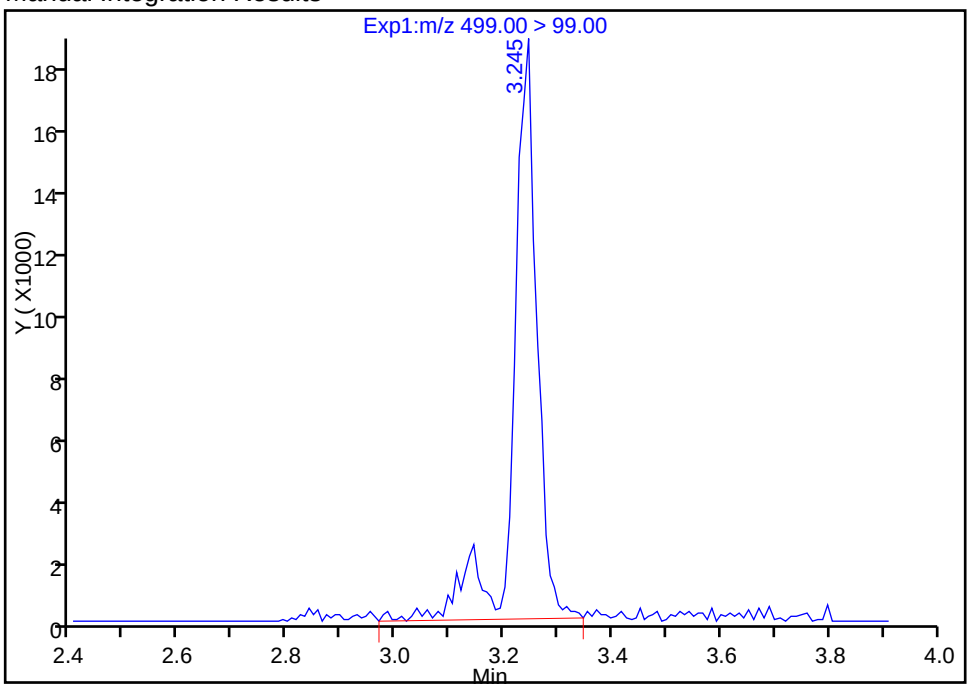
Processing Integration Results

Not Detected
Expected RT: 3.22



Manual Integration Results

RT: 3.25
Area: 56605
Amount: 0.868033
Amount Units: ng/ml



Reviewer: chandrasenas, 09-Jan-2017 14:58:35
Audit Action: Manually Integrated Audit Reason: Assign Peak

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_006.d
Lims ID: IC L3
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 09-Jan-2017 13:46:25 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*sub11

Method: \\ChromNa\Sacramento\ChromData\A8_N\20170109-38635.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 09-Jan-2017 15:59:04 Calib Date: 09-Jan-2017 15:16:24
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: chandrasenas Date: 09-Jan-2017 14:58:56

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	1.590	1.598	-0.008		17888278	51.2		102	1361873	
1 Perfluorobutyric acid										
212.90 > 169.00	1.590	1.600	-0.010	1.000	1557377	4.99		99.7	20578	
D 4 13C5-PFPeA										
267.90 > 223.00	1.868	1.884	-0.016		14434285	52.2		104	1733663	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.868	1.885	-0.017	1.000	1389061	4.89		97.9	16505	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.906	1.924	-0.018	1.000	2342406	4.63		105		
298.90 > 99.00	1.906	1.924	-0.018	1.000	953846		2.46(0.00-0.00)	105		
D 6 13C2 PFHxA										
315.00 > 270.00	2.165	2.187	-0.022		13265155	51.5		103	1217333	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.174	2.189	-0.015	1.000	1239056	5.05		101	42364	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.514	2.530	-0.016	1.000	1179661	5.01		100	11919	
D 11 13C4-PFHpA										
367.00 > 322.00	2.514	2.530	-0.016		11938109	53.3		107	857606	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.529	2.547	-0.018	1.000	1517736	4.34		95.3		
D 10 18O2 PFHxS										
403.00 > 84.00	2.529	2.548	-0.019		15791017	48.7		103	839427	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.862	2.891	-0.029	1.000	1246605	4.75		95.0	10804	
413.00 > 169.00	2.870	2.891	-0.021	1.003	731095		1.71(0.90-1.10)	95.0	37370	
D 14 13C4 PFOA										
417.00 > 372.00	2.870	2.891	-0.021		13077201	54.0		108	741787	

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	2.878	2.898	-0.020	1.000	1383541	4.85		102		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.235	3.221	0.013	1.000	1170589	4.40		94.8	63182	
499.00 > 99.00	3.235	3.221	0.013	1.000	258610		4.53(0.90-1.10)	94.8	16954	
D 17 13C4 PFOS										
503.00 > 80.00	3.235	3.261	-0.027		12566558	48.4		101	767391	
20 Perfluorononanoic acid										
463.00 > 419.00	3.243	3.261	-0.018	1.000	916884	4.90		98.1	23244	
D 19 13C5 PFNA										
468.00 > 423.00	3.235	3.263	-0.029		9814583	53.5		107	460024	
D 21 13C8 FOSA										
506.00 > 78.00	3.540	3.570	-0.030		21009814	51.3		103	453219	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.548	3.574	-0.026	1.000	2106204	5.35		107	151728	
D 23 13C2 PFDA										
515.00 > 470.00	3.598	3.621	-0.023		9143859	50.8		102	356842	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.598	3.621	-0.023	1.000	849782	5.00		99.9	33524	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.908	3.929	-0.021	1.000	771350	4.60		95.5		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.925	3.951	-0.026	1.000	632525	4.44		88.8	22913	
D 27 13C2 PFUnA										
565.00 > 520.00	3.925	3.953	-0.028		7270413	53.5		107	253628	
D 30 13C2 PFDoA										
615.00 > 570.00	4.220	4.245	-0.025		6878867	52.9		106	217902	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.220	4.247	-0.027	1.000	620927	4.88		97.6	14394	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.494	4.516	-0.022	1.000	578415	4.72		94.3	6497	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.734	4.758	-0.024	1.000	1056859	4.68		93.6	428	
713.00 > 169.00	4.734	4.758	-0.024	1.000	164109		6.44(0.00-0.00)	93.6	29067	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.734	4.758	-0.024		12103726	50.0		99.9	590379	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.155	5.179	-0.024		6551893	49.0		98.1	90227	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.166	5.180	-0.014	1.000	590121	4.10		81.9	399	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.533	5.554	-0.021	1.000	510722	4.64		92.8	450	

Reagents:

LCPFC-L3_00020 Amount Added: 1.00 Units: mL

Report Date: 09-Jan-2017 15:59:05 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_006.d

Injection Date: 09-Jan-2017 13:46:25 Instrument ID: A8_N

Lims ID: IC L3

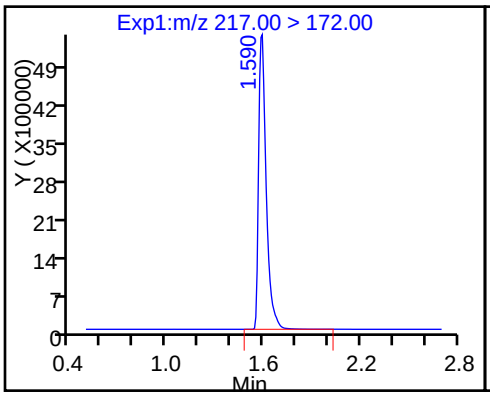
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 39 Worklist Smp#: 6

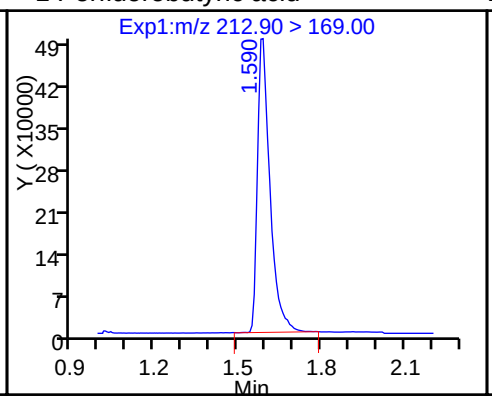
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

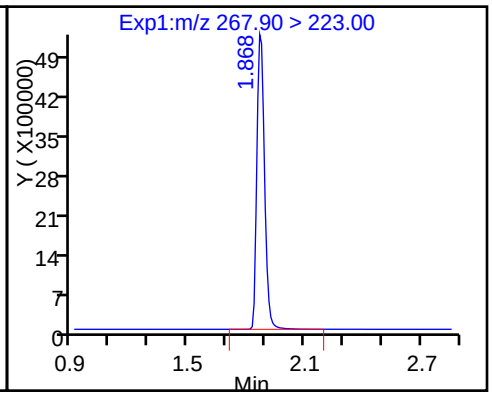
D 2 13C4 PFBA



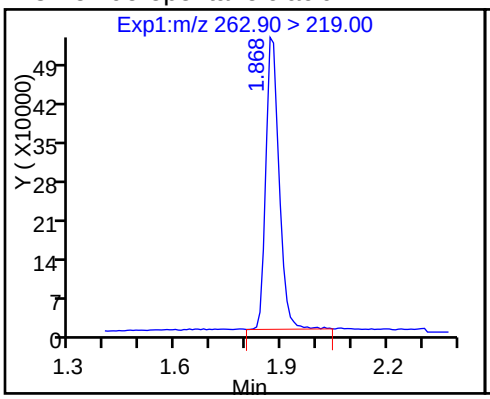
1 Perfluorobutyric acid



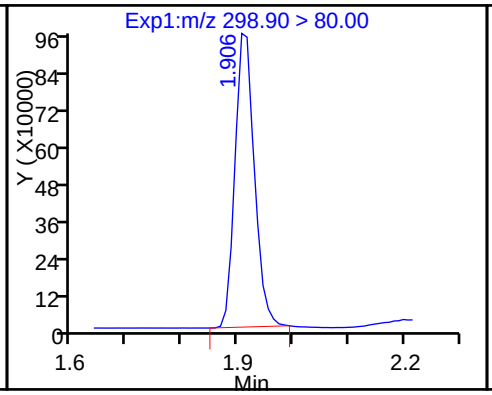
D 4 13C5-PFPeA



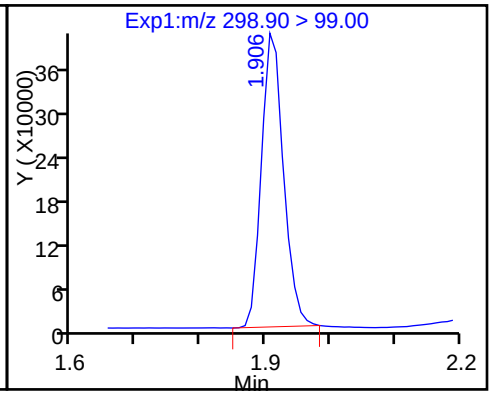
3 Perfluoropentanoic acid



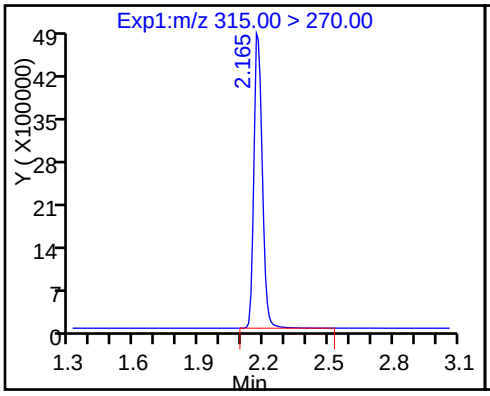
5 Perfluorobutanesulfonic acid



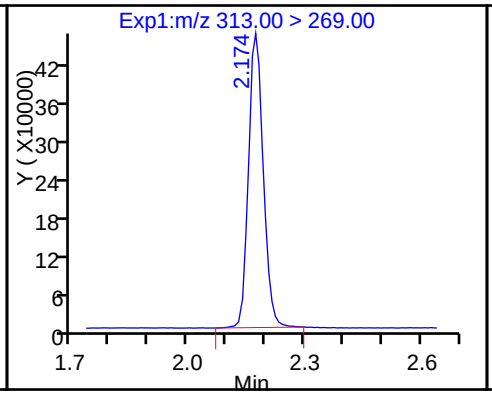
5 Perfluorobutanesulfonic acid



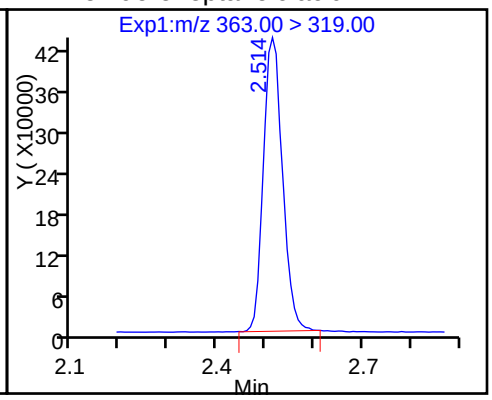
D 6 13C2 PFHxA



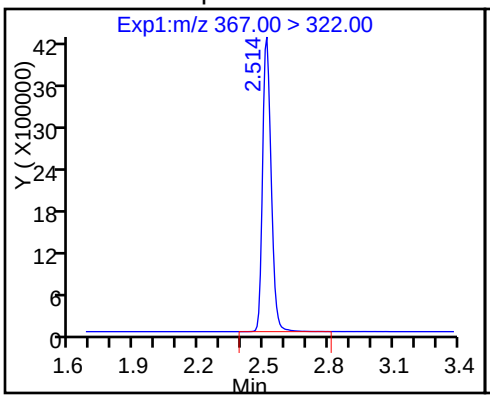
7 Perfluorohexanoic acid



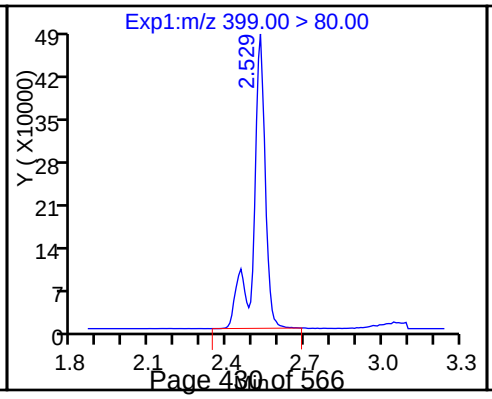
12 Perfluoroheptanoic acid



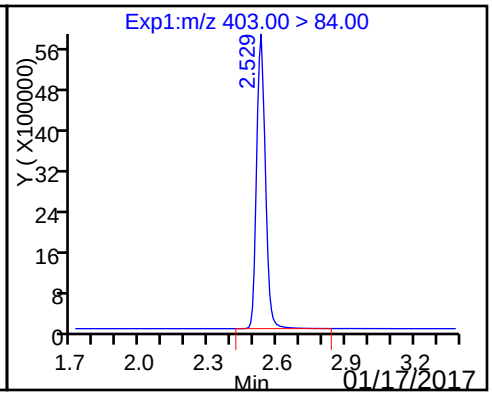
D 11 13C4-PFHpA



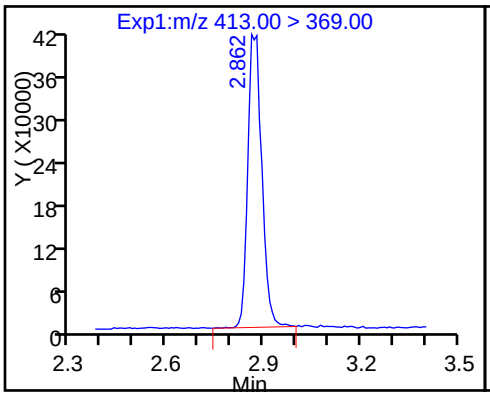
9 Perfluorohexanesulfonic acid



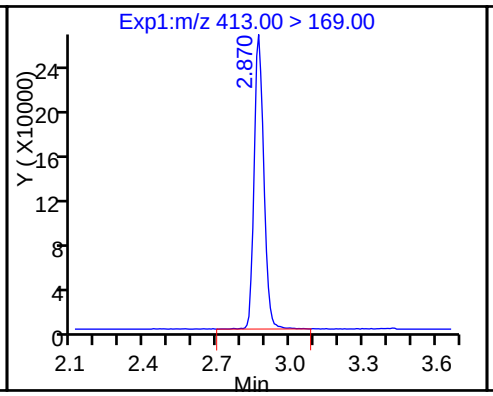
D 10 18O2 PFHxS



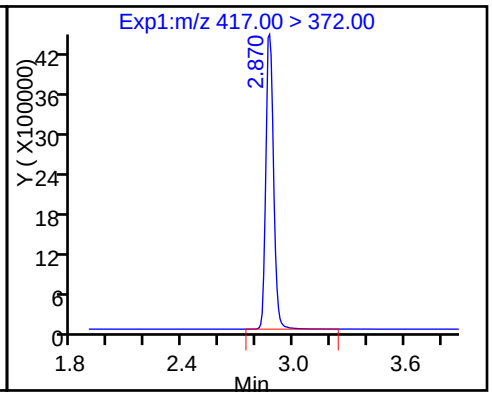
15 Perfluorooctanoic acid



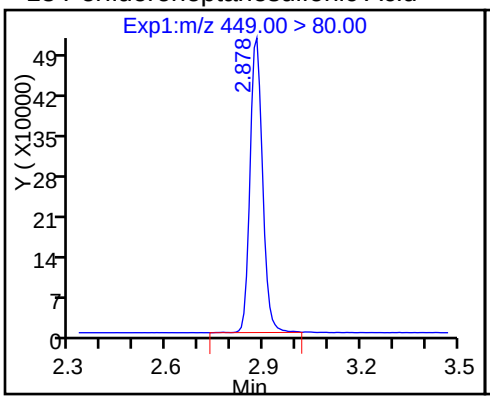
15 Perfluorooctanoic acid



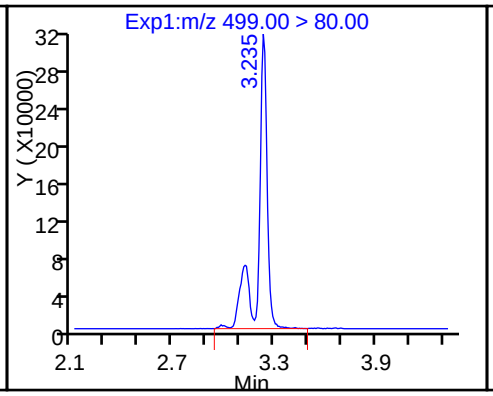
D 14 13C4 PFOA



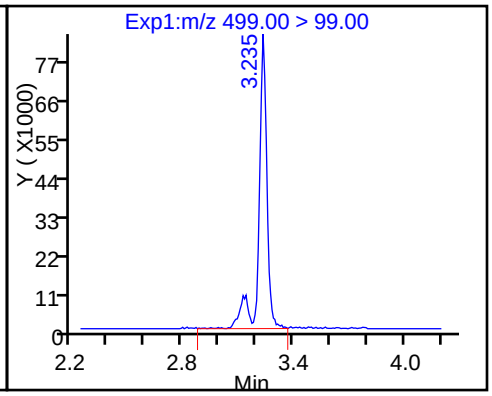
13 Perfluoroheptanesulfonic Acid



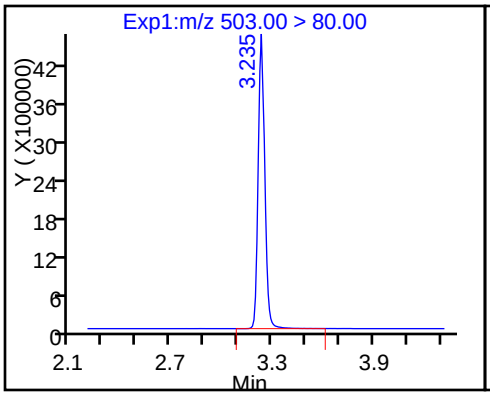
18 Perfluorooctane sulfonic acid



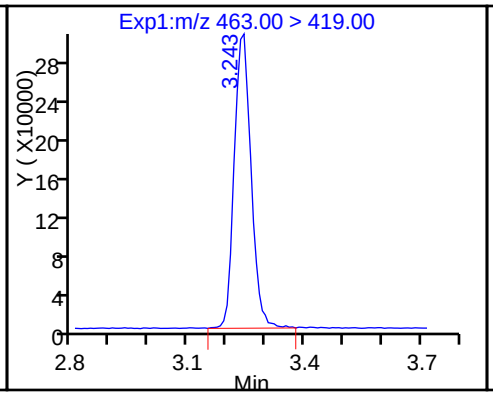
18 Perfluorooctane sulfonic acid



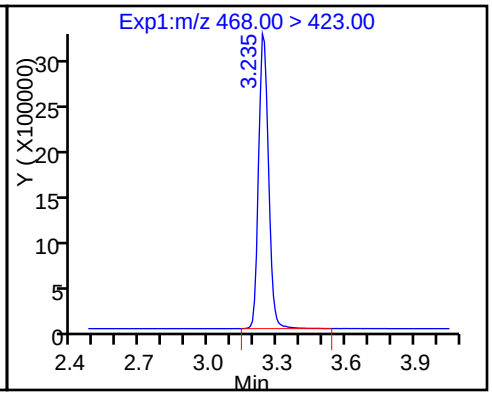
D 17 13C4 PFOS



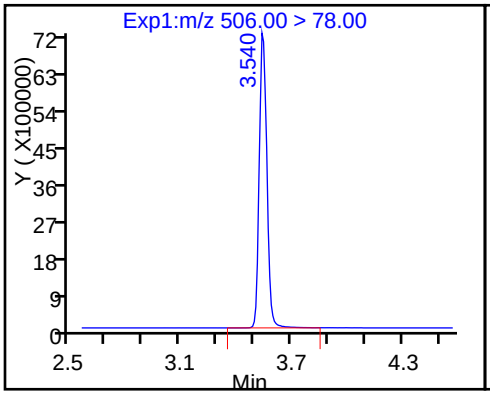
20 Perfluorononanoic acid



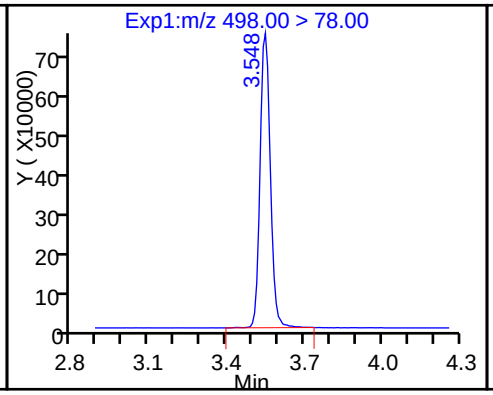
D 19 13C5 PFNA



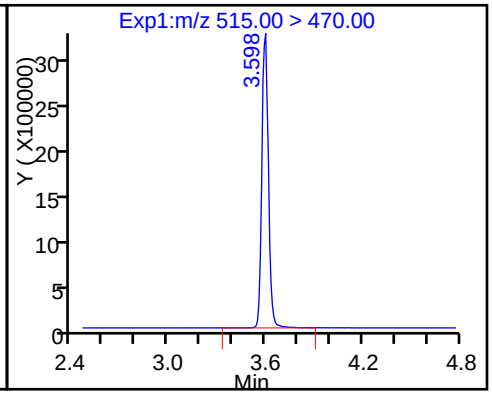
D 21 13C8 FOSA



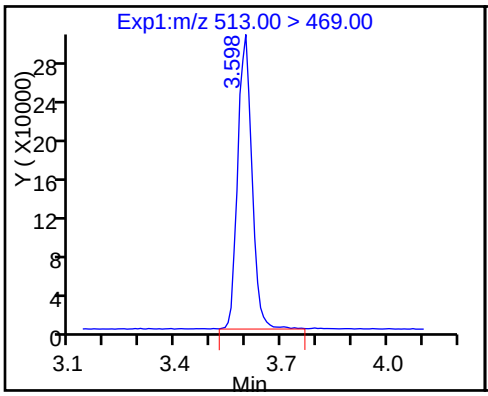
22 Perfluorooctane Sulfonamide



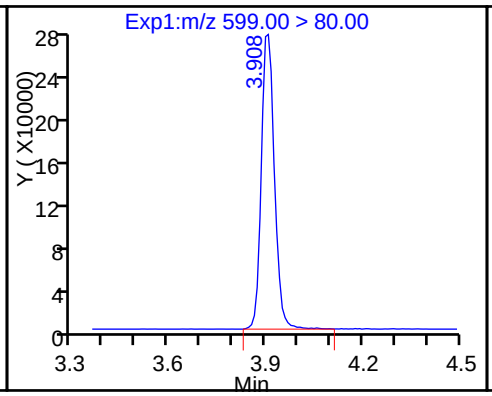
D 23 13C2 PFDA



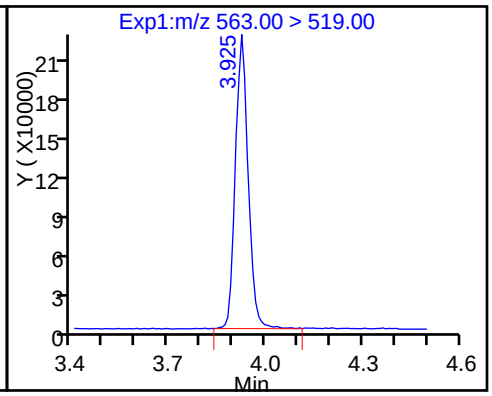
24 Perfluorodecanoic acid



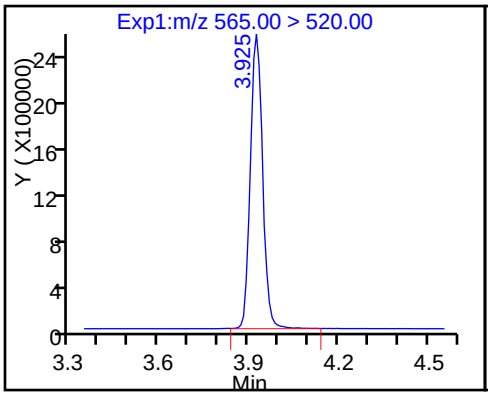
26 Perfluorodecane Sulfonic acid



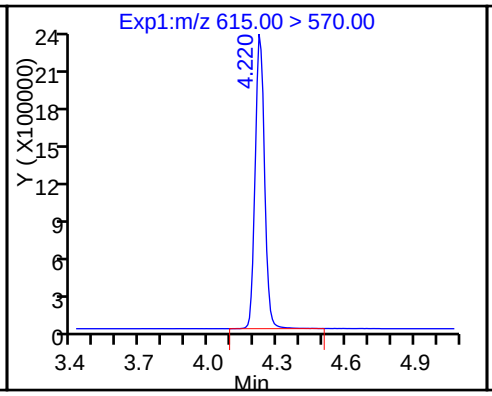
28 Perfluoroundecanoic acid



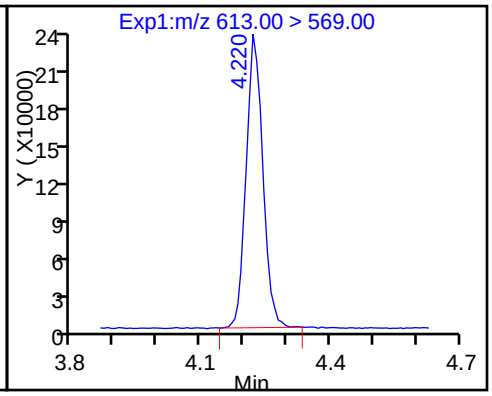
D 27 13C2 PFUnA



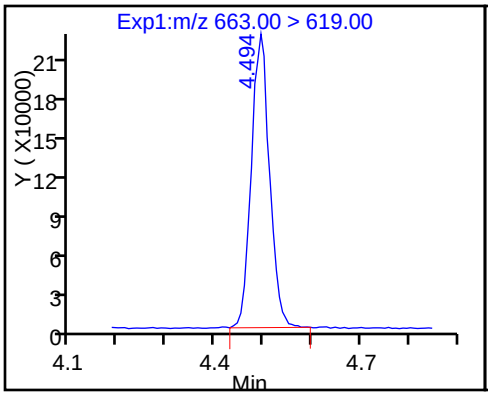
D 30 13C2 PFDoA



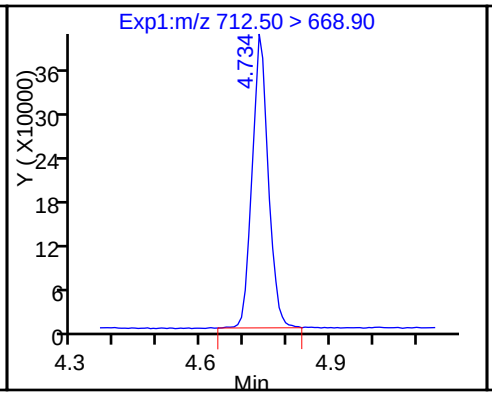
29 Perfluorododecanoic acid



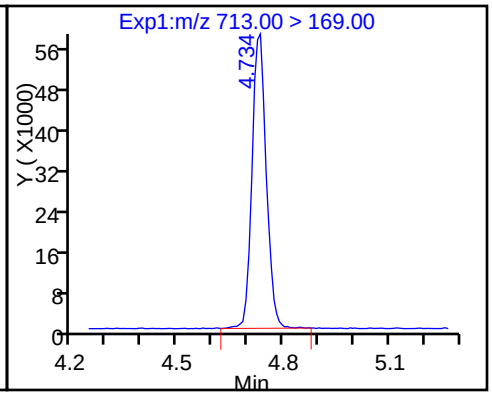
31 Perfluorotridecanoic acid



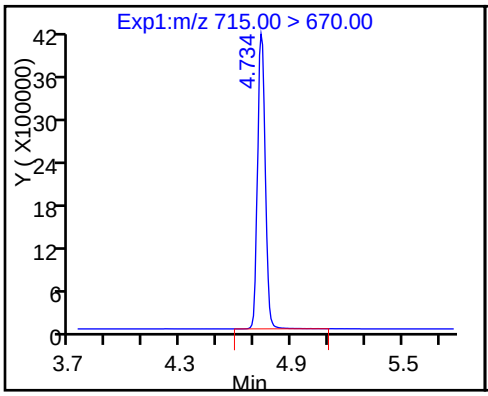
33 Perfluorotetradecanoic acid



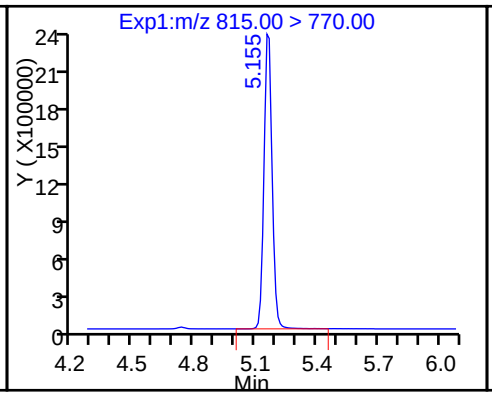
33 Perfluorotetradecanoic acid



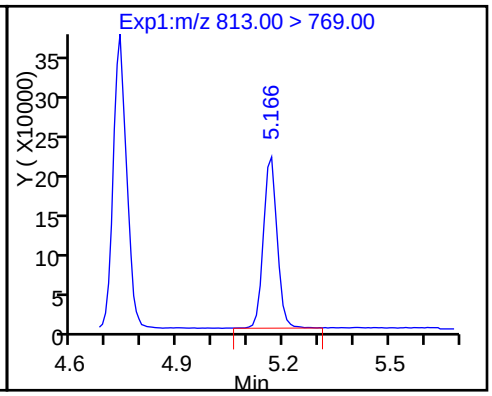
D 32 13C2-PFTeDA



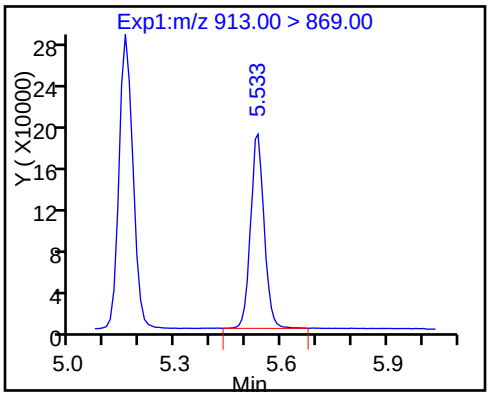
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_007.d
Lims ID: IC L4
Client ID:
Sample Type: IC Calib Level: 4
Inject. Date: 09-Jan-2017 13:53:55 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*sub11

Method: \\ChromNa\Sacramento\ChromData\A8_N\20170109-38635.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 09-Jan-2017 15:59:07 Calib Date: 09-Jan-2017 15:16:24
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: chandrasenas Date: 09-Jan-2017 14:54:28

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	1.590	1.598	-0.008		18359938	52.5		105	1117539	
1 Perfluorobutyric acid										
212.90 > 169.00	1.590	1.600	-0.010	1.000	7036524	21.9		110	88709	
D 4 13C5-PFPeA										
267.90 > 223.00	1.877	1.884	-0.007		14477908	52.4		105	1807575	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.877	1.885	-0.008	1.000	6163858	21.6		108	56716	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.916	1.924	-0.008	1.000	10657228	20.6		116		
298.90 > 99.00	1.916	1.924	-0.008	1.000	4415388		2.41(0.00-0.00)	116		
D 6 13C2 PFHxA										
315.00 > 270.00	2.190	2.187	0.003		13573169	52.7		105	1596087	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.190	2.189	0.001	1.000	5205130	20.7		104	200182	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.538	2.530	0.008	1.000	4764388	20.5		103	59393	
D 11 13C4-PFHpA										
367.00 > 322.00	2.538	2.530	0.008		11782960	52.6		105	1007020	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.553	2.547	0.006	1.000	6764901	18.9		104		
D 10 18O2 PFHxS										
403.00 > 84.00	2.553	2.548	0.005		16191475	49.9		106	1877937	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.904	2.891	0.013	1.000	5524420	21.2		106	52381	
413.00 > 169.00	2.904	2.891	0.013	1.000	3198199		1.73(0.90-1.10)	106	179428	
D 14 13C4 PFOA										
417.00 > 372.00	2.912	2.891	0.021		13008273	53.8		108	860545	

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	2.912	2.898	0.014	1.000	6310704	21.2		111		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.168	3.221	-0.053	1.000	5335568	19.2		103	53237	
499.00 > 99.00	3.286	3.221	0.065	1.037	1178986		4.53(0.90-1.10)	103	87255	
D 17 13C4 PFOS										
503.00 > 80.00	3.286	3.261	0.025		13131755	50.6		106	364964	
20 Perfluorononanoic acid										
463.00 > 419.00	3.286	3.261	0.025	1.000	3868179	20.9		105	76566	
D 19 13C5 PFNA										
468.00 > 423.00	3.278	3.263	0.015		9708212	52.9		106	671347	
D 21 13C8 FOSA										
506.00 > 78.00	3.593	3.570	0.023		21172948	51.7		103	543263	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.602	3.574	0.028	1.000	8568333	21.6		108	270472	
D 23 13C2 PFDA										
515.00 > 470.00	3.644	3.621	0.023		9830069	54.6		109	235455	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.653	3.621	0.032	1.000	3777687	20.7		103	111129	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.956	3.929	0.027	1.000	3542226	20.2		105		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.984	3.951	0.033	1.000	2867030	20.2		101	77916	
D 27 13C2 PFUnA										
565.00 > 520.00	3.975	3.953	0.022		7257815	53.4		107	263604	
D 30 13C2 PFDoA										
615.00 > 570.00	4.275	4.245	0.030		6596653	50.7		101	178146	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.275	4.247	0.028	1.000	2545344	20.9		104	27211	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.543	4.516	0.027	1.000	2501933	21.3		106	2538	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.780	4.758	0.022	1.000	4339153	20.0		100	1565	
713.00 > 169.00	4.780	4.758	0.022	1.000	670987		6.47(0.00-0.00)	100	47101	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.780	4.758	0.022		12374174	51.1		102	427747	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.199	5.179	0.020		6738129	50.4		101	80707	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.199	5.180	0.019	1.000	2417937	19.0		94.9	1755	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.582	5.554	0.028	1.000	2170055	20.6		103	1707	

Reagents:

LCPFC-L4_00024 Amount Added: 1.00 Units: mL

Report Date: 09-Jan-2017 15:59:07 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_007.d

Injection Date: 09-Jan-2017 13:53:55 Instrument ID: A8_N

Lims ID: IC L4

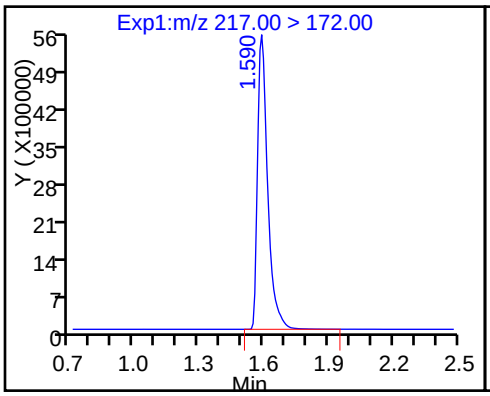
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 40 Worklist Smp#: 7

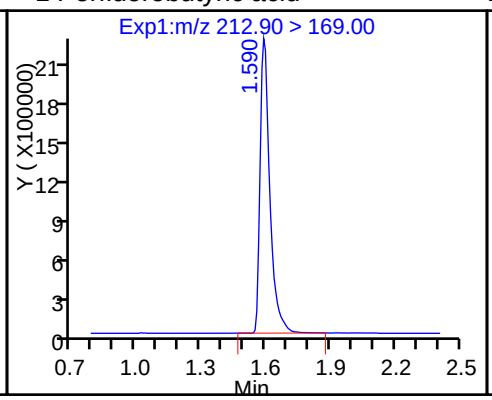
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

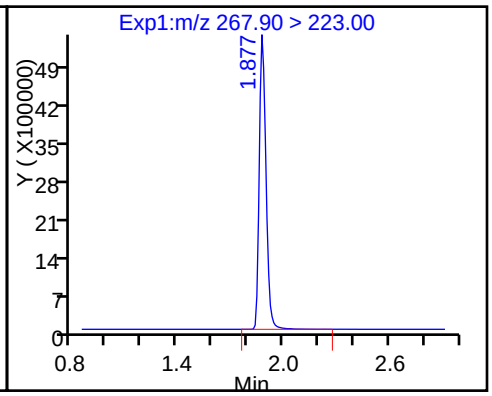
D 2 13C4 PFBA



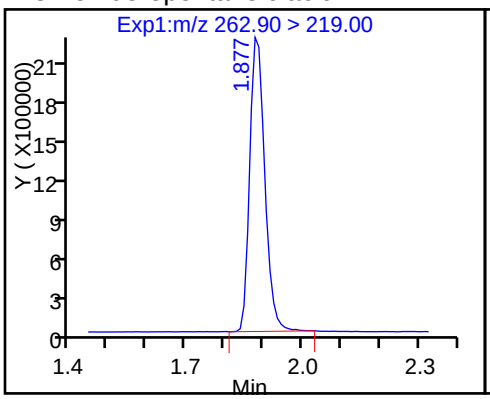
1 Perfluorobutyric acid



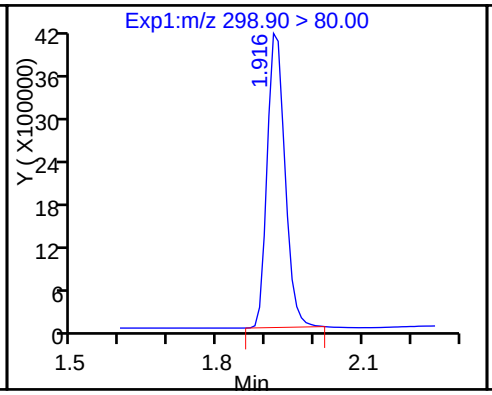
D 4 13C5-PFPeA



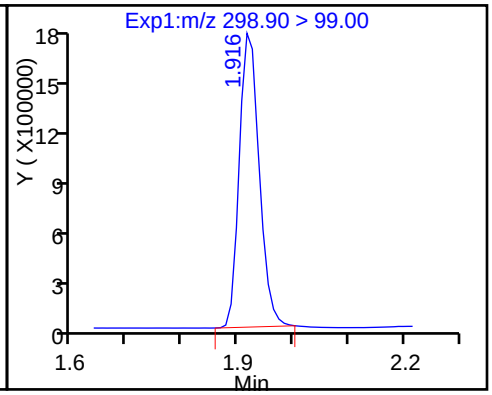
3 Perfluoropentanoic acid



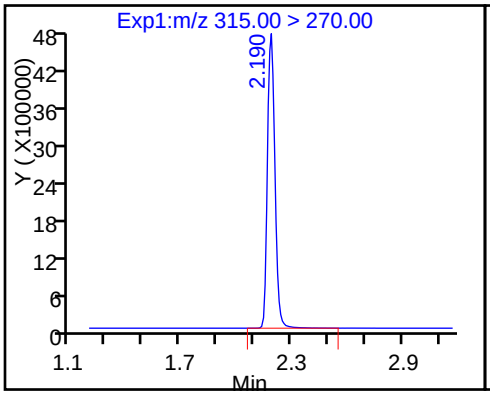
5 Perfluorobutanesulfonic acid



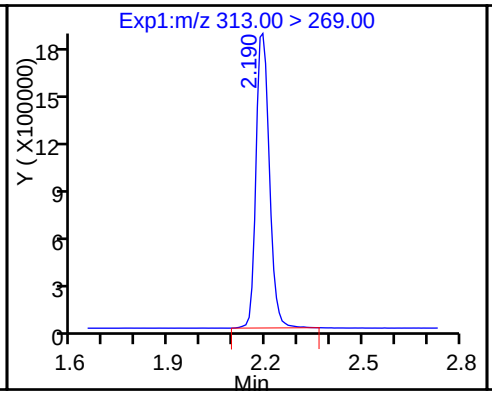
5 Perfluorobutanesulfonic acid



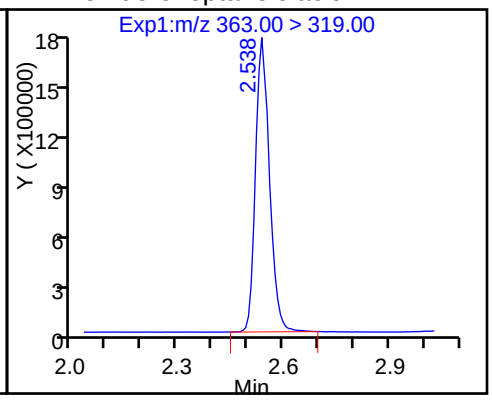
D 6 13C2 PFHxA



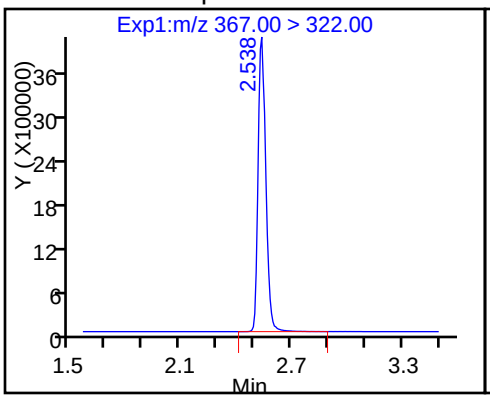
7 Perfluorohexanoic acid



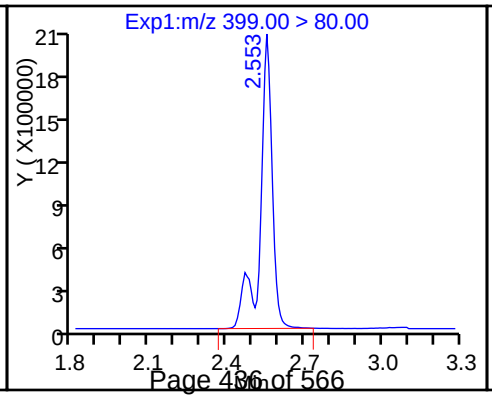
12 Perfluoroheptanoic acid



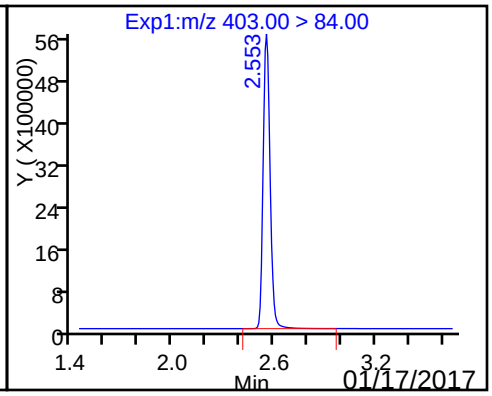
D 11 13C4-PFHpA



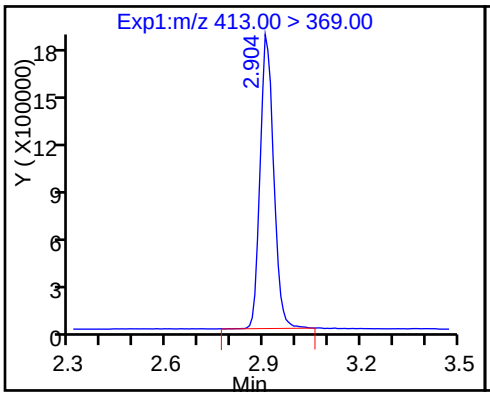
9 Perfluorohexanesulfonic acid



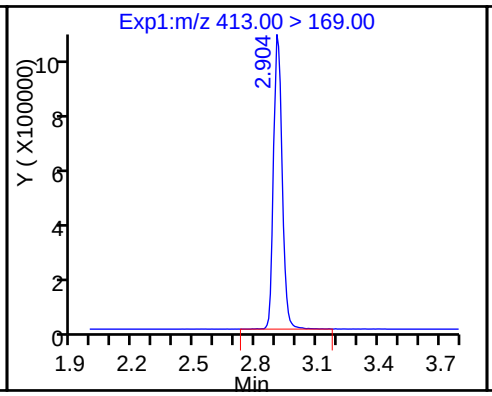
D 10 18O2 PFHxS



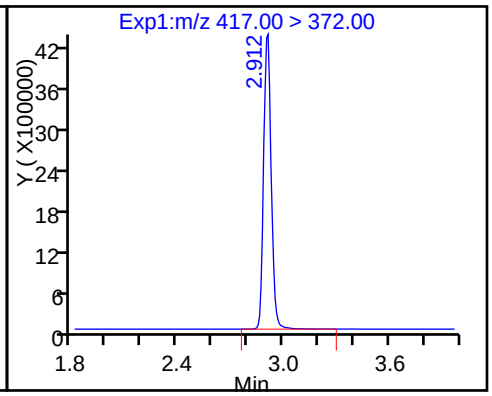
15 Perfluorooctanoic acid



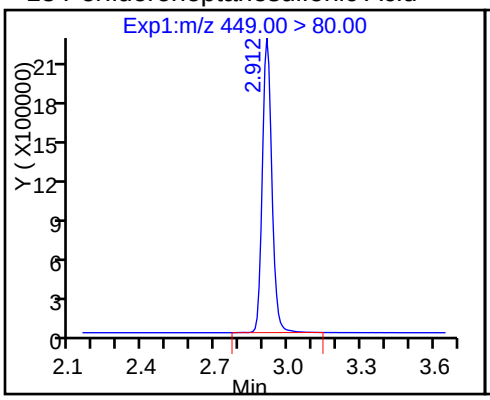
15 Perfluorooctanoic acid



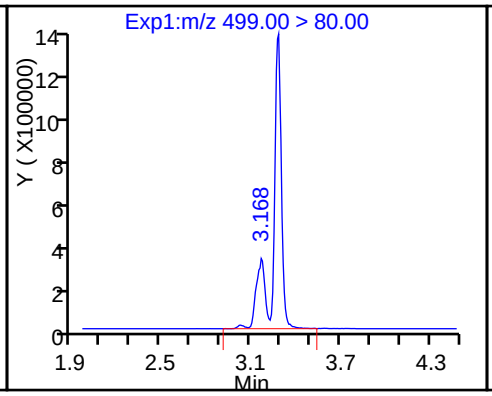
D 14 13C4 PFOA



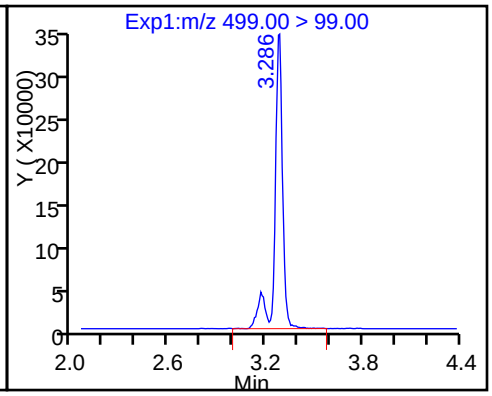
13 Perfluoroheptanesulfonic Acid



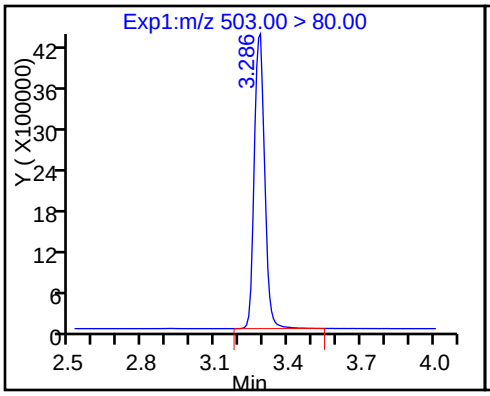
18 Perfluorooctane sulfonic acid



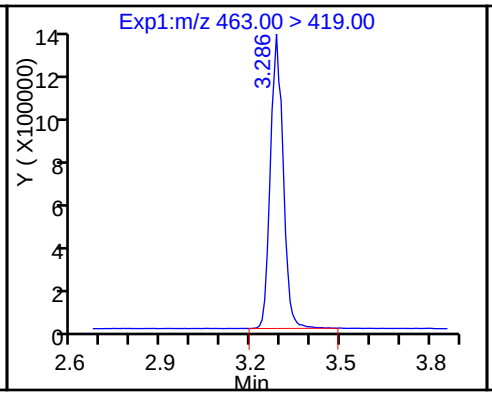
18 Perfluorooctane sulfonic acid



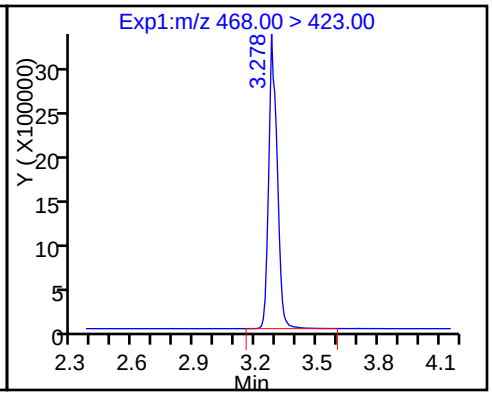
D 17 13C4 PFOS



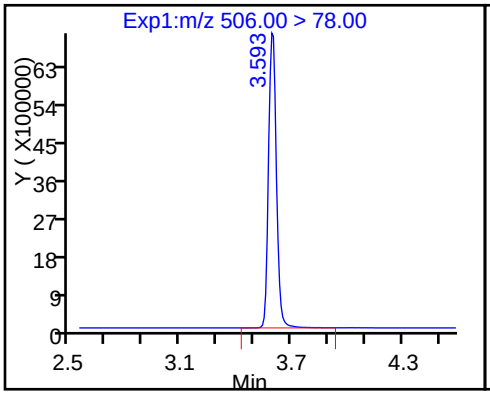
20 Perfluorononanoic acid



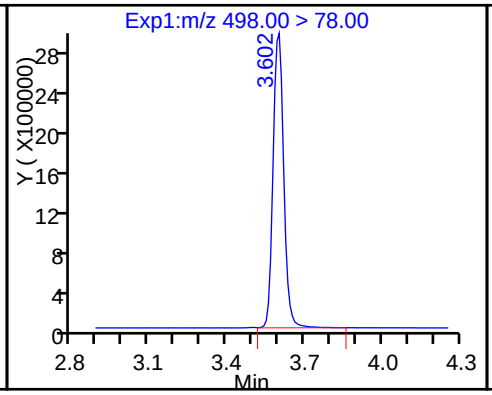
D 19 13C5 PFNA



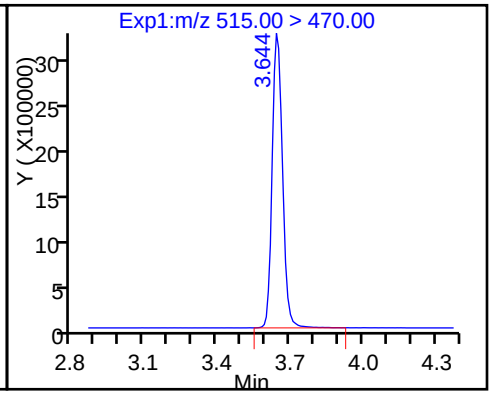
D 21 13C8 FOSA



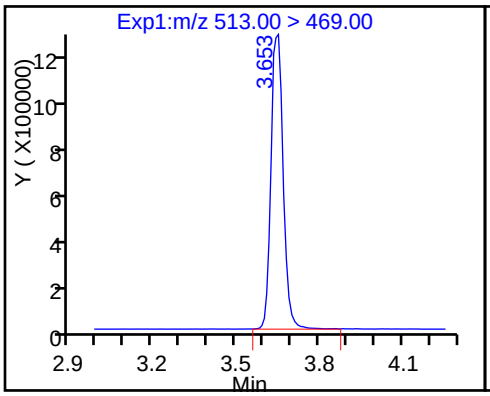
22 Perfluorooctane Sulfonamide



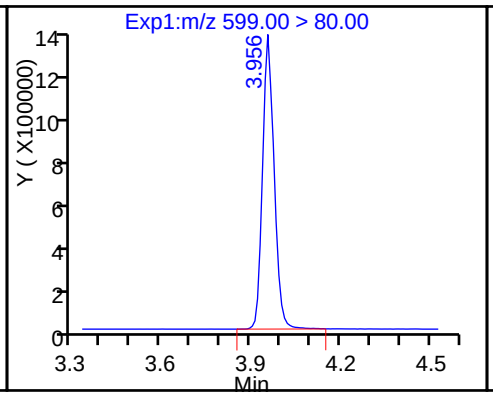
D 23 13C2 PFDA



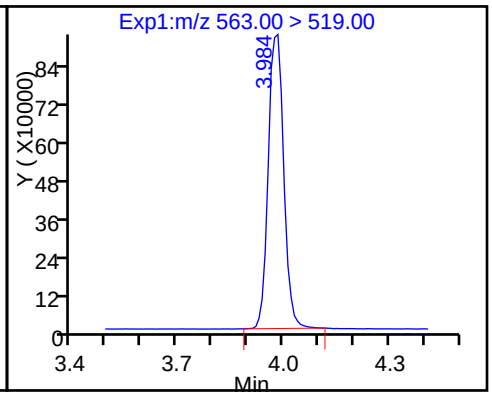
24 Perfluorodecanoic acid



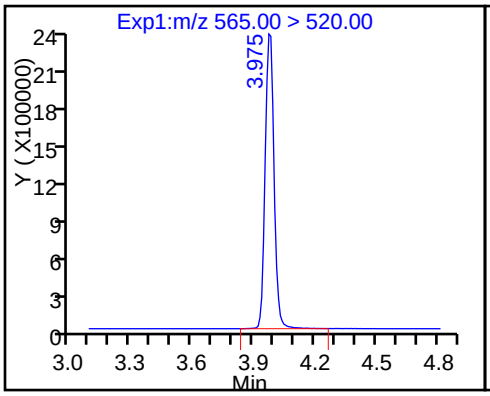
26 Perfluorodecane Sulfonic acid



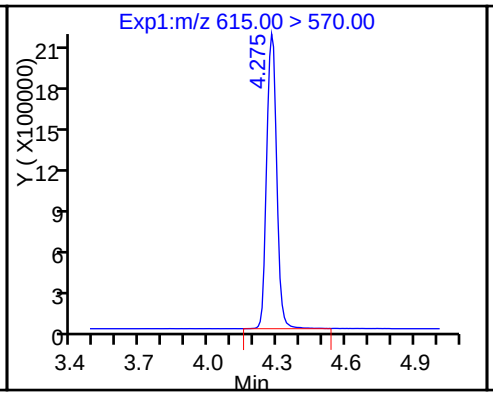
28 Perfluoroundecanoic acid



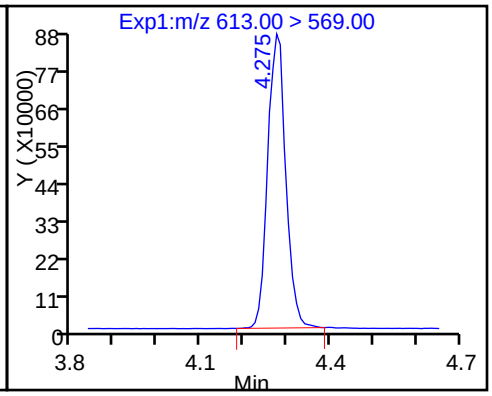
D 27 13C2 PFUnA



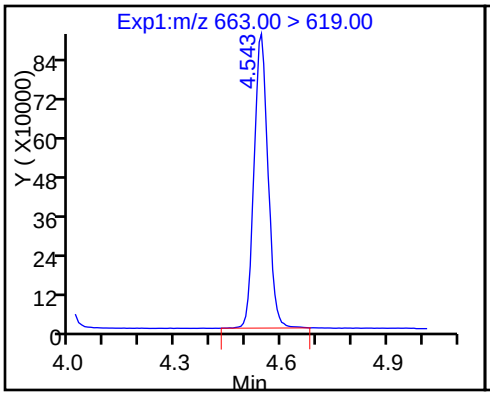
D 30 13C2 PFDoA



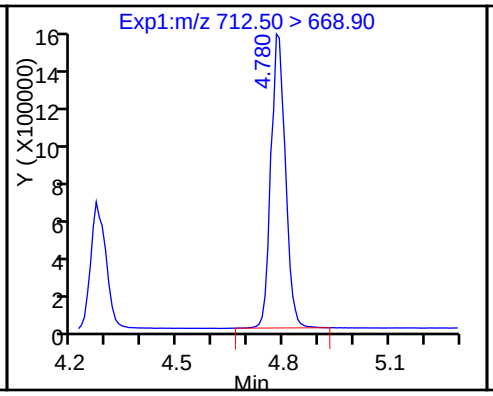
29 Perfluorododecanoic acid



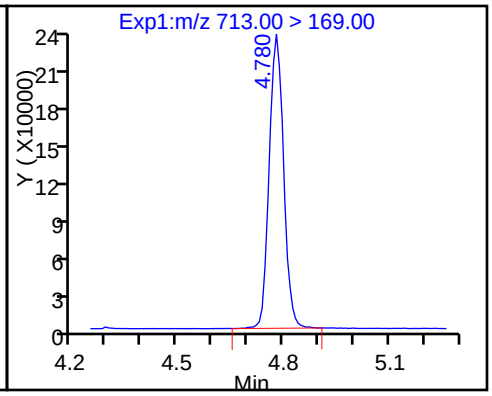
31 Perfluorotridecanoic acid



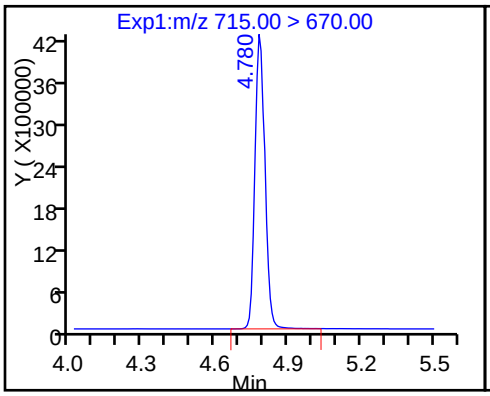
33 Perfluorotetradecanoic acid



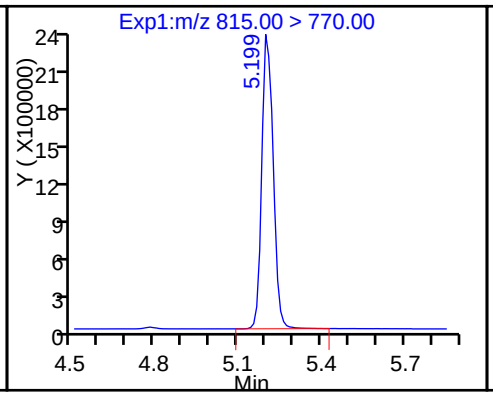
33 Perfluorotetradecanoic acid



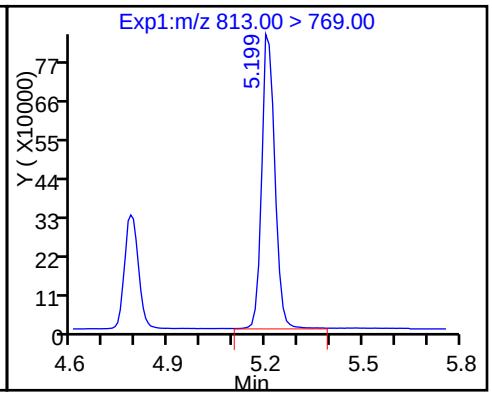
D 32 13C2-PFTeDA



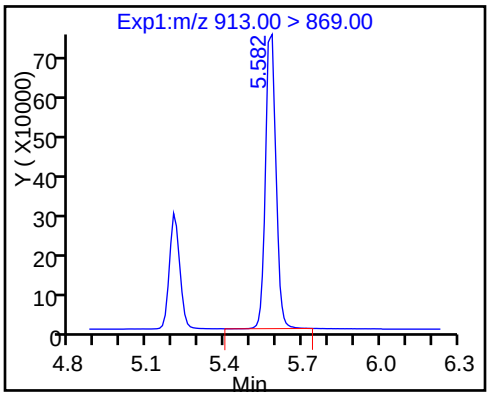
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_008.d
Lims ID: IC L5
Client ID:
Sample Type: IC Calib Level: 5
Inject. Date: 09-Jan-2017 14:01:26 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*sub11

Method: \\ChromNa\Sacramento\ChromData\A8_N\20170109-38635.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 09-Jan-2017 15:59:09 Calib Date: 09-Jan-2017 15:16:24
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: chandrasenas Date: 09-Jan-2017 14:59:35

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.609	1.598	0.011		17525932	50.2		100	856904	
1 Perfluorobutyric acid										
212.90 > 169.00	1.617	1.600	0.017	1.000	15793993	51.6		103	215368	
D 4 13C5-PFPeA										
267.90 > 223.00	1.900	1.884	0.016		13579579	49.1		98.2	1626119	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.900	1.885	0.015	1.000	13589501	50.9		102	118545	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.948	1.924	0.024	1.000	22983717	46.6		106		
298.90 > 99.00	1.939	1.924	0.014	0.995	10618123		2.16(0.00-0.00)	106		
D 6 13C2 PFHxA										
315.00 > 270.00	2.209	2.187	0.022		12925450	50.2		100	1123579	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.209	2.189	0.020	1.000	11904967	49.8		99.6	414977	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.547	2.530	0.017	1.000	10587301	49.8		99.6	98259	
D 11 13C4-PFHpA										
367.00 > 322.00	2.547	2.530	0.017		10785607	48.2		96.3	746569	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.569	2.547	0.022	1.000	15314165	44.9		98.7		
D 10 18O2 PFHxS										
403.00 > 84.00	2.569	2.548	0.021		15389703	47.4		100	5497396	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.913	2.891	0.022	1.000	11821302	50.3		101	115788	
413.00 > 169.00	2.913	2.891	0.022	1.000	6943718		1.70(0.90-1.10)	101	227141	
D 14 13C4 PFOA										
417.00 > 372.00	2.913	2.891	0.022		11710886	48.4		96.8	719974	

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	2.921	2.898	0.023	1.000	13944527	49.1		103		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.282	3.221	0.061	1.000	12667506	47.8		103	312678	
499.00 > 99.00	3.282	3.221	0.061	1.000	2735724		4.63(0.90-1.10)	103	137440	
D 17 13C4 PFOS										
503.00 > 80.00	3.282	3.261	0.021		12515576	48.2		101	246837	
20 Perfluorononanoic acid										
463.00 > 419.00	3.282	3.261	0.021	1.000	8487460	49.0		98.0	149657	
D 19 13C5 PFNA										
468.00 > 423.00	3.289	3.263	0.026		9089040	49.6		99.1	420160	
D 21 13C8 FOSA										
506.00 > 78.00	3.591	3.570	0.021		20671594	50.5		101	488720	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.591	3.574	0.017	1.000	19681169	50.8		102	457290	
D 23 13C2 PFDA										
515.00 > 470.00	3.642	3.621	0.021		9157145	50.8		102	304489	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.642	3.621	0.021	1.000	8404103	49.3		98.7	202222	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.945	3.929	0.016	1.000	8760153	52.5		109		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.972	3.951	0.021	1.000	6270770	48.2		96.4	130973	
D 27 13C2 PFUnA										
565.00 > 520.00	3.972	3.953	0.019		6638123	48.9		97.7	347702	
D 30 13C2 PFDoA										
615.00 > 570.00	4.264	4.245	0.019		6578052	50.6		101	277195	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.264	4.247	0.017	1.000	6111819	50.2		100	74309	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.532	4.516	0.016	1.000	6010249	51.2		102	5737	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.771	4.758	0.013	1.000	10731489	49.7		99.4	4063	
713.00 > 169.00	4.771	4.758	0.013	1.000	1687260		6.36(0.00-0.00)	99.4	149135	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.771	4.758	0.013		12597564	52.0		104	449140	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.200	5.179	0.021		6923040	51.8		104	93760	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.200	5.180	0.020	1.000	6072845	48.5		97.0	4149	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.568	5.554	0.014	1.000	6089373	57.9		116	5174	

Reagents:

LCPFC-L5_00022 Amount Added: 1.00 Units: mL

Report Date: 09-Jan-2017 15:59:09 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_008.d

Injection Date: 09-Jan-2017 14:01:26 Instrument ID: A8_N

Lims ID: IC L5

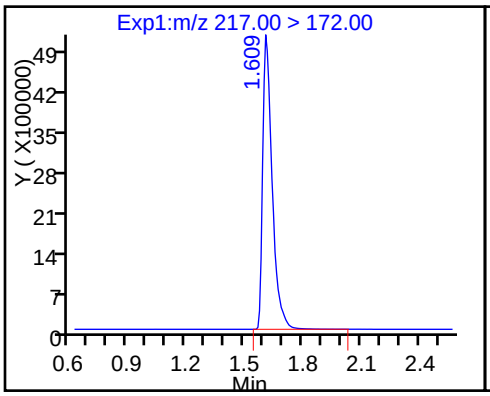
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 41 Worklist Smp#: 8

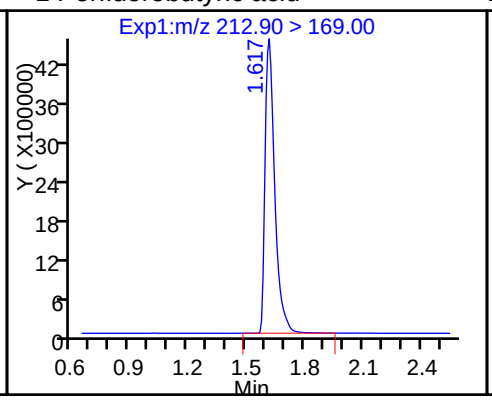
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

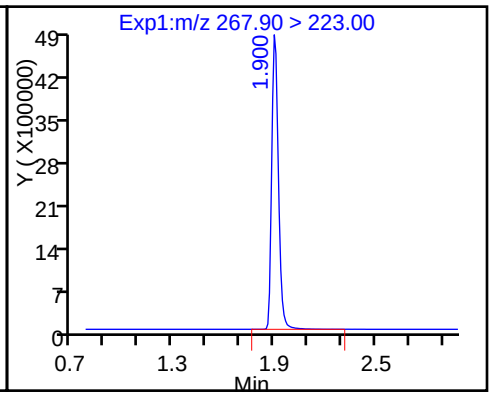
D 2 13C4 PFBA



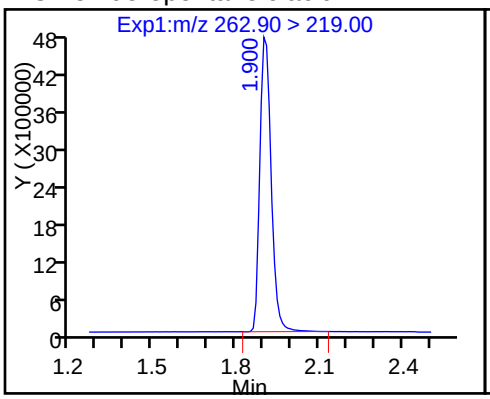
1 Perfluorobutyric acid



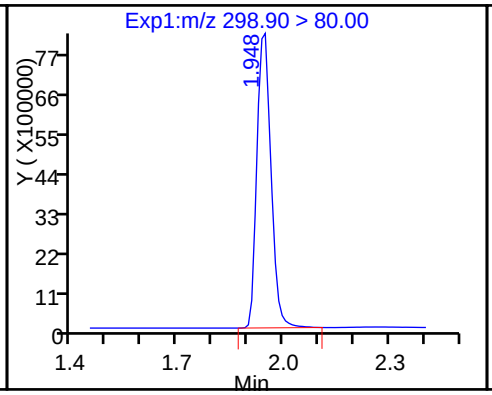
D 4 13C5-PFPeA



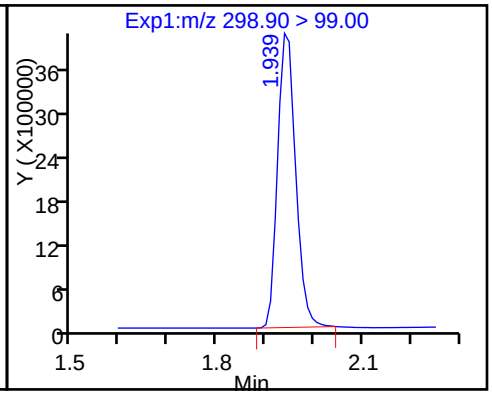
3 Perfluoropentanoic acid



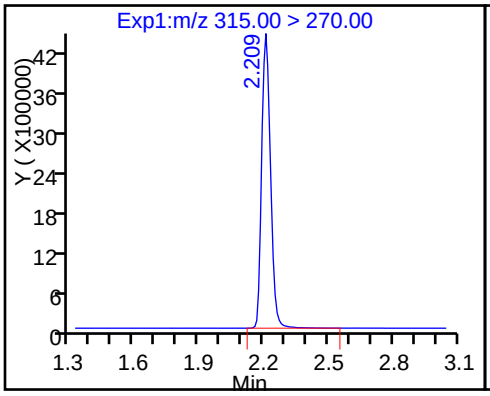
5 Perfluorobutanesulfonic acid



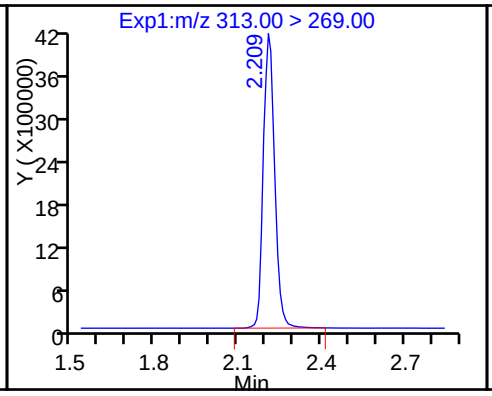
5 Perfluorobutanesulfonic acid



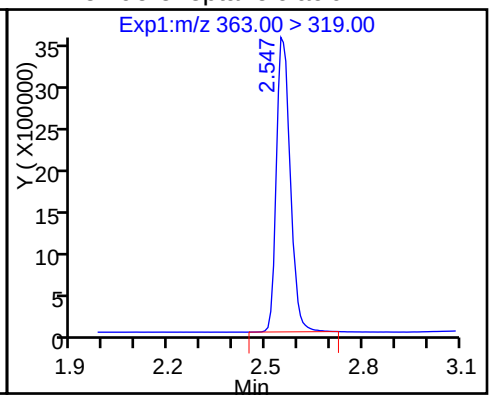
D 6 13C2 PFHxA



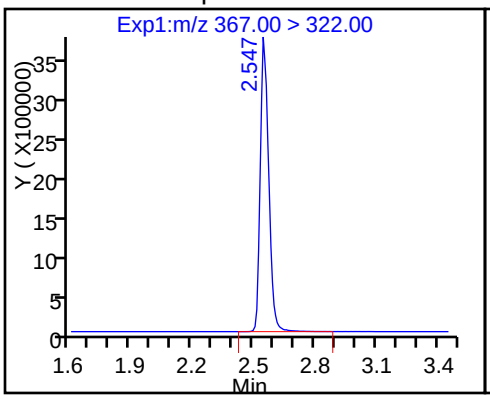
7 Perfluorohexanoic acid



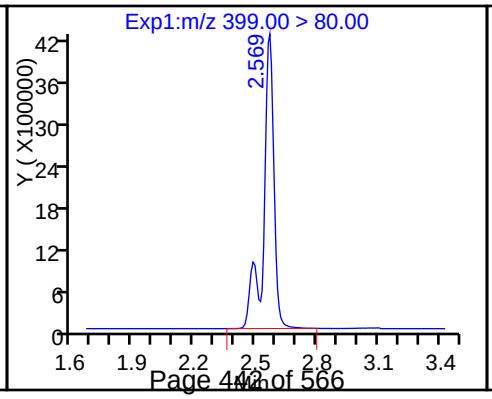
12 Perfluoroheptanoic acid



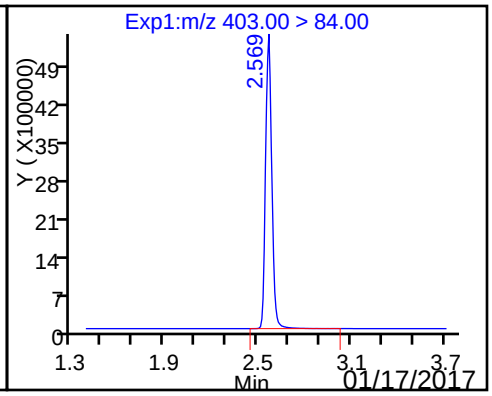
D 11 13C4-PFHpA



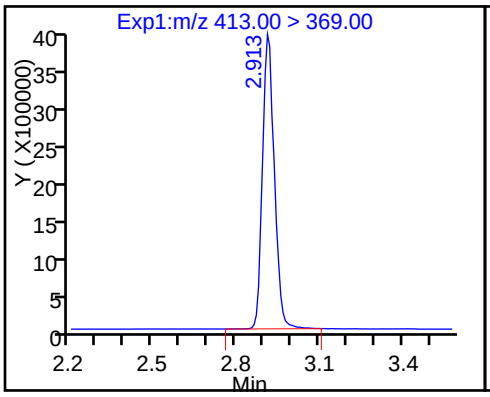
9 Perfluorohexanesulfonic acid



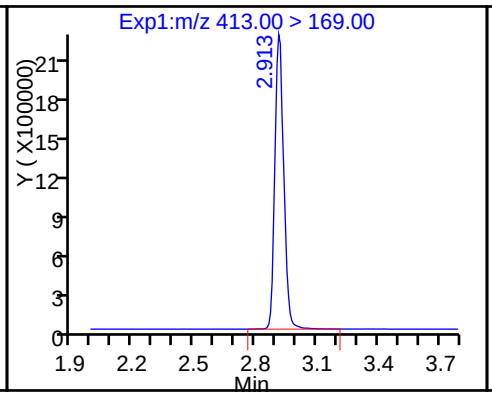
D 10 18O2 PFHxS



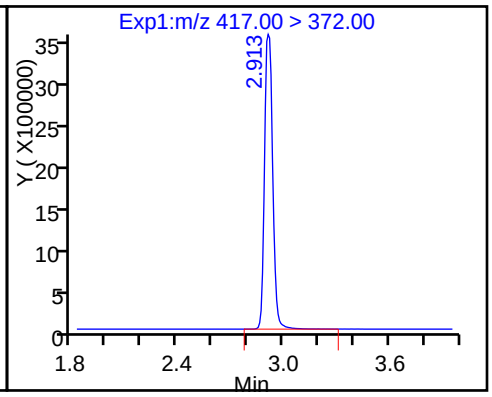
15 Perfluorooctanoic acid



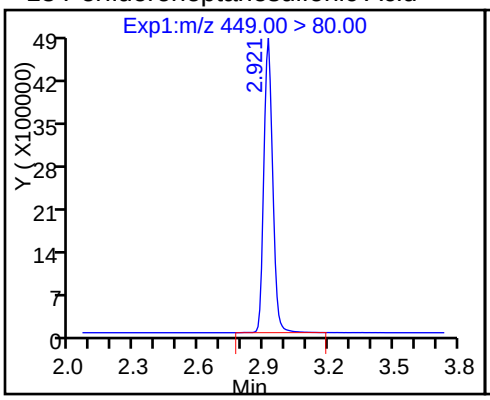
15 Perfluorooctanoic acid



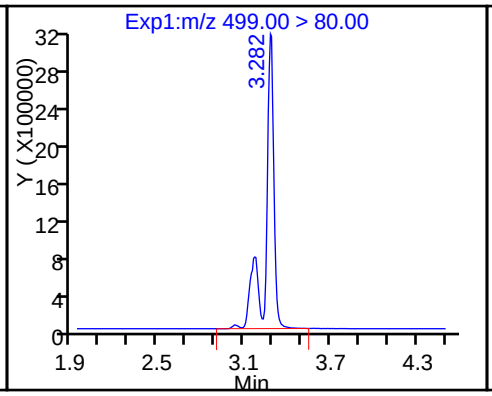
D 14 13C4 PFOA



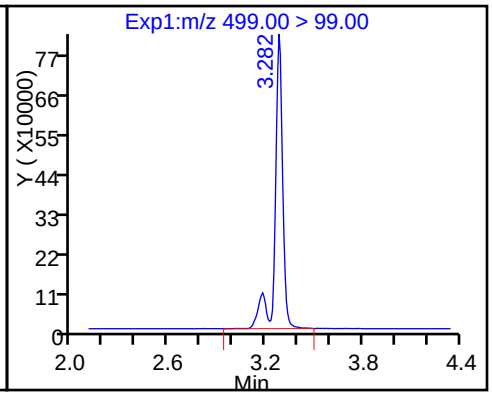
13 Perfluoroheptanesulfonic Acid



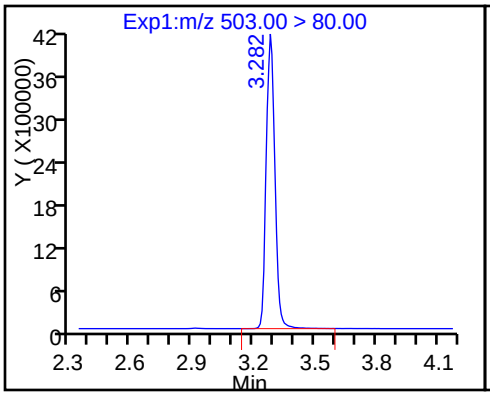
18 Perfluorooctane sulfonic acid



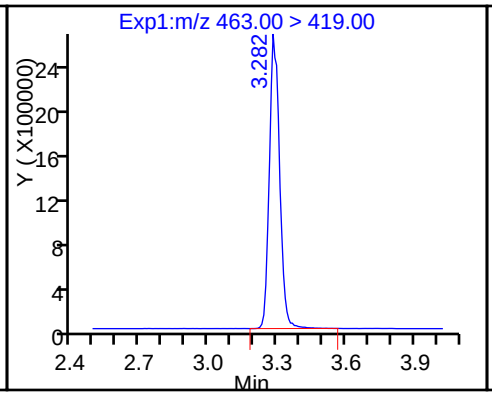
18 Perfluorooctane sulfonic acid



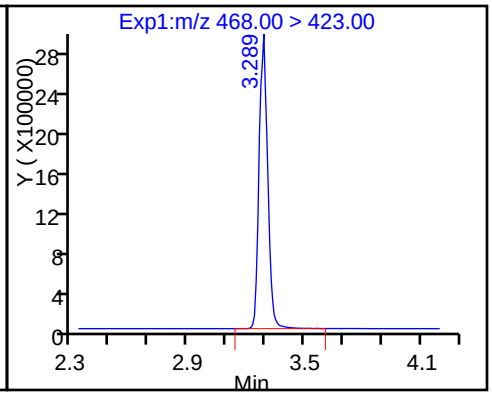
D 17 13C4 PFOS



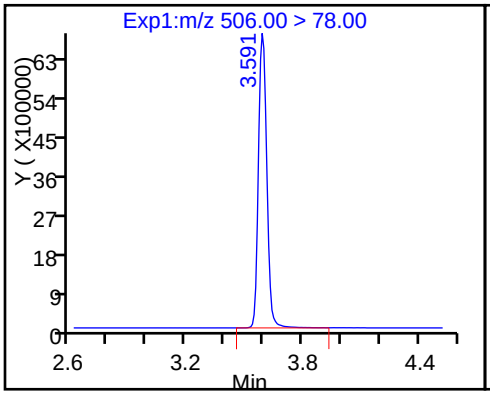
20 Perfluorononanoic acid



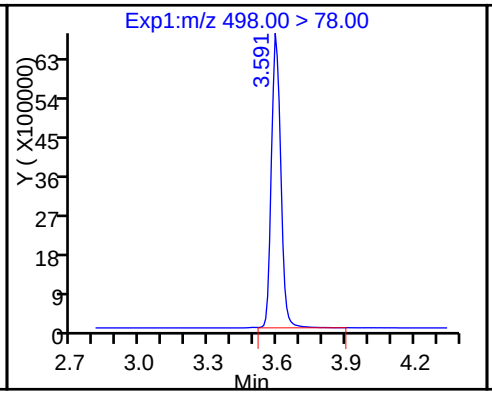
D 19 13C5 PFNA



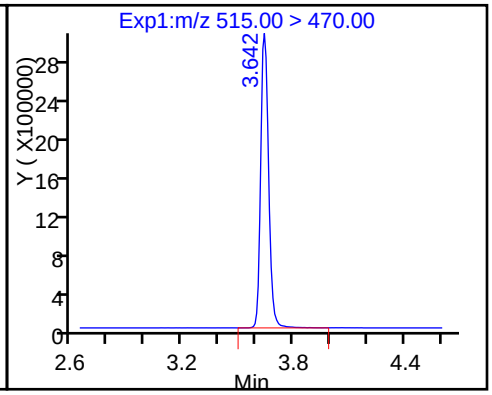
D 21 13C8 FOSA



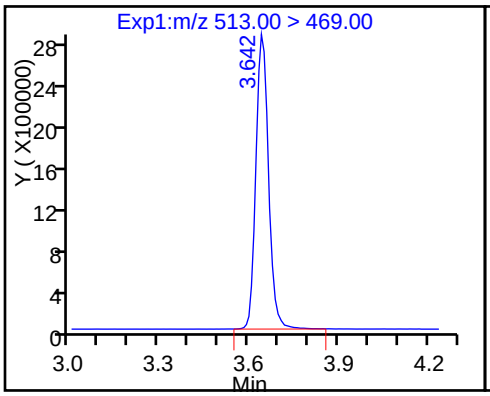
22 Perfluorooctane Sulfonamide



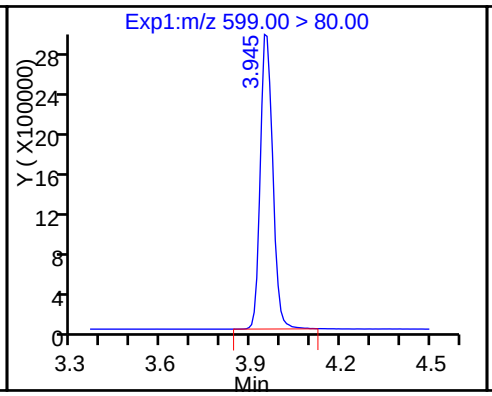
D 23 13C2 PFDA



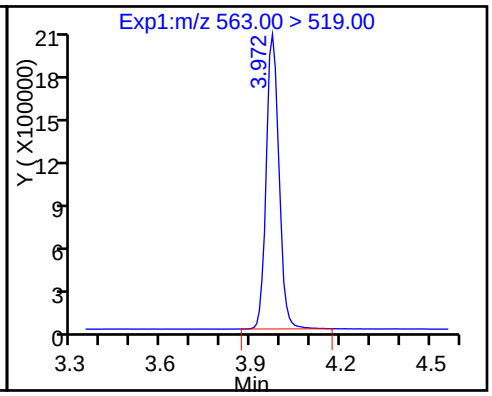
24 Perfluorodecanoic acid



26 Perfluorodecane Sulfonic acid



28 Perfluoroundecanoic acid



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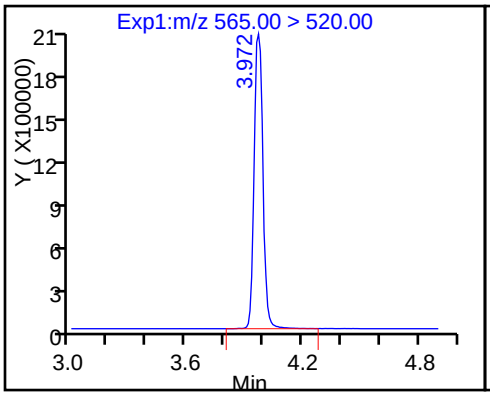
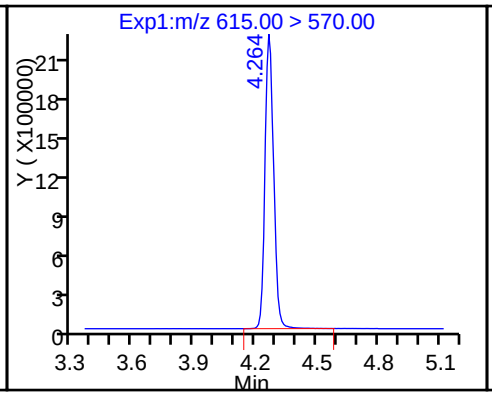
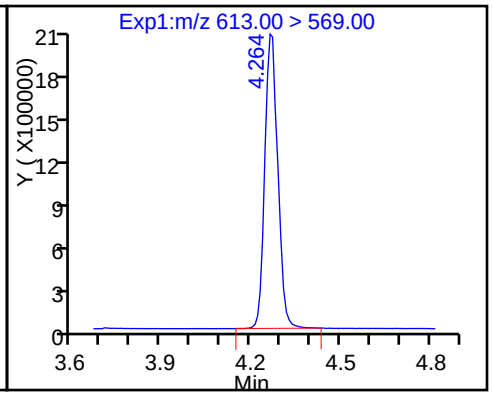


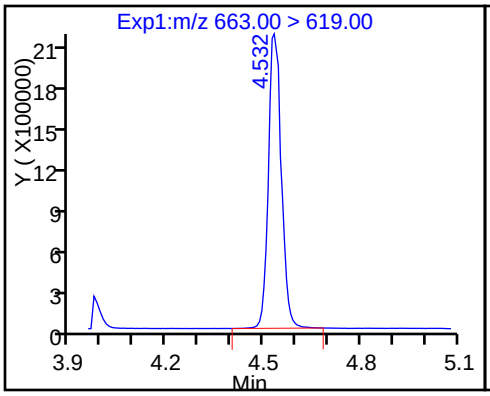
D 30 13C2 PFDoA



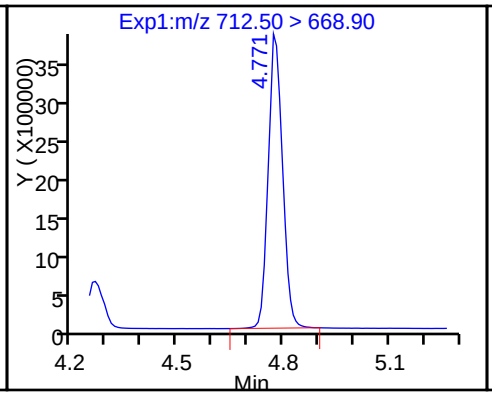
29 Perfluorododecanoic acid



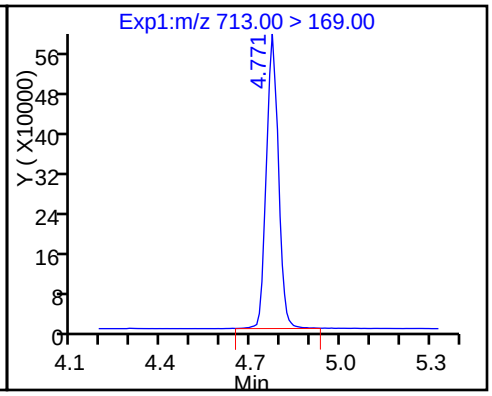
31 Perfluorotridecanoic acid



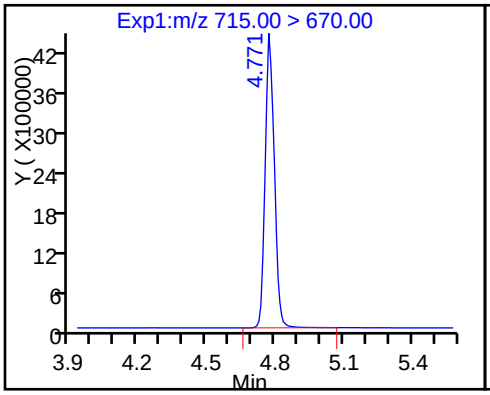
33 Perfluorotetradecanoic acid



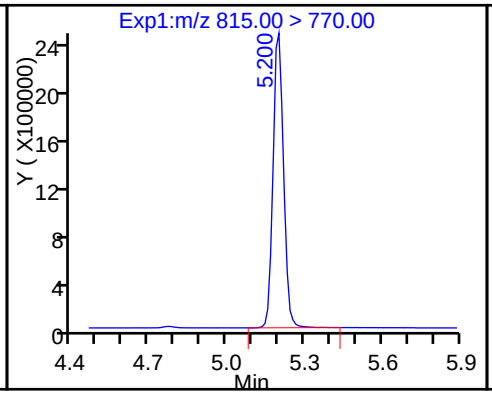
33 Perfluorotetradecanoic acid



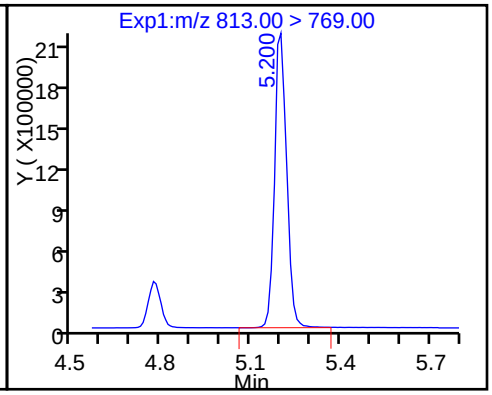
D 32 13C2-PFTeDA



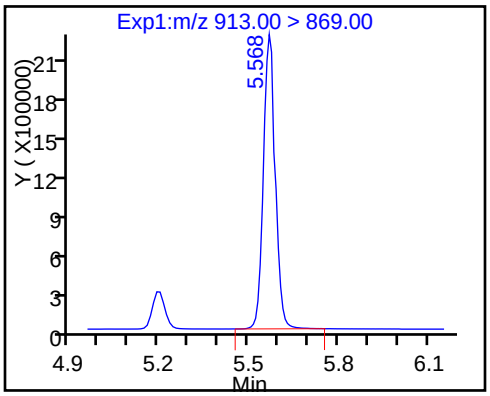
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_009.d
Lims ID: IC L6
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 09-Jan-2017 14:08:55 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*sub11

Method: \\ChromNa\Sacramento\ChromData\A8_N\20170109-38635.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 09-Jan-2017 15:59:11 Calib Date: 09-Jan-2017 15:16:24
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: chandrasenas Date: 09-Jan-2017 14:59:56

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	1.617	1.598	0.019		14035072	40.2		80.3	662791	
1 Perfluorobutyric acid										
212.90 > 169.00	1.617	1.600	0.017	1.000	42620436	173.9		86.9	414807	
D 4 13C5-PFPeA										
267.90 > 223.00	1.900	1.884	0.016		10388559	37.6		75.2	942361	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.910	1.885	0.025	1.000	33908231	166.0		83.0	282933	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.938	1.924	0.014	1.000	51940263	135.6		76.7		
298.90 > 99.00	1.938	1.924	0.014	1.000	28426782		1.83(0.00-0.00)	76.7		
D 6 13C2 PFHxA										
315.00 > 270.00	2.208	2.187	0.021		9838566	38.2		76.4	848564	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.208	2.189	0.019	1.000	32142166	176.6		88.3	736802	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.553	2.530	0.023	1.000	28512549	182.7		91.4	272181	
D 11 13C4-PFHpA										
367.00 > 322.00	2.553	2.530	0.023		7915336	35.4		70.7	667750	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.570	2.547	0.023	1.000	44357445	167.4		92.0		
D 10 18O2 PFHxS										
403.00 > 84.00	2.570	2.548	0.022		11960026	36.9		77.9	974820	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.917	2.891	0.026	1.000	29364167	185.9		92.9	219561	
413.00 > 169.00	2.917	2.891	0.026	1.000	19032570		1.54(0.90-1.10)	92.9	784356	
D 14 13C4 PFOA										
417.00 > 372.00	2.909	2.891	0.018		7871570	32.5		65.1	235883	

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	2.917	2.898	0.019	1.000	37546591	169.3		88.9		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.168	3.221	-0.053	1.000	40499129	195.6		105	148269	
499.00 > 99.00	3.286	3.221	0.065	1.037	9592541		4.22(0.90-1.10)	105	438359	
D 17 13C4 PFOS										
503.00 > 80.00	3.286	3.261	0.025		9774256	37.7		78.8	99711	
20 Perfluorononanoic acid										
463.00 > 419.00	3.286	3.261	0.025	1.000	23976816	196.0		98.0	366865	
D 19 13C5 PFNA										
468.00 > 423.00	3.286	3.263	0.023		6421370	35.0		70.0	478422	
D 21 13C8 FOSA										
506.00 > 78.00	3.599	3.570	0.029		16776754	41.0		81.9	563928	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.599	3.574	0.025	1.000	48748543	154.9		77.5	590983	
D 23 13C2 PFDA										
515.00 > 470.00	3.649	3.621	0.028		6738351	37.4		74.8	197039	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.641	3.621	0.020	1.000	24825913	198.1		99.0	367229	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.955	3.929	0.026	1.000	25317110	194.2		101		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.973	3.951	0.022	1.000	17277703	200.6		100	223500	
D 27 13C2 PFUnA										
565.00 > 520.00	3.983	3.953	0.030		4394648	32.3		64.7	339780	
D 30 13C2 PFDoA										
615.00 > 570.00	4.268	4.245	0.023		4836420	37.2		74.4	131604	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.268	4.247	0.021	1.000	18351830	205.2		103	165567	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.530	4.516	0.014	1.000	17443940	202.3		101	29524	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.776	4.758	0.018	1.000	30191429	190.3		95.1	15492	
713.00 > 169.00	4.776	4.758	0.018	1.000	5300295		5.70(0.00-0.00)	95.1	266617	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.776	4.758	0.018		9488741	39.2		78.3	628512	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.195	5.179	0.016		5526087	41.4		82.7	106253	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.195	5.180	0.015	1.000	18579953	203.3		102	16323	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.567	5.554	0.013	1.000	17128970	221.4		111	18124	

Reagents:

LCPFC-L6_00020 Amount Added: 1.00 Units: mL

Report Date: 09-Jan-2017 15:59:11 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_009.d

Injection Date: 09-Jan-2017 14:08:55 Instrument ID: A8_N

Lims ID: IC L6

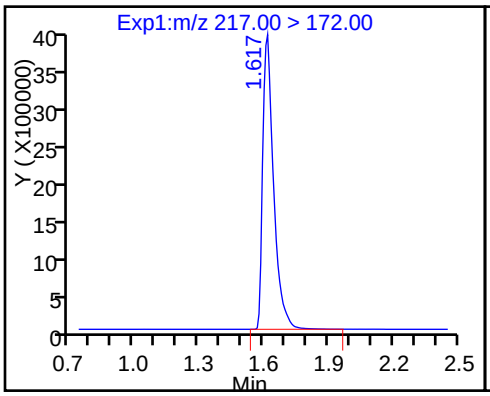
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 42 Worklist Smp#: 9

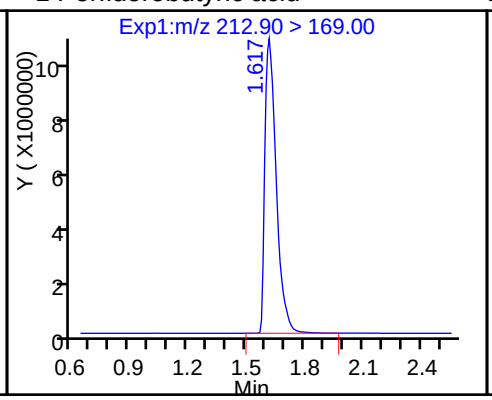
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

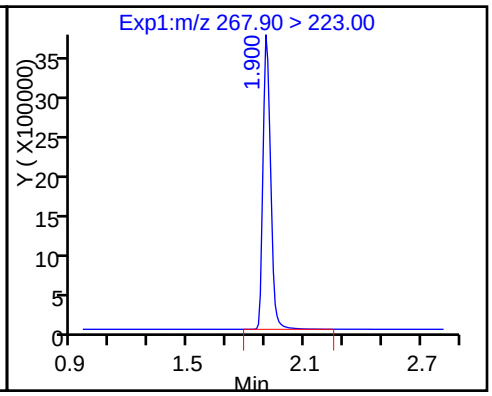
D 2 13C4 PFBA



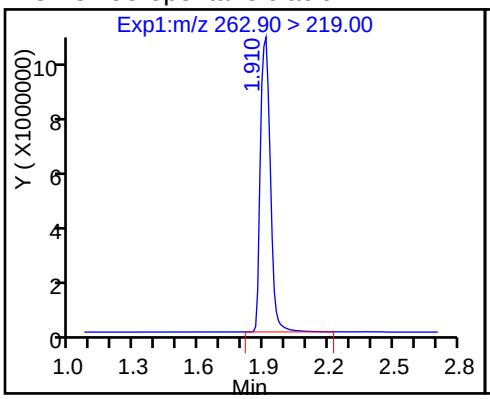
1 Perfluorobutyric acid



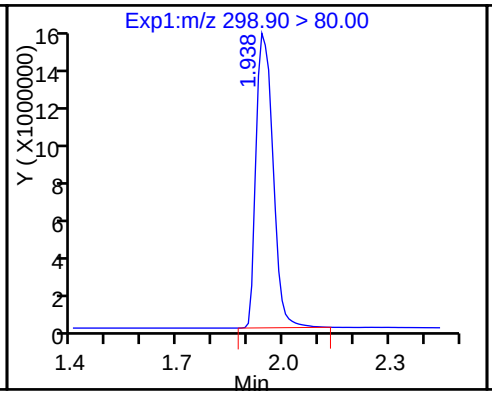
D 4 13C5-PFPeA



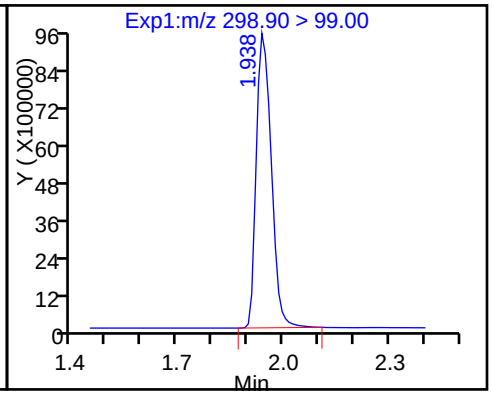
3 Perfluoropentanoic acid



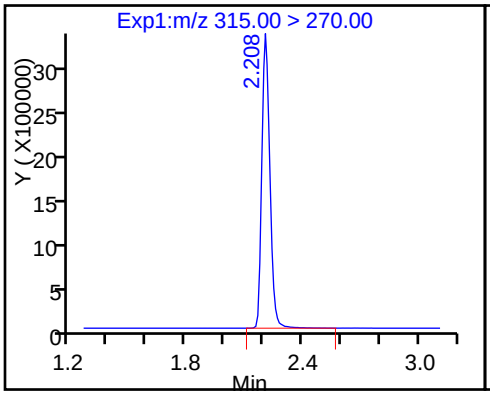
5 Perfluorobutanesulfonic acid



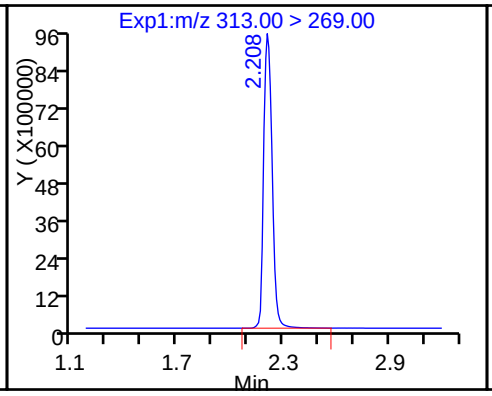
5 Perfluorobutanesulfonic acid



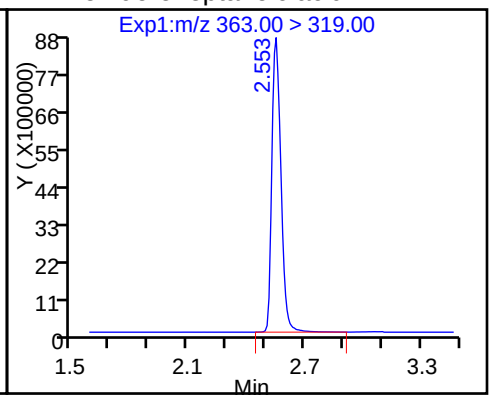
D 6 13C2 PFHxA



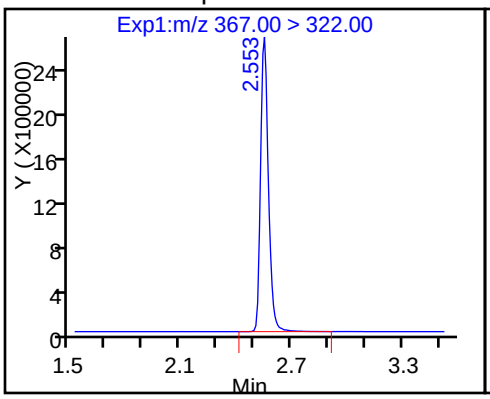
7 Perfluorohexanoic acid



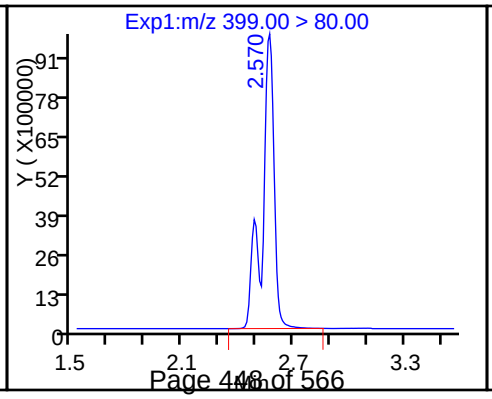
12 Perfluoroheptanoic acid



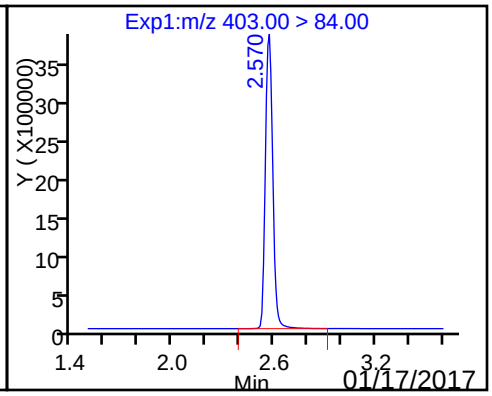
D 11 13C4-PFHpA



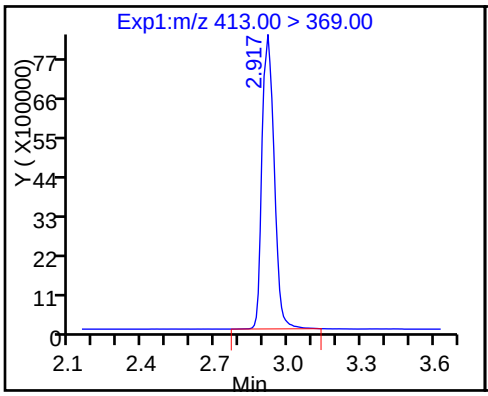
9 Perfluorohexanesulfonic acid



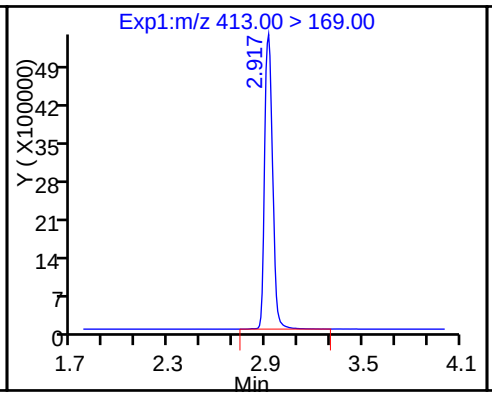
D 10 18O2 PFHxS



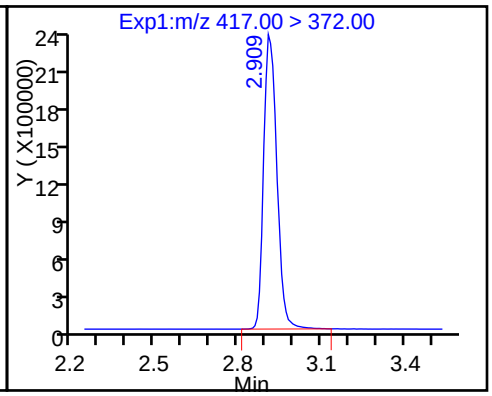
15 Perfluorooctanoic acid



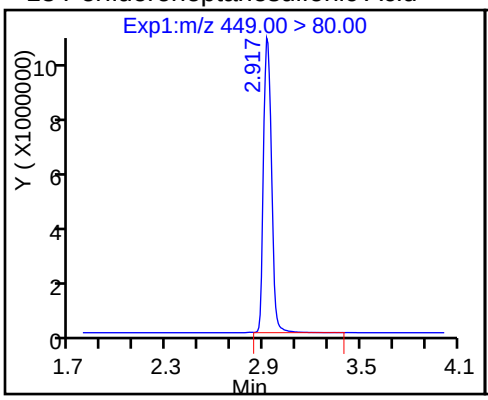
15 Perfluorooctanoic acid



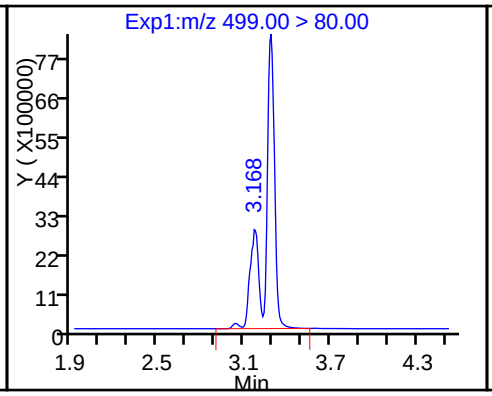
D 14 13C4 PFOA



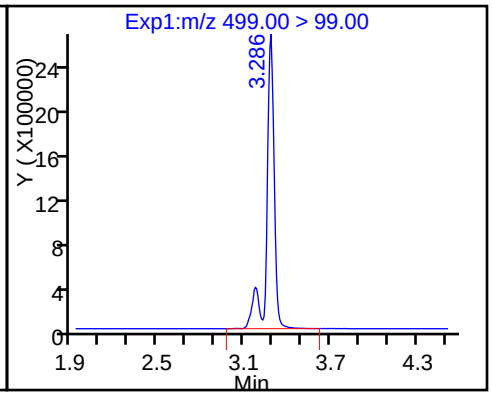
13 Perfluoroheptanesulfonic Acid



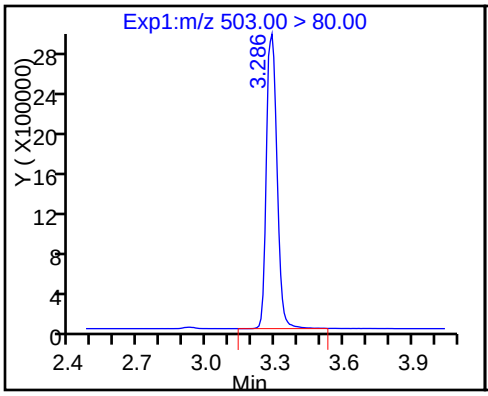
18 Perfluorooctane sulfonic acid



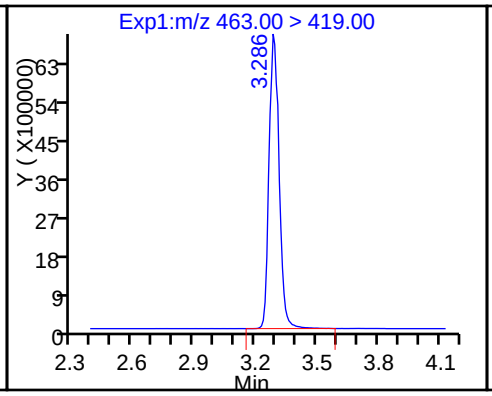
18 Perfluorooctane sulfonic acid



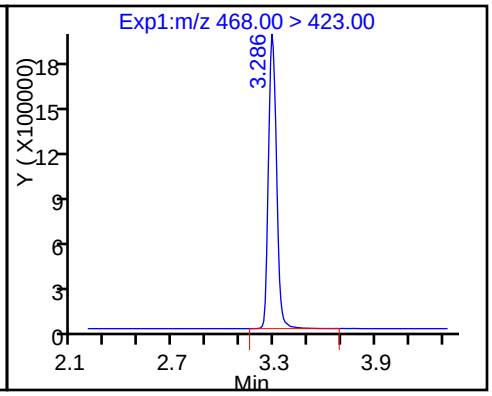
D 17 13C4 PFOS



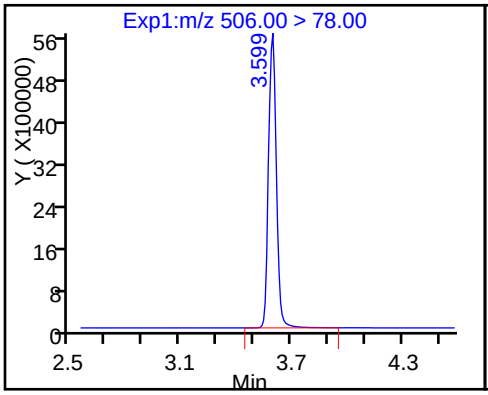
20 Perfluorononanoic acid



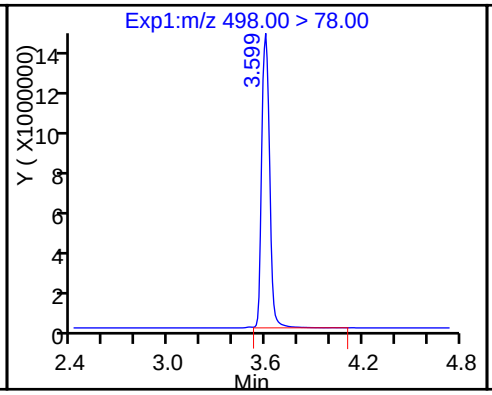
D 19 13C5 PFNA



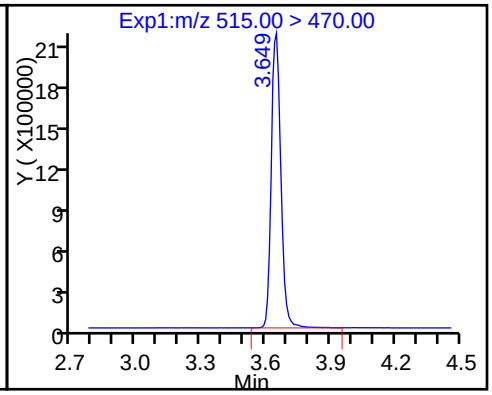
D 21 13C8 FOSA



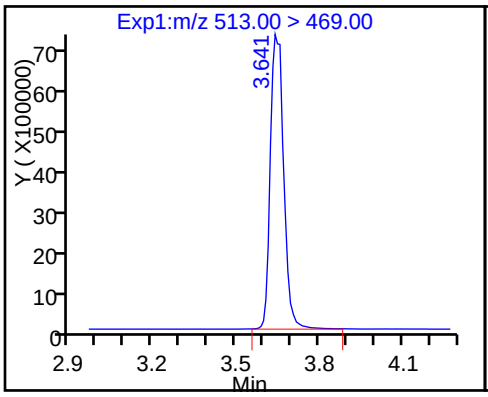
22 Perfluorooctane Sulfonamide



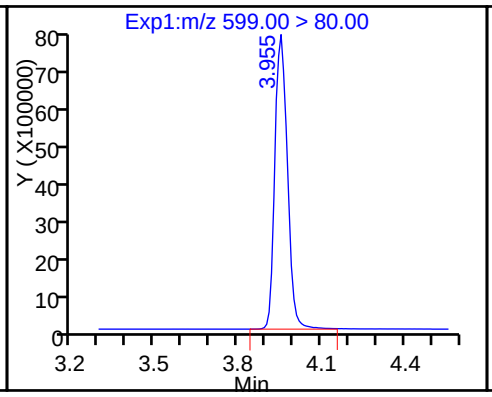
D 23 13C2 PFDA



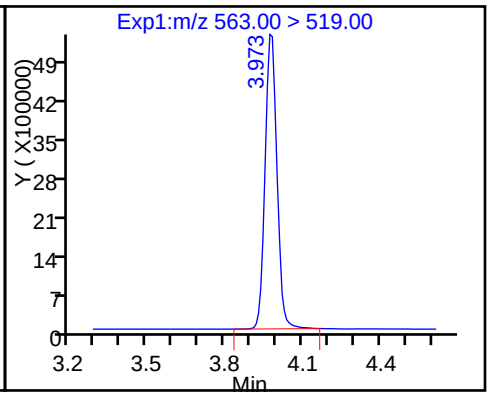
24 Perfluorodecanoic acid



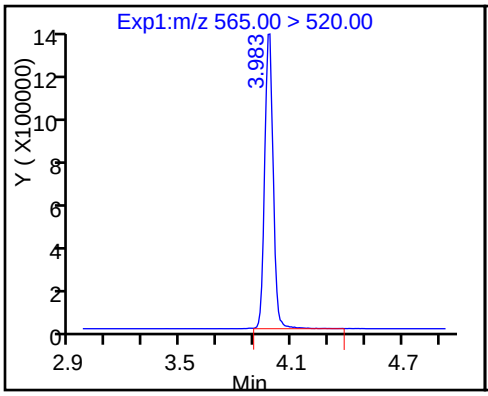
26 Perfluorodecane Sulfonic acid



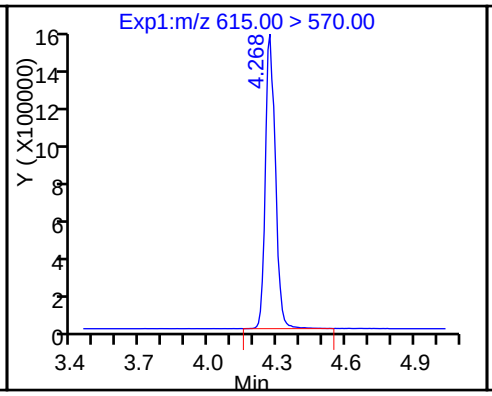
28 Perfluoroundecanoic acid



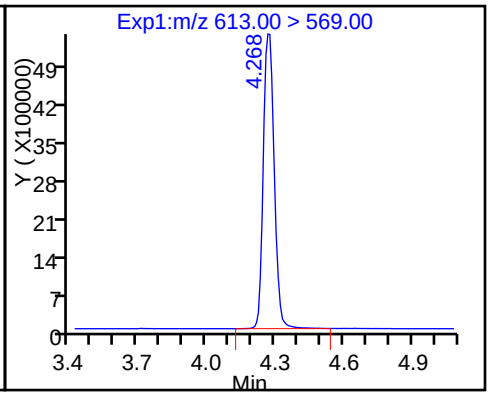
D 27 13C2 PFUnA



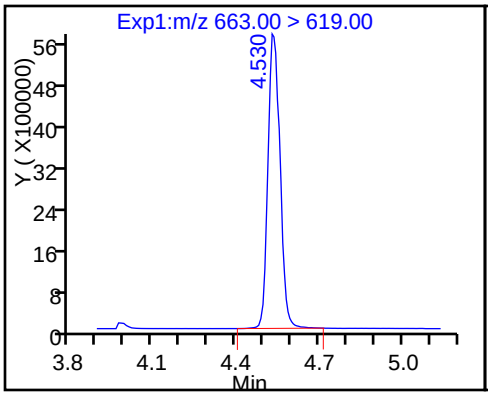
D 30 13C2 PFDoA



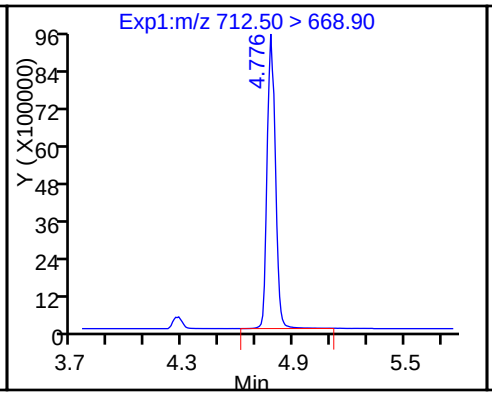
29 Perfluorododecanoic acid



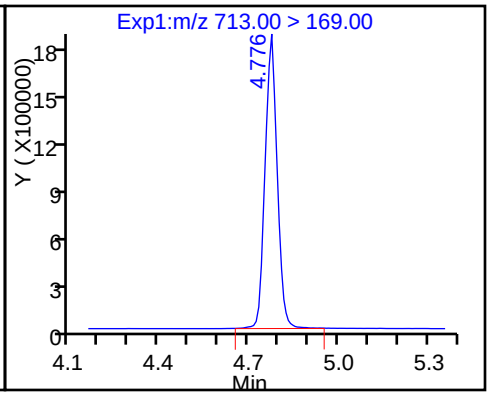
31 Perfluorotridecanoic acid



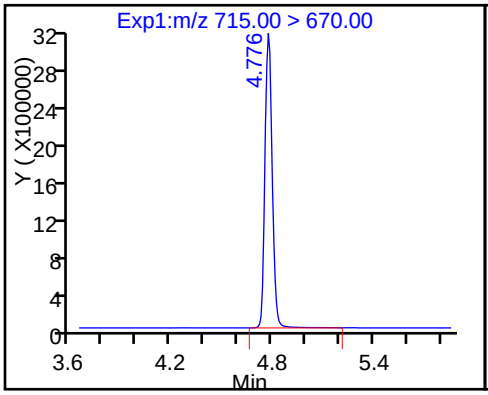
33 Perfluorotetradecanoic acid



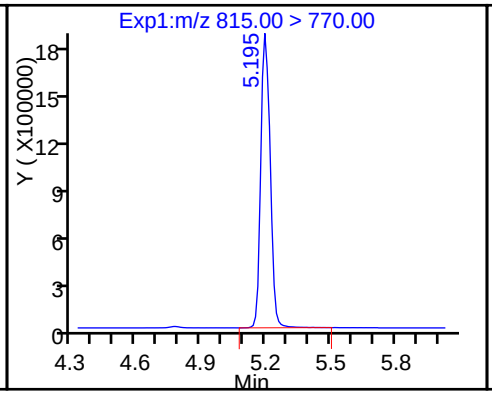
33 Perfluorotetradecanoic acid



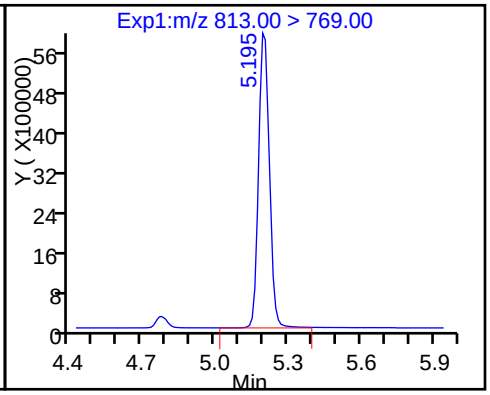
D 32 13C2-PFTeDA



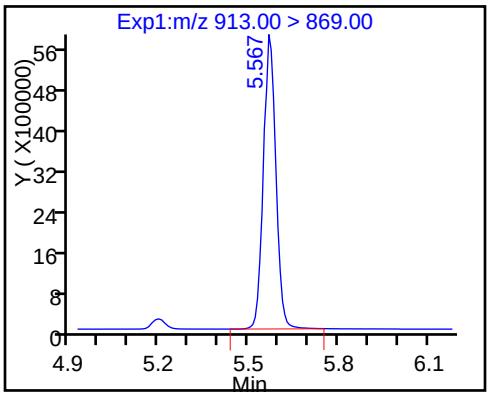
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_013.d
Lims ID: IC L1 Add-on
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 09-Jan-2017 14:38:55 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*sub11

Method: \\ChromNa\Sacramento\ChromData\A8_N\20170109-38635.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 09-Jan-2017 16:00:39 Calib Date: 09-Jan-2017 15:16:24
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: chandrasenas Date: 09-Jan-2017 15:54:51

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
48 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.895	2.894	0.001	1.000	48891	0.4249		89.6		
D 47 M2-6:2FTS										
429.00 > 409.00	2.895	2.895	0.0		6307331	47.2		99.5		
D 42 M2-8:2FTS										
529.00 > 509.00	3.635	3.637	-0.002		6252767	46.3		96.7		
43 Sodium 1H,1H,2H,2H-perfluorooctane										
527.00 > 507.00	3.635	3.639	-0.004	1.000	47744	0.4182		87.3		
D 45 d3-NMeFOSAA										
573.00 > 419.00	3.802	3.804	-0.002		4230030	51.8		104		
44 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.810	3.808	0.002	1.002	33371	0.4259		85.2		
D 46 d5-NEtFOSAA										
589.00 > 419.00	3.967	3.970	-0.003		4525254	50.0		100.0		
49 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.986	3.980	0.006	1.005	33226	0.4343		86.9		
D 52 d-N-MeFOSA-M										
515.00 > 169.00	4.087	4.092	-0.005		5101842	49.7		99.3		
54 MeFOSA										
512.00 > 169.00	4.095	4.093	0.002	1.000	41319	0.4739		94.8		
D 51 d-N-EtFOSA-M										
531.00 > 169.00	4.274	4.278	-0.004		4973124	49.7		99.3		
53 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.274	4.282	-0.008	1.000	41698	0.4522		90.4		

Reagents:

LCPFC2-L1_00004 Amount Added: 1.00 Units: mL

Report Date: 09-Jan-2017 16:00:39 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_013.d

Injection Date: 09-Jan-2017 14:38:55 Instrument ID: A8_N

Lims ID: IC L1 Add-on

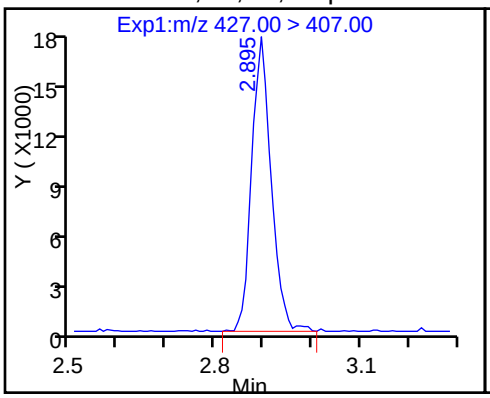
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 46 Worklist Smp#: 13

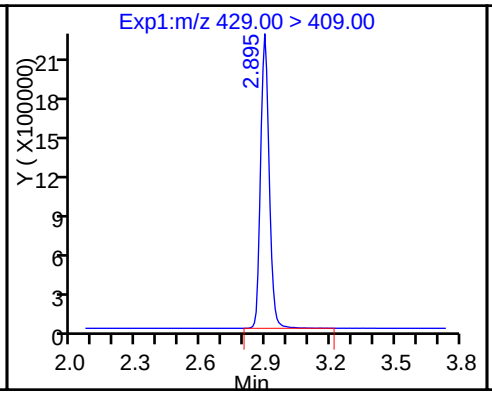
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

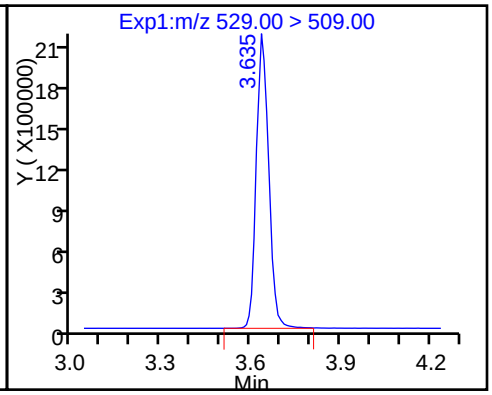
48 Sodium 1H,1H,2H,2H-perfluorooctane



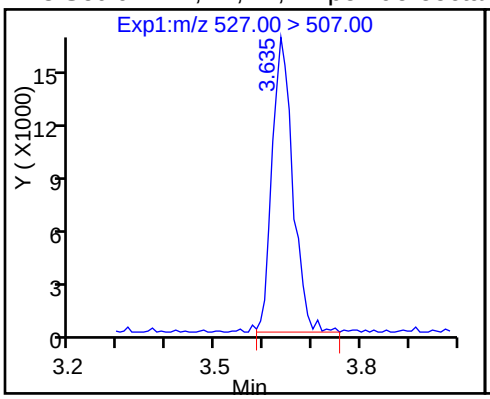
D 47 M2-6:2FTS



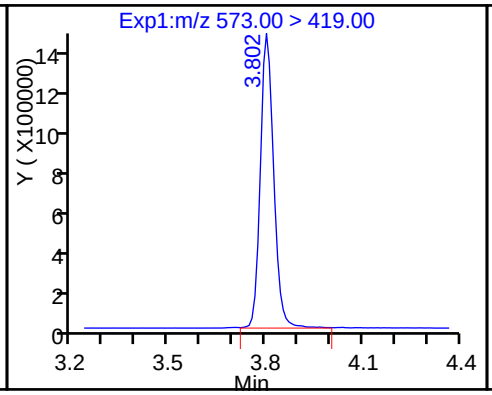
D 42 M2-8:2FTS



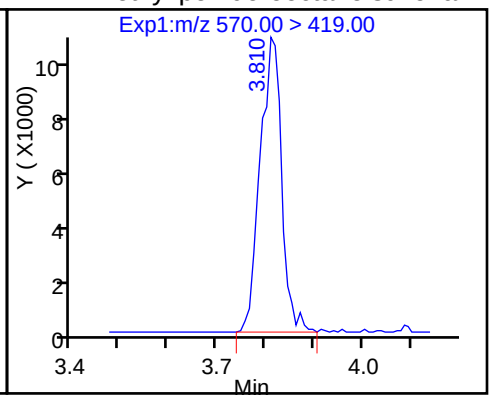
43 Sodium 1H,1H,2H,2H-perfluorooctane



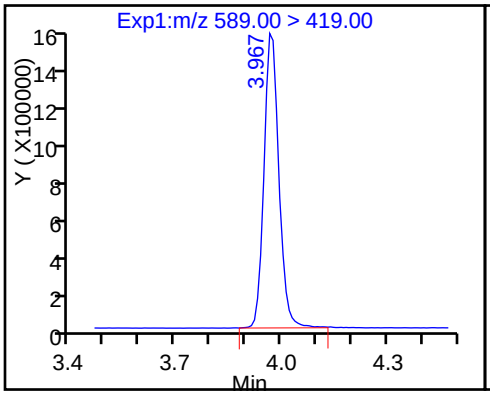
D 45 d3-NMeFOSAA



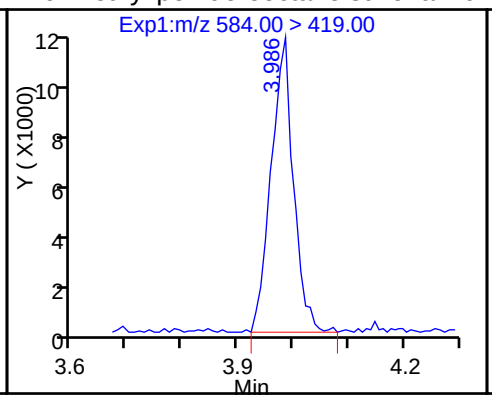
44 N-methyl perfluorooctane sulfonami



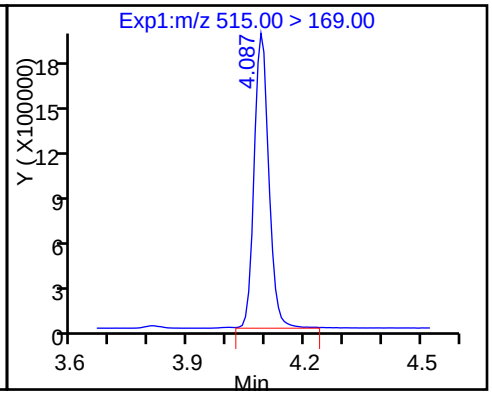
D 46 d5-NEtFOSAA



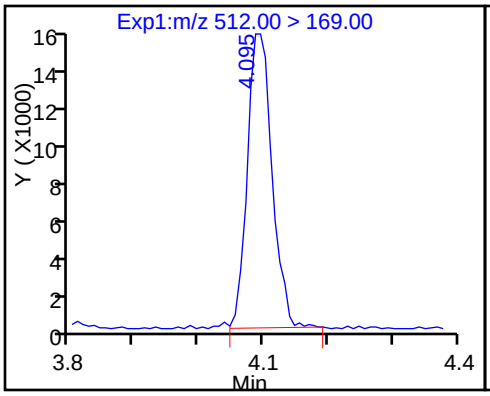
49 N-ethyl perfluorooctane sulfonamid



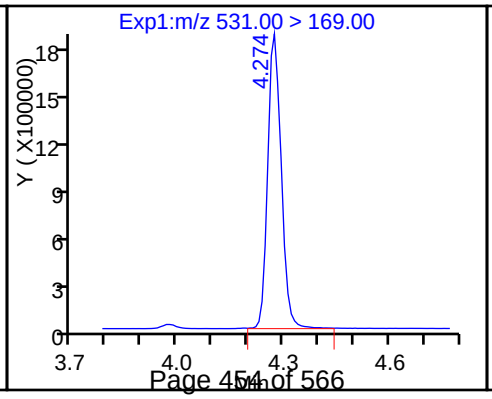
D 52 d-N-MeFOSA-M



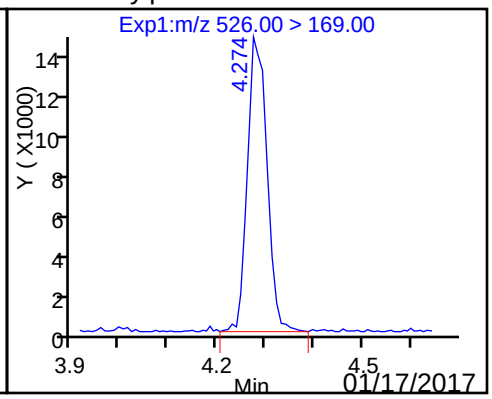
54 MeFOSA



D 51 d-N-EtFOSA-M



53 N-ethylperfluoro-1-octanesulfonami



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_014.d
Lims ID: IC L2 Add-on
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 09-Jan-2017 14:46:24 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*sub11

Method: \\ChromNa\Sacramento\ChromData\A8_N\20170109-38635.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 09-Jan-2017 16:00:41 Calib Date: 09-Jan-2017 15:16:24
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: chandrasenas Date: 09-Jan-2017 15:55:07

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
48 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.891	2.894	-0.004	1.000	104267	0.9171		96.7		
D 47 M2-6:2FTS										
429.00 > 409.00	2.891	2.895	-0.005		6231822	46.7		98.3		
D 42 M2-8:2FTS										
529.00 > 509.00	3.630	3.637	-0.007		6430713	47.6		99.5		
43 Sodium 1H,1H,2H,2H-perfluorooctane										
527.00 > 507.00	3.630	3.639	-0.009	1.000	107440	0.9150		95.5		
D 45 d3-NMeFOSAA										
573.00 > 419.00	3.797	3.804	-0.007		4088717	50.0		100		
44 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.797	3.808	-0.011	1.000	70926	0.9364		93.6		
D 46 d5-NEtFOSAA										
589.00 > 419.00	3.961	3.970	-0.009		4617663	51.0		102		
49 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.971	3.980	-0.009	1.002	73837	0.9457		94.6		
D 52 d-N-MeFOSA-M										
515.00 > 169.00	4.084	4.092	-0.008		5090921	49.6		99.1		
54 MeFOSA										
512.00 > 169.00	4.084	4.093	-0.009	1.000	76926	0.8841		88.4		
D 51 d-N-EtFOSA-M										
531.00 > 169.00	4.270	4.278	-0.008		4939370	49.3		98.7		
53 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.279	4.282	-0.003	1.000	83275	0.9092		90.9		

Reagents:

LCPFC2-L2_00003 Amount Added: 1.00 Units: mL

Report Date: 09-Jan-2017 16:00:42 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_014.d

Injection Date: 09-Jan-2017 14:46:24 Instrument ID: A8_N

Lims ID: IC L2 Add-on

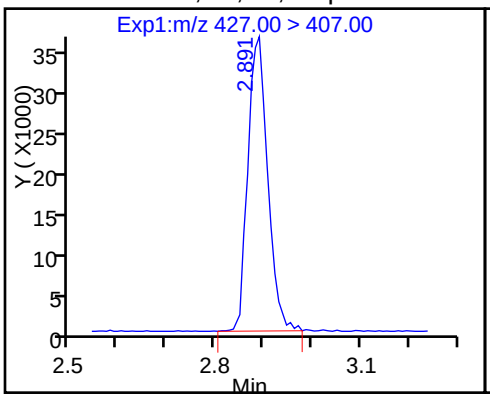
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 47 Worklist Smp#: 14

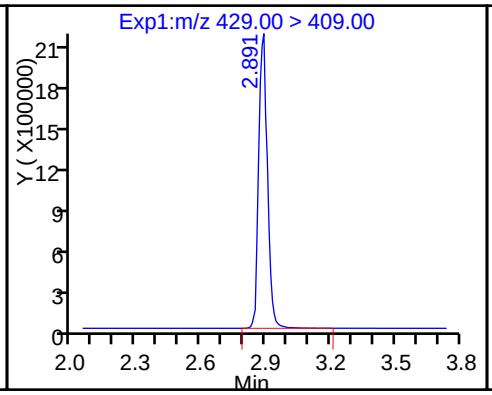
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

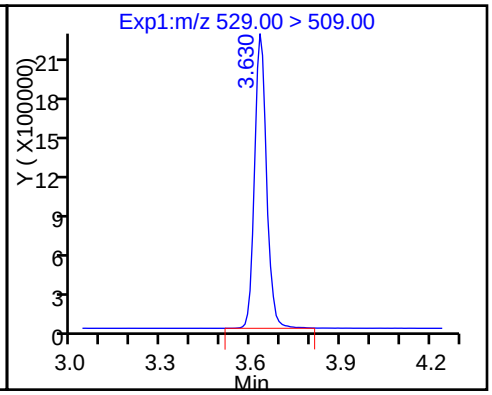
48 Sodium 1H,1H,2H,2H-perfluorooctane



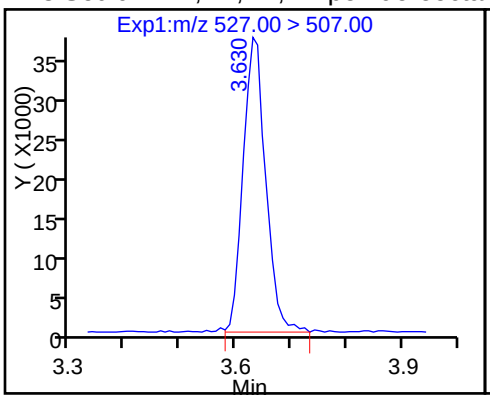
D 47 M2-6:2FTS



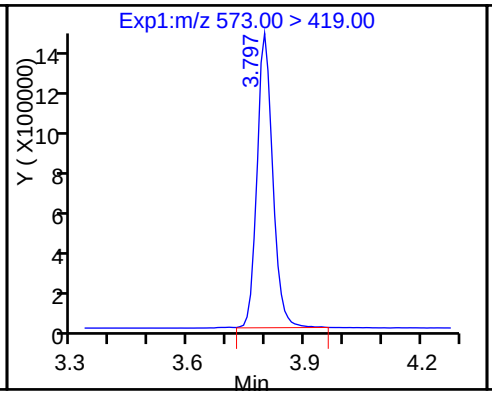
D 42 M2-8:2FTS



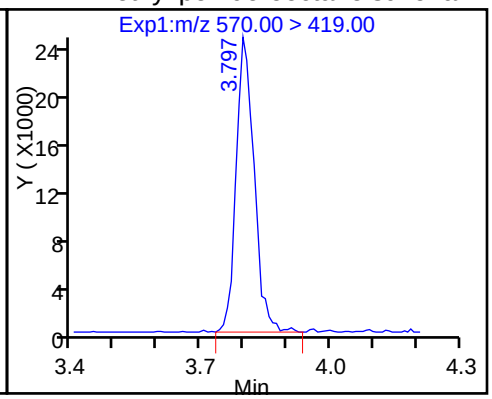
43 Sodium 1H,1H,2H,2H-perfluorooctane



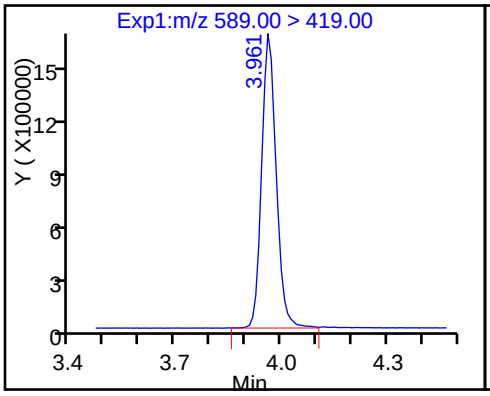
D 45 d3-NMeFOSAA



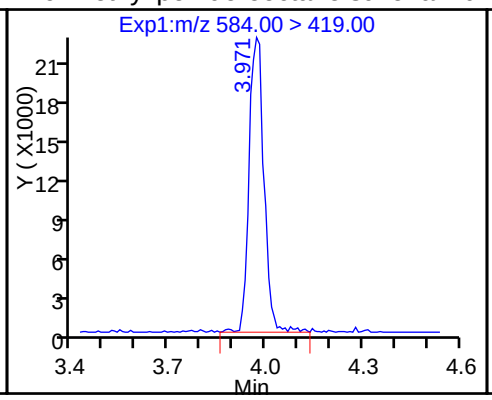
44 N-methyl perfluorooctane sulfonami



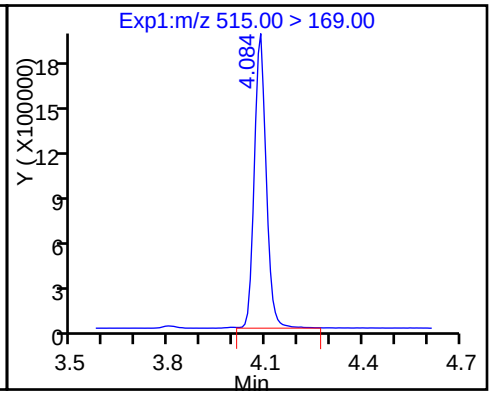
D 46 d5-NEtFOSAA



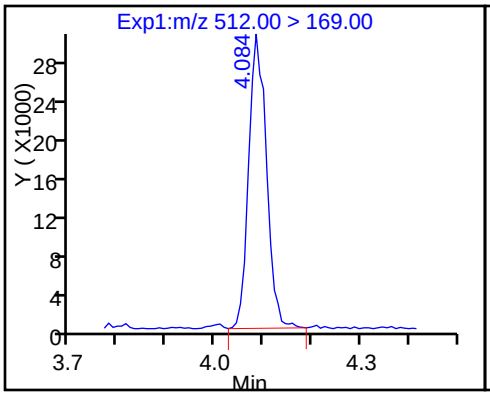
49 N-ethyl perfluorooctane sulfonamid



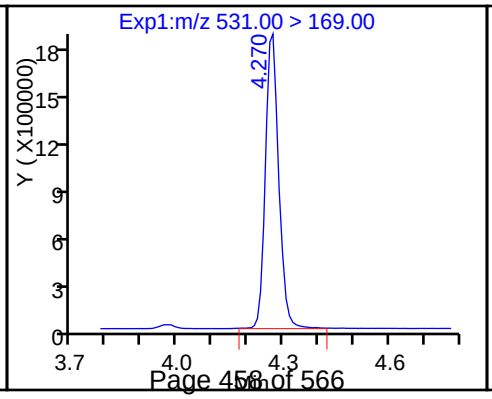
D 52 d-N-MeFOSA-M



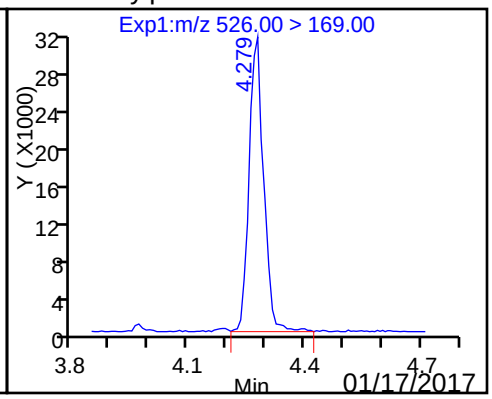
54 MeFOSA



D 51 d-N-EtFOSA-M



53 N-ethylperfluoro-1-octanesulfonami



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_015.d
Lims ID: IC L3 Add-on
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 09-Jan-2017 14:53:54 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*sub11

Method: \\ChromNa\Sacramento\ChromData\A8_N\20170109-38635.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 09-Jan-2017 16:00:43 Calib Date: 09-Jan-2017 15:16:24
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: chandrasenas Date: 09-Jan-2017 15:55:19

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
48 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.887	2.894	-0.007	1.000	613524	5.08		107		
D 47 M2-6:2FTS										
429.00 > 409.00	2.895	2.895	0.0		6615643	49.6		104		
D 42 M2-8:2FTS										
529.00 > 509.00	3.627	3.637	-0.010		6462002	47.9		100.0		
43 Sodium 1H,1H,2H,2H-perfluorooctane										
527.00 > 507.00	3.635	3.639	-0.004	1.002	629557	5.34		111		
D 45 d3-NMeFOSAA										
573.00 > 419.00	3.802	3.804	-0.002		4233937	51.8		104		
44 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.802	3.808	-0.006	1.000	405677	5.17		103		
D 46 d5-NEtFOSAA										
589.00 > 419.00	3.967	3.970	-0.003		4745262	52.4		105		
49 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.976	3.980	-0.004	1.002	417343	5.20		104		
D 52 d-N-MeFOSA-M										
515.00 > 169.00	4.088	4.092	-0.004		5275515	51.4		103		
54 MeFOSA										
512.00 > 169.00	4.088	4.093	-0.005	1.000	462937	5.13		103		
D 51 d-N-EtFOSA-M										
531.00 > 169.00	4.274	4.278	-0.004		5192294	51.9		104		
53 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.274	4.282	-0.008	1.000	496282	5.15		103		

Reagents:

LCPFC2-L3_00003 Amount Added: 1.00 Units: mL

Report Date: 09-Jan-2017 16:00:43 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_015.d

Injection Date: 09-Jan-2017 14:53:54 Instrument ID: A8_N

Lims ID: IC L3 Add-on

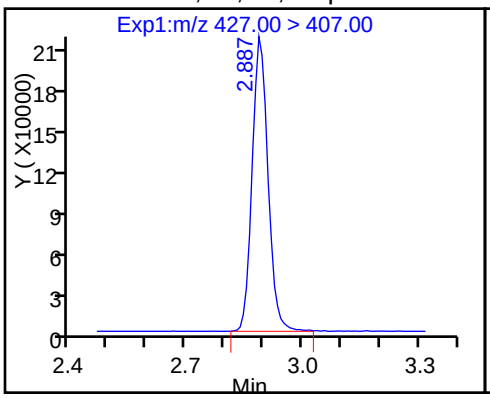
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 48 Worklist Smp#: 15

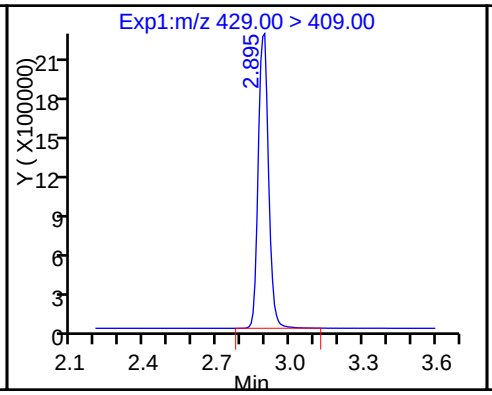
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

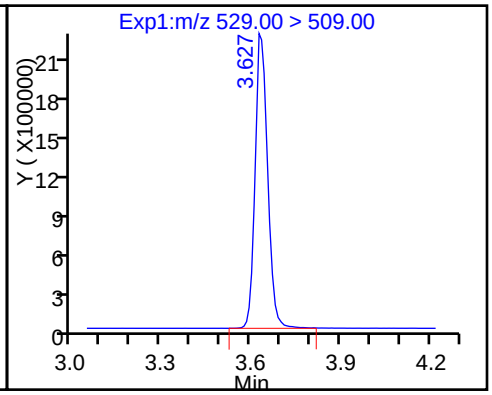
48 Sodium 1H,1H,2H,2H-perfluorooctane



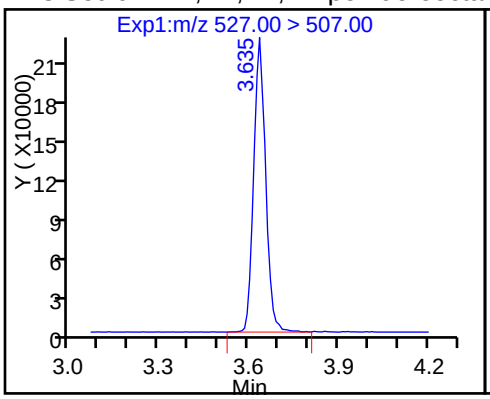
D 47 M2-6:2FTS



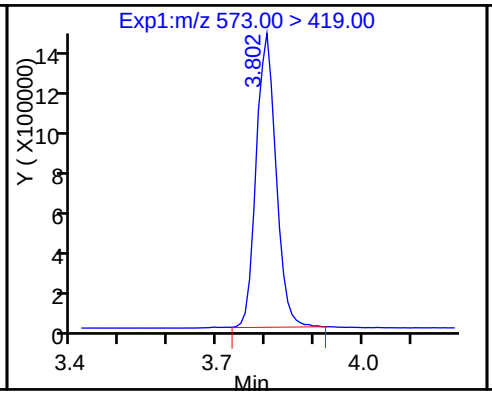
D 42 M2-8:2FTS



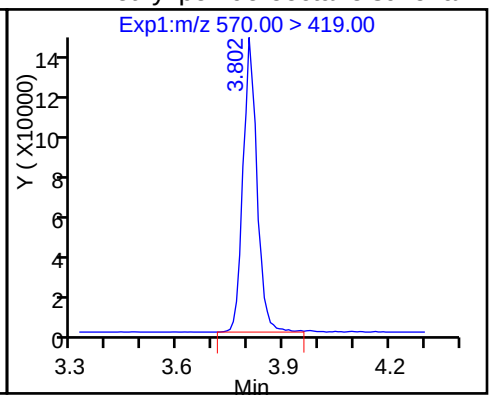
43 Sodium 1H,1H,2H,2H-perfluorooctane



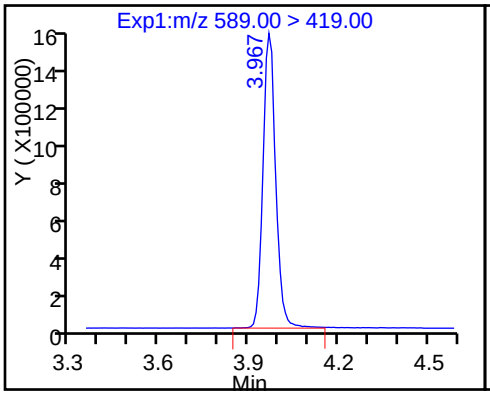
D 45 d3-NMeFOSAA



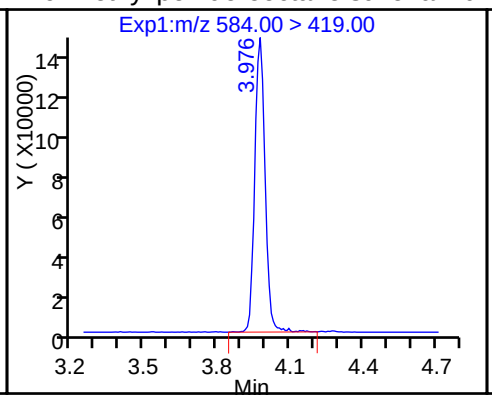
44 N-methyl perfluorooctane sulfonami



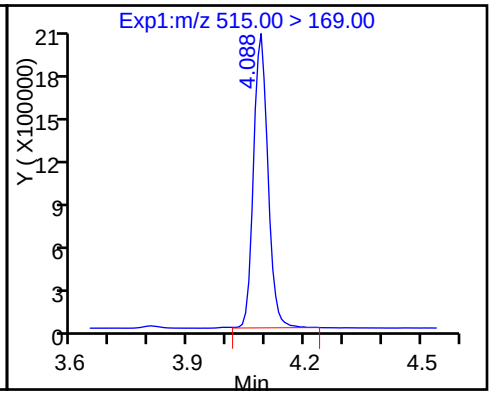
D 46 d5-NEtFOSAA



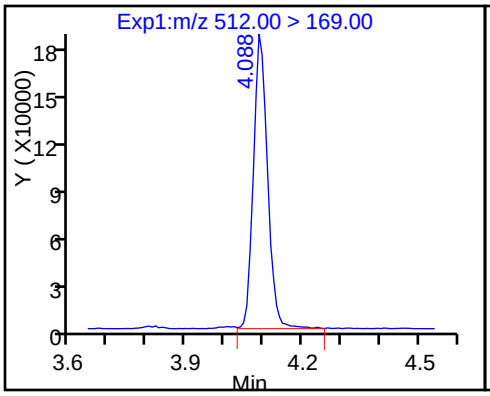
49 N-ethyl perfluorooctane sulfonamid



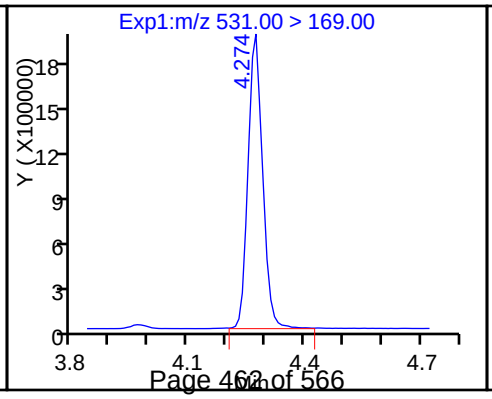
D 52 d-N-MeFOSA-M



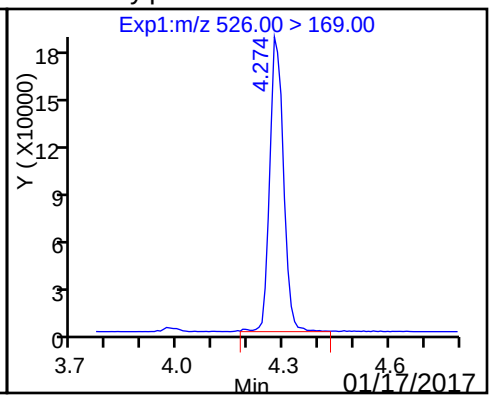
54 MeFOSA



D 51 d-N-EtFOSA-M



53 N-ethylperfluoro-1-octanesulfonami



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_016.d
Lims ID: IC L4 Add-on
Client ID:
Sample Type: IC Calib Level: 4
Inject. Date: 09-Jan-2017 15:01:24 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*sub11

Method: \\ChromNa\Sacramento\ChromData\A8_N\20170109-38635.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 09-Jan-2017 16:00:45 Calib Date: 09-Jan-2017 15:16:24
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: chandrasenas Date: 09-Jan-2017 15:53:44

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
48 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.886	2.894	-0.008	1.000	2343760	21.2		112		
D 47 M2-6:2FTS										
429.00 > 409.00	2.886	2.895	-0.009		6066171	45.4		95.7		
D 42 M2-8:2FTS										
529.00 > 509.00	3.632	3.637	-0.005		6251863	46.3		96.7		
43 Sodium 1H,1H,2H,2H-perfluorooctane										
527.00 > 507.00	3.632	3.639	-0.007	1.000	2386530	20.9		109		
D 45 d3-NMeFOSAA										
573.00 > 419.00	3.789	3.804	-0.015		4062854	49.7		99.4		
44 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.798	3.808	-0.010	1.002	1601725	21.3		106		
D 46 d5-NEtFOSAA										
589.00 > 419.00	3.963	3.970	-0.007		4590414	50.7		101		
49 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.963	3.980	-0.017	1.000	1618448	20.9		104		
D 52 d-N-MeFOSA-M										
515.00 > 169.00	4.085	4.092	-0.007		5129394	49.9		99.9		
54 MeFOSA										
512.00 > 169.00	4.085	4.093	-0.008	1.000	1818170	20.7		104		
D 51 d-N-EtFOSA-M										
531.00 > 169.00	4.271	4.278	-0.007		4947581	49.4		98.8		
53 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.271	4.282	-0.011	1.000	1922089	20.9		105		

Reagents:

LCPFC2-L4_00003 Amount Added: 1.00 Units: mL

Report Date: 09-Jan-2017 16:00:45 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_016.d

Injection Date: 09-Jan-2017 15:01:24 Instrument ID: A8_N

Lims ID: IC L4 Add-on

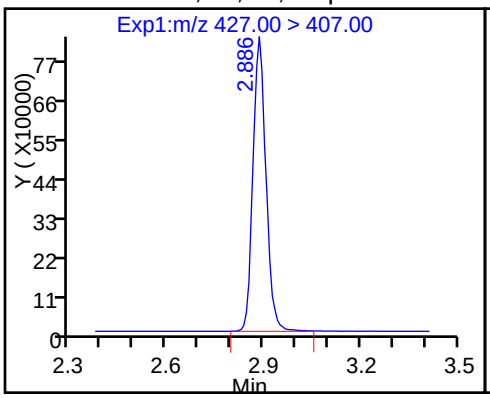
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 49 Worklist Smp#: 16

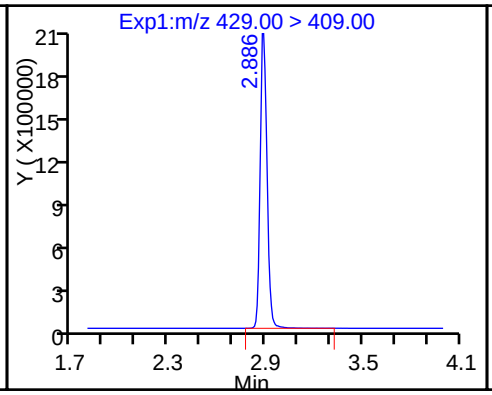
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

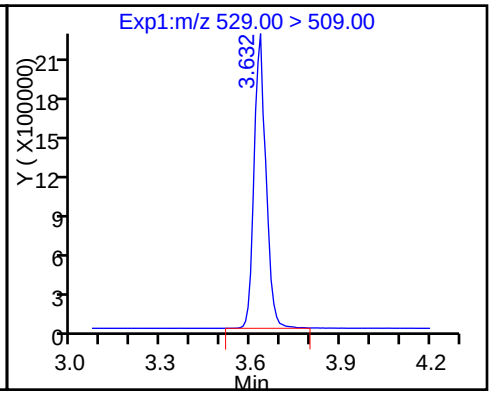
48 Sodium 1H,1H,2H,2H-perfluorooctane



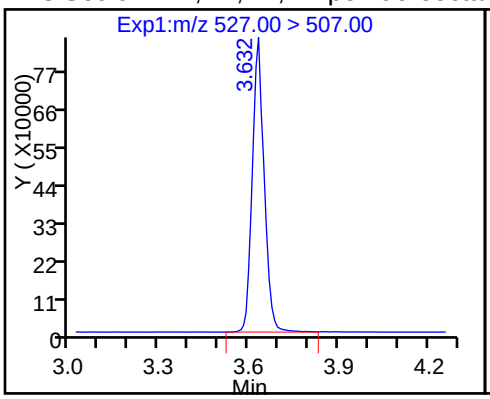
D 47 M2-6:2FTS



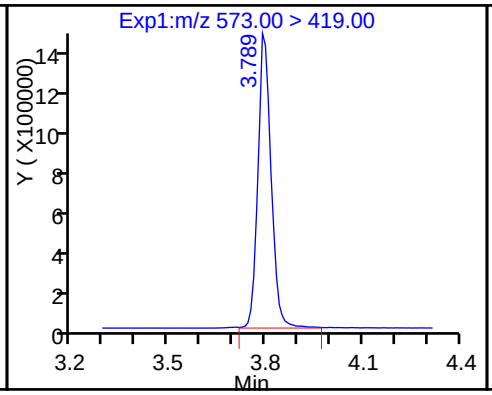
D 42 M2-8:2FTS



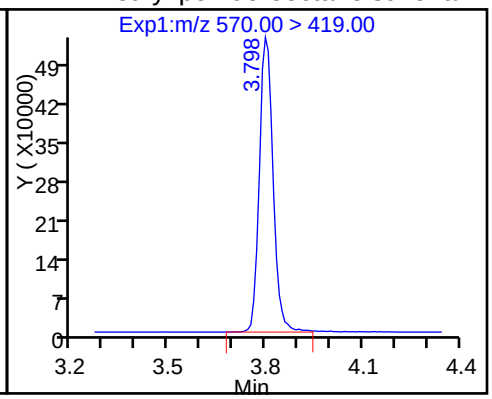
43 Sodium 1H,1H,2H,2H-perfluorooctane



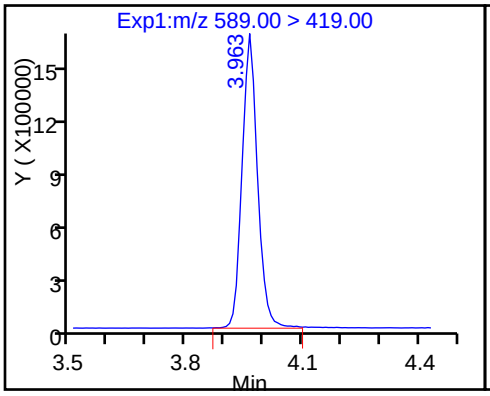
D 45 d3-NMeFOSAA



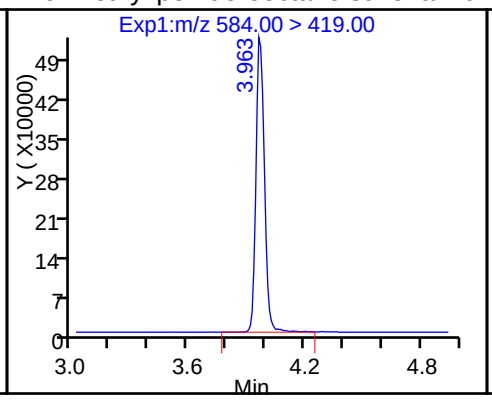
44 N-methyl perfluorooctane sulfonami



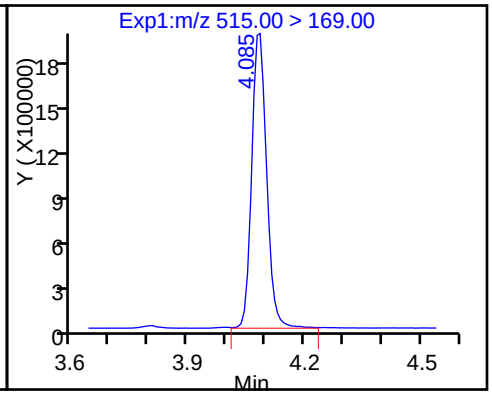
D 46 d5-NEtFOSAA



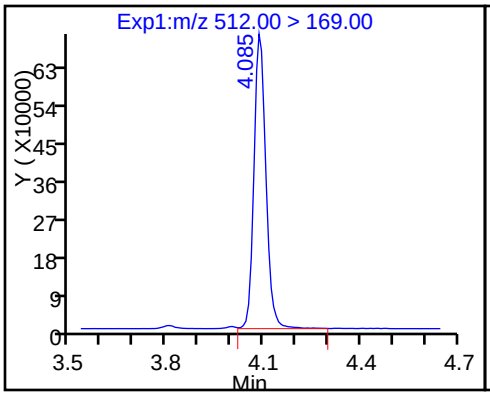
49 N-ethyl perfluorooctane sulfonamid



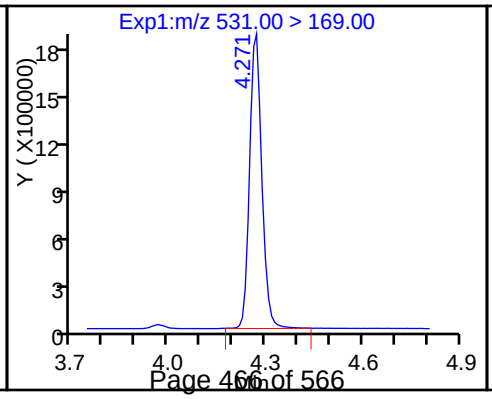
D 52 d-N-MeFOSA-M



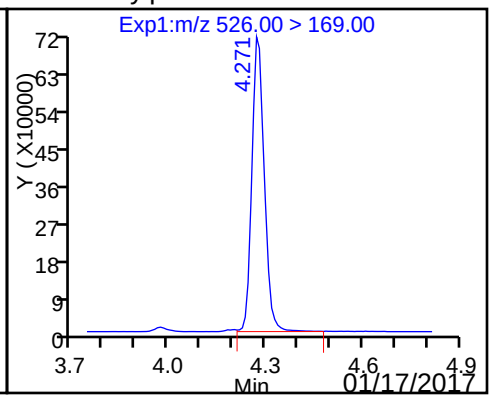
54 MeFOSA



D 51 d-N-EtFOSA-M



53 N-ethylperfluoro-1-octanesulfonami



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_017.d
Lims ID: IC L5 Add-on
Client ID:
Sample Type: IC Calib Level: 5
Inject. Date: 09-Jan-2017 15:08:54 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*sub11

Method: \\ChromNa\Sacramento\ChromData\A8_N\20170109-38635.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 09-Jan-2017 16:00:47 Calib Date: 09-Jan-2017 15:16:24
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: chandrasenas Date: 09-Jan-2017 15:55:53

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
48 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.894	2.894	0.0	1.000	5654816	49.3		104		
D 47 M2-6:2FTS										
429.00 > 409.00	2.894	2.895	-0.001		6288992	47.1		99.2		
D 42 M2-8:2FTS										
529.00 > 509.00	3.644	3.637	0.007		6549548	48.5		101		
43 Sodium 1H,1H,2H,2H-perfluorooctane										
527.00 > 507.00	3.644	3.639	0.005	1.000	6041633	50.5		105		
D 45 d3-NMeFOSAA										
573.00 > 419.00	3.811	3.804	0.007		4165665	51.0		102		
44 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.811	3.808	0.003	1.000	3905646	50.6		101		
D 46 d5-NEtFOSAA										
589.00 > 419.00	3.977	3.970	0.007		4536579	50.1		100		
49 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.986	3.980	0.006	1.002	3924762	51.2		102		
D 52 d-N-MeFOSA-M										
515.00 > 169.00	4.099	4.092	0.007		5258323	51.2		102		
54 MeFOSA										
512.00 > 169.00	4.099	4.093	0.006	1.000	4627255	51.5		103		
D 51 d-N-EtFOSA-M										
531.00 > 169.00	4.288	4.278	0.010		5133039	51.3		103		
53 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.288	4.282	0.006	1.000	4980246	52.3		105		

Reagents:

LCPFC2-L5_00005 Amount Added: 1.00 Units: mL

Report Date: 09-Jan-2017 16:00:48 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_017.d

Injection Date: 09-Jan-2017 15:08:54 Instrument ID: A8_N

Lims ID: IC L5 Add-on

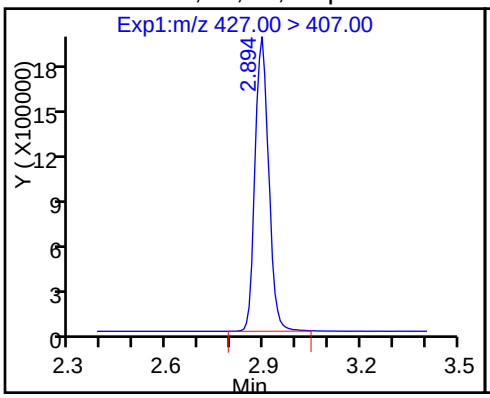
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 50 Worklist Smp#: 17

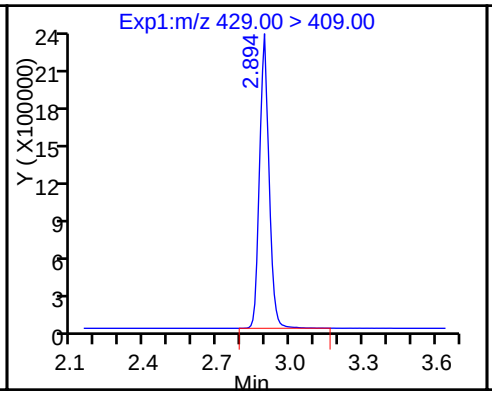
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

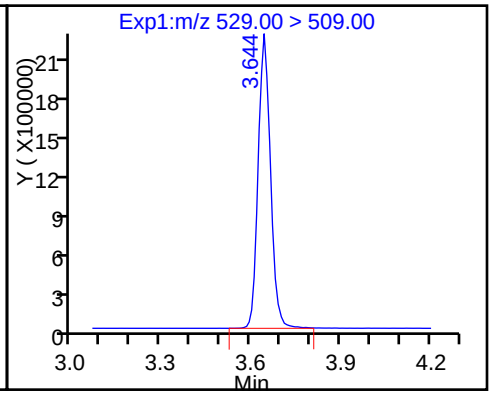
48 Sodium 1H,1H,2H,2H-perfluorooctane



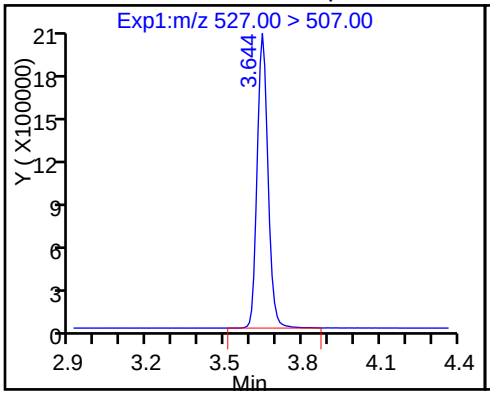
D 47 M2-6:2FTS



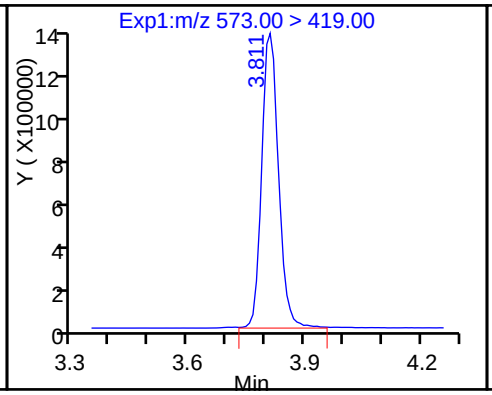
D 42 M2-8:2FTS



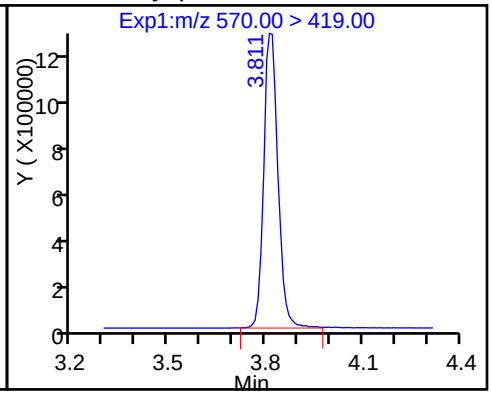
43 Sodium 1H,1H,2H,2H-perfluorooctane



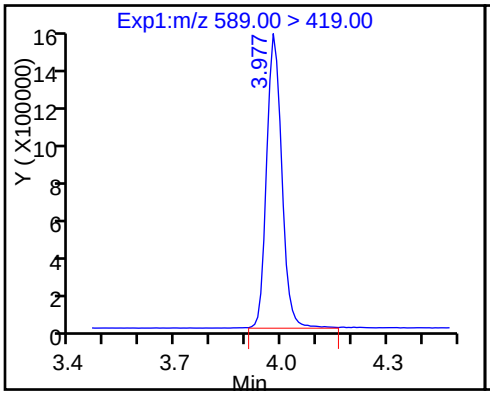
D 45 d3-NMeFOSAA



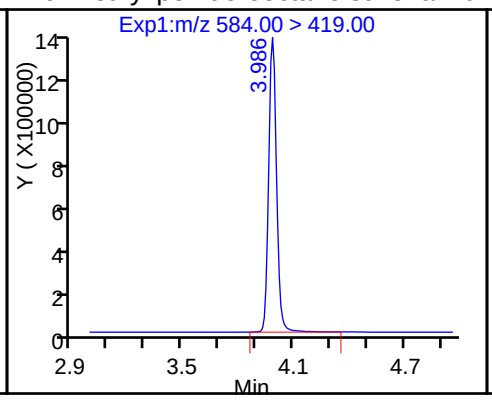
44 N-methyl perfluorooctane sulfonami



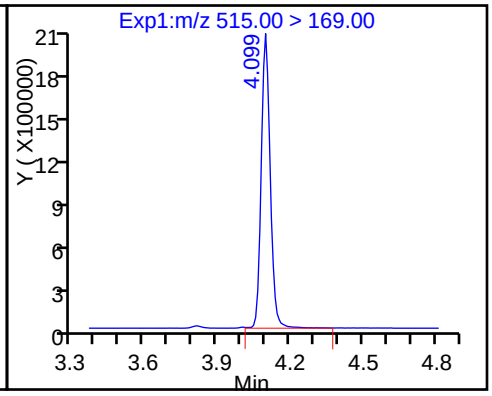
D 46 d5-NEtFOSAA



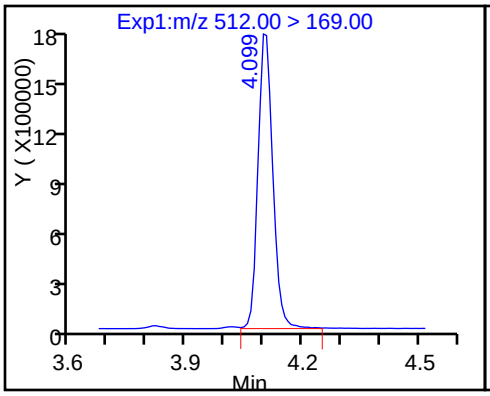
49 N-ethyl perfluorooctane sulfonamid



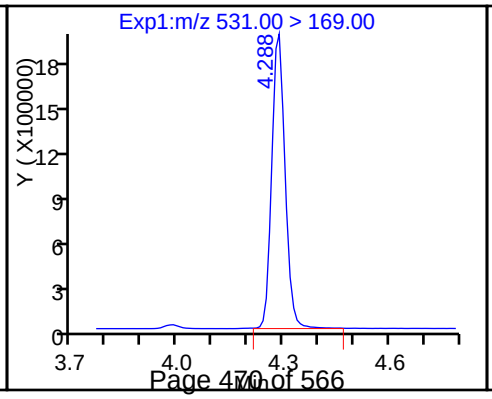
D 52 d-N-MeFOSA-M



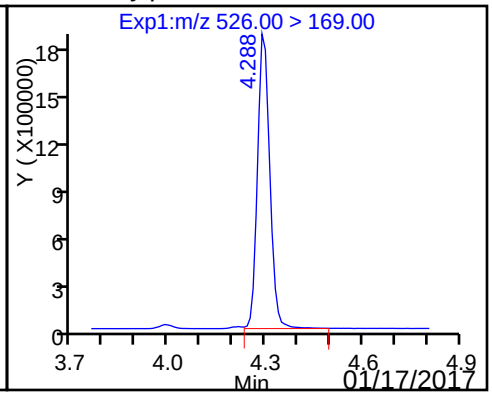
54 MeFOSA



D 51 d-N-EtFOSA-M



53 N-ethylperfluoro-1-octanesulfonami



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_018.d
Lims ID: IC L6 Add-on
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 09-Jan-2017 15:16:24 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*sub11

Method: \\ChromNa\Sacramento\ChromData\A8_N\20170109-38635.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 09-Jan-2017 16:00:49 Calib Date: 09-Jan-2017 15:16:24
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK002

First Level Reviewer: chandrasenas Date: 09-Jan-2017 15:56:06

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
48 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.909	2.894	0.015	1.000	20518891	172.0		90.7		
D 47 M2-6:2FTS										
429.00 > 409.00	2.909	2.895	0.014		6537880	49.0		103		
D 42 M2-8:2FTS										
529.00 > 509.00	3.655	3.637	0.018		6843326	50.7		106		
43 Sodium 1H,1H,2H,2H-perfluorooctane										
527.00 > 507.00	3.655	3.639	0.016	1.000	21834494	174.7		91.2		
D 45 d3-NMeFOSAA										
573.00 > 419.00	3.821	3.804	0.017		3737345	45.7		91.5		
44 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.830	3.808	0.022	1.002	15249090	220.2		110		
D 46 d5-NEtFOSAA										
589.00 > 419.00	3.988	3.970	0.018		4143372	45.8		91.5		
49 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.997	3.980	0.017	1.002	15124627	215.9		108		
D 52 d-N-MeFOSA-M										
515.00 > 169.00	4.108	4.092	0.016		4957068	48.3		96.5		
54 MeFOSA										
512.00 > 169.00	4.108	4.093	0.015	1.000	18209166	214.9		107		
D 51 d-N-EtFOSA-M										
531.00 > 169.00	4.293	4.278	0.015		4849132	48.4		96.9		
53 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.303	4.282	0.021	1.000	19094248	212.3		106		

Reagents:

LCPFC2-L6_00003 Amount Added: 1.00 Units: mL

Report Date: 09-Jan-2017 16:00:50 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_018.d

Injection Date: 09-Jan-2017 15:16:24 Instrument ID: A8_N

Lims ID: IC L6 Add-on

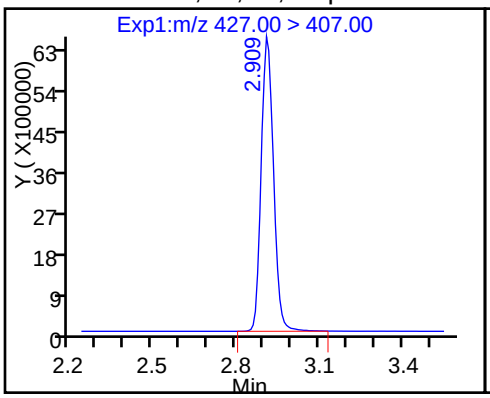
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 51 Worklist Smp#: 18

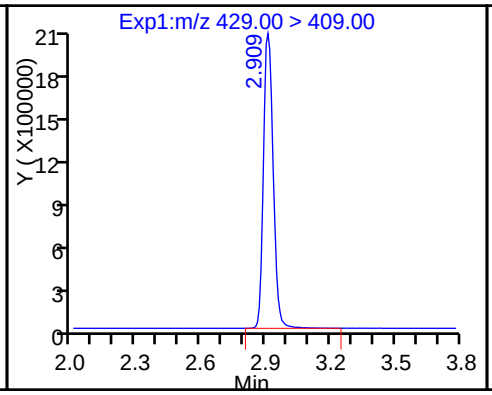
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

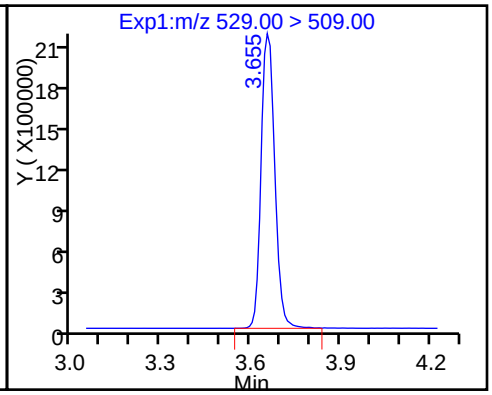
48 Sodium 1H,1H,2H,2H-perfluorooctane



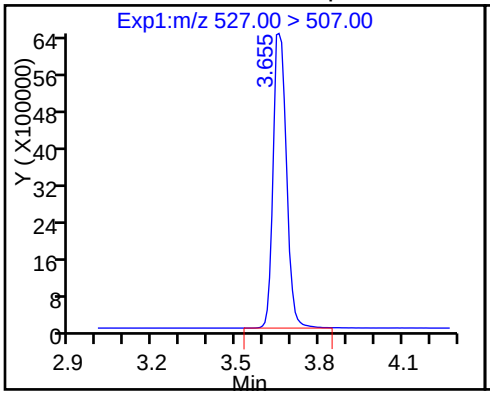
D 47 M2-6:2FTS



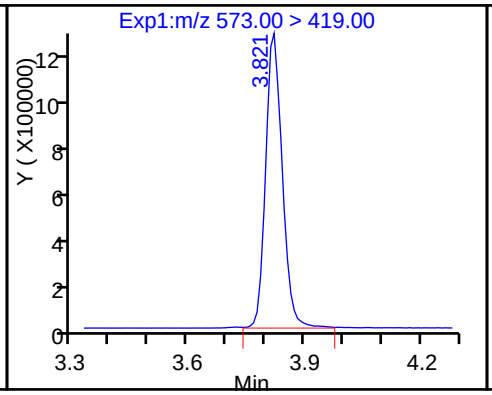
D 42 M2-8:2FTS



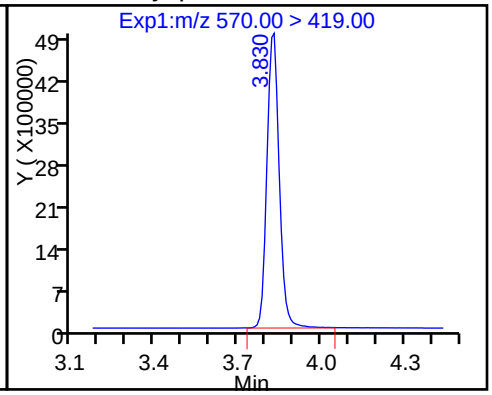
43 Sodium 1H,1H,2H,2H-perfluorooctane



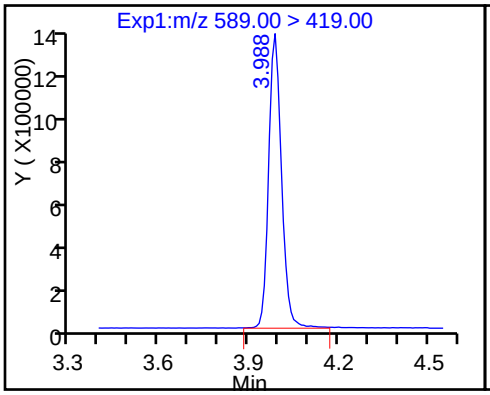
D 45 d3-NMeFOSAA



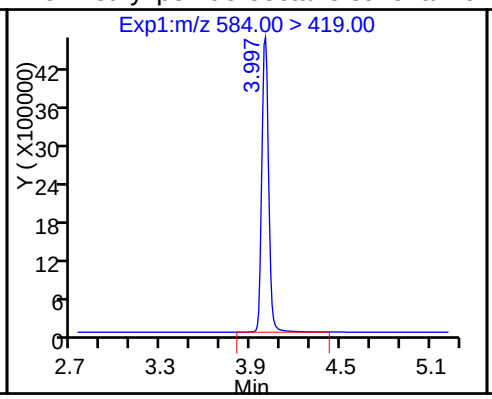
44 N-methyl perfluorooctane sulfonami



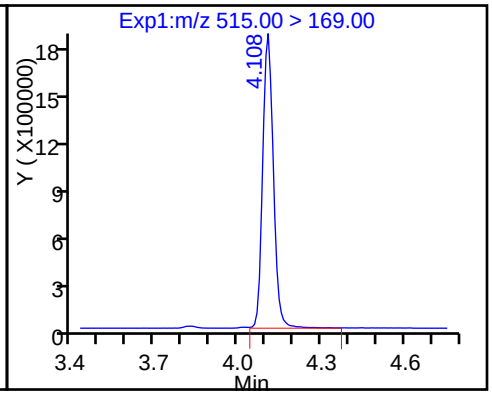
D 46 d5-NEtFOSAA



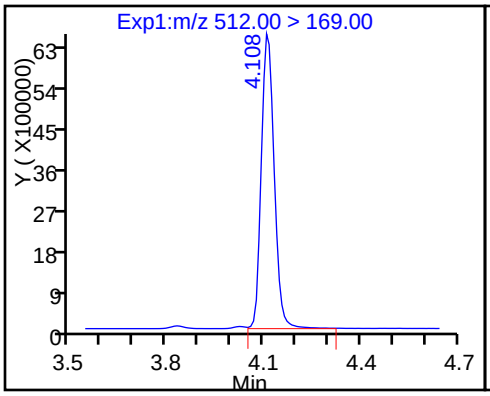
49 N-ethyl perfluorooctane sulfonamid



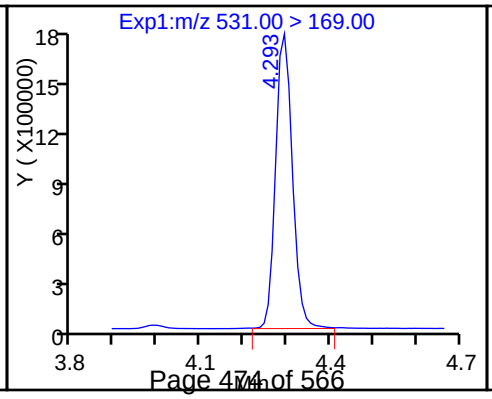
D 52 d-N-MeFOSA-M



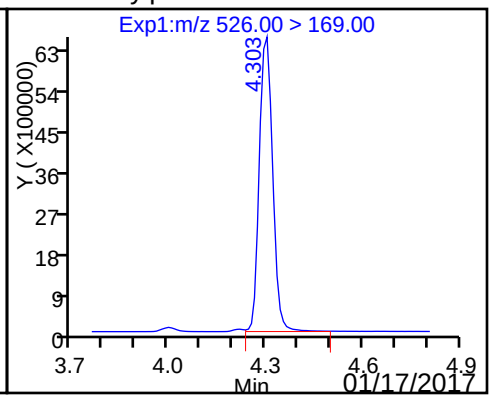
54 MeFOSA



D 51 d-N-EtFOSA-M



53 N-ethylperfluoro-1-octanesulfonami



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24961-1

SDG No.:

Lab Sample ID: ICV 320-145640/11 Calibration Date: 01/09/2017 14:23

Instrument ID: A8_N Calib Start Date: 01/09/2017 13:31

GC Column: Acquity ID: 2.10(mm) Calib End Date: 01/09/2017 15:16

Lab File ID: 09JAN2017A_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	0.8732	0.8577		49.1	50.0	-1.8	25.0
Perfluoropentanoic acid (PFPeA)	AveID	0.9834	0.9782		49.7	50.0	-0.5	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.515	1.549		45.3	44.3	2.3	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9250	0.9052		48.9	50.0	-2.1	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9857	0.9620		48.8	50.0	-2.4	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.048	0.9630		43.4	47.3	-8.1	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.085	1.153		50.6	47.6	6.3	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.004	0.9875		49.2	50.0	-1.6	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9528	0.9548		50.1	50.0	0.2	25.0
Perfluorooctane Sulfonate (PFOS)	AveID	1.013	0.9139		43.1	47.8	-9.8	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9377	0.9077		48.4	50.0	-3.2	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9300	0.8996		48.4	50.0	-3.3	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6377	0.6625		50.1	48.3	3.9	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9800	0.9539		48.7	50.0	-2.7	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9246	0.9064		49.0	50.0	-2.0	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.8916	0.9306		52.2	50.0	4.4	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.641	1.616		49.3	50.0	-1.5	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		0.9419		49.5	50.0	-1.0	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.7999	0.8560		53.5	50.0	7.0	25.0
13C4 PFBA	Ave	349384	310703		44.5	50.0	-11.1	50.0
13C5-PFPeA	Ave	276469	239141		43.2	50.0	-13.5	50.0
13C2 PFHxA	Ave	257652	229935		44.6	50.0	-10.8	50.0
13C4-PFHpA	Ave	223910	193945		43.3	50.0	-13.4	50.0
18O2 PFHxS	Ave	324397	296095		43.2	47.3	-8.7	50.0
13C4 PFOA	Ave	241947	203669		42.1	50.0	-15.8	50.0
13C4 PFOS	Ave	259571	229948		42.3	47.8	-11.4	50.0
13C5 PFNA	Ave	183400	160008		43.6	50.0	-12.8	50.0
13C8 FOSA	Ave	409635	384192		46.9	50.0	-6.2	50.0
13C2 PFDA	Ave	180118	159346		44.2	50.0	-11.5	50.0
13C2 PFUnA	Ave	135855	117262		43.2	50.0	-13.7	50.0
13C2 PFDoA	Ave	130008	113417		43.6	50.0	-12.8	50.0
13C2-PFTeDA	Ave	242238	216958		44.8	50.0	-10.4	50.0
13C2-PFHxDA	Ave	133587	124667		46.7	50.0	-6.7	50.0

FORM VII 537 (Modified)

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_011.d
Lims ID: ICV
Client ID:
Sample Type: ICV
Inject. Date: 09-Jan-2017 14:23:55 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\20170109-38635.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 10-Jan-2017 11:09:14 Calib Date: 09-Jan-2017 15:16:24
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK013

First Level Reviewer: chandrasenas Date: 09-Jan-2017 15:52:34

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.617	1.598	0.019		15535163	44.5		88.9	1142525	
1 Perfluorobutyric acid										
212.90 > 169.00	1.625	1.600	0.025	1.000	13323675	49.1			129707	
D 4 13C5-PFPeA										
267.90 > 223.00	1.910	1.884	0.026		11957043	43.2		86.5	1434931	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.910	1.885	0.025	1.000	11696869	49.7			103764	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.948	1.924	0.024	1.000	20298237	45.3				
298.90 > 99.00	1.948	1.924	0.024	1.000	9199234		2.21(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.213	2.187	0.026		11496754	44.6		89.2	1041682	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.213	2.189	0.024	1.000	10406434	48.9			528948	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.555	2.530	0.025	1.000	9328892	48.8			103219	
D 11 13C4-PFHpA										
367.00 > 322.00	2.563	2.530	0.033		9697234	43.3		86.6	1093364	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.578	2.547	0.031	1.000	13472344	43.4				
D 10 18O2 PFHxS										
403.00 > 84.00	2.571	2.548	0.023		14005282	43.2		91.3	1609103	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.923	2.891	0.032	1.000	10056204	49.2			90560	
413.00 > 169.00	2.923	2.891	0.032	1.000	6059435		1.66(0.90-1.10)		294068	
D 14 13C4 PFOA										
417.00 > 372.00	2.915	2.891	0.024		10183467	42.1		84.2	677890	

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	2.923	2.898	0.025	1.000	12624520	50.6				
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.292	3.221	0.071	1.000	10034072	43.1			417316	
499.00 > 99.00	3.292	3.221	0.071	1.000	2407971		4.17(0.90-1.10)		168150	
D 17 13C4 PFOS										
503.00 > 80.00	3.284	3.261	0.023		10991538	42.3		88.6	283702	
20 Perfluorononanoic acid										
463.00 > 419.00	3.292	3.261	0.031	1.000	7638584	50.1			130242	
D 19 13C5 PFNA										
468.00 > 423.00	3.299	3.263	0.036		8000423	43.6		87.2	502244	
D 21 13C8 FOSA										
506.00 > 78.00	3.603	3.570	0.033		19209580	46.9		93.8	547347	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.603	3.574	0.029	1.000	17435652	48.4			1156529	
D 23 13C2 PFDA										
515.00 > 470.00	3.645	3.621	0.024		7967293	44.2		88.5	254545	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.645	3.621	0.024	1.000	7167343	48.4			192812	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.960	3.929	0.031	1.000	7350136	50.1				
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.978	3.951	0.027	1.000	5592978	48.7			117201	
D 27 13C2 PFUnA										
565.00 > 520.00	3.988	3.953	0.035		5863094	43.2		86.3	326580	
D 30 13C2 PFDoA										
615.00 > 570.00	4.272	4.245	0.027		5670827	43.6		87.2	187165	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.280	4.247	0.033	1.000	5140220	49.0			52839	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.538	4.516	0.022	1.000	5277397	52.2			6238	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.780	4.758	0.022	1.000	9164720	49.3			3632	
713.00 > 169.00	4.780	4.758	0.022	1.000	1453646		6.30(0.00-0.00)		103167	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.780	4.758	0.022		10847892	44.8		89.6	623373	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.207	5.179	0.028		6233362	46.7		93.3	86837	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.207	5.180	0.027	1.000	5341466	49.5			4065	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.573	5.554	0.019	1.000	4854446	53.5			5141	

Reagents:

LCPFCIC_00020 Amount Added: 1.00 Units: mL

Report Date: 10-Jan-2017 11:09:14 Chrom Revision: 2.2 09-Jan-2017 13:04:14

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_011.d

Injection Date: 09-Jan-2017 14:23:55 Instrument ID: A8_N

Lims ID: ICV

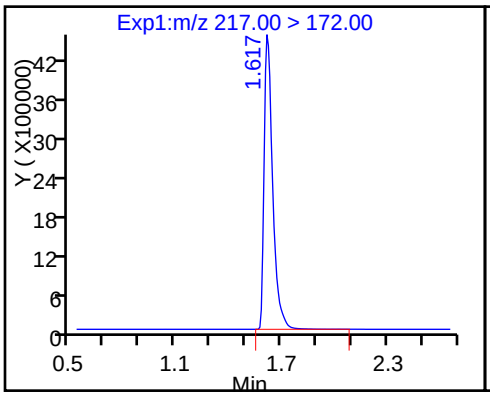
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 44 Worklist Smp#: 11

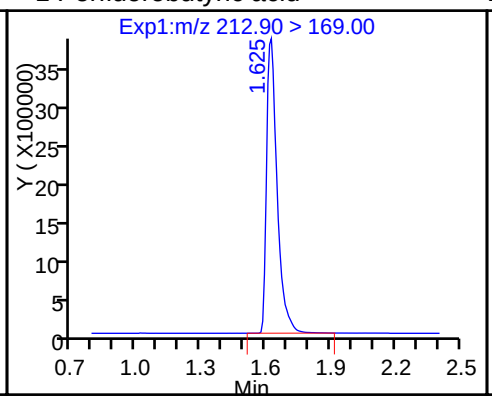
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

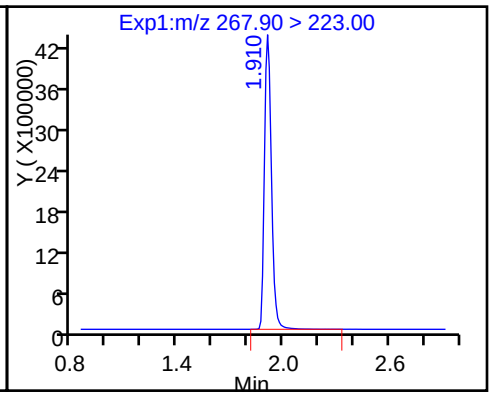
D 2 13C4 PFBA



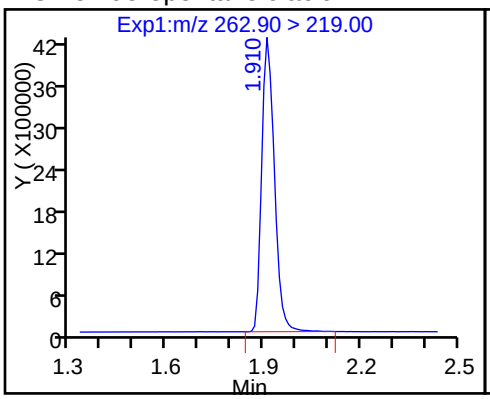
1 Perfluorobutyric acid



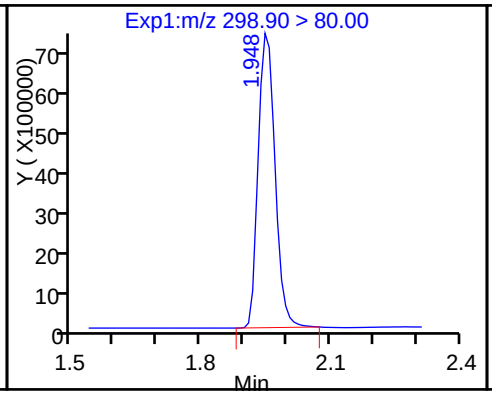
D 4 13C5-PFPeA



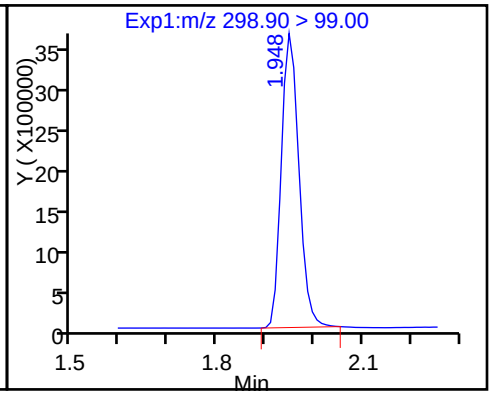
3 Perfluoropentanoic acid



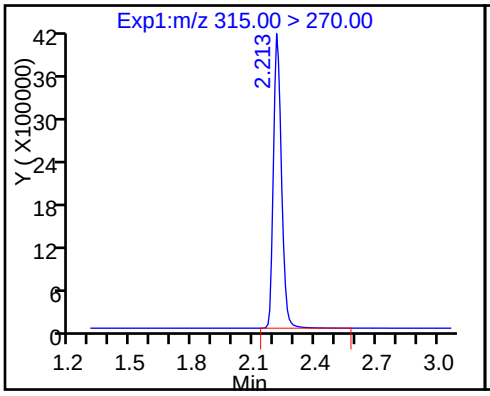
5 Perfluorobutanesulfonic acid



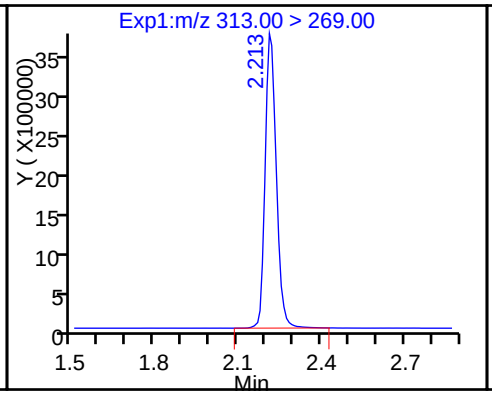
5 Perfluorobutanesulfonic acid



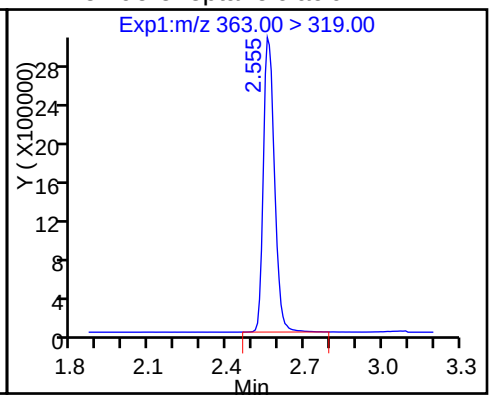
D 6 13C2 PFHxA



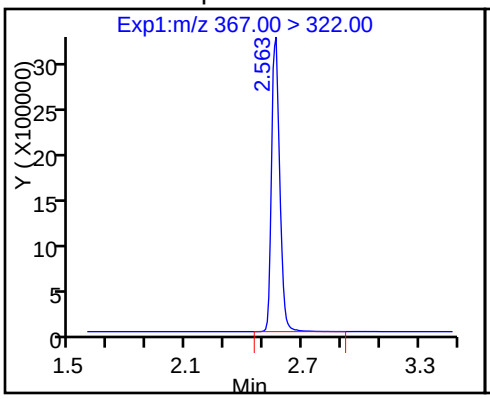
7 Perfluorohexanoic acid



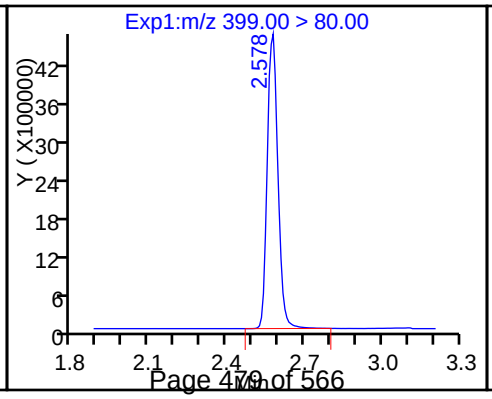
12 Perfluoroheptanoic acid



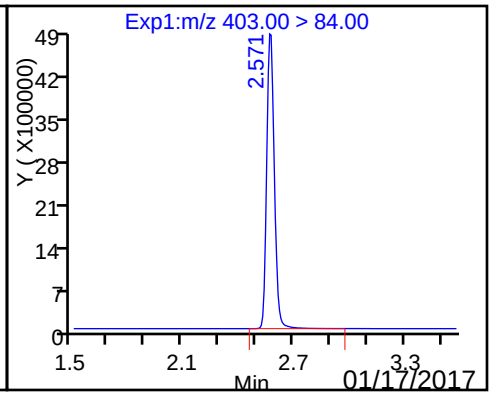
D 11 13C4-PFHpA



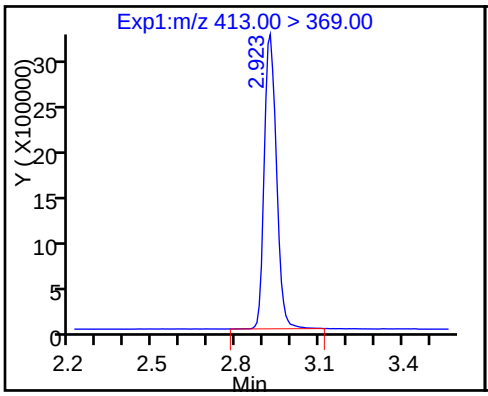
9 Perfluorohexanesulfonic acid



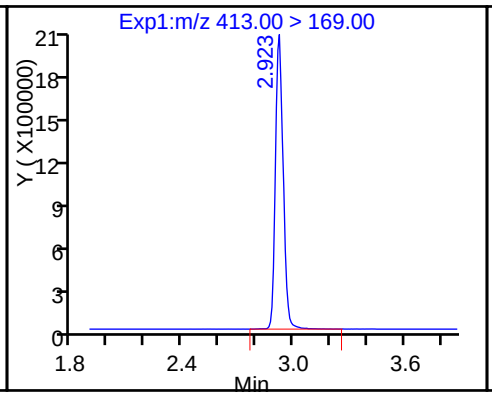
D 10 18O2 PFHxS



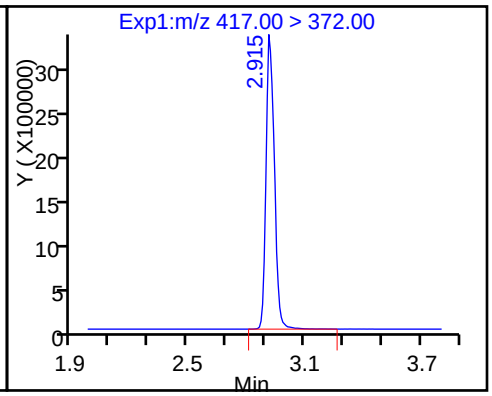
15 Perfluorooctanoic acid



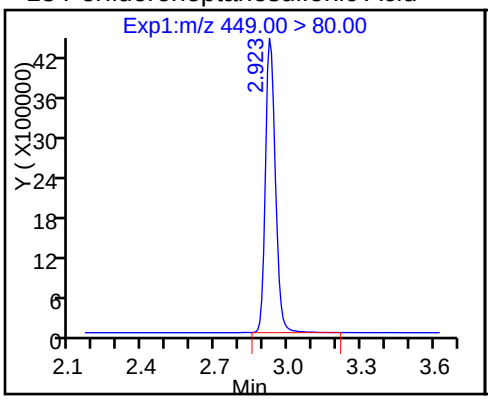
15 Perfluorooctanoic acid



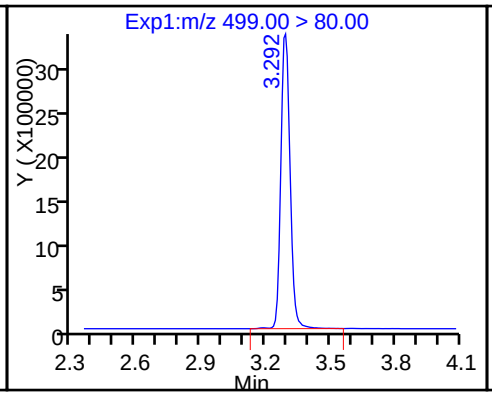
D 14 13C4 PFOA



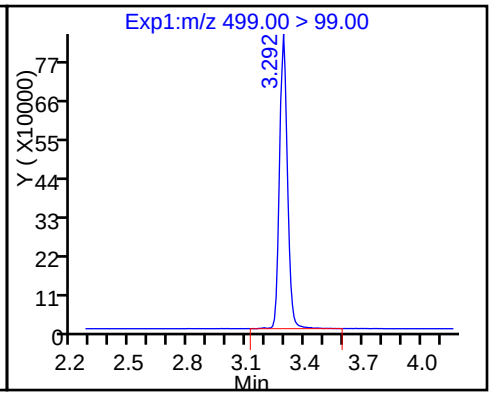
13 Perfluoroheptanesulfonic Acid



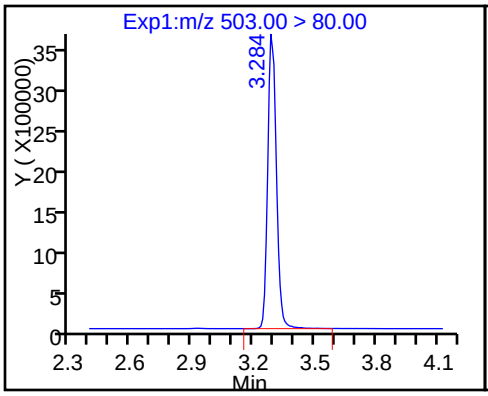
18 Perfluorooctane sulfonic acid



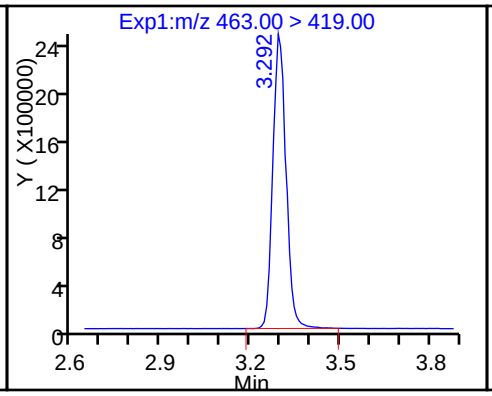
18 Perfluorooctane sulfonic acid



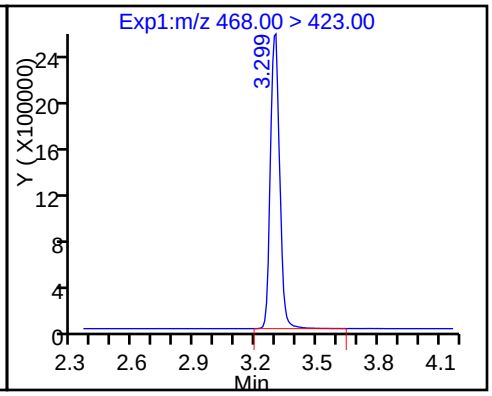
D 17 13C4 PFOS



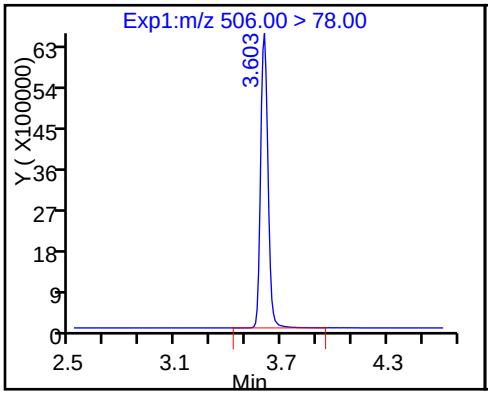
20 Perfluorononanoic acid



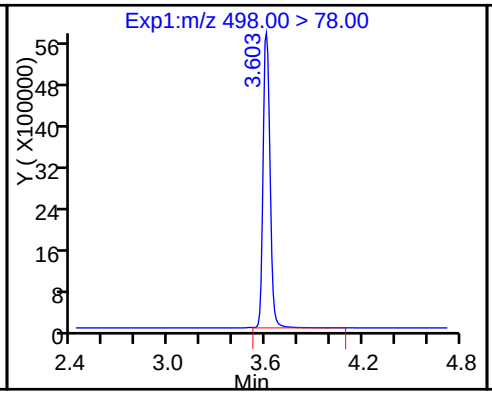
D 19 13C5 PFNA



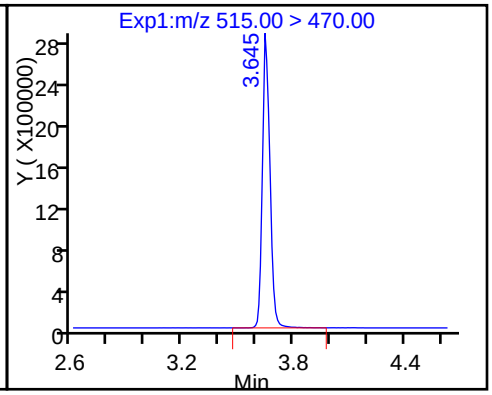
D 21 13C8 FOSA



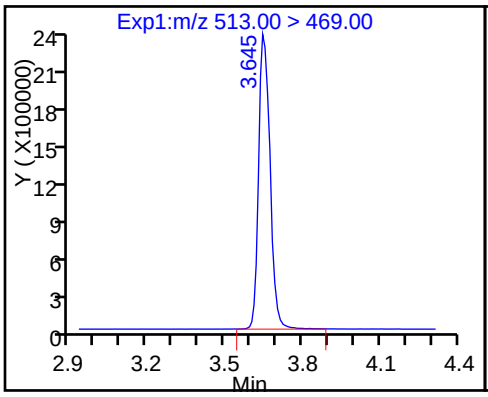
22 Perfluorooctane Sulfonamide



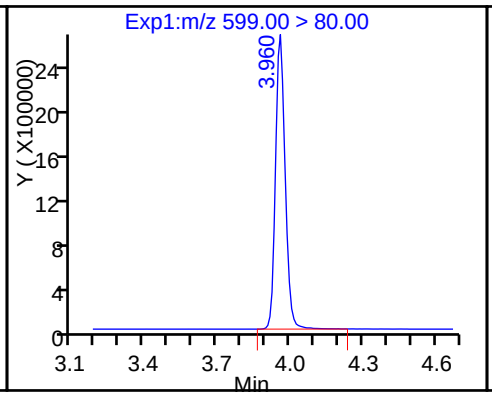
D 23 13C2 PFDA



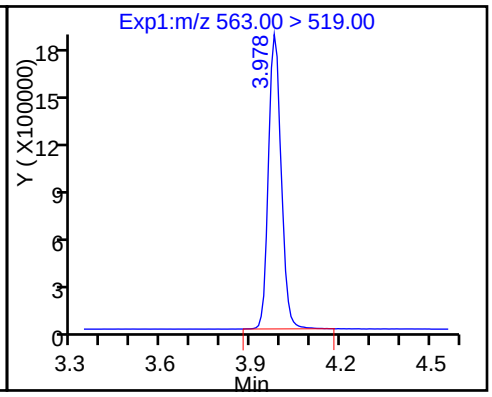
24 Perfluorodecanoic acid



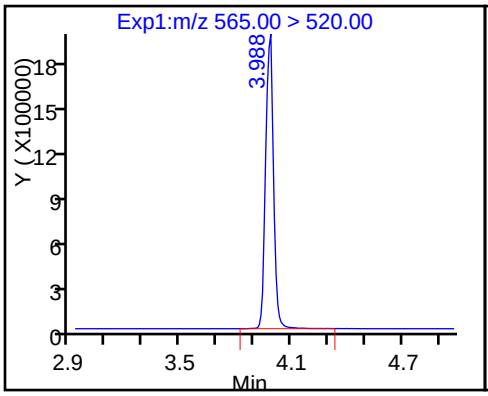
26 Perfluorodecane Sulfonic acid



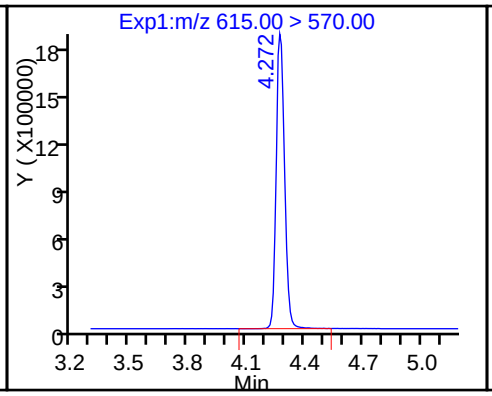
28 Perfluoroundecanoic acid



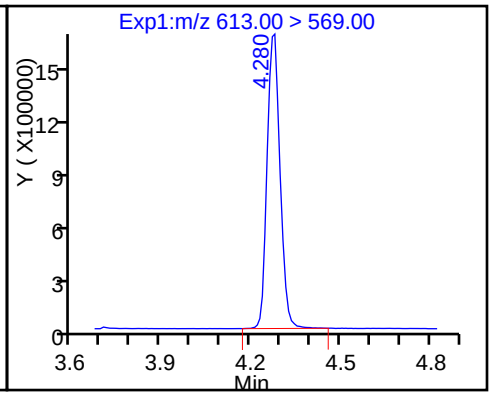
D 27 13C2 PFUnA



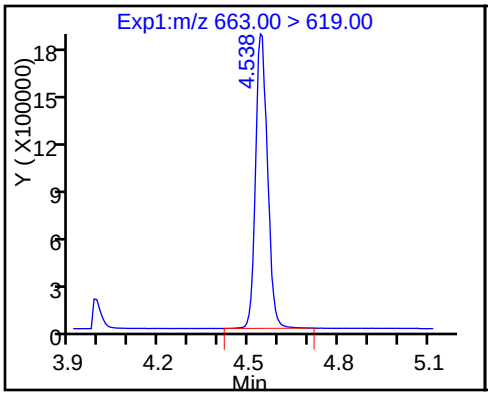
D 30 13C2 PFDoA



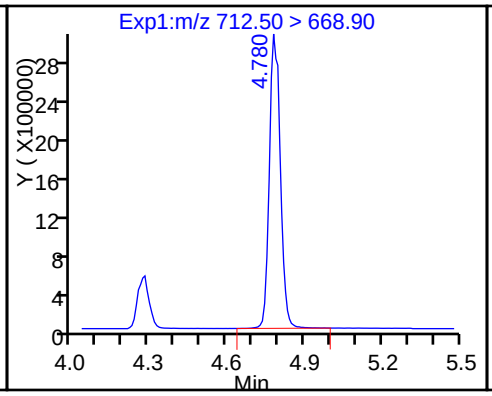
29 Perfluorododecanoic acid



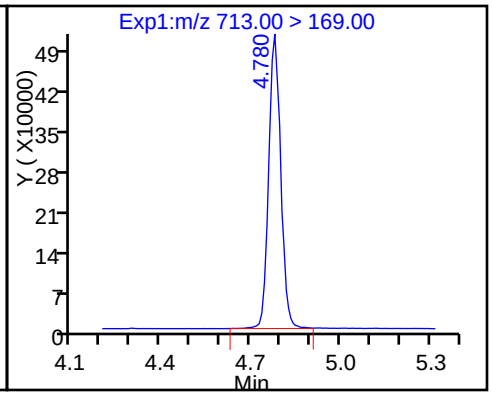
31 Perfluorotridecanoic acid



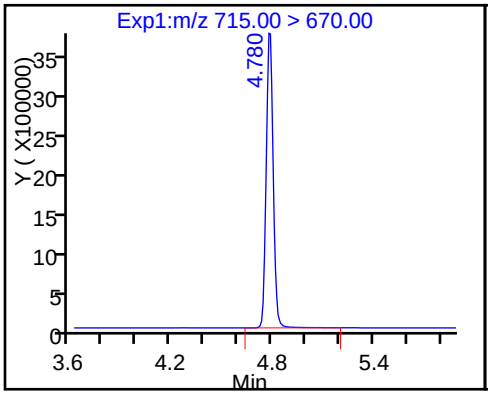
33 Perfluorotetradecanoic acid



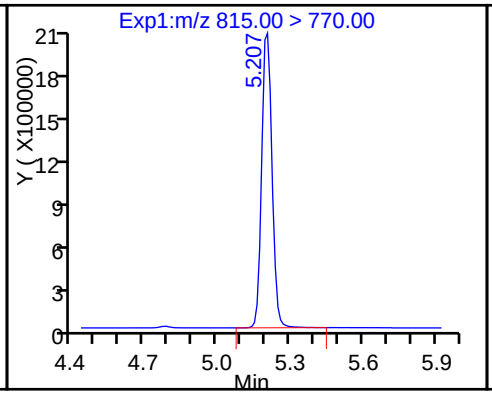
33 Perfluorotetradecanoic acid



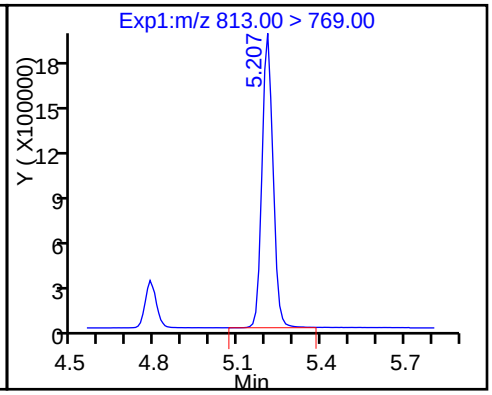
D 32 13C2-PFTeDA



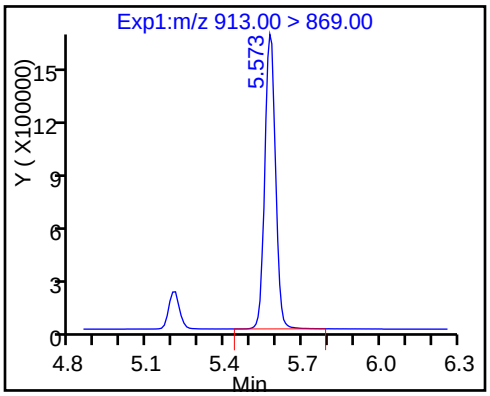
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24961-1

SDG No.:

Lab Sample ID: CCV 320-146533/4 Calibration Date: 01/16/2017 13:41

Instrument ID: A8_N Calib Start Date: 01/09/2017 13:31

GC Column: Acquity ID: 2.10(mm) Calib End Date: 01/09/2017 15:16

Lab File ID: 16JAN2017_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	0.8732	0.8468		0.970	1.00	-3.0	50.0
Perfluoropentanoic acid (PFPeA)	AveID	0.9834	1.002		1.02	1.00	1.9	50.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.515	1.506		0.879	0.884	-0.6	50.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9250	0.9537		1.03	1.00	3.1	50.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9857	1.050		1.07	1.00	6.5	50.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.048	1.138		0.988	0.910	8.5	50.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.085	1.028		0.902	0.952	-5.2	50.0
Perfluorooctanoic acid (PFOA)	AveID	1.004	1.096		1.09	1.00	9.2	50.0
Perfluorononanoic acid (PFNA)	AveID	0.9528	0.8709		0.914	1.00	-8.6	50.0
Perfluorooctane Sulfonate (PFOS)	AveID	1.013	0.9452		0.866	0.928	-6.7	50.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9377	0.9321		0.994	1.00	-0.6	50.0
Perfluorodecanoic acid (PFDA)	AveID	0.9300	0.9611		1.03	1.00	3.4	50.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6377	0.5848		0.884	0.964	-8.3	50.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9800	0.9551		0.975	1.00	-2.5	50.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9246	0.9183		0.993	1.00	-0.7	50.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.8916	0.9286		1.04	1.00	4.1	50.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.641	1.806		1.10	1.00	10.1	50.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		1.388		1.02	1.00	1.8	50.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.7999	0.7501		0.938	1.00	-6.2	50.0
13C4 PFBA	Ave	349384	350480		50.2	50.0	0.3	50.0
13C5-PFPeA	Ave	276469	265214		48.0	50.0	-4.1	50.0
13C2 PFHxA	Ave	257652	241474		46.9	50.0	-6.3	50.0
13C4-PFHpA	Ave	223910	214997		48.0	50.0	-4.0	50.0
18O2 PFHxS	Ave	324397	322797		47.1	47.3	-0.5	50.0
13C4 PFOA	Ave	241947	236974		49.0	50.0	-2.1	50.0
13C4 PFOS	Ave	259571	259602		47.8	47.8	0.0	50.0
13C5 PFNA	Ave	183400	190599		52.0	50.0	3.9	50.0
13C8 FOSA	Ave	409635	387882		47.3	50.0	-5.3	50.0
13C2 PFDA	Ave	180118	173573		48.2	50.0	-3.6	50.0
13C2 PFUnA	Ave	135855	134185		49.4	50.0	-1.2	50.0
13C2 PFDoA	Ave	130008	126006		48.5	50.0	-3.1	50.0
13C2-PFTeDA	Ave	242238	244121		50.4	50.0	0.8	50.0
13C2-PFHxDA	Ave	133587	123817		46.3	50.0	-7.3	50.0

FORM VII 537 (Modified)

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_002.d
Lims ID: CCV L2
Client ID:
Sample Type: CCVL
Inject. Date: 16-Jan-2017 13:41:48 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\20170116-38858.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 17-Jan-2017 09:48:53 Calib Date: 09-Jan-2017 15:16:24
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK027

First Level Reviewer: westendorfc Date: 16-Jan-2017 14:23:57

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.614	1.606	0.008		17523976	50.2		100	930656	
1 Perfluorobutyric acid										
212.90 > 169.00	1.614	1.614	0.0	1.000	296776	0.9697		97.0	1663	
D 4 13C5-PFPeA										
267.90 > 223.00	1.907	1.906	0.001		13260698	48.0		95.9	962295	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.916	1.906	0.010	1.000	265791	1.02		102	2747	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.945	1.945	0.0	1.000	429702	0.8790		99.4		
298.90 > 99.00	1.955	1.945	0.010	1.005	166301		2.58(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.229	2.225	0.004		12073688	46.9		93.7	1091515	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.229	2.225	0.004	1.000	230288	1.03		103	5964	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.601	2.591	0.010	1.000	334242	0.9878		109		
D 11 13C4-PFHpA										
367.00 > 322.00	2.578	2.568	0.010		10749847	48.0		96.0	466262	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.586	2.568	0.018	1.000	225741	1.07		107	3965	
D 10 18O2 PFHxS										
403.00 > 84.00	2.601	2.584	0.017		15268313	47.1		99.5	2676111	
D 14 13C4 PFOA										
417.00 > 372.00	2.963	2.944	0.019		11848718	49.0		97.9	787506	

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	2.963	2.952	0.011	1.000	259763	1.09		109	4191	
413.00 > 169.00	2.955	2.952	0.003	0.997	151182		1.72(0.90-1.10)		16345	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.963	2.952	0.011	1.000	254136	0.9025		94.8		
18 Perfluorooctane sulfonic acid										M
499.00 > 80.00	3.346	3.217	0.129	1.000	227702	0.8662		93.3	11707	M
499.00 > 99.00	3.338	3.217	0.121	0.998	51595		4.41(0.90-1.10)		2466	M
D 17 13C4 PFOS										
503.00 > 80.00	3.338	3.321	0.017		12408965	47.8		100	615307	
20 Perfluorononanoic acid										
463.00 > 419.00	3.338	3.329	0.009	1.000	166000	0.9141		91.4	2952	
D 19 13C5 PFNA										
468.00 > 423.00	3.346	3.329	0.017		9529966	52.0		104	624133	
D 21 13C8 FOSA										
506.00 > 78.00	3.603	3.591	0.012		19394088	47.3		94.7	739285	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.603	3.599	0.004	1.000	361549	0.99		99.4	32870	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.703	3.688	0.015	1.000	166826	1.03		103	4975	
D 23 13C2 PFDA										
515.00 > 470.00	3.703	3.697	0.006		8678633	48.2		96.4	202682	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	4.030	3.997	0.033	1.000	146337	0.8840		91.7		
28 Perfluoroundecanoic acid										
563.00 > 519.00	4.046	4.026	0.020	1.000	128155	0.9746		97.5	3670	
D 27 13C2 PFUnA										
565.00 > 520.00	4.046	4.026	0.020		6709245	49.4		98.8	332175	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.342	4.324	0.018	1.000	115707	0.99		99.3	163	
D 30 13C2 PFDoA										
615.00 > 570.00	4.342	4.324	0.018		6300285	48.5		96.9	169824	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.614	4.595	0.019	1.000	117002	1.04		104	163	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.863	4.838	0.025		12206064	50.4		101	685950	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.870	4.847	0.023	1.000	227543	1.10		110	117	
713.00 > 169.00	4.854	4.847	0.007	0.997	36168		6.29(0.00-0.00)		3105	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.307	5.274	0.033		6190831	46.3		92.7	105791	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.307	5.285	0.022	1.000	174933	1.02		102	192	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.706	5.672	0.034	1.000	94512	0.9376		93.8	124	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LCPFC-L2_00023 Amount Added: 1.00 Units: mL

Report Date: 17-Jan-2017 09:48:54 Chrom Revision: 2.2 10-Jan-2017 11:26:10

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_002.d

Injection Date: 16-Jan-2017 13:41:48 Instrument ID: A8_N

Lims ID: CCV L2

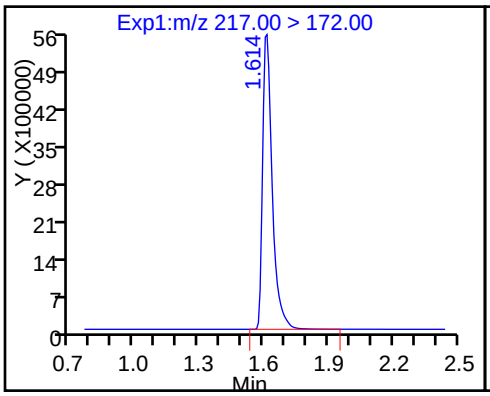
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 38 Worklist Smp#: 4

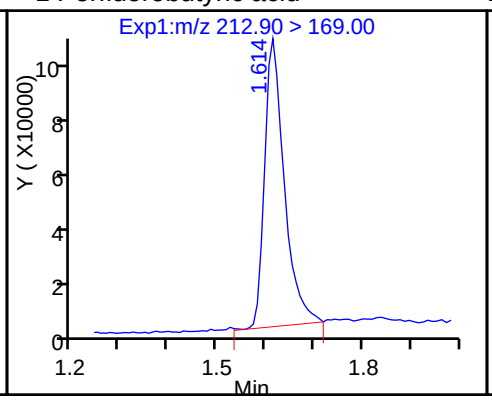
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

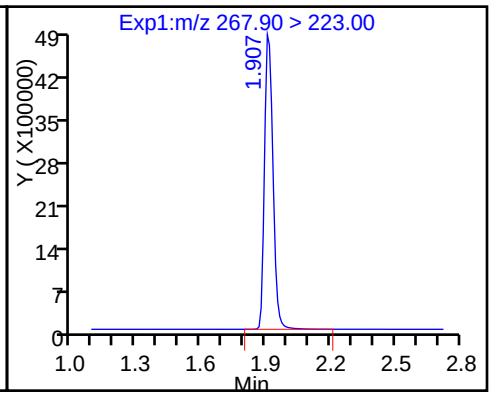
D 2 13C4 PFBA



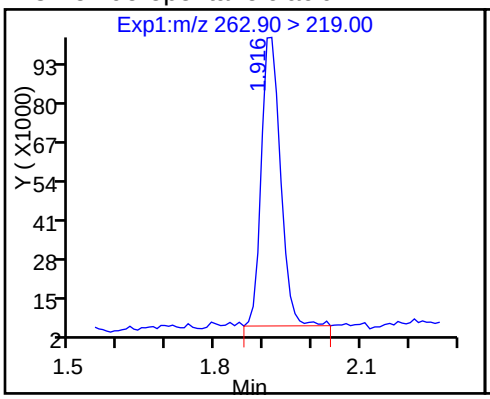
1 Perfluorobutyric acid



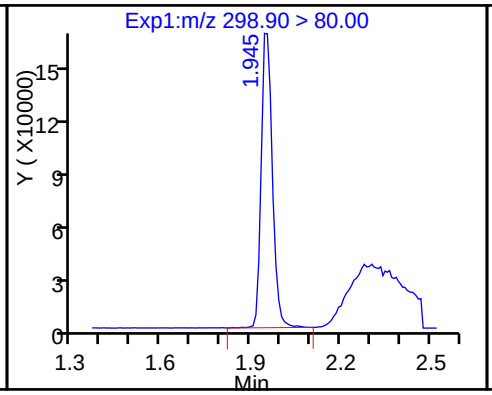
D 4 13C5-PFPeA



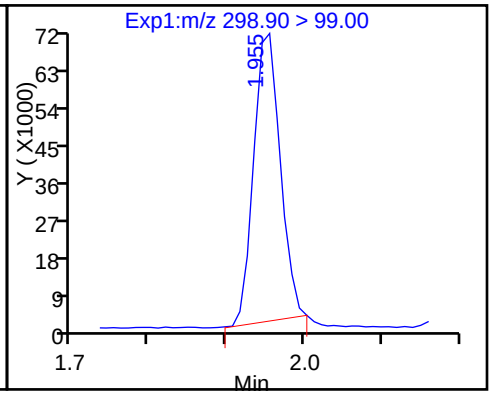
3 Perfluoropentanoic acid



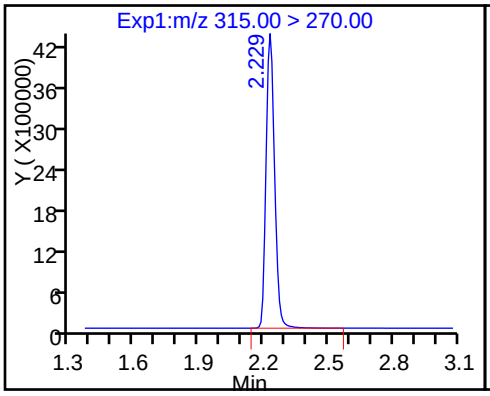
5 Perfluorobutanesulfonic acid



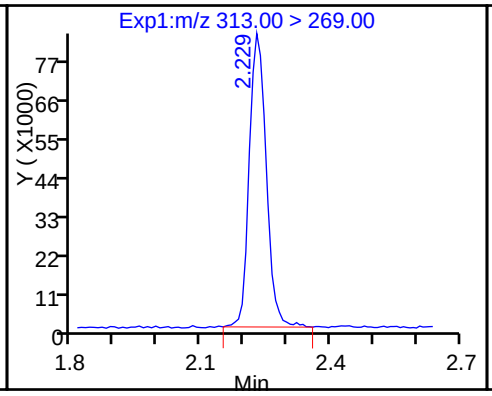
5 Perfluorobutanesulfonic acid



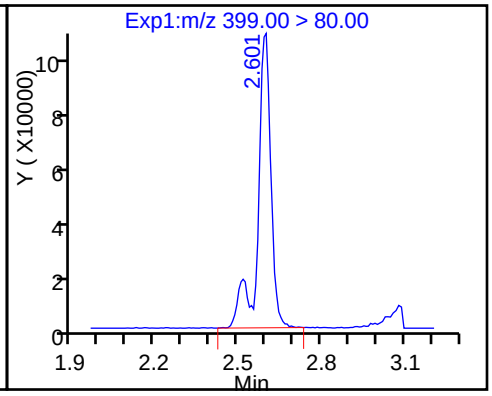
D 6 13C2 PFHxA



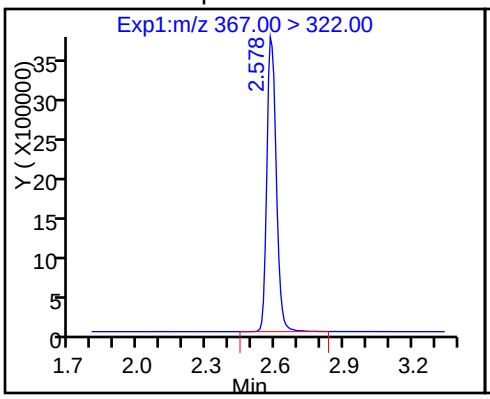
7 Perfluorohexanoic acid



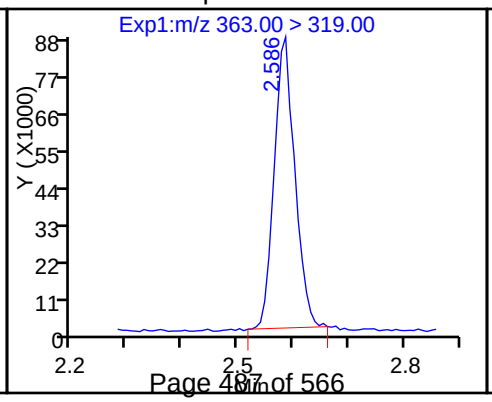
9 Perfluorohexanesulfonic acid



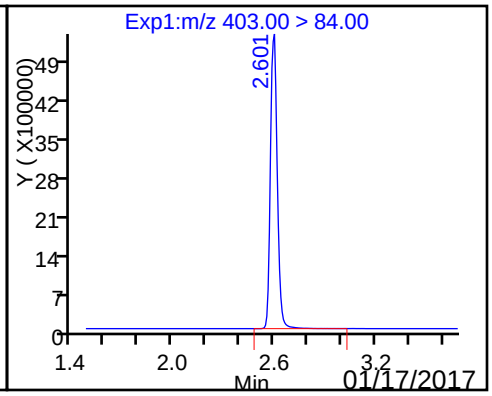
D 11 13C4-PFHpA



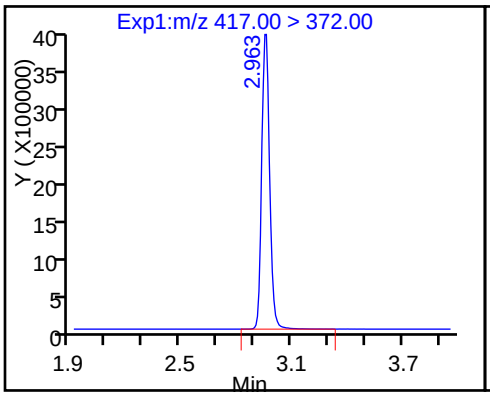
12 Perfluoroheptanoic acid



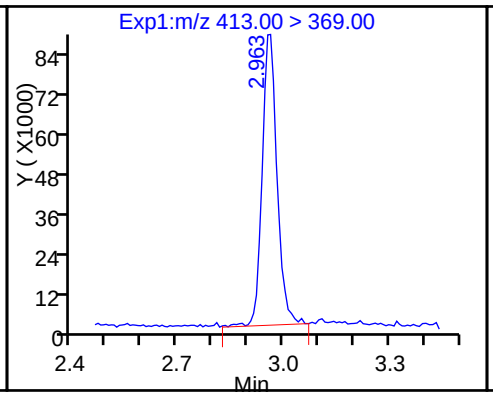
D 10 18O2 PFHxS



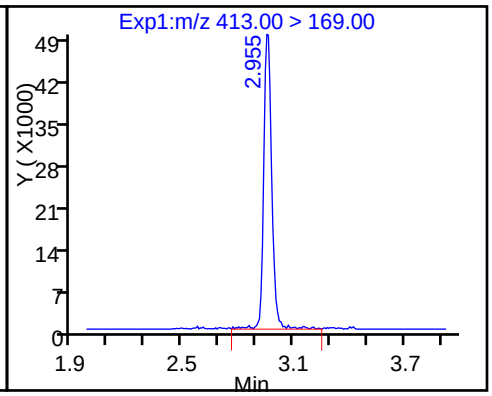
D 14 13C4 PFOA



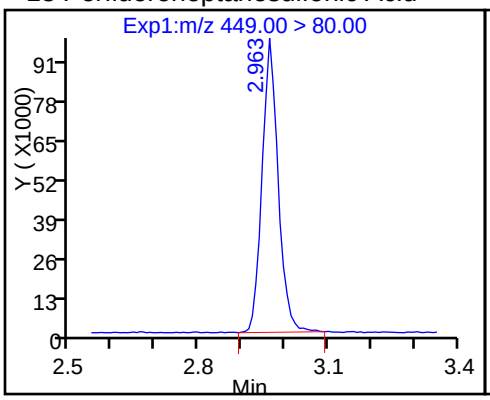
15 Perfluorooctanoic acid



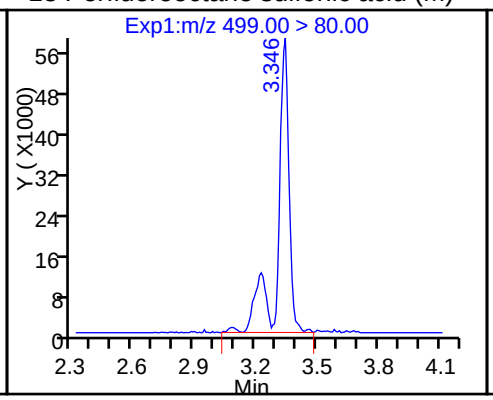
15 Perfluorooctanoic acid



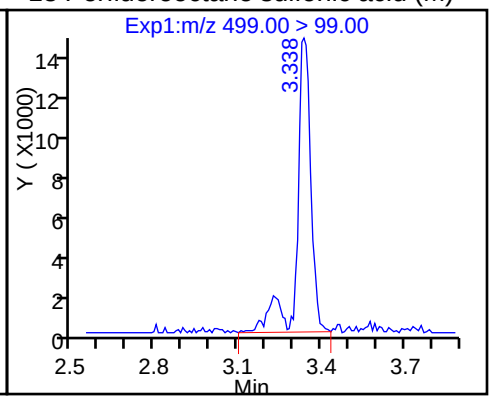
13 Perfluoroheptanesulfonic Acid



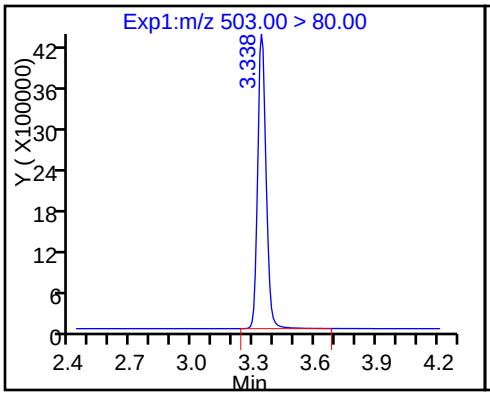
18 Perfluorooctane sulfonic acid (M)



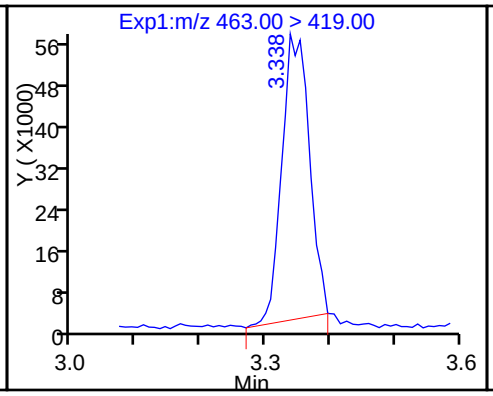
18 Perfluorooctane sulfonic acid (M)



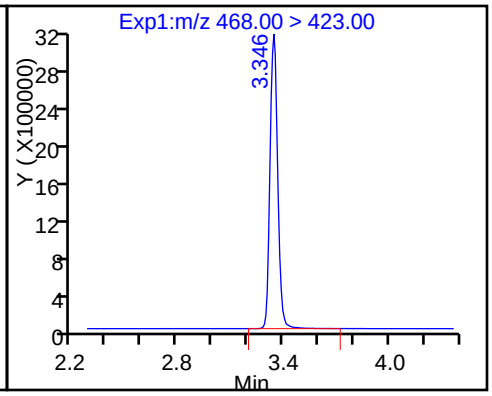
D 17 13C4 PFOS



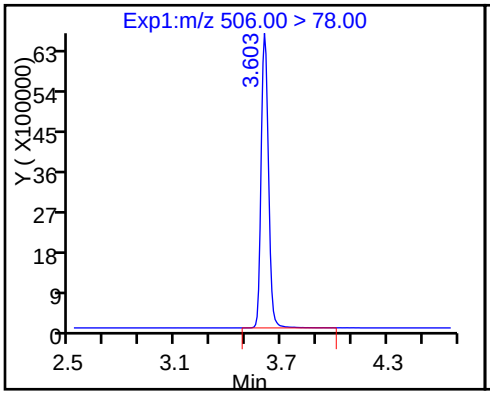
20 Perfluorononanoic acid



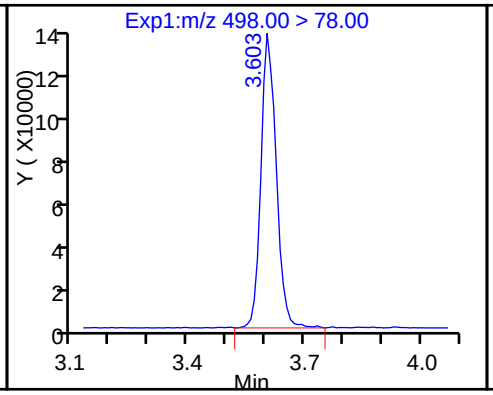
D 19 13C5 PFNA



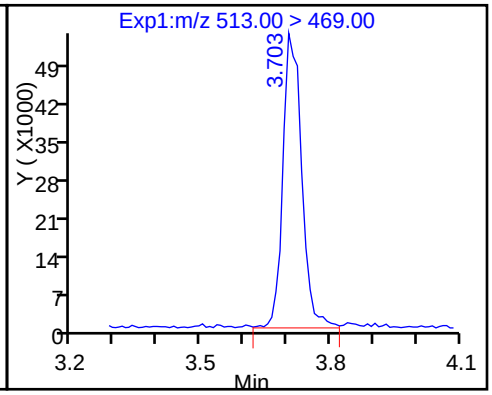
D 21 13C8 FOSA



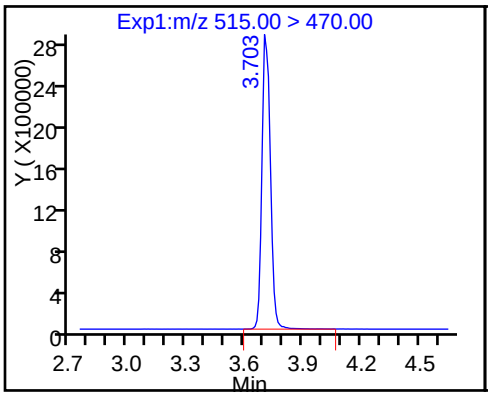
22 Perfluorooctane Sulfonamide



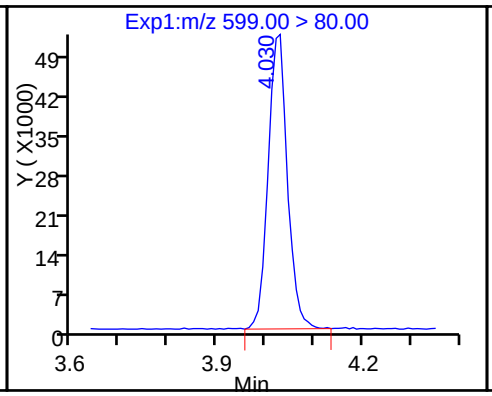
24 Perfluorodecanoic acid



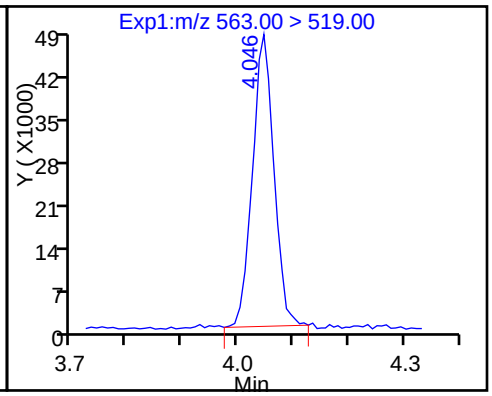
D 23 13C2 PFDA



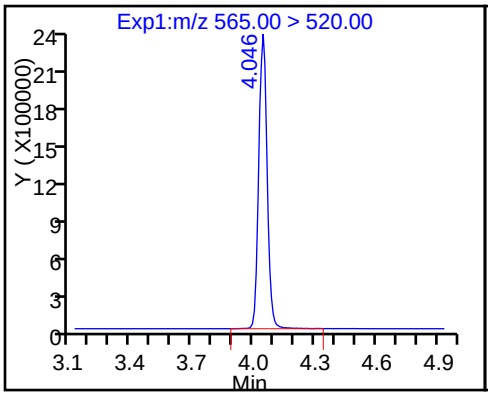
26 Perfluorodecane Sulfonic acid



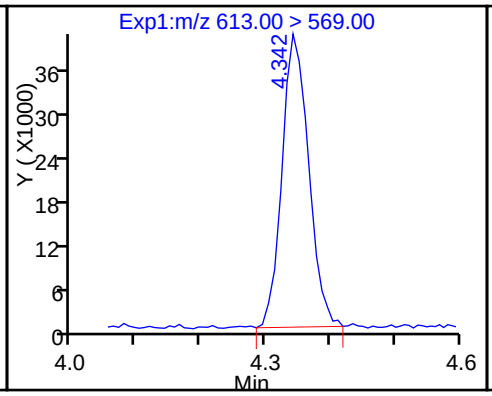
28 Perfluoroundecanoic acid



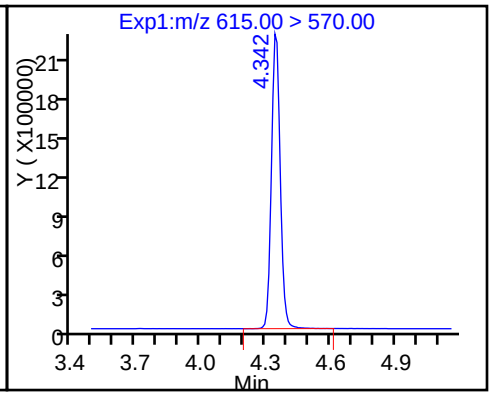
D 27 13C2 PFUnA



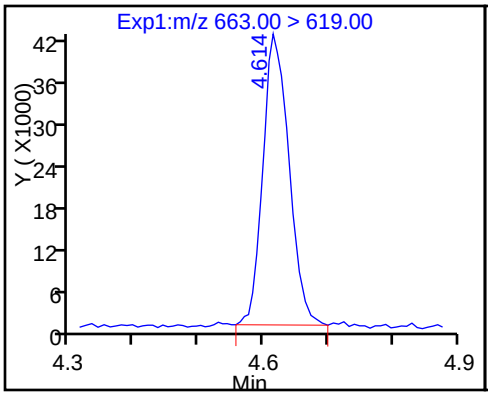
29 Perfluorododecanoic acid



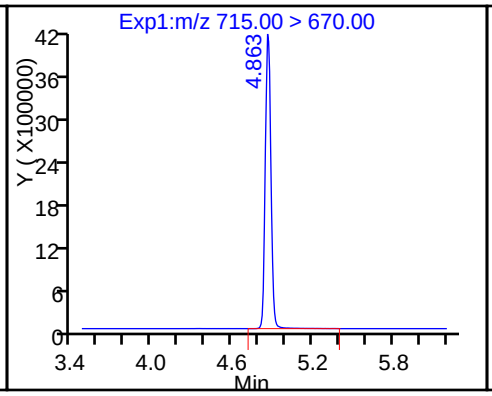
D 30 13C2 PFDoA



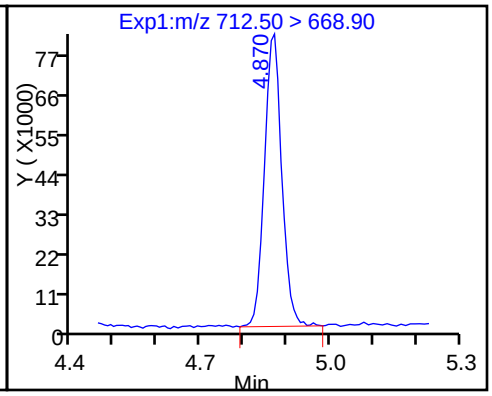
31 Perfluorotridecanoic acid



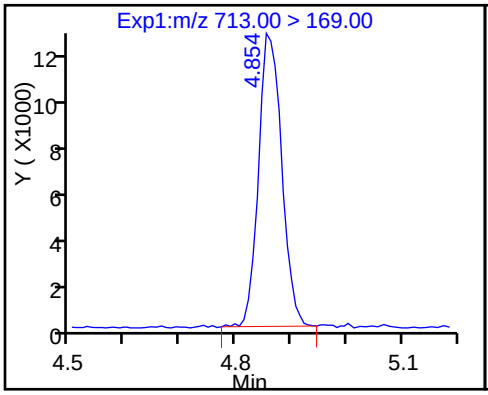
D 32 13C2-PFTeDA



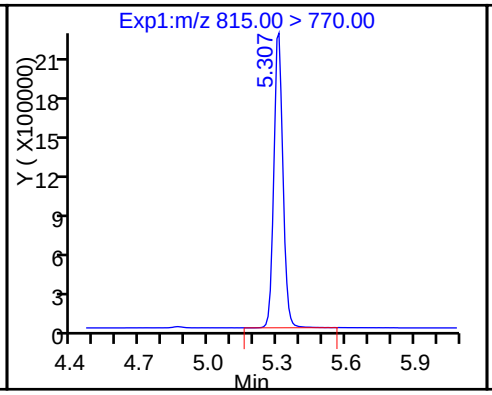
33 Perfluorotetradecanoic acid



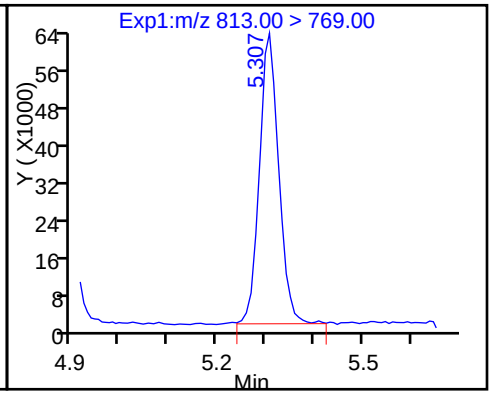
33 Perfluorotetradecanoic acid



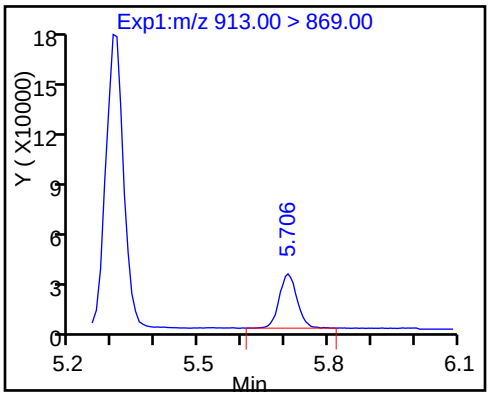
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

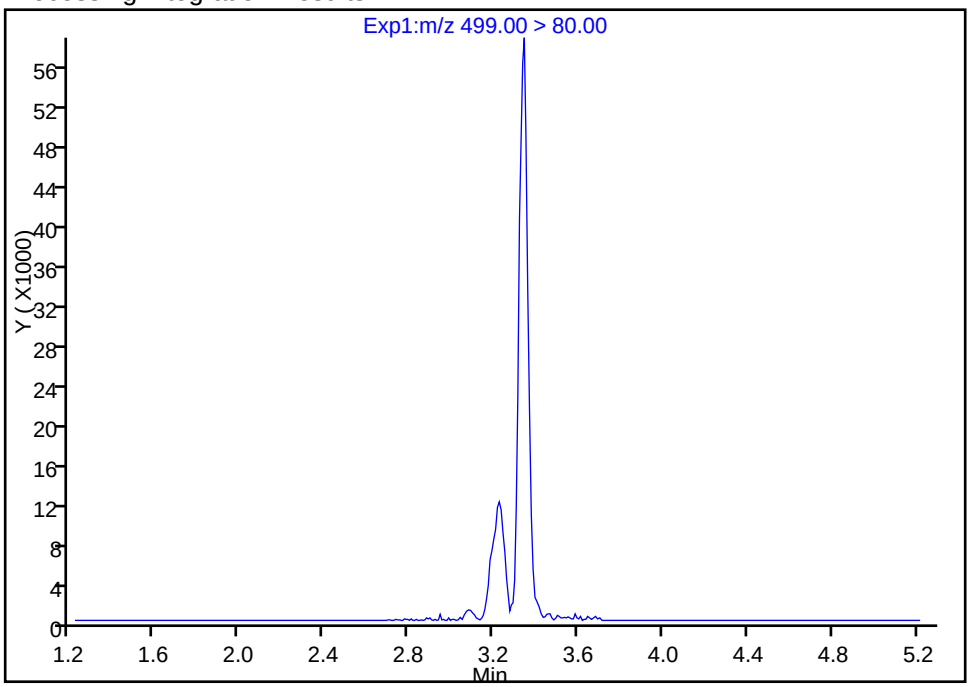
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_002.d				
Injection Date:	16-Jan-2017 13:41:48	Instrument ID:	A8_N		
Lims ID:	CCV L2				
Client ID:					
Operator ID:	A8-PC\A8	ALS Bottle#:	38	Worklist Smp#:	4
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

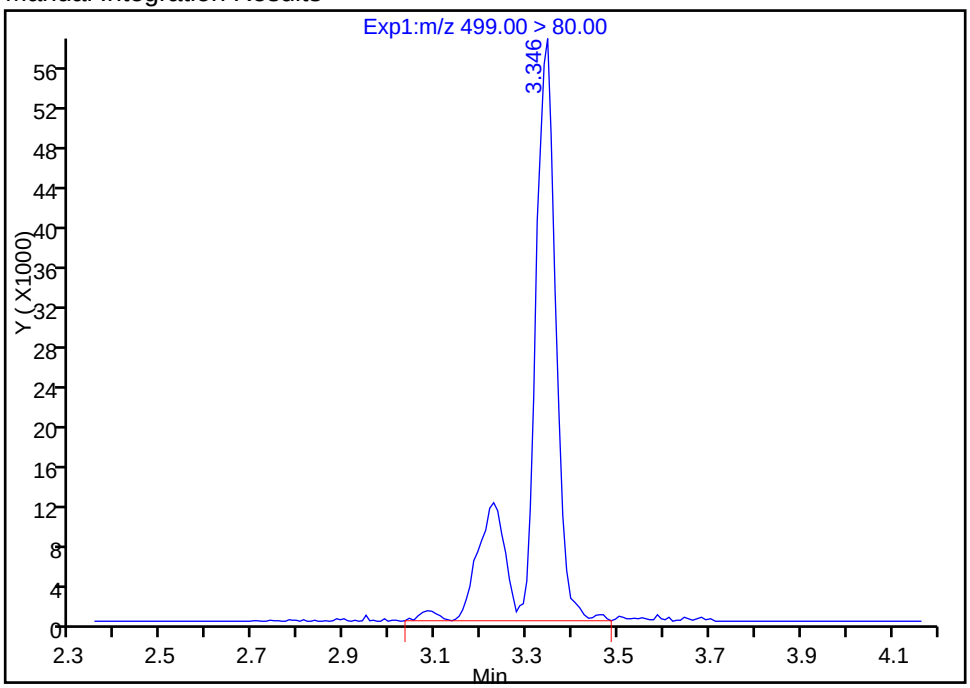
Processing Integration Results

Not Detected
Expected RT: 3.22



Manual Integration Results

RT: 3.35
Area: 227702
Amount: 0.866206
Amount Units: ng/ml



Reviewer: westendorfc, 16-Jan-2017 14:23:57
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

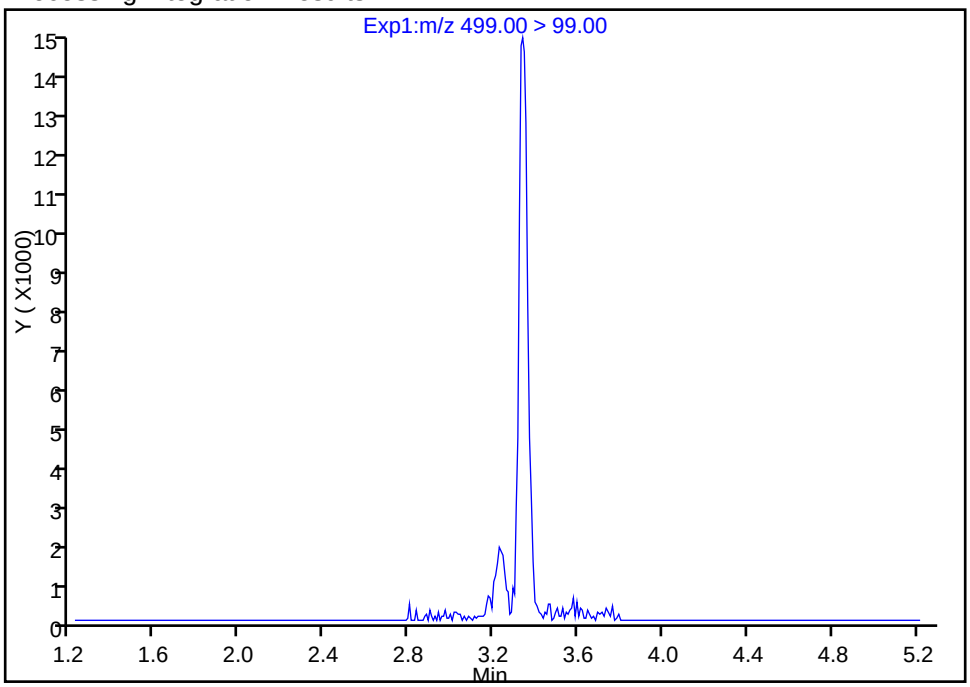
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_002.d				
Injection Date:	16-Jan-2017 13:41:48	Instrument ID:	A8_N		
Lims ID:	CCV L2				
Client ID:					
Operator ID:	A8-PC\A8	ALS Bottle#:	38	Worklist Smp#:	4
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

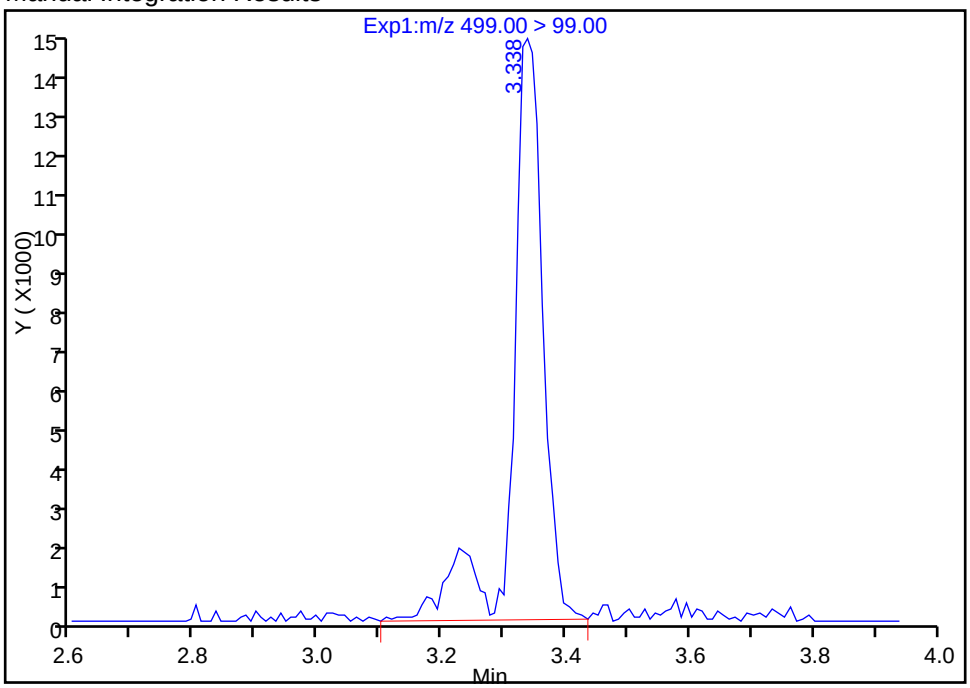
Processing Integration Results

Not Detected
Expected RT: 3.22



Manual Integration Results

RT: 3.34
Area: 51595
Amount: 0.866206
Amount Units: ng/ml



Reviewer: westendorfc, 16-Jan-2017 14:23:57
Audit Action: Manually Integrated Audit Reason: Assign Peak

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24961-1

SDG No.:

Lab Sample ID: CCV 320-146533/5 Calibration Date: 01/16/2017 13:49

Instrument ID: A8_N Calib Start Date: 01/09/2017 13:31

GC Column: Acquity ID: 2.10(mm) Calib End Date: 01/09/2017 15:16

Lab File ID: 16JAN2017_003.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.8732	0.9142		52.3	50.0	4.7	25.0
Perfluoropentanoic acid (PFPeA)	AveID	0.9834	1.008		51.3	50.0	2.5	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.515	1.594		46.5	44.2	5.3	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9250	0.9376		50.7	50.0	1.4	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9857	0.9940		50.4	50.0	0.8	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.048	1.048		45.5	45.5	-0.0	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.085	1.122		49.2	47.6	3.4	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.004	1.027		51.1	50.0	2.3	25.0
Perfluorooctane Sulfonate (PFOS)	AveID	1.013	1.021		46.8	46.4	0.9	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9528	0.9571		50.2	50.0	0.5	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9377	0.9536		50.8	50.0	1.7	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9300	0.9136		49.1	50.0	-1.8	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6377	0.6502		49.1	48.2	2.0	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9800	0.9732		49.7	50.0	-0.7	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9246	0.9295		50.3	50.0	0.5	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.8916	0.9206		51.6	50.0	3.3	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.641	1.853		56.5	50.0	13.0	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		0.9473		49.8	50.0	-0.4	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.7999	0.7995		50.0	50.0	-0.0	25.0
13C4 PFBA	Ave	349384	317691		45.5	50.0	-9.1	50.0
13C5-PFPeA	Ave	276469	237852		43.0	50.0	-14.0	50.0
13C2 PFHxA	Ave	257652	213146		41.4	50.0	-17.3	50.0
13C4-PFHpA	Ave	223910	182499		40.8	50.0	-18.5	50.0
18O2 PFHxS	Ave	324397	285534		41.6	47.3	-12.0	50.0
13C4 PFOA	Ave	241947	196003		40.5	50.0	-19.0	50.0
13C4 PFOS	Ave	259571	236774		43.6	47.8	-8.8	50.0
13C5 PFNA	Ave	183400	161033		43.9	50.0	-12.2	50.0
13C8 FOSA	Ave	409635	369090		45.1	50.0	-9.9	50.0
13C2 PFDA	Ave	180118	163362		45.3	50.0	-9.3	50.0
13C2 PFUnA	Ave	135855	115319		42.4	50.0	-15.1	50.0
13C2 PFDoA	Ave	130008	110776		42.6	50.0	-14.8	50.0
13C2-PFTeDA	Ave	242238	224345		46.3	50.0	-7.4	50.0
13C2-PFHxDA	Ave	133587	115741		43.3	50.0	-13.4	50.0

FORM VII 537 (Modified)

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_003.d
Lims ID: CCV L5
Client ID:
Sample Type: CCV
Inject. Date: 16-Jan-2017 13:49:19 ALS Bottle#: 41 Worklist Smp#: 5
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\20170116-38858.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 17-Jan-2017 09:48:55 Calib Date: 09-Jan-2017 15:16:24
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK027

First Level Reviewer: westendorfc Date: 16-Jan-2017 14:24:22

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	1.606	1.606	0.0		15884526	45.5		90.9	852909	
1 Perfluorobutyric acid										
212.90 > 169.00	1.614	1.614	0.0	1.000	14521010	52.3		105	131029	
D 4 13C5-PFPeA										
267.90 > 223.00	1.906	1.906	0.0		11892579	43.0		86.0	1114003	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.906	1.906	0.0	1.000	11990140	51.3		103	119886	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.945	1.945	0.0	1.000	20121081	46.5		105		
298.90 > 99.00	1.945	1.945	0.0	1.000	8930739		2.25(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.225	2.225	0.0		10657324	41.4		82.7	948660	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.225	2.225	0.0	1.000	9992616	50.7		101	317717	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.568	2.568	0.0	1.000	9069871	50.4		101	105608	
D 11 13C4-PFHpA										
367.00 > 322.00	2.568	2.568	0.0		9124934	40.8		81.5	791184	
D 10 18O2 PFHxS										
403.00 > 84.00	2.584	2.584	0.0		13505737	41.6		88.0	1571730	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.591	2.591	0.0	1.000	13611363	45.5		99.9		
D 14 13C4 PFOA										
417.00 > 372.00	2.944	2.944	0.0		9800144	40.5		81.0	657850	

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	2.952	2.952	0.0	1.000	10060720	51.1		102	101821	
413.00 > 169.00	2.944	2.952	-0.008	0.997	6122487		1.64(0.90-1.10)		327272	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.952	2.952	0.0	1.000	12642077	49.2		103		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.217	3.217	0.0	1.000	11220198	46.8		101	72503	
499.00 > 99.00	3.321	3.217	0.104	1.032	2430807		4.62(0.90-1.10)		240201	
D 17 13C4 PFOS										
503.00 > 80.00	3.321	3.321	0.0		11317811	43.6		91.2	268872	
20 Perfluorononanoic acid										
463.00 > 419.00	3.329	3.329	0.0	1.000	7706451	50.2		100	114892	
D 19 13C5 PFNA										
468.00 > 423.00	3.329	3.329	0.0		8051658	43.9		87.8	644462	
D 21 13C8 FOSA										
506.00 > 78.00	3.591	3.591	0.0		18454518	45.1		90.1	1266409	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.599	3.599	0.0	1.000	17599007	50.8		102	537954	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.688	3.688	0.0	1.000	7462258	49.1		98.2	130571	
D 23 13C2 PFDA										
515.00 > 470.00	3.697	3.697	0.0		8168103	45.3		90.7	206088	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.997	3.997	0.0	1.000	7419823	49.1		102		
D 27 13C2 PFUnA										
565.00 > 520.00	4.026	4.026	0.0		5765941	42.4		84.9	476289	
28 Perfluoroundecanoic acid										
563.00 > 519.00	4.026	4.026	0.0	1.000	5611528	49.7		99.3	118867	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.324	4.324	0.0	1.000	5148517	50.3		101	10573	
D 30 13C2 PFDoA										
615.00 > 570.00	4.324	4.324	0.0		5538802	42.6		85.2	152913	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.595	4.595	0.0	1.000	5099194	51.6		103	7404	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.838	4.838	0.0		11217259	46.3		92.6	540338	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.847	4.847	0.0	1.000	10264603	56.5		113	5139	
713.00 > 169.00	4.838	4.847	-0.009	0.998	1472257		6.97(0.00-0.00)		132548	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.274	5.274	0.0		5787057	43.3		86.6	104543	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.285	5.285	0.0	1.000	5246642	49.8		99.6	5563	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.672	5.672	0.0	1.000	4428229	50.0		99.9	4884	

Reagents:

LCPFC-L5_00022 Amount Added: 1.00 Units: mL

Report Date: 17-Jan-2017 09:48:55 Chrom Revision: 2.2 10-Jan-2017 11:26:10

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_003.d

Injection Date: 16-Jan-2017 13:49:19 Instrument ID: A8_N

Lims ID: CCV L5

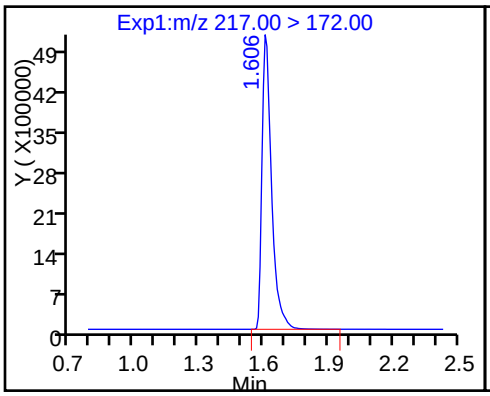
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 41 Worklist Smp#: 5

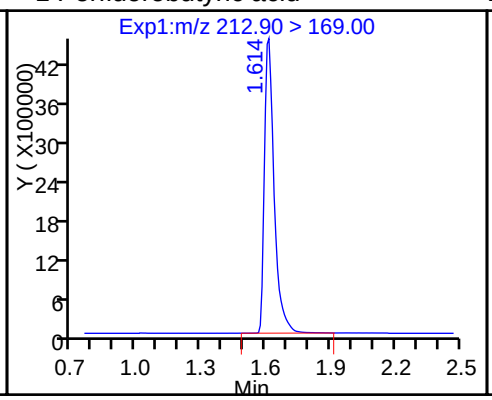
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

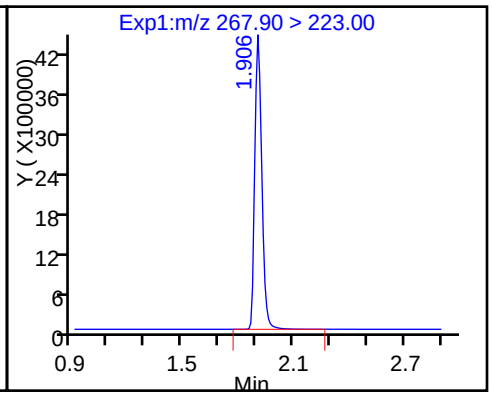
D 2 13C4 PFBA



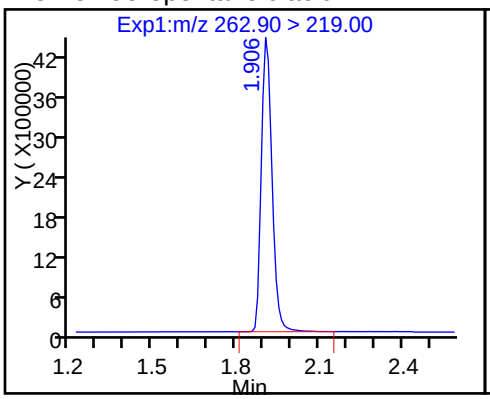
1 Perfluorobutyric acid



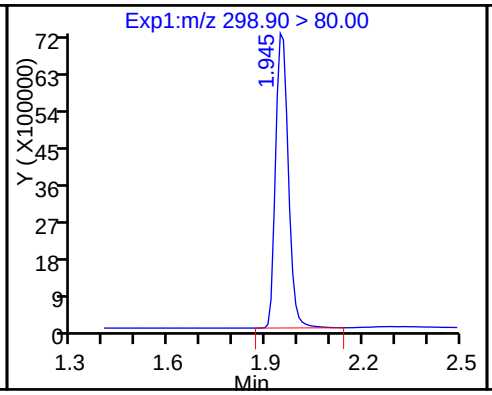
D 4 13C5-PFPeA



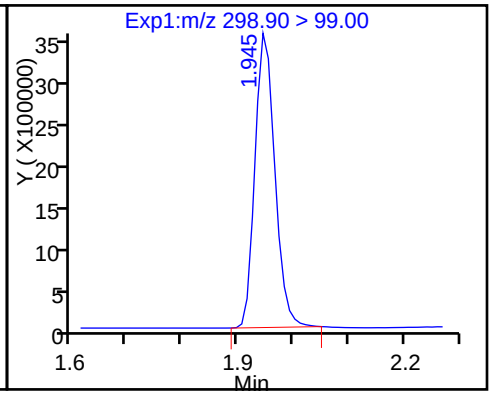
3 Perfluoropentanoic acid



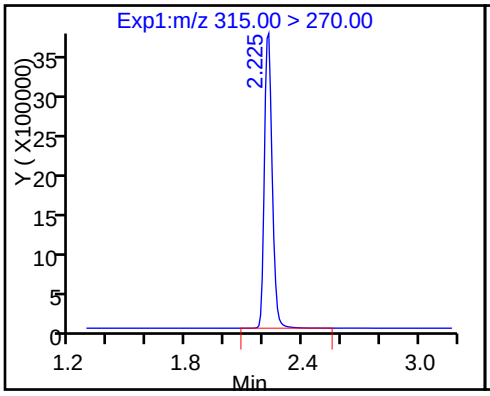
5 Perfluorobutanesulfonic acid



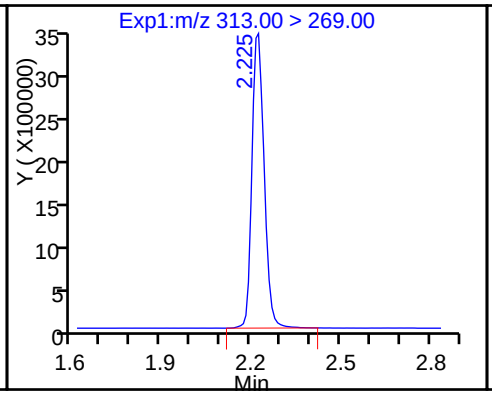
5 Perfluorobutanesulfonic acid



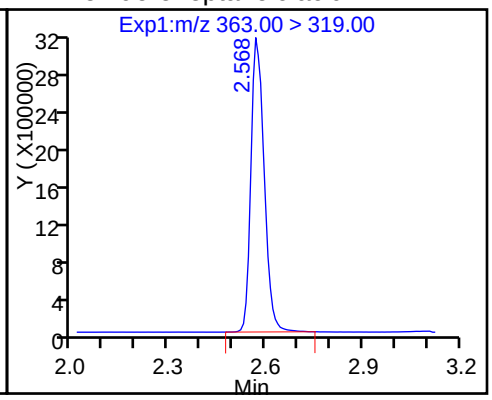
D 6 13C2 PFHxA



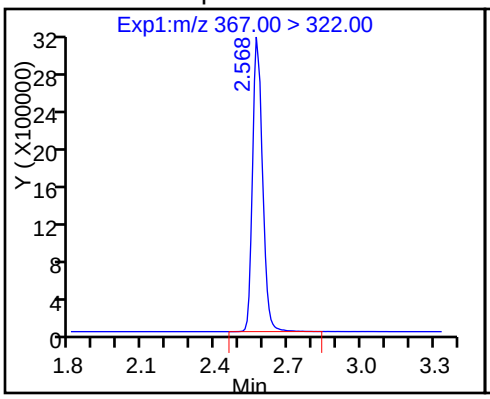
7 Perfluorohexanoic acid



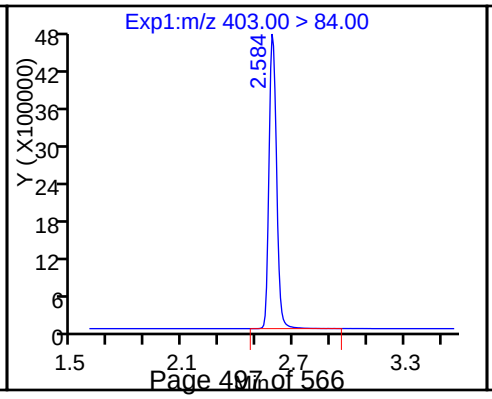
12 Perfluoroheptanoic acid



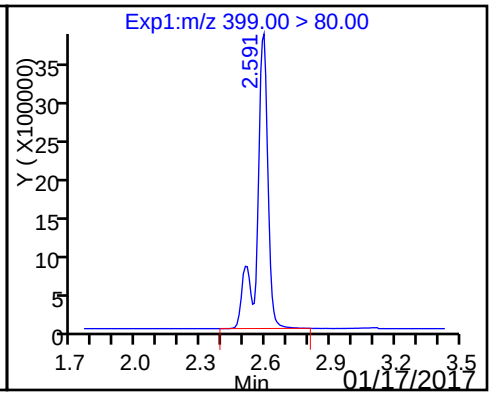
D 11 13C4-PFHpA



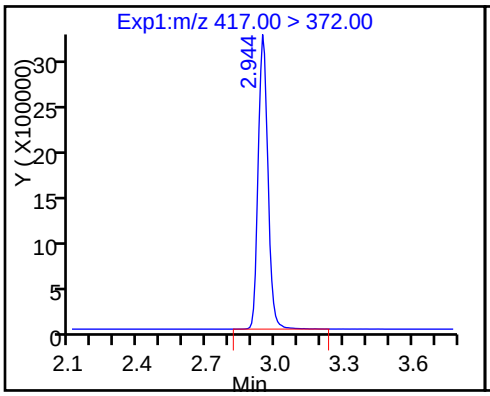
D 10 18O2 PFHxS



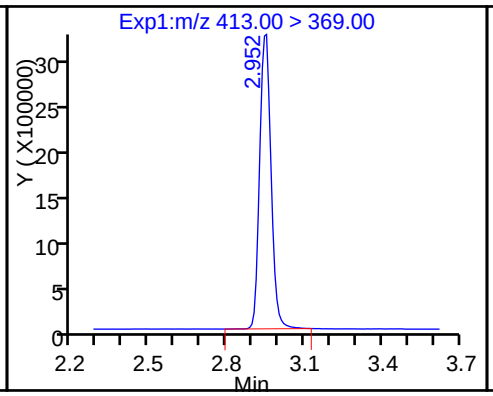
9 Perfluorohexanesulfonic acid



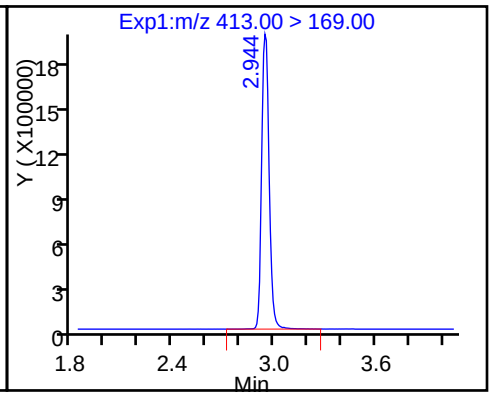
D 14 13C4 PFOA



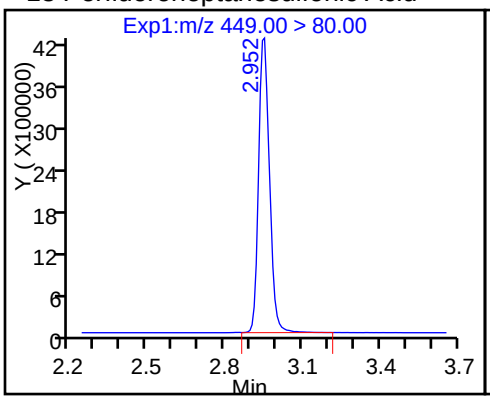
15 Perfluorooctanoic acid



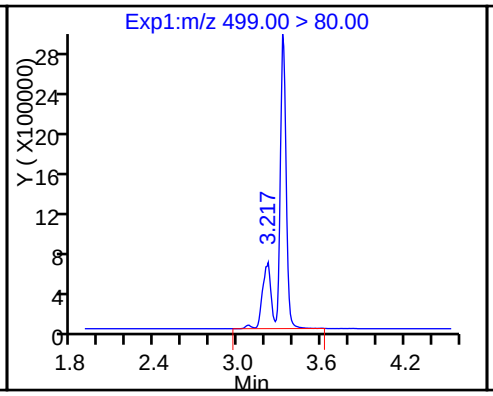
15 Perfluorooctanoic acid



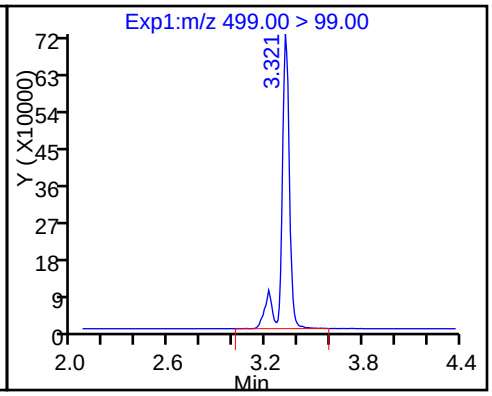
13 Perfluoroheptanesulfonic Acid



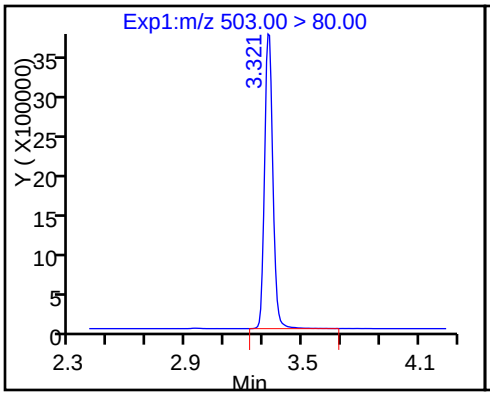
18 Perfluorooctane sulfonic acid



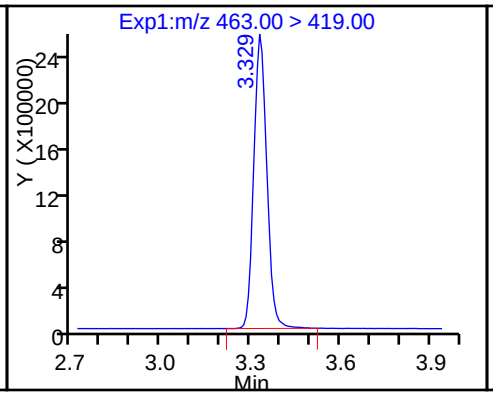
18 Perfluorooctane sulfonic acid



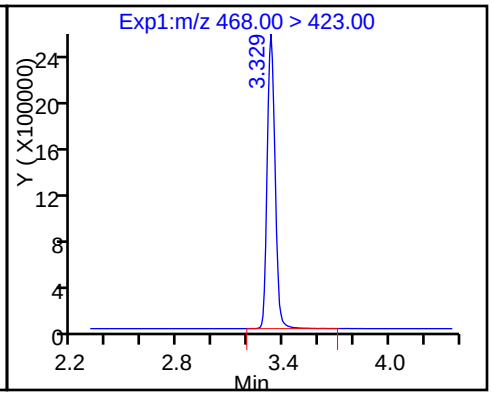
D 17 13C4 PFOS



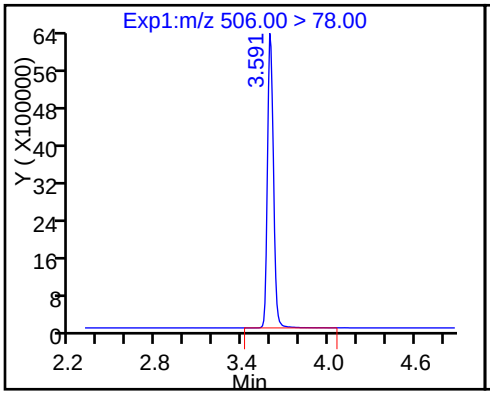
20 Perfluorononanoic acid



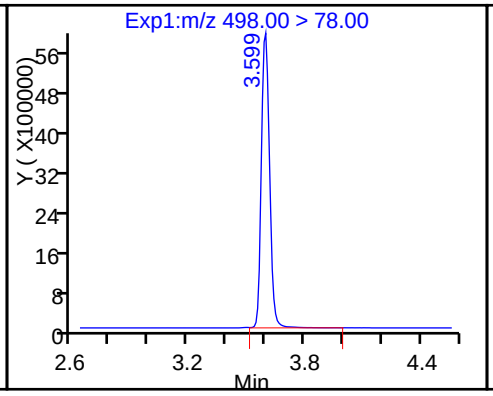
D 19 13C5 PFNA



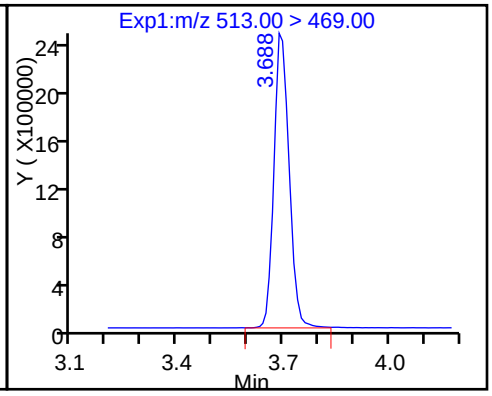
D 21 13C8 FOSA



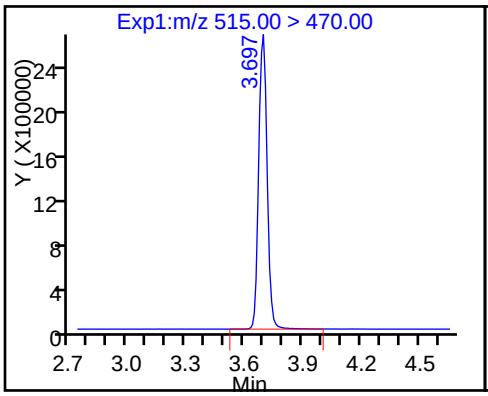
22 Perfluorooctane Sulfonamide



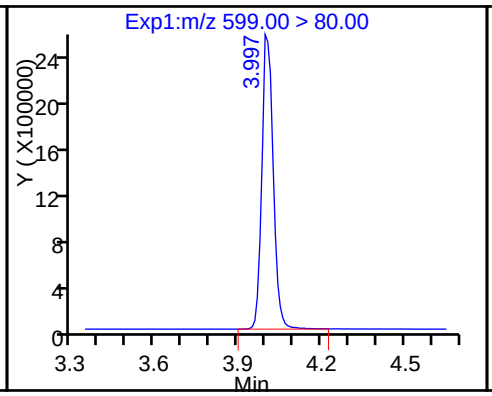
24 Perfluorodecanoic acid



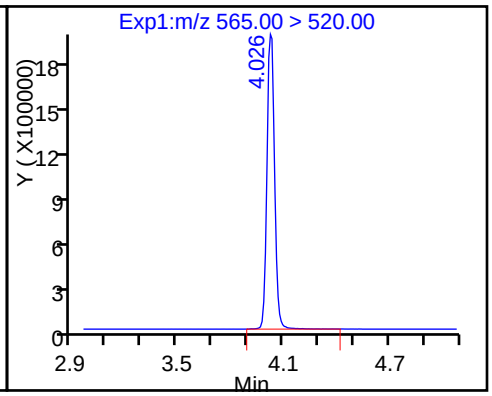
D 23 13C2 PFDA



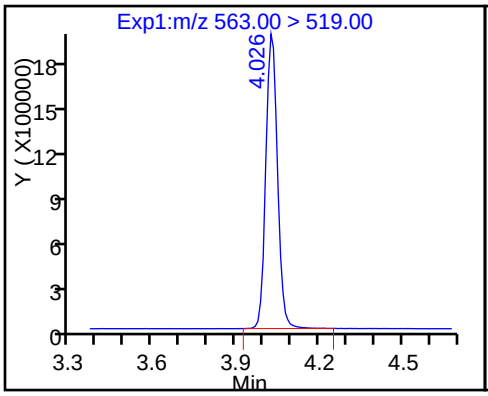
26 Perfluorodecane Sulfonic acid



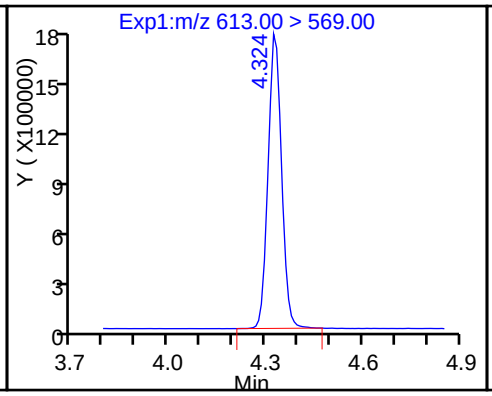
D 27 13C2 PFUnA



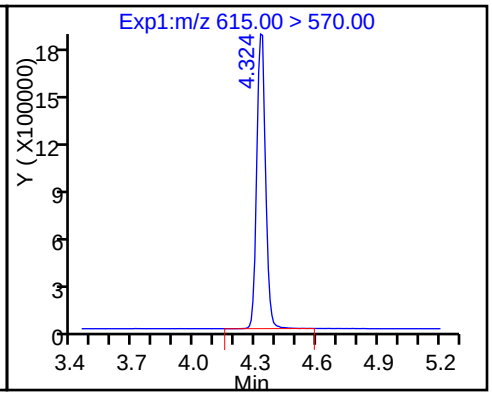
28 Perfluoroundecanoic acid



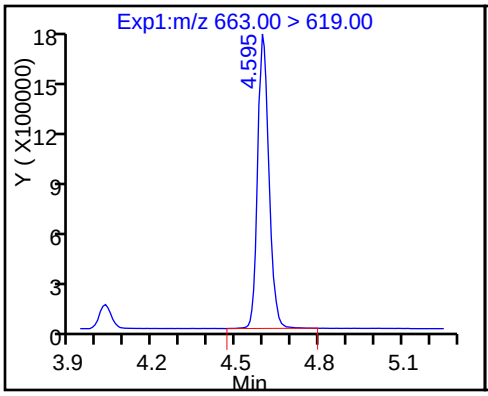
29 Perfluorododecanoic acid



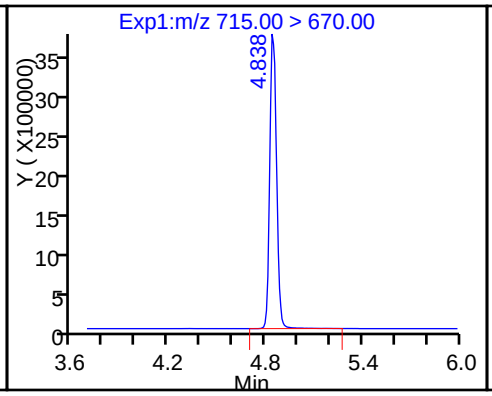
D 30 13C2 PFDoA



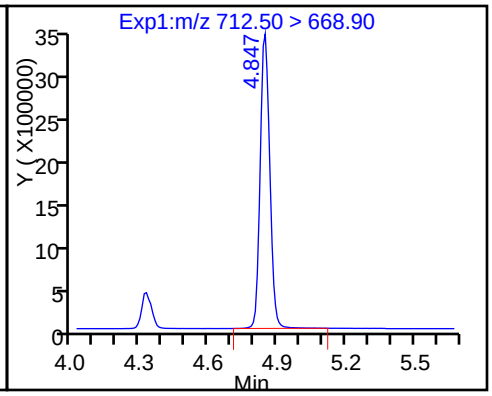
31 Perfluorotridecanoic acid



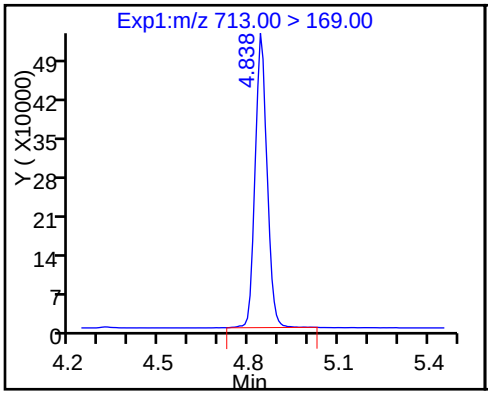
D 32 13C2-PFTeDA



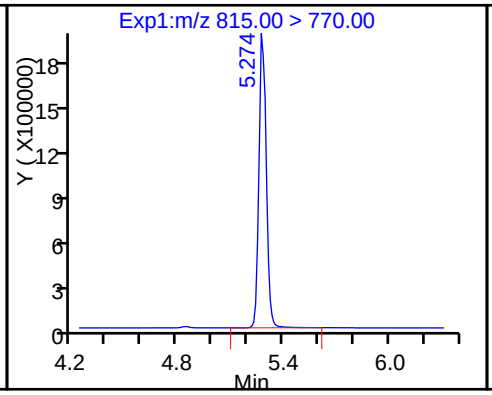
33 Perfluorotetradecanoic acid



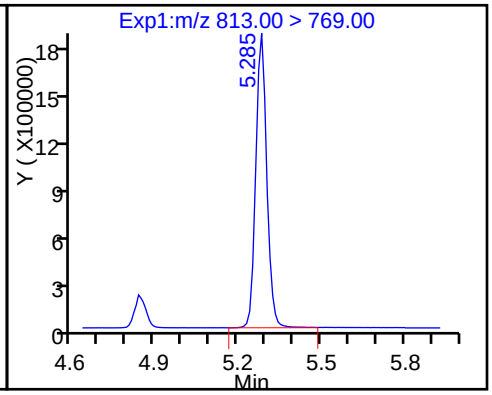
33 Perfluorotetradecanoic acid



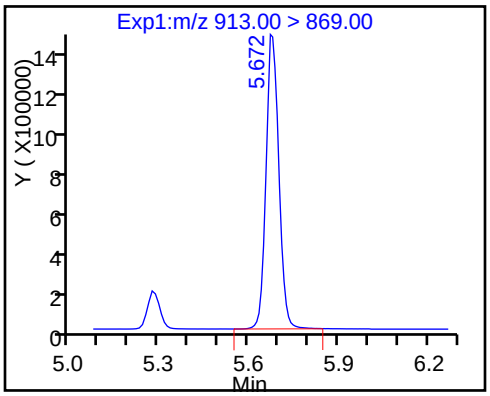
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24961-1

SDG No.:

Lab Sample ID: CCV 320-146533/18 Calibration Date: 01/16/2017 15:26

Instrument ID: A8_N Calib Start Date: 01/09/2017 13:31

GC Column: Acquity ID: 2.10(mm) Calib End Date: 01/09/2017 15:16

Lab File ID: 16JAN2017_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	0.8732	0.9721		22.3	20.0	11.3	25.0
Perfluoropentanoic acid (PFPeA)	AveID	0.9834	1.059		21.5	20.0	7.6	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.515	1.708		19.9	17.7	12.8	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9250	0.9678		20.9	20.0	4.6	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.048	1.108		19.2	18.2	5.7	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9857	1.028		20.9	20.0	4.3	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.004	1.064		21.2	20.0	6.0	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.085	1.197		21.0	19.0	10.4	25.0
Perfluorooctane Sulfonate (PFOS)	AveID	1.013	1.039		19.0	18.6	2.6	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9528	0.995		20.9	20.0	4.4	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9377	1.030		22.0	20.0	9.9	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9300	0.9449		20.3	20.0	1.6	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6377	0.6660		20.1	19.3	4.4	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9800	0.999		20.4	20.0	1.9	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9246	0.9462		20.5	20.0	2.3	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.8916	0.9281		20.8	20.0	4.1	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.641	1.821		22.2	20.0	11.0	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		0.8913		18.5	20.0	-7.7	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.7999	0.7251		18.1	20.0	-9.4	25.0
13C4 PFBA	Ave	349384	393731		56.3	50.0	12.7	50.0
13C5-PFPeA	Ave	276469	298574		54.0	50.0	8.0	50.0
13C2 PFHxA	Ave	257652	263879		51.2	50.0	2.4	50.0
13C4-PFHpA	Ave	223910	235004		52.5	50.0	5.0	50.0
18O2 PFHxS	Ave	324397	353165		51.5	47.3	8.9	50.0
13C4 PFOA	Ave	241947	261739		54.1	50.0	8.2	50.0
13C4 PFOS	Ave	259571	297108		54.7	47.8	14.5	50.0
13C5 PFNA	Ave	183400	204333		55.7	50.0	11.4	50.0
13C8 FOSA	Ave	409635	438245		53.5	50.0	7.0	50.0
13C2 PFDA	Ave	180118	206596		57.4	50.0	14.7	50.0
13C2 PFUnA	Ave	135855	149768		55.1	50.0	10.2	50.0
13C2 PFDoA	Ave	130008	141492		54.4	50.0	8.8	50.0
13C2-PFTeDA	Ave	242238	276110		57.0	50.0	14.0	50.0
13C2-PFHxDA	Ave	133587	136520		51.1	50.0	2.2	50.0

FORM VII 537 (Modified)

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_016.d
Lims ID: CCV L4
Client ID:
Sample Type: CCV
Inject. Date: 16-Jan-2017 15:26:58 ALS Bottle#: 40 Worklist Smp#: 18
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\20170116-38858.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 17-Jan-2017 09:54:24 Calib Date: 09-Jan-2017 15:16:24
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK027

First Level Reviewer: chandrasenas Date: 17-Jan-2017 09:46:27

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	1.609	1.609	0.0		19686558	56.3		113	1452979	
1 Perfluorobutyric acid										
212.90 > 169.00	1.609	1.609	0.0	1.000	7654596	22.3		111	46621	
D 4 13C5-PFPeA										
267.90 > 223.00	1.899	1.899	0.0		14928702	54.0		108	1058145	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.899	1.899	0.0	1.000	6321414	21.5		108	57136	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.938	1.938	0.0	1.000	10663319	19.9		113		
298.90 > 99.00	1.938	1.938	0.0	1.000	4485891		2.38(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.198	2.198	0.0		13193956	51.2		102	809654	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.207	2.207	0.0	1.000	5107469	20.9		105	183467	
D 11 13C4-PFHpA										
367.00 > 322.00	2.543	2.543	0.0		11750223	52.5		105	1046386	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.543	2.543	0.0	1.000	4832529	20.9		104	55488	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.481	2.481	0.0	1.000	7121635	19.2		106		
D 10 18O2 PFHxS										
403.00 > 84.00	2.558	2.558	0.0		16704724	51.5		109	926751	
D 14 13C4 PFOA										
417.00 > 372.00	2.903	2.903	0.0		13086953	54.1		108	733258	

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	2.903	2.903	0.0	1.000	5567609	21.2		106	63228	
413.00 > 169.00	2.903	2.903	0.0	1.000	3294525		1.69(0.90-1.10)		125437	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.911	2.911	0.0	1.000	6771688	21.0		110		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.276	3.276	0.0	1.000	5726651	19.0		103	183162	
499.00 > 99.00	3.276	3.276	0.0	1.000	1257240		4.55(0.90-1.10)		62182	
D 17 13C4 PFOS										
503.00 > 80.00	3.276	3.276	0.0		14201774	54.7		114	308833	
20 Perfluorononanoic acid										
463.00 > 419.00	3.284	3.284	0.0	1.000	4066691	20.9		104	65519	
D 19 13C5 PFNA										
468.00 > 423.00	3.284	3.284	0.0		10216643	55.7		111	808242	
D 21 13C8 FOSA										
506.00 > 78.00	3.574	3.574	0.0		21912266	53.5		107	940407	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.583	3.583	0.0	1.000	9030919	22.0		110	256700	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.642	3.642	0.0	1.000	3904278	20.3		102	104607	
D 23 13C2 PFDA										
515.00 > 470.00	3.642	3.642	0.0		10329823	57.4		115	204373	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.952	3.952	0.0	1.000	3814706	20.1		104		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.970	3.970	0.0	1.000	2991731	20.4		102	84693	
D 27 13C2 PFUnA										
565.00 > 520.00	3.970	3.970	0.0		7488383	55.1		110	353858	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.270	4.270	0.0	1.000	2677720	20.5		102	46132	
D 30 13C2 PFDoA										
615.00 > 570.00	4.270	4.270	0.0		7074622	54.4		109	196545	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.534	4.534	0.0	1.000	2626347	20.8		104	2810	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.778	4.778	0.0		13805494	57.0		114	518439	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.786	4.786	0.0	1.000	5152937	22.2		111	1709	
713.00 > 169.00	4.778	4.786	-0.008	0.998	796303		6.47(0.00-0.00)		91850	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.208	5.208	0.0		6825992	51.1		102	101645	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.208	5.208	0.0	1.000	2522110	18.5		92.3	2217	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.580	5.580	0.0	1.000	2052003	18.1		90.6	1977	

Reagents:

LCPFC-L4_00024 Amount Added: 1.00 Units: mL

Report Date: 17-Jan-2017 09:54:24 Chrom Revision: 2.2 10-Jan-2017 11:26:10

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_016.d

Injection Date: 16-Jan-2017 15:26:58 Instrument ID: A8_N

Lims ID: CCV L4

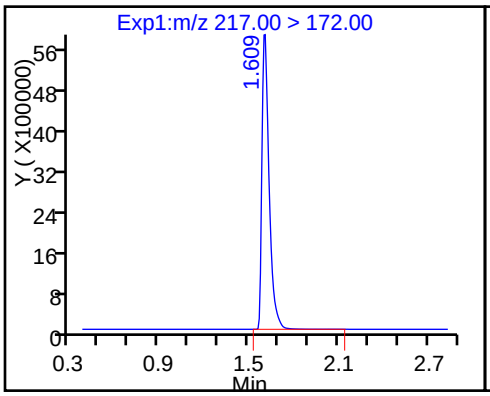
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 40 Worklist Smp#: 18

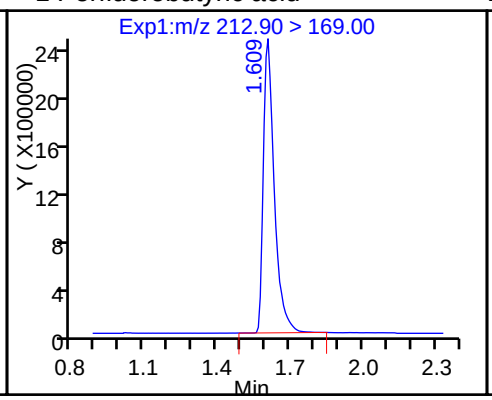
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

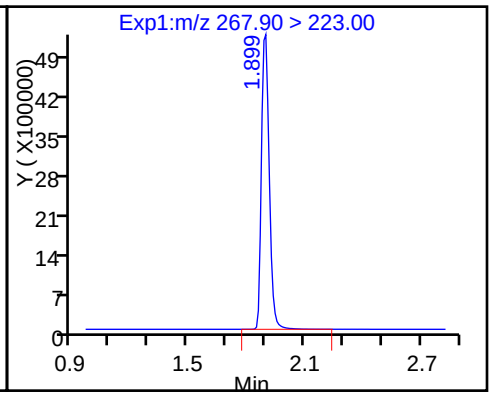
D 2 13C4 PFBA



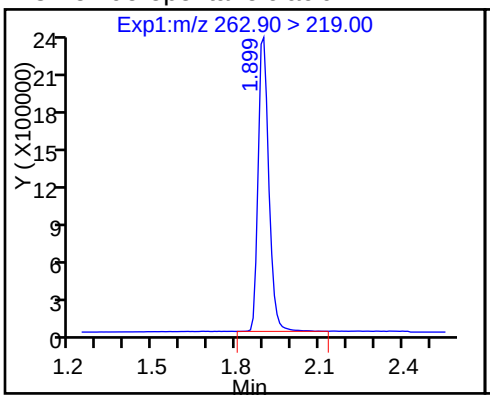
1 Perfluorobutyric acid



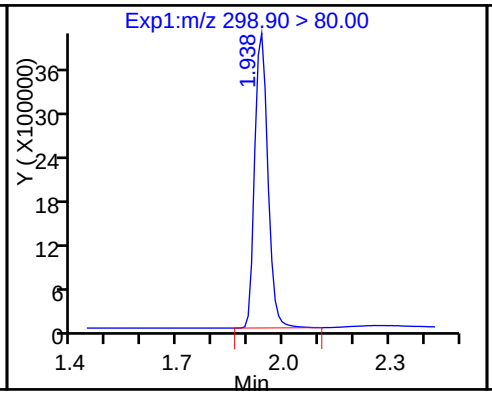
D 4 13C5-PFPeA



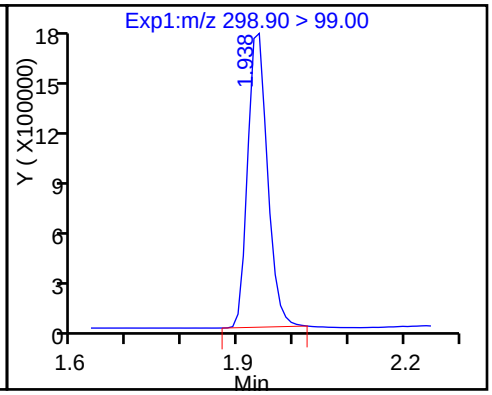
3 Perfluoropentanoic acid



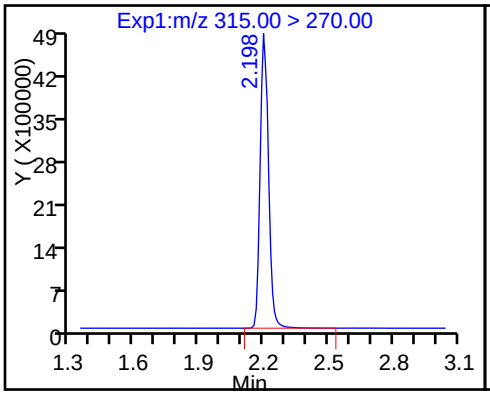
5 Perfluorobutanesulfonic acid



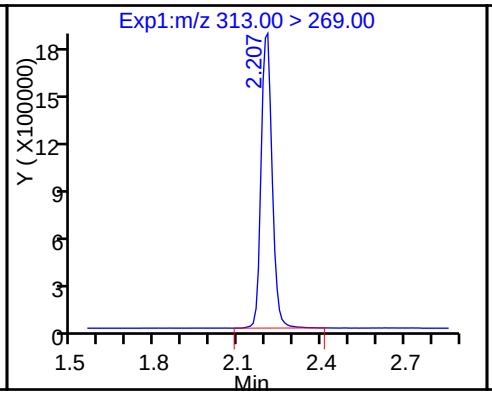
5 Perfluorobutanesulfonic acid



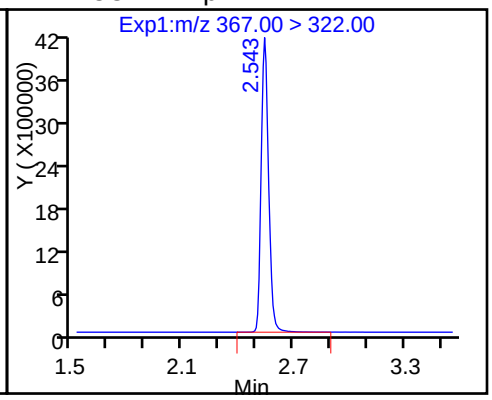
D 6 13C2 PFHxA



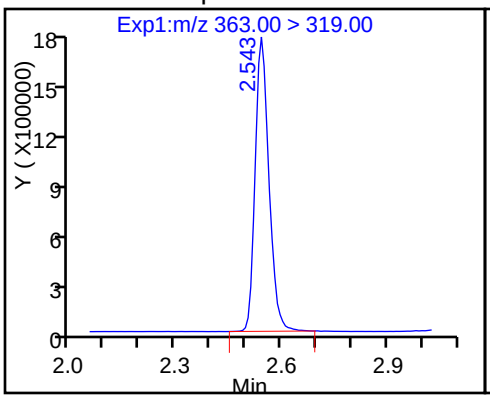
7 Perfluorohexanoic acid



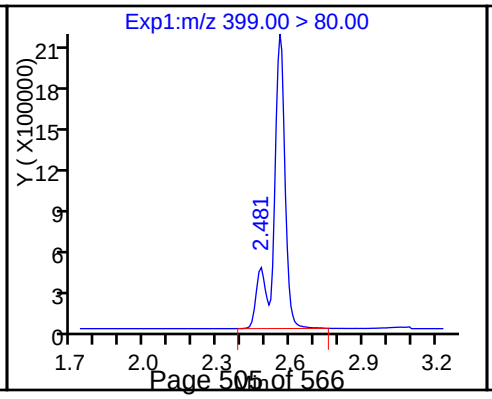
D 11 13C4-PFHpA



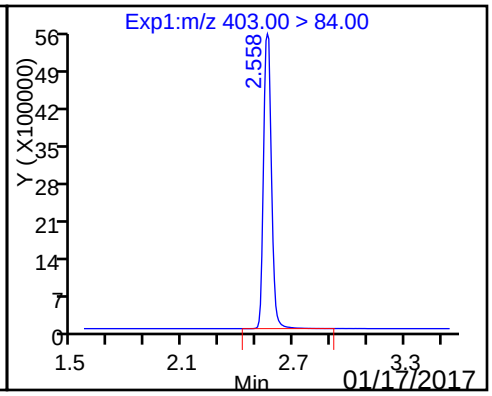
12 Perfluoroheptanoic acid



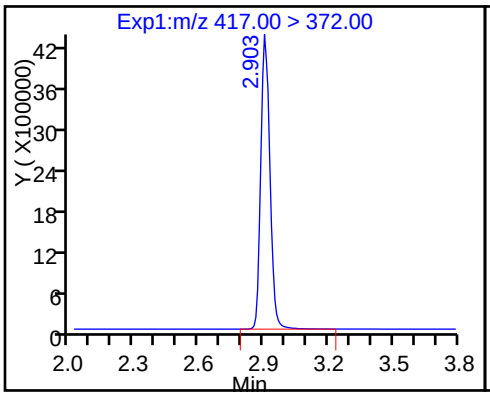
9 Perfluorohexanesulfonic acid



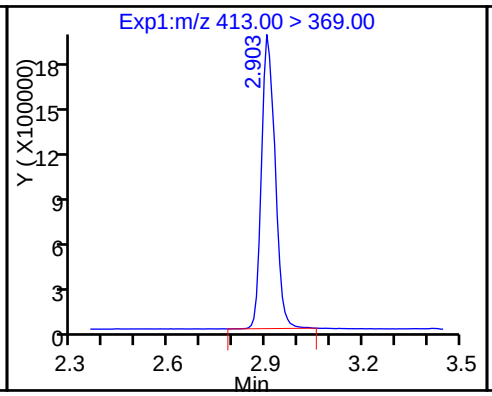
D 10 18O2 PFHxS



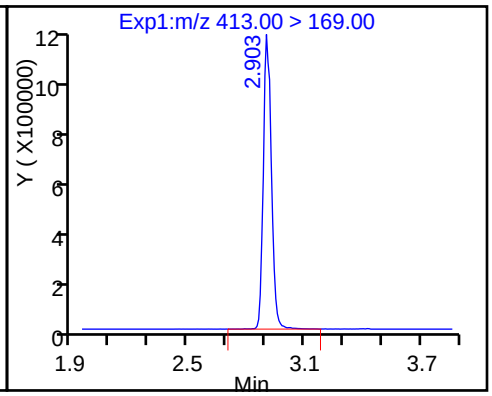
D 14 13C4 PFOA



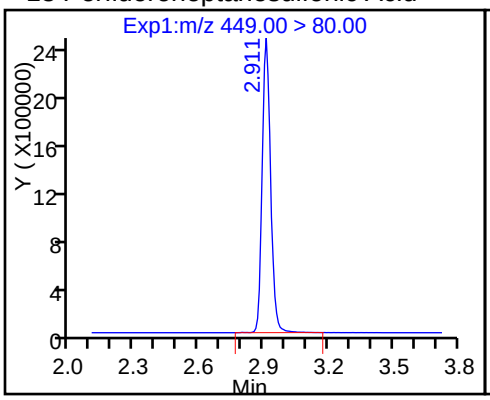
15 Perfluorooctanoic acid



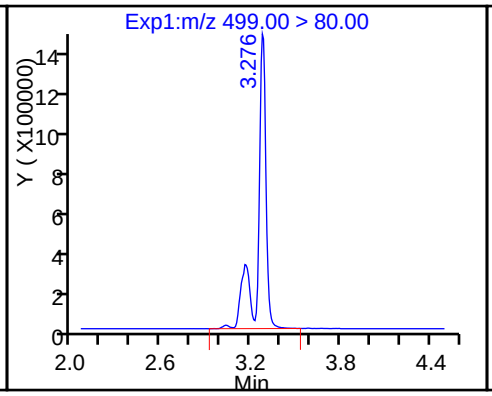
15 Perfluorooctanoic acid



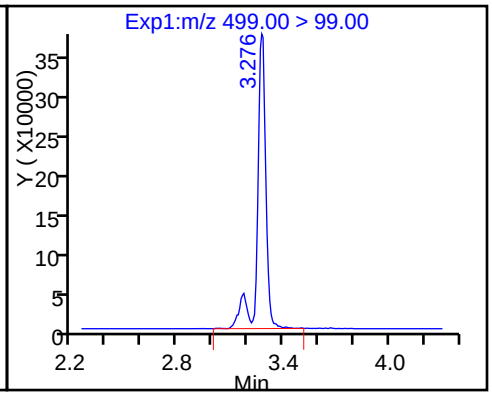
13 Perfluoroheptanesulfonic Acid



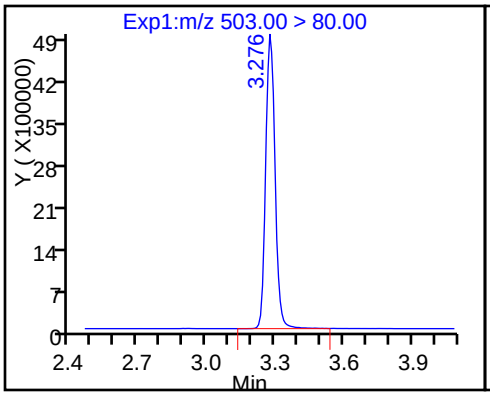
18 Perfluorooctane sulfonic acid



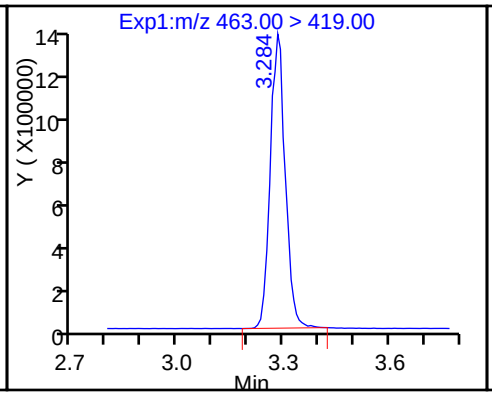
18 Perfluorooctane sulfonic acid



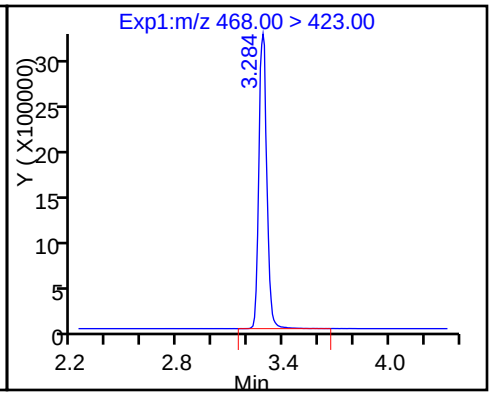
D 17 13C4 PFOS



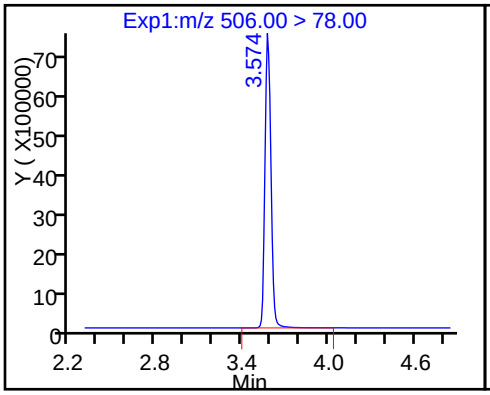
20 Perfluorononanoic acid



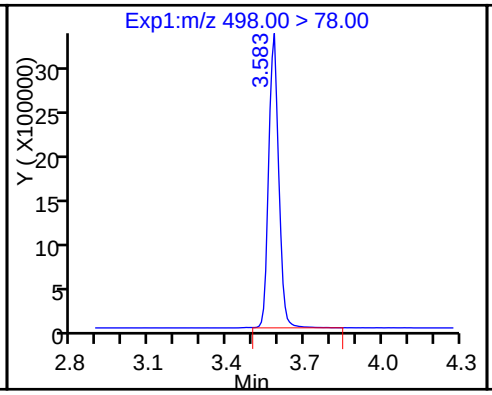
D 19 13C5 PFNA



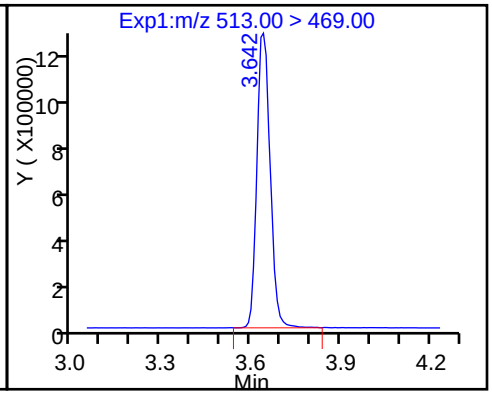
D 21 13C8 FOSA



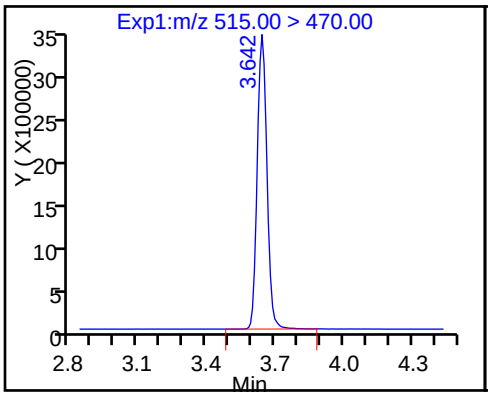
22 Perfluorooctane Sulfonamide



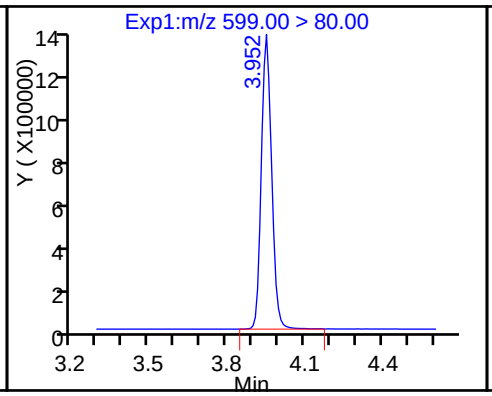
24 Perfluorodecanoic acid



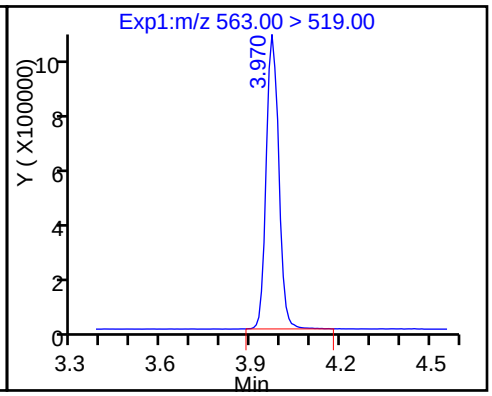
D 23 13C2 PFDA



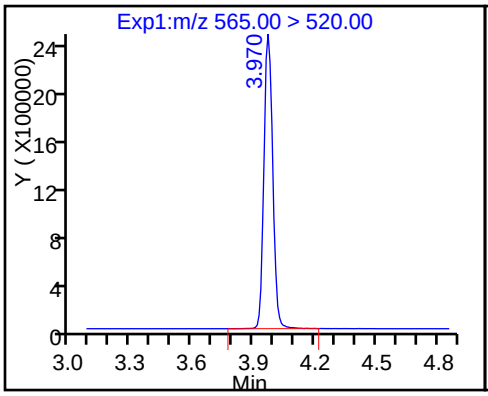
26 Perfluorodecane Sulfonic acid



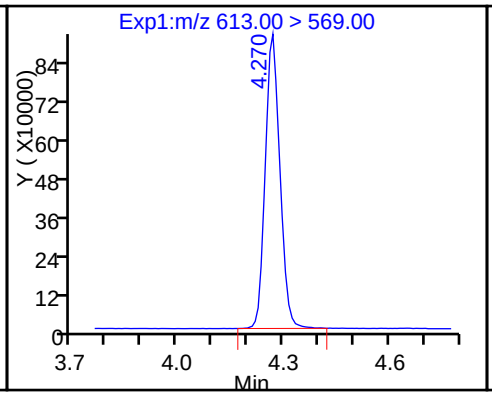
28 Perfluoroundecanoic acid



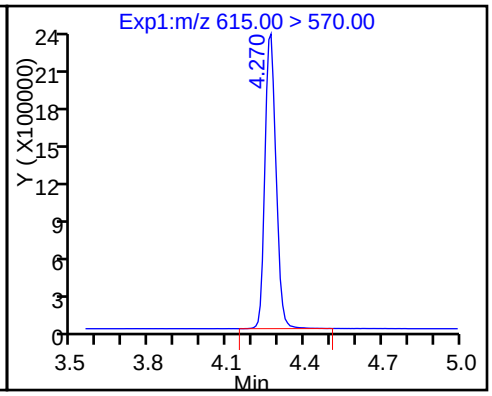
D 27 13C2 PFUnA



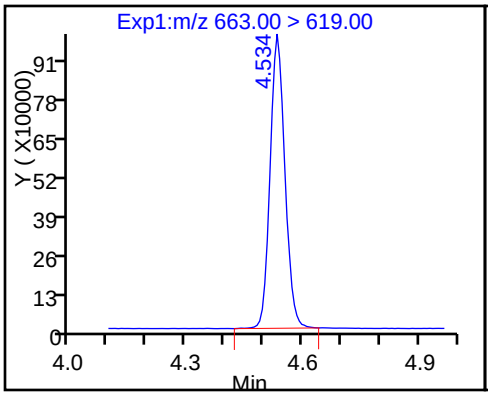
29 Perfluorododecanoic acid



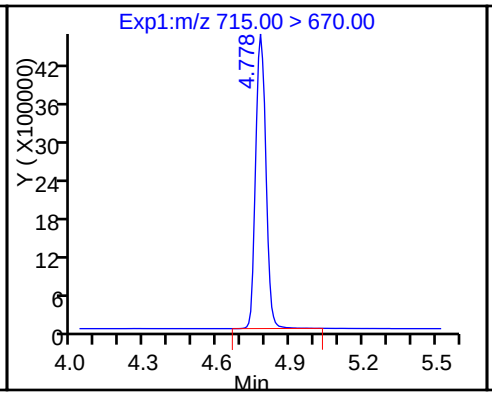
D 30 13C2 PFDoA



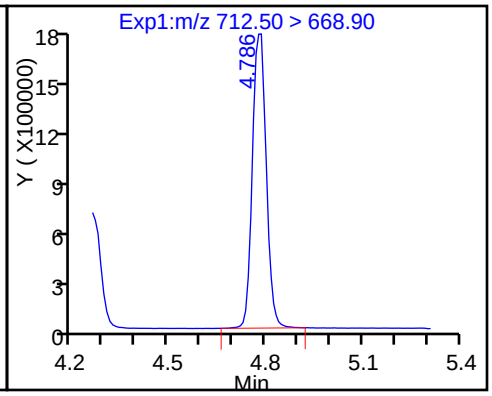
31 Perfluorotridecanoic acid



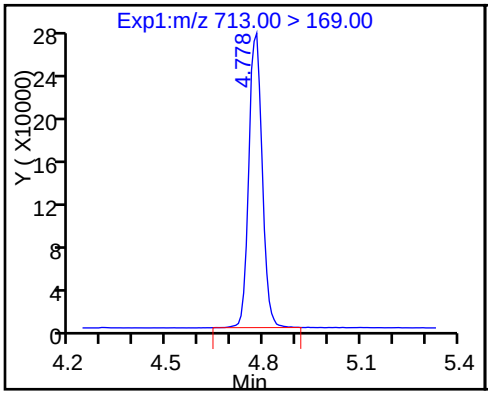
D 32 13C2-PFTeDA



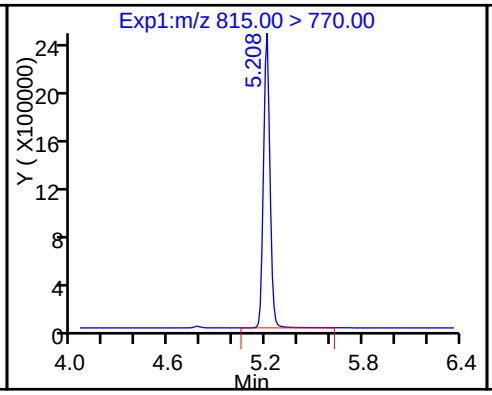
33 Perfluorotetradecanoic acid



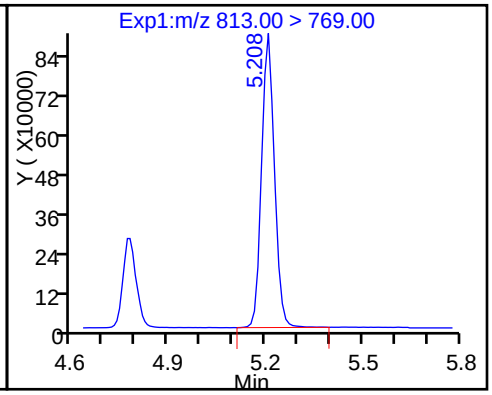
33 Perfluorotetradecanoic acid



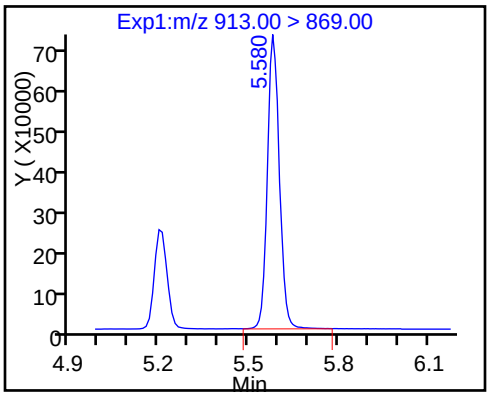
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24961-1

SDG No.:

Lab Sample ID: CCV 320-146533/32 Calibration Date: 01/16/2017 17:11

Instrument ID: A8_N Calib Start Date: 01/09/2017 13:31

GC Column: Acquity ID: 2.10(mm) Calib End Date: 01/09/2017 15:16

Lab File ID: 16JAN2017_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	0.8732	0.9017		51.6	50.0	3.3	25.0
Perfluoropentanoic acid (PFPeA)	AveID	0.9834	1.010		51.4	50.0	2.7	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.515	1.577		46.0	44.2	4.1	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9250	0.9201		49.7	50.0	-0.5	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9857	0.997		50.6	50.0	1.2	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.048	1.050		45.6	45.5	0.2	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.085	1.146		50.3	47.6	5.6	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.004	1.057		52.6	50.0	5.3	25.0
Perfluorooctane Sulfonate (PFOS)	AveID	1.013	1.046		47.9	46.4	3.3	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9528	0.9814		51.5	50.0	3.0	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9377	0.9397		50.1	50.0	0.2	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9300	0.9390		50.5	50.0	1.0	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6377	0.6607		49.9	48.2	3.6	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9800	0.995		50.8	50.0	1.5	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9246	0.9379		50.7	50.0	1.4	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.8916	0.8978		50.3	50.0	0.7	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.641	1.715		52.3	50.0	4.6	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		0.9559		50.2	50.0	0.5	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.7999	0.8637		54.0	50.0	8.0	25.0
13C4 PFBA	Ave	349384	333715		47.8	50.0	-4.5	50.0
13C5-PFPeA	Ave	276469	241096		43.6	50.0	-12.8	50.0
13C2 PFHxA	Ave	257652	215084		41.7	50.0	-16.5	50.0
13C4-PFHpA	Ave	223910	189696		42.4	50.0	-15.3	50.0
18O2 PFHxS	Ave	324397	291699		42.5	47.3	-10.1	50.0
13C4 PFOA	Ave	241947	199376		41.2	50.0	-17.6	50.0
13C4 PFOS	Ave	259571	239656		44.1	47.8	-7.7	50.0
13C5 PFNA	Ave	183400	159106		43.4	50.0	-13.2	50.0
13C8 FOSA	Ave	409635	377757		46.1	50.0	-7.8	50.0
13C2 PFDA	Ave	180118	160924		44.7	50.0	-10.7	50.0
13C2 PFUnA	Ave	135855	111654		41.1	50.0	-17.8	50.0
13C2 PFDoA	Ave	130008	113351		43.6	50.0	-12.8	50.0
13C2-PFTeDA	Ave	242238	228769		47.2	50.0	-5.6	50.0
13C2-PFHxDA	Ave	133587	122884		46.0	50.0	-8.0	50.0

FORM VII 537 (Modified)

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_030.d
Lims ID: CCV L5
Client ID:
Sample Type: CCV
Inject. Date: 16-Jan-2017 17:11:56 ALS Bottle#: 41 Worklist Smp#: 32
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\20170116-38858.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 17-Jan-2017 09:58:30 Calib Date: 09-Jan-2017 15:16:24
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK027

First Level Reviewer: chandrasenas Date: 17-Jan-2017 09:54:20

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	1.593	1.593	0.0		16685731	47.8		95.5	898438	
1 Perfluorobutyric acid										
212.90 > 169.00	1.601	1.601	0.0	1.000	15045660	51.6		103	91127	
D 4 13C5-PFPeA										
267.90 > 223.00	1.881	1.881	0.0		12054795	43.6		87.2	1138554	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.881	1.881	0.0	1.000	12179602	51.4		103	119181	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.919	1.919	0.0	1.000	20332158	46.0		104		
298.90 > 99.00	1.919	1.919	0.0	1.000	9130694		2.23(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.180	2.180	0.0		10754187	41.7		83.5	1344932	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.188	2.188	0.0	1.000	9894460	49.7		99.5	289769	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.539	2.539	0.0	1.000	13940524	45.6		100		
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.532	2.532	0.0	1.000	9458895	50.6		101	107957	
D 11 13C4-PFHpA										
367.00 > 322.00	2.524	2.524	0.0		9484818	42.4		84.7	651279	
D 10 18O2 PFHxS										
403.00 > 84.00	2.539	2.539	0.0		13797364	42.5		89.9	1177792	
D 14 13C4 PFOA										
417.00 > 372.00	2.882	2.882	0.0		9968783	41.2		82.4	493875	

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	2.890	2.890	0.0	1.000	10532514	52.6		105	87025	
413.00 > 169.00	2.882	2.890	-0.008	0.997	6355141		1.66(0.90-1.10)		211758	
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	2.890	2.890	0.0	1.000	13069673	50.3		106		
D 17 13C4 PFOS										
503.00 > 80.00	3.255	3.255	0.0		11455549	44.1		92.3	227209	
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.255	3.255	0.0	1.000	11626812	47.9		103	178110	
499.00 > 99.00	3.255	3.255	0.0	1.000	2544178		4.57(0.90-1.10)		111383	
20 Perfluorononanoic acid										
463.00 > 419.00	3.263	3.263	0.0	1.000	7807070	51.5		103	176658	
D 19 13C5 PFNA										
468.00 > 423.00	3.263	3.263	0.0		7955286	43.4		86.8	522214	
D 21 13C8 FOSA										
506.00 > 78.00	3.568	3.568	0.0		18887872	46.1		92.2	319817	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.568	3.568	0.0	1.000	17749321	50.1		100	395978	
D 23 13C2 PFDA										
515.00 > 470.00	3.619	3.619	0.0		8046220	44.7		89.3	193436	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.619	3.619	0.0	1.000	7554968	50.5		101	166579	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.927	3.927	0.0	1.000	7631539	49.9		104		
28 Perfluoroundecanoic acid										
563.00 > 519.00	3.944	3.944	0.0	1.000	5555056	50.8		102	148271	
D 27 13C2 PFUnA										
565.00 > 520.00	3.953	3.953	0.0		5582699	41.1		82.2	372825	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.242	4.242	0.0	1.000	5315281	50.7		101	119149	
D 30 13C2 PFDoA										
615.00 > 570.00	4.242	4.242	0.0		5667542	43.6		87.2	226961	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.511	4.511	0.0	1.000	5088299	50.3		101	13660	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.750	4.750	0.0		11438438	47.2		94.4	478634	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.750	4.750	0.0	1.000	9721666	52.3		105	4214	
713.00 > 169.00	4.741	4.750	-0.009	0.998	1567667		6.20(0.00-0.00)		175984	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.172	5.172	0.0		6144187	46.0		92.0	85211	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.172	5.172	0.0	1.000	5417654	50.2		100	5064	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.536	5.536	0.0	1.000	4894923	54.0		108	4595	

Reagents:

LCPFC-L5_00022 Amount Added: 1.00 Units: mL

Report Date: 17-Jan-2017 09:58:31 Chrom Revision: 2.2 10-Jan-2017 11:26:10

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_030.d

Injection Date: 16-Jan-2017 17:11:56 Instrument ID: A8_N

Lims ID: CCV L5

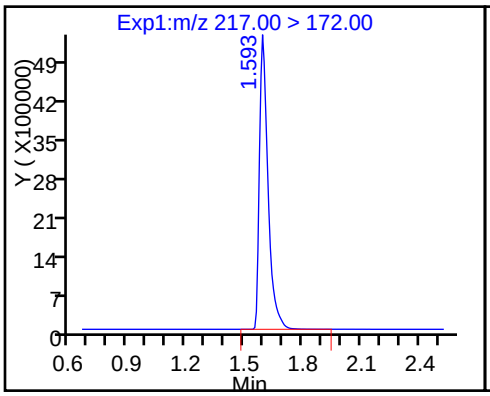
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 41 Worklist Smp#: 32

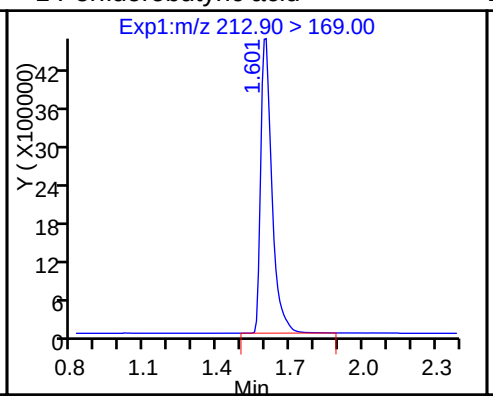
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

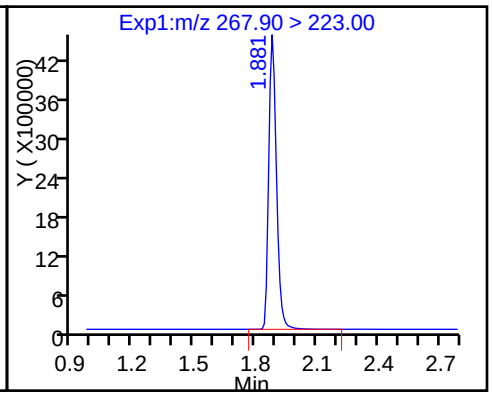
D 2 13C4 PFBA



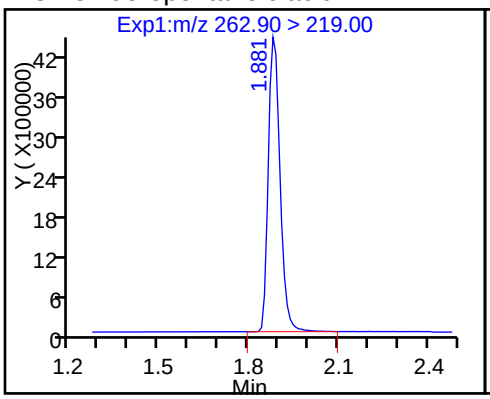
1 Perfluorobutyric acid



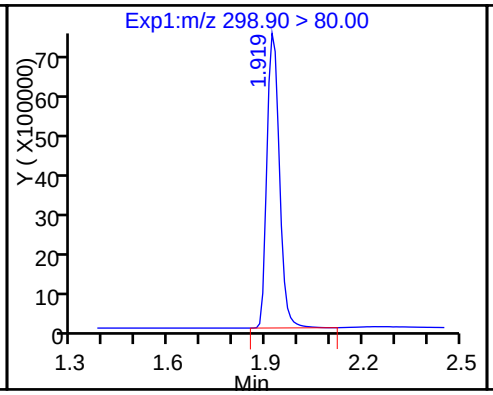
D 4 13C5-PFPeA



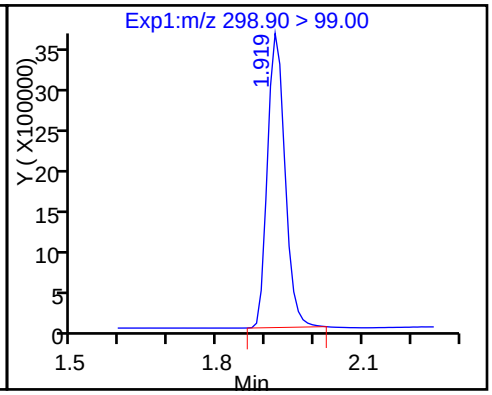
3 Perfluoropentanoic acid



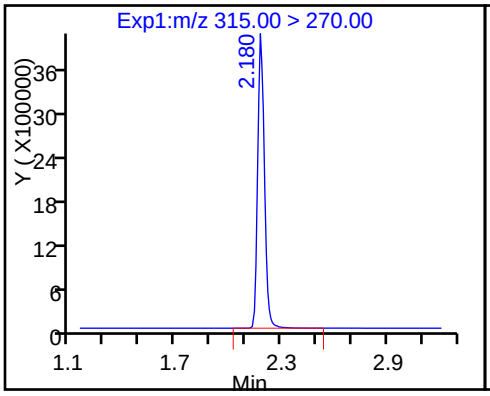
5 Perfluorobutanesulfonic acid



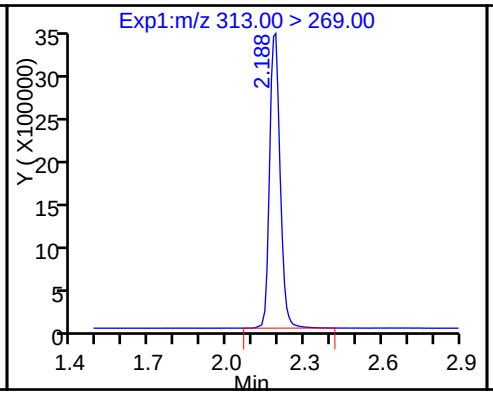
5 Perfluorobutanesulfonic acid



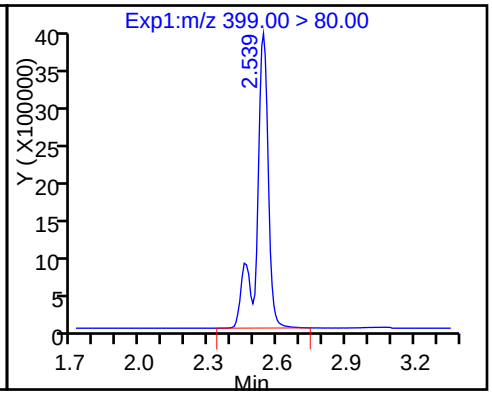
D 6 13C2 PFHxA



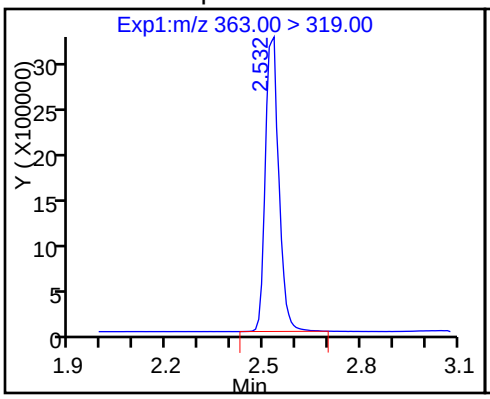
7 Perfluorohexanoic acid



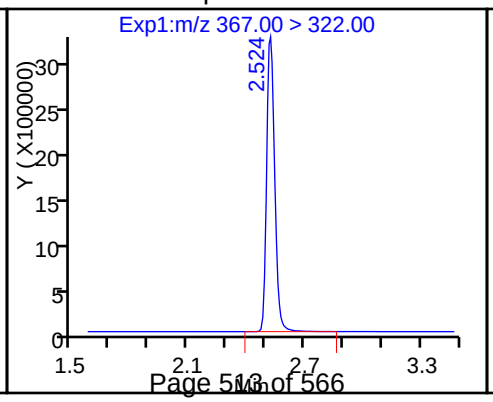
9 Perfluorohexanesulfonic acid



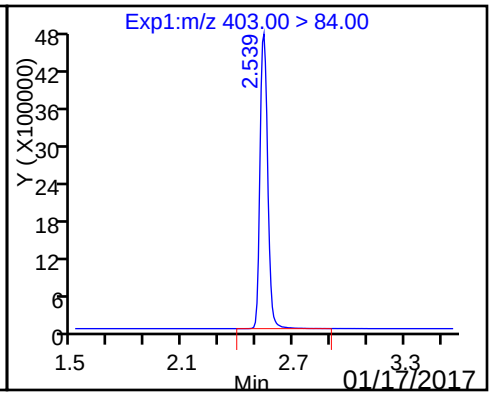
12 Perfluoroheptanoic acid



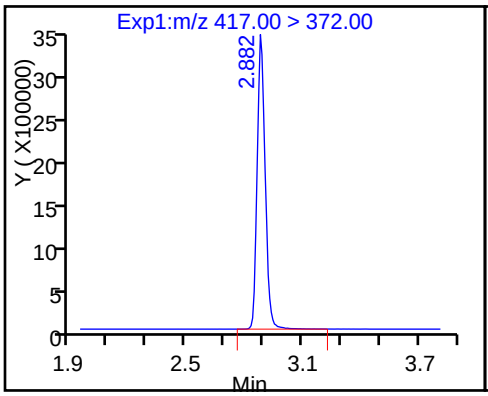
D 11 13C4-PFHpA



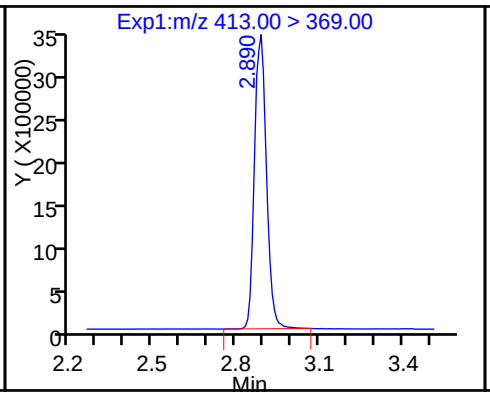
D 10 18O2 PFHxS



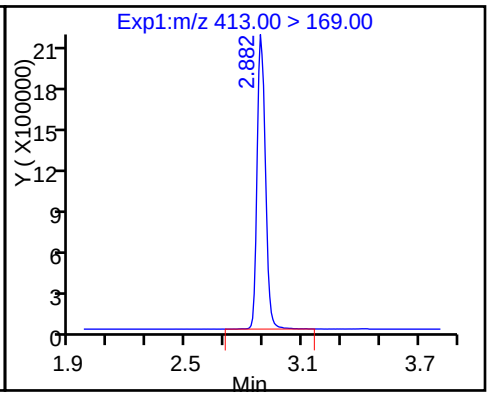
D 14 13C4 PFOA



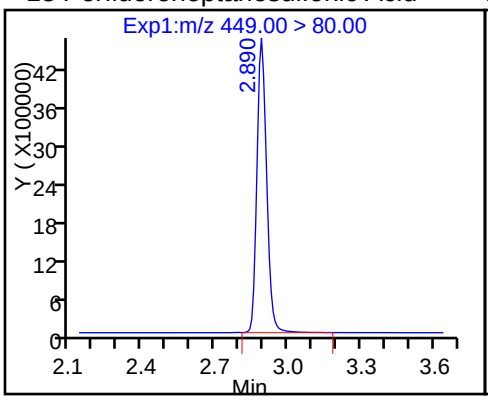
15 Perfluorooctanoic acid



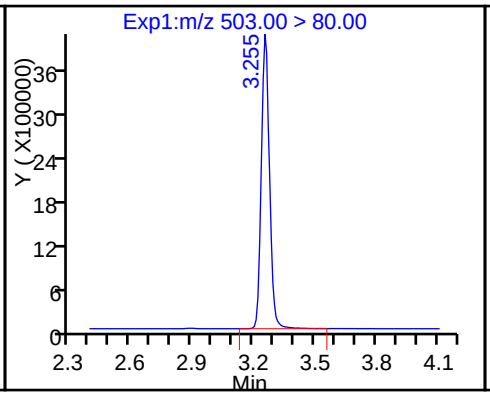
15 Perfluorooctanoic acid



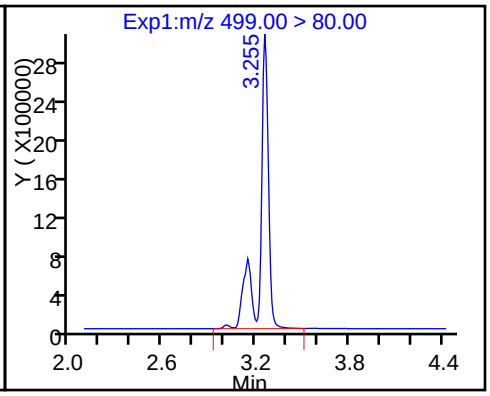
13 Perfluoroheptanesulfonic Acid



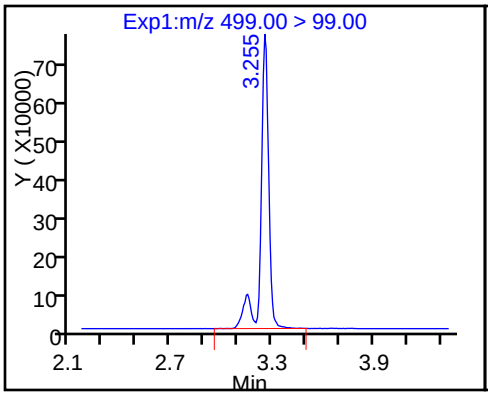
D 17 13C4 PFOS



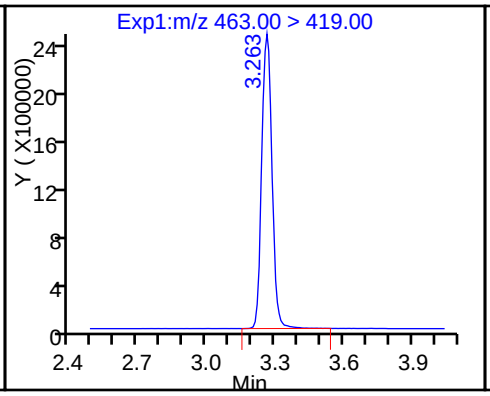
18 Perfluorooctane sulfonic acid



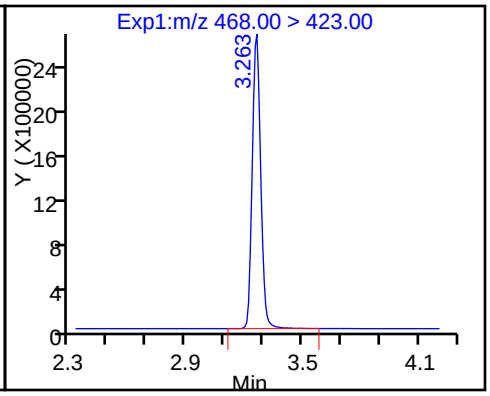
18 Perfluorooctane sulfonic acid



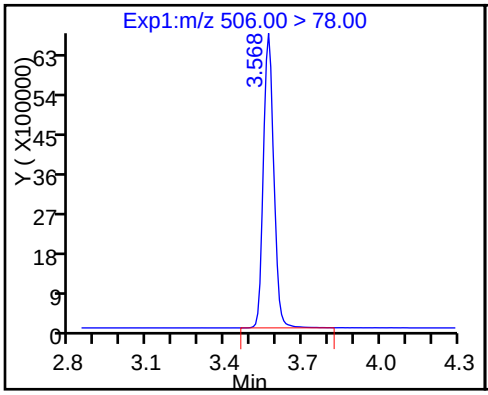
20 Perfluorononanoic acid



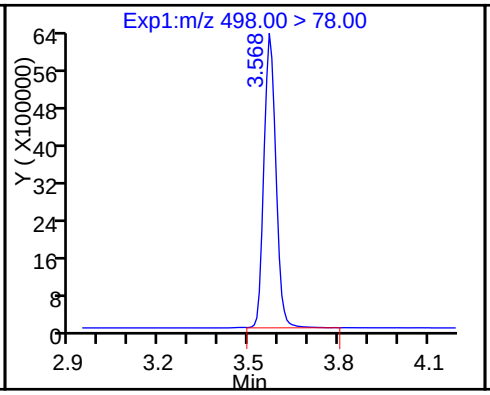
D 19 13C5 PFNA



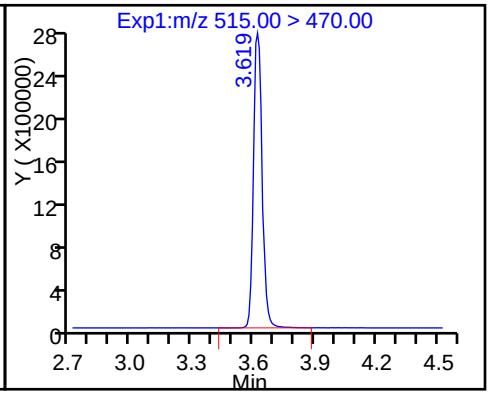
D 21 13C8 FOSA



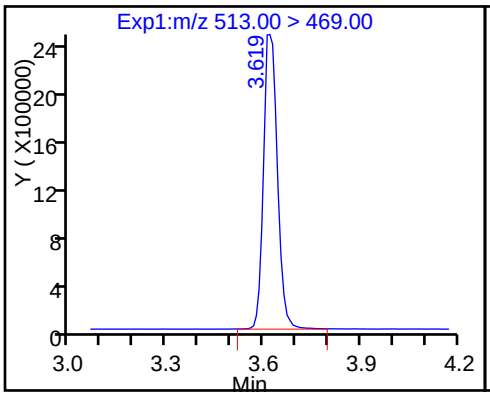
22 Perfluorooctane Sulfonamide



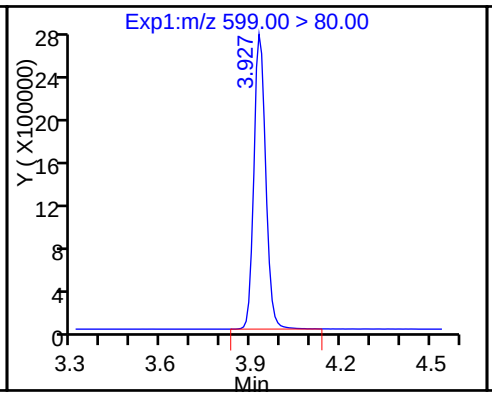
D 23 13C2 PFDA



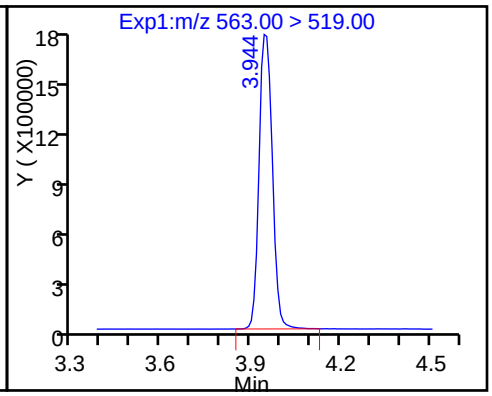
24 Perfluorodecanoic acid



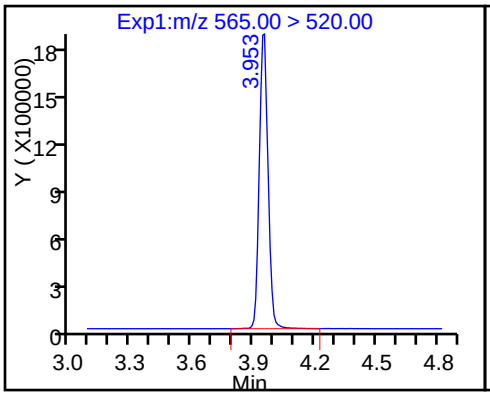
26 Perfluorodecane Sulfonic acid



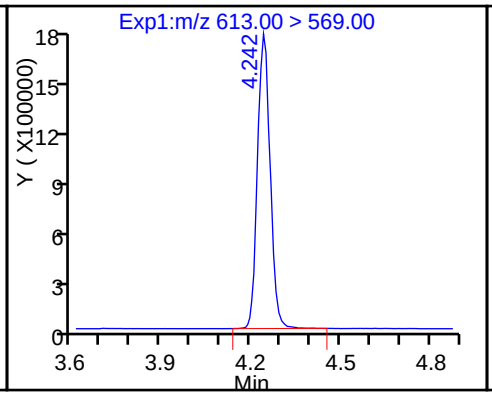
28 Perfluoroundecanoic acid



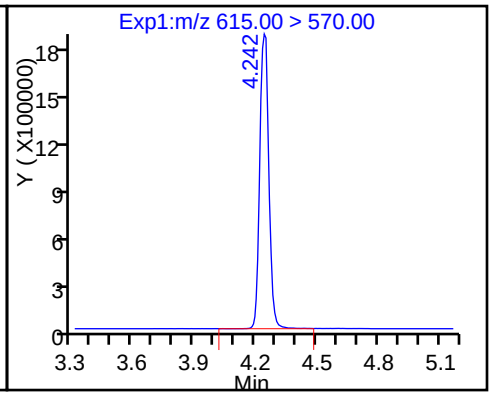
D 27 13C2 PFUnA



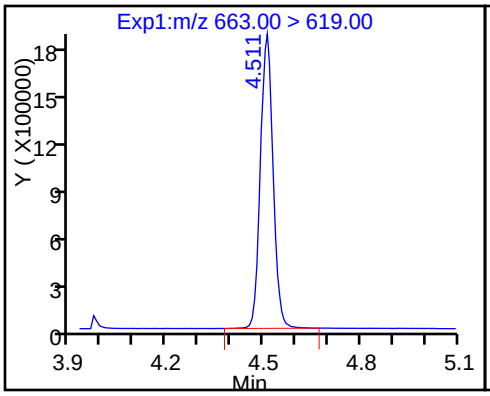
29 Perfluorododecanoic acid



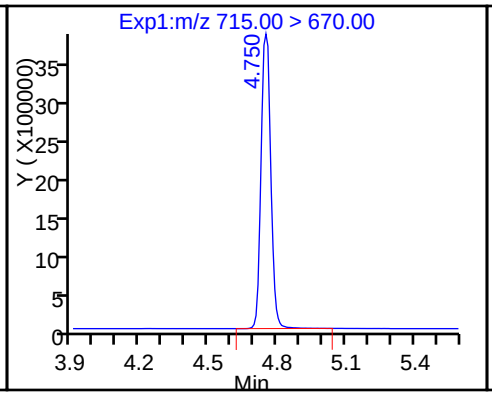
D 30 13C2 PFDoA



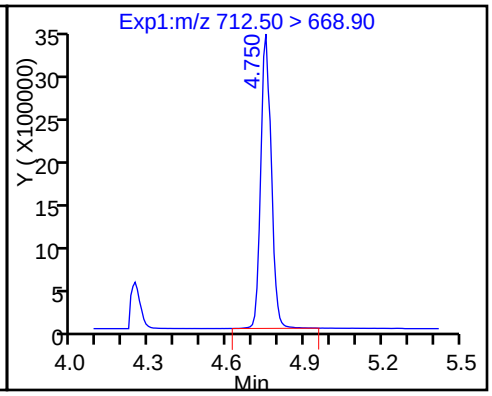
31 Perfluorotridecanoic acid



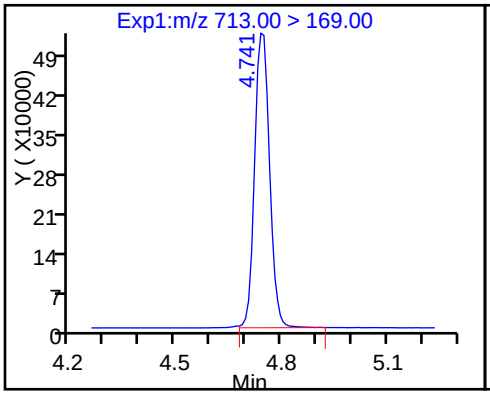
D 32 13C2-PFTeDA



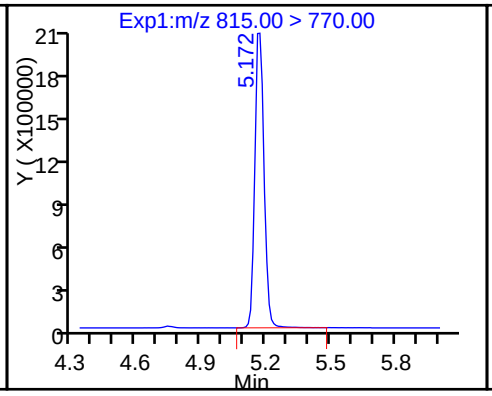
33 Perfluorotetradecanoic acid



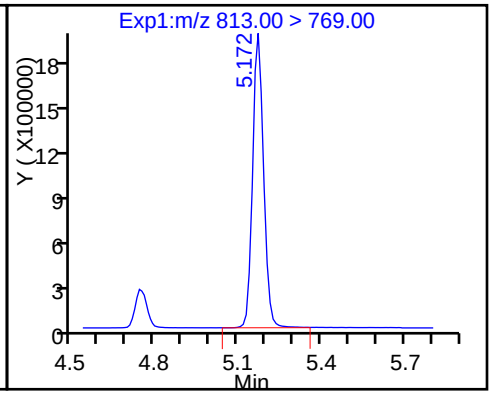
33 Perfluorotetradecanoic acid



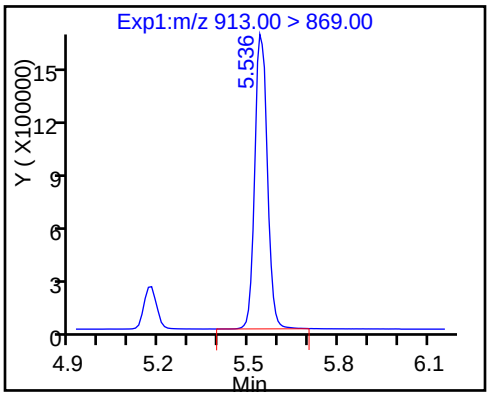
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-24961-1
SDG No.:
Client Sample ID:
Lab Sample ID: MB 320-146325/1-A
Matrix: Water
Lab File ID: 16JAN2017_005.d
Analysis Method: 537 (Modified)
Date Collected:
Extraction Method: 3535
Date Extracted: 01/13/2017 12:50
Sample wt/vol: 250(mL)
Date Analyzed: 01/16/2017 14:04
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.: 146533
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.0020	U	0.0025	0.0020	0.00075
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0020	U	0.0025	0.0020	0.00092
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.0030	U	0.0040	0.0030	0.0013

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	120		25-150
STL00994	18O2 PFHxS	123		25-150
STL00991	13C4 PFOS	123		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_005.d
Lims ID: MB 320-146325/1-A
Client ID:
Sample Type: MB
Inject. Date: 16-Jan-2017 14:04:22 ALS Bottle#: 28 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: mb 320-146325/1-a
Misc. Info.: Plate: 1 Rack: 3
Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 17-Jan-2017 09:48:55 Calib Date: 09-Jan-2017 15:16:24
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK027

First Level Reviewer: chandrasenas Date: 17-Jan-2017 09:41:05

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.606	1.606	0.0		21271580	60.9		122	1639525	
1 Perfluorobutyric acid										
212.90 > 169.00	1.630	1.614	0.016	1.000	60492	0.1628			241	
D 4 13C5-PFPeA										
267.90 > 223.00	1.907	1.906	0.001		16739887	60.5		121	743457	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.907	1.906	0.001	1.000	42203	0.1282			324	
D 6 13C2 PFHxA										
315.00 > 270.00	2.212	2.225	-0.013		14407811	55.9		112	1305876	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.212	2.225	-0.013	1.000	13982	0.0525			272	
D 11 13C4-PFHpA										
367.00 > 322.00	2.559	2.568	-0.009		12860029	57.4		115	1465192	
D 10 18O2 PFHxS										
403.00 > 84.00	2.574	2.584	-0.010		18869904	58.2		123	935413	
D 14 13C4 PFOA										
417.00 > 372.00	2.934	2.944	-0.010		14536455	60.1		120	699589	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.942	2.952	-0.010	1.000	76661	0.2628			675	
413.00 > 169.00	2.942	2.952	-0.010	1.000	50180		1.53(0.90-1.10)		2284	
D 47 M2-6:2FTS										
429.00 > 409.00	2.910	2.983	-0.073		7372	0.0552		0.0		
48 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.910	2.983	-0.073	1.000	11193	NR				
D 17 13C4 PFOS										
503.00 > 80.00	3.308	3.321	-0.013		15234909	58.7		123	1316504	
D 19 13C5 PFNA										
468.00 > 423.00	3.323	3.329	-0.006		11121758	60.6		121	442580	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 21 13C8 FOSA										
506.00 > 78.00	3.594	3.591	0.003		2802823	6.84		13.7	111066	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.673	3.688	-0.015	1.000	7402	0.0365			255	
D 23 13C2 PFDA										
515.00 > 470.00	3.682	3.697	-0.015		10914092	60.6		121	263085	
43 Sodium 1H,1H,2H,2H-perfluorooctane										
527.00 > 507.00	3.654	3.736	-0.082	0.997	1445	NR				
D 42 M2-8:2FTS										
529.00 > 509.00	3.663	3.745	-0.082		11234	0.0832		0.0		
D 45 d3-NMeFOSAA										
573.00 > 419.00	3.840	3.909	-0.069		22274	0.2725		0.0		
49 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.919	3.978	-0.059	0.975	570	NR				
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.981	3.997	-0.016	1.000	4558	0.0224				
D 27 13C2 PFUnA										
565.00 > 520.00	4.009	4.026	-0.017		8208829	60.4		121	394776	
28 Perfluoroundecanoic acid										
563.00 > 519.00	4.018	4.026	-0.008	1.000	28313	0.1760			888	
D 46 d5-NEtFOSAA										
589.00 > 419.00	4.018	4.080	-0.062		23445	0.2590		0.0		
D 52 d-N-MeFOSA-M										
515.00 > 169.00	4.066	4.097	-0.031		2401	0.0234		0.0		
D 51 d-N-EtFOSA-M										
531.00 > 169.00	4.242	4.273	-0.031		3601	0.0360		0.0		
29 Perfluorododecanoic acid										
613.00 > 569.00	4.303	4.324	-0.021	1.000	3072	0.0226			17.2	
D 30 13C2 PFDoA										
615.00 > 570.00	4.312	4.324	-0.012		7363571	56.6		113	321847	
53 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.312	4.349	-0.037	1.000	400	NR				
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.574	4.595	-0.021	1.000	5801	0.0442			10.2	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.828	4.838	-0.010		14168934	58.5		117	516408	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.828	4.847	-0.019	1.000	33134	0.1371			13.0	
713.00 > 169.00	4.828	4.847	-0.019	1.000	9937		3.33(0.00-0.00)		851	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.262	5.274	-0.012		8148870	61.0		122	119061	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.262	5.285	-0.023	1.000	121109	0.4180			105	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.650	5.672	-0.022	1.000	6379	0.0541			8.1	

QC Flag Legend

Processing Flags

NR - Missing Quant Standard

Report Date: 17-Jan-2017 09:49:00 Chrom Revision: 2.2 10-Jan-2017 11:26:10

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_005.d

Injection Date: 16-Jan-2017 14:04:22 Instrument ID: A8_N

Lims ID: MB 320-146325/1-A

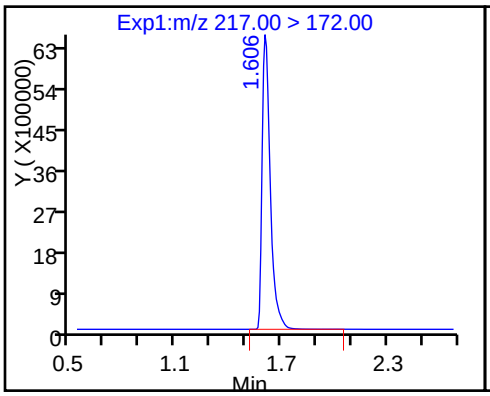
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 28 Worklist Smp#: 7

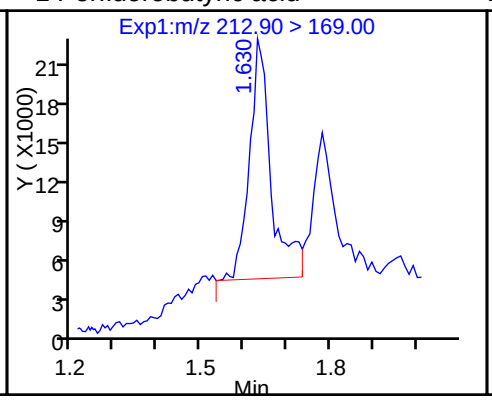
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

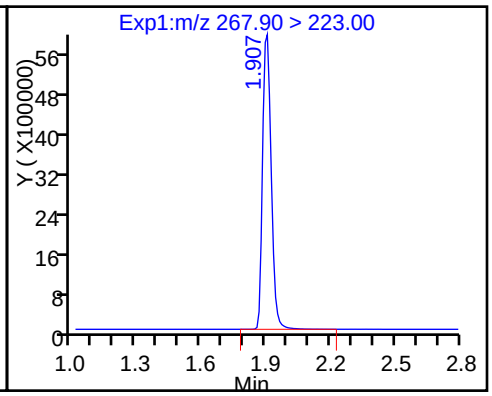
D 2 13C4 PFBA



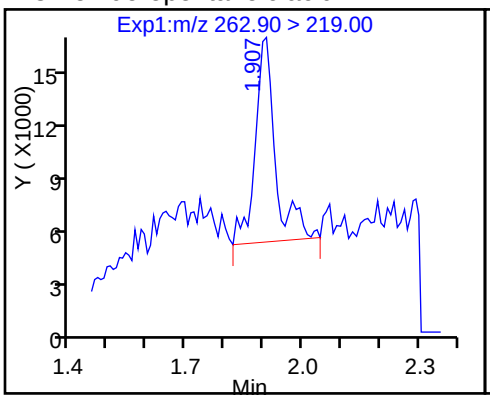
1 Perfluorobutyric acid



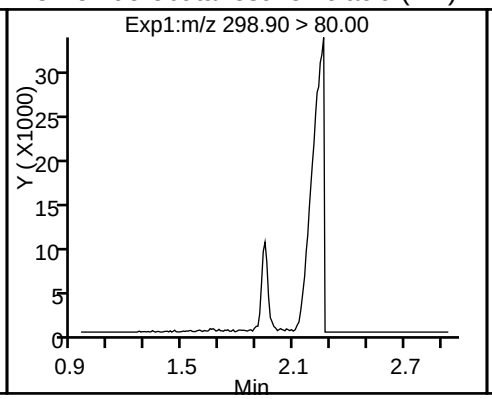
D 4 13C5-PFPeA



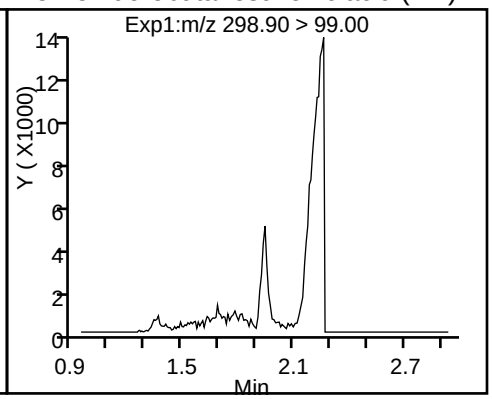
3 Perfluoropentanoic acid



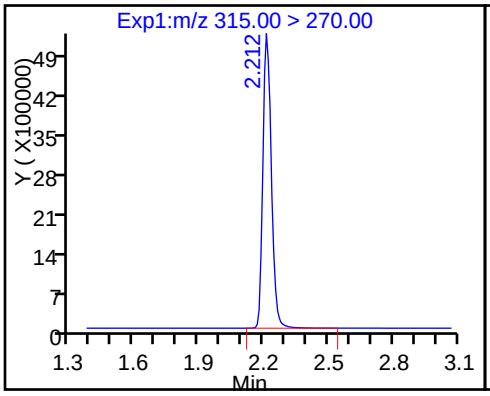
5 Perfluorobutanesulfonic acid (ND)



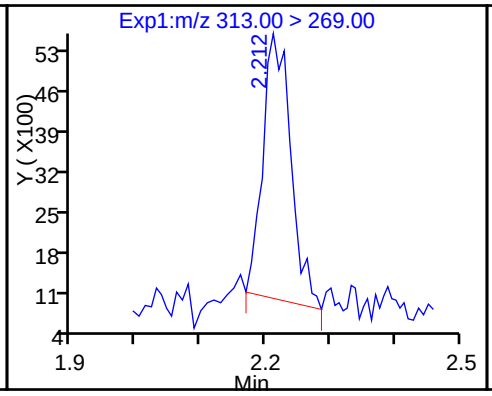
5 Perfluorobutanesulfonic acid (ND)



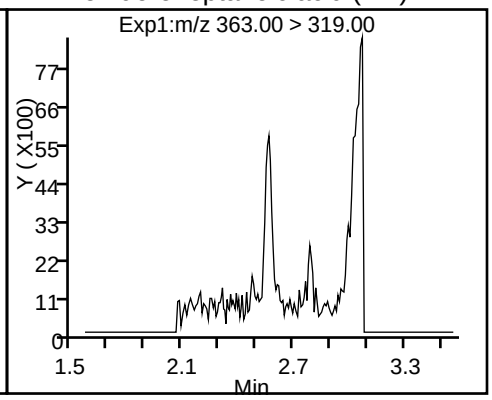
D 6 13C2 PFHxA



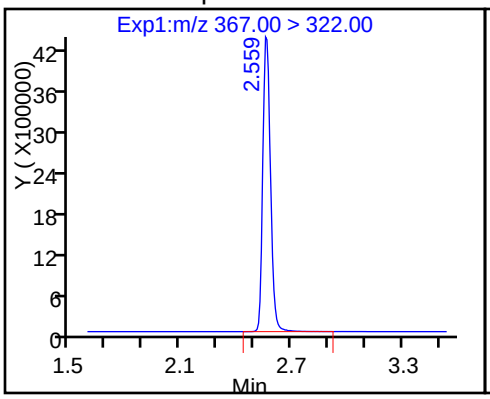
7 Perfluorohexanoic acid



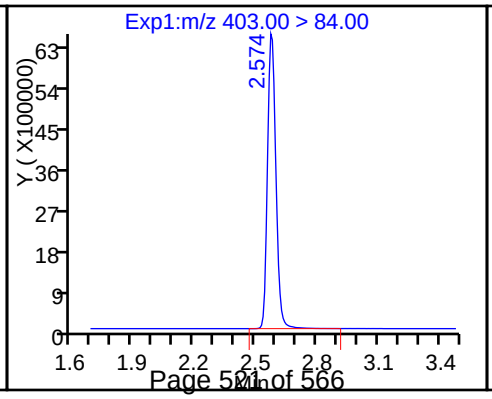
12 Perfluoroheptanoic acid (ND)



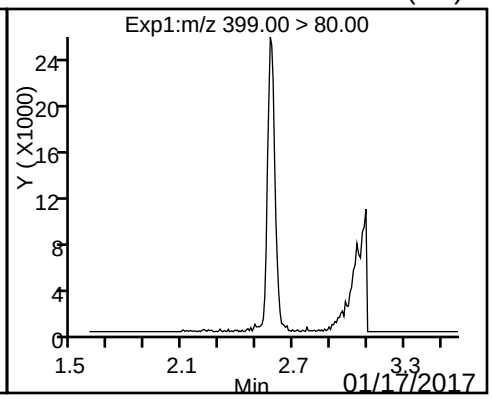
D 11 13C4-PFHpA



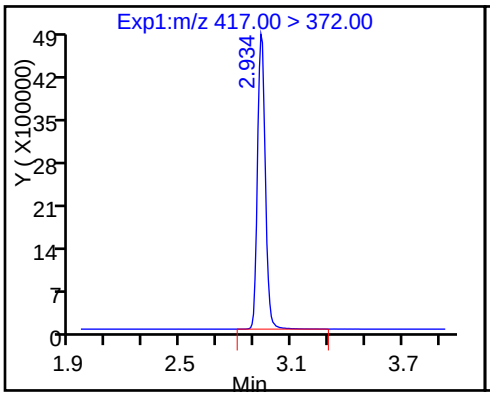
D 10 18O2 PFHxS



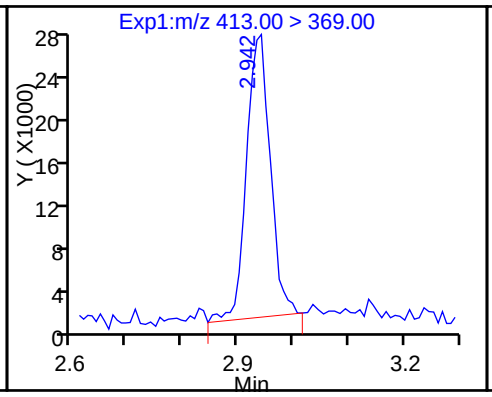
9 Perfluorohexanesulfonic acid (ND)



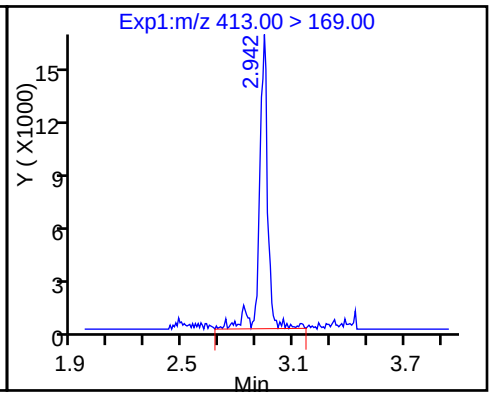
D 14 13C4 PFOA



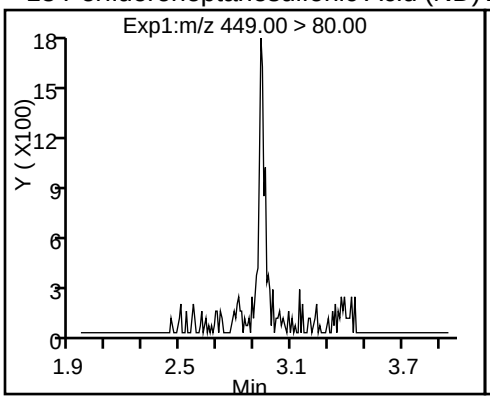
15 Perfluorooctanoic acid



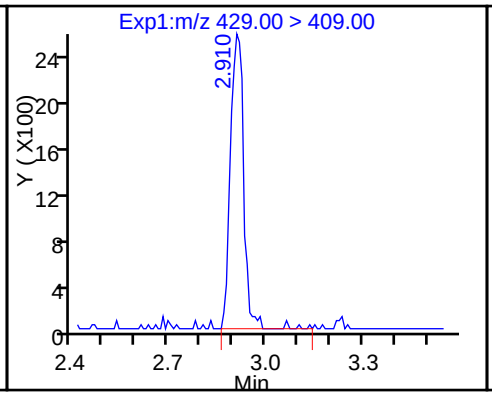
15 Perfluorooctanoic acid



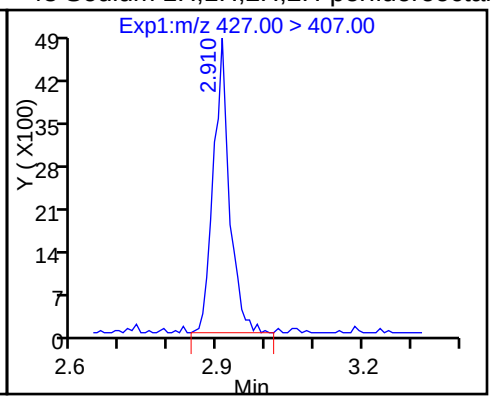
13 Perfluoroheptanesulfonic Acid (ND)



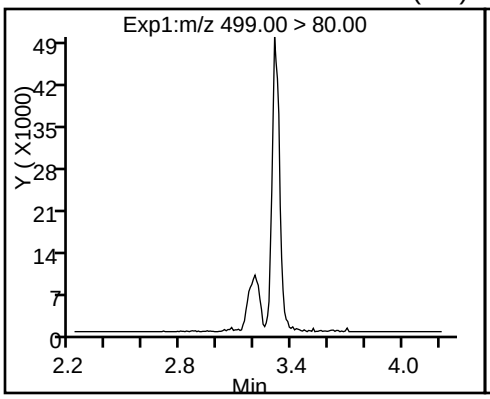
D 47 M2-6:2FTS



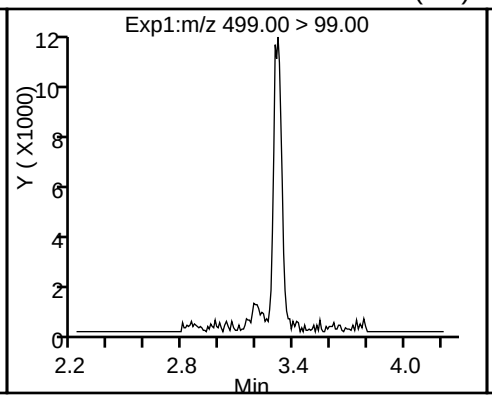
48 Sodium 1H,1H,2H,2H-perfluorooctane



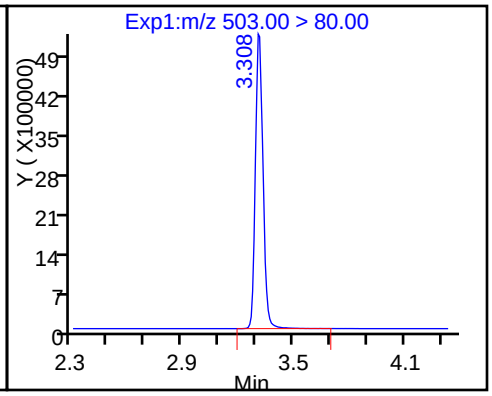
18 Perfluorooctane sulfonic acid (ND)



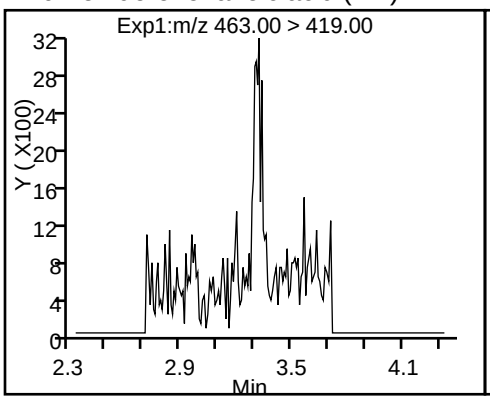
18 Perfluorooctane sulfonic acid (ND)



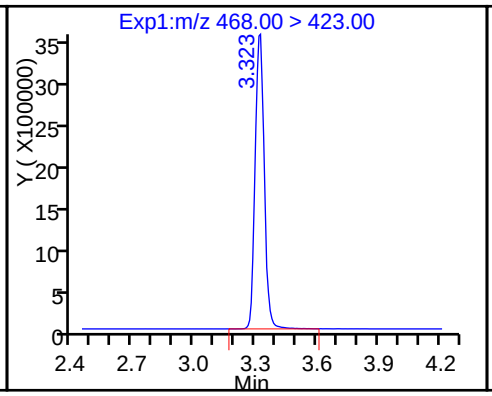
D 17 13C4 PFOS



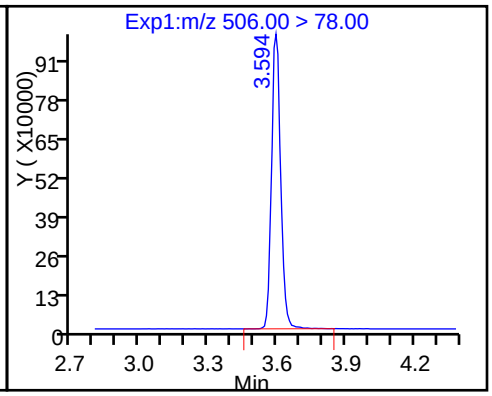
20 Perfluorononanoic acid (ND)



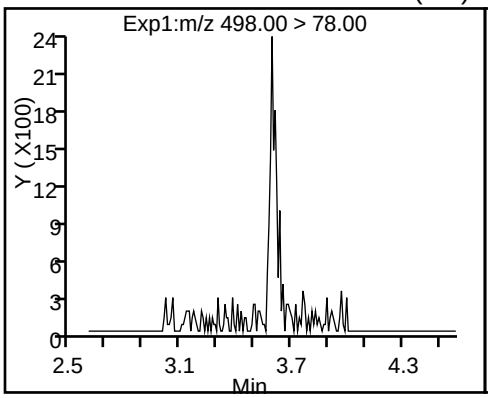
D 19 13C5 PFNA



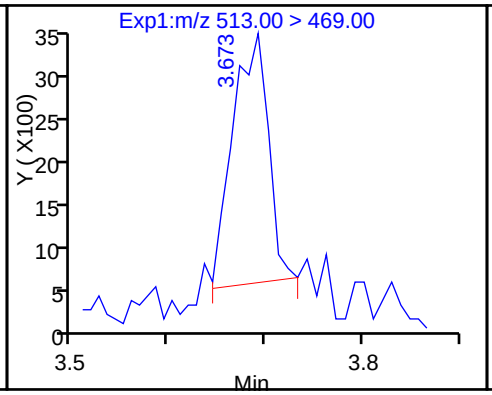
D 21 13C8 FOSA



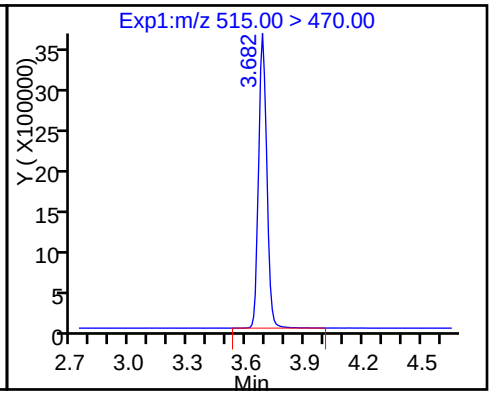
22 Perfluorooctane Sulfonamide (ND)



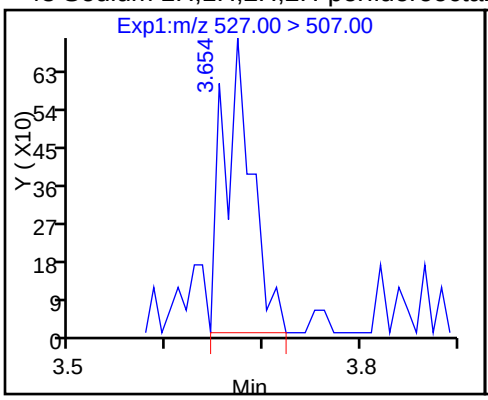
24 Perfluorodecanoic acid



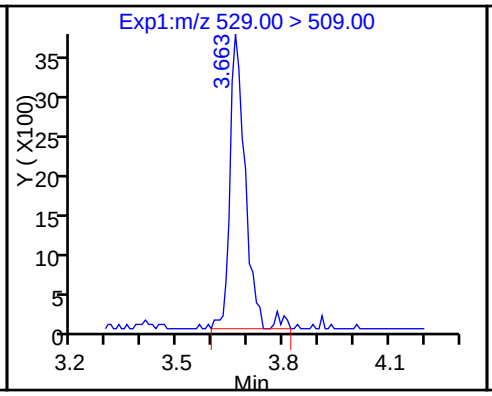
D 23 13C2 PFDA



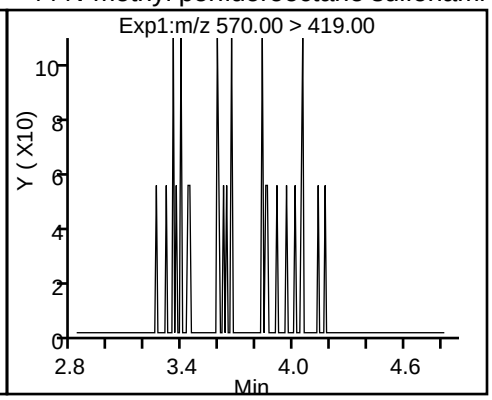
43 Sodium 1H,1H,2H,2H-perfluorooctane



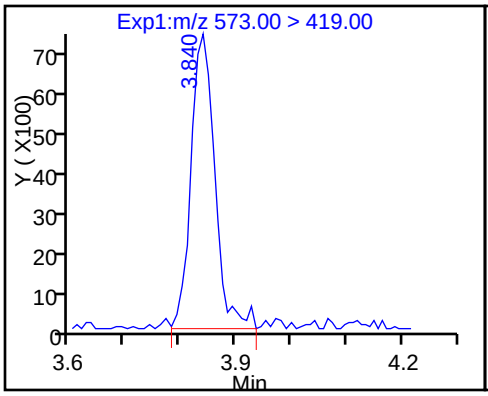
D 42 M2-8:2FTS



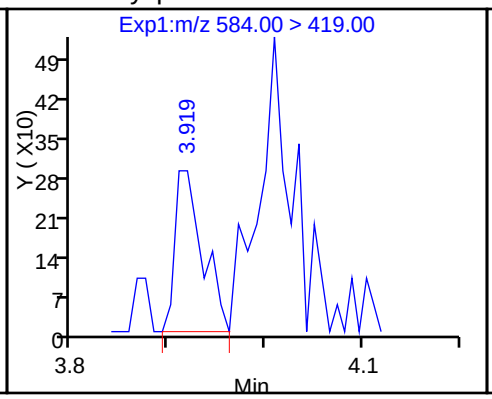
44 N-methyl perfluorooctane sulfonami (ND)



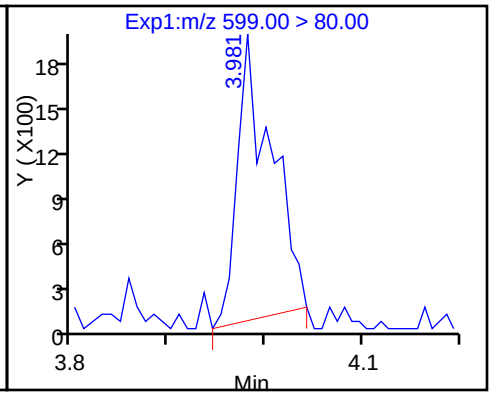
D 45 d3-NMeFOSAA



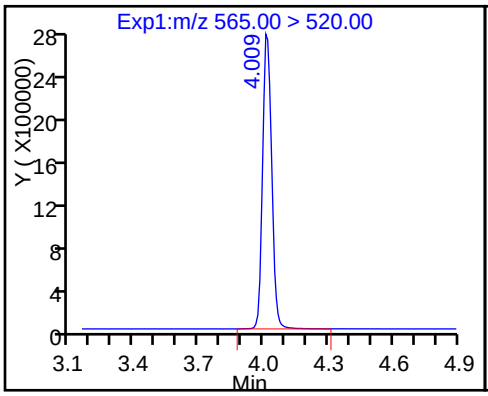
49 N-ethyl perfluorooctane sulfonamid



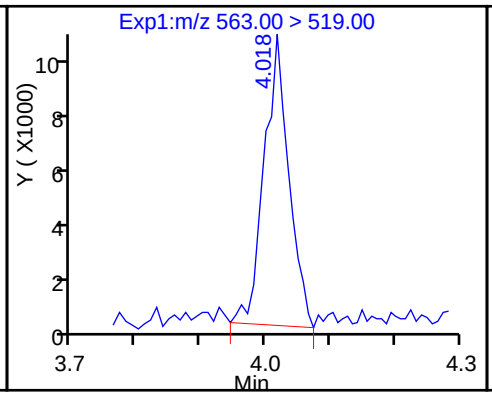
26 Perfluorodecane Sulfonic acid



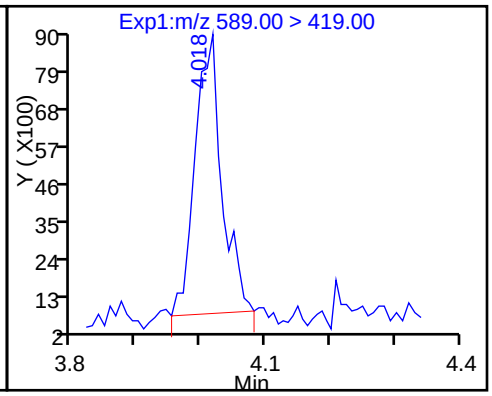
D 27 13C2 PFUnA



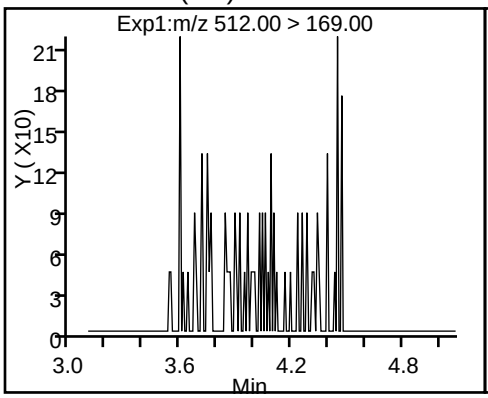
28 Perfluoroundecanoic acid



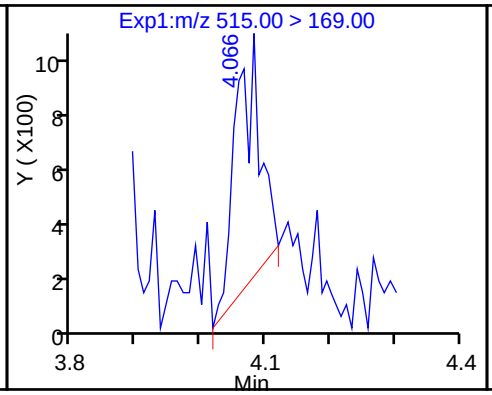
D 46 d5-NEtFOSAA



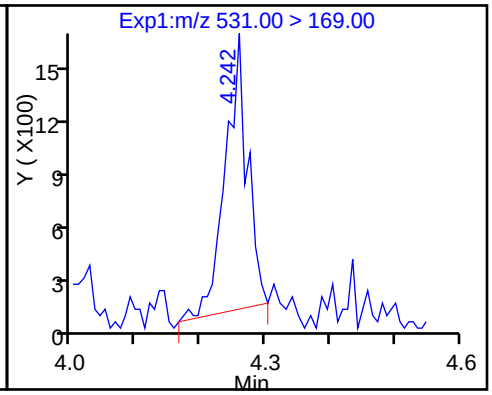
54 MeFOSA (ND)



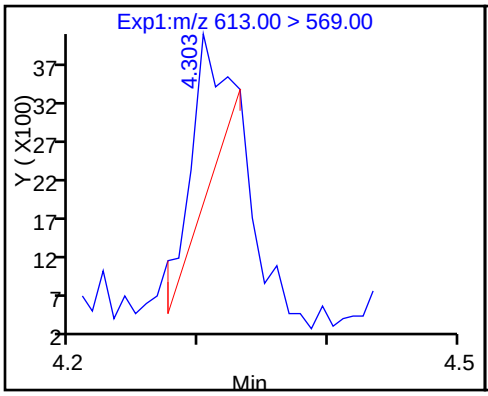
D 52 d-N-MeFOSA-M



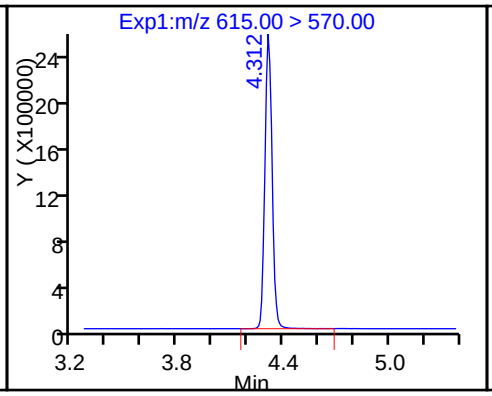
D 51 d-N-EtFOSA-M



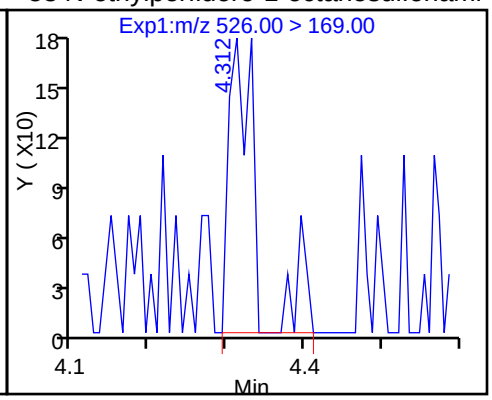
29 Perfluorododecanoic acid



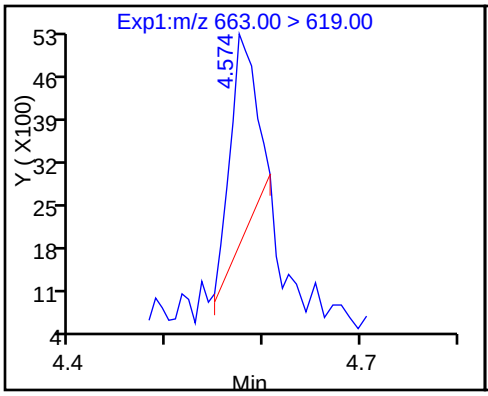
D 30 13C2 PFDoA



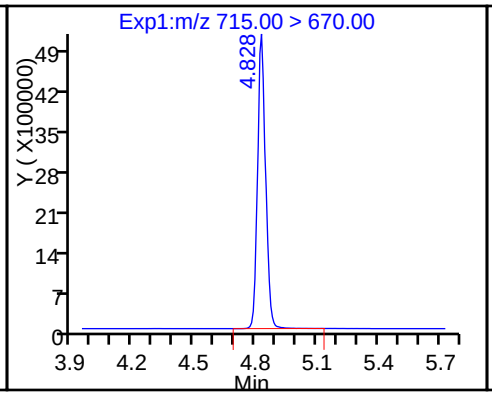
53 N-ethylperfluoro-1-octanesulfonami



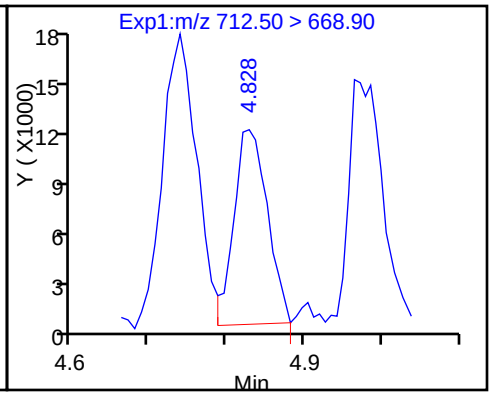
31 Perfluorotridecanoic acid



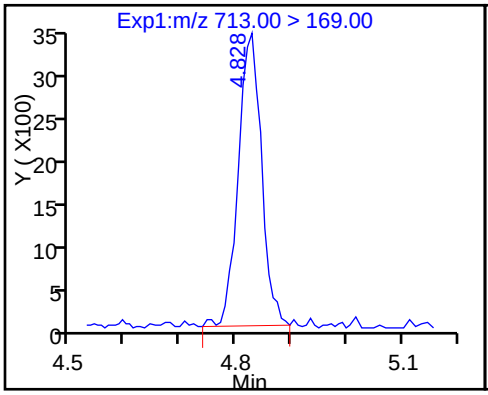
D 32 13C2-PFTeDA



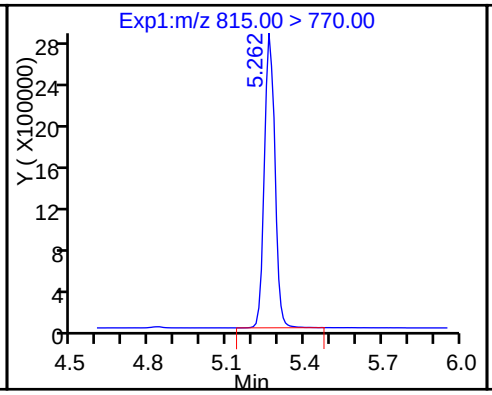
33 Perfluorotetradecanoic acid



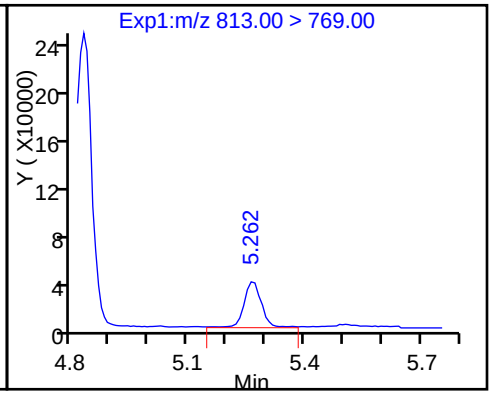
33 Perfluorotetradecanoic acid



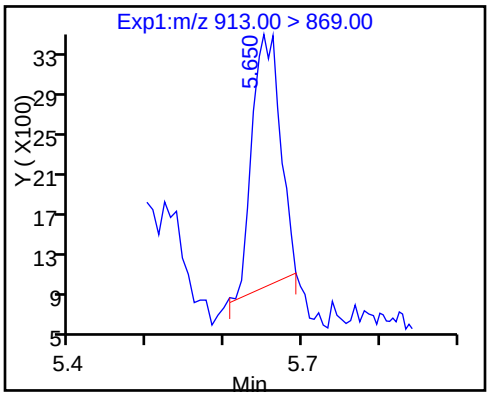
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-24961-1
SDG No.:
Client Sample ID:
Lab Sample ID: LCS 320-146325/2-A
Matrix: Water
Lab File ID: 16JAN2017_006.d
Analysis Method: 537 (Modified)
Date Collected:
Extraction Method: 3535
Date Extracted: 01/13/2017 12:50
Sample wt/vol: 250(mL)
Date Analyzed: 01/16/2017 14:11
Con. Extract Vol.: 0.5(mL)
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: Acquity ID: 2.1(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 146533
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.0411		0.0025	0.0020	0.00075
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0423		0.0025	0.0020	0.00092
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.0402		0.0040	0.0030	0.0013

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	116		25-150
STL00994	18O2 PFHxS	122		25-150
STL00991	13C4 PFOS	123		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_006.d
Lims ID: LCS 320-146325/2-A
Client ID:
Sample Type: LCS
Inject. Date: 16-Jan-2017 14:11:51 ALS Bottle#: 29 Worklist Smp#: 8
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: lcs 320-146325/2-a
Misc. Info.: Plate: 1 Rack: 3
Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 17-Jan-2017 09:48:55 Calib Date: 09-Jan-2017 15:16:24
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK027

First Level Reviewer: westendorfc Date: 16-Jan-2017 15:01:42

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.614	1.606	0.008		22268732	63.7		127	971468	
1 Perfluorobutyric acid										
212.90 > 169.00	1.614	1.614	0.0	1.000	8498375	21.9		109	43071	
D 4 13C5-PFPeA										
267.90 > 223.00	1.907	1.906	0.001		17381520	62.9		126	1005323	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.907	1.906	0.001	1.000	7228013	21.1		106	75986	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.945	1.945	0.0	1.000	12634530	21.1		120		
298.90 > 99.00	1.945	1.945	0.0	1.000	5328881		2.37(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.215	2.225	-0.010		14704579	57.1		114	742529	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.215	2.225	-0.010	1.000	5517425	20.3		101	154794	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.565	2.568	-0.003	1.000	5270986	20.5		102	70299	
D 11 13C4-PFHpA										
367.00 > 322.00	2.565	2.568	-0.003		13053662	58.3		117	1189362	
D 10 18O2 PFHxS										
403.00 > 84.00	2.580	2.584	-0.004		18663560	57.5		122	2171217	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.580	2.591	-0.011	1.000	7887479	19.1		105		
D 14 13C4 PFOA										
417.00 > 372.00	2.933	2.944	-0.011		13999783	57.9		116	667017	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.933	2.952	-0.019	1.000	5778653	20.6		103	67525	
413.00 > 169.00	2.933	2.952	-0.019	1.000	3541744		1.63(0.90-1.10)		138317	

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	2.942	2.952	-0.010	1.000	7059065	20.3		107		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.194	3.217	-0.023	1.000	6506406	20.1		108	60146	
499.00 > 99.00	3.309	3.217	0.092	1.036	1403443		4.64(0.90-1.10)		86631	
D 17 13C4 PFOS										
503.00 > 80.00	3.309	3.321	-0.012		15286636	58.9		123	467229	
20 Perfluorononanoic acid										
463.00 > 419.00	3.317	3.329	-0.012	1.000	4150600	19.9		99.7	70781	
D 19 13C5 PFNA										
468.00 > 423.00	3.317	3.329	-0.012		10926781	59.6		119	1097119	
D 21 13C8 FOSA										
506.00 > 78.00	3.591	3.591	-0.001		8088765	19.7		39.5	296153	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.599	3.599	0.0	1.000	2912546	19.2		96.0	151401	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.678	3.688	-0.010	1.000	4289545	20.5		102	109170	
D 23 13C2 PFDA										
515.00 > 470.00	3.688	3.697	-0.009		11261548	62.5		125	356035	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.985	3.997	-0.012	1.000	3942016	19.3		100		
D 27 13C2 PFUnA										
565.00 > 520.00	4.004	4.026	-0.022		7955742	58.6		117	392865	
28 Perfluoroundecanoic acid										
563.00 > 519.00	4.004	4.026	-0.022	1.000	3044185	19.5		97.6	67524	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.306	4.324	-0.018	1.000	2660662	20.0		99.9	9975	
D 30 13C2 PFDoA										
615.00 > 570.00	4.315	4.324	-0.009		7203710	55.4		111	177935	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.575	4.595	-0.020	1.000	2511675	19.6		97.8	2982	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.821	4.838	-0.017		13722258	56.6		113	461879	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.821	4.847	-0.026	1.000	4956935	21.0		105	2387	
713.00 > 169.00	4.821	4.847	-0.026	1.000	750157		6.61(0.00-0.00)		50803	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.255	5.274	-0.019		8225231	61.6		123	110462	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.255	5.285	-0.030	1.000	2866688	20.7		103	2761	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.638	5.672	-0.034	1.000	2910044	25.2		126	2759	

Report Date: 17-Jan-2017 09:49:01 Chrom Revision: 2.2 10-Jan-2017 11:26:10

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_006.d

Injection Date: 16-Jan-2017 14:11:51 Instrument ID: A8_N

Lims ID: LCS 320-146325/2-A

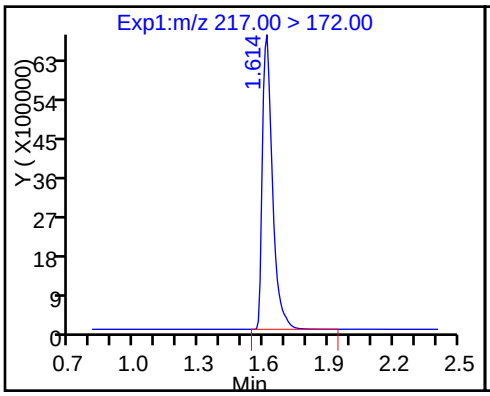
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 29 Worklist Smp#: 8

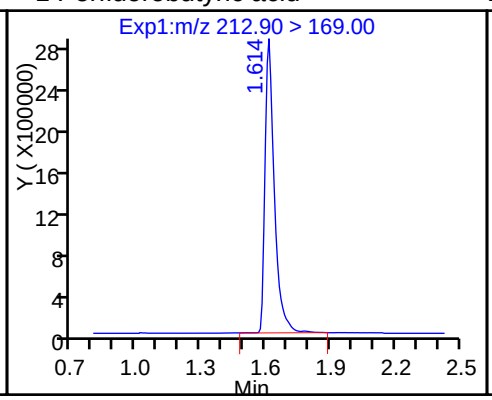
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

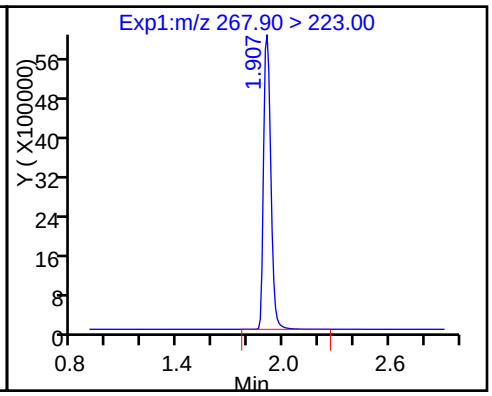
D 2 13C4 PFBA



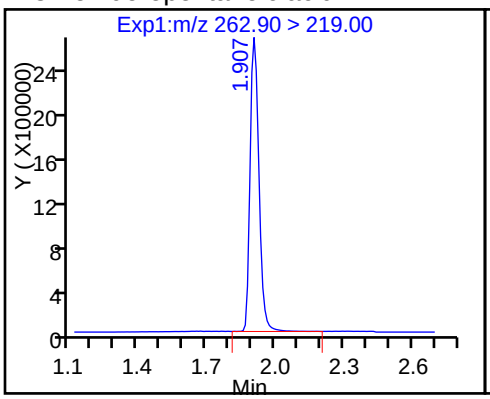
1 Perfluorobutyric acid



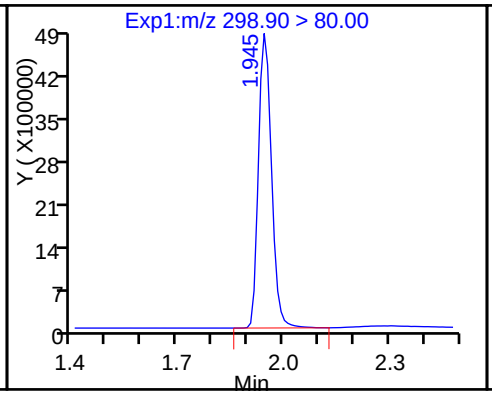
D 4 13C5-PFPeA



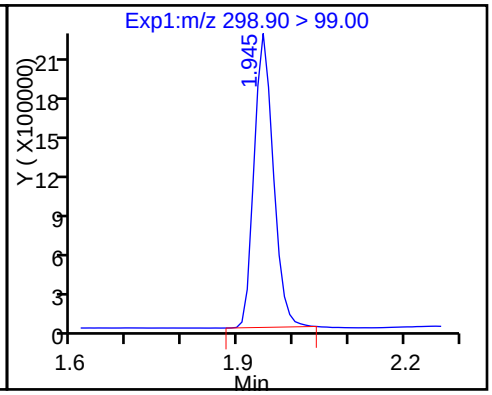
3 Perfluoropentanoic acid



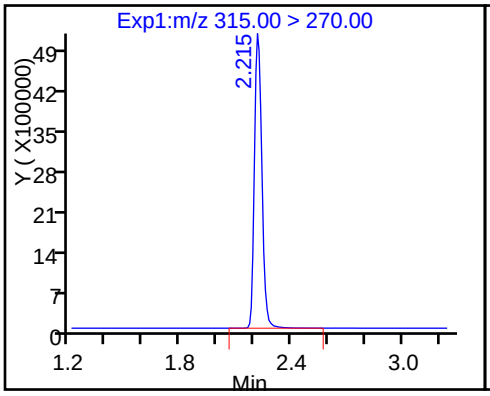
5 Perfluorobutanesulfonic acid



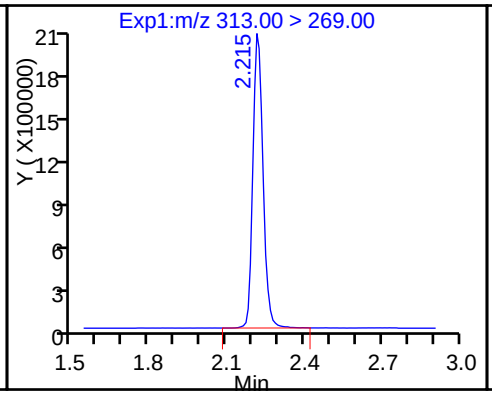
5 Perfluorobutanesulfonic acid



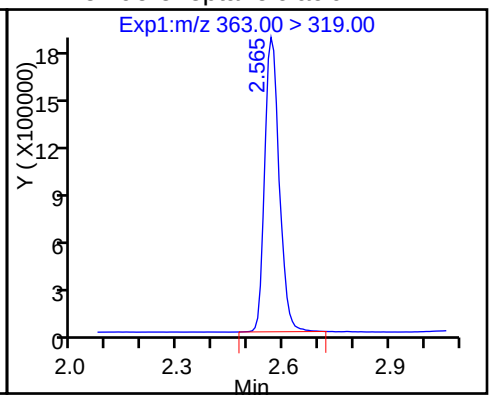
D 6 13C2 PFHxA



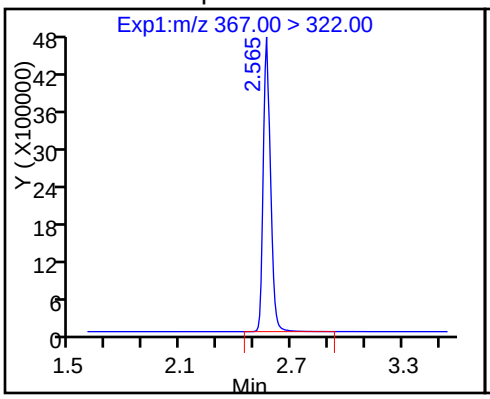
7 Perfluorohexanoic acid



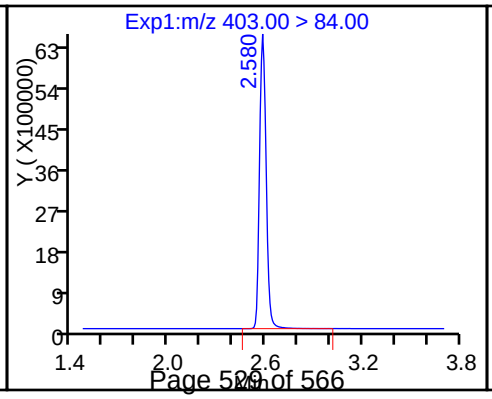
12 Perfluoroheptanoic acid



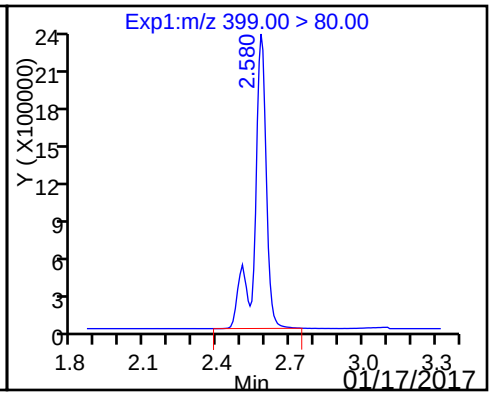
D 11 13C4-PFHpA



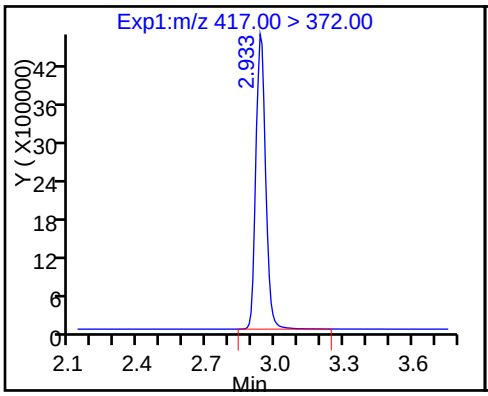
D 10 18O2 PFHxS



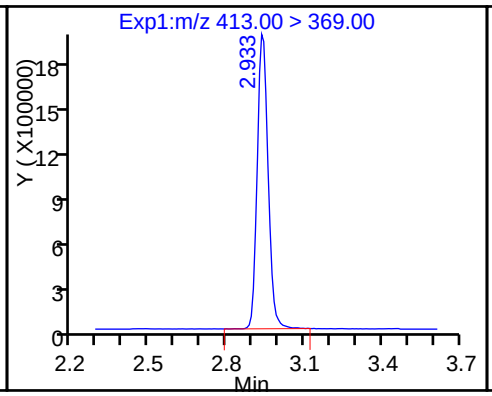
9 Perfluorohexanesulfonic acid



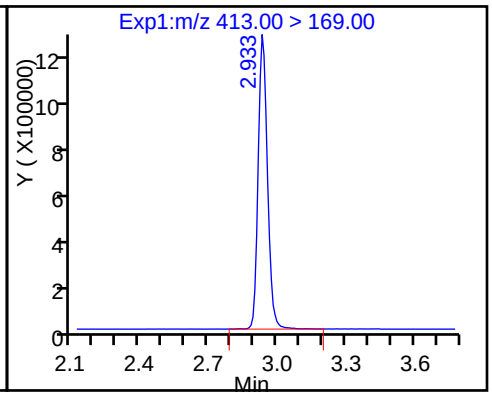
D 14 13C4 PFOA



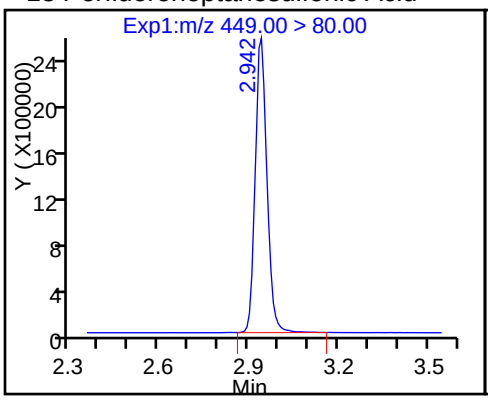
15 Perfluorooctanoic acid



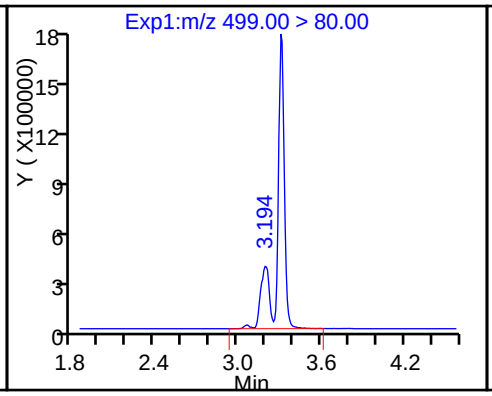
15 Perfluorooctanoic acid



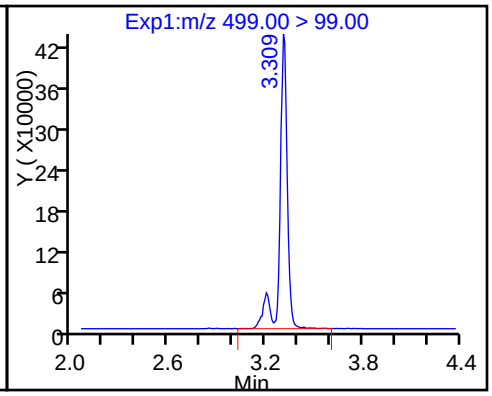
13 Perfluoroheptanesulfonic Acid



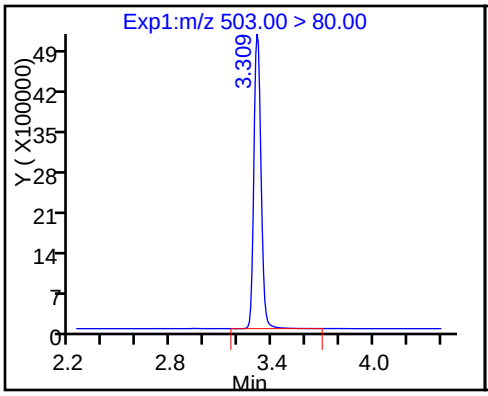
18 Perfluorooctane sulfonic acid



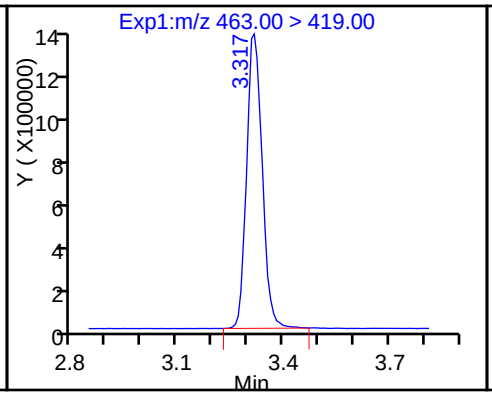
18 Perfluorooctane sulfonic acid



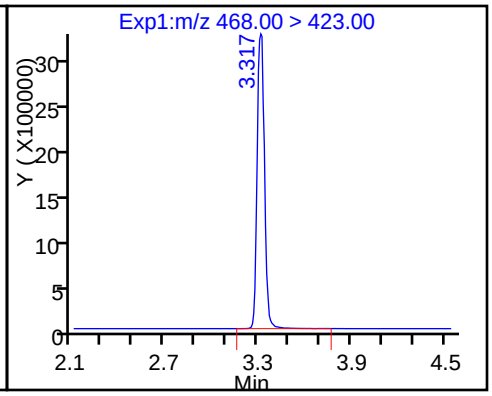
D 17 13C4 PFOS



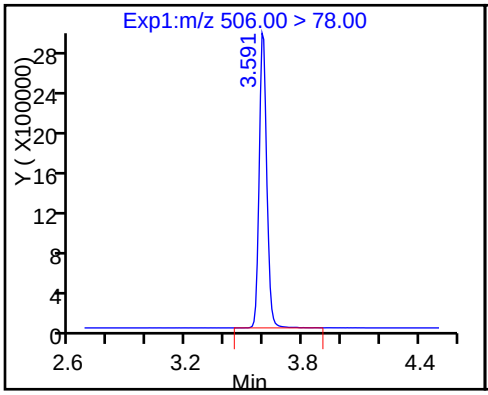
20 Perfluorononanoic acid



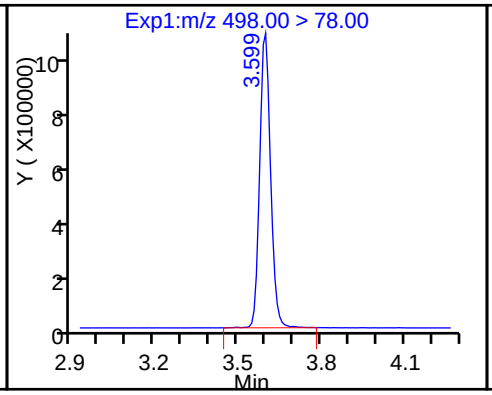
D 19 13C5 PFNA



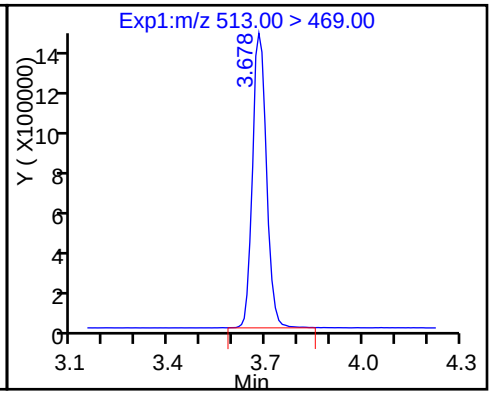
D 21 13C8 FOSA



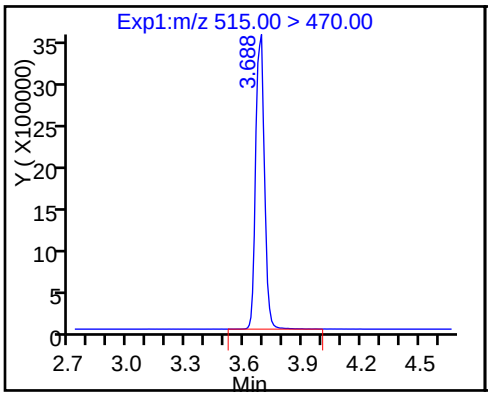
22 Perfluorooctane Sulfonamide



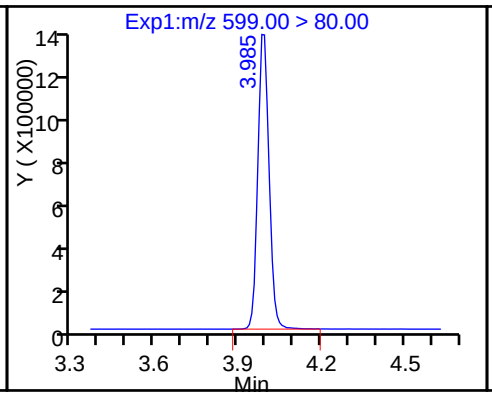
24 Perfluorodecanoic acid



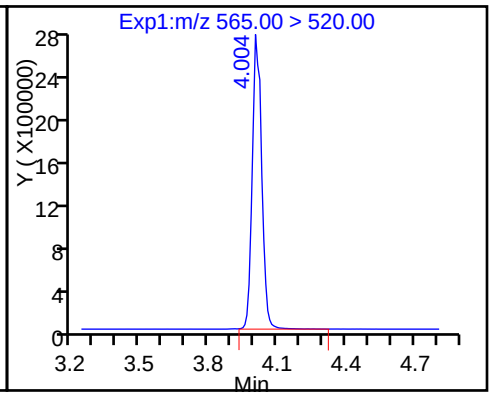
D 23 13C2 PFDA



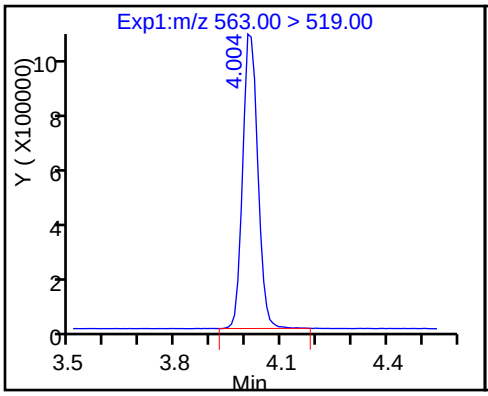
26 Perfluorodecane Sulfonic acid



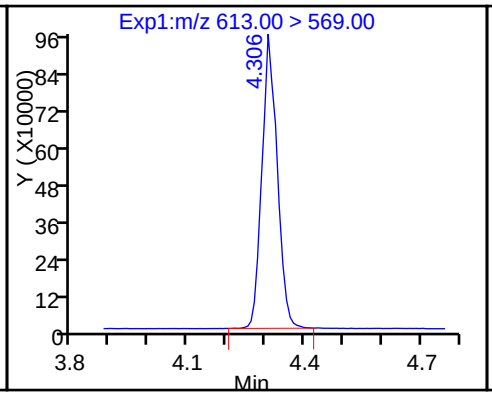
D 27 13C2 PFUnA



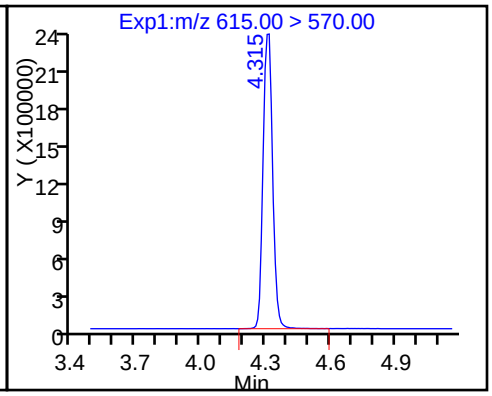
28 Perfluoroundecanoic acid



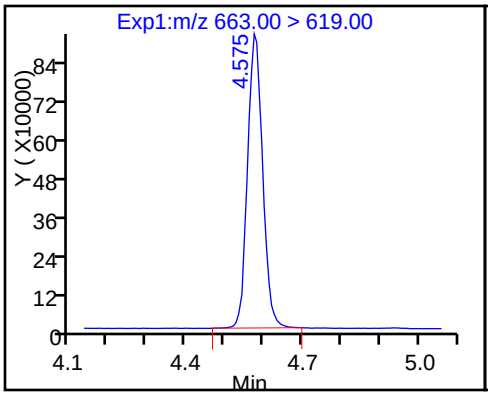
29 Perfluorododecanoic acid



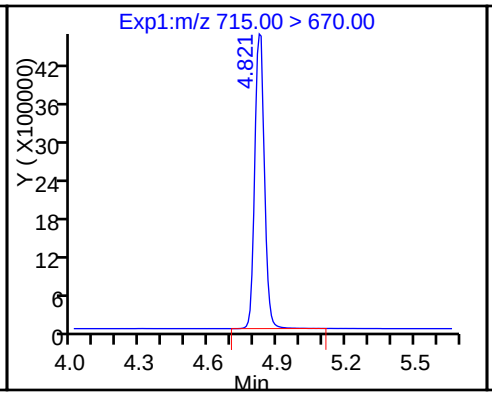
D 30 13C2 PFDoA



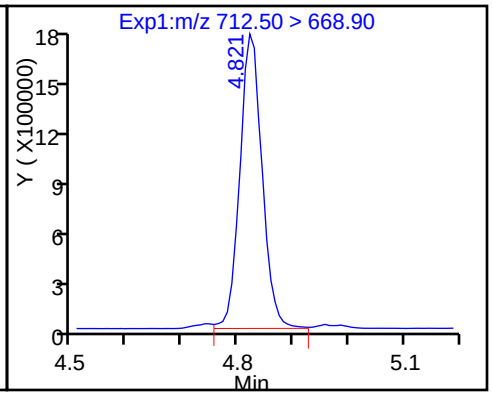
31 Perfluorotridecanoic acid



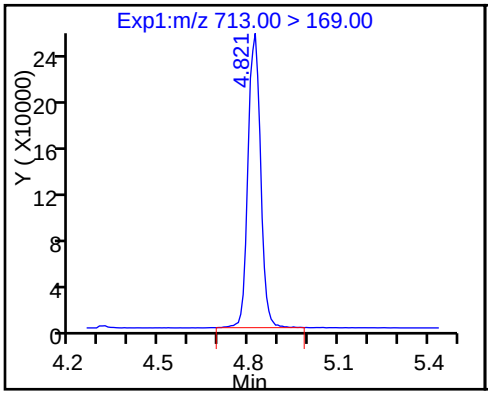
D 32 13C2-PFTeDA



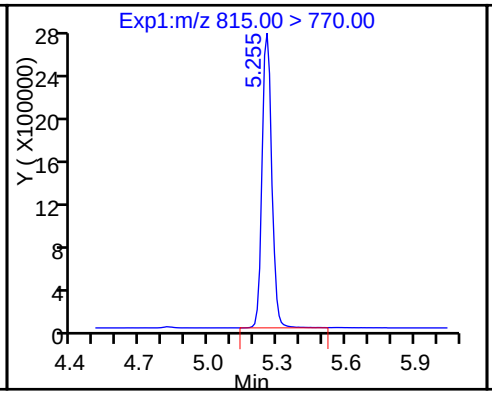
33 Perfluorotetradecanoic acid



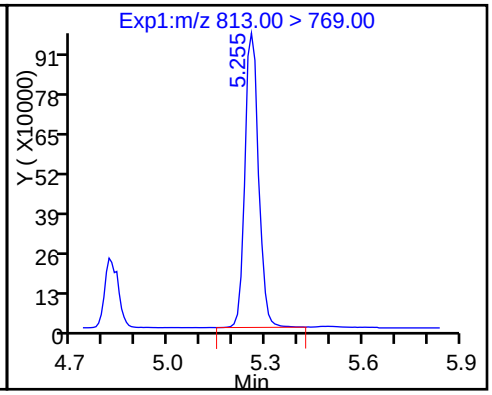
33 Perfluorotetradecanoic acid



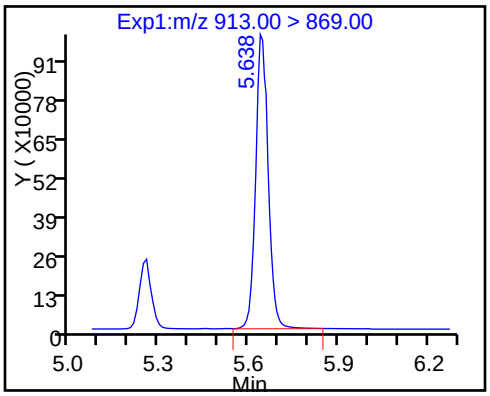
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento
Job No.: 320-24961-1
SDG No.:
Client Sample ID:
Lab Sample ID: LCSD 320-146325/3-A
Matrix: Water
Lab File ID: 16JAN2017_007.d
Analysis Method: 537 (Modified)
Date Collected:
Extraction Method: 3535
Date Extracted: 01/13/2017 12:50
Sample wt/vol: 250(mL)
Date Analyzed: 01/16/2017 14:19
Con. Extract Vol.: 0.5(mL)
Dilution Factor: 1
Injection Volume: 2(uL)
GC Column: Acquity ID: 2.1(mm)
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 146533
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.0421		0.0025	0.0020	0.00075
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0432		0.0025	0.0020	0.00092
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.0415		0.0040	0.0030	0.0013

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	117		25-150
STL00994	18O2 PFHxS	125		25-150
STL00991	13C4 PFOS	125		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_007.d
Lims ID: LCSD 320-146325/3-A
Client ID:
Sample Type: LCSD
Inject. Date: 16-Jan-2017 14:19:23 ALS Bottle#: 30 Worklist Smp#: 9
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: lcsd 320-146325/3-a
Misc. Info.: Plate: 1 Rack: 3
Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 17-Jan-2017 09:48:55 Calib Date: 09-Jan-2017 15:16:24
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170109-38635.b\09JAN2017A_018.d

Column 1 : Det: EXP1
Process Host: XAWRK027

First Level Reviewer: chandrasenas Date: 17-Jan-2017 09:41:39

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00	1.606	1.606	0.0		22697040	65.0		130	1376180	
1 Perfluorobutyric acid										
212.90 > 169.00	1.606	1.614	-0.008	1.000	8870932	22.4		112	73616	
D 4 13C5-PFPeA										
267.90 > 223.00	1.897	1.906	-0.009		17481865	63.2		126	1008666	
3 Perfluoropentanoic acid										
262.90 > 219.00	1.897	1.906	-0.009	1.000	7407394	21.5		108	68942	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.935	1.945	-0.010	1.000	13218708	21.6		122		
298.90 > 99.00	1.935	1.945	-0.010	1.000	5648448		2.34(0.00-0.00)			
D 6 13C2 PFHxA										
315.00 > 270.00	2.205	2.225	-0.020		15116645	58.7		117	894358	
7 Perfluorohexanoic acid										
313.00 > 269.00	2.205	2.225	-0.020	1.000	5754344	20.6		103	109404	
12 Perfluoroheptanoic acid										
363.00 > 319.00	2.558	2.568	-0.010	1.000	5545110	21.6		108	63008	
D 11 13C4-PFHpA										
367.00 > 322.00	2.551	2.568	-0.017		13041776	58.2		116	1079743	
D 10 18O2 PFHxS										
403.00 > 84.00	2.566	2.584	-0.018		19124831	59.0		125	1075801	
9 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.573	2.591	-0.018	1.000	8427995	19.9		109		
D 14 13C4 PFOA										
417.00 > 372.00	2.927	2.944	-0.017		14165094	58.5		117	787206	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.927	2.952	-0.025	1.000	5989607	21.1		105	54576	
413.00 > 169.00	2.927	2.952	-0.025	1.000	3652152		1.64(0.90-1.10)		249706	

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	2.935	2.952	-0.017	1.000	7693227	21.9		115		
18 Perfluorooctane sulfonic acid										
499.00 > 80.00	3.193	3.217	-0.024	1.000	6822633	20.8		112	31219	
499.00 > 99.00	3.301	3.217	0.084	1.034	1496029		4.56(0.90-1.10)		92403	
D 17 13C4 PFOS										
503.00 > 80.00	3.301	3.321	-0.020		15503980	59.7		125	646314	
20 Perfluorononanoic acid										
463.00 > 419.00	3.301	3.329	-0.028	1.000	4312583	20.6		103	70310	
D 19 13C5 PFNA										
468.00 > 423.00	3.301	3.329	-0.028		11008879	60.0		120	366720	
D 21 13C8 FOSA										
506.00 > 78.00	3.587	3.591	-0.004		6279978	15.3		30.7	206788	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.596	3.599	-0.003	1.000	2335082	19.8		99.1	142312	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.665	3.688	-0.023	1.000	4266376	20.4		102	84083	
D 23 13C2 PFDA										
515.00 > 470.00	3.674	3.697	-0.023		11249814	62.5		125	309151	
26 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.981	3.997	-0.016	1.000	4241501	20.5		106		
D 27 13C2 PFUnA										
565.00 > 520.00	4.000	4.026	-0.026		8198584	60.3		121	668158	
28 Perfluoroundecanoic acid										
563.00 > 519.00	4.000	4.026	-0.026	1.000	3242105	20.2		101	71606	
29 Perfluorododecanoic acid										
613.00 > 569.00	4.304	4.324	-0.020	1.000	2749540	19.5		97.6	13601	
D 30 13C2 PFDoA										
615.00 > 570.00	4.304	4.324	-0.020		7618085	58.6		117	285501	
31 Perfluorotridecanoic acid										
663.00 > 619.00	4.565	4.595	-0.030	1.000	2734833	20.1		101	3161	
D 32 13C2-PFTeDA										
715.00 > 670.00	4.808	4.838	-0.030		14666070	60.5		121	467613	
33 Perfluorotetradecanoic acid										
712.50 > 668.90	4.808	4.847	-0.039	1.000	5486034	21.9		110	2194	
713.00 > 169.00	4.808	4.847	-0.039	1.000	817762		6.71(0.00-0.00)		58153	
D 34 13C2-PFHxDA										
815.00 > 770.00	5.240	5.274	-0.034		7854342	58.8		118	117047	
35 Perfluorohexadecanoic acid										
813.00 > 769.00	5.251	5.285	-0.034	1.000	2854474	19.4		97.1	2717	
36 Perfluorooctadecanoic acid										
913.00 > 869.00	5.626	5.672	-0.046	1.000	2928364	24.0		120	2997	

Report Date: 17-Jan-2017 09:49:02 Chrom Revision: 2.2 10-Jan-2017 11:26:10

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b\16JAN2017_007.d

Injection Date: 16-Jan-2017 14:19:23 Instrument ID: A8_N

Lims ID: LCSD 320-146325/3-A

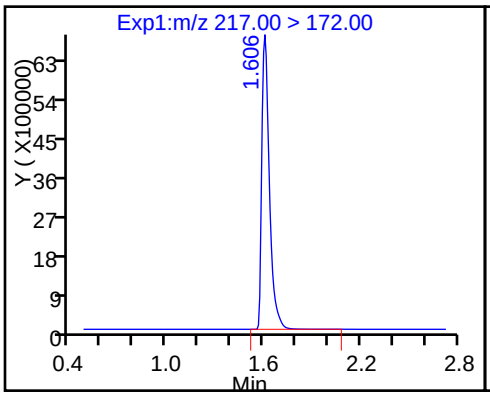
Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 30 Worklist Smp#: 9

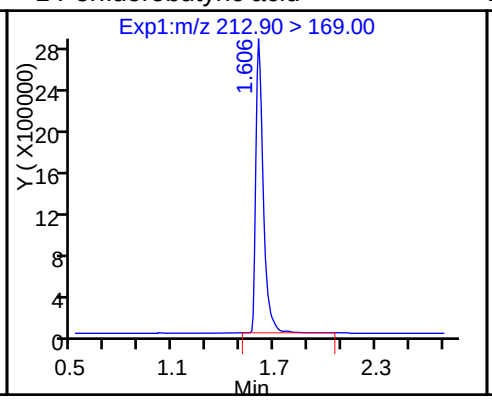
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

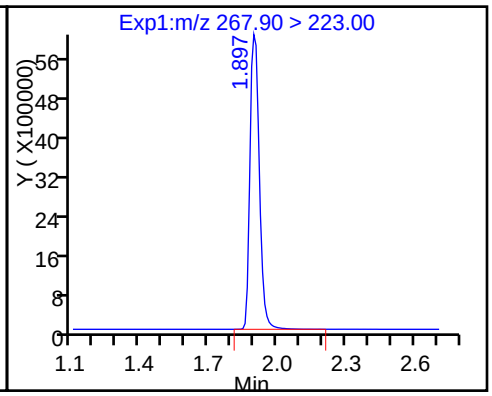
D 2 13C4 PFBA



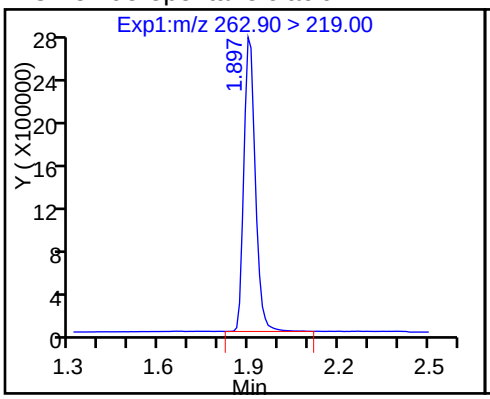
1 Perfluorobutyric acid



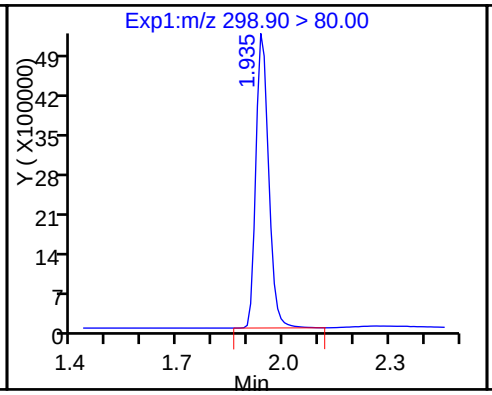
D 4 13C5-PFPeA



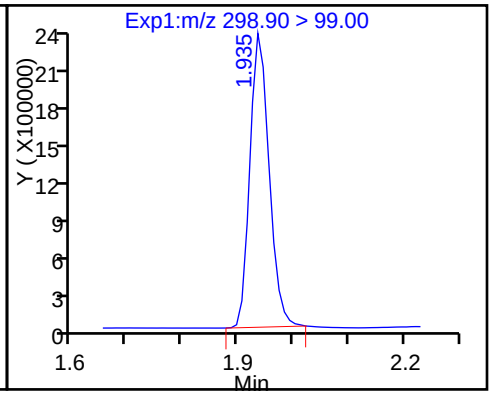
3 Perfluoropentanoic acid



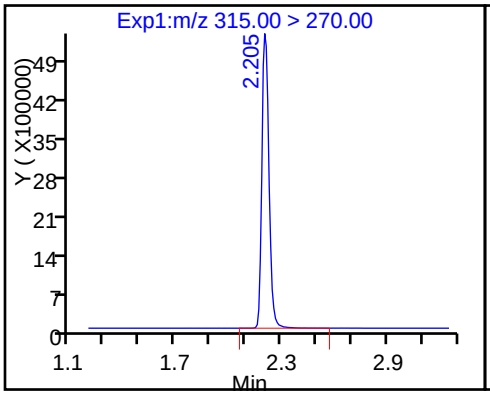
5 Perfluorobutanesulfonic acid



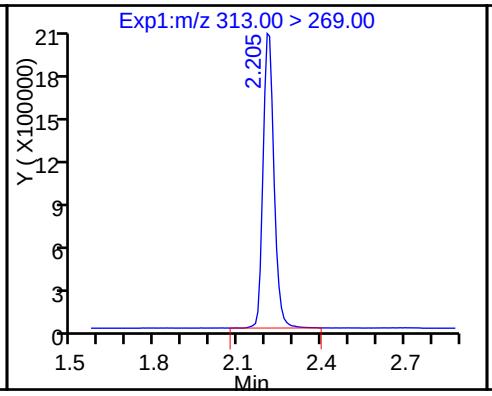
5 Perfluorobutanesulfonic acid



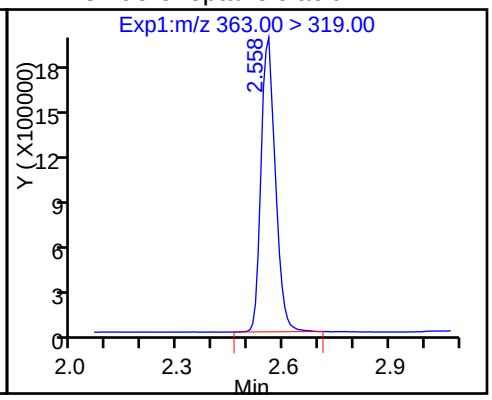
D 6 13C2 PFHxA



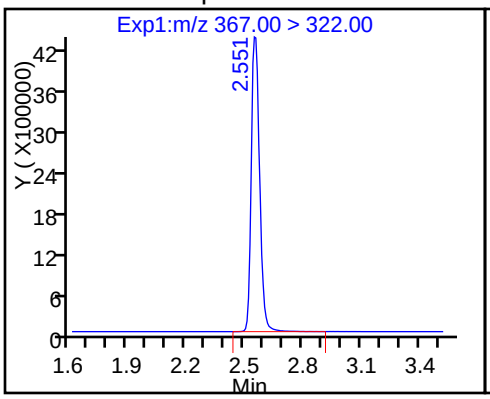
7 Perfluorohexanoic acid



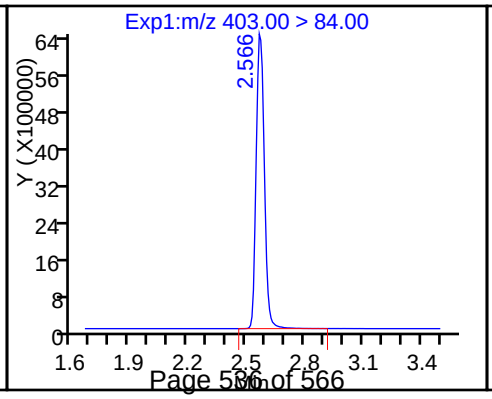
12 Perfluoroheptanoic acid



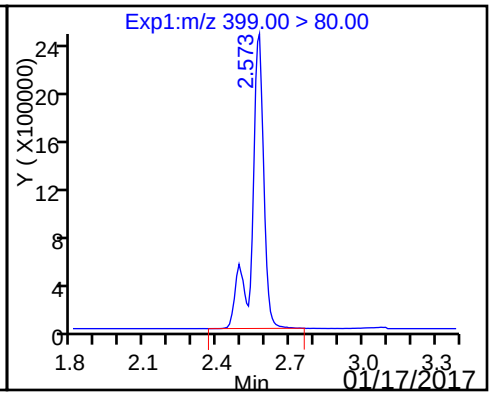
D 11 13C4-PFHpA



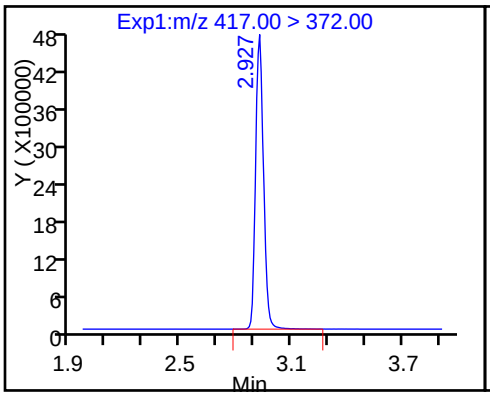
D 10 18O2 PFHxS



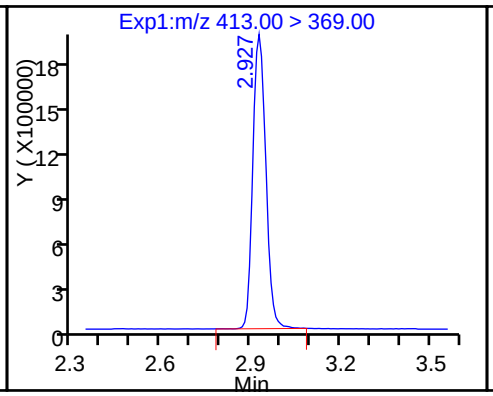
9 Perfluorohexanesulfonic acid



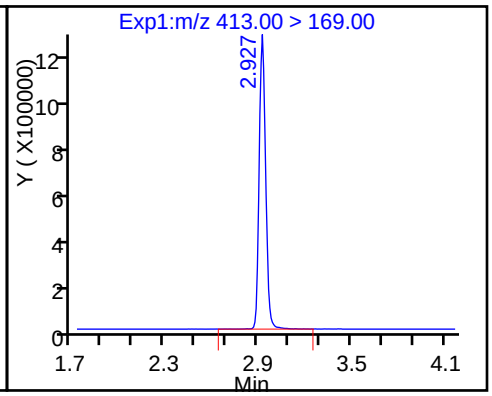
D 14 13C4 PFOA



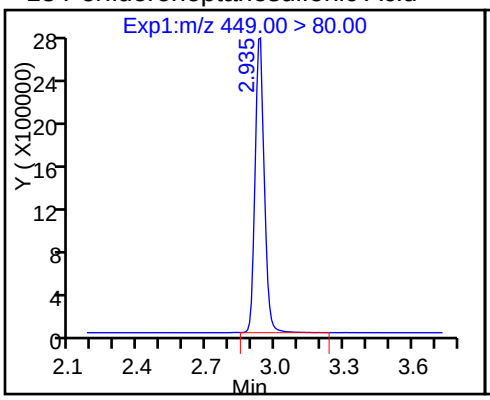
15 Perfluorooctanoic acid



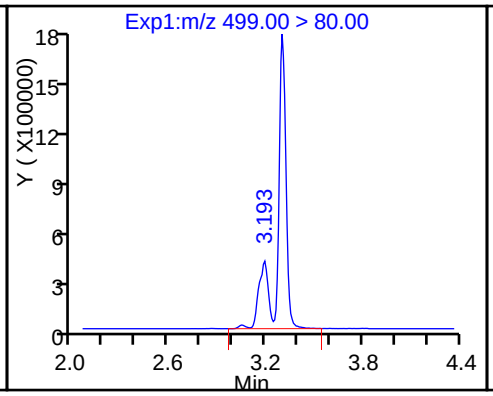
15 Perfluorooctanoic acid



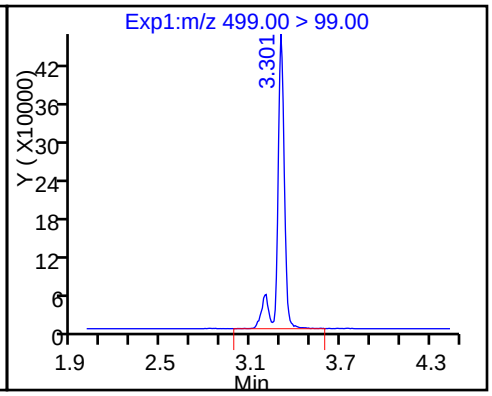
13 Perfluoroheptanesulfonic Acid



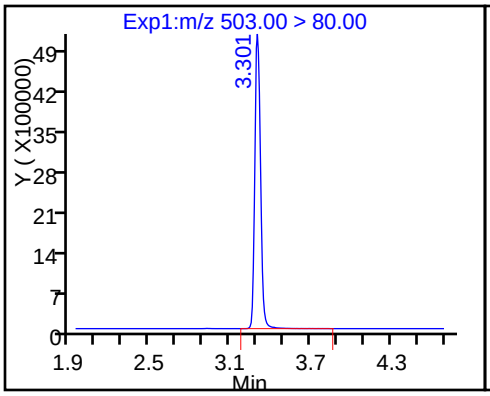
18 Perfluorooctane sulfonic acid



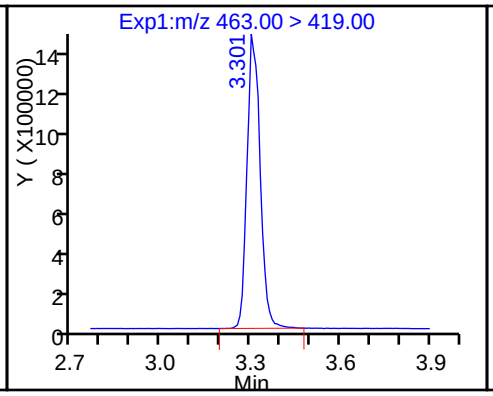
18 Perfluorooctane sulfonic acid



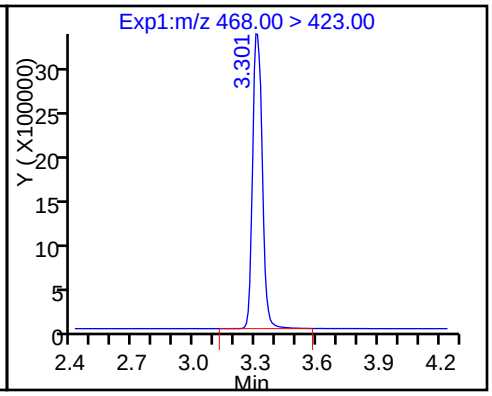
D 17 13C4 PFOS



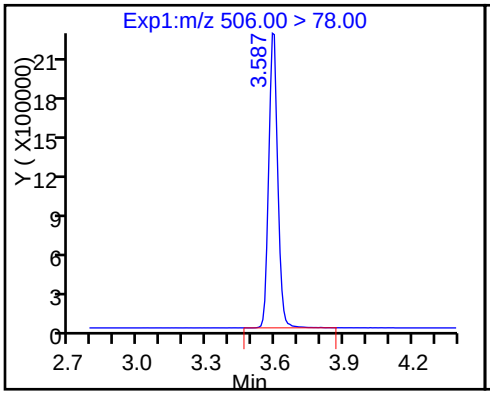
20 Perfluorononanoic acid



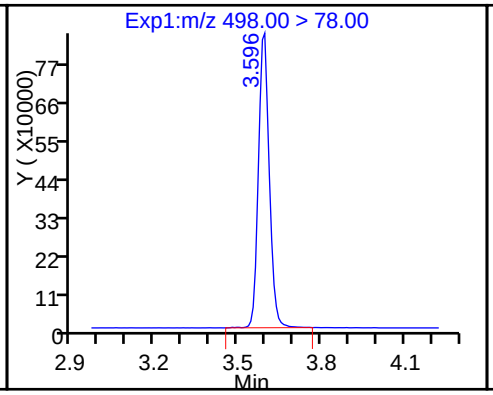
D 19 13C5 PFNA



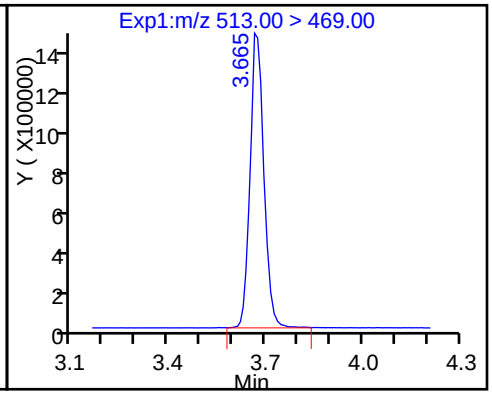
D 21 13C8 FOSA



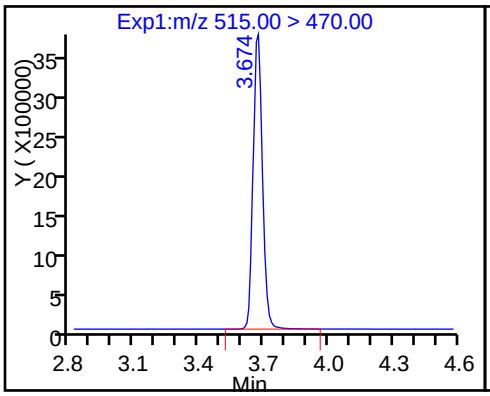
22 Perfluorooctane Sulfonamide



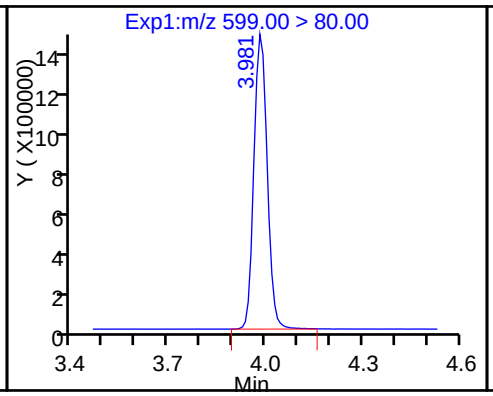
24 Perfluorodecanoic acid



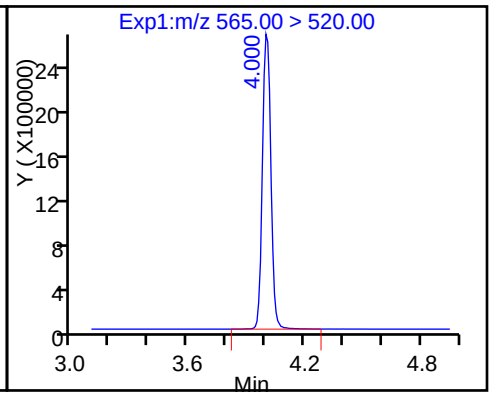
D 23 13C2 PFDA



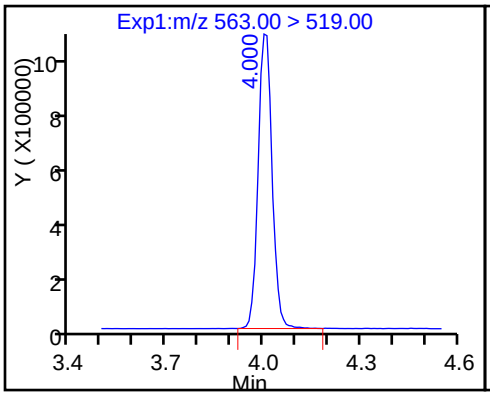
26 Perfluorodecane Sulfonic acid



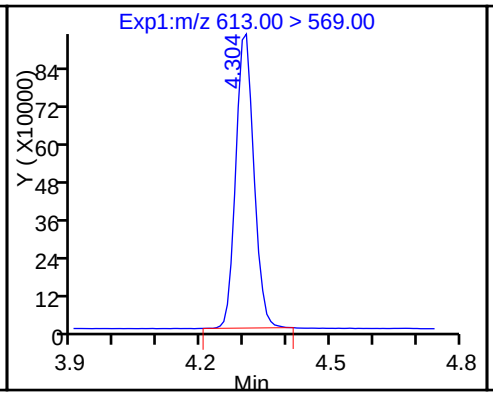
D 27 13C2 PFUnA



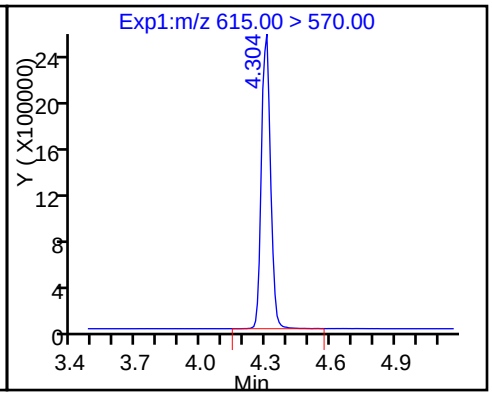
28 Perfluoroundecanoic acid



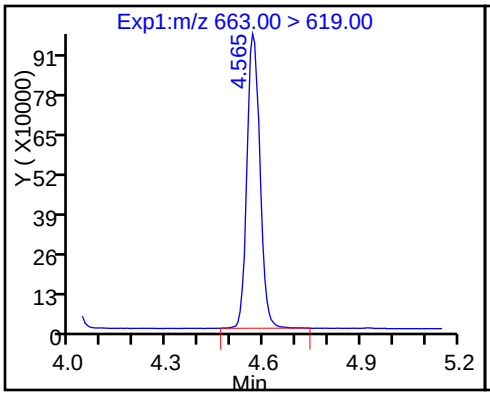
29 Perfluorododecanoic acid



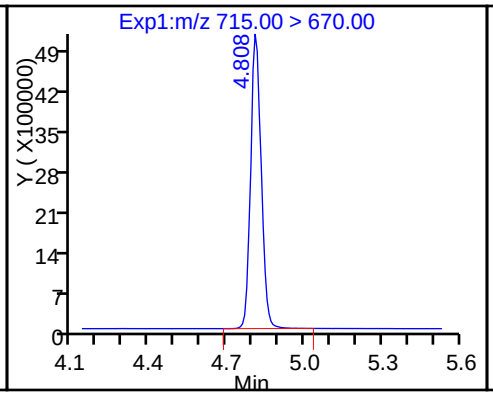
D 30 13C2 PFDoA



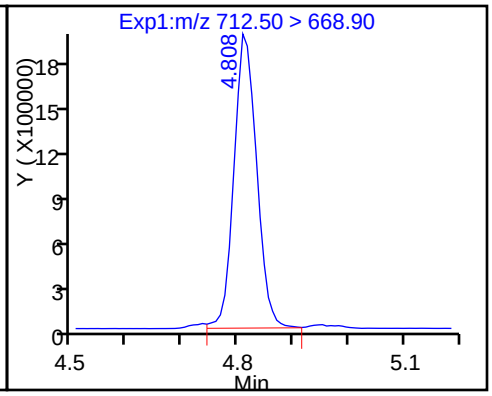
31 Perfluorotridecanoic acid



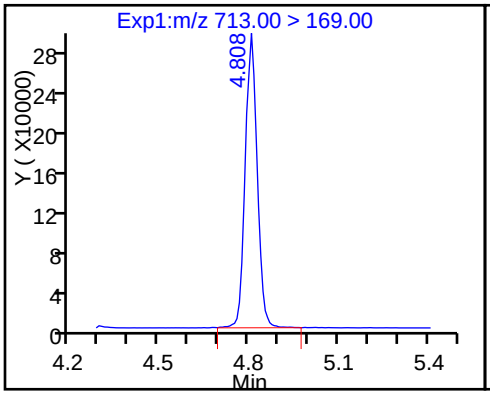
D 32 13C2-PFTeDA



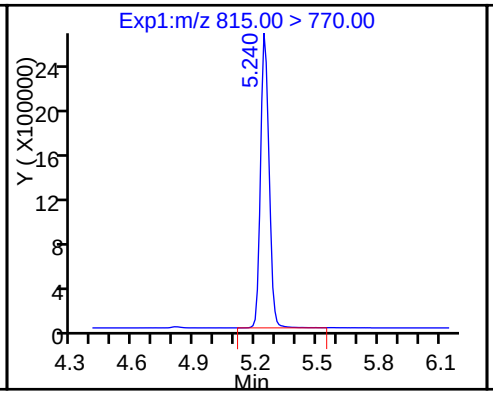
33 Perfluorotetradecanoic acid



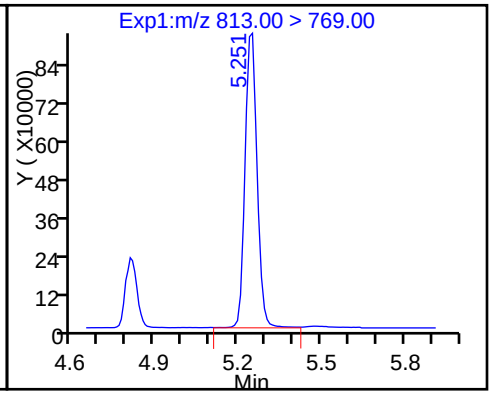
33 Perfluorotetradecanoic acid



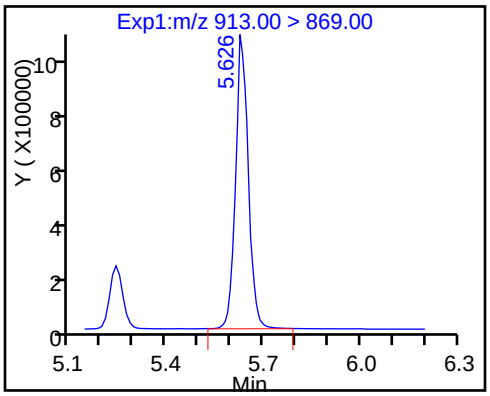
D 34 13C2-PFHxDA



35 Perfluorohexadecanoic acid



36 Perfluorooctadecanoic acid



LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-24961-1

SDG No.:

Instrument ID: A8_N Start Date: 01/09/2017 13:08

Analysis Batch Number: 145640 End Date: 01/09/2017 15:38

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
RB 320-145640/1 CCB		01/09/2017 13:08	1		Acquity 2.1(mm)
RB 320-145640/2 CCB		01/09/2017 13:16	1		Acquity 2.1(mm)
RB 320-145640/3 CCB		01/09/2017 13:23	1		Acquity 2.1(mm)
IC 320-145640/4		01/09/2017 13:31	1	09JAN2017A_004.d	Acquity 2.1(mm)
IC 320-145640/5		01/09/2017 13:38	1	09JAN2017A_005.d	Acquity 2.1(mm)
IC 320-145640/6		01/09/2017 13:46	1	09JAN2017A_006.d	Acquity 2.1(mm)
IC 320-145640/7		01/09/2017 13:53	1	09JAN2017A_007.d	Acquity 2.1(mm)
IC 320-145640/8		01/09/2017 14:01	1	09JAN2017A_008.d	Acquity 2.1(mm)
IC 320-145640/9		01/09/2017 14:08	1	09JAN2017A_009.d	Acquity 2.1(mm)
ICB 320-145640/10		01/09/2017 14:16	1		Acquity 2.1(mm)
ICV 320-145640/11		01/09/2017 14:23	1	09JAN2017A_011.d	Acquity 2.1(mm)
RB 320-145640/12 CCB		01/09/2017 14:31	1		Acquity 2.1(mm)
IC 320-145640/13		01/09/2017 14:38	1	09JAN2017A_013.d	Acquity 2.1(mm)
IC 320-145640/14		01/09/2017 14:46	1	09JAN2017A_014.d	Acquity 2.1(mm)
IC 320-145640/15		01/09/2017 14:53	1	09JAN2017A_015.d	Acquity 2.1(mm)
IC 320-145640/16		01/09/2017 15:01	1	09JAN2017A_016.d	Acquity 2.1(mm)
IC 320-145640/17		01/09/2017 15:08	1	09JAN2017A_017.d	Acquity 2.1(mm)
IC 320-145640/18		01/09/2017 15:16	1	09JAN2017A_018.d	Acquity 2.1(mm)
ICB 320-145640/19		01/09/2017 15:23	1		Acquity 2.1(mm)
ICV 320-145640/20		01/09/2017 15:31	1		Acquity 2.1(mm)
RB 320-145640/21 CCB		01/09/2017 15:38	1		Acquity 2.1(mm)

537 (Modified)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-24961-1

SDG No.:

Instrument ID: A8_N Start Date: 01/16/2017 13:34

Analysis Batch Number: 146533 End Date: 01/16/2017 17:56

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
RB 320-146533/3 CCB		01/16/2017 13:34	1		Acquity 2.1(mm)
CCV 320-146533/4 CCVL		01/16/2017 13:41	1	16JAN2017_002.d	Acquity 2.1(mm)
CCV 320-146533/5		01/16/2017 13:49	1	16JAN2017_003.d	Acquity 2.1(mm)
ZZZZZ		01/16/2017 13:56	1		Acquity 2.1(mm)
MB 320-146325/1-A		01/16/2017 14:04	1	16JAN2017_005.d	Acquity 2.1(mm)
LCS 320-146325/2-A		01/16/2017 14:11	1	16JAN2017_006.d	Acquity 2.1(mm)
LCSD 320-146325/3-A		01/16/2017 14:19	1	16JAN2017_007.d	Acquity 2.1(mm)
320-24961-1		01/16/2017 14:26	1	16JAN2017_008.d	Acquity 2.1(mm)
320-24961-2		01/16/2017 14:34	1	16JAN2017_009.d	Acquity 2.1(mm)
320-24961-3		01/16/2017 14:41	1	16JAN2017_010.d	Acquity 2.1(mm)
320-24961-4		01/16/2017 14:49	1	16JAN2017_011.d	Acquity 2.1(mm)
320-24961-5		01/16/2017 14:56	1	16JAN2017_012.d	Acquity 2.1(mm)
320-24961-6		01/16/2017 15:04	1	16JAN2017_013.d	Acquity 2.1(mm)
320-24961-7		01/16/2017 15:11	1	16JAN2017_014.d	Acquity 2.1(mm)
ZZZZZ		01/16/2017 15:19	1		Acquity 2.1(mm)
CCV 320-146533/18		01/16/2017 15:26	1	16JAN2017_016.d	Acquity 2.1(mm)
ZZZZZ		01/16/2017 15:34	1		Acquity 2.1(mm)
320-24961-8		01/16/2017 15:41	1	16JAN2017_018.d	Acquity 2.1(mm)
320-24961-9		01/16/2017 15:49	1	16JAN2017_019.d	Acquity 2.1(mm)
ZZZZZ		01/16/2017 15:56	1		Acquity 2.1(mm)
ZZZZZ		01/16/2017 16:04	1		Acquity 2.1(mm)
ZZZZZ		01/16/2017 16:11	1		Acquity 2.1(mm)
ZZZZZ		01/16/2017 16:19	1		Acquity 2.1(mm)
ZZZZZ		01/16/2017 16:26	1		Acquity 2.1(mm)
ZZZZZ		01/16/2017 16:34	1		Acquity 2.1(mm)
ZZZZZ		01/16/2017 16:41	1		Acquity 2.1(mm)
ZZZZZ		01/16/2017 16:49	1		Acquity 2.1(mm)
ZZZZZ		01/16/2017 16:56	1		Acquity 2.1(mm)
ZZZZZ		01/16/2017 17:04	1		Acquity 2.1(mm)
CCV 320-146533/32		01/16/2017 17:11	1	16JAN2017_030.d	Acquity 2.1(mm)
ZZZZZ		01/16/2017 17:19	1		Acquity 2.1(mm)
ZZZZZ		01/16/2017 17:26	1		Acquity 2.1(mm)
ZZZZZ		01/16/2017 17:34	1		Acquity 2.1(mm)
ZZZZZ		01/16/2017 17:41	1		Acquity 2.1(mm)
ZZZZZ		01/16/2017 17:49	1		Acquity 2.1(mm)
CCV 320-146533/38		01/16/2017 17:56	1		Acquity 2.1(mm)

537 (Modified)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-24961-1

SDG No.:

Batch Number: 146325 Batch Start Date: 01/13/17 12:49 Batch Analyst: Sharifi, Nooshin

Batch Method: 3535 Batch End Date: 01/13/17 21:40

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	LCMPFCSU 00046	LCPFCSP 00073
MB 320-146325/1		3535, 537 (Modified)				250 mL	0.5 mL	25 uL	
LCS 320-146325/2		3535, 537 (Modified)				250 mL	0.5 mL	25 uL	20 uL
LCSD 320-146325/3		3535, 537 (Modified)				250 mL	0.5 mL	25 uL	20 uL
320-24961-A-1	DPT-GW-EB-26-22	3535, 537 (Modified)	T	265.17 g	26.76 g	238.4 mL	0.5 mL	25 uL	
320-24961-A-2	DPT-GW-EB-26-33	3535, 537 (Modified)	T	268.38 g	26.68 g	241.7 mL	0.5 mL	25 uL	
320-24961-A-3	DPT-17-26-GW-29-33	3535, 537 (Modified)	T	286.05 g	25.87 g	260.2 mL	0.5 mL	25 uL	
320-24961-A-4	DPT-17-26-GW-18-22	3535, 537 (Modified)	T	278.13 g	26.39 g	251.7 mL	0.5 mL	25 uL	
320-24961-A-5	DPT-GW-EB-27-22	3535, 537 (Modified)	T	278.67 g	26.36 g	252.3 mL	0.5 mL	25 uL	
320-24961-A-6	DPT-GW-EB-27-33	3535, 537 (Modified)	T	287.46 g	26.73 g	260.7 mL	0.5 mL	25 uL	
320-24961-A-7	DPT-TB-011117	3535, 537 (Modified)	T	297.93 g	26.71 g	271.2 mL	0.5 mL	25 uL	
320-24961-A-8	DPT-17-27-GW-29-33	3535, 537 (Modified)	T	277.14 g	26.36 g	250.8 mL	0.5 mL	25 uL	
320-24961-A-9	DPT-17-27-GW-18-22	3535, 537 (Modified)	T	275.87 g	26.02 g	249.9 mL	0.5 mL	25 uL	

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.: 320-24961-1

SDG No.:

Batch Number: 146325 Batch Start Date: 01/13/17 12:49 Batch Analyst: Sharifi, Nooshin

Batch Method: 3535 Batch End Date: 01/13/17 21:40

Batch Notes	
Balance ID	QA-070
H2O ID	1/13/17
Hexane ID	0000146278
Manifold ID	2
Methanol ID	816945
Sodium Hydroxide ID	758321
Pipette ID	MD05306
Analyst ID - Reagent Drop	NSH
Analyst ID - SU Reagent Drop	NSH
Analyst ID - SU Reagent Drop Witness	CCB
Solvent Lot #	800648
Solvent Name	0.3% NH4OH/MeOH
SOP Number	WS-LC-0025
SPE Cartridge Type	WAX 500mg
Solid Phase Extraction Disk ID	002836112A

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

West Sacramento

HPLC/LCMS Data Review Checklist

Job Number(s): 24961; 24882; 24886 Work List ID(s): 38858

Extraction Batch: 146325; 146297 Analysis Batch(es): 146533

Delivery Rank 4 Due Date: 1/16/17; 1/20/17

A. Calibration/Instrument Run QC	1st Level	2nd Level	N/A
1. ICAL locked in Chrom and TALS? ICAL Batch# 145640	✓	✓	
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# 74963	✓	✓	
2. Do results make sense (e.g. dilutions, etc.)?	✓	✓	
3. Have all flags been reviewed for appropriateness?	✓	✓	
4. For level 3 and 4 reports, have forms and raw data been reviewed?		✓	
5. Was QC Checker run for this job?	✓	✓	

**Upon completion of this checklist, the reviewer must scan and attach the checklist to the TALS job.*

1st Level (Analyst): [signature] Date: 1/17/17

2nd Level Reviewer: [signature] Date: 1/17/2017

TestAmerica Laboratories
Worklist QC Batch Report

Worklist Name: 16JAN2017A_PFC Worklist Number: 38858
Instrument Name: A8_N Chrom Method: A8_N
Data Directory: \\ChromNa\Sacramento\ChromData\A8_N\20170116-38858.b
QC Batching: Disabled Limit Group Batching: Enabled

QC Batch: 1	LC PFC_DOD ICAL Raw Batch: 146533	LC PFC ICAL Raw Batch: 146534	LC PFAS ICAL Raw Batch: 146535
# 1 RB	# 1 RB	# 1 RB	# 1 RB
# 2 RB	# 2 RB	# 2 RB	# 2 RB
# 3 RB	# 3 RB	# 3 RB	# 3 RB
# 4 CCV L2	# 4 CCV L2	# 4 CCV L2	# 4 CCV L2
# 5 CCV L5	# 5 CCV L5	# 5 CCV L5	# 5 CCV L5
# 6 RB	# 6 RB	# 6 RB	# 6 RB
# 7 MB 320-146325/1-A	# 7 MB 320-146325/1-A		
# 8 LCS 320-146325/2-A	# 8 LCS 320-146325/2-A		
# 9 LCSD 320-146325/3-A	# 9 LCSD 320-146325/3-A		
#10 320-24961-A-1-A	#10 320-24961-A-1-A		
#11 320-24961-A-2-A	#11 320-24961-A-2-A		
#12 320-24961-A-3-A	#12 320-24961-A-3-A		
#13 320-24961-A-4-A	#13 320-24961-A-4-A		
#14 320-24961-A-5-A	#14 320-24961-A-5-A		
#15 320-24961-A-6-A	#15 320-24961-A-6-A		
#16 320-24961-A-7-A	#16 320-24961-A-7-A		
#17 RB	#17 RB	#17 RB	#17 RB
#18 CCV L4	#18 CCV L4	#18 CCV L4	#18 CCV L4
#19 RB	#19 RB	#19 RB	#19 RB
#20 320-24961-A-8-A	#20 320-24961-A-8-A		
#21 320-24961-A-9-A	#21 320-24961-A-9-A		
#22 RB	#22 RB	#22 RB	#22 RB
#23 MB 320-146297/1-A	#23 MB 320-146297/1-A		
#24 LCS 320-146297/2-A	#24 LCS 320-146297/2-A		
#25 LCSD 320-146297/3-A	#25 LCSD 320-146297/3-A		
#26 320-24882-H-1-A	#26 320-24882-H-1-A		
#27 320-24882-D-2-A	#27 320-24882-D-2-A		
#28 320-24882-D-3-A	#28 320-24882-D-3-A		
#29 320-24882-D-4-A	#29 320-24882-D-4-A		
#30 320-24882-D-5-A	#30 320-24882-D-5-A		
#31 RB	#31 RB	#31 RB	#31 RB
#32 CCV L5	#32 CCV L5	#32 CCV L5	#32 CCV L5
#33 RB	#33 RB	#33 RB	#33 RB
#34 320-24882-D-6-A	#34 320-24882-D-6-A		
#35 320-24886-K-2-A	#35 320-24886-K-2-A		
#36 320-24886-K-3-A	#36 320-24886-K-3-A		
#37 RB	#37 RB	#37 RB	#37 RB
#38 CCV L4	#38 CCV L4	#38 CCV L4	#38 CCV L4

ICV 145640

Tune NCM 74963

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Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-146325

Method Code: 320-3535_PFC-320

Analyst: Sharifi, Nooshin

Batch Open: 1/13/2017 12:49:00PM

Batch End: 1/13/2017 9:40:00PM

AB 1/15/17
Case 3 28-39

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~320-146325/1 N/A	N/A		250 mL				N/A	N/A	N/A		MB 320-146325/1-A
				0.5 mL								
2	LCS~320-146325/2 N/A	N/A		250 mL				N/A	N/A	N/A		LCS 320-146325/2-A
				0.5 mL								
3	LCSD~320-146325/3 N/A	N/A		250 mL				N/A	N/A	N/A		LCSD 320-146325/3-A
				0.5 mL								
4	320-24961-A-1 (PFC_IDA_DOD5)	N/A (320-24961-1)	265.17 g	238.4 mL				1/16/17	4_Day_RUSH	4		320-24961-A-1-A
			26.76 g	0.5 mL								
5	320-24961-A-2 (PFC_IDA_DOD5)	N/A (320-24961-1)	268.38 g	241.7 mL				1/16/17	4_Day_RUSH	4		320-24961-A-2-A
			26.68 g	0.5 mL								
6	320-24961-A-3 (PFC_IDA_DOD5)	N/A (320-24961-1)	286.05 g	260.2 mL				1/16/17	4_Day_RUSH	4		320-24961-A-3-A
			25.87 g	0.5 mL								
7	320-24961-A-4 (PFC_IDA_DOD5)	N/A (320-24961-1)	278.13 g	251.7 mL				1/16/17	4_Day_RUSH	4		320-24961-A-4-A
			26.39 g	0.5 mL								
8	320-24961-A-5 (PFC_IDA_DOD5)	N/A (320-24961-1)	278.67 g	252.3 mL				1/16/17	4_Day_RUSH	4		320-24961-A-5-A
			26.36 g	0.5 mL								
9	320-24961-A-6 (PFC_IDA_DOD5)	N/A (320-24961-1)	287.46 g	260.7 mL				1/16/17	4_Day_RUSH	4		320-24961-A-6-A
			26.73 g	0.5 mL								
10	320-24961-A-7 (PFC_IDA_DOD5)	N/A (320-24961-1)	297.93 g	271.2 mL				1/16/17	4_Day_RUSH	4		320-24961-A-7-A
			26.71 g	0.5 mL								

01/17/2017

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-146325

Analyst: Sharifi, Nooshin

Batch Open: 1/13/2017 12:49:00PM

Method Code: 320-3535_PFC-320

Batch End: 1/13/2017 9:40:00PM

11	320-24961-A-8 (PFC_IDA_DOD5)	N/A (320-24961-1)	277.14 g	250.8 mL				1/16/17	4_Day_RUSH	4		320-24961-A-8-A
			26.36 g	0.5 mL								
12	320-24961-A-9 (PFC_IDA_DOD5)	N/A (320-24961-1)	275.87 g	249.9 mL				1/16/17	4_Day_RUSH	4		320-24961-A-9-A
			26.02 g	0.5 mL								

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Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-146325

Method Code: 320-3535_PFC-320

Analyst: Sharifi, Nooshin

Batch Open: 1/13/2017 12:49:00PM

Batch End: 1/13/17 21:40

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	Div Rank	Comments	Output Sample Lab ID
1	MB~320-146325/1 N/A	N/A		250 mL				N/A	N/A	N/A		MB 320-146325/1-A
				0.5 mL								
2	LCS~320-146325/2 N/A	N/A		250 mL				N/A	N/A	N/A		LCS 320-146325/2-A
				0.5 mL								
3	LCSD~320-146325/3 N/A	N/A		250 mL				N/A	N/A	N/A		LCSD 320-146325/3-A
				0.5 mL								
4	320-24961-A-1 (PFC_IDA_DOD5)	N/A (320-24961-1)	265.17 g					1/16/17	4_Day_RUSH	4		320-24961-A-1-A
			26.76 g	0.5 mL								
5	320-24961-A-2 (PFC_IDA_DOD5)	N/A (320-24961-1)	268.38 g					1/16/17	4_Day_RUSH	4		320-24961-A-2-A
			26.68 g	0.5 mL								
6	320-24961-A-3 (PFC_IDA_DOD5)	N/A (320-24961-1)	286.05 g					1/16/17	4_Day_RUSH	4		320-24961-A-3-A
			25.87 g	0.5 mL								
7	320-24961-A-4 (PFC_IDA_DOD5)	N/A (320-24961-1)	278.13 g					1/16/17	4_Day_RUSH	4		320-24961-A-4-A
			26.39 g	0.5 mL								
8	320-24961-A-5 (PFC_IDA_DOD5)	N/A (320-24961-1)	278.67 g					1/16/17	4_Day_RUSH	4		320-24961-A-5-A
			26.36 g	0.5 mL								
9	320-24961-A-6 (PFC_IDA_DOD5)	N/A (320-24961-1)	287.46 g					1/16/17	4_Day_RUSH	4		320-24961-A-6-A
			26.73 g	0.5 mL								
10	320-24961-A-7 (PFC_IDA_DOD5)	N/A (320-24961-1)	297.93 g					1/16/17	4_Day_RUSH	4		320-24961-A-7-A
			26.71 g	0.5 mL								

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-146325

Analyst: Sharifi, Nooshin

Batch Open: 1/13/2017 12:49:00PM

Method Code: 320-3535_PFC-320

Batch End:

11	320-24961-A-8 (PFC_IDA_DOD5)	N/A (320-24961-1)	277.14 g					1/16/17	4_Day_RUSH	4	320-24961-A-8-A
			26.36 g	0.5 mL							
12	320-24961-A-9 (PFC_IDA_DOD5)	N/A (320-24961-1)	275.87 g					1/16/17	4_Day_RUSH	4	320-24961-A-9-A
			26.02 g	0.5 mL							

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-146325

Method Code: 320-3535_PFC-320

Analyst: Sharifi, Nooshin

Batch Open: 1/13/2017 12:49:00PM

Batch End:

Batch Notes

Manifold ID	2
Methanol ID	816945
Hexane ID	0000146278
Sodium Hydroxide ID	758321
First Start time	NA
First End time	NA
SPE Cartridge Type	WAX 500mg
Solid Phase Extraction Disk ID	002836112A
Balance ID	QA-070
H2O ID	1/13/17
Pipette ID	MD05306
Solvent Name	0.3% NH4OH/MeOH
Solvent Lot #	800648
Analyst ID - Reagent Drop	NSH
Analyst ID - SU Reagent Drop	NSH
Analyst ID - SU Reagent Drop Witness	CCB
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: 320-146325

Analyst: Sharifi, Nooshin

Batch Open: 1/13/2017 12:49:00PM

Method Code: 320-3535_PFC-320

Batch End:

Batch Comment NA

Comments

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-146325

Method Code: 320-3535_PFC-320

Analyst: Sharifi, Nooshin

Batch Open: 1/13/2017 12:49:00PM

Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-146325/1	LCMPFCSU_00046	25 uL	0.5 mL	NSH 1-13-17	CaB 1-13-17
LCS 320-146325/2	LCMPFCSU_00046	25 uL	0.5 mL		
LCS 320-146325/2	LCPFCSP_00073	20 uL	0.5 mL		
LCSD 320-146325/3	LCMPFCSU_00046	25 uL	0.5 mL		
LCSD 320-146325/3	LCPFCSP_00073	20 uL	0.5 mL		
320-24961-A-1	LCMPFCSU_00046	25 uL	0.5 mL		
320-24961-A-2	LCMPFCSU_00046	25 uL	0.5 mL		
320-24961-A-3	LCMPFCSU_00046	25 uL	0.5 mL		
320-24961-A-4	LCMPFCSU_00046	25 uL	0.5 mL		
320-24961-A-5	LCMPFCSU_00046	25 uL	0.5 mL		
320-24961-A-6	LCMPFCSU_00046	25 uL	0.5 mL		
320-24961-A-7	LCMPFCSU_00046	25 uL	0.5 mL		
320-24961-A-8	LCMPFCSU_00046	25 uL	0.5 mL		
320-24961-A-9	LCMPFCSU_00046	25 uL	0.5 mL		

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-146325

Analyst: Sharifi, Nooshin

Batch Open: 1/13/2017 12:49:00PM

Method Code: 320-3535_PFC-320

Batch End:

Other Reagents:

Reagent	Amount/Units	Lot#:

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Sacramento
Preparation Data Review Checklist

Preparation Batch Number(s): 146325 Test: PFC

Earliest Holding Time: 1-25-17

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	
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	
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: [signature] Date: 1/13/17

2nd Level Reviewer: Date:

Comments:

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Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

AS 1/15/17

Batch Number: 320-146297

Method Code: 320-3535_PFC-320

Analyst: Arauz, Horacio J

Batch Open: 1/13/2017 11:50:00AM

Batch End: 1/13/2017 7:40:00PM

case 3 40-50

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	Div Rank	Comments	Output Sample Lab ID
1	MB~320-146297/1 N/A	N/A		250 mL				N/A	N/A	N/A		MB 320-146297/1-A
				0.5 mL								
2	LCS~320-146297/2 N/A	N/A		250 mL				N/A	N/A	N/A		LCS 320-146297/2-A
				0.5 mL								
3	LCSD~320-146297/3 N/A	N/A		250 mL				N/A	N/A	N/A		LCSD 320-146297/3-A
				0.5 mL								
4	320-24882-H-1 (PFC_IDA_DOD5)	N/A (320-24882-1)	308.83 g	282.2 mL				1/20/17	8_Days	4		320-24882-H-1-A
			26.61 g	0.5 mL								
5	320-24882-D-2 (PFC_IDA_DOD5)	N/A (320-24882-1)	314.80 g	287.1 mL				1/20/17	8_Days	4		320-24882-D-2-A
			27.68 g	0.5 mL								
6	320-24882-D-3 (PFC_IDA_DOD5)	N/A (320-24882-1)	308.07 g	280.1 mL				1/20/17	8_Days	4		320-24882-D-3-A
			28.02 g	0.5 mL								
7	320-24882-D-4 (PFC_IDA_DOD5)	N/A (320-24882-1)	321.94 g	293.6 mL				1/20/17	8_Days	4		320-24882-D-4-A
			28.36 g	0.5 mL								
8	320-24882-D-5 (PFC_IDA_DOD5)	N/A (320-24882-1)	313.95 g	287.2 mL				1/20/17	8_Days	4		320-24882-D-5-A
			26.74 g	0.5 mL								
9	320-24882-D-6 (PFC_IDA_DOD5)	N/A (320-24882-1)	301.76 g	272.9 mL				1/20/17	8_Days	4		320-24882-D-6-A
			28.87 g	0.5 mL								
10	320-24886-K-2 (PFC_IDA_DOD5)	N/A (320-24886-1)	303.95 g	274.9 mL				1/20/17	8_Days	4		320-24886-K-2-A
			29.08 g	0.5 mL								

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-146297

Analyst: Arauz, Horacio J

Batch Open: 1/13/2017 11:50:00AM

Method Code: 320-3535_PFC-320

Batch End: 1/13/2017 7:40:00PM

11	320-24886-K-3 (PFC_IDA_DOD5)	N/A (320-24886-1)	308.94 g	280.2 mL				1/20/17	8_Days	4		320-24886-K-3-A
			28.75 g	0.5 mL								

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Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-146297

Method Code: 320-3535_PFC-320

Analyst: Arauz, Horacio J

Batch Open: 1/13/2017 11:50:00AM

Batch End: 1/13/17 19:40

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	Div Rank	Comments	Output Sample Lab ID
1	MB~320-146297/1 N/A	N/A		250 mL				N/A	N/A	N/A		MB 320-146297/1-A
				0.5 mL								
2	LCS~320-146297/2 N/A	N/A		250 mL				N/A	N/A	N/A		LCS 320-146297/2-A
				0.5 mL								
3	LCSD~320-146297/3 N/A	N/A		250 mL				N/A	N/A	N/A		LCSD 320-146297/3-A
				0.5 mL								
4	320-24882-H-1 (PFC_IDA_DOD5)	N/A (320-24882-1)	308.83 g					1/20/17	8_Days	4		320-24882-H-1-A
				0.5 mL								
5	320-24882-D-2 (PFC_IDA_DOD5)	N/A (320-24882-1)	314.80 g					1/20/17	8_Days	4		320-24882-D-2-A
				0.5 mL								
6	320-24882-D-3 (PFC_IDA_DOD5)	N/A (320-24882-1)	308.07 g					1/20/17	8_Days	4		320-24882-D-3-A
				0.5 mL								
7	320-24882-D-4 (PFC_IDA_DOD5)	N/A (320-24882-1)	321.94 g					1/20/17	8_Days	4		320-24882-D-4-A
				0.5 mL								
8	320-24882-D-5 (PFC_IDA_DOD5)	N/A (320-24882-1)	313.95 g					1/20/17	8_Days	4		320-24882-D-5-A
				0.5 mL								
9	320-24882-D-6 (PFC_IDA_DOD5)	N/A (320-24882-1)	301.76 g					1/20/17	8_Days	4		320-24882-D-6-A
				0.5 mL								
10	320-24886-K-2 (PFC_IDA_DOD5)	N/A (320-24886-1)	303.95 g					1/20/17	8_Days	4		320-24886-K-2-A
				0.5 mL								

01/17/2017

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-146297

Analyst: Arauz, Horacio J

Batch Open: 1/13/2017 11:50:00AM

Method Code: 320-3535_PFC-320

Batch End:

11	320-24886-K-3 (PFC_IDA_DOD5)	N/A (320-24886-1)	308.94 g	0.5 mL				1/20/17	8_Days	4	320-24886-K-3-A

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-146297

Method Code: 320-3535_PFC-320

Analyst: Arauz, Horacio J

Batch Open: 1/13/2017 11:50:00AM

Batch End:

Batch Notes

Manifold ID	5
Methanol ID	816945
Hexane ID	0000146278
Sodium Hydroxide ID	758321
First Start time	NA
First End time	NA
SPE Cartridge Type	WAX 500mg
Solid Phase Extraction Disk ID	002836112A
Balance ID	QA-070
H2O ID	1/03/17
Pipette ID	MD05306
Solvent Name	0.3% NH4OH/MeOH
Solvent Lot #	800648
Analyst ID - Reagent Drop	HJA
Analyst ID - SU Reagent Drop	HJA
Analyst ID - SU Reagent Drop Witness	CCB
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: 320-146297

Analyst: Arauz, Horacio J

Batch Open: 1/13/2017 11:50:00AM

Method Code: 320-3535_PFC-320

Batch End:

Batch Comment NA

Comments

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-146297

Method Code: 320-3535_PFC-320

Analyst: Arauz, Horacio J

Batch Open: 1/13/2017 11:50:00AM

Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-146297/1	LCMPFCSU_00046	25 uL	0.5 mL	HJA 1-13-17	CCR 1-13-17
LCS 320-146297/2	LCMPFCSU_00046	25 uL	0.5 mL		
LCS 320-146297/2	LCPFCSP_00073	20 uL	0.5 mL		
LCSD 320-146297/3	LCMPFCSU_00046	25 uL	0.5 mL		
LCSD 320-146297/3	LCPFCSP_00073	20 uL	0.5 mL		
320-24882-H-1	LCMPFCSU_00046	25 uL	0.5 mL		
320-24882-D-2	LCMPFCSU_00046	25 uL	0.5 mL		
320-24882-D-3	LCMPFCSU_00046	25 uL	0.5 mL		
320-24882-D-4	LCMPFCSU_00046	25 uL	0.5 mL		
320-24882-D-5	LCMPFCSU_00046	25 uL	0.5 mL		
320-24882-D-6	LCMPFCSU_00046	25 uL	0.5 mL		
320-24886-K-2	LCMPFCSU_00046	25 uL	0.5 mL		
320-24886-K-3	LCMPFCSU_00046	25 uL	0.5 mL		

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-146297

Analyst: Arauz, Horacio J

Batch Open: 1/13/2017 11:50:00AM

Method Code: 320-3535_PFC-320

Batch End:

Other Reagents:

Reagent	Amount/Units	Lot#:

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Sacramento
Preparation Data Review Checklist

Preparation Batch Number(s): 320-146297 Test: PFC-L

Earliest Holding Time: 1-20-17

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: NSH Date: 1-13-17

2nd Level Reviewer: VPM Date: 1/13/17

Comments:

Shipping and Receiving Documents

TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Phone (916) 373-5600 Fax (916) 372-1059

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: MIKE GLINSKI	Lab PM: Kellmann, Jill	Carrier Tracking No(s): 8066-1822-6725	COC No: 320-13948-3196.1
Client Contact: Claire Mitchell	Phone: (786) 374-8985	E-Mail: jill.kellmann@testamericainc.com		Page: Page 1 of 1
Company: AECOM Technical Services Inc.				Job #:
Address: 3101 Wilson Blvd. Suite 900	Due Date Requested:			
City: Arlington	TAT Requested (days): 5			
State, Zip: VA, 22201				
Phone: (703) 549-8728	PO #: 60444465.FI.WS			
Email: claire.mitchell@aecom.com	WO #:			
Project Name: Former Bay Head Road Annex (RFP JU06-01)	Project #: 32007449			
Site: DPT-26/27	SSOW#:			

Analysis Requested

320-24961 Chain of Custody

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA
M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=wasteoil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	PFOA	PFOS	PFBS	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N		
DPT-GW-EB-26-22	01/11/17	1015	G	Water	N	N	✓	✓	✓	2	
DPT-GW-EB-26-33		1030	G	Water	N	N	✓	✓	✓	2	
DPT-17-26-GW-29-33		1200	G	Water	N	N	✓	✓	✓	2	(DPT-17-26-GW-29-33)
DPT-17-26-GW-18-22		1230	G	Water	N	N	✓	✓	✓	2	(DPT-17-26-GW-18-22)
DPT-GW-EB-27-22		1340	G	Water	N	N	✓	✓	✓	2	
DPT-GW-EB-27-33		1345	G	Water	N	N	✓	✓	✓	2	
DPT-TB-011117		1350	G	Water	N	N	✓	✓	✓	2	
DPT-17-27-GW-29-33		1455	G	Water	N	N	✓	✓	✓	2	
DPT-17-27-GW-18-22		1515	G	Water	N	N	✓	✓	✓	2	
				Water							
				Water							

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by: | Date: | Time: | Method of Shipment:

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
[signature] / AECOM	01/11/17 1700		TRANSFER TO FEDEX	01/11/17 1700	
			[signature] Tracy G. Turpen	1/12/17 0930	TAS

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: 3.2°C ice

Login Sample Receipt Checklist

Client: AECOM Technical Services Inc.

Job Number: 320-24961-1

Login Number: 24961
List Number: 1
Creator: Nelson, Kym D

List Source: TestAmerica Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	851492
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

"DPT-17-26-GW-18-22","537","01/16/17","14:49","T","NA","Initial","1763-23-1","Perfluorooctane Sulfonate (PFOS)","0.0083","","TRG","Yes","Y","","Y","0.0013","0.0030","0.0040","UG_L","UG_L","","","0","","","","0","","","","

,"","","","","","","","","","","","","","","","","","
"DPT-GW-EB-27-22","537","01/16/17","14:56","T","NA","Initial","335-67-1","Perfluorooctanoic acid
(PFOA)","","","TRG","Yes","N","U","Y","0.00074","0.0020","0.0025","UG_L","UG_L","","","0","","","","0","","","",
"","","","","","","","","","","","","","","","","","
"DPT-GW-EB-27-22","537","01/16/17","14:56","T","NA","Initial","1763-23-1","Perfluorooctane Sulfonate
(PFOS)","0.0029","","TRG","Yes","Y","JM","Y","0.0013","0.0030","0.0040","UG_L","UG_L","","","0","","","","0","","
","","","","","","","","","","","","","","","","","","
"DPT-GW-EB-27-22","537","01/16/17","14:56","T","NA","Initial","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","","","TRG","Yes","N","U","Y","0.00091","0.0020","0.0025","UG_L","UG_L","","","0","","","","0","","","","
","","","","","","","","","","","","","","","","","","
"DPT-GW-EB-27-33","537","01/16/17","15:04","T","NA","Initial","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","","","TRG","Yes","N","U","Y","0.00088","0.0019","0.0024","UG_L","UG_L","","","0","","","","0","","","","
","","","","","","","","","","","","","","","","","","
"DPT-GW-EB-27-33","537","01/16/17","15:04","T","NA","Initial","335-67-1","Perfluorooctanoic acid
(PFOA)","0.00075","","TRG","Yes","Y","JM","Y","0.00072","0.0019","0.0024","UG_L","UG_L","","","0","","","","0"
","","","","","","","","","","","","","","","","","","
"DPT-GW-EB-27-33","537","01/16/17","15:04","T","NA","Initial","1763-23-1","Perfluorooctane Sulfonate
(PFOS)","0.0074","","TRG","Yes","Y","M","Y","0.0012","0.0029","0.0038","UG_L","UG_L","","","0","","","","0","","
","","","","","","","","","","","","","","","","","","
"DPT-TB-011117","537","01/16/17","15:11","T","NA","Initial","335-67-1","Perfluorooctanoic acid
(PFOA)","","","TRG","Yes","N","U","Y","0.00069","0.0018","0.0023","UG_L","UG_L","","","0","","","","0","","","","
","","","","","","","","","","","","","","","","","","
"DPT-TB-011117","537","01/16/17","15:11","T","NA","Initial","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","","","TRG","Yes","N","U","Y","0.00085","0.0018","0.0023","UG_L","UG_L","","","0","","","","0","","","","
","","","","","","","","","","","","","","","","","","
"DPT-TB-011117","537","01/16/17","15:11","T","NA","Initial","1763-23-1","Perfluorooctane Sulfonate
(PFOS)","","","TRG","Yes","N","U","Y","0.0012","0.0028","0.0037","UG_L","UG_L","","","0","","","","0","","","","
","","","","","","","","","","","","","","","","","","
"LCS 320-146325/2-A","537","01/16/17","14:11","T","NA","Initial","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","0.0423","","SC","Yes","Y","","Y","0.00092","0.0020","0.0025","UG_L","UG_L","","","0","0.0354","0.0423
","120","0","","","","","50","150","","","","","","","","","
"LCS 320-146325/2-A","537","01/16/17","14:11","T","NA","Initial","1763-23-1","Perfluorooctane Sulfonate
(PFOS)","0.0402","","SC","Yes","Y","","Y","0.0013","0.0030","0.0040","UG_L","UG_L","","","0","0.0371","0.0402",
"108","0","","","","","60","140","","","","","","","","","
"LCS 320-146325/2-A","537","01/16/17","14:11","T","NA","Initial","335-67-1","Perfluorooctanoic acid
(PFOA)","0.0411","","SC","Yes","Y","","Y","0.00075","0.0020","0.0025","UG_L","UG_L","","","0","0.0400","0.0411
","103","0","","","","","60","140","","","","","","","","","
"LCSD 320-146325/3-A","537","01/16/17","14:19","T","NA","Initial","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","0.0432","","SC","Yes","Y","","Y","0.00092","0.0020","0.0025","UG_L","UG_L","","","0","","","","0","0.03
54","0.0432","122","2","50","150","30","","","","","","","","
"LCSD 320-146325/3-A","537","01/16/17","14:19","T","NA","Initial","1763-23-1","Perfluorooctane Sulfonate
(PFOS)","0.0415","","SC","Yes","Y","","Y","0.0013","0.0030","0.0040","UG_L","UG_L","","","0","","","","0","0.037
1","0.0415","112","3","60","140","30","","","","","","","","
"LCSD 320-146325/3-A","537","01/16/17","14:19","T","NA","Initial","335-67-1","Perfluorooctanoic acid
(PFOA)","0.0421","","SC","Yes","Y","","Y","0.00075","0.0020","0.0025","UG_L","UG_L","","","0","","","","0","0.04
00","0.0421","105","2","60","140","30","","","","","","","","
"MB 320-146325/1-A","537","01/16/17","14:04","T","NA","Initial","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","","","TRG","Yes","N","U","Y","0.00092","0.0020","0.0025","UG_L","UG_L","","","0","","","","0","","","","
","","","","","","","","","","","","","","","","","","
"MB 320-146325/1-A","537","01/16/17","14:04","T","NA","Initial","1763-23-1","Perfluorooctane Sulfonate
(PFOS)","","","TRG","Yes","N","U","Y","0.0013","0.0030","0.0040","UG_L","UG_L","","","0","","","","0","","","","
","","","","","","","","","","","","","","","","","","
"MB 320-146325/1-A","537","01/16/17","14:04","T","NA","Initial","335-67-1","Perfluorooctanoic acid
(PFOA)","","","TRG","Yes","N","U","Y","0.00075","0.0020","0.0025","UG_L","UG_L","","","0","","","","0","","","",

"","","","","","","","","","","","

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Data Validation Report

Project:	Former Bay Head Road Annex- Annapolis, MD
Laboratory:	TestAmerica-West Sacramento, CA
Job Number:	320-24961-1
Analyses/Method:	Perfluorinated Compounds (PFCs) in Water, Soils, Sediments and Tissues by Liquid Chromatography/Mass Spectrometry/Mass Spectrometry (LC/MS/MS)/ Revision 1.4 (August 2015)
Validation Level:	Limited
Resolution Consultants Project Number:	60444465-DM.DE
Prepared by:	Paula DiMattei/Resolution Consultants — Completed on: 1/19/2017
Reviewed by:	Robert Kennedy/Resolution Consultants — Completed on:1 /19/2017
File Name: J24060-1_PFC memo.docx	

SUMMARY

The samples listed below were collected by Resolution Consultants from the Former Bay Head Road Annex site in Annapolis, MD on December 5-6, 2016.

Sample ID	Matrix/Sample Type
DPT-17-26-GW-18-22	Groundwater
DPT-17-26-GW-29-33	Groundwater
DPT-17-27-GW-18-22	Groundwater
DPT-17-27-GW-29-33	Groundwater
DPT-GW-EB-26-22	Equipment blank
DPT-GW-EB-26-33	Equipment blank
DPT-GW-EB-27-22	Equipment blank
DPT-GW-EB-27-33	Equipment blank
DPT-TB-011117	Trip blank

Data validation activities were conducted with reference to:

- TestAmerica-West Sacramento SOP: Perfluorinated Compounds (PFCs) in Water, Soils, Sediments and Tissues by Liquid Chromatography/Mass Spectrometry/Mass Spectrometry (LC/MS/MS)/Revision 1.4 (August 2015);
- USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (September 2016);
- USEPA Contract Laboratory Program National Functional Guidelines for High Resolution Superfund Methods Data Review (April 2016)
- Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (DoD, July 2013); and

- the project-specific Sampling and Analysis Plan.

In the absence of method-specific information, laboratory quality control (QC) limits, project-specific requirements and/or professional judgment were used as appropriate.

REVIEW ELEMENTS

The data were evaluated based on the following review elements (where applicable to the method):

✓ Data completeness (chain-of-custody (COC)/sample integrity
✓ Holding times/sample preservation
✓ Initial calibration/initial and continuing calibration verification
✗ Laboratory method blanks/equipment blanks
NA Matrix spike (MS) and/or matrix spike duplicate (MSD) results
✓ Laboratory control sample (LCS)/laboratory control sample duplicate (LCSD) results
NA Field duplicate results
✓ Labeled compound results
✓ Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. An "NA" indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. The symbol (✗) indicates that a QC nonconformance resulted in the qualification of data. Any QC nonconformance that resulted in the qualification of data is discussed below. In addition, nonconformances or other issues that were noted during validation, but did not result in qualification of data, may be discussed for informational purposes only.

The data appear valid as reported and may be used for decision making purposes. Select data points were qualified as negated due to nonconformances of certain QC criteria (see discussion below). Qualified sample results are presented in Table 1.

RESULTS

Data Completeness (chain-of-custody (COC)/Sample Integrity

The data package was reviewed and found to meet acceptance criteria for completeness:

- The COCs were reviewed for completeness of information relevant to the samples and requested analyses, and for signatures indicating transfer of sample custody.
- The laboratory sample login sheet(s) were reviewed for issues potentially affecting sample integrity, including the condition of sample containers upon receipt at the laboratory.
- Completeness of analyses was verified by comparing the reported results to the COC requests.

Holding Times/Sample Preservation

Sample preservation and preparation/analysis holding times were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Initial Calibration/Initial and Continuing Calibration Verification

Calibration data were reviewed for conformance with the QC acceptance criteria to ensure that:

- the initial calibration (ICAL) percent relative standard deviation (%RSD) or correlation coefficient (r) or coefficient of determination (r^2) method acceptance criteria were met;
- the initial calibration verification standard (ICV) percent recovery acceptance criteria were met; and
- the continuing calibration verification standard (CCV) frequency and method percent difference or percent drift (%D) criteria were met.

All QC acceptance criteria were met.

Laboratory Method Blanks/Equipment Blanks

Laboratory method blanks and equipment rinsate blanks are evaluated as to whether there are contaminants detected above the detection limit (DL). Data validation qualifications for individual samples are based on the maximum contaminant concentration detected in all associated blanks. Blank contamination is not discussed if qualification of the data was not required. The following table summarizes the contamination detected and the associated samples.

Blank ID	Compound	Concentration (µg/L)	Associated Samples
DPT-GW-EB-26-22	PFOS	0.020	DPT-17-26-GW-18-22
DPT-GW-EB-26-33	PFOA	0.00090 J	DPT-17-26-GW-29-33
DPT-GW-EB-27-33	PFOS	0.0074	DPT-17-27-GW-29-33

Samples were qualified as follows:

Actions: Based on NFG 2016

Blank Result	Sample Result	Actions
<LOQ	Not detected	No qualification
	< LOQ	Qualify sample result as U at the LOQ
	≥ LOQ	Use professional judgment
≥LOQ	< LOQ	Qualify sample result as U at the LOQ
	≥ LOQ but <blank result	Qualify sample result as U at the result concentration.
	≥ LOQ but ≥blank result	Use professional judgment

Qualified sample results are presented in Table 1.

MS/MSD Results

MS/MSD analyses were not performed on a sample from this data set. The data were not qualified on this basis.

LCS/LCSD Results

The LCS/LCSD percent recoveries (%Rs) and relative percent differences (RPDs) were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate Results

Field duplicate samples were not submitted with this data set. The data were not qualified on this basis.

Labeled Compound Results

The labeled compound results were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met or qualification of the data was not required.

Sample Results/Reporting Issues

If applicable, compounds detected at concentrations less than the LOQ but greater than the DL are qualified by the laboratory as estimated (J). This "J" qualifier is retained during data validation.

QUALIFICATION ACTIONS

Sample results qualified as a result of validation actions are summarized in Table 1. All actions are described above.

ATTACHMENTS

Attachment A: Qualifier Codes and Explanations

Attachment B: Reason Codes and Explanations

Table 1 - Data Validation Summary of Qualified Data

Sample ID	Matrix	Compound	Result	LOD	LOQ	Units	Validation Qualifiers	Validation Reason
DPT-17-26-GW-18-22	WG	Perfluorooctanesulfonic Acid (PFOS)		0.0083	0.0083	µg/L	U	be
DPT-17-26-GW-29-33	WG	Perfluorooctanoic Acid (PFOA)		0.0024	0.0024	µg/L	U	be
DPT-17-27-GW-29-33	WG	Perfluorooctanesulfonic Acid (PFOS)		0.0040	0.0040	µg/L	U	be

Attachment A

Qualifier Codes and Explanations

Qualifier	Explanation
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample and is potentially biased high.
J-	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample and is potentially biased low.
JN	The analyte was tentatively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Attachment B

Reason Codes and Explanations

Reason Code	Explanation
be	Equipment blank contamination
bf	Field blank contamination
bl	Laboratory blank contamination
c	Calibration issue
d	Reporting limit raised due to chromatographic interference
fd	Field duplicate RPDs
h	Holding times
i	Internal standard areas
k	Estimated Maximum Possible Concentration (EMPC)
l	LCS or OPR recoveries
lc	Labeled compound recovery
ld	Laboratory duplicate RPDs
lp	Laboratory control sample/laboratory control sample duplicate RPDs
m	Matrix spike recovery
md	Matrix spike/matrix spike duplicate RPDs
nb	Negative laboratory blank contamination
p	Chemical preservation issue
r	Dual column RPD
q	Quantitation issue
s	Surrogate recovery
si	Sample integrity issue
su	Ion suppression
t	Temperature preservation issue
x	Percent solids
y	Serial dilution results
z	ICS results

INSTALLATION_ID	SITE_NAME	LOCATION_NAME	LOCATION_TYPE_DESC	COORD_X	COORD_Y	SAMPLE_NAME	SAMPLE_MATRIX_DESC	COLLECT_DATE	ANALYTICAL_METHOD_GRP_DESC	SDG
DAVID_TAYLOR_RC	SITE 00003	DPT-17-26	Direct Push/Geoprobe	1473860	495960	DPT-17-26-GW-18-22	Ground water	1/11/2017	Perfluoroalkyl Compounds	320-24961-1
DAVID_TAYLOR_RC	SITE 00003	DPT-17-26	Direct Push/Geoprobe	1473860	495960	DPT-17-26-GW-29-33	Ground water	1/11/2017	Perfluoroalkyl Compounds	320-24961-1
DAVID_TAYLOR_RC	SITE 00003	DPT-17-27	Direct Push/Geoprobe	1473930	495908	DPT-17-27-GW-18-22	Ground water	1/11/2017	Perfluoroalkyl Compounds	320-24961-1
DAVID_TAYLOR_RC	SITE 00003	DPT-17-27	Direct Push/Geoprobe	1473930	495908	DPT-17-27-GW-29-33	Ground water	1/11/2017	Perfluoroalkyl Compounds	320-24961-1