N60087_003821
NAS BRUNSWICK, ME
SSIC 5000-33c

LABORATORY DATA PACKAGE, 320-35042-1, NAS BRUNSWICK ME

01/22/2018

TESTAMERICA LABORATORIES INC

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TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

Job Number: 320-35042-1

Job Description: TT: PFAS, Brunswick, Discharge

For:
Tetra Tech, Inc.
Foster Plaza VII
661 Anderson Drive
Foster Plaza 7
Pittsburgh, PA 15220

Attention: Jeff Orient

Approved for release.
David R Alltucker
Project Manager I
1/22/2018 3:49 PM

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01/22/2018

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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
E	Result exceeded calibration range.
M	Manual integrated compound.
D	The reported value is from a dilution.

Glossary

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

Job Narrative
320-35042-1

Receipt
The samples were received on 1/12/2018 1:20 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 5.2º C.

Receipt Exceptions
The Chain-of-Custody (COC) was not reliquished. A revised CoC was received from the client and both will be included in the report.

LCMS
Method(s) 537 (modified): The first level standard from the initial calibration curve is used to evaluate the tune criteria. The instrument mass windows are set at +/- 0.5amu; therefore, detection of the analyte serves as verification that the assigned mass is within +/- 0.5amu of the true value, which meets the DoD/DOE QSM tune criterion.

Method(s) 537 (modified): The following sample was diluted to bring the concentration of Perfluorooctanoic acid (PFOA) and Perfluorohexanesulfonic acid (PFHxS) within the calibration range: TP-PFC-025-TPI (320-35042-1). Elevated reporting limits (RLs) are provided.

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

Organic Prep
Method(s) 3535: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-204105.

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

Detection Summary

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

TestAmerica Job ID: 320-35042-1

Client Sample ID: TP-PFC-025-TPI — Lab Sample ID: 320-35042-1

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	73		2.0	0.34	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	190		2.0	0.48	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	340		3.9	0.57	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	67		2.0	0.24	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	1300	M E	3.9	0.83	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	2.4		2.0	0.26	ng/L	1		537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.89	J	2.0	0.30	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	51		2.0	0.29	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	360	E	2.0	0.29	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanesulfonic Acid (PFHpS)	7.1		2.0	0.29	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	340		3.9	0.53	ng/L	1		537 (modified)	Total/NA
Perfluorobutanoic acid (PFBA) - DL	74	D	20	3.4	ng/L	10		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA) - DL	200	D	20	4.8	ng/L	10		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA) - DL	350	D	39	5.7	ng/L	10		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA) - DL	75	D	20	2.4	ng/L	10		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	1800	D M	39	8.3	ng/L	10		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	41	D	20	2.9	ng/L	10		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	410	D	20	2.9	ng/L	10		537 (modified)	Total/NA
Perfluoroheptanesulfonic Acid (PFHpS) - DL	8.7	J D	20	2.9	ng/L	10		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	340	D	39	5.3	ng/L	10		537 (modified)	Total/NA

Client Sample ID: TP-PFC-025-MID-CARBON — Lab Sample ID: 320-35042-2

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	130		2.0	0.34	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	170		2.0	0.48	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	72		3.9	0.57	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.3	M	2.0	0.25	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	13	M	3.9	0.84	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	1.6	J	2.0	0.30	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	1.0	J	2.0	0.30	ng/L	1		537 (modified)	Total/NA

Client Sample ID: TP-PFC-025-TPE — Lab Sample ID: 320-35042-3

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	130		1.9	0.34	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	110		1.9	0.48	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	25		3.9	0.56	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.43	J M	1.9	0.24	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	1.1	J M	3.9	0.83	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.38	J	1.9	0.29	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.38	J	1.9	0.29	ng/L	1		537 (modified)	Total/NA

Client Sample ID: TP-PFC-025-TPE-D — Lab Sample ID: 320-35042-4

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	130		2.0	0.35	ng/L	1		537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: TP-PFC-025-TPE-D (Continued)

Lab Sample ID: 320-35042-4

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluoropentanoic acid (PFPeA)	110		2.0	0.48	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	25		4.0	0.57	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.43	J M	2.0	0.25	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	1.1	J M	4.0	0.84	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.45	J	2.0	0.30	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.32	J	2.0	0.30	ng/L	1		537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: TP-PFC-025-TPI

Lab Sample ID: 320-35042-1
Date Collected: 01/11/18 09:00
Matrix: Water
Date Received: 01/12/18 13:20

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**73**		2.0	0.34	ng/L		01/16/18 09:18	01/18/18 18:01	1
Perfluoropentanoic acid (PFPeA)	**190**		2.0	0.48	ng/L		01/16/18 09:18	01/18/18 18:01	1
Perfluorohexanoic acid (PFHxA)	**340**		3.9	0.57	ng/L		01/16/18 09:18	01/18/18 18:01	1
Perfluoroheptanoic acid (PFHpA)	**67**		2.0	0.24	ng/L		01/16/18 09:18	01/18/18 18:01	1
Perfluorooctanoic acid (PFOA)	**1300**	**M E**	3.9	0.83	ng/L		01/16/18 09:18	01/18/18 18:01	1
Perfluorononanoic acid (PFNA)	**2.4**		2.0	0.26	ng/L		01/16/18 09:18	01/18/18 18:01	1
Perfluorodecanoic acid (PFDA)	**0.89**	**J**	2.0	0.30	ng/L		01/16/18 09:18	01/18/18 18:01	1
Perfluoroundecanoic acid (PFUnA)	2.9	U	3.9	1.1	ng/L		01/16/18 09:18	01/18/18 18:01	1
Perfluorododecanoic acid (PFDoA)	2.0	U	3.9	0.54	ng/L		01/16/18 09:18	01/18/18 18:01	1
Perfluorotridecanoic Acid (PFTriA)	2.9	U	3.9	1.3	ng/L		01/16/18 09:18	01/18/18 18:01	1
Perfluorotetradecanoic acid (PFTeA)	0.98	U	2.0	0.28	ng/L		01/16/18 09:18	01/18/18 18:01	1
Perfluorobutanesulfonic acid (PFBS)	**51**		2.0	0.29	ng/L		01/16/18 09:18	01/18/18 18:01	1
Perfluorohexanesulfonic acid (PFHxS)	**360**	**E**	2.0	0.29	ng/L		01/16/18 09:18	01/18/18 18:01	1
Perfluoroheptanesulfonic Acid (PFHpS)	**7.1**		2.0	0.29	ng/L		01/16/18 09:18	01/18/18 18:01	1
Perfluorooctanesulfonic acid (PFOS)	**340**		3.9	0.53	ng/L		01/16/18 09:18	01/18/18 18:01	1
Perfluorodecanesulfonic acid (PFDS)	0.98	U	2.0	0.31	ng/L		01/16/18 09:18	01/18/18 18:01	1
Perfluorooctane Sulfonamide (FOSA)	0.98	U	2.0	0.34	ng/L		01/16/18 09:18	01/18/18 18:01	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*112*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:01*	*1*
13C4 PFBA	*114*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:01*	*1*
13C2 PFHxA	*118*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:01*	*1*
13C4 PFOA	*103*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:01*	*1*
13C5 PFNA	*124*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:01*	*1*
13C2 PFDA	*125*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:01*	*1*
13C2 PFUnA	*128*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:01*	*1*
13C2 PFDoA	*109*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:01*	*1*
18O2 PFHxS	*122*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:01*	*1*
13C4 PFOS	*124*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:01*	*1*
13C2-PFTeDA	*108*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:01*	*1*
13C4-PFHpA	*121*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:01*	*1*
13C5 PFPeA	*141*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:01*	*1*
13C3-PFBS	*123*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:01*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**74**	**D**	20	3.4	ng/L		01/16/18 09:18	01/19/18 16:58	10
Perfluoropentanoic acid (PFPeA)	**200**	**D**	20	4.8	ng/L		01/16/18 09:18	01/19/18 16:58	10
Perfluorohexanoic acid (PFHxA)	**350**	**D**	39	5.7	ng/L		01/16/18 09:18	01/19/18 16:58	10
Perfluoroheptanoic acid (PFHpA)	**75**	**D**	20	2.4	ng/L		01/16/18 09:18	01/19/18 16:58	10
Perfluorooctanoic acid (PFOA)	**1800**	**D M**	39	8.3	ng/L		01/16/18 09:18	01/19/18 16:58	10
Perfluorononanoic acid (PFNA)	9.8	U	20	2.6	ng/L		01/16/18 09:18	01/19/18 16:58	10
Perfluorodecanoic acid (PFDA)	9.8	U	20	3.0	ng/L		01/16/18 09:18	01/19/18 16:58	10
Perfluoroundecanoic acid (PFUnA)	29	U	39	11	ng/L		01/16/18 09:18	01/19/18 16:58	10
Perfluorododecanoic acid (PFDoA)	20	U	39	5.4	ng/L		01/16/18 09:18	01/19/18 16:58	10
Perfluorotridecanoic Acid (PFTriA)	29	U	39	13	ng/L		01/16/18 09:18	01/19/18 16:58	10
Perfluorotetradecanoic acid (PFTeA)	9.8	U	20	2.8	ng/L		01/16/18 09:18	01/19/18 16:58	10

Client Sample ID: TP-PFC-025-TPI — Lab Sample ID: 320-35042-1

Date Collected: 01/11/18 09:00 — **Matrix: Water**
Date Received: 01/12/18 13:20

Method: 537 (modified) - Fluorinated Alkyl Substances - DL (Continued)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	**41**	**D**	20	2.9	ng/L		01/16/18 09:18	01/19/18 16:58	10
Perfluorohexanesulfonic acid (PFHxS)	**410**	**D**	20	2.9	ng/L		01/16/18 09:18	01/19/18 16:58	10
Perfluoroheptanesulfonic Acid (PFHpS)	**8.7**	**J D**	20	2.9	ng/L		01/16/18 09:18	01/19/18 16:58	10
Perfluorooctanesulfonic acid (PFOS)	**340**	**D**	39	5.3	ng/L		01/16/18 09:18	01/19/18 16:58	10
Perfluorodecanesulfonic acid (PFDS)	9.8	U	20	3.1	ng/L		01/16/18 09:18	01/19/18 16:58	10
Perfluorooctane Sulfonamide (FOSA)	9.8	U	20	3.4	ng/L		01/16/18 09:18	01/19/18 16:58	10

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*95*		*25 - 150*	*01/16/18 09:18*	*01/19/18 16:58*	*10*
13C4 PFBA	*101*		*25 - 150*	*01/16/18 09:18*	*01/19/18 16:58*	*10*
13C2 PFHxA	*101*		*25 - 150*	*01/16/18 09:18*	*01/19/18 16:58*	*10*
13C4 PFOA	*103*		*25 - 150*	*01/16/18 09:18*	*01/19/18 16:58*	*10*
13C5 PFNA	*100*		*25 - 150*	*01/16/18 09:18*	*01/19/18 16:58*	*10*
13C2 PFDA	*102*		*25 - 150*	*01/16/18 09:18*	*01/19/18 16:58*	*10*
13C2 PFUnA	*106*		*25 - 150*	*01/16/18 09:18*	*01/19/18 16:58*	*10*
13C2 PFDoA	*94*		*25 - 150*	*01/16/18 09:18*	*01/19/18 16:58*	*10*
18O2 PFHxS	*99*		*25 - 150*	*01/16/18 09:18*	*01/19/18 16:58*	*10*
13C4 PFOS	*101*		*25 - 150*	*01/16/18 09:18*	*01/19/18 16:58*	*10*
13C2-PFTeDA	*95*		*25 - 150*	*01/16/18 09:18*	*01/19/18 16:58*	*10*
13C4-PFHpA	*96*		*25 - 150*	*01/16/18 09:18*	*01/19/18 16:58*	*10*
13C5 PFPeA	*104*		*25 - 150*	*01/16/18 09:18*	*01/19/18 16:58*	*10*
13C3-PFBS	*118*		*25 - 150*	*01/16/18 09:18*	*01/19/18 16:58*	*10*

Client Sample ID: TP-PFC-025-MID-CARBON — Lab Sample ID: 320-35042-2

Date Collected: 01/11/18 09:05 — **Matrix: Water**
Date Received: 01/12/18 13:20

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**130**		2.0	0.34	ng/L		01/16/18 09:18	01/18/18 18:08	1
Perfluoropentanoic acid (PFPeA)	**170**		2.0	0.48	ng/L		01/16/18 09:18	01/18/18 18:08	1
Perfluorohexanoic acid (PFHxA)	**72**		3.9	0.57	ng/L		01/16/18 09:18	01/18/18 18:08	1
Perfluoroheptanoic acid (PFHpA)	**2.3**	**M**	2.0	0.25	ng/L		01/16/18 09:18	01/18/18 18:08	1
Perfluorooctanoic acid (PFOA)	**13**	**M**	3.9	0.84	ng/L		01/16/18 09:18	01/18/18 18:08	1
Perfluorononanoic acid (PFNA)	0.98	U	2.0	0.27	ng/L		01/16/18 09:18	01/18/18 18:08	1
Perfluorodecanoic acid (PFDA)	0.98	U	2.0	0.31	ng/L		01/16/18 09:18	01/18/18 18:08	1
Perfluoroundecanoic acid (PFUnA)	3.0	U	3.9	1.1	ng/L		01/16/18 09:18	01/18/18 18:08	1
Perfluorododecanoic acid (PFDoA)	2.0	U	3.9	0.54	ng/L		01/16/18 09:18	01/18/18 18:08	1
Perfluorotridecanoic Acid (PFTriA)	3.0	U	3.9	1.3	ng/L		01/16/18 09:18	01/18/18 18:08	1
Perfluorotetradecanoic acid (PFTeA)	0.98	U	2.0	0.29	ng/L		01/16/18 09:18	01/18/18 18:08	1
Perfluorobutanesulfonic acid (PFBS)	**1.6**	**J**	2.0	0.30	ng/L		01/16/18 09:18	01/18/18 18:08	1
Perfluorohexanesulfonic acid (PFHxS)	**1.0**	**J**	2.0	0.30	ng/L		01/16/18 09:18	01/18/18 18:08	1
Perfluoroheptanesulfonic Acid (PFHpS)	0.98	U	2.0	0.30	ng/L		01/16/18 09:18	01/18/18 18:08	1
Perfluorooctanesulfonic acid (PFOS)	2.0	U	3.9	0.53	ng/L		01/16/18 09:18	01/18/18 18:08	1
Perfluorodecanesulfonic acid (PFDS)	0.98	U	2.0	0.32	ng/L		01/16/18 09:18	01/18/18 18:08	1

Client Sample ID: TP-PFC-025-MID-CARBON — Lab Sample ID: 320-35042-2

Date Collected: 01/11/18 09:05 — **Matrix: Water**
Date Received: 01/12/18 13:20

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctane Sulfonamide (FOSA)	0.98	U	2.0	0.34	ng/L		01/16/18 09:18	01/18/18 18:08	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*92*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:08*	*1*
13C4 PFBA	*104*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:08*	*1*
13C2 PFHxA	*98*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:08*	*1*
13C4 PFOA	*102*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:08*	*1*
13C5 PFNA	*104*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:08*	*1*
13C2 PFDA	*97*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:08*	*1*
13C2 PFUnA	*100*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:08*	*1*
13C2 PFDoA	*90*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:08*	*1*
18O2 PFHxS	*99*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:08*	*1*
13C4 PFOS	*100*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:08*	*1*
13C2-PFTeDA	*94*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:08*	*1*
13C4-PFHpA	*100*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:08*	*1*
13C5 PFPeA	*102*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:08*	*1*
13C3-PFBS	*98*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:08*	*1*

Client Sample ID: TP-PFC-025-TPE — Lab Sample ID: 320-35042-3

Date Collected: 01/11/18 09:10 — **Matrix: Water**
Date Received: 01/12/18 13:20

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**130**		1.9	0.34	ng/L		01/16/18 09:18	01/18/18 18:16	1
Perfluoropentanoic acid (PFPeA)	**110**		1.9	0.48	ng/L		01/16/18 09:18	01/18/18 18:16	1
Perfluorohexanoic acid (PFHxA)	**25**		3.9	0.56	ng/L		01/16/18 09:18	01/18/18 18:16	1
Perfluoroheptanoic acid (PFHpA)	**0.43**	**J M**	1.9	0.24	ng/L		01/16/18 09:18	01/18/18 18:16	1
Perfluorooctanoic acid (PFOA)	**1.1**	**J M**	3.9	0.83	ng/L		01/16/18 09:18	01/18/18 18:16	1
Perfluorononanoic acid (PFNA)	0.97	U	1.9	0.26	ng/L		01/16/18 09:18	01/18/18 18:16	1
Perfluorodecanoic acid (PFDA)	0.97	U	1.9	0.30	ng/L		01/16/18 09:18	01/18/18 18:16	1
Perfluoroundecanoic acid (PFUnA)	2.9	U	3.9	1.1	ng/L		01/16/18 09:18	01/18/18 18:16	1
Perfluorododecanoic acid (PFDoA)	1.9	U	3.9	0.54	ng/L		01/16/18 09:18	01/18/18 18:16	1
Perfluorotridecanoic Acid (PFTriA)	2.9	U	3.9	1.3	ng/L		01/16/18 09:18	01/18/18 18:16	1
Perfluorotetradecanoic acid (PFTeA)	0.97	U	1.9	0.28	ng/L		01/16/18 09:18	01/18/18 18:16	1
Perfluorobutanesulfonic acid (PFBS)	**0.38**	**J**	1.9	0.29	ng/L		01/16/18 09:18	01/18/18 18:16	1
Perfluorohexanesulfonic acid (PFHxS)	**0.38**	**J**	1.9	0.29	ng/L		01/16/18 09:18	01/18/18 18:16	1
Perfluoroheptanesulfonic Acid (PFHpS)	0.97	U	1.9	0.29	ng/L		01/16/18 09:18	01/18/18 18:16	1
Perfluorooctanesulfonic acid (PFOS)	1.9	U	3.9	0.53	ng/L		01/16/18 09:18	01/18/18 18:16	1
Perfluorodecanesulfonic acid (PFDS)	0.97	U	1.9	0.31	ng/L		01/16/18 09:18	01/18/18 18:16	1
Perfluorooctane Sulfonamide (FOSA)	0.97	U	1.9	0.34	ng/L		01/16/18 09:18	01/18/18 18:16	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*87*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:16*	*1*
13C4 PFBA	*105*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:16*	*1*
13C2 PFHxA	*101*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:16*	*1*
13C4 PFOA	*107*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:16*	*1*
13C5 PFNA	*106*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:16*	*1*
13C2 PFDA	*89*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:16*	*1*

Client Sample ID: TP-PFC-025-TPE

Lab Sample ID: 320-35042-3
Date Collected: 01/11/18 09:10
Matrix: Water
Date Received: 01/12/18 13:20

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFUnA	*99*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:16*	*1*
13C2 PFDoA	*93*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:16*	*1*
18O2 PFHxS	*102*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:16*	*1*
13C4 PFOS	*100*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:16*	*1*
13C2-PFTeDA	*94*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:16*	*1*
13C4-PFHpA	*110*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:16*	*1*
13C5 PFPeA	*107*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:16*	*1*
13C3-PFBS	*99*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:16*	*1*

Client Sample ID: TP-PFC-025-TPE-D

Lab Sample ID: 320-35042-4
Date Collected: 01/11/18 00:00
Matrix: Water
Date Received: 01/12/18 13:20

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**130**		2.0	0.35	ng/L		01/16/18 09:18	01/18/18 18:24	1
Perfluoropentanoic acid (PFPeA)	**110**		2.0	0.48	ng/L		01/16/18 09:18	01/18/18 18:24	1
Perfluorohexanoic acid (PFHxA)	**25**		4.0	0.57	ng/L		01/16/18 09:18	01/18/18 18:24	1
Perfluoroheptanoic acid (PFHpA)	**0.43**	**J M**	2.0	0.25	ng/L		01/16/18 09:18	01/18/18 18:24	1
Perfluorooctanoic acid (PFOA)	**1.1**	**J M**	4.0	0.84	ng/L		01/16/18 09:18	01/18/18 18:24	1
Perfluorononanoic acid (PFNA)	0.99	U	2.0	0.27	ng/L		01/16/18 09:18	01/18/18 18:24	1
Perfluorodecanoic acid (PFDA)	0.99	U	2.0	0.31	ng/L		01/16/18 09:18	01/18/18 18:24	1
Perfluoroundecanoic acid (PFUnA)	3.0	U	4.0	1.1	ng/L		01/16/18 09:18	01/18/18 18:24	1
Perfluorododecanoic acid (PFDoA)	2.0	U	4.0	0.54	ng/L		01/16/18 09:18	01/18/18 18:24	1
Perfluorotridecanoic Acid (PFTriA)	3.0	U	4.0	1.3	ng/L		01/16/18 09:18	01/18/18 18:24	1
Perfluorotetradecanoic acid (PFTeA)	0.99	U	2.0	0.29	ng/L		01/16/18 09:18	01/18/18 18:24	1
Perfluorobutanesulfonic acid (PFBS)	**0.45**	**J**	2.0	0.30	ng/L		01/16/18 09:18	01/18/18 18:24	1
Perfluorohexanesulfonic acid (PFHxS)	**0.32**	**J**	2.0	0.30	ng/L		01/16/18 09:18	01/18/18 18:24	1
Perfluoroheptanesulfonic Acid (PFHpS)	0.99	U	2.0	0.30	ng/L		01/16/18 09:18	01/18/18 18:24	1
Perfluorooctanesulfonic acid (PFOS)	2.0	U	4.0	0.53	ng/L		01/16/18 09:18	01/18/18 18:24	1
Perfluorodecanesulfonic acid (PFDS)	0.99	U	2.0	0.32	ng/L		01/16/18 09:18	01/18/18 18:24	1
Perfluorooctane Sulfonamide (FOSA)	0.99	U	2.0	0.35	ng/L		01/16/18 09:18	01/18/18 18:24	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*98*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:24*	*1*
13C4 PFBA	*105*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:24*	*1*
13C2 PFHxA	*108*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:24*	*1*
13C4 PFOA	*107*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:24*	*1*
13C5 PFNA	*107*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:24*	*1*
13C2 PFDA	*102*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:24*	*1*
13C2 PFUnA	*108*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:24*	*1*
13C2 PFDoA	*102*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:24*	*1*
18O2 PFHxS	*103*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:24*	*1*
13C4 PFOS	*108*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:24*	*1*
13C2-PFTeDA	*99*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:24*	*1*
13C4-PFHpA	*108*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:24*	*1*
13C5 PFPeA	*109*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:24*	*1*
13C3-PFBS	*99*		*25 - 150*	*01/16/18 09:18*	*01/18/18 18:24*	*1*

Default Detection Limits

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

TestAmerica Job ID: 320-35042-1

Method: 537 (modified) - Fluorinated Alkyl Substances

Prep: 3535

Analyte	LOQ	DL	Units	Method
Perfluorobutanesulfonic acid (PFBS)	2.0	0.30	ng/L	537 (modified)
Perfluorobutanoic acid (PFBA)	2.0	0.35	ng/L	537 (modified)
Perfluorodecanesulfonic acid (PFDS)	2.0	0.32	ng/L	537 (modified)
Perfluorodecanoic acid (PFDA)	2.0	0.31	ng/L	537 (modified)
Perfluorododecanoic acid (PFDoA)	4.0	0.55	ng/L	537 (modified)
Perfluoroheptanesulfonic Acid (PFHpS)	2.0	0.30	ng/L	537 (modified)
Perfluoroheptanoic acid (PFHpA)	2.0	0.25	ng/L	537 (modified)
Perfluorohexanesulfonic acid (PFHxS)	2.0	0.30	ng/L	537 (modified)
Perfluorohexanoic acid (PFHxA)	4.0	0.58	ng/L	537 (modified)
Perfluorononanoic acid (PFNA)	2.0	0.27	ng/L	537 (modified)
Perfluorooctane Sulfonamide (FOSA)	2.0	0.35	ng/L	537 (modified)
Perfluorooctanesulfonic acid (PFOS)	4.0	0.54	ng/L	537 (modified)
Perfluorooctanoic acid (PFOA)	4.0	0.85	ng/L	537 (modified)
Perfluoropentanoic acid (PFPeA)	2.0	0.49	ng/L	537 (modified)
Perfluorotetradecanoic acid (PFTeA)	2.0	0.29	ng/L	537 (modified)
Perfluorotridecanoic Acid (PFTriA)	4.0	1.3	ng/L	537 (modified)
Perfluoroundecanoic acid (PFUnA)	4.0	1.1	ng/L	537 (modified)

Isotope Dilution Summary

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

TestAmerica Job ID: 320-35042-1

Method: 537 (modified) - Fluorinated Alkyl Substances

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

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	PFOSA (25-150)	PFBA (25-150)	PFHxA (25-150)	PFOA (25-150)	PFNA (25-150)	PFDA (25-150)	PFUnA (25-150)	PFDoA (25-150)
320-35042-1	TP-PFC-025-TPI	112	114	118	103	124	125	128	109
320-35042-1 - DL	TP-PFC-025-TPI	95	101	101	103	100	102	106	94
320-35042-2	TP-PFC-025-MID-CARBON	92	104	98	102	104	97	100	90
320-35042-3	TP-PFC-025-TPE	87	105	101	107	106	89	99	93
320-35042-4	TP-PFC-025-TPE-D	98	105	108	107	107	102	108	102
LCS 320-204105/2-A	Lab Control Sample	84	98	97	100	95	94	100	91
LCSD 320-204105/3-A	Lab Control Sample Dup	92	104	108	104	103	102	99	94
MB 320-204105/1-A	Method Blank	91	104	102	102	106	100	107	96

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	PFHxS (25-150)	PFOS (25-150)	PFTDA (25-150)	PFHpA (25-150)	PFPeA (25-150)	3C3-PFBS (25-150)		
320-35042-1	TP-PFC-025-TPI	122	124	108	121	141	123		
320-35042-1 - DL	TP-PFC-025-TPI	99	101	95	96	104	118		
320-35042-2	TP-PFC-025-MID-CARBON	99	100	94	100	102	98		
320-35042-3	TP-PFC-025-TPE	102	100	94	110	107	99		
320-35042-4	TP-PFC-025-TPE-D	103	108	99	108	109	99		
LCS 320-204105/2-A	Lab Control Sample	94	93	92	97	101	96		
LCSD 320-204105/3-A	Lab Control Sample Dup	100	101	99	104	106	105		
MB 320-204105/1-A	Method Blank	104	104	98	101	108	101		

Surrogate Legend

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

Method: 537 (modified) - Fluorinated Alkyl Substances

Lab Sample ID: MB 320-204105/1-A
Matrix: Water
Analysis Batch: 204556

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 204105

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	1.0	U	2.0	0.35	ng/L		01/16/18 09:18	01/18/18 17:37	1
Perfluoropentanoic acid (PFPeA)	1.0	U	2.0	0.49	ng/L		01/16/18 09:18	01/18/18 17:37	1
Perfluorohexanoic acid (PFHxA)	2.0	U	4.0	0.58	ng/L		01/16/18 09:18	01/18/18 17:37	1
Perfluoroheptanoic acid (PFHpA)	1.0	U	2.0	0.25	ng/L		01/16/18 09:18	01/18/18 17:37	1
Perfluorooctanoic acid (PFOA)	2.0	U	4.0	0.85	ng/L		01/16/18 09:18	01/18/18 17:37	1
Perfluorononanoic acid (PFNA)	1.0	U	2.0	0.27	ng/L		01/16/18 09:18	01/18/18 17:37	1
Perfluorodecanoic acid (PFDA)	1.0	U	2.0	0.31	ng/L		01/16/18 09:18	01/18/18 17:37	1
Perfluoroundecanoic acid (PFUnA)	3.0	U	4.0	1.1	ng/L		01/16/18 09:18	01/18/18 17:37	1
Perfluorododecanoic acid (PFDoA)	2.0	U	4.0	0.55	ng/L		01/16/18 09:18	01/18/18 17:37	1
Perfluorotridecanoic Acid (PFTriA)	3.0	U	4.0	1.3	ng/L		01/16/18 09:18	01/18/18 17:37	1
Perfluorotetradecanoic acid (PFTeA)	1.0	U	2.0	0.29	ng/L		01/16/18 09:18	01/18/18 17:37	1
Perfluorobutanesulfonic acid (PFBS)	1.0	U	2.0	0.30	ng/L		01/16/18 09:18	01/18/18 17:37	1
Perfluorohexanesulfonic acid (PFHxS)	1.0	U	2.0	0.30	ng/L		01/16/18 09:18	01/18/18 17:37	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.0	U	2.0	0.30	ng/L		01/16/18 09:18	01/18/18 17:37	1
Perfluorooctanesulfonic acid (PFOS)	2.0	U	4.0	0.54	ng/L		01/16/18 09:18	01/18/18 17:37	1
Perfluorodecanesulfonic acid (PFDS)	1.0	U	2.0	0.32	ng/L		01/16/18 09:18	01/18/18 17:37	1
Perfluorooctane Sulfonamide (FOSA)	1.0	U	2.0	0.35	ng/L		01/16/18 09:18	01/18/18 17:37	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*91*		*25 - 150*	*01/16/18 09:18*	*01/18/18 17:37*	*1*
13C4 PFBA	*104*		*25 - 150*	*01/16/18 09:18*	*01/18/18 17:37*	*1*
13C2 PFHxA	*102*		*25 - 150*	*01/16/18 09:18*	*01/18/18 17:37*	*1*
13C4 PFOA	*102*		*25 - 150*	*01/16/18 09:18*	*01/18/18 17:37*	*1*
13C5 PFNA	*106*		*25 - 150*	*01/16/18 09:18*	*01/18/18 17:37*	*1*
13C2 PFDA	*100*		*25 - 150*	*01/16/18 09:18*	*01/18/18 17:37*	*1*
13C2 PFUnA	*107*		*25 - 150*	*01/16/18 09:18*	*01/18/18 17:37*	*1*
13C2 PFDoA	*96*		*25 - 150*	*01/16/18 09:18*	*01/18/18 17:37*	*1*
18O2 PFHxS	*104*		*25 - 150*	*01/16/18 09:18*	*01/18/18 17:37*	*1*
13C4 PFOS	*104*		*25 - 150*	*01/16/18 09:18*	*01/18/18 17:37*	*1*
13C2-PFTeDA	*98*		*25 - 150*	*01/16/18 09:18*	*01/18/18 17:37*	*1*
13C4-PFHpA	*101*		*25 - 150*	*01/16/18 09:18*	*01/18/18 17:37*	*1*
13C5 PFPeA	*108*		*25 - 150*	*01/16/18 09:18*	*01/18/18 17:37*	*1*
13C3-PFBS	*101*		*25 - 150*	*01/16/18 09:18*	*01/18/18 17:37*	*1*

Lab Sample ID: LCS 320-204105/2-A
Matrix: Water
Analysis Batch: 204556

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 204105

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorobutanoic acid (PFBA)	40.0	39.2		ng/L		98	89 - 128
Perfluoropentanoic acid (PFPeA)	40.0	36.2		ng/L		90	66 - 136
Perfluorohexanoic acid (PFHxA)	40.0	36.9		ng/L		92	86 - 126
Perfluoroheptanoic acid (PFHpA)	40.0	38.0		ng/L		95	89 - 127
Perfluorooctanoic acid (PFOA)	40.0	36.9		ng/L		92	80 - 120
Perfluorononanoic acid (PFNA)	40.0	38.8		ng/L		97	77 - 137
Perfluorodecanoic acid (PFDA)	40.0	40.0		ng/L		100	84 - 123
Perfluoroundecanoic acid (PFUnA)	40.0	34.4		ng/L		86	73 - 122

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-204105/2-A
Matrix: Water
Analysis Batch: 204556

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 204105

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorododecanoic acid (PFDoA)	40.0	40.3		ng/L		101	82 - 122
Perfluorotridecanoic Acid (PFTriA)	40.0	39.4		ng/L		99	56 - 163
Perfluorotetradecanoic acid (PFTeA)	40.0	40.7		ng/L		102	66 - 120
Perfluorobutanesulfonic acid (PFBS)	35.4	34.9		ng/L		99	88 - 130
Perfluorohexanesulfonic acid (PFHxS)	36.4	34.8		ng/L		96	87 - 126
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	38.0		ng/L		100	92 - 135
Perfluorooctanesulfonic acid (PFOS)	37.1	36.0		ng/L		97	83 - 126
Perfluorodecanesulfonic acid (PFDS)	38.6	40.0		ng/L		104	80 - 129
Perfluorooctane Sulfonamide (FOSA)	40.0	39.5		ng/L		99	91 - 133

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C8 FOSA	*84*		*25 - 150*
13C4 PFBA	*98*		*25 - 150*
13C2 PFHxA	*97*		*25 - 150*
13C4 PFOA	*100*		*25 - 150*
13C5 PFNA	*95*		*25 - 150*
13C2 PFDA	*94*		*25 - 150*
13C2 PFUnA	*100*		*25 - 150*
13C2 PFDoA	*91*		*25 - 150*
18O2 PFHxS	*94*		*25 - 150*
13C4 PFOS	*93*		*25 - 150*
13C2-PFTeDA	*92*		*25 - 150*
13C4-PFHpA	*97*		*25 - 150*
13C5 PFPeA	*101*		*25 - 150*
13C3-PFBS	*96*		*25 - 150*

Lab Sample ID: LCSD 320-204105/3-A
Matrix: Water
Analysis Batch: 204556

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 204105

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorobutanoic acid (PFBA)	40.0	38.1		ng/L		95	89 - 128	3	30
Perfluoropentanoic acid (PFPeA)	40.0	35.9		ng/L		90	66 - 136	1	30
Perfluorohexanoic acid (PFHxA)	40.0	35.7		ng/L		89	86 - 126	3	30
Perfluoroheptanoic acid (PFHpA)	40.0	37.2		ng/L		93	89 - 127	2	30
Perfluorooctanoic acid (PFOA)	40.0	37.8		ng/L		94	80 - 120	2	30
Perfluorononanoic acid (PFNA)	40.0	37.5		ng/L		94	77 - 137	3	30
Perfluorodecanoic acid (PFDA)	40.0	37.9		ng/L		95	84 - 123	6	30
Perfluoroundecanoic acid (PFUnA)	40.0	37.2		ng/L		93	73 - 122	8	30
Perfluorododecanoic acid (PFDoA)	40.0	39.8		ng/L		100	82 - 122	1	30

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCSD 320-204105/3-A
Matrix: Water
Analysis Batch: 204556

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 204105

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorotridecanoic Acid (PFTriA)			40.0	38.6		ng/L		97	56 - 163	2	30
Perfluorotetradecanoic acid (PFTeA)			40.0	40.7		ng/L		102	66 - 120	0	30
Perfluorobutanesulfonic acid (PFBS)			35.4	33.8		ng/L		96	88 - 130	3	30
Perfluorohexanesulfonic acid (PFHxS)			36.4	33.8		ng/L		93	87 - 126	3	30
Perfluoroheptanesulfonic Acid (PFHpS)			38.1	37.5		ng/L		98	92 - 135	2	30
Perfluorooctanesulfonic acid (PFOS)			37.1	34.3		ng/L		93	83 - 126	5	30
Perfluorodecanesulfonic acid (PFDS)			38.6	36.9		ng/L		96	80 - 129	8	30
Perfluorooctane Sulfonamide (FOSA)			40.0	36.6		ng/L		92	91 - 133	8	30

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C8 FOSA	*92*		*25 - 150*
13C4 PFBA	*104*		*25 - 150*
13C2 PFHxA	*108*		*25 - 150*
13C4 PFOA	*104*		*25 - 150*
13C5 PFNA	*103*		*25 - 150*
13C2 PFDA	*102*		*25 - 150*
13C2 PFUnA	*99*		*25 - 150*
13C2 PFDoA	*94*		*25 - 150*
18O2 PFHxS	*100*		*25 - 150*
13C4 PFOS	*101*		*25 - 150*
13C2-PFTeDA	*99*		*25 - 150*
13C4-PFHpA	*104*		*25 - 150*
13C5 PFPeA	*106*		*25 - 150*
13C3-PFBS	*105*		*25 - 150*

LCMS

Prep Batch: 204105

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-35042-1	TP-PFC-025-TPI	Total/NA	Water	3535	
320-35042-1 - DL	TP-PFC-025-TPI	Total/NA	Water	3535	
320-35042-2	TP-PFC-025-MID-CARBON	Total/NA	Water	3535	
320-35042-3	TP-PFC-025-TPE	Total/NA	Water	3535	
320-35042-4	TP-PFC-025-TPE-D	Total/NA	Water	3535	
MB 320-204105/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-204105/2-A	Lab Control Sample	Total/NA	Water	3535	
LCSD 320-204105/3-A	Lab Control Sample Dup	Total/NA	Water	3535	

Analysis Batch: 204556

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-35042-1	TP-PFC-025-TPI	Total/NA	Water	537 (modified)	204105
320-35042-2	TP-PFC-025-MID-CARBON	Total/NA	Water	537 (modified)	204105
320-35042-3	TP-PFC-025-TPE	Total/NA	Water	537 (modified)	204105
320-35042-4	TP-PFC-025-TPE-D	Total/NA	Water	537 (modified)	204105
MB 320-204105/1-A	Method Blank	Total/NA	Water	537 (modified)	204105
LCS 320-204105/2-A	Lab Control Sample	Total/NA	Water	537 (modified)	204105
LCSD 320-204105/3-A	Lab Control Sample Dup	Total/NA	Water	537 (modified)	204105

Analysis Batch: 204757

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-35042-1 - DL	TP-PFC-025-TPI	Total/NA	Water	537 (modified)	204105

Lab Chronicle

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

TestAmerica Job ID: 320-35042-1

Client Sample ID: TP-PFC-025-TPI
Lab Sample ID: 320-35042-1
Date Collected: 01/11/18 09:00
Matrix: Water
Date Received: 01/12/18 13:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			204105	01/16/18 09:18	CCB	TAL SAC
Total/NA	Analysis	537 (modified)		1	204556	01/18/18 18:01	AAR	TAL SAC
Total/NA	Prep	3535	DL		204105	01/16/18 09:18	CCB	TAL SAC
Total/NA	Analysis	537 (modified)	DL	10	204757	01/19/18 16:58	AAR	TAL SAC

Client Sample ID: TP-PFC-025-MID-CARBON
Lab Sample ID: 320-35042-2
Date Collected: 01/11/18 09:05
Matrix: Water
Date Received: 01/12/18 13:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			204105	01/16/18 09:18	CCB	TAL SAC
Total/NA	Analysis	537 (modified)		1	204556	01/18/18 18:08	AAR	TAL SAC

Client Sample ID: TP-PFC-025-TPE
Lab Sample ID: 320-35042-3
Date Collected: 01/11/18 09:10
Matrix: Water
Date Received: 01/12/18 13:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			204105	01/16/18 09:18	CCB	TAL SAC
Total/NA	Analysis	537 (modified)		1	204556	01/18/18 18:16	AAR	TAL SAC

Client Sample ID: TP-PFC-025-TPE-D
Lab Sample ID: 320-35042-4
Date Collected: 01/11/18 00:00
Matrix: Water
Date Received: 01/12/18 13:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			204105	01/16/18 09:18	CCB	TAL SAC
Total/NA	Analysis	537 (modified)		1	204556	01/18/18 18:24	AAR	TAL SAC

Laboratory References:

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

Accreditation/Certification Summary

Client: Tetra Tech, Inc. TestAmerica Job ID: 320-35042-1
Project/Site: TT: PFAS, Brunswick, Discharge

Laboratory: TestAmerica Sacramento

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
Oregon	NELAP	10	4040	01-29-20

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

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

Method Summary

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

TestAmerica Job ID: 320-35042-1

Method	Method Description	Protocol	Laboratory
537 (modified)	Fluorinated Alkyl Substances	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: Tetra Tech, Inc.
Project/Site: TT: PFAS, Brunswick, Discharge

TestAmerica Job ID: 320-35042-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-35042-1	TP-PFC-025-TPI	Water	01/11/18 09:00	01/12/18 13:20
320-35042-2	TP-PFC-025-MID-CARBON	Water	01/11/18 09:05	01/12/18 13:20
320-35042-3	TP-PFC-025-TPE	Water	01/11/18 09:10	01/12/18 13:20
320-35042-4	TP-PFC-025-TPE-D	Water	01/11/18 00:00	01/12/18 13:20

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 204375

Lab Sample ID: IC 320-204375/2 Client Sample ID:

Date Analyzed: 01/17/18 14:19 Lab File ID: 2018.01.17CURVELLA_002.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanoic acid (PFHxA)	1.94	Baseline	hannigana	01/17/18 16:49

Lab Sample ID: IC 320-204375/3 Client Sample ID:

Date Analyzed: 01/17/18 14:27 Lab File ID: 2018.01.17CURVELLA_003.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoropentanoic acid (PFPeA)	1.66	Baseline	hannigana	01/17/18 16:50
Perfluorohexanoic acid (PFHxA)	1.94	Baseline	hannigana	01/17/18 16:50

537 (modified)

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 204504

Lab Sample ID: CCVL 320-204504/1 Client Sample ID:

Date Analyzed: 01/18/18 10:35 Lab File ID: 2018.01.18LLC_004.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanoic acid (PFHxA)	1.93	Baseline	roycea	01/18/18 12:26
Perfluorooctanesulfonic acid (PFOS)	2.98	Isomers	roycea	01/18/18 12:25

537 (modified)

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 204556

Lab Sample ID: 320-35042-1 Client Sample ID: TP-PFC-025-TPI

Date Analyzed: 01/18/18 18:01 Lab File ID: 2018.01.18LLA_005.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.62	Isomers	roycea	01/19/18 15:49

Lab Sample ID: 320-35042-2 Client Sample ID: TP-PFC-025-MID-CARBON

Date Analyzed: 01/18/18 18:08 Lab File ID: 2018.01.18LLA_006.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid (PFHpA)	2.24	Baseline	roycea	01/19/18 15:44
Perfluorooctanoic acid (PFOA)	2.62	Isomers	roycea	01/19/18 15:43

Lab Sample ID: 320-35042-3 Client Sample ID: TP-PFC-025-TPE

Date Analyzed: 01/18/18 18:16 Lab File ID: 2018.01.18LLA_007.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid (PFHpA)	2.25	Baseline	roycea	01/19/18 16:27
Perfluorooctanoic acid (PFOA)	2.62	Isomers	roycea	01/19/18 16:32

Lab Sample ID: 320-35042-4 Client Sample ID: TP-PFC-025-TPE-D

Date Analyzed: 01/18/18 18:24 Lab File ID: 2018.01.18LLA_008.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid (PFHpA)	2.23	Baseline	roycea	01/19/18 16:28
Perfluorooctanoic acid (PFOA)	2.62	Isomers	roycea	01/19/18 16:29

537 (modified)

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 204757

Lab Sample ID: 320-35042-1 DL Client Sample ID: TP-PFC-025-TPI DL

Date Analyzed: 01/19/18 16:58 Lab File ID: 2018.01.19LLC_010.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.62	Isomers	roycea	01/22/18 09:45

537 (modified)

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
LCMPFC_ALL_SU_00031	06/28/18	12/28/17	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00006	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00006	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00006	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00008	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00013	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFTeDA_00012	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00012	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00013	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00016	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00013	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00006	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00018	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00013	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00019	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00013	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00013	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00017	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00025	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00014	200 uL	13C2 PFUnA	0.05 ug/mL
.LCd3-NMeFOSAA_00006	05/19/22	WELLINGTON, Lot d3NMeFOSAA0517			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
.LCd5-NEtFOSAA_00006	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
.LCM2-6:FTS_00006	02/17/22	WELLINGTON, Lot M262FTS0217			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
.LCM2-8:2FTS_00008	07/05/22	WELLINGTON, Lot M282FTS0717			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
.LCM2PFHxDA_00013	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
.LCM2PFTeDA_00012	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
.LCM4PFHPA_00012	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
.LCM5PFPEA_00013	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5 PFPeA	50 ug/mL
.LCM8FOSA_00016	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
.LCMPFBA_00013	04/12/22	Wellington Laboratories, Lot MPFBA0417			(Purchased Reagent)		13C4 PFBA	50 ug/mL
.LCMPFBS_00006	05/24/22	Wellington Laboratories, Lot M3PFBS0815			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
.LCMPFDA_00018	07/13/22	Wellington Laboratories, Lot MPFDA0717			(Purchased Reagent)		13C2 PFDA	50 ug/mL
.LCMPFDoA_00013	05/23/22	Wellington Laboratories, Lot MPFDoA0517			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
.LCMPFHxA_00019	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
.LCMPFHxS_00013	02/17/22	Wellington Laboratories, Lot MPFHxS0217			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
.LCMPFNA_00013	09/30/21	Wellington Laboratories, Lot MPFNA0916			(Purchased Reagent)		13C5 PFNA	50 ug/mL
.LCMPFOA_00017	10/17/22	Wellington Laboratories, Lot MPFOA1017			(Purchased Reagent)		13C4 PFOA	50 ug/mL
.LCMPFOS_00025	10/17/22	Wellington Laboratories, Lot MPFOS1017			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LCMPFUdA_00014	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
LCPFC-IS_00020	06/28/18	12/28/17	Methanol, Lot 090285	200 mL	LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
.LCM2PFOA_00008	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
LCPFC_CCVL_00002	06/23/18	01/17/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ALL_SU_00029	500 uL	d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							13C4-PFHpA	2.5 ng/mL
							13C5 PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFCSP_00129	100 uL	Perfluorobutanoic acid (PFBA)	0.05 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0442 ng/mL
							Perfluorodecanoic acid (PFDA)	0.05 ng/mL
							Perfluorododecanoic acid (PFDoA)	0.05 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	0.0482 ng/mL
							Perfluoroheptanoic acid (PFHpA)	0.05 ng/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	0.0476 ng/mL
							Perfluorohexanoic acid (PFHxA)	0.05 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.0455 ng/mL
							Perfluorononanoic acid (PFNA)	0.05 ng/mL
							Perfluorooctanoic acid (PFOA)	0.05 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0464 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	0.05 ng/mL
							Perfluoropentanoic acid (PFPeA)	0.05 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	0.05 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	0.05 ng/mL
							Perfluoroundecanoic acid (PFUnA)	0.05 ng/mL
.LCMPFC_ALL_SU_00029	06/28/18	12/28/17	Methanol, Lot Baker 141039	10000 uL	LCd3-NMeFOSAA_00006	200 uL	d3-NMeFOSAA	1 ug/mL
					LCd5-NEtFOSAA_00006	200 uL	d5-NEtFOSAA	1 ug/mL
					LCM2-6:FTS_00006	200 uL	M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS_00008	200 uL	M2-8:2FTS	0.958 ug/mL
					LCM2PFHxDA_00013	200 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00012	200 uL	13C2-PFTeDA	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCM4PFHPA_00012	200 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00013	200 uL	13C5 PFPeA	1 ug/mL
					LCM8FOSA_00016	200 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00013	200 uL	13C4 PFBA	1 ug/mL
					LCMPFBS_00006	200 uL	13C3-PFBS	0.93 ug/mL
					LCMPFDA_00018	200 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00013	200 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00019	200 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00013	200 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00013	200 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00017	200 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00025	200 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00014	200 uL	13C2 PFUnA	1 ug/mL
..LCd3-NMeFOSAA_00006	05/19/22	WELLINGTON, Lot d3NMeFOSAA0517			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00006	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00006	02/17/22	WELLINGTON, Lot M262FTS0217			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00008	07/05/22	WELLINGTON, Lot M282FTS0717			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00013	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00012	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00012	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00013	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00016	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00013	04/12/22	Wellington Laboratories, Lot MPFBA0417			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00006	05/24/22	Wellington Laboratories, Lot M3PFBS0815			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00018	07/13/22	Wellington Laboratories, Lot MPFDA0717			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00013	05/23/22	Wellington Laboratories, Lot MPFDoA0517			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00019	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00013	02/17/22	Wellington Laboratories, Lot MPFHxS0217			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00013	09/30/21	Wellington Laboratories, Lot MPFNA0916			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00017	10/17/22	Wellington Laboratories, Lot MPFOA1017			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00025	10/17/22	Wellington Laboratories, Lot MPFOS1017			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00014	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00129	06/23/18	12/23/17	Methanol, Lot 090285	10000 uL	LCPFCSP_00127	1 mL	Perfluorobutanoic acid (PFBA)	0.1 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0884 ug/mL
							Perfluorodecanoic acid (PFDA)	0.1 ug/mL
							Perfluorododecanoic acid (PFDoA)	0.1 ug/mL
							Perfluorodecanesulfonic acid (PFDS)	0.0964 ug/mL
							Perfluoroheptanoic acid (PFHpA)	0.1 ug/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	0.0952 ug/mL
							Perfluorohexanoic acid (PFHxA)	0.1 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.091 ug/mL
							Perfluorononanoic acid (PFNA)	0.1 ug/mL
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorooctanesulfonic acid (PFOS)	0.0928 ug/mL
							Perfluorooctane Sulfonamide (FOSA)	0.1 ug/mL
							Perfluoropentanoic acid (PFPeA)	0.1 ug/mL
							Perfluorotetradecanoic acid (PFTeA)	0.1 ug/mL
							Perfluorotridecanoic Acid (PFTriA)	0.1 ug/mL
							Perfluoroundecanoic acid (PFUnA)	0.1 ug/mL
..LCPFCSP_00127	06/23/18	12/23/17	Methanol, Lot 090285	10000 uL	LCPFBA_00007	200 uL	Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00008	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00008	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA_00008	200 uL	Perfluorododecanoic acid (PFDoA)	1 ug/mL
					LCPFDSA_00002	200 uL	Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL
					LCPFHpA_00008	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00003	200 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ug/mL
					LCPFHxA_00007	200 uL	Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxS-br_00004	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00009	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00009	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFOS-br_00004	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00010	200 uL	Perfluorooctane Sulfonamide (FOSA)	1 ug/mL
					LCPFPeA_00007	200 uL	Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFTeDA_00006	200 uL	Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00006	200 uL	Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00007	200 uL	Perfluoroundecanoic acid (PFUnA)	1 ug/mL
...LCPFBA_00007	05/27/21	Wellington Laboratories, Lot PFBA0516			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
...LCPFBS_00008	03/15/21	Wellington Laboratories, Lot LPFBS0316			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
...LCPFDA_00008	05/29/22	Wellington Laboratories, Lot PFDA0517			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
...LCPFDoA_00008	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
...LCPFDSA_00002	05/24/21	Wellington Laboratories, Lot LPFDS0516			(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LCPFHpA_00008	12/02/21	Wellington Laboratories, Lot PFHpA1216			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
...LCPFHpSA_00003	09/01/22	Wellington Laboratories, Lot LPFHpS0817			(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
...LCPFHxA_00007	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
...LCPFHxS-br_00004	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
...LCPFNA_00009	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
...LCPFOA_00009	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
...LCPFOS-br_00004	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
...LCPFOSA_00010	09/30/21	Wellington Laboratories, Lot FOSA0916I			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
...LCPFPeA_00007	05/31/21	Wellington Laboratories, Lot PFPeA0516			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
...LCPFTeDA_00006	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
...LCPFTrDA_00006	02/12/21	Wellington Laboratories, Lot PFTrDA0216			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
...LCPFUdA_00007	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC_LL1_00003	06/23/18	01/02/18	MeOH/H2O, Lot 90285	200 mL	LCMPFC_ALL_SU_00032	10 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5 PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFC-IS_00023	10 mL	13C2-PFOA	2.5 ng/mL
					LCPFCSP_00129	50 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.02335 ng/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.0237 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

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-perfluorodecane sulfonate (8:2)	0.02395 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.025 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.025 ng/mL
							Perfluorobutanoic acid (PFBA)	0.025 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0221 ng/mL
							Perfluorodecanoic acid (PFDA)	0.025 ng/mL
							Perfluorododecanoic acid (PFDoA)	0.025 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	0.0241 ng/mL
							Perfluoroheptanoic acid (PFHpA)	0.025 ng/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	0.0238 ng/mL
							Perfluorohexanoic acid (PFHxA)	0.025 ng/mL
							Perfluorohexadecanoic acid	0.025 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.02275 ng/mL
							Perfluorononanoic acid (PFNA)	0.025 ng/mL
							Perfluorooctanoic acid (PFOA)	0.025 ng/mL
							Perfluorooctadecanoic acid	0.025 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0232 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	0.025 ng/mL
							Perfluoropentanoic acid (PFPeA)	0.025 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	0.025 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	0.025 ng/mL
							Perfluoroundecanoic acid (PFUnA)	0.025 ng/mL
.LCMPFC_ALL_SU_00032	06/28/18	12/28/17	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00006	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00006	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00006	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00008	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00013	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFTeDA_00012	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00012	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00013	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00016	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00013	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00006	200 uL	13C3-PFBS	0.0465 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCMPFDA_00018	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00013	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00019	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00013	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00013	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00017	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00025	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00014	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00006	05/19/22	WELLINGTON, Lot d3NMeFOSAA0517			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00006	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00006	02/17/22	WELLINGTON, Lot M262FTS0217			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00008	07/05/22	WELLINGTON, Lot M282FTS0717			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00013	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00012	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00012	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00013	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00016	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00013	04/12/22	Wellington Laboratories, Lot MPFBA0417			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00006	05/24/22	Wellington Laboratories, Lot M3PFBS0815			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00018	07/13/22	Wellington Laboratories, Lot MPFDA0717			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00013	05/23/22	Wellington Laboratories, Lot MPFDoA0517			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00019	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00013	02/17/22	Wellington Laboratories, Lot MPFHxS0217			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00013	09/30/21	Wellington Laboratories, Lot MPFNA0916			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00017	10/17/22	Wellington Laboratories, Lot MPFOA1017			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00025	10/17/22	Wellington Laboratories, Lot MPFOS1017			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00014	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFC-IS_00023	06/28/18	12/28/17	Methanol, Lot 090285	200 mL	LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
..LCM2PFOA_00008	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
.LCPFCSP_00129	06/23/18	12/23/17	Methanol, Lot 090285	10000 uL	LCPFCSP_00127	1 mL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.0934 ug/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.0948 ug/mL
							Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.0958 ug/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
							Perfluorobutanoic acid (PFBA)	0.1 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0884 ug/mL
							Perfluorodecanoic acid (PFDA)	0.1 ug/mL
							Perfluorododecanoic acid (PFDoA)	0.1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorodecanesulfonic acid (PFDS)	0.0964 ug/mL
							Perfluoroheptanoic acid (PFHpA)	0.1 ug/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	0.0952 ug/mL
							Perfluorohexanoic acid (PFHxA)	0.1 ug/mL
							Perfluorohexadecanoic acid	0.1 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.091 ug/mL
							Perfluorononanoic acid (PFNA)	0.1 ug/mL
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL
							Perfluorooctadecanoic acid	0.1 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0928 ug/mL
							Perfluorooctane Sulfonamide (FOSA)	0.1 ug/mL
							Perfluoropentanoic acid (PFPeA)	0.1 ug/mL
							Perfluorotetradecanoic acid (PFTeA)	0.1 ug/mL
							Perfluorotridecanoic Acid (PFTriA)	0.1 ug/mL
							Perfluoroundecanoic acid (PFUnA)	0.1 ug/mL
..LCPFCSP_00127	06/23/18	12/23/17	Methanol, Lot 090285	10000 uL	LC4:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.934 ug/mL
					LC6:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL
					LC8:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.958 ug/mL
					LCN-EtFOSAA_00004	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSAA_00005	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCPFBA_00007	200 uL	Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00008	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00008	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA_00008	200 uL	Perfluorododecanoic acid (PFDoA)	1 ug/mL
					LCPFDSA_00002	200 uL	Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL
					LCPFHpA_00008	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00003	200 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFHxA_00007	200 uL	Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxDA_00009	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00004	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00009	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00009	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00009	200 uL	Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS-br_00004	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00010	200 uL	Perfluorooctane Sulfonamide (FOSA)	1 ug/mL
					LCPFPeA_00007	200 uL	Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFTeDA_00006	200 uL	Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00006	200 uL	Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00007	200 uL	Perfluoroundecanoic acid (PFUnA)	1 ug/mL
...LC4:2FTS_00003	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	46.7 ug/mL
...LC6:2FTS_00003	06/25/21	WELLINGTON, Lot 62FTS0616			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
...LC8:2FTS_00003	08/22/21	WELLINGTON, Lot 82FTS0816			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	47.9 ug/mL
...LCN-EtFOSAA_00004	09/30/21	WELLINGTON, Lot NEtFOSAA0916			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
...LCN-MeFOSAA_00005	10/12/21	WELLINGTON, Lot NMeFOSAA0916			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
...LCPFBA_00007	05/27/21	Wellington Laboratories, Lot PFBA0516			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
...LCPFBS_00008	03/15/21	Wellington Laboratories, Lot LPFBS0316			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
...LCPFDA_00008	05/29/22	Wellington Laboratories, Lot PFDA0517			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
...LCPFDoA_00008	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
...LCPFDSA_00002	05/24/21	Wellington Laboratories, Lot LPFDS0516			(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
...LCPFHpA_00008	12/02/21	Wellington Laboratories, Lot PFHpA1216			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
...LCPFHpSA_00003	09/01/22	Wellington Laboratories, Lot LPFHpS0817			(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
...LCPFHxA_00007	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
...LCPFHxDA_00009	07/13/22	Wellington Laboratories, Lot PFHxDA0717			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
...LCPFHxS-br_00004	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
...LCPFNA_00009	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
...LCPFOA_00009	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LCPFODA_00009	07/13/22	Wellington Laboratories, Lot PFODA0717			(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
...LCPFOS-br_00004	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
...LCPFOSA_00010	09/30/21	Wellington Laboratories, Lot FOSA0916I			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
...LCPFPeA_00007	05/31/21	Wellington Laboratories, Lot PFPeA0516			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
...LCPFTeDA_00006	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
...LCPFTrDA_00006	02/12/21	Wellington Laboratories, Lot PFTrDA0216			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
...LCPFUdA_00007	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC_LL2_00003	06/23/18	01/02/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ALL_SU_00032	10 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5 PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFC-IS_00023	10 mL	13C2-PFOA	2.5 ng/mL
					LCPFCSP_00129	100 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.0467 ng/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.0474 ng/mL
							Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.0479 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.05 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.05 ng/mL
							Perfluorobutanoic acid (PFBA)	0.05 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0442 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorodecanoic acid (PFDA)	0.05 ng/mL
							Perfluorododecanoic acid (PFDoA)	0.05 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	0.0482 ng/mL
							Perfluoroheptanoic acid (PFHpA)	0.05 ng/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	0.0476 ng/mL
							Perfluorohexanoic acid (PFHxA)	0.05 ng/mL
							Perfluorohexadecanoic acid	0.05 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.0455 ng/mL
							Perfluorononanoic acid (PFNA)	0.05 ng/mL
							Perfluorooctanoic acid (PFOA)	0.05 ng/mL
							Perfluorooctadecanoic acid	0.05 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0464 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	0.05 ng/mL
							Perfluoropentanoic acid (PFPeA)	0.05 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	0.05 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	0.05 ng/mL
							Perfluoroundecanoic acid (PFUnA)	0.05 ng/mL
.LCMPFC_ALL_SU_00032	06/28/18	12/28/17	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00006	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00006	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00006	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00008	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00013	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFTeDA_00012	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00012	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00013	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00016	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00013	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00006	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00018	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00013	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00019	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00013	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00013	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00017	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00025	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00014	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00006	05/19/22	WELLINGTON, Lot d3NMeFOSAA0517			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCd5-NEtFOSAA_00006	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00006	02/17/22	WELLINGTON, Lot M262FTS0217			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00008	07/05/22	WELLINGTON, Lot M282FTS0717			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00013	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00012	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00012	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00013	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00016	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00013	04/12/22	Wellington Laboratories, Lot MPFBA0417			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00006	05/24/22	Wellington Laboratories, Lot M3PFBS0815			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00018	07/13/22	Wellington Laboratories, Lot MPFDA0717			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00013	05/23/22	Wellington Laboratories, Lot MPFDoA0517			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00019	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00013	02/17/22	Wellington Laboratories, Lot MPFHxS0217			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00013	09/30/21	Wellington Laboratories, Lot MPFNA0916			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00017	10/17/22	Wellington Laboratories, Lot MPFOA1017			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00025	10/17/22	Wellington Laboratories, Lot MPFOS1017			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00014	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFC-IS_00023	06/28/18	12/28/17	Methanol, Lot 090285	200 mL	LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
..LCM2PFOA_00008	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
.LCPFCSP_00129	06/23/18	12/23/17	Methanol, Lot 090285	10000 uL	LCPFCSP_00127	1 mL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.0934 ug/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.0948 ug/mL
							Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.0958 ug/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
							Perfluorobutanoic acid (PFBA)	0.1 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0884 ug/mL
							Perfluorodecanoic acid (PFDA)	0.1 ug/mL
							Perfluorododecanoic acid (PFDoA)	0.1 ug/mL
							Perfluorodecanesulfonic acid (PFDS)	0.0964 ug/mL
							Perfluoroheptanoic acid (PFHpA)	0.1 ug/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	0.0952 ug/mL
							Perfluorohexanoic acid (PFHxA)	0.1 ug/mL
							Perfluorohexadecanoic acid	0.1 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.091 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorononanoic acid (PFNA)	0.1 ug/mL
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL
							Perfluorooctadecanoic acid	0.1 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0928 ug/mL
							Perfluorooctane Sulfonamide (FOSA)	0.1 ug/mL
							Perfluoropentanoic acid (PFPeA)	0.1 ug/mL
							Perfluorotetradecanoic acid (PFTeA)	0.1 ug/mL
							Perfluorotridecanoic Acid (PFTriA)	0.1 ug/mL
							Perfluoroundecanoic acid (PFUnA)	0.1 ug/mL
..LCPFCSP_00127	06/23/18	12/23/17	Methanol, Lot 090285	10000 uL	LC4:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.934 ug/mL
					LC6:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL
					LC8:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.958 ug/mL
					LCN-EtFOSAA_00004	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSAA_00005	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCPFBA_00007	200 uL	Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00008	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00008	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA_00008	200 uL	Perfluorododecanoic acid (PFDoA)	1 ug/mL
					LCPFDSA_00002	200 uL	Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL
					LCPFHpA_00008	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00003	200 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ug/mL
					LCPFHxA_00007	200 uL	Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxDA_00009	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00004	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00009	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00009	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00009	200 uL	Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS-br_00004	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFOSA_00010	200 uL	Perfluorooctane Sulfonamide (FOSA)	1 ug/mL
					LCPFPeA_00007	200 uL	Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFTeDA_00006	200 uL	Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00006	200 uL	Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00007	200 uL	Perfluoroundecanoic acid (PFUnA)	1 ug/mL
...LC4:2FTS_00003	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	46.7 ug/mL
...LC6:2FTS_00003	06/25/21	WELLINGTON, Lot 62FTS0616			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
...LC8:2FTS_00003	08/22/21	WELLINGTON, Lot 82FTS0816			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	47.9 ug/mL
...LCN-EtFOSAA_00004	09/30/21	WELLINGTON, Lot NEtFOSAA0916			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
...LCN-MeFOSAA_00005	10/12/21	WELLINGTON, Lot NMeFOSAA0916			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
...LCPFBA_00007	05/27/21	Wellington Laboratories, Lot PFBA0516			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
...LCPFBS_00008	03/15/21	Wellington Laboratories, Lot LPFBS0316			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
...LCPFDA_00008	05/29/22	Wellington Laboratories, Lot PFDA0517			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
...LCPFDoA_00008	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
...LCPFDSA_00002	05/24/21	Wellington Laboratories, Lot LPFDS0516			(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
...LCPFHpA_00008	12/02/21	Wellington Laboratories, Lot PFHpA1216			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
...LCPFHpSA_00003	09/01/22	Wellington Laboratories, Lot LPFHpS0817			(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
...LCPFHxA_00007	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
...LCPFHxDA_00009	07/13/22	Wellington Laboratories, Lot PFHxDA0717			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
...LCPFHxS-br_00004	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
...LCPFNA_00009	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
...LCPFOA_00009	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
...LCPFODA_00009	07/13/22	Wellington Laboratories, Lot PFODA0717			(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
...LCPFOS-br_00004	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
...LCPFOSA_00010	09/30/21	Wellington Laboratories, Lot FOSA0916I			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
...LCPFPeA_00007	05/31/21	Wellington Laboratories, Lot PFPeA0516			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
...LCPFTeDA_00006	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LCPFTrDA_00006	02/12/21	Wellington Laboratories, Lot PFTrDA0216			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
...LCPFUdA_00007	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC_LL3_00003	06/23/18	01/02/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ALL_SU_00032	10 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5 PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFC-IS_00023	10 mL	13C2-PFOA	2.5 ng/mL
					LCPFCSP_00129	500 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.2335 ng/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.237 ng/mL
							Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.2395 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.25 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.25 ng/mL
							Perfluorobutanoic acid (PFBA)	0.25 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.221 ng/mL
							Perfluorodecanoic acid (PFDA)	0.25 ng/mL
							Perfluorododecanoic acid (PFDoA)	0.25 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	0.241 ng/mL
							Perfluoroheptanoic acid (PFHpA)	0.25 ng/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	0.238 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorohexanoic acid (PFHxA)	0.25 ng/mL
							Perfluorohexadecanoic acid	0.25 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.2275 ng/mL
							Perfluorononanoic acid (PFNA)	0.25 ng/mL
							Perfluorooctanoic acid (PFOA)	0.25 ng/mL
							Perfluorooctadecanoic acid	0.25 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.232 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	0.25 ng/mL
							Perfluoropentanoic acid (PFPeA)	0.25 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	0.25 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	0.25 ng/mL
							Perfluoroundecanoic acid (PFUnA)	0.25 ng/mL
.LCMPFC_ALL_SU_00032	06/28/18	12/28/17	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00006	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00006	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00006	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00008	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00013	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFTeDA_00012	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00012	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00013	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00016	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00013	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00006	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00018	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00013	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00019	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00013	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00013	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00017	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00025	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00014	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00006	05/19/22	WELLINGTON, Lot d3NMeFOSAA0517			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00006	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00006	02/17/22	WELLINGTON, Lot M262FTS0217			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00008	07/05/22	WELLINGTON, Lot M282FTS0717			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00013	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00012	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00012	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00013	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00016	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00013	04/12/22	Wellington Laboratories, Lot MPFBA0417			(Purchased Reagent)		13C4 PFBA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCMPFBS_00006	05/24/22	Wellington Laboratories, Lot M3PFBS0815			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00018	07/13/22	Wellington Laboratories, Lot MPFDA0717			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00013	05/23/22	Wellington Laboratories, Lot MPFDoA0517			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00019	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00013	02/17/22	Wellington Laboratories, Lot MPFHxS0217			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00013	09/30/21	Wellington Laboratories, Lot MPFNA0916			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00017	10/17/22	Wellington Laboratories, Lot MPFOA1017			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00025	10/17/22	Wellington Laboratories, Lot MPFOS1017			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00014	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFC-IS_00023	06/28/18	12/28/17	Methanol, Lot 090285	200 mL	LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
..LCM2PFOA_00008	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
.LCPFCSP_00129	06/23/18	12/23/17	Methanol, Lot 090285	10000 uL	LCPFCSP_00127	1 mL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.0934 ug/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.0948 ug/mL
							Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.0958 ug/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
							Perfluorobutanoic acid (PFBA)	0.1 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0884 ug/mL
							Perfluorodecanoic acid (PFDA)	0.1 ug/mL
							Perfluorododecanoic acid (PFDoA)	0.1 ug/mL
							Perfluorodecanesulfonic acid (PFDS)	0.0964 ug/mL
							Perfluoroheptanoic acid (PFHpA)	0.1 ug/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	0.0952 ug/mL
							Perfluorohexanoic acid (PFHxA)	0.1 ug/mL
							Perfluorohexadecanoic acid	0.1 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.091 ug/mL
							Perfluorononanoic acid (PFNA)	0.1 ug/mL
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL
							Perfluorooctadecanoic acid	0.1 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0928 ug/mL
							Perfluorooctane Sulfonamide (FOSA)	0.1 ug/mL
							Perfluoropentanoic acid (PFPeA)	0.1 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorotetradecanoic acid (PFTeA)	0.1 ug/mL
							Perfluorotridecanoic Acid (PFTriA)	0.1 ug/mL
							Perfluoroundecanoic acid (PFUnA)	0.1 ug/mL
..LCPFCSP_00127	06/23/18	12/23/17	Methanol, Lot 090285	10000 uL	LC4:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.934 ug/mL
					LC6:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL
					LC8:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.958 ug/mL
					LCN-EtFOSAA_00004	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSAA_00005	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCPFBA_00007	200 uL	Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00008	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00008	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA_00008	200 uL	Perfluorododecanoic acid (PFDoA)	1 ug/mL
					LCPFDSA_00002	200 uL	Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL
					LCPFHpA_00008	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00003	200 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ug/mL
					LCPFHxA_00007	200 uL	Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxDA_00009	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00004	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00009	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00009	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00009	200 uL	Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS-br_00004	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00010	200 uL	Perfluorooctane Sulfonamide (FOSA)	1 ug/mL
					LCPFPeA_00007	200 uL	Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFTeDA_00006	200 uL	Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00006	200 uL	Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00007	200 uL	Perfluoroundecanoic acid (PFUnA)	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LC4:2FTS_00003	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	46.7 ug/mL
...LC6:2FTS_00003	06/25/21	WELLINGTON, Lot 62FTS0616			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
...LC8:2FTS_00003	08/22/21	WELLINGTON, Lot 82FTS0816			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	47.9 ug/mL
...LCN-EtFOSAA_00004	09/30/21	WELLINGTON, Lot NEtFOSAA0916			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
...LCN-MeFOSAA_00005	10/12/21	WELLINGTON, Lot NMeFOSAA0916			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
...LCPFBA_00007	05/27/21	Wellington Laboratories, Lot PFBA0516			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
...LCPFBS_00008	03/15/21	Wellington Laboratories, Lot LPFBS0316			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
...LCPFDA_00008	05/29/22	Wellington Laboratories, Lot PFDA0517			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
...LCPFDoA_00008	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
...LCPFDSA_00002	05/24/21	Wellington Laboratories, Lot LPFDS0516			(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
...LCPFHpA_00008	12/02/21	Wellington Laboratories, Lot PFHpA1216			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
...LCPFHpSA_00003	09/01/22	Wellington Laboratories, Lot LPFHpS0817			(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
...LCPFHxA_00007	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
...LCPFHxDA_00009	07/13/22	Wellington Laboratories, Lot PFHxDA0717			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
...LCPFHxS-br_00004	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
...LCPFNA_00009	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
...LCPFOA_00009	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
...LCPFODA_00009	07/13/22	Wellington Laboratories, Lot PFODA0717			(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
...LCPFOS-br_00004	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
...LCPFOSA_00010	09/30/21	Wellington Laboratories, Lot FOSA0916I			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
...LCPFPeA_00007	05/31/21	Wellington Laboratories, Lot PFPeA0516			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
...LCPFTeDA_00006	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
...LCPFTrDA_00006	02/12/21	Wellington Laboratories, Lot PFTrDA0216			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
...LCPFUdA_00007	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC_LL4_00003	06/23/18	01/02/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ALL_SU_00032	10 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							13C4-PFHpA	2.5 ng/mL
							13C5 PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFC-IS_00023	10 mL	13C2-PFOA	2.5 ng/mL
					LCPFCSP_00127	200 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.934 ng/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ng/mL
							Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.958 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	1 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	1 ng/mL
							Perfluorobutanoic acid (PFBA)	1 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.884 ng/mL
							Perfluorodecanoic acid (PFDA)	1 ng/mL
							Perfluorododecanoic acid (PFDoA)	1 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	0.964 ng/mL
							Perfluoroheptanoic acid (PFHpA)	1 ng/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ng/mL
							Perfluorohexanoic acid (PFHxA)	1 ng/mL
							Perfluorohexadecanoic acid	1 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.91 ng/mL
							Perfluorononanoic acid (PFNA)	1 ng/mL
							Perfluorooctanoic acid (PFOA)	1 ng/mL
							Perfluorooctadecanoic acid	1 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.928 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorooctane Sulfonamide (FOSA)	1 ng/mL
							Perfluoropentanoic acid (PFPeA)	1 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	1 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	1 ng/mL
							Perfluoroundecanoic acid (PFUnA)	1 ng/mL
.LCMPFC_ALL_SU_00032	06/28/18	12/28/17	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00006	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00006	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00006	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00008	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00013	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFTeDA_00012	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00012	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00013	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00016	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00013	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00006	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00018	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00013	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00019	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00013	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00013	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00017	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00025	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00014	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00006	05/19/22	WELLINGTON, Lot d3NMeFOSAA0517			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00006	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00006	02/17/22	WELLINGTON, Lot M262FTS0217			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00008	07/05/22	WELLINGTON, Lot M282FTS0717			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00013	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00012	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00012	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00013	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00016	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00013	04/12/22	Wellington Laboratories, Lot MPFBA0417			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00006	05/24/22	Wellington Laboratories, Lot M3PFBS0815			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00018	07/13/22	Wellington Laboratories, Lot MPFDA0717			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00013	05/23/22	Wellington Laboratories, Lot MPFDoA0517			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00019	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00013	02/17/22	Wellington Laboratories, Lot MPFHxS0217			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00013	09/30/21	Wellington Laboratories, Lot MPFNA0916			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00017	10/17/22	Wellington Laboratories, Lot MPFOA1017			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00025	10/17/22	Wellington Laboratories, Lot MPFOS1017			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00014	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LCPFC-IS_00023	06/28/18	12/28/17	Methanol, Lot 090285	200 mL	LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
..LCM2PFOA_00008	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
.LCPFCSP_00127	06/23/18	12/23/17	Methanol, Lot 090285	10000 uL	LC4:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.934 ug/mL
					LC6:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL
					LC8:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.958 ug/mL
					LCN-EtFOSAA_00004	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSAA_00005	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCPFBA_00007	200 uL	Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00008	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00008	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA_00008	200 uL	Perfluorododecanoic acid (PFDoA)	1 ug/mL
					LCPFDSA_00002	200 uL	Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL
					LCPFHpA_00008	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00003	200 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ug/mL
					LCPFHxA_00007	200 uL	Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxDA_00009	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00004	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00009	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00009	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00009	200 uL	Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS-br_00004	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00010	200 uL	Perfluorooctane Sulfonamide (FOSA)	1 ug/mL
					LCPFPeA_00007	200 uL	Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFTeDA_00006	200 uL	Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00006	200 uL	Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00007	200 uL	Perfluoroundecanoic acid (PFUnA)	1 ug/mL
..LC4:2FTS_00003	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	46.7 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LC6:2FTS_00003	06/25/21	WELLINGTON, Lot 62FTS0616			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
..LC8:2FTS_00003	08/22/21	WELLINGTON, Lot 82FTS0816			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	47.9 ug/mL
..LCN-EtFOSAA_00004	09/30/21	WELLINGTON, Lot NEtFOSAA0916			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCN-MeFOSAA_00005	10/12/21	WELLINGTON, Lot NMeFOSAA0916			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCPFBA_00007	05/27/21	Wellington Laboratories, Lot PFBA0516			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
..LCPFBS_00008	03/15/21	Wellington Laboratories, Lot LPFBS0316			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00008	05/29/22	Wellington Laboratories, Lot PFDA0517			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
..LCPFDoA_00008	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
..LCPFDSA_00002	05/24/21	Wellington Laboratories, Lot LPFDS0516			(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
..LCPFHpA_00008	12/02/21	Wellington Laboratories, Lot PFHpA1216			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpSA_00003	09/01/22	Wellington Laboratories, Lot LPFHpS0817			(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
..LCPFHxA_00007	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
..LCPFHxDA_00009	07/13/22	Wellington Laboratories, Lot PFHxDA0717			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
..LCPFHxS-br_00004	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00009	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFOA_00009	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFODA_00009	07/13/22	Wellington Laboratories, Lot PFODA0717			(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
..LCPFOS-br_00004	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFOSA_00010	09/30/21	Wellington Laboratories, Lot FOSA0916I			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
..LCPFPeA_00007	05/31/21	Wellington Laboratories, Lot PFPeA0516			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
..LCPFTeDA_00006	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
..LCPFTrDA_00006	02/12/21	Wellington Laboratories, Lot PFTrDA0216			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
..LCPFUdA_00007	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC_LL5_00003	06/23/18	01/02/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ALL_SU_00032	10 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5 PFPeA	2.5 ng/mL

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFC-IS_00023	10 mL	13C2-PFOA	2.5 ng/mL
					LCPFCSP_00127	500 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	2.335 ng/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	2.37 ng/mL
							Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	2.395 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	2.5 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	2.5 ng/mL
							Perfluorobutanoic acid (PFBA)	2.5 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	2.21 ng/mL
							Perfluorodecanoic acid (PFDA)	2.5 ng/mL
							Perfluorododecanoic acid (PFDoA)	2.5 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	2.41 ng/mL
							Perfluoroheptanoic acid (PFHpA)	2.5 ng/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	2.38 ng/mL
							Perfluorohexanoic acid (PFHxA)	2.5 ng/mL
							Perfluorohexadecanoic acid	2.5 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	2.275 ng/mL
							Perfluorononanoic acid (PFNA)	2.5 ng/mL
							Perfluorooctanoic acid (PFOA)	2.5 ng/mL
							Perfluorooctadecanoic acid	2.5 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	2.32 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	2.5 ng/mL
							Perfluoropentanoic acid (PFPeA)	2.5 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorotetradecanoic acid (PFTeA)	2.5 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	2.5 ng/mL
							Perfluoroundecanoic acid (PFUnA)	2.5 ng/mL
.LCMPFC_ALL_SU_00032	06/28/18	12/28/17	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00006	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00006	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00006	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00008	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00013	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFTeDA_00012	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00012	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00013	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00016	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00013	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00006	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00018	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00013	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00019	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00013	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00013	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00017	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00025	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00014	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00006	05/19/22	WELLINGTON, Lot d3NMeFOSAA0517			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00006	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00006	02/17/22	WELLINGTON, Lot M262FTS0217			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00008	07/05/22	WELLINGTON, Lot M282FTS0717			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00013	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00012	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00012	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00013	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00016	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00013	04/12/22	Wellington Laboratories, Lot MPFBA0417			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00006	05/24/22	Wellington Laboratories, Lot M3PFBS0815			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00018	07/13/22	Wellington Laboratories, Lot MPFDA0717			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00013	05/23/22	Wellington Laboratories, Lot MPFDoA0517			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00019	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00013	02/17/22	Wellington Laboratories, Lot MPFHxS0217			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00013	09/30/21	Wellington Laboratories, Lot MPFNA0916			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00017	10/17/22	Wellington Laboratories, Lot MPFOA1017			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00025	10/17/22	Wellington Laboratories, Lot MPFOS1017			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00014	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFC-IS_00023	06/28/18	12/28/17	Methanol, Lot 090285	200 mL	LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
..LCM2PFOA_00008	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LCPFCSP_00127	06/23/18	12/23/17	Methanol, Lot 090285	10000 uL	LC4:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.934 ug/mL
					LC6:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL
					LC8:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.958 ug/mL
					LCN-EtFOSAA_00004	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSAA_00005	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCPFBA_00007	200 uL	Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00008	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00008	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA_00008	200 uL	Perfluorododecanoic acid (PFDoA)	1 ug/mL
					LCPFDSA_00002	200 uL	Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL
					LCPFHpA_00008	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00003	200 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ug/mL
					LCPFHxA_00007	200 uL	Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxDA_00009	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00004	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00009	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00009	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00009	200 uL	Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS-br_00004	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00010	200 uL	Perfluorooctane Sulfonamide (FOSA)	1 ug/mL
					LCPFPeA_00007	200 uL	Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFTeDA_00006	200 uL	Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00006	200 uL	Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00007	200 uL	Perfluoroundecanoic acid (PFUnA)	1 ug/mL
..LC4:2FTS_00003	12/12/21		WELLINGTON, Lot 42FTS1216		(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	46.7 ug/mL
..LC6:2FTS_00003	06/25/21		WELLINGTON, Lot 62FTS0616		(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LC8:2FTS_00003	08/22/21	WELLINGTON, Lot 82FTS0816			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	47.9 ug/mL
..LCN-EtFOSAA_00004	09/30/21	WELLINGTON, Lot NEtFOSAA0916			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCN-MeFOSAA_00005	10/12/21	WELLINGTON, Lot NMeFOSAA0916			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCPFBA_00007	05/27/21	Wellington Laboratories, Lot PFBA0516			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
..LCPFBS_00008	03/15/21	Wellington Laboratories, Lot LPFBS0316			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00008	05/29/22	Wellington Laboratories, Lot PFDA0517			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
..LCPFDoA_00008	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
..LCPFDSA_00002	05/24/21	Wellington Laboratories, Lot LPFDS0516			(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
..LCPFHpA_00008	12/02/21	Wellington Laboratories, Lot PFHpA1216			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpSA_00003	09/01/22	Wellington Laboratories, Lot LPFHpS0817			(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
..LCPFHxA_00007	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
..LCPFHxDA_00009	07/13/22	Wellington Laboratories, Lot PFHxDA0717			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
..LCPFHxS-br_00004	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00009	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFOA_00009	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFODA_00009	07/13/22	Wellington Laboratories, Lot PFODA0717			(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
..LCPFOS-br_00004	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFOSA_00010	09/30/21	Wellington Laboratories, Lot FOSA0916I			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
..LCPFPeA_00007	05/31/21	Wellington Laboratories, Lot PFPeA0516			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
..LCPFTeDA_00006	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
..LCPFTrDA_00006	02/12/21	Wellington Laboratories, Lot PFTrDA0216			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
..LCPFUdA_00007	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC_LL6_00004	06/23/18	01/02/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ALL_SU_00032	10 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5 PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFC-IS_00023	10 mL	13C2-PFOA	2.5 ng/mL
					LCPFCSP_00127	1 mL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	4.67 ng/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	4.74 ng/mL
							Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	4.79 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	5 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	5 ng/mL
							Perfluorobutanoic acid (PFBA)	5 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	4.42 ng/mL
							Perfluorodecanoic acid (PFDA)	5 ng/mL
							Perfluorododecanoic acid (PFDoA)	5 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	4.82 ng/mL
							Perfluoroheptanoic acid (PFHpA)	5 ng/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	4.76 ng/mL
							Perfluorohexanoic acid (PFHxA)	5 ng/mL
							Perfluorohexadecanoic acid	5 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	4.55 ng/mL
							Perfluorononanoic acid (PFNA)	5 ng/mL
							Perfluorooctanoic acid (PFOA)	5 ng/mL
							Perfluorooctadecanoic acid	5 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	4.64 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	5 ng/mL
							Perfluoropentanoic acid (PFPeA)	5 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	5 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorotridecanoic Acid (PFTriA)	5 ng/mL
							Perfluoroundecanoic acid (PFUnA)	5 ng/mL
.LCMPFC_ALL_SU_00032	06/28/18	12/28/17	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00006	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00006	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00006	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00008	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00013	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFTeDA_00012	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00012	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00013	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00016	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00013	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00006	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00018	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00013	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00019	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00013	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00013	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00017	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00025	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00014	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00006	05/19/22	WELLINGTON, Lot d3NMeFOSAA0517			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00006	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00006	02/17/22	WELLINGTON, Lot M262FTS0217			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00008	07/05/22	WELLINGTON, Lot M282FTS0717			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00013	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00012	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00012	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00013	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00016	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00013	04/12/22	Wellington Laboratories, Lot MPFBA0417			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00006	05/24/22	Wellington Laboratories, Lot M3PFBS0815			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00018	07/13/22	Wellington Laboratories, Lot MPFDA0717			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00013	05/23/22	Wellington Laboratories, Lot MPFDoA0517			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00019	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00013	02/17/22	Wellington Laboratories, Lot MPFHxS0217			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00013	09/30/21	Wellington Laboratories, Lot MPFNA0916			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00017	10/17/22	Wellington Laboratories, Lot MPFOA1017			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00025	10/17/22	Wellington Laboratories, Lot MPFOS1017			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00014	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFC-IS_00023	06/28/18	12/28/17	Methanol, Lot 090285	200 mL	LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
..LCM2PFOA_00008	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
.LCPFCSP_00127	06/23/18	12/23/17	Methanol, Lot 090285	10000 uL	LC4:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.934 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LC6:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL
					LC8:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.958 ug/mL
					LCN-EtFOSAA_00004	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSAA_00005	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCPFBA_00007	200 uL	Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00008	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00008	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA_00008	200 uL	Perfluorododecanoic acid (PFDoA)	1 ug/mL
					LCPFDSA_00002	200 uL	Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL
					LCPFHpA_00008	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00003	200 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ug/mL
					LCPFHxA_00007	200 uL	Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxDA_00009	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00004	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00009	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00009	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00009	200 uL	Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS-br_00004	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00010	200 uL	Perfluorooctane Sulfonamide (FOSA)	1 ug/mL
					LCPFPeA_00007	200 uL	Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFTeDA_00006	200 uL	Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00006	200 uL	Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00007	200 uL	Perfluoroundecanoic acid (PFUnA)	1 ug/mL
..LC4:2FTS_00003	12/12/21		WELLINGTON, Lot 42FTS1216		(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	46.7 ug/mL
..LC6:2FTS_00003	06/25/21		WELLINGTON, Lot 62FTS0616		(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
..LC8:2FTS_00003	08/22/21		WELLINGTON, Lot 82FTS0816		(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	47.9 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCN-EtFOSAA_00004	09/30/21	WELLINGTON, Lot NEtFOSAA0916			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCN-MeFOSAA_00005	10/12/21	WELLINGTON, Lot NMeFOSAA0916			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCPFBA_00007	05/27/21	Wellington Laboratories, Lot PFBA0516			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
..LCPFBS_00008	03/15/21	Wellington Laboratories, Lot LPFBS0316			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00008	05/29/22	Wellington Laboratories, Lot PFDA0517			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
..LCPFDoA_00008	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
..LCPFDSA_00002	05/24/21	Wellington Laboratories, Lot LPFDS0516			(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
..LCPFHpA_00008	12/02/21	Wellington Laboratories, Lot PFHpA1216			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpSA_00003	09/01/22	Wellington Laboratories, Lot LPFHpS0817			(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
..LCPFHxA_00007	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
..LCPFHxDA_00009	07/13/22	Wellington Laboratories, Lot PFHxDA0717			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
..LCPFHxS-br_00004	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00009	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFOA_00009	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFODA_00009	07/13/22	Wellington Laboratories, Lot PFODA0717			(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
..LCPFOS-br_00004	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFOSA_00010	09/30/21	Wellington Laboratories, Lot FOSA0916I			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
..LCPFPeA_00007	05/31/21	Wellington Laboratories, Lot PFPeA0516			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
..LCPFTeDA_00006	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
..LCPFTrDA_00006	02/12/21	Wellington Laboratories, Lot PFTrDA0216			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
..LCPFUdA_00007	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC_LL7_00003	06/23/18	01/02/18	MeOH/H2O, Lot 090285	200 mL	LCMPFC_ALL_SU_00032	10 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5 PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFC-IS_00023	10 mL	13C2-PFOA	2.5 ng/mL
					LCPFCSP_00127	2 mL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	9.34 ng/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	9.48 ng/mL
							Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	9.58 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	10 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	10 ng/mL
							Perfluorobutanoic acid (PFBA)	10 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	8.84 ng/mL
							Perfluorodecanoic acid (PFDA)	10 ng/mL
							Perfluorododecanoic acid (PFDoA)	10 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	9.64 ng/mL
							Perfluoroheptanoic acid (PFHpA)	10 ng/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	9.52 ng/mL
							Perfluorohexanoic acid (PFHxA)	10 ng/mL
							Perfluorohexadecanoic acid	10 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	9.1 ng/mL
							Perfluorononanoic acid (PFNA)	10 ng/mL
							Perfluorooctanoic acid (PFOA)	10 ng/mL
							Perfluorooctadecanoic acid	10 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	9.28 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	10 ng/mL
							Perfluoropentanoic acid (PFPeA)	10 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	10 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	10 ng/mL
							Perfluoroundecanoic acid (PFUnA)	10 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LCMPFC_ALL_SU_00032	06/28/18	12/28/17	Methanol, Lot Baker 141039	200 mL	LCd3-NMeFOSAA_00006	200 uL	d3-NMeFOSAA	0.05 ug/mL
					LCd5-NEtFOSAA_00006	200 uL	d5-NEtFOSAA	0.05 ug/mL
					LCM2-6:FTS_00006	200 uL	M2-6:2FTS	0.0475 ug/mL
					LCM2-8:2FTS_00008	200 uL	M2-8:2FTS	0.0479 ug/mL
					LCM2PFHxDA_00013	200 uL	13C2-PFHxDA	0.05 ug/mL
					LCM2PFTeDA_00012	200 uL	13C2-PFTeDA	0.05 ug/mL
					LCM4PFHPA_00012	200 uL	13C4-PFHpA	0.05 ug/mL
					LCM5PFPEA_00013	200 uL	13C5 PFPeA	0.05 ug/mL
					LCM8FOSA_00016	200 uL	13C8 FOSA	0.05 ug/mL
					LCMPFBA_00013	200 uL	13C4 PFBA	0.05 ug/mL
					LCMPFBS_00006	200 uL	13C3-PFBS	0.0465 ug/mL
					LCMPFDA_00018	200 uL	13C2 PFDA	0.05 ug/mL
					LCMPFDoA_00013	200 uL	13C2 PFDoA	0.05 ug/mL
					LCMPFHxA_00019	200 uL	13C2 PFHxA	0.05 ug/mL
					LCMPFHxS_00013	200 uL	18O2 PFHxS	0.0473 ug/mL
					LCMPFNA_00013	200 uL	13C5 PFNA	0.05 ug/mL
					LCMPFOA_00017	200 uL	13C4 PFOA	0.05 ug/mL
					LCMPFOS_00025	200 uL	13C4 PFOS	0.0478 ug/mL
					LCMPFUdA_00014	200 uL	13C2 PFUnA	0.05 ug/mL
..LCd3-NMeFOSAA_00006	05/19/22	WELLINGTON, Lot d3NMeFOSAA0517			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00006	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00006	02/17/22	WELLINGTON, Lot M262FTS0217			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00008	07/05/22	WELLINGTON, Lot M282FTS0717			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00013	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00012	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00012	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00013	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00016	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00013	04/12/22	Wellington Laboratories, Lot MPFBA0417			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00006	05/24/22	Wellington Laboratories, Lot M3PFBS0815			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00018	07/13/22	Wellington Laboratories, Lot MPFDA0717			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00013	05/23/22	Wellington Laboratories, Lot MPFDoA0517			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00019	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00013	02/17/22	Wellington Laboratories, Lot MPFHxS0217			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00013	09/30/21	Wellington Laboratories, Lot MPFNA0916			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00017	10/17/22	Wellington Laboratories, Lot MPFOA1017			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00025	10/17/22	Wellington Laboratories, Lot MPFOS1017			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00014	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFC-IS_00023	06/28/18	12/28/17	Methanol, Lot 090285	200 mL	LCM2PFOA_00008	200 uL	13C2-PFOA	0.05 ug/mL
..LCM2PFOA_00008	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
.LCPFCSP_00127	06/23/18	12/23/17	Methanol, Lot 090285	10000 uL	LC4:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.934 ug/mL
					LC6:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LC8:2FTS_00003	200 uL	Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.958 ug/mL
					LCN-EtFOSAA_00004	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSAA_00005	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCPFBA_00007	200 uL	Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00008	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00008	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA_00008	200 uL	Perfluorododecanoic acid (PFDoA)	1 ug/mL
					LCPFDSA_00002	200 uL	Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL
					LCPFHpA_00008	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00003	200 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.952 ug/mL
					LCPFHxA_00007	200 uL	Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxDA_00009	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00004	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00009	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00009	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00009	200 uL	Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS-br_00004	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00010	200 uL	Perfluorooctane Sulfonamide (FOSA)	1 ug/mL
					LCPFPeA_00007	200 uL	Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFTeDA_00006	200 uL	Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00006	200 uL	Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00007	200 uL	Perfluoroundecanoic acid (PFUnA)	1 ug/mL
..LC4:2FTS_00003	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	46.7 ug/mL
..LC6:2FTS_00003	06/25/21	WELLINGTON, Lot 62FTS0616			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
..LC8:2FTS_00003	08/22/21	WELLINGTON, Lot 82FTS0816			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	47.9 ug/mL
..LCN-EtFOSAA_00004	09/30/21	WELLINGTON, Lot NEtFOSAA0916			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCN-MeFOSAA_00005	10/12/21	WELLINGTON, Lot NMeFOSAA0916			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
..LCPFBA_00007	05/27/21	Wellington Laboratories, Lot PFBA0516			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
..LCPFBS_00008	03/15/21	Wellington Laboratories, Lot LPFBS0316			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00008	05/29/22	Wellington Laboratories, Lot PFDA0517			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
..LCPFDoA_00008	05/29/22	Wellington Laboratories, Lot PFDoA0517			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
..LCPFDSA_00002	05/24/21	Wellington Laboratories, Lot LPFDS0516			(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
..LCPFHpA_00008	12/02/21	Wellington Laboratories, Lot PFHpA1216			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpSA_00003	09/01/22	Wellington Laboratories, Lot LPFHpS0817			(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
..LCPFHxA_00007	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
..LCPFHxDA_00009	07/13/22	Wellington Laboratories, Lot PFHxDA0717			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
..LCPFHxS-br_00004	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00009	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFOA_00009	09/27/22	Wellington Laboratories, Lot PFOA0917			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFODA_00009	07/13/22	Wellington Laboratories, Lot PFODA0717			(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
..LCPFOS-br_00004	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFOSA_00010	09/30/21	Wellington Laboratories, Lot FOSA0916I			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
..LCPFPeA_00007	05/31/21	Wellington Laboratories, Lot PFPeA0516			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
..LCPFTeDA_00006	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
..LCPFTrDA_00006	02/12/21	Wellington Laboratories, Lot PFTrDA0216			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
..LCPFUdA_00007	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFCIC_FULL_00009	06/28/18	01/02/18	MeOH/H2O, Lot 09285	200 mL	LCMPFC_ALL_SU_00029	0.5 mL	d3-NMeFOSAA	2.5 ng/mL
							d5-NEtFOSAA	2.5 ng/mL
							M2-6:2FTS	2.375 ng/mL
							M2-8:2FTS	2.395 ng/mL
							13C2-PFHxDA	2.5 ng/mL
							13C2-PFTeDA	2.5 ng/mL
							13C4-PFHpA	2.5 ng/mL
							13C5 PFPeA	2.5 ng/mL
							13C8 FOSA	2.5 ng/mL
							13C4 PFBA	2.5 ng/mL
							13C3-PFBS	2.325 ng/mL
							13C2 PFDA	2.5 ng/mL
							13C2 PFDoA	2.5 ng/mL
							13C2 PFHxA	2.5 ng/mL
							18O2 PFHxS	2.365 ng/mL
							13C5 PFNA	2.5 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							13C4 PFOA	2.5 ng/mL
							13C4 PFOS	2.39 ng/mL
							13C2 PFUnA	2.5 ng/mL
					LCPFAC-24PAR_00001	250 uL	Perfluorobutanesulfonic acid (PFBS)	2.2125 ng/mL
							Perfluorobutanoic acid (PFBA)	2.5 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	2.4125 ng/mL
							Perfluorodecanoic acid (PFDA)	2.5 ng/mL
							Perfluorododecanoic acid (PFDoA)	2.5 ng/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	2.375 ng/mL
							Perfluoroheptanoic acid (PFHpA)	2.5 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	2.28 ng/mL
							Perfluorohexanoic acid (PFHxA)	2.5 ng/mL
							Perfluorononanoic acid (PFNA)	2.5 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	2.5 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	2.31375 ng/mL
							Perfluorooctanoic acid (PFOA)	2.5 ng/mL
							Perfluoropentanoic acid (PFPeA)	2.5 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	2.5 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	2.5 ng/mL
							Perfluoroundecanoic acid (PFUnA)	2.5 ng/mL
.LCMPFC_ALL_SU_00029	06/28/18	12/28/17	Methanol, Lot Baker 141039	10000 uL	LCd3-NMeFOSAA_00006	200 uL	d3-NMeFOSAA	1 ug/mL
					LCd5-NEtFOSAA_00006	200 uL	d5-NEtFOSAA	1 ug/mL
					LCM2-6:FTS_00006	200 uL	M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS_00008	200 uL	M2-8:2FTS	0.958 ug/mL
					LCM2PFHxDA_00013	200 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00012	200 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00012	200 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00013	200 uL	13C5 PFPeA	1 ug/mL
					LCM8FOSA_00016	200 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00013	200 uL	13C4 PFBA	1 ug/mL
					LCMPFBS_00006	200 uL	13C3-PFBS	0.93 ug/mL
					LCMPFDA_00018	200 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00013	200 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00019	200 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00013	200 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00013	200 uL	13C5 PFNA	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCMPFOA_00017	200 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00025	200 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00014	200 uL	13C2 PFUnA	1 ug/mL
..LCd3-NMeFOSAA_00006	05/19/22	WELLINGTON, Lot d3NMeFOSAA0517			(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
..LCd5-NEtFOSAA_00006	11/08/22	WELLINGTON, Lot d5NEtFOSAA1117			(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
..LCM2-6:FTS_00006	02/17/22	WELLINGTON, Lot M262FTS0217			(Purchased Reagent)		M2-6:2FTS	47.5 ug/mL
..LCM2-8:2FTS_00008	07/05/22	WELLINGTON, Lot M282FTS0717			(Purchased Reagent)		M2-8:2FTS	47.9 ug/mL
..LCM2PFHxDA_00013	07/13/22	Wellington Laboratories, Lot M2PFHxDA0717			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00012	11/30/22	Wellington Laboratories, Lot M2PFTeDA1117			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00012	05/03/22	Wellington Laboratories, Lot M4PFHpA0517			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00013	07/20/22	Wellington Laboratories, Lot M5PFPeA0717			(Purchased Reagent)		13C5 PFPeA	50 ug/mL
..LCM8FOSA_00016	10/11/22	Wellington Laboratories, Lot M8FOSA1017I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00013	04/12/22	Wellington Laboratories, Lot MPFBA0417			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFBS_00006	05/24/22	Wellington Laboratories, Lot M3PFBS0815			(Purchased Reagent)		13C3-PFBS	46.5 ug/mL
..LCMPFDA_00018	07/13/22	Wellington Laboratories, Lot MPFDA0717			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00013	05/23/22	Wellington Laboratories, Lot MPFDoA0517			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00019	10/27/22	Wellington Laboratories, Lot MPFHxA1017			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00013	02/17/22	Wellington Laboratories, Lot MPFHxS0217			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00013	09/30/21	Wellington Laboratories, Lot MPFNA0916			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00017	10/17/22	Wellington Laboratories, Lot MPFOA1017			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00025	10/17/22	Wellington Laboratories, Lot MPFOS1017			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00014	11/22/21	Wellington Laboratories, Lot MPFUdA1116			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFAC-24PAR_00001	09/15/22	Wellington Laboratories, Lot PFAC24PAR0917			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1.77 ug/mL
							Perfluorobutanoic acid (PFBA)	2 ug/mL
							Perfluorodecanesulfonic acid (PFDS)	1.93 ug/mL
							Perfluorodecanoic acid (PFDA)	2 ug/mL
							Perfluorododecanoic acid (PFDoA)	2 ug/mL
							Perfluoroheptanesulfonic Acid (PFHpS)	1.9 ug/mL
							Perfluoroheptanoic acid (PFHpA)	2 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	1.824 ug/mL
							Perfluorohexanoic acid (PFHxA)	2 ug/mL
							Perfluorononanoic acid (PFNA)	2 ug/mL
							Perfluorooctane Sulfonamide (FOSA)	2 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	1.851 ug/mL
							Perfluorooctanoic acid (PFOA)	2 ug/mL
							Perfluoropentanoic acid (PFPeA)	2 ug/mL
							Perfluorotetradecanoic acid (PFTeA)	2 ug/mL
							Perfluorotridecanoic Acid (PFTriA)	2 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluoroundecanoic acid (PFUnA)	2 ug/mL
LCPFCSP_00119	03/29/18	10/02/17	Methanol, Lot 090285	250 mL	LC4:2FTS_00003	100 uL	Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	0.01868 ug/mL
					LC6:2FTS_00003	100 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.01896 ug/mL
					LC8:2FTS_00003	100 uL	Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	0.01916 ug/mL
					LCN-EtFOSA-M_00005	100 uL	N-ethylperfluoro-1-octanesulfonamide	0.02 ug/mL
					LCN-EtFOSAA_00004	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.02 ug/mL
					LCN-MeFOSA-M_00004	100 uL	MeFOSA	0.02 ug/mL
					LCN-MeFOSAA_00004	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.02 ug/mL
					LCPFBA_00007	100 uL	Perfluorobutanoic acid (PFBA)	0.02 ug/mL
					LCPFBS_00008	100 uL	Perfluorobutane Sulfonate	0.01768 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.01768 ug/mL
					LCPFDA_00007	100 uL	Perfluorodecanoic acid (PFDA)	0.02 ug/mL
					LCPFDoA_00007	100 uL	Perfluorododecanoic acid (PFDoA)	0.02 ug/mL
					LCPFDSA_00002	100 uL	Perfluorodecanesulfonic acid (PFDS)	0.01928 ug/mL
					LCPFHpA_00008	100 uL	Perfluoroheptanoic acid (PFHpA)	0.02 ug/mL
					LCPFHpSA_00003	100 uL	Perfluoroheptanesulfonic Acid (PFHpS)	0.01904 ug/mL
					LCPFHxA_00007	100 uL	Perfluorohexanoic acid (PFHxA)	0.02 ug/mL
					LCPFHxDA_00008	100 uL	Perfluorohexadecanoic acid	0.02 ug/mL
					LCPFHxS-br_00004	100 uL	Perfluorohexane Sulfonate	0.0182 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.0182 ug/mL
					LCPFNA_00009	100 uL	Perfluorononanoic acid (PFNA)	0.02 ug/mL
					LCPFOA_00008	100 uL	Perfluorooctanoic acid (PFOA)	0.02 ug/mL
					LCPFODA_00008	100 uL	Perfluorooctadecanoic acid	0.02 ug/mL
					LCPFOS-br_00004	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.01856 ug/mL
					LCPFOSA_00010	100 uL	Perfluorooctane Sulfonamide (FOSA)	0.02 ug/mL
					LCPFPeA_00007	100 uL	Perfluoropentanoic acid (PFPeA)	0.02 ug/mL
					LCPFTeDA_00007	100 uL	Perfluorotetradecanoic acid (PFTeA)	0.02 ug/mL
					LCPFTrDA_00007	100 uL	Perfluorotridecanoic Acid (PFTriA)	0.02 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFUdA_00007	100 uL	Perfluoroundecanoic acid (PFUnA)	0.02 ug/mL
.LC4:2FTS_00003	12/12/21	WELLINGTON, Lot 42FTS1216			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	46.7 ug/mL
.LC6:2FTS_00003	06/25/21	WELLINGTON, Lot 62FTS0616			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
.LC8:2FTS_00003	08/22/21	WELLINGTON, Lot 82FTS0816			(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	47.9 ug/mL
.LCN-EtFOSA-M_00005	05/24/21	WELLINGTON, Lot NEtFOSA0516M			(Purchased Reagent)		N-ethylperfluoro-1-octanesulfonamide	50 ug/mL
.LCN-EtFOSAA_00004	09/30/21	WELLINGTON, Lot NEtFOSAA0916			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
.LCN-MeFOSA-M_00004	05/24/21	WELLINGTON, Lot NMeFOSA0516M			(Purchased Reagent)		MeFOSA	50 ug/mL
.LCN-MeFOSAA_00004	10/12/21	WELLINGTON, Lot NMeFOSAA0916			(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
.LCPFBA_00007	05/27/21	Wellington Laboratories, Lot PFBA0516			(Purchased Reagent)		Perfluorobutanoic acid (PFBA)	50 ug/mL
.LCPFBS_00008	03/15/21	Wellington Laboratories, Lot LPFBS0316			(Purchased Reagent)		Perfluorobutane Sulfonate	44.2 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
.LCPFDA_00007	05/31/21	Wellington Laboratories, Lot PFDA0516			(Purchased Reagent)		Perfluorodecanoic acid (PFDA)	50 ug/mL
.LCPFDoA_00007	05/31/21	Wellington Laboratories, Lot PFDoA0516			(Purchased Reagent)		Perfluorododecanoic acid (PFDoA)	50 ug/mL
.LCPFDSA_00002	05/24/21	Wellington Laboratories, Lot LPFDS0516			(Purchased Reagent)		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
.LCPFHpA_00008	12/02/21	Wellington Laboratories, Lot PFHpA1216			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
.LCPFHpSA_00003	09/01/22	Wellington Laboratories, Lot LPFHpS0817			(Purchased Reagent)		Perfluoroheptanesulfonic Acid (PFHpS)	47.6 ug/mL
.LCPFHxA_00007	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid (PFHxA)	50 ug/mL
.LCPFHxDA_00008	05/25/21	Wellington Laboratories, Lot PFHxDA0516			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
.LCPFHxS-br_00004	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexane Sulfonate	45.5 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
.LCPFNA_00009	07/20/22	Wellington Laboratories, Lot PFNA0717			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
.LCPFOA_00008	08/02/21	Wellington Laboratories, Lot PFOA0716			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
.LCPFODA_00008	04/29/21	Wellington Laboratories, Lot PFODA0416			(Purchased Reagent)		Perfluorooctadecanoic acid	50 ug/mL
.LCPFOS-br_00004	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
.LCPFOSA_00010	09/30/21	Wellington Laboratories, Lot FOSA0916I			(Purchased Reagent)		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
.LCPFPeA_00007	05/31/21	Wellington Laboratories, Lot PFPeA0516			(Purchased Reagent)		Perfluoropentanoic acid (PFPeA)	50 ug/mL
.LCPFTeDA_00007	09/30/21	Wellington Laboratories, Lot PFTeDA0916			(Purchased Reagent)		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
.LCPFTrDA_00007	02/12/21	Wellington Laboratories, Lot PFTrDA0216			(Purchased Reagent)		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LCPFUdA_00007	10/18/21	Wellington Laboratories, Lot PFUdA1016			(Purchased Reagent)		Perfluoroundecanoic acid (PFUnA)	50 ug/mL

Reagent

LC4:2FTS_00003

n: 7/19/17 SRV

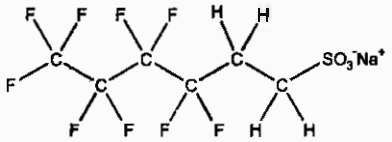
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: 4:2FTS **LOT NUMBER:** 42FTS1216

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

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$C_8H_4F_8SO_3Na$	**MOLECULAR WEIGHT:**	350.13
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt)	**SOLVENT(S):**	Methanol
	46.7 ± 2.3 µg/ml (4:2FTS anion)		
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	12/12/2016		
EXPIRY DATE: (mm/dd/yyyy)	12/12/2021		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 12/21/2016 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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:

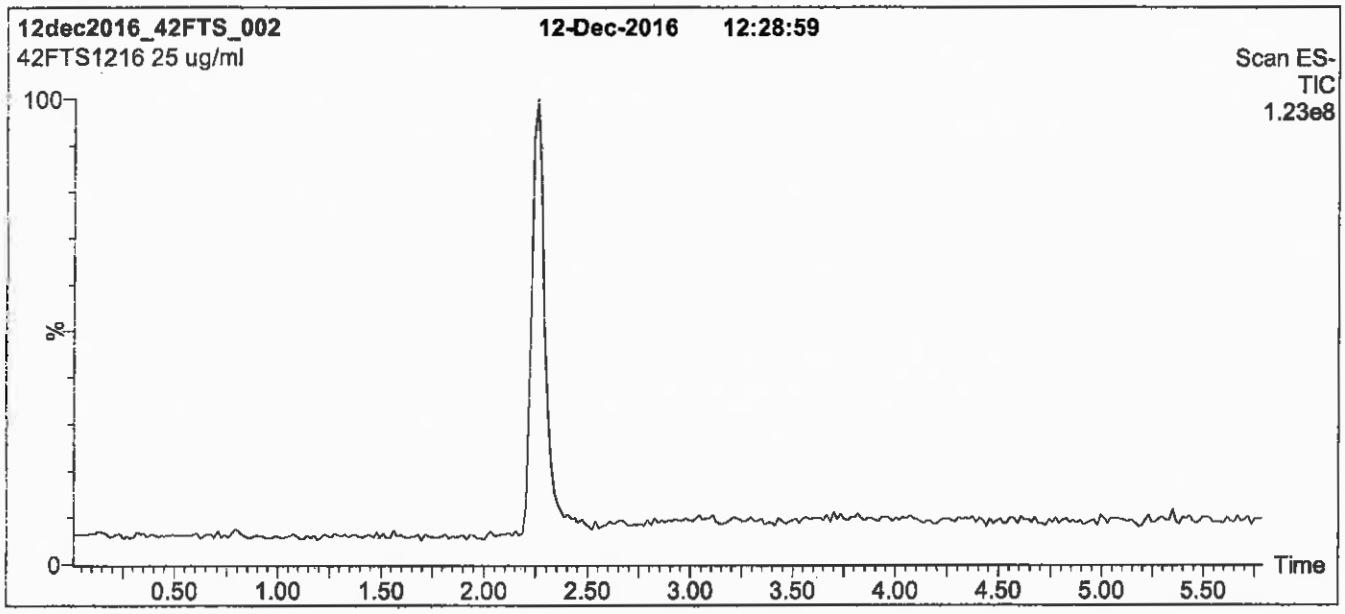
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

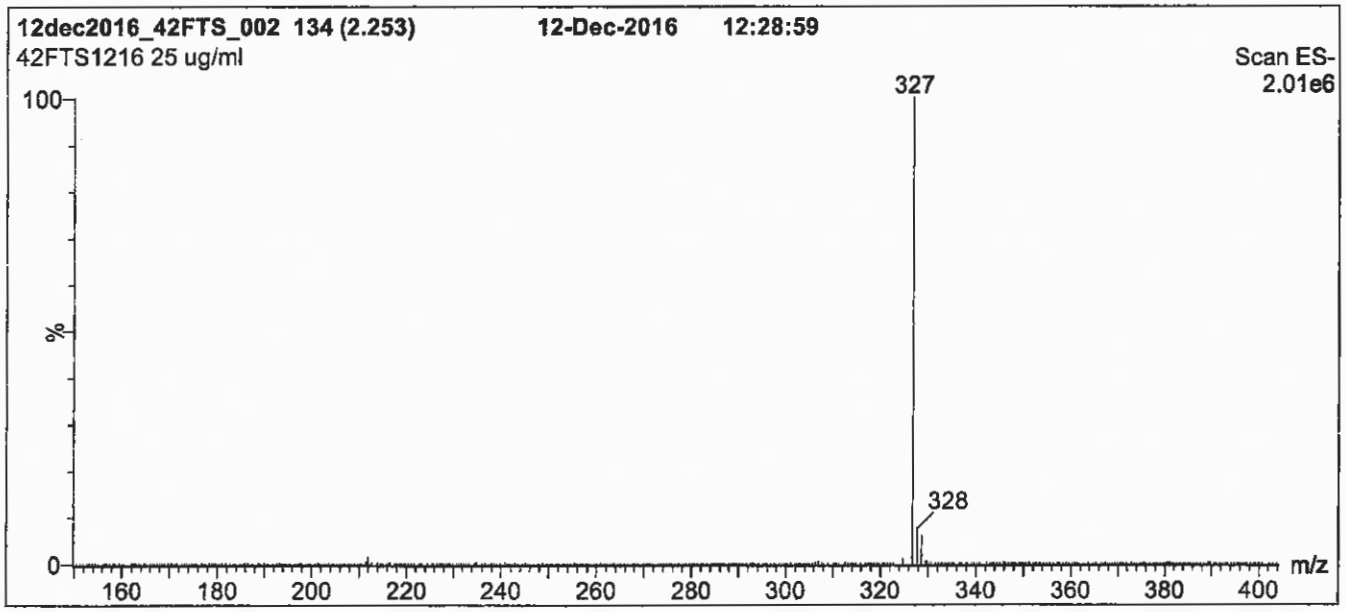
CALA

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





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield 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

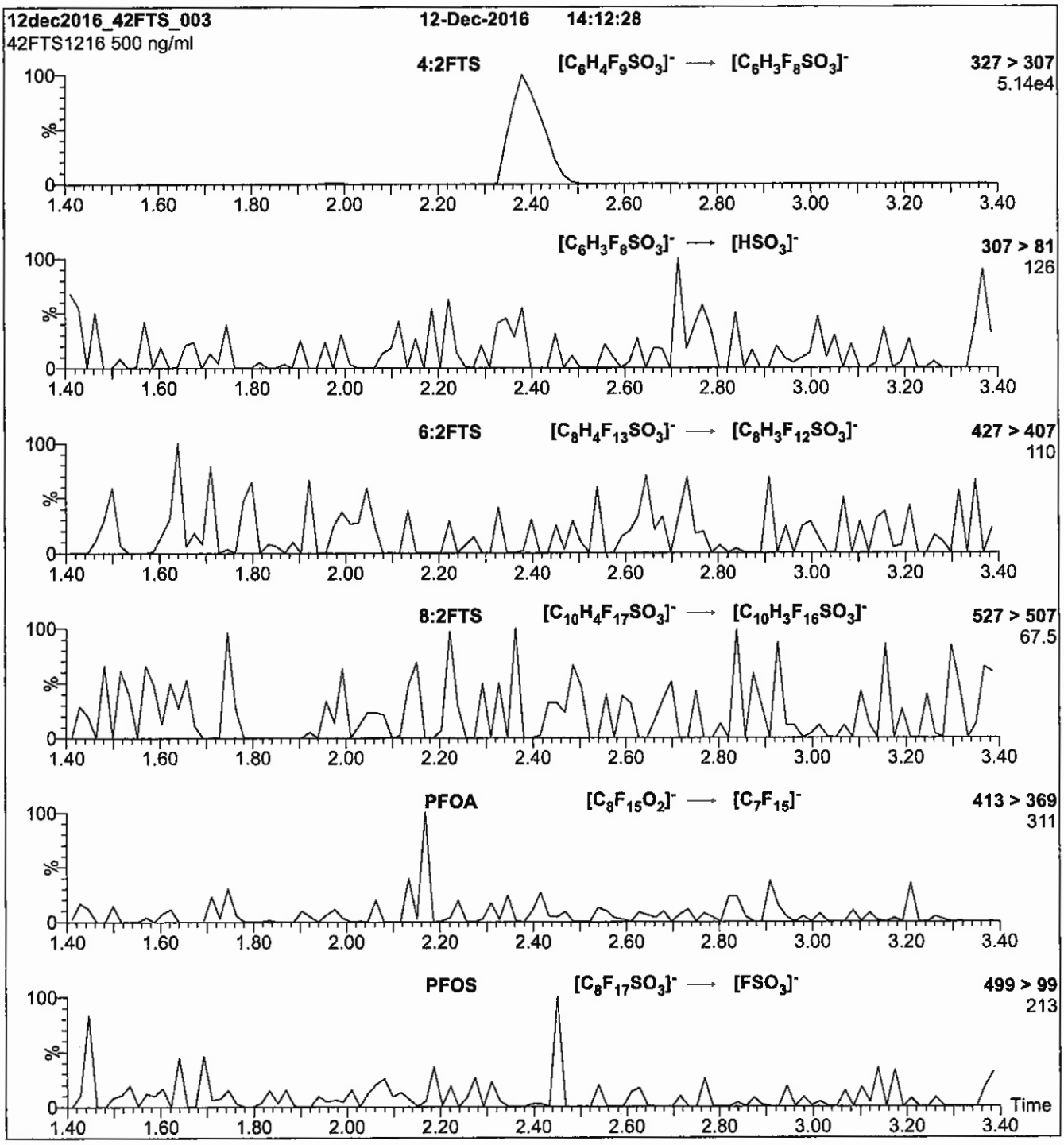
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 25.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml 4:2FTS)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

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

Reagent

LC6:2FTS_00003

P: 12/29/16 SRV

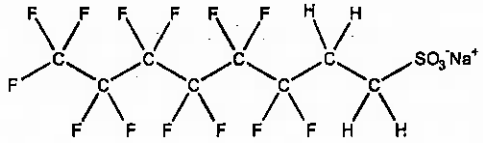
WELLINGTON LABORATORIES

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:

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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:

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

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:

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QUALITY MANAGEMENT:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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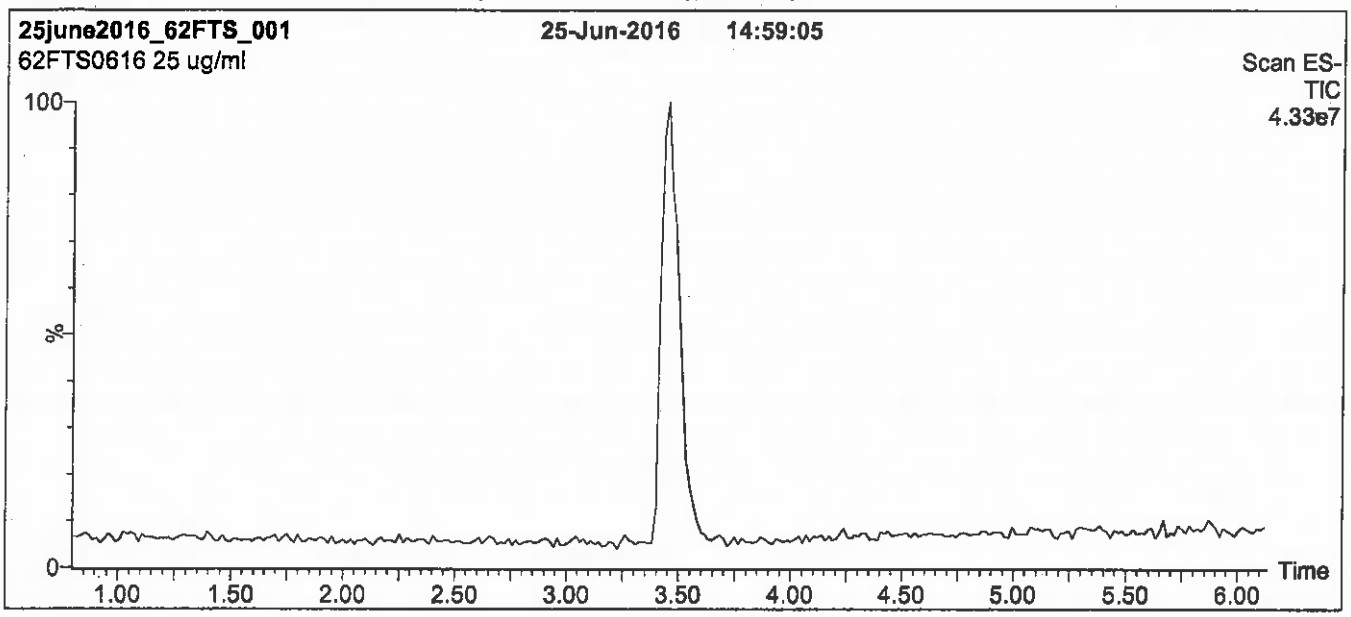
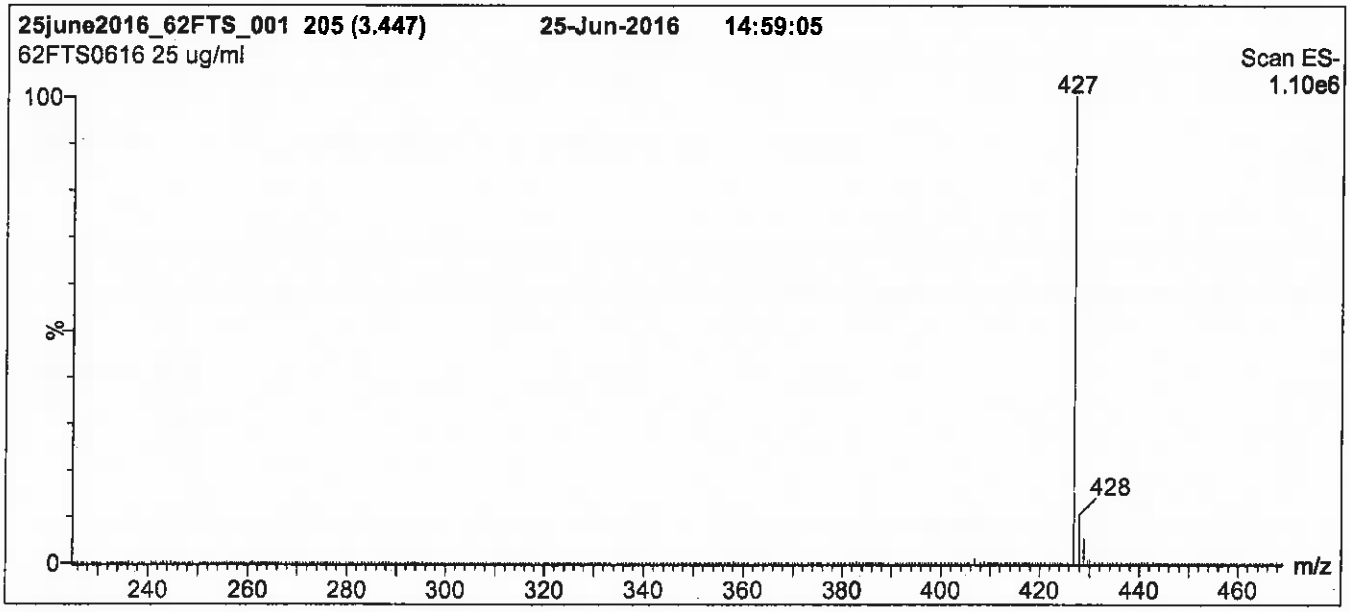
Figure 1: **6:2FTS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

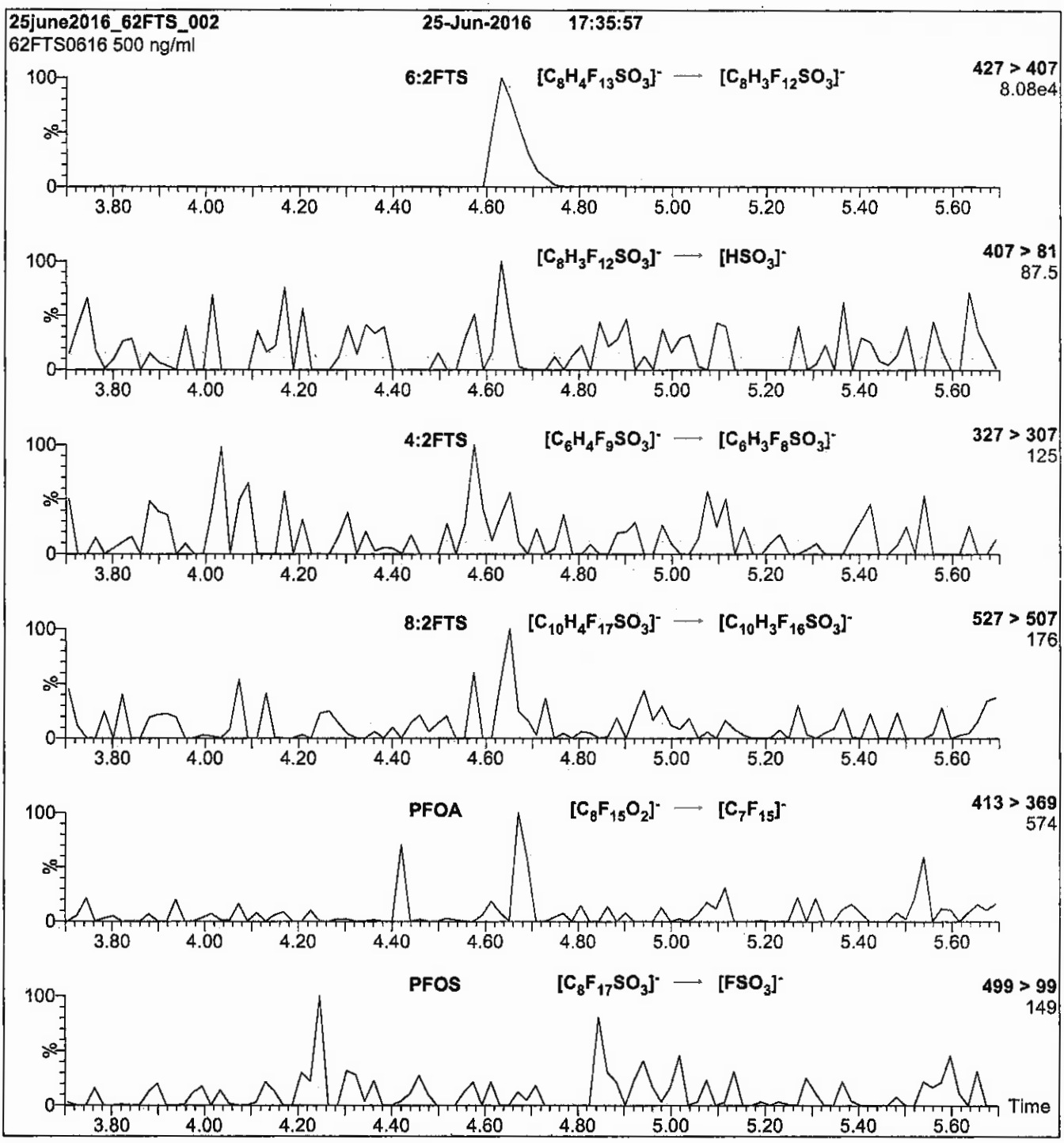
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

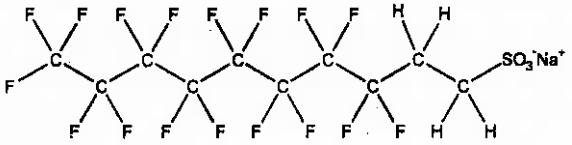
LC8:2FTS_00003

P: 12/29/16

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	8:2FTS	**LOT NUMBER:**	82FTS0816
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)	08/22/2016		
EXPIRY DATE: (mm/dd/yyyy)	08/22/2021		
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:** 08/25/2016 (mm/dd/yyyy)

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

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CALA

ANAB ACCREDITED

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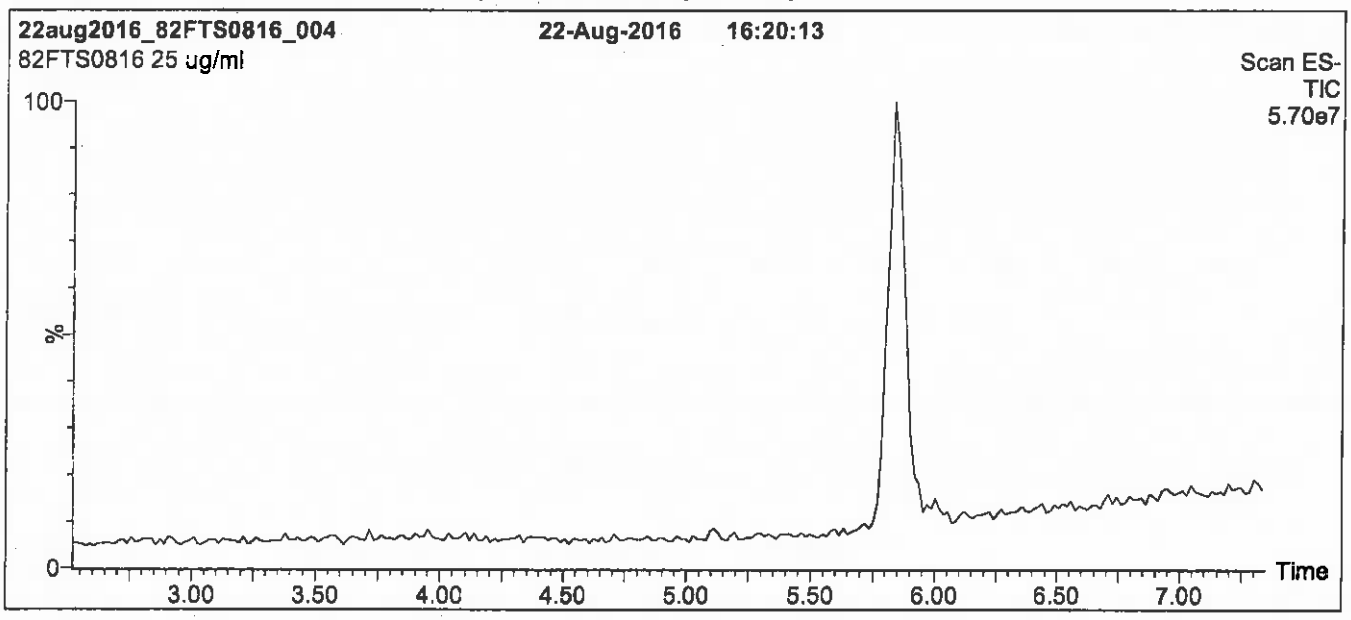
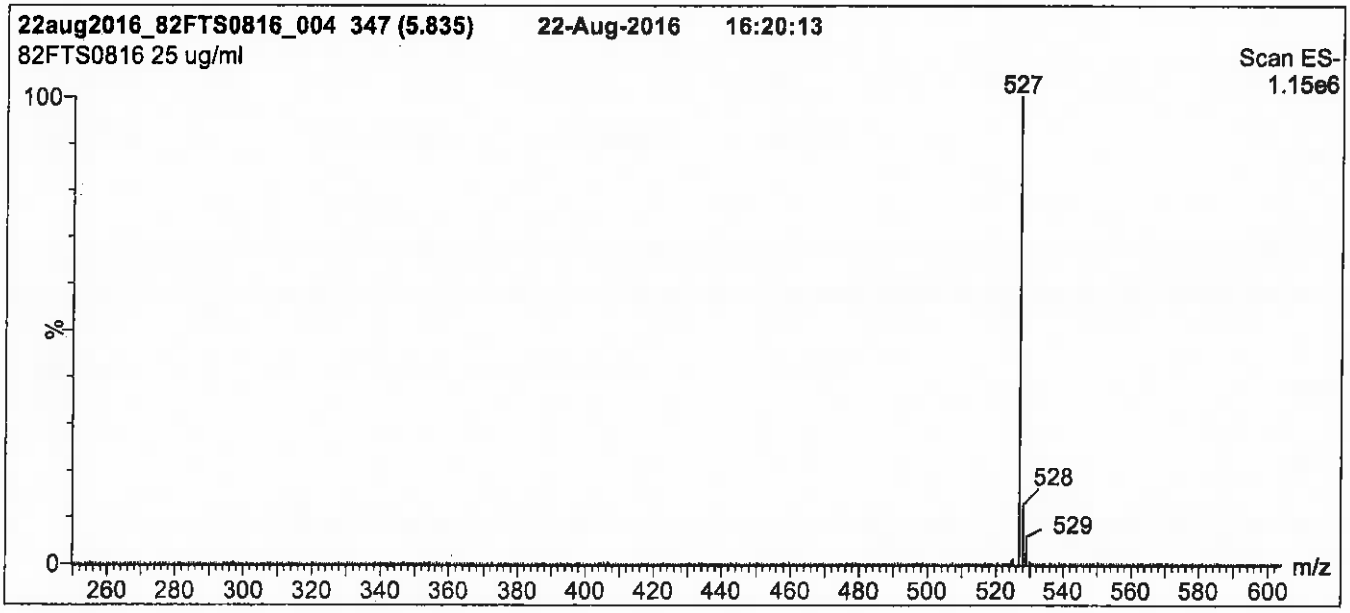
Figure 1: **8:2FTS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Agilent Zorbax Bonus-RP
1.8 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 7.5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

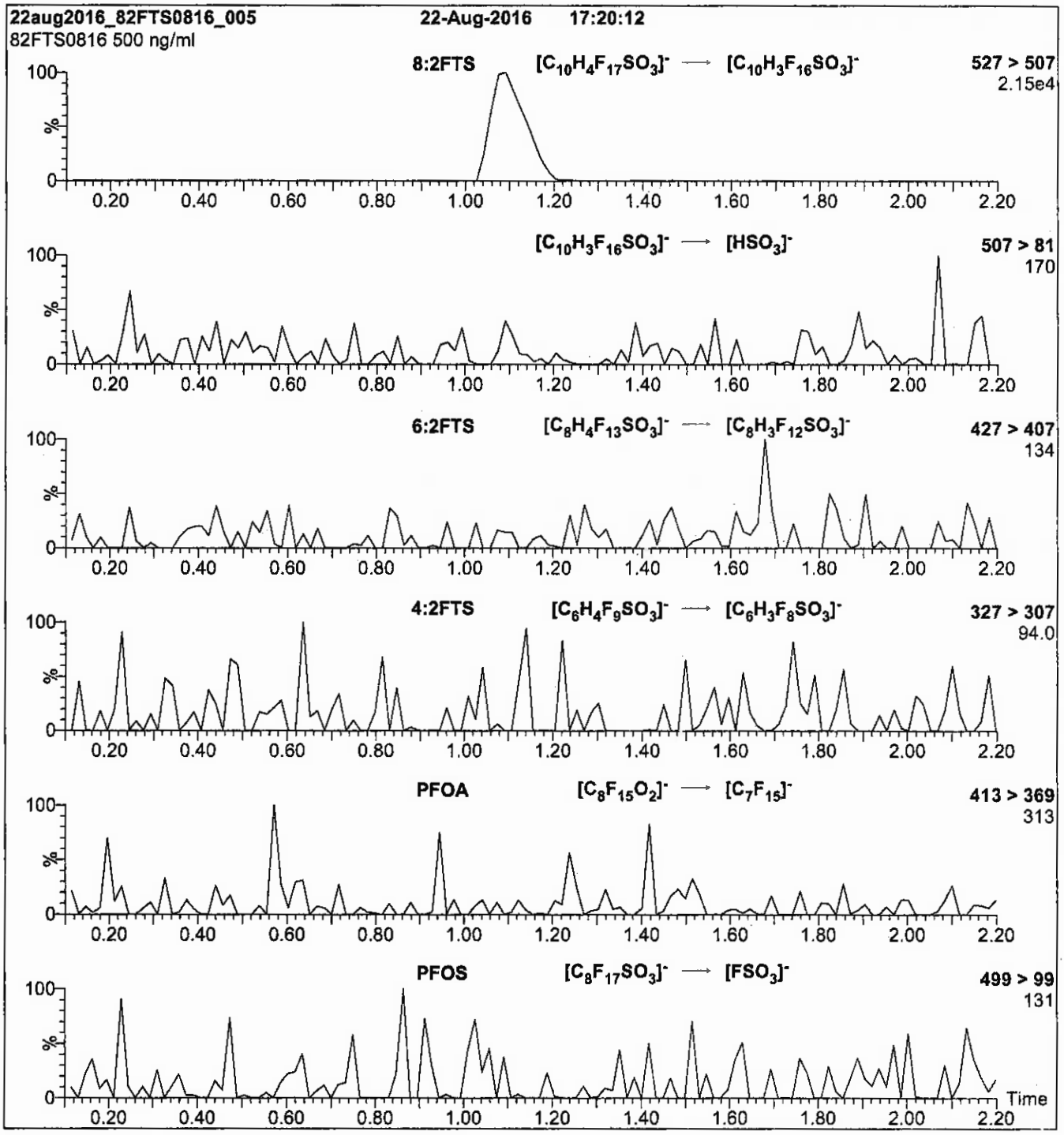
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250- 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) = 3.31e-3
Collision Energy (eV) = 30

Reagent

LCd3-NMeFOSAA_00006

1106123
ID: LCd3-NMeFOSAA_00006
Exp: 05/19/22 Prpd: CCL
d3-N-MeFOSAA

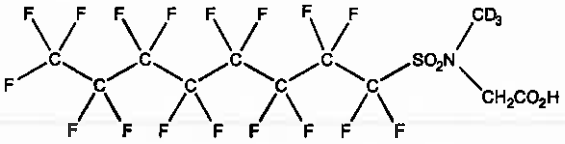
R: 12/4/17 CCL

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: d3-N-MeFOSAA **LOT NUMBER:** d3NMeFOSAA0517
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)	05/19/2017		
EXPIRY DATE: (mm/dd/yyyy)	05/19/2022		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 05/31/2017
(mm/dd/yyyy)
B.G. Chittim, General Manager

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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UNCERTAINTY:

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

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

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

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

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

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CALA

ANAB ACCREDITED

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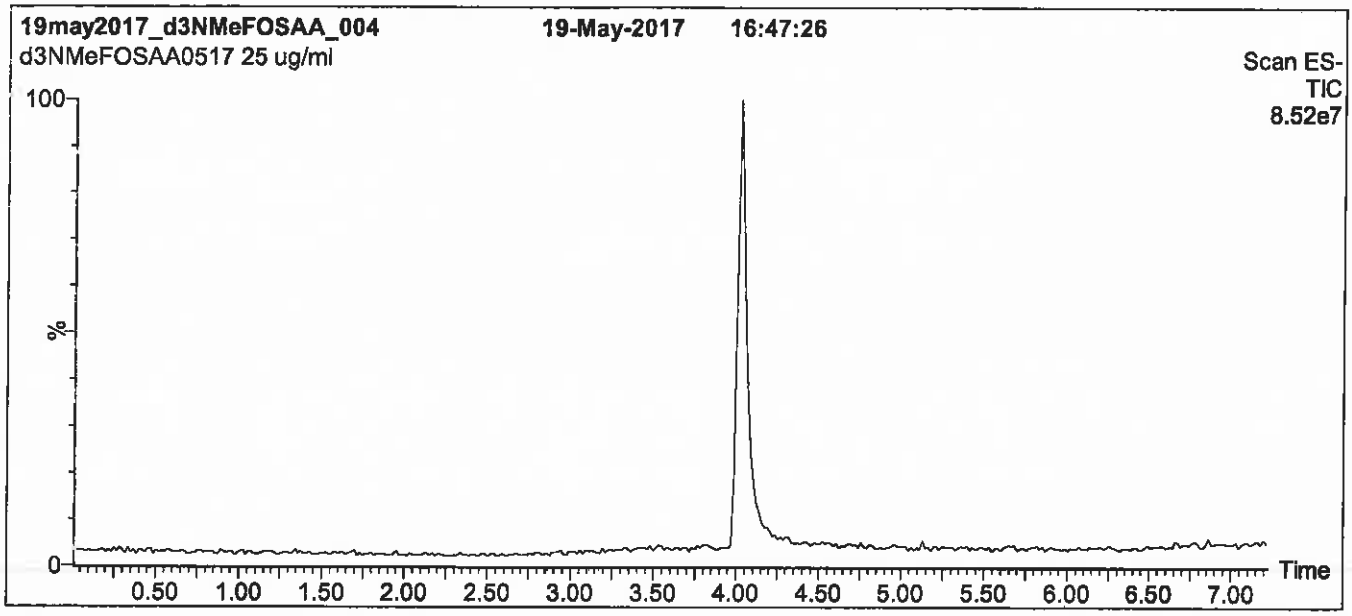
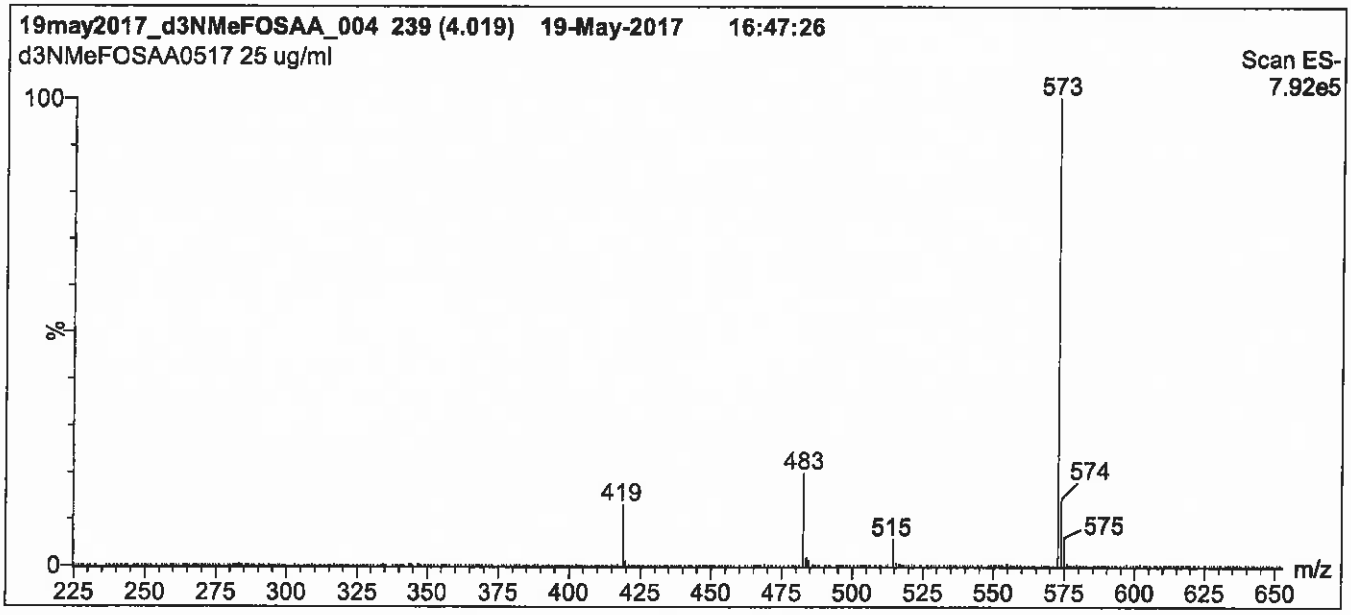
Figure 1: **d3-N-MeFOSAA; LC/MS Data (TIC and Mass Spectrum)**





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

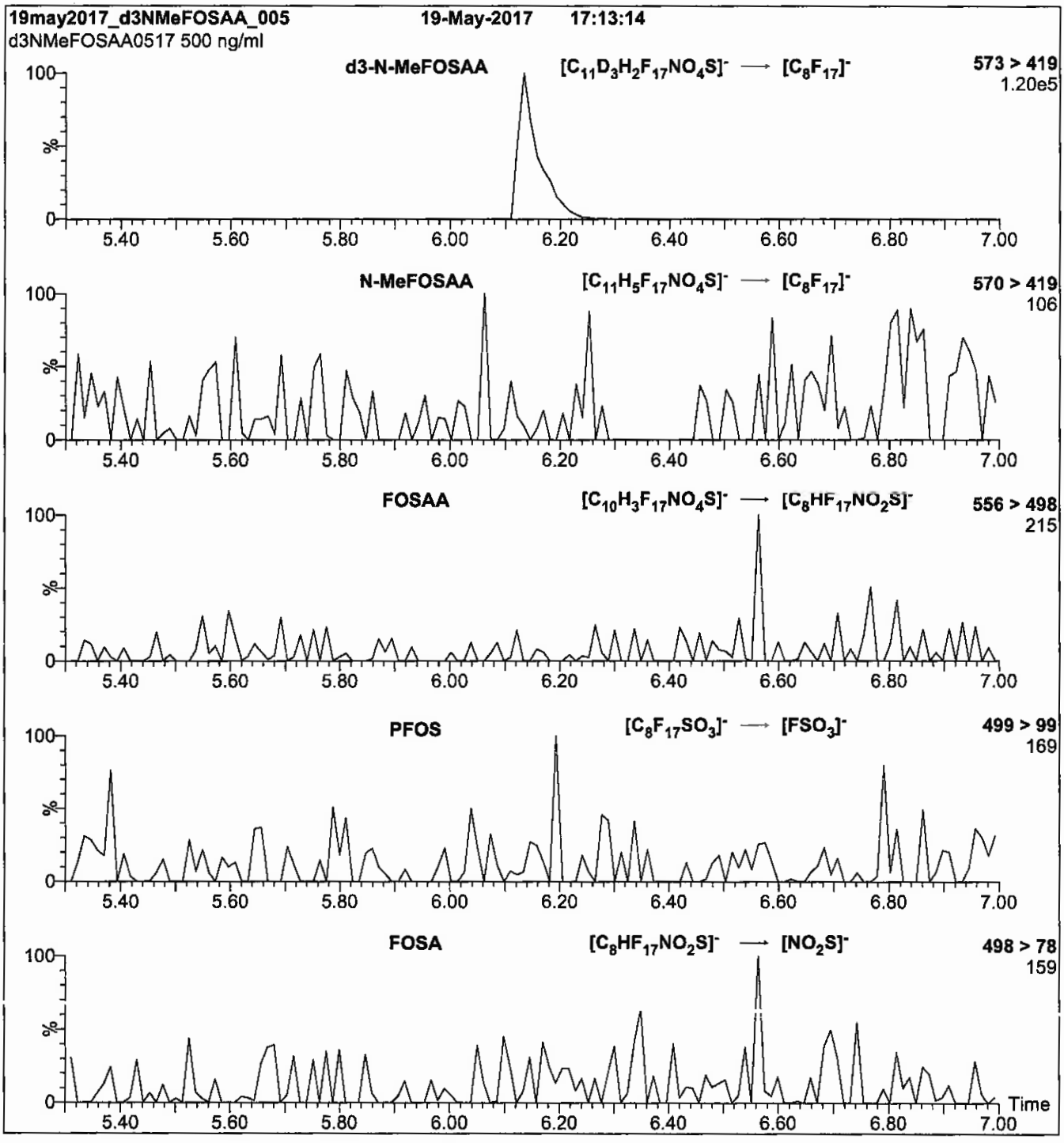
Flow: 300 µl/min

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) = 3.39e-3
Collision Energy (eV) = 20

Reagent

LCd5-NEtFOSAA_00006

1106105
ID: LCd5-NEtFOSAA_00006
Exp: 11/08/22 Prpd: CCL
d5-N-EtFOSAA

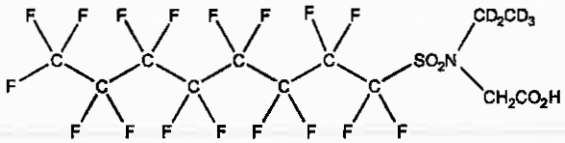
R: 12/4/17 ccl

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: d5-N-EtFOSAA **LOT NUMBER:** d5NEtFOSAA1117
COMPOUND: N-ethyl-d5-perfluoro-1-octanesulfonamidoacetic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: $C_{12}D_5H_3F_{17}NO_4S$ **MOLECULAR WEIGHT:** 590.26
CONCENTRATION: 50 ± 2.5 µg/ml **SOLVENT(S):** Methanol, Water (<1%)
CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥98% $^2H_5$
LAST TESTED: (mm/dd/yyyy) 11/08/2017
EXPIRY DATE: (mm/dd/yyyy) 11/08/2022
RECOMMENDED STORAGE: Refrigerate ampoule

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

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Certified By: _____ **Date:** 11/16/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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ANAB ACCREDITED

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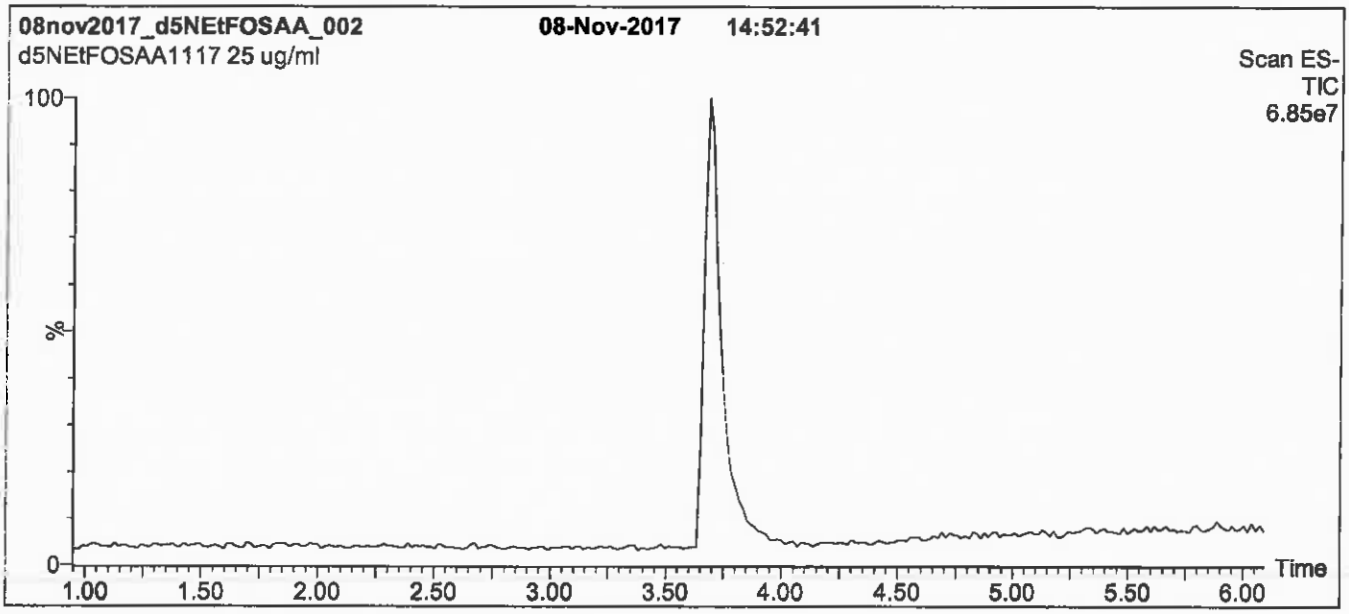
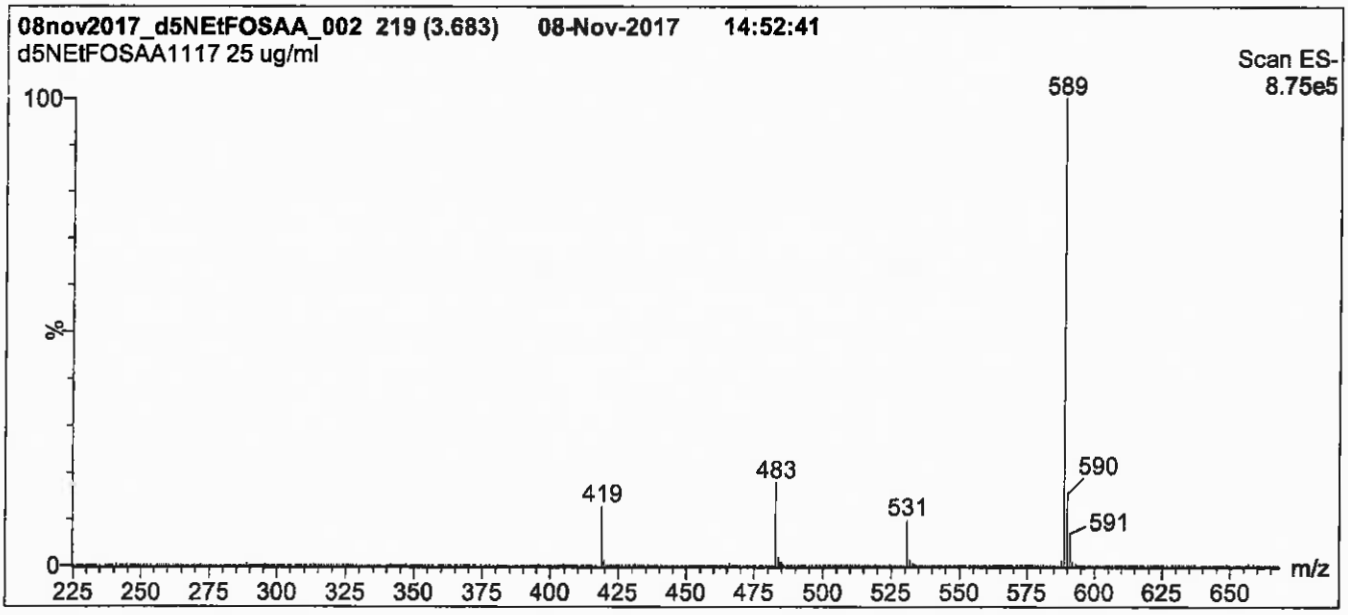
Figure 1: **d5-N-EtFOSAA; LC/MS Data (TIC and Mass Spectrum)**





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

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

Mobile phase: Gradient
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)
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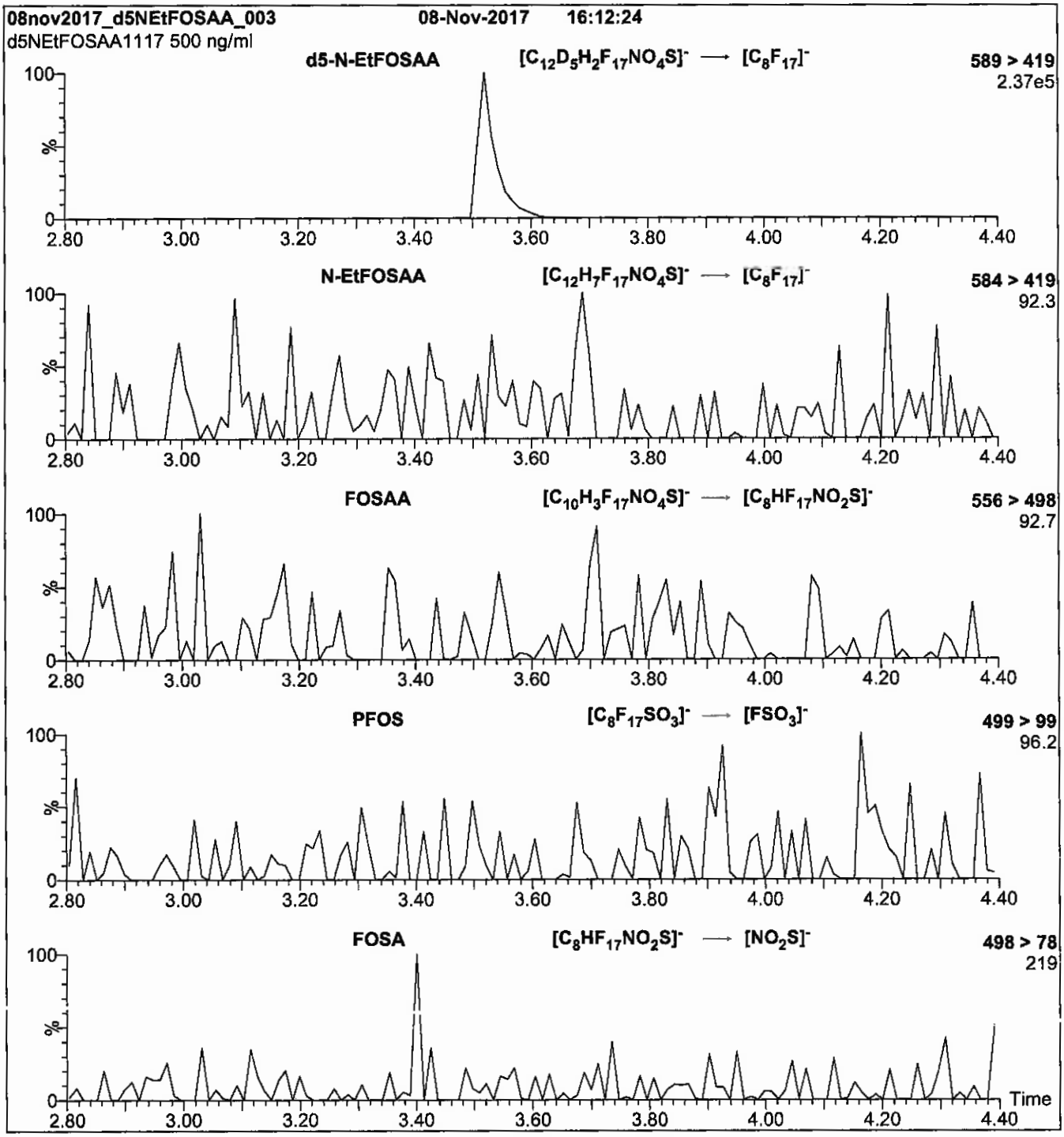
Cone Voltage (V) = 35.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCM2-6:FTS_00006

R: 12/4/17 CCL

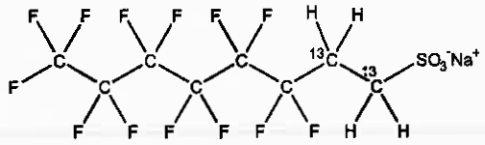
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2-6:2FTS **LOT NUMBER:** M262FTS0217

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

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_6H_4F_{13}SO_3Na$	**MOLECULAR WEIGHT:**	452.13
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt)	**SOLVENT(S):**	Methanol
	47.5 ± 2.4 µg/ml (M2-6:2FTS anion)		
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	02/17/2017		
EXPIRY DATE: (mm/dd/yyyy)	02/17/2022		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- 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:** 02/24/2017 (mm/dd/yyyy)

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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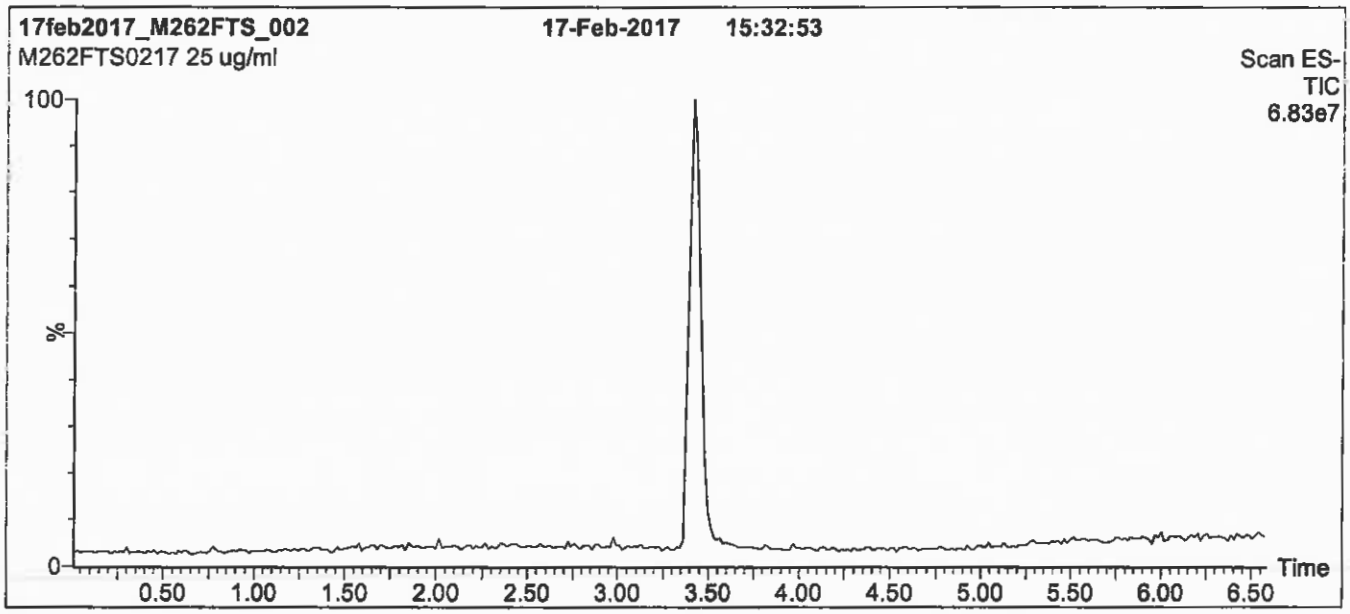
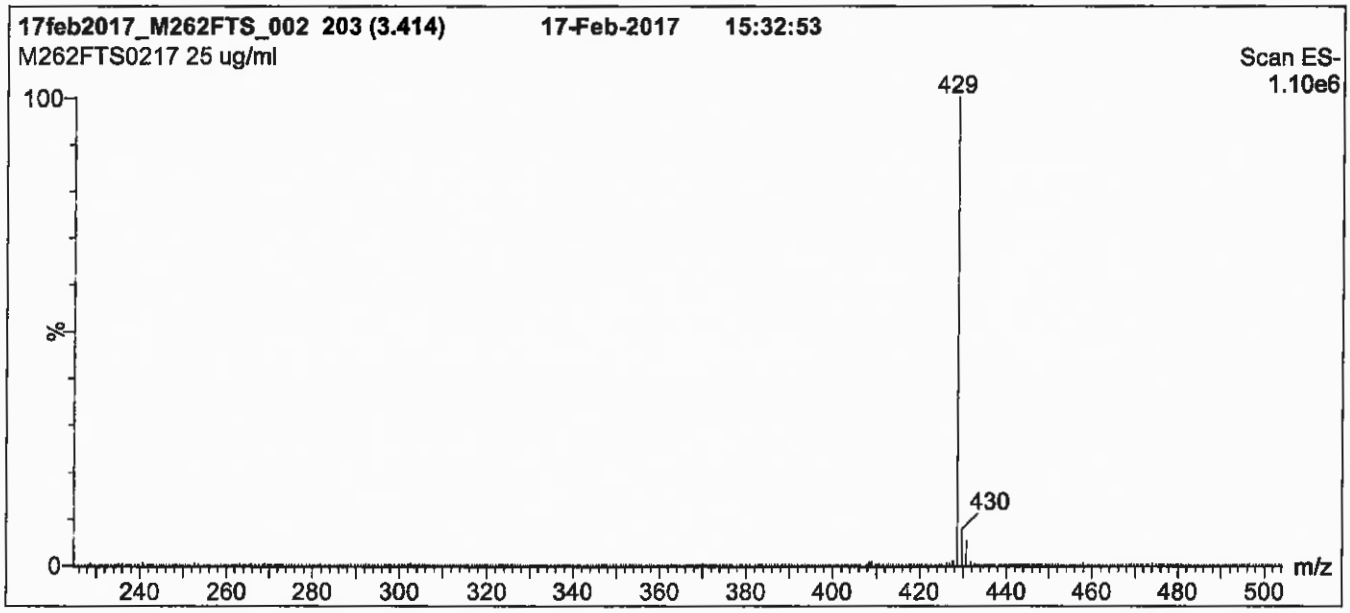




Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 8 min and hold for 1 min
before returning to initial conditions in 0.5 min.
Time: 10 min

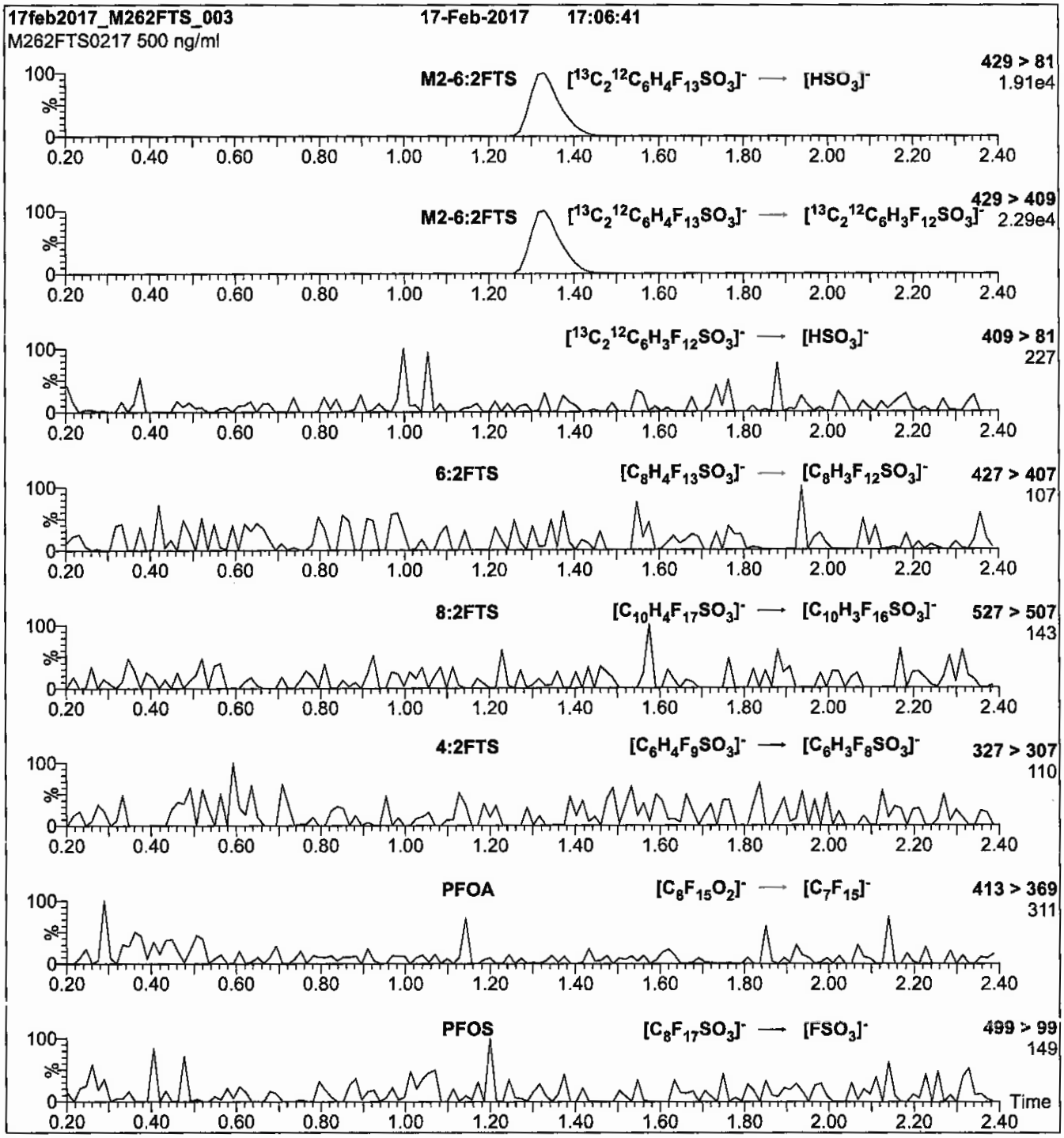
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (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: **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) = 3.39e-3
Collision Energy (eV) = 25

Reagent

LCM2-8:2FTS_00008

1106092
ID: LCM2-8:2FTS_00008
Exp: 07/05/22 Prpd: CCL
M2-8:2FTS

R: 12/4/17 CCL

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M2-8:2FTS **LOT NUMBER:** M282FTS0717

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
LAST TESTED: (mm/dd/yyyy)	07/05/2017		(1,2-$^{13}C_2$)
EXPIRY DATE: (mm/dd/yyyy)	07/05/2022		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- 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: _____ **Date:** 07/07/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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

UNCERTAINTY:

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

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ 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 calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

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

CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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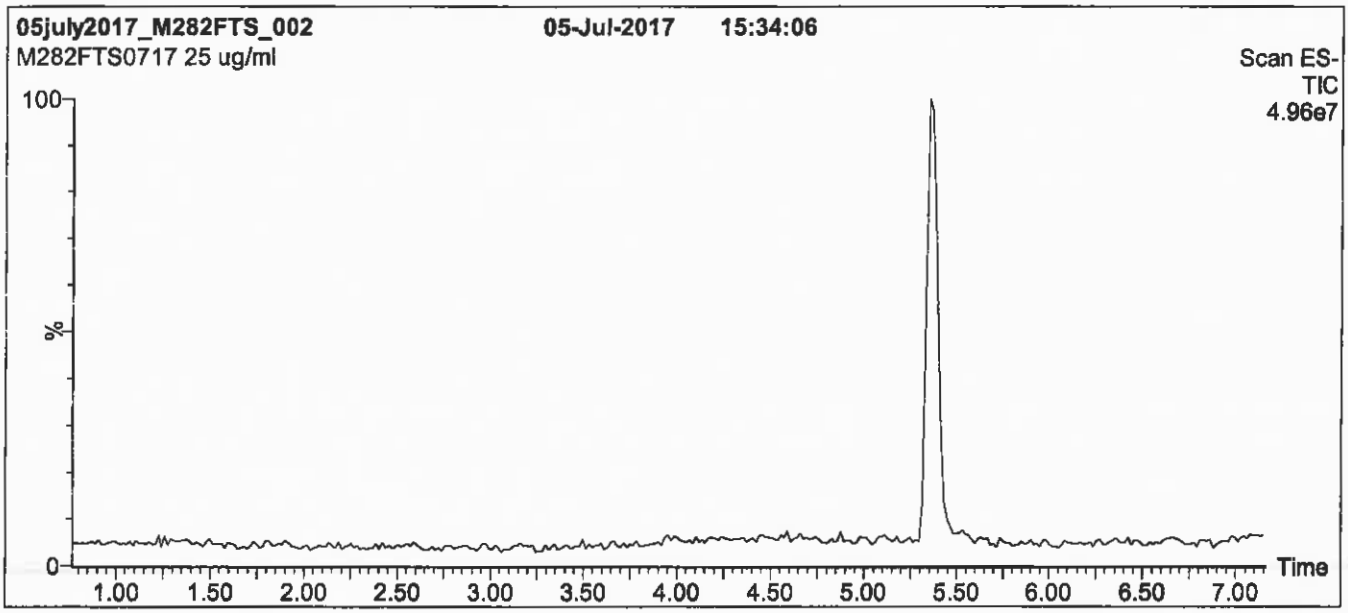
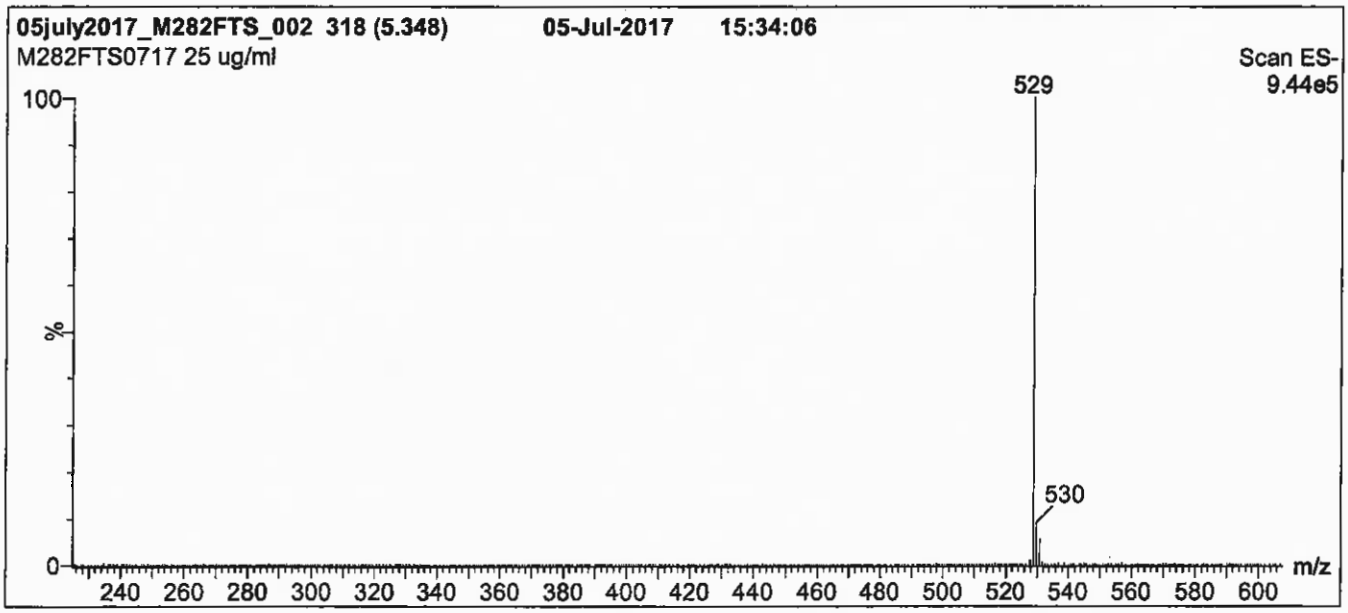
Figure 1: **M2-8:2FTS; LC/MS Data (TIC and Mass Spectrum)**





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: 55% (80:20 MeOH:ACN) / 45% 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

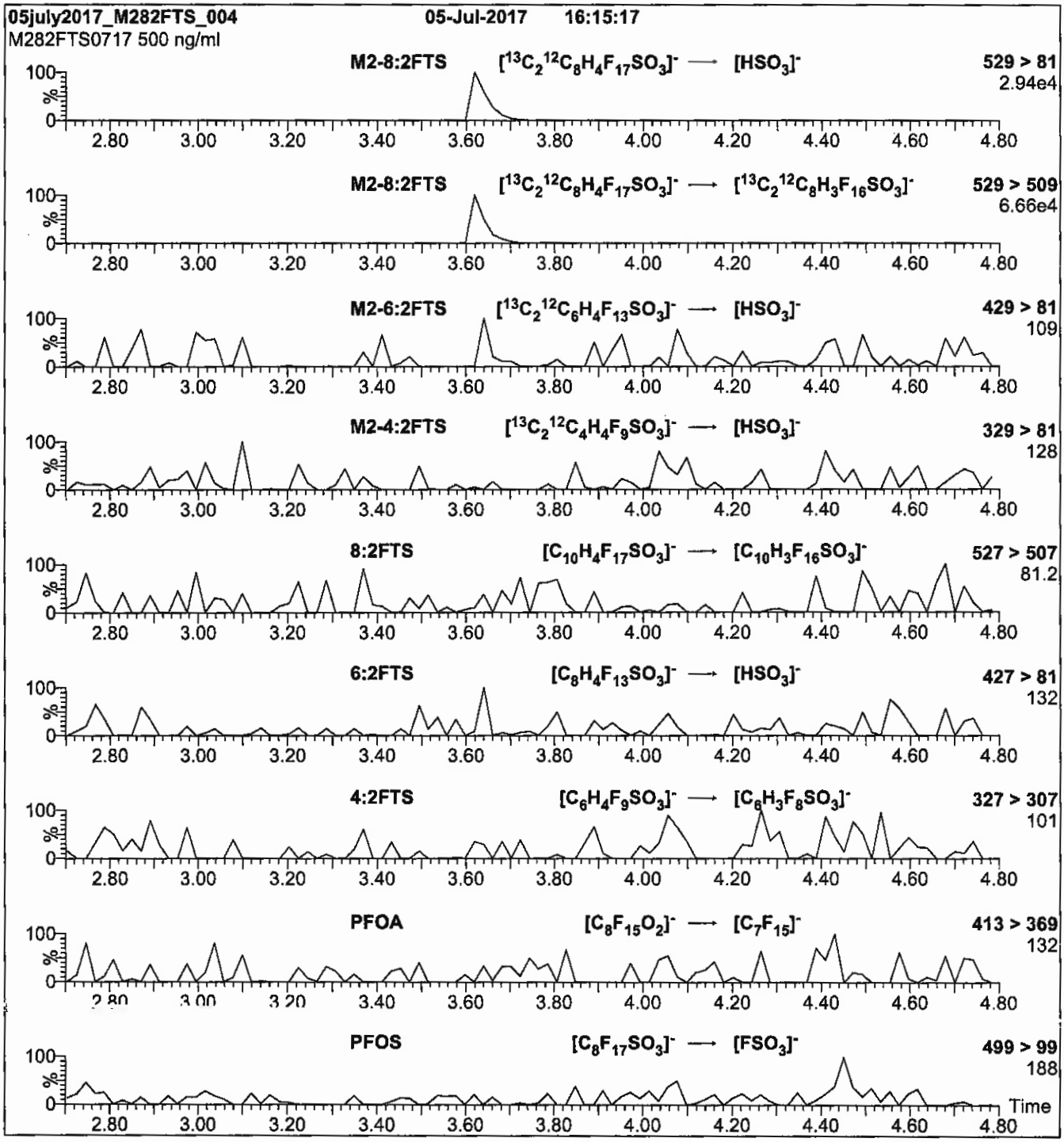
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (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) = 3.50e-3
Collision Energy (eV) = 30

Reagent

LCM2PFHxDA_00013

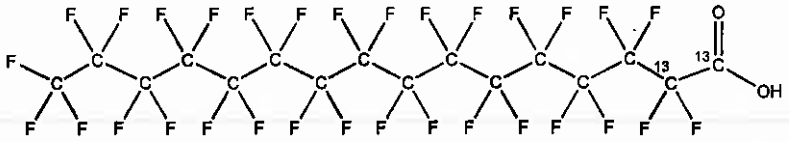
1106068
ID: LCM2PFHxDA_00013
Exp: 07/13/22 Prpd: CCL
13C2-PFHxDA at 50ug/mL

r: 12/4/17 ccz

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M2PFHxDA	**LOT NUMBER:**	M2PFHxDA0717
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)	07/13/2017		
EXPIRY DATE: (mm/dd/yyyy)	07/13/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 07/14/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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

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SYNTHESIS / CHARACTERIZATION:

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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:

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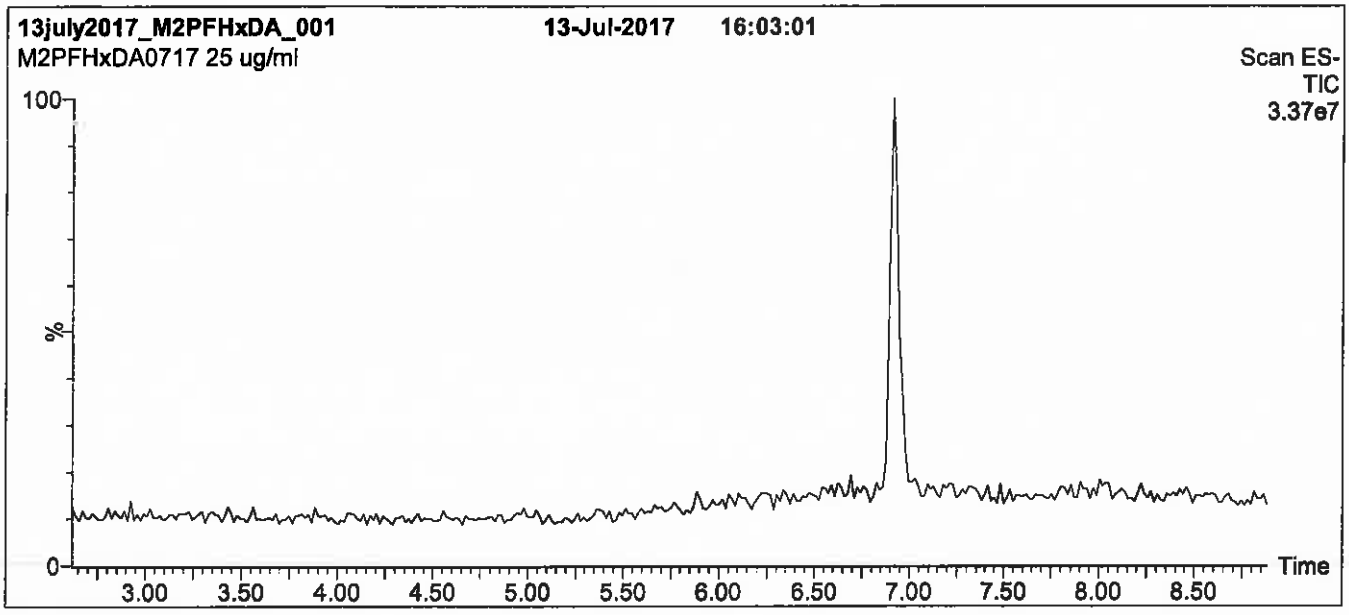
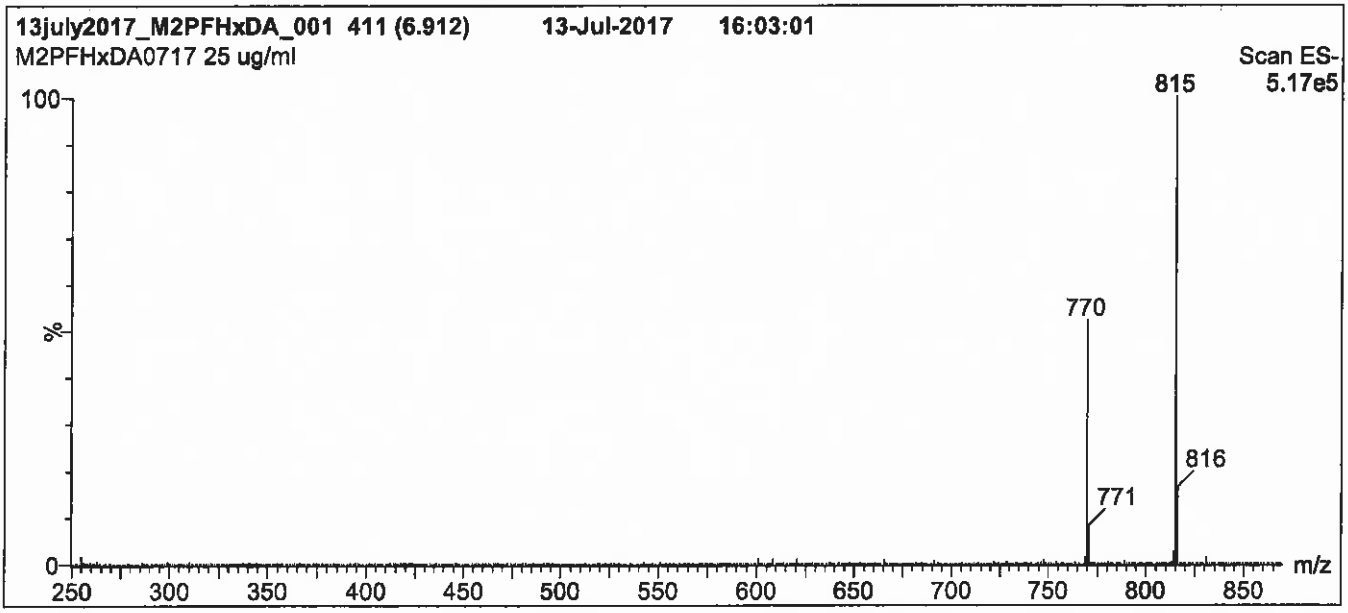
Figure 1: **M2PFHxDA; LC/MS Data (TIC and Mass Spectrum)**





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: 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

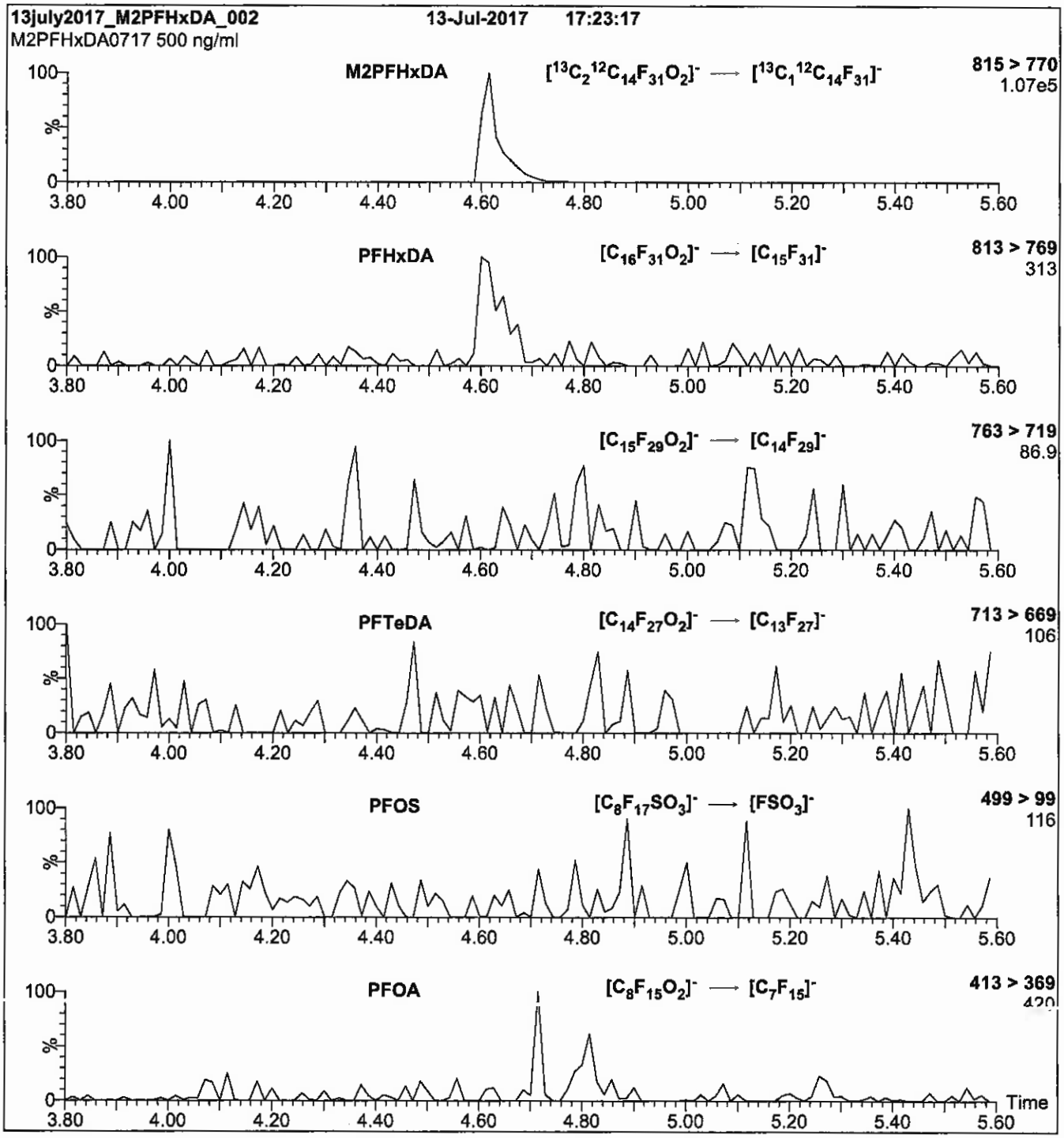
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1250 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

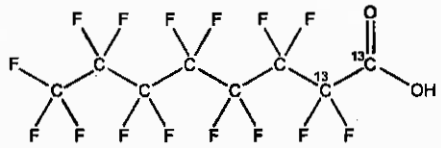
LCM2PFOA_00008

Y: 5/8/17 SW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	M2PFOA	**LOT NUMBER:**	M2PFOA0216
COMPOUND:	Perfluoro-n-[1,2-$^{13}C_2$]octanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_6HF_{16}O_2$	**MOLECULAR WEIGHT:**	416.05
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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

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CALA ANAB

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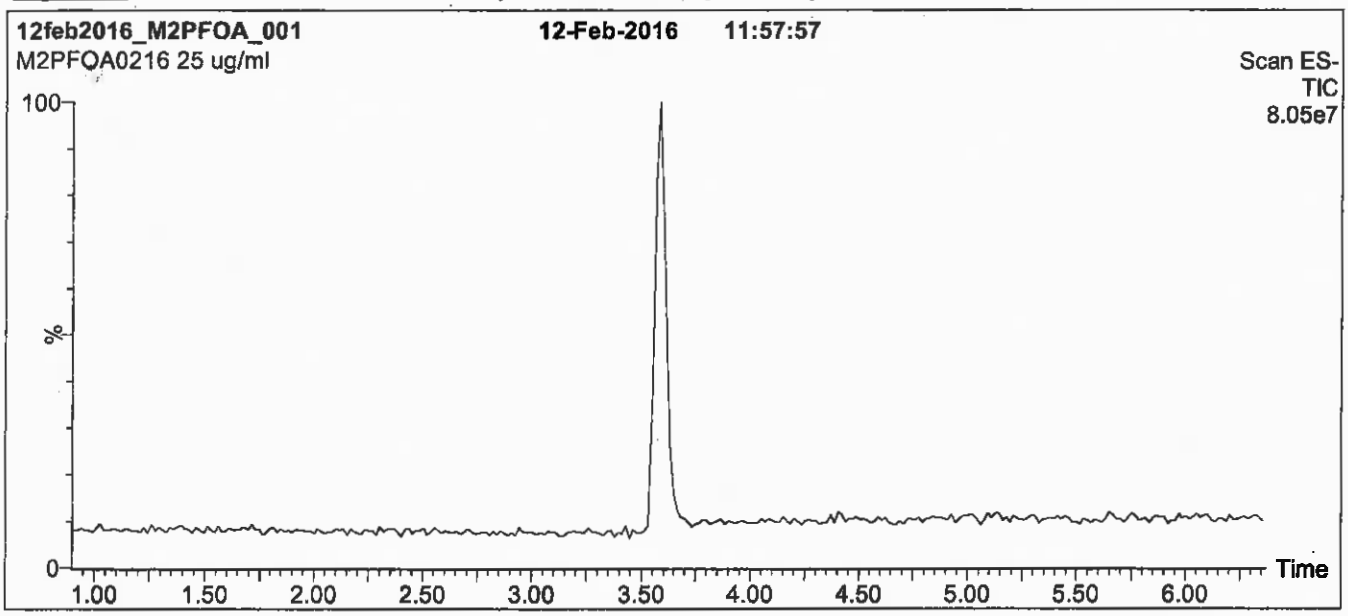
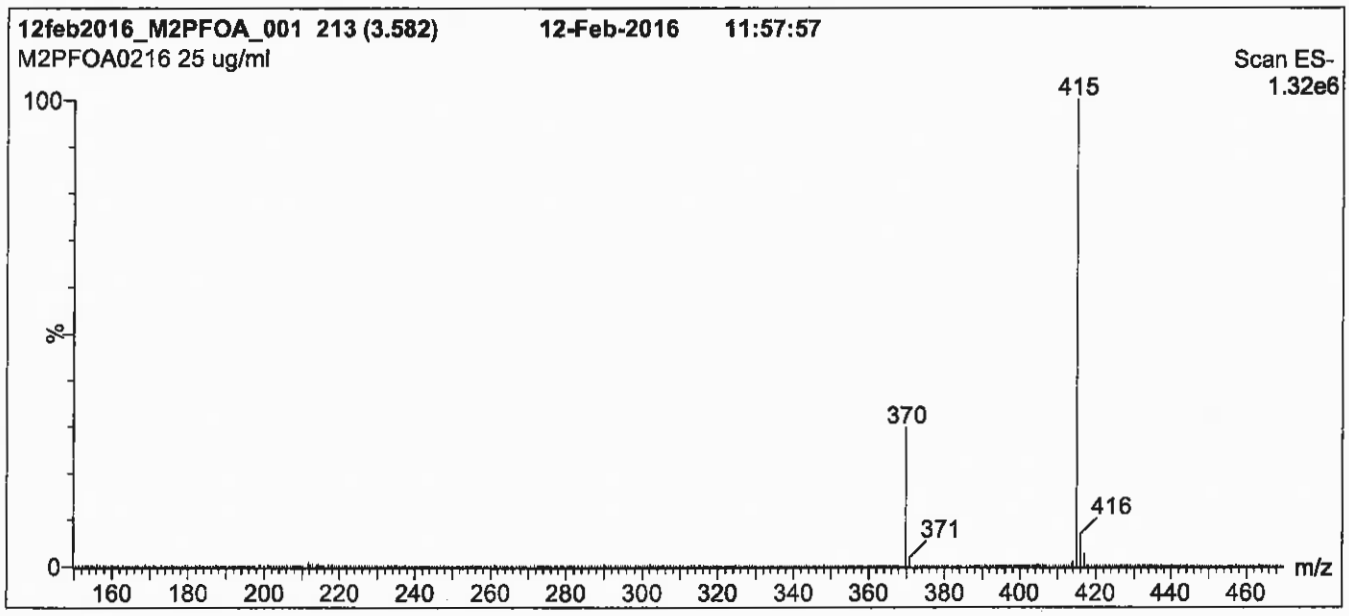
Figure 1: **M2PFOA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield 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

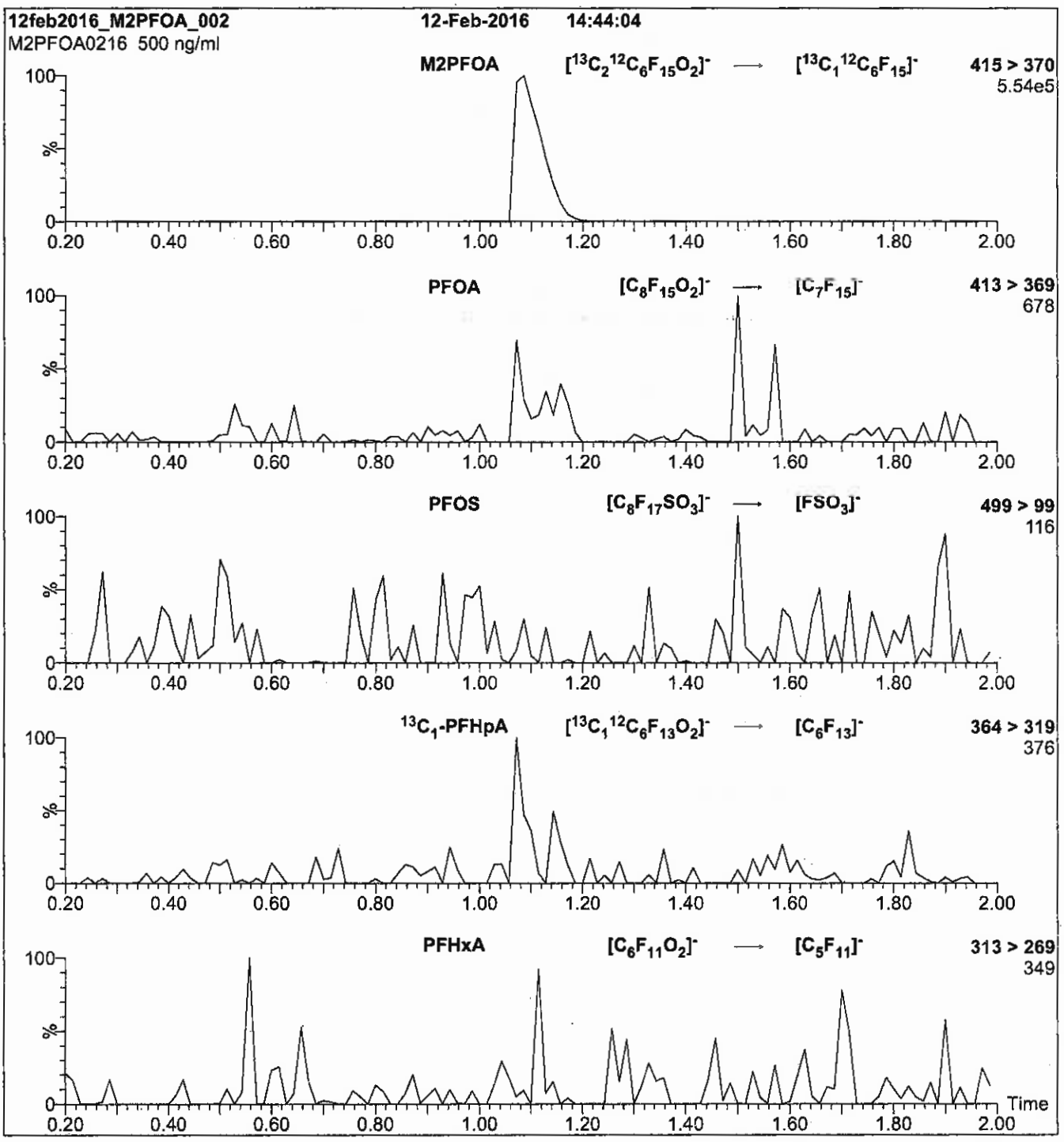
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

Mobile phase: Isocratic 80% MeOH / 20% H_2O

Flow: 300 µl/min

MS Parameters

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

Reagent

LCM2PFTeDA_00012

1106065
ID: LCM2PFTeDA_00012
Exp: 11/30/22 Prpd: CCL
13C2-PFTeDA at 50ug/mL

r: 12/4/17 ccl

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M2PFTeDA	**LOT NUMBER:**	M2PFTeDA1117
COMPOUND:	Perfluoro-n-[1,2-$^{13}C_2$]tetradecanoic acid		
STRUCTURE:		**CAS #:**	Not available

MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_{12}HF_{27}O_2$	**MOLECULAR WEIGHT:**	716.10
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	11/30/2017		
EXPIRY DATE: (mm/dd/yyyy)	11/30/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 12/01/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

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

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ 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 calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

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

CALA

ANAB ACCREDITED

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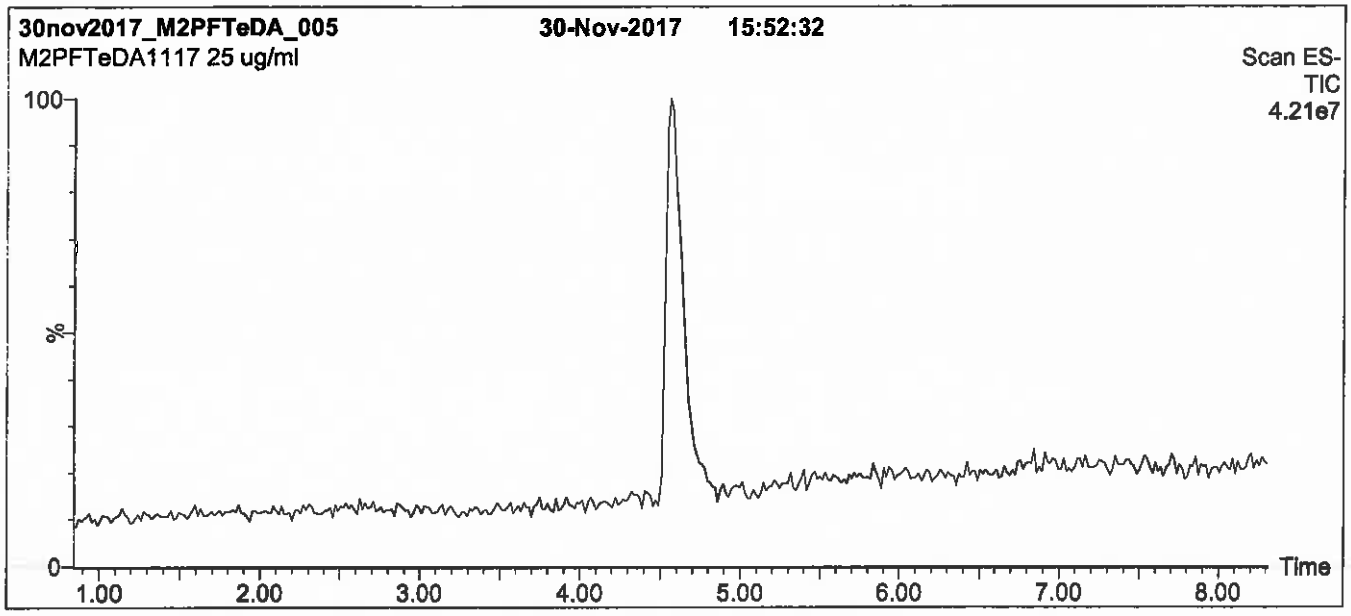
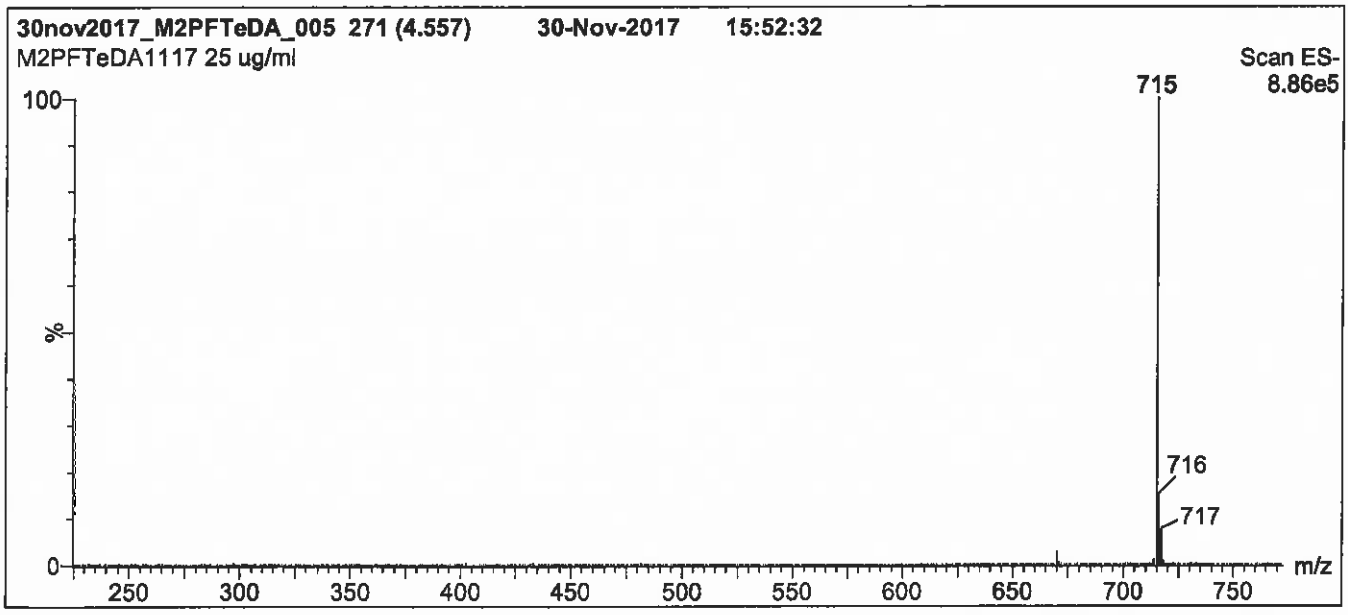
Figure 1: **M2PFTeDA; LC/MS Data (TIC and Mass Spectrum)**





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

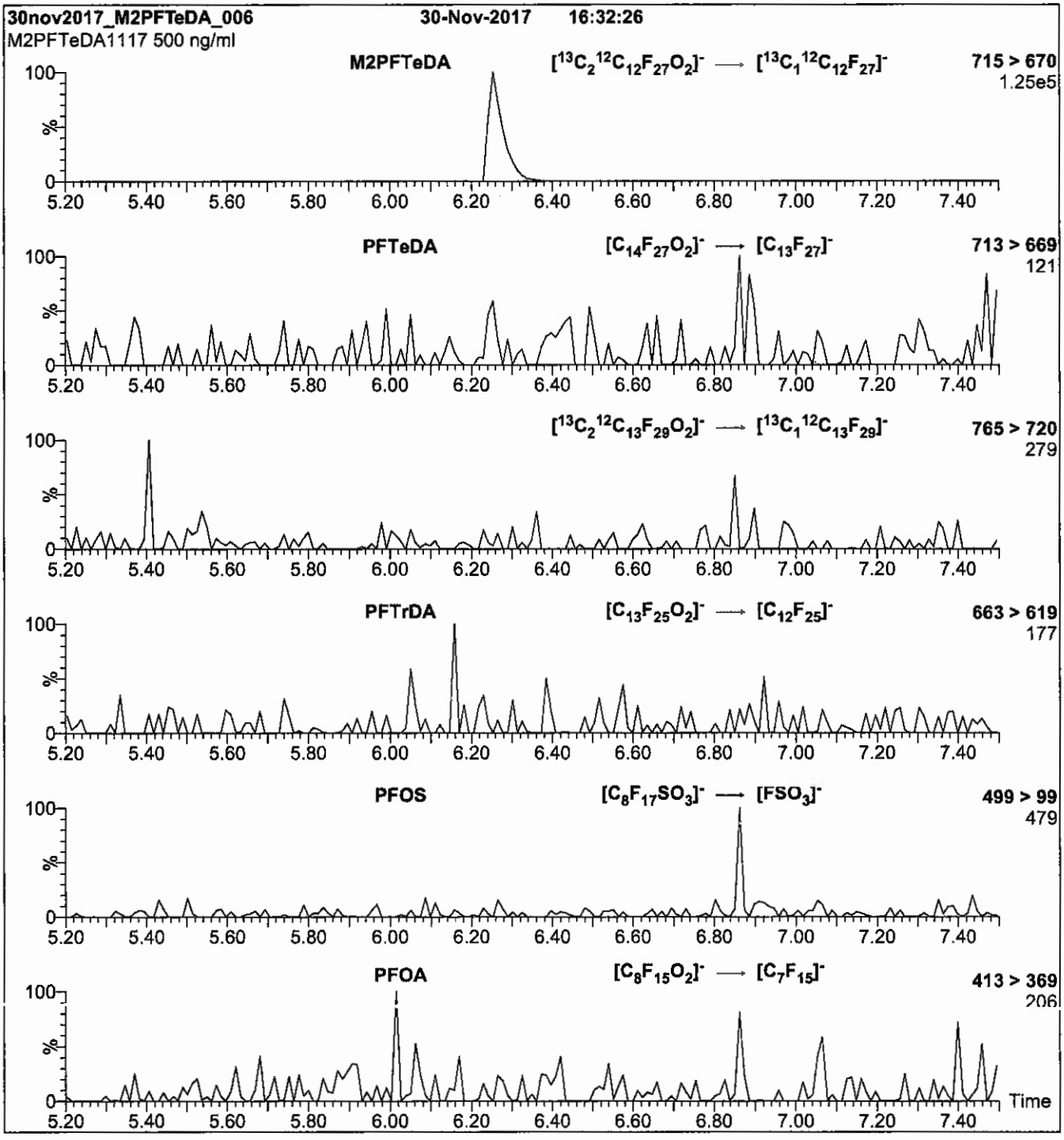
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCM4PFHPA_00012

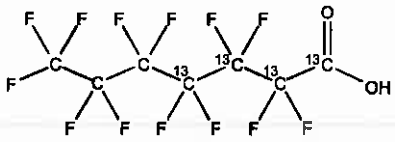
1106316
ID: LCM4PFHPA_00012
Exp: 05/03/22 Prpd: CCL
13C4-Perfluoroheptanoic a

v: 12/4/17 CCL

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M4PFHpA	**LOT NUMBER:**	M4PFHpA0517
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 ($1,2,3,4\text{-}^{13}C_4$)
LAST TESTED: (mm/dd/yyyy)	05/03/2017		
EXPIRY DATE: (mm/dd/yyyy)	05/03/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 05/11/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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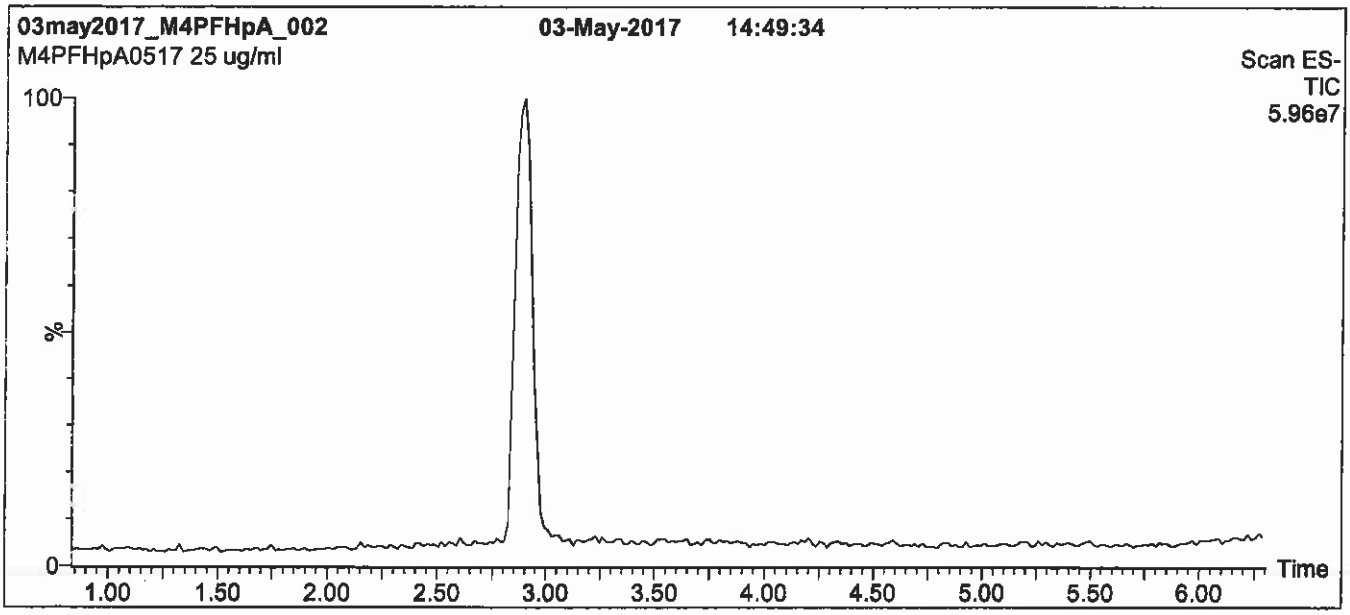
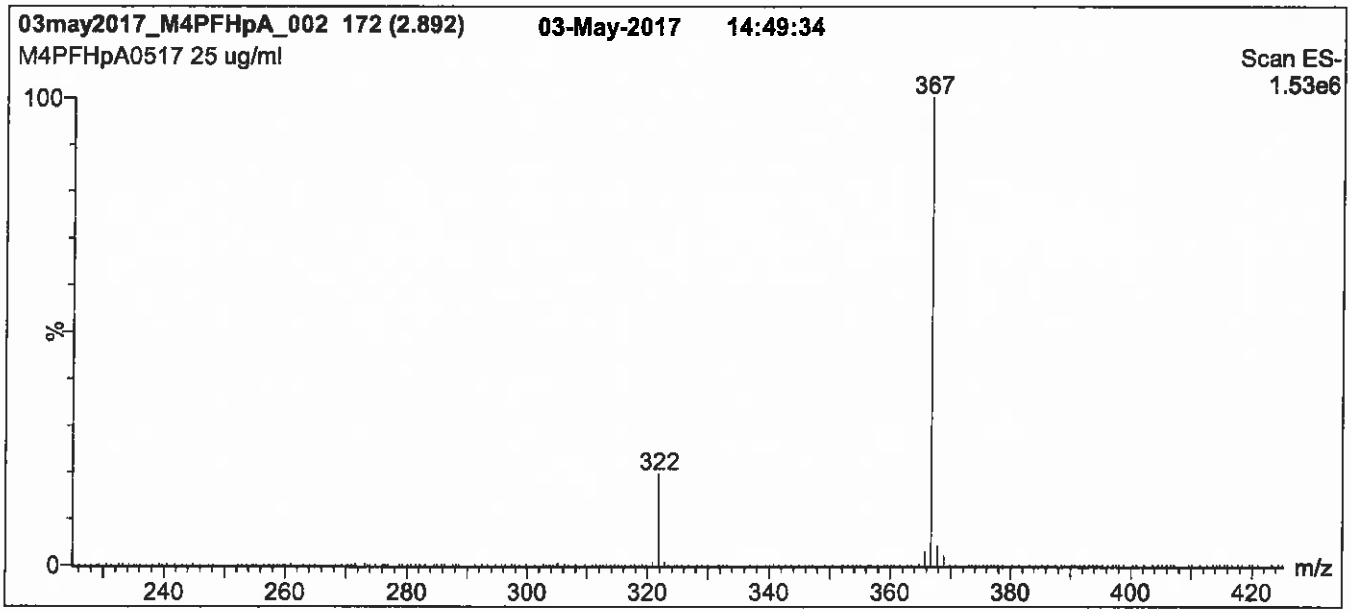
Figure 1: **M4PFHpA; LC/MS Data (TIC and Mass Spectrum)**





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 8 min and hold for 1 min
before returning to initial conditions in 0.5 min.
Time: 10 min

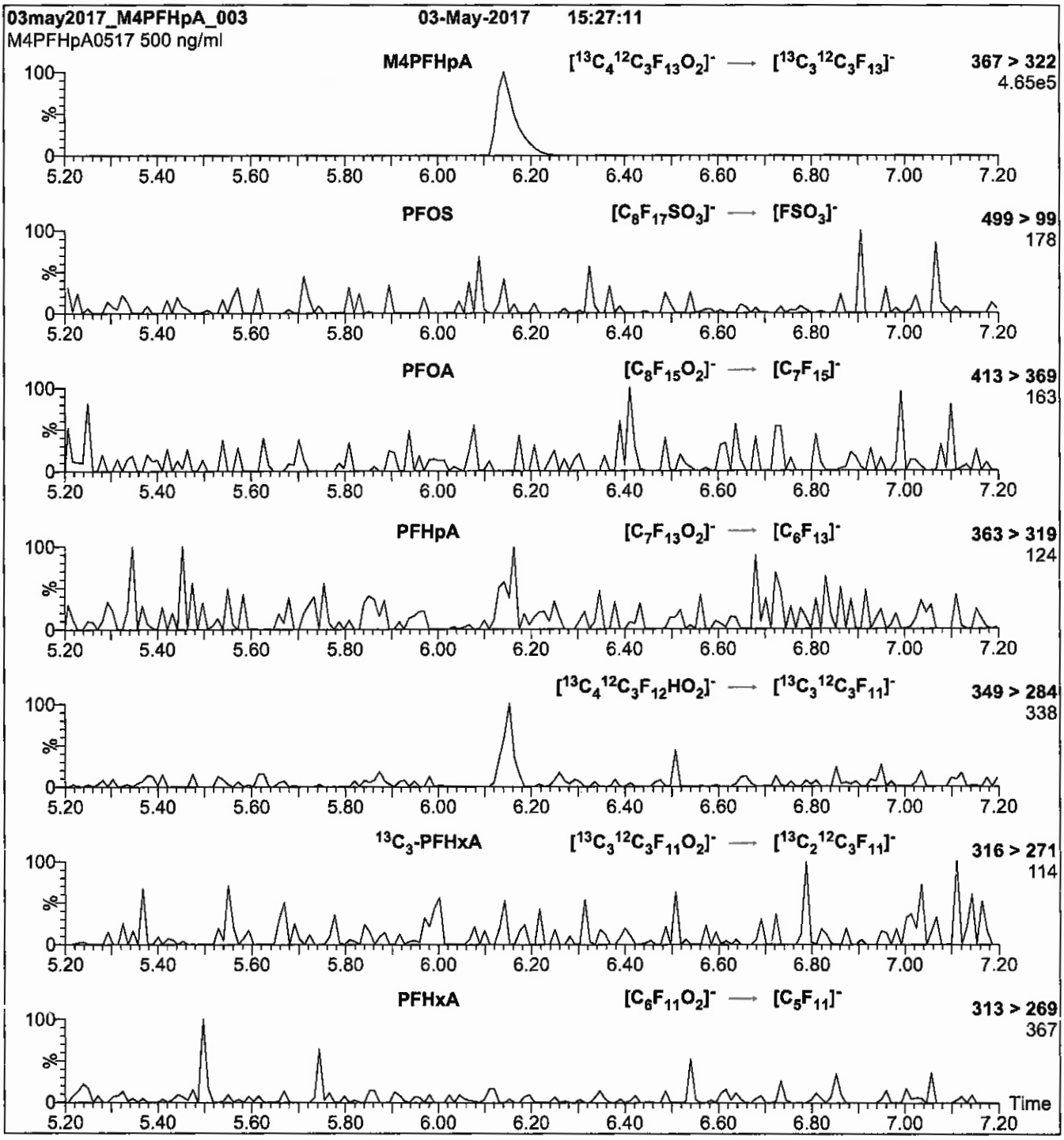
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

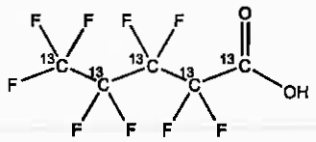
Reagent

LCM5PFPEA_00013

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	M5PFPeA	**LOT NUMBER:**	M5PFPeA0717
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)	07/20/2017		
EXPIRY DATE: (mm/dd/yyyy)	07/20/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 07/26/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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

INTENDED USE:

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HOMOGENEITY:

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CALA

ANAB ACCREDITED

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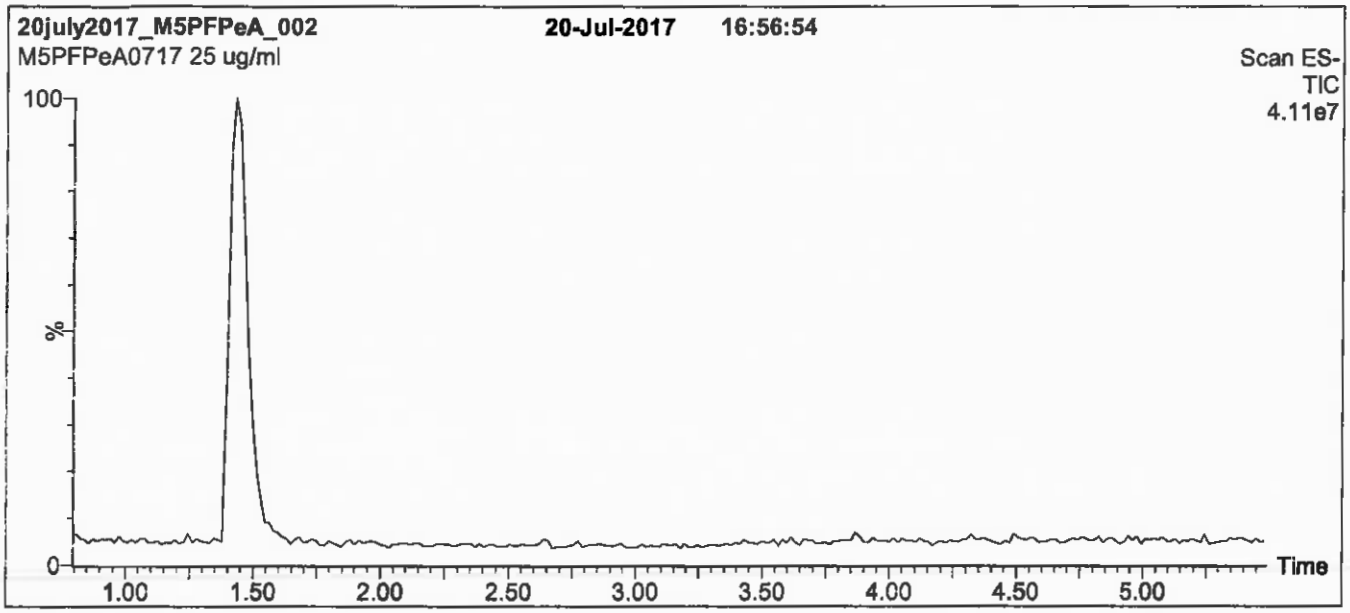
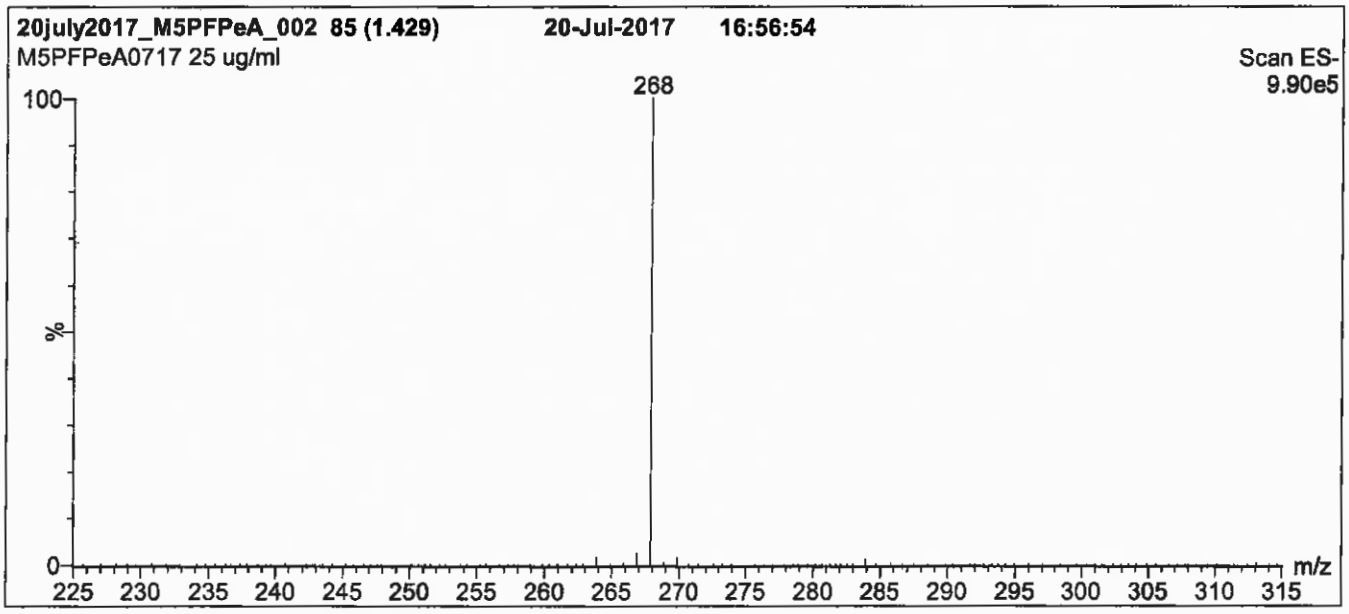
Figure 1: **M5PFPeA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Hold for 1 min. Ramp to 90% organic over 7 min and hold for 1 min before returning to initial conditions in 0.5 min.
Time: 10 min

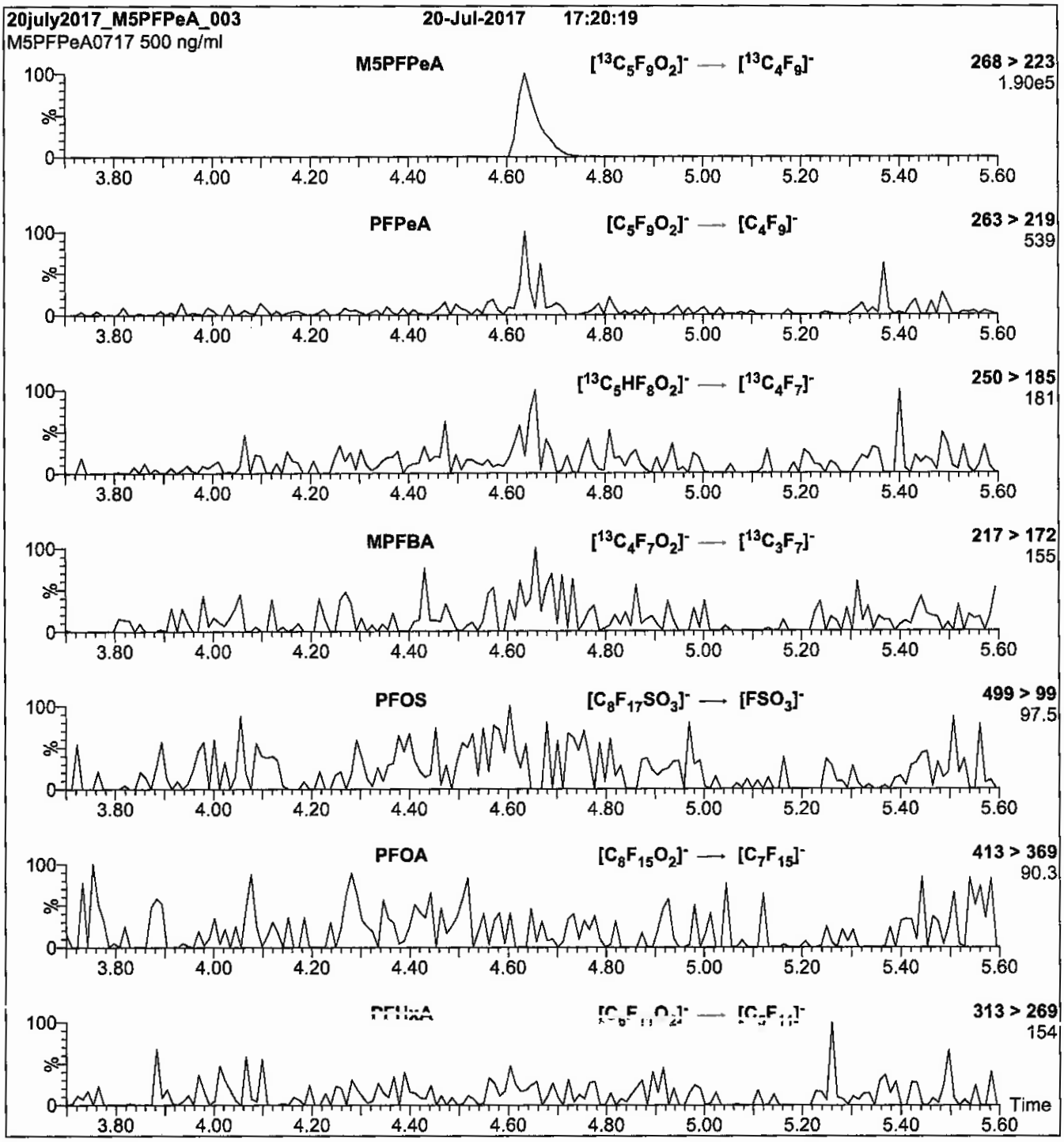
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.54e-3
Collision Energy (eV) = 9

Reagent

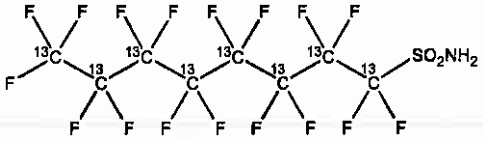
LCM8FOSA_00016

r: 12/4/17
CCL

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M8FOSA-I	**LOT NUMBER:**	M8FOSA1017I
COMPOUND:	Perfluoro-1-[$^{13}C_8$]octanesulfonamide		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_8H_2F_{17}NO_2S$	**MOLECULAR WEIGHT:**	507.09
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Isopropanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($^{13}C_8$)
LAST TESTED: (mm/dd/yyyy)	10/11/2017		
EXPIRY DATE: (mm/dd/yyyy)	10/11/2022		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 1.1% of perfluoro-1-[$^{13}C_4$]octanesulfonamide and ~ 0.01% of perfluoro-1-[$^{13}C_7$]heptanesulfonamide.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 10/20/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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

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

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

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA

ANAB ACCREDITED CERTIFIED REFERENCE MATERIAL PRODUCER

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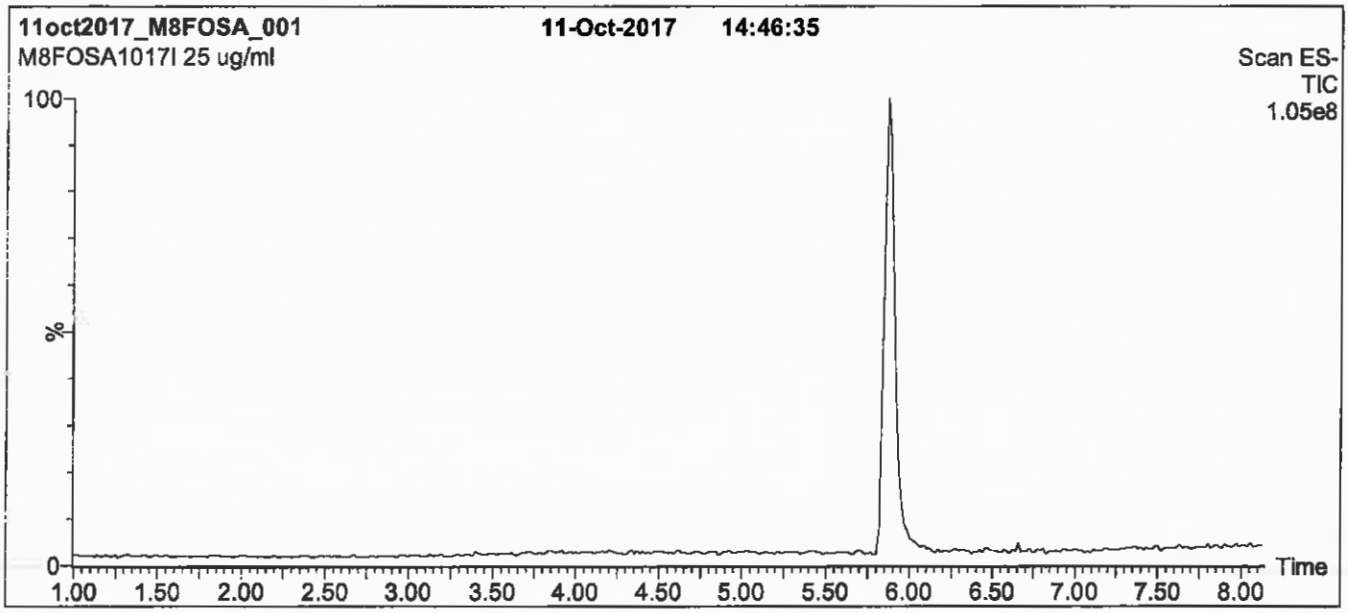
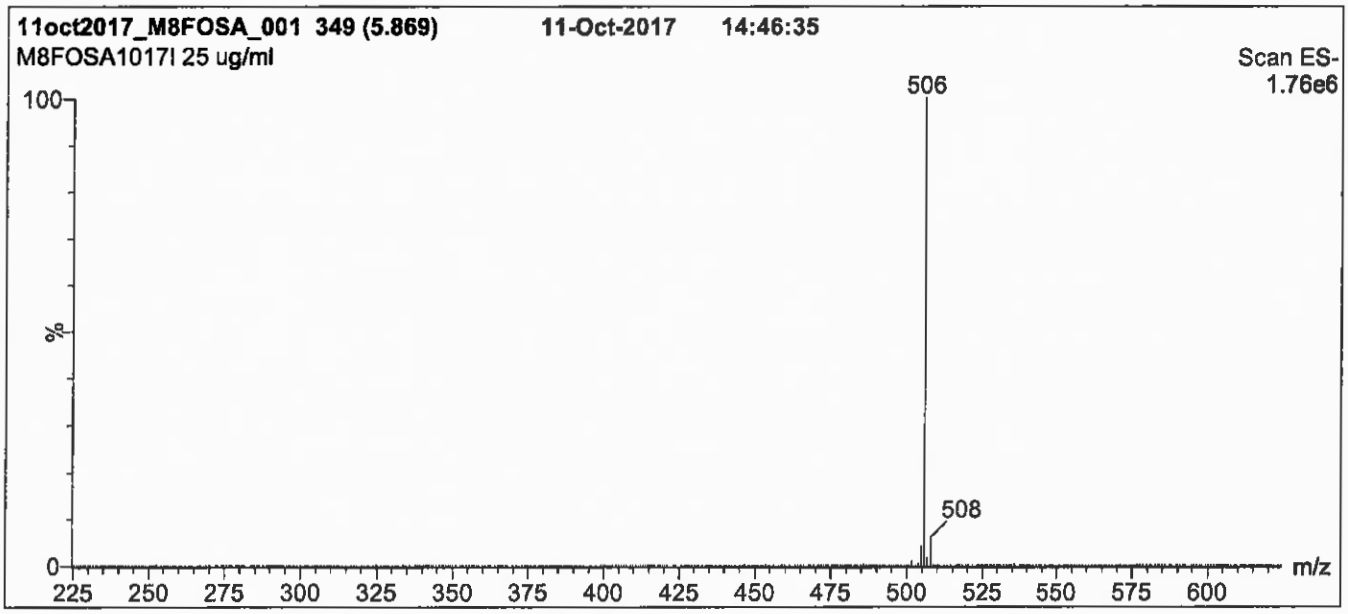
Figure 1: **M8FOSA-I; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 85% organic over 7.5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

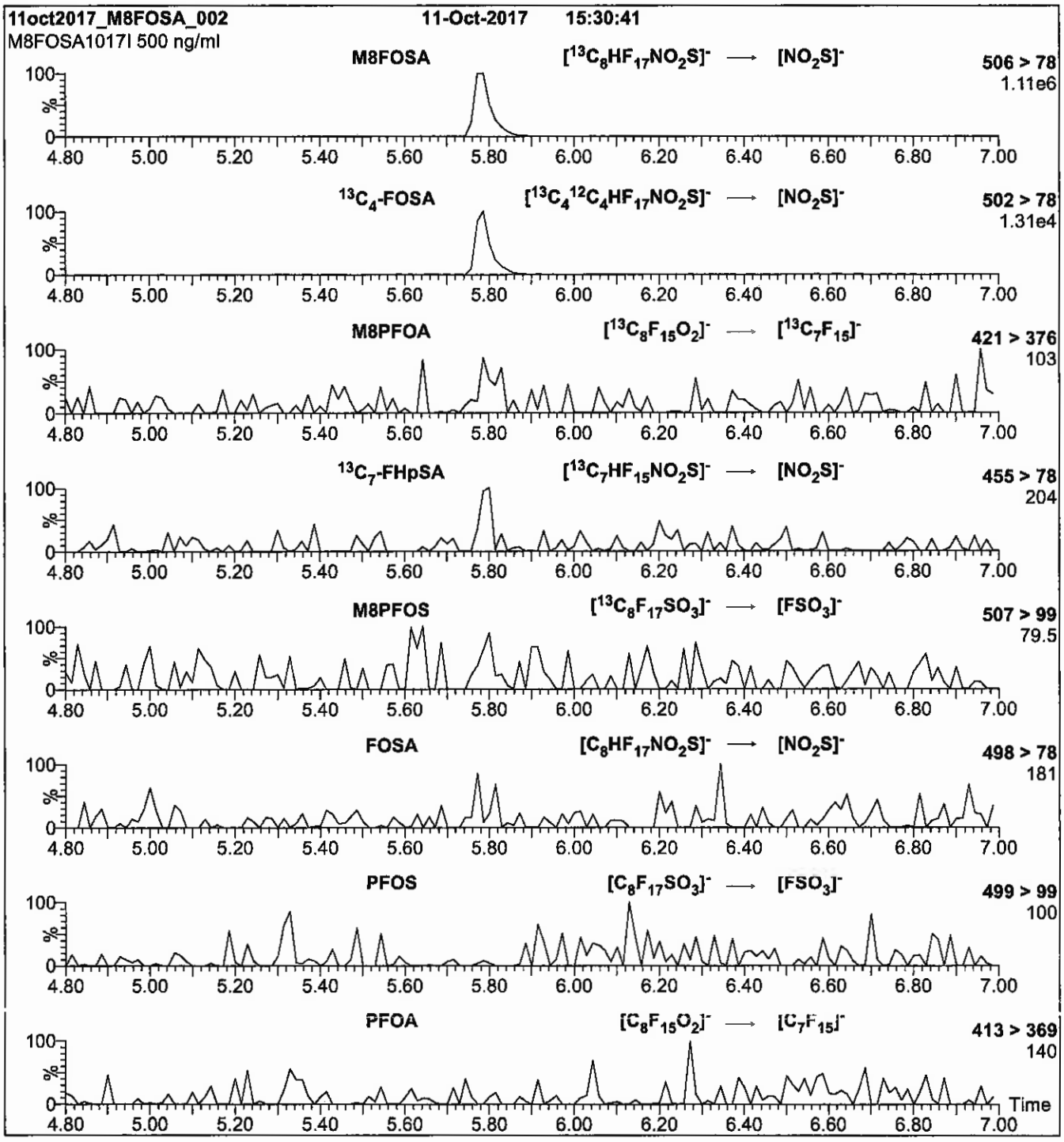
Flow: 300 µl/min

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

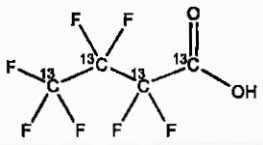
LCMPFBA_00013

r: 12/4/17 ccc

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	MPFBA	**LOT NUMBER:**	MPFBA0417
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)	04/12/2017		
EXPIRY DATE: (mm/dd/yyyy)	04/12/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 04/20/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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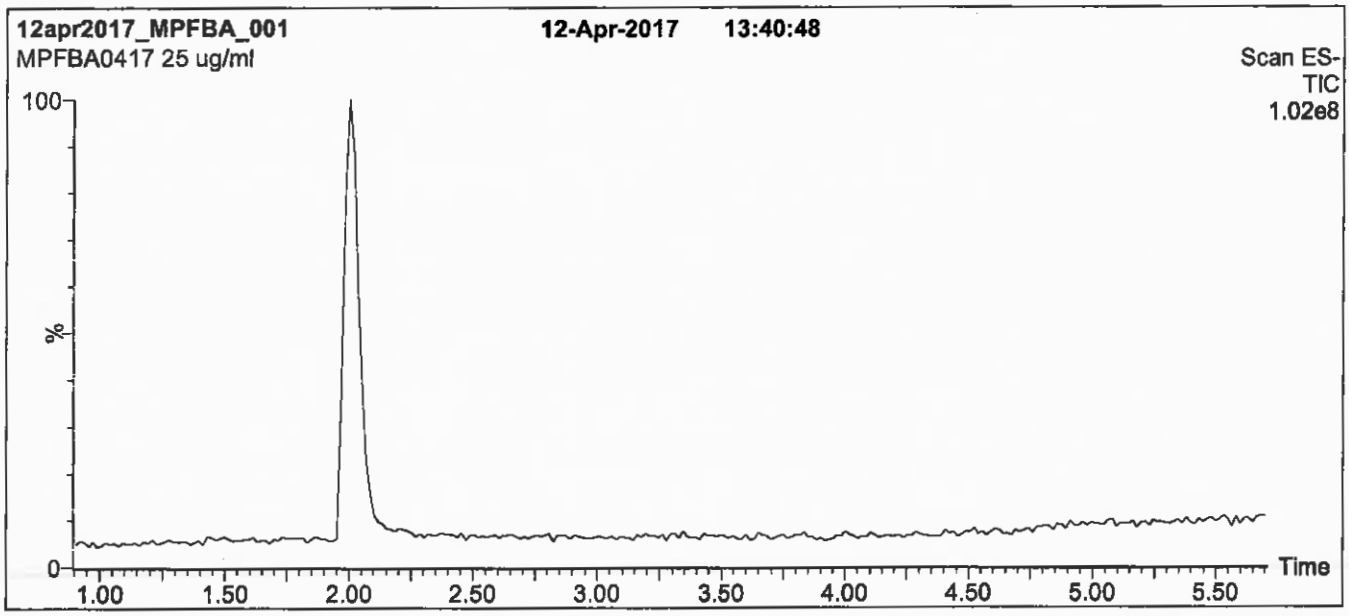
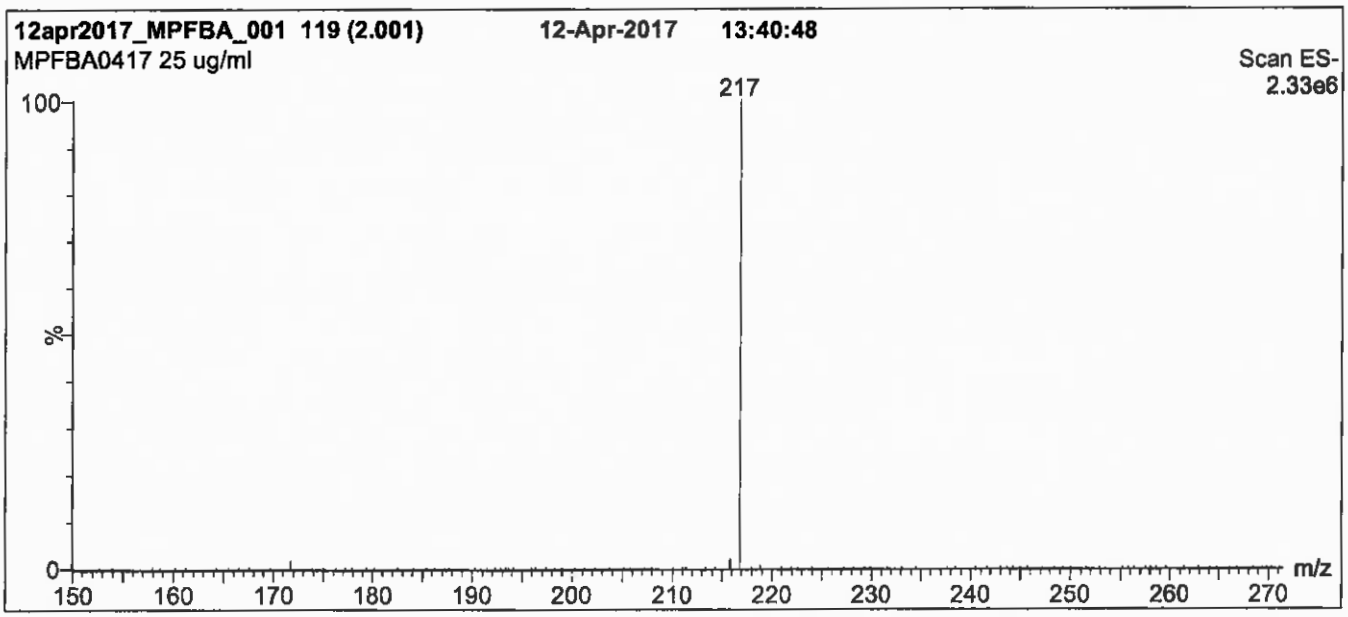
Figure 1: **MPFBA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

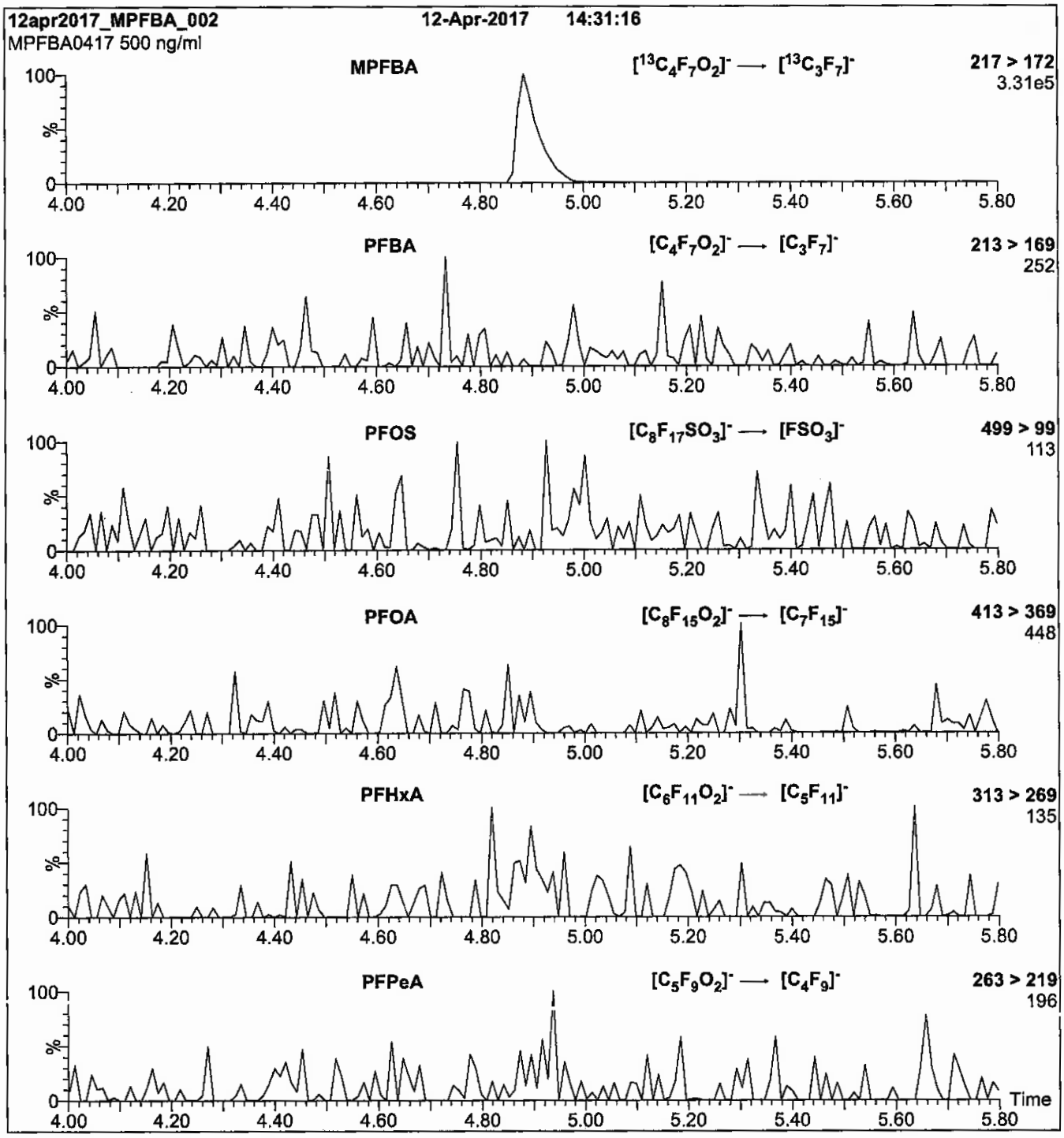
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCMPFBS_00006

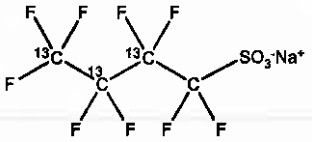
1106130
ID: LCMPFBS_00006
Exp: 05/24/22 Prpd: CCL
13C3-Perfluorobutanesulfo

r: 12/4/17 CCL

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M3PFBS	**LOT NUMBER:**	M3PFBS0815
COMPOUND:	Sodium perfluoro-1-[2,3,4-$^{13}C_3$]butanesulfonate		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_3{}^{12}CF_8SO_3Na$	**MOLECULAR WEIGHT:**	325.06
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 46.5 ± 2.3 µg/ml (M3PFBS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($2,3,4\text{-}^{13}C_3$)
LAST TESTED: (mm/dd/yyyy)	05/24/2017		
EXPIRY DATE: (mm/dd/yyyy)	05/24/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 05/25/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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

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CALA

ANAB ACCREDITED

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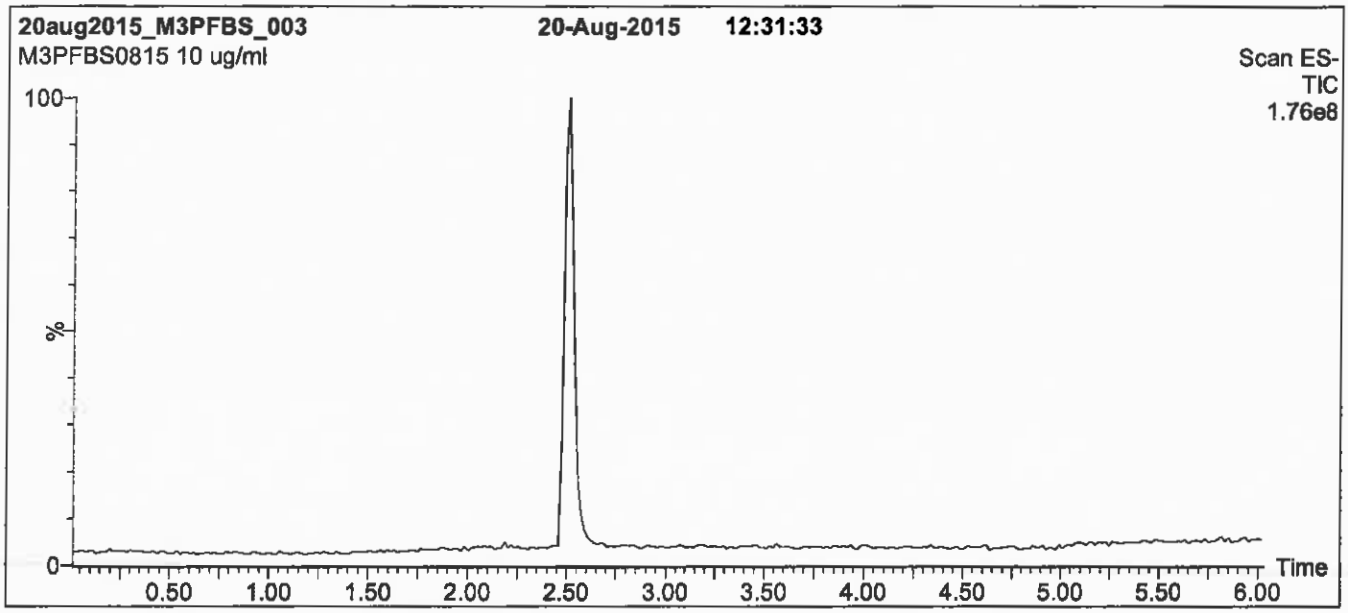
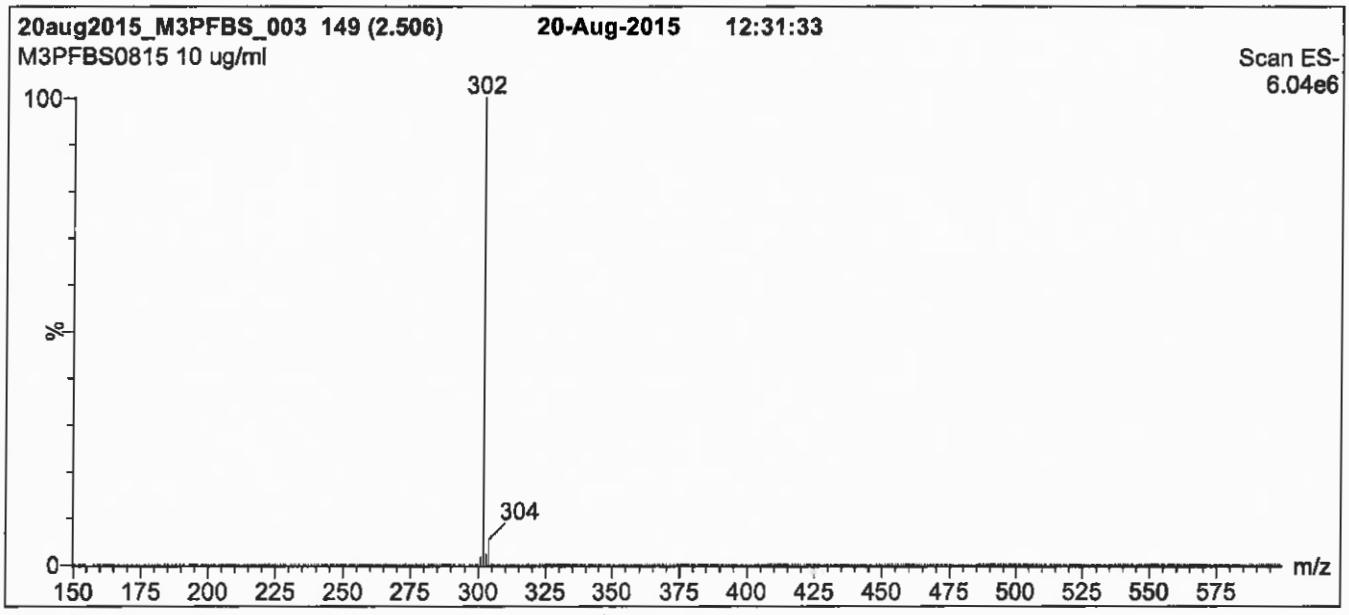
Figure 1: **M3PFBS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield 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
2 min before returning to initial conditions in 0.5 min.
Time: 10 min

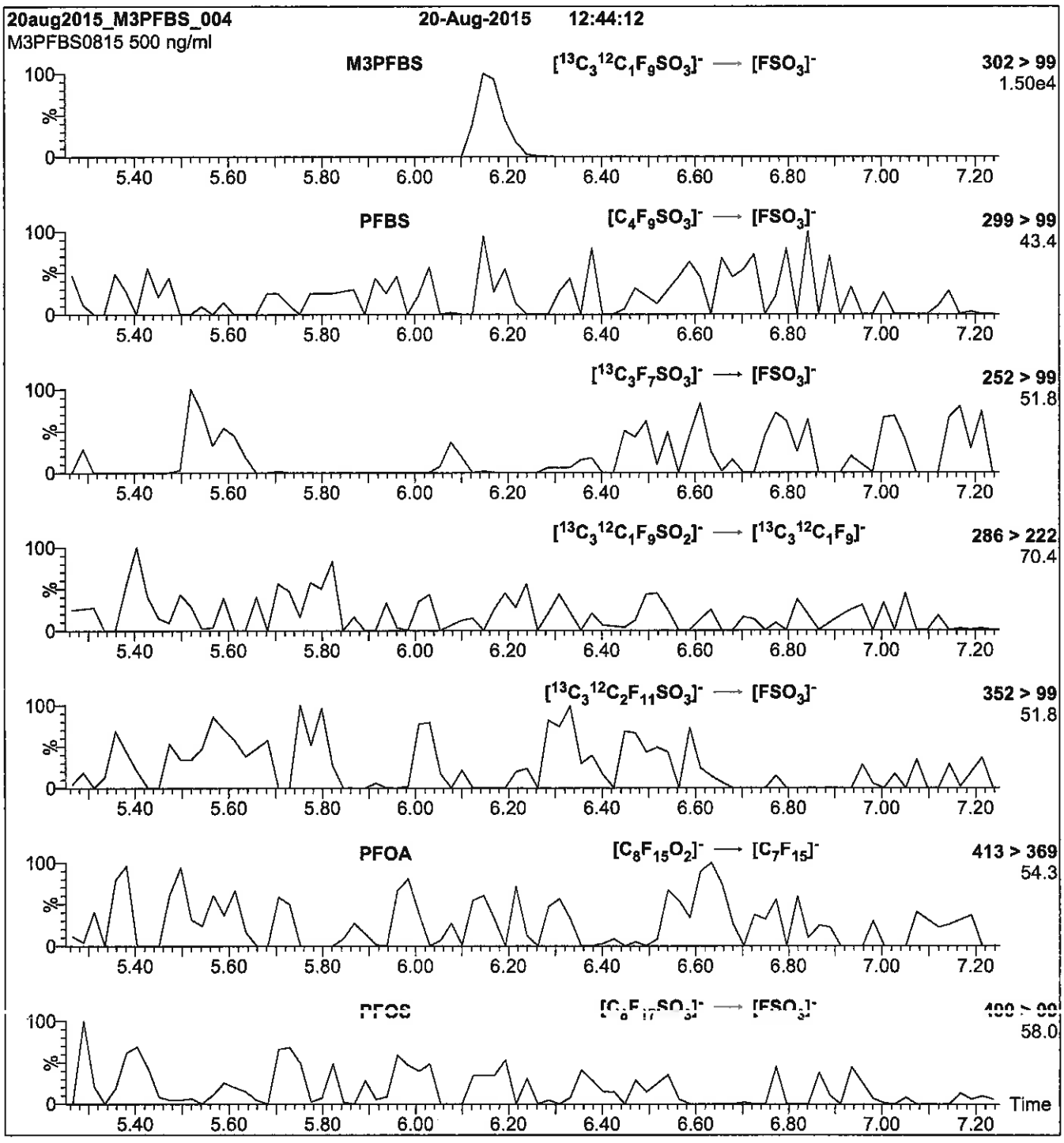
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCMPFDA_00018

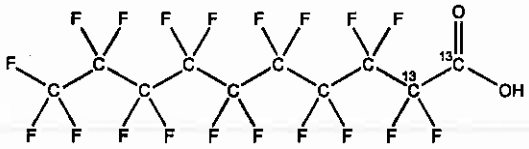
1106159
ID: LCMPFDA_00018
Exp: 07/13/22 Prpd: CCL
13C2-Perfluorodecanoic a

r: 12/4/17 cc

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MPFDA	**LOT NUMBER:**	MPFDA0717
COMPOUND:	Perfluoro-n-[1,2-$^{13}C_2$]decanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_8HF_{19}O_2$	**MOLECULAR WEIGHT:**	516.07
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	07/13/2017		
EXPIRY DATE: (mm/dd/yyyy)	07/13/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains < 0.1% of $^{13}C_4$-PFNA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 07/14/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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

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

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

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

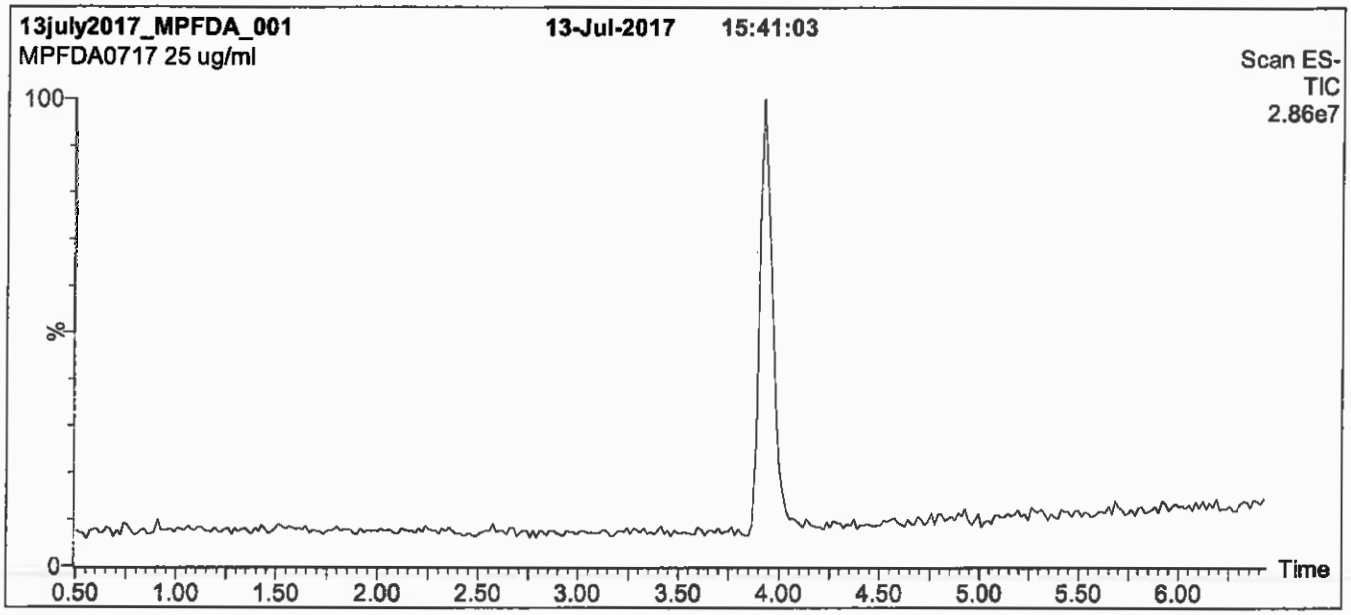
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

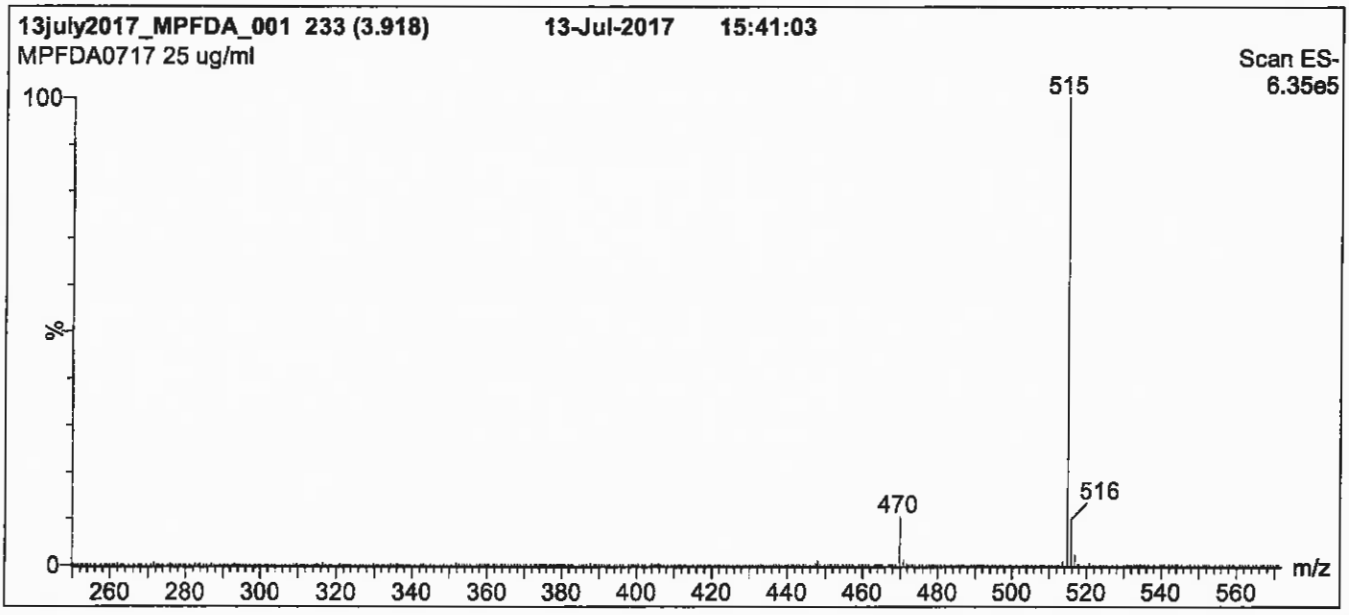
CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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

Figure 1: **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: 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

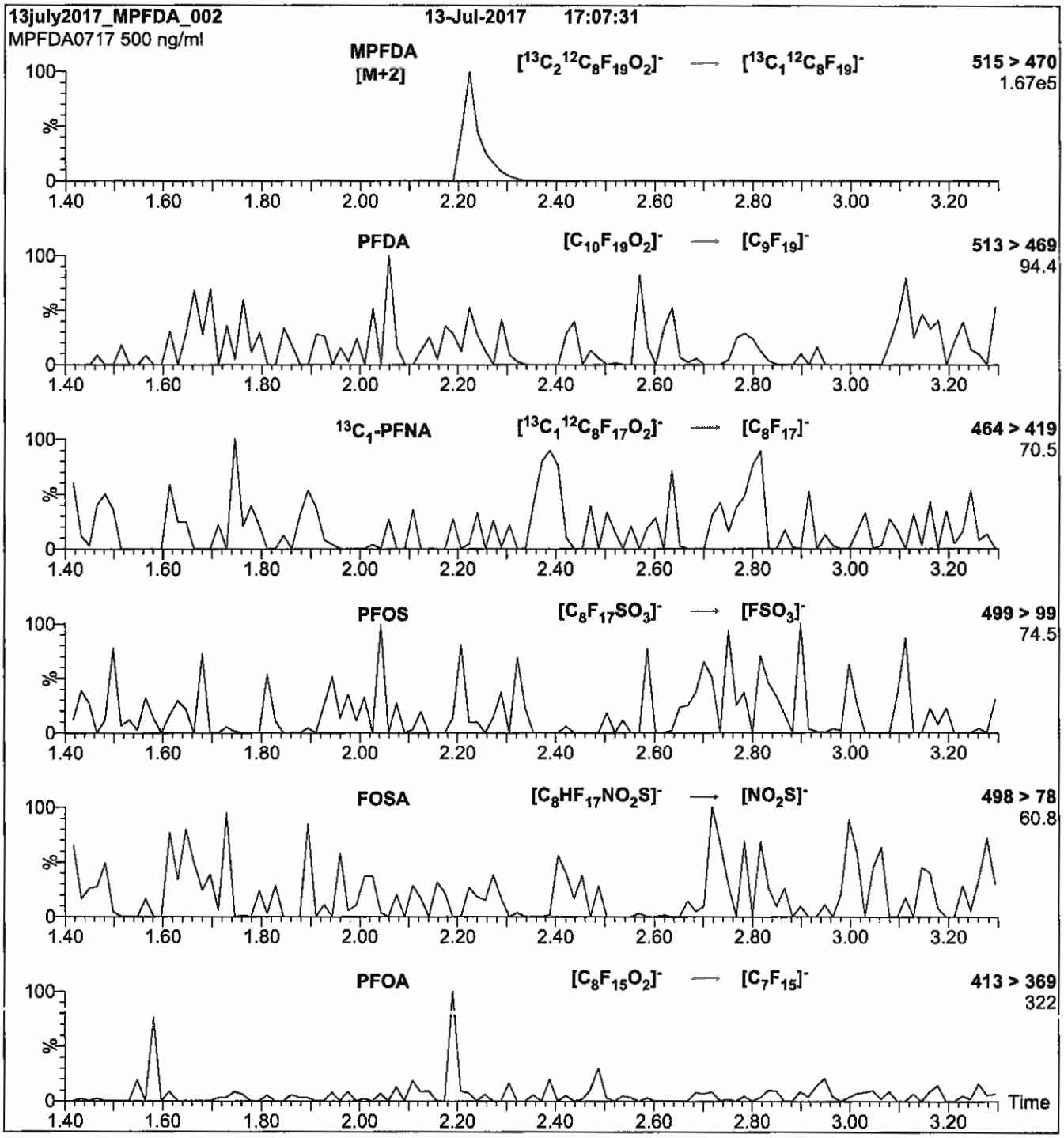
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.17e-3
Collision Energy (eV) = 13

Reagent

LCMPFDoA_00013

1106319
ID: LCMPFDoA_00013
Exp: 05/23/22 Prpd: CCL
13C2-Perfluorododecanoic

r: 12/4/17

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	MPFDoA	**LOT NUMBER:**	MPFDoA0517
COMPOUND:	Perfluoro-n-[1,2-$^{13}C_2$]dodecanoic acid		
STRUCTURE:		**CAS #:**	Not available

MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_{10}HF_{23}O_2$	**MOLECULAR WEIGHT:**	616.08
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	05/23/2017		
EXPIRY DATE: (mm/dd/yyyy)	05/23/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 05/26/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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

UNCERTAINTY:

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

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CALA

ANAB ACCREDITED

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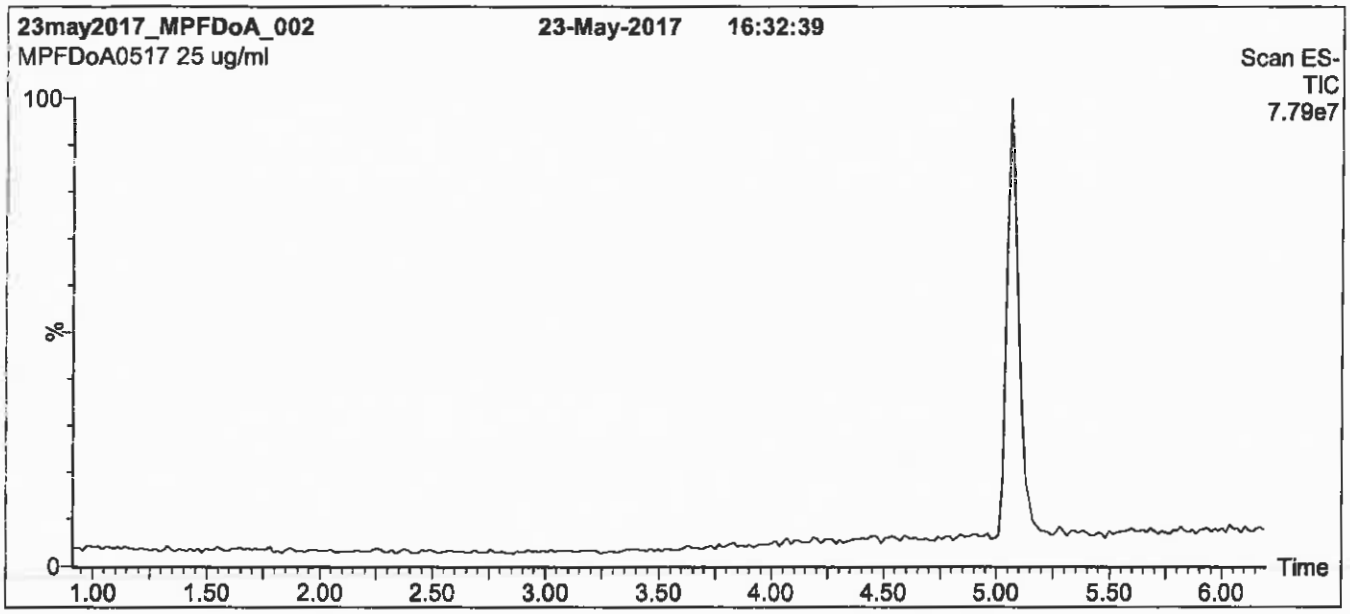
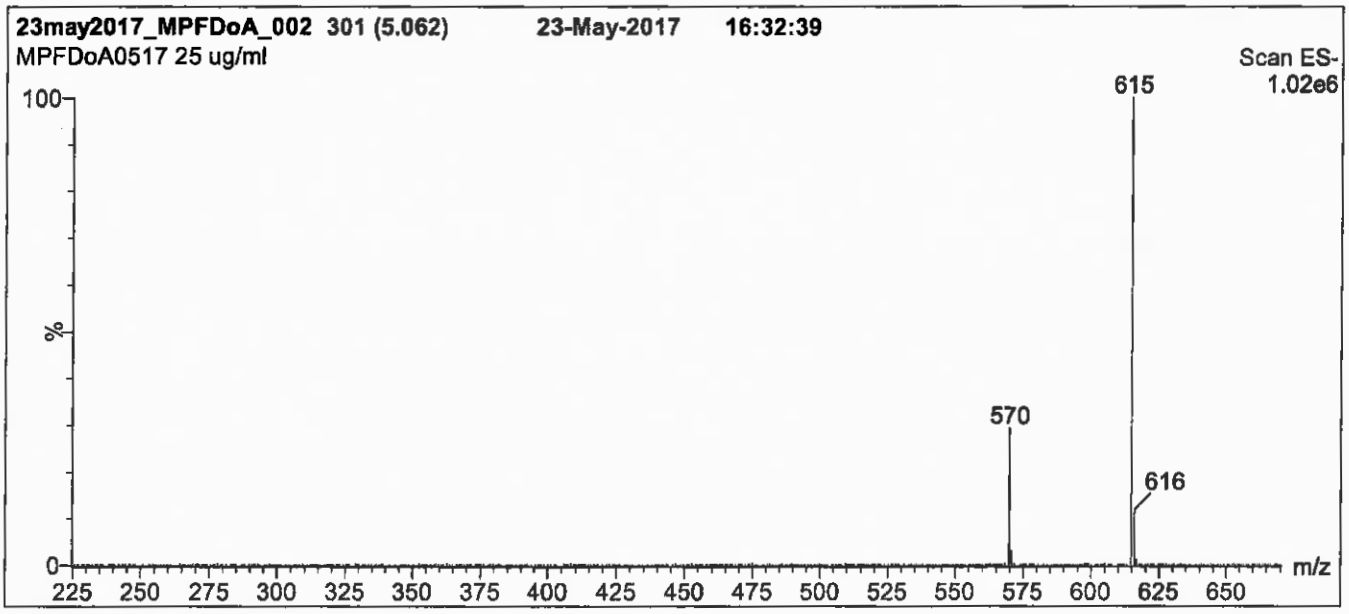
Figure 1: **MPFDoA; LC/MS Data (TIC and Mass Spectrum)**





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

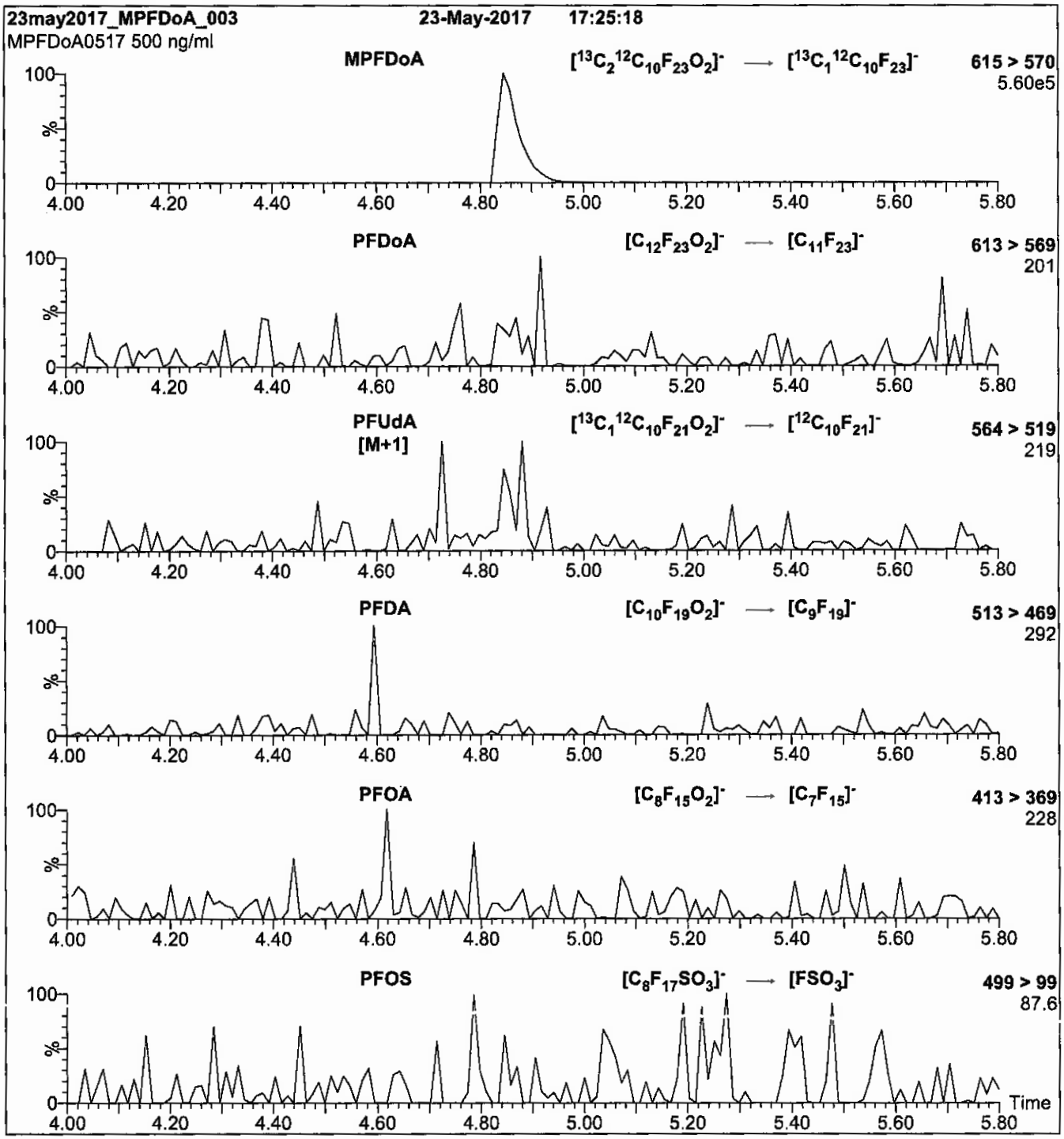
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

Figure 2: **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) = 3.39e-3
Collision Energy (eV) = 13

Reagent

LCMPFHxA_00019

1106139
ID: LCMPFHxA_00019
Exp: 10/27/22 Rpd: CCL
13C2-Perfluorohexanoic ac

r: 12/4/17 ccl

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	MPFHxA	**LOT NUMBER:**	MPFHxA1017
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 ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	10/27/2017		
EXPIRY DATE: (mm/dd/yyyy)	10/27/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 10/30/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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

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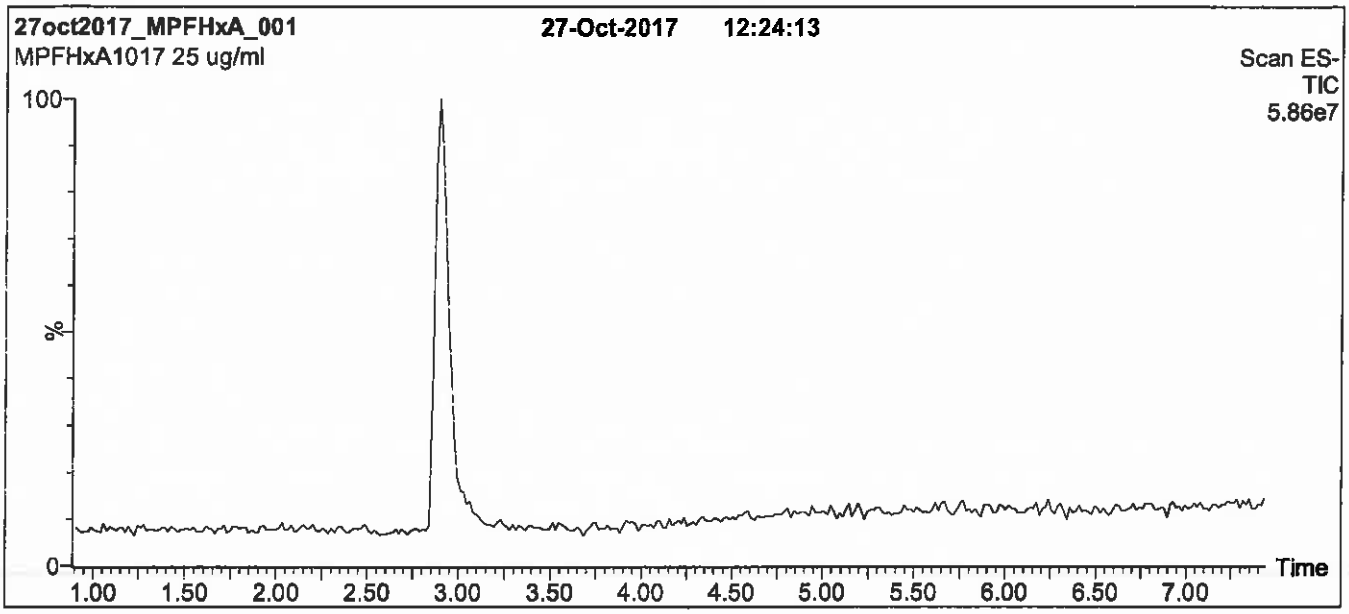
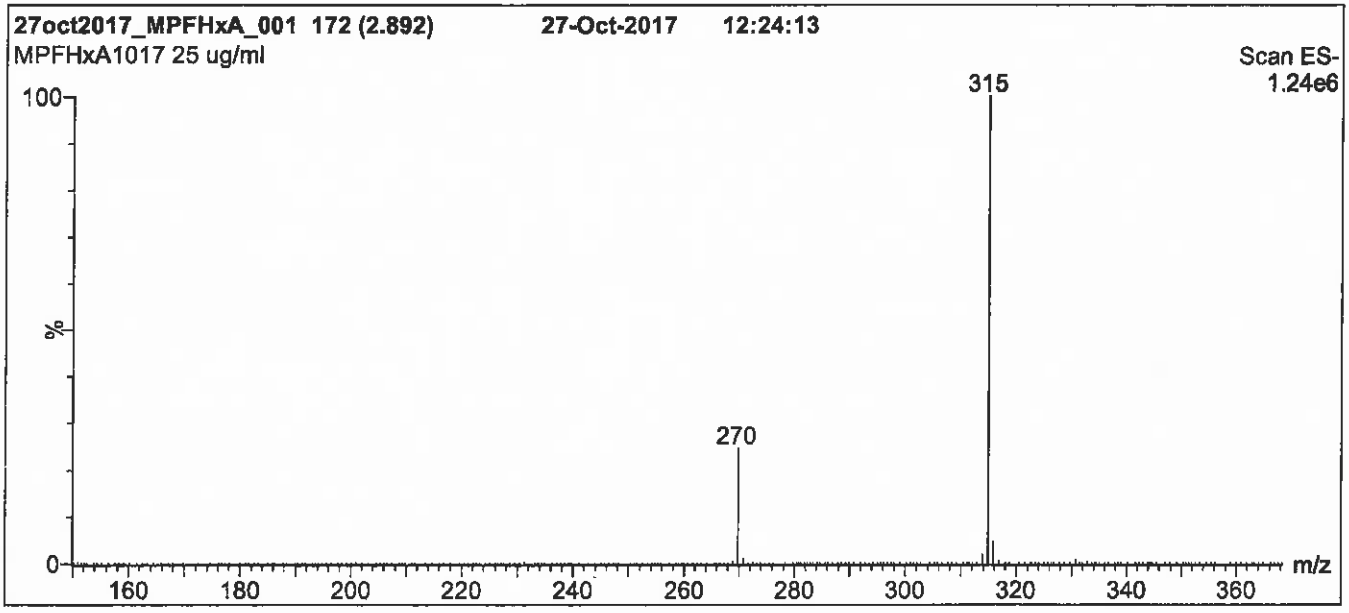
Figure 1: **MPFHxA; LC/MS Data (TIC and Mass Spectrum)**





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: 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 2 min before returning to initial conditions over 0.5 min.
Time: 10 min

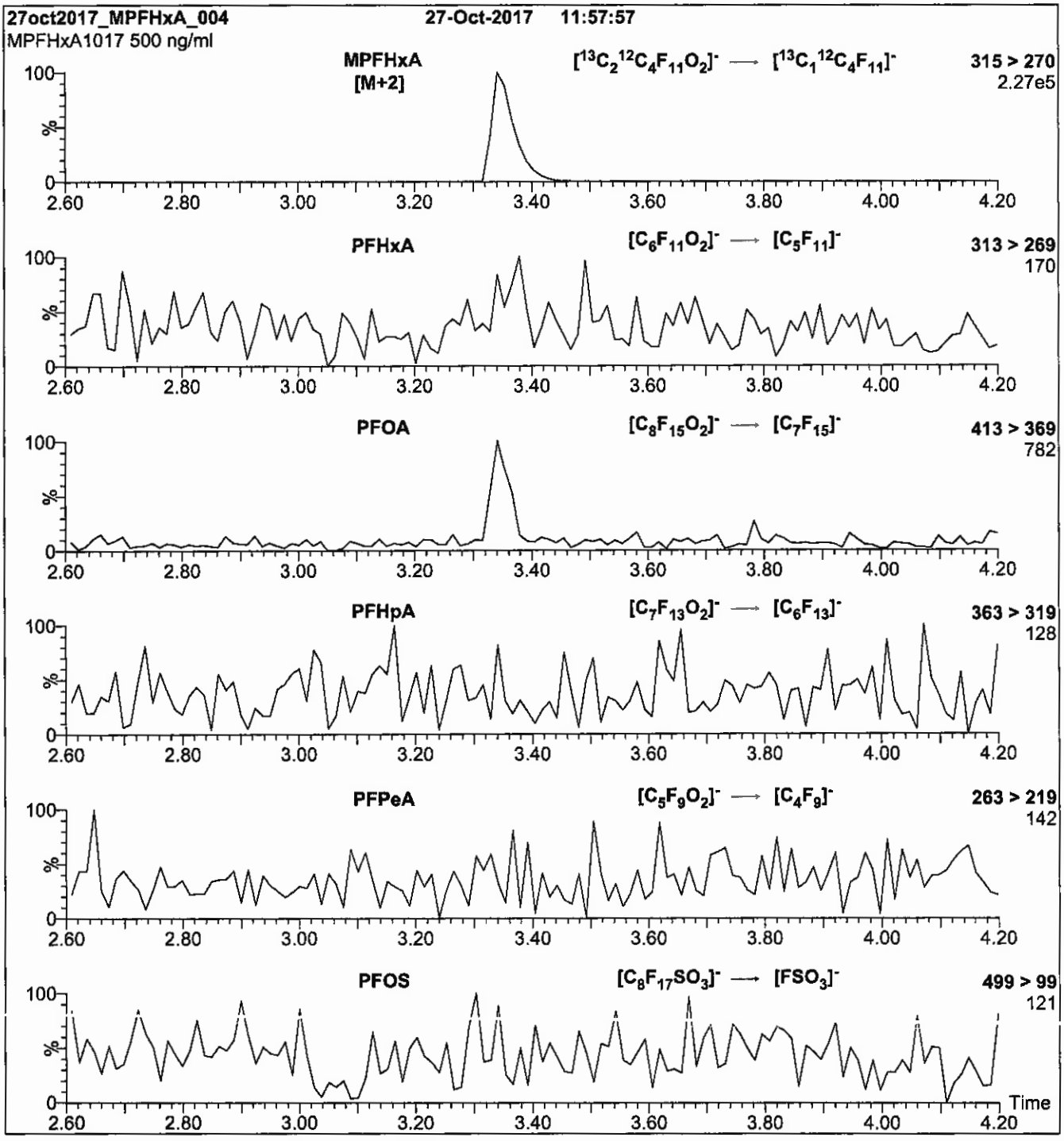
Flow: 300 µl/min

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

Reagent

LCMPFHxS_00013

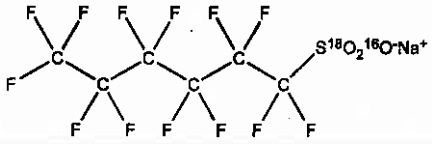
1106238
ID: LCMPFHxS_00013
Exp: 02/17/22 Prpd: CCL
18O2-Perfluorohexanesulfo

r: 12/4/17 CCL

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MPFHxS	**LOT NUMBER:**	MPFHxS0217
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)	02/17/2017		
EXPIRY DATE: (mm/dd/yyyy)	02/17/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- 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.
- Contains ~ 1.0% of sodium perfluoro-1-octane[$^{18}O_2$]sulfonate ($^{18}O_2$-PFOS).
- 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:** 03/02/2017 (mm/dd/yyyy)

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

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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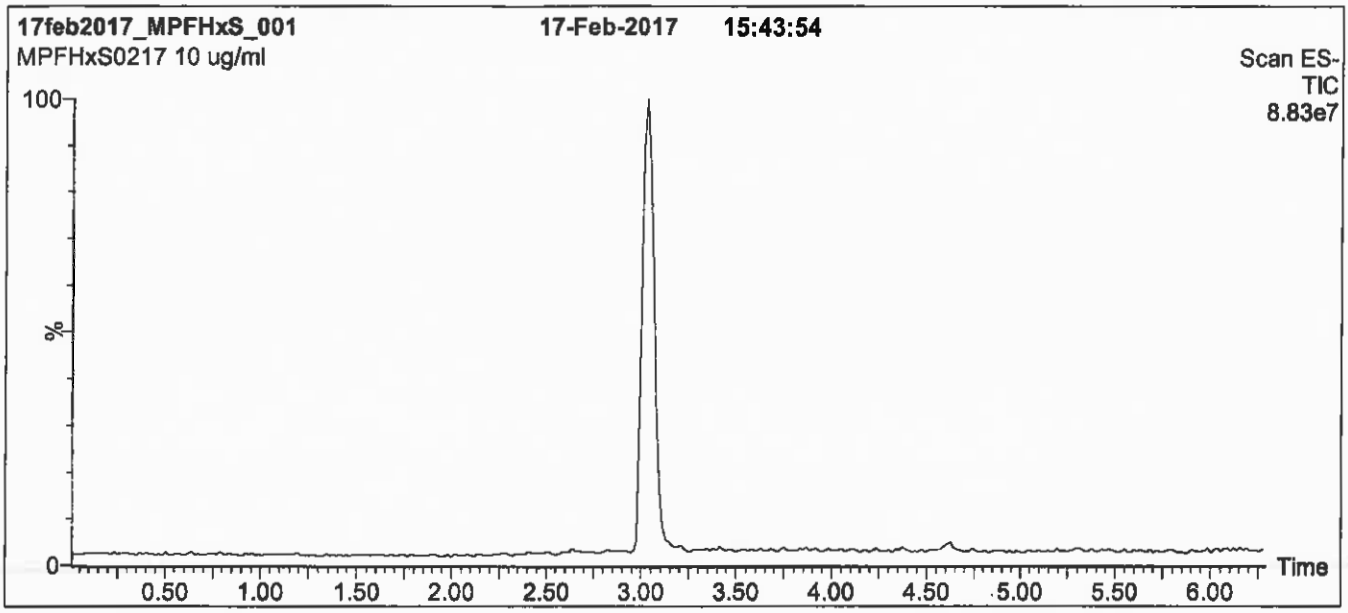
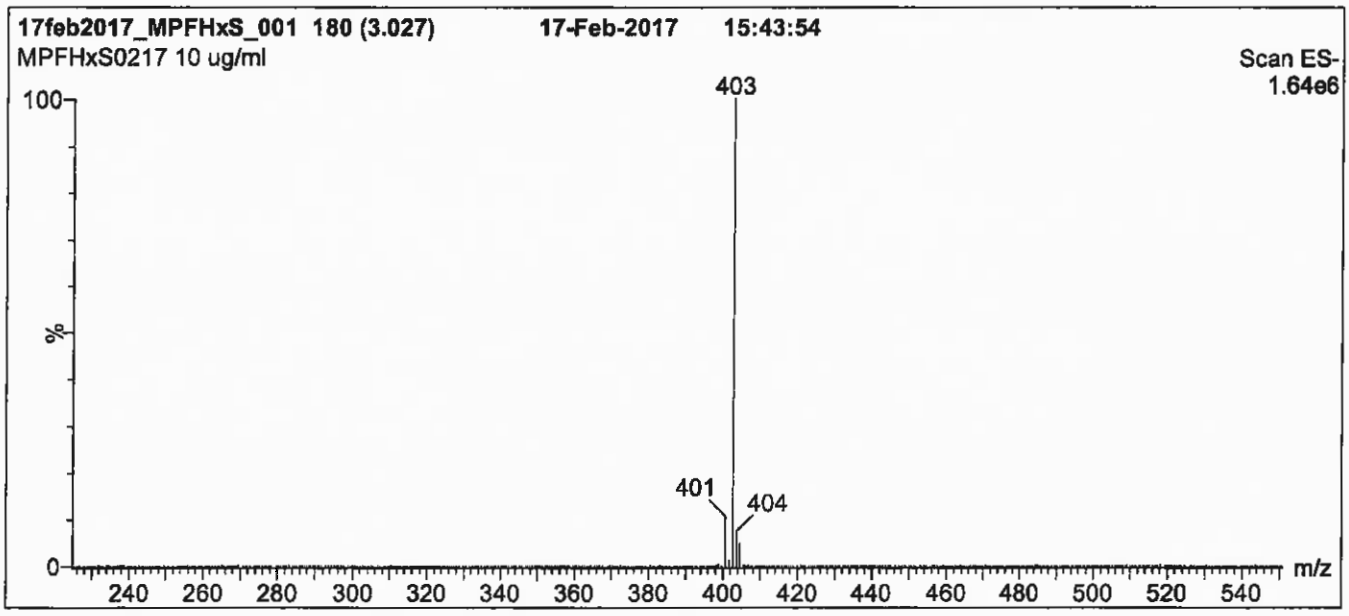
Figure 1: **MPFHxS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 8 min and hold for 1 min before returning to initial conditions in 0.5 min.
Time: 10 min

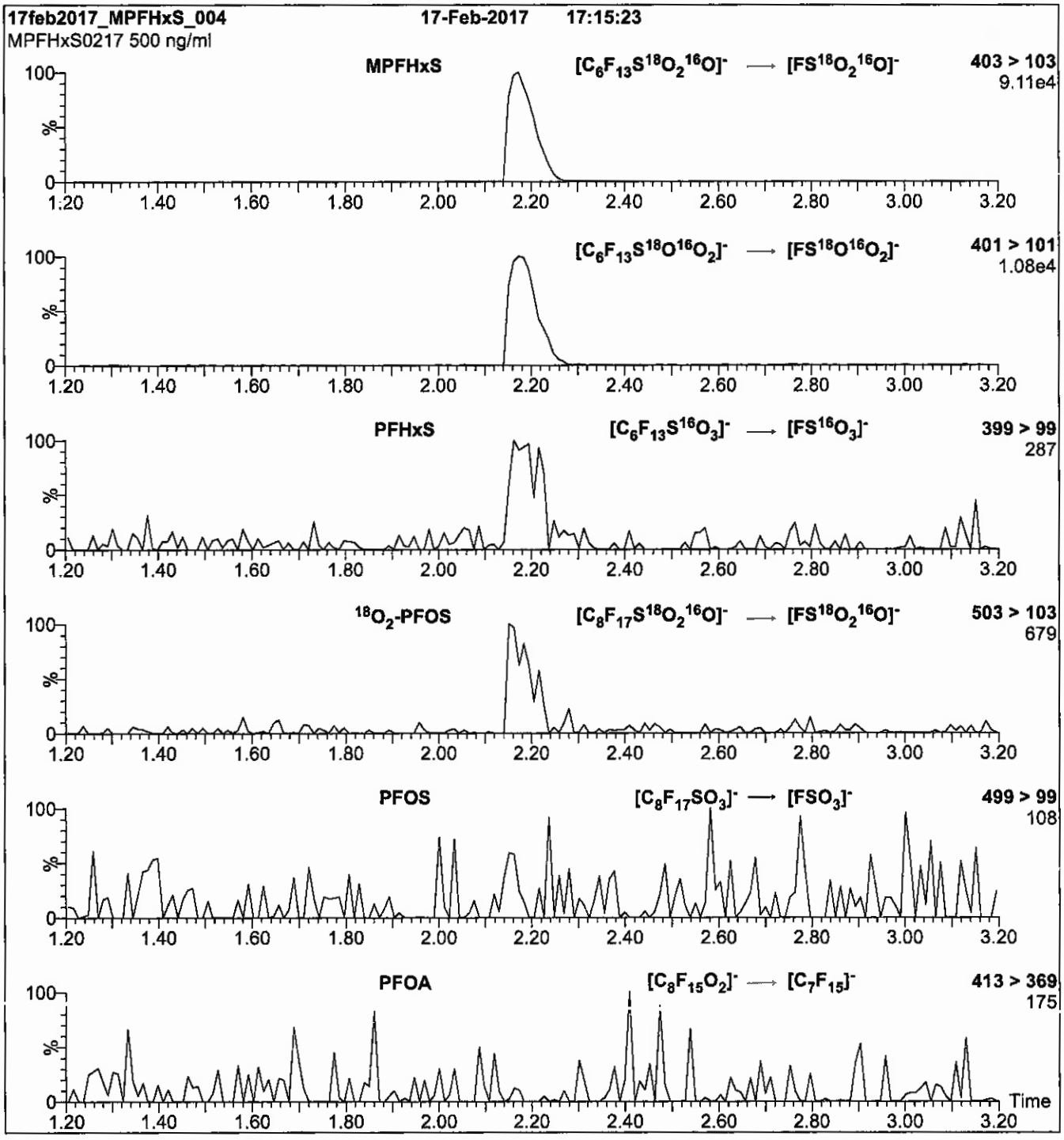
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

Figure 2: **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) = 3.43e-3
Collision Energy (eV) = 30

Reagent

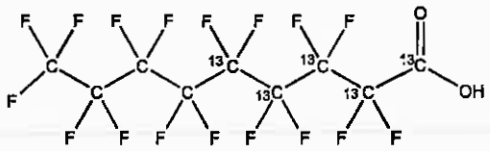
LCMPFNA_00013

r: 12/4/17 ccc

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	MPFNA	**LOT NUMBER:**	MPFNA0916
COMPOUND:	Perfluoro-n-[1,2,3,4,5-$^{13}C_5$]nonanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_5{}^{12}C_4HF_{17}O_2$	**MOLECULAR WEIGHT:**	469.04
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2,3,4,5-$^{13}C_5$)
LAST TESTED: (mm/dd/yyyy)	09/30/2016		
EXPIRY DATE: (mm/dd/yyyy)	09/30/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 10/11/2016 (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.

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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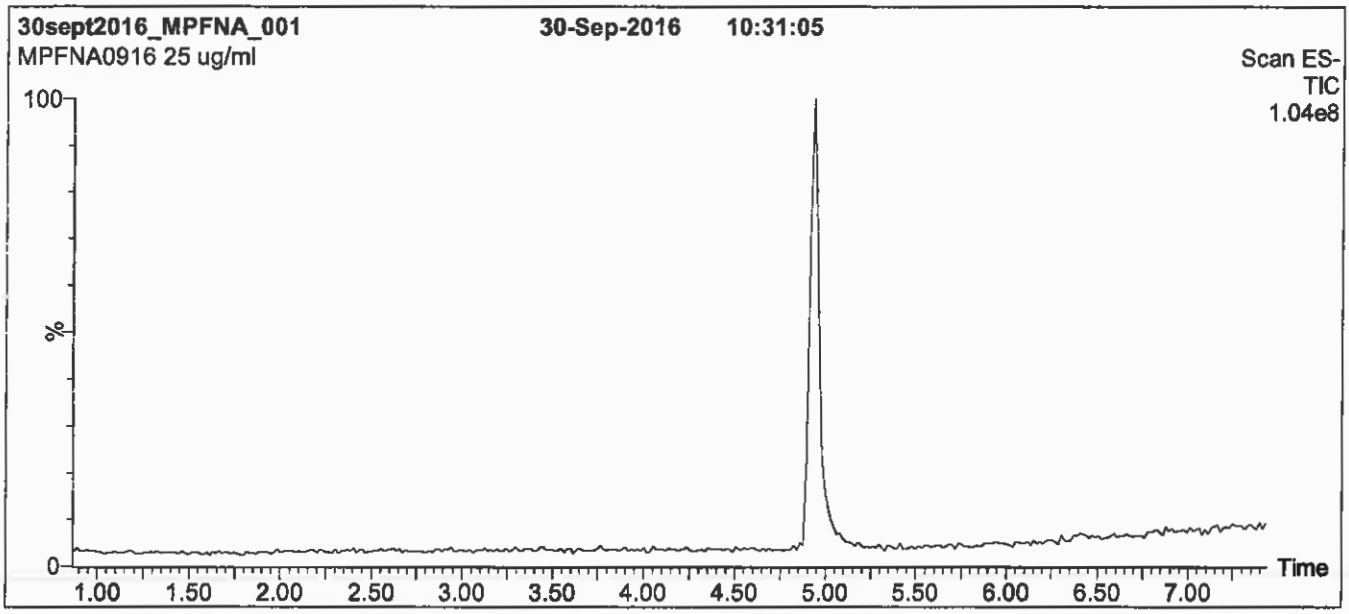
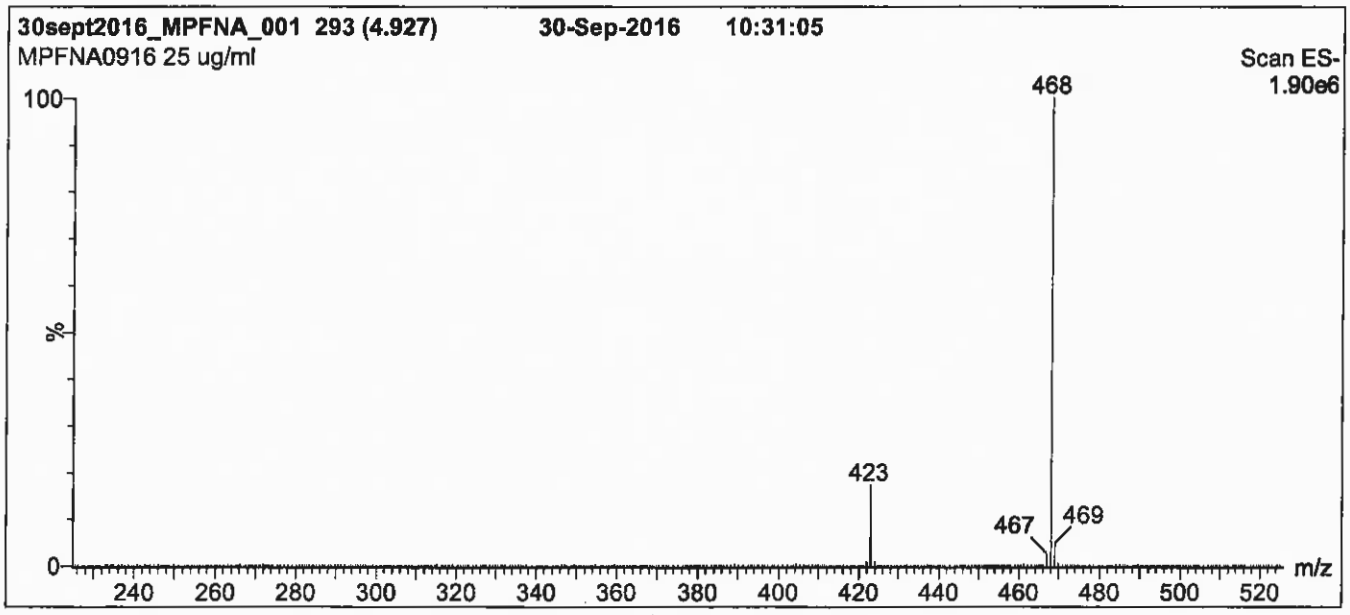




Conditions for Figure 1:

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

Chromatographic Conditions

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

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

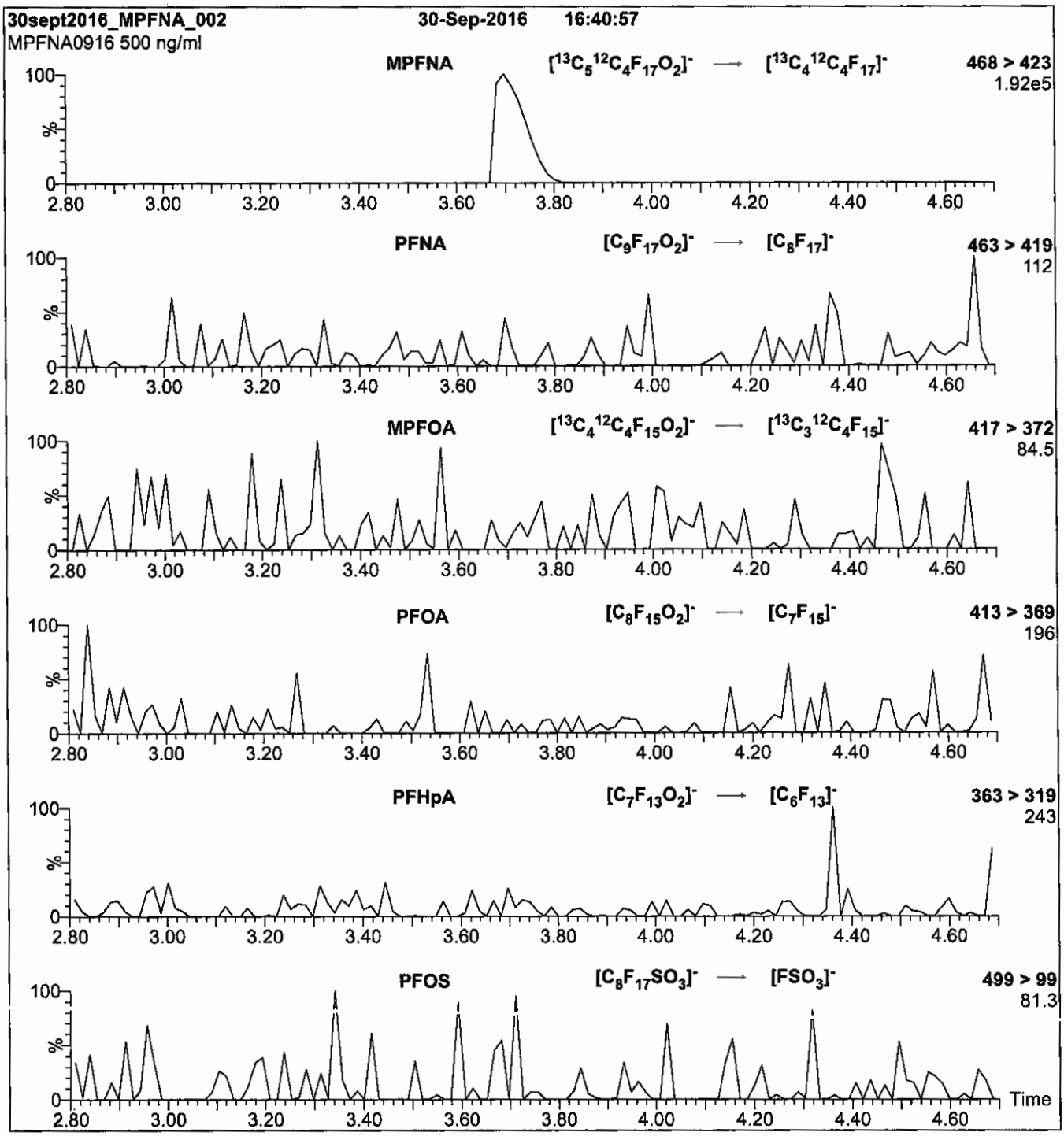
Flow: 300 µl/min

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) = 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) = 3.39e-3
Collision Energy (eV) = 11

Reagent

LCMPFOA_00017

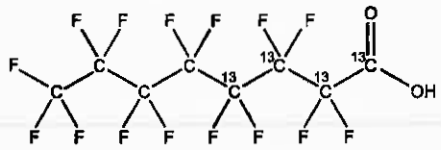
1106032
ID: LCMPFOA_00017
Exp: 10/17/22 Prpd: SKV
13C4-Perfluorooctanoic ac

R: 12/4/17 ccc

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	MPFOA	**LOT NUMBER:**	MPFOA1017
COMPOUND:	Perfluoro-n-[1,2,3,4-$^{13}C_4$]octanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_4{}^{12}C_4HF_{16}O_2$	**MOLECULAR WEIGHT:**	418.04
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2,3,4-$^{13}C_4$)
LAST TESTED: (mm/dd/yyyy)	10/17/2017		
EXPIRY DATE: (mm/dd/yyyy)	10/17/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 10/19/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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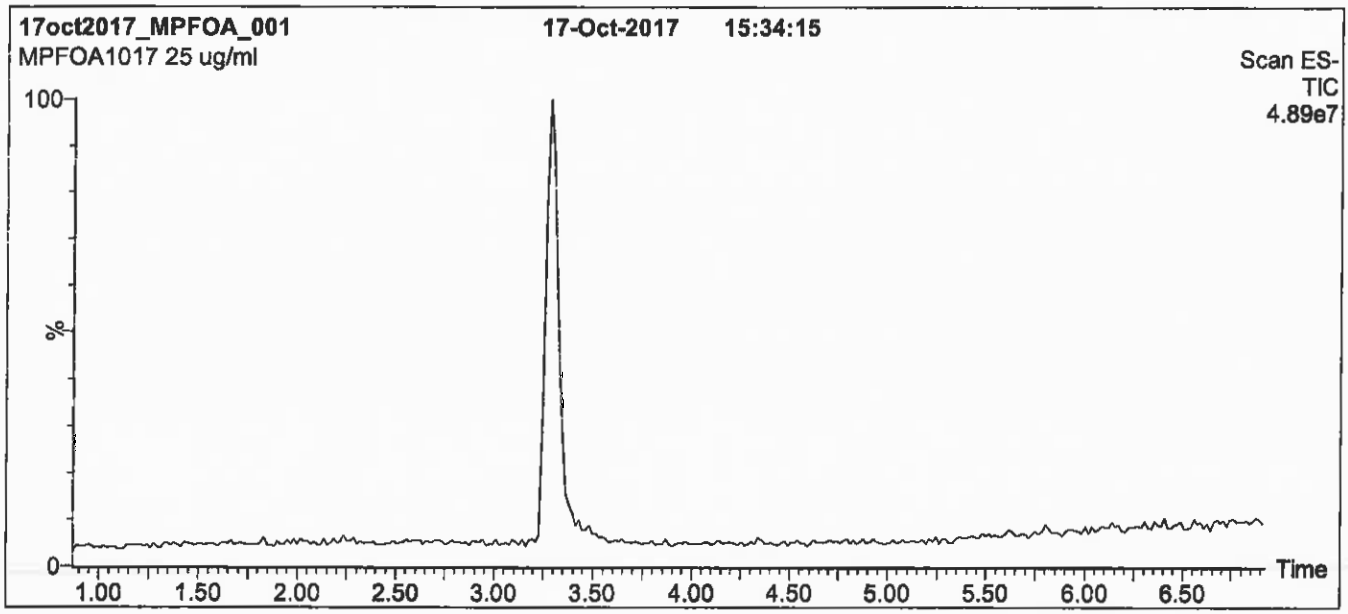
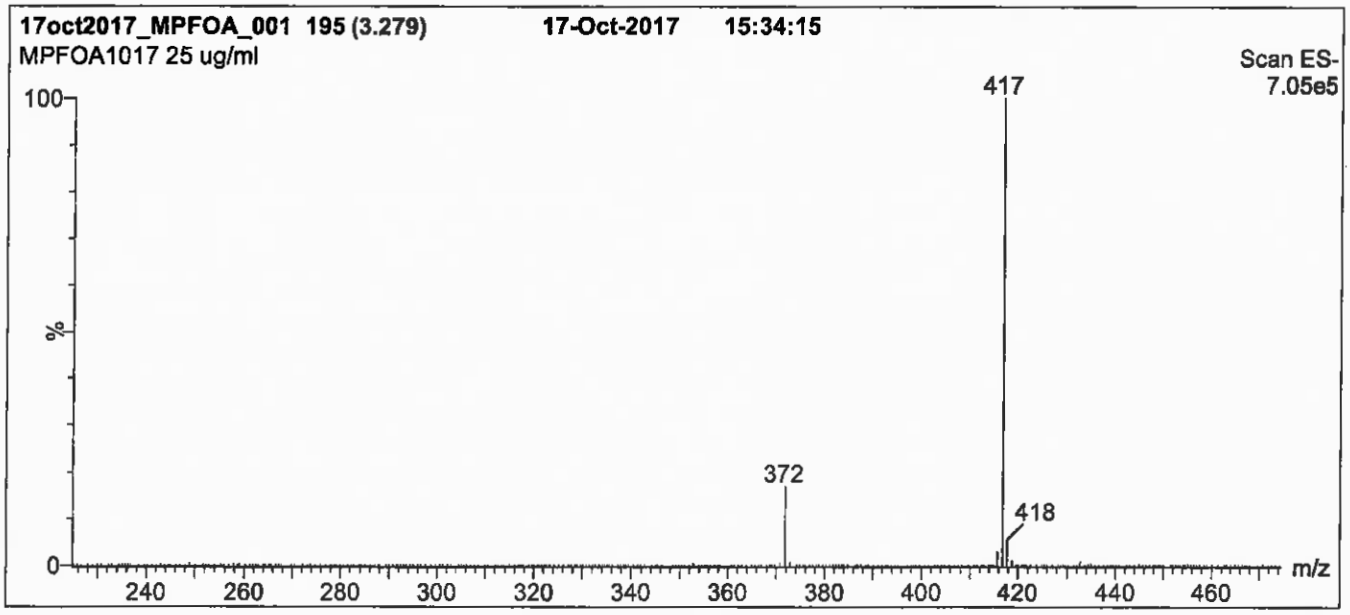
Figure 1: **MPFOA; LC/MS Data (TIC and Mass Spectrum)**





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

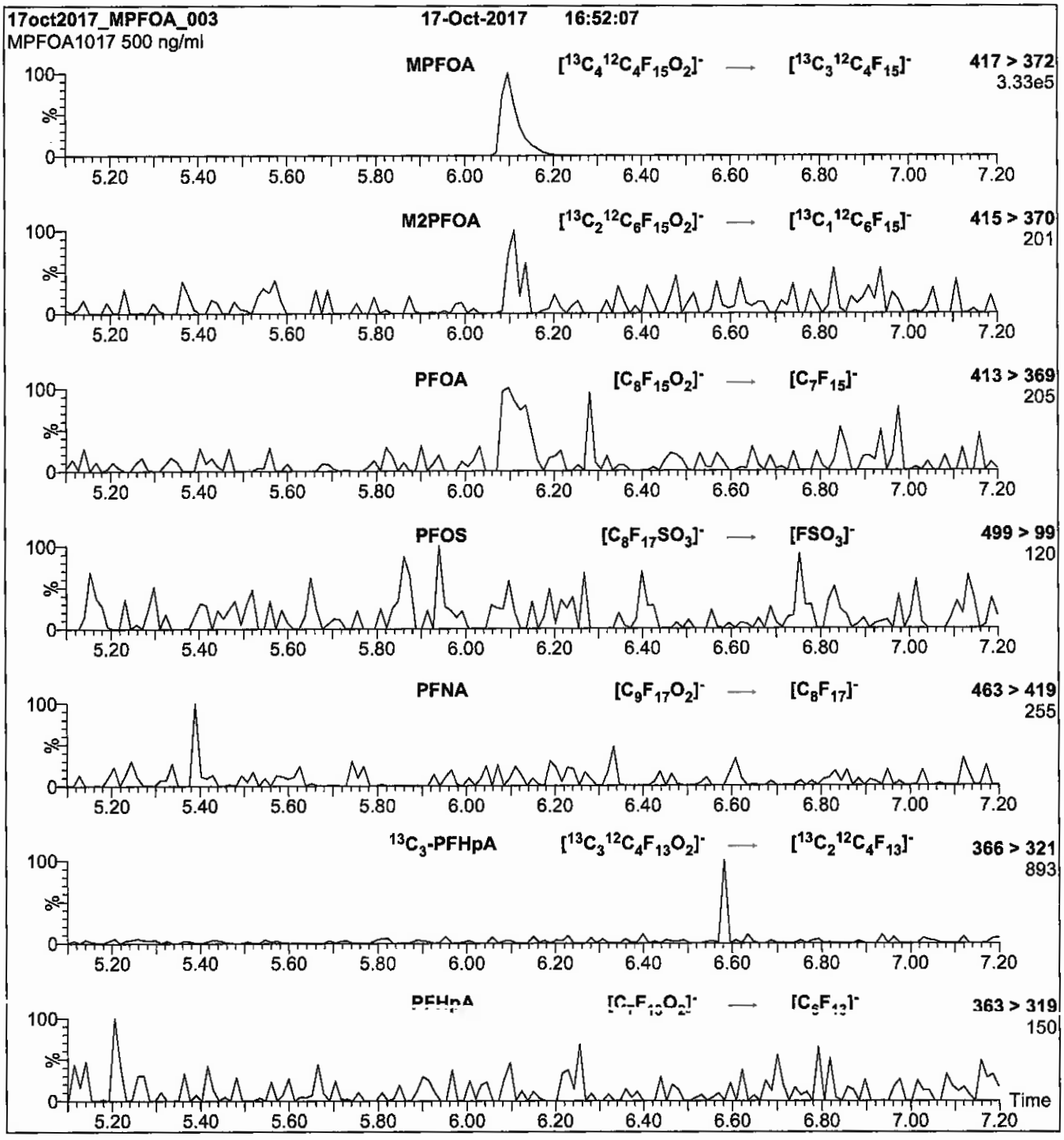
Flow: 300 µl/min

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: **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) = 3.28e-3
Collision Energy (eV) = 11

Reagent

LCMPFOS_00025

1106029
ID: LCMPFOS_00025
Exp: 10/17/22 Prpd: SKV
13C4-Perfluorooctanesulfo

P: 12/4/17 CCL

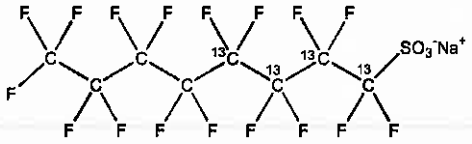
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFOS **LOT NUMBER:** MPFOS1017

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

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$^{13}C_4{}^{12}C_4F_{17}SO_3Na$	**MOLECULAR WEIGHT:**	526.08
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.8 ± 2.4 µg/ml (MPFOS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2,3,4\text{-}^{13}C_4$)
LAST TESTED: (mm/dd/yyyy)	10/17/2017		
EXPIRY DATE: (mm/dd/yyyy)	10/17/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.4% Sodium perfluoro-1-[1,2,3-$^{13}C_3$]heptanesulfonate.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 10/18/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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

ANAB ACCREDITED

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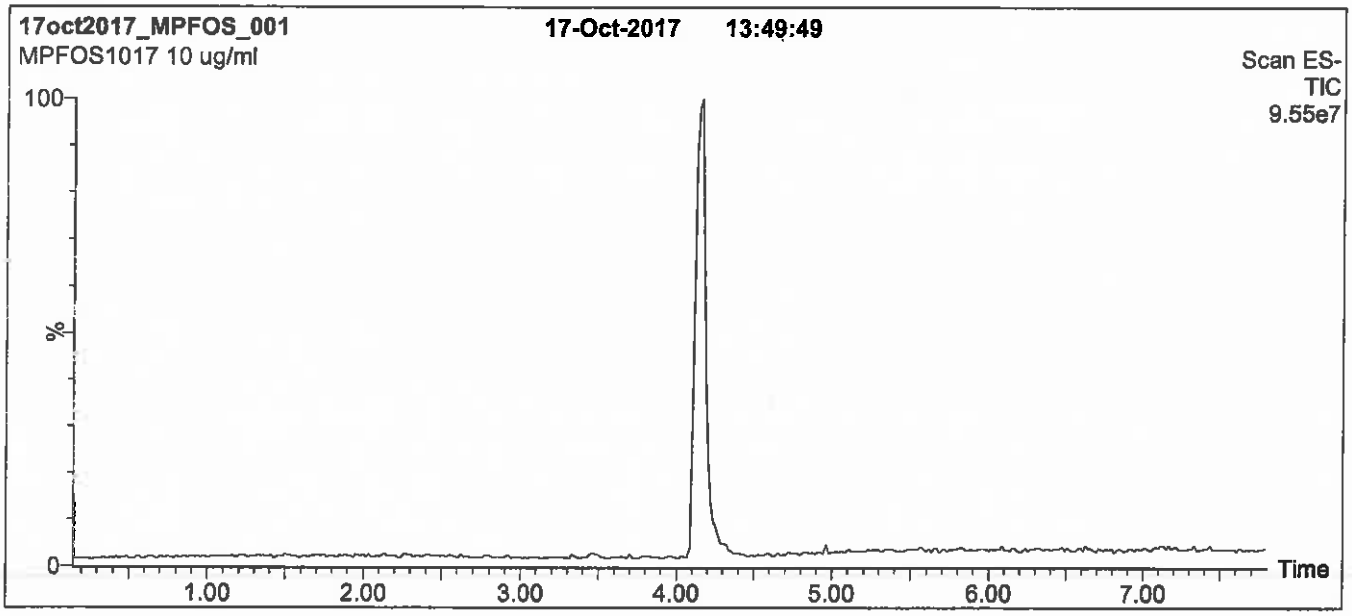
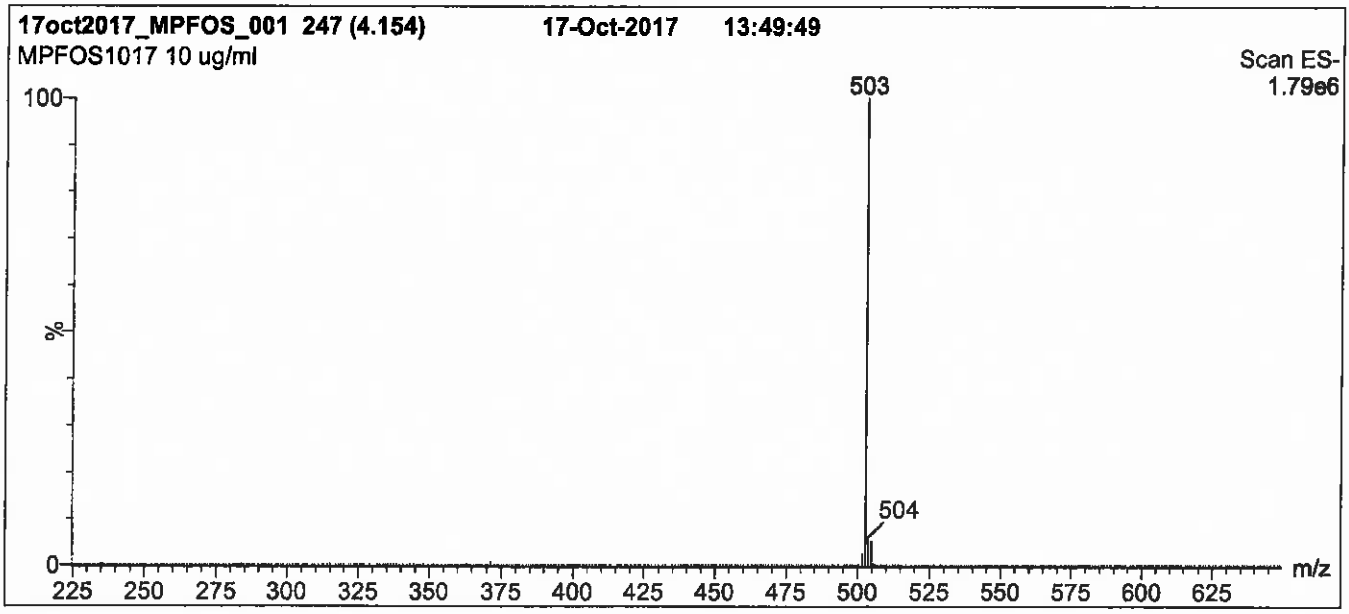
Figure 1: **MPFOS; LC/MS Data (TIC and Mass Spectrum)**





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: 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

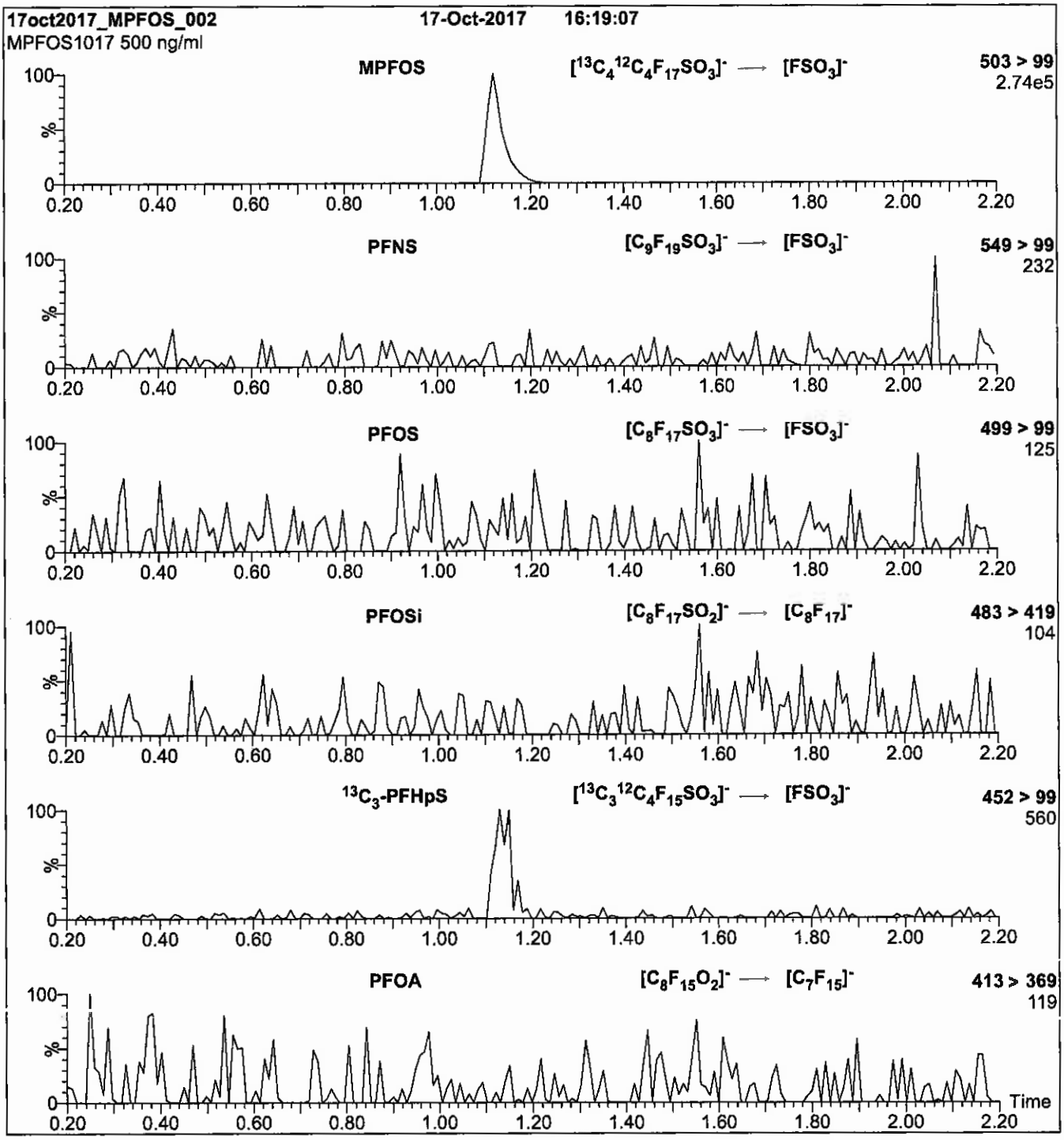
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 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) = 3.31e-3
Collision Energy (eV) = 40

Reagent

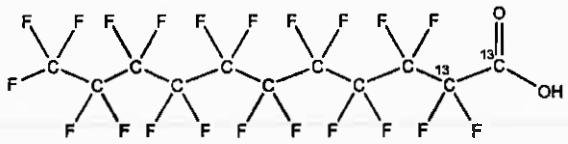
LCMPFUdA_00014

R: 12/4/17 ccl

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFUdA
LOT NUMBER: MPFUdA1116
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]undecanoic acid
STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_9HF_{21}O_2$
MOLECULAR WEIGHT: 566.08
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)
CHEMICAL PURITY: >98%
ISOTOPIC PURITY: ≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy) 11/22/2016
EXPIRY DATE: (mm/dd/yyyy) 11/22/2021
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.
- 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:** 12/07/2016 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

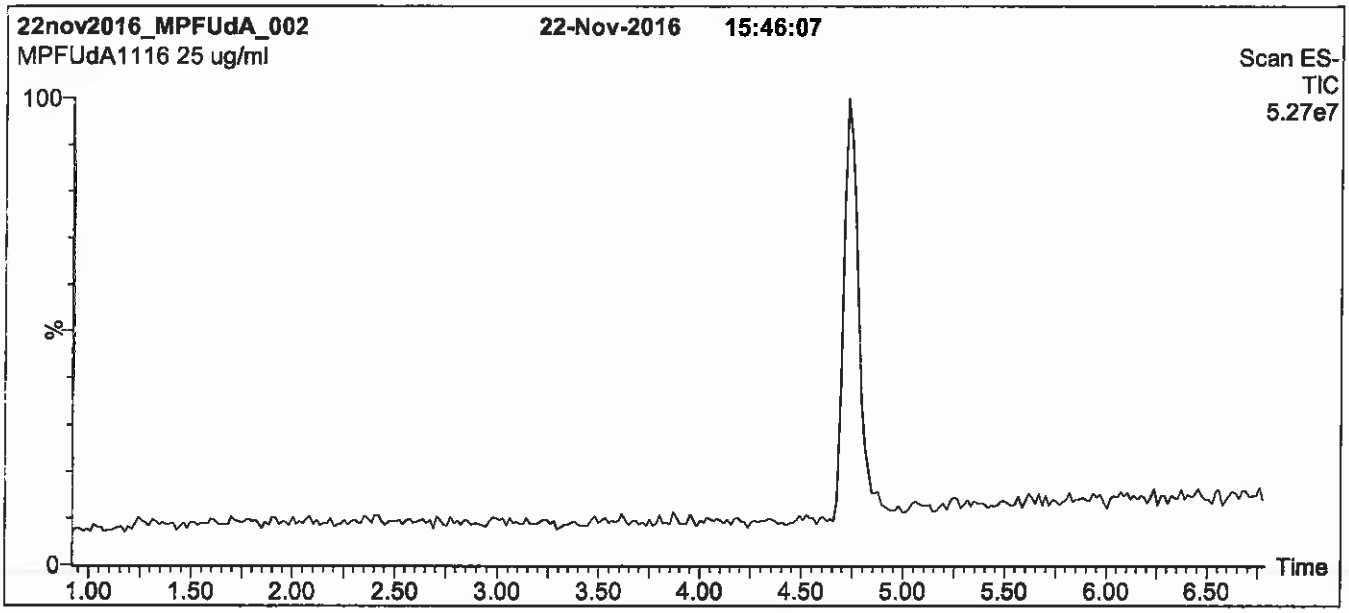
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

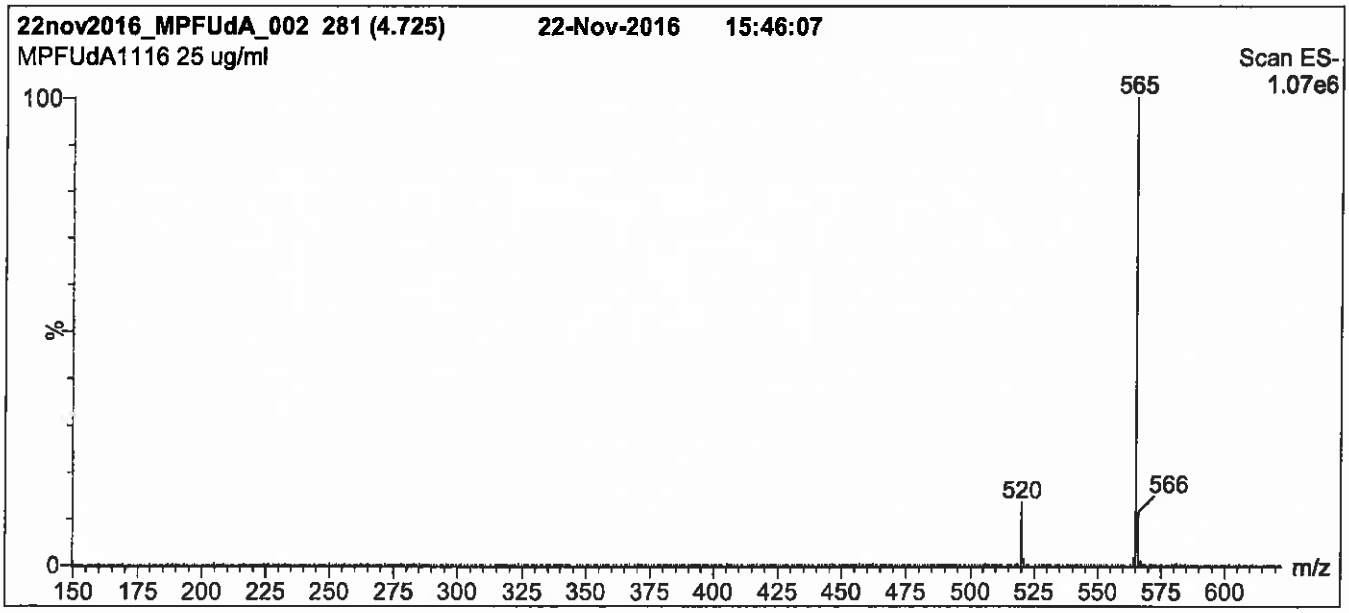
CALA

ANAB ACCREDITED

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

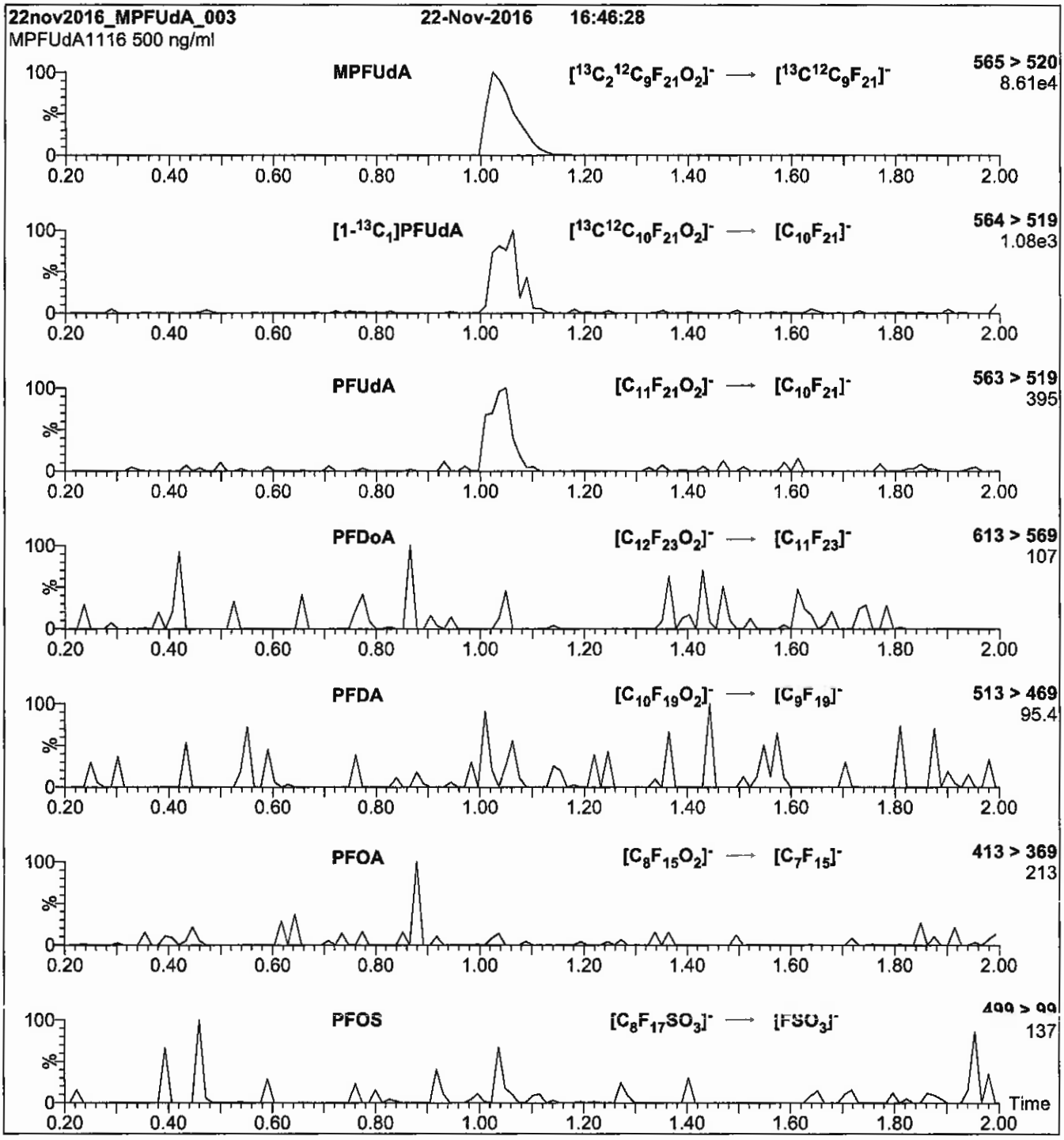
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

Mobile phase: Isocratic 80% (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) = 11

Reagent

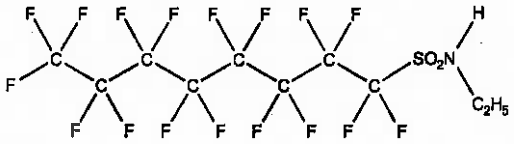
LCN-EtFOSA-M_00005

R: 12/20/16 SK✓

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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



MOLECULAR FORMULA:	$C_{10}H_5F_{17}NO_2S$	**MOLECULAR WEIGHT:**	527.20
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	05/24/2016		
EXPIRY DATE: (mm/dd/yyyy)	05/24/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

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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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ANAB ACCREDITED

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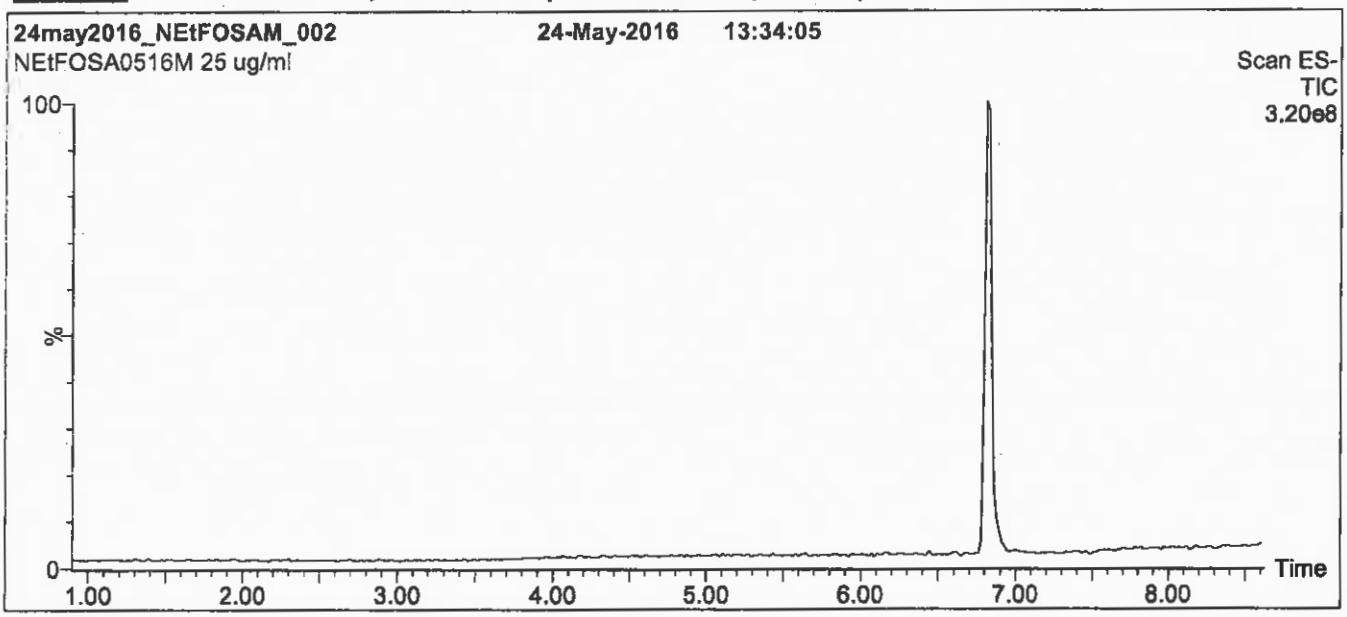
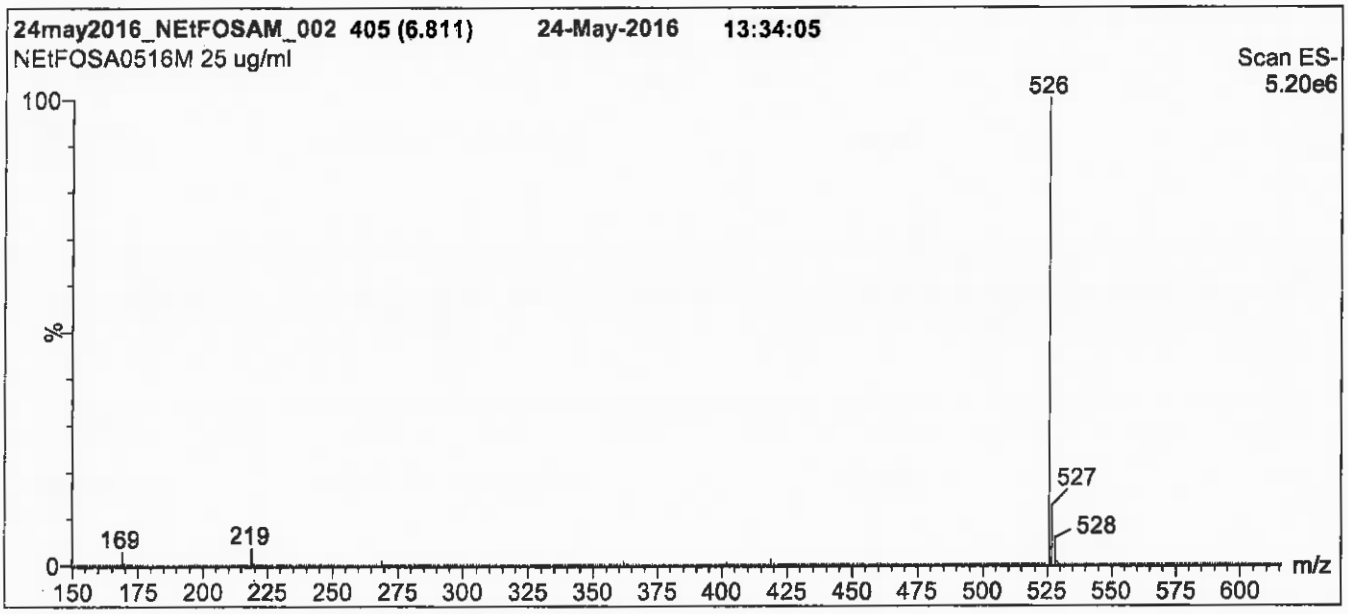
Figure 1: **N-EtFOSA-M; LC/MS Data (TIC and Mass Spectrum)**





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

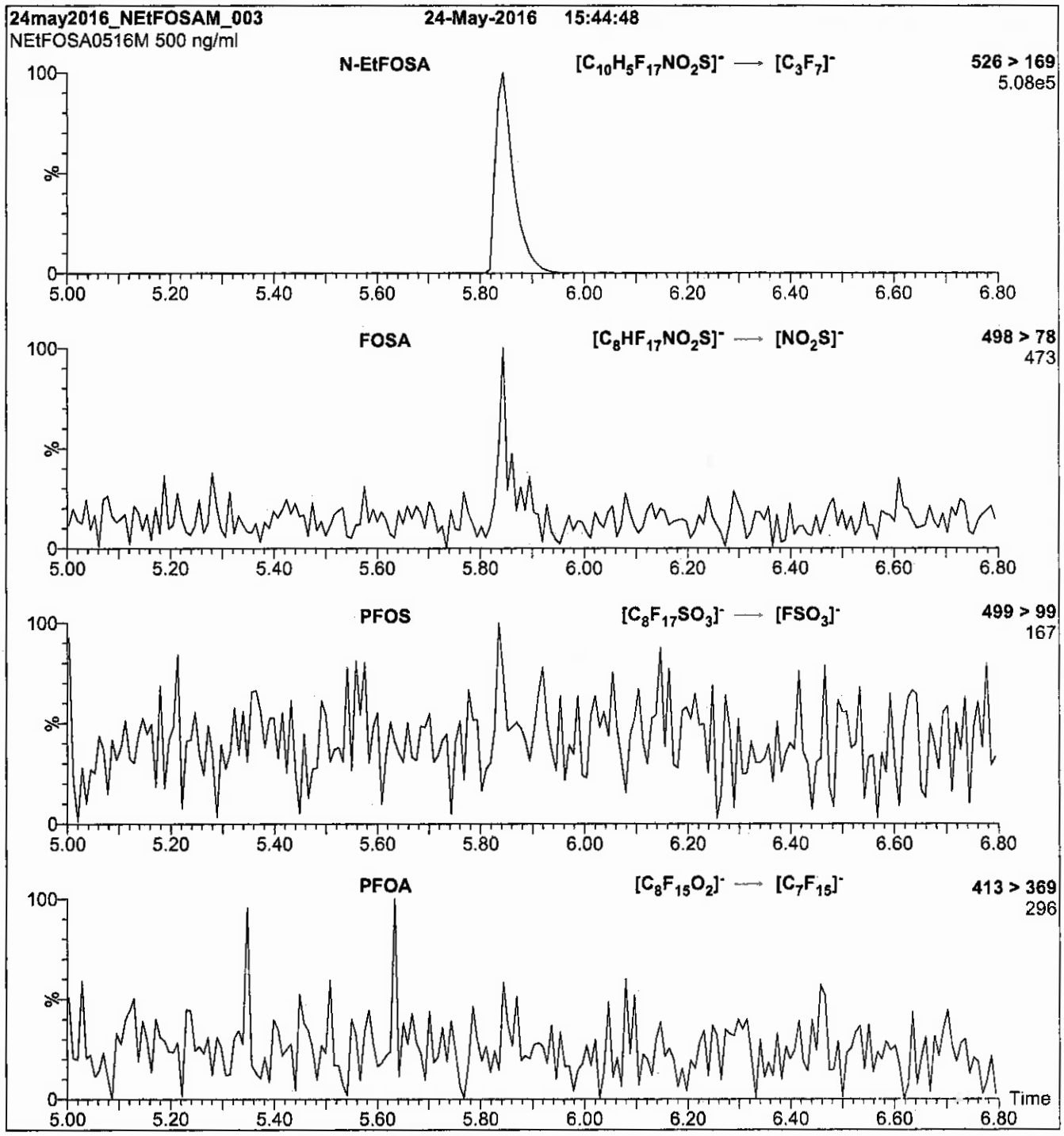
Flow: 300 µl/min

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

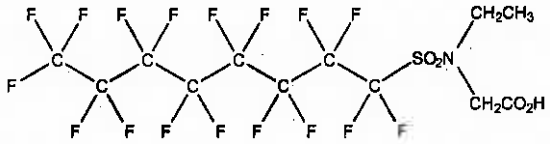
LCN-EtFOSAA_00004

P: 12/29/16 SFV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	N-EtFOSAA	**LOT NUMBER:**	NEtFOSAA0916
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)	09/30/2016		
EXPIRY DATE: (mm/dd/yyyy)	09/30/2021		
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 molety to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 10/07/2016 (mm/dd/yyyy)

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

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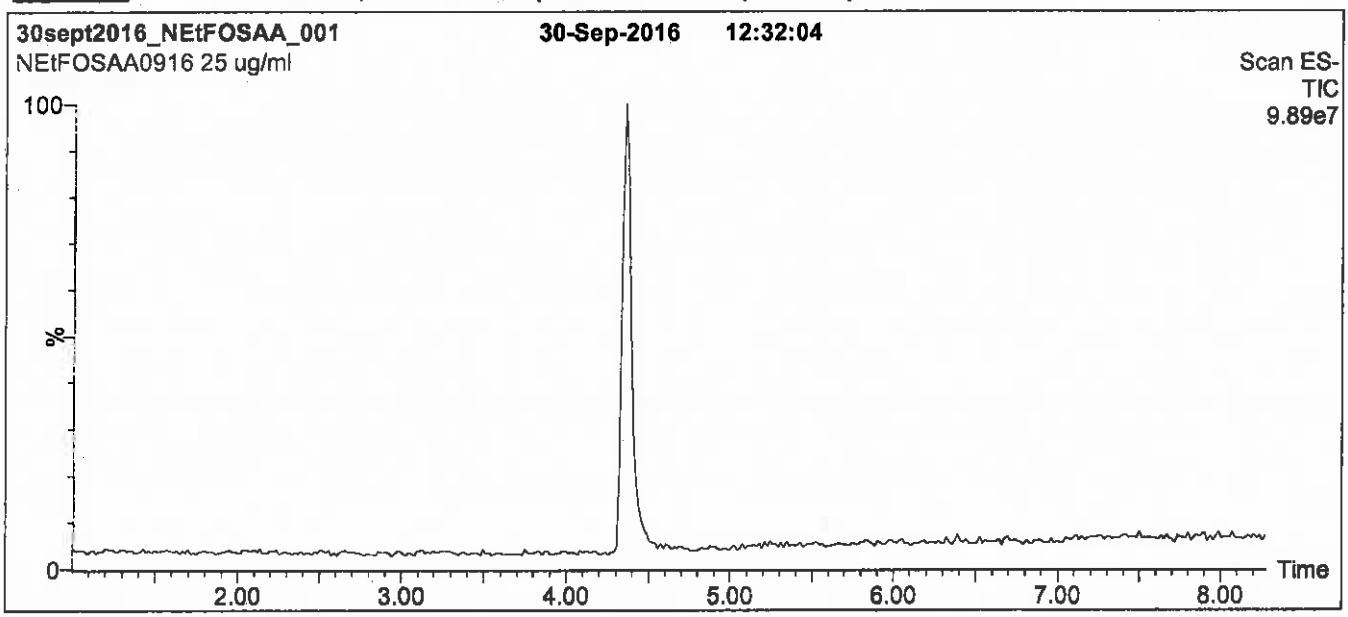
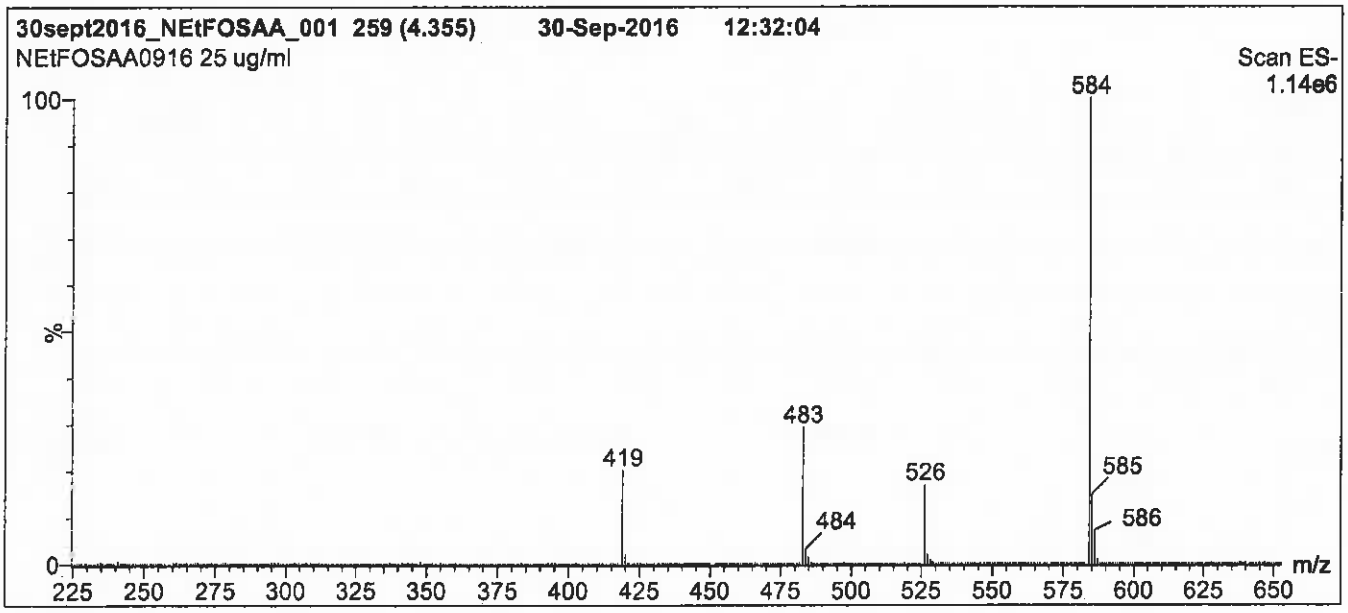
CALA

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: **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

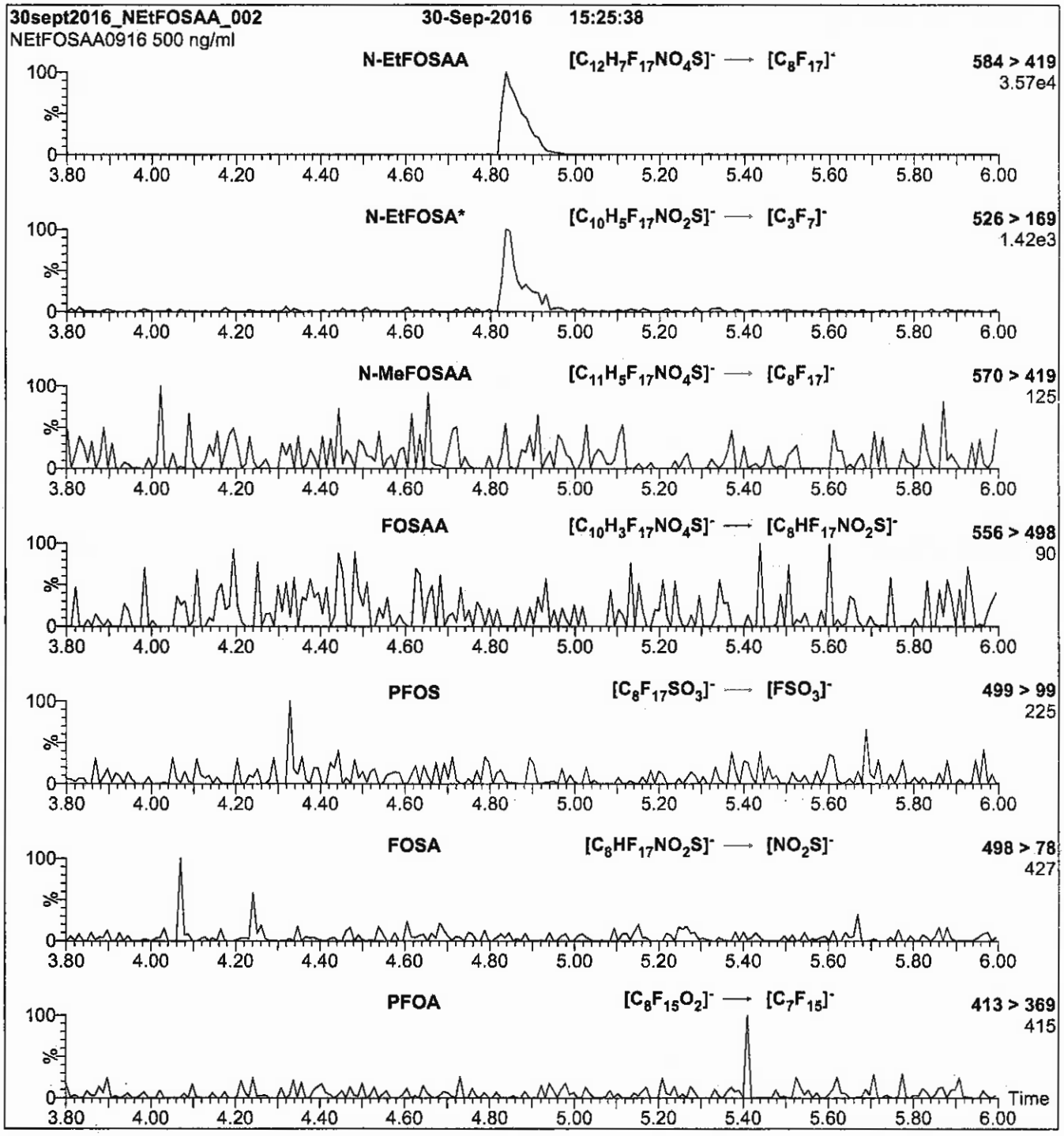
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



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

Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

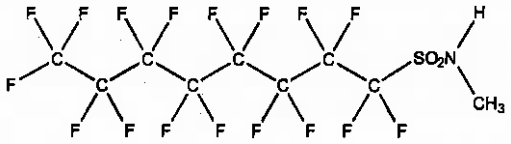
LCN-MeFOSA-M_00004

Pr 12/20/16 SRV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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



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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 05/26/2016 (mm/dd/yyyy)

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

INTENDED USE:

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HAZARDS:

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UNCERTAINTY:

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

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters x_1, x_2,...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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CALA

ANAB ACCREDITED

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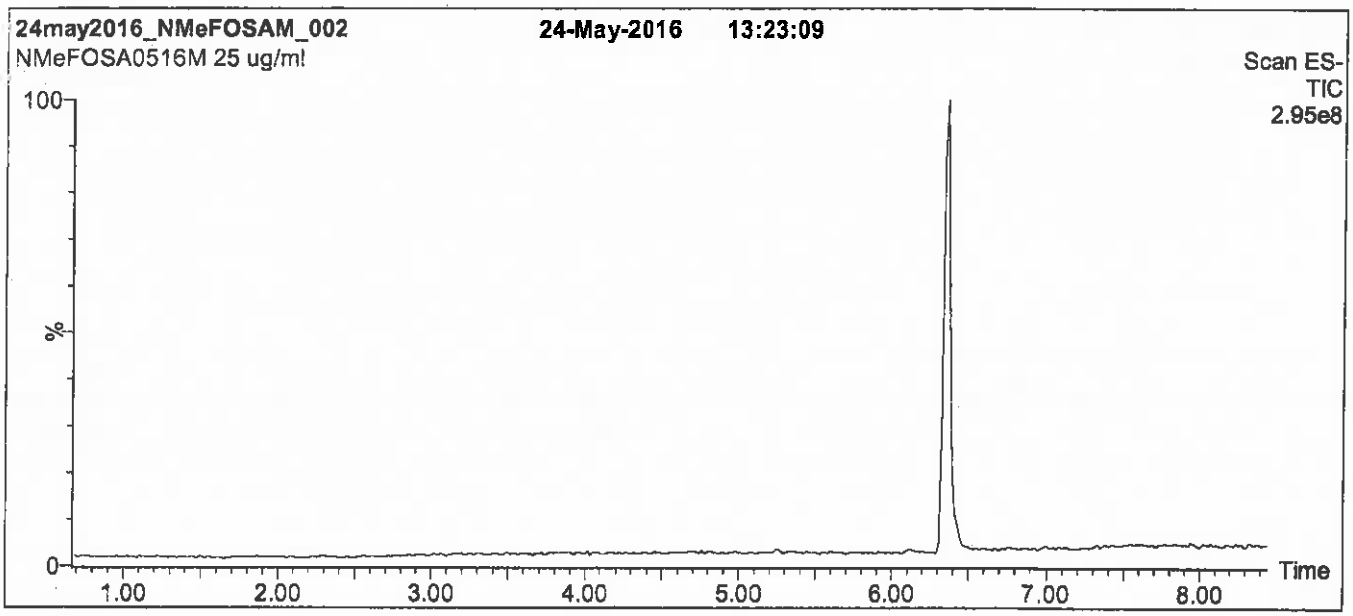
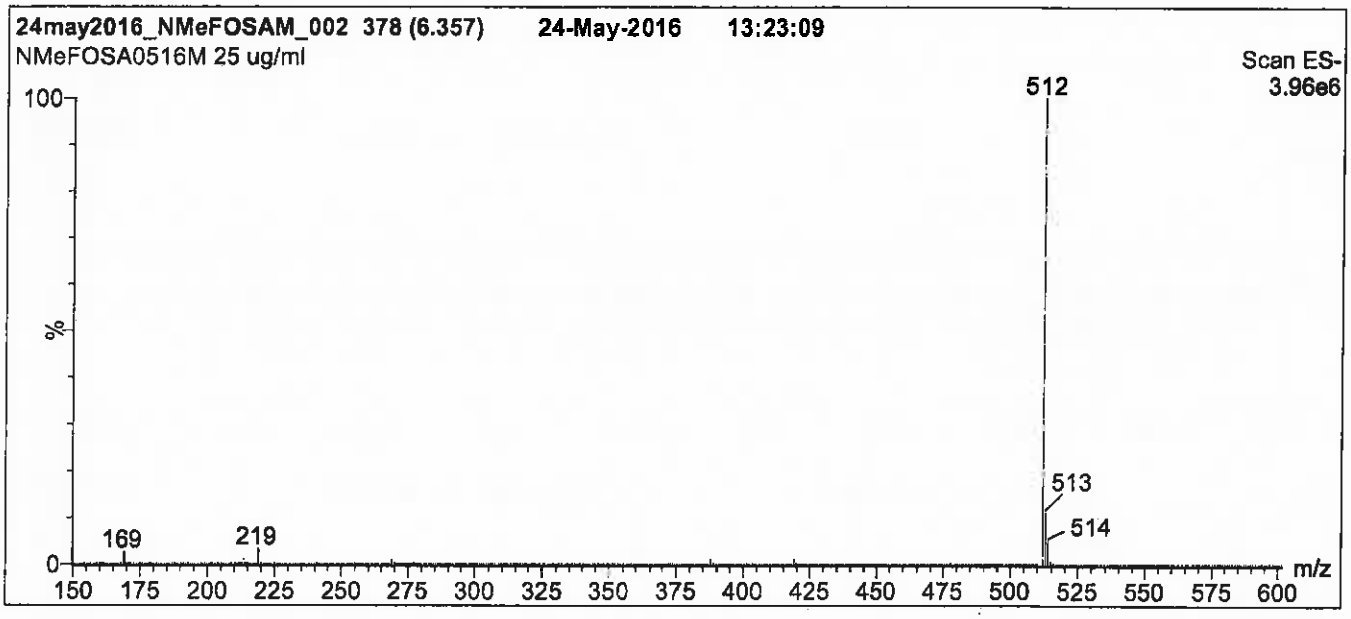
Figure 1: **N-MeFOSA-M; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

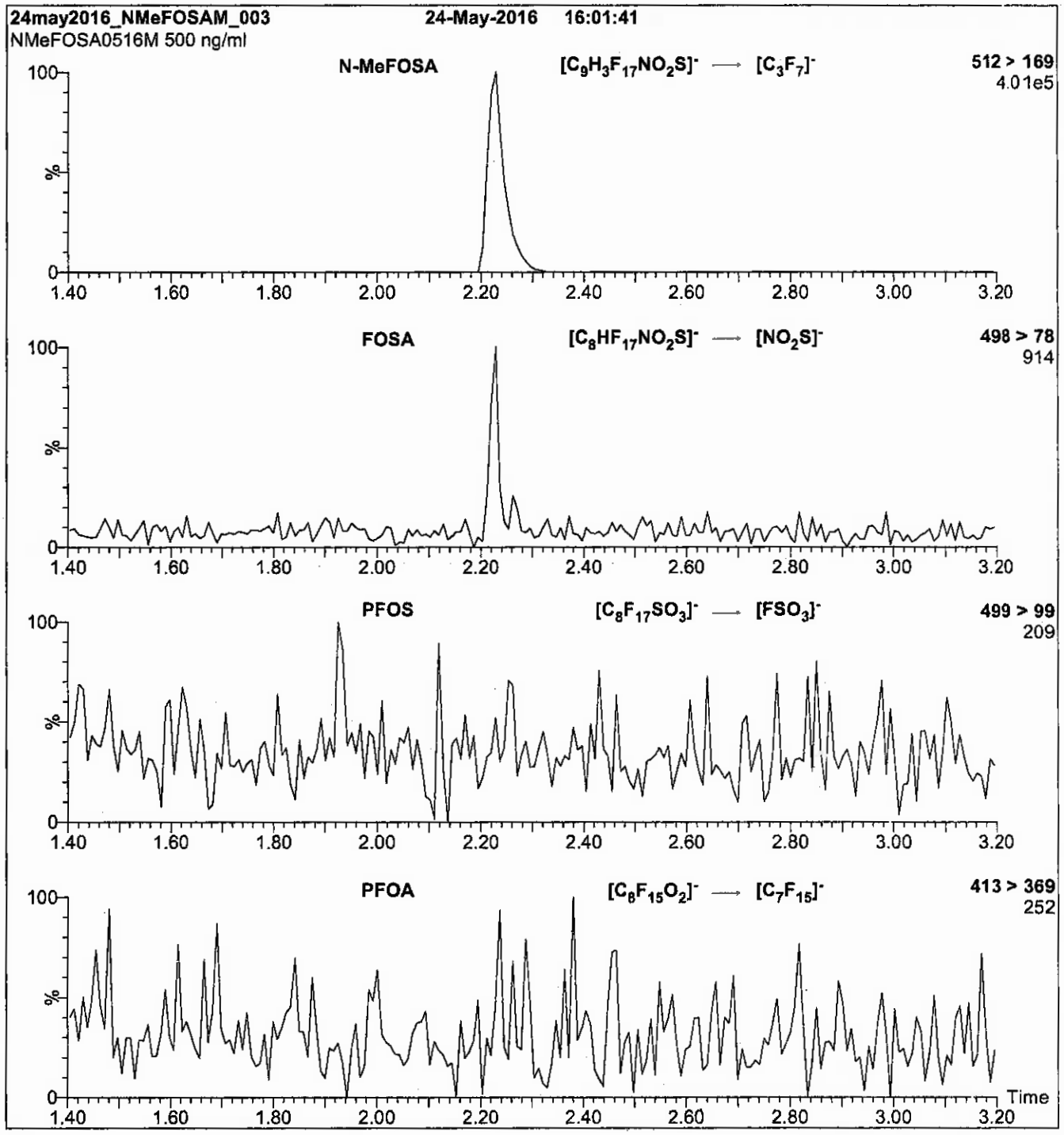
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

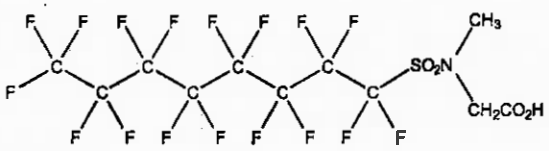
LCN-MeFOSAA_00004

P: R/28/16 SV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	N-MeFOSAA	**LOT NUMBER:**	NMeFOSAA0916
COMPOUND:	N-methylperfluoro-1-octanesulfonamidoacetic acid		
STRUCTURE:		**CAS #:**	2355-31-9



MOLECULAR FORMULA:	$C_{11}H_8F_{17}NO_4S$	**MOLECULAR WEIGHT:**	571.21
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	10/12/2016		
EXPIRY DATE: (mm/dd/yyyy)	10/12/2021		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

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Certified By: B.G. Chittim **Date:** 10/25/2016 (mm/dd/yyyy)

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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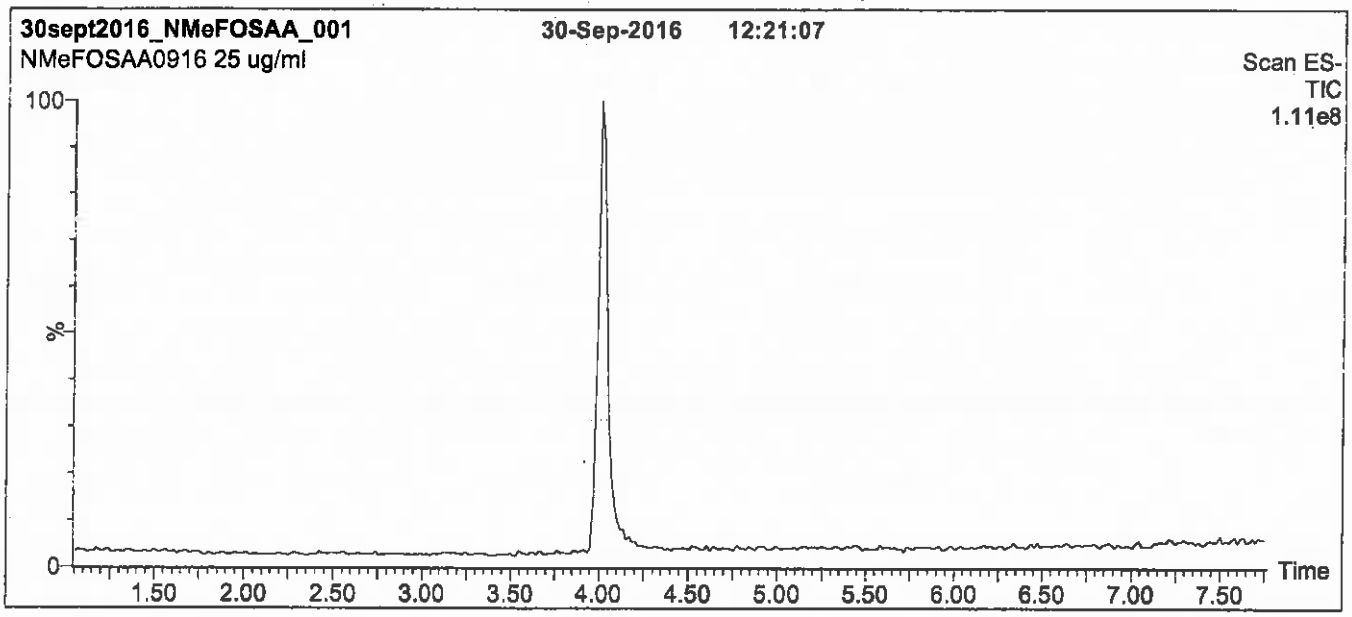
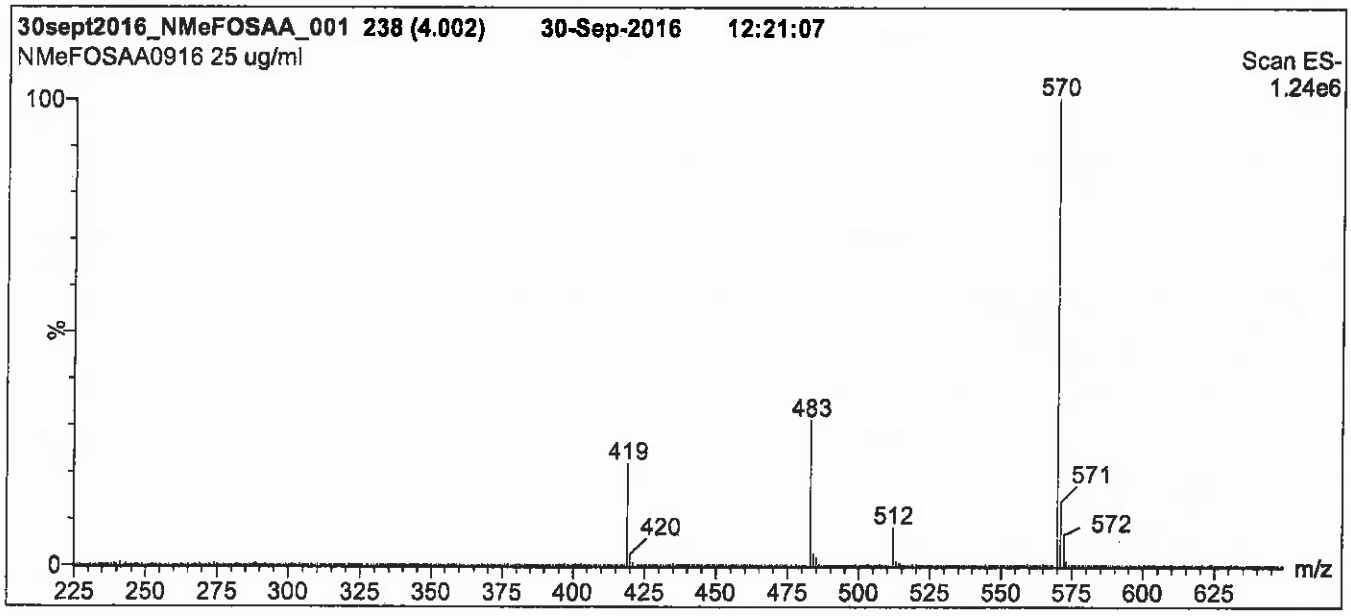
Figure 1: **N-MeFOSAA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 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

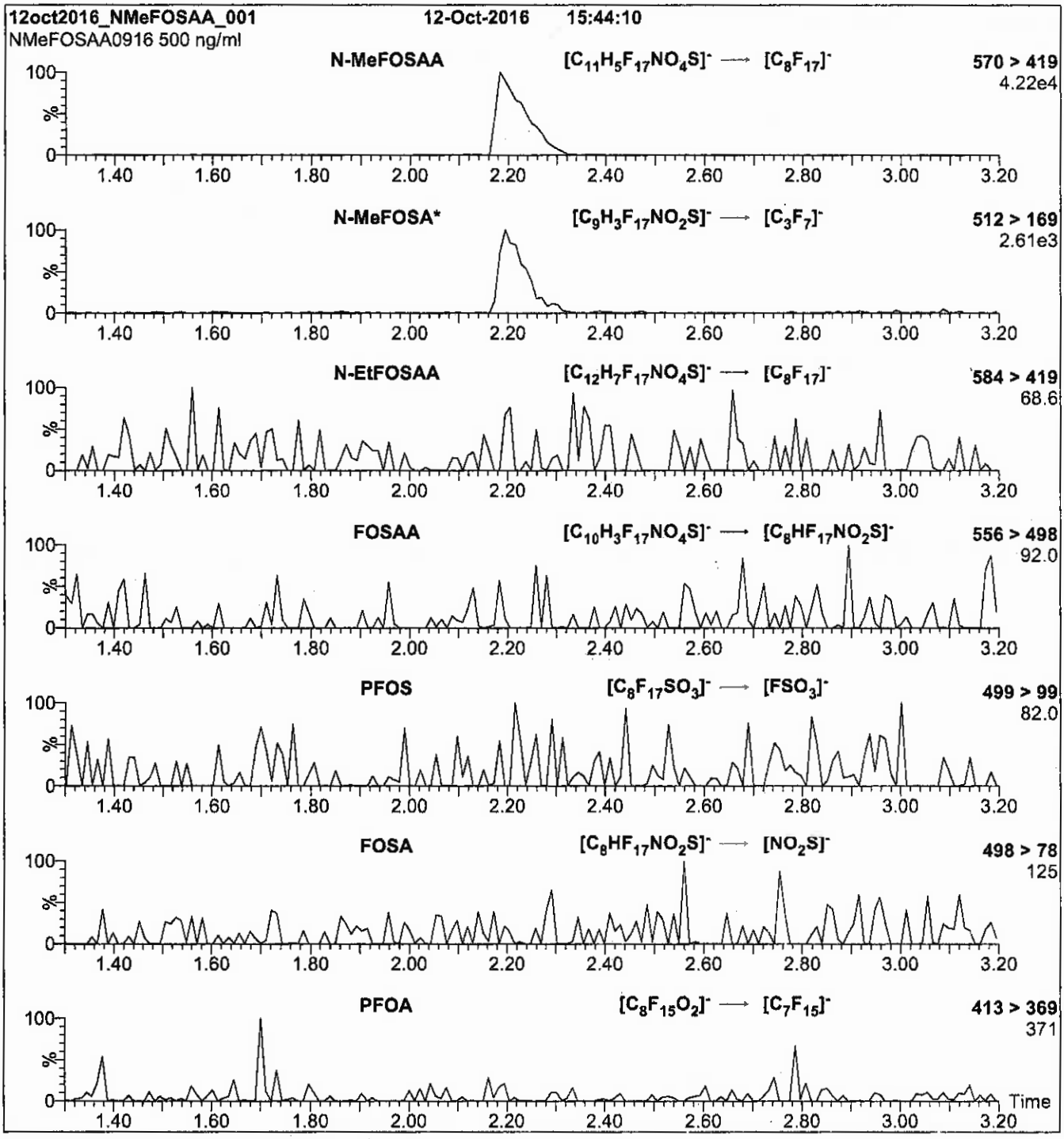
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (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) = 3.28e-3
Collision Energy (eV) = 20

Reagent

LCN-MeFOSAA_00005

P: R/28/16 SRV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	N-MeFOSAA	**LOT NUMBER:**	NMeFOSAA0916
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STRUCTURE:		**CAS #:**	2355-31-9

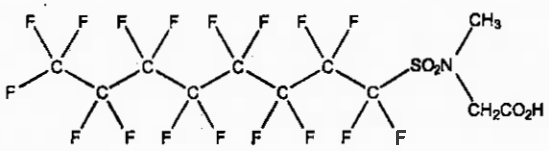

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Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

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

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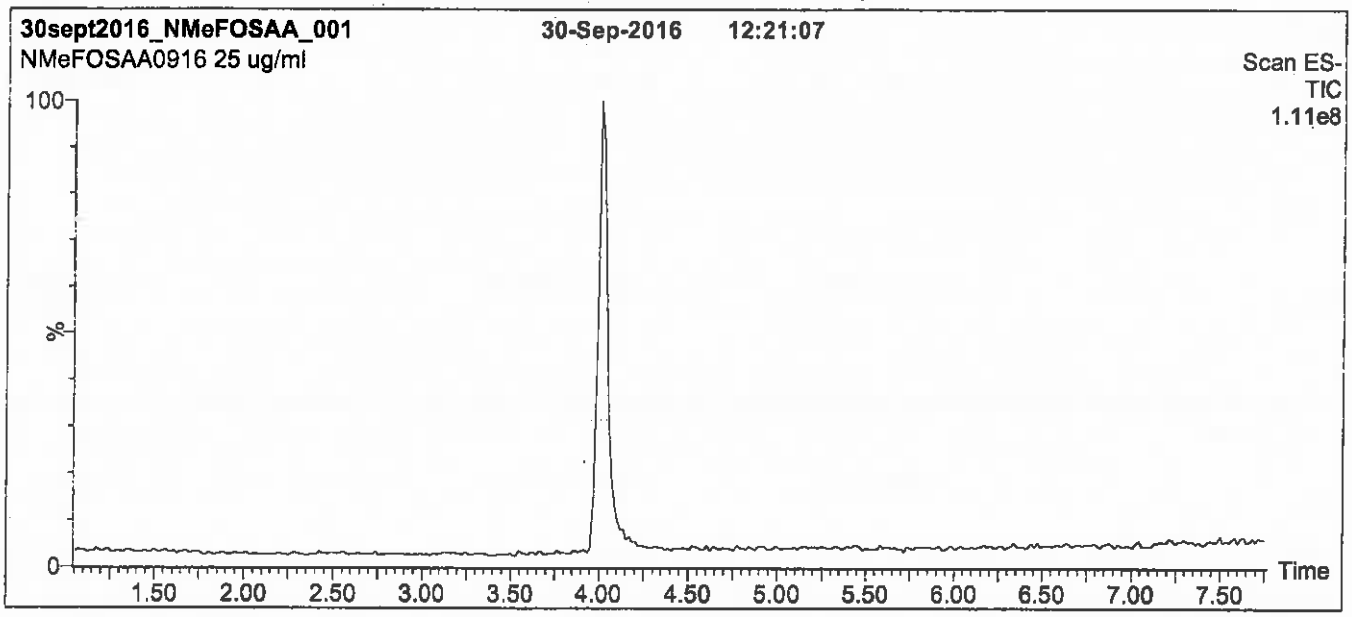
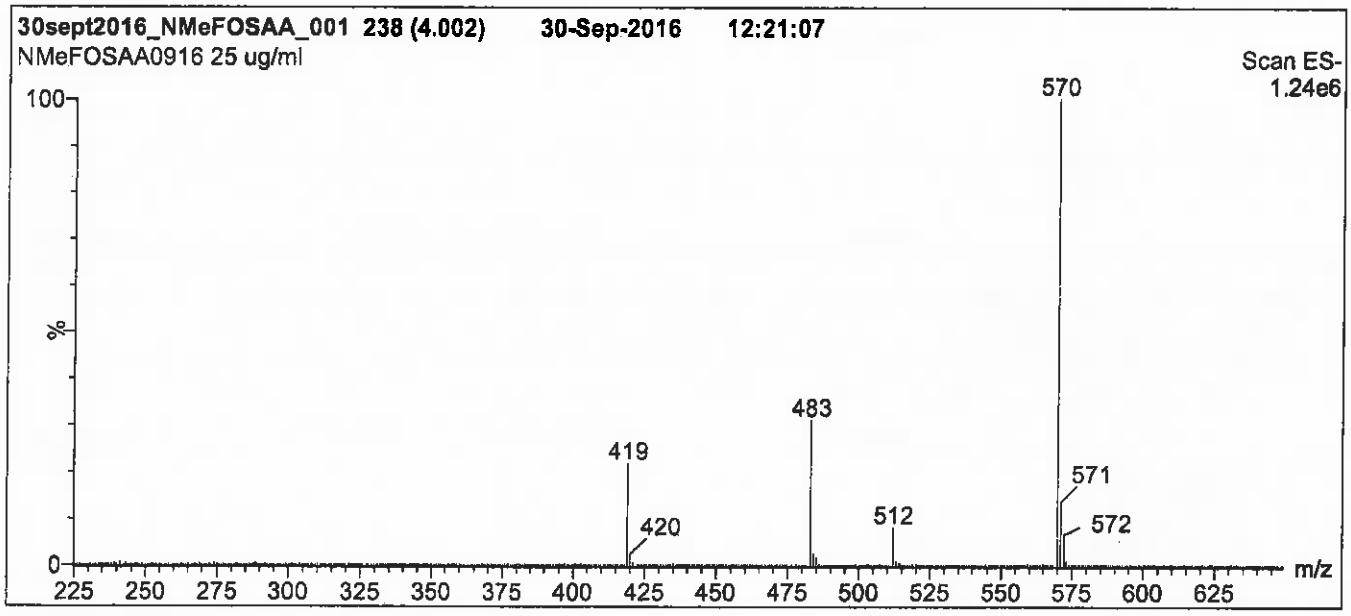




Conditions for Figure 1:

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

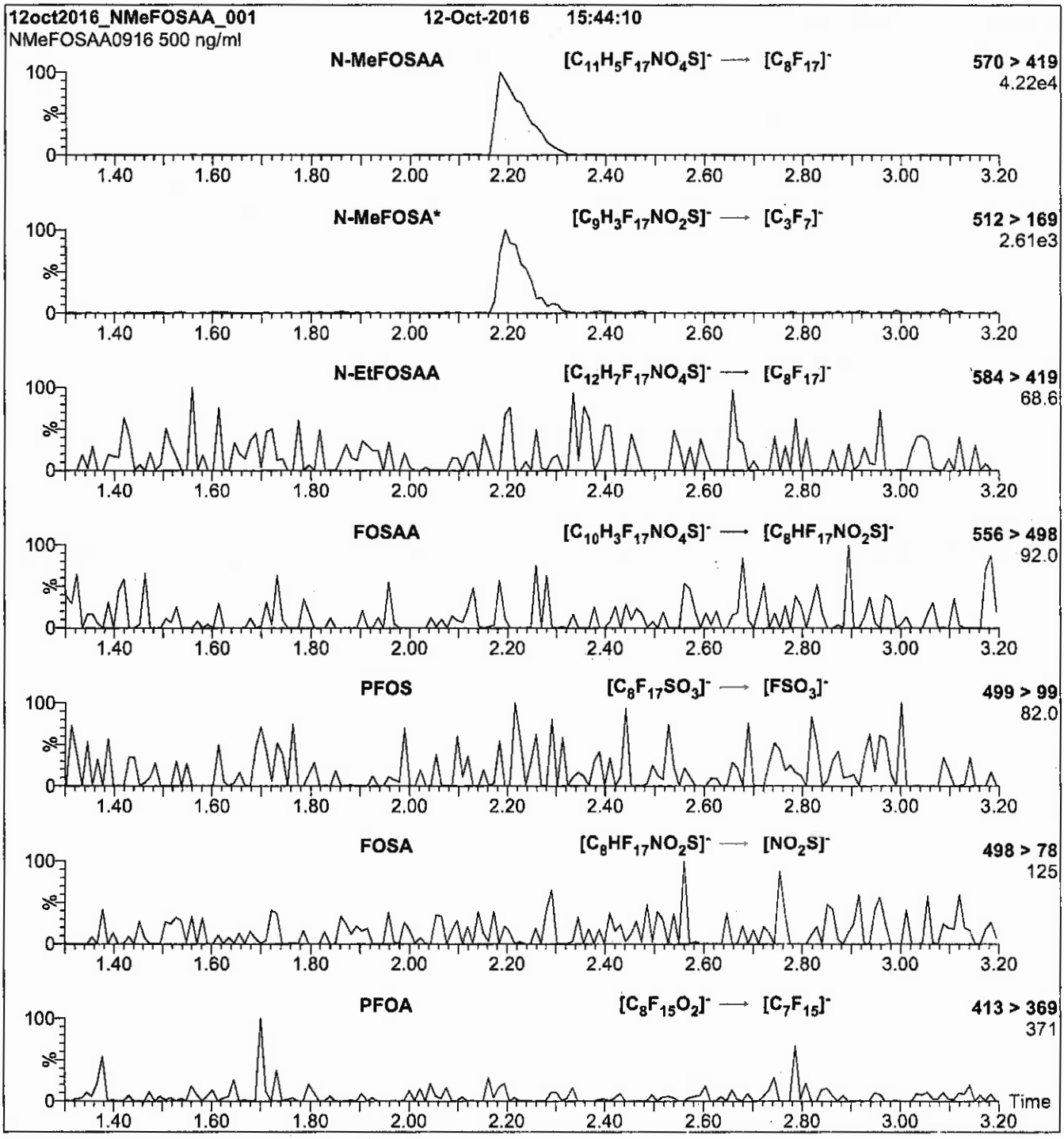
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (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) = 3.28e-3
Collision Energy (eV) = 20

Reagent

LCPFAC-24PAR_00001

P: 11/B/17SW SW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PFAC-24PAR

Native Per- and Poly-fluoroalkyl Substance Precision and Recovery Standard Solution

PRODUCT CODE:	PFAC-24PAR
LOT NUMBER:	PFAC24PAR0917
SOLVENT(S):	Methanol / Isopropanol (4%) / Water (<1%)
DATE PREPARED: (mm/dd/yyyy)	09/13/2017
LAST TESTED: (mm/dd/yyyy)	09/15/2017
EXPIRY DATE: (mm/dd/yyyy)	09/15/2022
RECOMMENDED STORAGE:	Refrigerate ampoule

DESCRIPTION:

PFAC-24PAR is a solution/mixture of eleven native linear perfluoroalkylcarboxylic acids (C_4-C_{14}), seven native perfluoroalkylsulfonates (C_4, C_5, C_7, C_9, and C_{10} linear; C_8 and C_8 linear and branched), three native telomer sulfonates (4:2, 6:2, and 8:2), two native perfluorooctanesulfonamidoacetic acids, and perfluoro-1-octanesulfonamide. The components and their concentrations are given in Table A.

The individual native perfluoroalkylcarboxylic acids, native perfluoroalkylsulfonates, native telomer sulfonates, native perfluorooctanesulfonamidoacetic acids, and perfluoro-1-octanesulfonamide all have chemical purities of >98%.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
Table B: Isomeric Components and Percent Composition of PFHxSK
Table C: Isomeric Components and Percent Composition of PFOSK
Figure 1: LC/MS Data (SIR)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acids to their respective methyl esters.

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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, as well as mixtures and calibration solutions, are compared to older lots in a similar manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

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

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ 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 calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

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

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: **PFAC-24PAR; Components and Concentrations (ng/ml, ± 5% in Methanol / Isopropanol (4%) / Water (<1%))**

Compound	Abbreviation	Concentration (ng/ml)	Peak Assignment in Figure 1
Perfluoro-n-butanoic acid	PFBA	2000	A
Perfluoro-n-pentanoic acid	PFPeA	2000	B
Perfluoro-n-hexanoic acid	PFHxA	2000	E
Perfluoro-n-heptanoic acid	PFHpA	2000	G
Perfluoro-n-octanoic acid	PFOA	2000	K
Perfluoro-n-nonanoic acid	PFNA	2000	M
Perfluoro-n-decanoic acid	PFDA	2000	Q
Perfluoro-n-undecanoic acid	PFUdA	2000	V
Perfluoro-n-dodecanoic acid	PFDoA	2000	X
Perfluoro-n-tridecanoic acid	PFTrDA	2000	Y
Perfluoro-n-tetradecanoic acid	PFTeDA	2000	Z
Perfluoro-1-octanesulfonamide	FOSA	2000	T
N-methylperfluoro-1-octanesulfonamidoacetic acid	N-MeFOSAA	2000	S
N-ethylperfluoro-1-octanesulfonamidoacetic acid	N-EtFOSAA	2000	U

Compound	Abbreviation	Concentration (ng/ml)		Peak Assignment in Figure 1
		as the salt	as the anion	
Potassium perfluoro-1-butanesulfonate	L-PFBS	2000	1770	C
Sodium perfluoro-1-pentanesulfonate	L-PFPeS	2000	1880	F
Potassium perfluorohexanesulfonate*	PFHxSK: linear isomer	1620	1480	I
	PFHxSK: ∑ branched isomers	378	344	H
Sodium perfluoro-1-heptanesulfonate	L-PFHpS	2000	1900	L
Potassium perfluorooctanesulfonate**	PFOSK: linear isomer	1580	1460	O
	PFOSK: ∑ branched isomers	422	391	N
Sodium perfluoro-1-nonanesulfonate	L-PFNS	2000	1920	R
Sodium perfluoro-1-decanesulfonate	L-PFDS	2000	1930	W
Sodium 1H,1H,2H,2H-perfluoro-1-hexanesulfonate	4:2FTS	2000	1870	D
Sodium 1H,1H,2H,2H-perfluoro-1-octanesulfonate	6:2FTS	2000	1900	J
Sodium 1H,1H,2H,2H-perfluoro-1-decanesulfonate	8:2FTS	2000	1920	P

* See Table B for percent composition of linear and branched PFHxSK isomers.
** See Table C for percent composition of linear and branched PFOSK isomers.

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

Isomer	Name	Structure	Percent Composition by ^{19}F-NMR	
1	Potassium perfluoro-1-hexanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	81.1	81.1
2	Potassium 1-trifluoromethylperfluoropentanesulfonate**	$CF_3CF_2CF_2CF_2CF(CF_3)SO_3^-K^+$	2.9	18.9
3	Potassium 2-trifluoromethylperfluoropentanesulfonate	$CF_3CF_2CF_2CF(CF_3)CF_2SO_3^-K^+$	1.4	
4	Potassium 3-trifluoromethylperfluoropentanesulfonate	$CF_3CF_2CF(CF_3)CF_2CF_2SO_3^-K^+$	5.0	
5	Potassium 4-trifluoromethylperfluoropentanesulfonate	$CF_3CF(CF_3)CF_2CF_2CF_2SO_3^-K^+$	8.9	
6	Potassium 3,3-di(trifluoromethyl)perfluorobutanesulfonate	$CF_3C(CF_3)_2CF_2CF_2SO_3^-K^+$	0.2	
7	Other Unidentified Isomers		0.5	

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

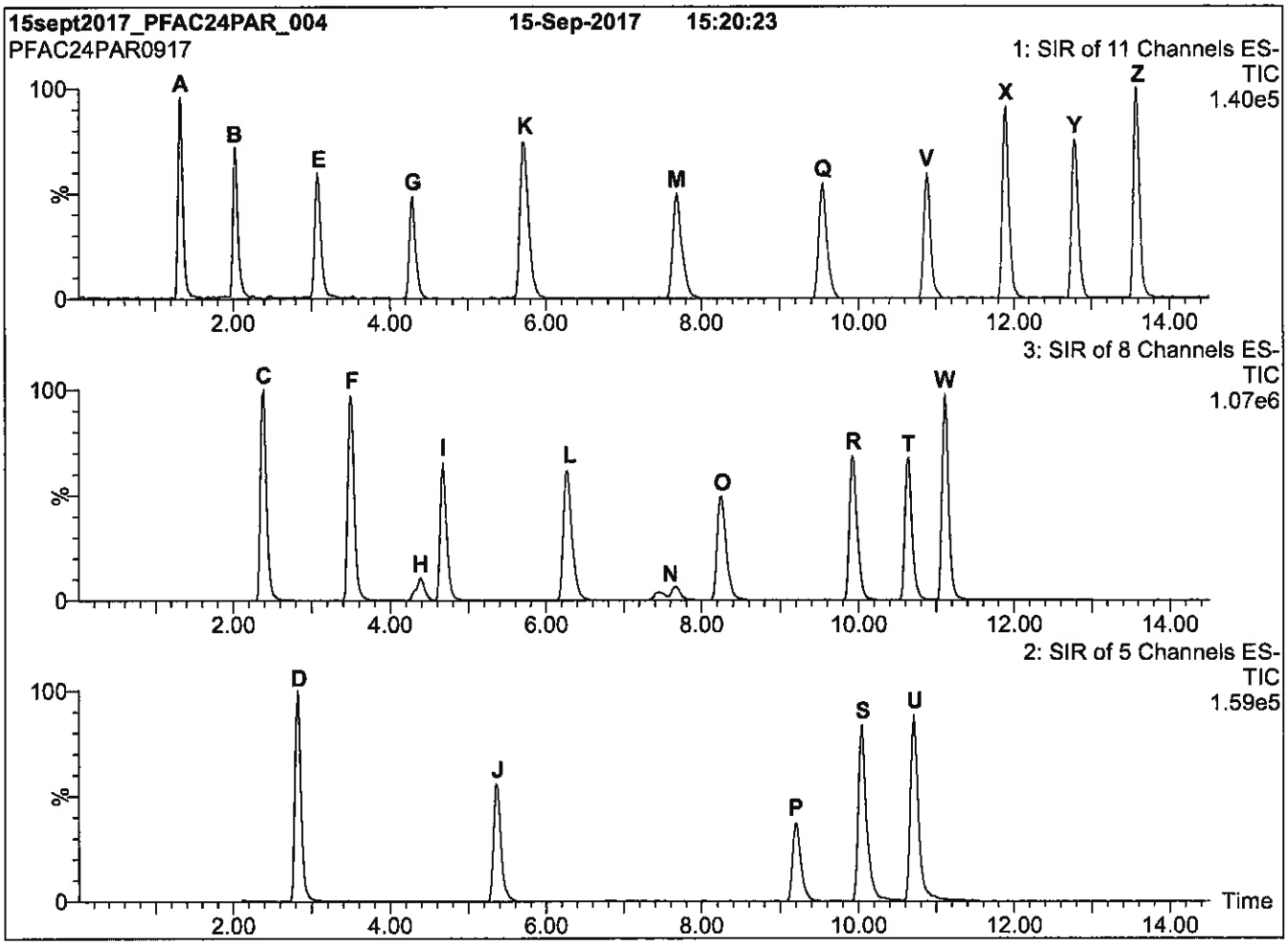
Table C: **PFOSK; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

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	78.8
2	Potassium 1-trifluoromethylperfluoroheptanesulfonate**	$CF_3CF_2CF_2CF_2CF_2CF_2CF(CF_3)SO_3^-K^+$	1.2	21.1
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	$CF_3C(CF_3)CF_2CF_2CF_2CF_2SO_3^-K^+$	0.2	
9	Potassium 4,4-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3CF_2C(CF_3)CF_2CF_2CF_2SO_3^-K^+$	0.03	
10	Potassium 4,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3CF(CF_3)CF_2CF_2CF_2CF_2SO_3^-K^+$	0.4	
11	Potassium 3,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3CF(CF_3)CF_2CF(CF_3)CF_2CF_2SO_3^-K^+$	0.07	

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

Certified By: _____ **Date:** 09/19/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Figure 1: **PFAC-24PAR; 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: 40% (80:20 MeOH:ACN) / 60% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 55% organic over 3.5 min.
Ramp to 70% organic over 6.5 min.
Ramp to 85% organic over 5 min and hold for
1 min before returning to initial conditions in 0.5 min.
Time: 17 min

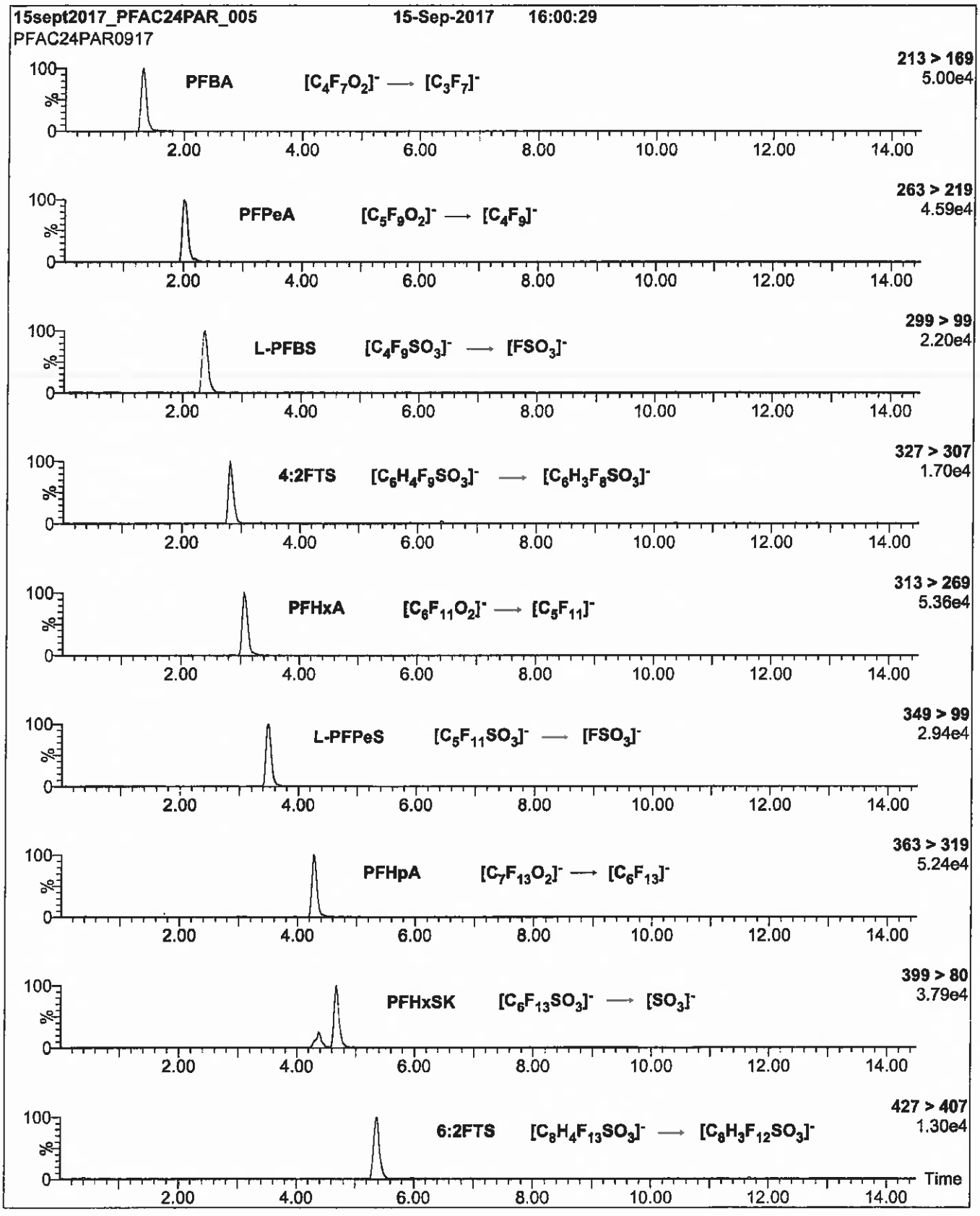
Flow: 300 µl/min

MS Parameters

Experiment: SIR

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-24PAR; LC/MS/MS Data (Selected MRM Transitions)**



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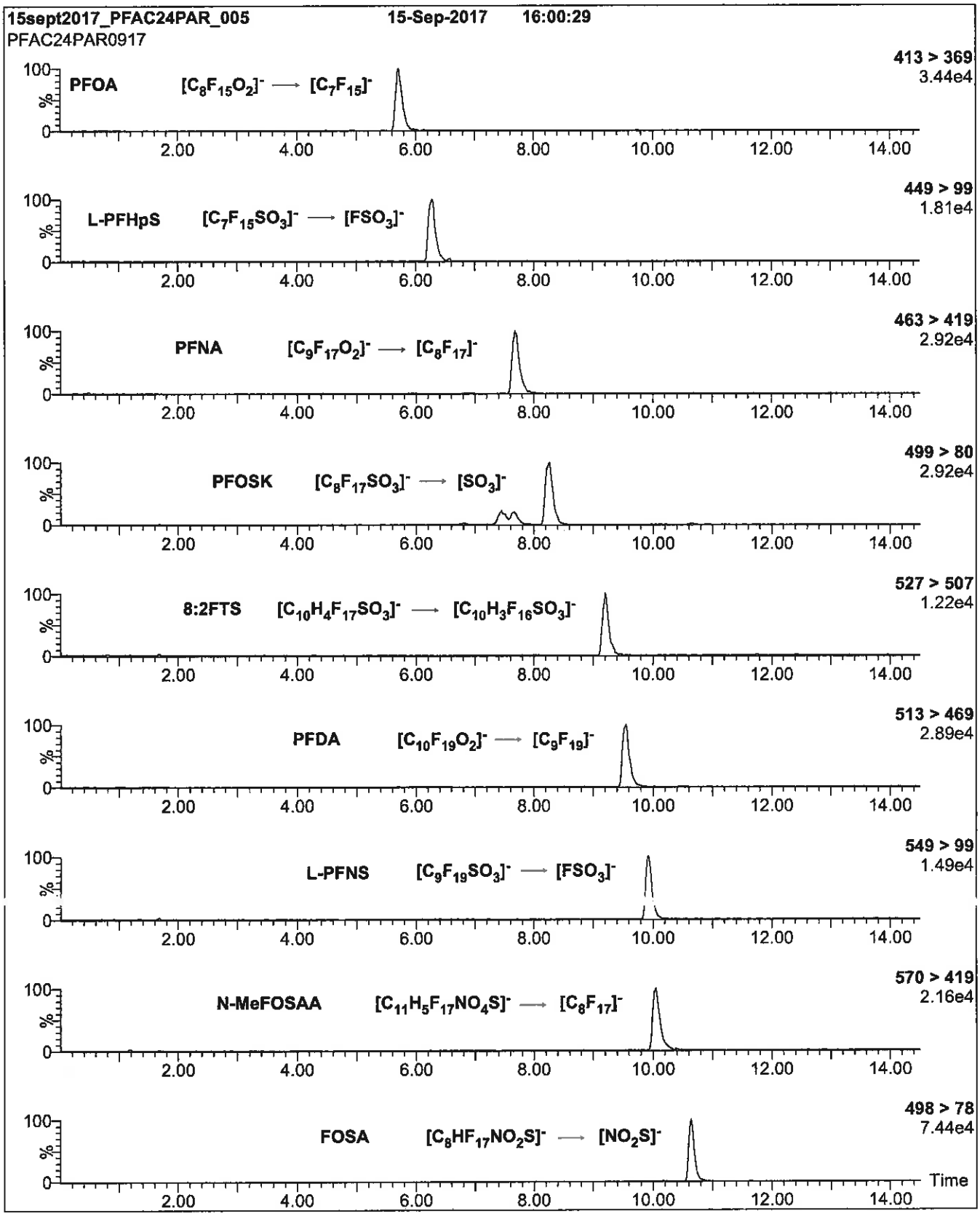
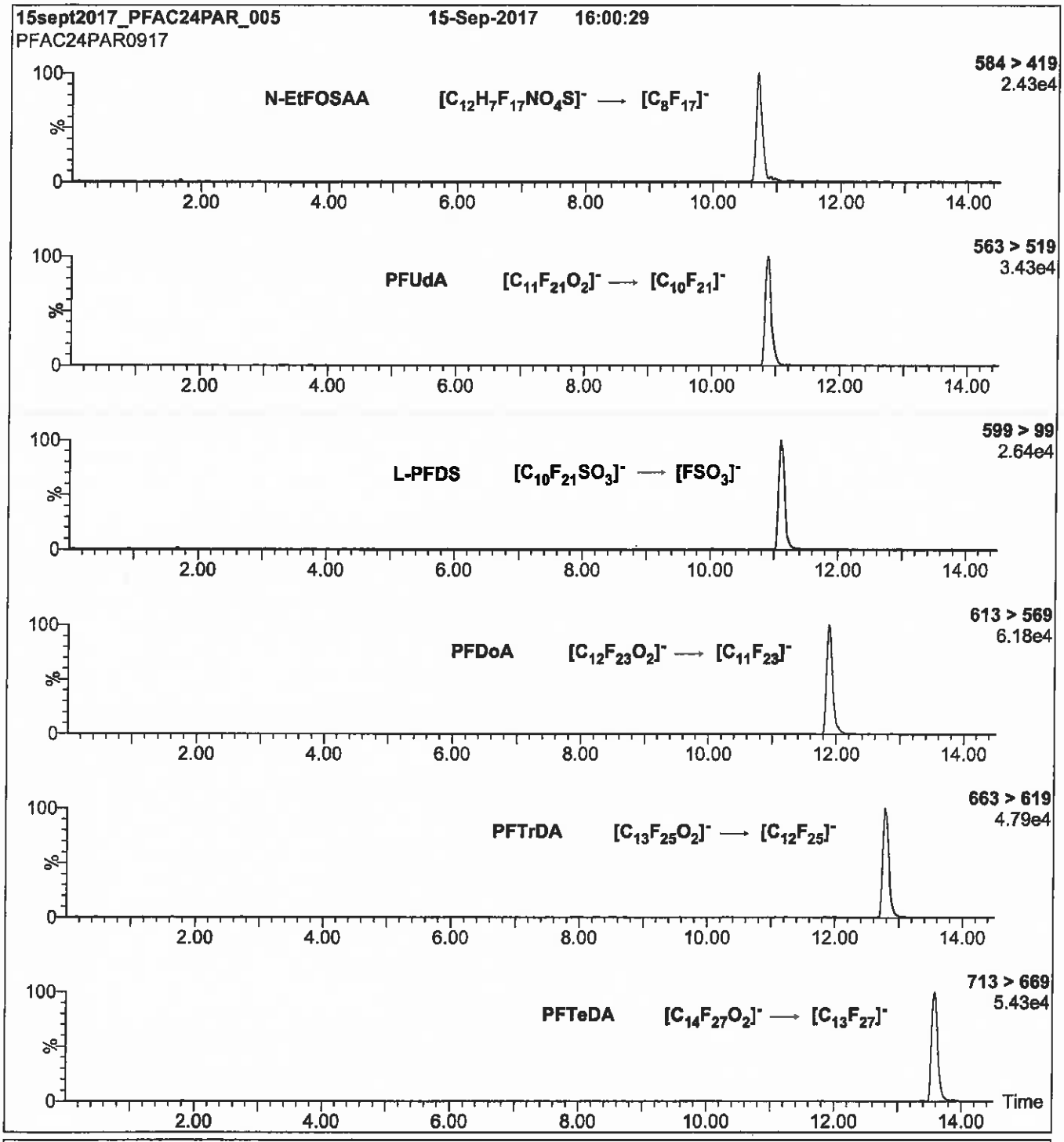


Figure 2: **PFAC-24PAR; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (PFAC-24PAR)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3

Collision Energy (eV) = 8-50 (variable)

Reagent

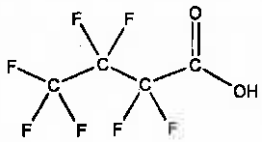
LCPFBA_00007

r: 12/20/16 SN
S

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFBA	**LOT NUMBER:**	PFBA0516
COMPOUND:	Perfluoro-n-butanoic acid		
STRUCTURE:		**CAS #:**	375-22-4



MOLECULAR FORMULA:	$C_4HF_7O_2$	**MOLECULAR WEIGHT:**	214.04
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	05/27/2016		
EXPIRY DATE: (mm/dd/yyyy)	05/27/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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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.

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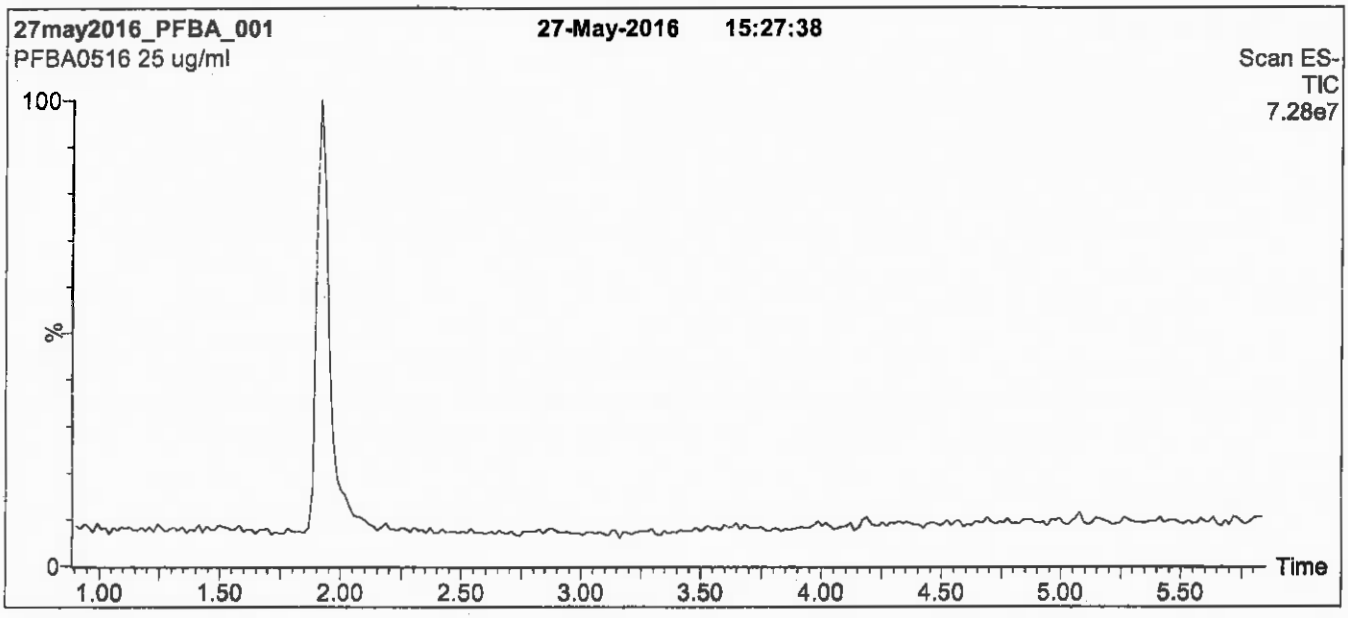
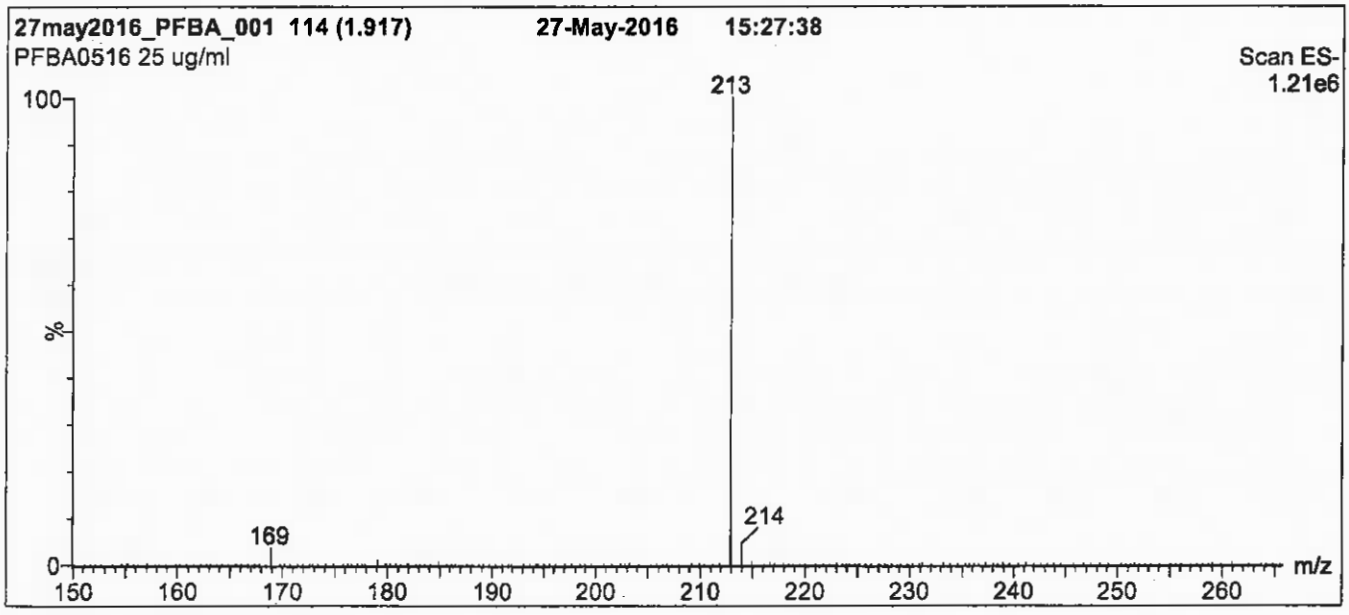
Figure 1: **PFBA; LC/MS Data (TIC and Mass Spectrum)**





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

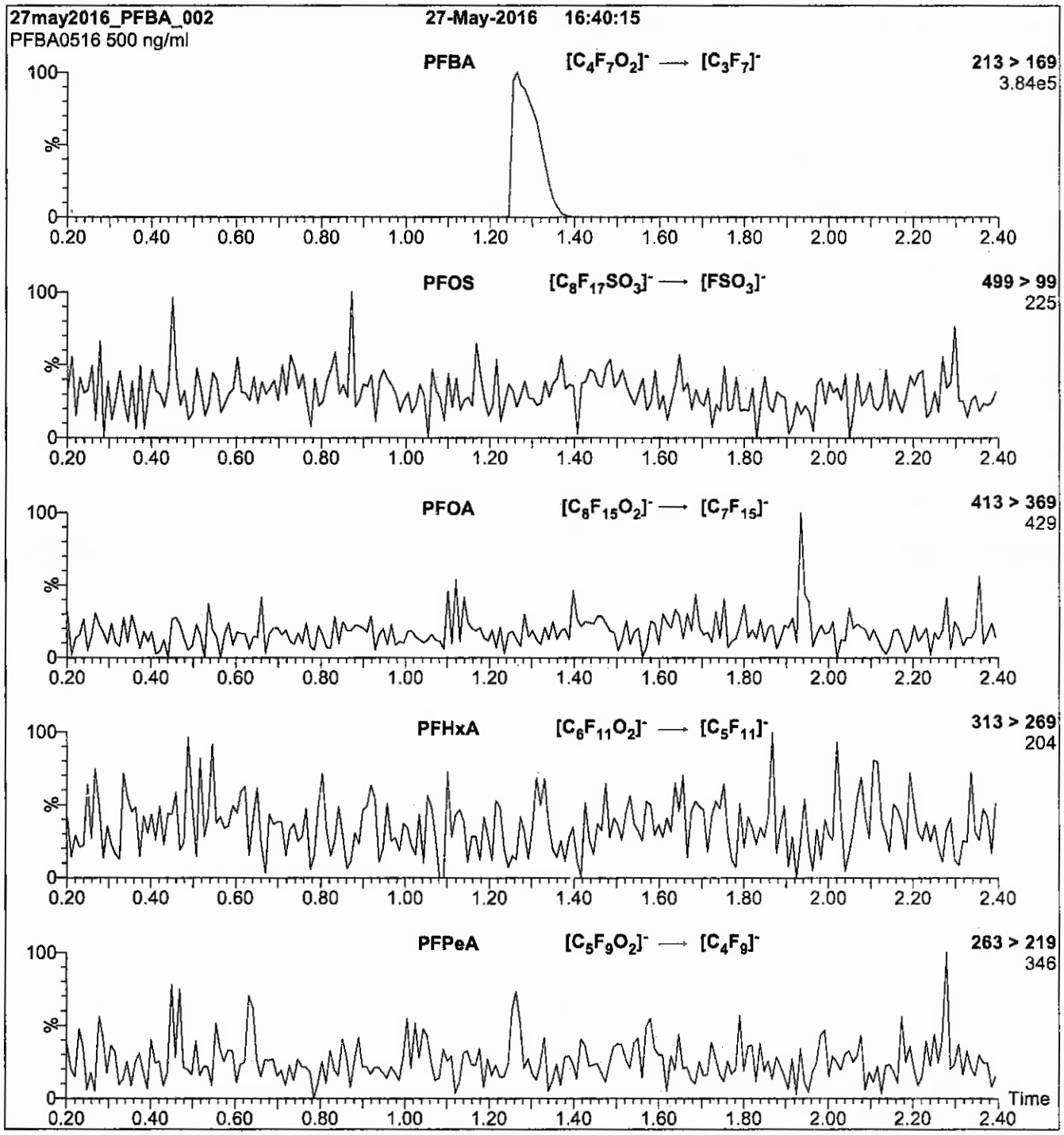
Flow: 300 µl/min

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_00008

R: SBC 9/13/16

730724
ID: LCPFBS_00007
Exp: 03/15/21 Prpd: SBC
PF-1-butanesulfonate K sa

730725
ID: LCPFBS_00008
Exp: 03/15/21 Prpd: SBC
PF-1-butanesulfonate K sa

WELLINGTON LABORATORIES

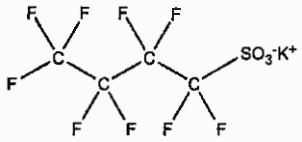
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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		

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

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

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ANSI-ASQ REFERENCE MATERIAL PRODUCER

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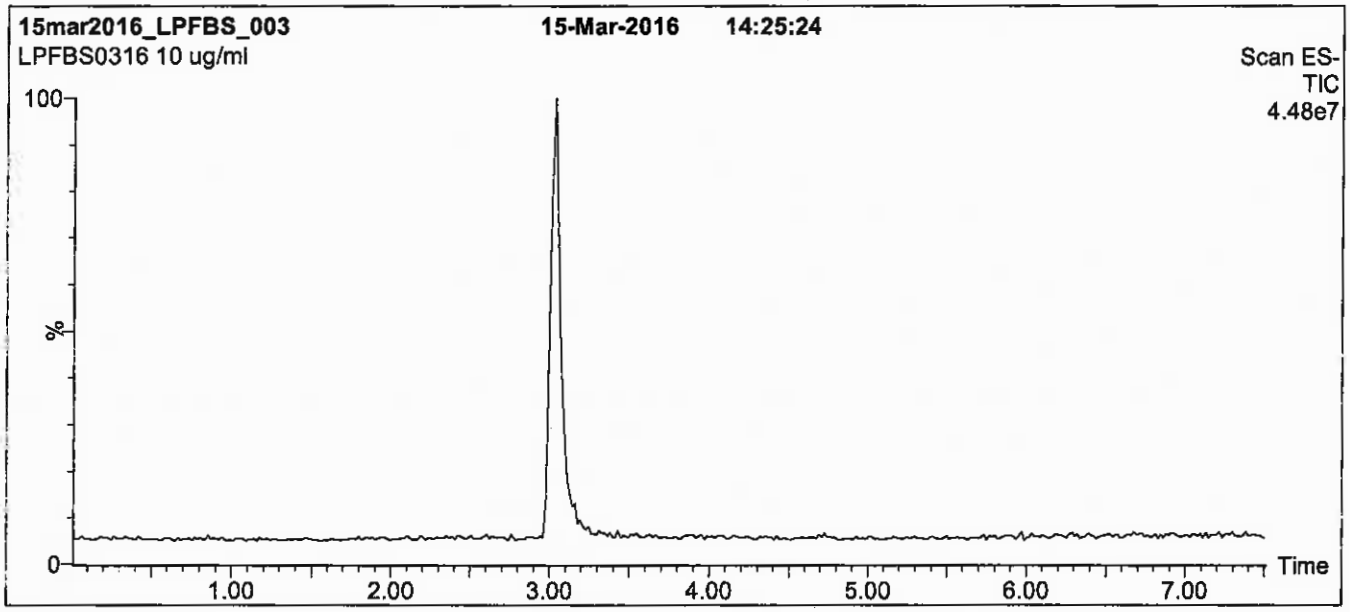
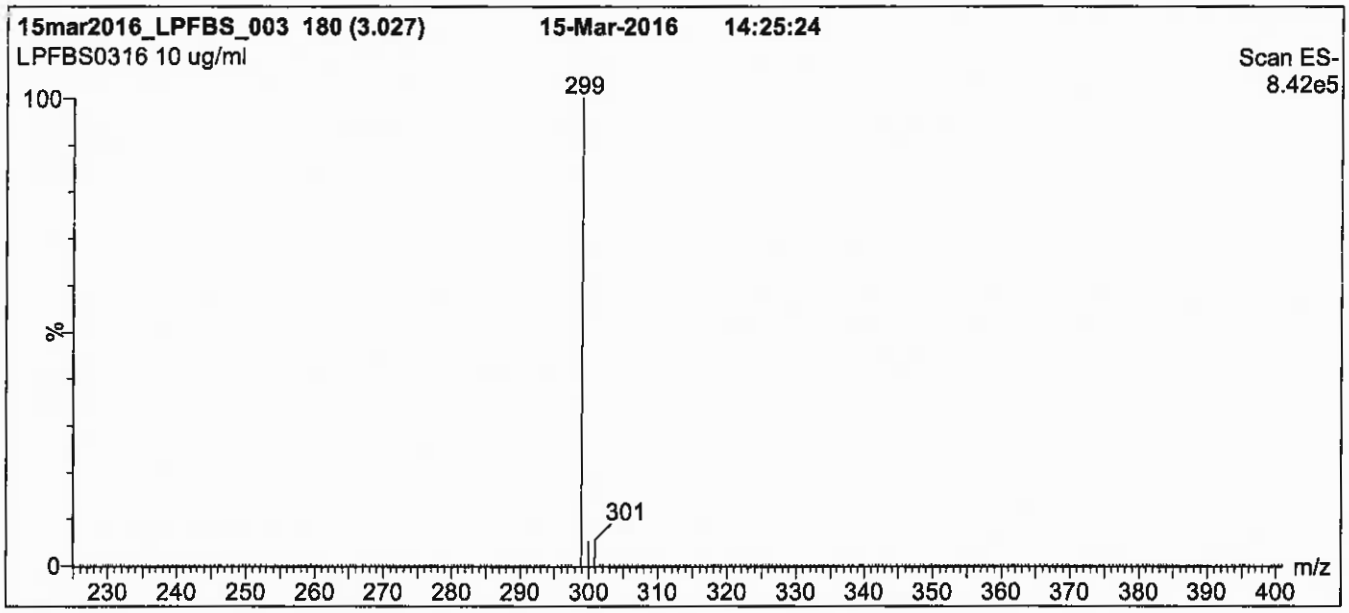
Figure 1: **L-PFBS; LC/MS Data (TIC and Mass Spectrum)**





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

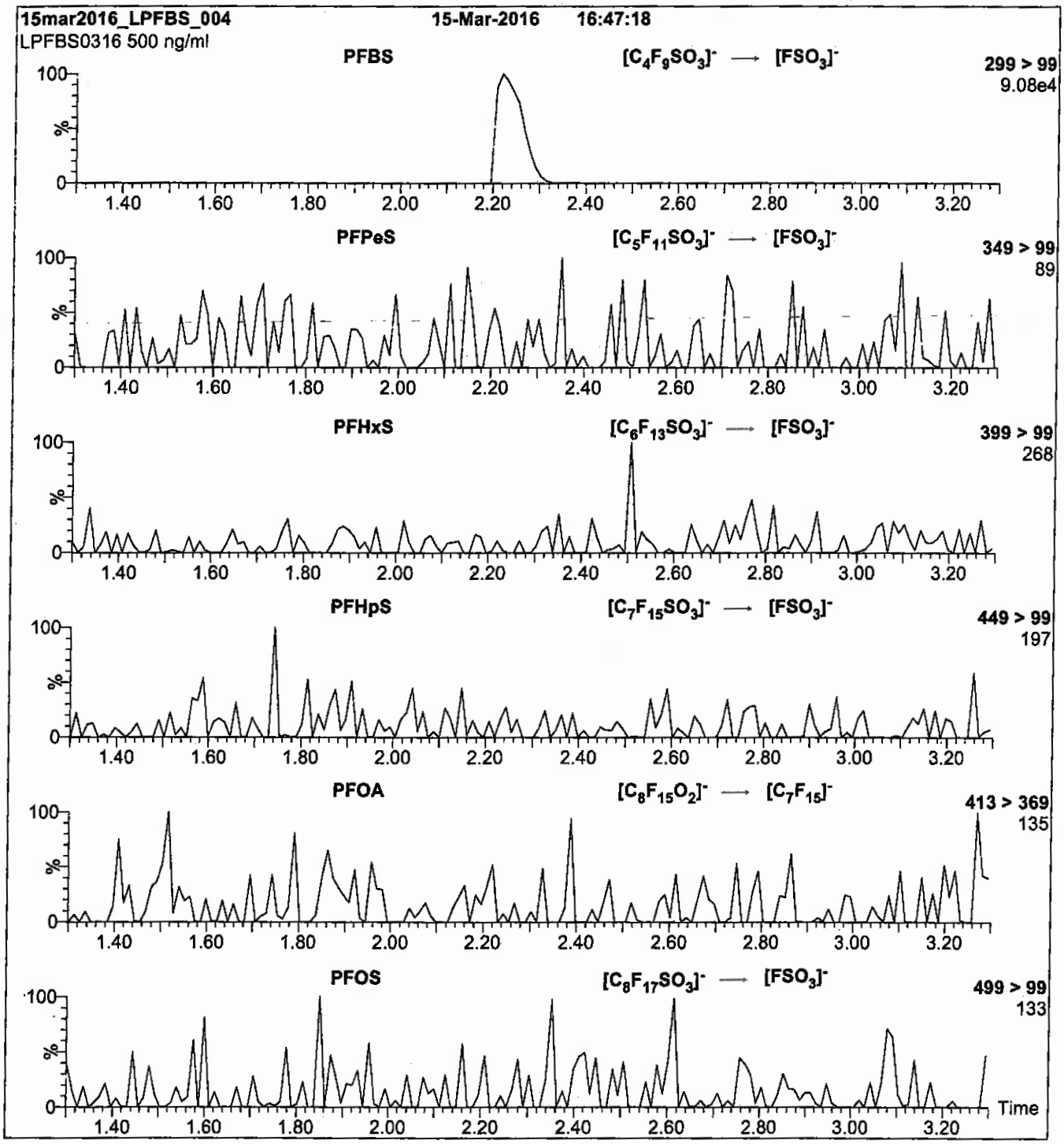
Flow: 300 µl/min

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_00007

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

730620
ID: LCPFDA_00006
Exp: 05/31/21 Prpd: SBC
PF-n-decanoic acid

730621
ID: LCPFDA_00007
Exp: 05/31/21 Prpd: SBC
PF-n-decanoic acid

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFDA	**LOT NUMBER:**	PFDA0516
COMPOUND:	Perfluoro-n-decanoic acid		
STRUCTURE:		**CAS #:**	335-76-2

MOLECULAR FORMULA:	$C_{10}HF_{19}O_2$	**MOLECULAR WEIGHT:**	514.08
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	05/31/2016		
EXPIRY DATE: (mm/dd/yyyy)	05/31/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 06/13/2016 (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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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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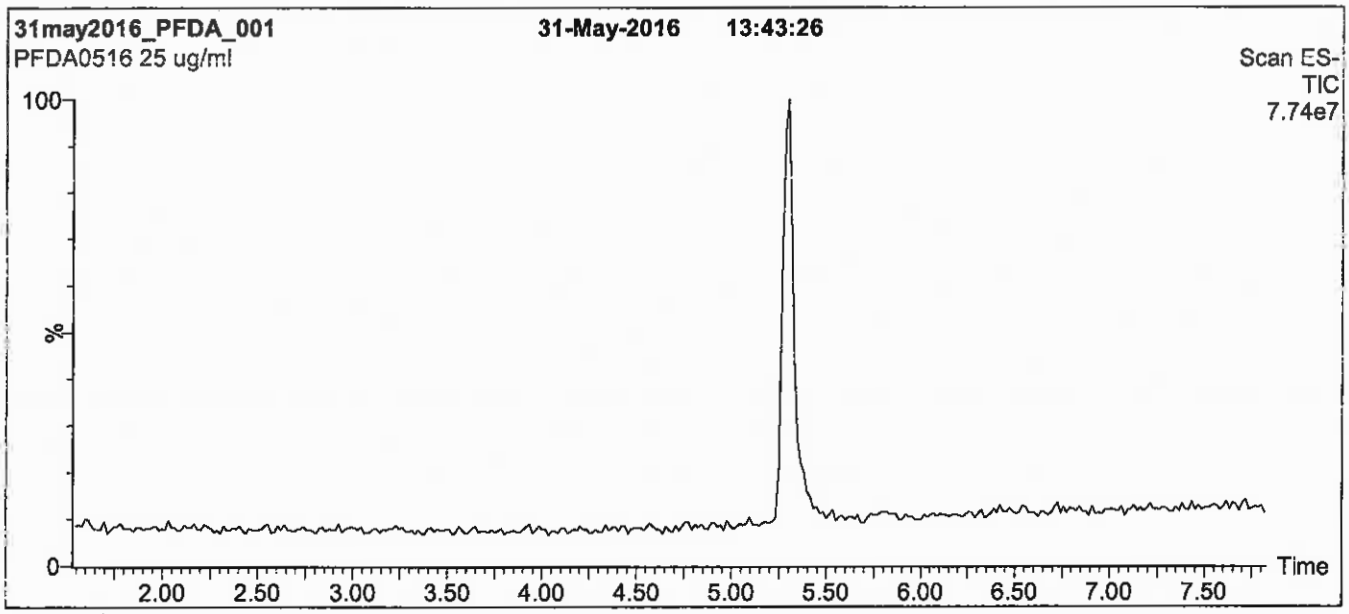

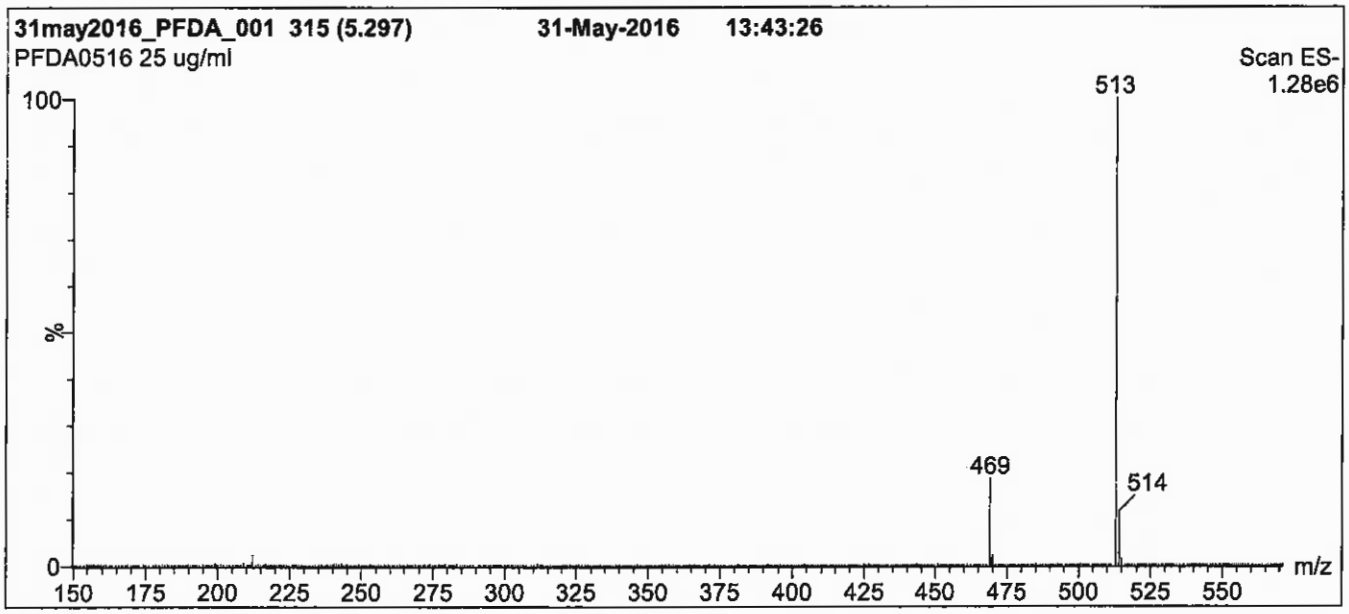

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1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
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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

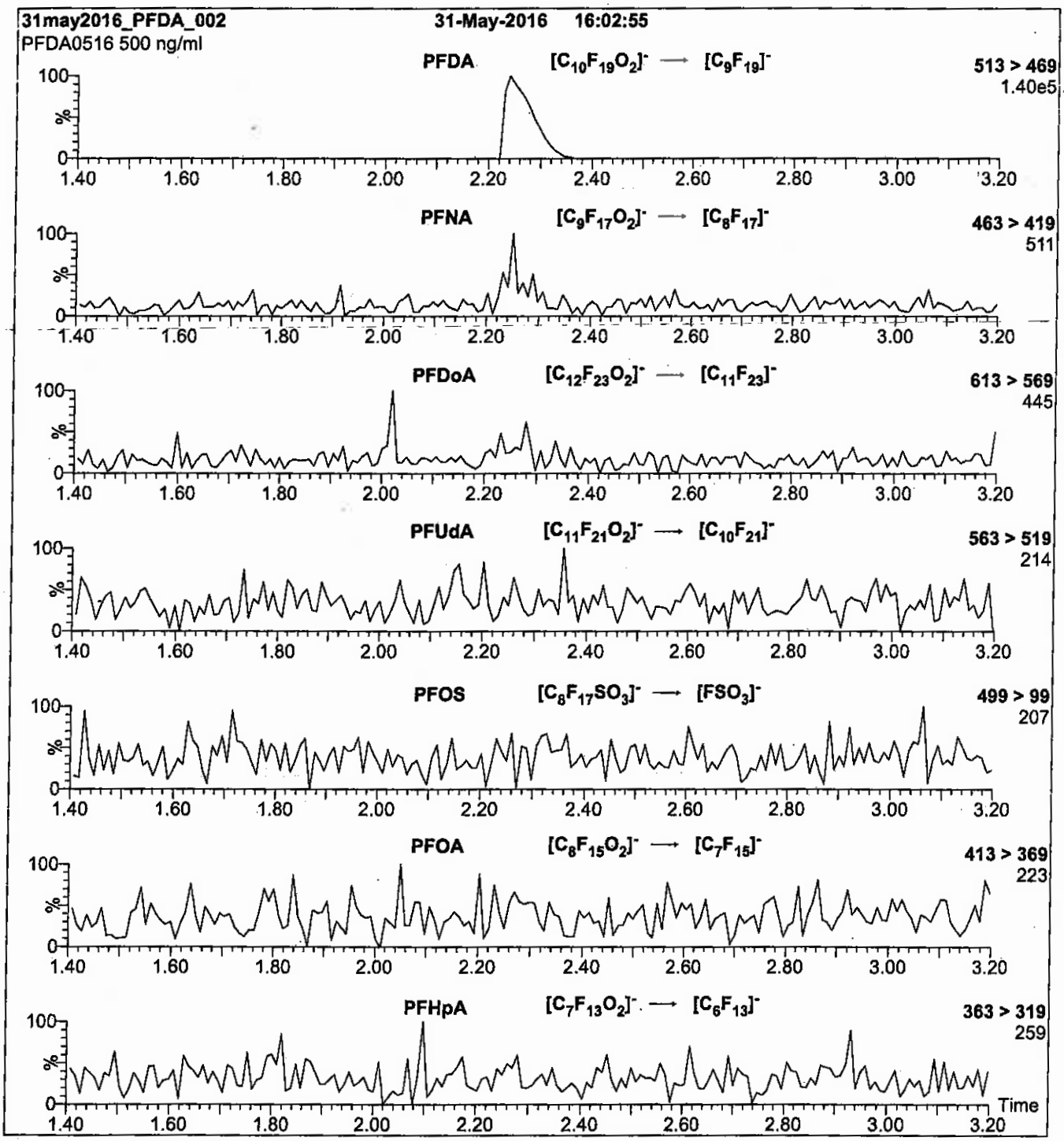
Flow: 300 µl/min

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: **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) = 3.39e-3
Collision Energy (eV) = 13

Reagent

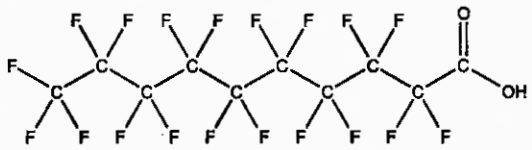
LCPFDA_00008

R: 9/21/17 SKJ

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFDA	**LOT NUMBER:**	PFDA0517
COMPOUND:	Perfluoro-n-decanoic acid		
STRUCTURE:		**CAS #:**	335-76-2



MOLECULAR FORMULA:	$C_{10}HF_{19}O_2$	**MOLECULAR WEIGHT:**	514.08
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	05/29/2017		
EXPIRY DATE: (mm/dd/yyyy)	05/29/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 05/30/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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

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

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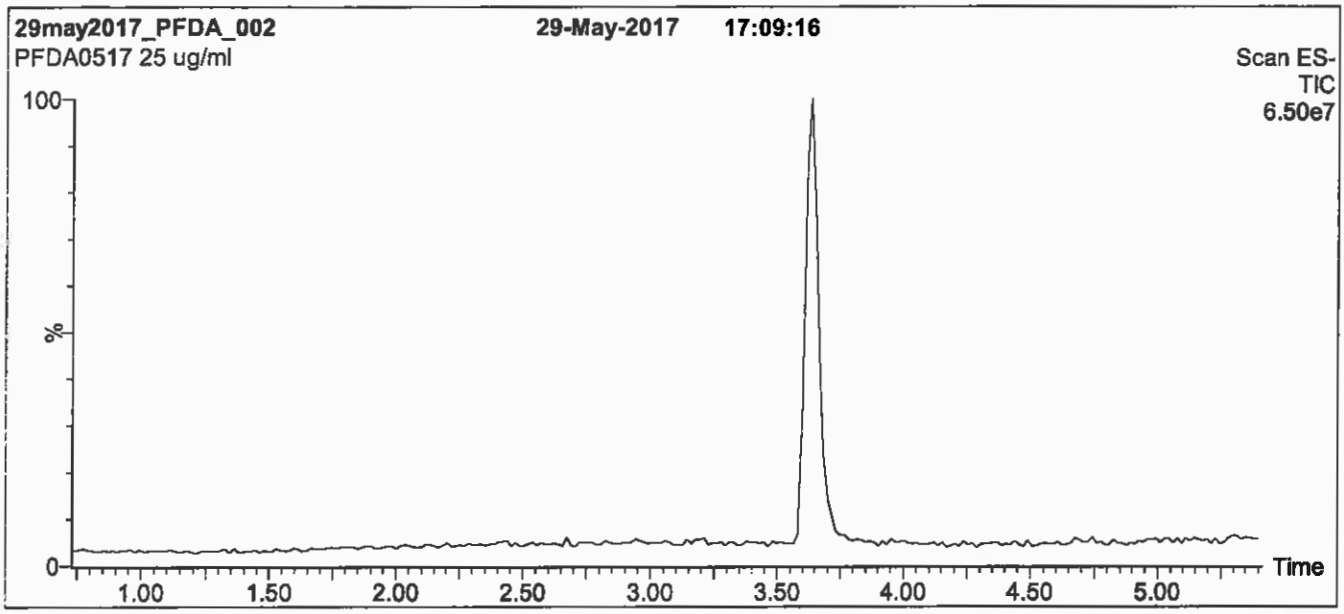
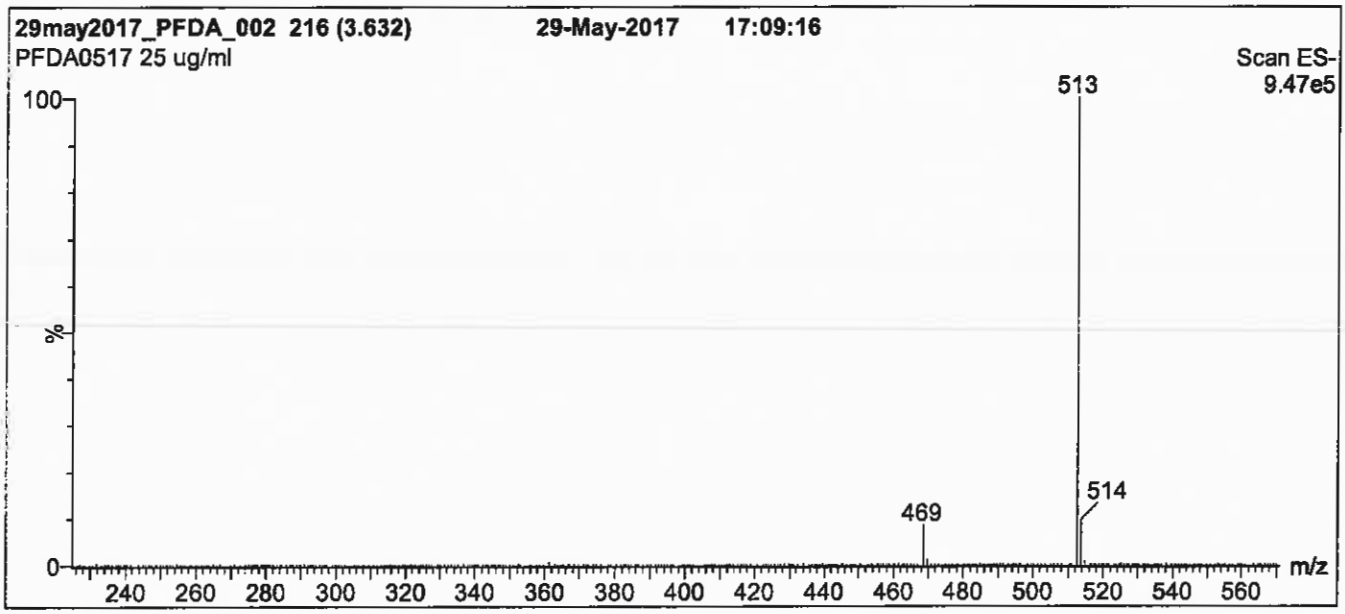




Conditions for Figure 1:

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

Chromatographic Conditions

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

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

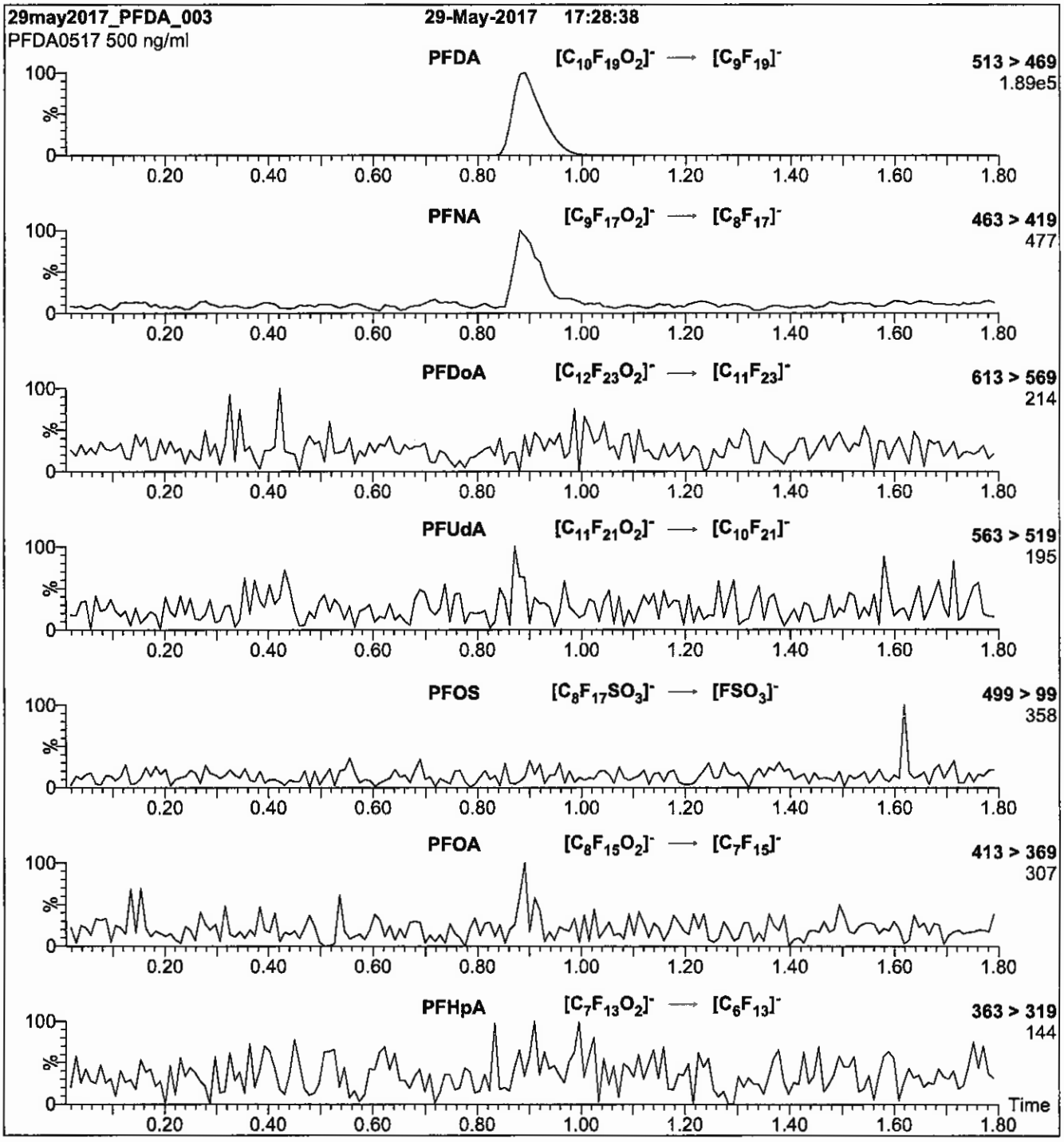
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 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) = 3.20e-3
Collision Energy (eV) = 13

Reagent

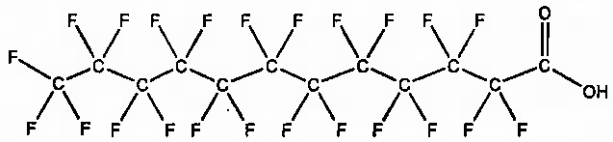
LCPFDoA_00007

r: 12/21/16 SPV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFDoA	**LOT NUMBER:**	PFDoA0516
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)	05/31/2016		
EXPIRY DATE: (mm/dd/yyyy)	05/31/2021		
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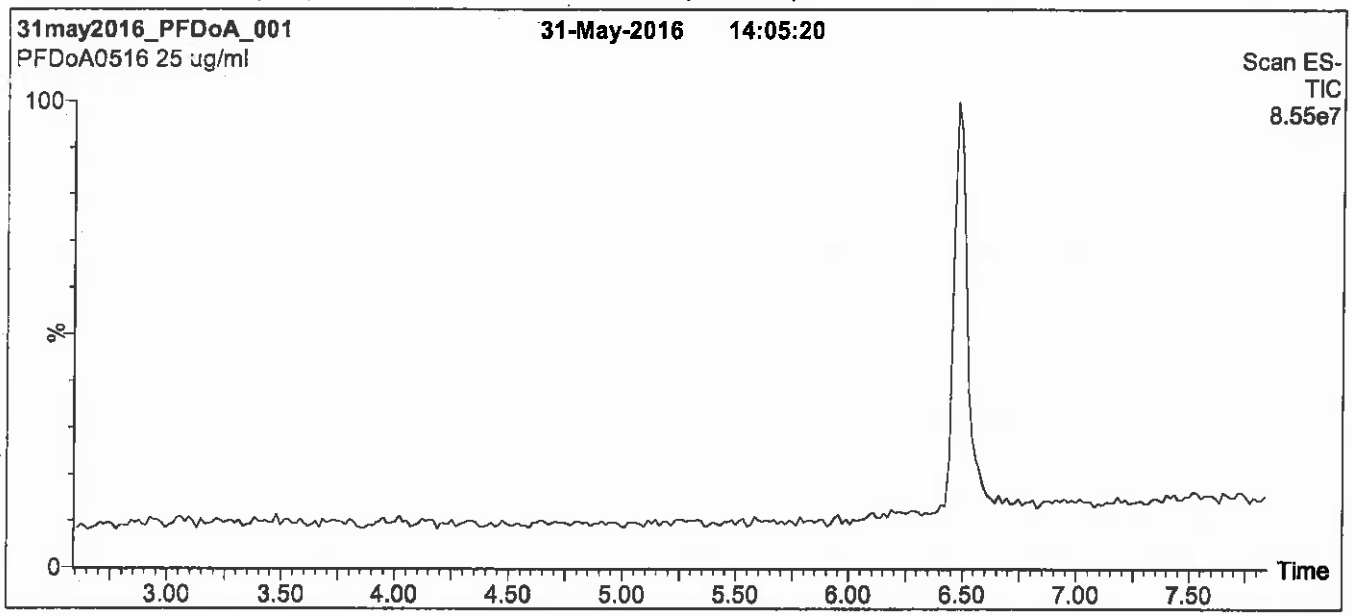

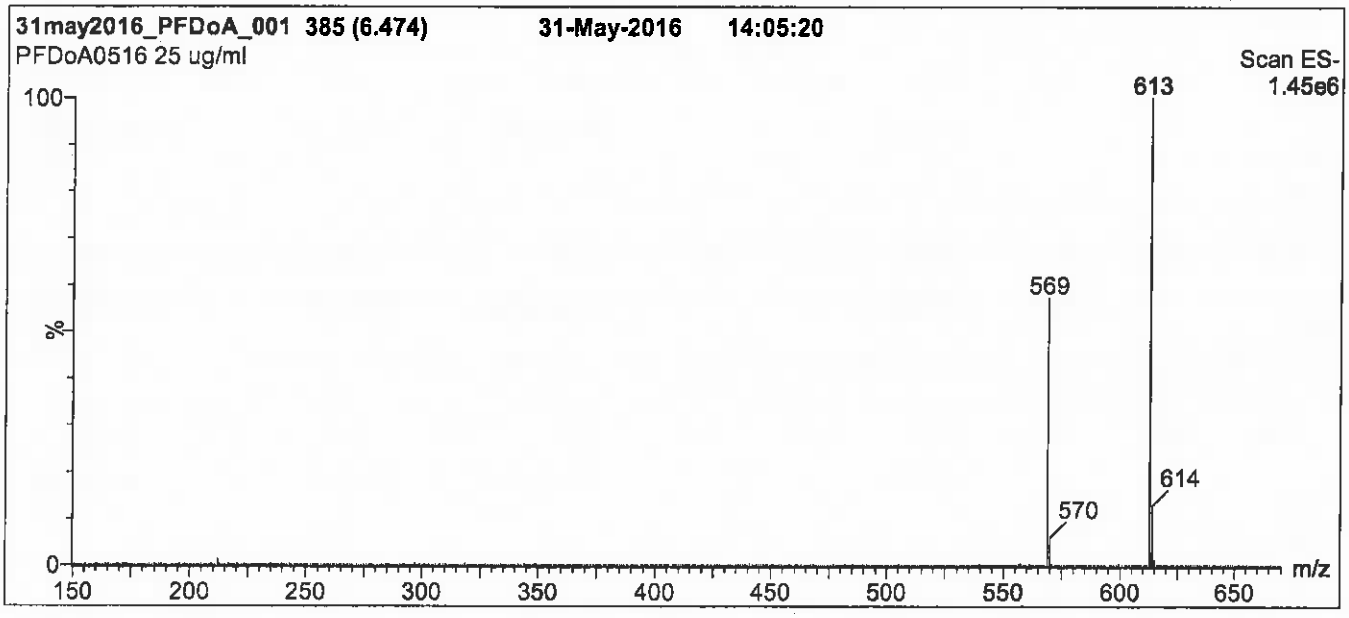

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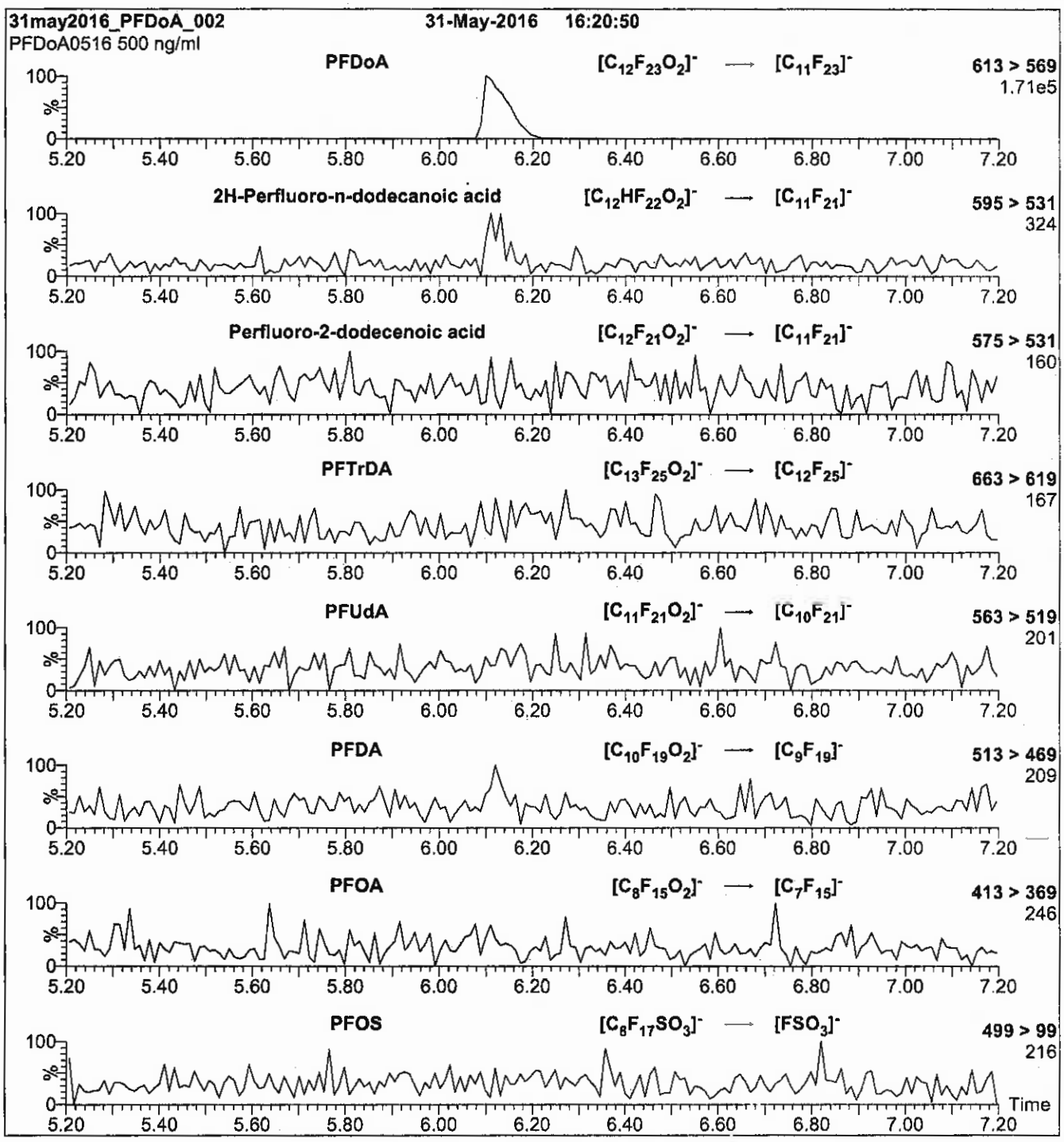
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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) = 13

Reagent

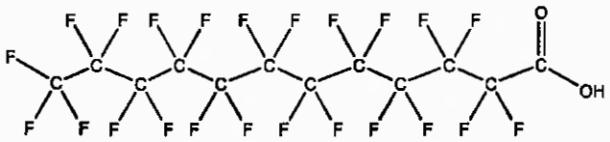
LCPFDoA_00008

P: 10/20/17 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	PFDoA	**LOT NUMBER:**	PFDoA0517
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)	05/29/2017		
EXPIRY DATE: (mm/dd/yyyy)	05/29/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 05/30/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ 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 calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

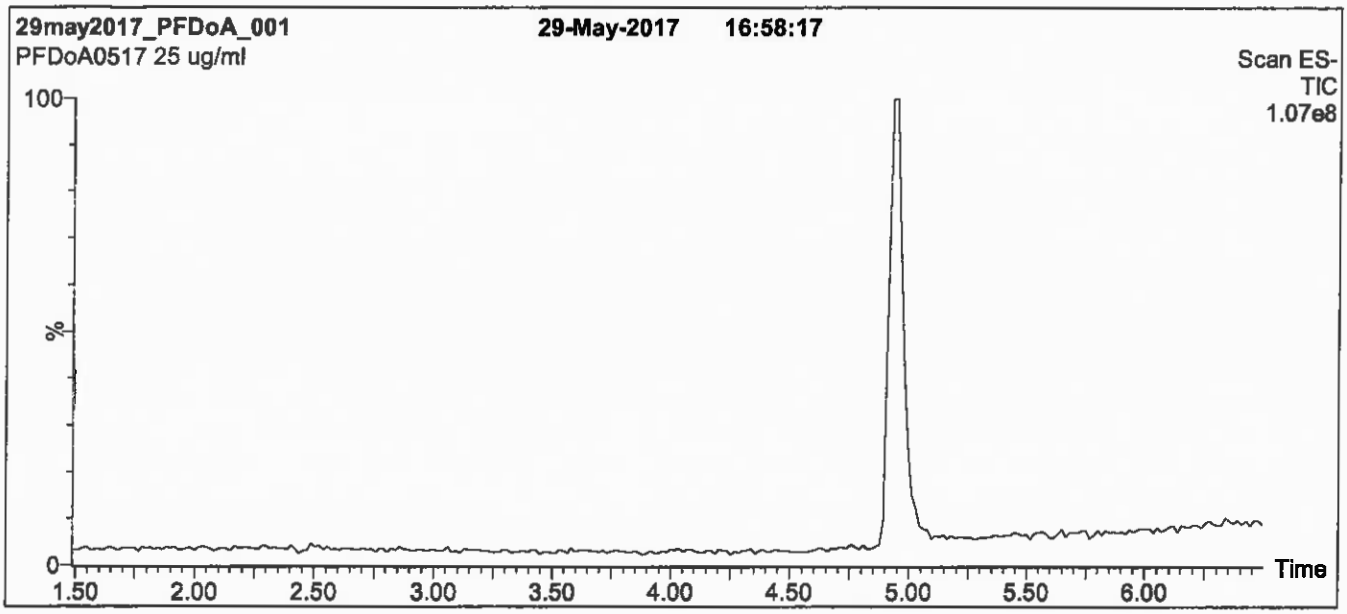
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

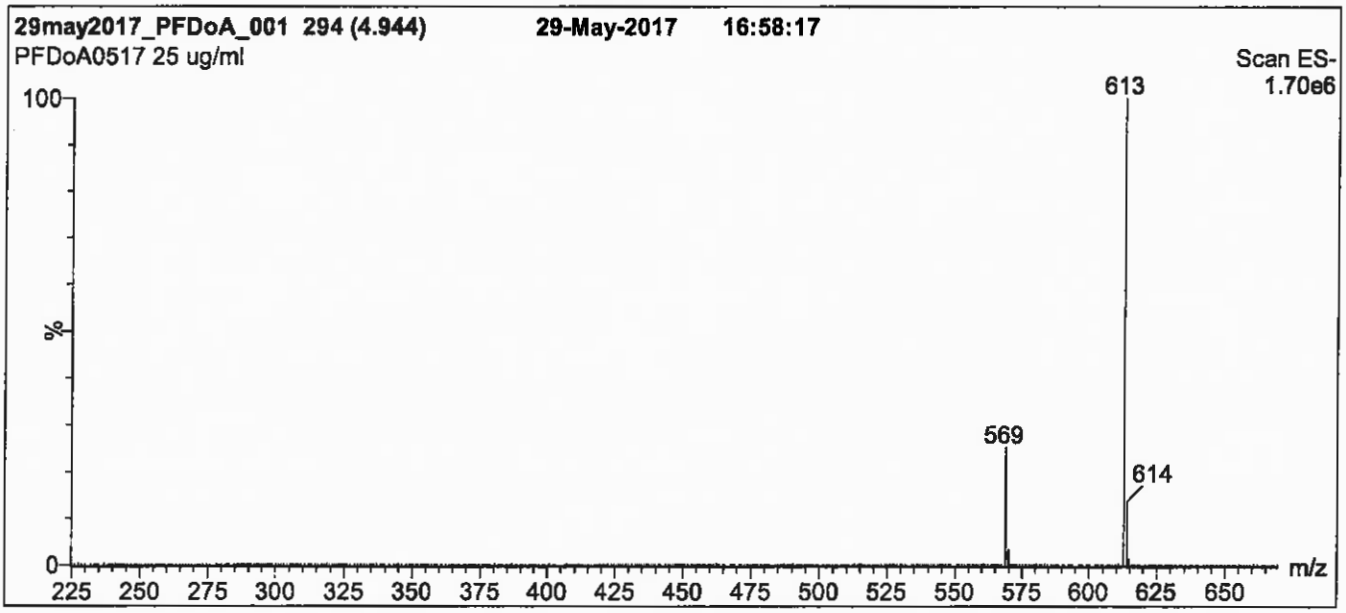
CALA

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

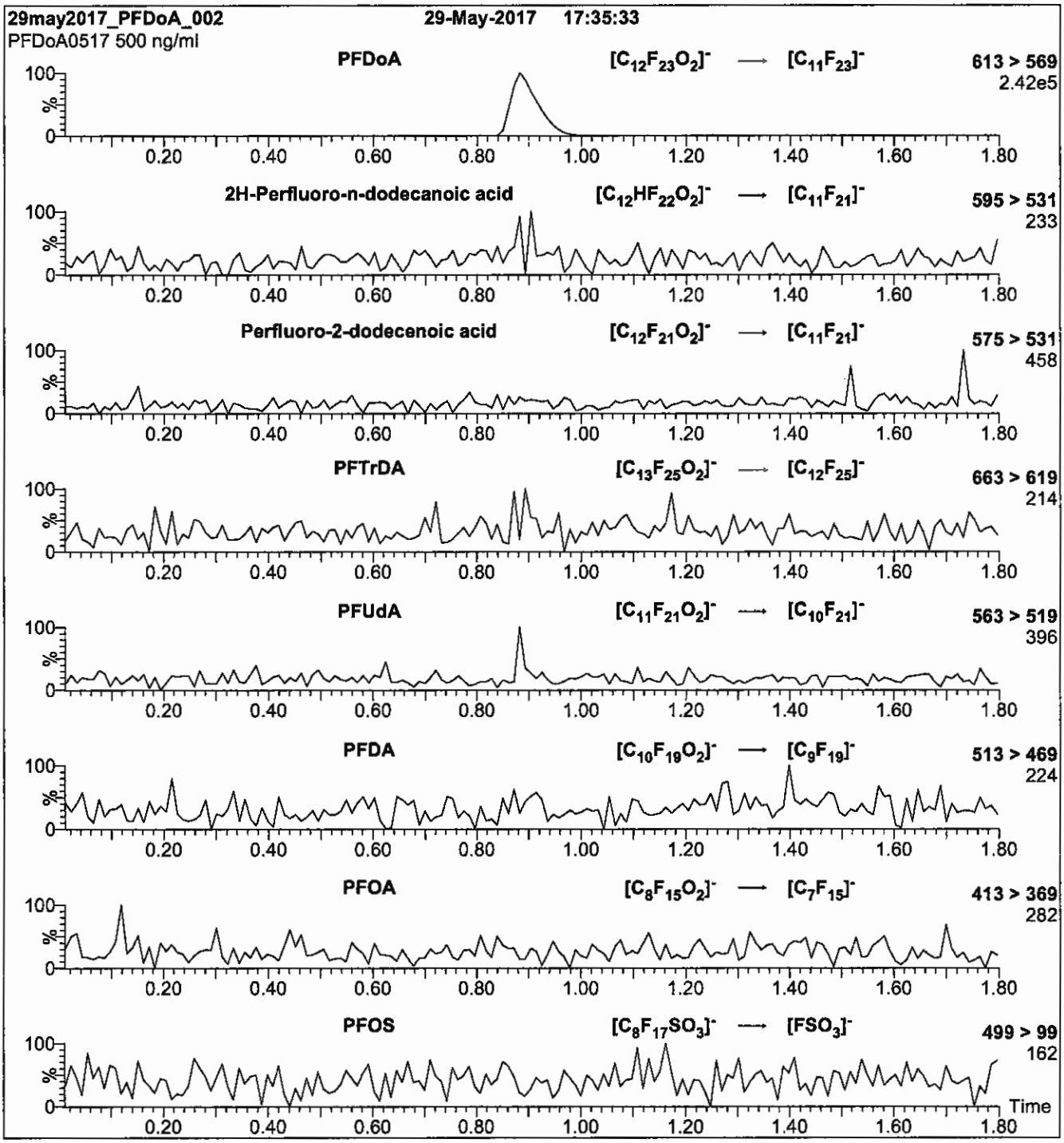
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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) = 13

Reagent

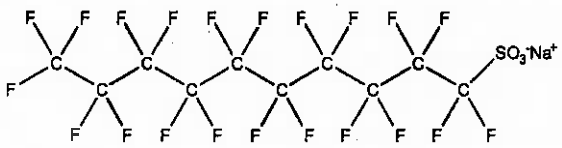
LCPFDSA_00002

D: 12/29/16 SK✓

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	L-PFDS	**LOT NUMBER:**	LPFDS0516
COMPOUND:	Sodium perfluoro-1-decanesulfonate		
STRUCTURE:		**CAS #:**	2806-15-7



MOLECULAR FORMULA:	$C_{10}F_{21}SO_3Na$	**MOLECULAR WEIGHT:**	622.13
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 48.2 ± 2.4 µg/ml (PFDS anion)	**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.
- Contains ~ 0.9% of sodium perfluoro-1-dodecanesulfonate (L-PFDoS).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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:

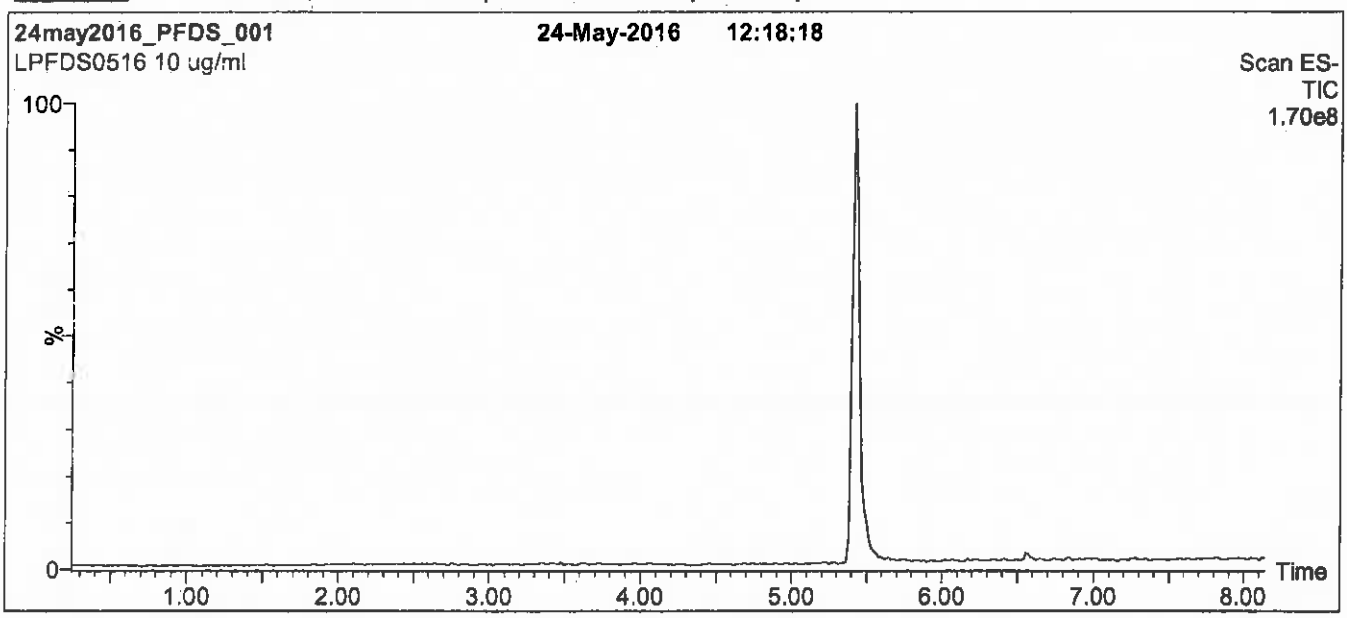
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

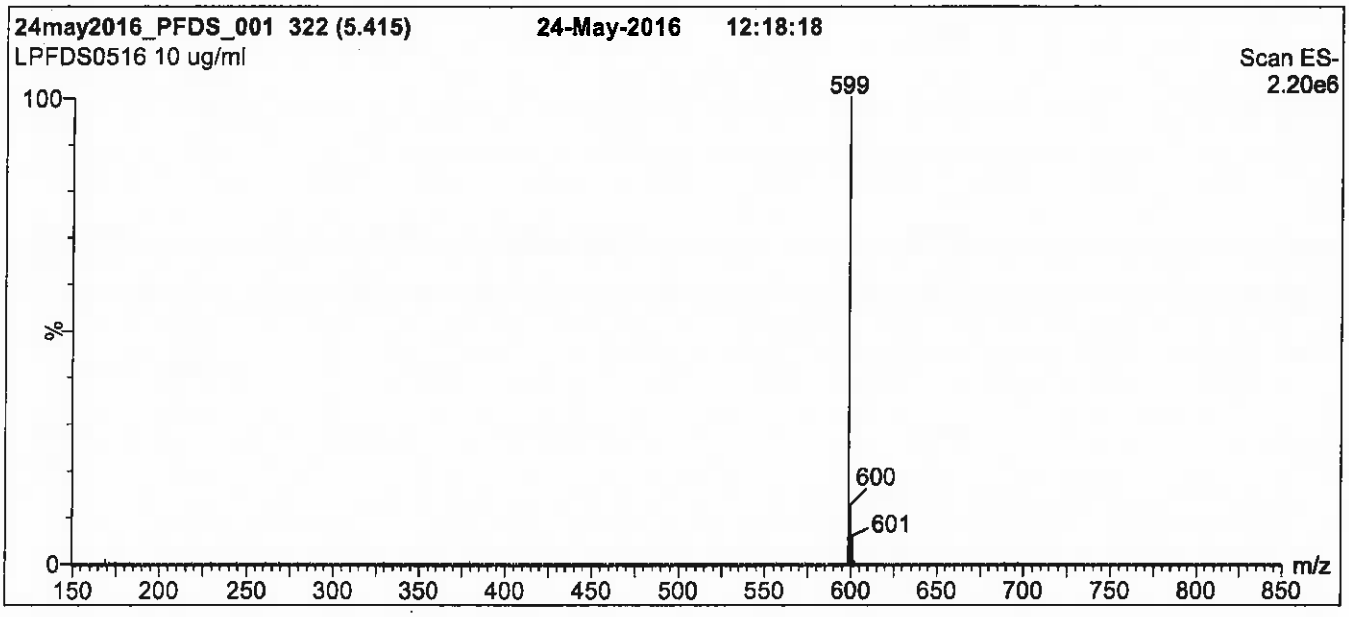
CALA

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





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield 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 7.5 min and hold for
1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

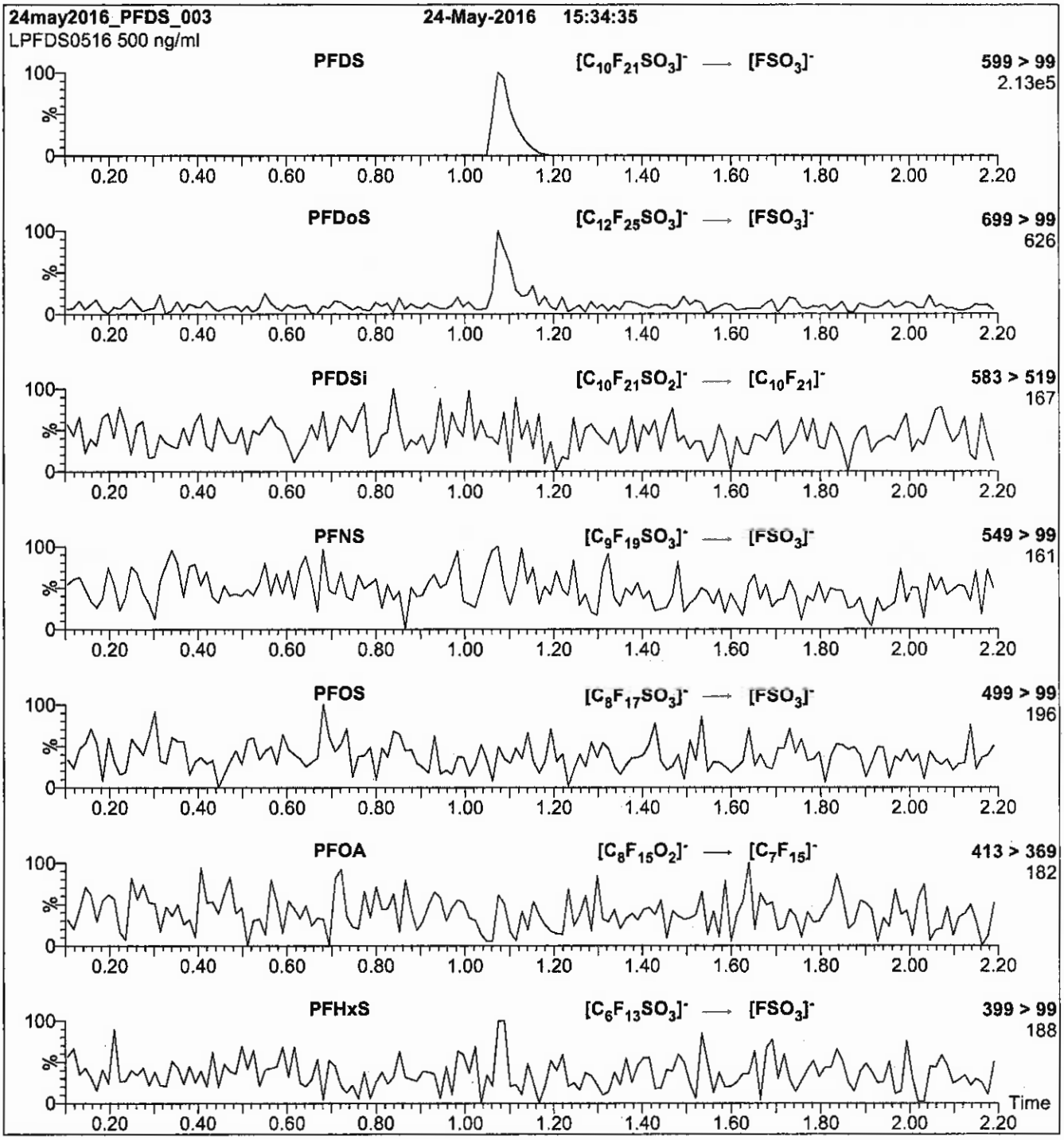
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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) = 3.70e-3
Collision Energy (eV) = 50

Reagent

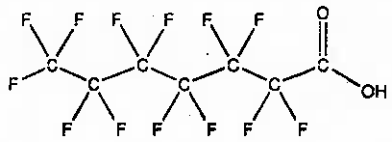
LCPFHpA_00008

P: 12/29/16 SGN

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFHpA	**LOT NUMBER:**	PFHpA1216
COMPOUND:	Perfluoro-n-heptanoic acid		
STRUCTURE:		**CAS #:**	375-85-9



MOLECULAR FORMULA:	$C_7HF_{13}O_2$	**MOLECULAR WEIGHT:**	364.06
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	12/02/2016		
EXPIRY DATE: (mm/dd/yyyy)	12/02/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 12/12/2016
B.G. Chittim (mm/dd/yyyy)

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

INTENDED USE:

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

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TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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QUALITY MANAGEMENT:

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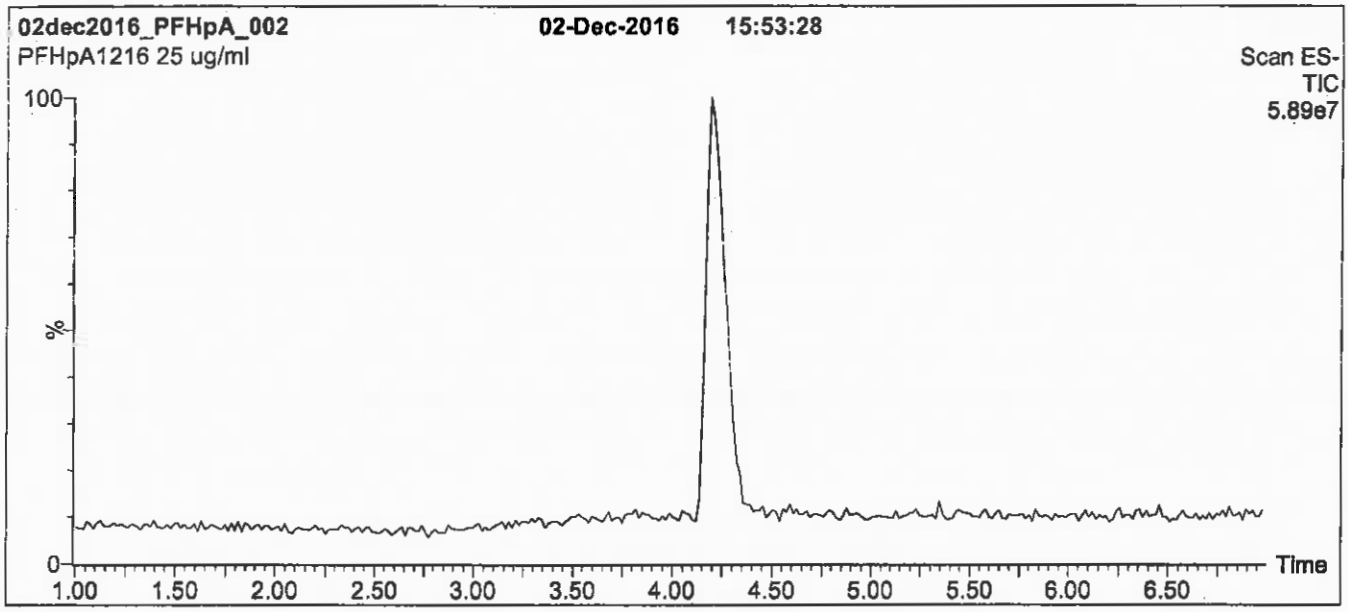
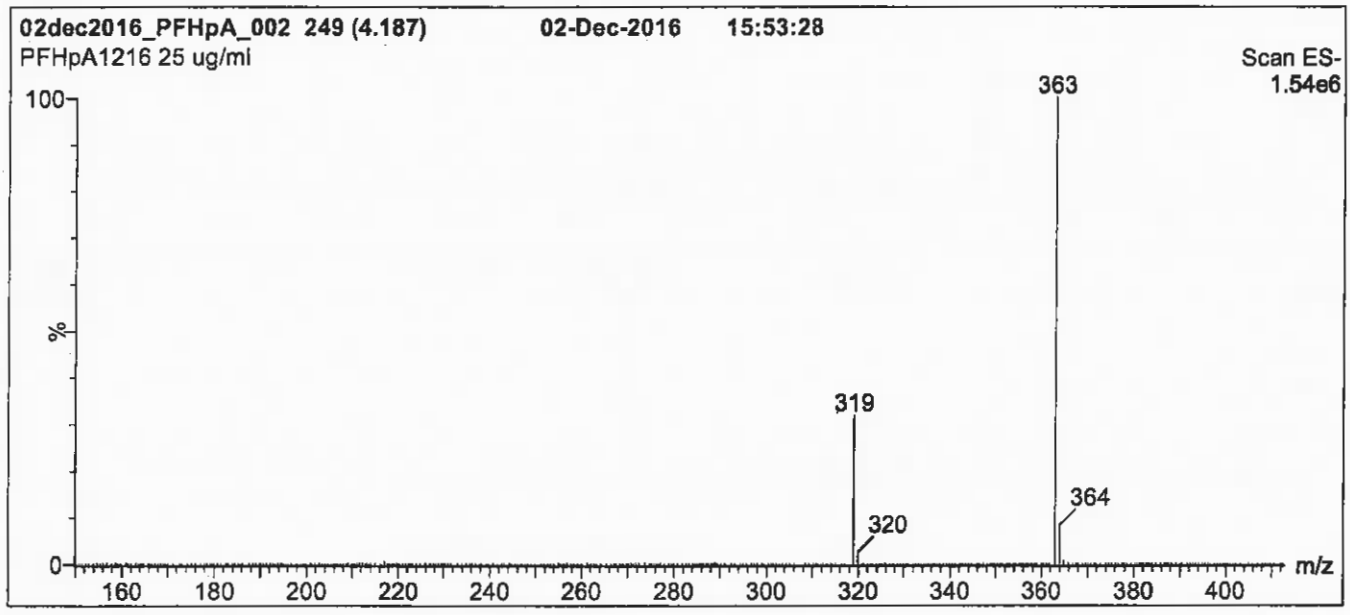
CALA

ANAB ACCREDITED REFERENCE MATERIAL

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield 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

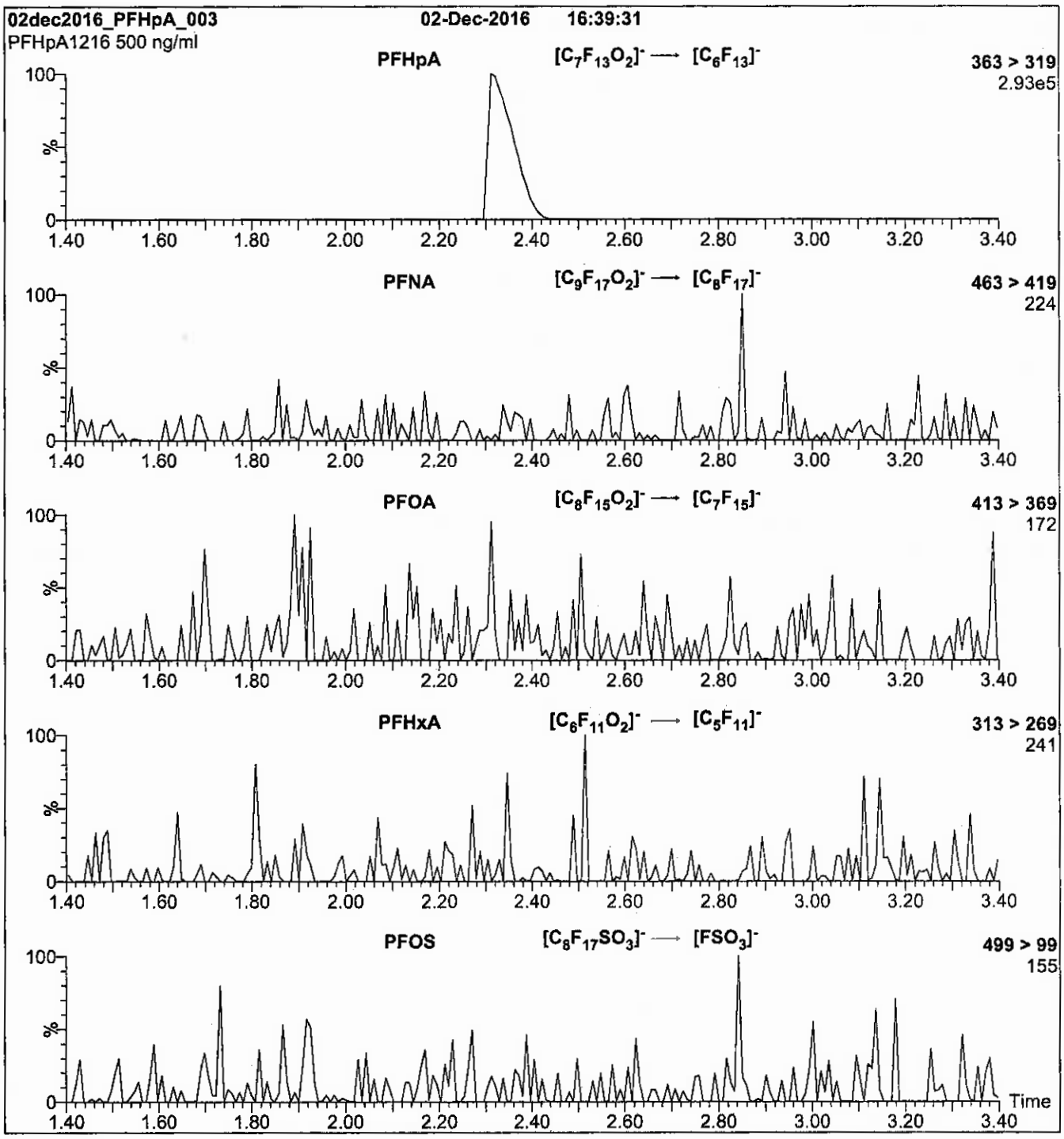
Flow: 300 µl/min

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: **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

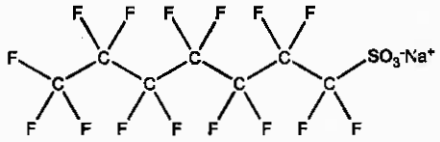
LCPFHpSA_00003

R: 9/21/17 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	L-PFHpS	**LOT NUMBER:**	LPFHpS0817
COMPOUND:	Sodium perfluoro-1-heptanesulfonate		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$C_7F_{15}SO_3Na$	**MOLECULAR WEIGHT:**	472.10
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.6 ± 2.4 µg/ml (PFHpS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	09/01/2017		
EXPIRY DATE: (mm/dd/yyyy)	09/01/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 09/07/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ 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 calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

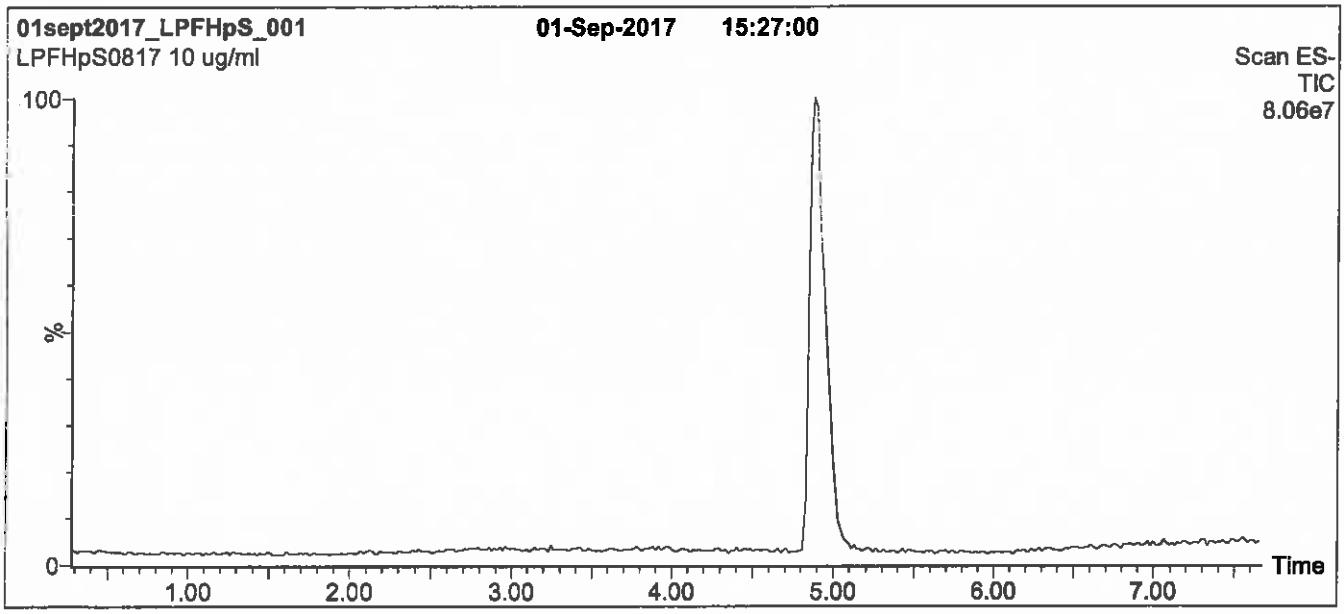
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

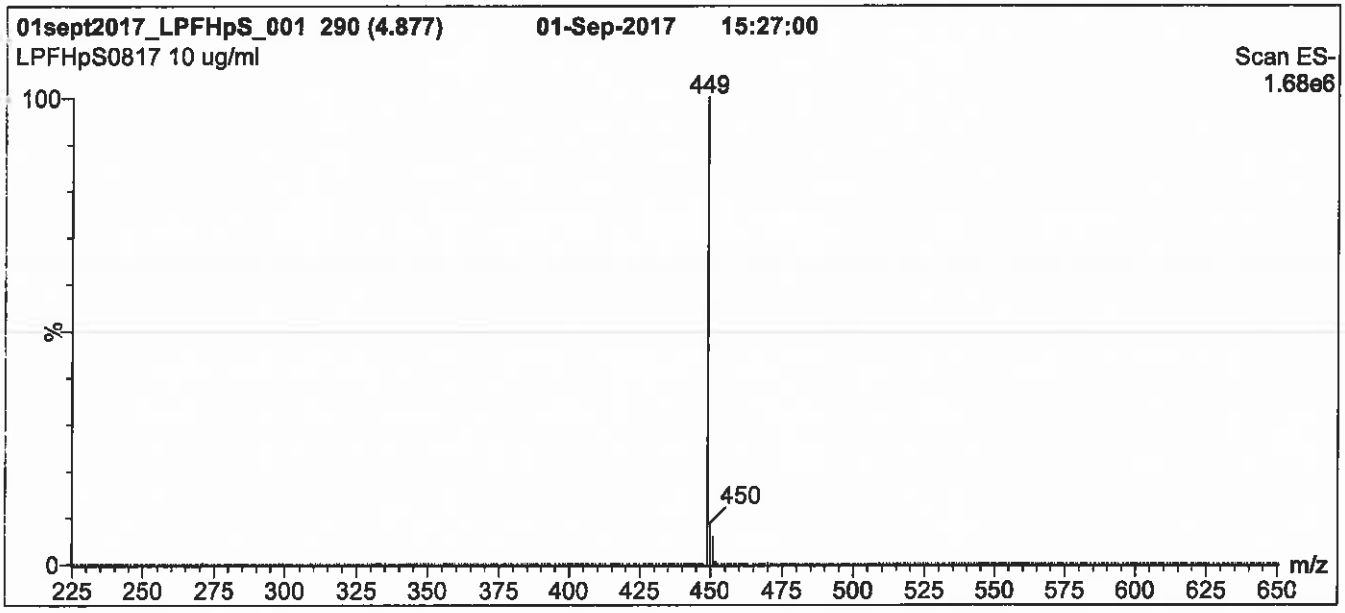
CALA

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 8 min and hold
for 1 min before returning to initial conditions in 0.5 min.
Time: 10 min

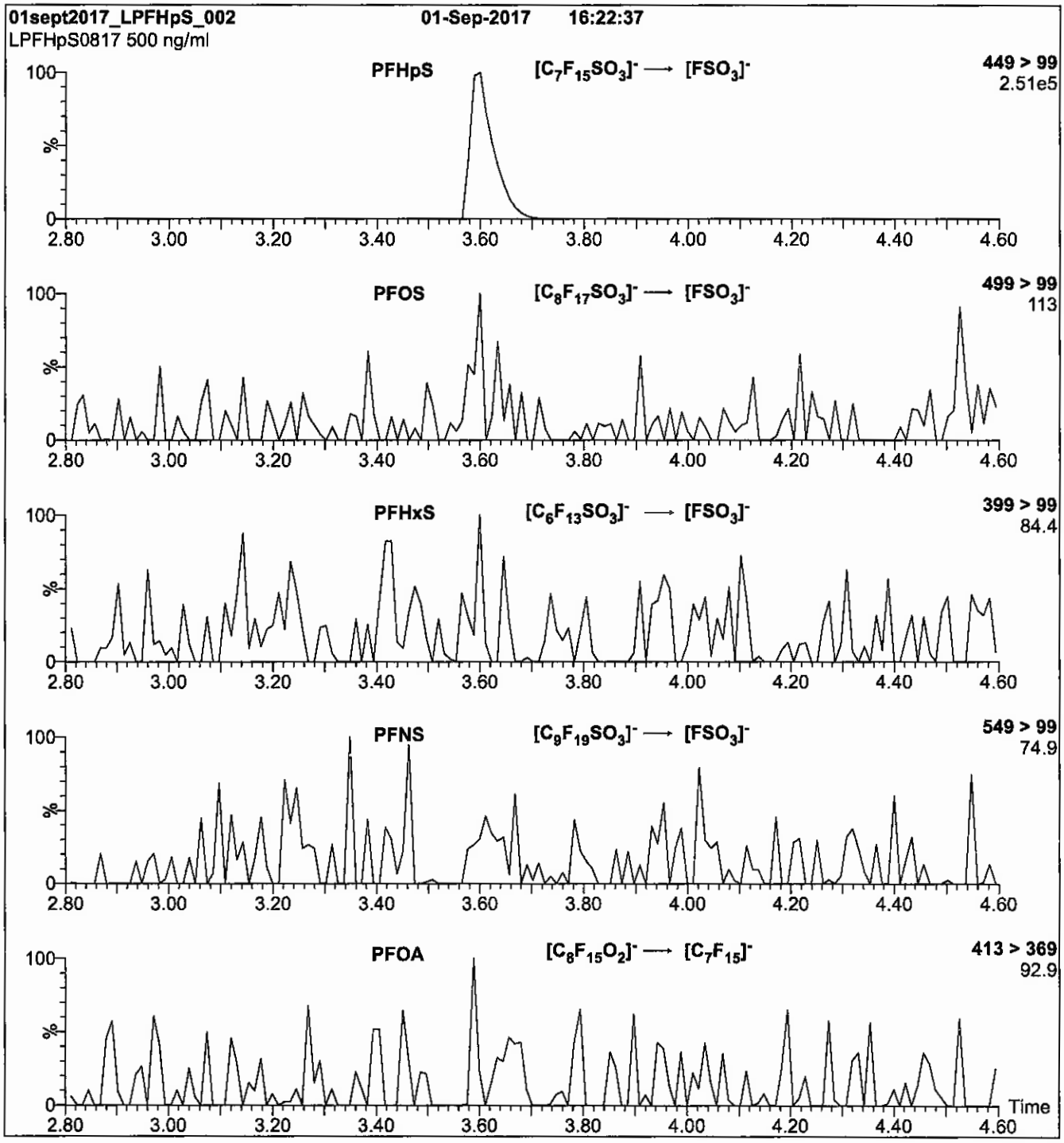
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (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) = 3.35e-3
Collision Energy (eV) = 35

Reagent

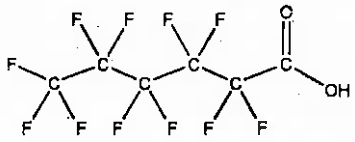
LCPFHxA_00007

R: 12/29/16 SAV

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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HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

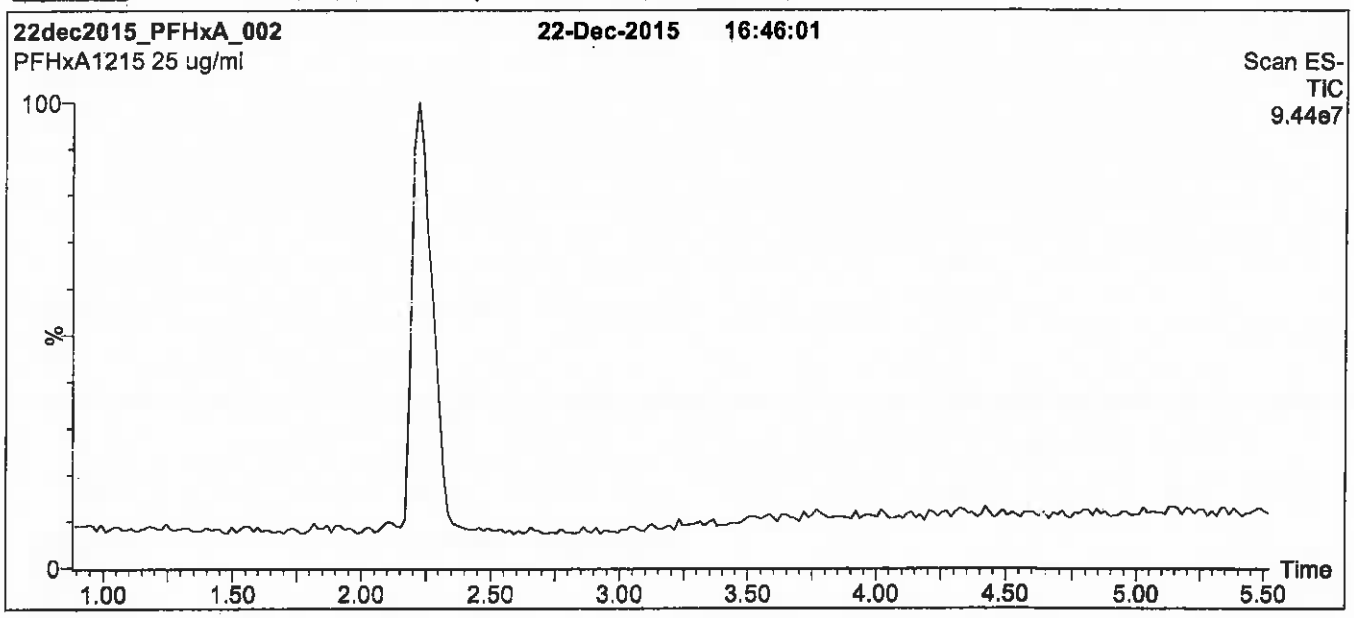
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

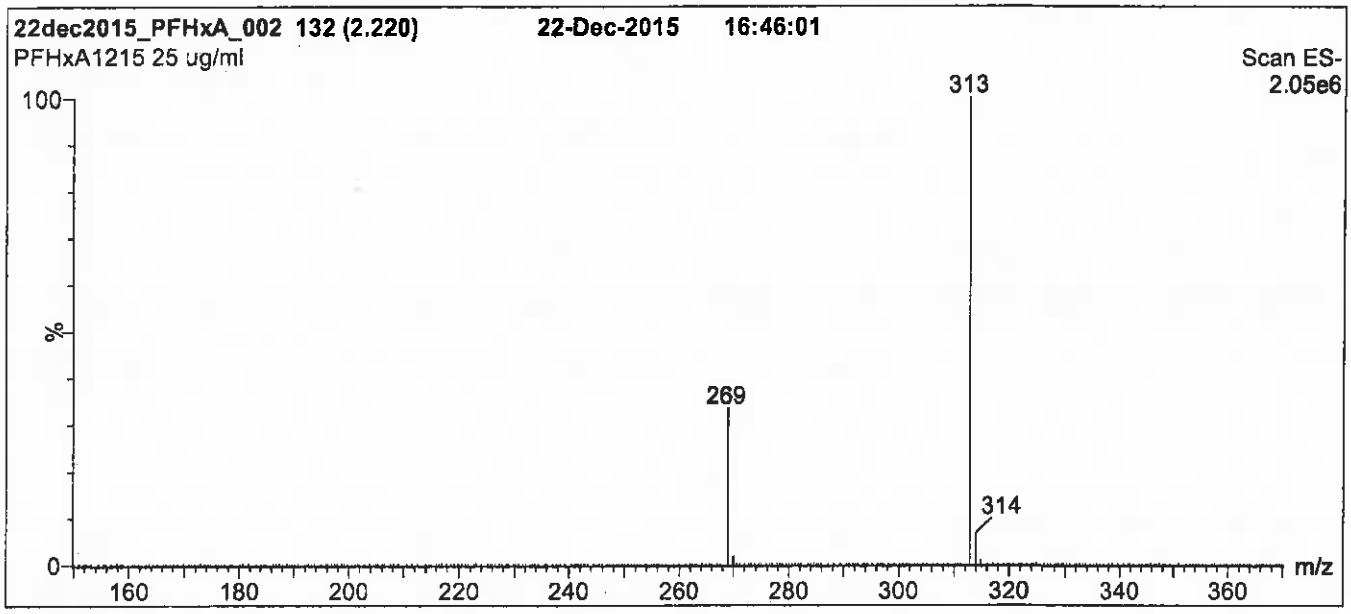
CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield 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

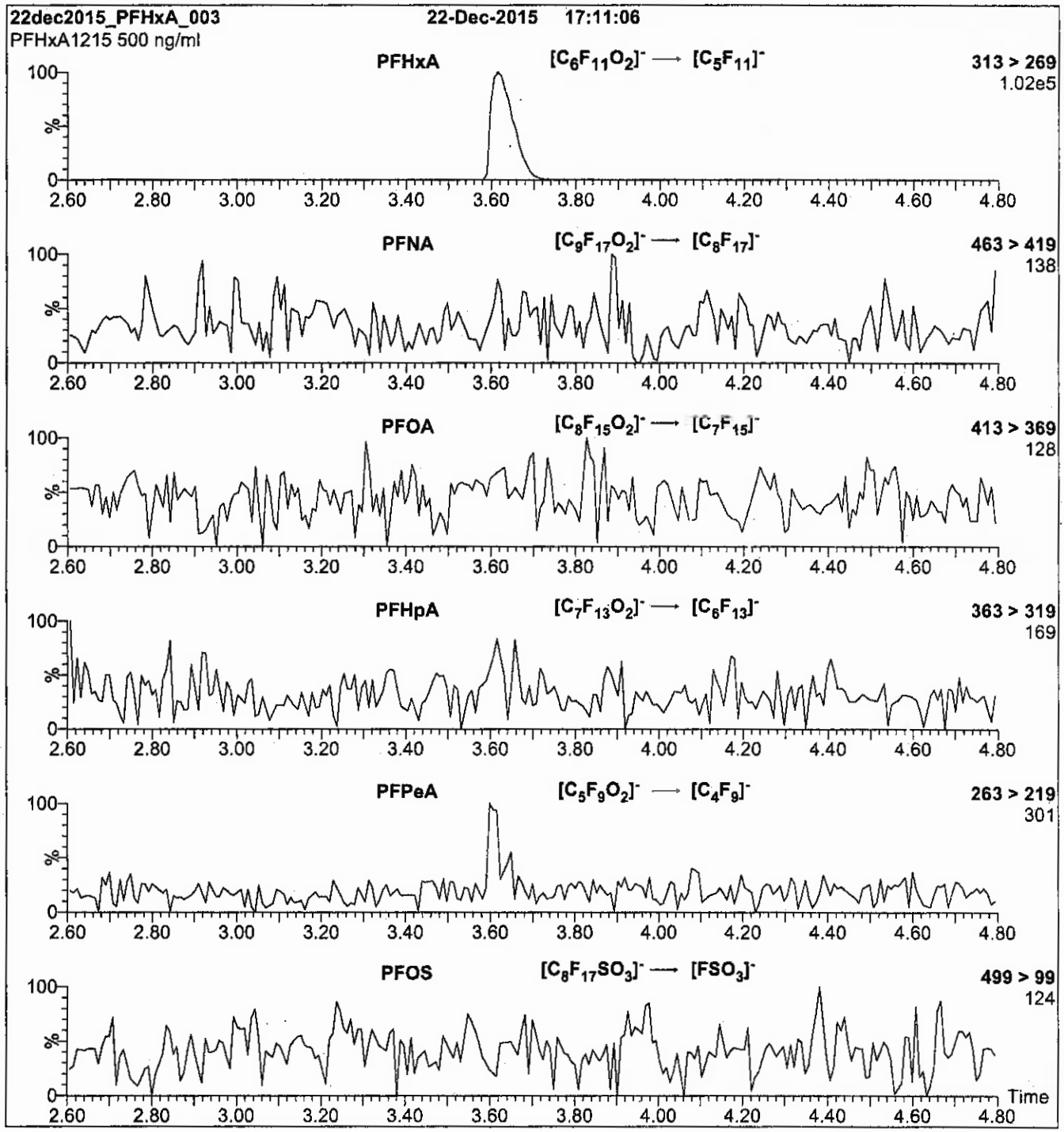
Flow: 300 µl/min

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

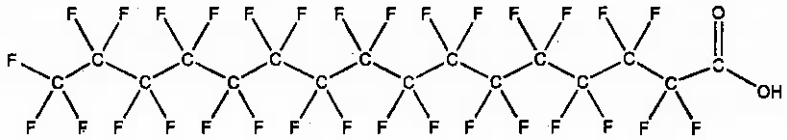
LCPFHxDA_00008

T: 12/29/16 SEV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFHxDA	**LOT NUMBER:**	PFHxDA0516
COMPOUND:	Perfluoro-n-hexadecanoic acid		
STRUCTURE:		**CAS #:**	67905-19-5



MOLECULAR FORMULA:	$C_{16}HF_{31}O_2$	**MOLECULAR WEIGHT:**	814.13
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	05/25/2016		
EXPIRY DATE: (mm/dd/yyyy)	05/25/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.4% of PFODA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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HAZARDS:

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

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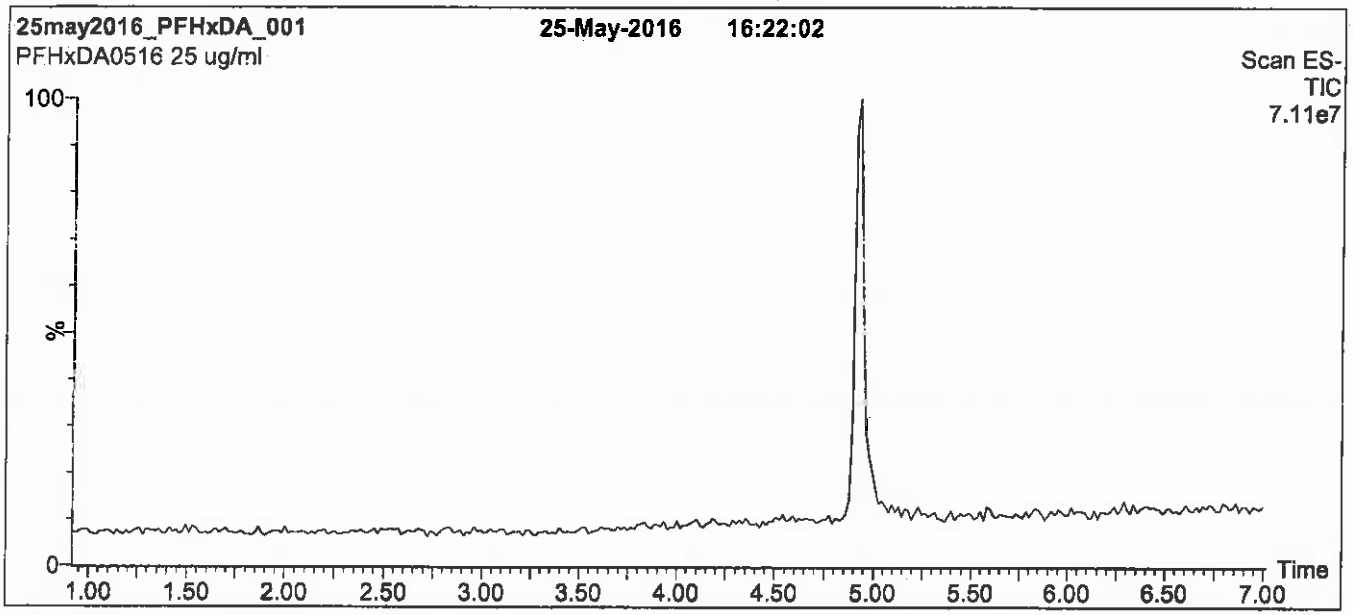
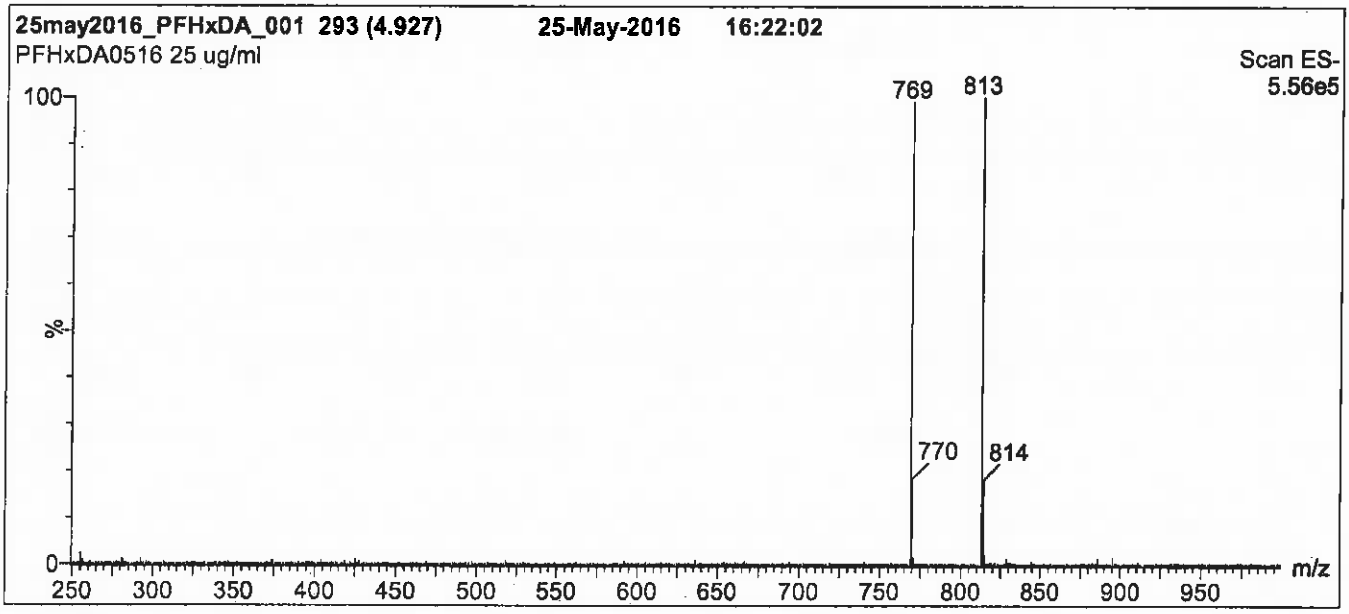
CALA

ANAB ACCREDITED

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

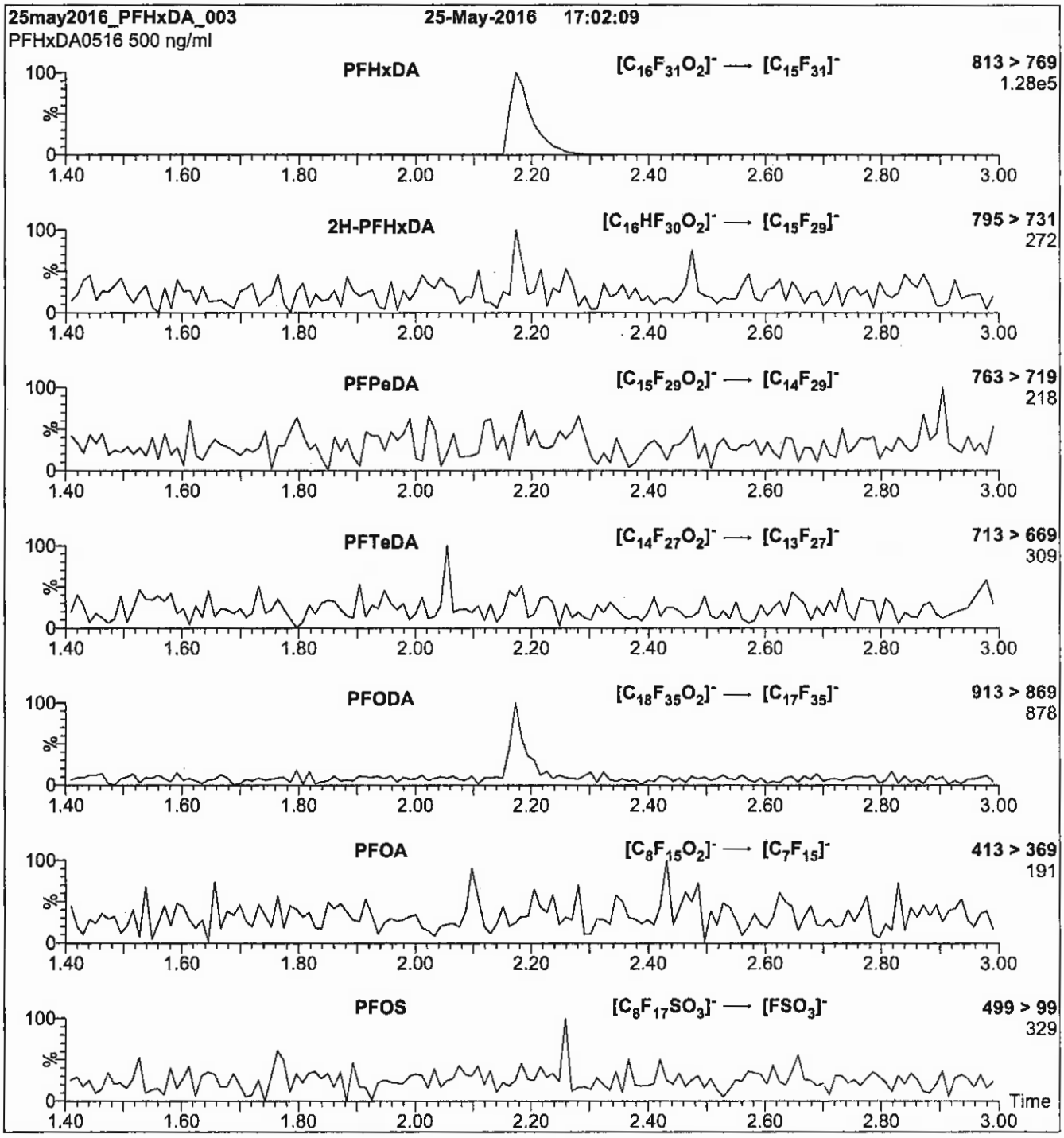
Flow: 300 µl/min

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

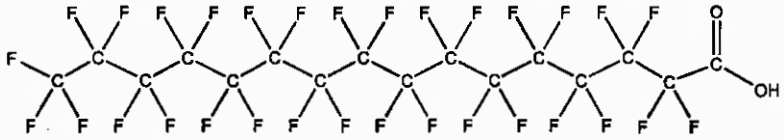
LCPFHxDA_00009

R: 9/2/17 SCV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	PFHxDA	**LOT NUMBER:**	PFHxDA0717
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)	07/13/2017		
EXPIRY DATE: (mm/dd/yyyy)	07/13/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 08/04/2017 (mm/dd/yyyy)

B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

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

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

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ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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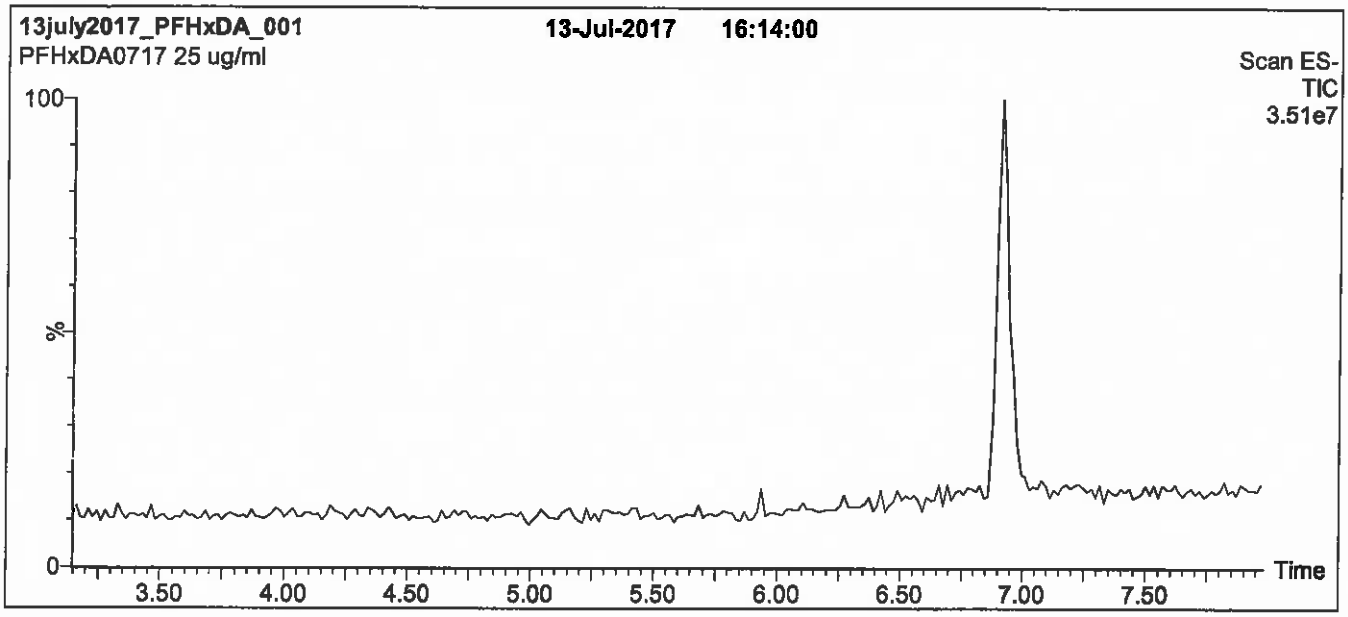
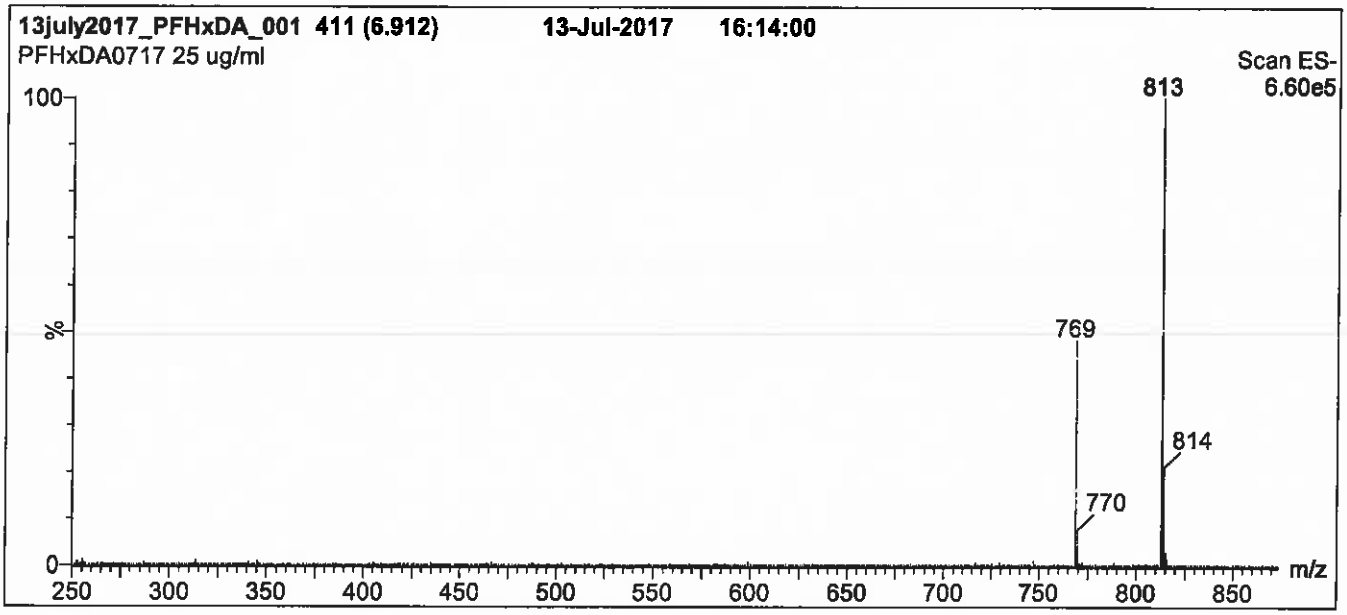
Figure 1: **PFHxDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 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

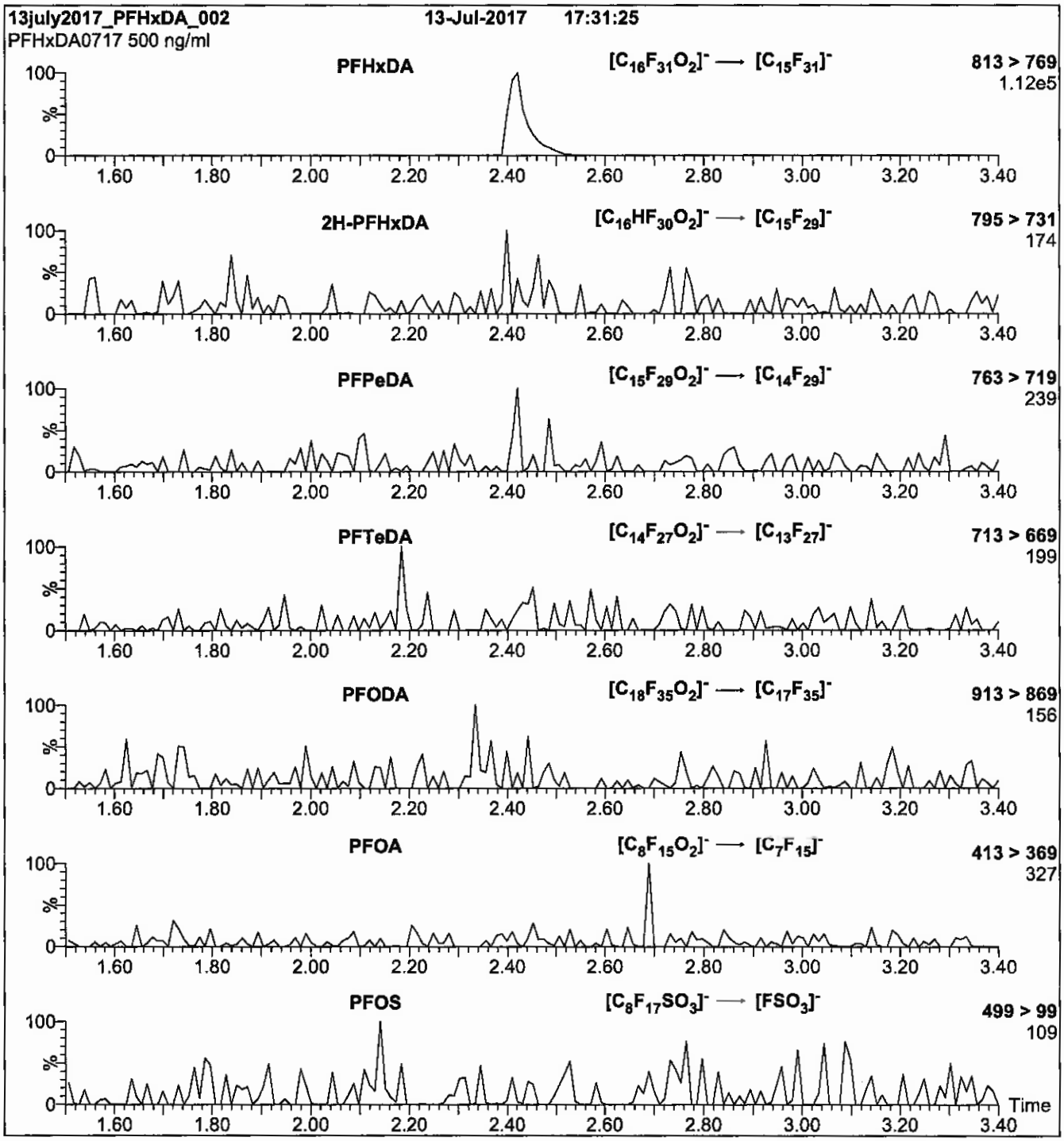
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (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) = 3.13e-3
Collision Energy (eV) = 15

Reagent

LCPFHxS-br_00004

r: 12/29/16 SKd

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.

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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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ANAB ACCREDITED

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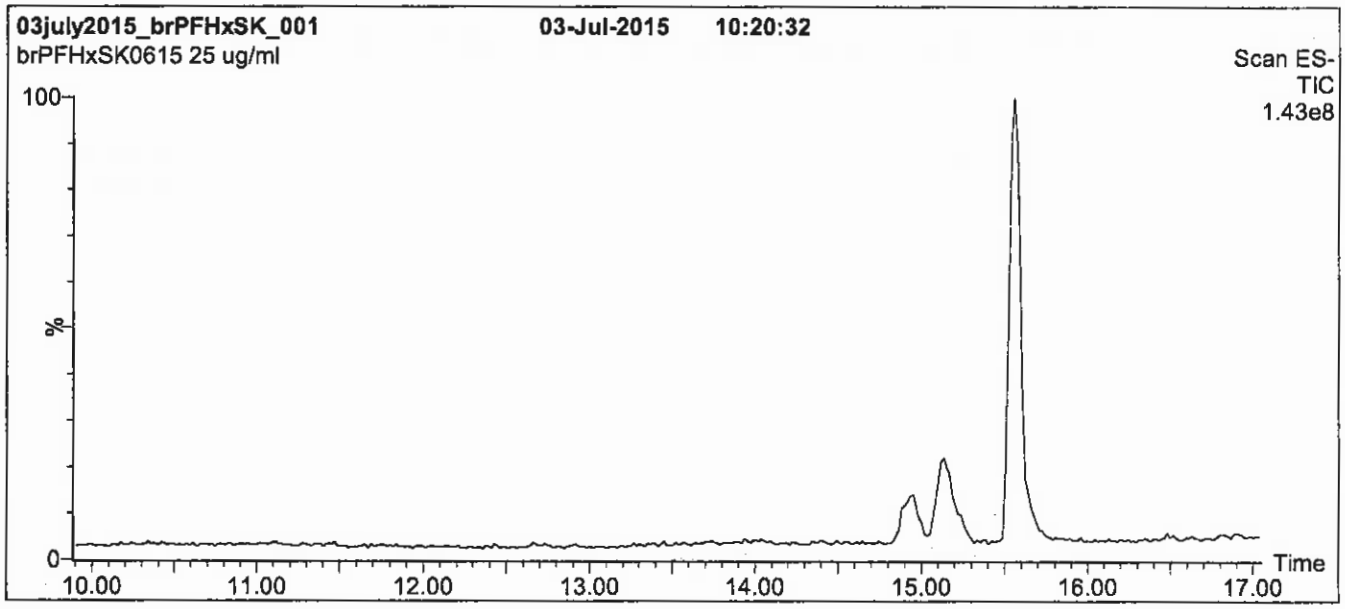
Table A: **br-PFHxSK; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

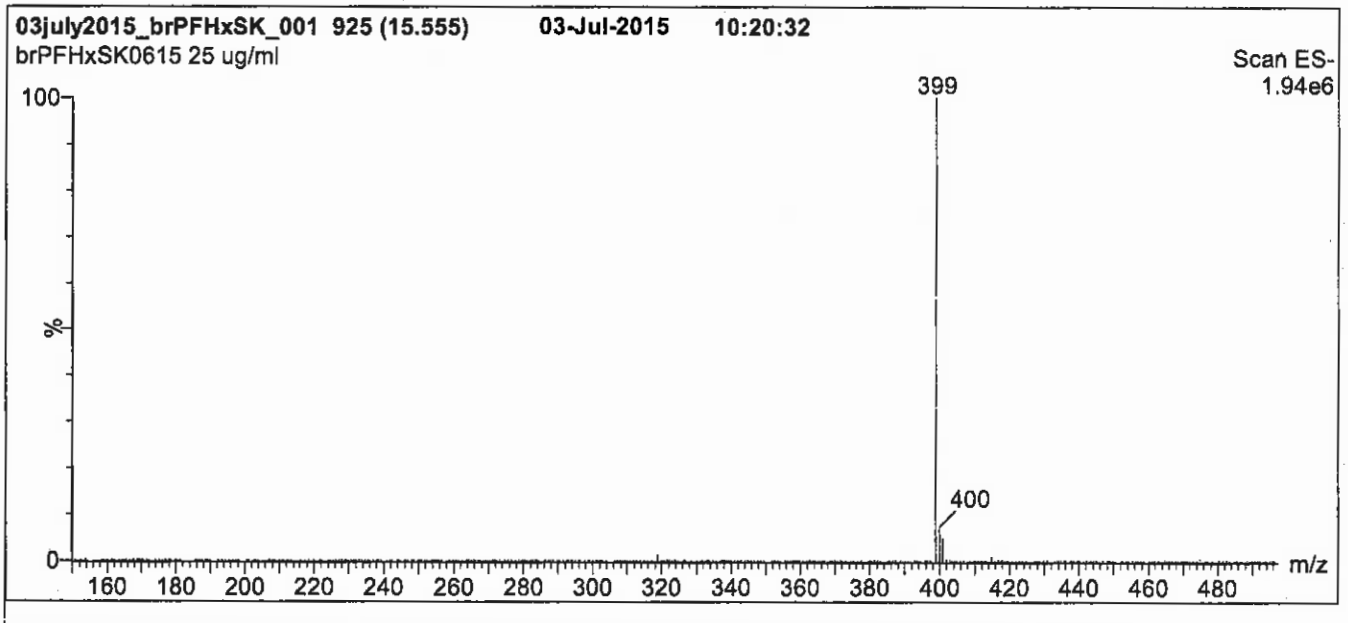
Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	Potassium perfluoro-1-hexanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	81.1
2	Potassium 1-trifluoromethylperfluoropentanesulfonate**	$CF_3CF_2CF_2CF_2CF(CF_3)SO_3^-K^+$	2.9
3	Potassium 2-trifluoromethylperfluoropentanesulfonate	$CF_3CF_2CF_2CF(CF_3)CF_2SO_3^-K^+$	1.4
4	Potassium 3-trifluoromethylperfluoropentanesulfonate	$CF_3CF_2CF(CF_3)CF_2CF_2SO_3^-K^+$	5.0
5	Potassium 4-trifluoromethylperfluoropentanesulfonate	$CF_3CF(CF_3)CF_2CF_2CF_2SO_3^-K^+$	8.9
6	Potassium 3,3-di(trifluoromethyl)perfluorobutanesulfonate	$CF_3C(CF_3)CF_2CF_2SO_3^-K^+$	0.2
7	Other Unidentified Isomers		0.5

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

Certified By: _____ **Date:** 09/27/2016
B.G. Chittim (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

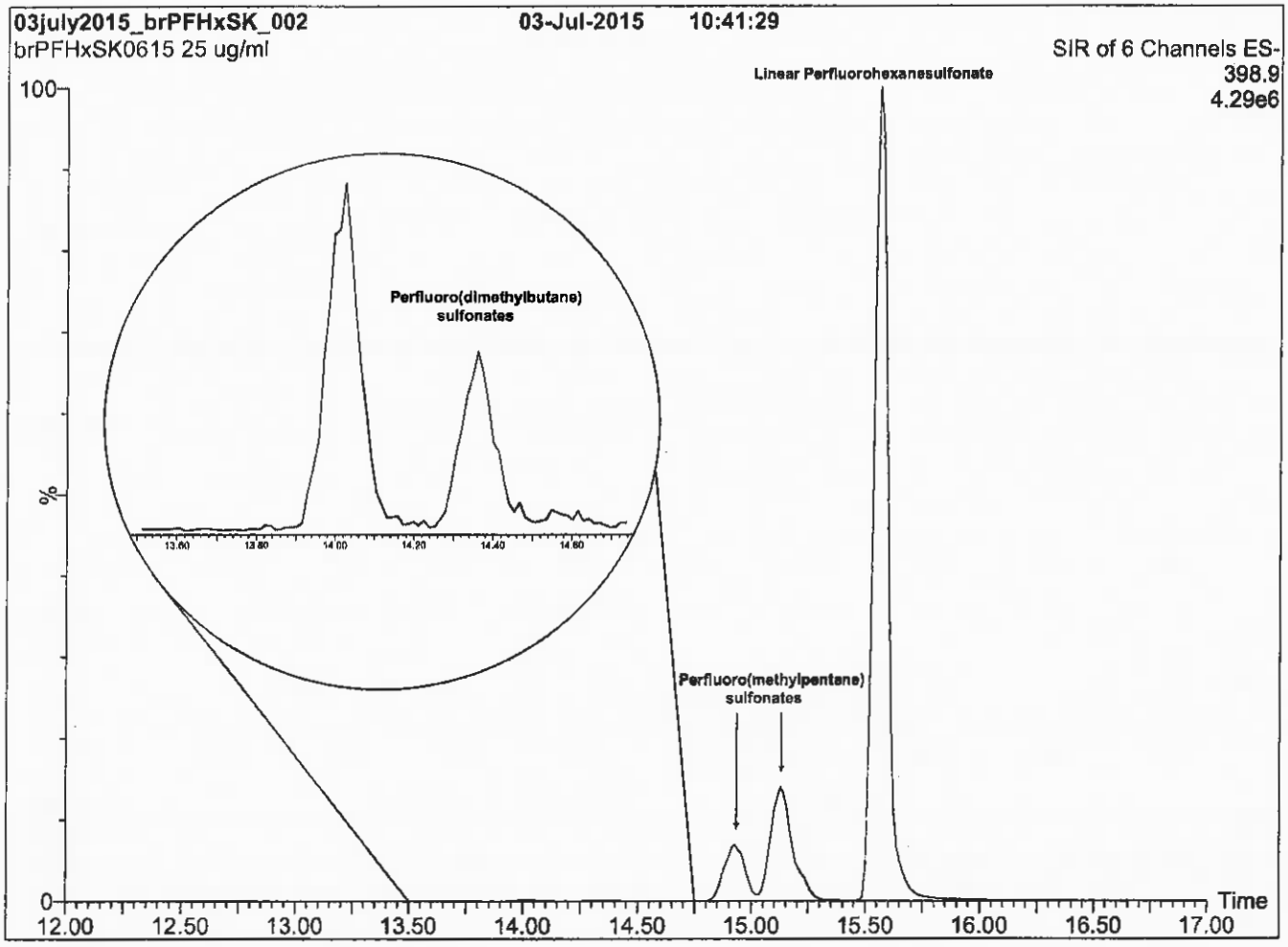
Flow: 300 µl/min

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

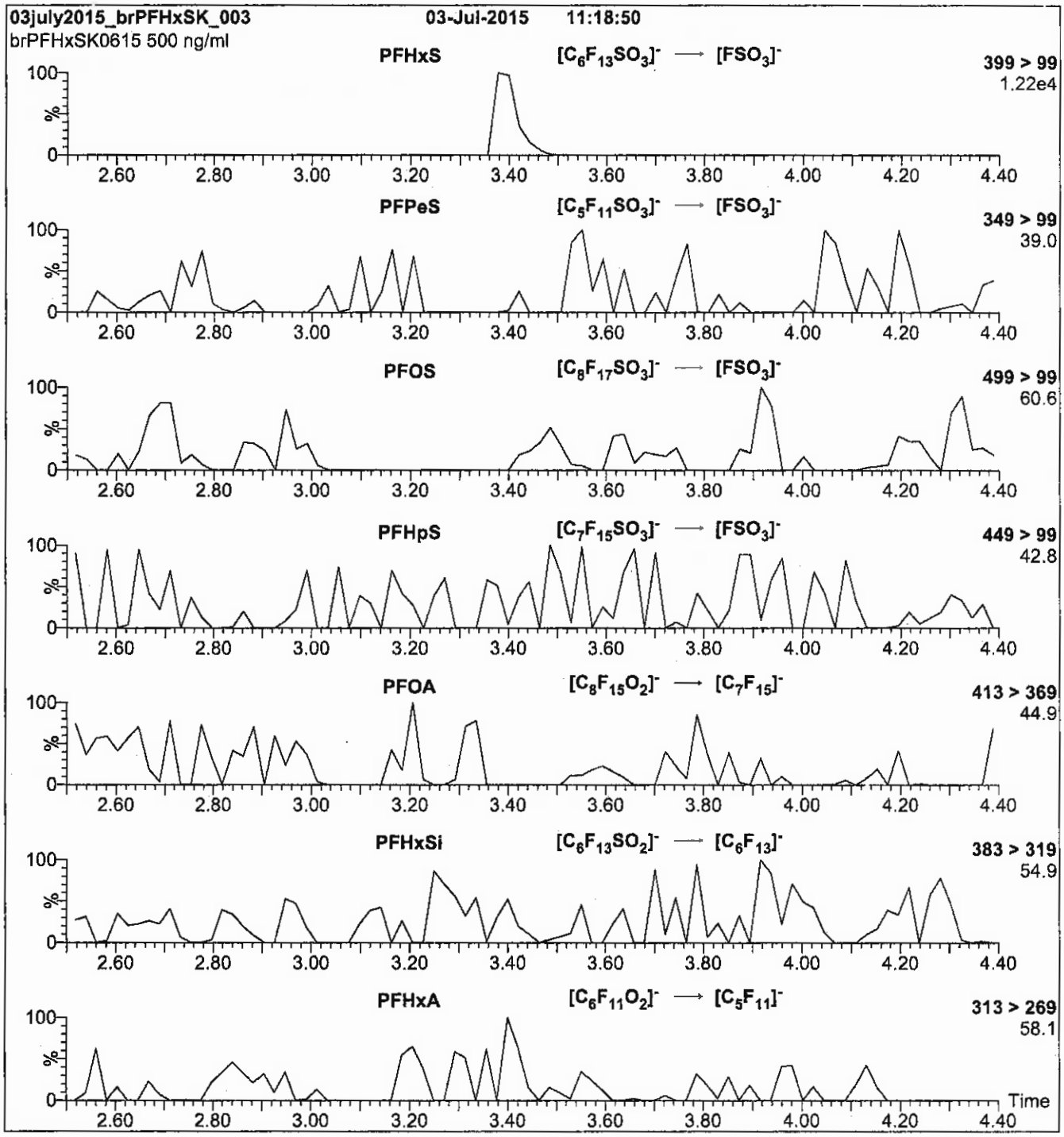
Flow: 300 µl/min

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

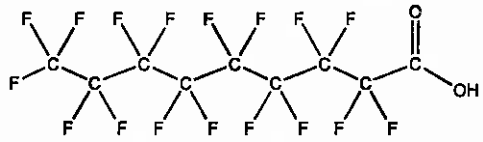
LCPFNA_00009

R: 9/21/17 SKJ

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	PFNA	**LOT NUMBER:**	PFNA0717
COMPOUND:	Perfluoro-n-nonanoic acid		
STRUCTURE:		**CAS #:**	375-95-1



MOLECULAR FORMULA:	$C_9HF_{17}O_2$	**MOLECULAR WEIGHT:**	464.08
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	07/20/2017		
EXPIRY DATE: (mm/dd/yyyy)	07/20/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.1% of perfluoro-n-octanoic acid (PFOA), < 0.1% of perfluoro-n-heptanoic acid (PFHpA), and < 0.1% of perfluoro-n-undecanoic acid (PFUdA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 07/24/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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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ANAB ACCREDITED

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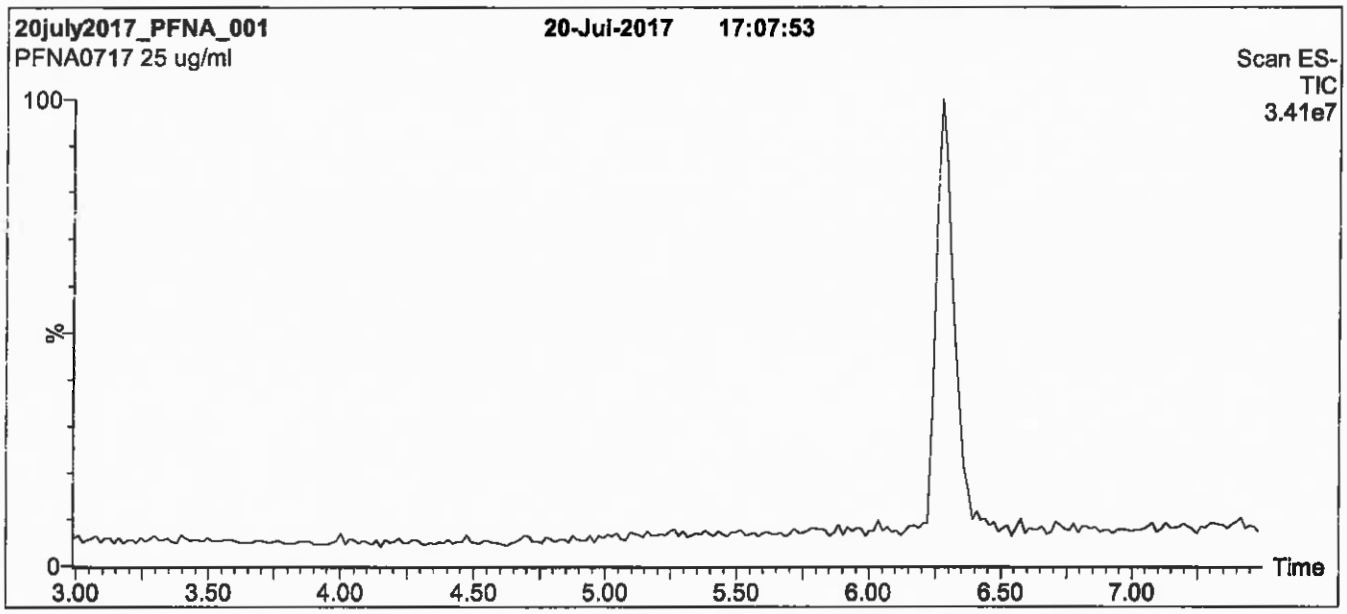
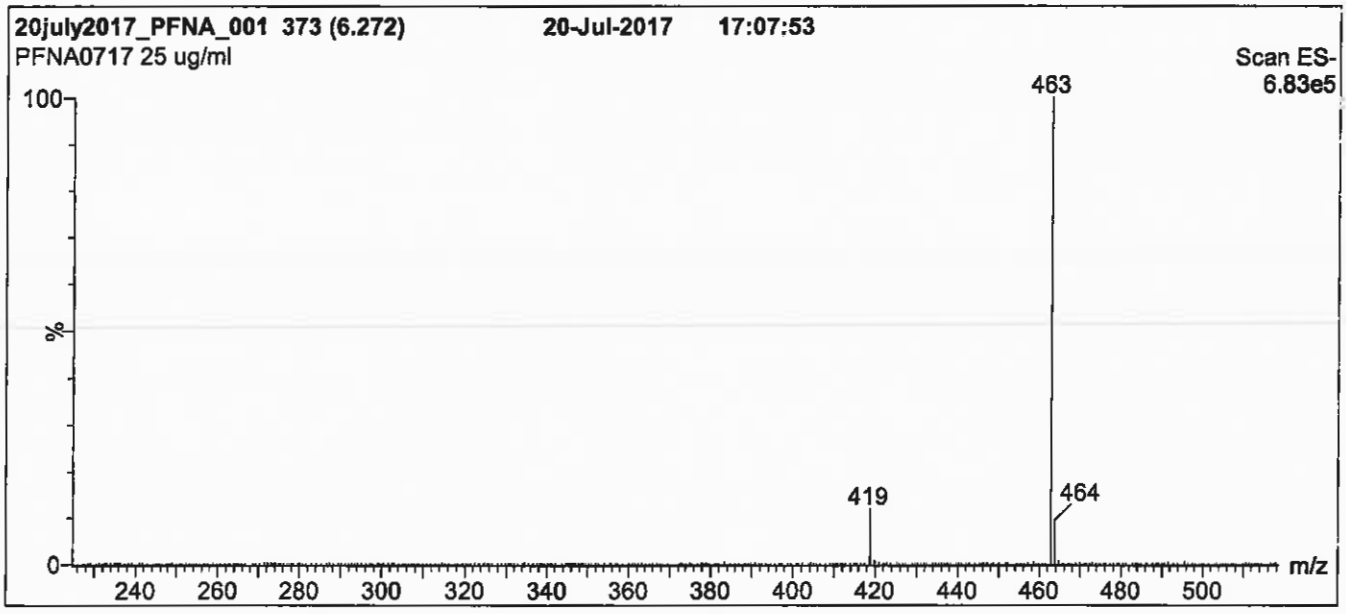
Figure 1: **PFNA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

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

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Hold for 1 min. Ramp to 90% organic over 7 min and hold for 1 min before returning to initial conditions in 0.5 min.
Time: 10 min

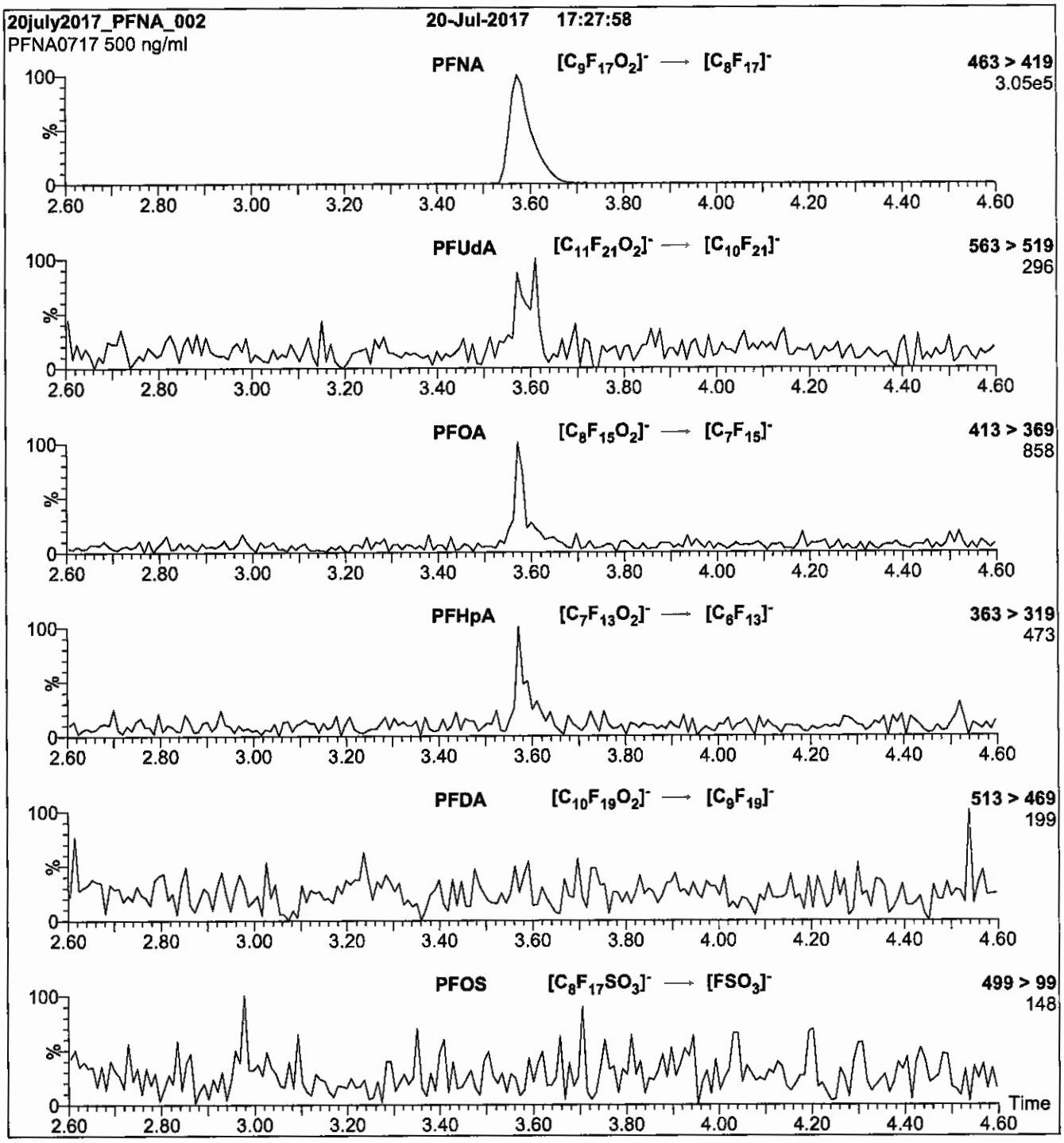
Flow: 300 µl/min

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

Reagent

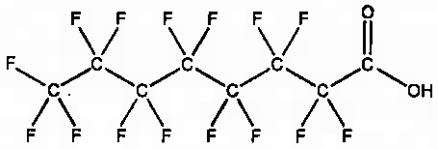
LCPFOA_00008

r: 12/24/16 SPV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFOA	**LOT NUMBER:**	PFOA0716
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)	08/02/2016		
EXPIRY DATE: (mm/dd/yyyy)	08/02/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

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

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

INTENDED USE:

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

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

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

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

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

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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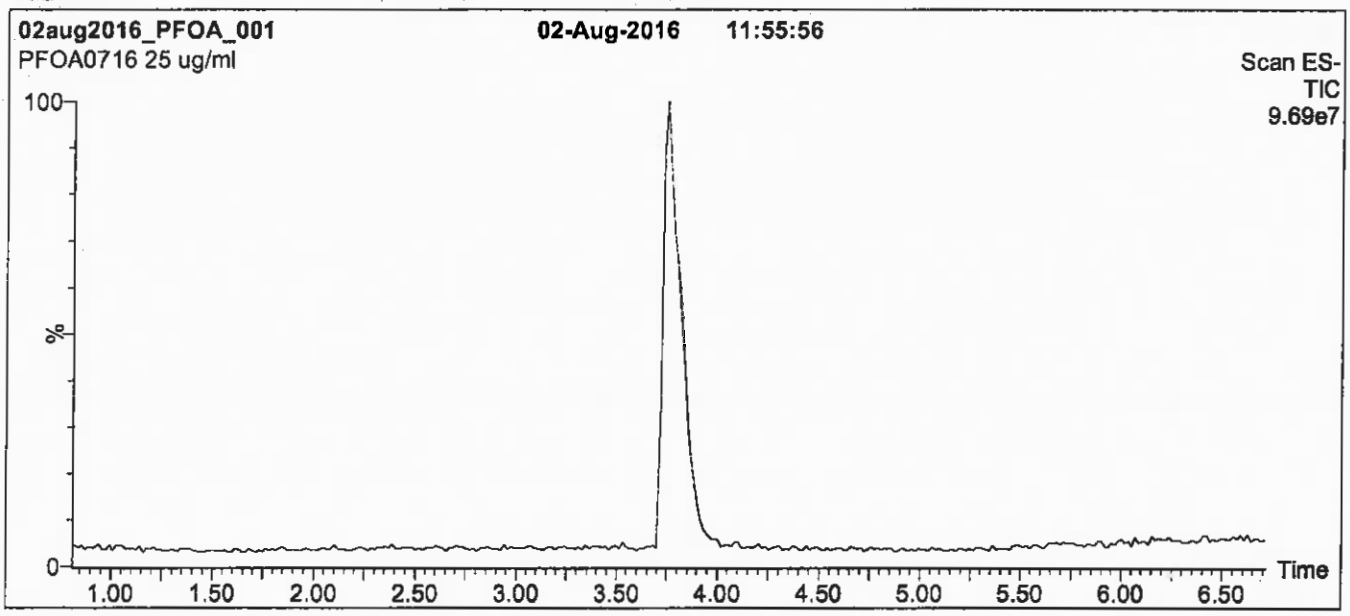
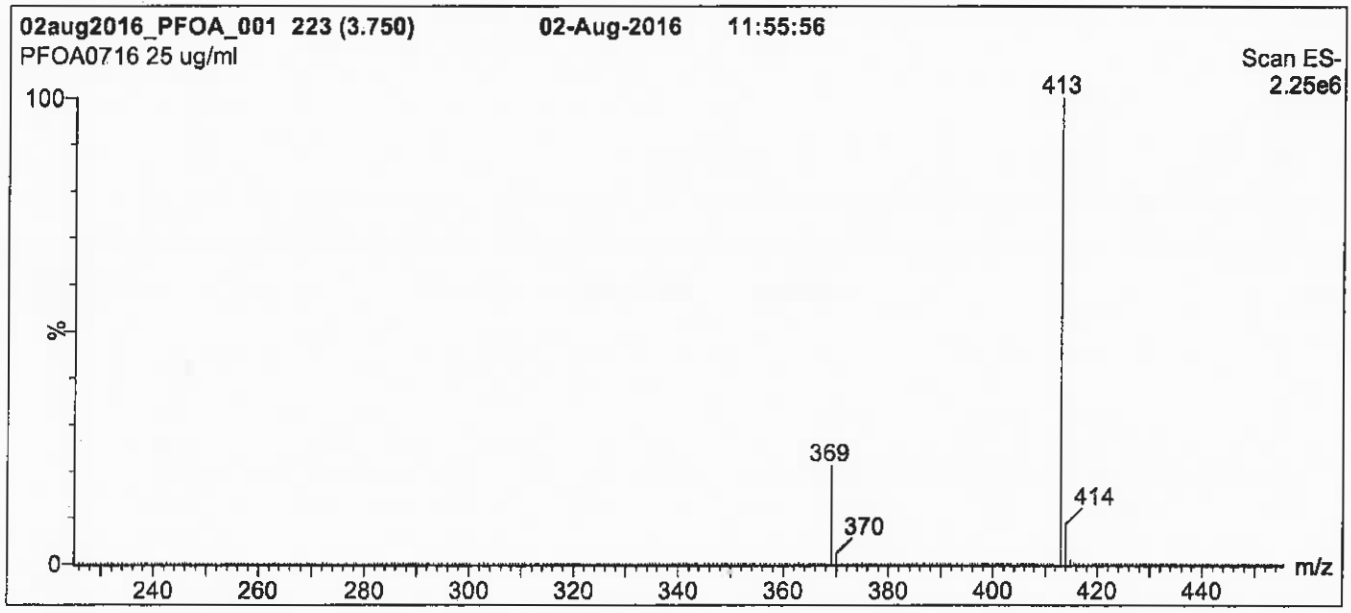
Figure 1: **PFOA; LC/MS Data (TIC and Mass Spectrum)**





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 m:M 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

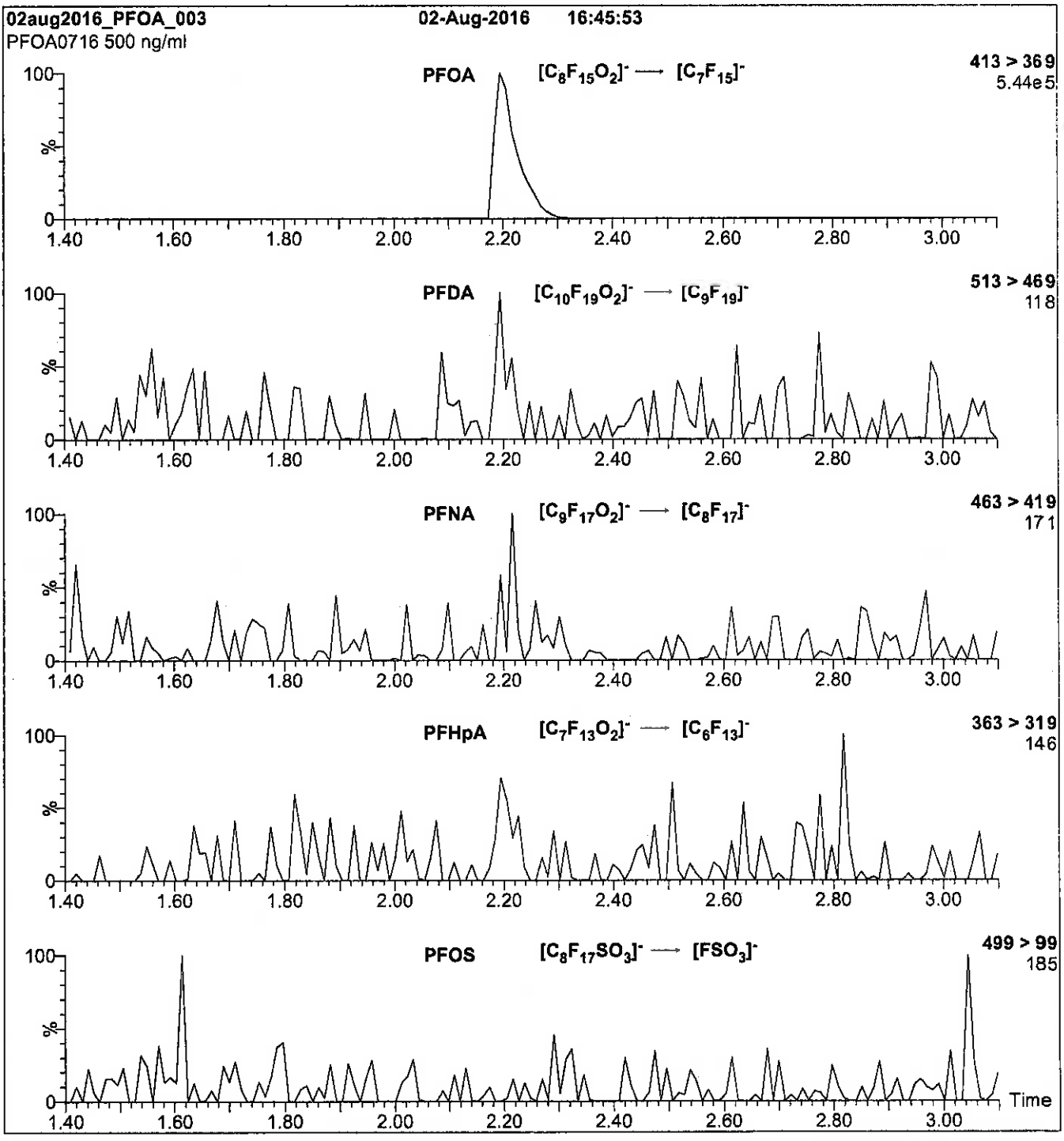
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 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) = 3.43e-3
Collision Energy (eV) = 10

Reagent

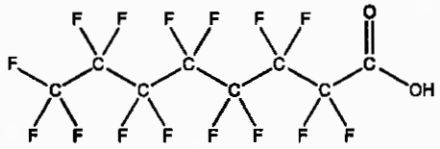
LCPFOA_00009

P: 10/2017 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	PFOA	**LOT NUMBER:**	PFOA0917
COMPOUND:	Perfluoro-n-octanoic acid		
STRUCTURE:		**CAS #:**	335-67-1



MOLECULAR FORMULA:	$C_8HF_{15}O_2$	**MOLECULAR WEIGHT:**	414.07
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	09/27/2017		
EXPIRY DATE: (mm/dd/yyyy)	09/27/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 09/28/2017 (mm/dd/yyyy)

B.G. Chittim, General Manager

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

ANAB ACCREDITED

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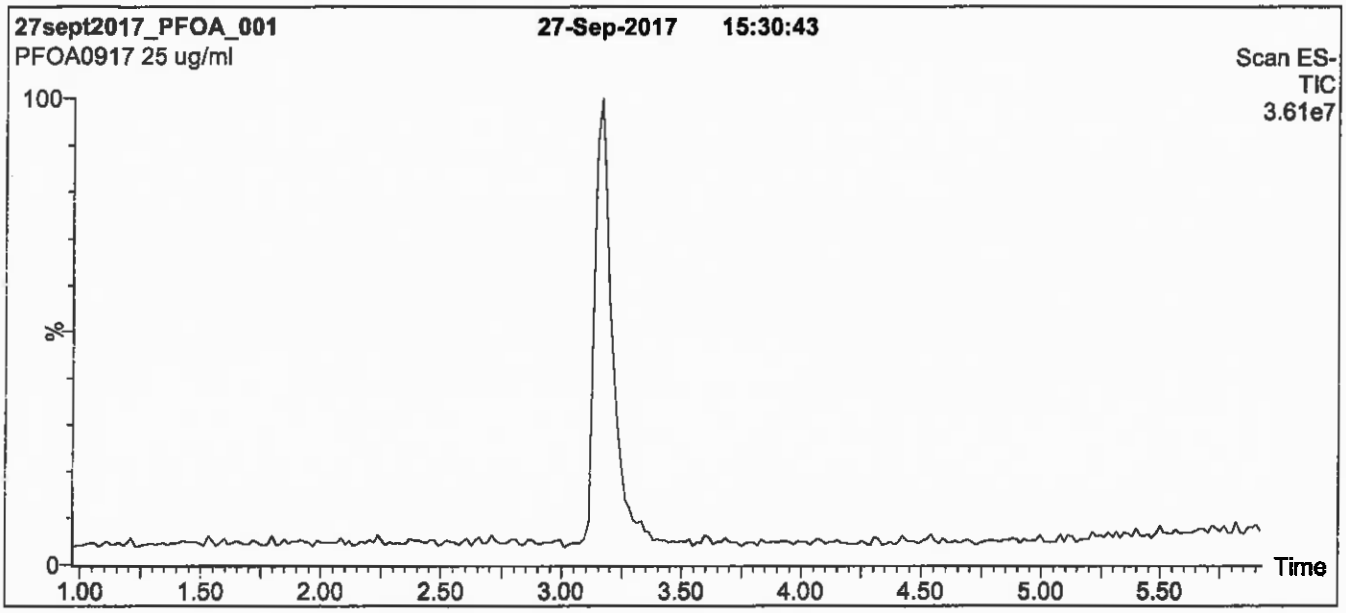
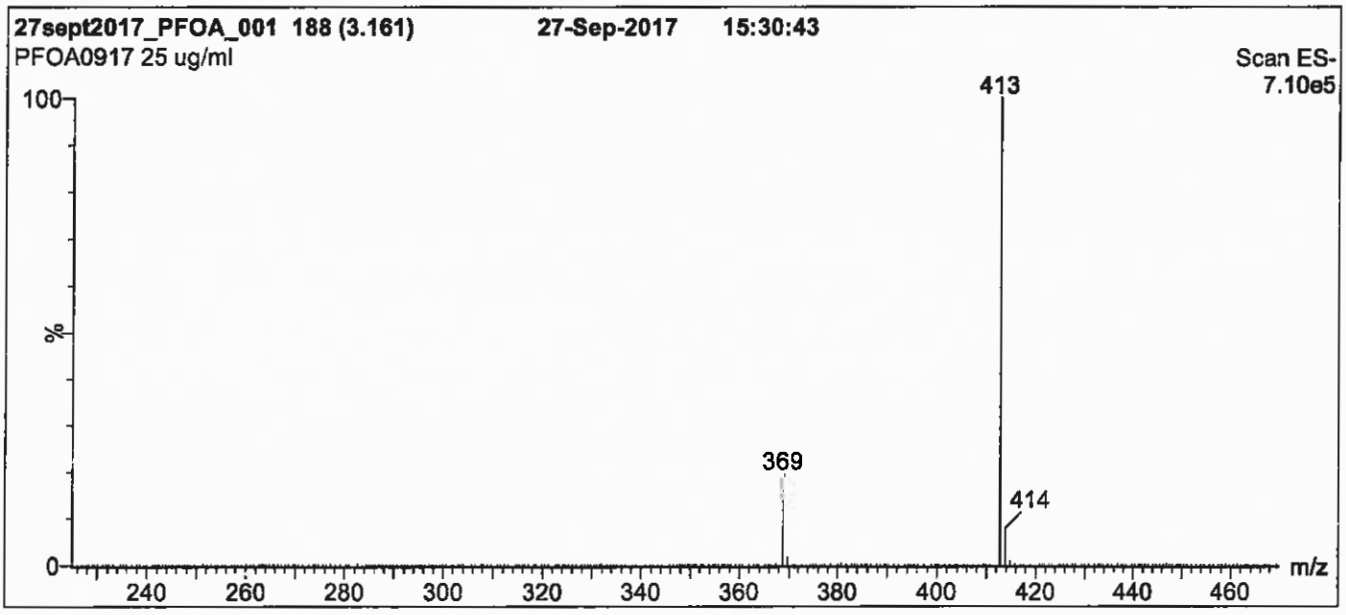




Conditions for Figure 1:

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

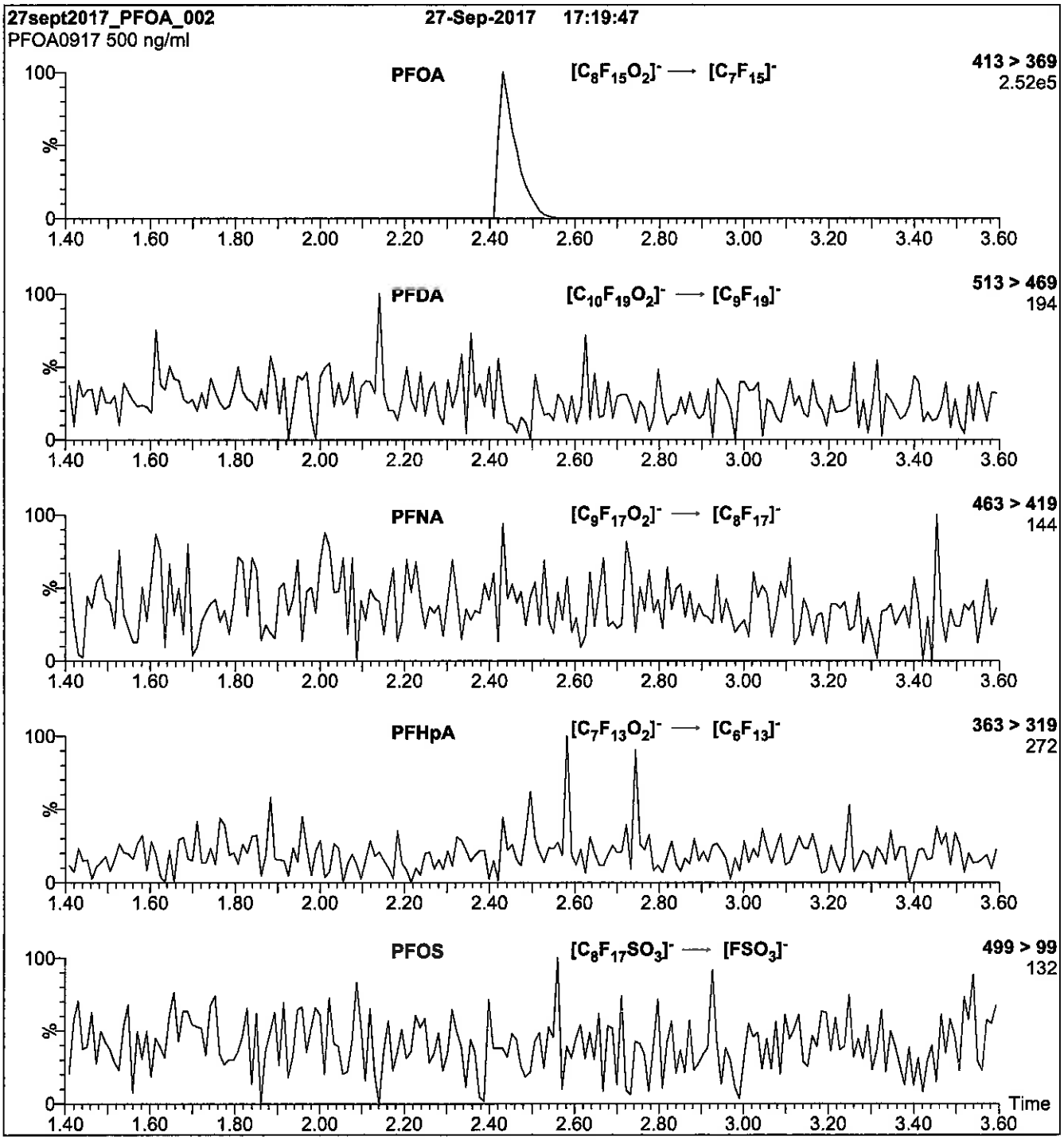
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 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) = 3.46e-3
Collision Energy (eV) = 11

Reagent

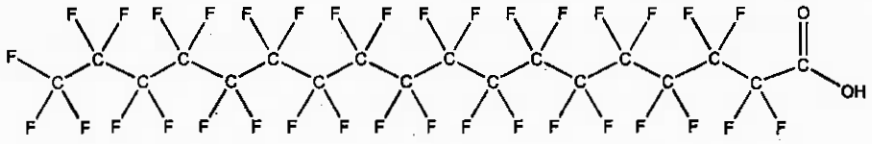
LCPFODA_00008

R: 12/22/16 SFN

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		

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

- See page 2 for further details.
- 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
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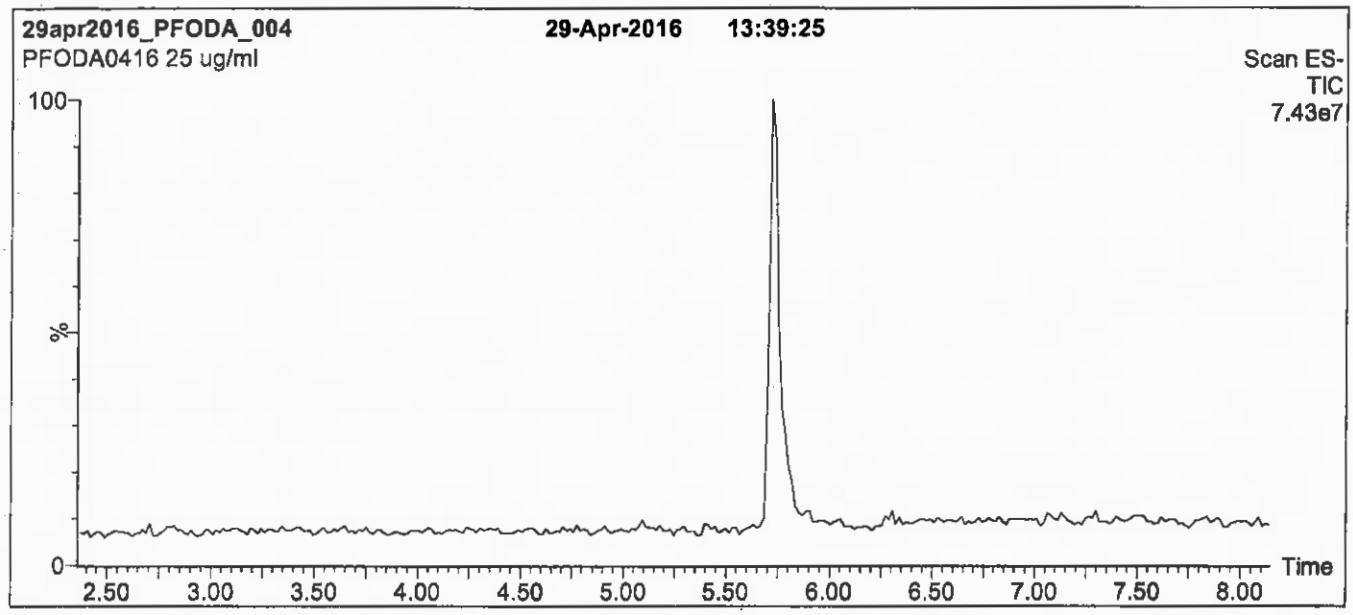

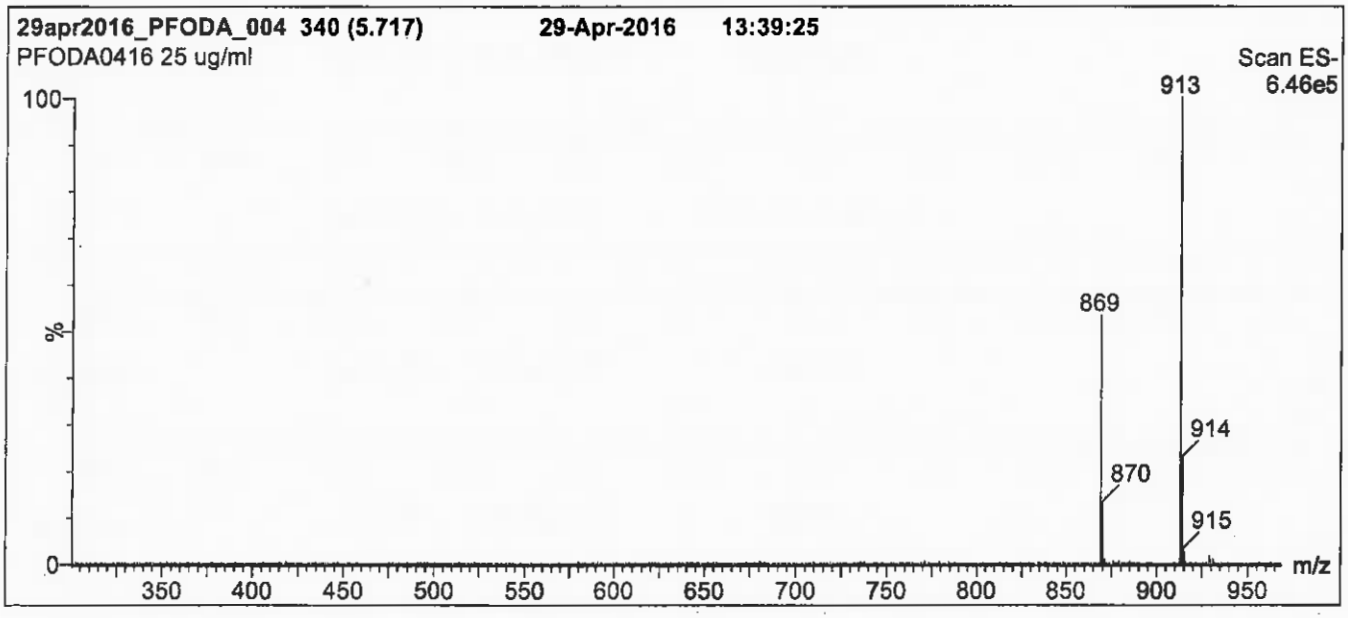

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MS: Micromass Quattro *micro* API MS

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

Mobile phase: Gradient
Start: 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

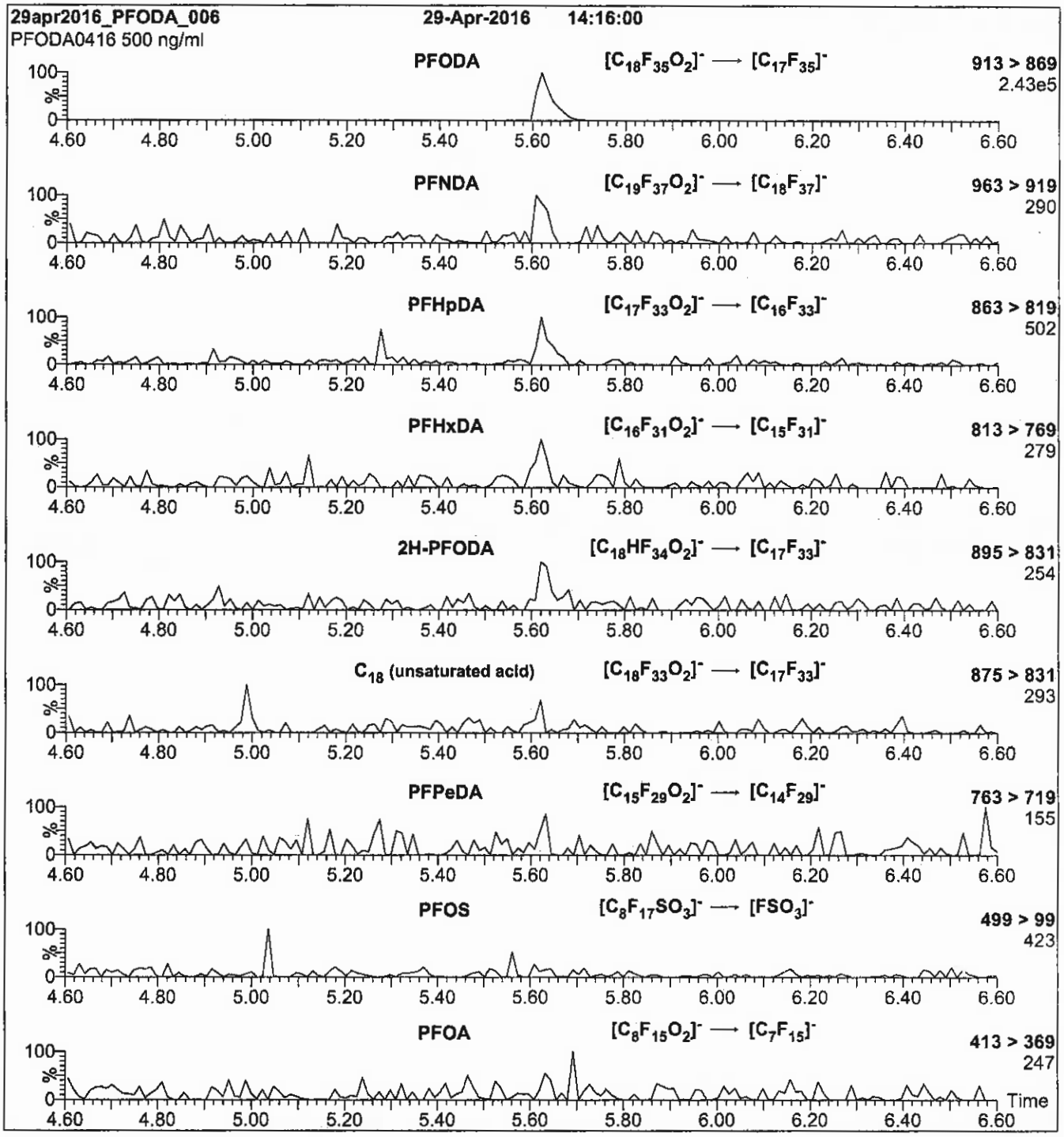
Flow: 300 µl/min

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

LCPFODA_00009

r: 9/2/17 SW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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COMPOUND:	Perfluoro-n-octadecanoic acid		
STRUCTURE:		**CAS #:**	16517-11-6

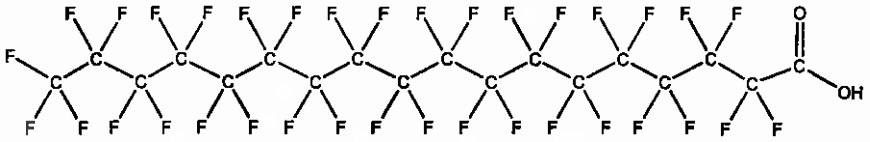

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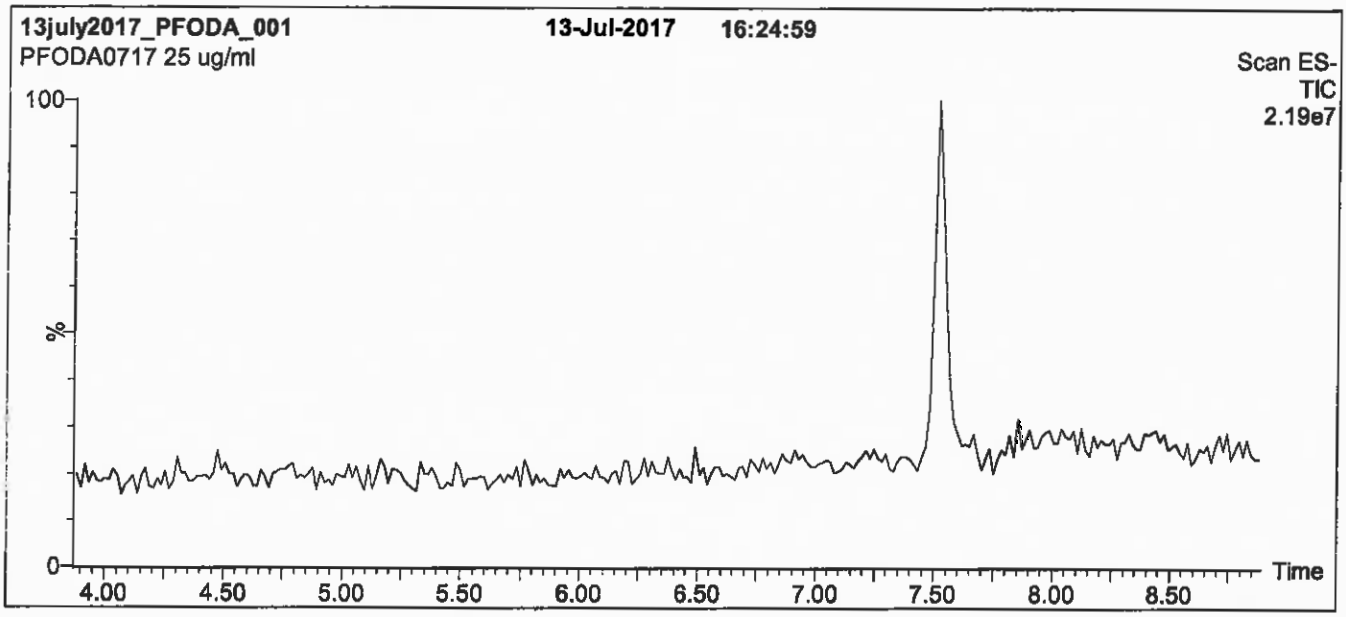
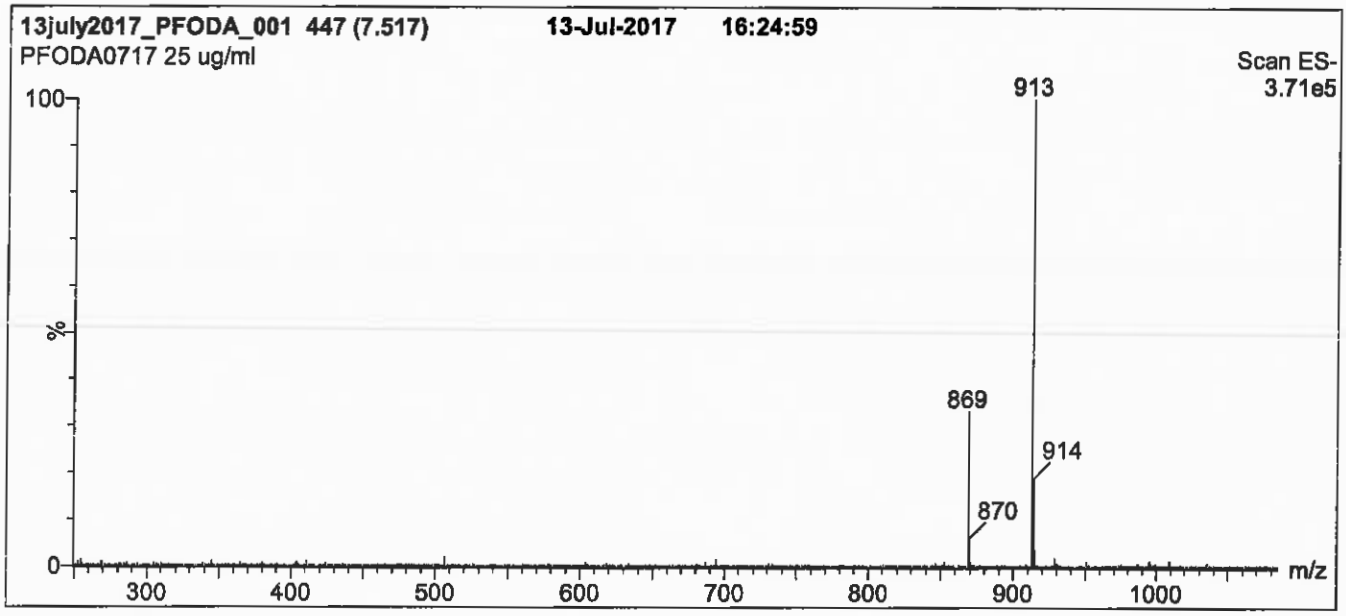
Figure 1: **PFODA; LC/MS Data (TIC and Mass Spectrum)**





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: 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

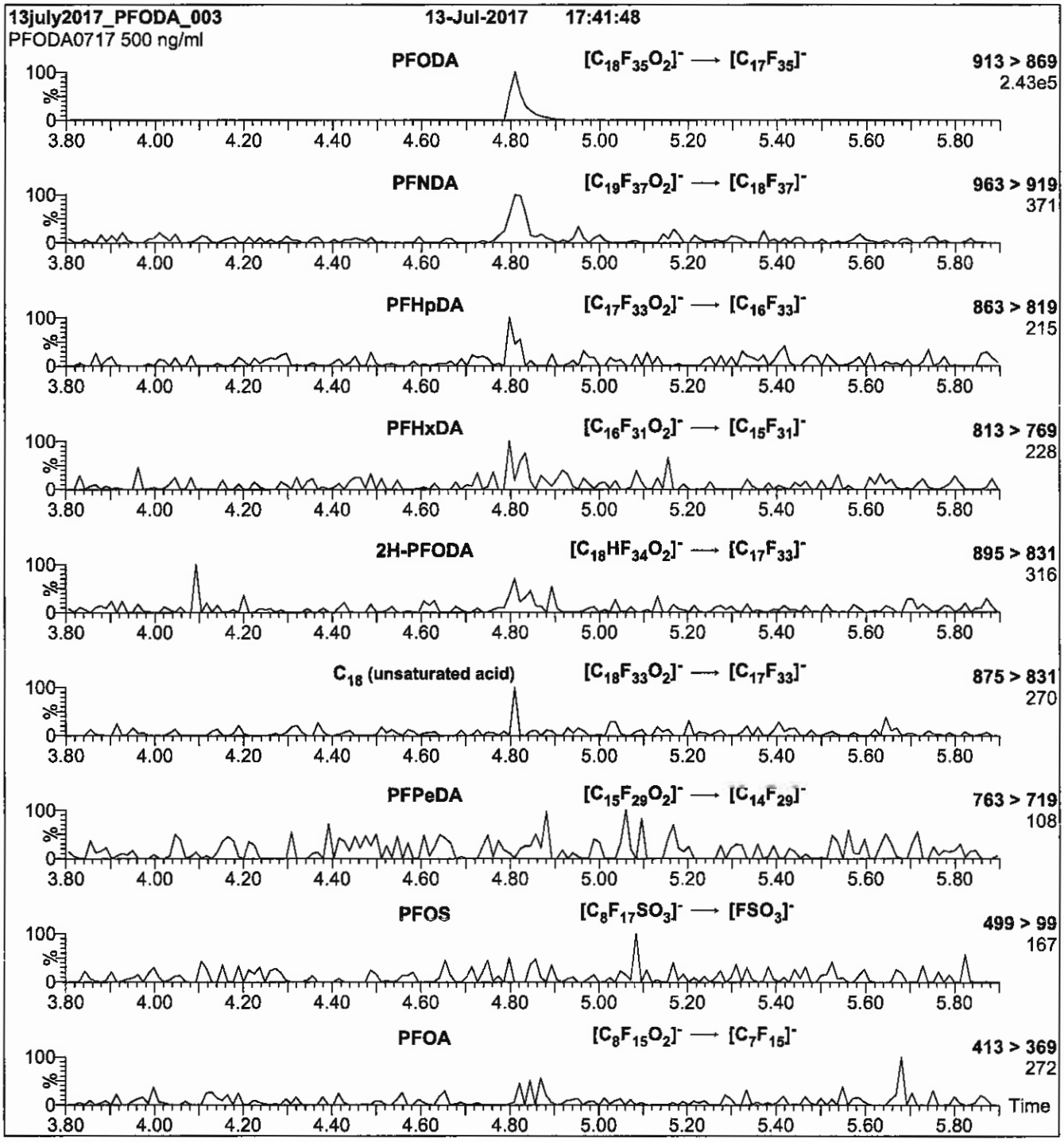
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1250 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 25.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: Direct loop injection
10 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

LCPFOS-br_00004

P: R/2a/10SFN

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

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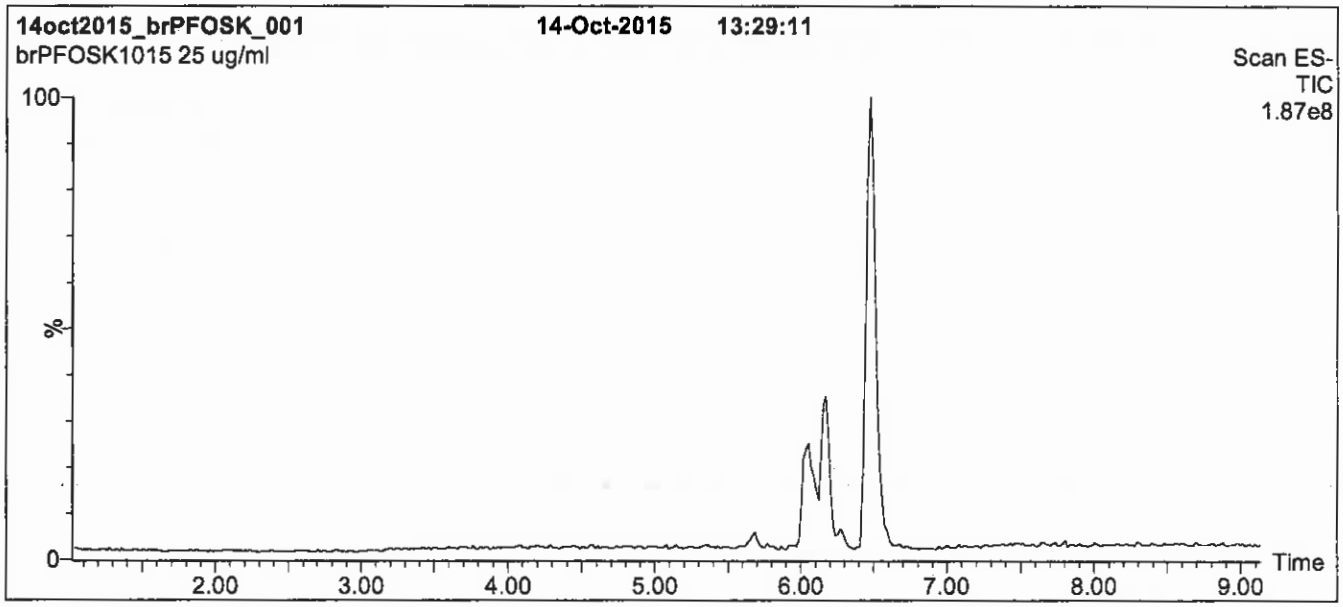
Table A: **br-PFOSK; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

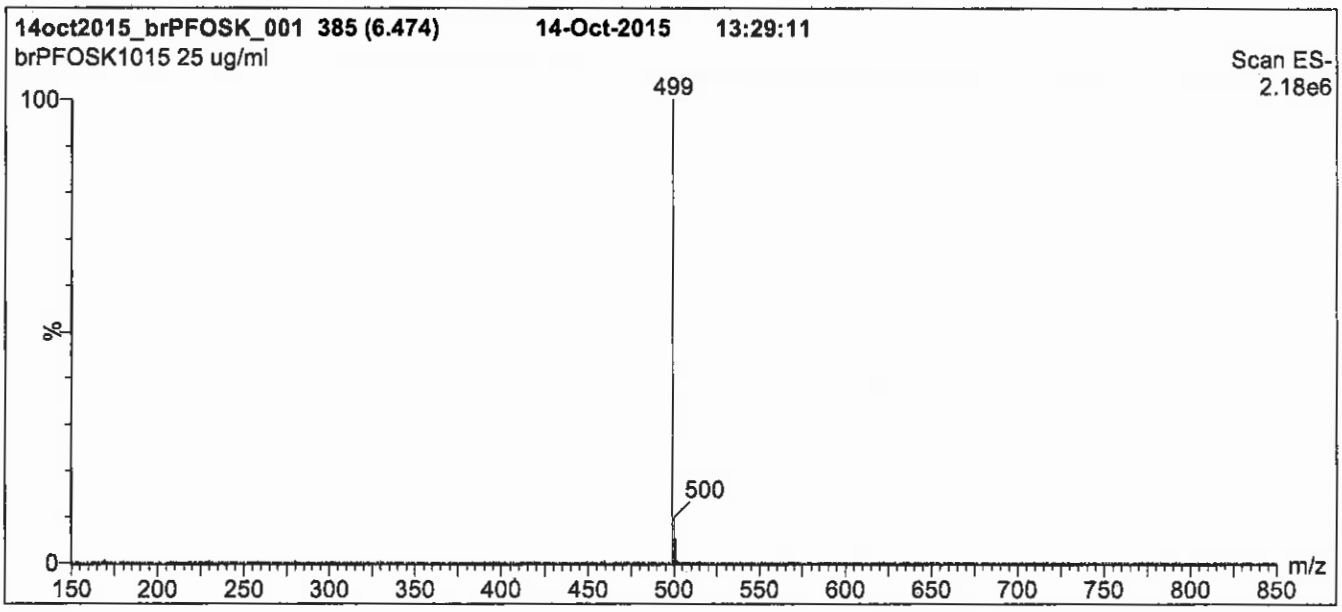
Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	Potassium perfluoro-1-octanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	78.8
2	Potassium 1-trifluoromethylperfluoroheptanesulfonate**	$CF_3CF_2CF_2CF_2CF_2CF_2CF(CF_3)SO_3^-K^+$	1.2
3	Potassium 2-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF(CF_3)CF_2SO_3^-K^+$	0.6
4	Potassium 3-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF_2CF(CF_3)CF_2CF_2SO_3^-K^+$	1.9
5	Potassium 4-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF(CF_3)CF_2CF_2CF_2SO_3^-K^+$	2.2
6	Potassium 5-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF(CF_3)CF_2CF_2CF_2CF_2SO_3^-K^+$	4.5
7	Potassium 6-trifluoromethylperfluoroheptanesulfonate	$CF_3CF(CF_3)CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	10.0
8	Potassium 5,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3-C(CF_3)(CF_3)CF_2CF_2CF_2CF_2SO_3^-K^+$	0.2
9	Potassium 4,4-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3CF_2-C(CF_3)(CF_3)-CF_2CF_2CF_2SO_3^-K^+$	0.03
10	Potassium 4,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3-CF(CF_3)-CF(CF_3)-CF_2CF_2CF_2SO_3^-K^+$	0.4
11	Potassium 3,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3-CF(CF_3)-CF_2-CF(CF_3)-CF_2CF_2SO_3^-K^+$	0.07

* Percent of total perfluorooctanesulfonate isomers only. Isomers are labelled in Figure 2.
** Systematic Name: Potassium perfluorooctane-2-sulfonate.

Certified By: _____ **Date:** 10/15/2015
B.G. Chittim (mm/dd/yyyy)

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 45% (80:20 MeOH:ACN) / 55% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 12 min and hold for 2 min.
Return to initial conditions over 0.5 min.
Time: 16 min

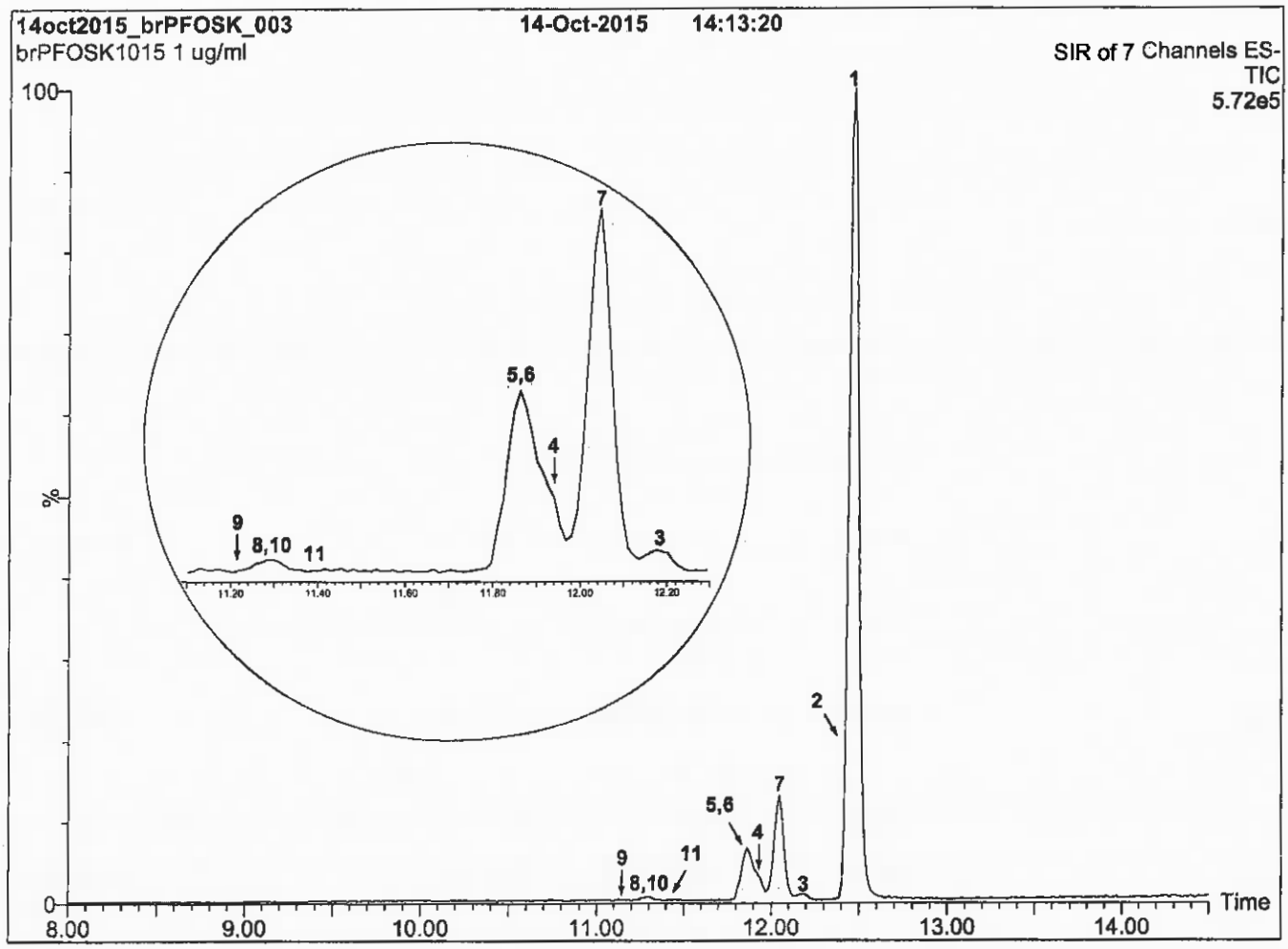
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 60.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **br-PFOSK; LC/MS Data (SIR)**



Conditions for Figure 2:

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

Chromatographic Conditions:

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

Injection: 1.0 µg/ml of br-PFOSK

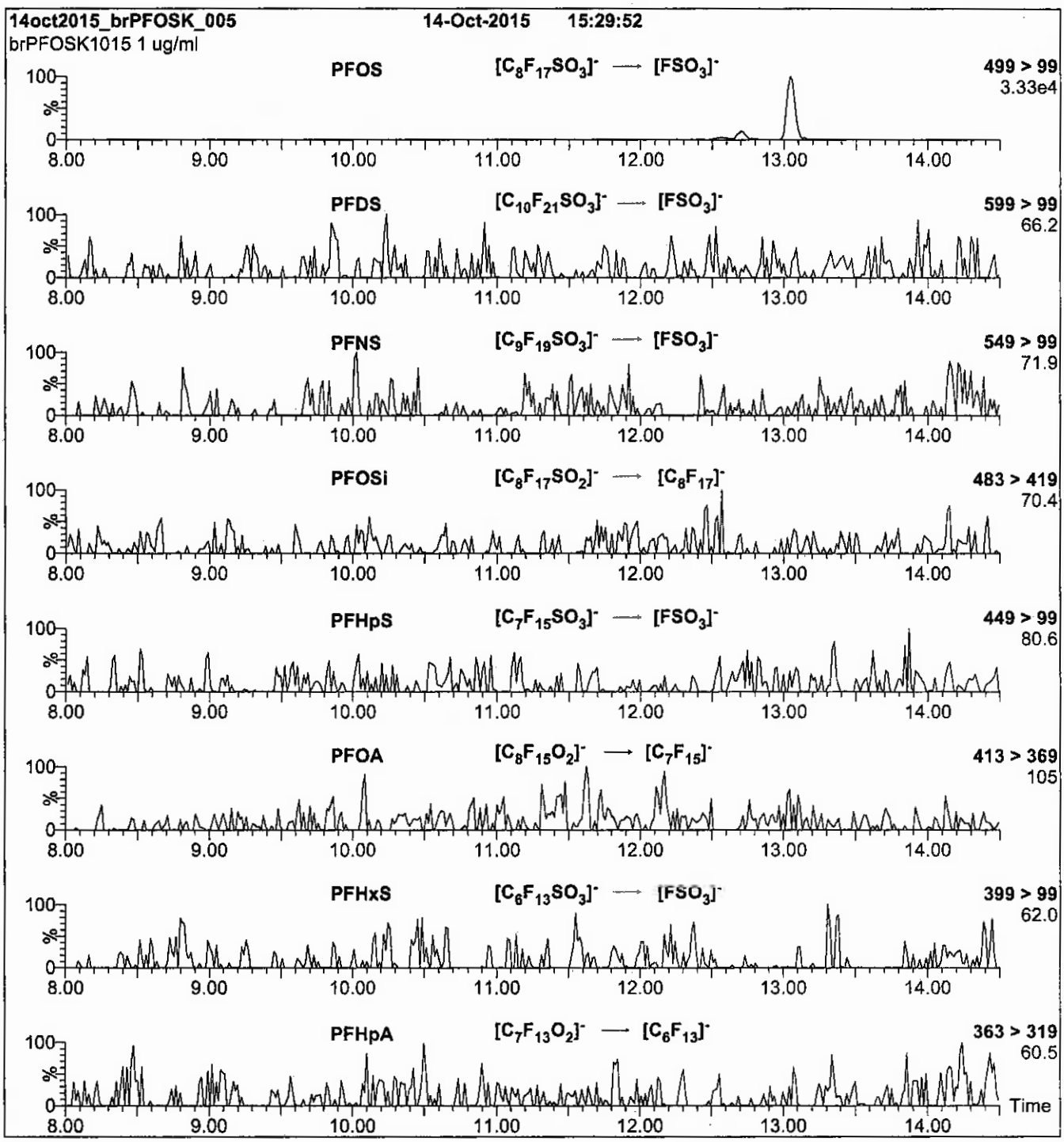
Mobile Phase: Gradient
45% (80:20 MeOH:ACN) / 55% H_2O (both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 15 min and hold for 3 min.
Return to initial conditions over 1 min.
Time: 20 min

Flow: 300 µl/min

MS Conditions:

SIR (ES^-)
Source = 110 °C
Desolvation = 325 °C
Cone Voltage = 60V

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



Conditions for Figure 3:

Injection: On-column

Mobile phase: Same as Figure 2

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.06e-3
Collision Energy (eV) = 11-50 (variable)

Reagent

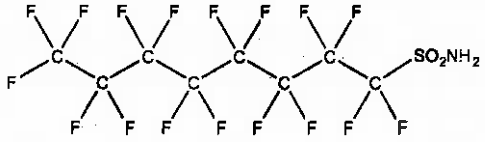
LCPFOSA_00010

12/20/16 SKI

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	FOSA-I	**LOT NUMBER:**	FOSA0916I
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)	09/30/2016		
EXPIRY DATE: (mm/dd/yyyy)	09/30/2021		
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:** 10/07/2016 (mm/dd/yyyy)

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

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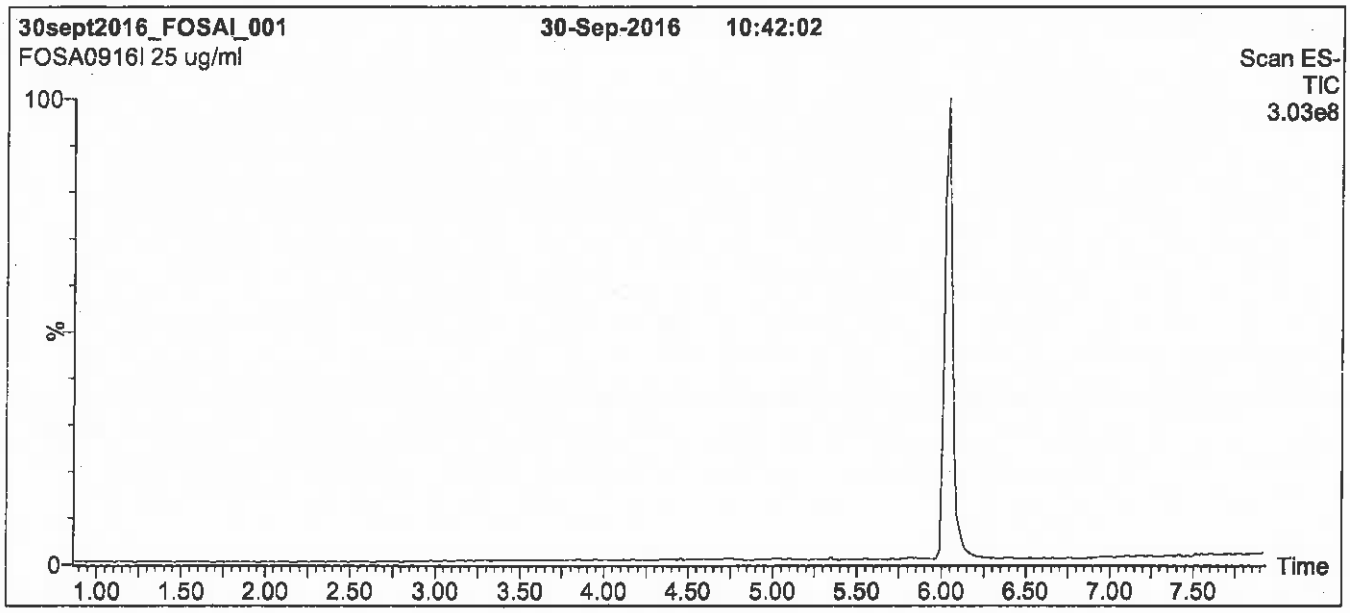
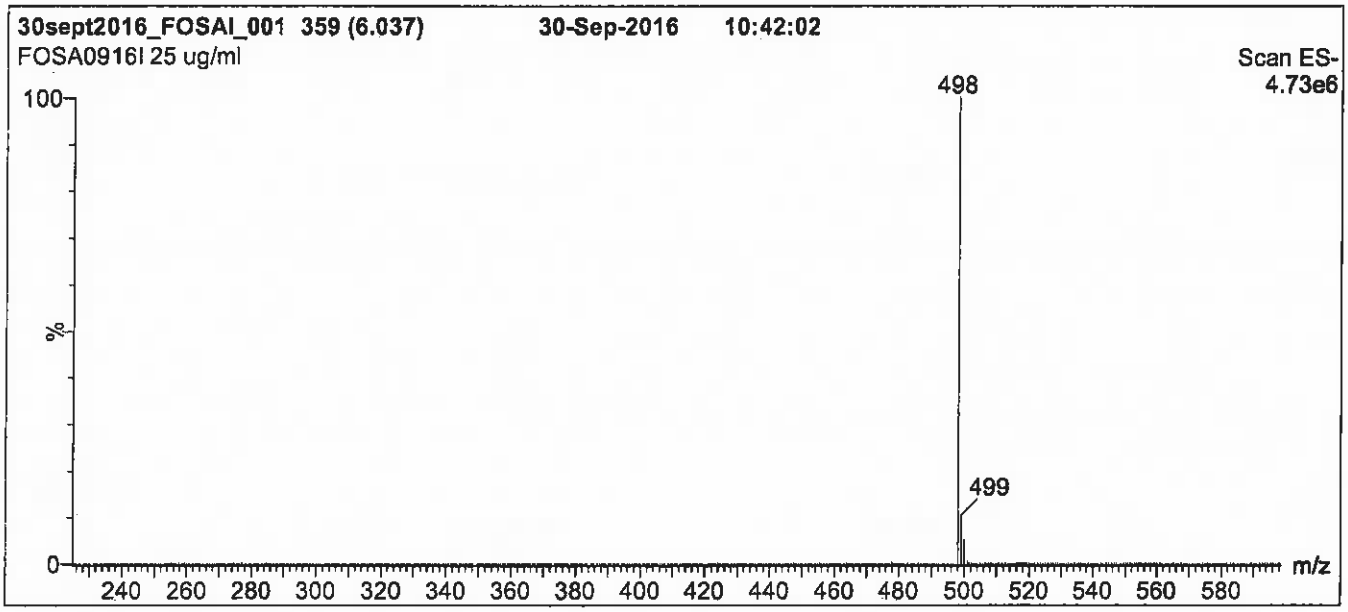
Figure 1: **FOSA-I; LC/MS Data (TIC and Mass Spectrum)**





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: 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

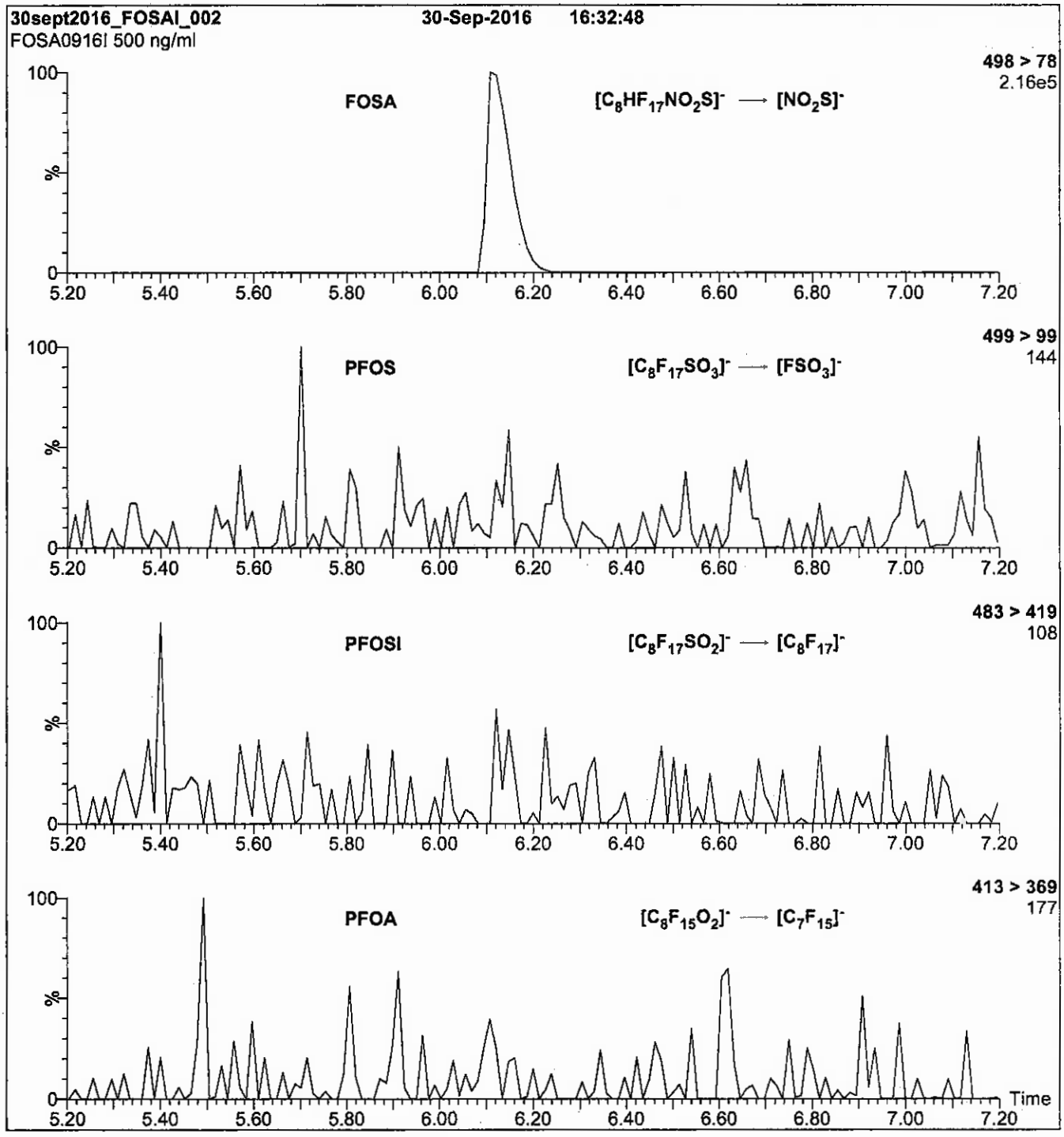
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 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) = 3.20e-3
Collision Energy (eV) = 30

Reagent

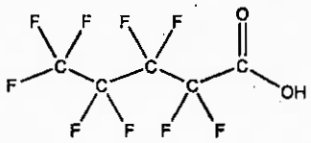
LCPFPeA_00007

r: 12/29/16 SRV
s: 1/6/17 SRV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	PFPeA	**LOT NUMBER:**	PFPeA0516
COMPOUND:	Perfluoro-n-pentanoic acid		
STRUCTURE:		**CAS #:**	2706-90-3



MOLECULAR FORMULA:	$C_5HF_8O_2$	**MOLECULAR WEIGHT:**	264.05
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	05/31/2016		
EXPIRY DATE: (mm/dd/yyyy)	05/31/2021		
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 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:** 06/02/2016 (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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HOMOGENEITY:

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

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

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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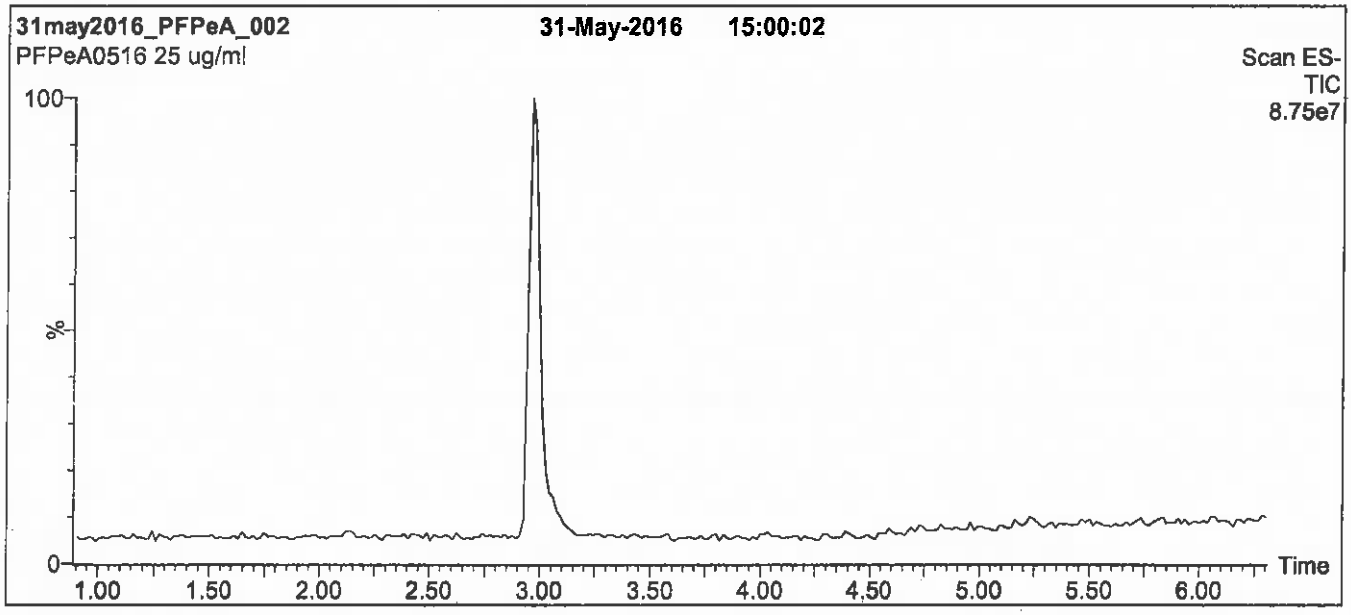
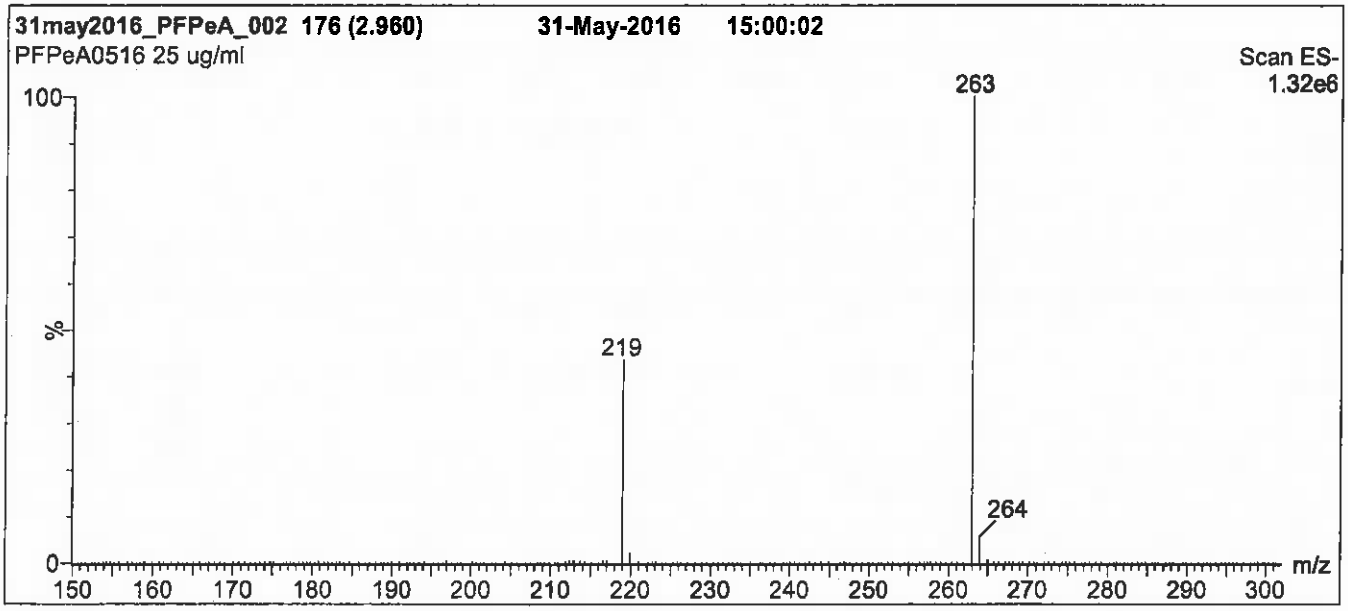
CALA

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

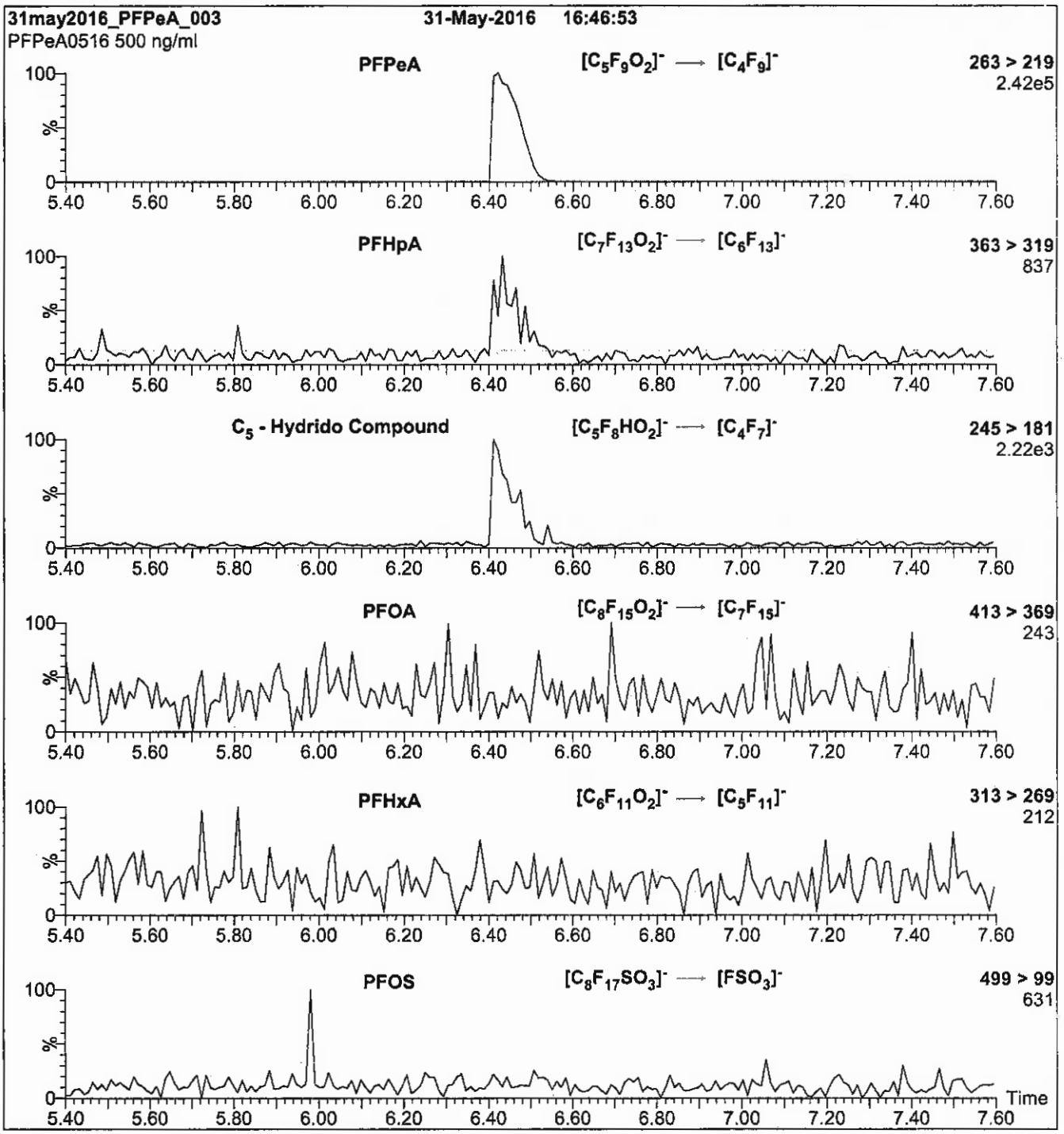
Flow: 300 µl/min

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) = 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) = 3.20e-3
Collision Energy (eV) = 9

Reagent

LCPFTeDA_00006

R: SBG 9/13/16

730645
ID: LCPFTeDA_00005
Exp: 12/09/20 Prpd: SBC
PF-n-tetradecanoic acid

730659
ID: LCPFTeDA_00006
Exp: 12/09/20 Prpd: SBC
PF-n-tetradecanoic acid

WELLINGTON LABORATORIES

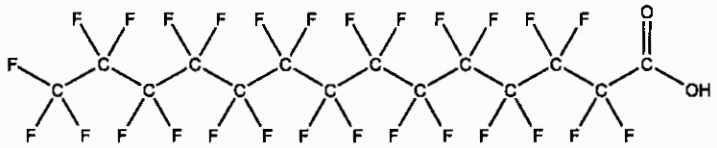
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFTeDA
COMPOUND: Perfluoro-n-tetradecanoic acid

LOT NUMBER: PFTeDA1215

STRUCTURE:

CAS #: 376-06-7



MOLECULAR FORMULA: $C_{14}HF_{27}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 714.11
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 12/09/2015
EXPIRY DATE: (mm/dd/yyyy) 12/09/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.2% of PFDoA ($C_{12}HF_{23}O_2$) and ~ 0.2% of PFPeDA ($C_{15}HF_{29}O_2$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 12/09/2015 (mm/dd/yyyy)

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

INTENDED USE:

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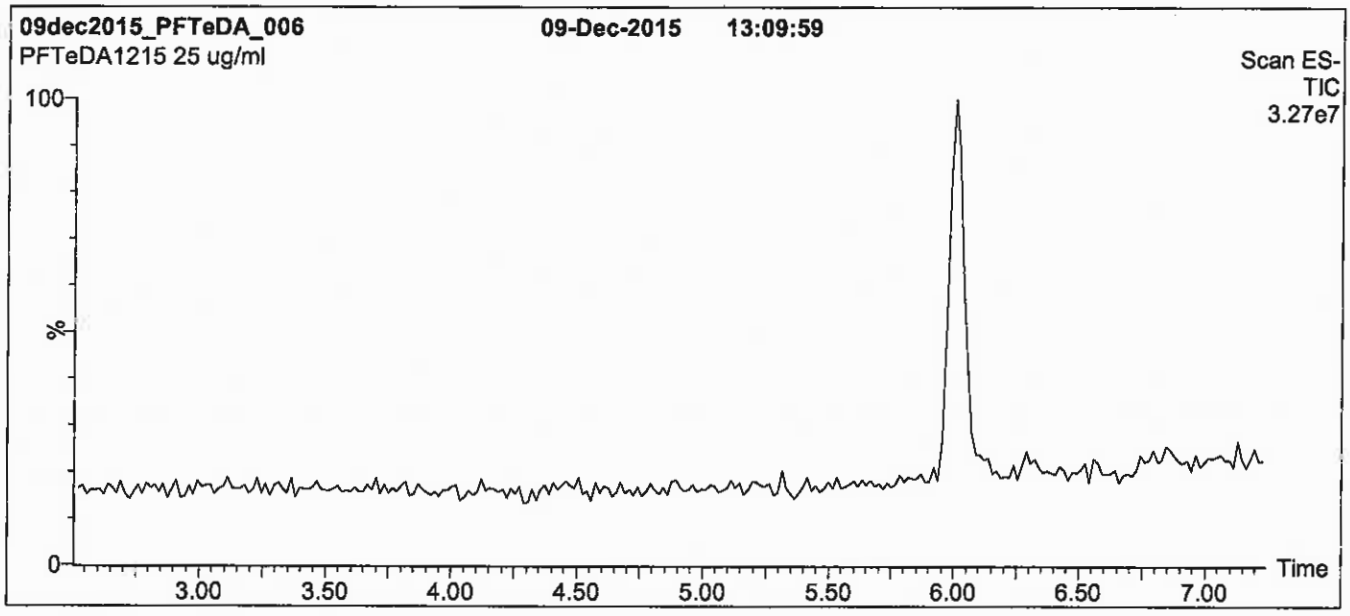
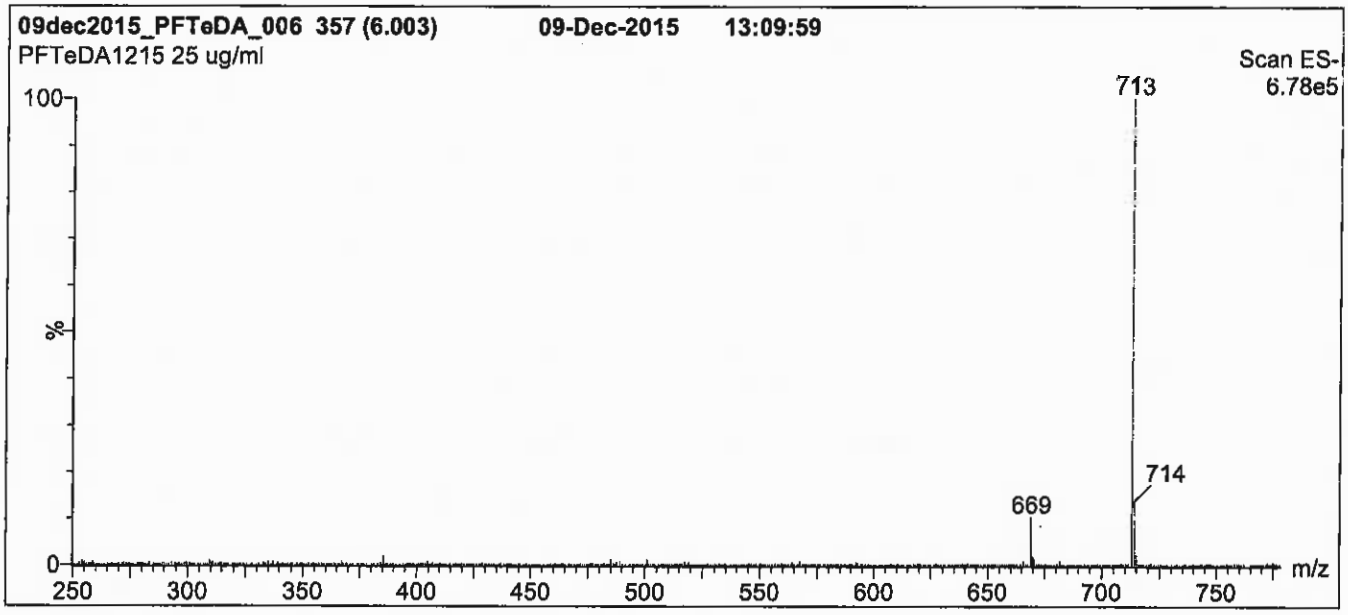




Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

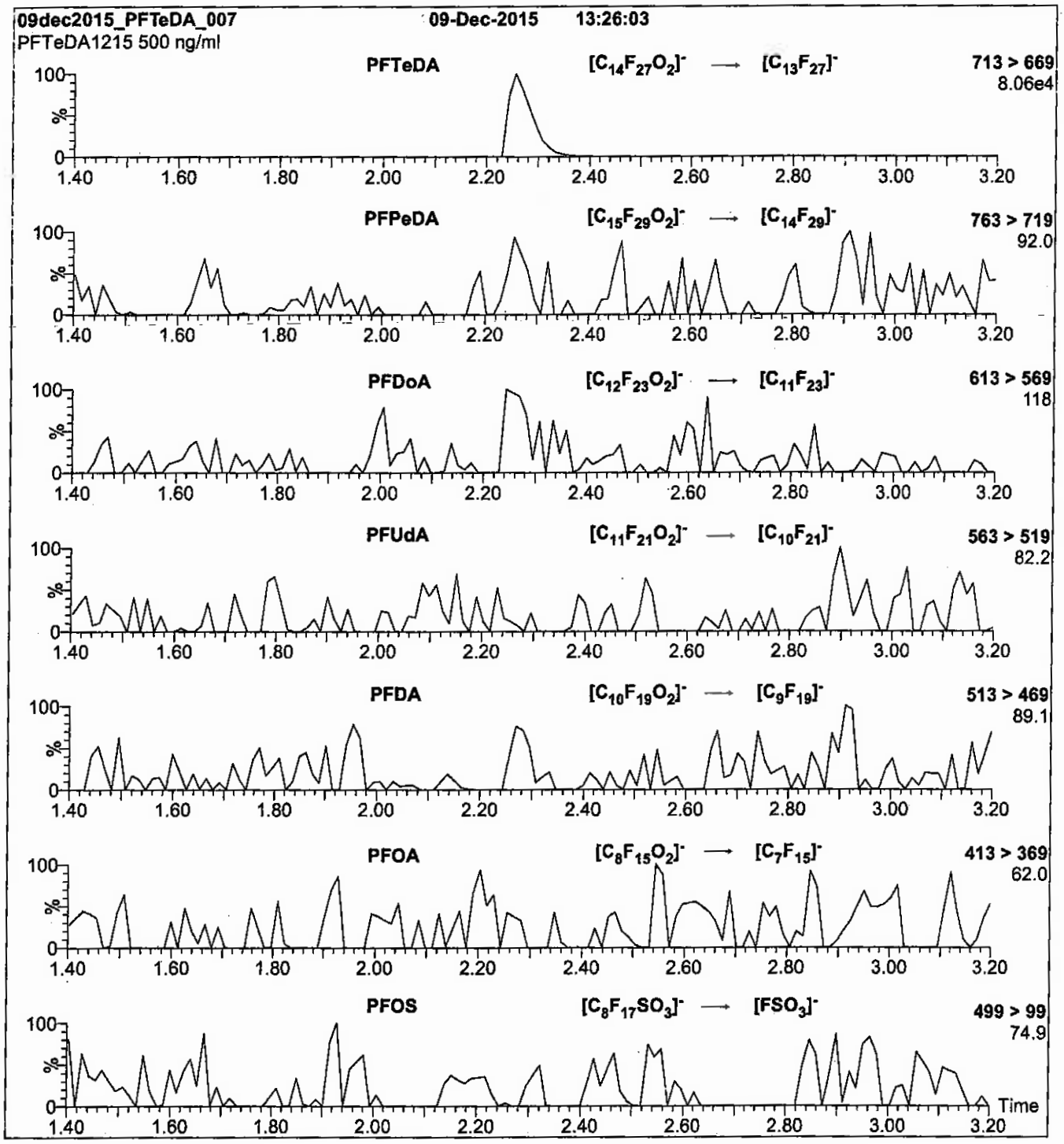
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1250 amu)

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

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



Conditions for Figure 2:

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

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 14

Reagent

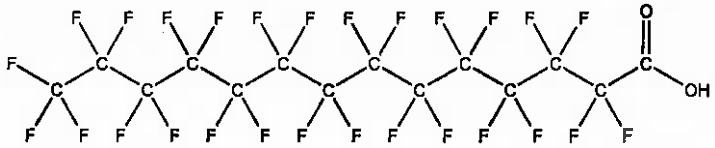
LCPFTeDA_00007

D: 12/20/16 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	PFTeDA	**LOT NUMBER:**	PFTeDA0916
COMPOUND:	Perfluoro-n-tetradecanoic acid		
STRUCTURE:		**CAS #:**	376-06-7



MOLECULAR FORMULA:	$C_{14}HF_{27}O_2$	**MOLECULAR WEIGHT:**	714.11
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	09/30/2016		
EXPIRY DATE: (mm/dd/yyyy)	09/30/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

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Figure 1: 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 ($C_{15}HF_{29}O_2$).

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Certified By: B.G. Chittim **Date:** 10/05/2016 (mm/dd/yyyy)

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

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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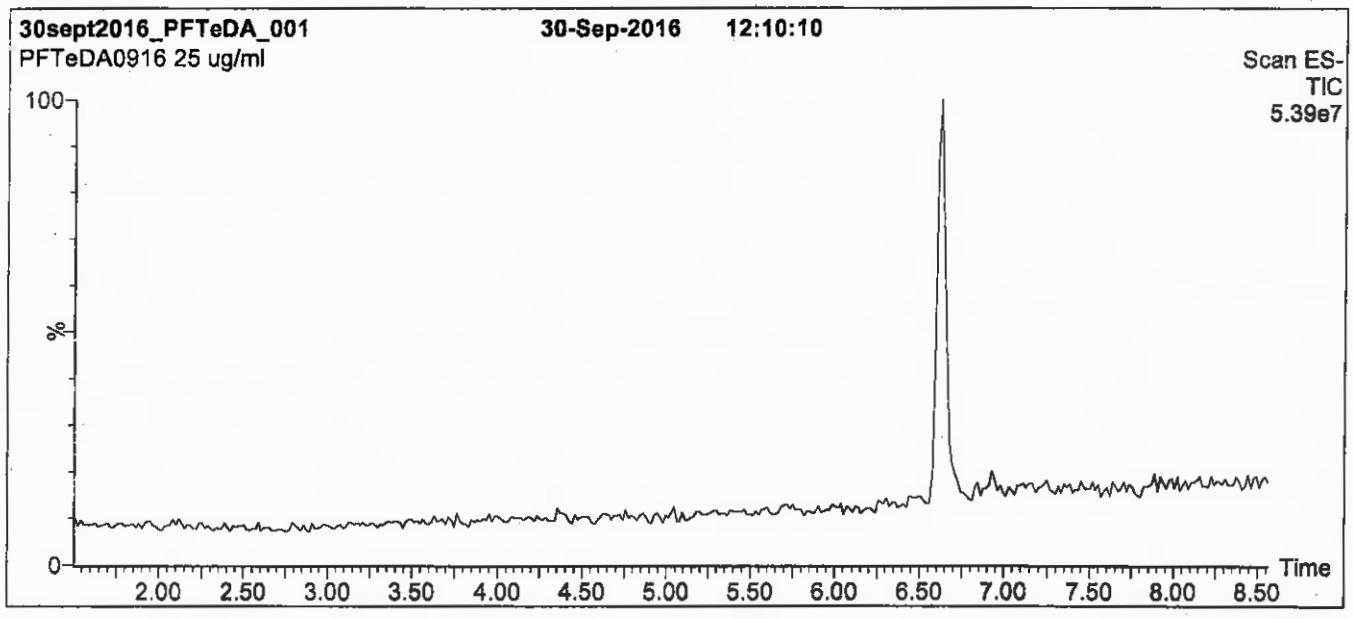

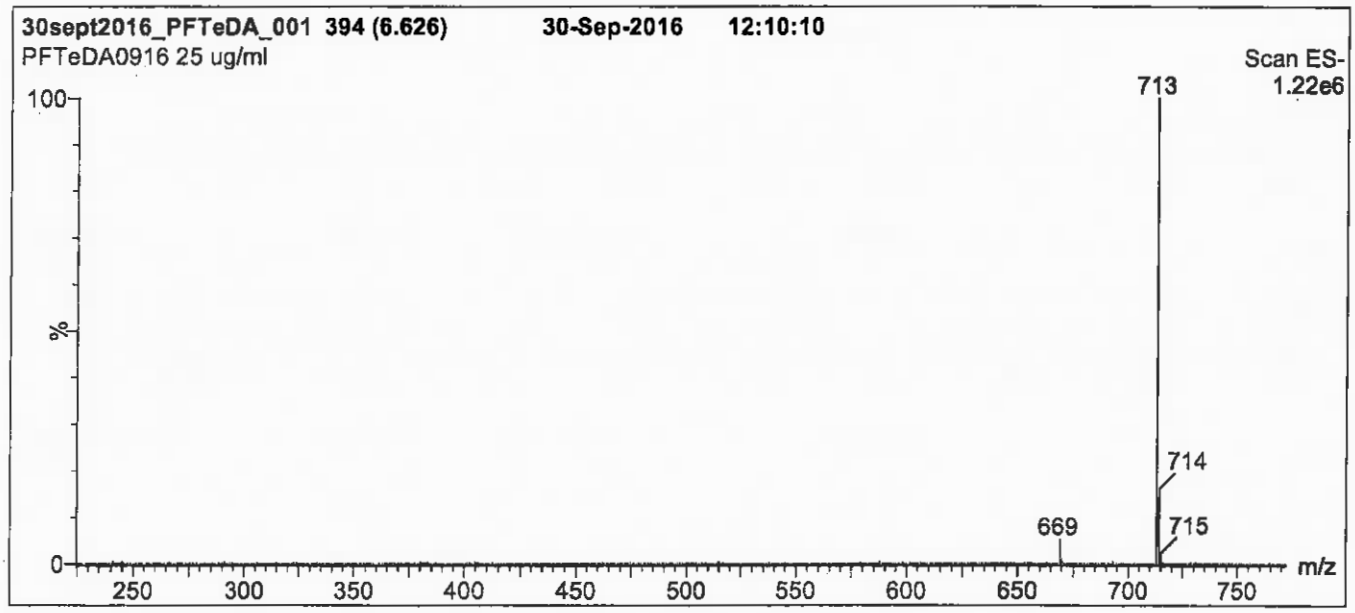

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LC: Waters Acquity Ultra Performance LC
MS: Micromass Quattro *micro* API MS

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

Mobile phase: Gradient
Start: 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

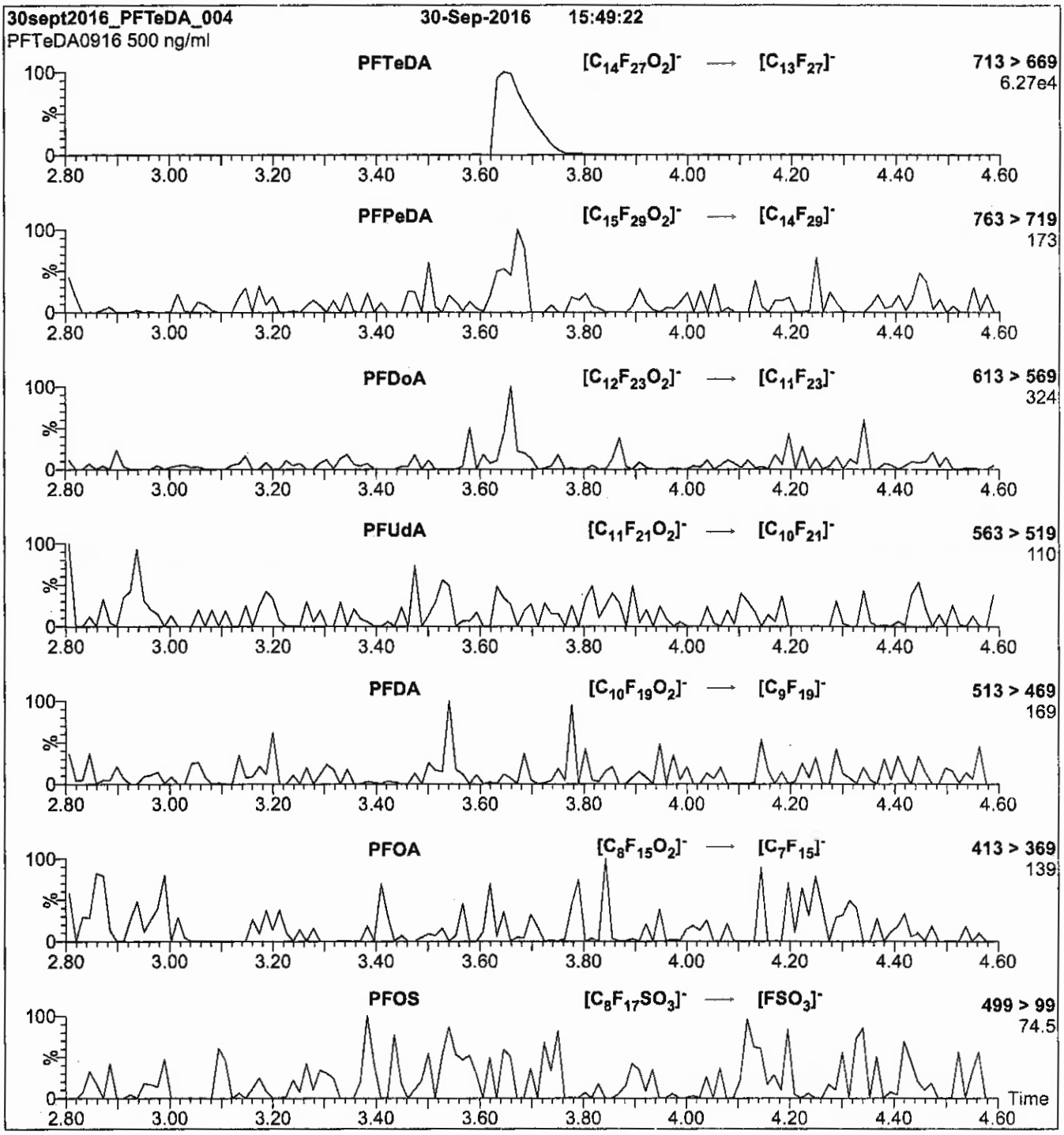
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

Injection: Direct loop injection
10 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) = 3.20e-3
Collision Energy (eV) = 14

Reagent

LCPFTrDA_00006

R: SBC 9/13/16

730665
ID: LCPFTrDA_00005
Exp: 02/12/21 Prpd: SBC
PF-n-tridecanoic acid

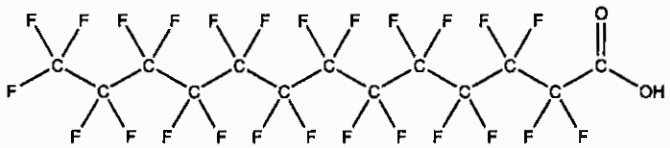
730666
ID: LCPFTrDA_00006
Exp: 02/12/21 Prpd: SBC
PF-n-tridecanoic acid

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFTrDA
LOT NUMBER: PFTrDA0216
COMPOUND: Perfluoro-n-tridecanoic acid

STRUCTURE:
CAS #: 72629-94-8



MOLECULAR FORMULA: $C_{13}HF_{25}O_2$
MOLECULAR WEIGHT: 664.11
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 02/12/2016
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- 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)

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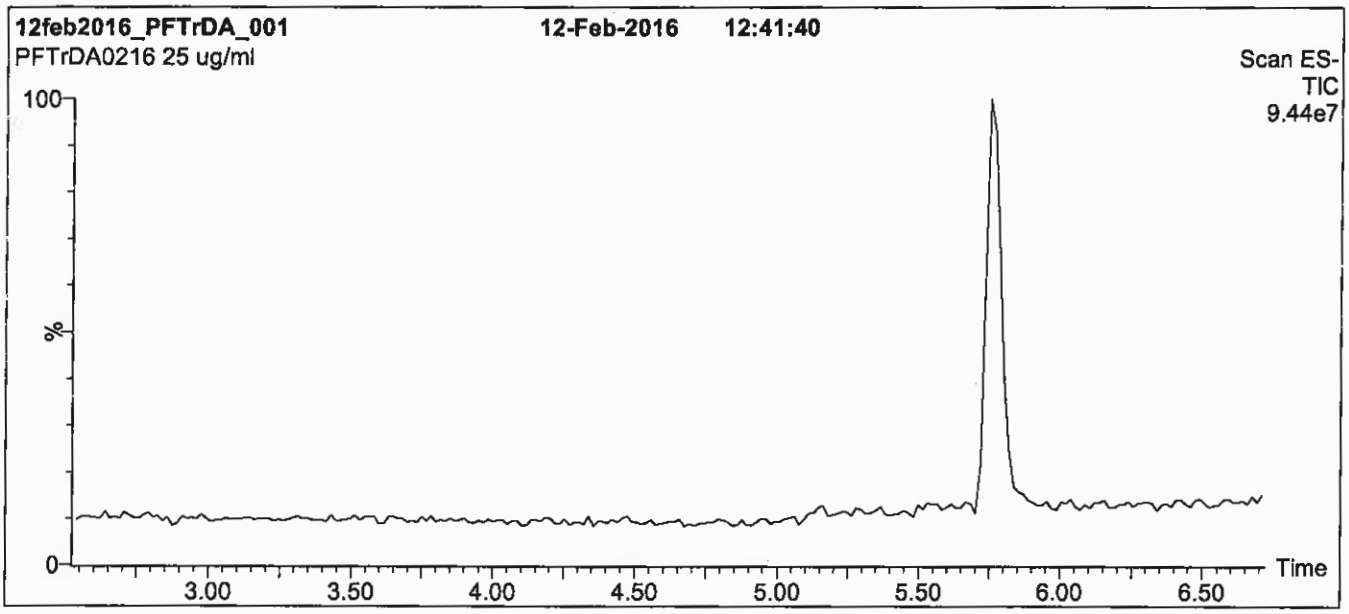
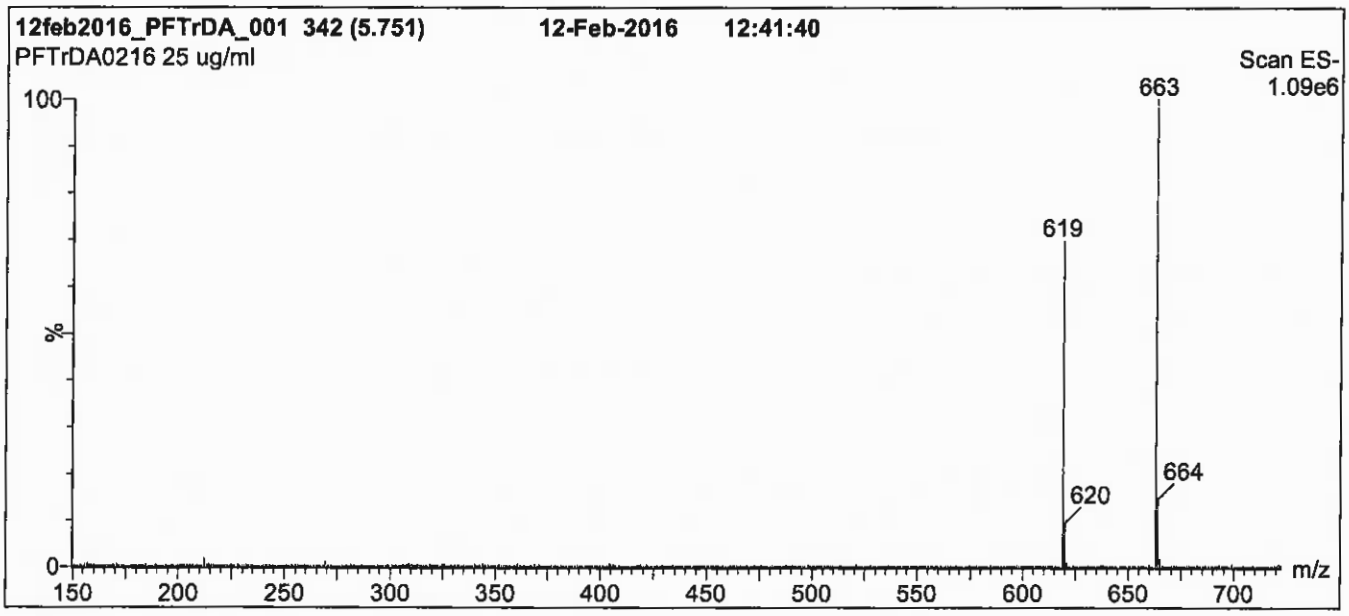
CALA

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

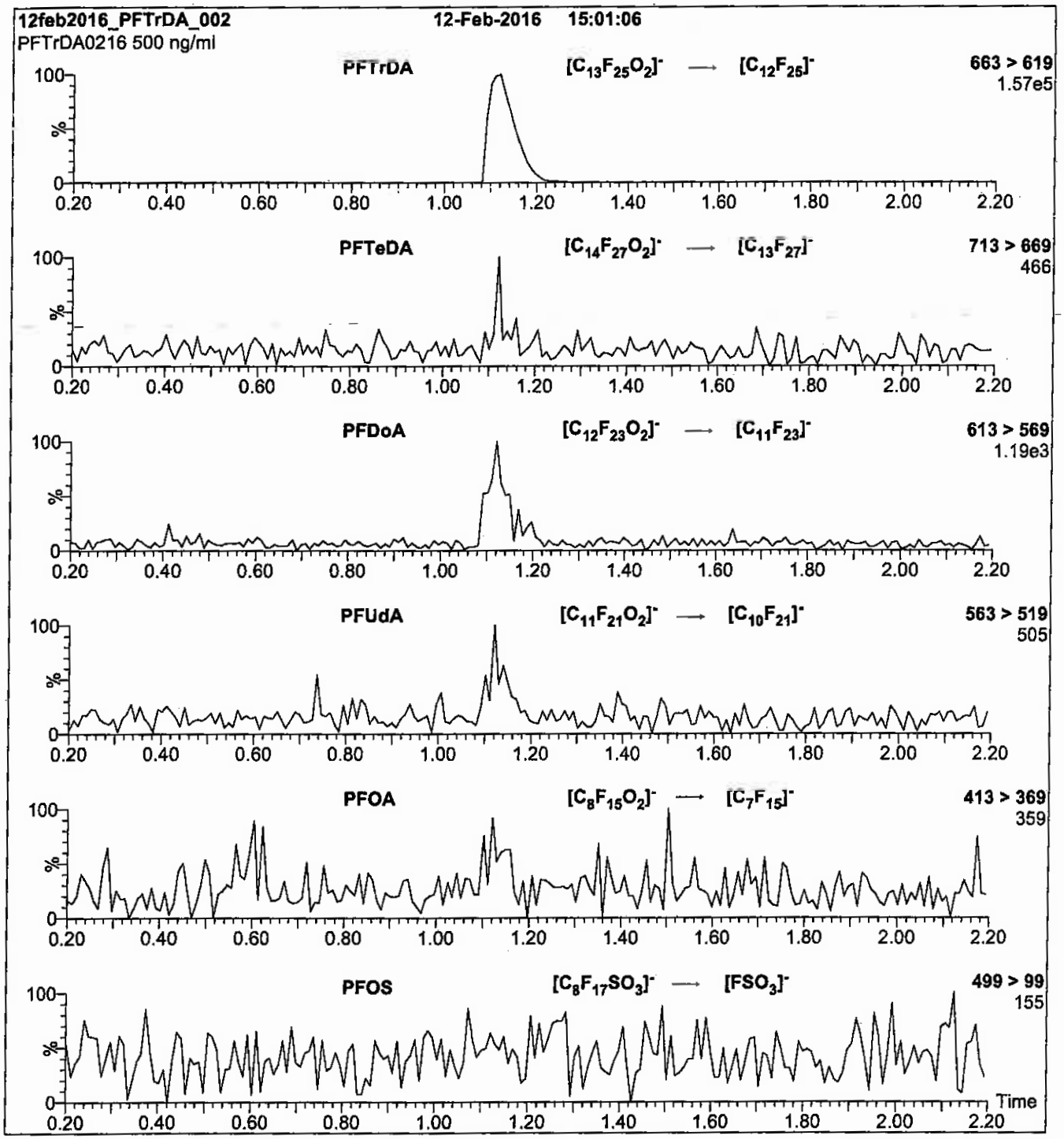
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 22.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 650

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



Conditions for Figure 2:

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

Mobile phase: Isocratic 80% MeOH / 20% H_2O

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 15

Reagent

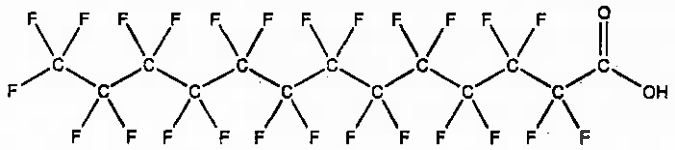
LCPFTrDA_00007

r: 12/29/16 SGJ

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFTrDA	**LOT NUMBER:**	PFTrDA0216
COMPOUND:	Perfluoro-n-tridecanoic acid		
STRUCTURE:		**CAS #:**	72629-94-8



MOLECULAR FORMULA:	$C_{13}HF_{25}O_2$	**MOLECULAR WEIGHT:**	664.11
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	02/12/2016		
EXPIRY DATE: (mm/dd/yyyy)	02/12/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.1% of PFUdA ($C_{11}HF_{21}O_2$), ~ 0.4% of PFDoA ($C_{12}HF_{23}O_2$), and ~ 0.1% of PFTeDA ($C_{14}HF_{27}O_2$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 02/16/2016 (mm/dd/yyyy)

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

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.

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CALA

ANAB ACCREDITED

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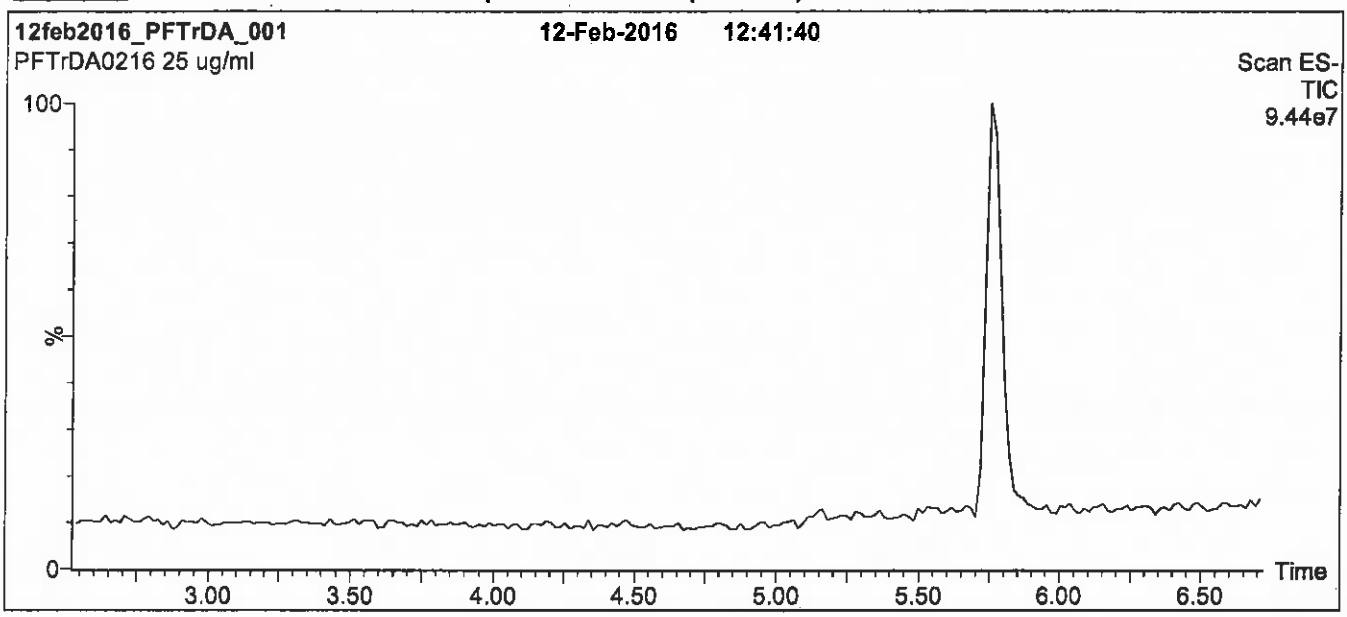

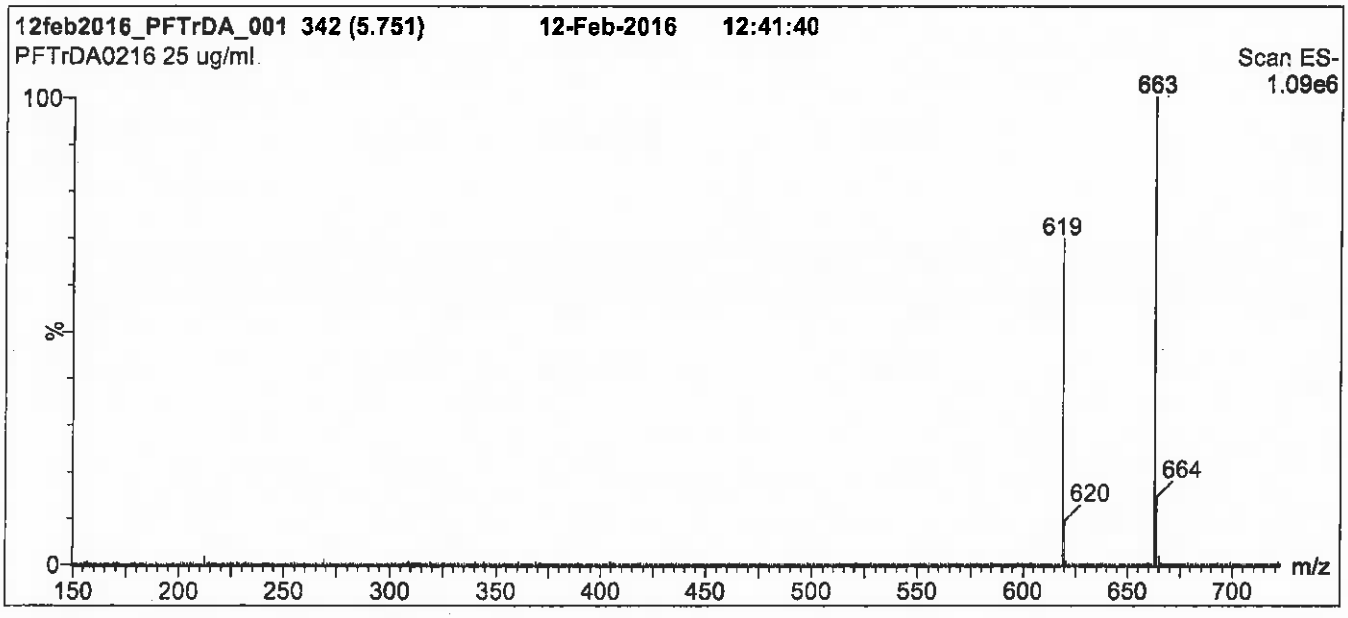

Conditions for Figure 1:

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: 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)
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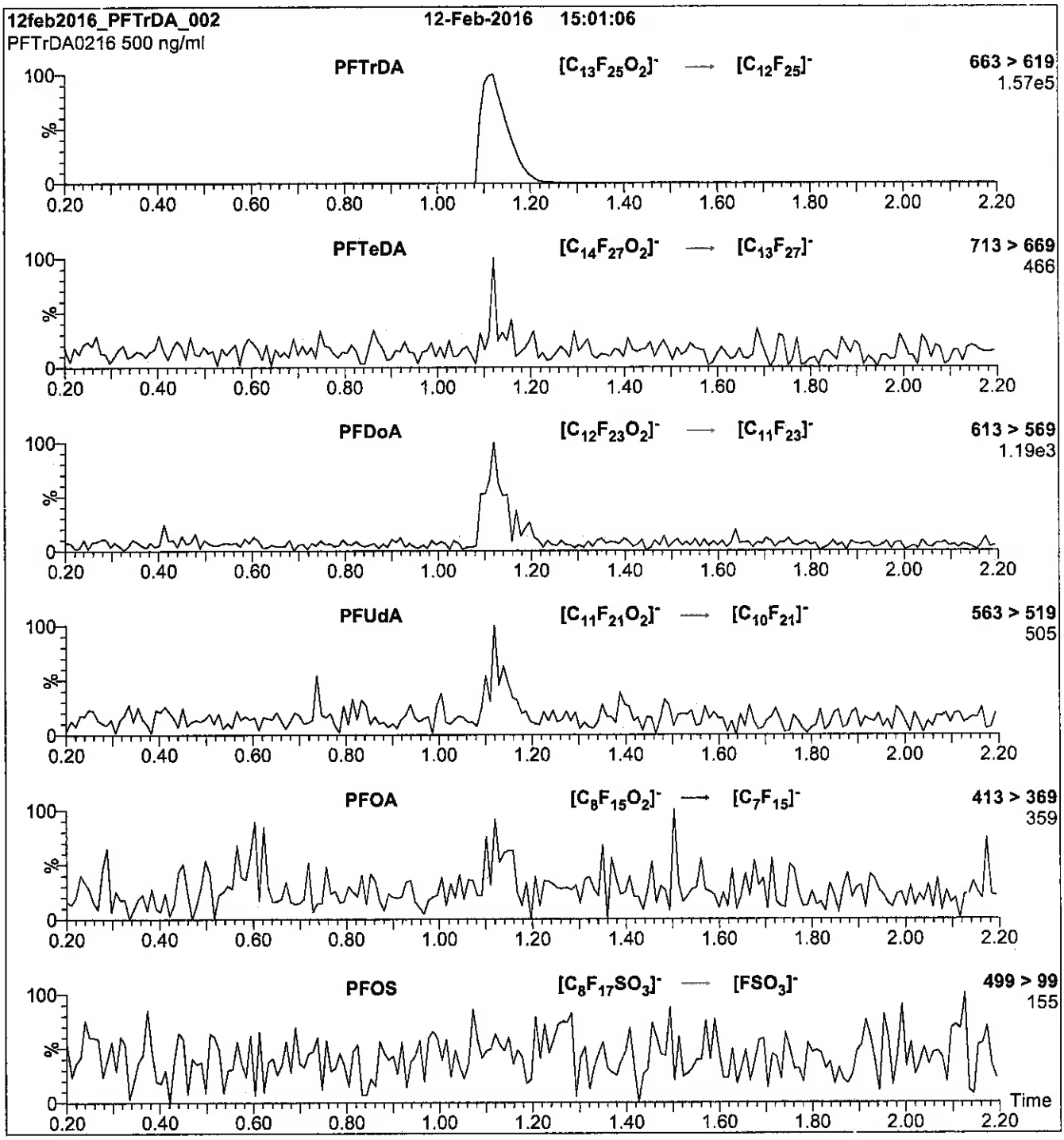
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 650

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

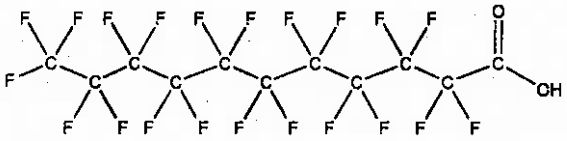
LCPFUdA_00007

r: 12/20/16 SK

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	PFUdA	**LOT NUMBER:**	PFUdA1016
COMPOUND:	Perfluoro-n-undecanoic acid		
STRUCTURE:		**CAS #:**	2058-94-8



MOLECULAR FORMULA:	$C_{11}HF_{21}O_2$	**MOLECULAR WEIGHT:**	564.09
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	10/18/2016		
EXPIRY DATE: (mm/dd/yyyy)	10/18/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

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

ADDITIONAL INFORMATION:

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

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Certified By: B.G. Chittim **Date:** 10/19/2016 (mm/dd/yyyy)

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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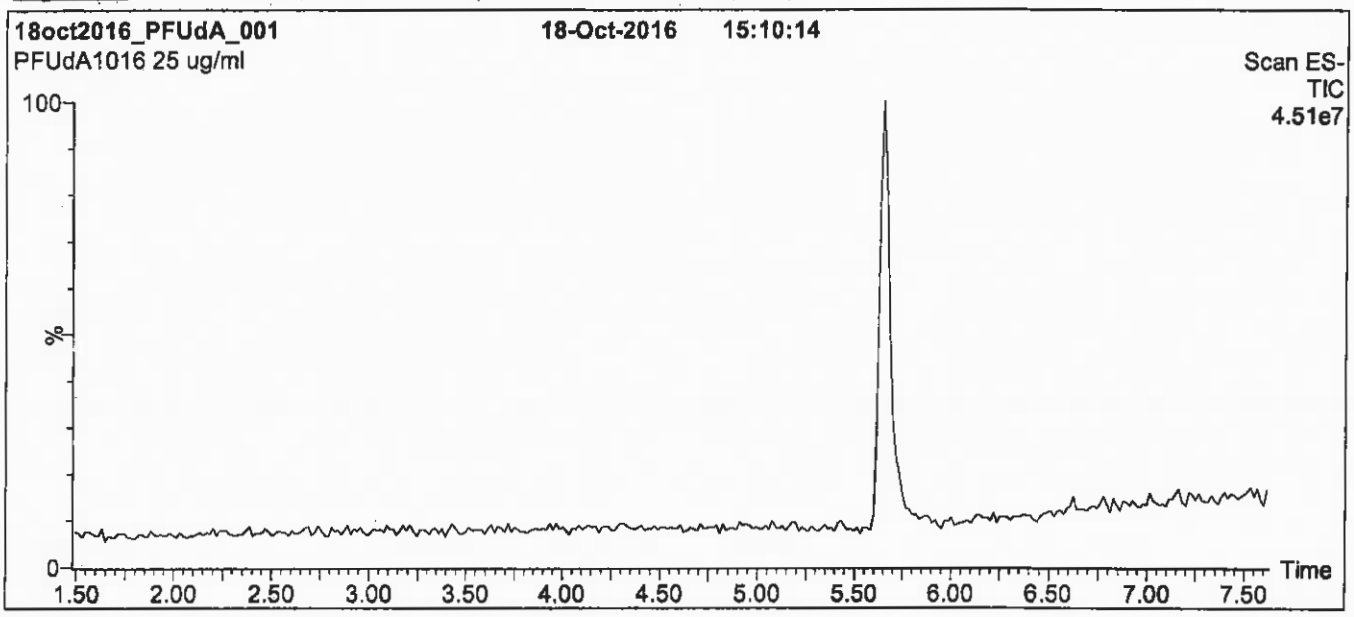
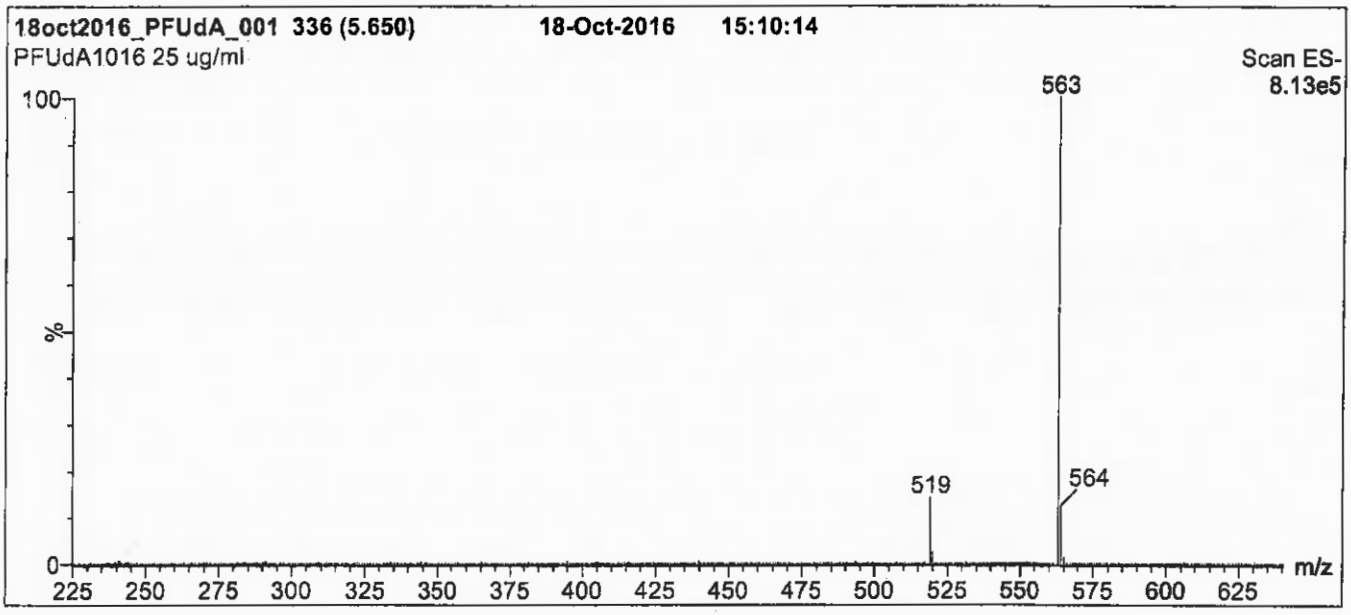
Figure 1: **PFUdA; LC/MS Data (TIC and Mass Spectrum)**





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

Chromatographic Conditions

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1.7 µm, 2.1 x 100 mm

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

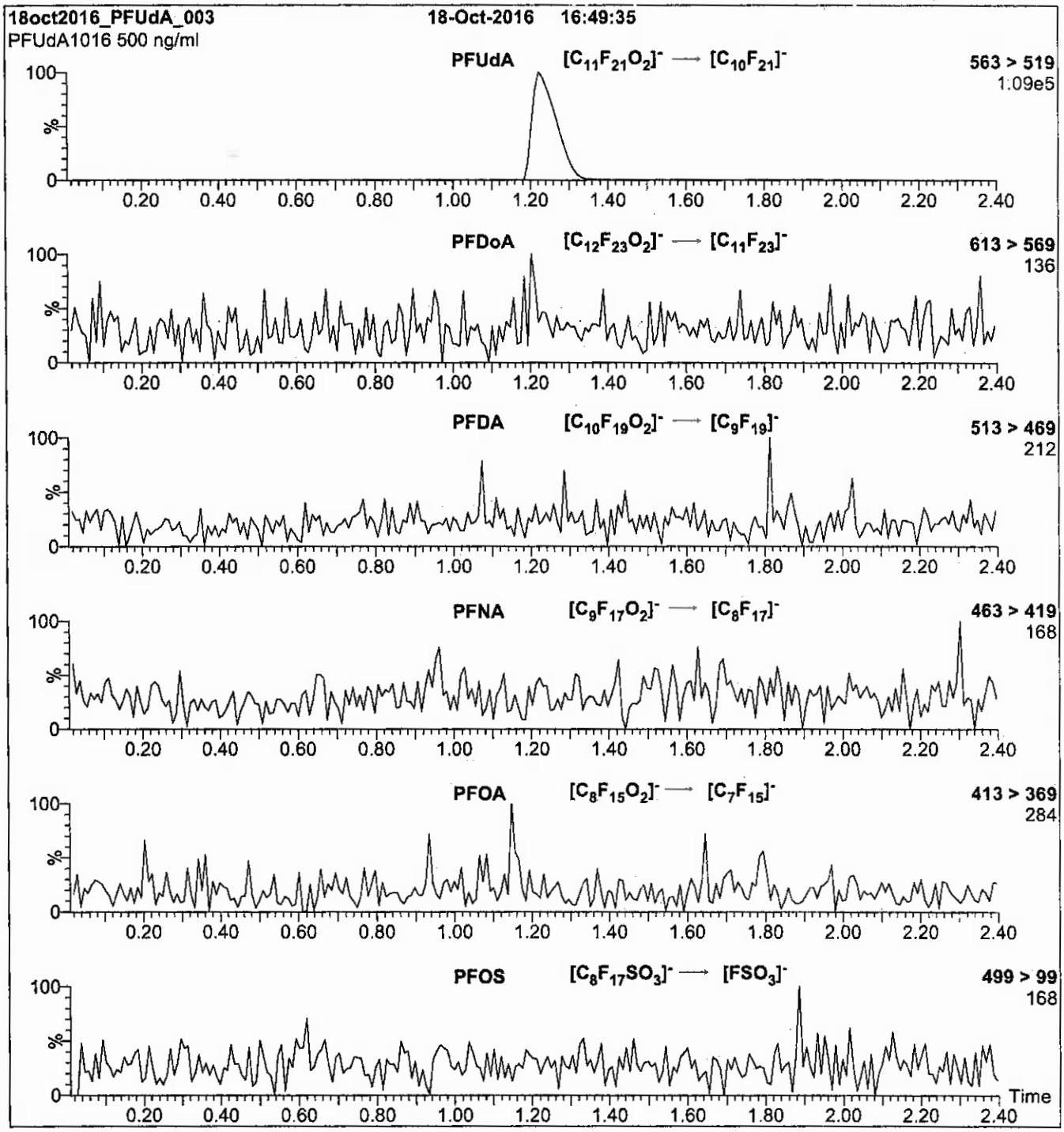
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 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) = 3.24e-3
Collision Energy (eV) = 11

Method PFC DOD

Fluorinated Hydrocarbons (LC/MS) by Method PFAS_DOD

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Matrix: Water Level: Low

GC Column (1): GeminiC18 3 ID: 3 (mm)

Client Sample ID	Lab Sample ID	PFBA #	PFPeA #	PFBS #	PFHxA #	PFHpA #	PFHxS #	PFOA #	PFNA #
TP-PFC-025-TPI	320-35042-1	114	141	123	118	121	122	103	124
TP-PFC-025-TPI DL	320-35042-1 DL	101	104	118	101	96	99	103	100
TP-PFC-025-MID-CARBON	320-35042-2	104	102	98	98	100	99	102	104
TP-PFC-025-TPE	320-35042-3	105	107	99	101	110	102	107	106
TP-PFC-025-TPE-D	320-35042-4	105	109	99	108	108	103	107	107
	MB 320-204105/1-A	104	108	101	102	101	104	102	106
	LCS 320-204105/2-A	98	101	96	97	97	94	100	95
	LCSD 320-204105/3-A	104	106	105	108	104	100	104	103

	QC LIMITS
PFBA = 13C4 PFBA	25-150
PFPeA = 13C5 PFPeA	25-150
PFBS = 13C3-PFBS	25-150
PFHxA = 13C2 PFHxA	25-150
PFHpA = 13C4-PFHpA	25-150
PFHxS = 18O2 PFHxS	25-150
PFOA = 13C4 PFOA	25-150
PFNA = 13C5 PFNA	25-150

Column to be used to flag recovery values

FORM II 537 (modified)

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Matrix: Water Level: Low

GC Column (1): GeminiC18 3 ID: 3 (mm)

Client Sample ID	Lab Sample ID	PFOS #	PFOSA #	PFDA #	PFUnA #	PFDoA #	PFTDA #
TP-PFC-025-TPI	320-35042-1	124	112	125	128	109	108
TP-PFC-025-TPI DL	320-35042-1 DL	101	95	102	106	94	95
TP-PFC-025-MID-CARBON	320-35042-2	100	92	97	100	90	94
TP-PFC-025-TPE	320-35042-3	100	87	89	99	93	94
TP-PFC-025-TPE-D	320-35042-4	108	98	102	108	102	99
	MB 320-204105/1-A	104	91	100	107	96	98
	LCS 320-204105/2-A	93	84	94	100	91	92
	LCSD 320-204105/3-A	101	92	102	99	94	99

	QC LIMITS
PFOS = 13C4 PFOS	25-150
PFOSA = 13C8 FOSA	25-150
PFDA = 13C2 PFDA	25-150
PFUnA = 13C2 PFUnA	25-150
PFDoA = 13C2 PFDoA	25-150
PFTDA = 13C2-PFTeDA	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.: 320-35042-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2018.01.18LLA_003.d

Lab ID: LCS 320-204105/2-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
Perfluorobutanoic acid (PFBA)	40.0	39.2	98	89-128	
Perfluoropentanoic acid (PFPeA)	40.0	36.2	90	66-136	
Perfluorohexanoic acid (PFHxA)	40.0	36.9	92	86-126	
Perfluoroheptanoic acid (PFHpA)	40.0	38.0	95	89-127	
Perfluorooctanoic acid (PFOA)	40.0	36.9	92	80-120	
Perfluorononanoic acid (PFNA)	40.0	38.8	97	77-137	
Perfluorodecanoic acid (PFDA)	40.0	40.0	100	84-123	
Perfluoroundecanoic acid (PFUnA)	40.0	34.4	86	73-122	
Perfluorododecanoic acid (PFDoA)	40.0	40.3	101	82-122	
Perfluorotridecanoic Acid (PFTriA)	40.0	39.4	99	56-163	
Perfluorotetradecanoic acid (PFTeA)	40.0	40.7	102	66-120	
Perfluorobutanesulfonic acid (PFBS)	35.4	34.9	99	88-130	
Perfluorohexanesulfonic acid (PFHxS)	36.4	34.8	96	87-126	
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	38.0	100	92-135	
Perfluorooctanesulfonic acid (PFOS)	37.1	36.0	97	83-126	
Perfluorodecanesulfonic acid (PFDS)	38.6	40.0	104	80-129	
Perfluorooctane Sulfonamide (FOSA)	40.0	39.5	99	91-133	
13C8 FOSA	100	83.6	84	25-150	
13C4 PFBA	100	98.4	98	25-150	
13C2 PFHxA	100	96.9	97	25-150	
13C4 PFOA	100	99.9	100	25-150	
13C5 PFNA	100	94.8	95	25-150	
13C2 PFDA	100	93.9	94	25-150	
13C2 PFUnA	100	99.5	100	25-150	
13C2 PFDoA	100	90.6	91	25-150	
18O2 PFHxS	94.6	89.0	94	25-150	
13C4 PFOS	95.6	89.2	93	25-150	
13C2-PFTeDA	100	91.5	92	25-150	
13C4-PFHpA	100	97.4	97	25-150	
13C5 PFPeA	100	101	101	25-150	
13C3-PFBS	93.0	89.4	96	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.: 320-35042-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2018.01.18LLA_004.d

Lab ID: LCSD 320-204105/3-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LCSD CONCENTRATION (ng/L)	LCSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Perfluorobutanoic acid (PFBA)	40.0	38.1	95	3	30	89-128	
Perfluoropentanoic acid (PFPeA)	40.0	35.9	90	1	30	66-136	
Perfluorohexanoic acid (PFHxA)	40.0	35.7	89	3	30	86-126	
Perfluoroheptanoic acid (PFHpA)	40.0	37.2	93	2	30	89-127	
Perfluorooctanoic acid (PFOA)	40.0	37.8	94	2	30	80-120	
Perfluorononanoic acid (PFNA)	40.0	37.5	94	3	30	77-137	
Perfluorodecanoic acid (PFDA)	40.0	37.9	95	6	30	84-123	
Perfluoroundecanoic acid (PFUnA)	40.0	37.2	93	8	30	73-122	
Perfluorododecanoic acid (PFDoA)	40.0	39.8	100	1	30	82-122	
Perfluorotridecanoic Acid (PFTriA)	40.0	38.6	97	2	30	56-163	
Perfluorotetradecanoic acid (PFTeA)	40.0	40.7	102	0	30	66-120	
Perfluorobutanesulfonic acid (PFBS)	35.4	33.8	96	3	30	88-130	
Perfluorohexanesulfonic acid (PFHxS)	36.4	33.8	93	3	30	87-126	
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	37.5	98	2	30	92-135	
Perfluorooctanesulfonic acid (PFOS)	37.1	34.3	93	5	30	83-126	
Perfluorodecanesulfonic acid (PFDS)	38.6	36.9	96	8	30	80-129	
Perfluorooctane Sulfonamide (FOSA)	40.0	36.6	92	8	30	91-133	
13C8 FOSA	100	92.0	92			25-150	
13C4 PFBA	100	104	104			25-150	
13C2 PFHxA	100	108	108			25-150	
13C4 PFOA	100	104	104			25-150	
13C5 PFNA	100	103	103			25-150	
13C2 PFDA	100	102	102			25-150	
13C2 PFUnA	100	98.5	99			25-150	
13C2 PFDoA	100	94.3	94			25-150	
18O2 PFHxS	94.6	94.8	100			25-150	
13C4 PFOS	95.6	96.8	101			25-150	
13C2-PFTeDA	100	98.6	99			25-150	
13C4-PFHpA	100	104	104			25-150	
13C5 PFPeA	100	106	106			25-150	
13C3-PFBS	93.0	98.0	105			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.: 320-35042-1

SDG No.:

Lab File ID: 2018.01.18LLA_002.d Lab Sample ID: MB 320-204105/1-A

Matrix: Water Date Extracted: 01/16/2018 09:18

Instrument ID: A8_N Date Analyzed: 01/18/2018 17:37

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-204105/2-A	2018.01.18LLA_003.d	01/18/2018 17:45
	LCSD 320-204105/3-A	2018.01.18LLA_004.d	01/18/2018 17:53
TP-PFC-025-TPI	320-35042-1	2018.01.18LLA_005.d	01/18/2018 18:01
TP-PFC-025-MID-CARBON	320-35042-2	2018.01.18LLA_006.d	01/18/2018 18:08
TP-PFC-025-TPE	320-35042-3	2018.01.18LLA_007.d	01/18/2018 18:16
TP-PFC-025-TPE-D	320-35042-4	2018.01.18LLA_008.d	01/18/2018 18:24
TP-PFC-025-TPI DL	320-35042-1 DL	2018.01.19LLC_010.d	01/19/2018 16:58

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35042-1

SDG No.:

Client Sample ID: TP-PFC-025-TPI | Lab Sample ID: 320-35042-1

Matrix: Water | Lab File ID: 2018.01.18LLA_005.d

Analysis Method: 537 (modified) | Date Collected: 01/11/2018 09:00

Extraction Method: 3535 | Date Extracted: 01/16/2018 09:18

Sample wt/vol: 256.2(mL) | Date Analyzed: 01/18/2018 18:01

Con. Extract Vol.: 10.0(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 204556 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	73		2.0	0.98	0.34
2706-90-3	Perfluoropentanoic acid (PFPeA)	190		2.0	0.98	0.48
307-24-4	Perfluorohexanoic acid (PFHxA)	340		3.9	2.0	0.57
375-85-9	Perfluoroheptanoic acid (PFHpA)	67		2.0	0.98	0.24
335-67-1	*Perfluorooctanoic acid (PFOA)*	*1300*	*M E*	*3.9*	2.0	*0.83*
375-95-1	Perfluorononanoic acid (PFNA)	2.4		2.0	0.98	0.26
335-76-2	Perfluorodecanoic acid (PFDA)	0.89	J	2.0	0.98	0.30
2058-94-8	Perfluoroundecanoic acid (PFUnA)	2.9	U	3.9	2.9	1.1
307-55-1	Perfluorododecanoic acid (PFDoA)	2.0	U	3.9	2.0	0.54
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.9	U	3.9	2.9	1.3
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.98	U	2.0	0.98	0.28
375-73-5	Perfluorobutanesulfonic acid (PFBS)	51		2.0	0.98	0.29
355-46-4	*Perfluorohexanesulfonic acid (PFHxS)*	*360*	*E*	*2.0*	0.98	*0.29*
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	7.1		2.0	0.98	0.29
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	340		3.9	2.0	0.53
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.98	U	2.0	0.98	0.31
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.98	U	2.0	0.98	0.34

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35042-1

SDG No.:

Client Sample ID: TP-PFC-025-TPI | Lab Sample ID: 320-35042-1

Matrix: Water | Lab File ID: 2018.01.18LLA_005.d

Analysis Method: 537 (modified) | Date Collected: 01/11/2018 09:00

Extraction Method: 3535 | Date Extracted: 01/16/2018 09:18

Sample wt/vol: 256.2(mL) | Date Analyzed: 01/18/2018 18:01

Con. Extract Vol.: 10.0(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 204556 | Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	112		25-150
STL00992	13C4 PFBA	114		25-150
STL00993	13C2 PFHxA	118		25-150
STL00990	13C4 PFOA	103		25-150
STL00995	13C5 PFNA	124		25-150
STL00996	13C2 PFDA	125		25-150
STL00997	13C2 PFUnA	128		25-150
STL00998	13C2 PFDoA	109		25-150
STL00994	18O2 PFHxS	122		25-150
STL00991	13C4 PFOS	124		25-150
STL02116	13C2-PFTeDA	108		25-150
STL01892	13C4-PFHpA	121		25-150
STL01893	13C5 PFPeA	141		25-150
STL02337	13C3-PFBS	123		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_005.d
Lims ID: 320-35042-A-1-A
Client ID: TP-PFC-025-TPI
Sample Type: Client
Inject. Date: 18-Jan-2018 18:01:06 ALS Bottle#: 44 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-35042-a-1-a
Misc. Info.: Plate: 1 Rack: 5
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 19-Jan-2018 15:50:53 Calib Date: 17-Jan-2018 15:06:20
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_008.d

Column 1 : Det: EXP1
Process Host: XAWRK004

First Level Reviewer: roycea Date: 19-Jan-2018 15:49:58

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.405	1.411	-0.006	0.537	7288609	2.86		114	20627	
2 Perfluorobutyric acid										
212.90 > 169.00	1.405	1.413	-0.008	1.000	5101681	1.87			524	
D 3 13C5-PFPeA										
267.90 > 223.00	1.657	1.659	-0.002	0.633	5319366	3.53		141	34460	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.657	1.662	-0.005	1.000	12274468	4.90			4844	
D 47 13C3-PFBS										
301.90 > 83.00	1.693	1.695	-0.002	0.647	95153	2.85		123	2197	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.693	1.697	-0.004	1.000	4110596	1.30			6414	
298.90 > 99.00	1.693	1.697	-0.004	1.000	1730486		2.38(1.25-3.74)		4785	
D 7 13C2 PFHxA										
315.00 > 270.00	1.938	1.939	-0.001	0.740	4790740	2.95		118	39096	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.927	1.939	-0.012	0.995	17181190	8.65			20188	
313.00 > 119.00	1.938	1.939	-0.001	1.000	1403643		12.24(5.03-15.10)		14489	
D 9 13C4-PFHpA										
367.00 > 322.00	2.258	2.267	-0.009	0.863	4691685	3.03		121	28991	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.258	2.268	-0.010	1.000	3546989	1.72			4512	
363.00 > 169.00	2.258	2.268	-0.010	1.000	1405477		2.52(1.13-3.40)		9709	
8 Perfluorohexanesulfonic acid										E
399.00 > 80.00	2.271	2.280	-0.009	1.000	23815404	9.21			25331	E
399.00 > 99.00	2.271	2.280	-0.009	1.000	7910504		3.01(1.50-4.49)		20907	
D 11 18O2 PFHxS										
403.00 > 84.00	2.271	2.282	-0.011	0.868	5490770	2.88		122	51779	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 14 13C4 PFOA										
417.00 > 372.00	2.617	2.622	-0.005	1.000	3906924	2.58		103	27259	
* 62 13C2-PFOA										
415.00 > 370.00	2.617	2.622	-0.005		4209333	2.50			26112	
15 Perfluorooctanoic acid										EM
413.00 > 369.00	2.617	2.623	-0.006	1.000	59521551	32.5			9590	EM
413.00 > 169.00	2.617	2.623	-0.006	1.000	41758687		1.43(0.84-2.52)		12570	M
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.624	2.629	-0.005	1.000	368984	0.1825			138	
449.00 > 99.00	2.624	2.629	-0.005	1.000	113910		3.24(1.94-5.82)		271	
D 19 13C5 PFNA										
468.00 > 423.00	2.987	2.992	-0.005	1.141	3802263	3.09		124	28260	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.987	2.992	-0.005	1.000	14596177	8.74			2414	
499.00 > 99.00	2.987	2.992	-0.005	1.000	3224214		4.53(2.31-6.93)		3874	
D 18 13C4 PFOS										
503.00 > 80.00	2.987	2.992	-0.005	1.141	3566895	2.96		124	22028	
20 Perfluorononanoic acid										
463.00 > 419.00	2.987	2.992	-0.005	1.000	95262	0.0607			126	
463.00 > 169.00	2.987	2.992	-0.005	1.000	24042		3.96(1.90-5.69)		89.6	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.335	3.338	-0.003	1.000	6902	0.003700			18.5	
D 21 13C8 FOSA										
506.00 > 78.00	3.335	3.338	-0.003	1.274	4747315	2.80		112	26223	
D 23 13C2 PFDA										
515.00 > 470.00	3.350	3.352	-0.002	1.280	3317023	3.12		125	29192	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.350	3.353	-0.003	1.000	29225	0.0227			74.8	
513.00 > 169.00	3.342	3.353	-0.011	0.998	5526		5.29(2.36-7.09)		48.9	
D 30 13C2 PFUnA										
565.00 > 520.00	3.673	3.679	-0.006	1.404	2581650	3.21		128	25155	
D 36 13C2 PFDoA										
615.00 > 570.00	3.975	3.979	-0.004	1.519	2377921	2.72		109	26960	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.473	4.483	-0.010	1.709	3088544	2.70		108	17009	

QC Flag Legend

Processing Flags

E - Exceeded Maximum Amount

Review Flags

M - Manually Integrated

Report Date: 19-Jan-2018 15:50:59 Chrom Revision: 2.2 08-Dec-2017 11:41:26

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_005.d

Injection Date: 18-Jan-2018 18:01:06 Instrument ID: A8_N

Lims ID: 320-35042-A-1-A Lab Sample ID: 320-35042-1

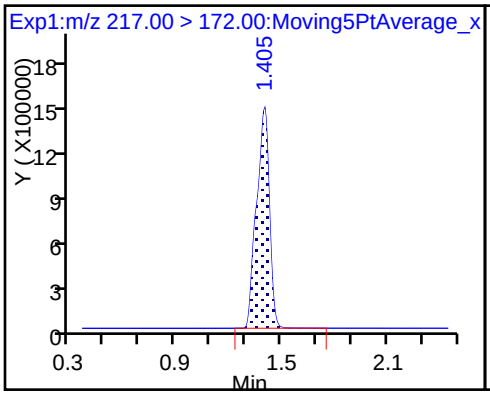
Client ID: TP-PFC-025-TPI

Operator ID: SACINSTLCMS01 ALS Bottle#: 44 Worklist Smp#: 5

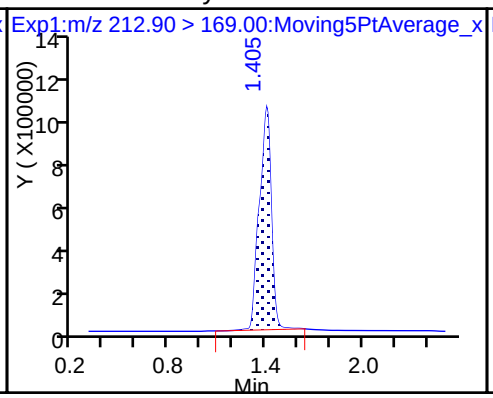
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

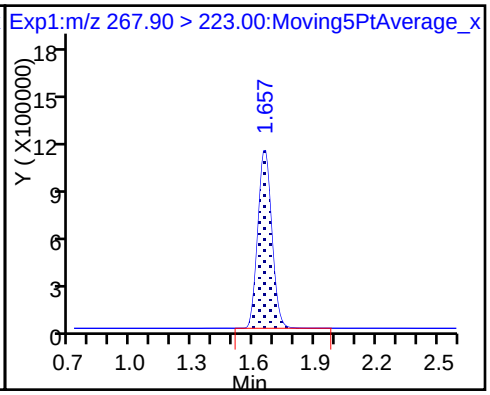
D 1 13C4 PFBA



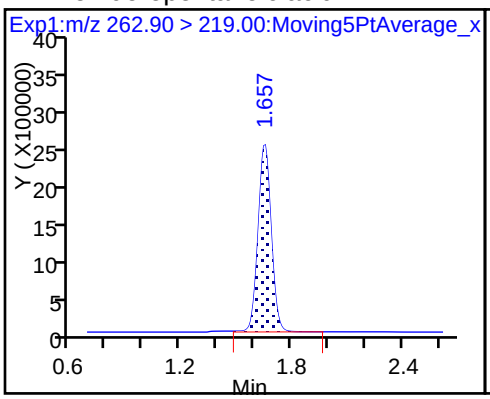
2 Perfluorobutyric acid



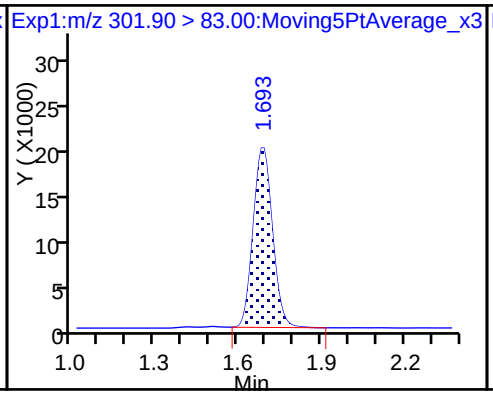
D 3 13C5-PFPeA



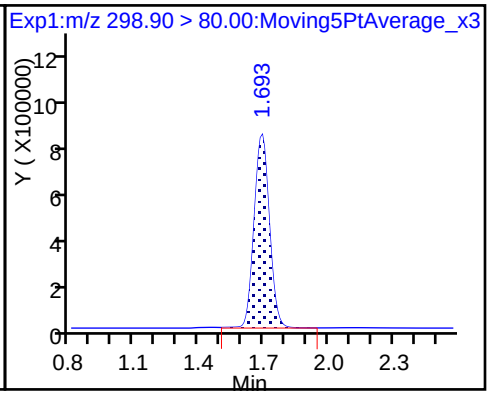
4 Perfluoropentanoic acid



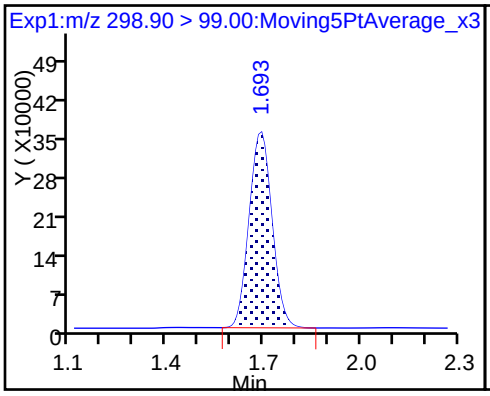
D 47 13C3-PFBS



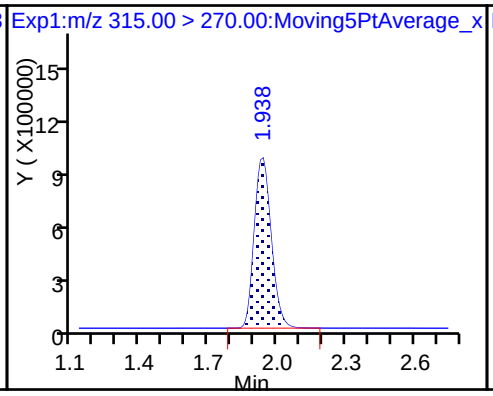
5 Perfluorobutanesulfonic acid



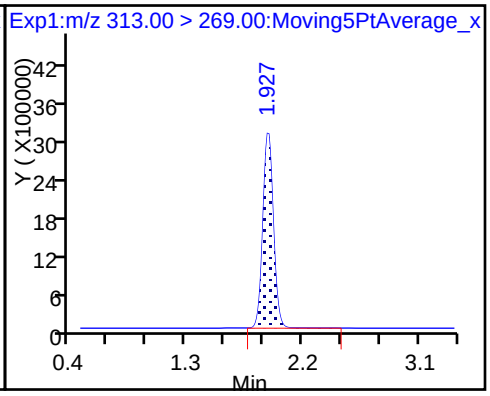
5 Perfluorobutanesulfonic acid



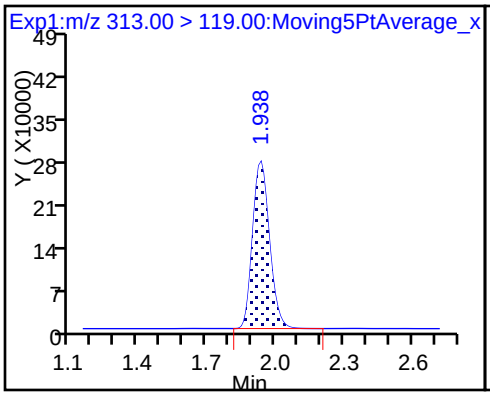
D 7 13C2 PFHxA



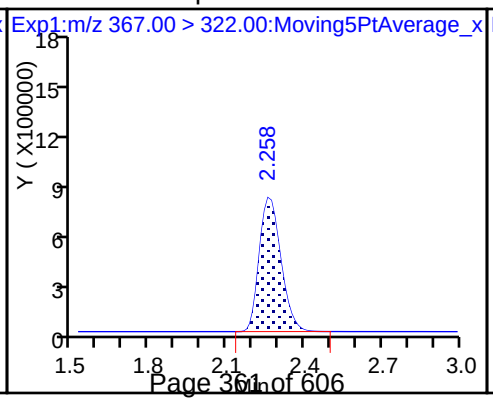
6 Perfluorohexanoic acid



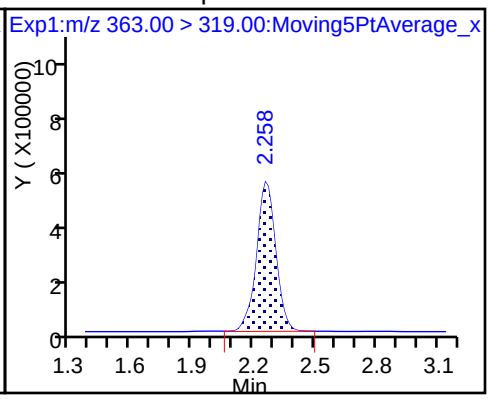
6 Perfluorohexanoic acid



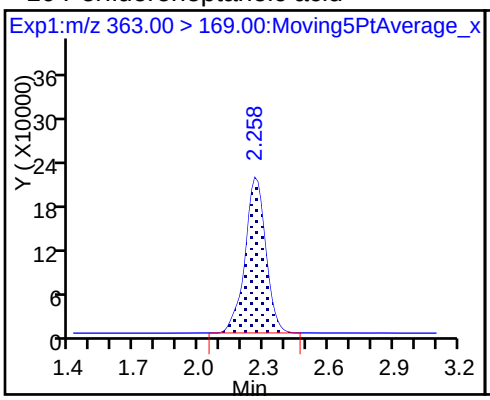
D 9 13C4-PFHpA



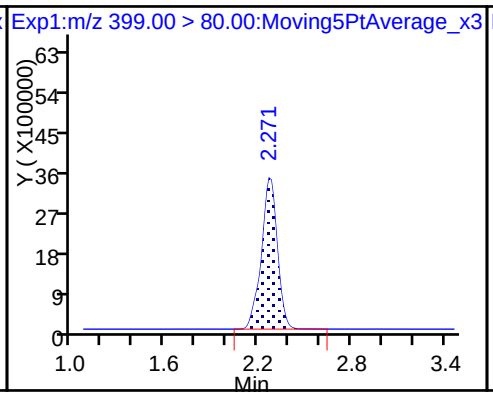
10 Perfluoroheptanoic acid



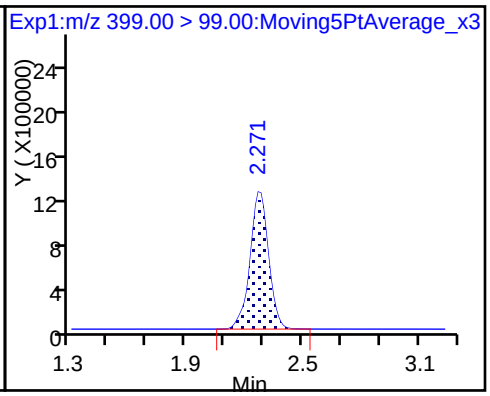
10 Perfluoroheptanoic acid



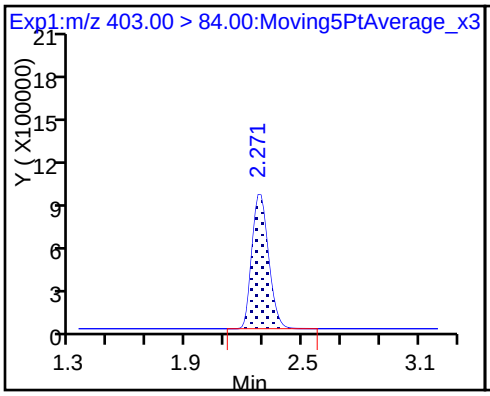
8 Perfluorohexanesulfonic acid



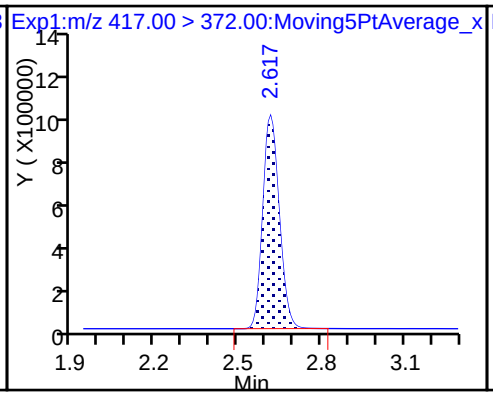
8 Perfluorohexanesulfonic acid



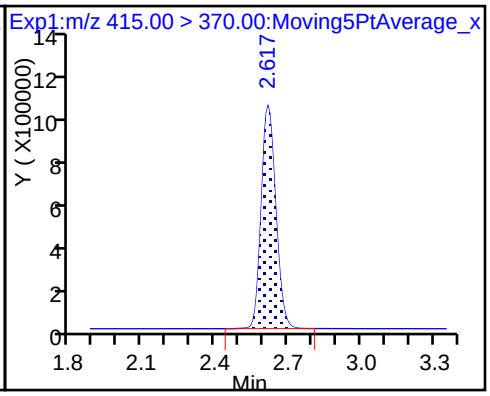
D 11 18O2 PFHxS



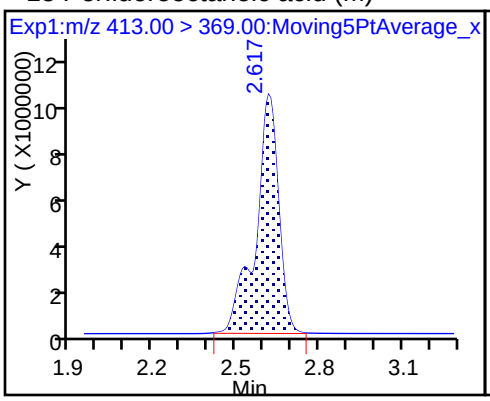
D 14 13C4 PFOA



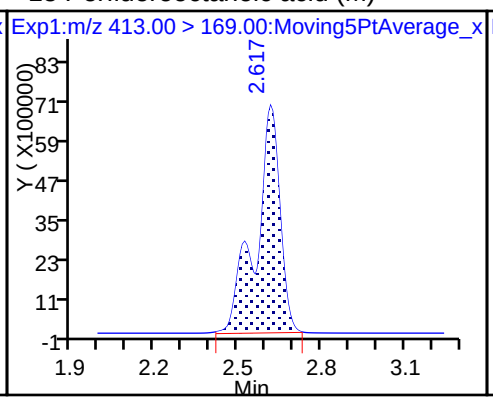
* 62 13C2-PFOA



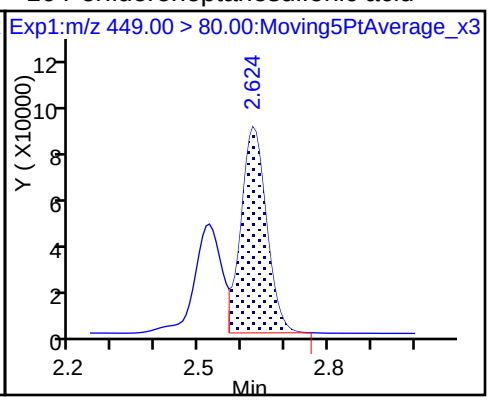
15 Perfluorooctanoic acid (M)



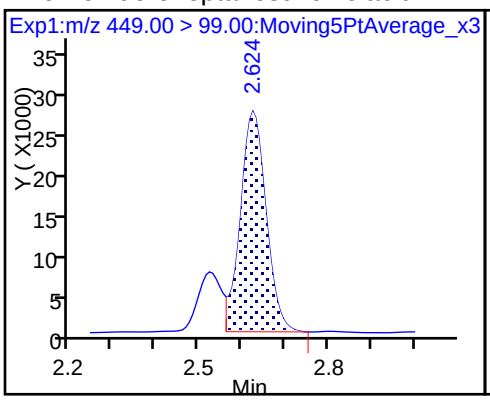
15 Perfluorooctanoic acid (M)



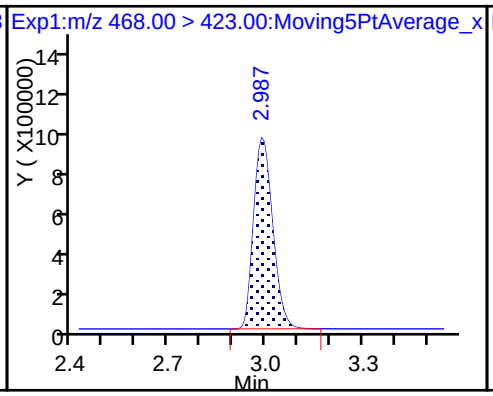
16 Perfluoroheptanesulfonic acid



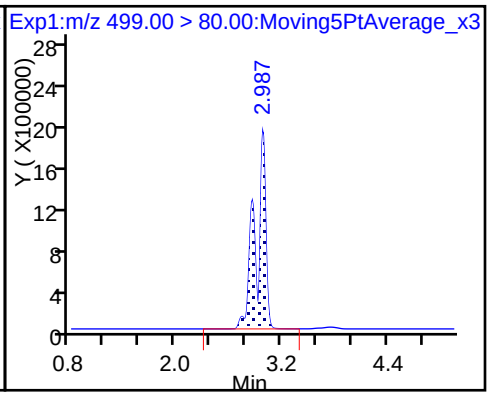
16 Perfluoroheptanesulfonic acid



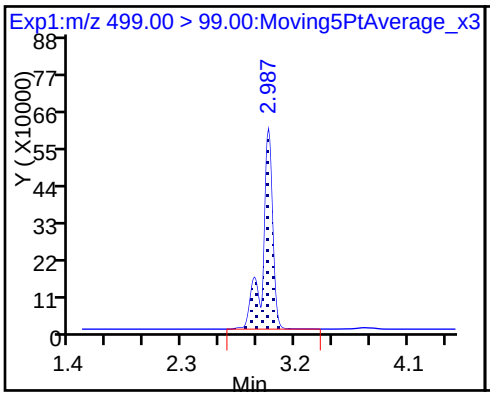
D 19 13C5 PFNA



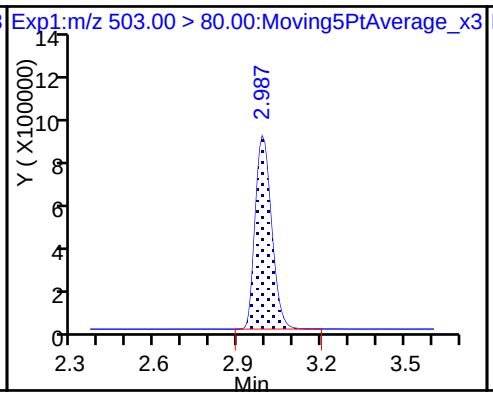
17 Perfluorooctane sulfonic acid



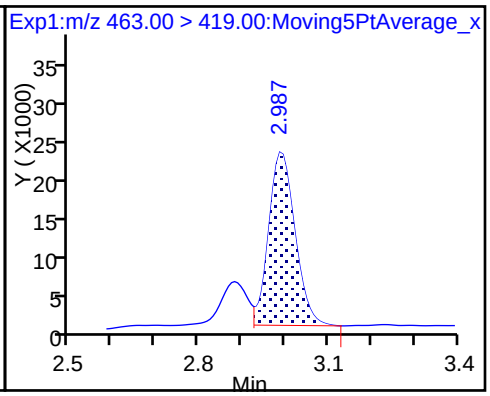
17 Perfluorooctane sulfonic acid



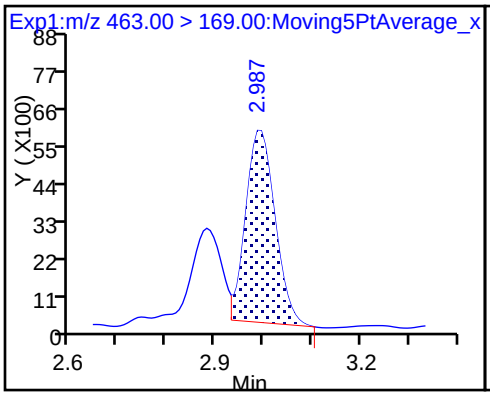
D 18 13C4 PFOS



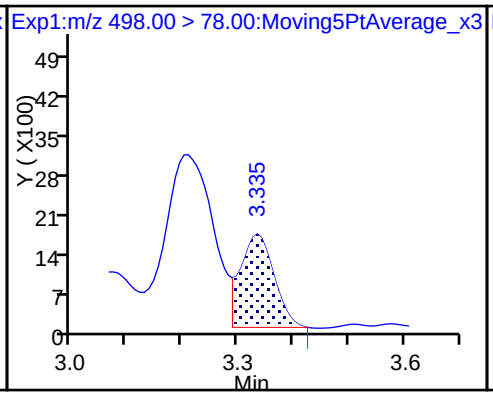
20 Perfluorononanoic acid



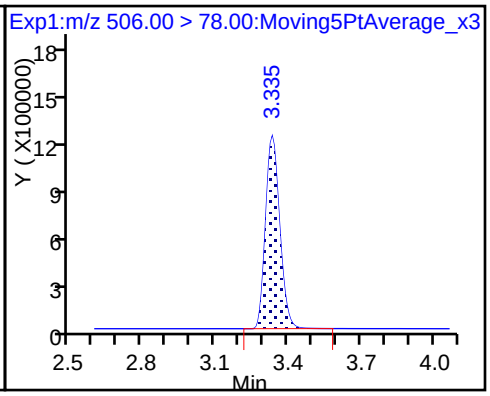
20 Perfluorononanoic acid



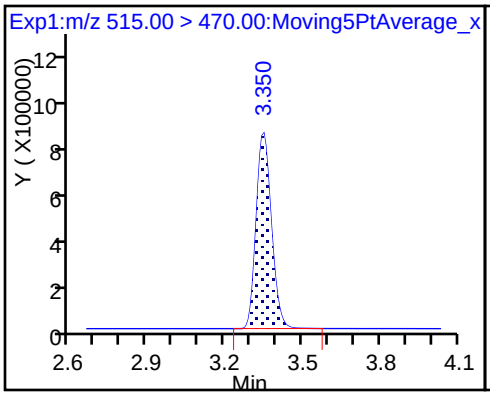
22 Perfluorooctane Sulfonamide



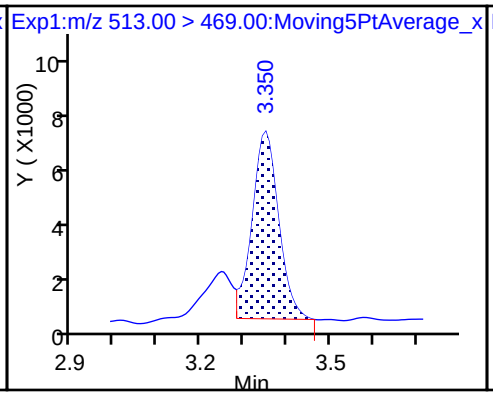
D 21 13C8 FOSA



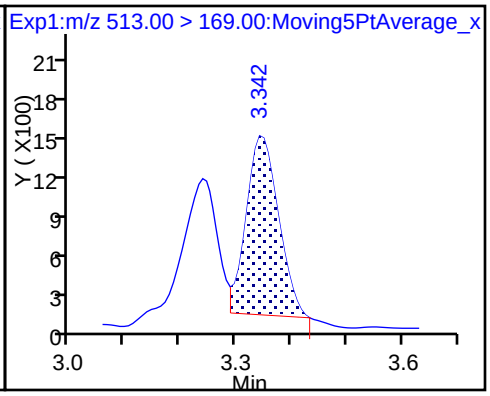
D 23 13C2 PFDA



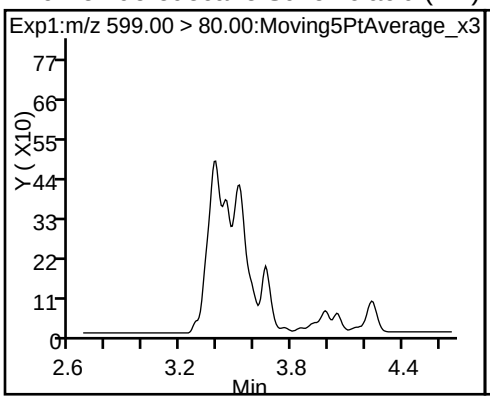
24 Perfluorodecanoic acid



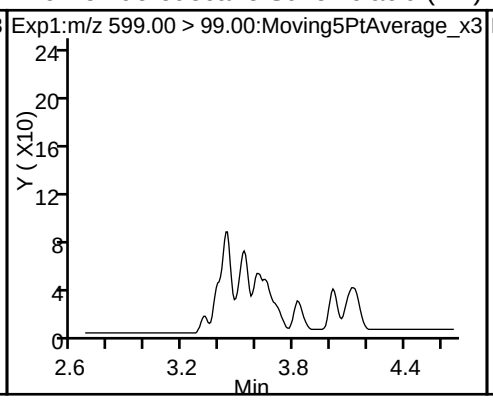
24 Perfluorodecanoic acid



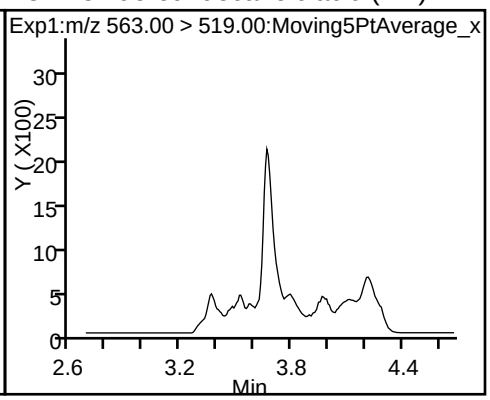
29 Perfluorodecane Sulfonic acid (ND)



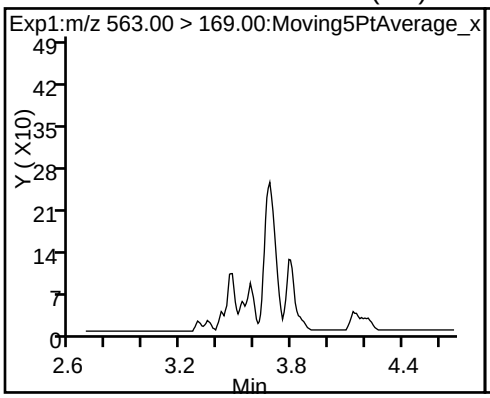
29 Perfluorodecane Sulfonic acid (ND)



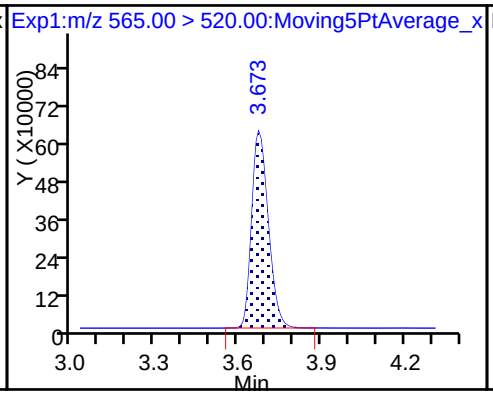
31 Perfluoroundecanoic acid (ND)



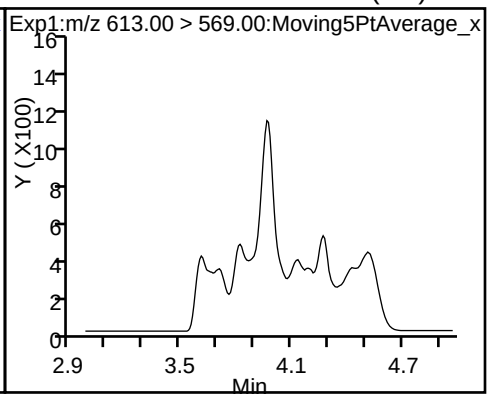
31 Perfluoroundecanoic acid (ND)



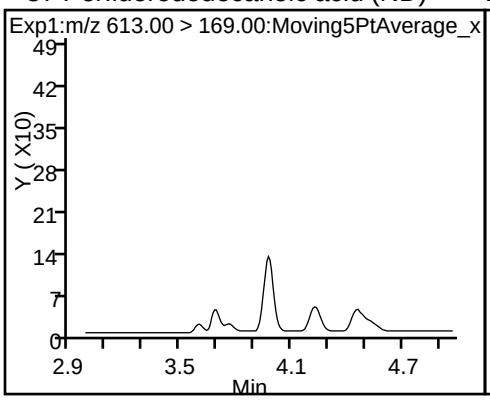
D 30 13C2 PFUnA



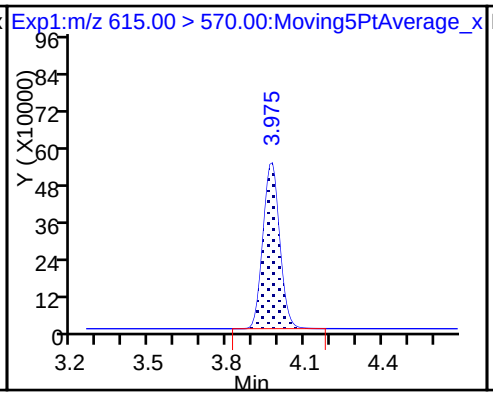
37 Perfluorododecanoic acid (ND)



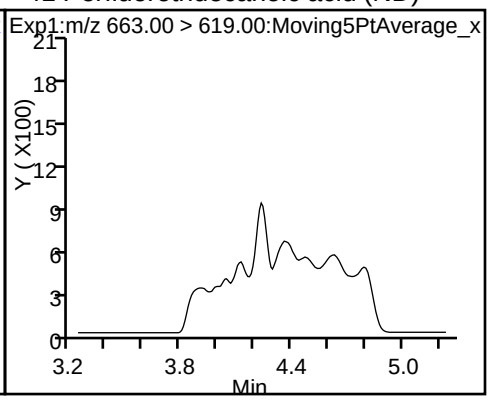
37 Perfluorododecanoic acid (ND)



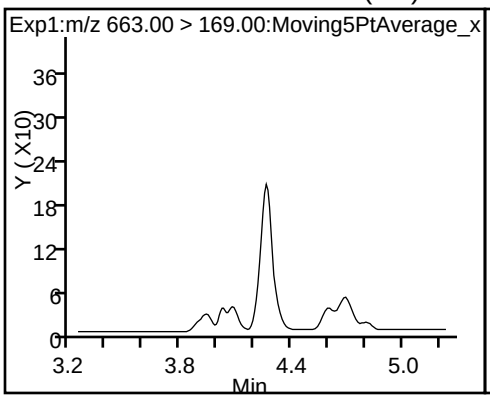
D 36 13C2 PFDoA



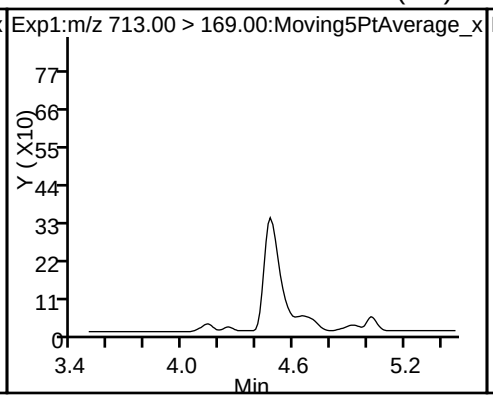
41 Perfluorotridecanoic acid (ND)



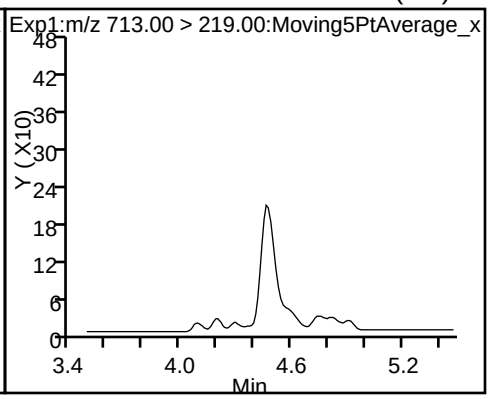
41 Perfluorotridecanoic acid (ND)



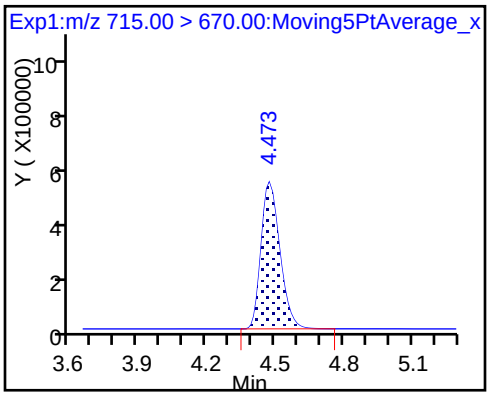
42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



D 43 13C2-PFTeDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

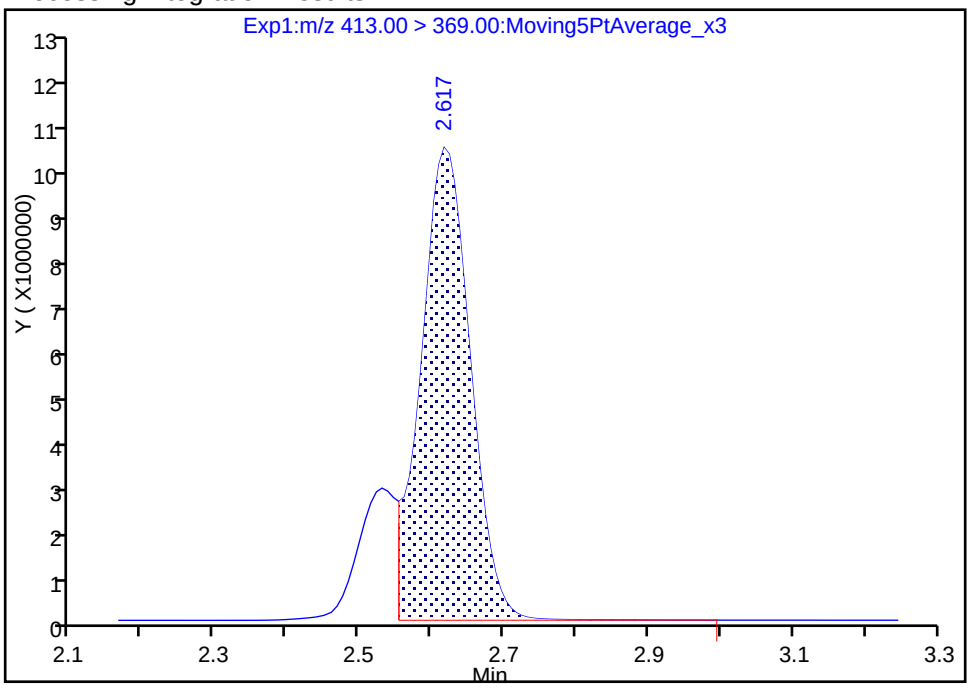
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_005.d				
Injection Date:	18-Jan-2018 18:01:06	Instrument ID:	A8_N		
Lims ID:	320-35042-A-1-A	Lab Sample ID:	320-35042-1		
Client ID:	TP-PFC-025-TPI				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	44	Worklist Smp#:	5
Injection 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

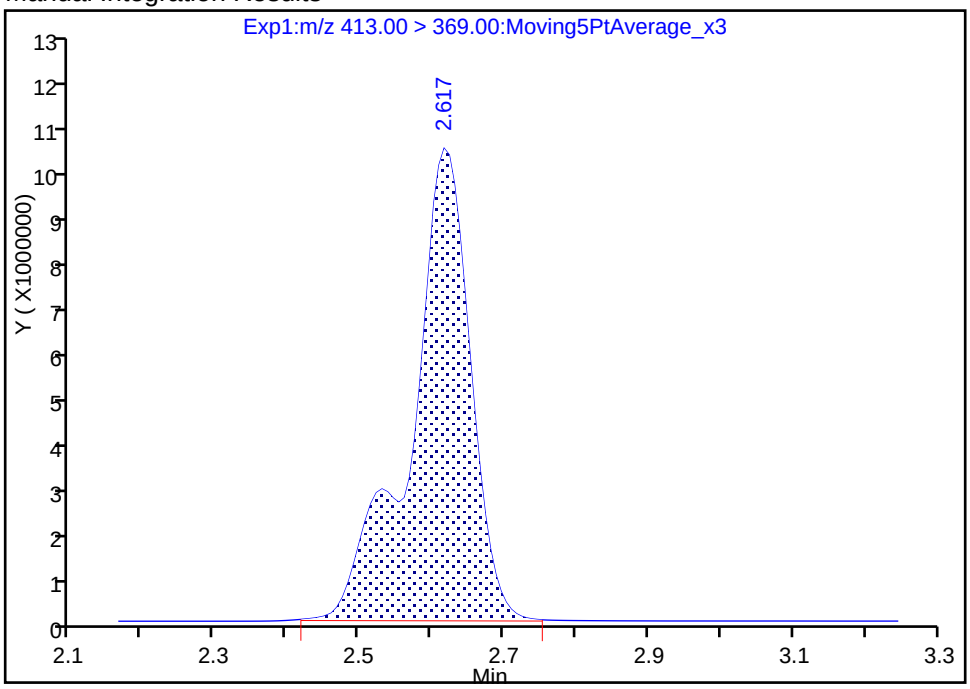
Processing Integration Results

RT: 2.62
Area: 49196549
Amount: 26.858293
Amount Units: ng/ml



Manual Integration Results

RT: 2.62
Area: 59521551
Amount: 32.495109
Amount Units: ng/ml



Reviewer: roycea, 19-Jan-2018 15:49:10

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

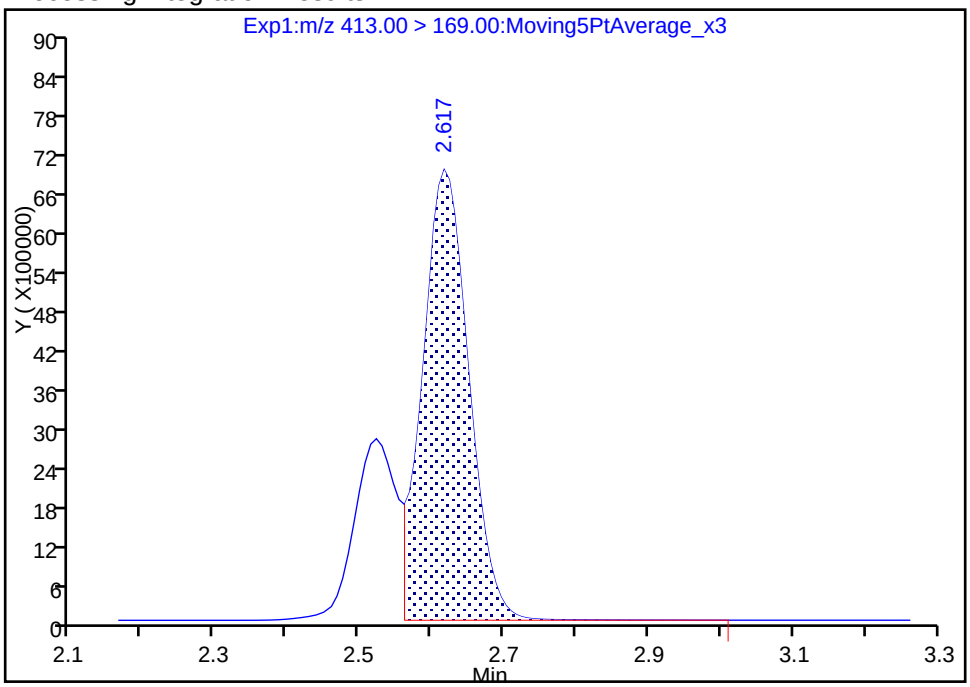
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_005.d				
Injection Date:	18-Jan-2018 18:01:06	Instrument ID:	A8_N		
Lims ID:	320-35042-A-1-A	Lab Sample ID:	320-35042-1		
Client ID:	TP-PFC-025-TPI				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	44	Worklist Smp#:	5
Injection 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

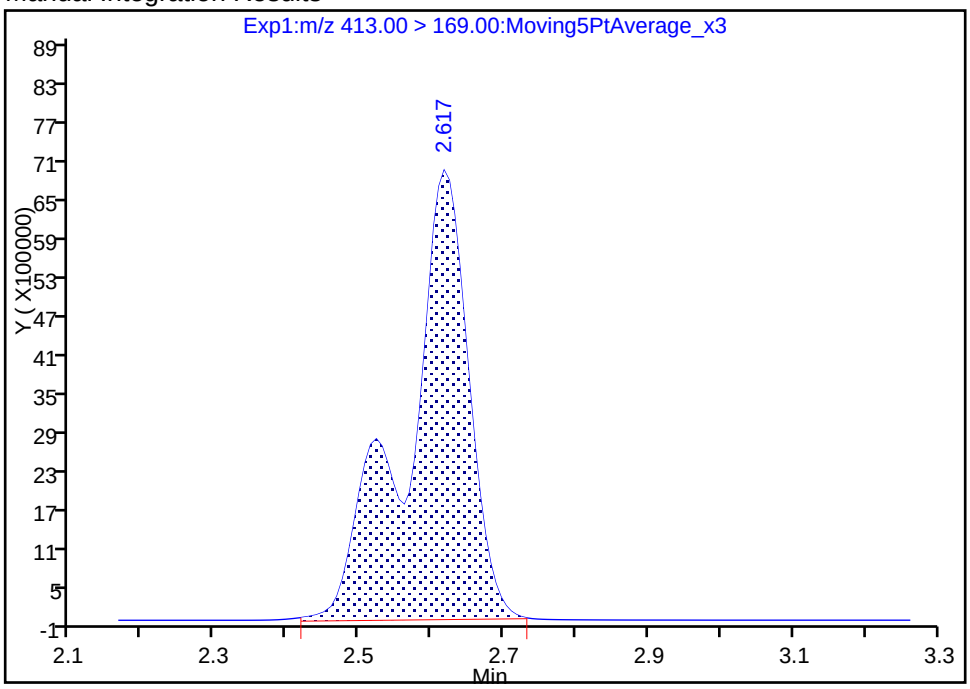
Processing Integration Results

RT: 2.62
Area: 30667807
Amount: 26.858293
Amount Units: ng/ml



Manual Integration Results

RT: 2.62
Area: 41758687
Amount: 32.495109
Amount Units: ng/ml



Reviewer: roycea, 19-Jan-2018 15:49:15

Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35042-1

SDG No.:

Client Sample ID: TP-PFC-025-TPI DL | Lab Sample ID: 320-35042-1 DL

Matrix: Water | Lab File ID: 2018.01.19LLC_010.d

Analysis Method: 537 (modified) | Date Collected: 01/11/2018 09:00

Extraction Method: 3535 | Date Extracted: 01/16/2018 09:18

Sample wt/vol: 256.2(mL) | Date Analyzed: 01/19/2018 16:58

Con. Extract Vol.: 10.0(mL) | Dilution Factor: 10

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 204757 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	*Perfluorobutanoic acid (PFBA)*	*74*	*D*	*20*	9.8	*3.4*
2706-90-3	*Perfluoropentanoic acid (PFPeA)*	*200*	*D*	*20*	9.8	*4.8*
307-24-4	*Perfluorohexanoic acid (PFHxA)*	*350*	*D*	*39*	20	*5.7*
375-85-9	*Perfluoroheptanoic acid (PFHpA)*	*75*	*D*	*20*	9.8	*2.4*
335-67-1	Perfluorooctanoic acid (PFOA)	1800	D M	39	20	8.3
375-95-1	*Perfluorononanoic acid (PFNA)*	*9.8*	*U*	*20*	9.8	*2.6*
335-76-2	*Perfluorodecanoic acid (PFDA)*	*9.8*	*U*	*20*	9.8	*3.0*
2058-94-8	*Perfluoroundecanoic acid (PFUnA)*	*29*	*U*	*39*	29	*11*
307-55-1	*Perfluorododecanoic acid (PFDoA)*	*20*	*U*	*39*	20	*5.4*
72629-94-8	*Perfluorotridecanoic Acid (PFTriA)*	*29*	*U*	*39*	29	*13*
376-06-7	*Perfluorotetradecanoic acid (PFTeA)*	*9.8*	*U*	*20*	9.8	*2.8*
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*41*	*D*	*20*	9.8	*2.9*
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	410	D	20	9.8	2.9
375-92-8	*Perfluoroheptanesulfonic Acid (PFHpS)*	*8.7*	*J D*	*20*	9.8	*2.9*
1763-23-1	*Perfluorooctanesulfonic acid (PFOS)*	*340*	*D*	*39*	20	*5.3*
335-77-3	*Perfluorodecanesulfonic acid (PFDS)*	*9.8*	*U*	*20*	9.8	*3.1*
754-91-6	*Perfluorooctane Sulfonamide (FOSA)*	*9.8*	*U*	*20*	9.8	*3.4*

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35042-1

SDG No.:

Client Sample ID: TP-PFC-025-TPI DL | Lab Sample ID: 320-35042-1 DL

Matrix: Water | Lab File ID: 2018.01.19LLC_010.d

Analysis Method: 537 (modified) | Date Collected: 01/11/2018 09:00

Extraction Method: 3535 | Date Extracted: 01/16/2018 09:18

Sample wt/vol: 256.2(mL) | Date Analyzed: 01/19/2018 16:58

Con. Extract Vol.: 10.0(mL) | Dilution Factor: 10

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 204757 | Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	95		25-150
STL00992	13C4 PFBA	101		25-150
STL00993	13C2 PFHxA	101		25-150
STL00990	13C4 PFOA	103		25-150
STL00995	13C5 PFNA	100		25-150
STL00996	13C2 PFDA	102		25-150
STL00997	13C2 PFUnA	106		25-150
STL00998	13C2 PFDoA	94		25-150
STL00994	18O2 PFHxS	99		25-150
STL00991	13C4 PFOS	101		25-150
STL02116	13C2-PFTeDA	95		25-150
STL01892	13C4-PFHpA	96		25-150
STL01893	13C5 PFPeA	104		25-150
STL02337	13C3-PFBS	118		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180119-53121.b\2018.01.19LLC_010.d
Lims ID: 320-35042-A-1-A
Client ID: TP-PFC-025-TPI
Sample Type: Client
Inject. Date: 19-Jan-2018 16:58:19 ALS Bottle#: 4 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 10.0000
Sample Info: 320-35042-a-1-a 10X
Misc. Info.: Plate: 1 Rack: 3
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180119-53121.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 22-Jan-2018 09:48:36 Calib Date: 17-Jan-2018 15:06:20
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_008.d

Column 1 : Det: EXP1
Process Host: XAWRK027

First Level Reviewer: roycea Date: 22-Jan-2018 09:46:10

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.412	1.411	0.001	0.539	780426	0.2529		101	3694	
2 Perfluorobutyric acid										
212.90 > 169.00	1.412	1.413	-0.001	1.000	553531	0.1898			93.3	
D 3 13C5-PFPeA										
267.90 > 223.00	1.660	1.659	0.001	0.634	473103	0.2589		104	5239	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.660	1.662	-0.002	1.000	1133171	0.5083			662	
D 47 13C3-PFBS										
301.90 > 83.00	1.695	1.695	0.0	0.647	11138	0.2753		118	397	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.695	1.697	-0.002	1.000	384011	0.1038			1479	
298.90 > 99.00	1.695	1.697	-0.002	1.000	167500		2.29(1.25-3.74)		1195	
D 7 13C2 PFHxA										
315.00 > 270.00	1.941	1.939	0.002	0.741	495558	0.2517		101	8430	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.941	1.939	0.002	1.000	1855045	0.9029			4314	
313.00 > 119.00	1.941	1.939	0.002	1.000	151968		12.21(5.03-15.10)		2824	
D 9 13C4-PFHpA										
367.00 > 322.00	2.262	2.267	-0.005	0.864	450617	0.2403		96.1	5852	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.262	2.268	-0.006	1.000	379741	0.1917			500	
363.00 > 169.00	2.262	2.268	-0.006	1.000	144826		2.62(1.13-3.40)		1001	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.275	2.280	-0.005	1.000	2693873	1.06			9561	
399.00 > 99.00	2.275	2.280	-0.005	1.000	836814		3.22(1.50-4.49)		5312	
D 11 18O2 PFHxS										
403.00 > 84.00	2.275	2.282	-0.007	0.869	538182	0.2331		98.6	9916	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 14 13C4 PFOA										
417.00 > 372.00	2.620	2.622	-0.002	1.000	473904	0.2579		103	7770	
* 62 13C2-PFOA										
415.00 > 370.00	2.620	2.622	-0.002		510199	0.2500			7391	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.620	2.623	-0.003	1.000	9964013	4.48			3204	M
413.00 > 169.00	2.620	2.623	-0.003	1.000	5777661		1.72(0.84-2.52)		13973	M
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.627	2.629	-0.002	1.000	44565	0.0222			141	
449.00 > 99.00	2.620	2.629	-0.009	0.997	13170		3.38(1.94-5.82)		192	
D 19 13C5 PFNA										
468.00 > 423.00	2.990	2.992	-0.002	1.141	373416	0.2507		100	5985	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.990	2.992	-0.002	1.000	1433034	0.8656			424	
499.00 > 99.00	2.990	2.992	-0.002	1.000	345046		4.15(2.31-6.93)		689	
D 18 13C4 PFOS										
503.00 > 80.00	2.990	2.992	-0.002	1.141	353452	0.2420		101	5780	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.336	3.338	-0.002	1.000	2249	0.001171			30.1	
D 21 13C8 FOSA										
506.00 > 78.00	3.336	3.338	-0.002	1.274	488901	0.2380		95.2	6710	
D 23 13C2 PFDA										
515.00 > 470.00	3.344	3.352	-0.008	1.277	326774	0.2539		102	4482	
D 30 13C2 PFUnA										
565.00 > 520.00	3.675	3.679	-0.004	1.403	259179	0.2655		106	4552	
D 36 13C2 PFDoA										
615.00 > 570.00	3.969	3.979	-0.010	1.515	249688	0.2356		94.3	2829	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.476	4.483	-0.007	1.709	329225	0.2378		95.1	2943	

QC Flag Legend

Review Flags

M - Manually Integrated

Report Date: 22-Jan-2018 09:48:48 Chrom Revision: 2.2 08-Dec-2017 11:41:26

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180119-53121.b\2018.01.19LLC_010.d

Injection Date: 19-Jan-2018 16:58:19 Instrument ID: A8_N

Lims ID: 320-35042-A-1-A Lab Sample ID:

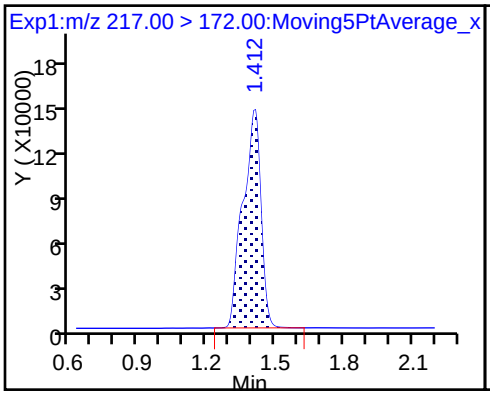
Client ID: TP-PFC-025-TPI

Operator ID: SACINSTLCMS01 ALS Bottle#: 4 Worklist Smp#: 2

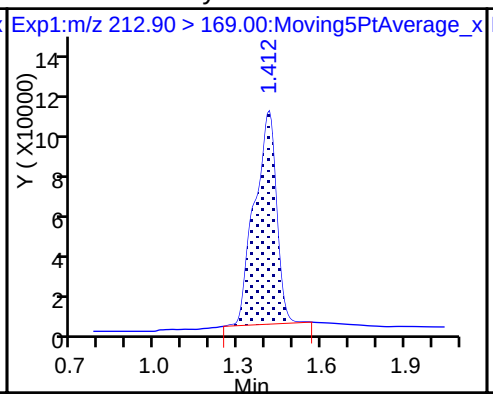
Injection Vol: 2.0 ul Dil. Factor: 10.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

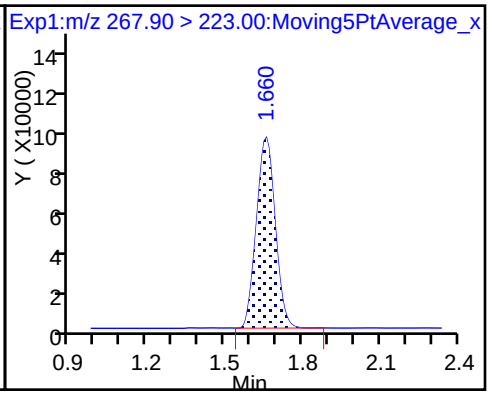
D 1 13C4 PFBA



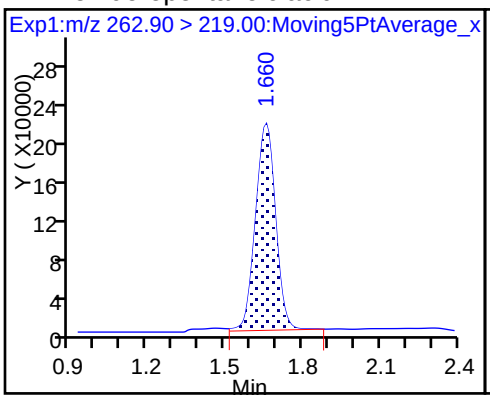
2 Perfluorobutyric acid



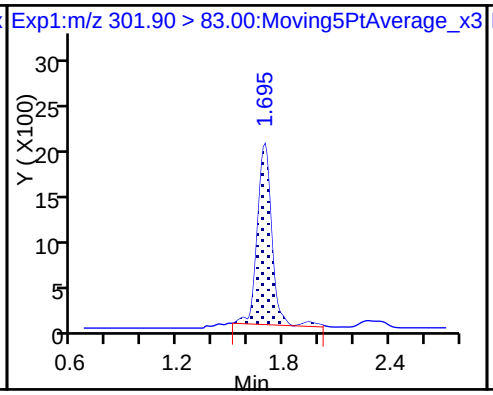
D 3 13C5-PFPeA



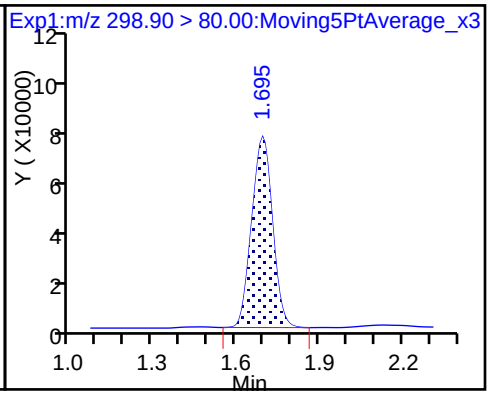
4 Perfluoropentanoic acid



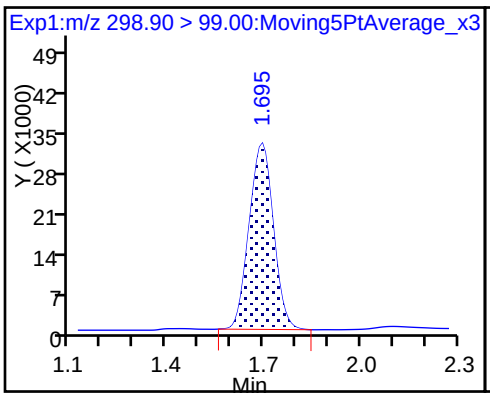
D 47 13C3-PFBS



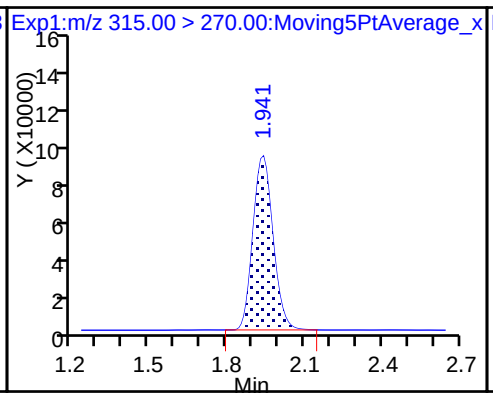
5 Perfluorobutanesulfonic acid



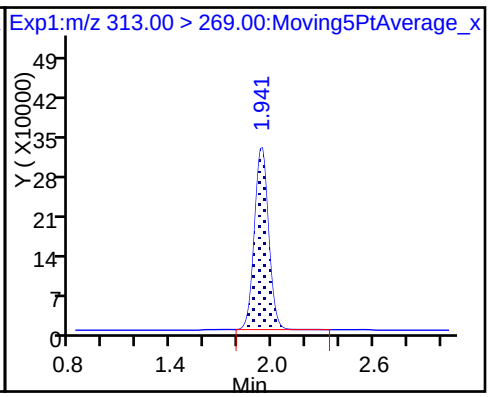
5 Perfluorobutanesulfonic acid



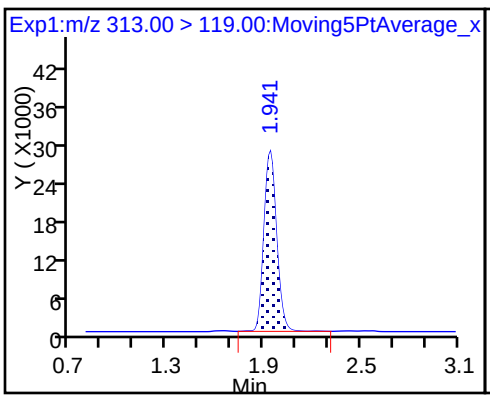
D 7 13C2 PFHxA



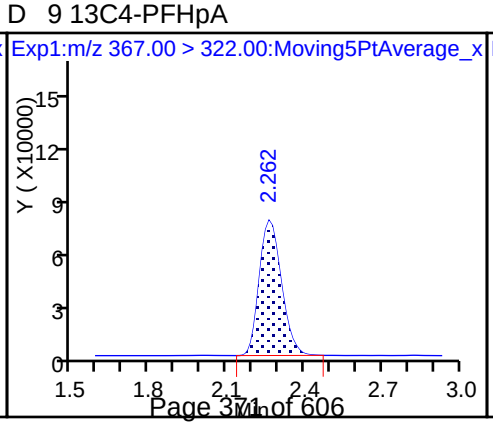
6 Perfluorohexanoic acid



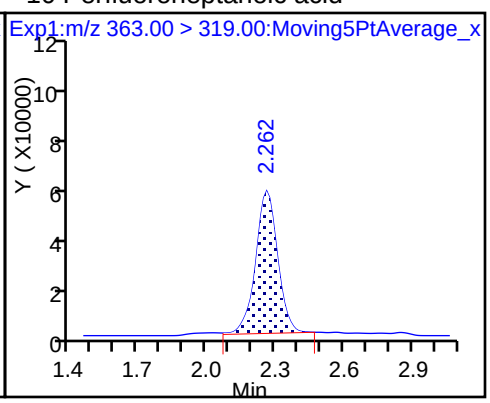
6 Perfluorohexanoic acid



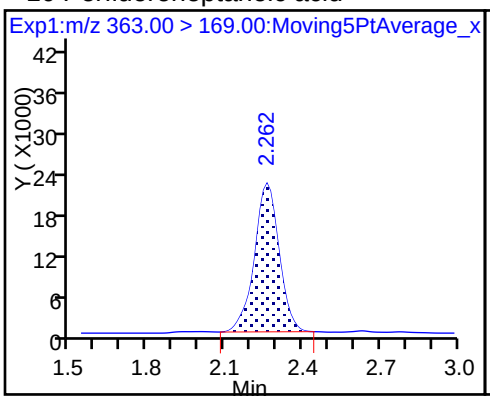
D 9 13C4-PFHpA



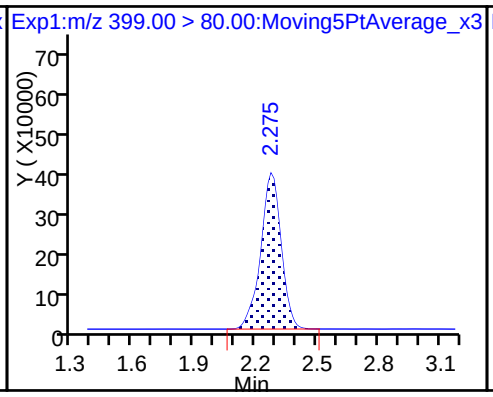
10 Perfluoroheptanoic acid



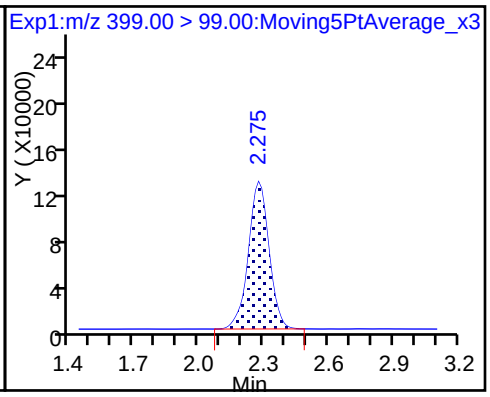
10 Perfluoroheptanoic acid



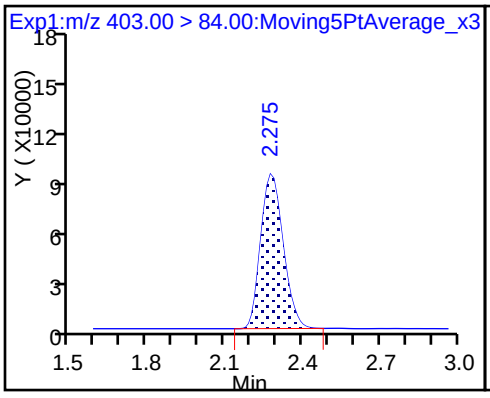
8 Perfluorohexanesulfonic acid



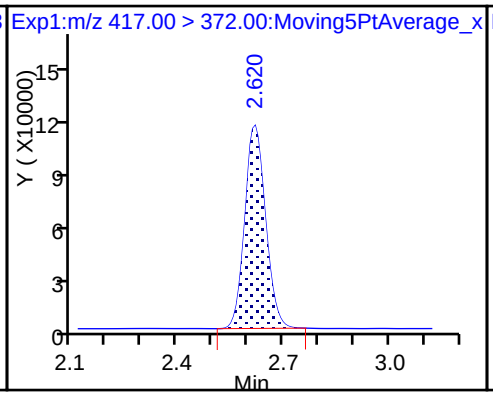
8 Perfluorohexanesulfonic acid



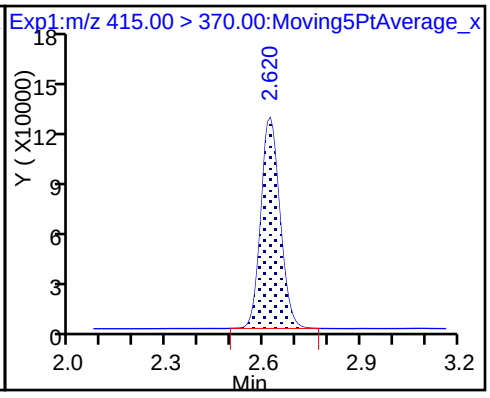
D 11 18O2 PFHxS



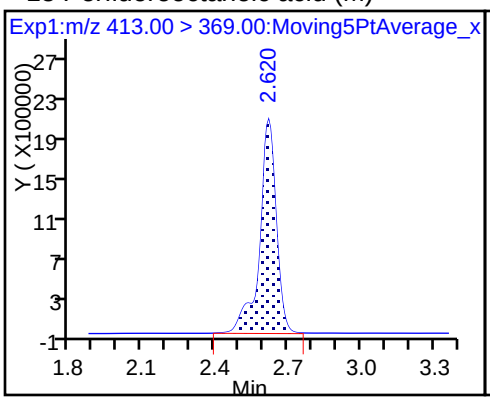
D 14 13C4 PFOA



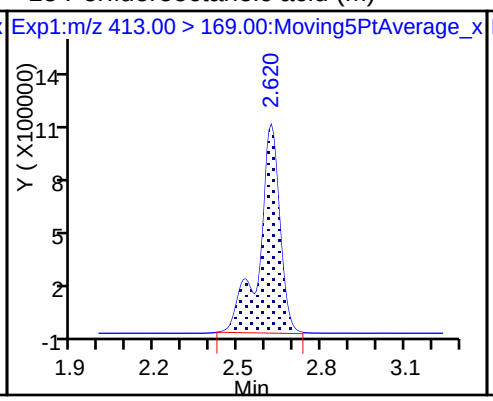
* 62 13C2-PFOA



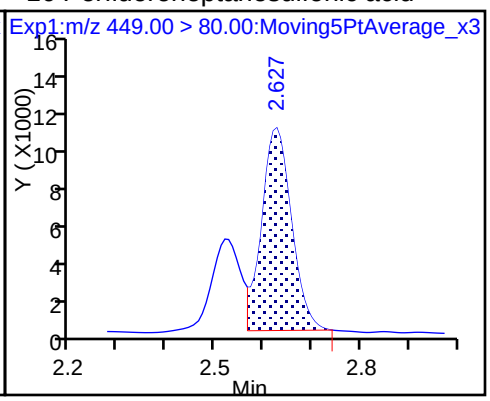
15 Perfluorooctanoic acid (M)



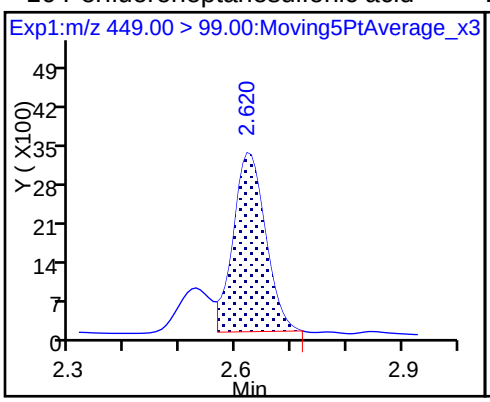
15 Perfluorooctanoic acid (M)



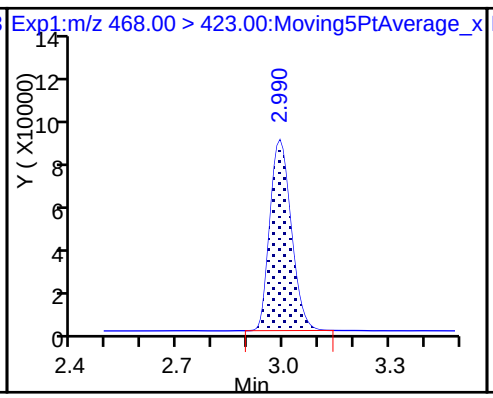
16 Perfluoroheptanesulfonic acid



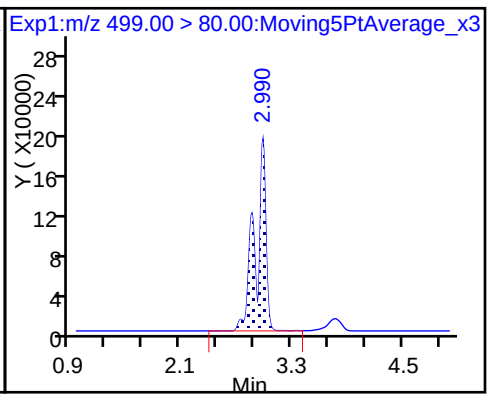
16 Perfluoroheptanesulfonic acid



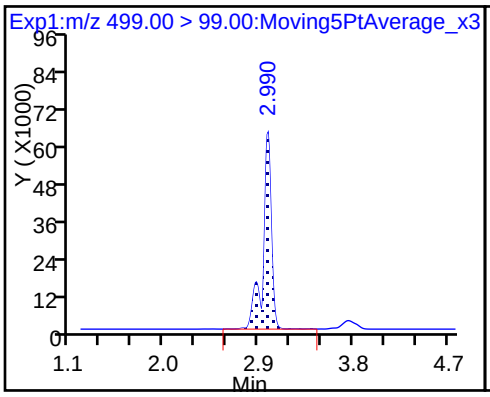
D 19 13C5 PFNA



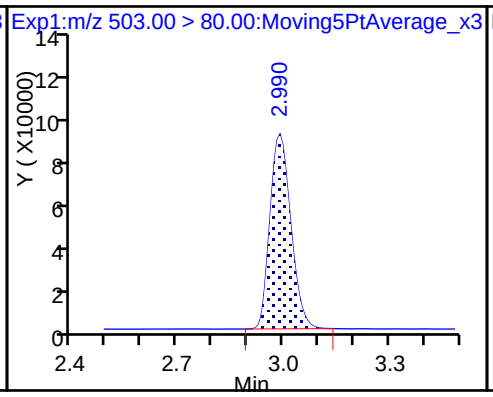
17 Perfluorooctane sulfonic acid



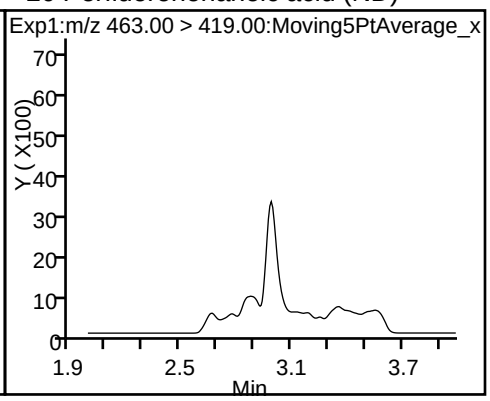
17 Perfluorooctane sulfonic acid



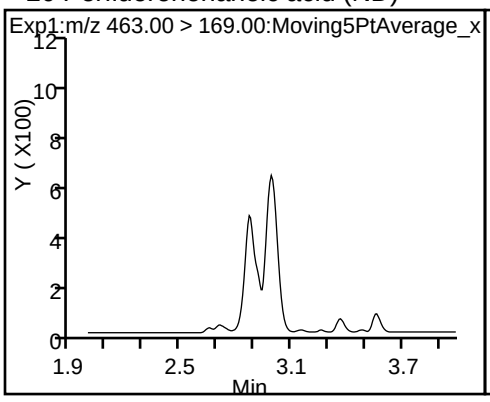
D 18 13C4 PFOS



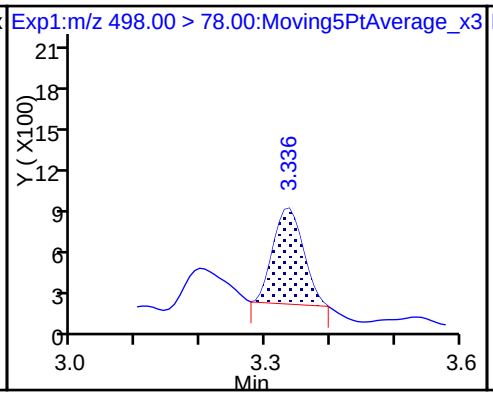
20 Perfluorononanoic acid (ND)



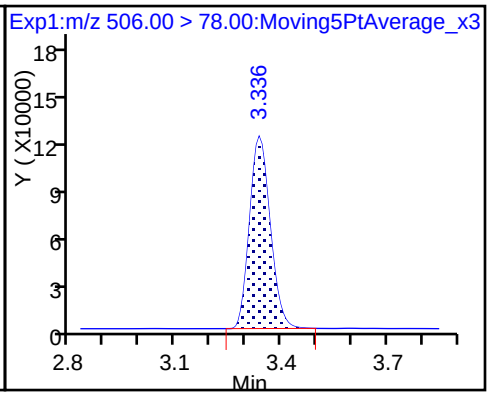
20 Perfluorononanoic acid (ND)



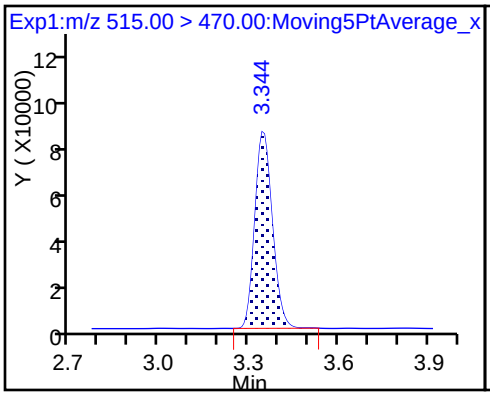
22 Perfluorooctane Sulfonamide



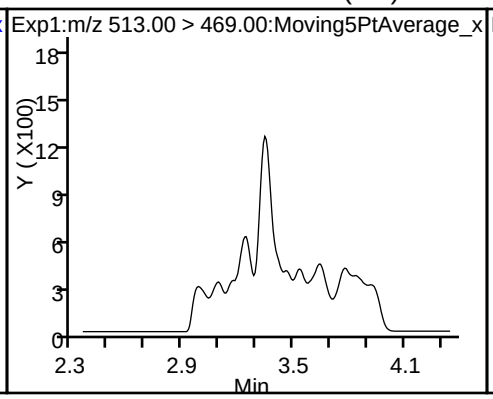
D 21 13C8 FOSA



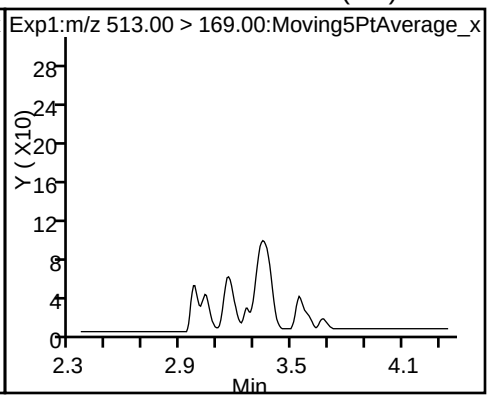
D 23 13C2 PFDA



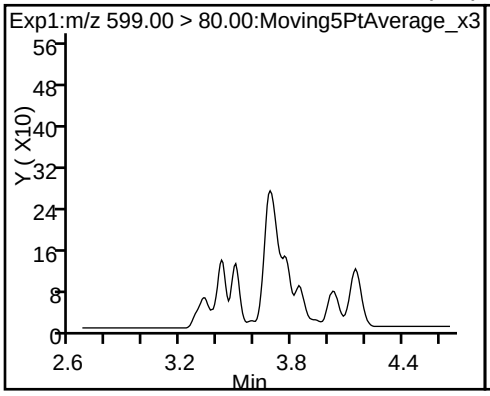
24 Perfluorodecanoic acid (ND)



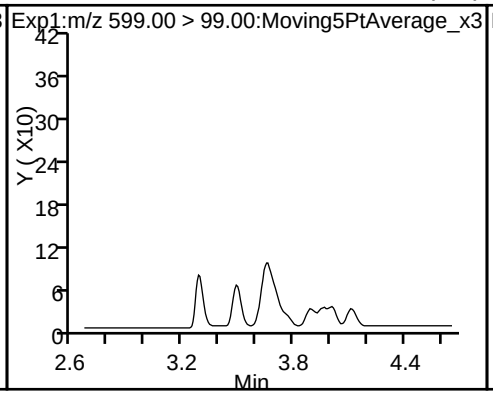
24 Perfluorodecanoic acid (ND)



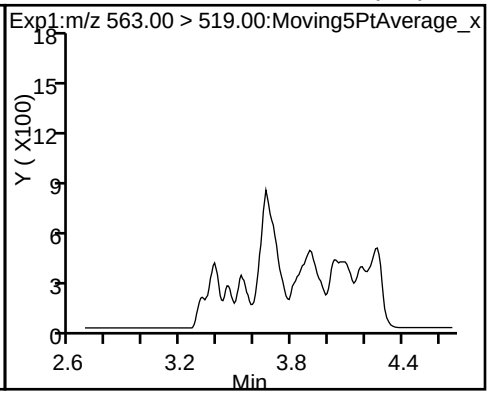
29 Perfluorodecane Sulfonic acid (ND)



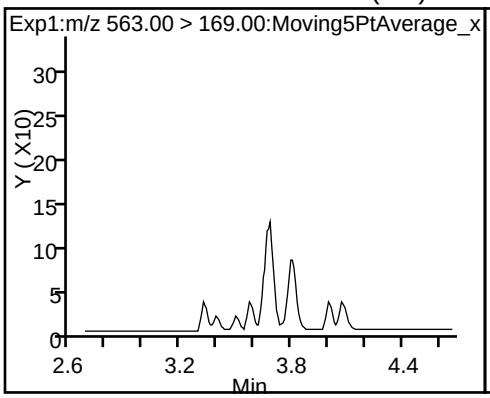
29 Perfluorodecane Sulfonic acid (ND)



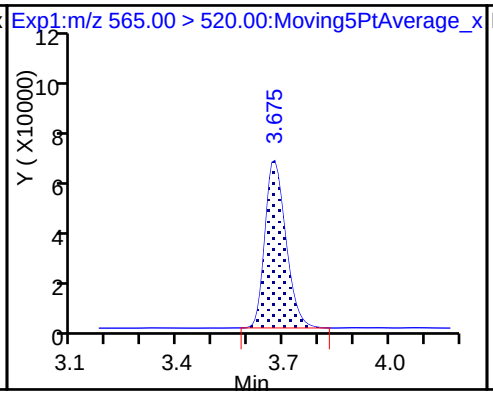
31 Perfluoroundecanoic acid (ND)



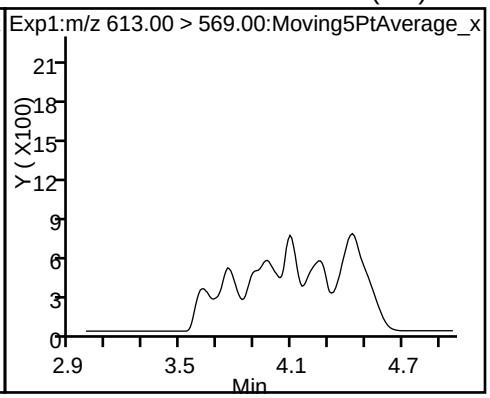
31 Perfluoroundecanoic acid (ND)



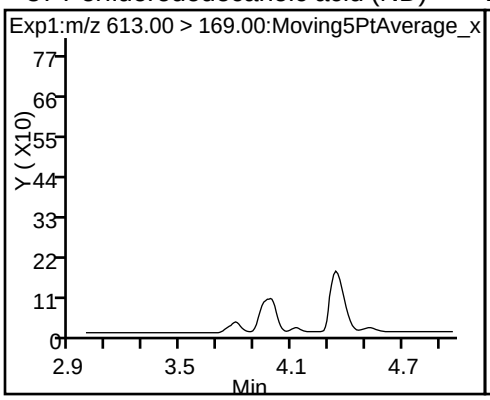
D 30 13C2 PFUnA



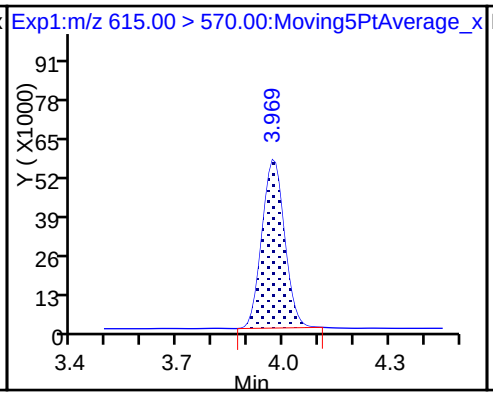
37 Perfluorododecanoic acid (ND)



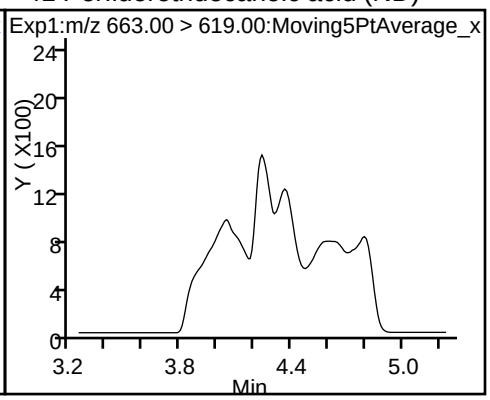
37 Perfluorododecanoic acid (ND)



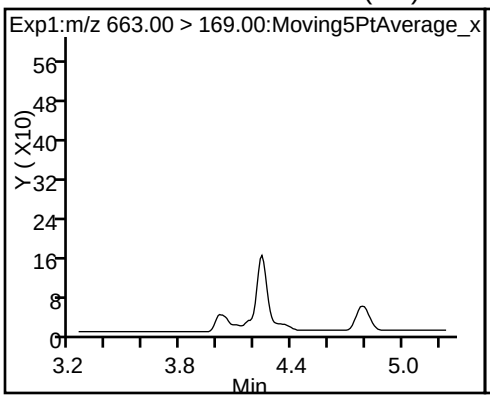
D 36 13C2 PFDoA



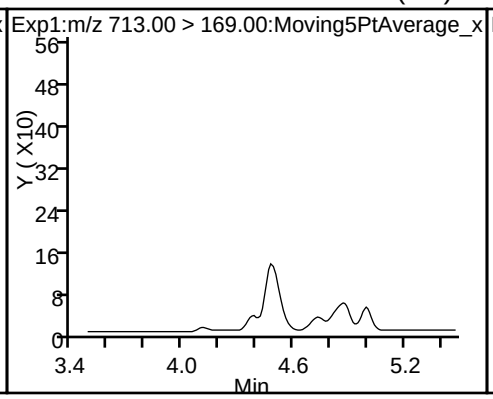
41 Perfluorotridecanoic acid (ND)



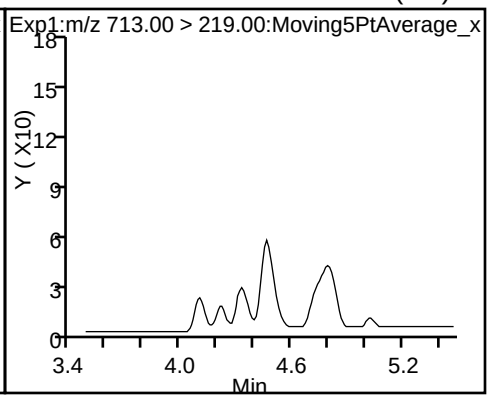
41 Perfluorotridecanoic acid (ND)



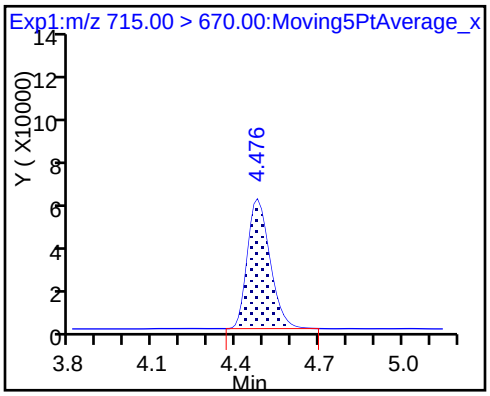
42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



D 43 13C2-PFTeDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

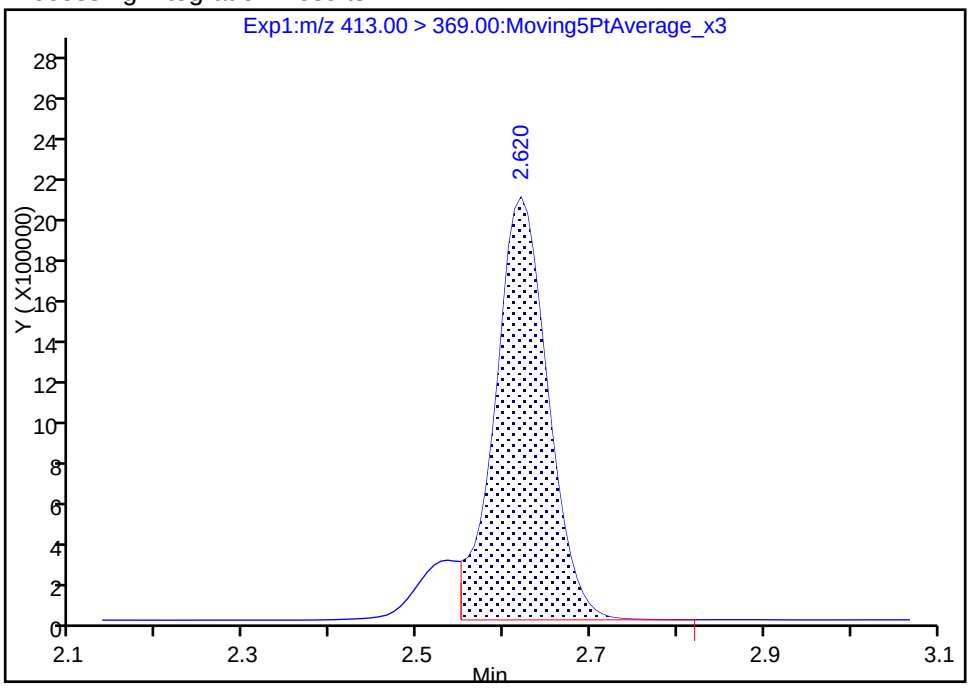
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180119-53121.b\2018.01.19LLC_010.d				
Injection Date:	19-Jan-2018 16:58:19	Instrument ID:	A8_N		
Lims ID:	320-35042-A-1-A	Lab Sample ID:			
Client ID:	TP-PFC-025-TPI				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	4	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	10.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

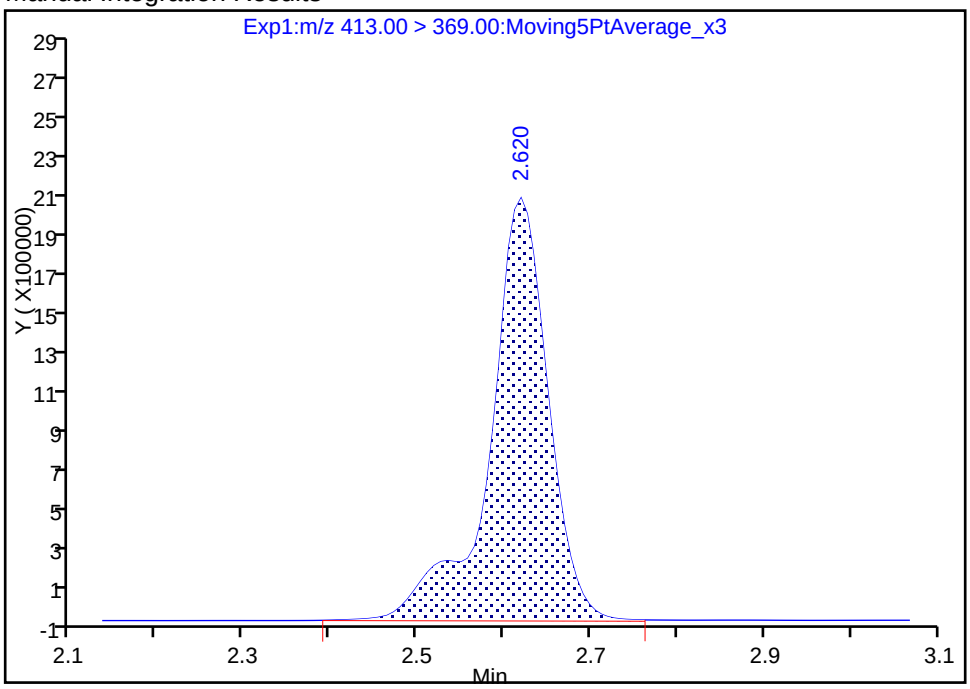
Processing Integration Results

RT: 2.62
Area: 8889365
Amount: 4.000913
Amount Units: ng/ml



Manual Integration Results

RT: 2.62
Area: 9964013
Amount: 4.484589
Amount Units: ng/ml



Reviewer: roycea, 22-Jan-2018 09:45:11

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

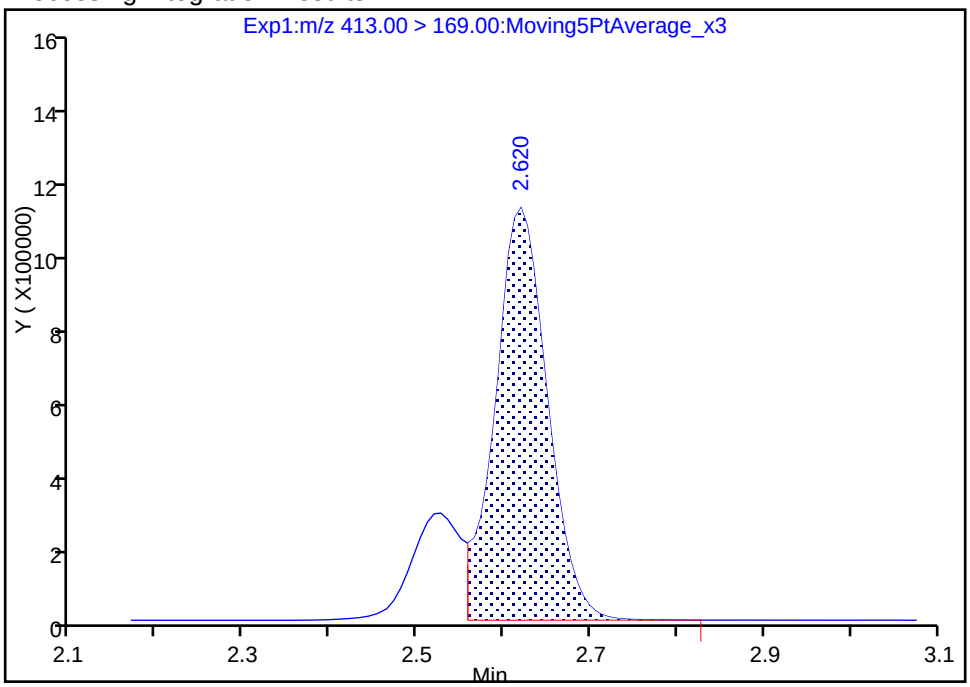
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180119-53121.b\2018.01.19LLC_010.d				
Injection Date:	19-Jan-2018 16:58:19	Instrument ID:	A8_N		
Lims ID:	320-35042-A-1-A	Lab Sample ID:			
Client ID:	TP-PFC-025-TPI				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	4	Worklist Smp#:	2
Injection Vol:	2.0 ul	Dil. Factor:	10.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

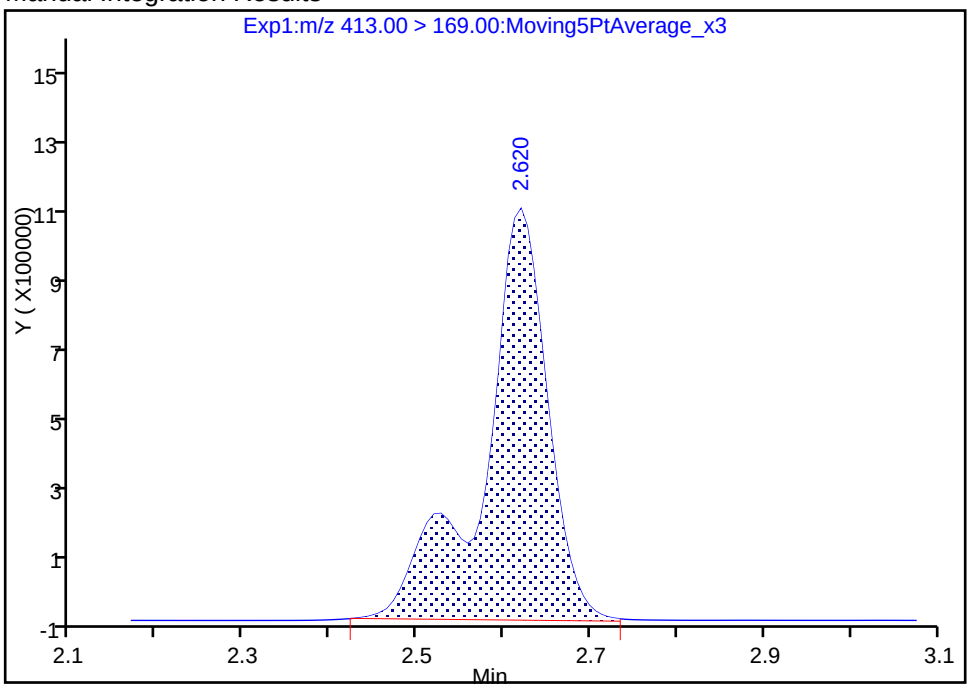
Processing Integration Results

RT: 2.62
Area: 4667585
Amount: 4.000913
Amount Units: ng/ml



Manual Integration Results

RT: 2.62
Area: 5777661
Amount: 4.484589
Amount Units: ng/ml



Reviewer: roycea, 22-Jan-2018 09:45:19

Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35042-1

SDG No.:

Client Sample ID: TP-PFC-025-MID-CARBON | Lab Sample ID: 320-35042-2

Matrix: Water | Lab File ID: 2018.01.18LLA_006.d

Analysis Method: 537 (modified) | Date Collected: 01/11/2018 09:05

Extraction Method: 3535 | Date Extracted: 01/16/2018 09:18

Sample wt/vol: 253.9(mL) | Date Analyzed: 01/18/2018 18:08

Con. Extract Vol.: 10.0(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 204556 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	130		2.0	0.98	0.34
2706-90-3	Perfluoropentanoic acid (PFPeA)	170		2.0	0.98	0.48
307-24-4	Perfluorohexanoic acid (PFHxA)	72		3.9	2.0	0.57
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.3	M	2.0	0.98	0.25
335-67-1	Perfluorooctanoic acid (PFOA)	13	M	3.9	2.0	0.84
375-95-1	Perfluorononanoic acid (PFNA)	0.98	U	2.0	0.98	0.27
335-76-2	Perfluorodecanoic acid (PFDA)	0.98	U	2.0	0.98	0.31
2058-94-8	Perfluoroundecanoic acid (PFUnA)	3.0	U	3.9	3.0	1.1
307-55-1	Perfluorododecanoic acid (PFDoA)	2.0	U	3.9	2.0	0.54
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	3.0	U	3.9	3.0	1.3
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.98	U	2.0	0.98	0.29
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.6	J	2.0	0.98	0.30
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.0	J	2.0	0.98	0.30
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.98	U	2.0	0.98	0.30
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.0	U	3.9	2.0	0.53
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.98	U	2.0	0.98	0.32
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.98	U	2.0	0.98	0.34

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35042-1

SDG No.:

Client Sample ID: TP-PFC-025-MID-CARBON | Lab Sample ID: 320-35042-2

Matrix: Water | Lab File ID: 2018.01.18LLA_006.d

Analysis Method: 537 (modified) | Date Collected: 01/11/2018 09:05

Extraction Method: 3535 | Date Extracted: 01/16/2018 09:18

Sample wt/vol: 253.9(mL) | Date Analyzed: 01/18/2018 18:08

Con. Extract Vol.: 10.0(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 204556 | Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	92		25-150
STL00992	13C4 PFBA	104		25-150
STL00993	13C2 PFHxA	98		25-150
STL00990	13C4 PFOA	102		25-150
STL00995	13C5 PFNA	104		25-150
STL00996	13C2 PFDA	97		25-150
STL00997	13C2 PFUnA	100		25-150
STL00998	13C2 PFDoA	90		25-150
STL00994	18O2 PFHxS	99		25-150
STL00991	13C4 PFOS	100		25-150
STL02116	13C2-PFTeDA	94		25-150
STL01892	13C4-PFHpA	100		25-150
STL01893	13C5 PFPeA	102		25-150
STL02337	13C3-PFBS	98		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_006.d
Lims ID: 320-35042-A-2-A
Client ID: TP-PFC-025-MID-CARBON
Sample Type: Client
Inject. Date: 18-Jan-2018 18:08:54 ALS Bottle#: 45 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-35042-a-2-a
Misc. Info.: Plate: 1 Rack: 5
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 19-Jan-2018 15:50:53 Calib Date: 17-Jan-2018 15:06:20
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_008.d

Column 1 : Det: EXP1
Process Host: XAWRK004

First Level Reviewer: roycea Date: 19-Jan-2018 15:45:32

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.407	1.411	-0.004	0.538	7799018	2.59		104	20396	
2 Perfluorobutyric acid										
212.90 > 169.00	1.407	1.413	-0.006	1.000	9385437	3.22			1203	
D 3 13C5-PFPeA										
267.90 > 223.00	1.654	1.659	-0.005	0.632	4539714	2.54		102	38544	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.654	1.662	-0.008	1.000	9246023	4.32			9275	
D 47 13C3-PFBS										
301.90 > 83.00	1.689	1.695	-0.006	0.646	89737	2.27		97.8	4564	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.689	1.697	-0.008	1.000	117637	0.0395			577	
298.90 > 99.00	1.689	1.697	-0.008	1.000	60420		1.95(1.25-3.74)		449	
D 7 13C2 PFHxA										
315.00 > 270.00	1.934	1.939	-0.005	0.739	4701020	2.45		97.8	32398	
6 Perfluorohexanoic acid										R
313.00 > 269.00	1.924	1.939	-0.015	0.995	3543396	1.82			6664	R
313.00 > 119.00	1.934	1.939	-0.005	1.000	209332		16.93(5.03-15.10)		3164	
D 9 13C4-PFHpA										
367.00 > 322.00	2.266	2.267	-0.001	0.866	4561586	2.49		99.7	30014	
10 Perfluoroheptanoic acid										M
363.00 > 319.00	2.239	2.268	-0.029	0.988	116179	0.0579			181	M
363.00 > 169.00	2.253	2.268	-0.015	0.994	46575		2.49(1.13-3.40)		263	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.266	2.280	-0.014	0.994	63702	0.0257			250	
399.00 > 99.00	2.279	2.280	-0.001	1.000	16644		3.83(1.50-4.49)		118	
D 11 18O2 PFHxS										
403.00 > 84.00	2.279	2.282	-0.003	0.871	5268042	2.34		98.9	45018	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 14 13C4 PFOA										
417.00 > 372.00	2.616	2.622	-0.006	1.000	4588515	2.56		102	35859	
* 62 13C2-PFOA										
415.00 > 370.00	2.616	2.622	-0.006		4979921	2.50			29574	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.616	2.623	-0.007	1.000	690212	0.3208			312	M
413.00 > 169.00	2.616	2.623	-0.007	1.000	462242		1.49(0.84-2.52)		1043	M
D 19 13C5 PFNA										
468.00 > 423.00	2.985	2.992	-0.007	1.141	3767780	2.59		104	28687	
D 18 13C4 PFOS										
503.00 > 80.00	2.985	2.992	-0.007	1.141	3399268	2.38		99.8	27832	
D 21 13C8 FOSA										
506.00 > 78.00	3.333	3.338	-0.006	1.274	4605447	2.30		91.9	24255	
D 23 13C2 PFDA										
515.00 > 470.00	3.348	3.352	-0.004	1.280	3032866	2.41		96.6	23505	
D 30 13C2 PFUnA										
565.00 > 520.00	3.671	3.679	-0.008	1.403	2372244	2.49		99.6	21911	
D 36 13C2 PFDoA										
615.00 > 570.00	3.972	3.979	-0.007	1.518	2320287	2.24		89.7	24096	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.472	4.483	-0.011	1.709	3162017	2.34		93.6	23209	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

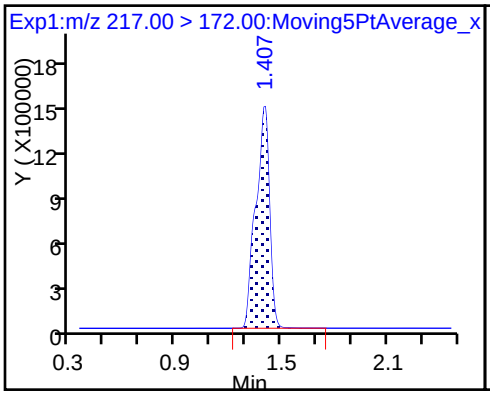
Report Date: 19-Jan-2018 15:51:00 Chrom Revision: 2.2 08-Dec-2017 11:41:26

TestAmerica Sacramento

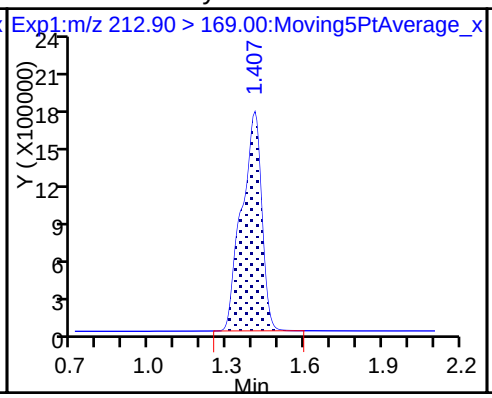
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_006.d

Injection Date:	18-Jan-2018 18:08:54	Instrument ID:	A8_N		
Lims ID:	320-35042-A-2-A	Lab Sample ID:	320-35042-2		
Client ID:	TP-PFC-025-MID-CARBON				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	45	Worklist Smp#:	6
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		

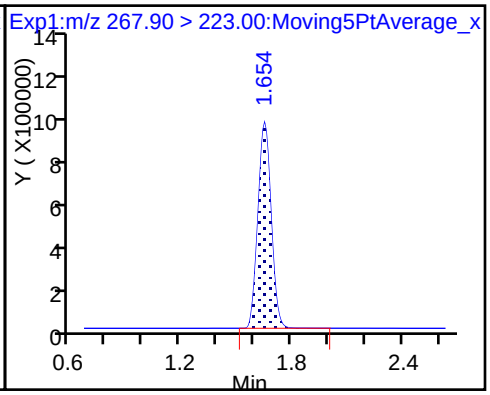
D 1 13C4 PFBA



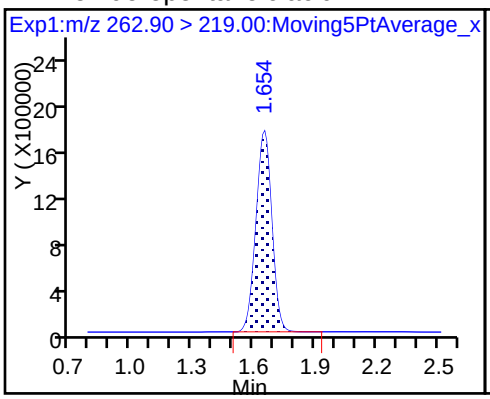
2 Perfluorobutyric acid



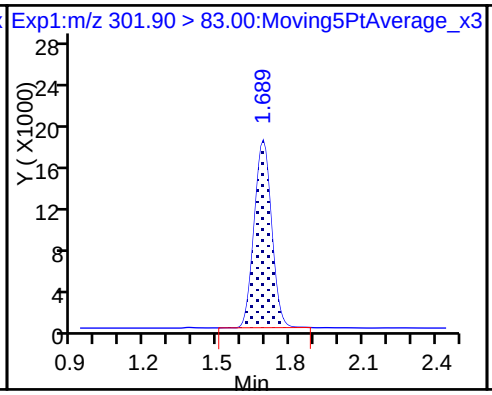
D 3 13C5-PFPeA



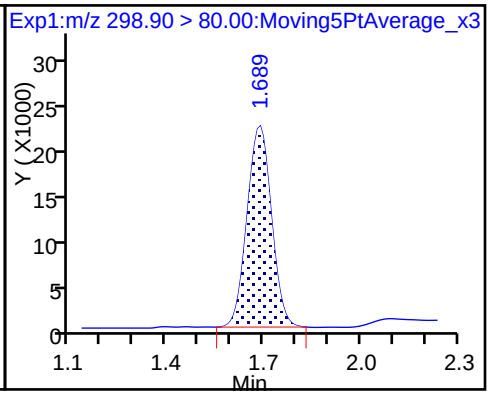
4 Perfluoropentanoic acid



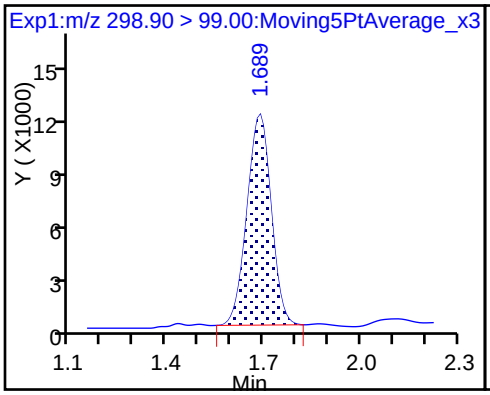
D 47 13C3-PFBS



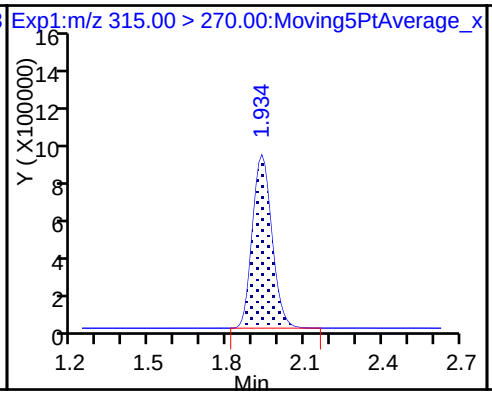
5 Perfluorobutanesulfonic acid



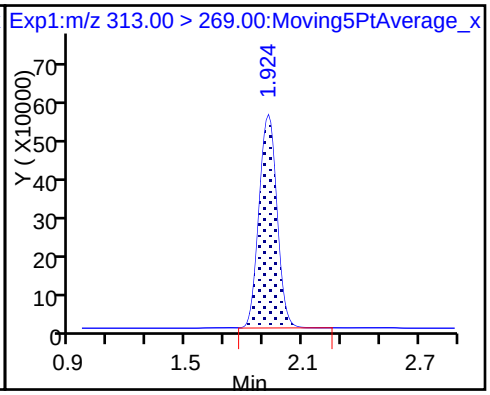
5 Perfluorobutanesulfonic acid



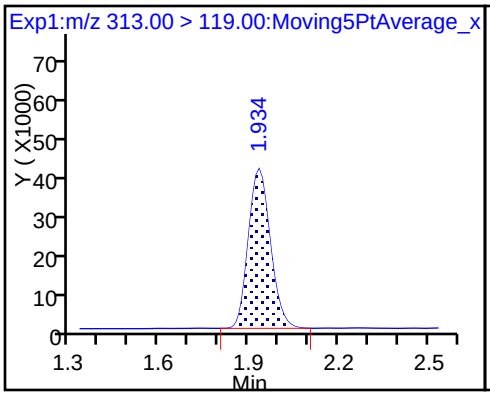
D 7 13C2 PFHxA



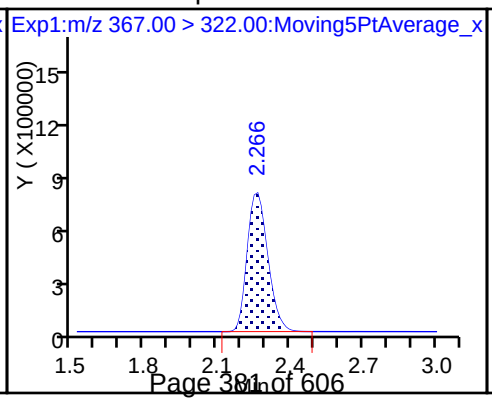
6 Perfluorohexanoic acid



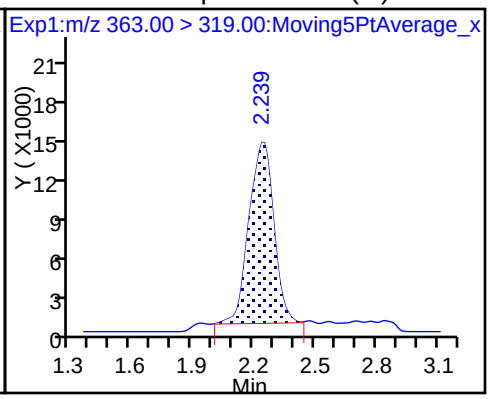
6 Perfluorohexanoic acid



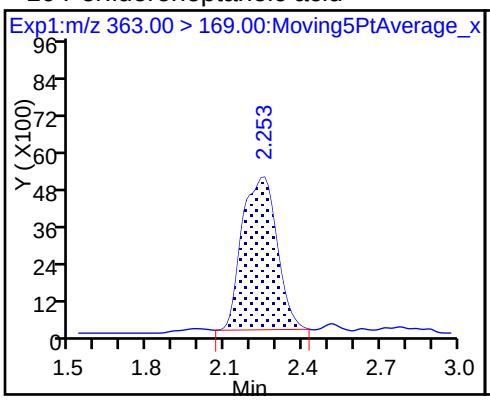
D 9 13C4-PFHpA



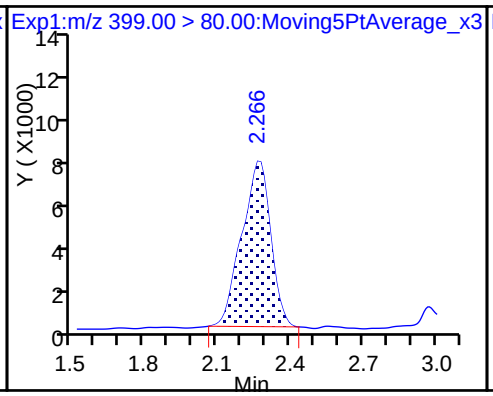
10 Perfluoroheptanoic acid (M)



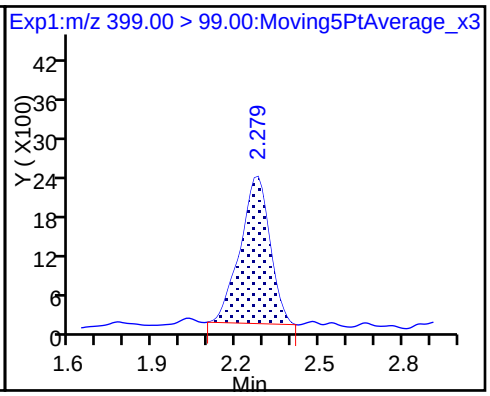
10 Perfluoroheptanoic acid



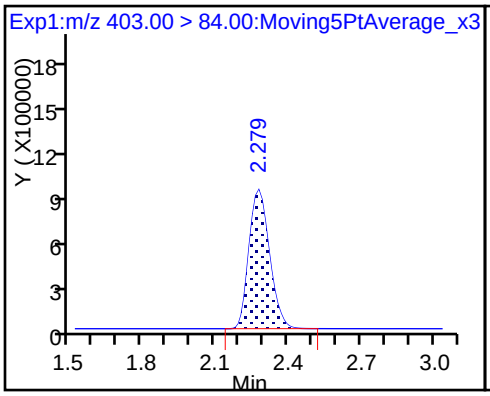
8 Perfluorohexanesulfonic acid



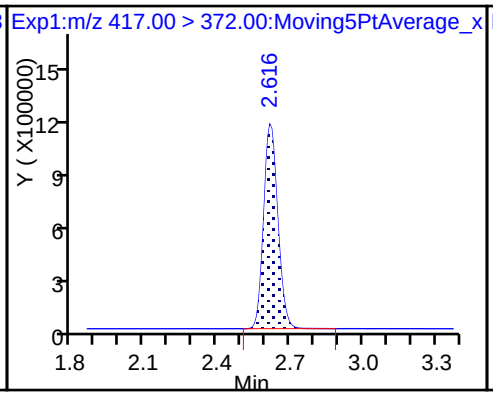
8 Perfluorohexanesulfonic acid



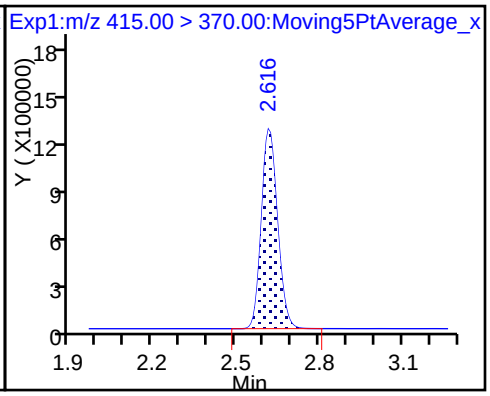
D 11 18O2 PFHxS



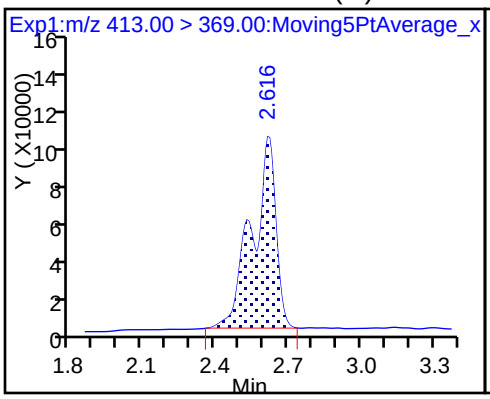
D 14 13C4 PFOA



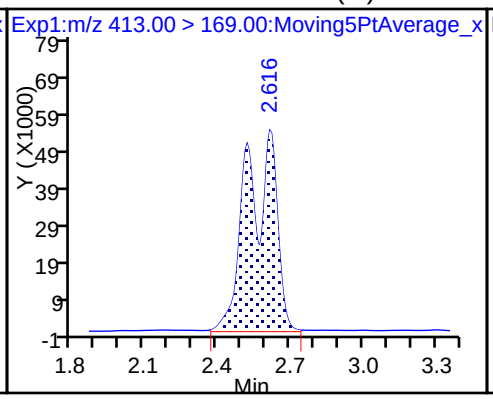
* 62 13C2-PFOA



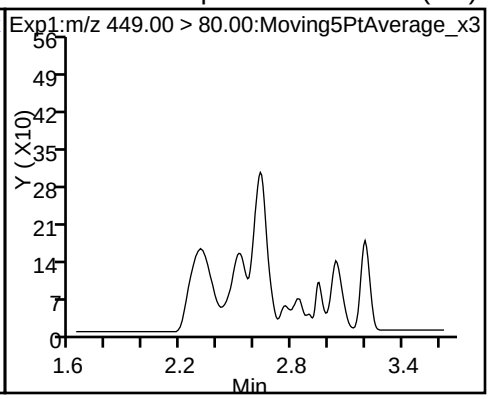
15 Perfluorooctanoic acid (M)



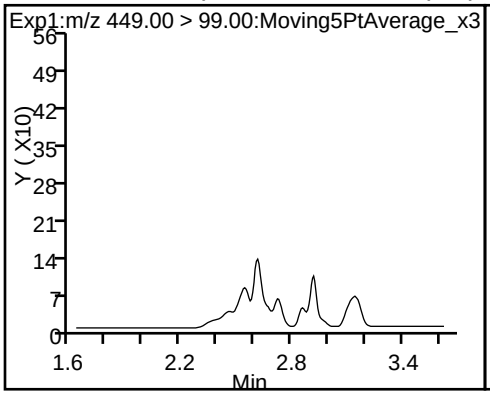
15 Perfluorooctanoic acid (M)



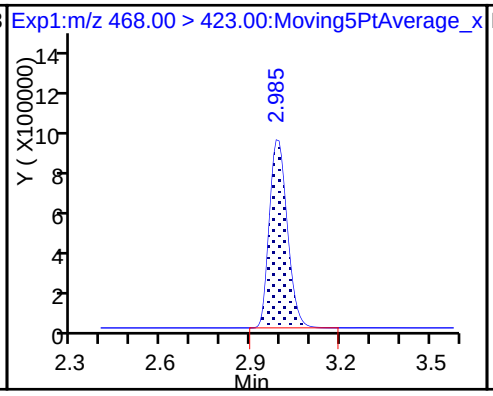
16 Perfluoroheptanesulfonic acid (ND)



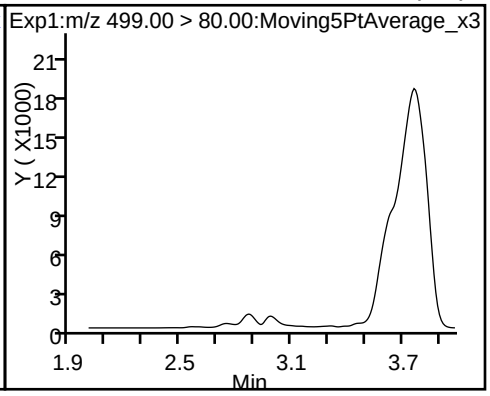
16 Perfluoroheptanesulfonic acid (ND)



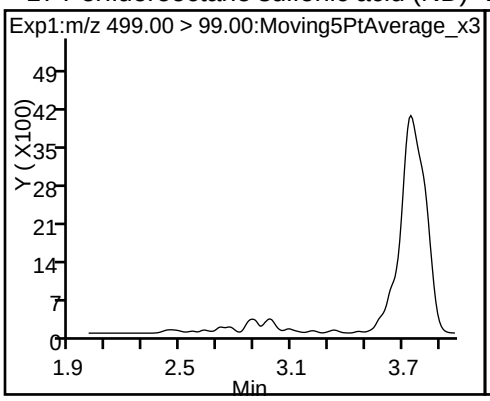
D 19 13C5 PFNA



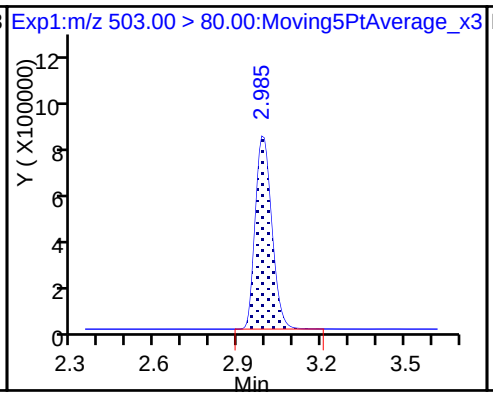
17 Perfluorooctane sulfonic acid (ND)



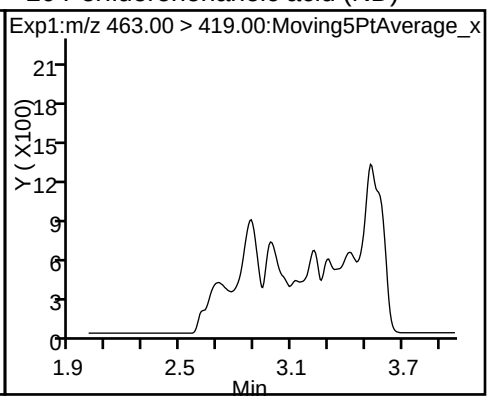
17 Perfluorooctane sulfonic acid (ND)



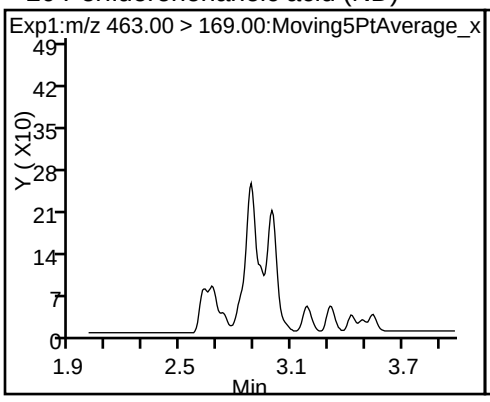
D 18 13C4 PFOS



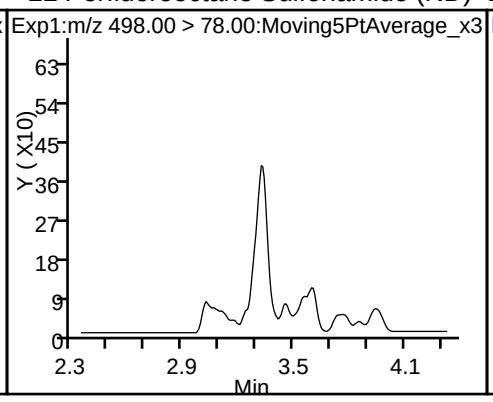
20 Perfluorononanoic acid (ND)



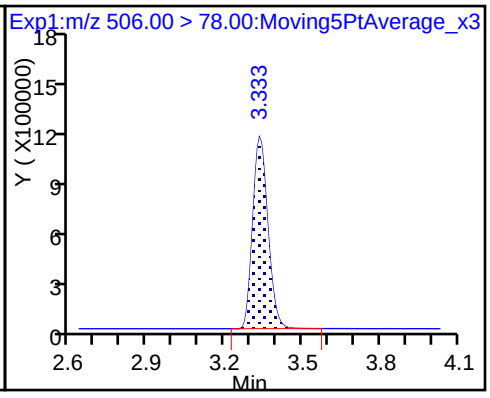
20 Perfluorononanoic acid (ND)



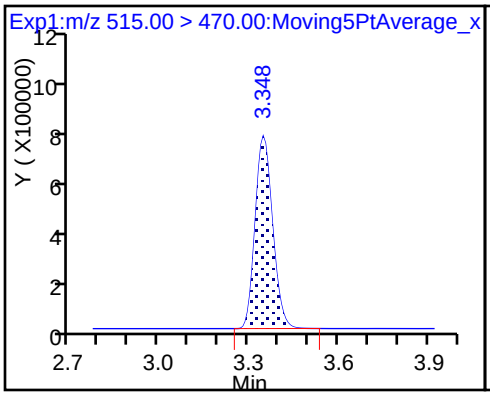
22 Perfluorooctane Sulfonamide (ND)



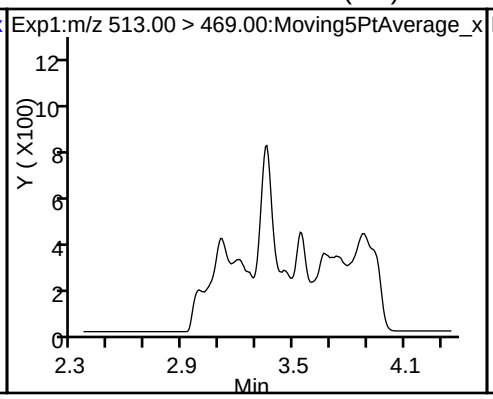
D 21 13C8 FOSA



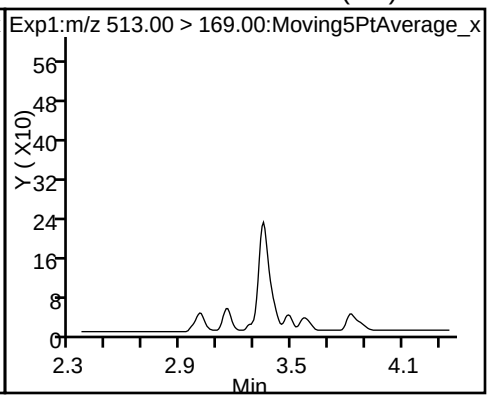
D 23 13C2 PFDA



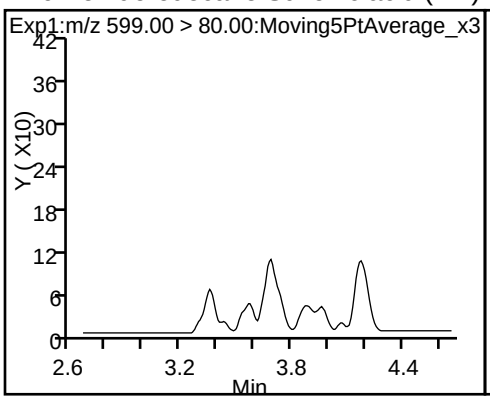
24 Perfluorodecanoic acid (ND)



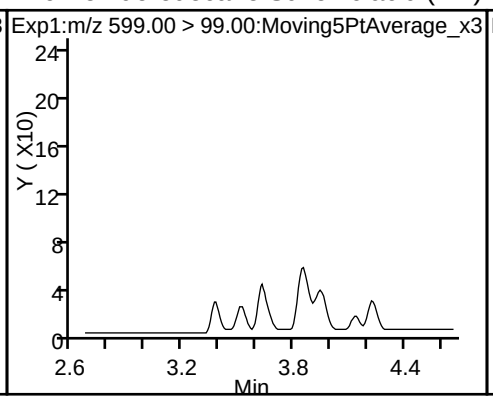
24 Perfluorodecanoic acid (ND)



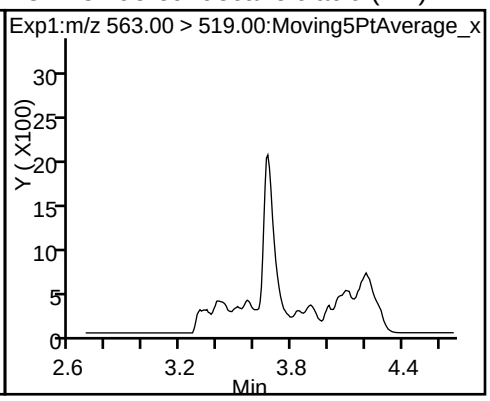
29 Perfluorodecane Sulfonic acid (ND)



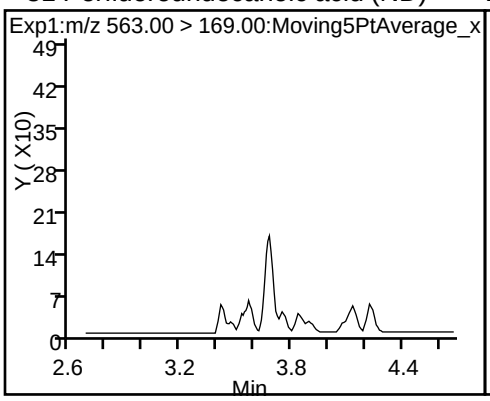
29 Perfluorodecane Sulfonic acid (ND)



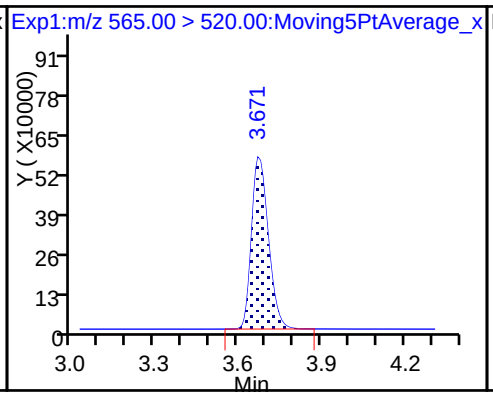
31 Perfluoroundecanoic acid (ND)



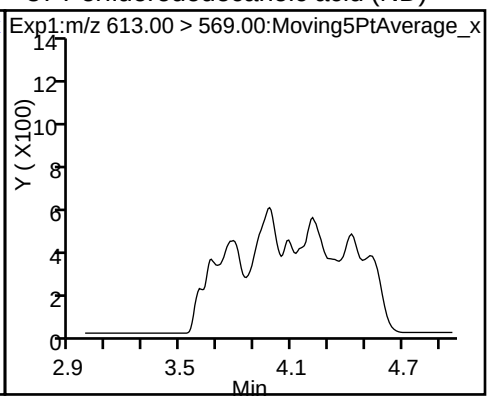
31 Perfluoroundecanoic acid (ND)



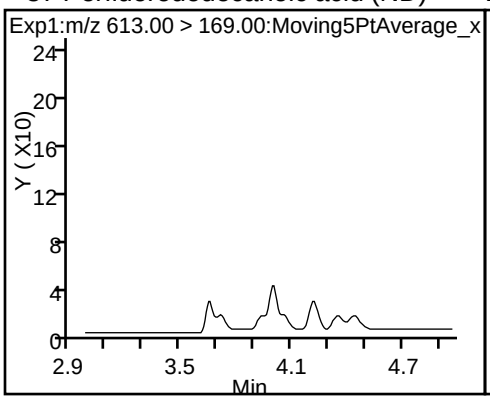
D 30 13C2 PFUnA



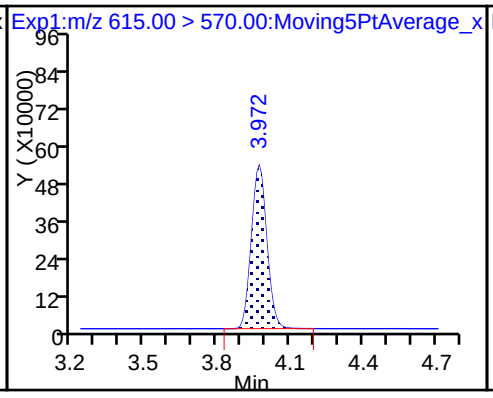
37 Perfluorododecanoic acid (ND)



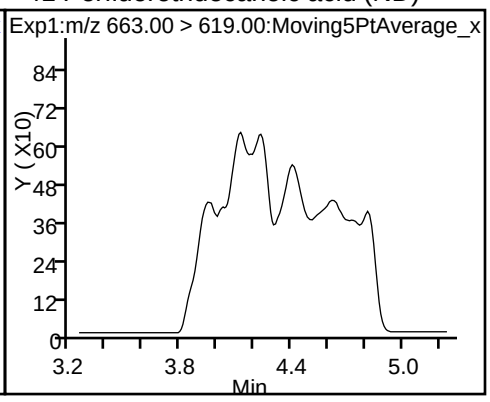
37 Perfluorododecanoic acid (ND)



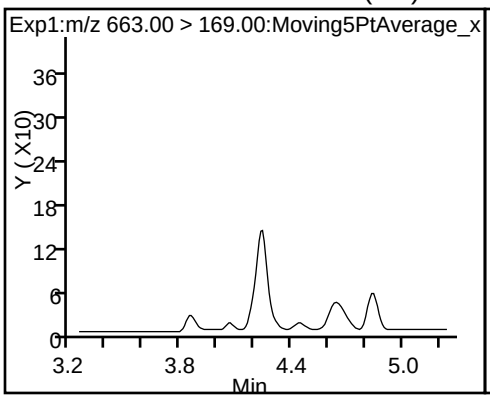
D 36 13C2 PFDoA



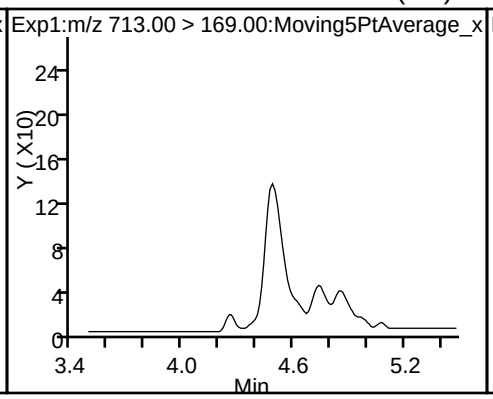
41 Perfluorotridecanoic acid (ND)



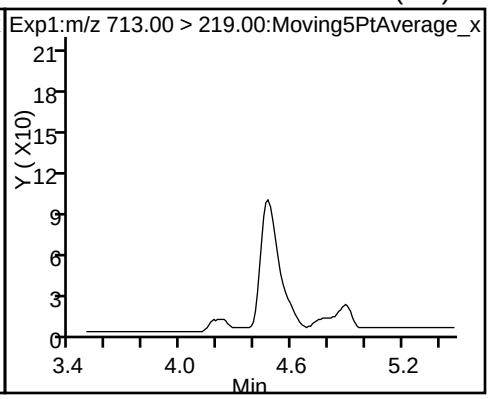
41 Perfluorotridecanoic acid (ND)



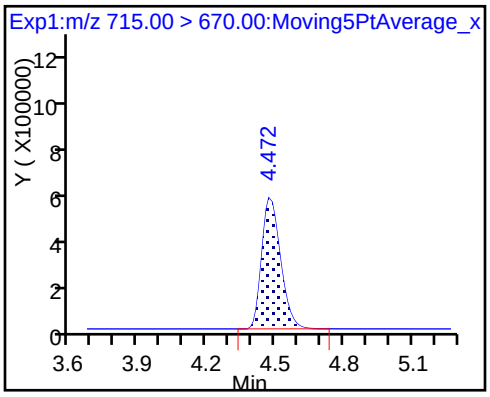
42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



D 43 13C2-PFTeDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

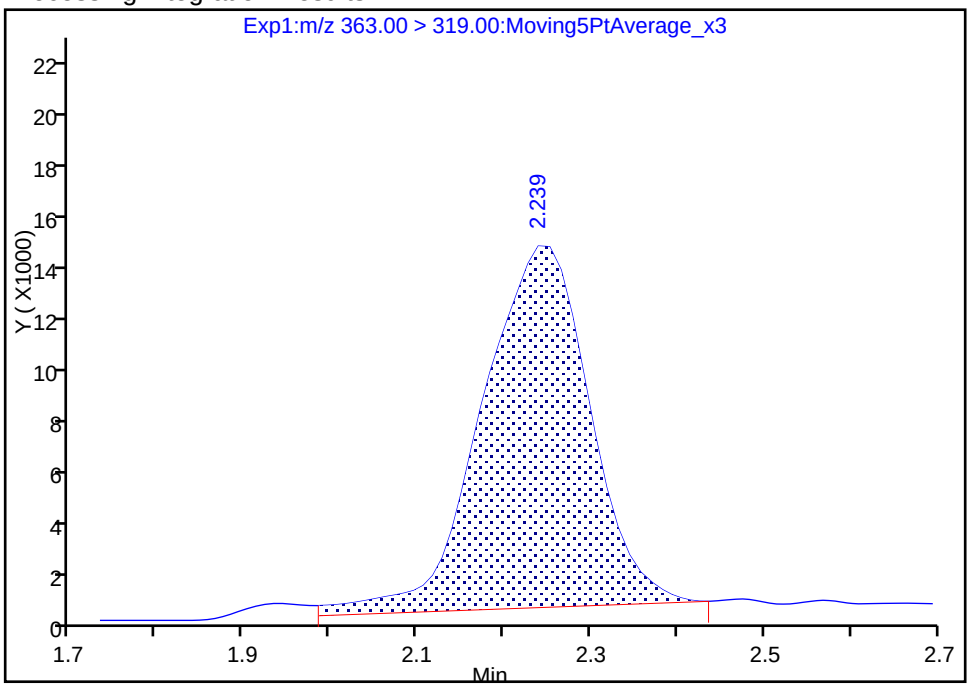
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_006.d				
Injection Date:	18-Jan-2018 18:08:54	Instrument ID:	A8_N		
Lims ID:	320-35042-A-2-A	Lab Sample ID:	320-35042-2		
Client ID:	TP-PFC-025-MID-CARBON				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	45	Worklist Smp#:	6
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

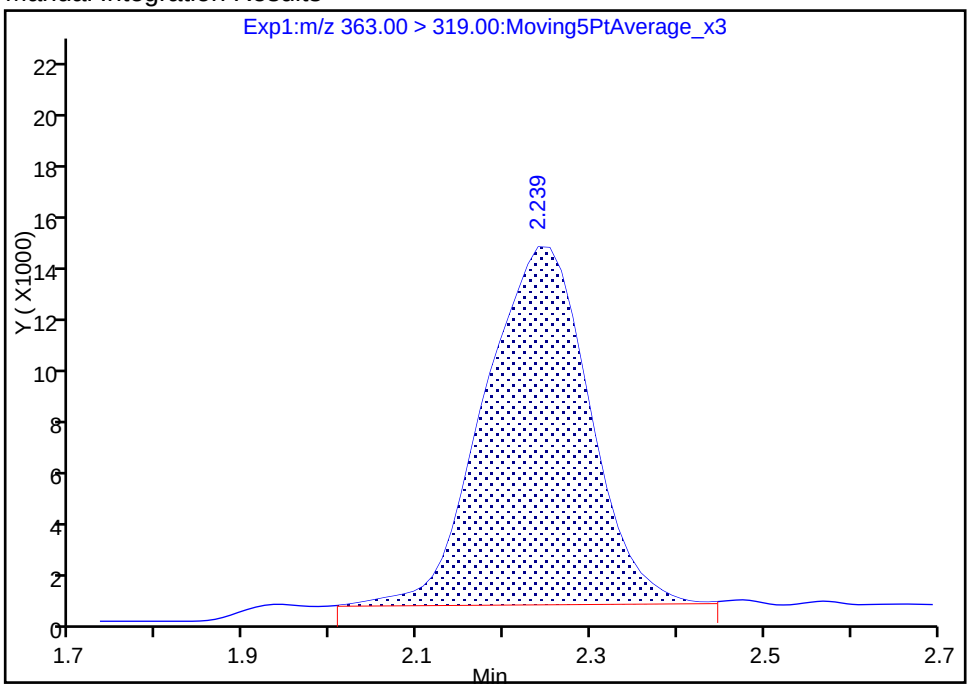
Processing Integration Results

RT: 2.24
Area: 120706
Amount: 0.060193
Amount Units: ng/ml



Manual Integration Results

RT: 2.24
Area: 116179
Amount: 0.057936
Amount Units: ng/ml



Reviewer: roycea, 19-Jan-2018 15:44:54

Audit Action: Manually Integrated Audit Reason: Baseline

TestAmerica Sacramento

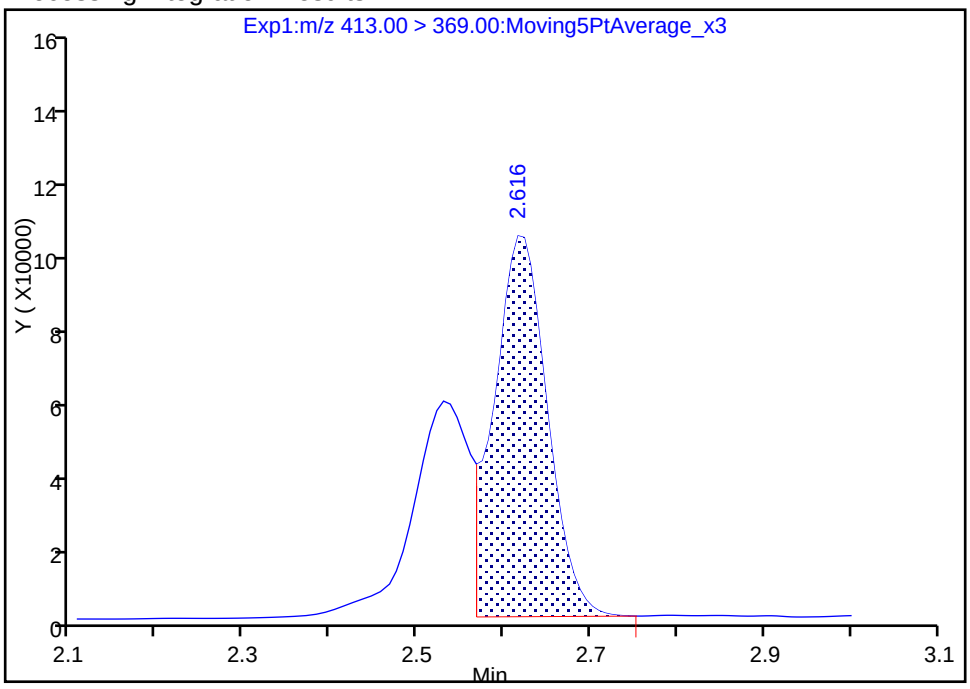
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_006.d				
Injection Date:	18-Jan-2018 18:08:54	Instrument ID:	A8_N		
Lims ID:	320-35042-A-2-A	Lab Sample ID:	320-35042-2		
Client ID:	TP-PFC-025-MID-CARBON				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	45	Worklist Smp#:	6
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

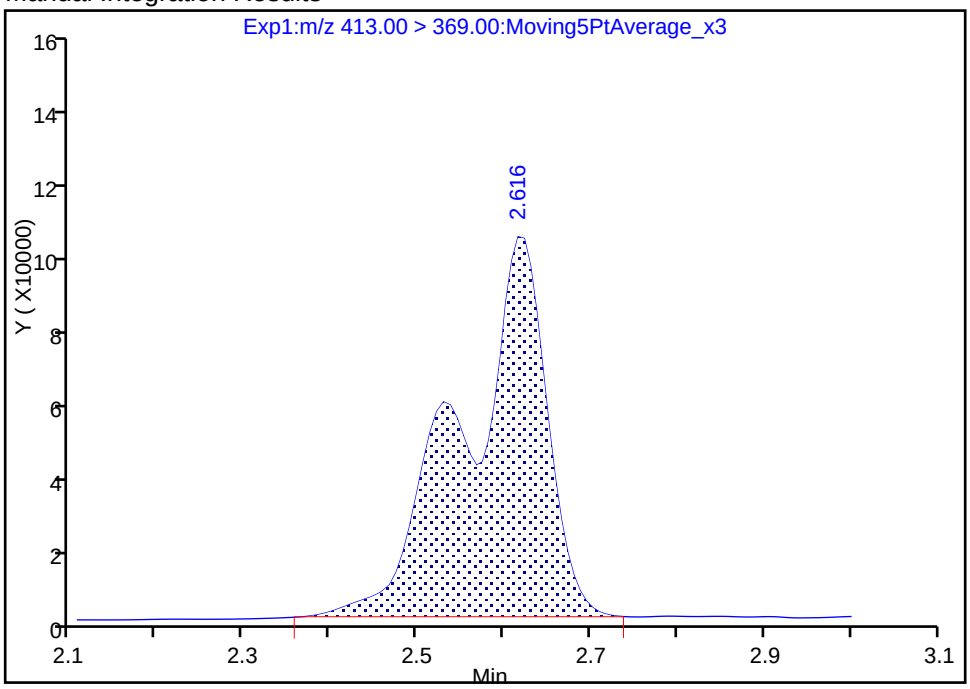
Processing Integration Results

RT: 2.62
Area: 432998
Amount: 0.201276
Amount Units: ng/ml



Manual Integration Results

RT: 2.62
Area: 690212
Amount: 0.320840
Amount Units: ng/ml



Reviewer: roycea, 19-Jan-2018 15:43:59
Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

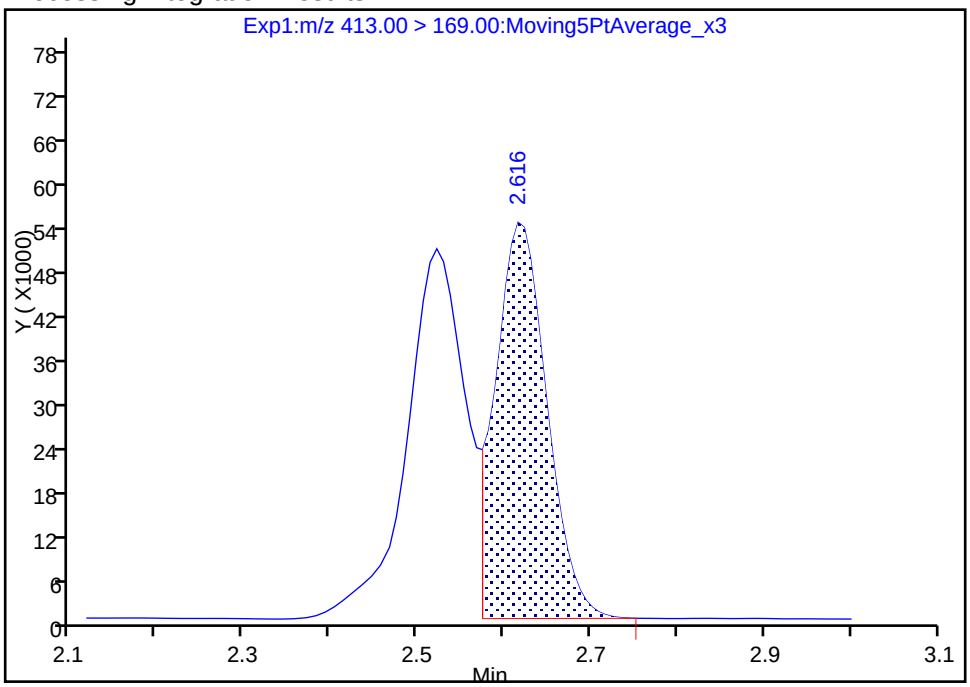
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_006.d				
Injection Date:	18-Jan-2018 18:08:54	Instrument ID:	A8_N		
Lims ID:	320-35042-A-2-A	Lab Sample ID:	320-35042-2		
Client ID:	TP-PFC-025-MID-CARBON				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	45	Worklist Smp#:	6
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

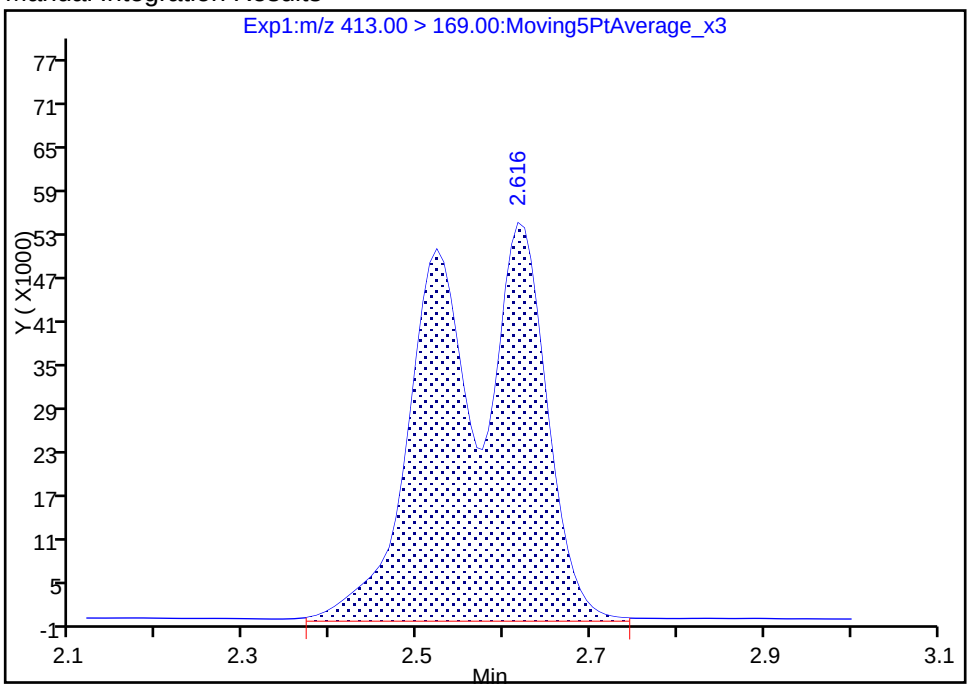
Processing Integration Results

RT: 2.62
Area: 218577
Amount: 0.201276
Amount Units: ng/ml



Manual Integration Results

RT: 2.62
Area: 462242
Amount: 0.320840
Amount Units: ng/ml



Reviewer: roycea, 19-Jan-2018 15:44:09

Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35042-1

SDG No.:

Client Sample ID: TP-PFC-025-TPE | Lab Sample ID: 320-35042-3

Matrix: Water | Lab File ID: 2018.01.18LLA_007.d

Analysis Method: 537 (modified) | Date Collected: 01/11/2018 09:10

Extraction Method: 3535 | Date Extracted: 01/16/2018 09:18

Sample wt/vol: 256.7(mL) | Date Analyzed: 01/18/2018 18:16

Con. Extract Vol.: 10.0(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 204556 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	130		1.9	0.97	0.34
2706-90-3	Perfluoropentanoic acid (PFPeA)	110		1.9	0.97	0.48
307-24-4	Perfluorohexanoic acid (PFHxA)	25		3.9	1.9	0.56
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.43	J M	1.9	0.97	0.24
335-67-1	Perfluorooctanoic acid (PFOA)	1.1	J M	3.9	1.9	0.83
375-95-1	Perfluorononanoic acid (PFNA)	0.97	U	1.9	0.97	0.26
335-76-2	Perfluorodecanoic acid (PFDA)	0.97	U	1.9	0.97	0.30
2058-94-8	Perfluoroundecanoic acid (PFUnA)	2.9	U	3.9	2.9	1.1
307-55-1	Perfluorododecanoic acid (PFDoA)	1.9	U	3.9	1.9	0.54
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.9	U	3.9	2.9	1.3
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.97	U	1.9	0.97	0.28
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.38	J	1.9	0.97	0.29
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.38	J	1.9	0.97	0.29
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.97	U	1.9	0.97	0.29
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	1.9	U	3.9	1.9	0.53
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.97	U	1.9	0.97	0.31
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.97	U	1.9	0.97	0.34

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35042-1

SDG No.:

Client Sample ID: TP-PFC-025-TPE | Lab Sample ID: 320-35042-3

Matrix: Water | Lab File ID: 2018.01.18LLA_007.d

Analysis Method: 537 (modified) | Date Collected: 01/11/2018 09:10

Extraction Method: 3535 | Date Extracted: 01/16/2018 09:18

Sample wt/vol: 256.7(mL) | Date Analyzed: 01/18/2018 18:16

Con. Extract Vol.: 10.0(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 204556 | Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	87		25-150
STL00992	13C4 PFBA	105		25-150
STL00993	13C2 PFHxA	101		25-150
STL00990	13C4 PFOA	107		25-150
STL00995	13C5 PFNA	106		25-150
STL00996	13C2 PFDA	89		25-150
STL00997	13C2 PFUnA	99		25-150
STL00998	13C2 PFDoA	93		25-150
STL00994	18O2 PFHxS	102		25-150
STL00991	13C4 PFOS	100		25-150
STL02116	13C2-PFTeDA	94		25-150
STL01892	13C4-PFHpA	110		25-150
STL01893	13C5 PFPeA	107		25-150
STL02337	13C3-PFBS	99		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_007.d
Lims ID: 320-35042-A-3-A
Client ID: TP-PFC-025-TPE
Sample Type: Client
Inject. Date: 18-Jan-2018 18:16:42 ALS Bottle#: 46 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-35042-a-3-a
Misc. Info.: Plate: 1 Rack: 5
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 19-Jan-2018 16:33:02 Calib Date: 17-Jan-2018 15:06:20
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_008.d

Column 1 : Det: EXP1
Process Host: XAWRK004

First Level Reviewer: roycea Date: 19-Jan-2018 15:56:17

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.411	1.411	0.0	0.538	7722621	2.63		105	26091	
2 Perfluorobutyric acid										
212.90 > 169.00	1.411	1.413	-0.002	1.000	9681577	3.35			1424	
D 3 13C5-PFPeA										
267.90 > 223.00	1.666	1.659	0.007	0.635	4668791	2.68		107	42085	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.657	1.662	-0.005	0.995	6022018	2.74			5767	
D 47 13C3-PFBS										
301.90 > 83.00	1.702	1.695	0.007	0.648	88867	2.31		99.2	3724	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.693	1.697	-0.004	0.995	28513	0.009661			145	
298.90 > 99.00	1.693	1.697	-0.004	0.995	16348		1.74(1.25-3.74)		115	
D 7 13C2 PFHxA										
315.00 > 270.00	1.948	1.939	0.009	0.742	4735455	2.53		101	35205	
6 Perfluorohexanoic acid										R
313.00 > 269.00	1.917	1.939	-0.022	0.984	1268753	0.6463			2628	R
313.00 > 119.00	1.948	1.939	0.009	1.000	59701		21.25(5.03-15.10)		1031	
D 9 13C4-PFHpA										
367.00 > 322.00	2.271	2.267	0.004	0.865	4907094	2.75		110	30322	
10 Perfluoroheptanoic acid										M
363.00 > 319.00	2.245	2.268	-0.023	0.988	23538	0.0109			29.6	M
363.00 > 169.00	2.258	2.268	-0.010	0.994	8868		2.65(1.13-3.40)		54.7	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.284	2.280	0.004	1.000	24597	0.009821			126	
399.00 > 99.00	2.284	2.280	0.004	1.000	6616		3.72(1.50-4.49)		72.0	
D 11 18O2 PFHxS										
403.00 > 84.00	2.284	2.282	0.002	0.870	5319781	2.42		102	31241	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 14 13C4 PFOA										
417.00 > 372.00	2.624	2.622	0.002	1.000	4665018	2.67		107	30697	
* 62 13C2-PFOA										
415.00 > 370.00	2.624	2.622	0.002		4857245	2.50			32726	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.624	2.623	0.001	1.000	63207	0.0289			29.6	M
413.00 > 169.00	2.531	2.623	-0.092	0.964	44291		1.43(0.84-2.52)		151	M
D 19 13C5 PFNA										
468.00 > 423.00	2.995	2.992	0.003	1.141	3768458	2.66		106	27588	
D 18 13C4 PFOS										
503.00 > 80.00	2.995	2.992	0.003	1.141	3336948	2.40		100	30252	
D 21 13C8 FOSA										
506.00 > 78.00	3.335	3.338	-0.003	1.271	4259418	2.18		87.1	19057	
D 23 13C2 PFDA										
515.00 > 470.00	3.358	3.352	0.006	1.280	2735154	2.23		89.3	18134	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.682	3.678	0.004	1.000	6148	0.006451			31.3	
563.00 > 169.00	3.682	3.678	0.004	1.000	1000		6.15(0.00-0.00)		67.4	
D 30 13C2 PFUnA										
565.00 > 520.00	3.682	3.679	0.003	1.403	2308144	2.48		99.3	24042	
D 36 13C2 PFDoA										
615.00 > 570.00	3.983	3.979	0.004	1.518	2342668	2.32		92.9	24438	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.488	4.483	0.005	1.710	3092140	2.35		93.8	17850	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

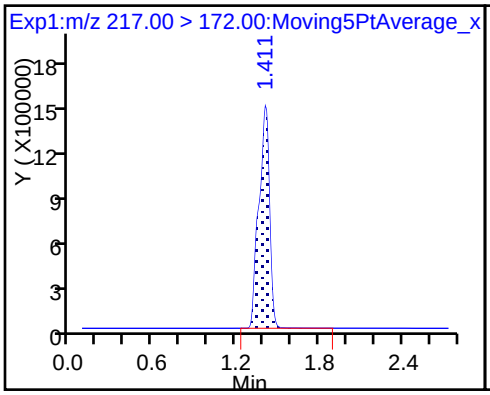
Report Date: 19-Jan-2018 16:33:15 Chrom Revision: 2.2 08-Dec-2017 11:41:26

TestAmerica Sacramento

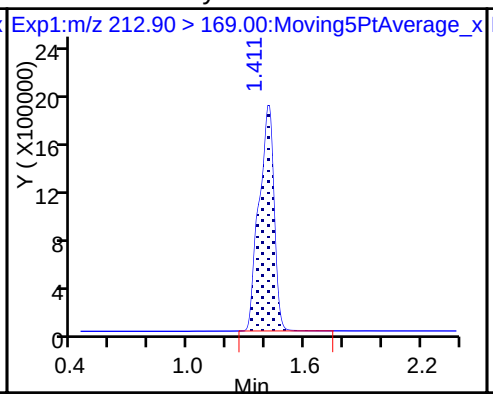
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_007.d

Injection Date:	18-Jan-2018 18:16:42	Instrument ID:	A8_N		
Lims ID:	320-35042-A-3-A	Lab Sample ID:	320-35042-3		
Client ID:	TP-PFC-025-TPE				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	46	Worklist Smp#:	7
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		

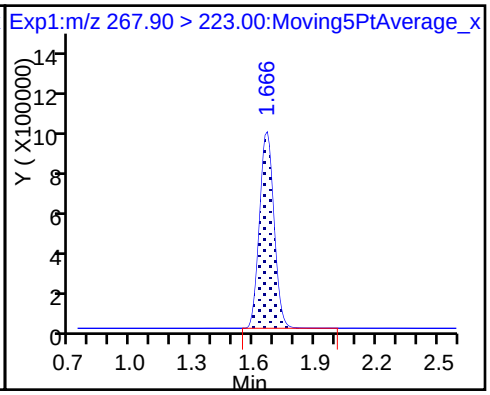
D 1 13C4 PFBA



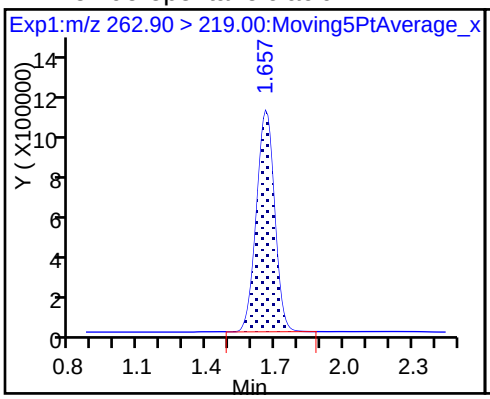
2 Perfluorobutyric acid



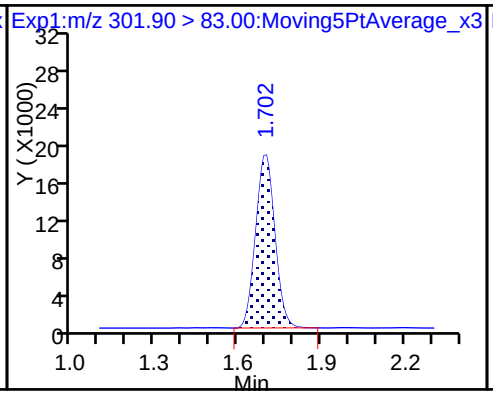
D 3 13C5-PFPeA



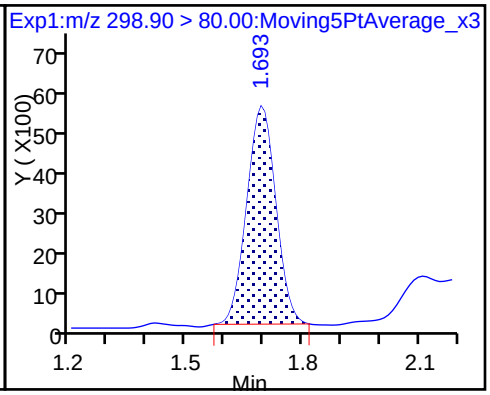
4 Perfluoropentanoic acid



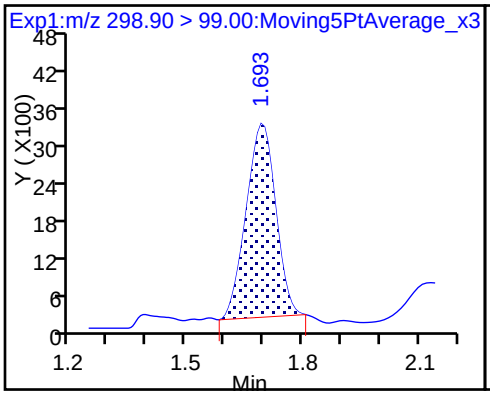
D 47 13C3-PFBS



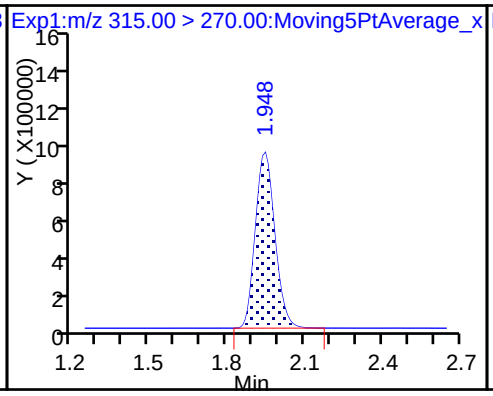
5 Perfluorobutanesulfonic acid



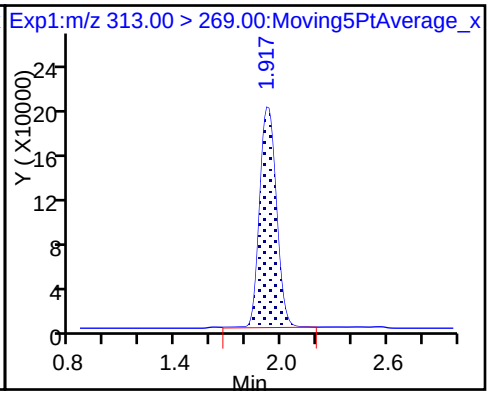
5 Perfluorobutanesulfonic acid



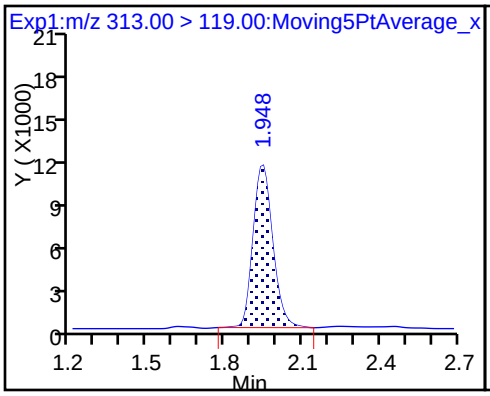
D 7 13C2 PFHxA



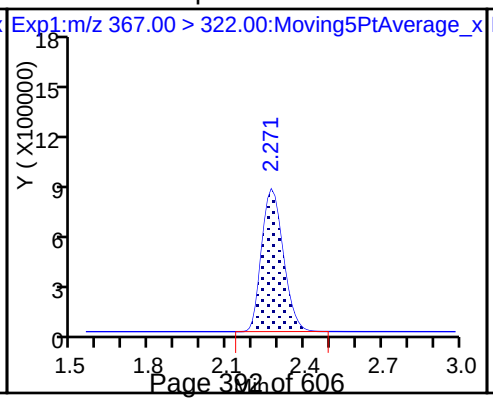
6 Perfluorohexanoic acid



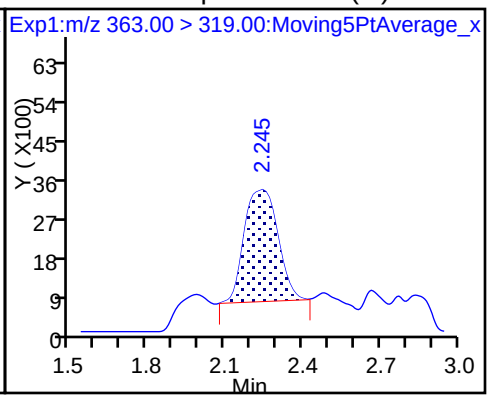
6 Perfluorohexanoic acid



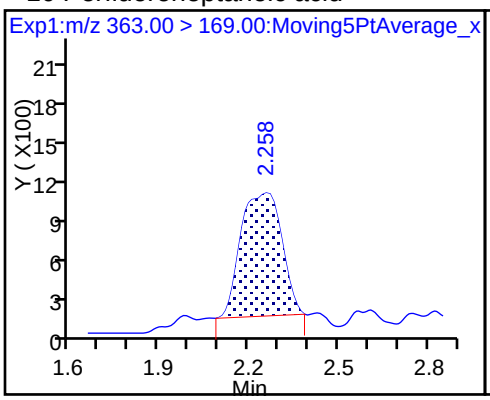
D 9 13C4-PFHpA



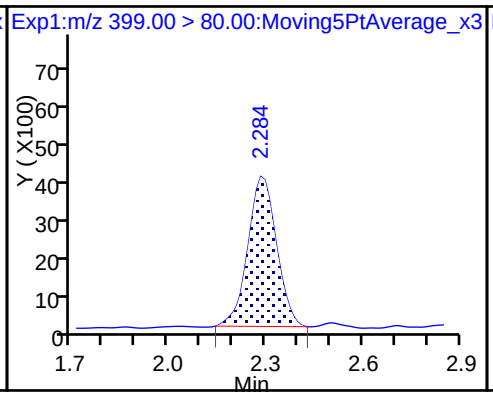
10 Perfluoroheptanoic acid (M)



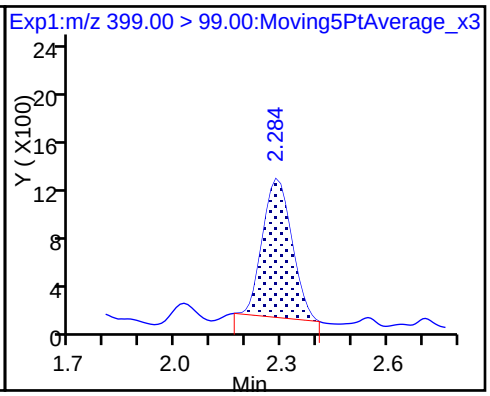
10 Perfluoroheptanoic acid



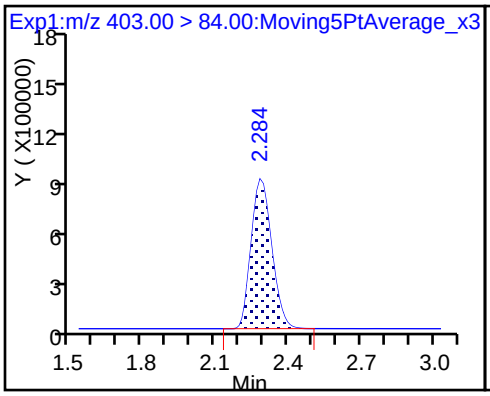
8 Perfluorohexanesulfonic acid



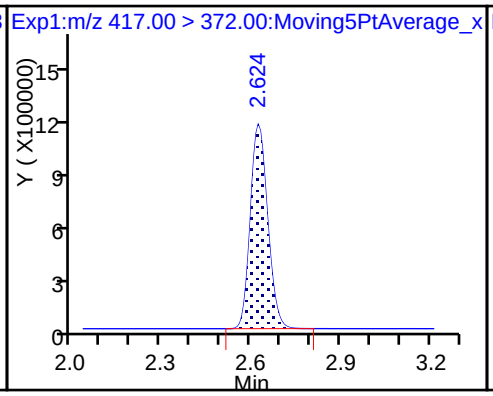
8 Perfluorohexanesulfonic acid



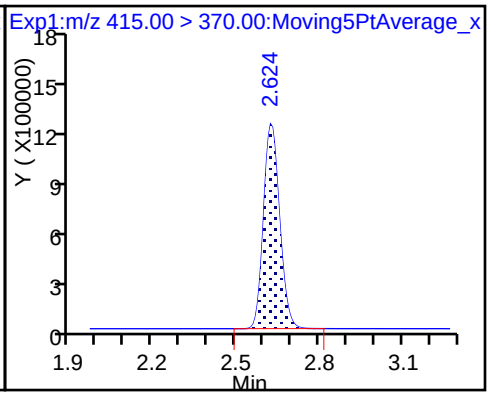
D 11 18O2 PFHxS



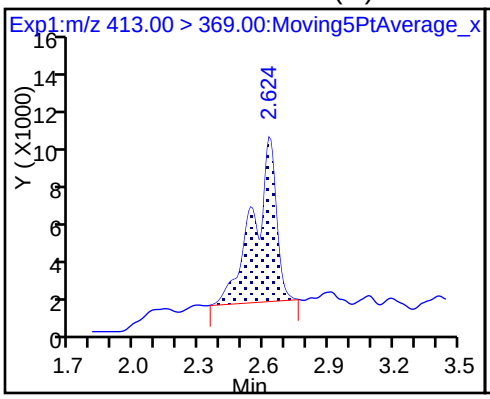
D 14 13C4 PFOA



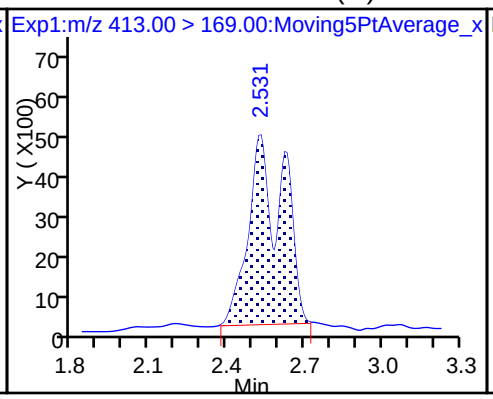
* 62 13C2-PFOA



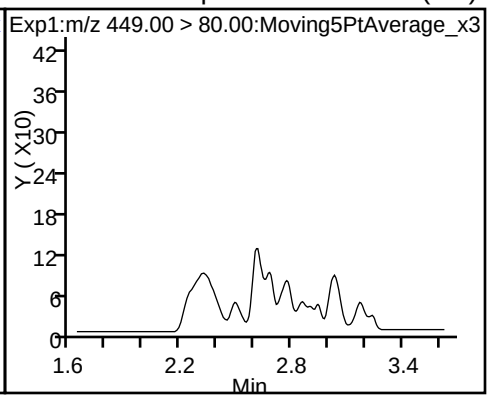
15 Perfluorooctanoic acid (M)



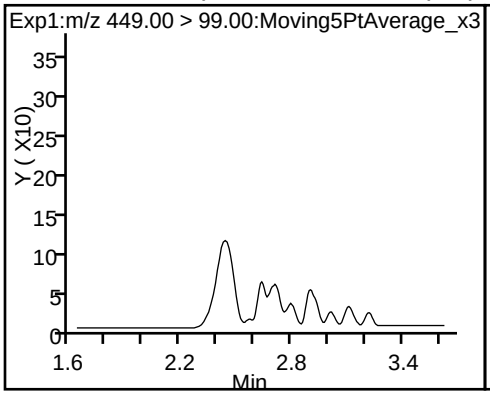
15 Perfluorooctanoic acid (M)



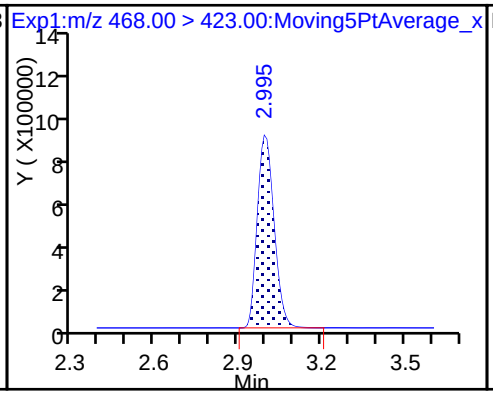
16 Perfluoroheptanesulfonic acid (ND)



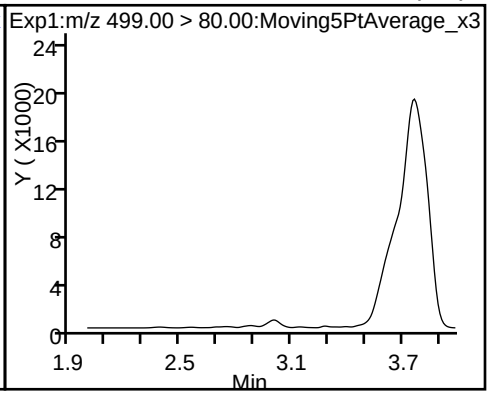
16 Perfluoroheptanesulfonic acid (ND)



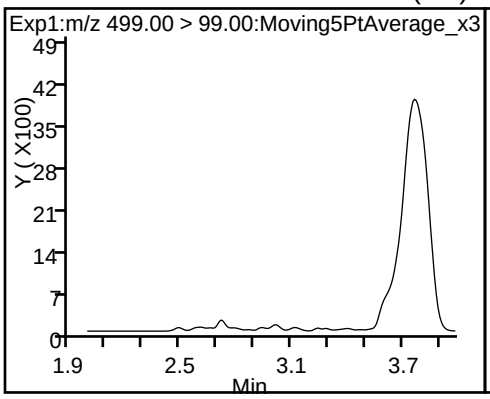
D 19 13C5 PFNA



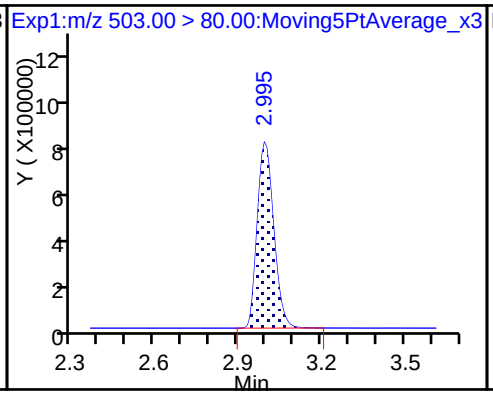
17 Perfluorooctane sulfonic acid (ND)



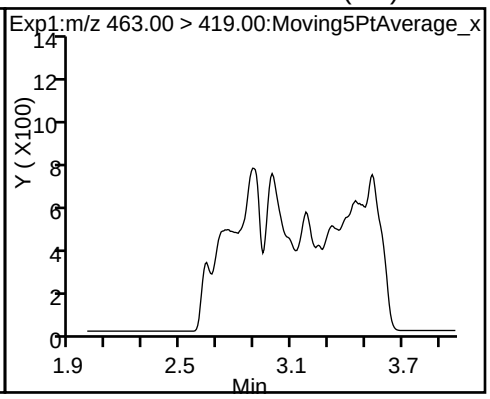
17 Perfluorooctane sulfonic acid (ND)



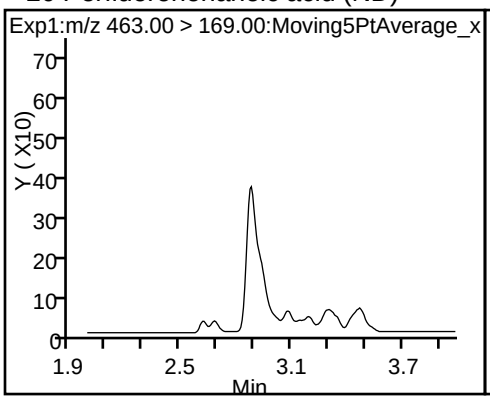
D 18 13C4 PFOS



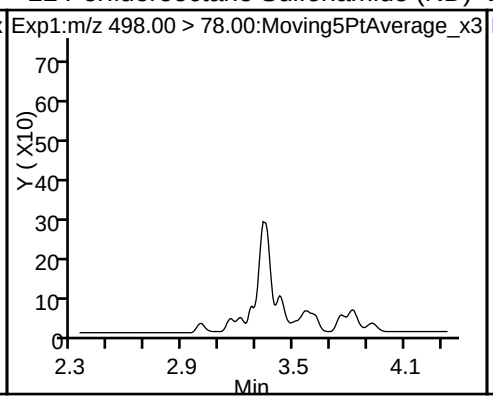
20 Perfluorononanoic acid (ND)



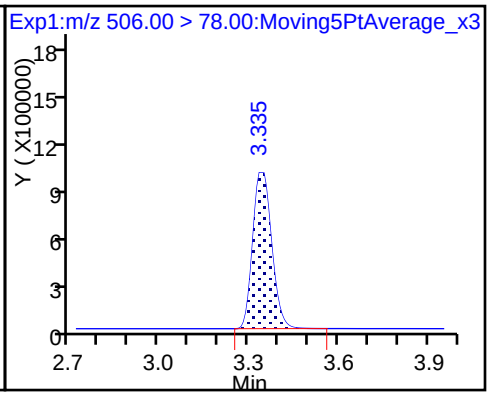
20 Perfluorononanoic acid (ND)



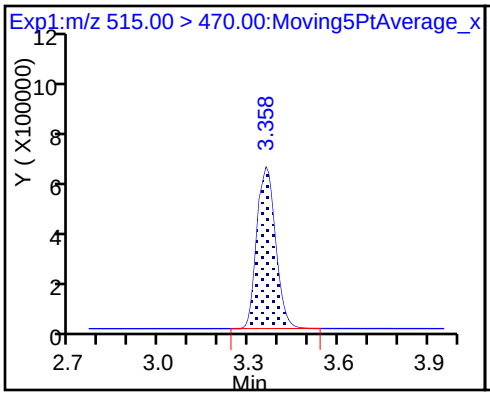
22 Perfluorooctane Sulfonamide (ND)



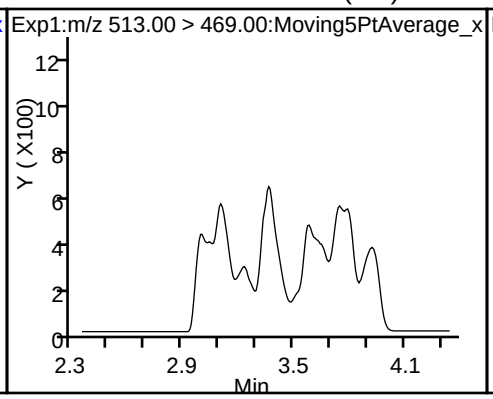
D 21 13C8 FOSA



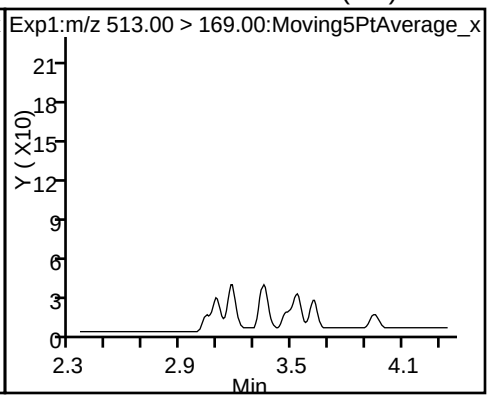
D 23 13C2 PFDA



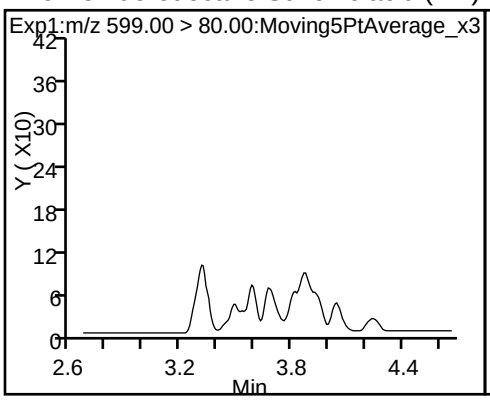
24 Perfluorodecanoic acid (ND)



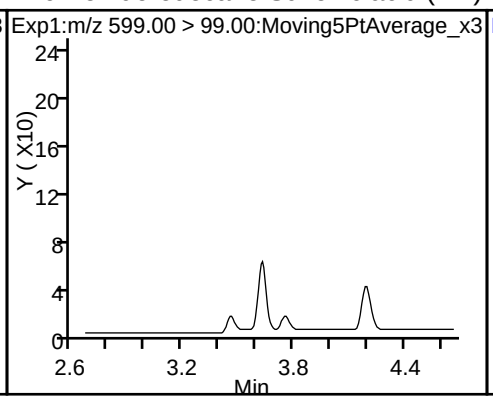
24 Perfluorodecanoic acid (ND)



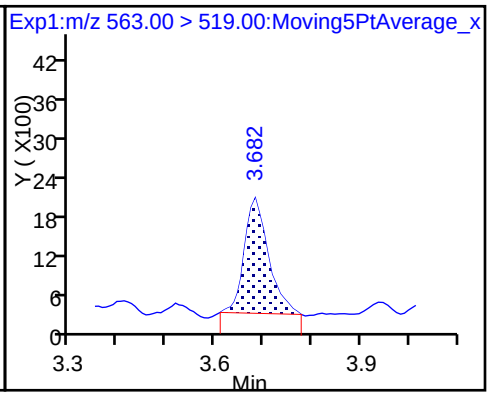
29 Perfluorodecane Sulfonic acid (ND)



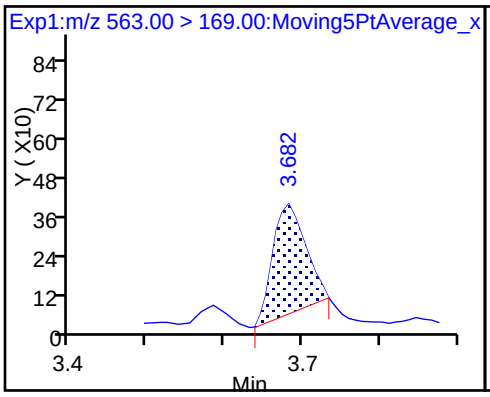
29 Perfluorodecane Sulfonic acid (ND)



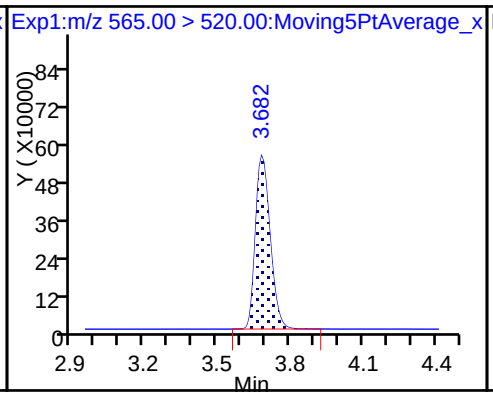
31 Perfluoroundecanoic acid



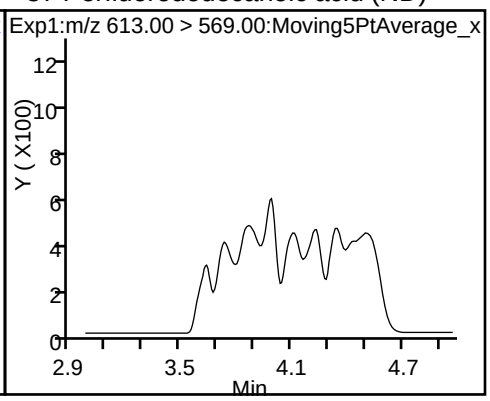
31 Perfluoroundecanoic acid



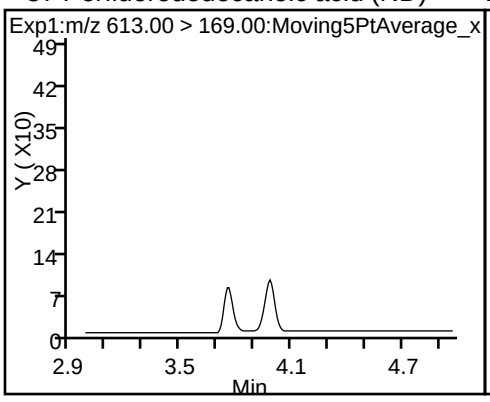
D 30 13C2 PFUnA



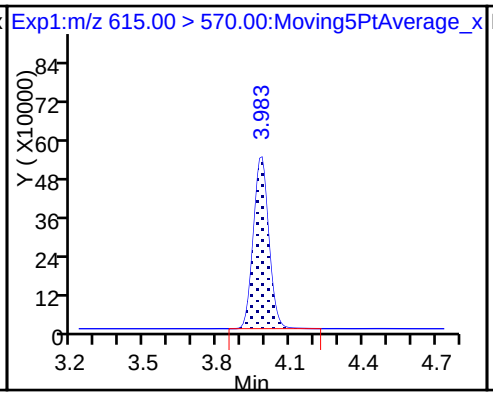
37 Perfluorododecanoic acid (ND)



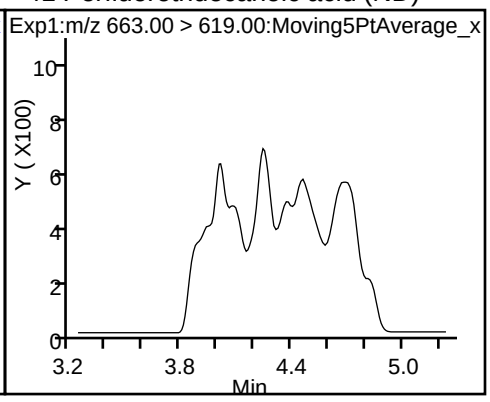
37 Perfluorododecanoic acid (ND)



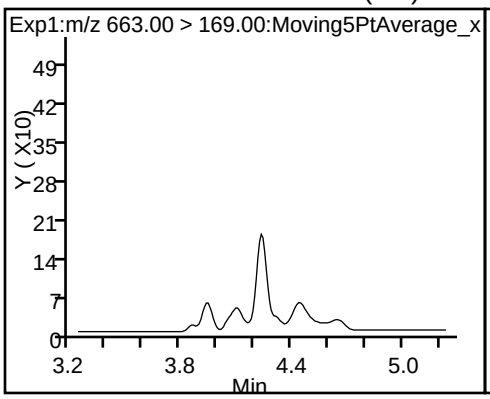
D 36 13C2 PFDoA



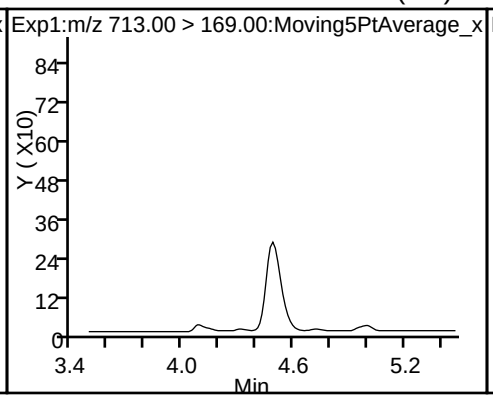
41 Perfluorotridecanoic acid (ND)



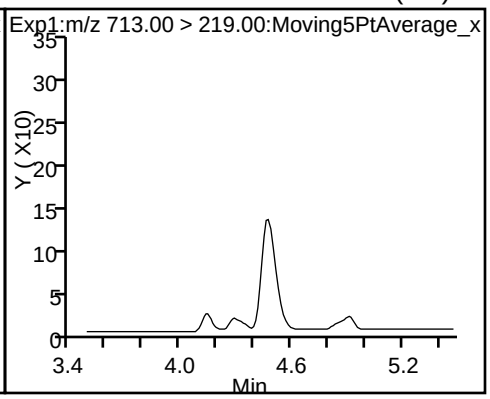
41 Perfluorotridecanoic acid (ND)



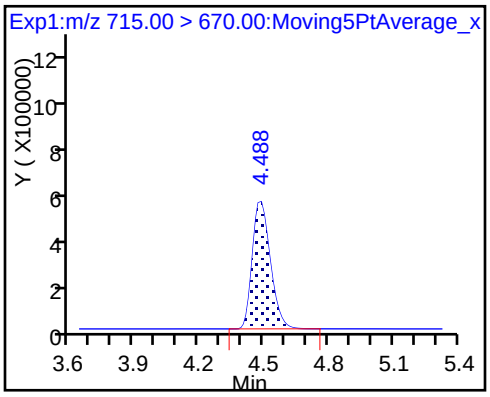
42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



D 43 13C2-PFTeDA



TestAmerica Sacramento

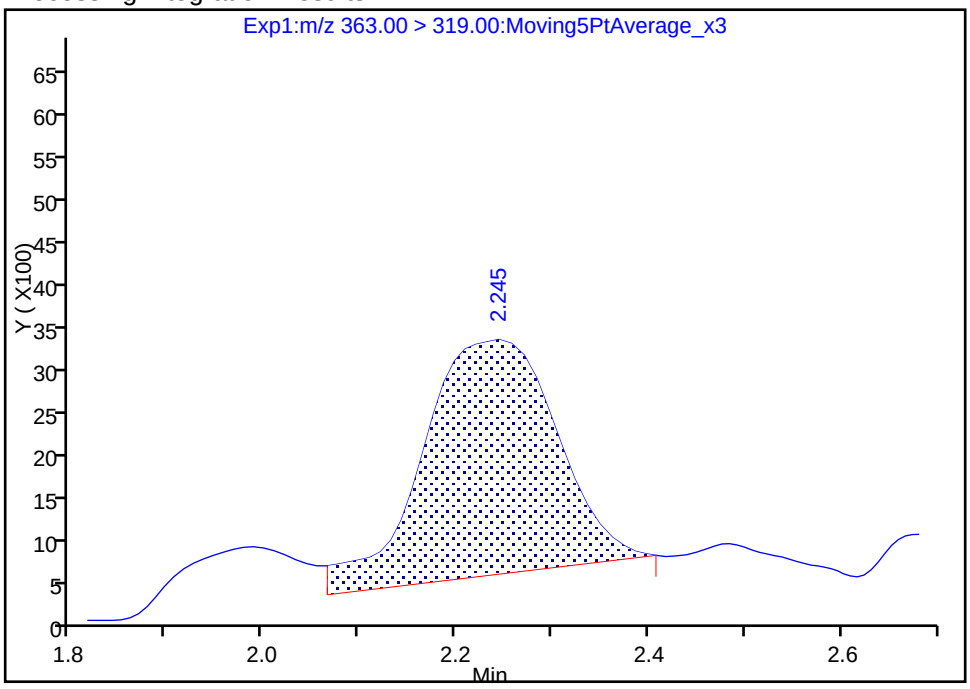
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_007.d				
Injection Date:	18-Jan-2018 18:16:42	Instrument ID:	A8_N		
Lims ID:	320-35042-A-3-A	Lab Sample ID:	320-35042-3		
Client ID:	TP-PFC-025-TPE				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	46	Worklist Smp#:	7
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

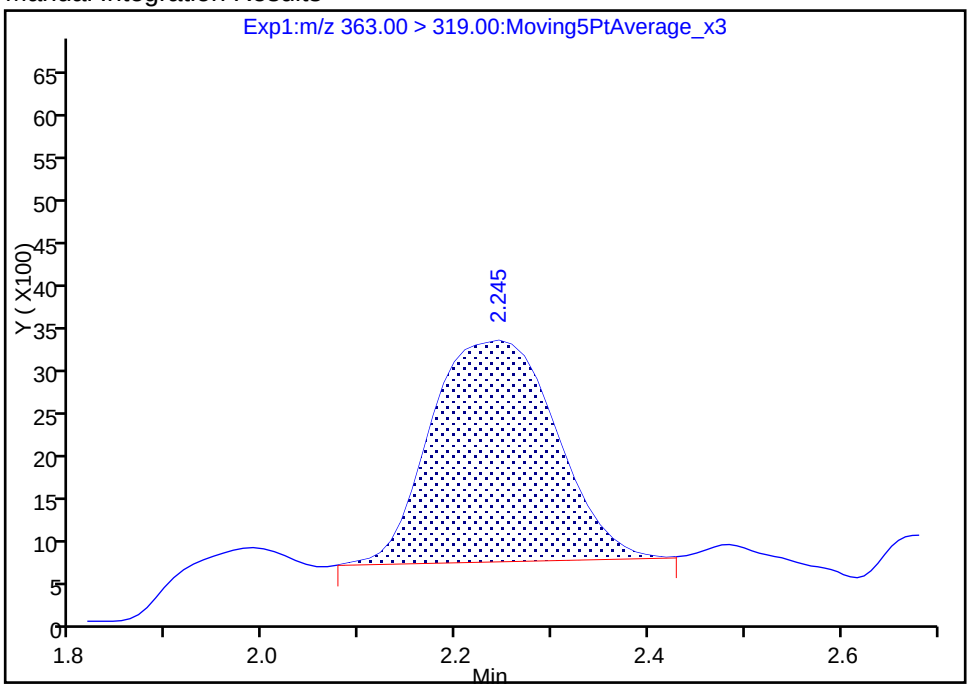
Processing Integration Results

RT: 2.24
Area: 26877
Amount: 0.012459
Amount Units: ng/ml



Manual Integration Results

RT: 2.24
Area: 23538
Amount: 0.010911
Amount Units: ng/ml



Reviewer: roycea, 19-Jan-2018 16:27:47
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

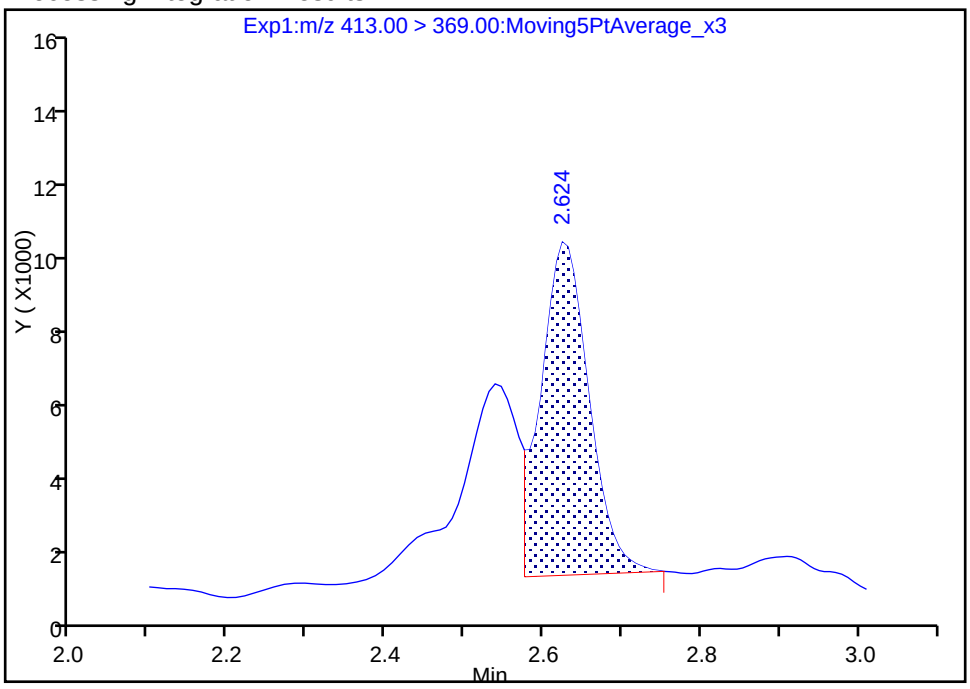
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_007.d				
Injection Date:	18-Jan-2018 18:16:42	Instrument ID:	A8_N		
Lims ID:	320-35042-A-3-A	Lab Sample ID:	320-35042-3		
Client ID:	TP-PFC-025-TPE				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	46	Worklist Smp#:	7
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

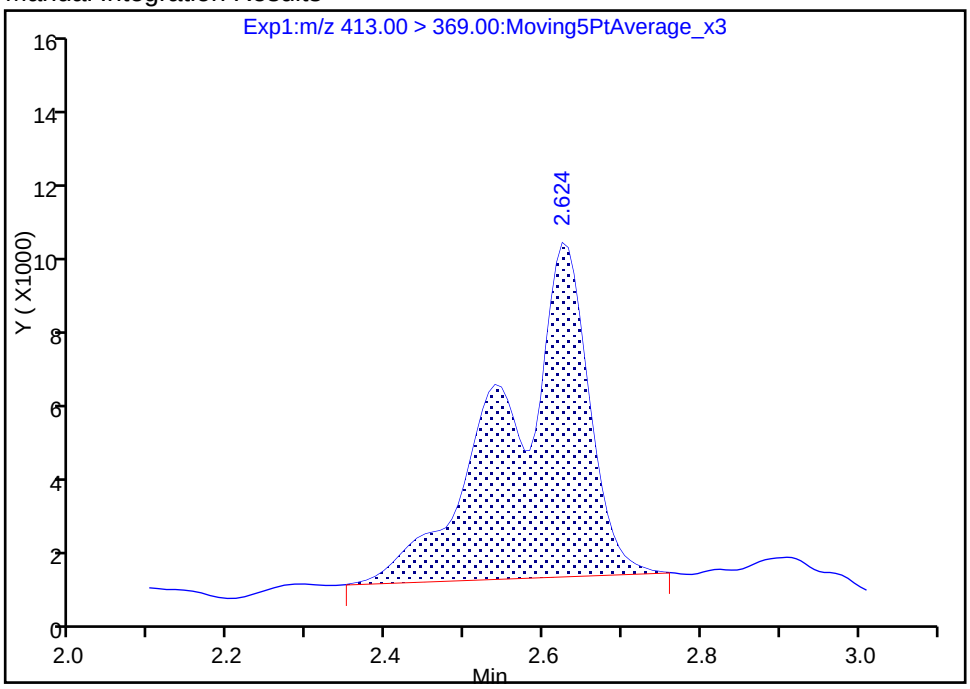
Processing Integration Results

RT: 2.62
Area: 36357
Amount: 0.016623
Amount Units: ng/ml



Manual Integration Results

RT: 2.62
Area: 63207
Amount: 0.028900
Amount Units: ng/ml



Reviewer: roycea, 19-Jan-2018 16:32:16

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

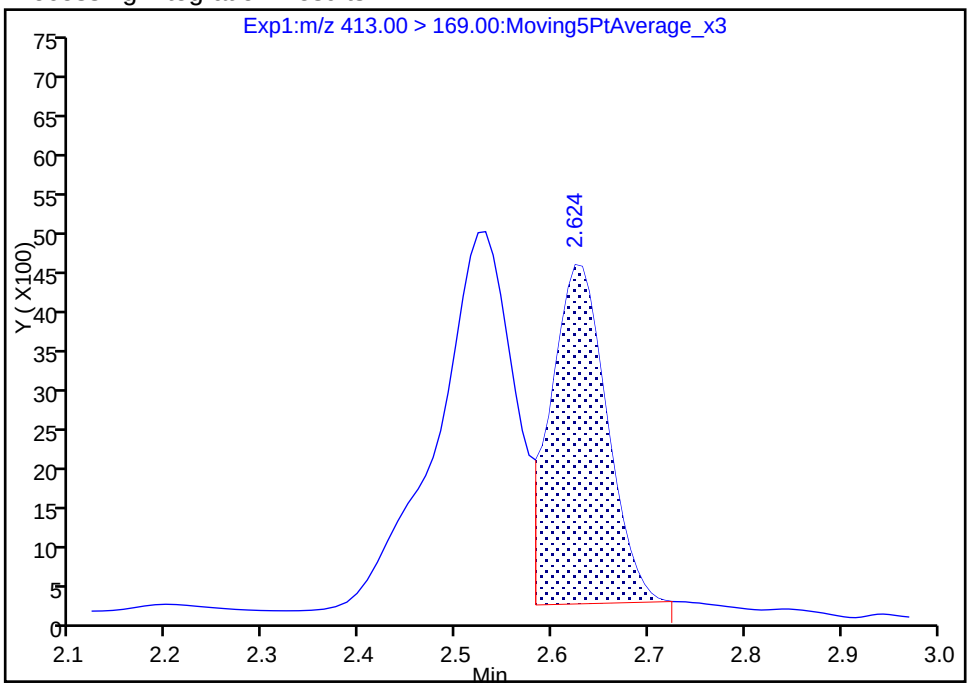
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_007.d				
Injection Date:	18-Jan-2018 18:16:42	Instrument ID:	A8_N		
Lims ID:	320-35042-A-3-A	Lab Sample ID:	320-35042-3		
Client ID:	TP-PFC-025-TPE				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	46	Worklist Smp#:	7
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

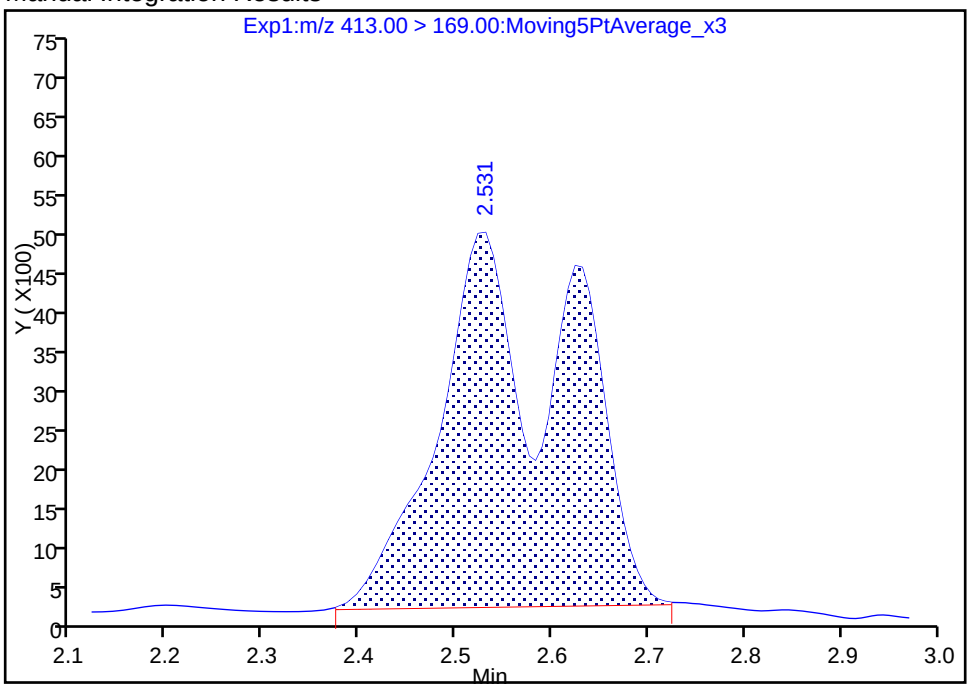
Processing Integration Results

RT: 2.62
Area: 17397
Amount: 0.016623
Amount Units: ng/ml



Manual Integration Results

RT: 2.53
Area: 44291
Amount: 0.028900
Amount Units: ng/ml



Reviewer: roycea, 19-Jan-2018 16:32:27

Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35042-1

SDG No.:

Client Sample ID: TP-PFC-025-TPE-D | Lab Sample ID: 320-35042-4

Matrix: Water | Lab File ID: 2018.01.18LLA_008.d

Analysis Method: 537 (modified) | Date Collected: 01/11/2018 00:00

Extraction Method: 3535 | Date Extracted: 01/16/2018 09:18

Sample wt/vol: 253(mL) | Date Analyzed: 01/18/2018 18:24

Con. Extract Vol.: 10.0(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 204556 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	130		2.0	0.99	0.35
2706-90-3	Perfluoropentanoic acid (PFPeA)	110		2.0	0.99	0.48
307-24-4	Perfluorohexanoic acid (PFHxA)	25		4.0	2.0	0.57
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.43	J M	2.0	0.99	0.25
335-67-1	Perfluorooctanoic acid (PFOA)	1.1	J M	4.0	2.0	0.84
375-95-1	Perfluorononanoic acid (PFNA)	0.99	U	2.0	0.99	0.27
335-76-2	Perfluorodecanoic acid (PFDA)	0.99	U	2.0	0.99	0.31
2058-94-8	Perfluoroundecanoic acid (PFUnA)	3.0	U	4.0	3.0	1.1
307-55-1	Perfluorododecanoic acid (PFDoA)	2.0	U	4.0	2.0	0.54
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	3.0	U	4.0	3.0	1.3
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.99	U	2.0	0.99	0.29
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.45	J	2.0	0.99	0.30
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.32	J	2.0	0.99	0.30
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.99	U	2.0	0.99	0.30
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.0	U	4.0	2.0	0.53
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.99	U	2.0	0.99	0.32
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.99	U	2.0	0.99	0.35

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35042-1

SDG No.:

Client Sample ID: TP-PFC-025-TPE-D | Lab Sample ID: 320-35042-4

Matrix: Water | Lab File ID: 2018.01.18LLA_008.d

Analysis Method: 537 (modified) | Date Collected: 01/11/2018 00:00

Extraction Method: 3535 | Date Extracted: 01/16/2018 09:18

Sample wt/vol: 253(mL) | Date Analyzed: 01/18/2018 18:24

Con. Extract Vol.: 10.0(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 204556 | Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	98		25-150
STL00992	13C4 PFBA	105		25-150
STL00993	13C2 PFHxA	108		25-150
STL00990	13C4 PFOA	107		25-150
STL00995	13C5 PFNA	107		25-150
STL00996	13C2 PFDA	102		25-150
STL00997	13C2 PFUnA	108		25-150
STL00998	13C2 PFDoA	102		25-150
STL00994	18O2 PFHxS	103		25-150
STL00991	13C4 PFOS	108		25-150
STL02116	13C2-PFTeDA	99		25-150
STL01892	13C4-PFHpA	108		25-150
STL01893	13C5 PFPeA	109		25-150
STL02337	13C3-PFBS	99		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_008.d
Lims ID: 320-35042-A-4-A
Client ID: TP-PFC-025-TPE-D
Sample Type: Client
Inject. Date: 18-Jan-2018 18:24:31 ALS Bottle#: 47 Worklist Smp#: 8
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-35042-a-4-a
Misc. Info.: Plate: 1 Rack: 5
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 19-Jan-2018 16:33:02 Calib Date: 17-Jan-2018 15:06:20
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_008.d

Column 1 : Det: EXP1
Process Host: XAWRK004

First Level Reviewer: roycea Date: 19-Jan-2018 16:29:39

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.405	1.411	-0.006	0.537	7869622	2.62		105	20022	
2 Perfluorobutyric acid										
212.90 > 169.00	1.405	1.413	-0.008	1.000	9691035	3.30			1123	
D 3 13C5-PFPeA										
267.90 > 223.00	1.658	1.659	-0.001	0.633	4822122	2.72		109	58594	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.650	1.662	-0.012	0.995	6340101	2.79			6634	
D 47 13C3-PFBS										
301.90 > 83.00	1.694	1.695	-0.001	0.647	90753	2.31		99.3	3925	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.685	1.697	-0.012	0.995	34394	0.0114			178	
298.90 > 99.00	1.685	1.697	-0.012	0.995	17931		1.92(1.25-3.74)		137	
D 7 13C2 PFHxA										
315.00 > 270.00	1.939	1.939	0.0	0.740	5156215	2.70		108	37190	
6 Perfluorohexanoic acid										R
313.00 > 269.00	1.918	1.939	-0.021	0.989	1335001	0.6245			3120	R
313.00 > 119.00	1.939	1.939	0.0	1.000	60550		22.05(5.03-15.10)		1724	
D 9 13C4-PFHpA										
367.00 > 322.00	2.273	2.267	0.006	0.868	4916964	2.70		108	28063	
10 Perfluoroheptanoic acid										M
363.00 > 319.00	2.233	2.268	-0.035	0.983	23459	0.0109			26.9	M
363.00 > 169.00	2.199	2.268	-0.069	0.968	9896		2.37(1.13-3.40)		71.9	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.273	2.280	-0.007	0.994	20729	0.008024			90.8	
399.00 > 99.00	2.286	2.280	0.006	1.000	6705		3.09(1.50-4.49)		59.4	
D 11 18O2 PFHxS										
403.00 > 84.00	2.286	2.282	0.004	0.873	5487319	2.45		103	39123	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 14 13C4 PFOA										
417.00 > 372.00	2.618	2.622	-0.004	1.000	4757229	2.66		107	30217	
* 62 13C2-PFOA										
415.00 > 370.00	2.618	2.622	-0.004		4956808	2.50			30607	
15 Perfluorooctanoic acid										M
413.00 > 369.00	2.618	2.623	-0.005	1.000	64858	0.0291			30.5	M
413.00 > 169.00	2.525	2.623	-0.098	0.965	45211		1.43(0.84-2.52)		142	M
D 19 13C5 PFNA										
468.00 > 423.00	2.988	2.992	-0.004	1.141	3858228	2.67		107	29562	
D 18 13C4 PFOS										
503.00 > 80.00	2.988	2.992	-0.004	1.141	3665866	2.58		108	25830	
D 21 13C8 FOSA										
506.00 > 78.00	3.335	3.338	-0.003	1.274	4913009	2.46		98.5	23028	
D 23 13C2 PFDA										
515.00 > 470.00	3.350	3.352	-0.002	1.280	3194873	2.56		102	29213	
D 30 13C2 PFUnA										
565.00 > 520.00	3.673	3.679	-0.006	1.403	2560045	2.70		108	21333	
D 36 13C2 PFDoA										
615.00 > 570.00	3.974	3.979	-0.005	1.518	2632339	2.56		102	20860	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.473	4.483	-0.010	1.709	3335462	2.48		99.2	23730	

QC Flag Legend

Processing Flags

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

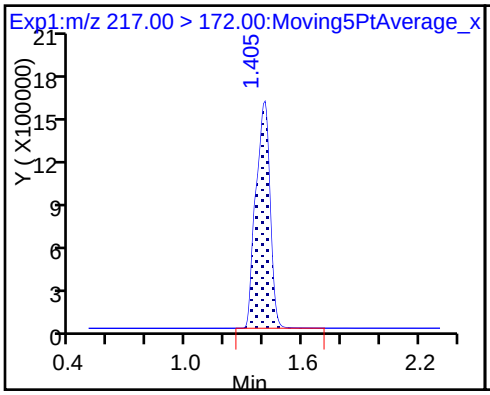
Report Date: 19-Jan-2018 16:33:17 Chrom Revision: 2.2 08-Dec-2017 11:41:26

TestAmerica Sacramento

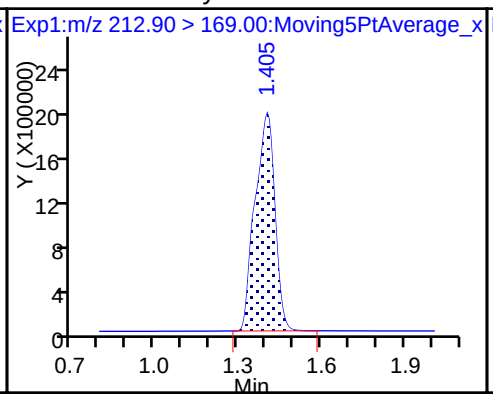
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_008.d

Injection Date:	18-Jan-2018 18:24:31	Instrument ID:	A8_N		
Lims ID:	320-35042-A-4-A	Lab Sample ID:	320-35042-4		
Client ID:	TP-PFC-025-TPE-D				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	47	Worklist Smp#:	8
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		

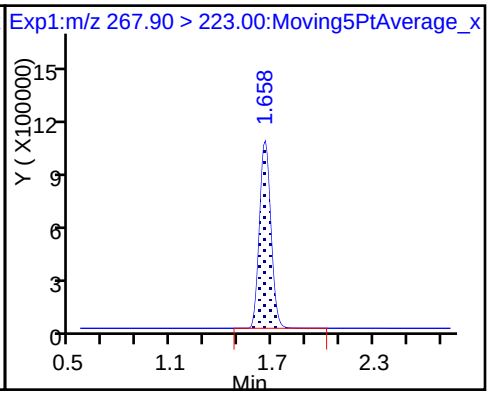
D 1 13C4 PFBA



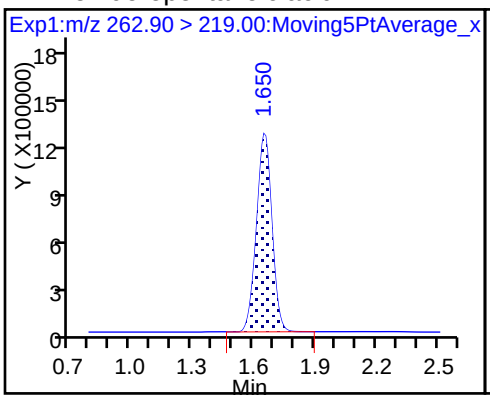
2 Perfluorobutyric acid



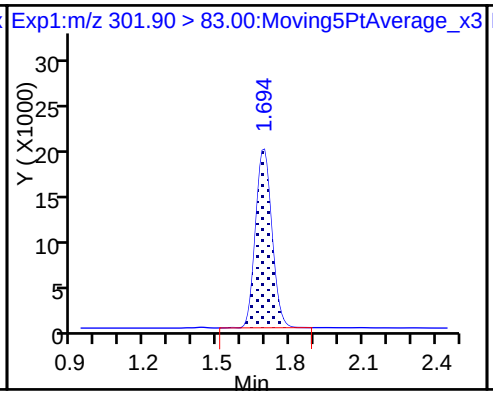
D 3 13C5-PFPeA



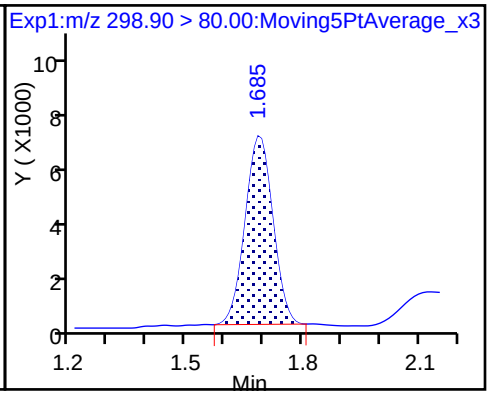
4 Perfluoropentanoic acid



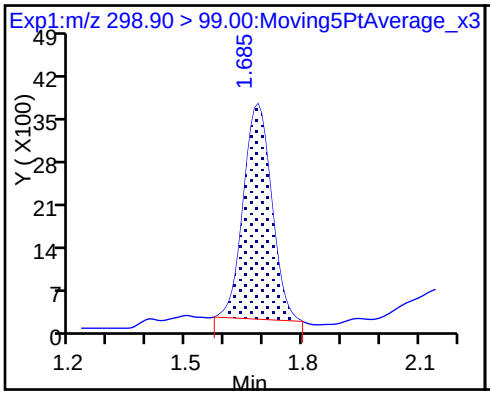
D 47 13C3-PFBS



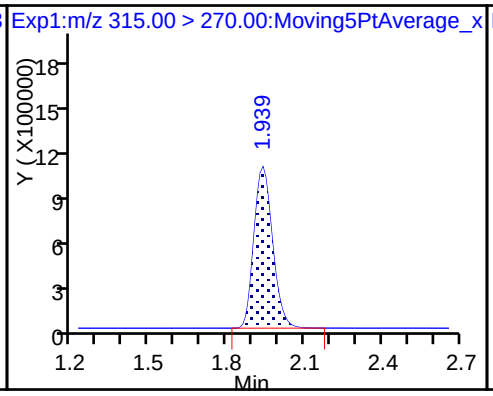
5 Perfluorobutanesulfonic acid



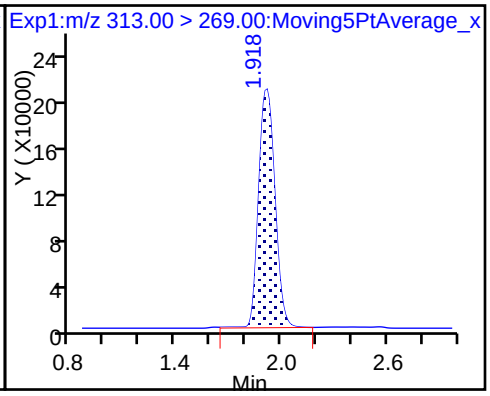
5 Perfluorobutanesulfonic acid



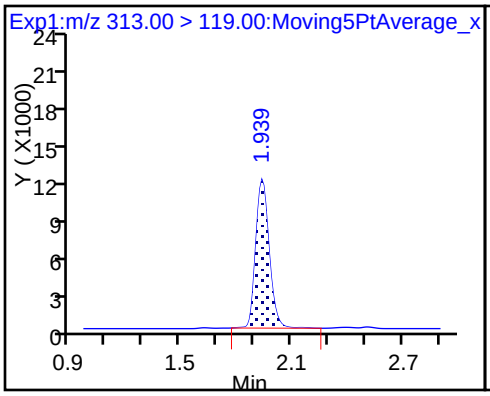
D 7 13C2 PFHxA



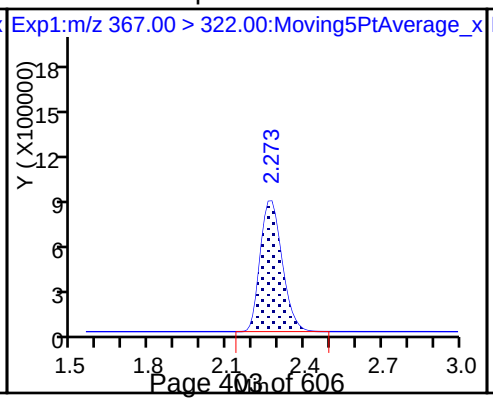
6 Perfluorohexanoic acid



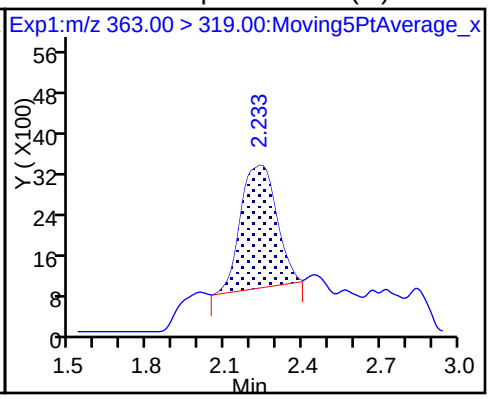
6 Perfluorohexanoic acid



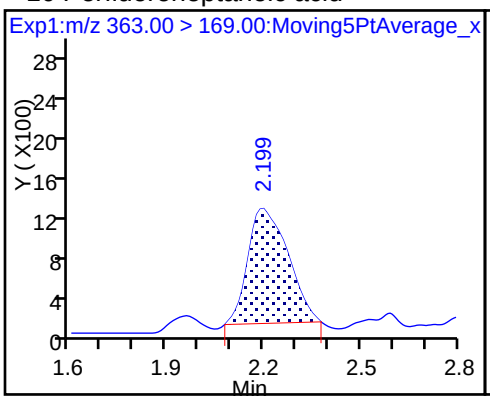
D 9 13C4-PFHpA



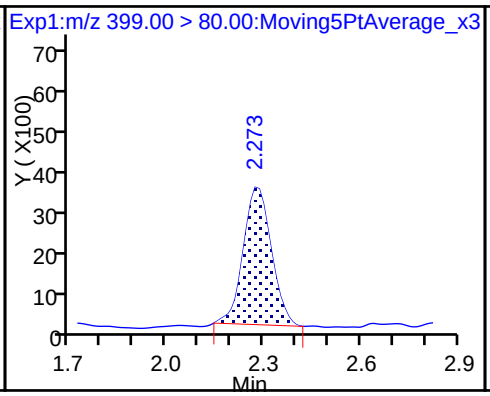
10 Perfluoroheptanoic acid (M)



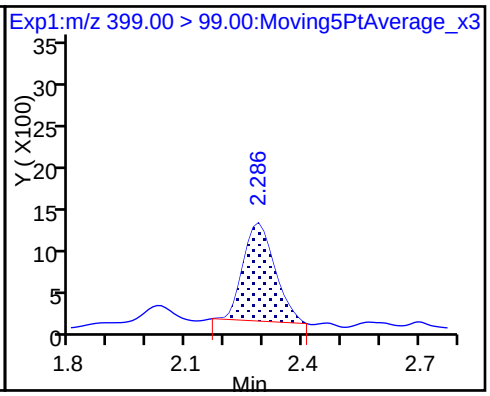
10 Perfluoroheptanoic acid



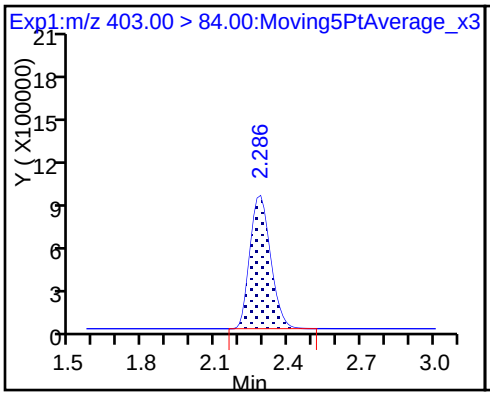
8 Perfluorohexanesulfonic acid



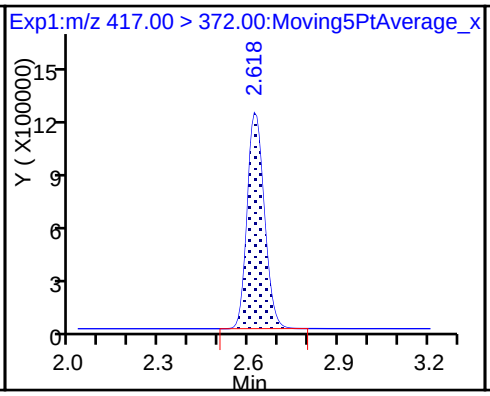
8 Perfluorohexanesulfonic acid



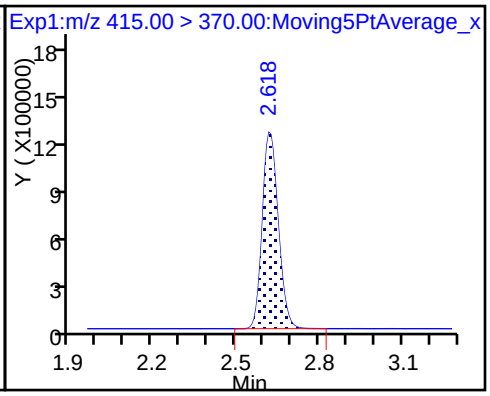
D 11 18O2 PFHxS



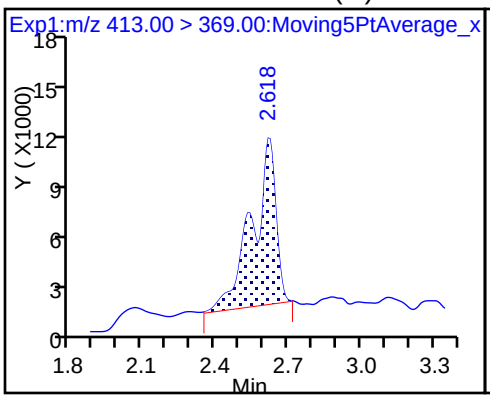
D 14 13C4 PFOA



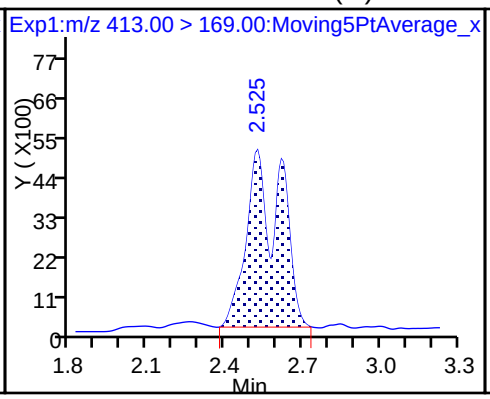
* 62 13C2-PFOA



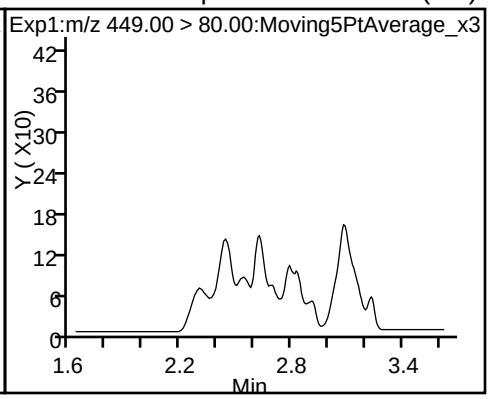
15 Perfluorooctanoic acid (M)



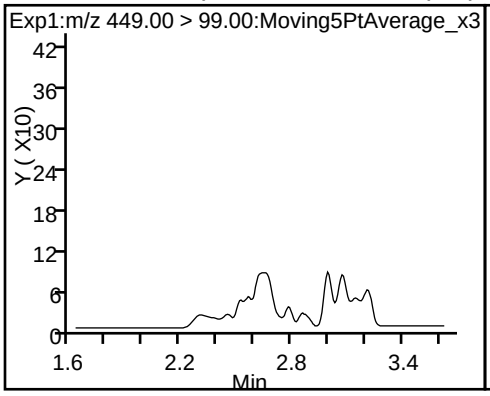
15 Perfluorooctanoic acid (M)



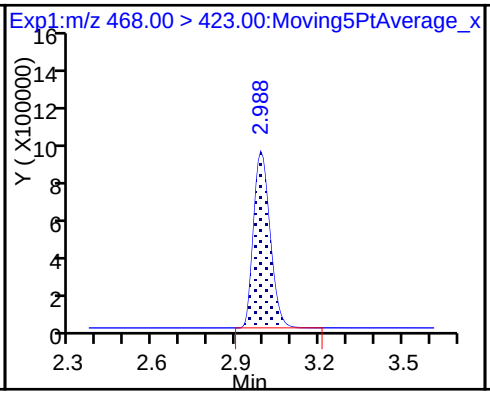
16 Perfluoroheptanesulfonic acid (ND)



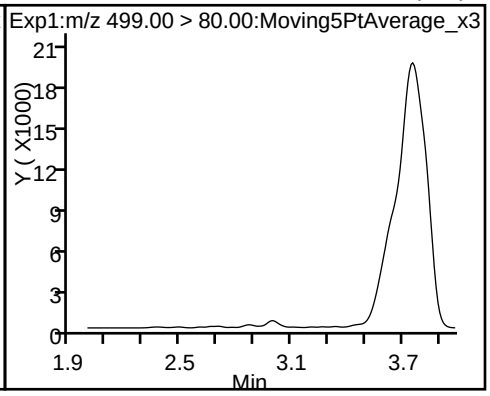
16 Perfluoroheptanesulfonic acid (ND)



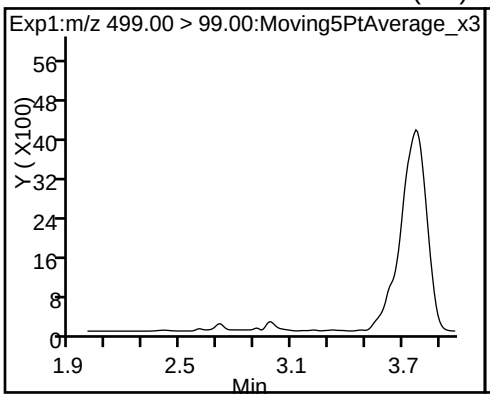
D 19 13C5 PFNA



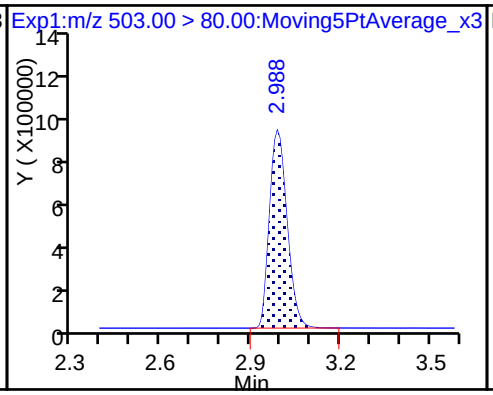
17 Perfluorooctane sulfonic acid (ND)



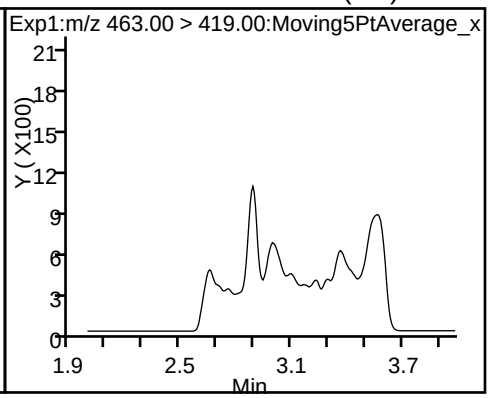
17 Perfluorooctane sulfonic acid (ND)



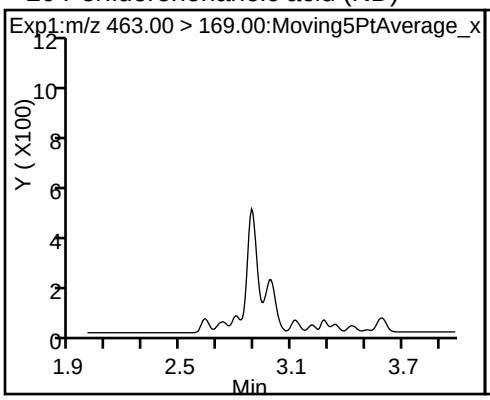
D 18 13C4 PFOS



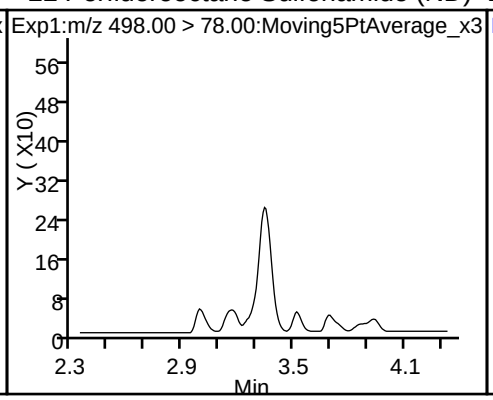
20 Perfluorononanoic acid (ND)



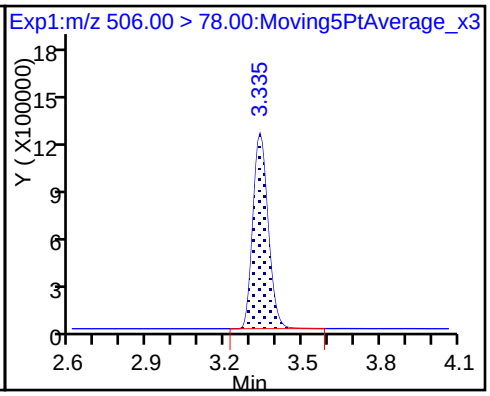
20 Perfluorononanoic acid (ND)



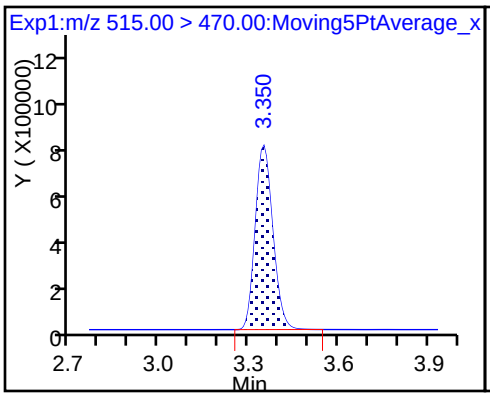
22 Perfluorooctane Sulfonamide (ND)



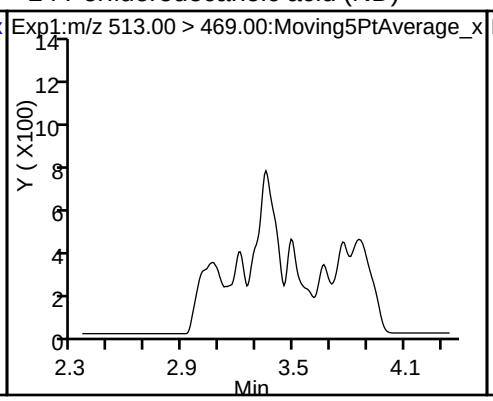
D 21 13C8 FOSA



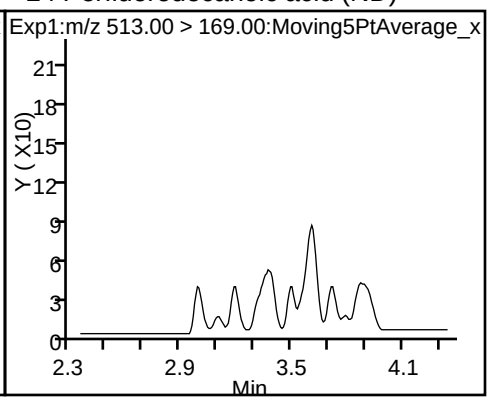
D 23 13C2 PFDA



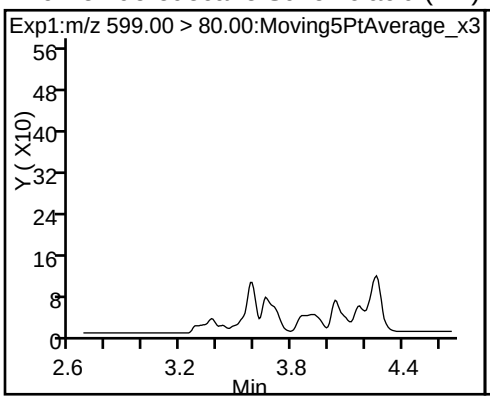
24 Perfluorodecanoic acid (ND)



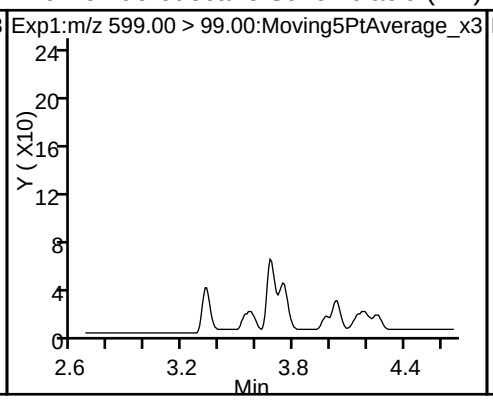
24 Perfluorodecanoic acid (ND)



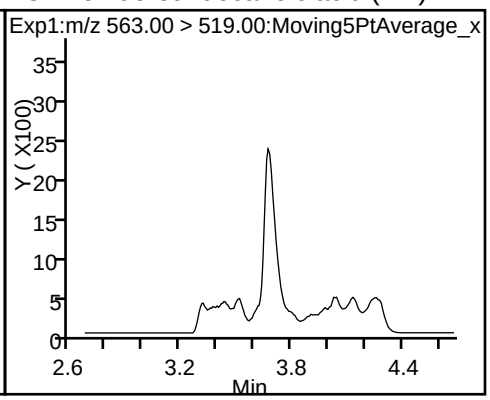
29 Perfluorodecane Sulfonic acid (ND)



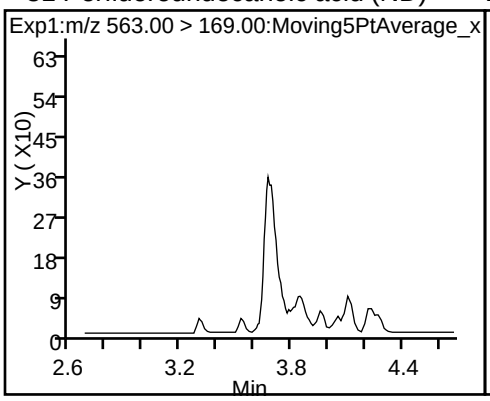
29 Perfluorodecane Sulfonic acid (ND)



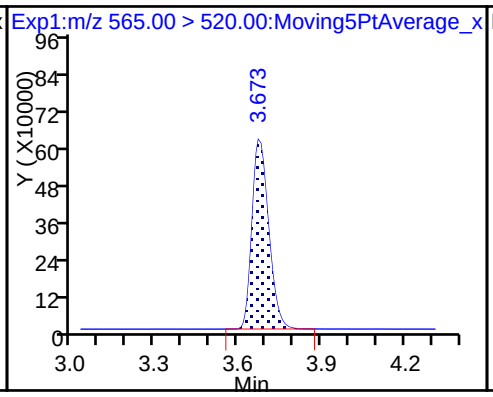
31 Perfluoroundecanoic acid (ND)



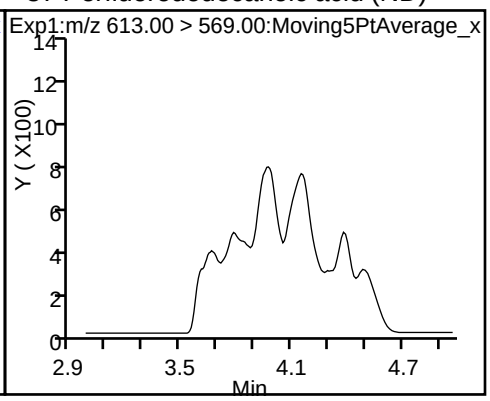
31 Perfluoroundecanoic acid (ND)



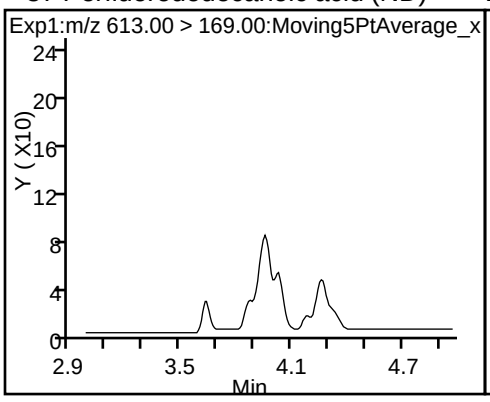
D 30 13C2 PFUnA



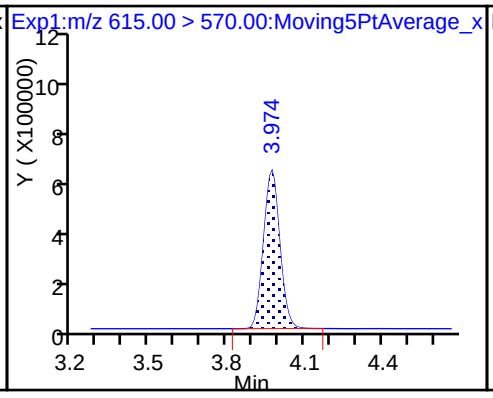
37 Perfluorododecanoic acid (ND)



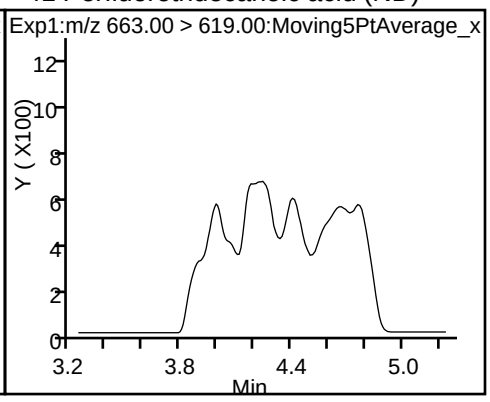
37 Perfluorododecanoic acid (ND)



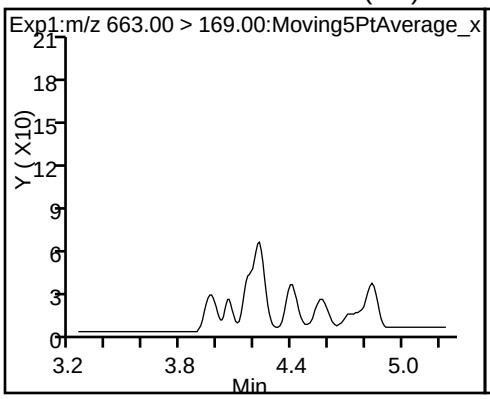
D 36 13C2 PFDoA



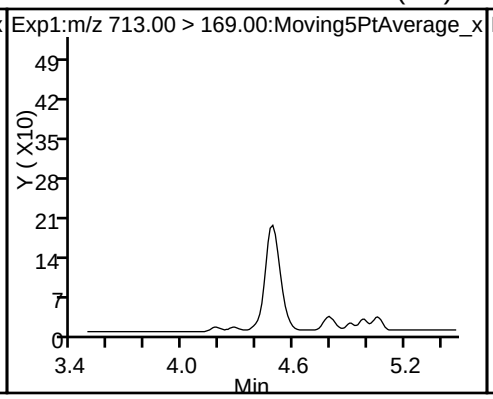
41 Perfluorotridecanoic acid (ND)



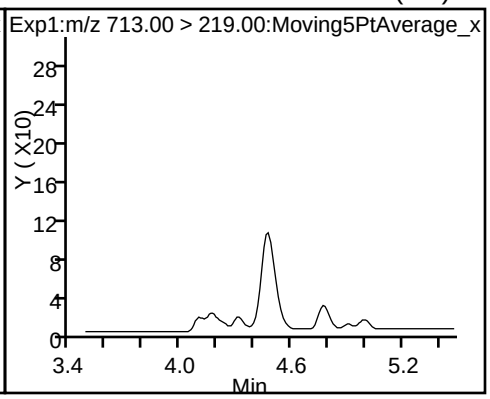
41 Perfluorotridecanoic acid (ND)



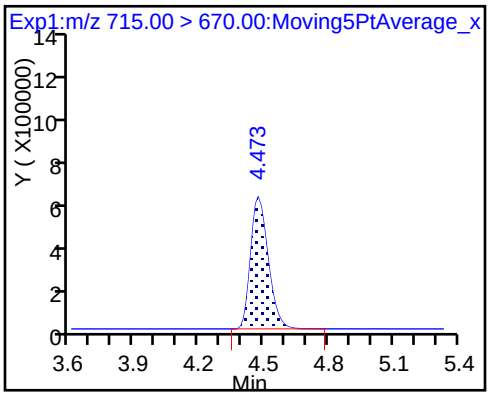
42 Perfluorotetradecanoic acid (ND)



42 Perfluorotetradecanoic acid (ND)



D 43 13C2-PFTeDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

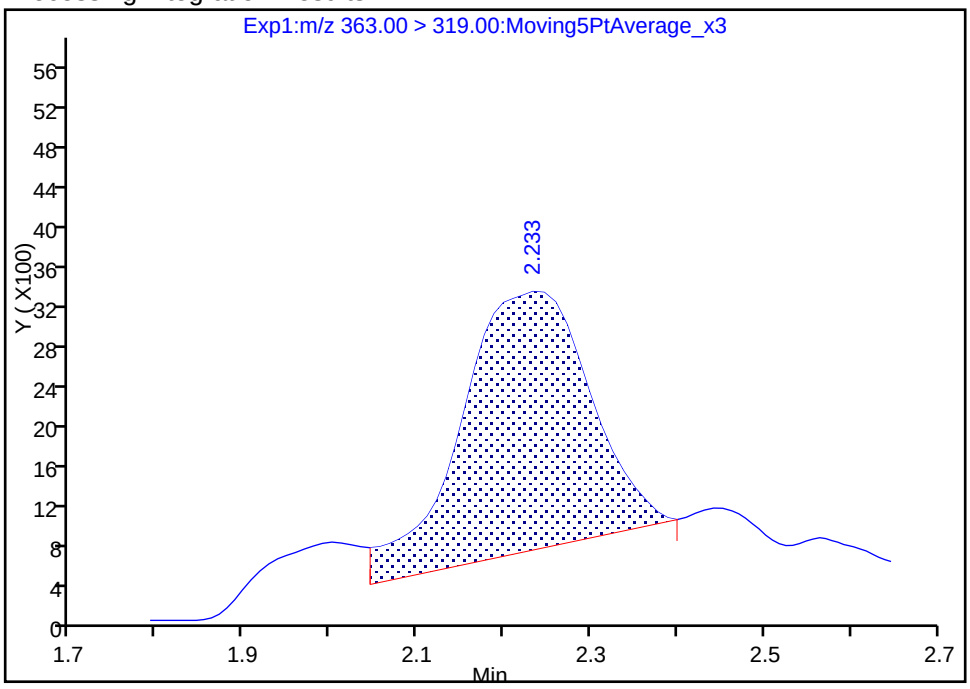
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_008.d				
Injection Date:	18-Jan-2018 18:24:31	Instrument ID:	A8_N		
Lims ID:	320-35042-A-4-A	Lab Sample ID:	320-35042-4		
Client ID:	TP-PFC-025-TPE-D				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	47	Worklist Smp#:	8
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

10 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

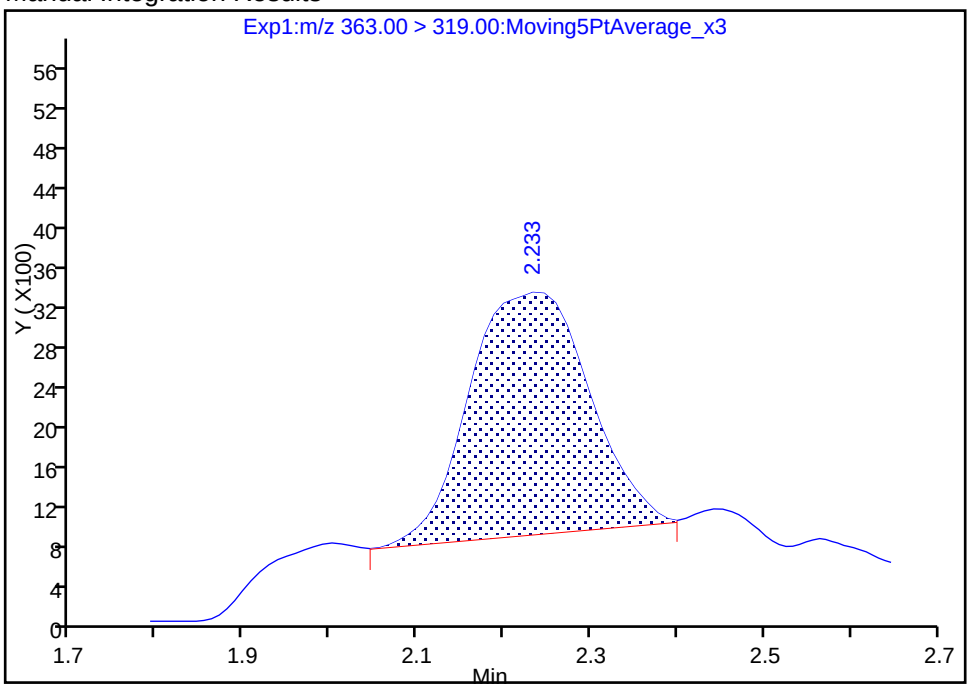
Processing Integration Results

RT: 2.23
Area: 27105
Amount: 0.012540
Amount Units: ng/ml



Manual Integration Results

RT: 2.23
Area: 23459
Amount: 0.010853
Amount Units: ng/ml



Reviewer: roycea, 19-Jan-2018 16:28:41

Audit Action: Manually Integrated Audit Reason: Baseline

TestAmerica Sacramento

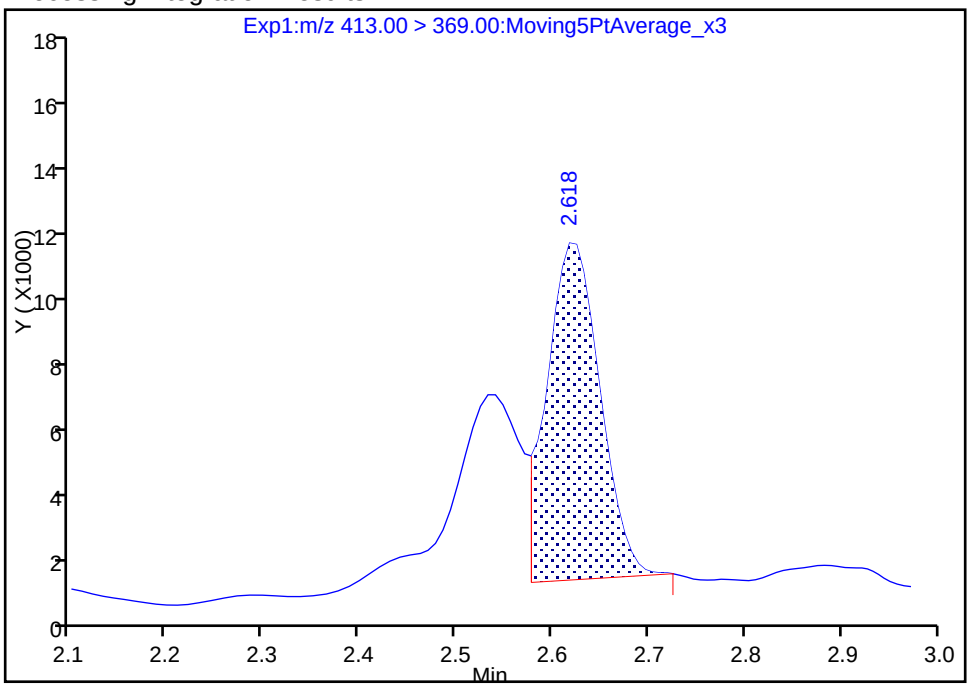
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_008.d				
Injection Date:	18-Jan-2018 18:24:31	Instrument ID:	A8_N		
Lims ID:	320-35042-A-4-A	Lab Sample ID:	320-35042-4		
Client ID:	TP-PFC-025-TPE-D				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	47	Worklist Smp#:	8
Injection 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

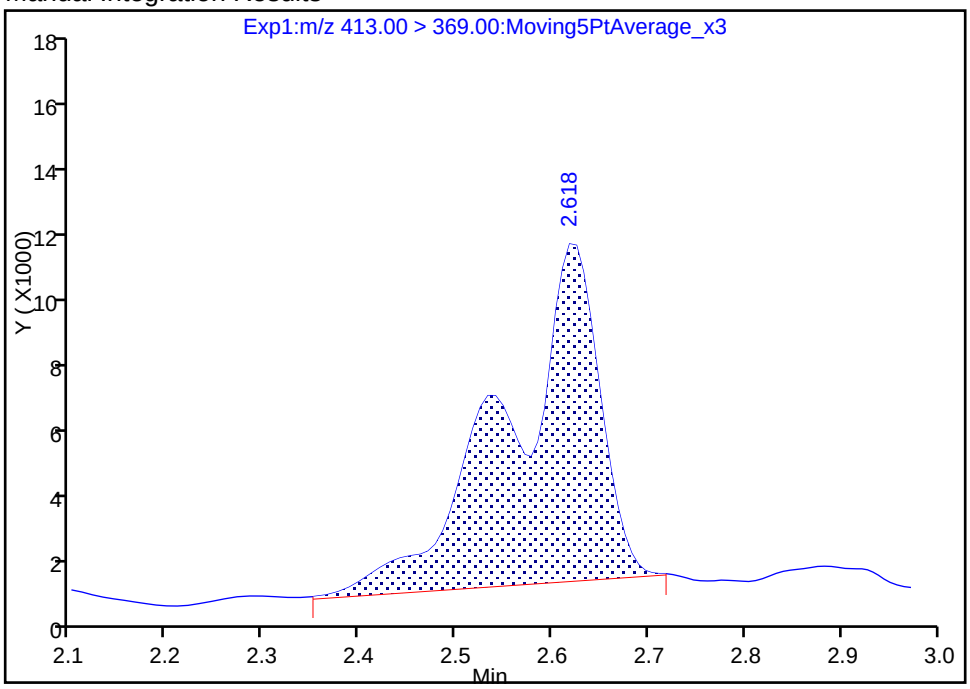
Processing Integration Results

RT: 2.62
Area: 36316
Amount: 0.016283
Amount Units: ng/ml



Manual Integration Results

RT: 2.62
Area: 64858
Amount: 0.029080
Amount Units: ng/ml



Reviewer: roycea, 19-Jan-2018 16:29:16
Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

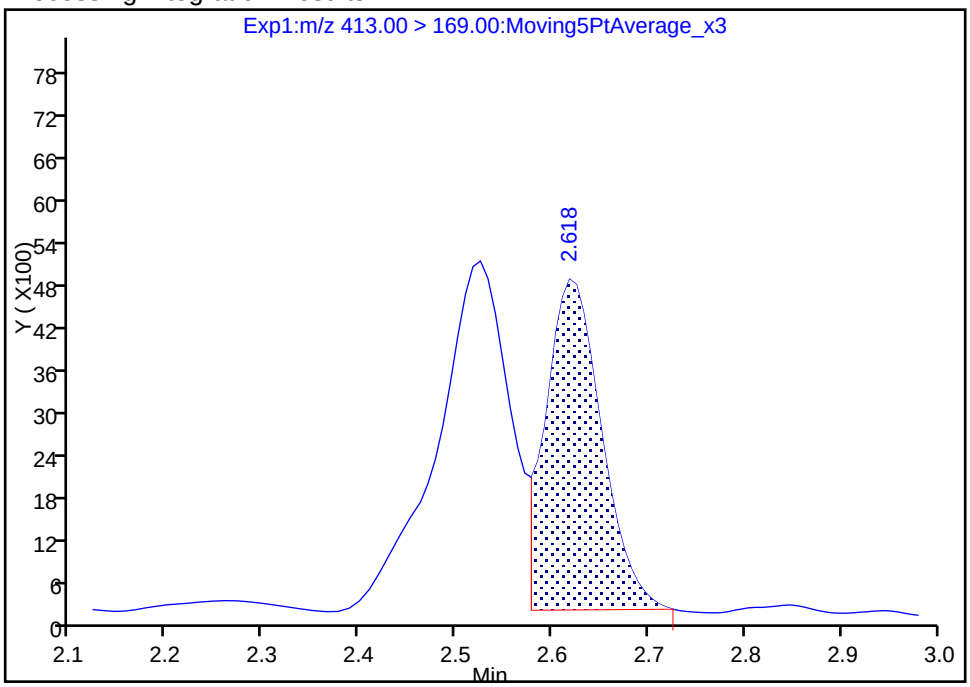
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_008.d				
Injection Date:	18-Jan-2018 18:24:31	Instrument ID:	A8_N		
Lims ID:	320-35042-A-4-A	Lab Sample ID:	320-35042-4		
Client ID:	TP-PFC-025-TPE-D				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	47	Worklist Smp#:	8
Injection 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

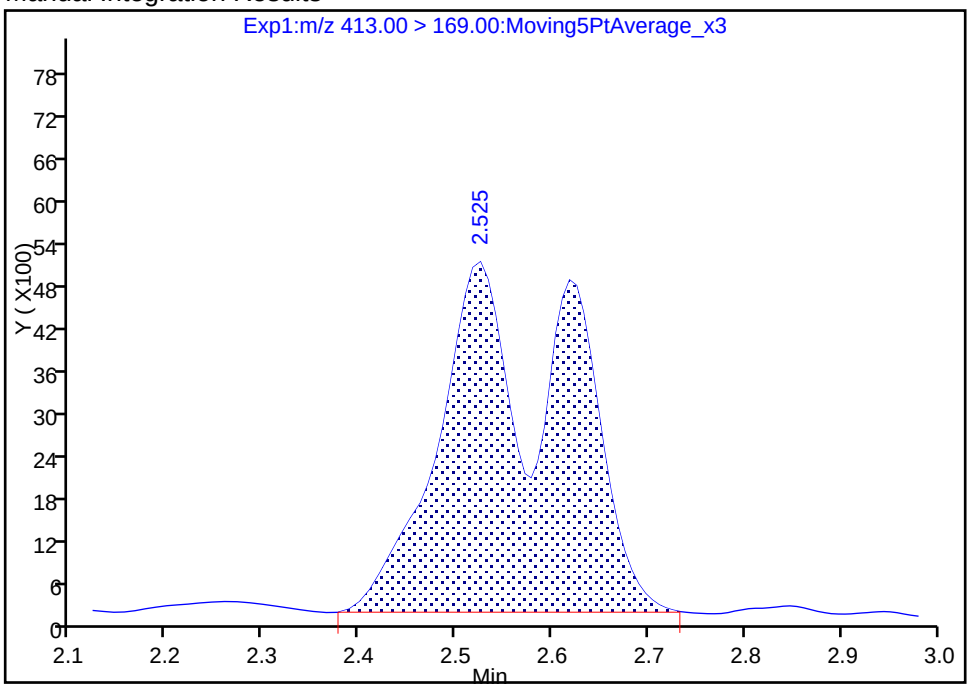
Processing Integration Results

RT: 2.62
Area: 18770
Amount: 0.016283
Amount Units: ng/ml



Manual Integration Results

RT: 2.53
Area: 45211
Amount: 0.029080
Amount Units: ng/ml



Reviewer: roycea, 19-Jan-2018 16:29:21

Audit Action: Manually Integrated Audit Reason: Isomers

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1 Analy Batch No.: 204375

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/17/2018 14:19 Calibration End Date: 01/17/2018 15:06 Calibration ID: 37572

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-204375/2	2018.01.17CURVELLA_002.d
Level 2	IC 320-204375/3	2018.01.17CURVELLA_003.d
Level 3	IC 320-204375/4	2018.01.17CURVELLA_004.d
Level 4	IC 320-204375/5	2018.01.17CURVELLA_005.d
Level 5	IC 320-204375/6	2018.01.17CURVELLA_006.d
Level 6	IC 320-204375/7	2018.01.17CURVELLA_007.d
Level 7	IC 320-204375/8	2018.01.17CURVELLA_008.d

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Perfluorobutanoic acid (PFBA)	0.9492 0.9454	0.9387 0.9305	0.9217	0.9121	0.9423	AveID		0.9343				1.4		35.0			
Perfluoropentanoic acid (PFPeA)	1.2629 1.1486	1.1820 1.1603	1.1793	1.1351	1.1782	AveID		1.1781				3.5		35.0			
Perfluorobutanesulfonic acid (PFBS)	77.125 80.005	75.338 74.458	80.939	77.763	74.861	AveID		77.213				3.3		50.0			
4:2 FTS	14.861 14.172	13.294 14.456	13.574	13.365	13.533	AveID		13.894				4.4		35.0			
Perfluorohexanoic acid (PFHxA)	1.1691 1.0364	1.0016 1.0049	1.0117	1.0418	0.9896	AveID		1.0365				5.9		35.0			
Perfluoroheptanoic acid (PFHpA)	1.0781 1.1040	1.1090 1.0717	1.2181	1.0322	1.0801	AveID		1.0990				5.3		35.0			
Perfluorohexanesulfonic acid (PFHxS)	1.2907 1.1001	1.1727 1.0631	1.0672	1.0113	1.0892	AveID		1.1135				8.3		35.0			
6:2FTS	1.8237 1.7817	1.5350 1.6869	1.5599	1.5572	1.6409	AveID		1.6551				6.9		35.0			
Perfluorooctanoic acid (PFOA)	1.3391 1.1097	1.2175 1.1351	1.1389	1.1301	1.1344	AveID		1.1721				6.9		35.0			
Perfluoroheptanesulfonic Acid (PFHpS)	1.2991 1.4080	1.3017 1.3785	1.3248	1.3329	1.4365	AveID		1.3545				4.0		50.0			
Perfluorononanoic acid (PFNA)	1.0065 1.0724	0.9779 1.0322	1.0085	1.0513	1.0771	AveID		1.0323				3.6		35.0			
Perfluorooctanesulfonic acid (PFOS)	1.1888 1.1074	1.1027 1.1406	1.0854	1.0789	1.1321	AveID		1.1194				3.4		35.0			
Perfluorooctane Sulfonamide (FOSA)	0.9734 1.0164	0.9422 0.9708	0.9781	0.9630	1.0326	AveID		0.9823				3.2		35.0			
8:2FTS	1.1123 1.2810	1.2494 1.2330	1.2204	1.1973	1.2254	AveID		1.2170				4.4		35.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1 Analy Batch No.: 204375

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/17/2018 14:19 Calibration End Date: 01/17/2018 15:06 Calibration ID: 37572

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Perfluorodecanoic acid (PFDA)	0.9958 1.0058	0.9255 0.9904	0.9962	0.9341	0.9440	AveID		0.9702				3.5		35.0			
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	1.1587 1.0920	1.0556 1.1156	1.0118	1.0520	1.0759	AveID		1.0802				4.4		35.0			
Perfluorodecanesulfonic acid (PFDS)	0.6602 0.6484	0.5989 0.6844	0.6566	0.6572	0.6784	AveID		0.6549				4.2		50.0			
Perfluoroundecanoic acid (PFUnA)	1.2159 0.9998	1.0169 1.0224	1.0056	0.9503	1.0142	AveID		1.0322				8.2		35.0			
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.9515 1.0073	0.9715 1.0104	0.9434	0.9222	1.0107	AveID		0.9739				3.7		35.0			
Perfluorododecanoic acid (PFDoA)	0.9260 1.0217	1.0424 1.0415	1.0407	1.0402	1.0605	AveID		1.0247				4.4		35.0			
Perfluorotridecanoic Acid (PFTriA)	1.3513 1.1017	1.1184 1.1380	1.0705	1.1935	1.1553	AveID		1.1612				8.0		50.0			
Perfluorotetradecanoic acid (PFTeA)	0.2670 0.2417	0.2330 0.2473	0.2354	0.2343	0.2495	AveID		0.2440				4.9		50.0			
Perfluoro-n-hexadecanoic acid (PFHxDA)	+++++ 0.9569	1.3189 0.9411	0.9976	0.9485	0.9929	L2ID	0.0183	0.9474							0.9990		0.9900
Perfluoro-n-octadecanoic acid (PFODA)	1.0044 1.1214	0.9618 1.0904	1.0301	1.0498	1.1172	AveID		1.0536				5.7		50.0			
13C4 PFBA	1.5259 1.5432	1.4941 1.5278	1.4952	1.4862	1.5144	Ave		1.5124				1.4		50.0			
13C5 PFPeA	0.8953 0.9232	0.9039 0.8803	0.8845	0.8952	0.8865	Ave		0.8956				1.6		50.0			
13C3-PFBS	0.0201 0.0200	0.0191 0.0199	0.0196	0.0193	0.0207	Ave		0.0198				2.7		50.0			
13C2 PFHxA	0.9582 0.9743	0.9588 0.9515	0.9851	0.9384	0.9878	Ave		0.9649				1.9		50.0			
13C4-PFHpA	0.9403 0.9242	0.9318 0.8808	0.9077	0.9173	0.9288	Ave		0.9187				2.1		50.0			
18O2 PFHxS	1.1706 1.1114	1.1402 1.1088	1.1523	1.1305	1.1042	Ave		1.1311				2.2		50.0			
M2-6:2FTS	0.1667 0.1660	0.1714 0.1654	0.1731	0.1738	0.1725	Ave		0.1699				2.1		50.0			
13C4 PFOA	0.9250 0.9076	0.8991 0.8635	0.9088	0.8785	0.9201	Ave		0.9004				2.5		50.0			
13C4 PFOS	0.7222 0.7287	0.7129 0.6942	0.7303	0.7109	0.7113	Ave		0.7158				1.7		50.0			
13C5 PFNA	0.7504 0.7333	0.7406 0.7157	0.7466	0.7136	0.7096	Ave		0.7300				2.3		50.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1 Analy Batch No.: 204375

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/17/2018 14:19 Calibration End Date: 01/17/2018 15:06 Calibration ID: 37572

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
13C8 FOSA	1.0308 0.9887	1.0350 0.9639	1.0156	1.0178	0.9955	Ave		1.0067				2.5		50.0			
M2-8:2FTS	0.1862 0.1771	0.1796 0.1819	0.1811	0.1727	0.1782	Ave		0.1795				2.3		50.0			
13C2 PFDA	0.6444 0.6295	0.6287 0.6181	0.6279	0.6313	0.6343	Ave		0.6306				1.2		50.0			
d3-NMeFOSAA	0.3174 0.3180	0.3130 0.3163	0.3169	0.3149	0.3063	Ave		0.3147				1.3		50.0			
d5-NEtFOSAA	0.3461 0.3155	0.3243 0.2973	0.3232	0.3158	0.3054	Ave		0.3182				4.9		50.0			
13C2 PFUnA	0.4983 0.4862	0.4847 0.4512	0.4836	0.4728	0.4716	Ave		0.4783				3.1		50.0			
13C2 PFDoA	0.5470 0.5260	0.5388 0.4978	0.5263	0.4927	0.5060	Ave		0.5192				4.0		50.0			
13C2-PFTeDA	0.7322 0.6661	0.7412 0.6171	0.6868	0.6615	0.6446	Ave		0.6785				6.7		50.0			
13C2-PFHxDA	1.2777 1.1845	1.2965 1.0894	1.2016	1.2154	1.1984	Ave		1.2091				5.6		50.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1 Analy Batch No.: 204375

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/17/2018 14:19 Calibration End Date: 01/17/2018 15:06 Calibration ID: 37572

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-204375/2	2018.01.17CURVELLA_002.d
Level 2	IC 320-204375/3	2018.01.17CURVELLA_003.d
Level 3	IC 320-204375/4	2018.01.17CURVELLA_004.d
Level 4	IC 320-204375/5	2018.01.17CURVELLA_005.d
Level 5	IC 320-204375/6	2018.01.17CURVELLA_006.d
Level 6	IC 320-204375/7	2018.01.17CURVELLA_007.d
Level 7	IC 320-204375/8	2018.01.17CURVELLA_008.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Perfluorobutanoic acid (PFBA)		AveID	71970 13027499	134919 24898296	645094	2581287	6694565	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoropentanoic acid (PFPeA)		AveID	56184 9469006	102787 17890417	488305	1934955	4900043	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorobutanesulfonic acid (PFBS)		AveID	67976 12635108	122306 22970596	656362	2532634	6433939	0.0221 4.42	0.0442 8.84	0.221	0.884	2.21
4:2 FTS		AveID	13839 2364722	22803 4712009	116305	459884	1228862	0.0234 4.67	0.0467 9.34	0.234	0.934	2.34
Perfluorohexanoic acid (PFHxA)		AveID	55664 9016831	92376 16747455	466560	1861593	4586272	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoroheptanoic acid (PFHpA)		AveID	50371 9111535	99406 16533181	517603	1803022	4706368	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorohexanesulfonic acid (PFHxS)		AveID	68319 9935695	117059 18787887	523793	1981094	5134885	0.0228 4.55	0.0455 9.10	0.228	0.910	2.28
6:2FTS		AveID	14322 2504300	23999 4633505	119814	488565	1258940	0.0237 4.74	0.0474 9.48	0.237	0.948	2.37
Perfluorooctanoic acid (PFOA)		AveID	61549 8993265	105297 17167030	484462	1890626	4896648	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoroheptanesulfonic Acid (PFHpS)		AveID	44381 8721809	84987 15956747	431169	1717801	4563453	0.0238 4.76	0.0476 9.52	0.238	0.952	2.38
Perfluorononanoic acid (PFNA)		AveID	37531 7021740	69666 12938458	352431	1428679	3585870	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorooctanesulfonic acid (PFOS)		AveID	39589 6686934	70183 12870491	344328	1355316	3505745	0.0232 4.64	0.0464 9.28	0.232	0.928	2.32
Perfluorooctane Sulfonamide (FOSA)		AveID	49852 8973330	93805 16389523	464966	1866404	4822749	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
8:2FTS		AveID	9860 1941077	20684 3762460	99090	377296	981168	0.0240 4.79	0.0479 9.58	0.240	0.958	2.40
Perfluorodecanoic acid (PFDA)		AveID	31882 5653894	55975 10721843	292799	1122840	2809263	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1 Analy Batch No.: 204375

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/17/2018 14:19 Calibration End Date: 01/17/2018 15:06 Calibration ID: 37572

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)		AveID	18275 3100803	31785 6179313	150110	630879	1546077	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorodecanesulfonic acid (PFDS)		AveID	22837 4067427	39594 8022809	216397	857674	2182261	0.0241 4.82	0.0482 9.64	0.241	0.964	2.41
Perfluoroundecanoic acid (PFUnA)		AveID	30104 4341065	47415 8080078	227630	855685	2244135	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)		AveID	16362 2837873	30312 5261873	142743	554613	1447969	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorododecanoic acid (PFDoA)		AveID	25166 4798721	54026 9080911	256381	975905	2517800	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorotridecanoic Acid (PFTriA)		AveID	36726 5174158	57967 9922216	263708	1119808	2742788	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorotetradecanoic acid (PFTeA)		AveID	9714 1437735	16612 2672440	75670	295170	754490	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoro-n-hexadecanoic acid (PFHxDA)		L2ID	+++++ 10121041	164489 17956480	561148	2195395	5582637	+++++ 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoro-n-octadecanoic acid (PFODA)		AveID	63769 11861271	119958 20806019	579412	2429777	6281608	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
13C4 PFBA	13PFOA	Ave	7581930 6889924	7186789 6689622	6999196	7075449	7104763	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C5 PFPeA	13PFOA	Ave	4448756 4122126	4347864 3854737	4140508	4261723	4159040	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C3-PFBS	13PFOA	Ave	92724 83073	85395 81139	85313	85658	90418	2.33 2.33	2.33 2.33	2.33	2.33	2.33
13C2 PFHxA	13PFOA	Ave	4761111 4349882	4611605 4166297	4611448	4467394	4634604	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C4-PFHpA	13PFOA	Ave	4672251 4126515	4481837 3856924	4249130	4367056	4357423	2.50 2.50	2.50 2.50	2.50	2.50	2.50
18O2 PFHxS	13PFOA	Ave	5502563 4694368	5188305 4592963	5102469	5091273	4900649	2.37 2.37	2.37 2.37	2.37	2.37	2.37
M2-6:2FTS	13PFOA	Ave	786962 704248	783363 688126	769728	786039	768843	2.38 2.38	2.38 2.38	2.38	2.38	2.38
13C4 PFOA	13PFOA	Ave	4596206 4052198	4324416 3781095	4253926	4182465	4316678	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C4 PFOS	13PFOA	Ave	3430582 3110246	3278250 2906103	3268191	3235344	3190243	2.39 2.39	2.39 2.39	2.39	2.39	2.39
13C5 PFNA	13PFOA	Ave	3728829 3273972	3562167 3133770	3494654	3397294	3329183	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C8 FOSA	13PFOA	Ave	5121669 4414446	4978224 4220474	4753896	4845519	4670673	2.50 2.50	2.50 2.50	2.50	2.50	2.50
M2-8:2FTS	13PFOA	Ave	886480 757639	827776 762870	811941	787775	800715	2.40 2.40	2.40 2.40	2.40	2.40	2.40

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1 Analy Batch No.: 204375

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/17/2018 14:19 Calibration End Date: 01/17/2018 15:06 Calibration ID: 37572

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
13C2 PFDA	13PF OA	Ave	3201735 2810507	3024128 2706406	2939305	3005224	2975947	2.50 2.50	2.50 2.50	2.50	2.50	2.50
d3-NMeFOSAA	13PF OA	Ave	1577189 1419745	1505517 1384778	1483575	1499251	1437020	2.50 2.50	2.50 2.50	2.50	2.50	2.50
d5-NEtFOSAA	13PF OA	Ave	1719534 1408625	1560100 1301953	1512999	1503508	1432688	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2 PFUnA	13PF OA	Ave	2475898 2170924	2331330 1975688	2263551	2250985	2212774	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2 PFDoA	13PF OA	Ave	2717793 2348326	2591482 2179814	2463501	2345552	2374065	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2-PFTeDA	13PF OA	Ave	3638245 2973878	3565275 2702115	3214801	3148987	3024149	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2-PFHxDA	13PF OA	Ave	6348846 5288590	6235993 4770244	5624728	5786263	5622608	2.50 2.50	2.50 2.50	2.50	2.50	2.50

Curve Type Legend:

Ave = Average ISTD
AveID = Average isotope dilution
L2ID = Linear 1/conc^2 IsoDil

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
READBACK PERCENT ERROR

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1 Analy Batch No.: 204375

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/17/2018 14:19 Calibration End Date: 01/17/2018 15:06 Calibration ID: 37572

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-204375/2	2018.01.17CURVELLA_002.d
Level 2	IC 320-204375/3	2018.01.17CURVELLA_003.d
Level 3	IC 320-204375/4	2018.01.17CURVELLA_004.d
Level 4	IC 320-204375/5	2018.01.17CURVELLA_005.d
Level 5	IC 320-204375/6	2018.01.17CURVELLA_006.d
Level 6	IC 320-204375/7	2018.01.17CURVELLA_007.d
Level 7	IC 320-204375/8	2018.01.17CURVELLA_008.d

ANALYTE	PERCENT ERROR						PERCENT ERROR LIMIT					
	LVL 1 # LVL 7 #	LVL 2 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1 LVL 7	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6
Perfluorobutanoic acid (PFBA)	-0.4	0.5	-1.3	-2.4	0.9	1.2	25	25	25	25	25	25
Perfluoropentanoic acid (PFPeA)	-1.5	0.3	0.1	-3.6	0.0	-2.5	25	25	25	25	25	25
Perfluorobutanesulfonic acid (PFBS)	-3.6	-2.4	4.8	0.7	-3.0	3.6	25	25	25	25	25	25
4:2 FTS	4.0	-4.3	-2.3	-3.8	-2.6	2.0	25	25	25	25	25	25
Perfluorohexanoic acid (PFHxA)	-3.0	-3.4	-2.4	0.5	-4.5	0.0	25	25	25	25	25	25
Perfluoroheptanoic acid (PFHpA)	-2.5	0.9	10.8	-6.1	-1.7	0.5	25	25	25	25	25	25
Perfluorohexanesulfonic acid (PFHxS)	-4.5	5.3	-4.2	-9.2	-2.2	-1.2	25	25	25	25	25	25
6:2FTS	1.9	-7.3	-5.8	-5.9	-0.9	7.7	25	25	25	25	25	25
Perfluorooctanoic acid (PFOA)	-3.2	3.9	-2.8	-3.6	-3.2	-5.3	25	25	25	25	25	25
Perfluoroheptanesulfonic Acid (PFHpS)	1.8	-3.9	-2.2	-1.6	6.1	3.9	25	25	25	25	25	25
Perfluorononanoic acid (PFNA)	0.0	-5.3	-2.3	1.8	4.3	3.9	25	25	25	25	25	25
Perfluorooctanesulfonic acid (PFOS)	1.9	-1.5	-3.0	-3.6	1.1	-1.1	25	25	25	25	25	25
Perfluorooctane Sulfonamide (FOSA)	-1.2	-4.1	-0.4	-2.0	5.1	3.5	25	25	25	25	25	25
8:2FTS	1.3	2.7	0.3	-1.6	0.7	5.3	25	25	25	25	25	25
Perfluorodecanoic acid (PFDA)	2.1	-4.6	2.7	-3.7	-2.7	3.7	25	25	25	25	25	25

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
READBACK PERCENT ERROR

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1 Analy Batch No.: 204375

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/17/2018 14:19 Calibration End Date: 01/17/2018 15:06 Calibration ID: 37572

ANALYTE	PERCENT ERROR						PERCENT ERROR LIMIT					
	LVL 1 # LVL 7 #	LVL 2 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1 LVL 7	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	3.3	-2.3	-6.3	-2.6	-0.4	1.1	25	25	25	25	25	25
Perfluorodecanesulfonic acid (PFDS)	4.5	-8.6	0.3	0.4	3.6	-1.0	25	25	25	25	25	25
Perfluoroundecanoic acid (PFUnA)	-0.9	-1.5	-2.6	-7.9	-1.7	-3.1	25	25	25	25	25	25
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	3.8	-0.2	-3.1	-5.3	3.8	3.4	25	25	25	25	25	25
Perfluorododecanoic acid (PFDoA)	1.6	1.7	1.6	1.5	3.5	-0.3	25	25	25	25	25	25
Perfluorotridecanoic Acid (PFTriA)	-2.0	-3.7	-7.8	2.8	-0.5	-5.1	25	25	25	25	25	25
Perfluorotetradecanoic acid (PFTeA)	1.3	-4.5	-3.5	-4.0	2.2	-0.9	25	25	25	25	25	25
Perfluoro-n-hexadecanoic acid (PFHxDA)	+++++ -0.9		-2.4	-1.8	4.0	0.6	25		25	25	25	25
Perfluoro-n-octadecanoic acid (PFODA)	3.5	-8.7	-2.2	-0.4	6.0	6.4	25	25	25	25	25	25

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_002.d
Lims ID: IC L1 Full
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 17-Jan-2018 14:19:28 ALS Bottle#: 10 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L1-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-A8_N*sub30

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 18-Jan-2018 08:22:18 Calib Date: 17-Jan-2018 15:06:20
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_008.d

Column 1 : Det: EXP1
Process Host: XAWRK019

First Level Reviewer: hannigana Date: 17-Jan-2018 16:50:04

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.411	1.411	0.0	0.539	7581930	2.52		101	20935	
2 Perfluorobutyric acid										
212.90 > 169.00	1.411	1.413	-0.002	1.000	71970	0.0254		102	8.9	
D 3 13C5-PFPeA										
267.90 > 223.00	1.658	1.659	-0.001	0.633	4448756	2.50		100.0	60885	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.667	1.662	0.005	1.005	56184	0.0268		107	48.5	
D 47 13C3-PFBS										
301.90 > 83.00	1.694	1.695	-0.001	0.647	92724	2.35		101	3469	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.703	1.697	0.006	1.005	67976	0.0221		99.9	723	
298.90 > 99.00	1.694	1.697	-0.003	1.000	27737		2.45(1.25-3.74)	99.9	281	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.908	1.903	0.005	1.000	13839	0.0250		107	847	
D 60 M2-4:2FTS										
329.00 > 81.00	1.908	1.903	0.005	0.729	573139	NC			6642	
D 7 13C2 PFHxA										
315.00 > 270.00	1.939	1.939	0.0	0.740	4761111	2.48		99.3	38466	
6 Perfluorohexanoic acid										M
313.00 > 269.00	1.939	1.939	0.0	1.000	55664	0.0282		113	82.9	M
313.00 > 119.00	1.949	1.939	0.010	1.005	5323		10.46(5.03-15.10)	113	58.2	
D 9 13C4-PFHpA										
367.00 > 322.00	2.273	2.267	0.006	0.868	4672251	2.56		102	27332	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.273	2.268	0.005	1.000	50371	0.0245		98.1	90.2	
363.00 > 169.00	2.273	2.268	0.005	1.000	21592		2.33(1.13-3.40)	98.1	179	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.286	2.280	0.006	1.000	68319	0.0264		116	357	
399.00 > 99.00	2.286	2.280	0.006	1.000	22422		3.05(1.50-4.49)	116	177	
D 11 18O2 PFHxS										
403.00 > 84.00	2.286	2.282	0.004	0.873	5502563	2.45		103	34563	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.592	2.596	-0.004	0.998	14322	0.0261		110	230	
D 12 M2-6:2FTS										
429.00 > 81.00	2.598	2.597	0.001	0.992	786962	2.33		98.2	19002	
D 14 13C4 PFOA										
417.00 > 372.00	2.618	2.622	-0.004	1.000	4596206	2.57		103	25049	
* 62 13C2-PFOA										
415.00 > 370.00	2.618	2.622	-0.004		4968823	2.50			36344	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.625	2.623	0.002	1.003	61549	0.0286		114	46.8	
413.00 > 169.00	2.625	2.623	0.002	1.003	31497		1.95(0.84-2.52)	114	341	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.625	2.629	-0.004	1.000	44381	0.0228		95.9	1137	
449.00 > 99.00	2.633	2.629	0.004	1.003	10990		4.04(1.94-5.82)	95.9	376	
D 19 13C5 PFNA										
468.00 > 423.00	2.992	2.992	0.0	1.143	3728829	2.57		103	24545	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.992	2.992	0.0	1.000	39589	0.0246		106	15.5	
499.00 > 99.00	2.992	2.992	0.0	1.000	8998		4.40(2.31-6.93)	106	23.3	
D 18 13C4 PFOS										
503.00 > 80.00	2.992	2.992	0.0	1.143	3430582	2.41		101	27205	
20 Perfluorononanoic acid										
463.00 > 419.00	2.992	2.992	0.0	1.000	37531	0.0244		97.5	137	
463.00 > 169.00	2.992	2.992	0.0	1.000	7669		4.89(1.90-5.69)	97.5	183	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.338	3.338	0.0	1.000	49852	0.0248		99.1	1336	
D 21 13C8 FOSA										
506.00 > 78.00	3.338	3.338	0.0	1.275	5121669	2.56		102	26667	
D 26 M2-8:2FTS										
529.00 > 81.00	3.338	3.342	-0.004	1.275	886480	2.48		104	21540	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.338	3.342	-0.004	1.000	9860	0.0219		91.4	410	
D 23 13C2 PFDA										
515.00 > 470.00	3.354	3.352	0.002	1.281	3201735	2.55		102	24663	
24 Perfluorodecanoic acid										R
513.00 > 469.00	3.354	3.353	0.001	1.000	31882	0.0257		103	167	R
513.00 > 169.00	3.346	3.353	-0.007	0.998	4224		7.55(2.36-7.09)	103	193	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.506	3.507	-0.001	1.339	1577189	2.52		101	9864	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.513	3.513	0.0	1.002	18275	0.0268		107	176	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.670	3.666	0.004	1.000	22837	0.0243		101	815	
599.00 > 99.00	3.662	3.666	-0.004	0.998	7975		2.86(1.39-4.16)	101	416	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.670	3.672	-0.002	1.402	1719534	2.72		109	5328	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.677	3.678	-0.001	1.000	30104	0.0294		118	150	
563.00 > 169.00	3.686	3.678	0.008	1.002	5221		5.77(0.00-0.00)	118	226	
D 30 13C2 PFUnA										
565.00 > 520.00	3.677	3.679	-0.002	1.404	2475898	2.60		104	26904	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.677	3.679	-0.002	1.002	16362	0.0244		97.7	493	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.978	3.979	-0.001	1.000	25166	0.0226		90.4	107	
613.00 > 169.00	3.978	3.979	-0.001	1.000	7159		3.52(2.13-6.40)	90.4	279	
D 36 13C2 PFDoA										
615.00 > 570.00	3.978	3.979	-0.001	1.519	2717793	2.63		105	28326	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.240	4.242	-0.002	1.000	36726	0.0291		116	132	
663.00 > 169.00	4.240	4.242	-0.002	1.000	10674		3.44(1.25-3.76)	116	402	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.477	4.483	-0.006	1.000	9714	0.0274		109	295	
713.00 > 219.00	4.466	4.483	-0.017	0.997	5226		1.86(0.71-2.13)	109	161	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.477	4.483	-0.006	1.710	3638245	2.70		108	21362	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.898	4.902	-0.004	1.871	6348846	2.64		106	15507	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.898	4.902	-0.004	1.000	118972	0.0301		120	86.3	
813.00 > 169.00	4.898	4.902	-0.004	1.000	19372		6.14(2.86-8.58)	120	275	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.249	5.255	-0.006	1.000	63769	0.0238		95.3	20.1	
913.00 > 169.00	5.249	5.255	-0.006	1.000	7822		8.15(0.00-0.00)	95.3	41.5	

QC Flag Legend

Processing Flags

NC - Not Calibrated

R - Failed Signal Ratio Test

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL1_00003 Amount Added: 1.00 Units: mL

Report Date: 18-Jan-2018 08:22:18 Chrom Revision: 2.2 08-Dec-2017 11:41:26

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_002.d

Injection Date: 17-Jan-2018 14:19:28 Instrument ID: A8_N

Lims ID: IC L1 Full

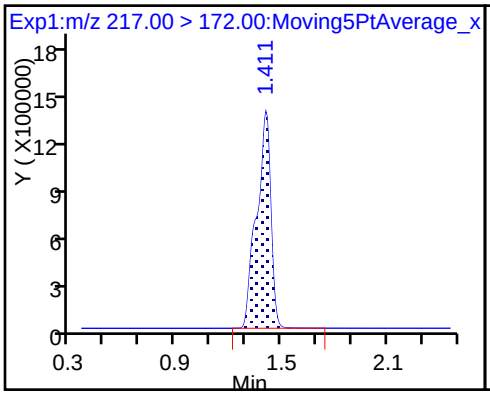
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 10 Worklist Smp#: 2

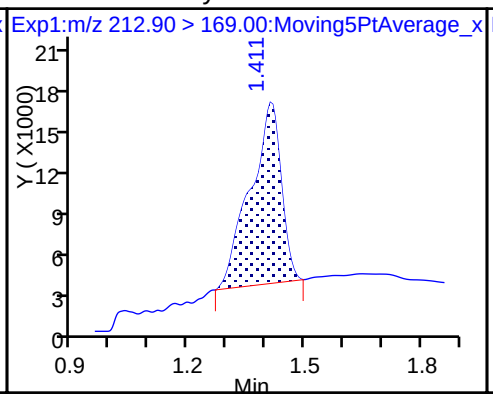
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

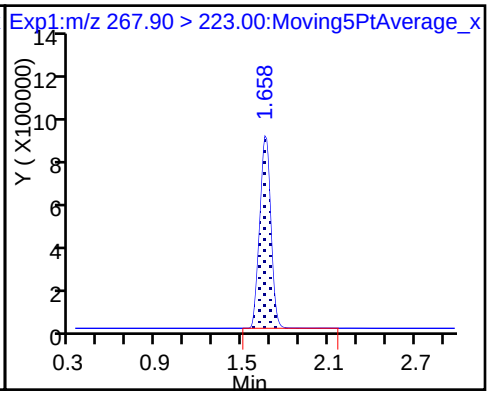
D 1 13C4 PFBA



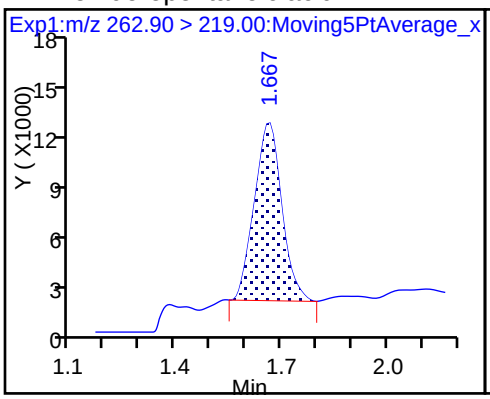
2 Perfluorobutyric acid



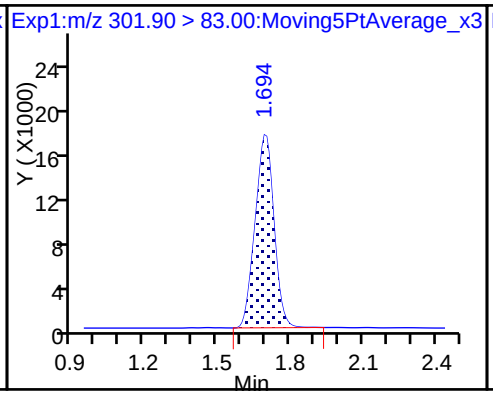
D 3 13C5-PFPeA



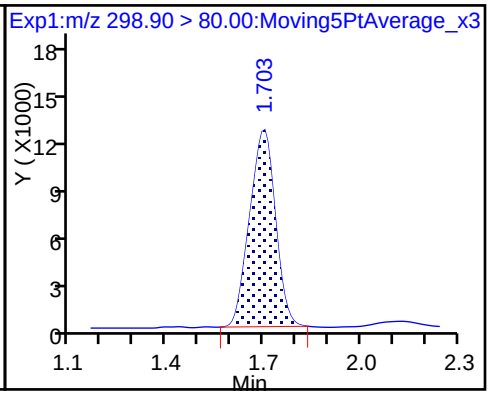
4 Perfluoropentanoic acid



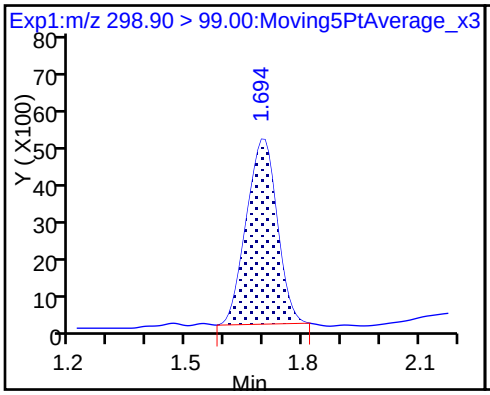
D 47 13C3-PFBS



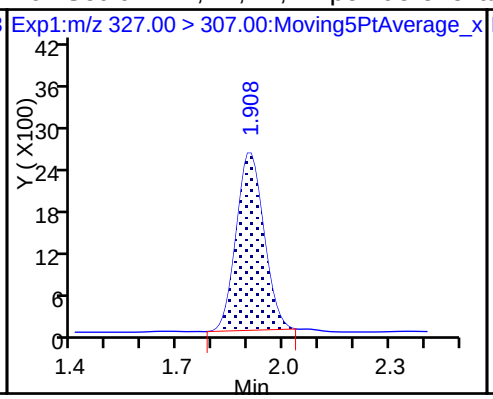
5 Perfluorobutanesulfonic acid



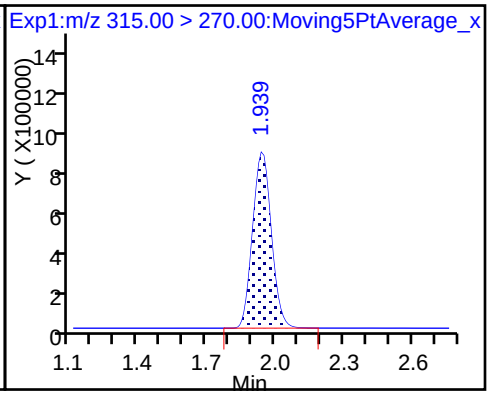
5 Perfluorobutanesulfonic acid



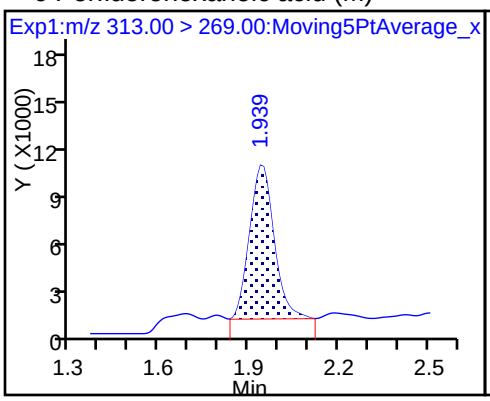
61 Sodium 1H,1H,2H,2H-perfluorohexa



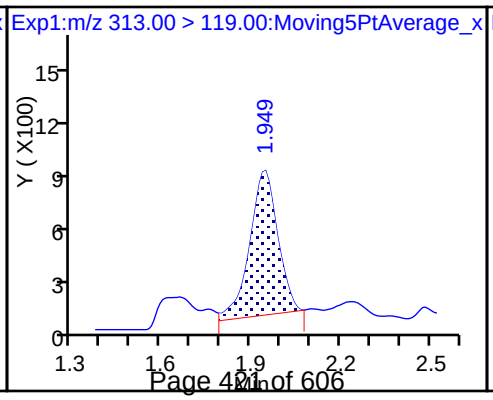
D 7 13C2 PFHxA



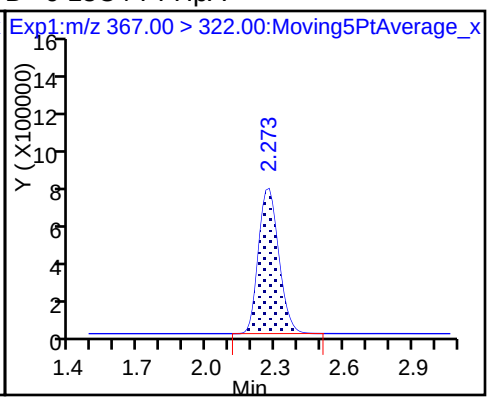
6 Perfluorohexanoic acid (M)



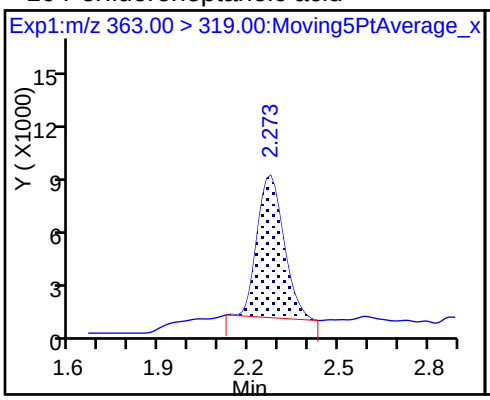
6 Perfluorohexanoic acid



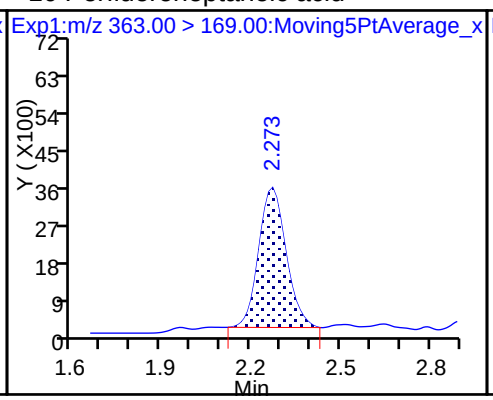
D 9 13C4-PFHpA



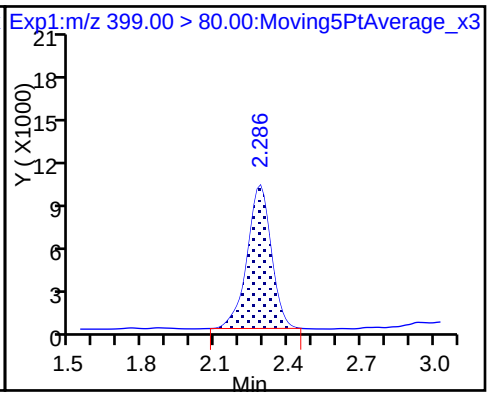
10 Perfluoroheptanoic acid



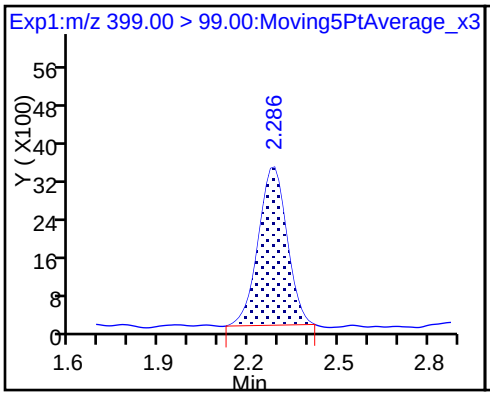
10 Perfluoroheptanoic acid



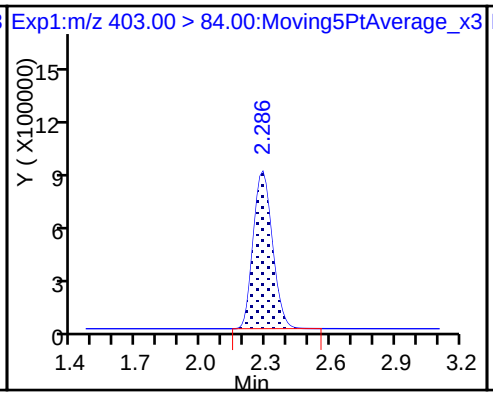
8 Perfluorohexanesulfonic acid



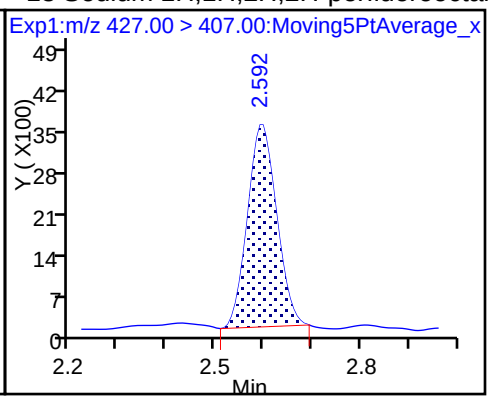
8 Perfluorohexanesulfonic acid



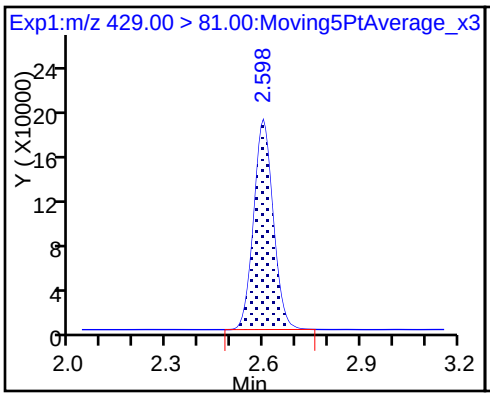
D 11 18O2 PFHxS



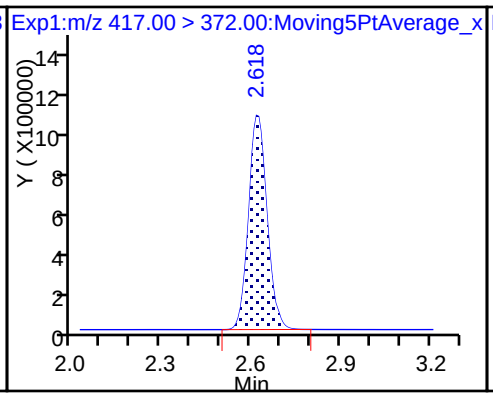
13 Sodium 1H,1H,2H,2H-perfluorooctane



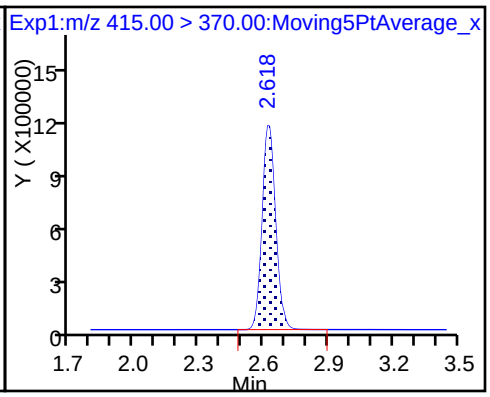
D 12 M2-6:2FTS



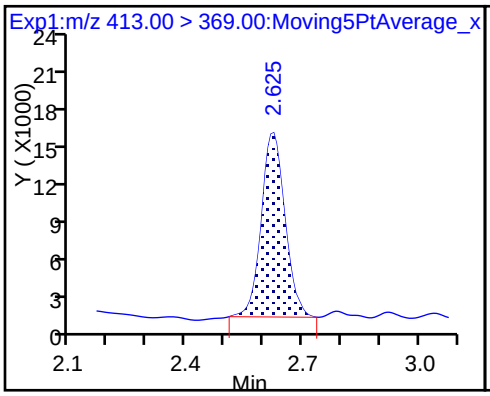
D 14 13C4 PFOA



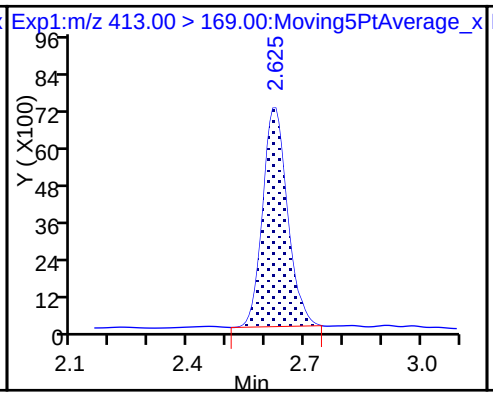
* 62 13C2-PFOA



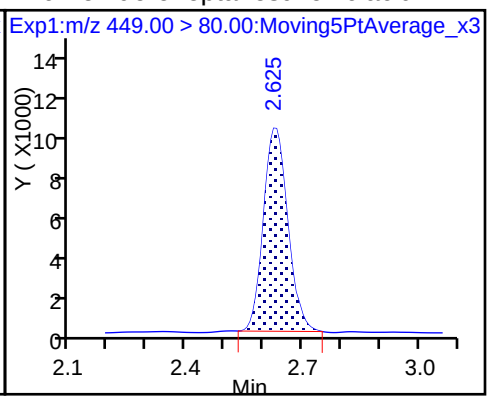
15 Perfluorooctanoic acid



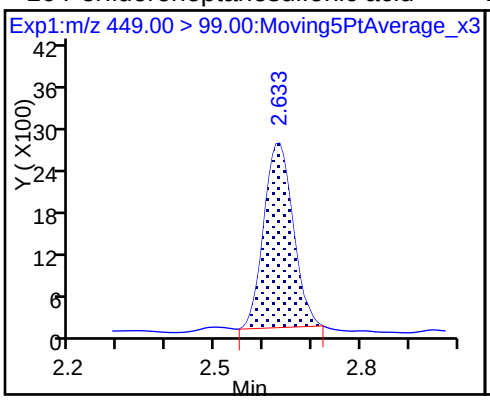
15 Perfluorooctanoic acid



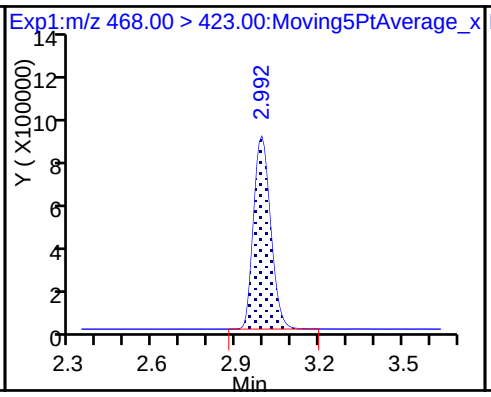
16 Perfluoroheptanesulfonic acid



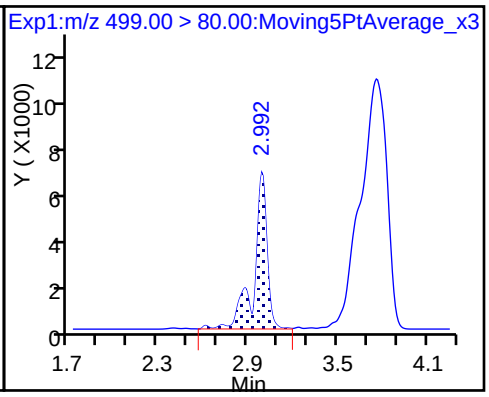
16 Perfluoroheptanesulfonic acid



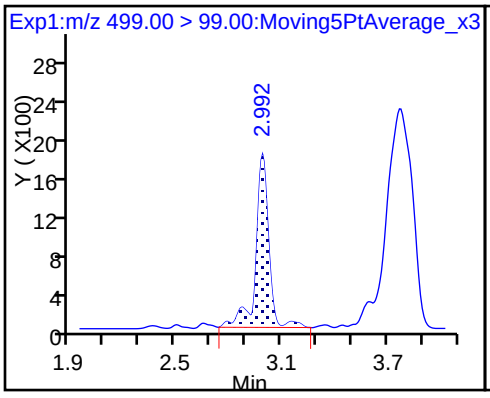
D 19 13C5 PFNA



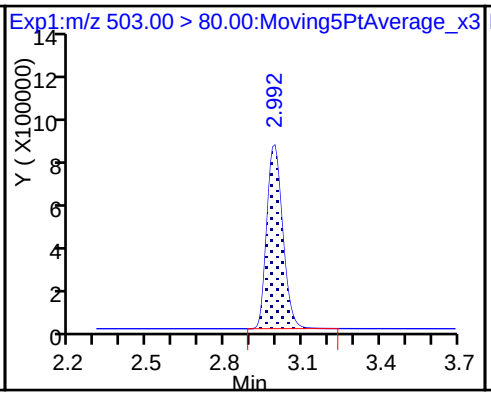
17 Perfluorooctane sulfonic acid



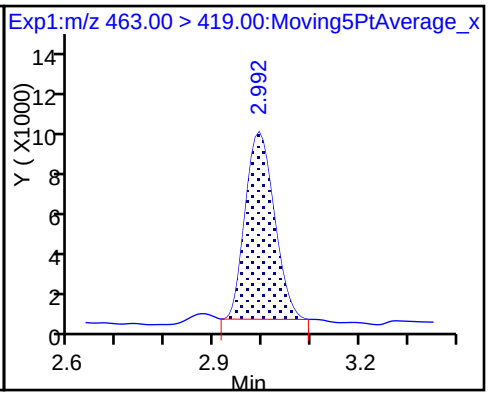
17 Perfluorooctane sulfonic acid



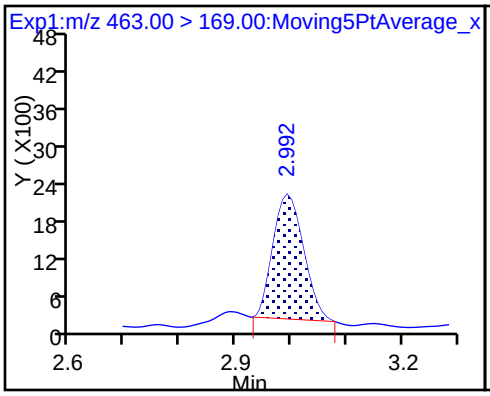
D 18 13C4 PFOS



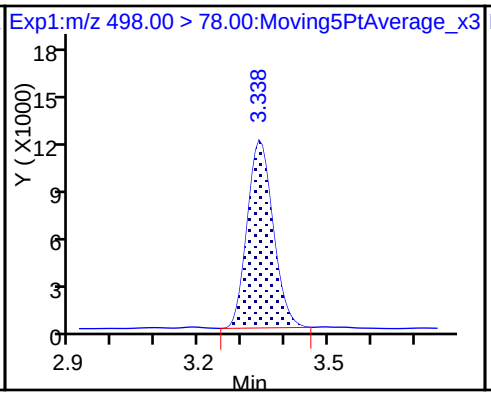
20 Perfluorononanoic acid



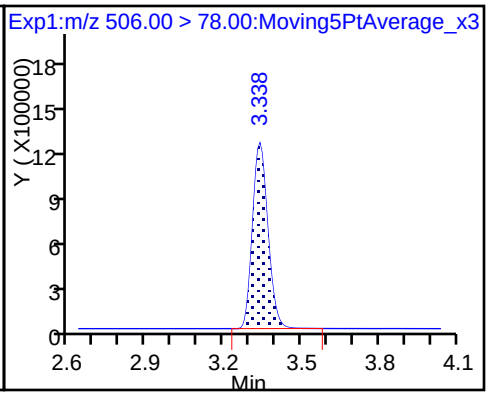
20 Perfluorononanoic acid



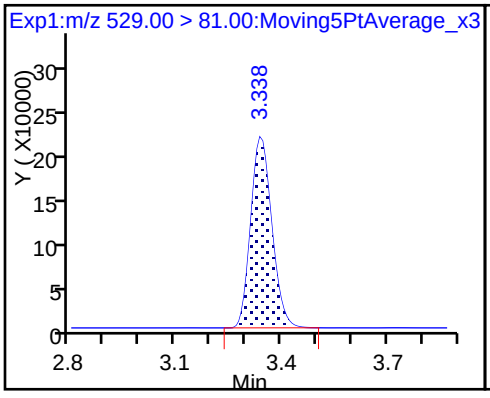
22 Perfluorooctane Sulfonamide



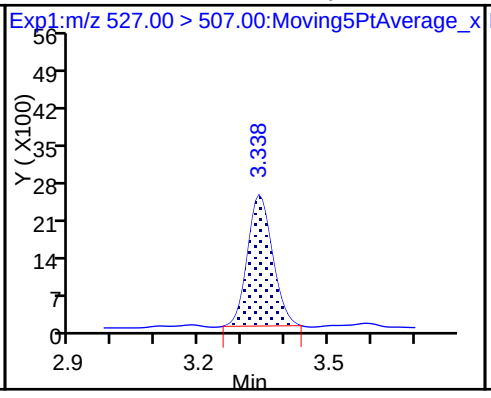
D 21 13C8 FOSA



D 26 M2-8:2FTS



25 Sodium 1H,1H,2H,2H-perfluorodecane



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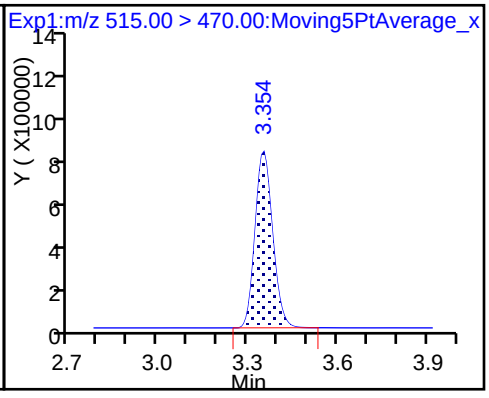
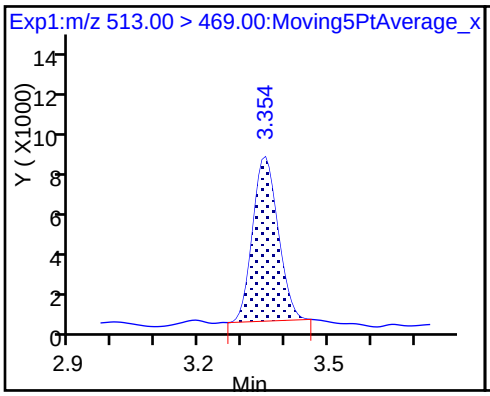
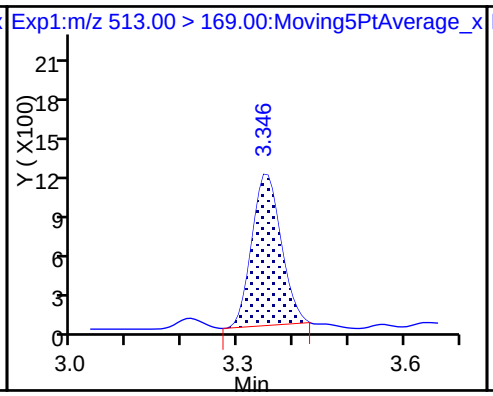


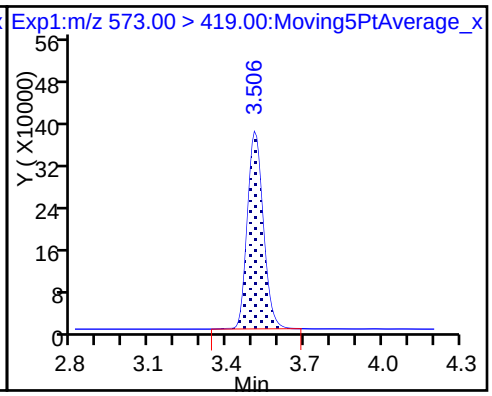
24 Perfluorodecanoic acid



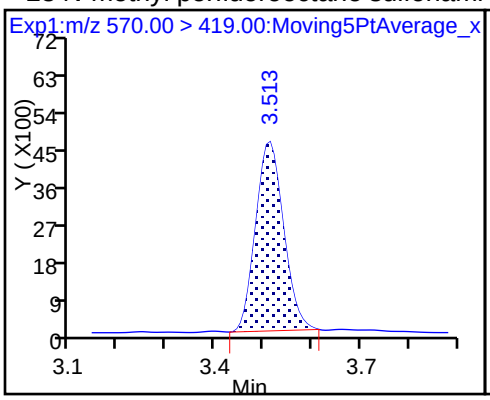
24 Perfluorodecanoic acid



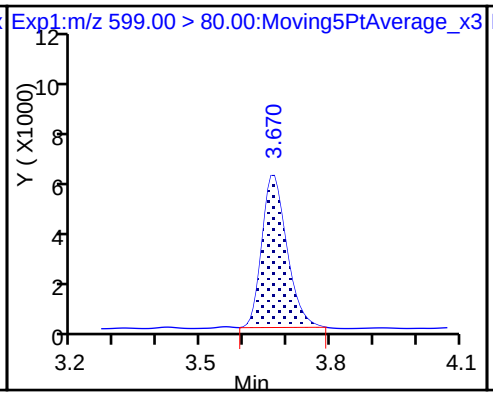
D 27 d3-NMeFOSAA



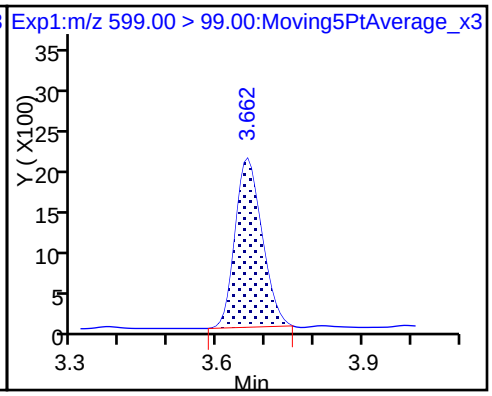
28 N-methyl perfluorooctane sulfonami



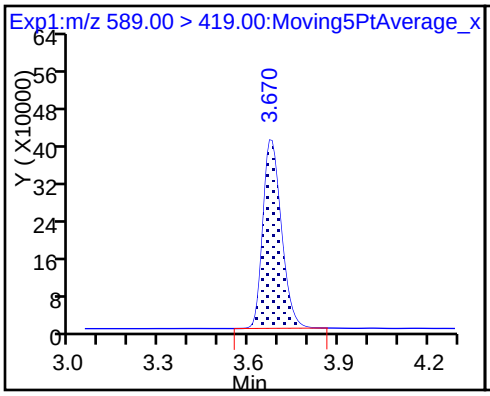
29 Perfluorodecane Sulfonic acid



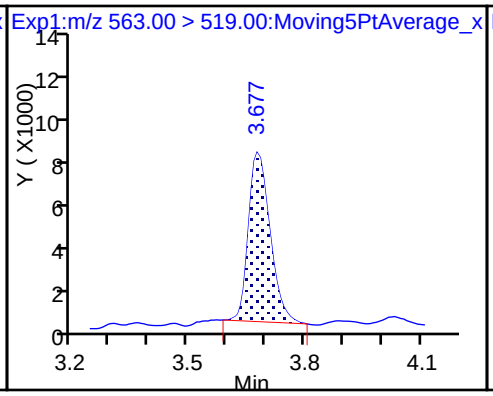
29 Perfluorodecane Sulfonic acid



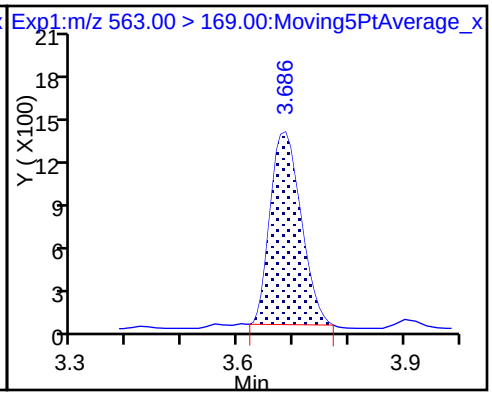
D 32 d5-NEtFOSAA



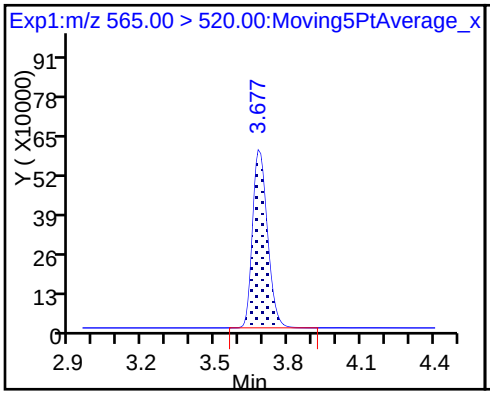
31 Perfluoroundecanoic acid



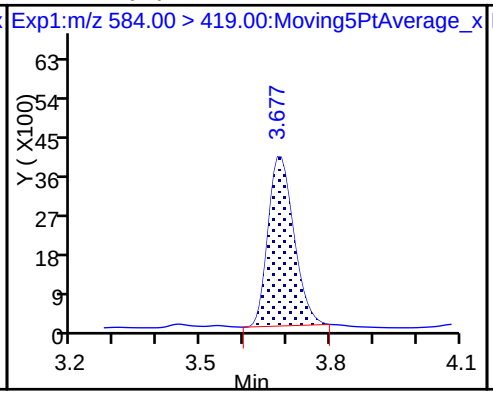
31 Perfluoroundecanoic acid



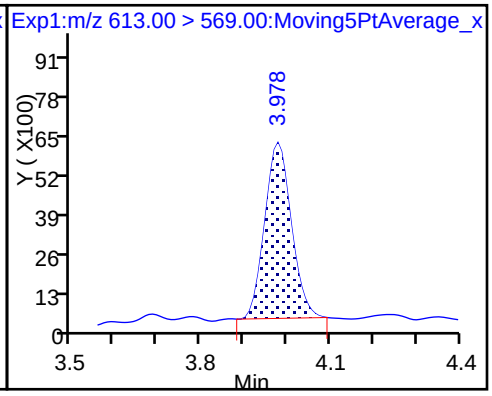
D 30 13C2 PFUnA



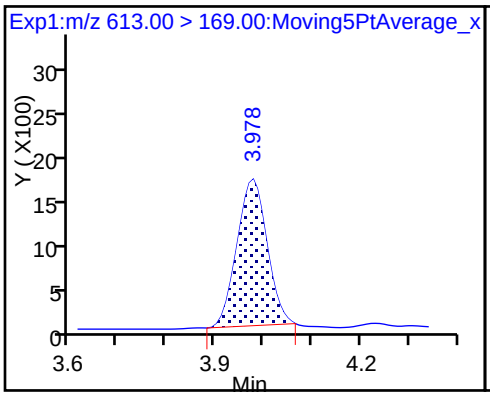
33 N-ethyl perfluorooctane sulfonamid



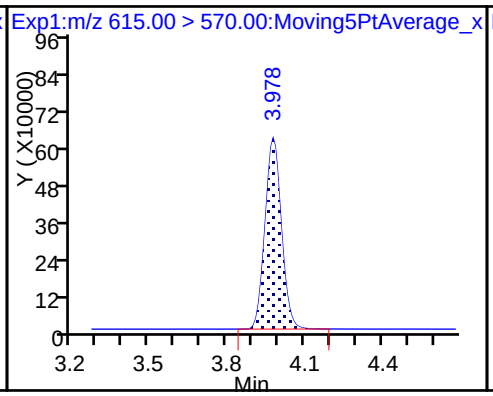
37 Perfluorododecanoic acid



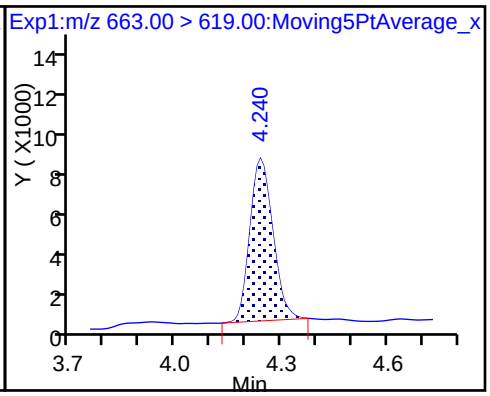
37 Perfluorododecanoic acid



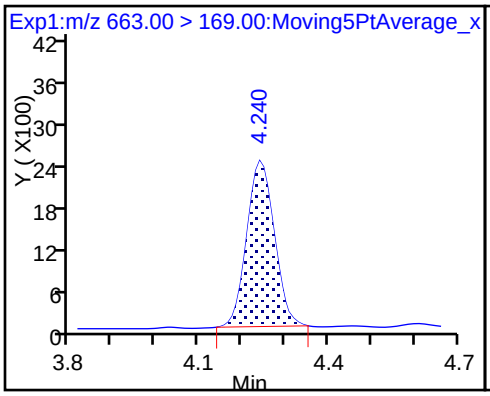
D 36 13C2 PFDoA



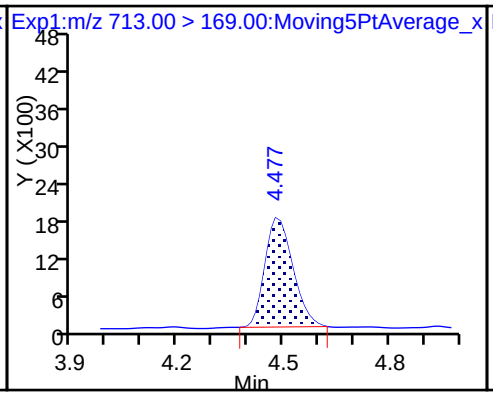
41 Perfluorotridecanoic acid



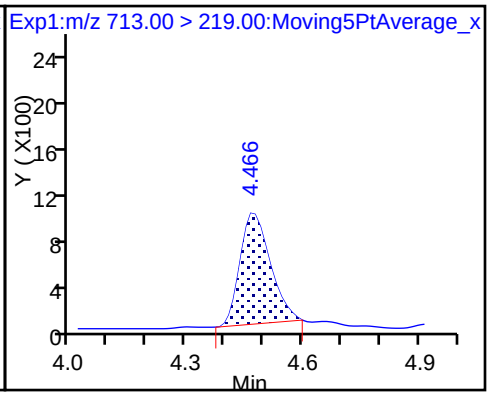
41 Perfluorotridecanoic acid



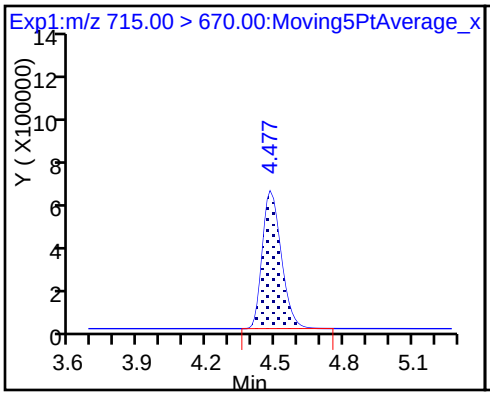
42 Perfluorotetradecanoic acid



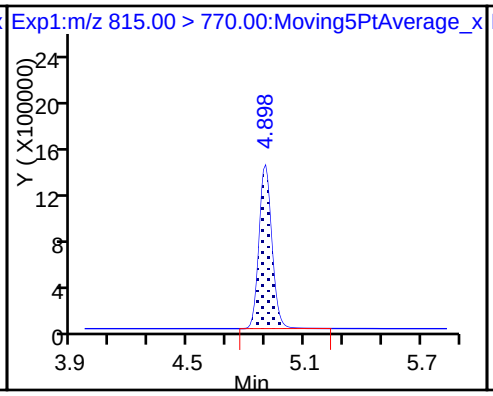
42 Perfluorotetradecanoic acid



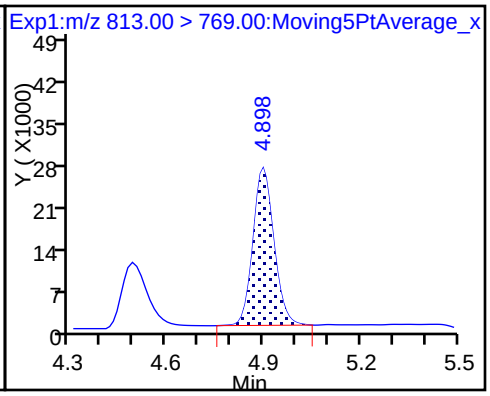
D 43 13C2-PFTeDA



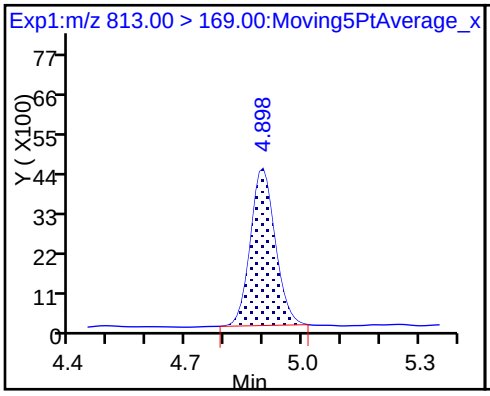
D 44 13C2-PFHxDA



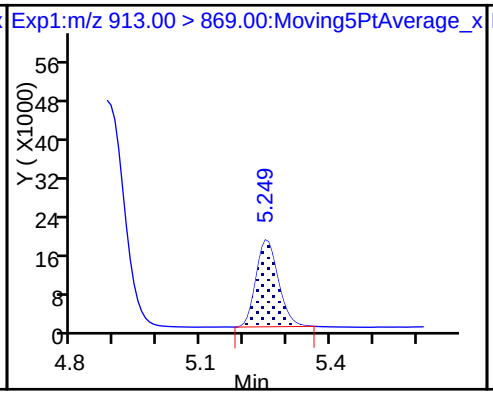
45 Perfluorohexadecanoic acid



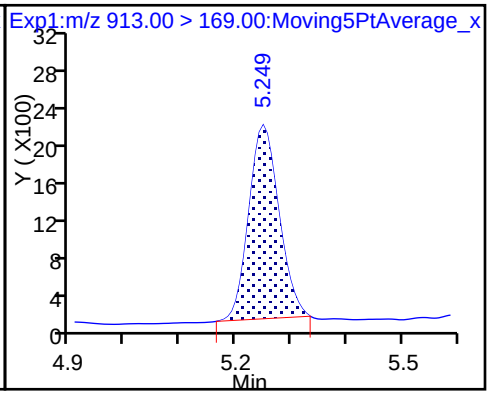
45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid



46 Perfluorooctadecanoic acid



TestAmerica Sacramento

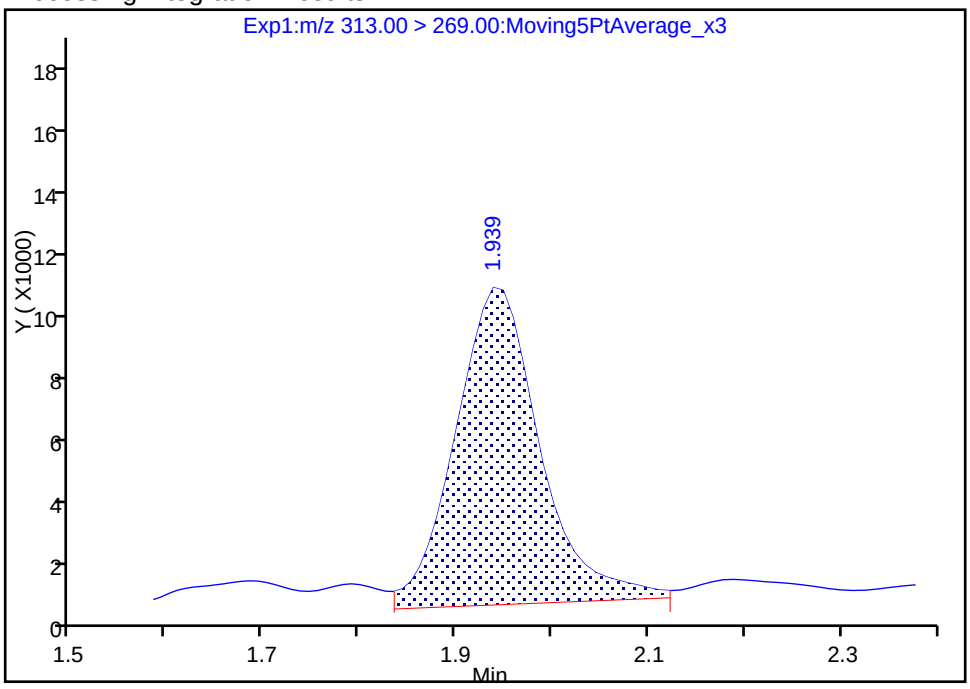
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_002.d
Injection Date: 17-Jan-2018 14:19:28 Instrument ID: A8_N
Lims ID: IC L1 Full
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 10 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

6 Perfluorohexanoic acid, CAS: 307-24-4

Signal: 1

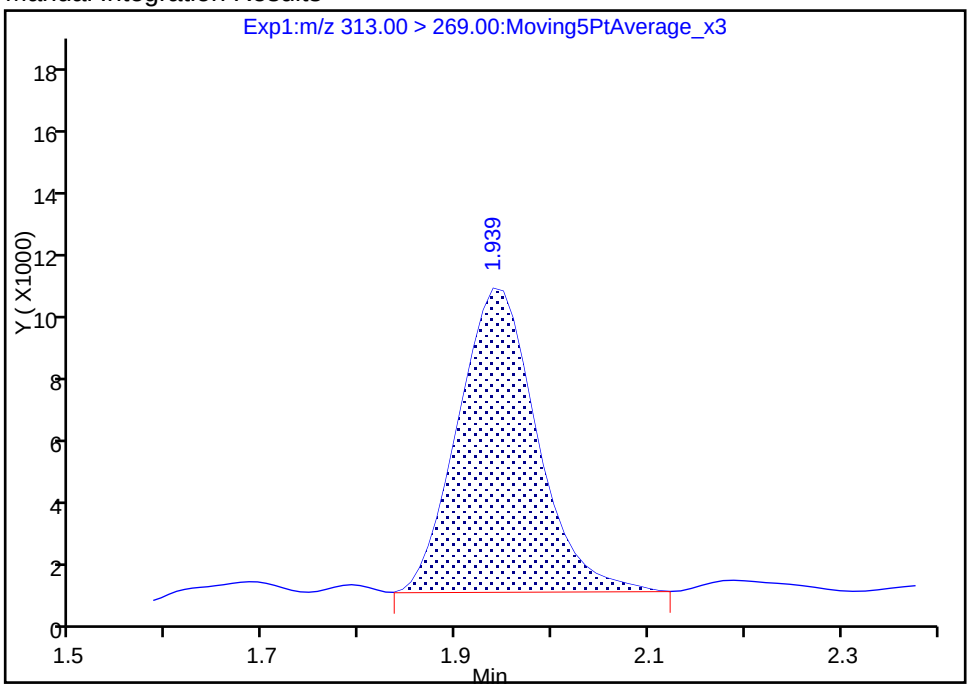
Processing Integration Results

RT: 1.94
Area: 62355
Amount: 0.030336
Amount Units: ng/ml



Manual Integration Results

RT: 1.94
Area: 55664
Amount: 0.028201
Amount Units: ng/ml



Reviewer: hannigana, 17-Jan-2018 16:49:22
Audit Action: Manually Integrated Audit Reason: Baseline

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_003.d
Lims ID: IC L2 Full
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 17-Jan-2018 14:27:16 ALS Bottle#: 11 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L2-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-A8_N*sub30

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 18-Jan-2018 08:22:21 Calib Date: 17-Jan-2018 15:06:20
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_008.d

Column 1 : Det: EXP1
Process Host: XAWRK019

First Level Reviewer: hannigana Date: 17-Jan-2018 16:50:56

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.412	1.411	0.001	0.538	7186789	2.47		98.8	22574	
2 Perfluorobutyric acid										
212.90 > 169.00	1.412	1.413	-0.001	1.000	134919	0.0502		100	15.1	
D 3 13C5-PFPeA										
267.90 > 223.00	1.659	1.659	0.0	0.632	4347864	2.52		101	81847	
4 Perfluoropentanoic acid										M
262.90 > 219.00	1.659	1.662	-0.003	1.000	102787	0.0502		100	93.8	M
D 47 13C3-PFBS										
301.90 > 83.00	1.694	1.695	-0.001	0.645	85395	2.24		96.3	3100	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.694	1.697	-0.003	1.000	122306	0.0431		97.6	1035	
298.90 > 99.00	1.703	1.697	0.006	1.005	53280		2.30(1.25-3.74)	97.6	599	
D 60 M2-4:2FTS										
329.00 > 81.00	1.908	1.903	0.005	0.727	547524	NC			4977	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.908	1.903	0.005	1.000	22803	0.0447		95.7	1430	
6 Perfluorohexanoic acid										M
313.00 > 269.00	1.939	1.939	0.0	1.000	92376	0.0483		96.6	146	M
313.00 > 119.00	1.939	1.939	0.0	1.000	10049		9.19(5.03-15.10)	96.6	181	
D 7 13C2 PFHxA										
315.00 > 270.00	1.939	1.939	0.0	0.738	4611605	2.48		99.4	33760	
D 9 13C4-PFHpA										
367.00 > 322.00	2.273	2.267	0.006	0.866	4481837	2.54		101	24988	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.273	2.268	0.005	1.000	99406	0.0505		101	170	
363.00 > 169.00	2.273	2.268	0.005	1.000	36419		2.73(1.13-3.40)	101	307	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.286	2.280	0.006	1.000	117059	0.0479		105	672	
399.00 > 99.00	2.286	2.280	0.006	1.000	35478		3.30(1.50-4.49)	105	292	
D 11 18O2 PFHxS										
403.00 > 84.00	2.286	2.282	0.004	0.871	5188305	2.38		101	30938	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.598	2.596	0.002	1.000	23999	0.0440		92.7	384	
D 12 M2-6:2FTS										
429.00 > 81.00	2.598	2.597	0.001	0.990	783363	2.40		101	18764	
* 62 13C2-PFOA										
415.00 > 370.00	2.626	2.622	0.004		4809954	2.50			29656	
D 14 13C4 PFOA										
417.00 > 372.00	2.626	2.622	0.004	1.000	4324416	2.50		99.9	24697	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.626	2.623	0.003	1.000	105297	0.0519		104	82.6	
413.00 > 169.00	2.626	2.623	0.003	1.000	54228		1.94(0.84-2.52)	104	522	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.633	2.629	0.004	1.000	84987	0.0457		96.1	2230	
449.00 > 99.00	2.633	2.629	0.004	1.000	23208		3.66(1.94-5.82)	96.1	907	
D 18 13C4 PFOS										
503.00 > 80.00	2.989	2.992	-0.003	1.138	3278250	2.38		99.6	25618	
20 Perfluorononanoic acid										
463.00 > 419.00	2.989	2.992	-0.003	1.000	69666	0.0474		94.7	317	
463.00 > 169.00	2.989	2.992	-0.003	1.000	15857		4.39(1.90-5.69)	94.7	303	
D 19 13C5 PFNA										
468.00 > 423.00	2.989	2.992	-0.003	1.138	3562167	2.54		101	25415	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.989	2.992	-0.003	1.000	70183	0.0457		98.5	28.7	
499.00 > 99.00	2.989	2.992	-0.003	1.000	20217		3.47(2.31-6.93)	98.5	47.2	
D 21 13C8 FOSA										
506.00 > 78.00	3.335	3.338	-0.003	1.270	4978224	2.57		103	21232	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.335	3.338	-0.003	1.000	93805	0.0480		95.9	2916	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.343	3.342	0.001	1.000	20684	0.0492		103	857	
D 26 M2-8:2FTS										
529.00 > 81.00	3.343	3.342	0.001	1.273	827776	2.40		100	22220	
D 23 13C2 PFDA										
515.00 > 470.00	3.350	3.352	-0.002	1.276	3024128	2.49		99.7	26939	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.350	3.353	-0.003	1.000	55975	0.0477		95.4	299	
513.00 > 169.00	3.350	3.353	-0.003	1.000	10839		5.16(2.36-7.09)	95.4	473	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.510	3.507	0.003	1.337	1505517	2.49		99.5	9842	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.510	3.513	-0.003	1.000	31785	0.0489		97.7	294	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.666	3.666	0.0	1.000	39594	0.0441		91.4	1203	
599.00 > 99.00	3.659	3.666	-0.007	0.998	14282		2.77(1.39-4.16)	91.4	1217	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.673	3.672	0.001	1.399	1560100	2.55		102	4767	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.682	3.678	0.004	1.000	47415	0.0493		98.5	219	
563.00 > 169.00	3.682	3.678	0.004	1.000	11810		4.01(0.00-0.00)	98.5	439	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.682	3.679	0.003	1.002	30312	0.0499		99.8	886	
D 30 13C2 PFUnA										
565.00 > 520.00	3.682	3.679	0.003	1.402	2331330	2.53		101	22196	
D 36 13C2 PFDoA										
615.00 > 570.00	3.983	3.979	0.004	1.517	2591482	2.59		104	18542	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.983	3.979	0.004	1.000	54026	0.0509		102	233	
613.00 > 169.00	3.983	3.979	0.004	1.000	12483		4.33(2.13-6.40)	102	556	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.244	4.242	0.002	1.000	57967	0.0482		96.3	190	
663.00 > 169.00	4.244	4.242	0.002	1.000	16714		3.47(1.25-3.76)	96.3	633	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.487	4.483	0.004	1.709	3565275	2.73		109	16355	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.487	4.483	0.004	1.000	16612	0.0477		95.5	414	
713.00 > 219.00	4.473	4.483	-0.010	0.997	11965		1.39(0.71-2.13)	95.5	311	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.905	4.902	0.003	1.000	164489	0.0502		100	103	
813.00 > 169.00	4.905	4.902	0.003	1.000	28141		5.85(2.86-8.58)	100	527	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.905	4.902	0.003	1.868	6235993	2.68		107	13127	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.254	5.255	-0.001	1.000	119958	0.0456		91.3	35.9	
913.00 > 169.00	5.254	5.255	-0.001	1.000	14488		8.28(0.00-0.00)	91.3	91.9	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_LL2_00003 Amount Added: 1.00 Units: mL

Report Date: 18-Jan-2018 08:22:21 Chrom Revision: 2.2 08-Dec-2017 11:41:26

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_003.d

Injection Date: 17-Jan-2018 14:27:16 Instrument ID: A8_N

Lims ID: IC L2 Full

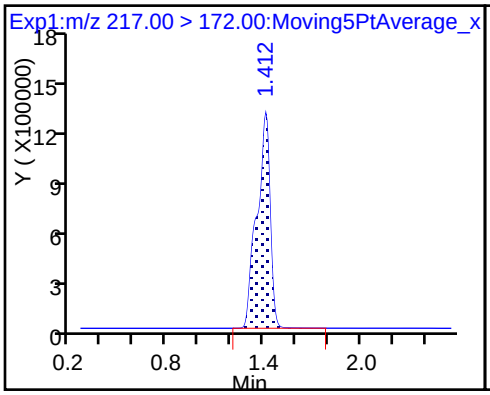
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 11 Worklist Smp#: 3

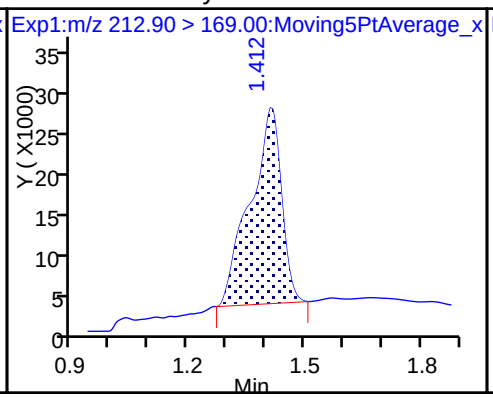
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

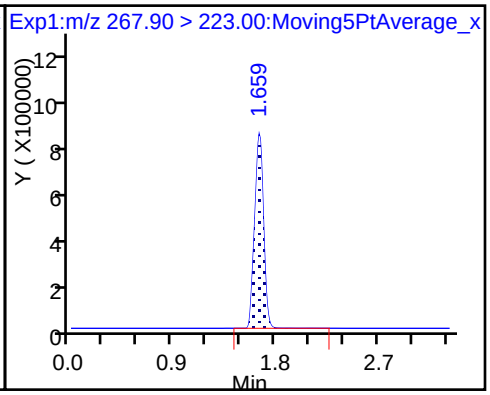
D 1 13C4 PFBA



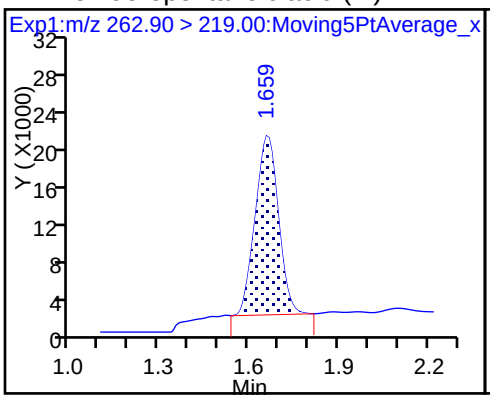
2 Perfluorobutyric acid



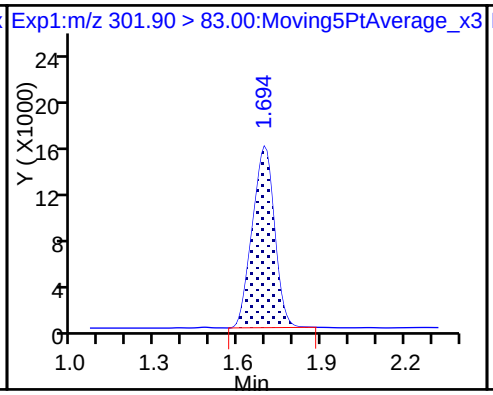
D 3 13C5-PFPeA



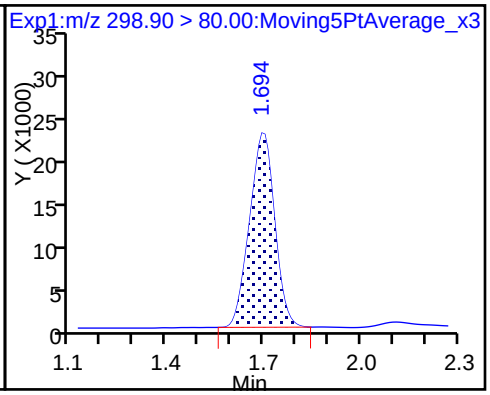
4 Perfluoropentanoic acid (M)



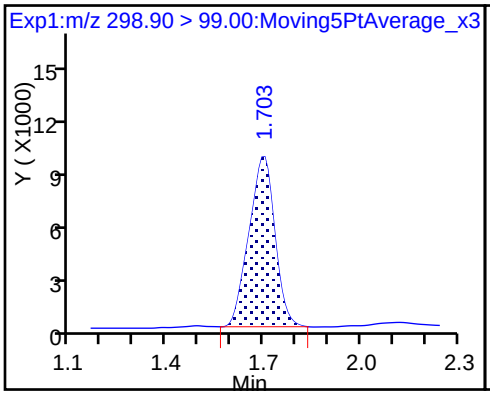
D 47 13C3-PFBS



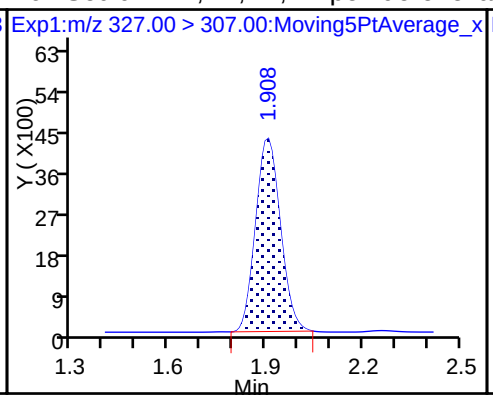
5 Perfluorobutanesulfonic acid



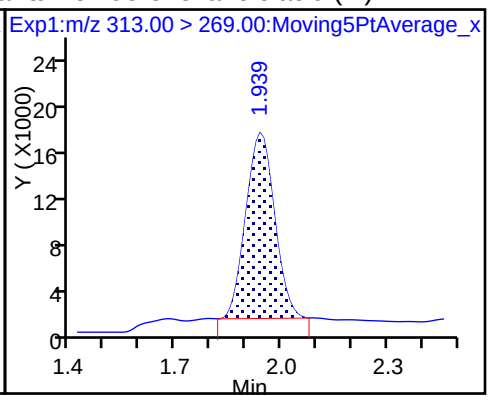
5 Perfluorobutanesulfonic acid



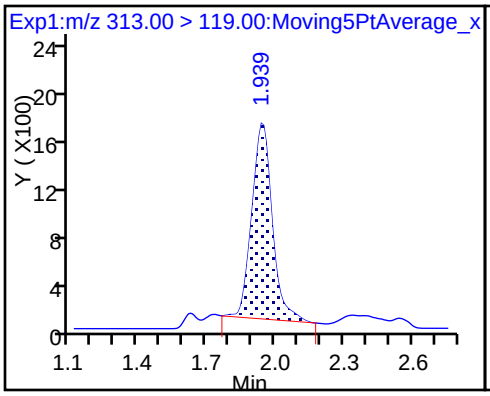
61 Sodium 1H,1H,2H,2H-perfluorohexane



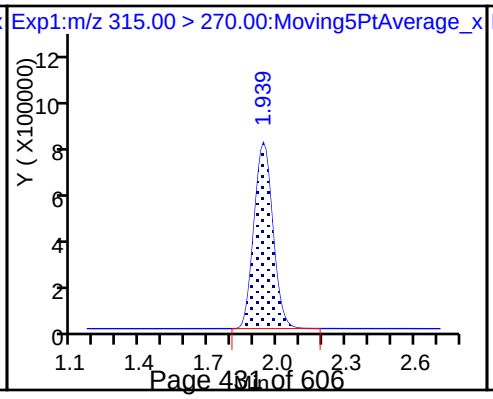
6 Perfluorohexanoic acid (M)



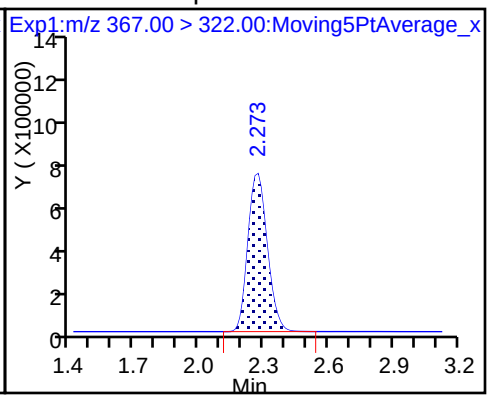
6 Perfluorohexanoic acid



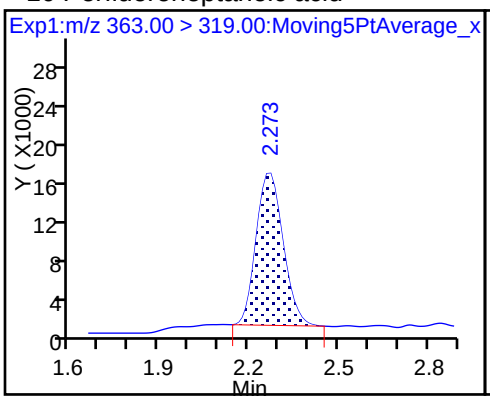
D 7 13C2 PFHxA



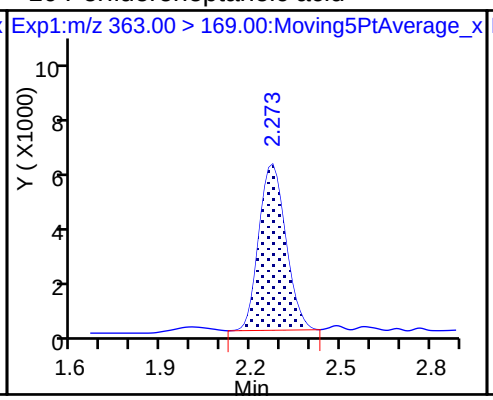
D 9 13C4-PFHpA



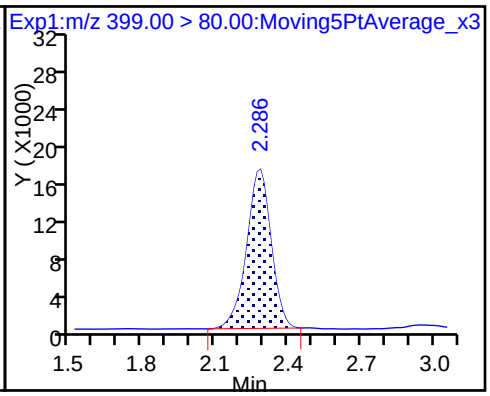
10 Perfluoroheptanoic acid



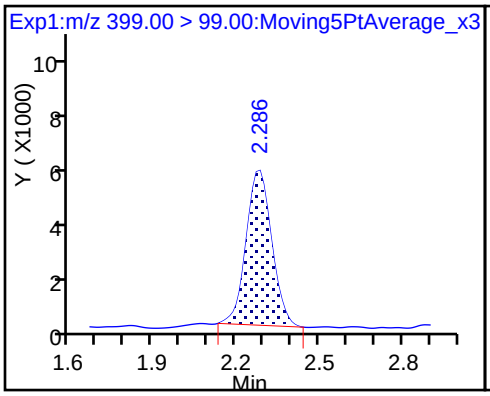
10 Perfluoroheptanoic acid



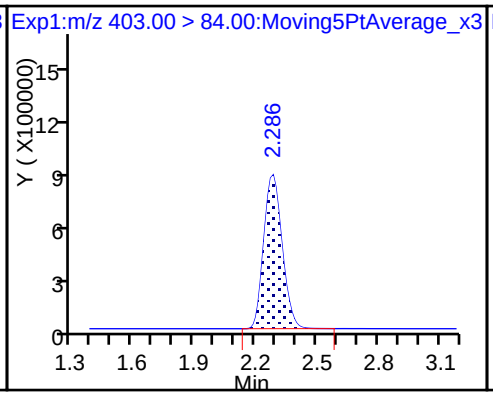
8 Perfluorohexanesulfonic acid



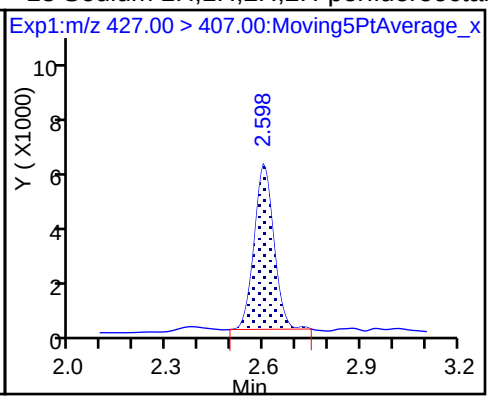
8 Perfluorohexanesulfonic acid



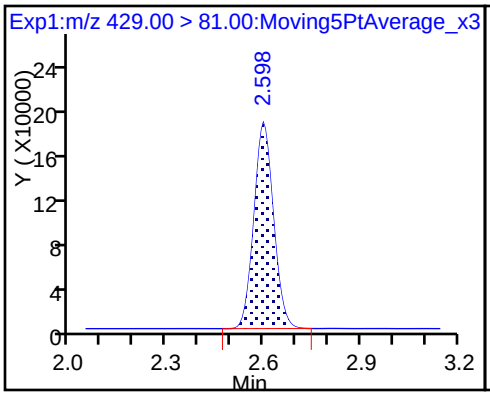
D 11 18O2 PFHxS



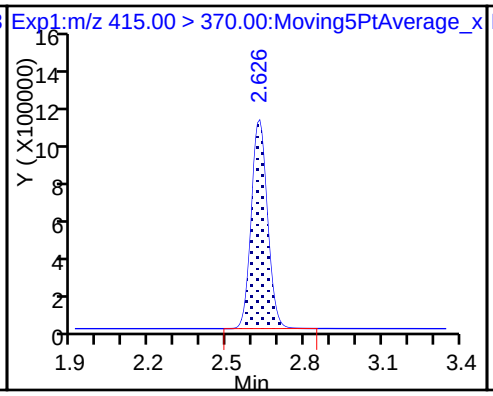
13 Sodium 1H,1H,2H,2H-perfluorooctane



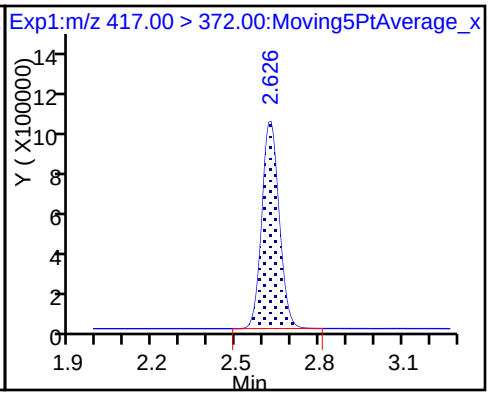
D 12 M2-6:2FTS



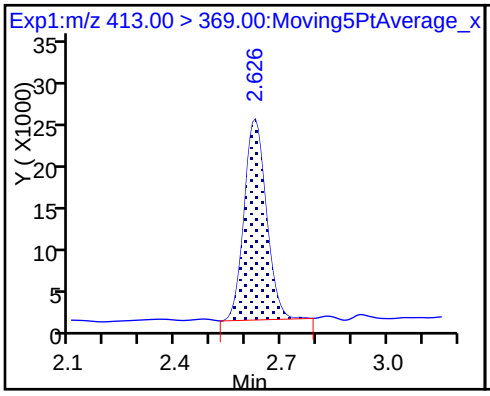
* 62 13C2-PFOA



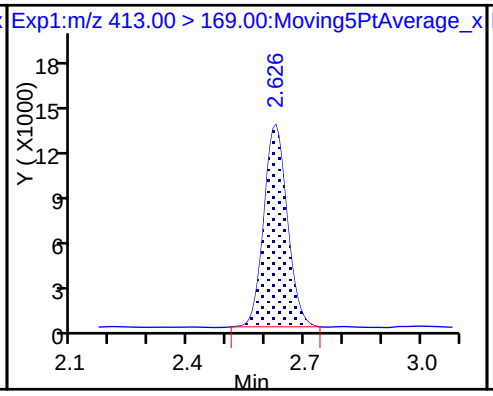
D 14 13C4 PFOA



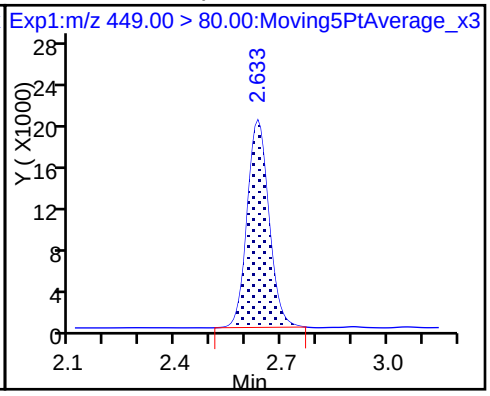
15 Perfluorooctanoic acid



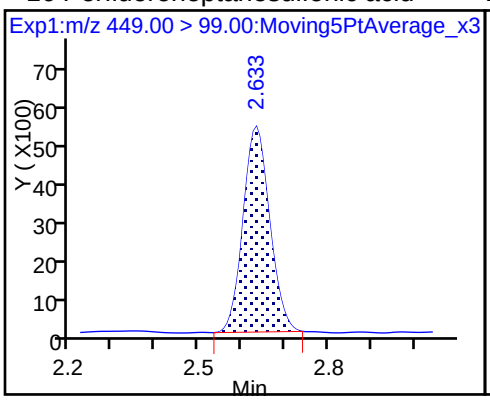
15 Perfluorooctanoic acid



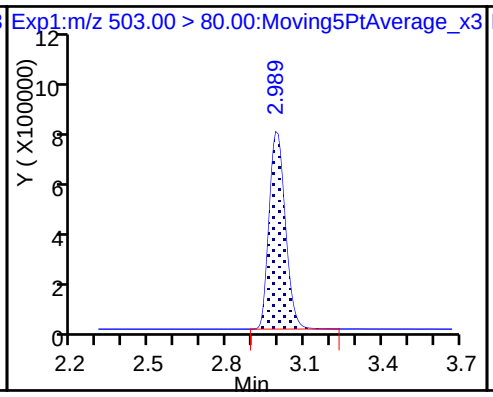
16 Perfluoroheptanesulfonic acid



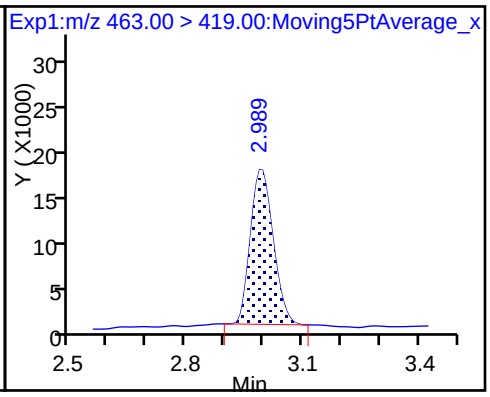
16 Perfluoroheptanesulfonic acid



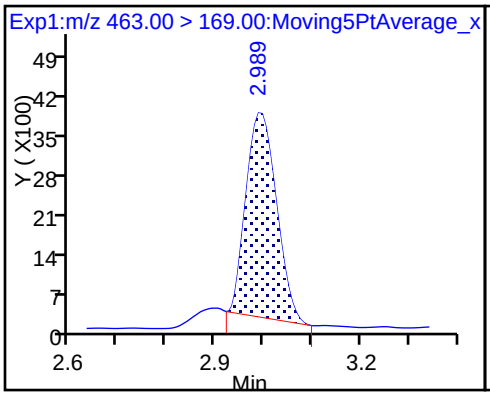
D 18 13C4 PFOS



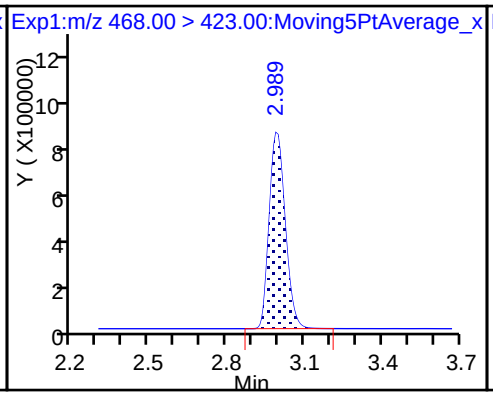
20 Perfluorononanoic acid



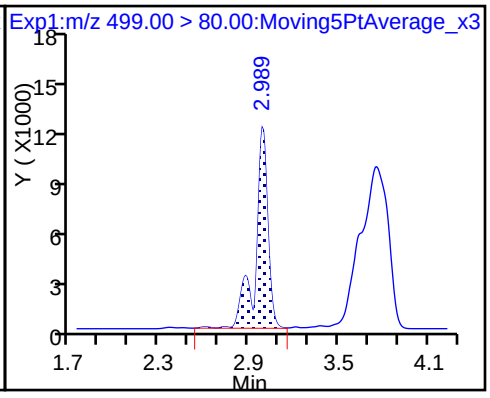
20 Perfluorononanoic acid



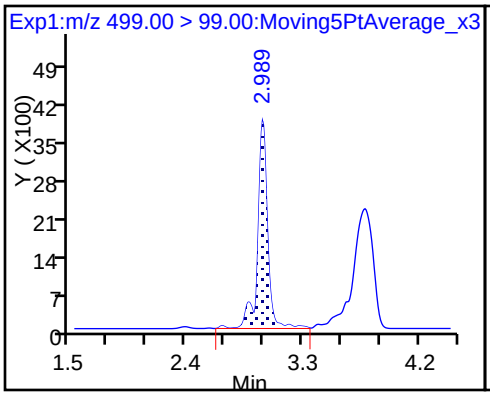
D 19 13C5 PFNA



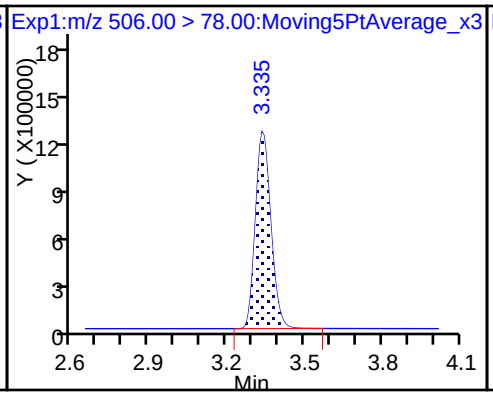
17 Perfluorooctane sulfonic acid



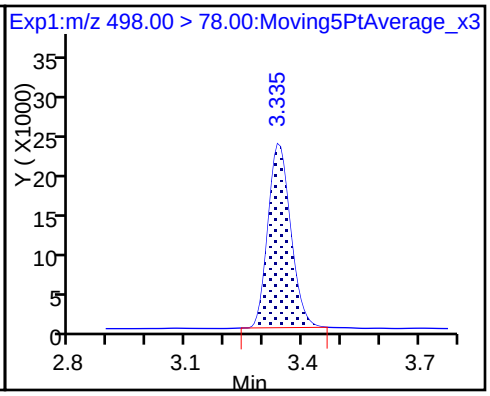
17 Perfluorooctane sulfonic acid



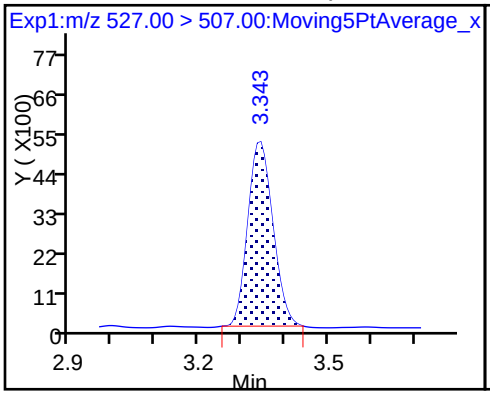
D 21 13C8 FOSA



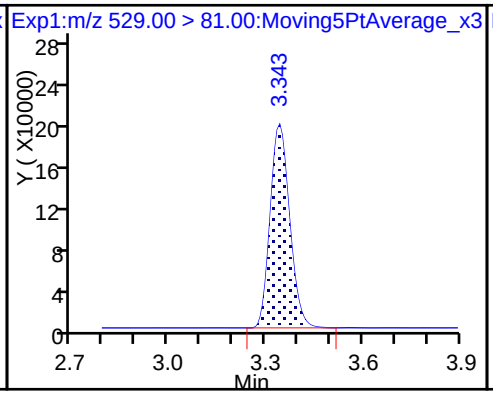
22 Perfluorooctane Sulfonamide



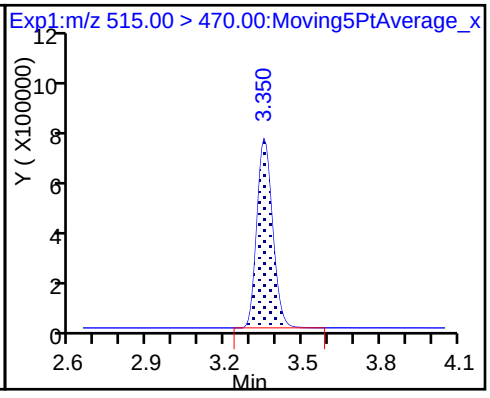
25 Sodium 1H,1H,2H,2H-perfluorodecane



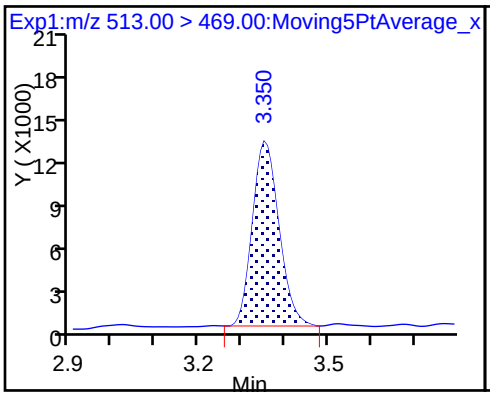
D 26 M2-8:2FTS



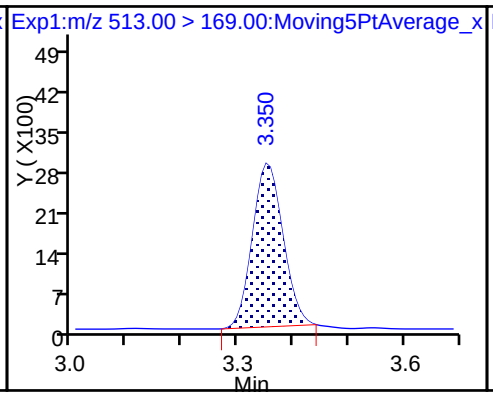
D 23 13C2 PFDA



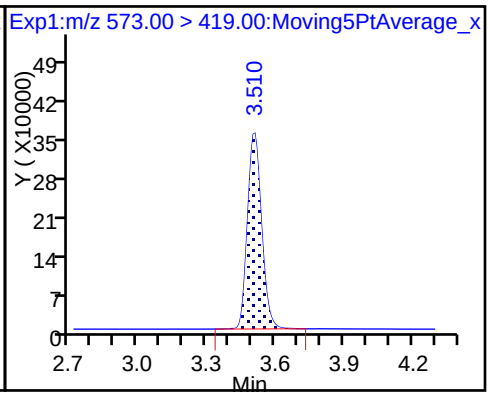
24 Perfluorodecanoic acid



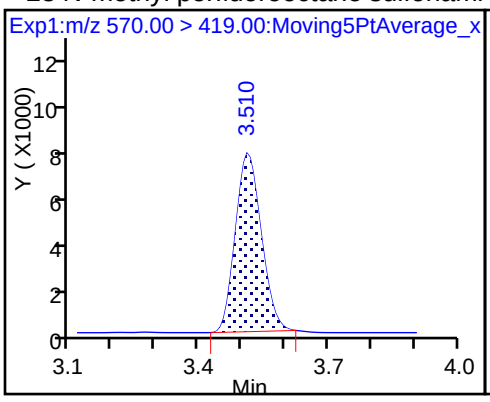
24 Perfluorodecanoic acid



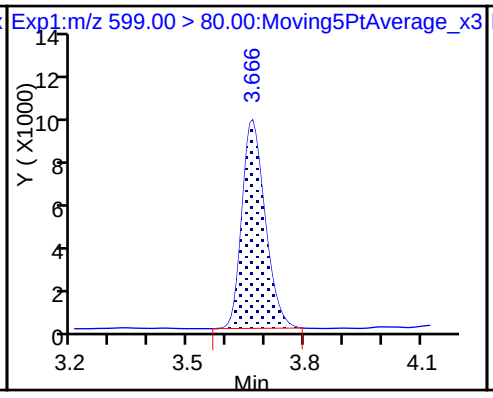
D 27 d3-NMeFOSAA



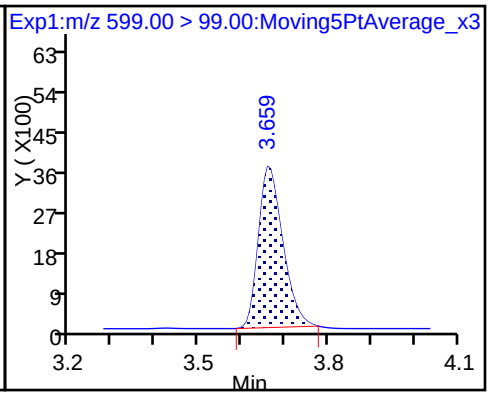
28 N-methyl perfluorooctane sulfonami



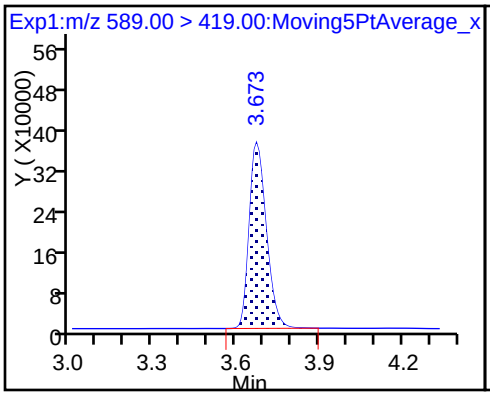
29 Perfluorodecane Sulfonic acid



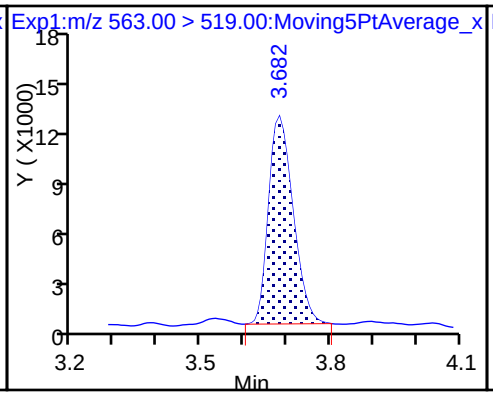
29 Perfluorodecane Sulfonic acid



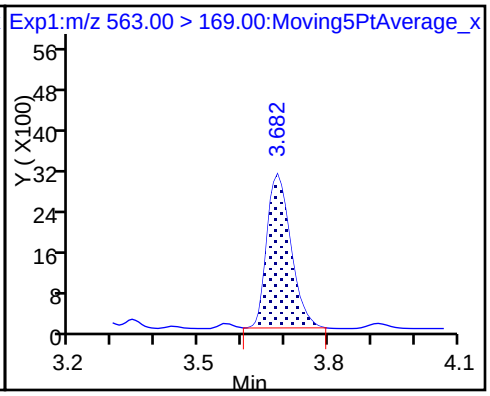
D 32 d5-NEtFOSAA



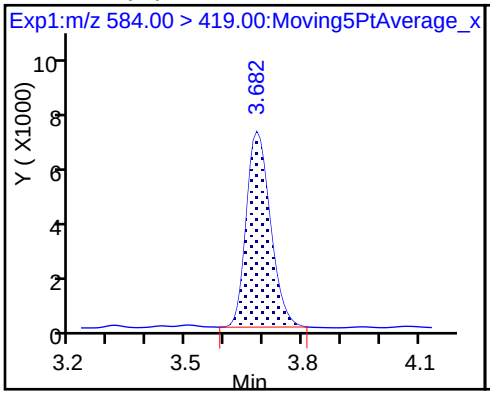
31 Perfluoroundecanoic acid



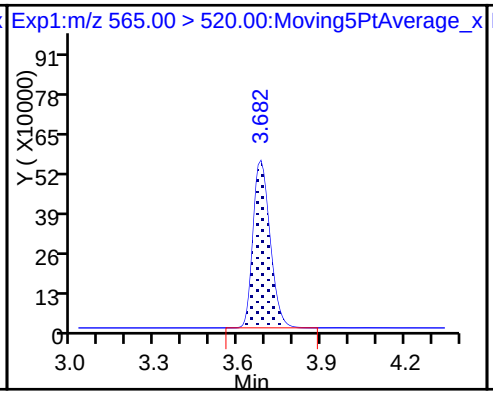
31 Perfluoroundecanoic acid



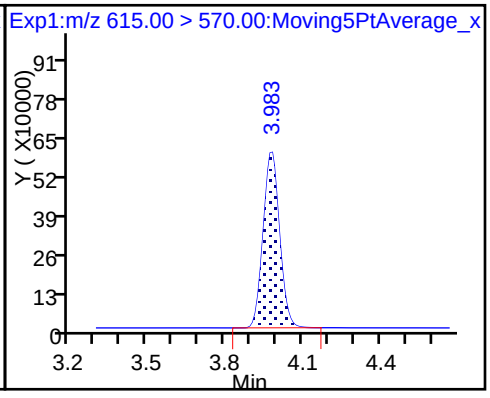
33 N-ethyl perfluorooctane sulfonamid



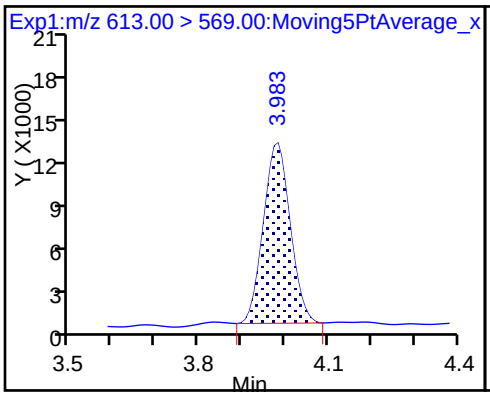
D 30 13C2 PFUnA



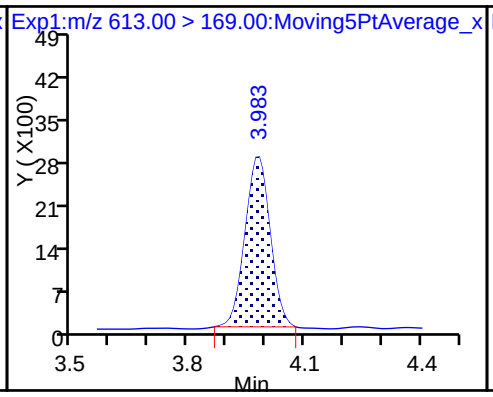
D 36 13C2 PFDoA



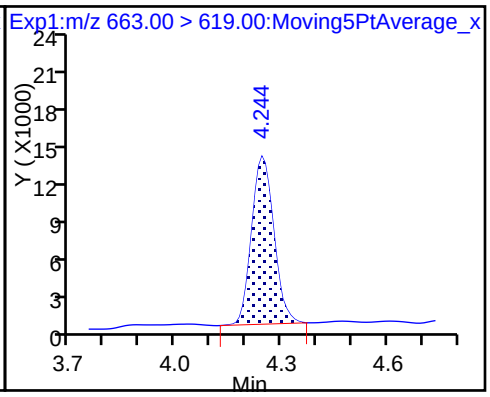
37 Perfluorododecanoic acid



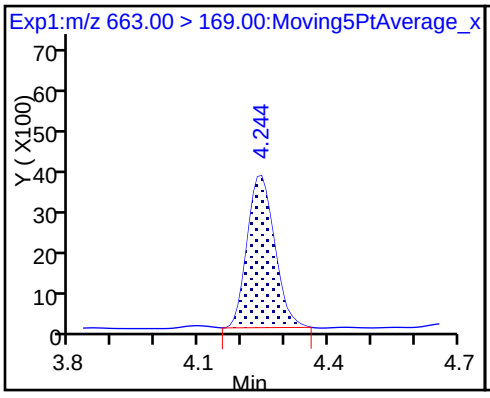
37 Perfluorododecanoic acid



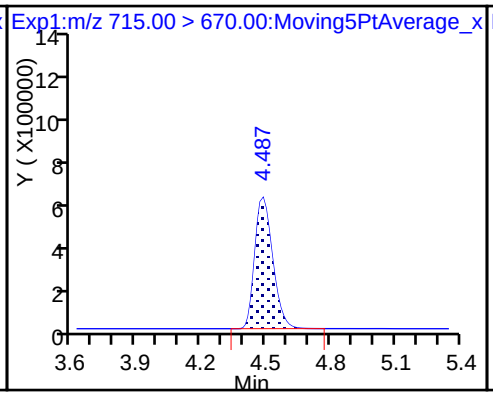
41 Perfluorotridecanoic acid



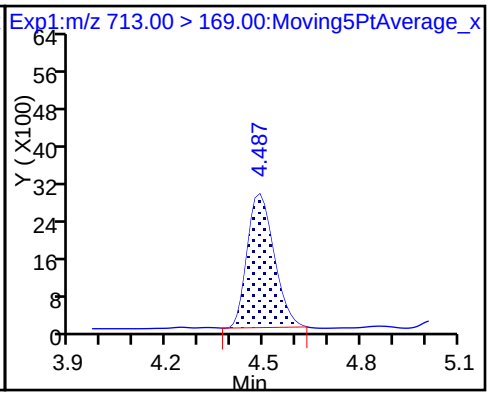
41 Perfluorotridecanoic acid



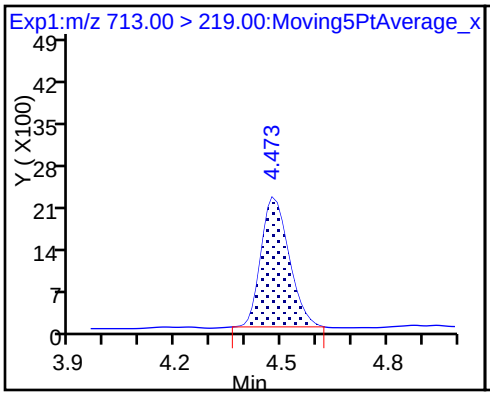
D 43 13C2-PFTeDA



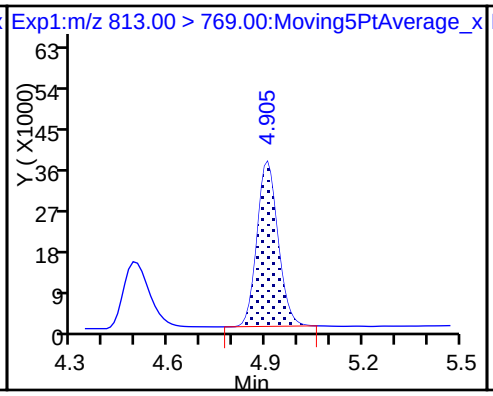
42 Perfluorotetradecanoic acid



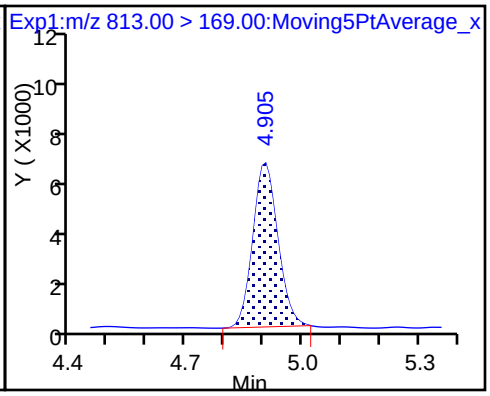
42 Perfluorotetradecanoic acid



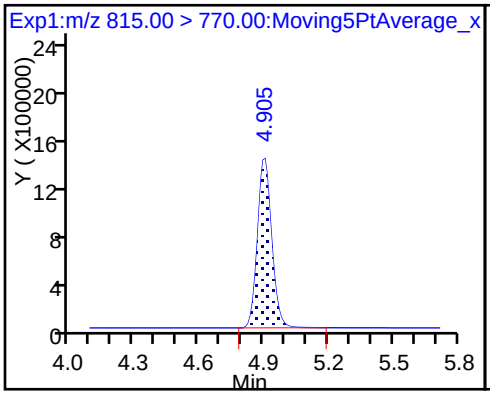
45 Perfluorohexadecanoic acid



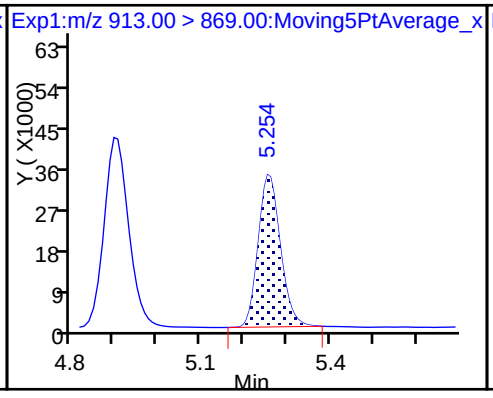
45 Perfluorohexadecanoic acid



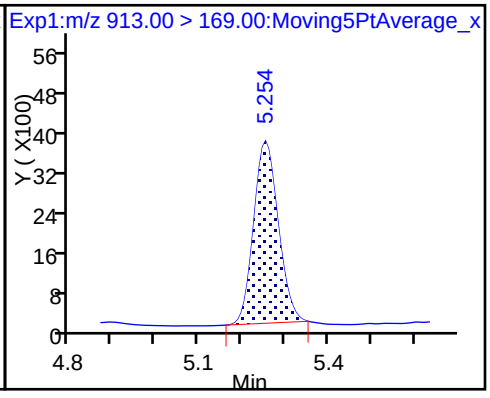
D 44 13C2-PFHxDA



46 Perfluorooctadecanoic acid



46 Perfluorooctadecanoic acid



TestAmerica Sacramento

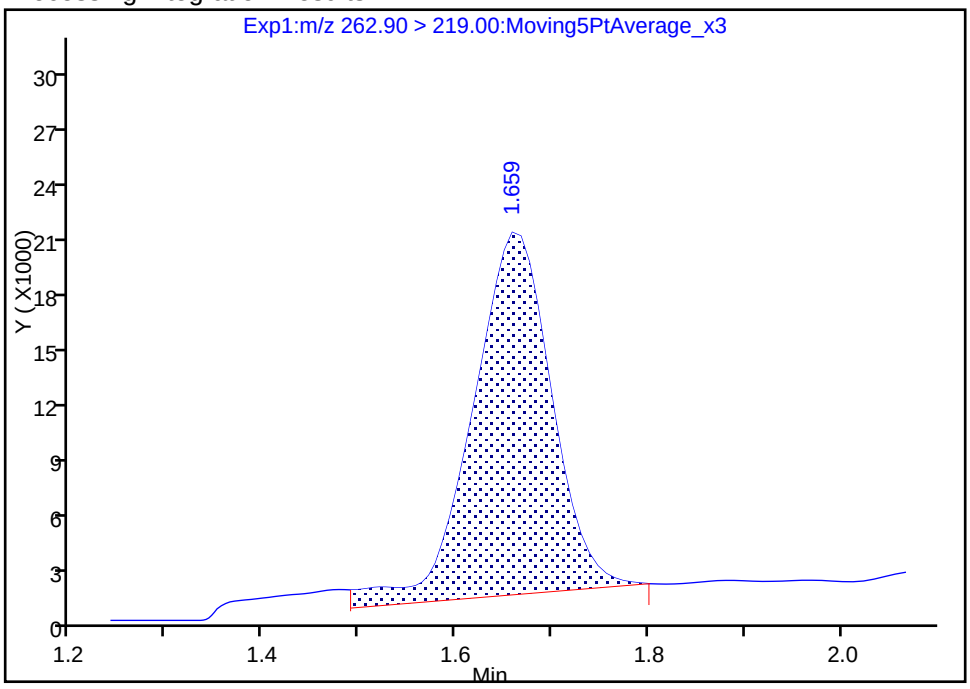
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_003.d
Injection Date: 17-Jan-2018 14:27:16 Instrument ID: A8_N
Lims ID: IC L2 Full
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 11 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

4 Perfluoropentanoic acid, CAS: 2706-90-3

Signal: 1

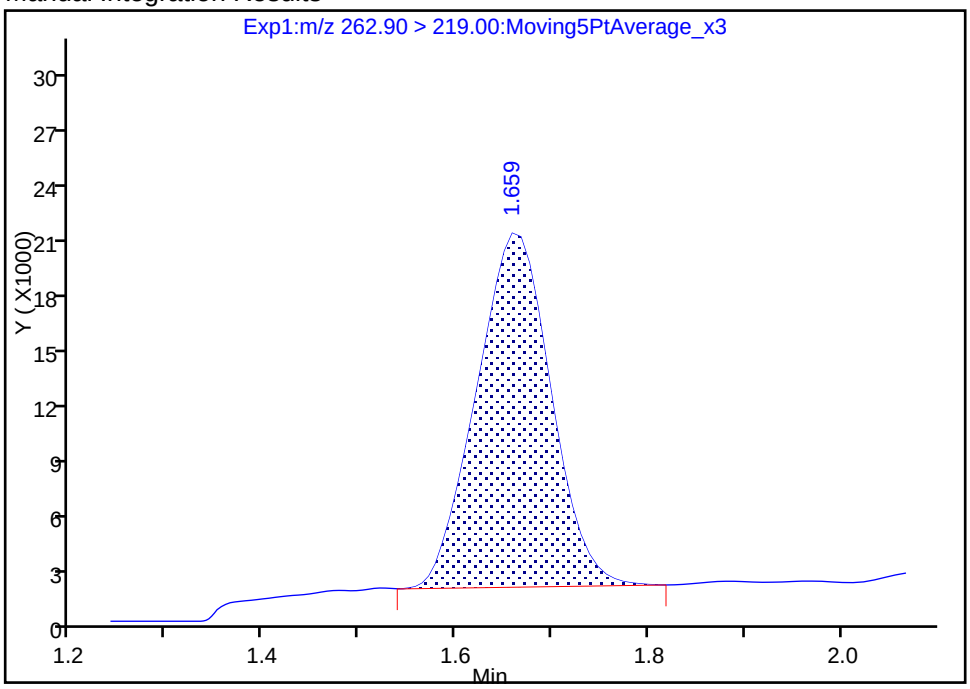
Processing Integration Results

RT: 1.66
Area: 112194
Amount: 0.054052
Amount Units: ng/ml



Manual Integration Results

RT: 1.66
Area: 102787
Amount: 0.050169
Amount Units: ng/ml



Reviewer: hannigana, 17-Jan-2018 16:50:27
Audit Action: Manually Integrated Audit Reason: Baseline

TestAmerica Sacramento

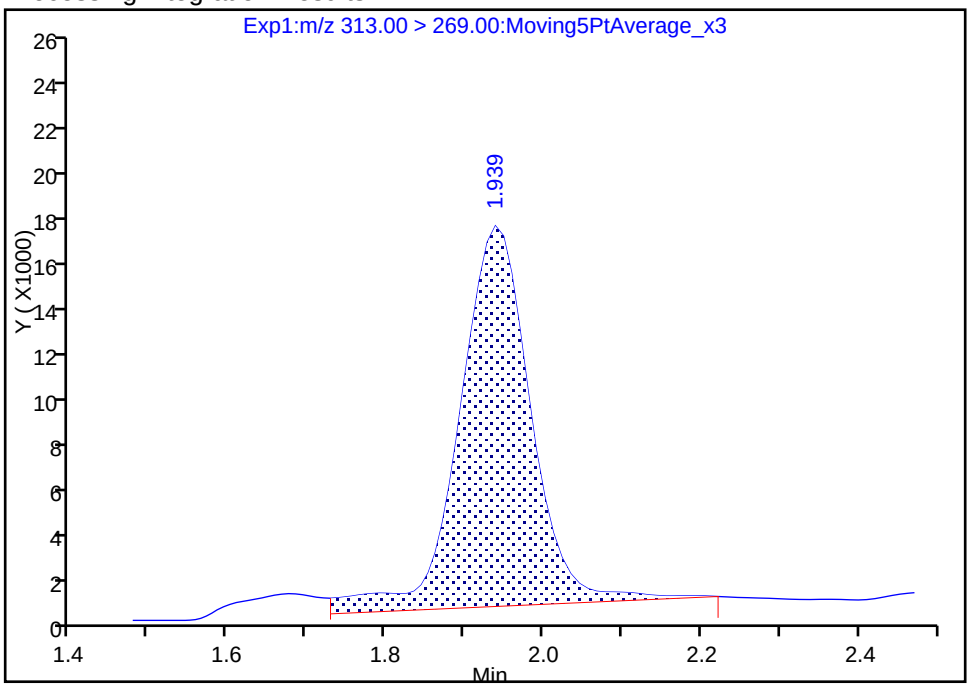
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_003.d
Injection Date: 17-Jan-2018 14:27:16 Instrument ID: A8_N
Lims ID: IC L2 Full
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 11 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

6 Perfluorohexanoic acid, CAS: 307-24-4

Signal: 1

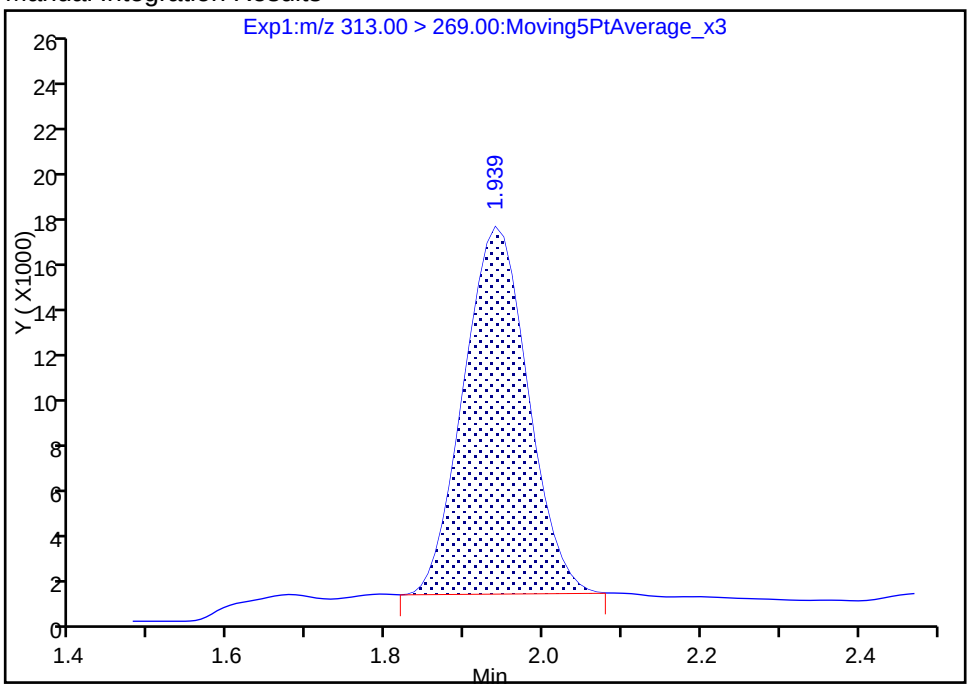
Processing Integration Results

RT: 1.94
Area: 107080
Amount: 0.054803
Amount Units: ng/ml



Manual Integration Results

RT: 1.94
Area: 92376
Amount: 0.048317
Amount Units: ng/ml



Reviewer: hannigana, 17-Jan-2018 16:50:39
Audit Action: Manually Integrated Audit Reason: Baseline

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_004.d
Lims ID: IC L3 Full
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 17-Jan-2018 14:35:05 ALS Bottle#: 12 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L3-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-A8_N*sub30

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 18-Jan-2018 08:22:24 Calib Date: 17-Jan-2018 15:06:20
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_008.d

Column 1 : Det: EXP1
Process Host: XAWRK019

First Level Reviewer: hannigana Date: 17-Jan-2018 16:51:20

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.413	1.411	0.002	0.539	6999196	2.47		98.9	21409	
2 Perfluorobutyric acid										
212.90 > 169.00	1.413	1.413	0.0	1.000	645094	0.2466		98.7	69.7	
D 3 13C5-PFPeA										
267.90 > 223.00	1.661	1.659	0.002	0.633	4140508	2.47		98.8	30360	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.661	1.662	-0.001	1.000	488305	0.2503		100	434	
D 47 13C3-PFBS										
301.90 > 83.00	1.697	1.695	0.002	0.647	85313	2.30		98.9	2557	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.697	1.697	0.0	1.000	656362	0.2317		105	5197	
298.90 > 99.00	1.697	1.697	0.0	1.000	266712		2.46(1.25-3.74)	105	2686	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.902	1.903	-0.001	1.000	116305	0.2281		97.7	6855	
D 60 M2-4:2FTS										
329.00 > 81.00	1.902	1.903	-0.001	0.725	530337	NC			5867	
D 7 13C2 PFHxA										
315.00 > 270.00	1.943	1.939	0.004	0.741	4611448	2.55		102	40346	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.943	1.939	0.004	1.000	466560	0.2440		97.6	991	
313.00 > 119.00	1.943	1.939	0.004	1.000	42394		11.01(5.03-15.10)	97.6	597	
D 9 13C4-PFHpA										
367.00 > 322.00	2.264	2.267	-0.003	0.863	4249130	2.47		98.8	31194	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.264	2.268	-0.004	1.000	517603	0.2771		111	847	
363.00 > 169.00	2.264	2.268	-0.004	1.000	193390		2.68(1.13-3.40)	111	1653	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.278	2.280	-0.002	1.000	523793	0.2180		95.8	2590	
399.00 > 99.00	2.278	2.280	-0.002	1.000	175428		2.99(1.50-4.49)	95.8	1962	
D 11 18O2 PFHxS										
403.00 > 84.00	2.278	2.282	-0.004	0.868	5102469	2.41		102	28027	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.601	2.596	0.005	1.000	119814	0.2234		94.2	2001	
D 12 M2-6:2FTS										
429.00 > 81.00	2.601	2.597	0.004	0.992	769728	2.42		102	16698	
D 14 13C4 PFOA										
417.00 > 372.00	2.623	2.622	0.001	1.000	4253926	2.52		101	25316	
* 62 13C2-PFOA										
415.00 > 370.00	2.623	2.622	0.001		4681031	2.50			33089	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.623	2.623	0.0	1.000	484462	0.2429		97.2	373	
413.00 > 169.00	2.623	2.623	0.0	1.000	250575		1.93(0.84-2.52)	97.2	2345	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.630	2.629	0.001	1.000	431169	0.2328		97.8	7142	
449.00 > 99.00	2.630	2.629	0.001	1.000	127520		3.38(1.94-5.82)	97.8	3310	
D 19 13C5 PFNA										
468.00 > 423.00	2.993	2.992	0.001	1.141	3494654	2.56		102	24262	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.993	2.992	0.001	1.000	344328	0.2249		97.0	139	
499.00 > 99.00	2.993	2.992	0.001	1.000	77366		4.45(2.31-6.93)	97.0	213	
D 18 13C4 PFOS										
503.00 > 80.00	2.993	2.992	0.001	1.141	3268191	2.44		102	26597	
20 Perfluorononanoic acid										
463.00 > 419.00	2.993	2.992	0.001	1.000	352431	0.2442		97.7	1227	
463.00 > 169.00	2.993	2.992	0.001	1.000	78627		4.48(1.90-5.69)	97.7	1695	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.340	3.338	0.002	1.000	464966	0.2489		99.6	6583	
D 21 13C8 FOSA										
506.00 > 78.00	3.340	3.338	0.002	1.273	4753896	2.52		101	24528	
D 26 M2-8:2FTS										
529.00 > 81.00	3.347	3.342	0.005	1.276	811941	2.42		101	16088	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.347	3.342	0.005	1.000	99090	0.2402		100	4021	
D 23 13C2 PFDA										
515.00 > 470.00	3.355	3.352	0.003	1.279	2939305	2.49		99.6	23157	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.355	3.353	0.002	1.000	292799	0.2567		103	1518	
513.00 > 169.00	3.355	3.353	0.002	1.000	47430		6.17(2.36-7.09)	103	1255	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.507	3.507	0.0	1.337	1483575	2.52		101	8558	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.514	3.513	0.001	1.002	150110	0.2342		93.7	1427	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.671	3.666	0.005	1.000	216397	0.2416		100	7571	
599.00 > 99.00	3.663	3.666	-0.003	0.998	71956		3.01(1.39-4.16)	100	2967	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.678	3.672	0.006	1.402	1512999	2.54		102	5661	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.678	3.678	0.0	1.000	227630	0.2436		97.4	1202	
563.00 > 169.00	3.687	3.678	0.009	1.002	47276		4.81(0.00-0.00)	97.4	2503	
D 30 13C2 PFUnA										
565.00 > 520.00	3.678	3.679	-0.001	1.402	2263551	2.53		101	20649	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.678	3.679	-0.001	1.000	142743	0.2422		96.9	3005	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.979	3.979	0.0	1.000	256381	0.2539		102	1243	
613.00 > 169.00	3.979	3.979	0.0	1.000	56420		4.54(2.13-6.40)	102	4395	
D 36 13C2 PFDoA										
615.00 > 570.00	3.979	3.979	0.0	1.517	2463501	2.53		101	26849	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.241	4.242	-0.001	1.000	263708	0.2305		92.2	792	
663.00 > 169.00	4.241	4.242	-0.001	1.000	87121		3.03(1.25-3.76)	92.2	2810	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.485	4.483	0.002	1.000	75670	0.2411		96.5	2188	
713.00 > 219.00	4.485	4.483	0.002	1.000	51317		1.47(0.71-2.13)	96.5	1498	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.485	4.483	0.002	1.710	3214801	2.53		101	15524	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.904	4.902	0.002	1.870	5624728	2.48		99.4	11541	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.904	4.902	0.002	1.000	561148	0.2439		97.6	334	
813.00 > 169.00	4.904	4.902	0.002	1.000	100487		5.58(2.86-8.58)	97.6	1611	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.253	5.255	-0.002	1.000	579412	0.2444		97.8	170	
913.00 > 169.00	5.246	5.255	-0.009	0.999	70347		8.24(0.00-0.00)	97.8	401	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL3_00003 Amount Added: 1.00 Units: mL

Report Date: 18-Jan-2018 08:22:24 Chrom Revision: 2.2 08-Dec-2017 11:41:26

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_004.d

Injection Date: 17-Jan-2018 14:35:05 Instrument ID: A8_N

Lims ID: IC L3 Full

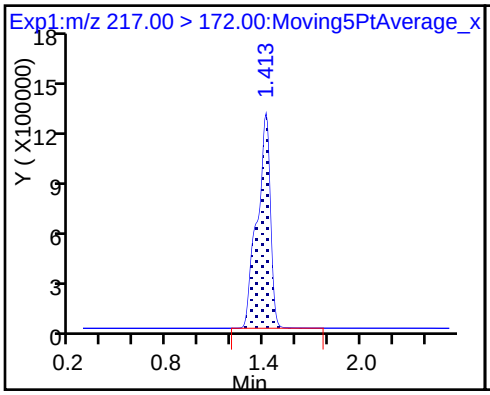
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 12 Worklist Smp#: 4

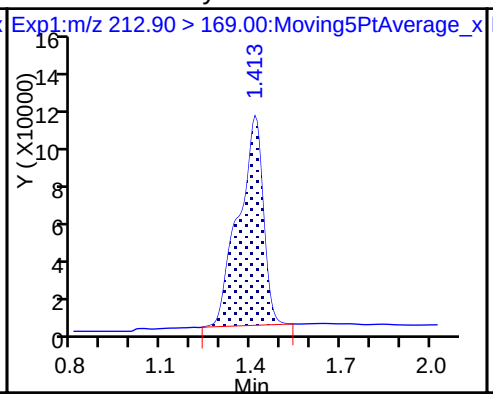
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

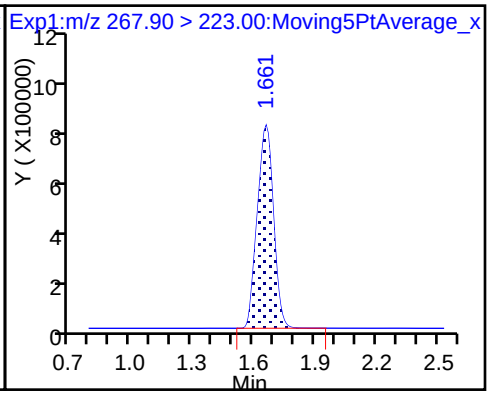
D 1 13C4 PFBA



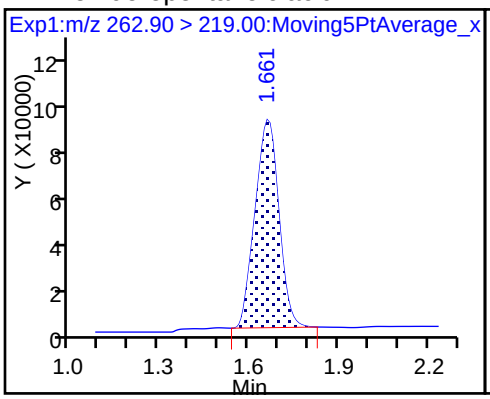
2 Perfluorobutyric acid



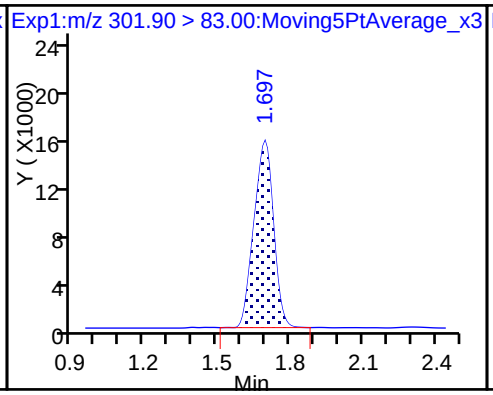
D 3 13C5-PFPeA



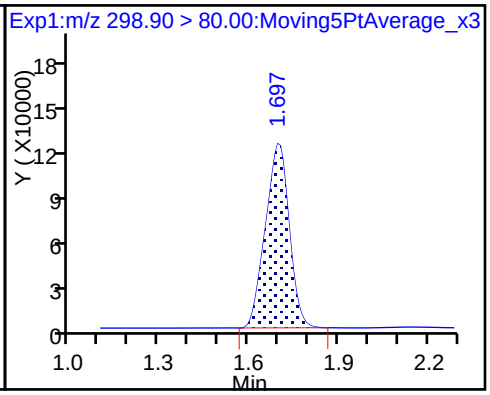
4 Perfluoropentanoic acid



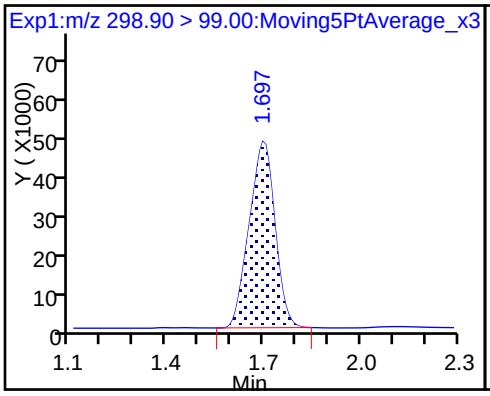
D 47 13C3-PFBS



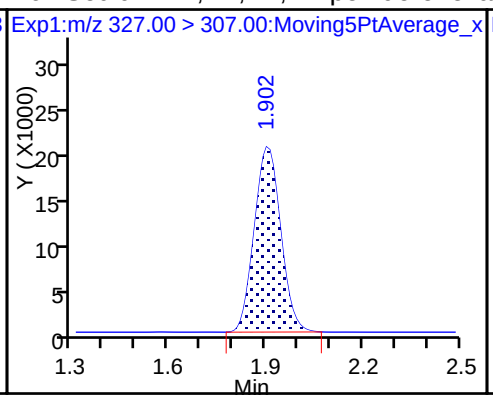
5 Perfluorobutanesulfonic acid



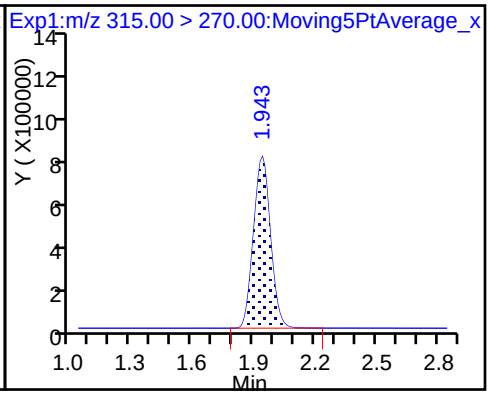
5 Perfluorobutanesulfonic acid



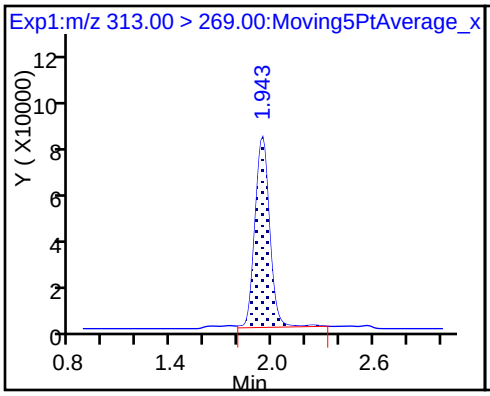
61 Sodium 1H,1H,2H,2H-perfluorohexa



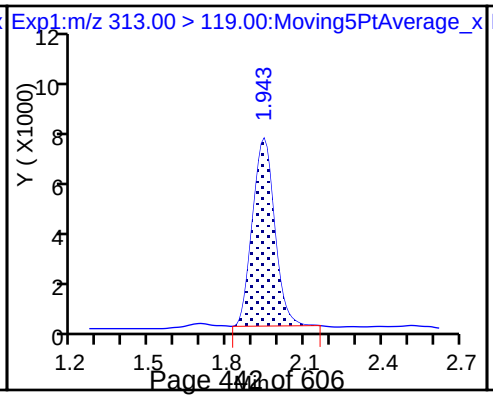
D 7 13C2 PFHxA



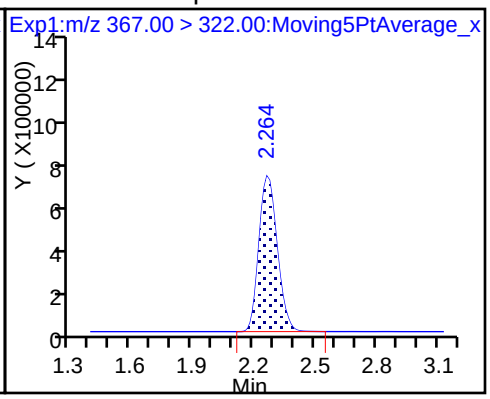
6 Perfluorohexanoic acid



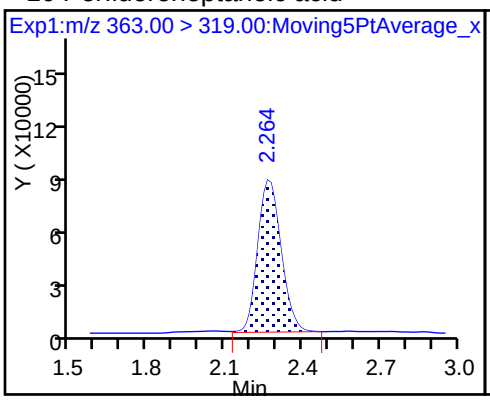
6 Perfluorohexanoic acid



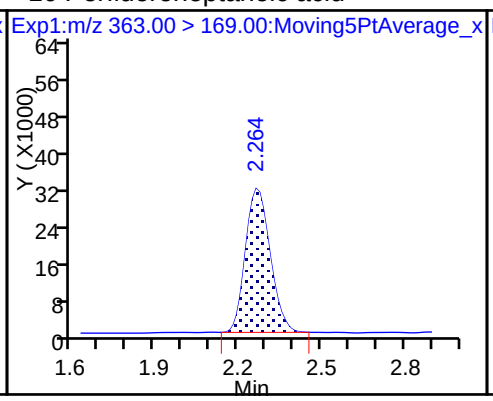
D 9 13C4-PFHpA



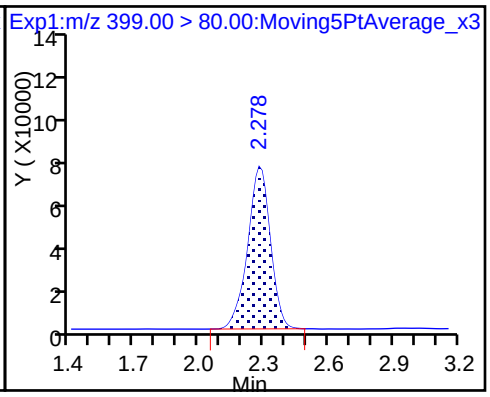
10 Perfluoroheptanoic acid



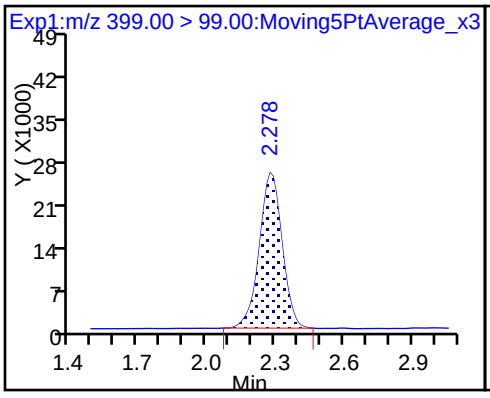
10 Perfluoroheptanoic acid



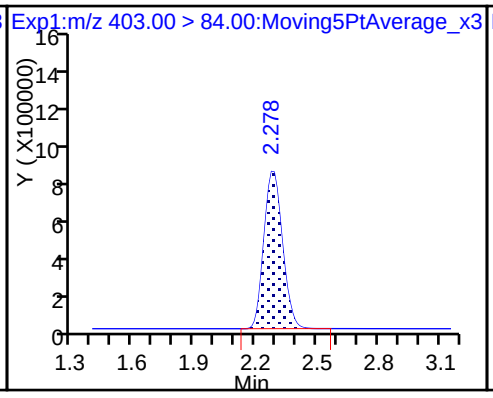
8 Perfluorohexanesulfonic acid



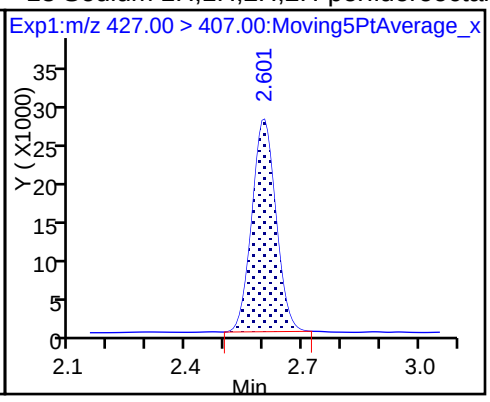
8 Perfluorohexanesulfonic acid



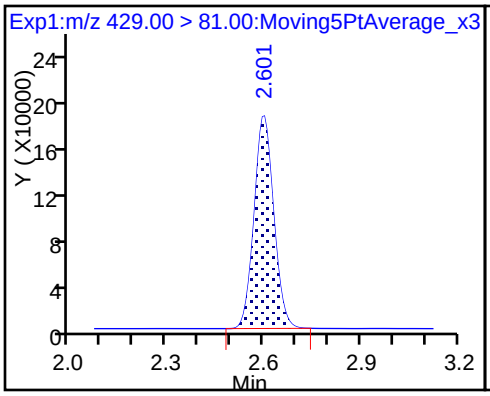
D 11 18O2 PFHxS



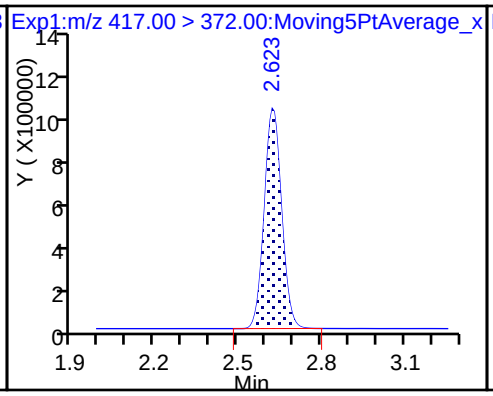
13 Sodium 1H,1H,2H,2H-perfluorooctane



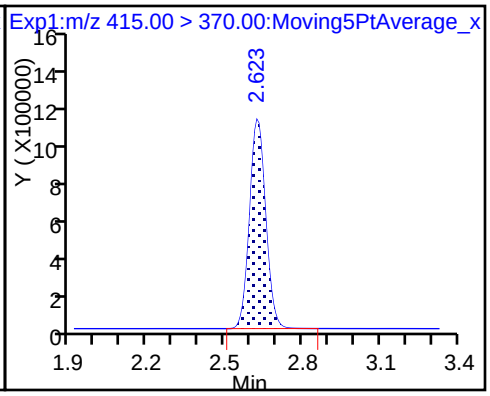
D 12 M2-6:2FTS



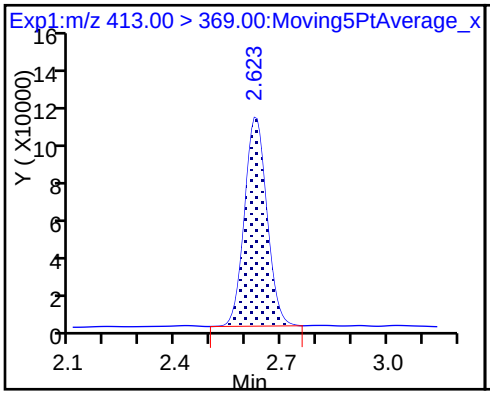
D 14 13C4 PFOA



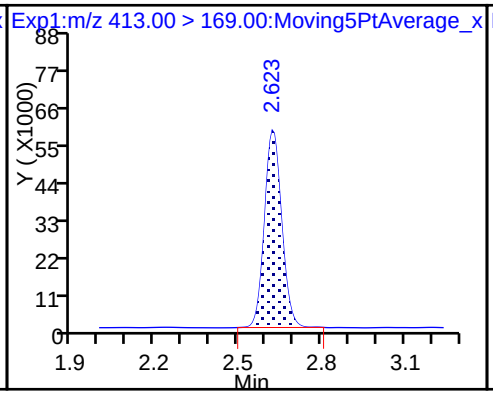
* 62 13C2-PFOA



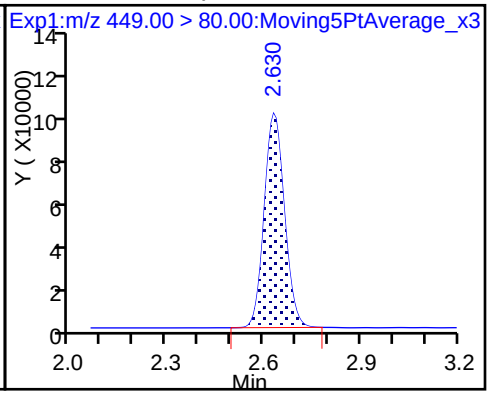
15 Perfluorooctanoic acid



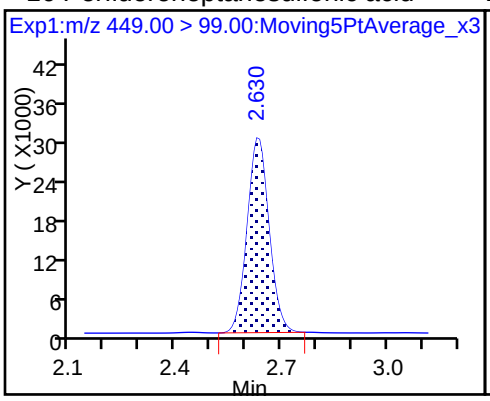
15 Perfluorooctanoic acid



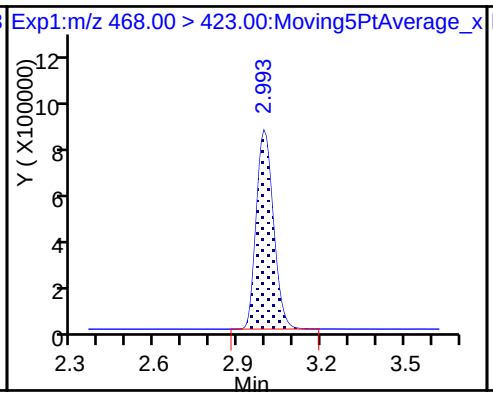
16 Perfluoroheptanesulfonic acid



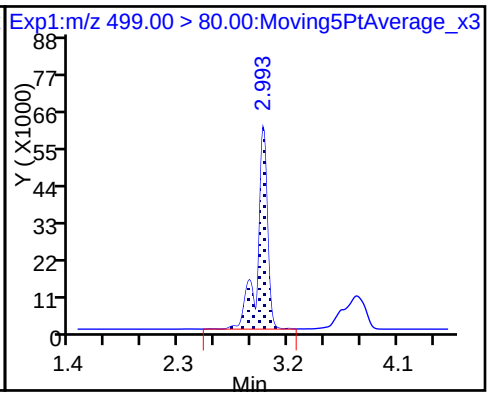
16 Perfluoroheptanesulfonic acid



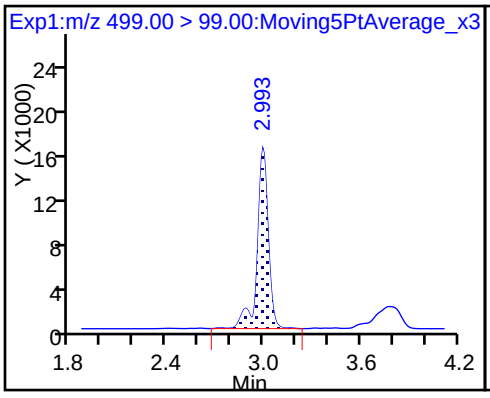
D 19 13C5 PFNA



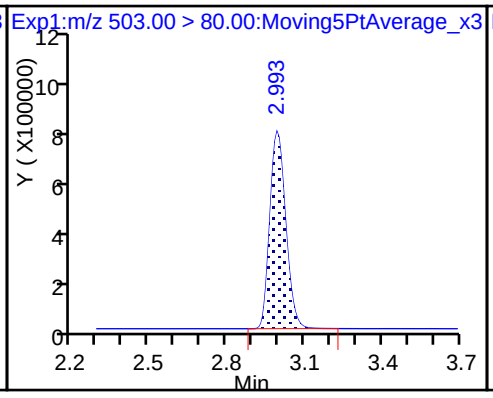
17 Perfluorooctane sulfonic acid



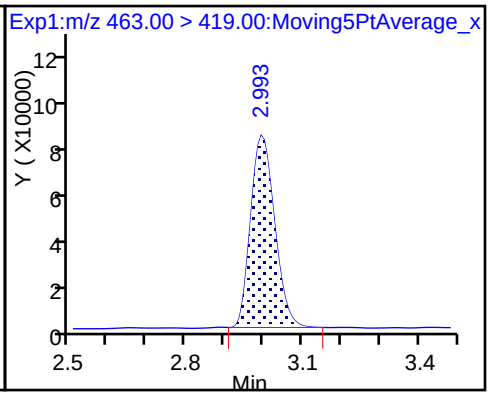
17 Perfluorooctane sulfonic acid



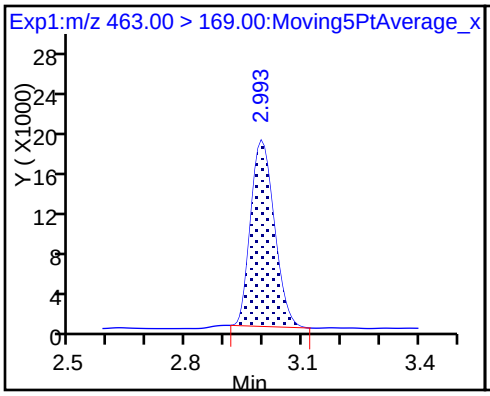
D 18 13C4 PFOS



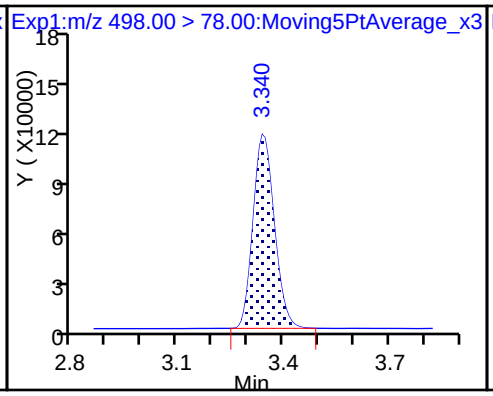
20 Perfluorononanoic acid



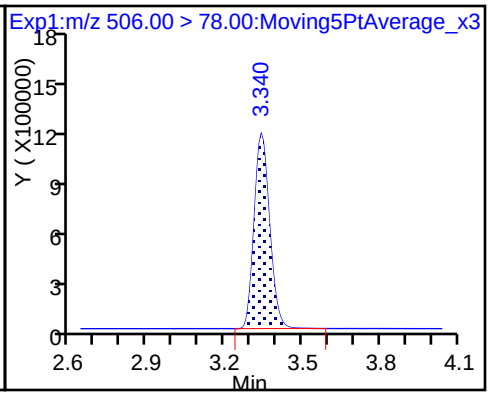
20 Perfluorononanoic acid



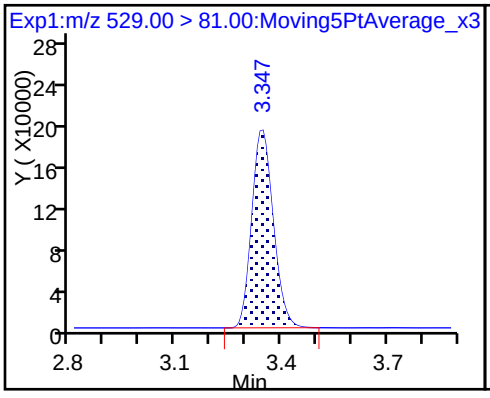
22 Perfluorooctane Sulfonamide



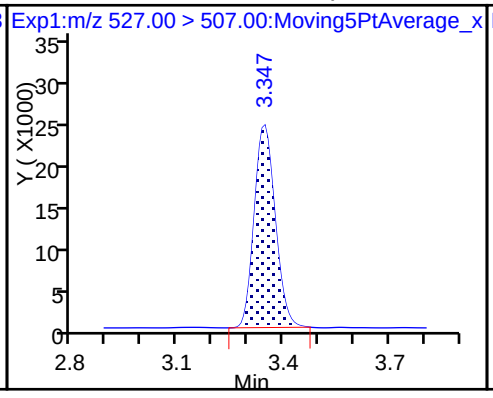
D 21 13C8 FOSA



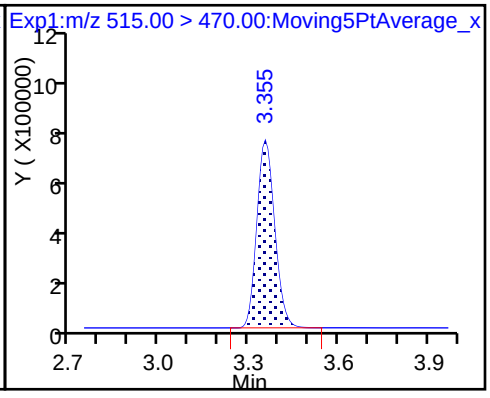
D 26 M2-8:2FTS



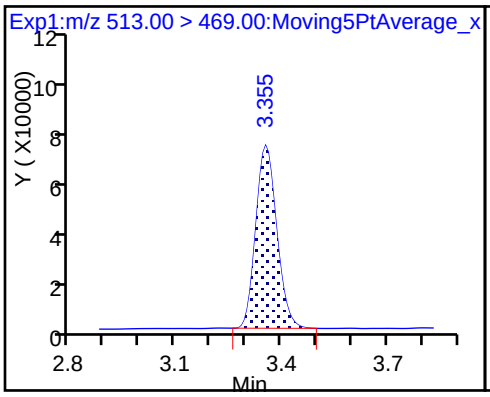
25 Sodium 1H,1H,2H,2H-perfluorodecane



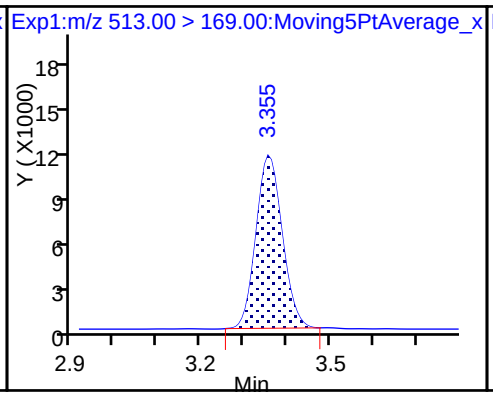
D 23 13C2 PFDA



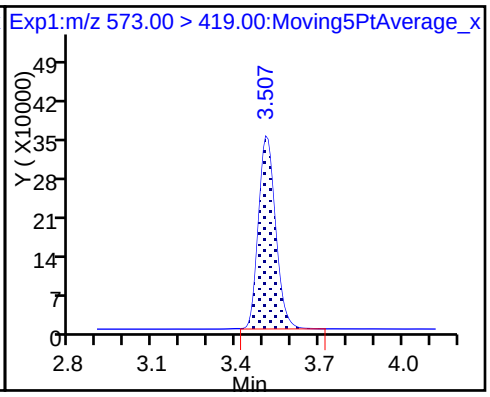
24 Perfluorodecanoic acid



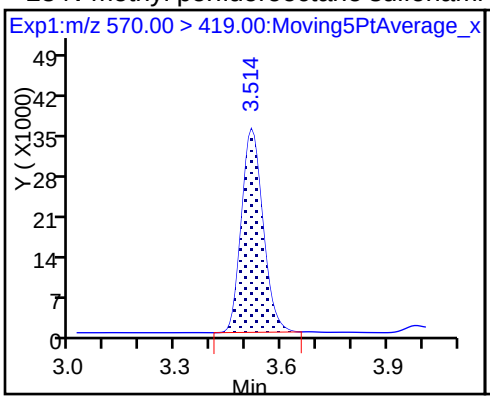
24 Perfluorodecanoic acid



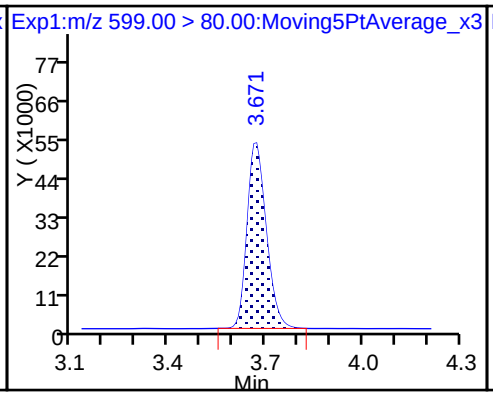
D 27 d3-NMeFOSAA



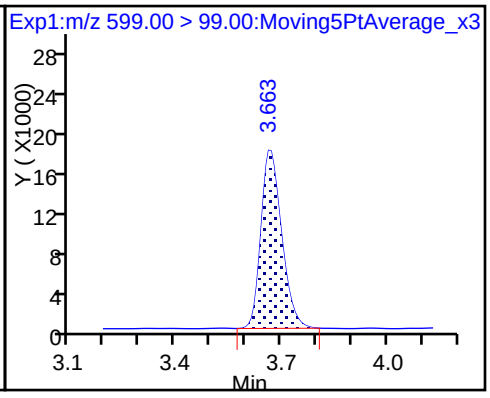
28 N-methyl perfluorooctane sulfonami



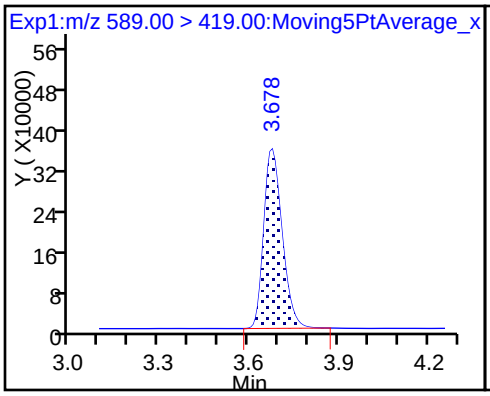
29 Perfluorodecane Sulfonic acid



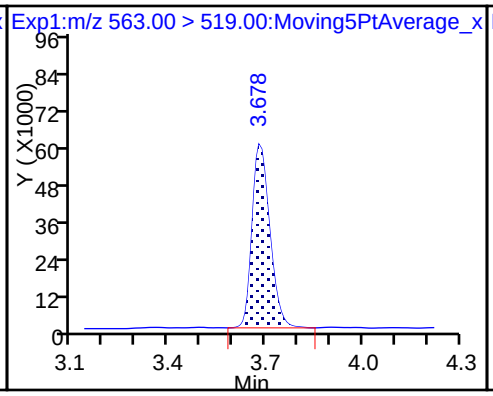
29 Perfluorodecane Sulfonic acid



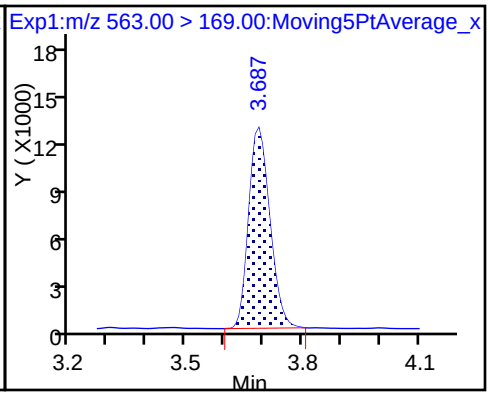
D 32 d5-NEtFOSAA



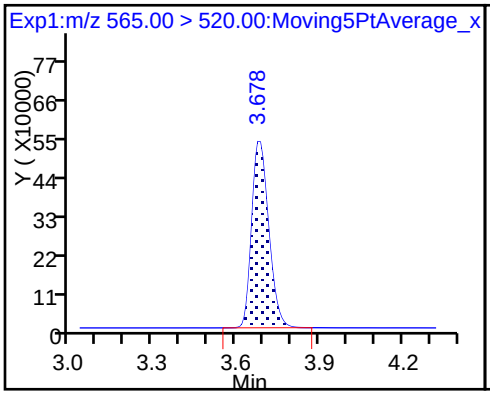
31 Perfluoroundecanoic acid



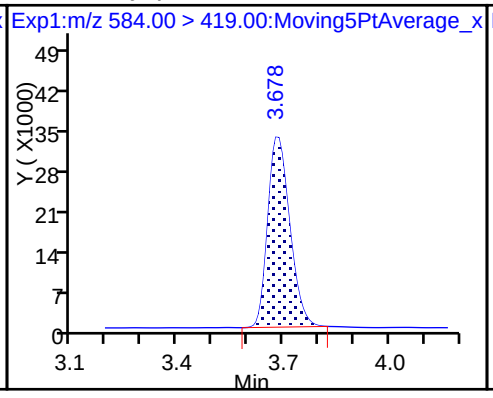
31 Perfluoroundecanoic acid



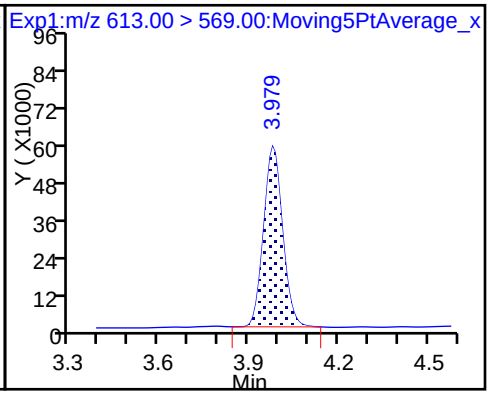
D 30 13C2 PFUnA



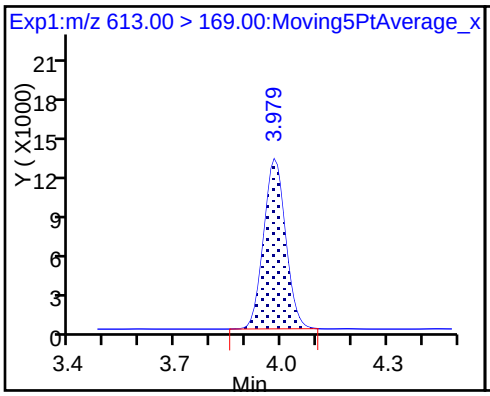
33 N-ethyl perfluorooctane sulfonamid



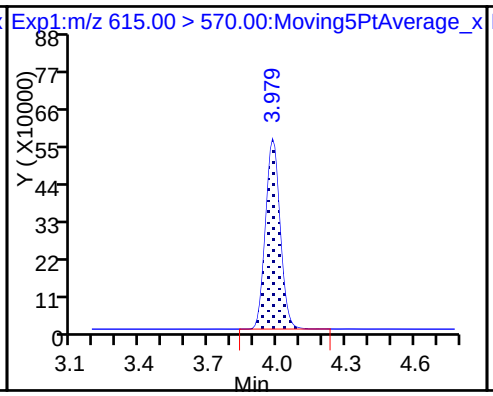
37 Perfluorododecanoic acid



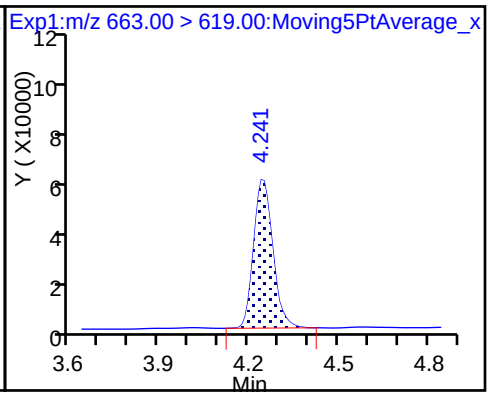
37 Perfluorododecanoic acid



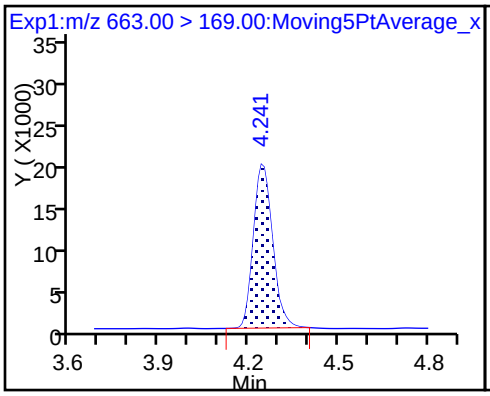
D 36 13C2 PFDoA



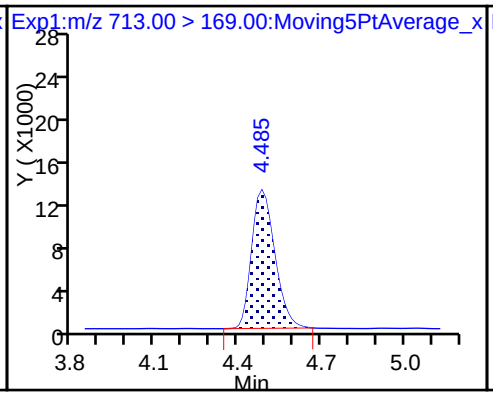
41 Perfluorotridecanoic acid



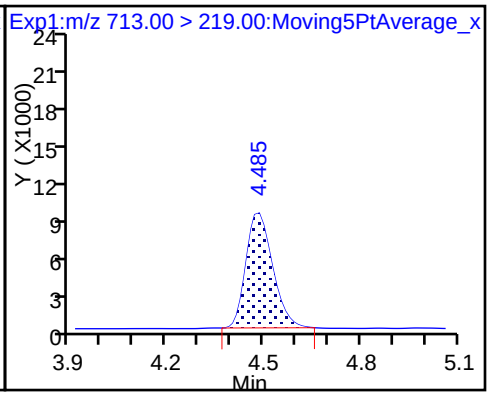
41 Perfluorotridecanoic acid



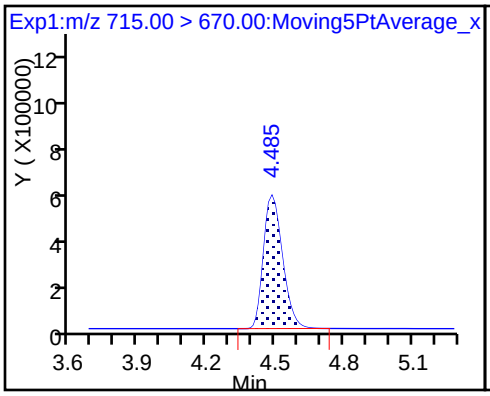
42 Perfluorotetradecanoic acid



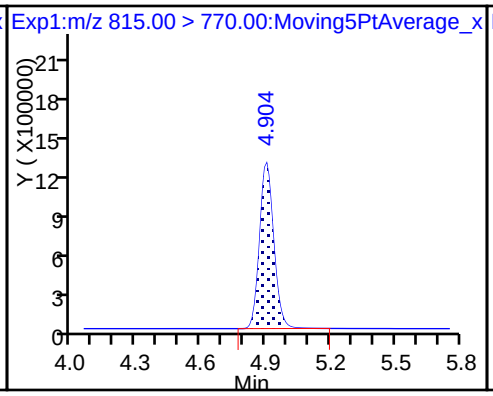
42 Perfluorotetradecanoic acid



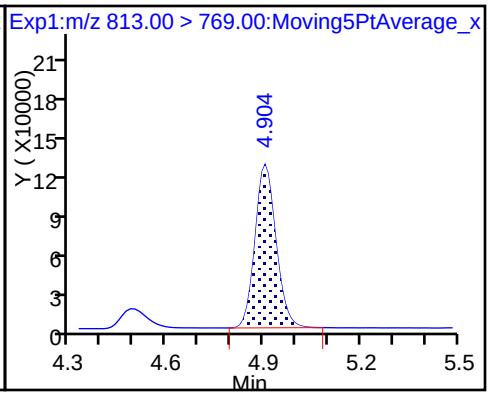
D 43 13C2-PFTeDA



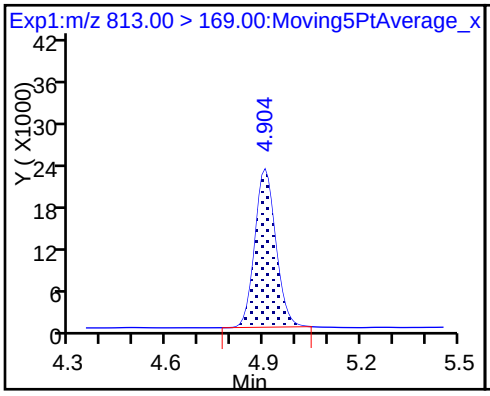
D 44 13C2-PFHxDA



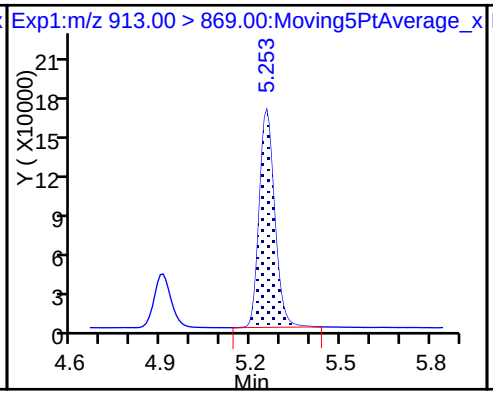
45 Perfluorohexadecanoic acid



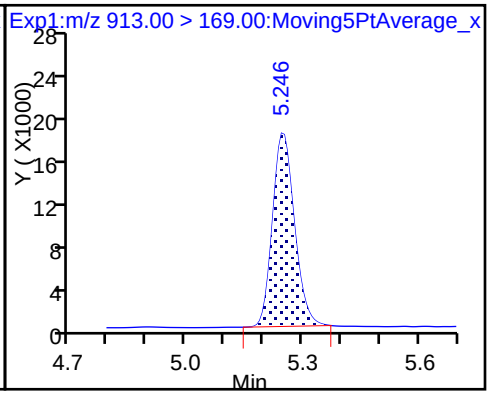
45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid



46 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_005.d
Lims ID: IC L4 Full
Client ID:
Sample Type: IC Calib Level: 4
Inject. Date: 17-Jan-2018 14:42:53 ALS Bottle#: 13 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L4-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-A8_N*sub30

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 18-Jan-2018 08:22:27 Calib Date: 17-Jan-2018 15:06:20
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_008.d

Column 1 : Det: EXP1
Process Host: XAWRK019

First Level Reviewer: hannigana Date: 17-Jan-2018 16:51:59

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.411	1.411	0.0	0.538	7075449	2.46		98.3	22003	
2 Perfluorobutyric acid										
212.90 > 169.00	1.418	1.413	0.005	1.004	2581287	0.9762		97.6	317	
D 3 13C5-PFPeA										
267.90 > 223.00	1.658	1.659	-0.001	0.632	4261723	2.50		100.0	35794	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.667	1.662	0.005	1.005	1934955	0.9635		96.4	1826	
D 47 13C3-PFBS										
301.90 > 83.00	1.694	1.695	-0.001	0.645	85658	2.27		97.6	3903	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.703	1.697	0.006	1.005	2532634	0.8903		101	18418	
298.90 > 99.00	1.703	1.697	0.006	1.005	1089273		2.33(1.25-3.74)	101	10994	
D 60 M2-4:2FTS										
329.00 > 81.00	1.908	1.903	0.005	0.727	544574	NC			5492	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.908	1.903	0.005	1.000	459884	0.8984		96.2	20899	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.939	1.939	0.0	1.000	1861593	1.01		101	4714	
313.00 > 119.00	1.939	1.939	0.0	1.000	163514		11.38(5.03-15.10)	101	2185	
D 7 13C2 PFHxA										
315.00 > 270.00	1.939	1.939	0.0	0.738	4467394	2.43		97.3	35572	
D 9 13C4-PFHpA										
367.00 > 322.00	2.273	2.267	0.006	0.866	4367056	2.50		99.8	24480	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.273	2.268	0.005	1.000	1803022	0.9392		93.9	3372	
363.00 > 169.00	2.273	2.268	0.005	1.000	733365		2.46(1.13-3.40)	93.9	5388	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.286	2.280	0.006	1.000	1981094	0.8265		90.8	6767	
399.00 > 99.00	2.286	2.280	0.006	1.000	683021		2.90(1.50-4.49)	90.8	4324	
D 11 18O2 PFHxS										
403.00 > 84.00	2.286	2.282	0.004	0.871	5091273	2.36		99.9	25595	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.598	2.596	0.002	1.000	488565	0.8919		94.1	11772	
D 12 M2-6:2FTS										
429.00 > 81.00	2.598	2.597	0.001	0.990	786039	2.43		102	21117	
* 62 13C2-PFOA										
415.00 > 370.00	2.625	2.622	0.003		4760693	2.50			29372	
D 14 13C4 PFOA										
417.00 > 372.00	2.625	2.622	0.003	1.000	4182465	2.44		97.6	33554	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.625	2.623	0.002	1.000	1890626	0.9642		96.4	1371	
413.00 > 169.00	2.625	2.623	0.002	1.000	990720		1.91(0.84-2.52)	96.4	7524	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.633	2.629	0.004	1.000	1717801	0.9369		98.4	15386	
449.00 > 99.00	2.633	2.629	0.004	1.000	474373		3.62(1.94-5.82)	98.4	9136	
D 18 13C4 PFOS										
503.00 > 80.00	2.996	2.992	0.004	1.141	3235344	2.37		99.3	23758	
20 Perfluorononanoic acid										
463.00 > 419.00	2.996	2.992	0.004	1.000	1428679	1.02		102	4853	
463.00 > 169.00	2.996	2.992	0.004	1.000	339665		4.21(1.90-5.69)	102	7289	
D 19 13C5 PFNA										
468.00 > 423.00	2.996	2.992	0.004	1.141	3397294	2.44		97.8	23997	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.996	2.992	0.004	1.000	1355316	0.8944		96.4	530	
499.00 > 99.00	2.996	2.992	0.004	1.000	299471		4.53(2.31-6.93)	96.4	769	
D 21 13C8 FOSA										
506.00 > 78.00	3.343	3.338	0.005	1.273	4845519	2.53		101	28675	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.343	3.338	0.005	1.000	1866404	0.9803		98.0	14587	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.343	3.342	0.001	1.000	377296	0.9426		98.4	9990	
D 26 M2-8:2FTS										
529.00 > 81.00	3.343	3.342	0.001	1.273	787775	2.30		96.2	21130	
D 23 13C2 PFDA										
515.00 > 470.00	3.358	3.352	0.006	1.279	3005224	2.50		100	31282	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.358	3.353	0.005	1.000	1122840	0.9627		96.3	5520	
513.00 > 169.00	3.358	3.353	0.005	1.000	202609		5.54(2.36-7.09)	96.3	1737	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.510	3.507	0.003	1.337	1499251	2.50		100	11909	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.518	3.513	0.005	1.002	630879	0.9739		97.4	3748	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.665	3.666	-0.001	1.000	857674	0.9675		100	18976	
599.00 > 99.00	3.665	3.666	-0.001	1.000	292568		2.93(1.39-4.16)	100	10167	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.673	3.672	0.001	1.399	1503508	2.48		99.2	5023	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.682	3.678	0.004	1.000	855685	0.9207		92.1	3773	
563.00 > 169.00	3.682	3.678	0.004	1.000	187060		4.57(0.00-0.00)	92.1	9908	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.682	3.679	0.003	1.002	554613	0.9470		94.7	6060	
D 30 13C2 PFUnA										
565.00 > 520.00	3.682	3.679	0.003	1.402	2250985	2.47		98.8	31522	
D 36 13C2 PFDoA										
615.00 > 570.00	3.983	3.979	0.004	1.517	2345552	2.37		94.9	23548	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.983	3.979	0.004	1.000	975905	1.02		102	4517	
613.00 > 169.00	3.983	3.979	0.004	1.000	233684		4.18(2.13-6.40)	102	10727	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.244	4.242	0.002	1.000	1119808	1.03		103	4585	
663.00 > 169.00	4.244	4.242	0.002	1.000	344544		3.25(1.25-3.76)	103	12891	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.487	4.483	0.004	1.709	3148987	2.44		97.5	16074	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.487	4.483	0.004	1.000	295170	0.9603		96.0	5686	
713.00 > 219.00	4.473	4.483	-0.010	0.997	198743		1.49(0.71-2.13)	96.0	5800	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.904	4.902	0.002	1.000	2195395	0.9818		98.2	1281	
813.00 > 169.00	4.904	4.902	0.002	1.000	373694		5.87(2.86-8.58)	98.2	3967	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.904	4.902	0.002	1.868	5786263	2.51		101	11016	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.261	5.255	0.006	1.000	2429777	1.00		99.6	587	
913.00 > 169.00	5.261	5.255	0.006	1.000	304165		7.99(0.00-0.00)	99.6	1267	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL4_00003 Amount Added: 1.00 Units: mL

Report Date: 18-Jan-2018 08:22:27 Chrom Revision: 2.2 08-Dec-2017 11:41:26

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_005.d

Injection Date: 17-Jan-2018 14:42:53 Instrument ID: A8_N

Lims ID: IC L4 Full

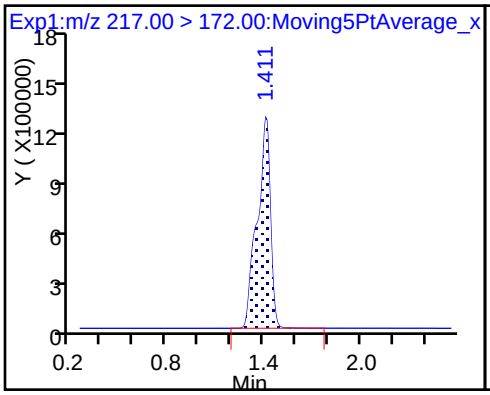
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 13 Worklist Smp#: 5

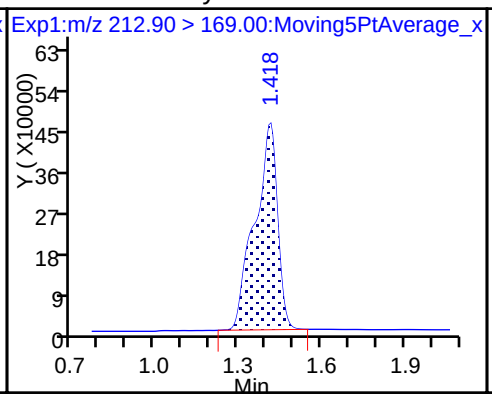
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

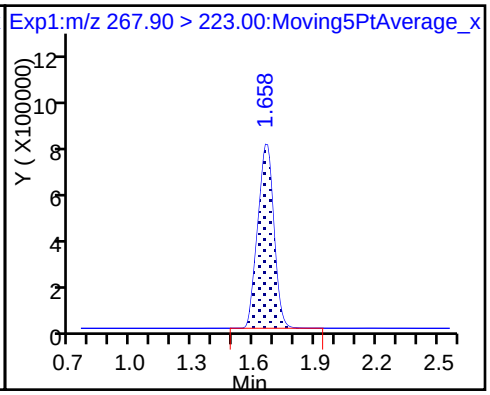
D 1 13C4 PFBA



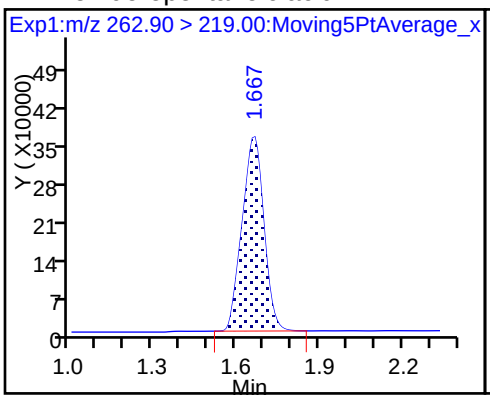
2 Perfluorobutyric acid



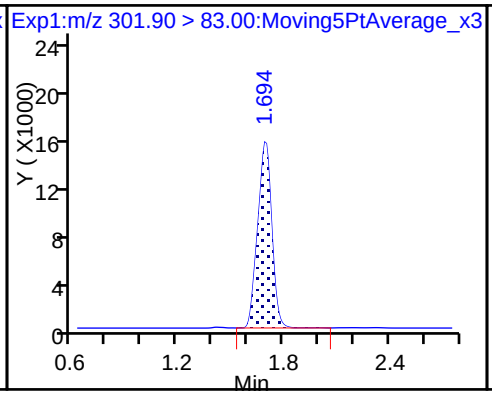
D 3 13C5-PFPeA



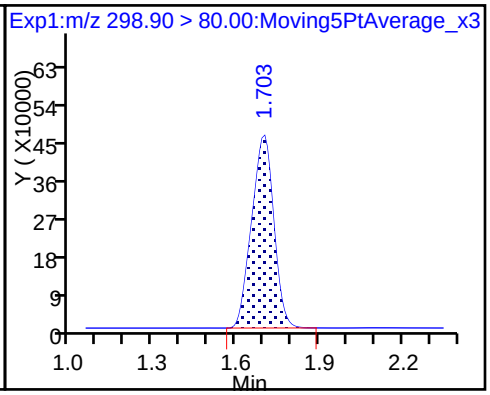
4 Perfluoropentanoic acid



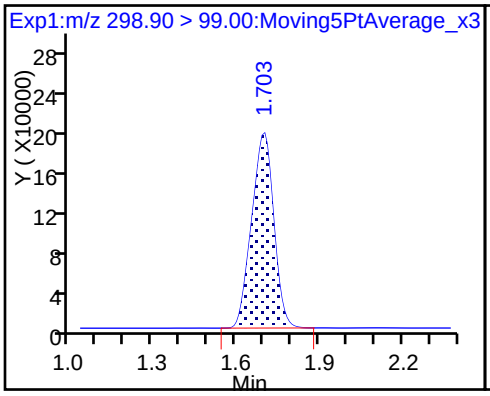
D 47 13C3-PFBS



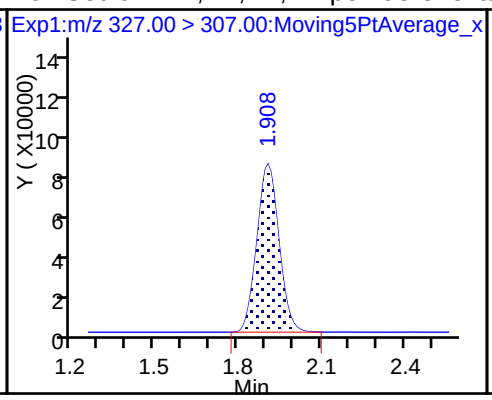
5 Perfluorobutanesulfonic acid



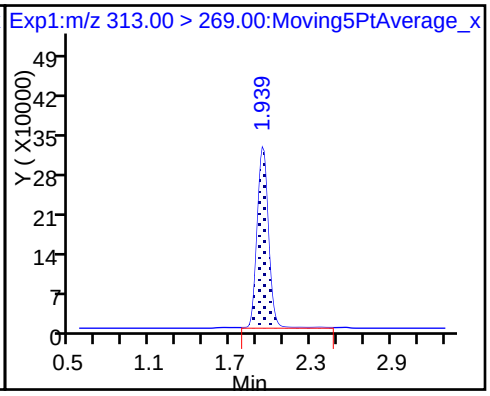
5 Perfluorobutanesulfonic acid



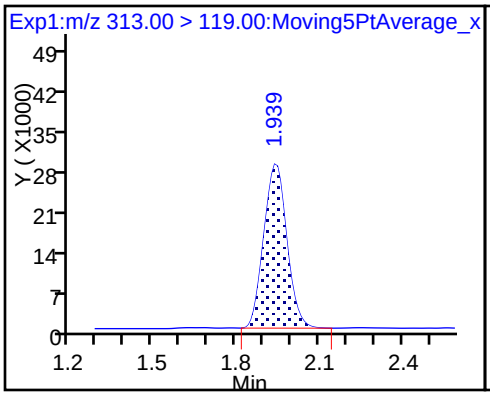
61 Sodium 1H,1H,2H,2H-perfluorohexane



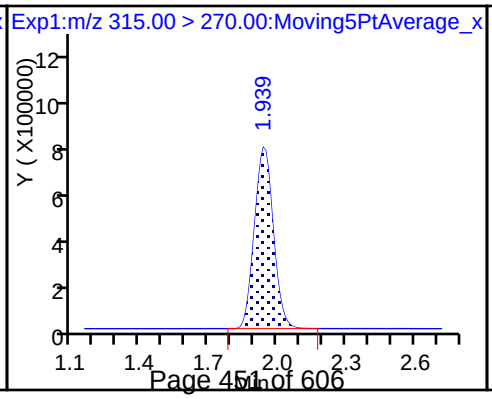
6 Perfluorohexanoic acid



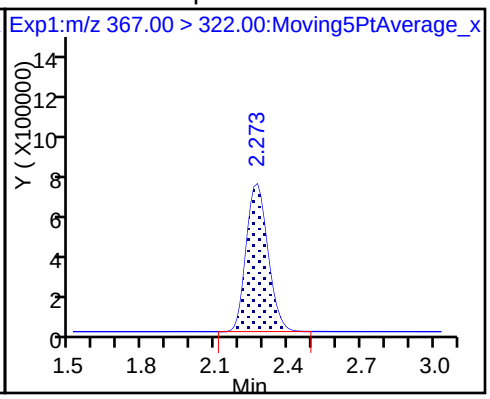
6 Perfluorohexanoic acid



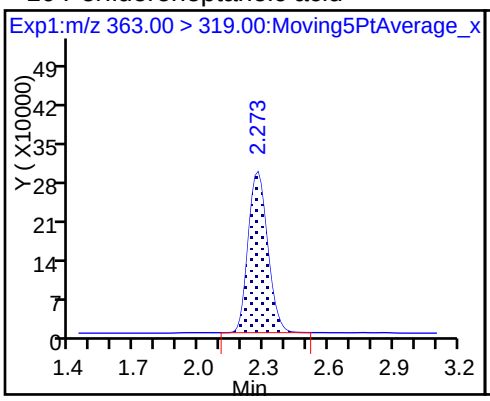
D 7 13C2 PFHxA



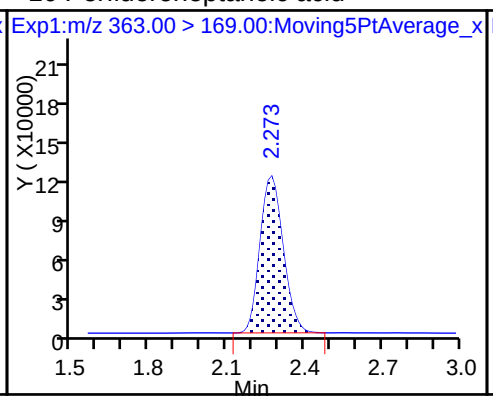
D 9 13C4-PFHpA



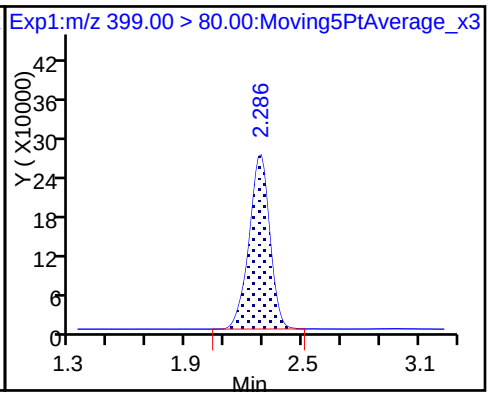
10 Perfluoroheptanoic acid



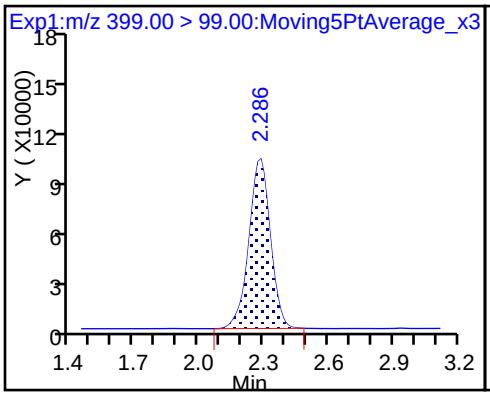
10 Perfluoroheptanoic acid



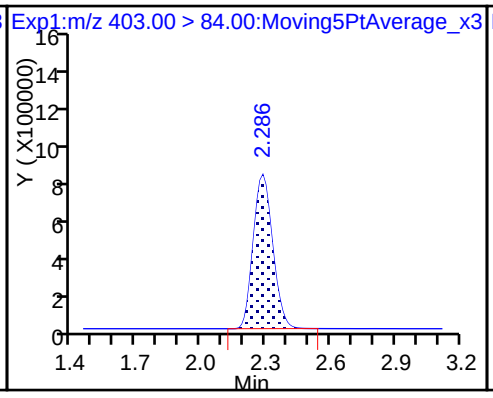
8 Perfluorohexanesulfonic acid



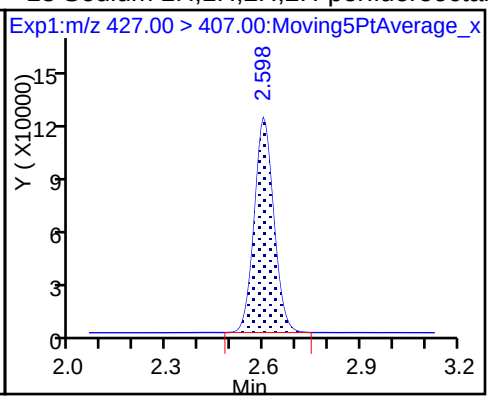
8 Perfluorohexanesulfonic acid



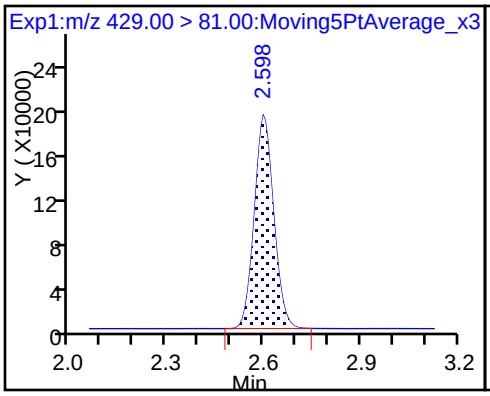
D 11 18O2 PFHxS



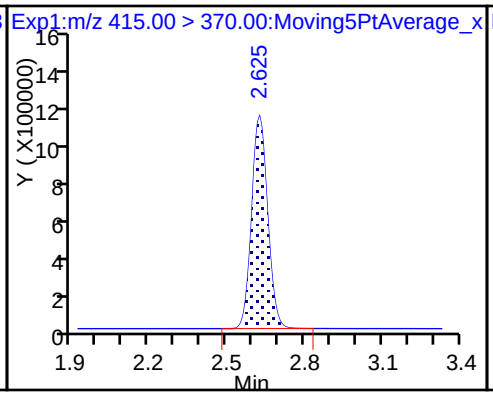
13 Sodium 1H,1H,2H,2H-perfluorooctane



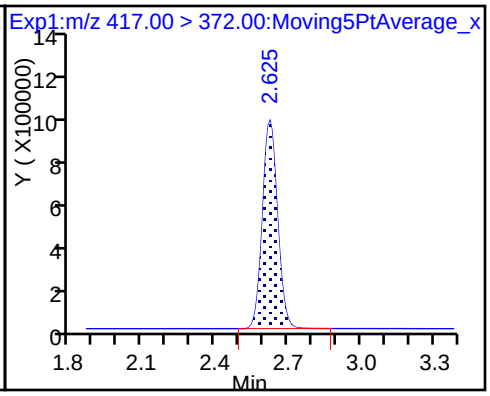
D 12 M2-6:2FTS



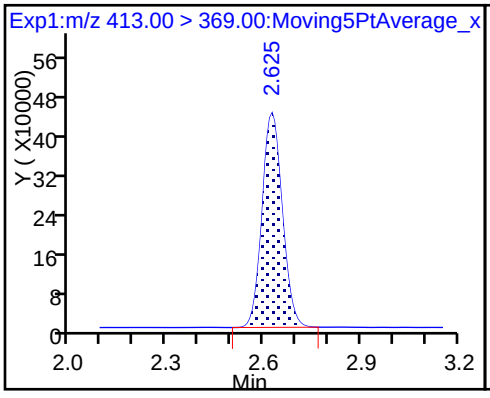
* 62 13C2-PFOA



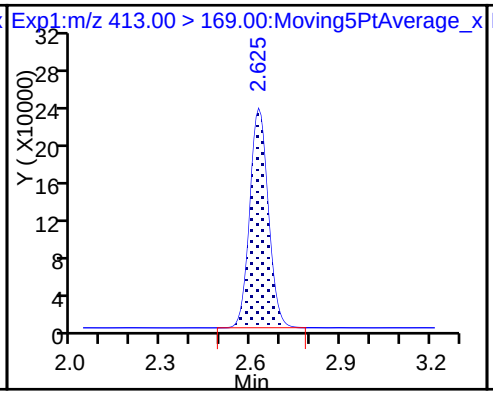
D 14 13C4 PFOA



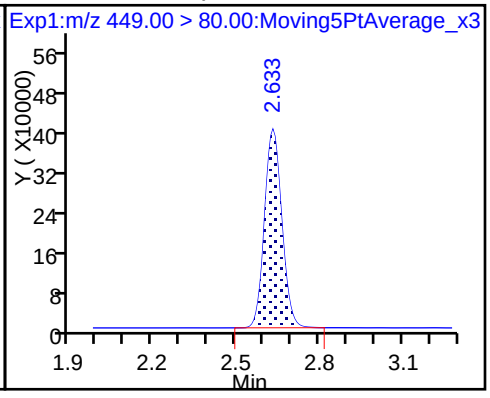
15 Perfluorooctanoic acid



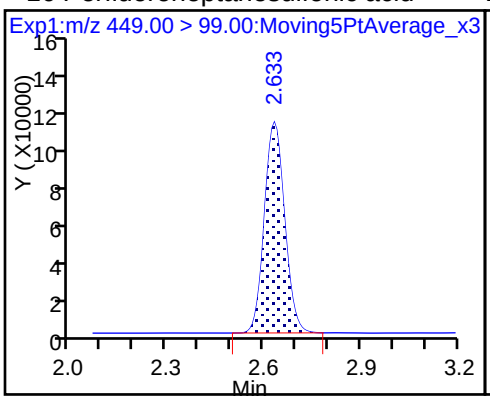
15 Perfluorooctanoic acid



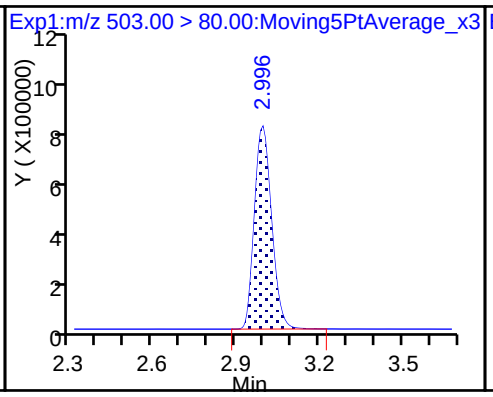
16 Perfluoroheptanesulfonic acid



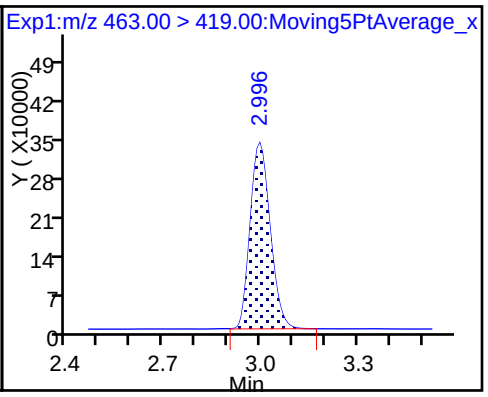
16 Perfluoroheptanesulfonic acid



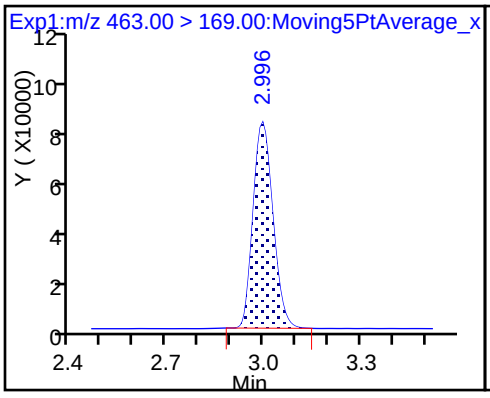
D 18 13C4 PFOS



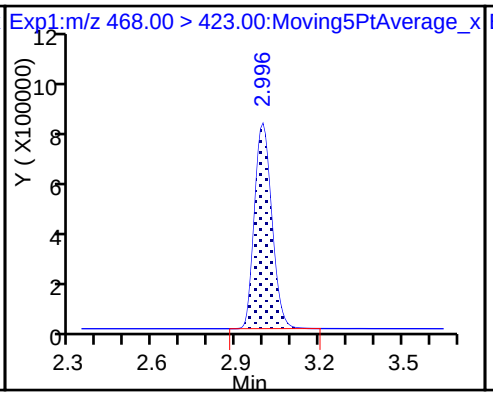
20 Perfluorononanoic acid



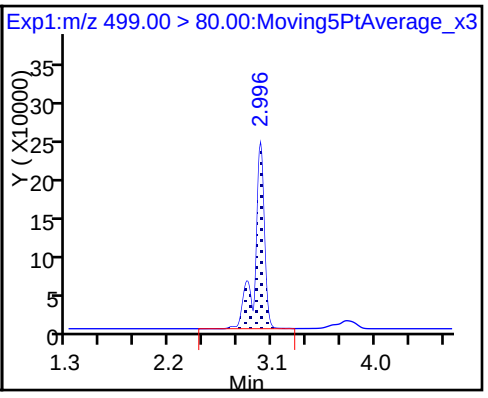
20 Perfluorononanoic acid



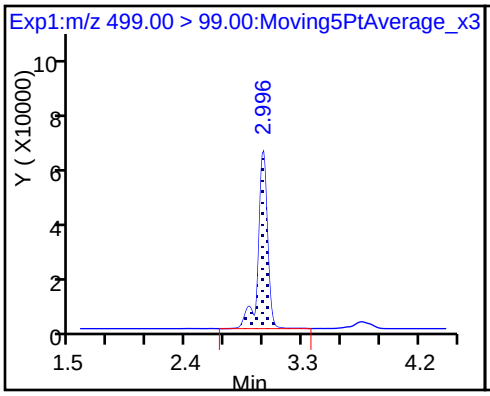
D 19 13C5 PFNA



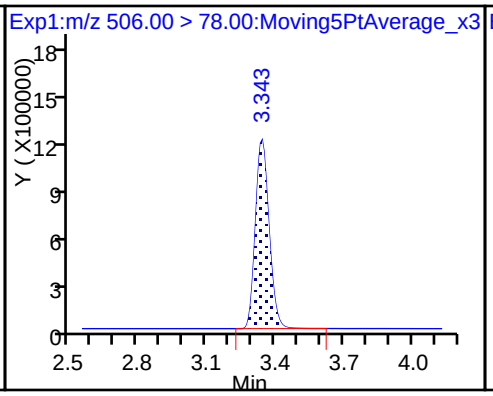
17 Perfluorooctane sulfonic acid



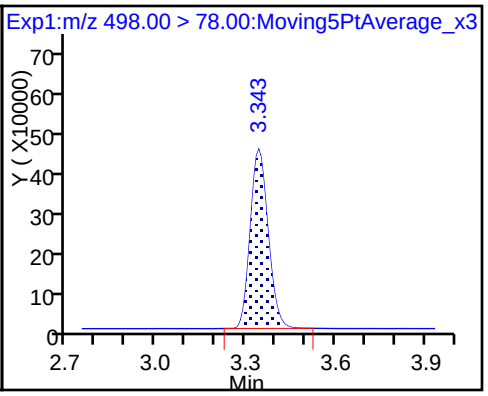
17 Perfluorooctane sulfonic acid



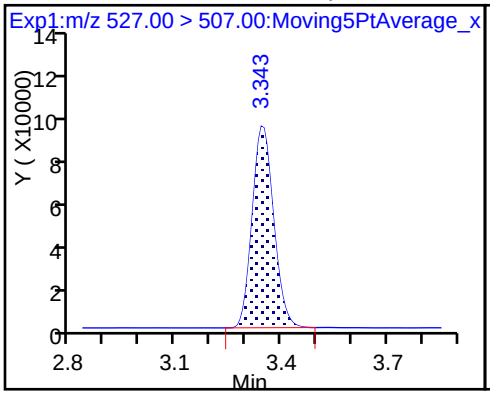
D 21 13C8 FOSA



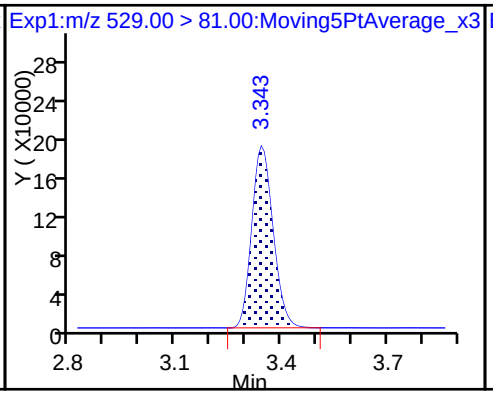
22 Perfluorooctane Sulfonamide



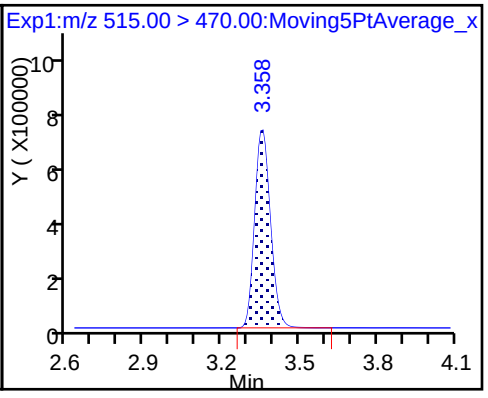
25 Sodium 1H,1H,2H,2H-perfluorodecane



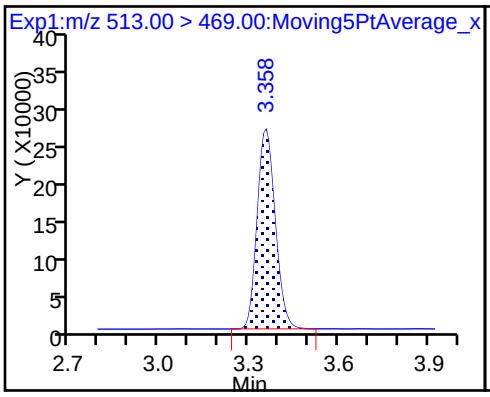
D 26 M2-8:2FTS



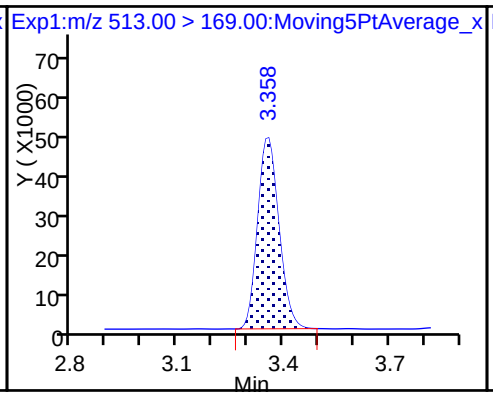
D 23 13C2 PFDA



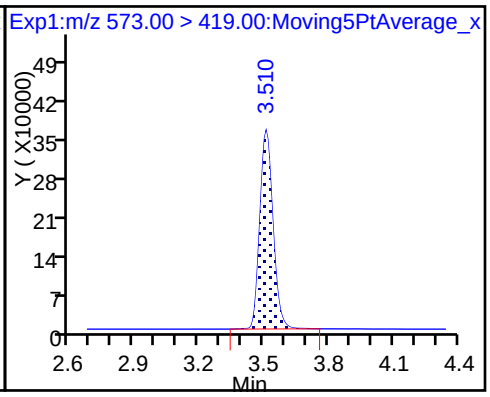
24 Perfluorodecanoic acid



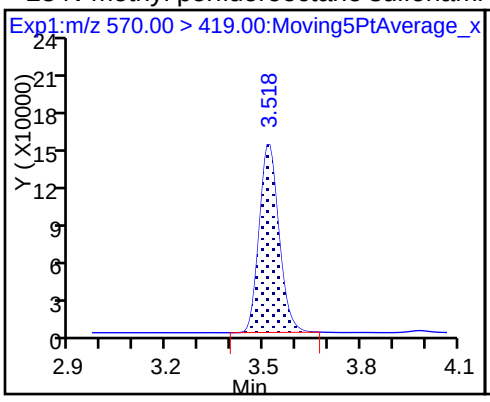
24 Perfluorodecanoic acid



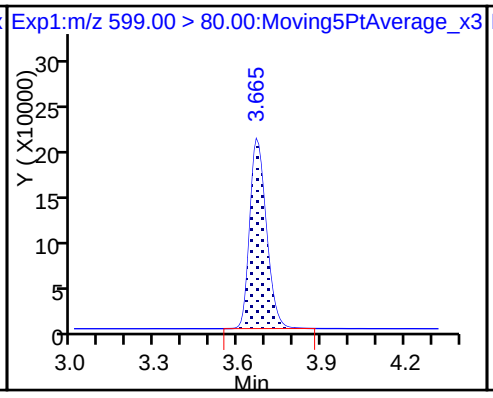
D 27 d3-NMeFOSAA



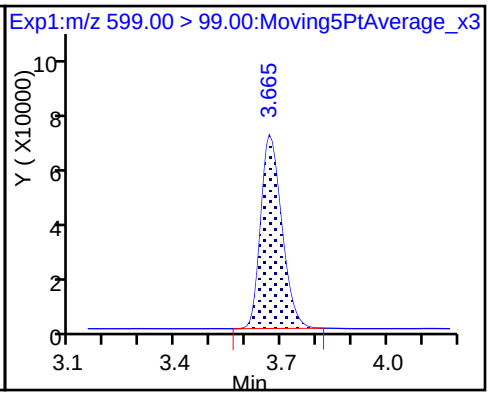
28 N-methyl perfluorooctane sulfonami



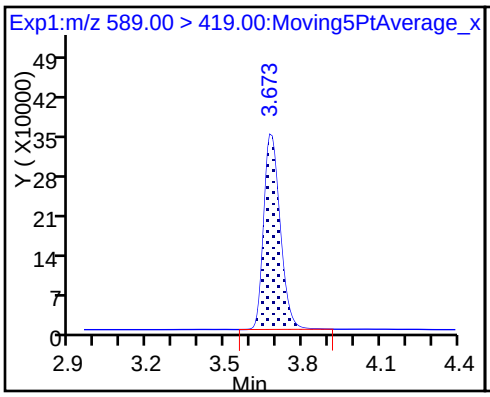
29 Perfluorodecane Sulfonic acid



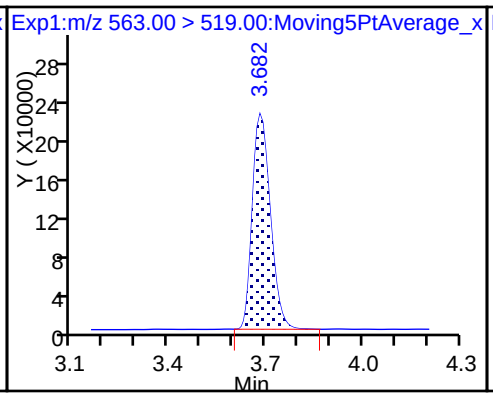
29 Perfluorodecane Sulfonic acid



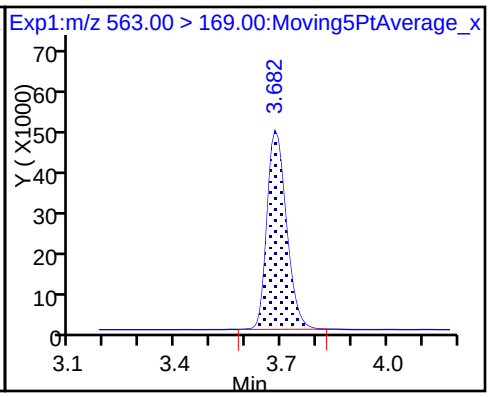
D 32 d5-NEtFOSAA



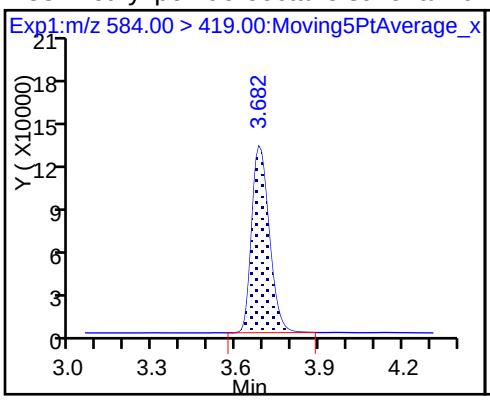
31 Perfluoroundecanoic acid



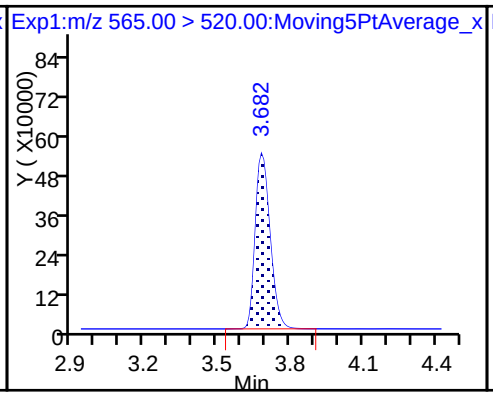
31 Perfluoroundecanoic acid



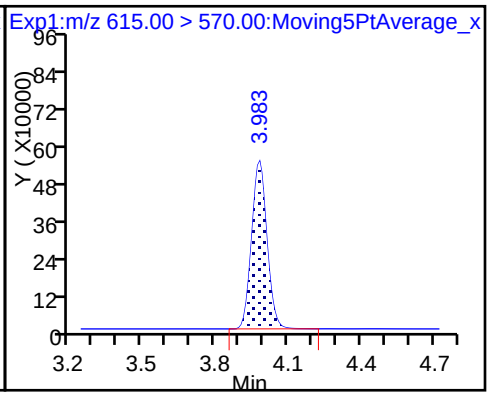
33 N-ethyl perfluorooctane sulfonamid



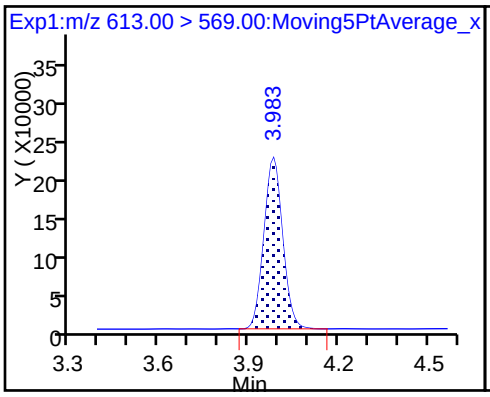
D 30 13C2 PFUnA



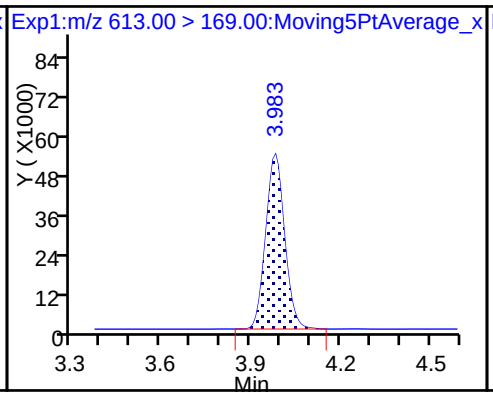
D 36 13C2 PFDoA



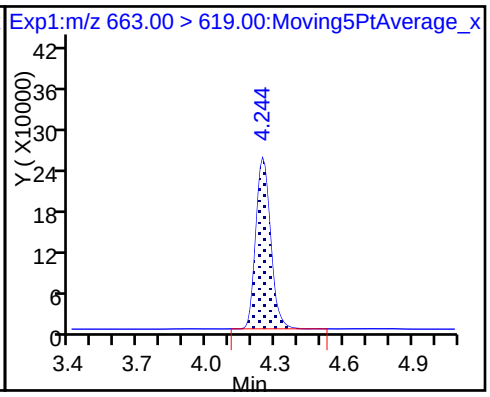
37 Perfluorododecanoic acid



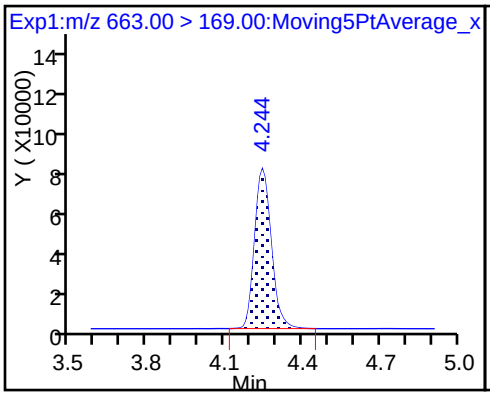
37 Perfluorododecanoic acid



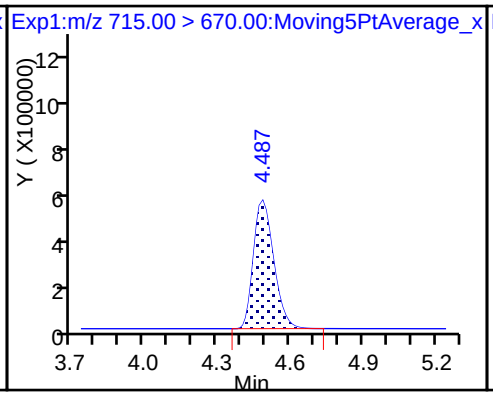
41 Perfluorotridecanoic acid



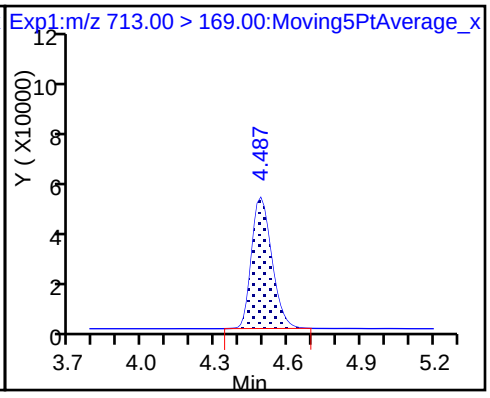
41 Perfluorotridecanoic acid



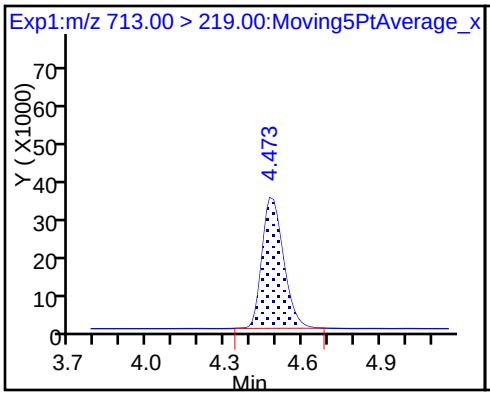
D 43 13C2-PFTeDA



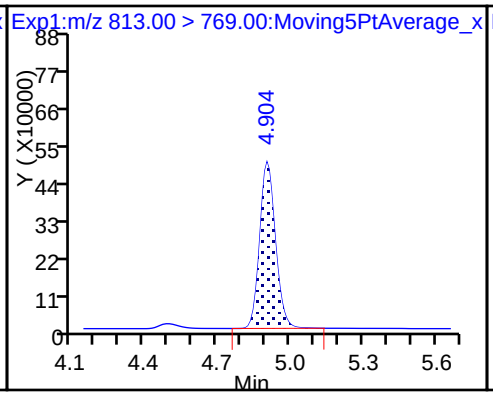
42 Perfluorotetradecanoic acid



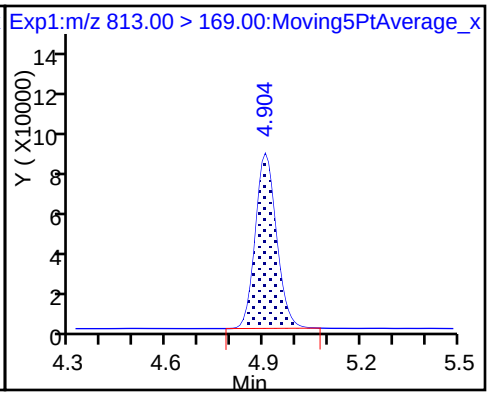
42 Perfluorotetradecanoic acid



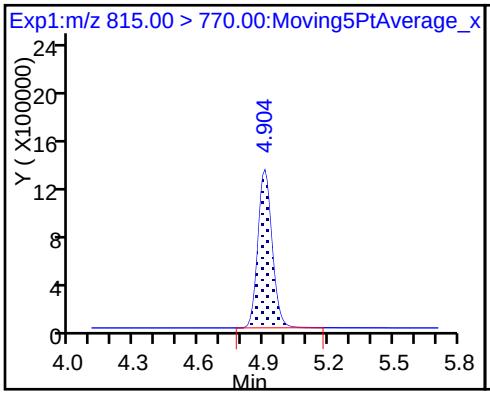
45 Perfluorohexadecanoic acid



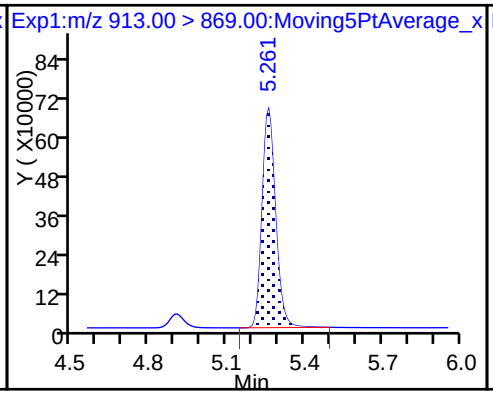
45 Perfluorohexadecanoic acid



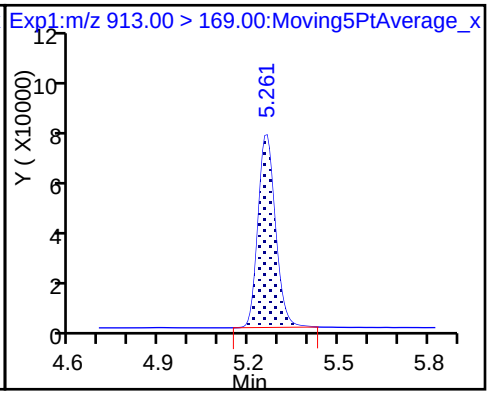
D 44 13C2-PFHxDA



46 Perfluorooctadecanoic acid



46 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_006.d
Lims ID: IC L5 Full
Client ID:
Sample Type: IC Calib Level: 5
Inject. Date: 17-Jan-2018 14:50:40 ALS Bottle#: 14 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L5-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-A8_N*sub30

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 18-Jan-2018 08:22:30 Calib Date: 17-Jan-2018 15:06:20
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_008.d

Column 1 : Det: EXP1
Process Host: XAWRK019

First Level Reviewer: hannigana Date: 17-Jan-2018 16:52:24

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.407	1.411	-0.004	0.537	7104763	2.50		100	23372	
2 Perfluorobutyric acid										
212.90 > 169.00	1.413	1.413	0.0	1.004	6694565	2.52		101	716	
D 3 13C5-PFPeA										
267.90 > 223.00	1.661	1.659	0.002	0.633	4159040	2.47		99.0	36968	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.661	1.662	-0.001	1.000	4900043	2.50		100	4378	
D 47 13C3-PFBS										
301.90 > 83.00	1.697	1.695	0.002	0.647	90418	2.43		105	4203	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.697	1.697	0.0	1.000	6433939	2.14		97.0	38054	
298.90 > 99.00	1.697	1.697	0.0	1.000	2753698		2.34(1.25-3.74)	97.0	24045	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.902	1.903	-0.001	1.000	1228862	2.27		97.4	44672	
D 60 M2-4:2FTS										
329.00 > 81.00	1.902	1.903	-0.001	0.725	545775	NC			5185	
D 7 13C2 PFHxA										
315.00 > 270.00	1.943	1.939	0.004	0.741	4634604	2.56		102	36923	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.943	1.939	0.004	1.000	4586272	2.39		95.5	9351	
313.00 > 119.00	1.943	1.939	0.004	1.000	427468		10.73(5.03-15.10)	95.5	6848	
D 9 13C4-PFHpA										
367.00 > 322.00	2.265	2.267	-0.002	0.863	4357423	2.53		101	24387	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.265	2.268	-0.003	1.000	4706368	2.46		98.3	7569	
363.00 > 169.00	2.265	2.268	-0.003	1.000	1827469		2.58(1.13-3.40)	98.3	12368	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.278	2.280	-0.002	1.000	5134885	2.23		97.8	11137	
399.00 > 99.00	2.278	2.280	-0.002	1.000	1689075		3.04(1.50-4.49)	97.8	7428	
D 11 18O2 PFHxS										
403.00 > 84.00	2.278	2.282	-0.004	0.868	4900649	2.31		97.6	24542	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.596	2.596	0.0	1.000	1258940	2.35		99.1	18472	
D 12 M2-6:2FTS										
429.00 > 81.00	2.596	2.597	-0.001	0.990	768843	2.41		102	14965	
D 14 13C4 PFOA										
417.00 > 372.00	2.623	2.622	0.001	1.000	4316678	2.55		102	28740	
* 62 13C2-PFOA										
415.00 > 370.00	2.623	2.622	0.001		4691625	2.50			34097	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.623	2.623	0.0	1.000	4896648	2.42		96.8	3583	
413.00 > 169.00	2.623	2.623	0.0	1.000	2496697		1.96(0.84-2.52)	96.8	14913	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.630	2.629	0.001	1.000	4563453	2.52		106	39180	
449.00 > 99.00	2.630	2.629	0.001	1.000	1192536		3.83(1.94-5.82)	106	17356	
D 19 13C5 PFNA										
468.00 > 423.00	2.993	2.992	0.001	1.141	3329183	2.43		97.2	19465	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.993	2.992	0.001	1.000	3505745	2.35		101	1395	
499.00 > 99.00	2.993	2.992	0.001	1.000	755117		4.64(2.31-6.93)	101	1932	
D 18 13C4 PFOS										
503.00 > 80.00	2.993	2.992	0.001	1.141	3190243	2.37		99.4	20975	
20 Perfluorononanoic acid										
463.00 > 419.00	2.993	2.992	0.001	1.000	3585870	2.61		104	11368	
463.00 > 169.00	2.993	2.992	0.001	1.000	848001		4.23(1.90-5.69)	104	11677	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.340	3.338	0.002	1.000	4822749	2.63		105	31460	
D 21 13C8 FOSA										
506.00 > 78.00	3.340	3.338	0.002	1.273	4670673	2.47		98.9	22093	
D 26 M2-8:2FTS										
529.00 > 81.00	3.340	3.342	-0.002	1.273	800715	2.38		99.2	12843	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.340	3.342	-0.002	1.000	981168	2.41		101	23396	
D 23 13C2 PFDA										
515.00 > 470.00	3.347	3.352	-0.005	1.276	2975947	2.51		101	26544	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.355	3.353	0.002	1.002	2809263	2.43		97.3	11645	
513.00 > 169.00	3.355	3.353	0.002	1.002	499275		5.63(2.36-7.09)	97.3	1687	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.507	3.507	0.0	1.337	1437020	2.43		97.3	9404	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.514	3.513	0.001	1.002	1546077	2.49		99.6	7151	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.663	3.666	-0.003	1.000	2182261	2.50		104	24456	
599.00 > 99.00	3.663	3.666	-0.003	1.000	732660		2.98(1.39-4.16)	104	20219	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.671	3.672	-0.001	1.399	1432688	2.40		96.0	5320	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.678	3.678	0.0	1.000	2244135	2.46		98.3	10302	
563.00 > 169.00	3.678	3.678	0.0	1.000	454077		4.94(0.00-0.00)	98.3	15259	
D 30 13C2 PFUnA										
565.00 > 520.00	3.678	3.679	-0.001	1.402	2212774	2.46		98.6	20353	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.678	3.679	-0.001	1.002	1447969	2.59		104	7749	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.979	3.979	0.0	1.000	2517800	2.59		103	11349	
613.00 > 169.00	3.979	3.979	0.0	1.000	619932		4.06(2.13-6.40)	103	20447	
D 36 13C2 PFDoA										
615.00 > 570.00	3.979	3.979	0.0	1.517	2374065	2.44		97.5	19498	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.241	4.242	-0.001	1.000	2742788	2.49		99.5	8424	
663.00 > 169.00	4.241	4.242	-0.001	1.000	872619		3.14(1.25-3.76)	99.5	16274	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.485	4.483	0.002	1.000	754490	2.56		102	12988	
713.00 > 219.00	4.471	4.483	-0.012	0.997	517531		1.46(0.71-2.13)	102	12896	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.485	4.483	0.002	1.710	3024149	2.38		95.0	17363	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.903	4.902	0.001	1.869	5622608	2.48		99.1	13087	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.903	4.902	0.001	1.000	5582637	2.60		104	2992	
813.00 > 169.00	4.903	4.902	0.001	1.000	920324		6.07(2.86-8.58)	104	5818	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.259	5.255	0.004	1.000	6281608	2.65		106	1238	
913.00 > 169.00	5.252	5.255	-0.003	0.999	778273		8.07(0.00-0.00)	106	1952	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL5_00003 Amount Added: 1.00 Units: mL

Report Date: 18-Jan-2018 08:22:30 Chrom Revision: 2.2 08-Dec-2017 11:41:26

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_006.d

Injection Date: 17-Jan-2018 14:50:40 Instrument ID: A8_N

Lims ID: IC L5 Full

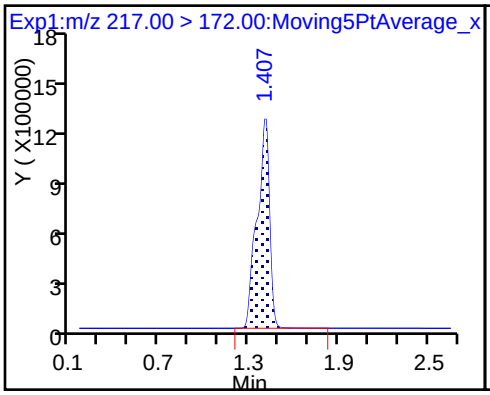
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 14 Worklist Smp#: 6

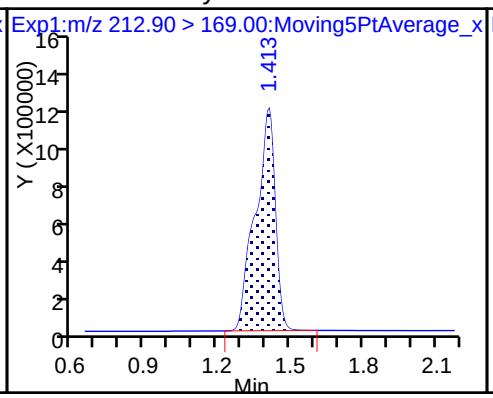
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

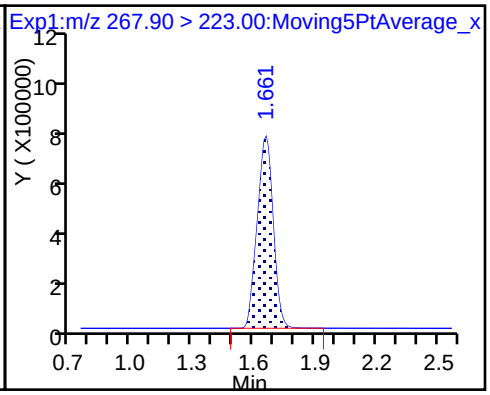
D 1 13C4 PFBA



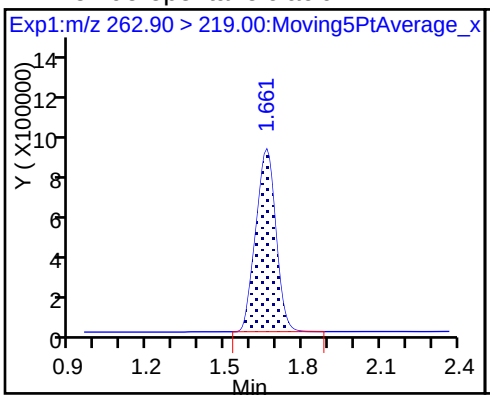
2 Perfluorobutyric acid



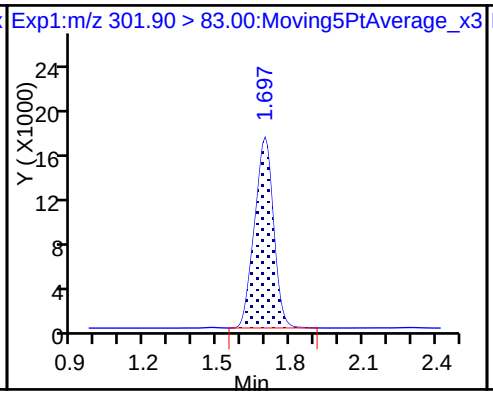
D 3 13C5-PFPeA



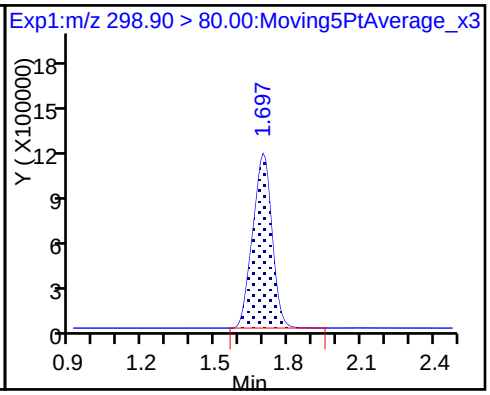
4 Perfluoropentanoic acid



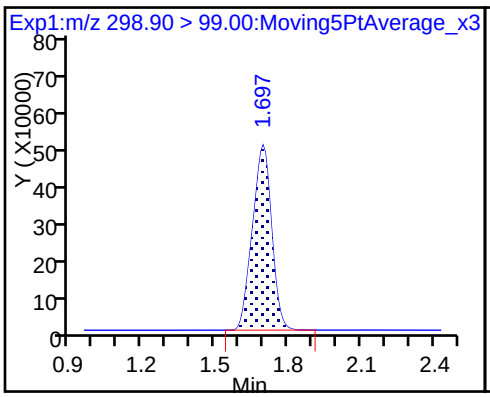
D 47 13C3-PFBS



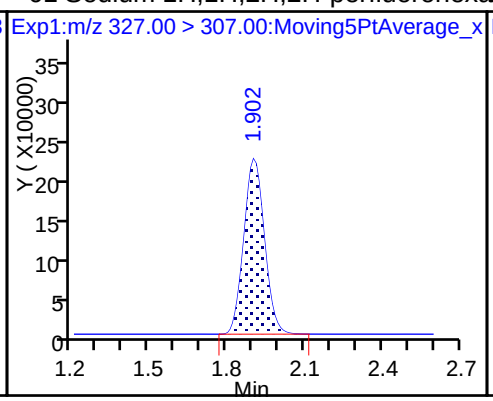
5 Perfluorobutanesulfonic acid



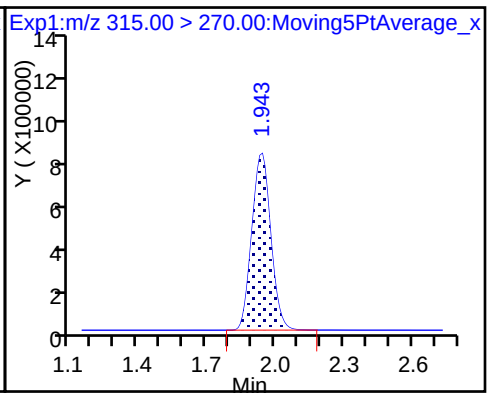
5 Perfluorobutanesulfonic acid



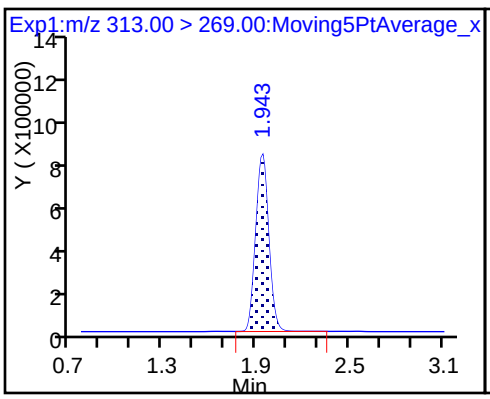
61 Sodium 1H,1H,2H,2H-perfluorohexa



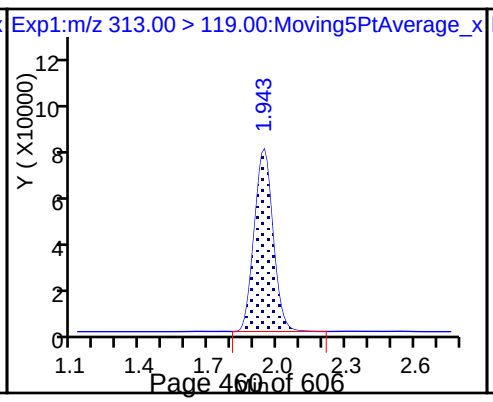
D 7 13C2 PFHxA



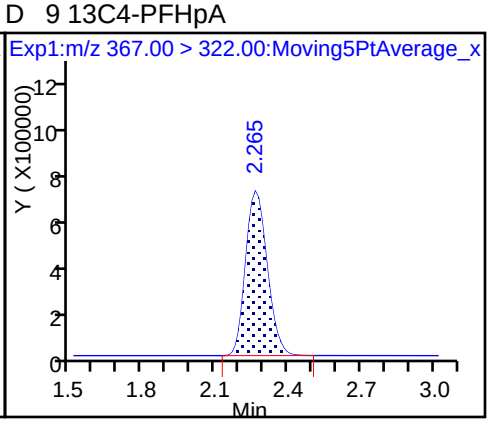
6 Perfluorohexanoic acid



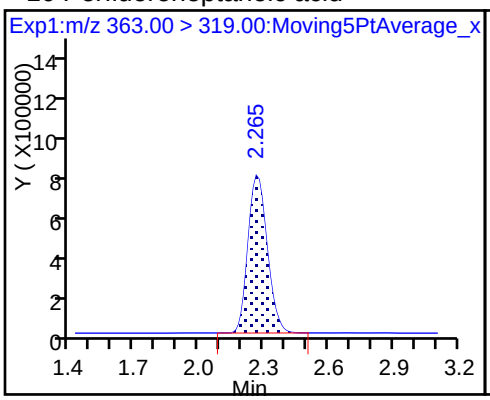
6 Perfluorohexanoic acid



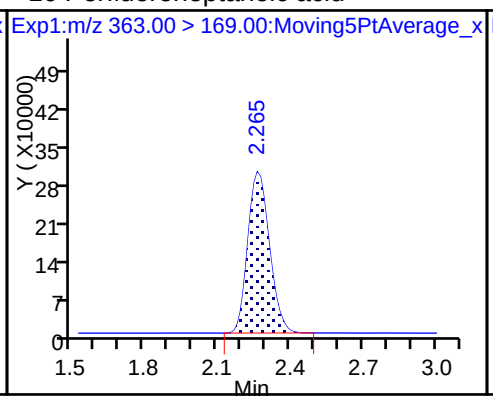
D 9 13C4-PFHpA



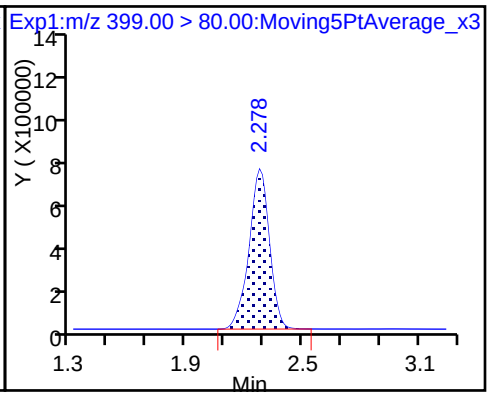
10 Perfluoroheptanoic acid



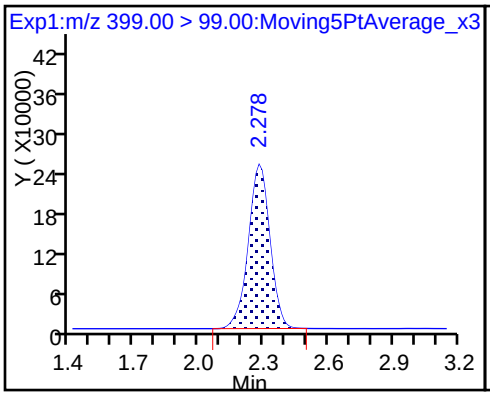
10 Perfluoroheptanoic acid



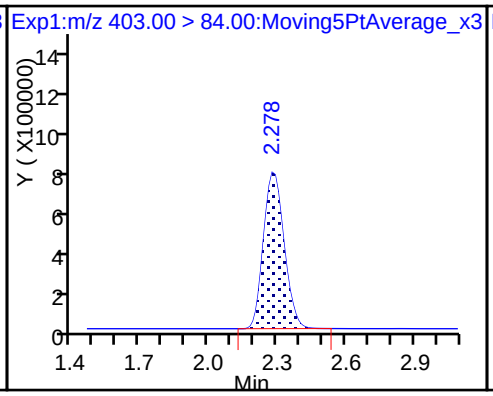
8 Perfluorohexanesulfonic acid



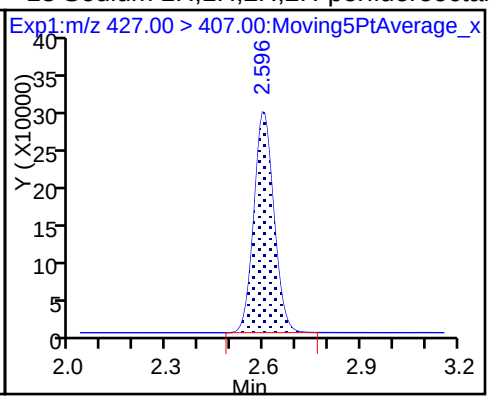
8 Perfluorohexanesulfonic acid



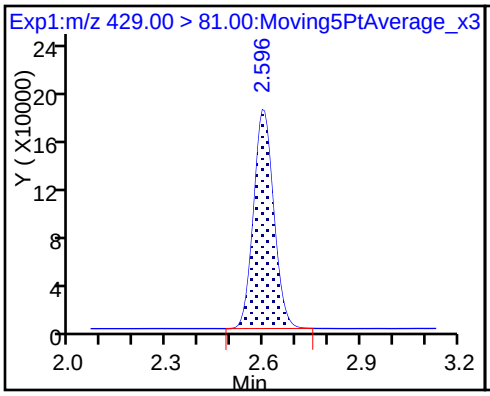
D 11 18O2 PFHxS



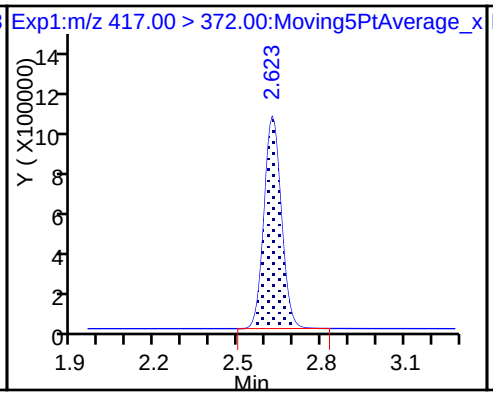
13 Sodium 1H,1H,2H,2H-perfluorooctane



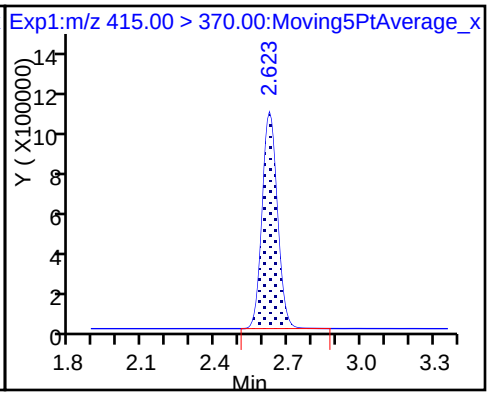
D 12 M2-6:2FTS



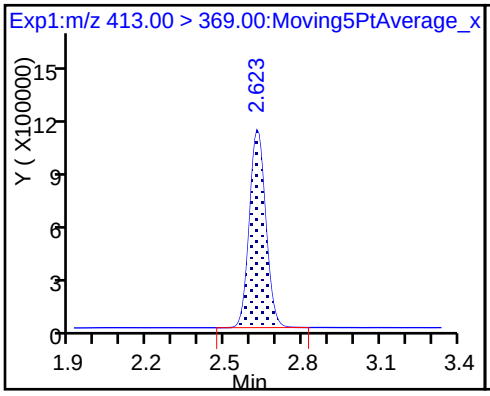
D 14 13C4 PFOA



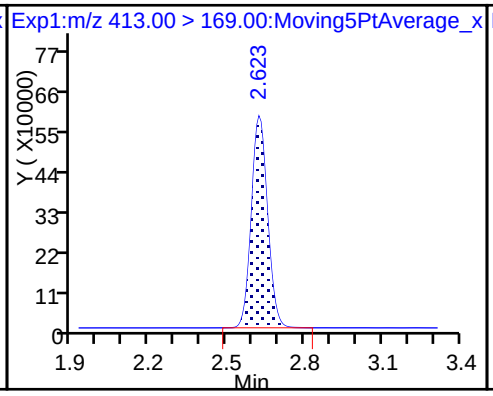
* 62 13C2-PFOA



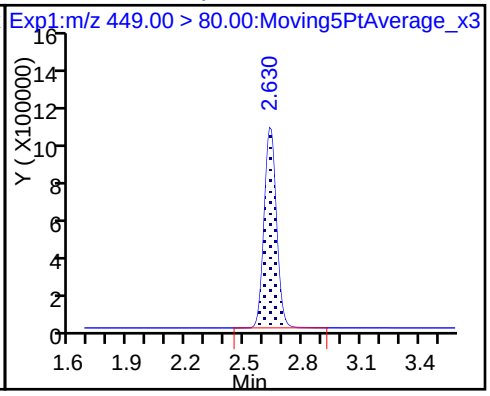
15 Perfluorooctanoic acid



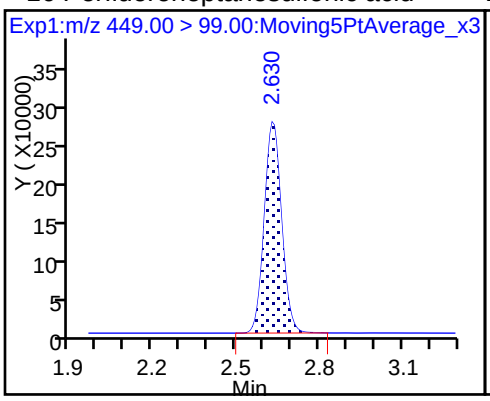
15 Perfluorooctanoic acid



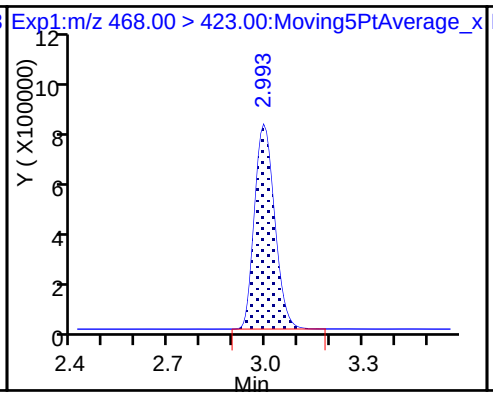
16 Perfluoroheptanesulfonic acid



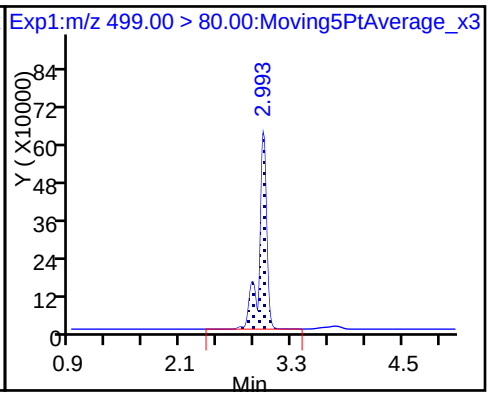
16 Perfluoroheptanesulfonic acid



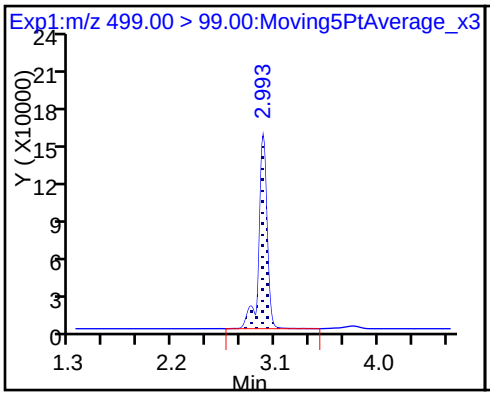
D 19 13C5 PFNA



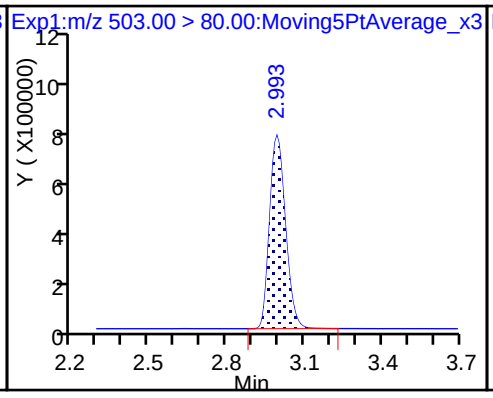
17 Perfluorooctane sulfonic acid



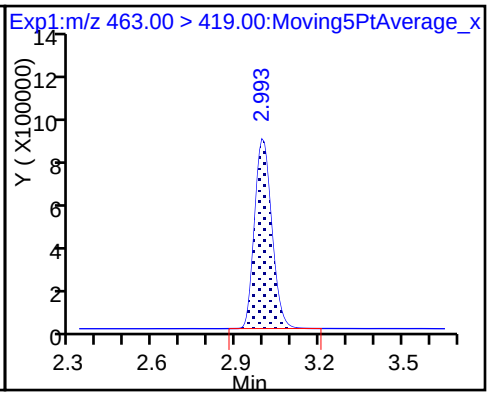
17 Perfluorooctane sulfonic acid



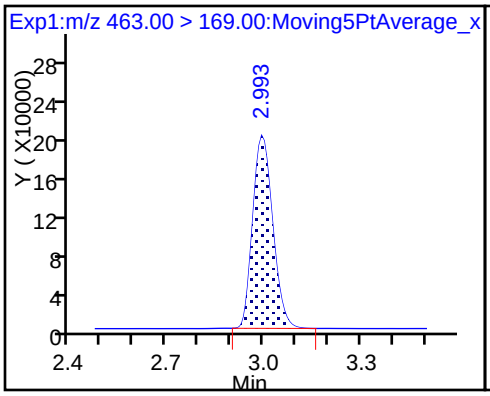
D 18 13C4 PFOS



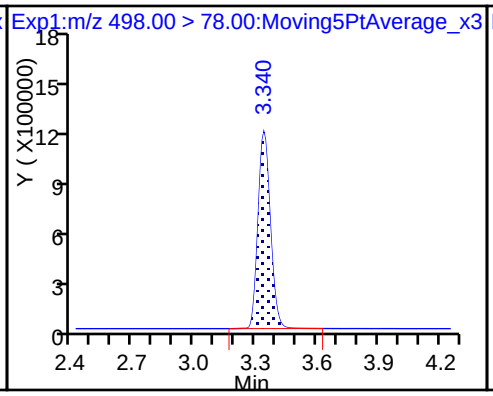
20 Perfluorononanoic acid



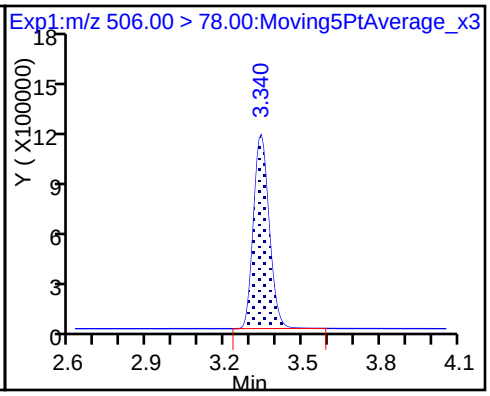
20 Perfluorononanoic acid



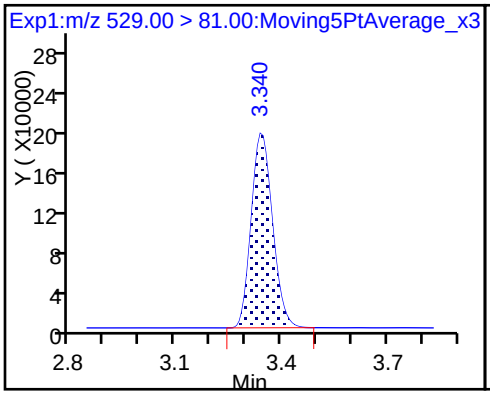
22 Perfluorooctane Sulfonamide



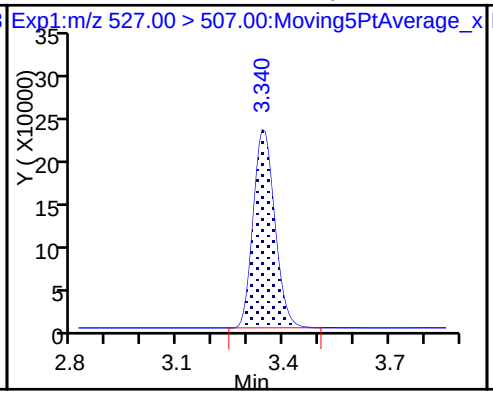
D 21 13C8 FOSA



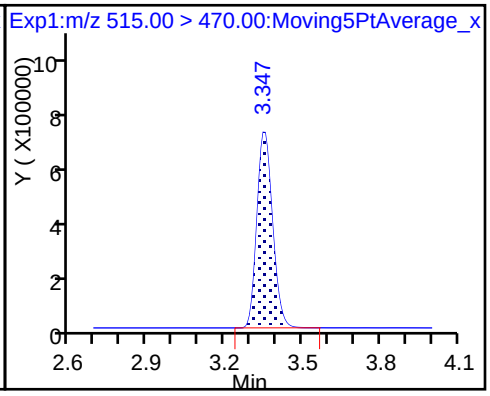
D 26 M2-8:2FTS



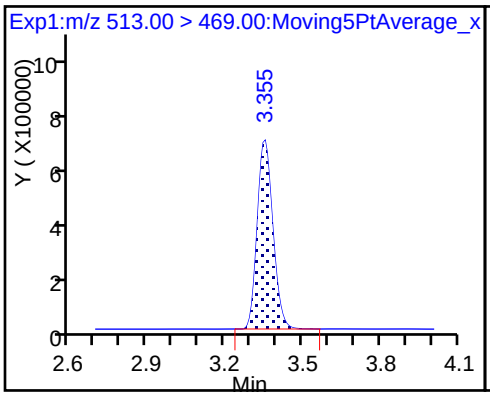
25 Sodium 1H,1H,2H,2H-perfluorodecane



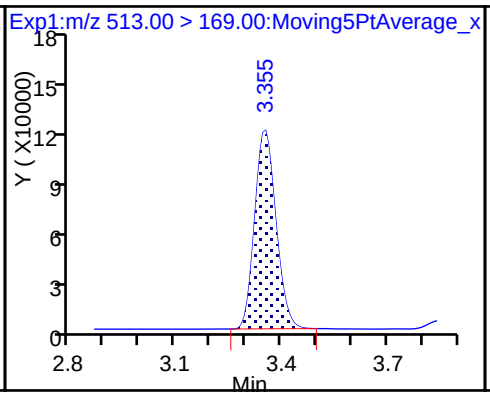
D 23 13C2 PFDA



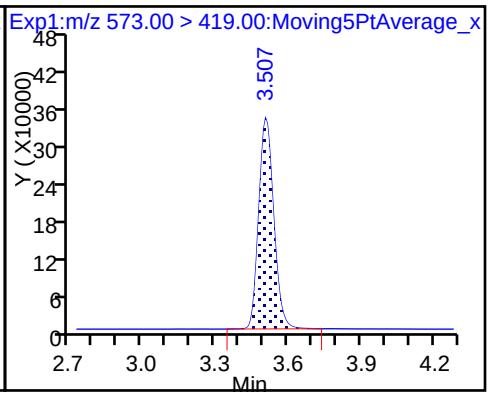
24 Perfluorodecanoic acid



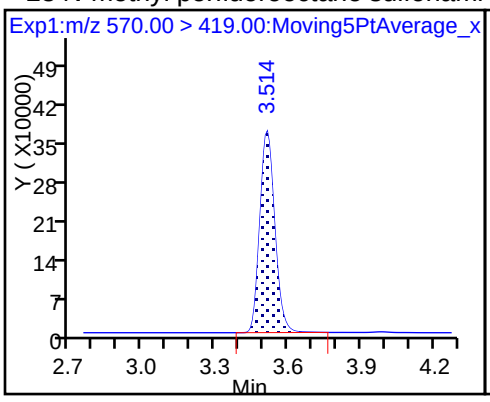
24 Perfluorodecanoic acid



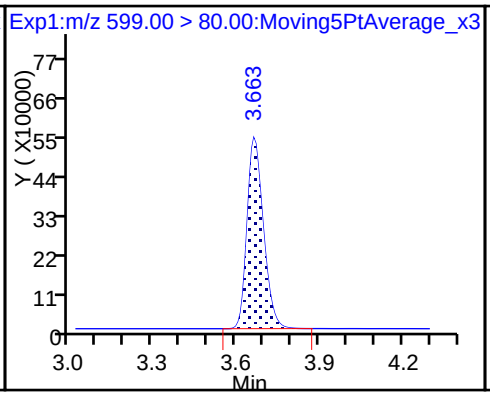
D 27 d3-NMeFOSAA



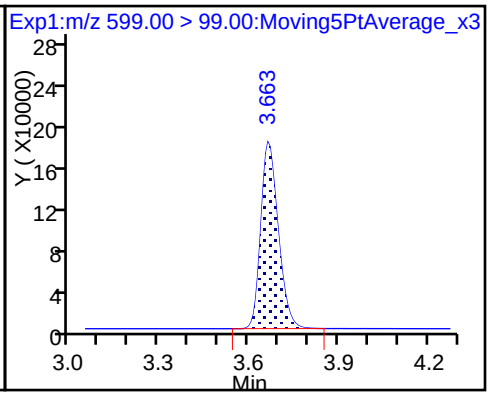
28 N-methyl perfluorooctane sulfonami



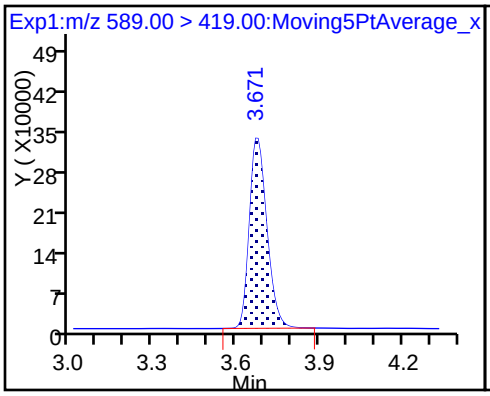
29 Perfluorodecane Sulfonic acid



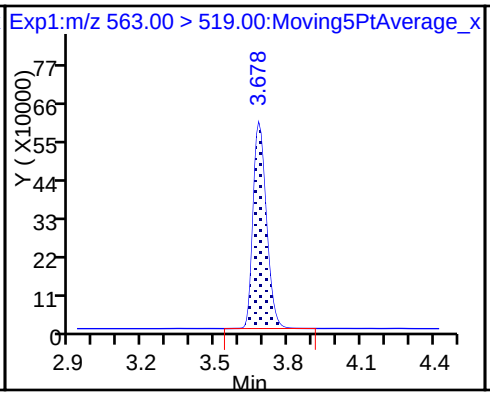
29 Perfluorodecane Sulfonic acid



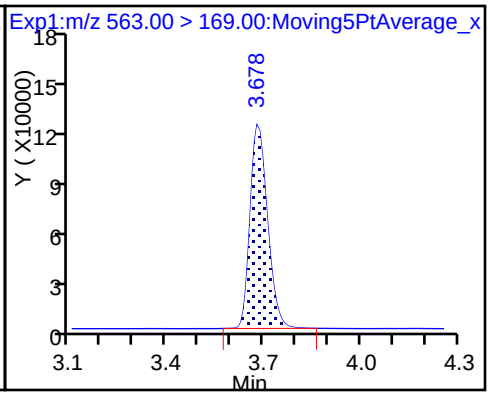
D 32 d5-NEtFOSAA



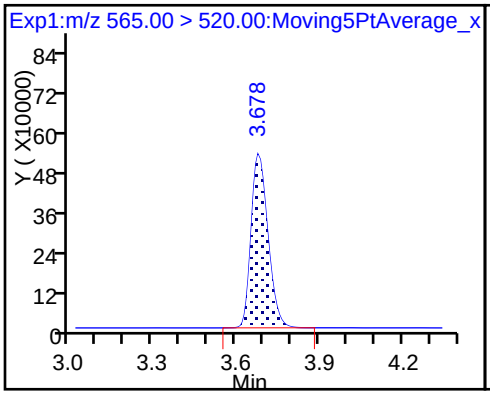
31 Perfluoroundecanoic acid



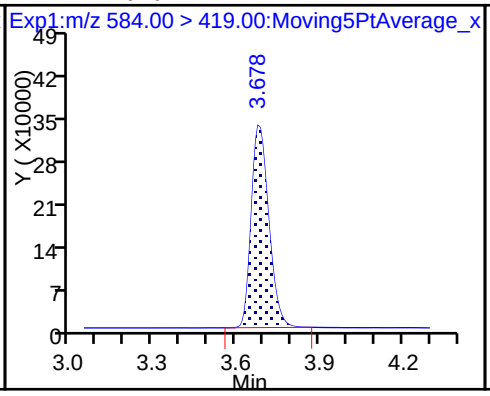
31 Perfluoroundecanoic acid



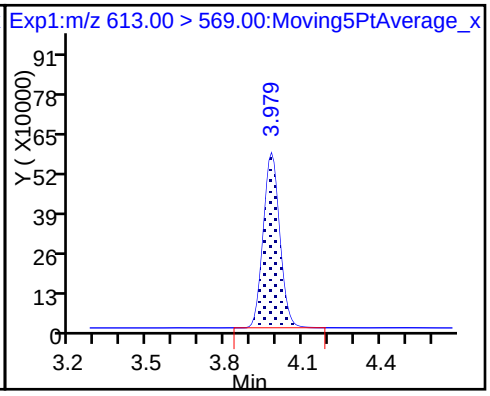
D 30 13C2 PFUnA



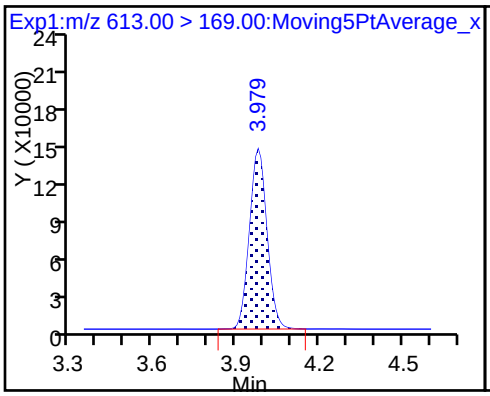
33 N-ethyl perfluorooctane sulfonamid



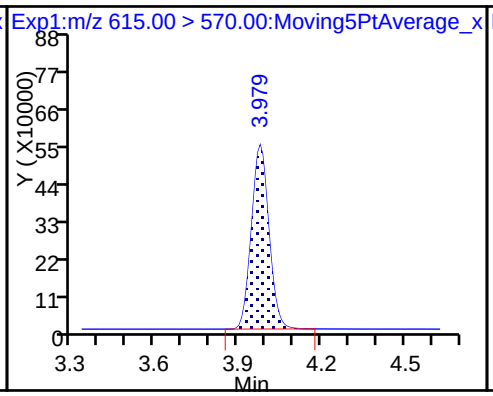
37 Perfluorododecanoic acid



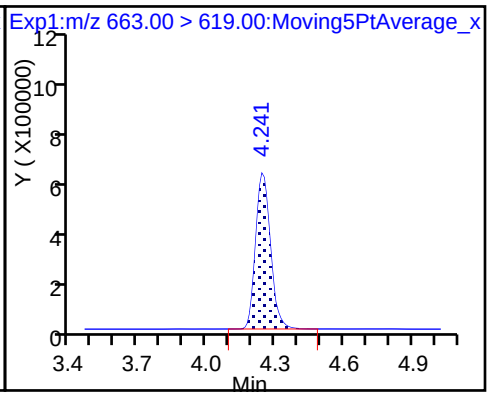
37 Perfluorododecanoic acid



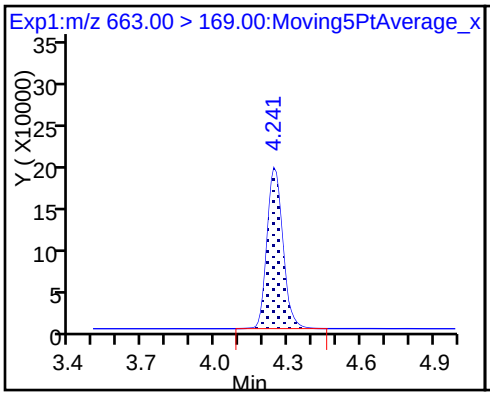
D 36 13C2 PFDoA



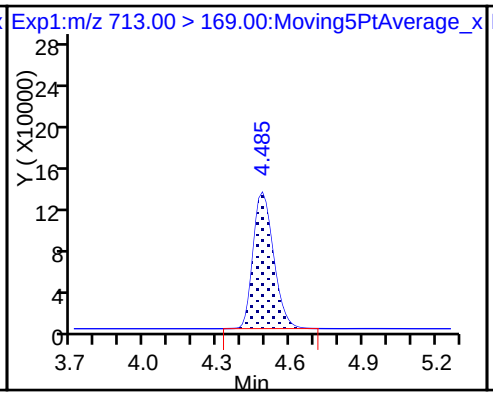
41 Perfluorotridecanoic acid



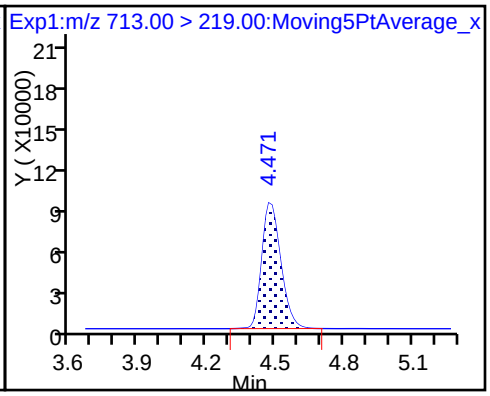
41 Perfluorotridecanoic acid



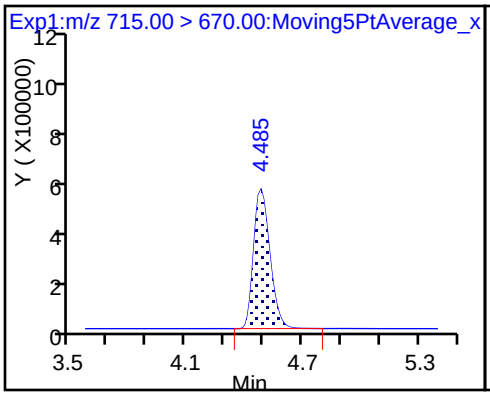
42 Perfluorotetradecanoic acid



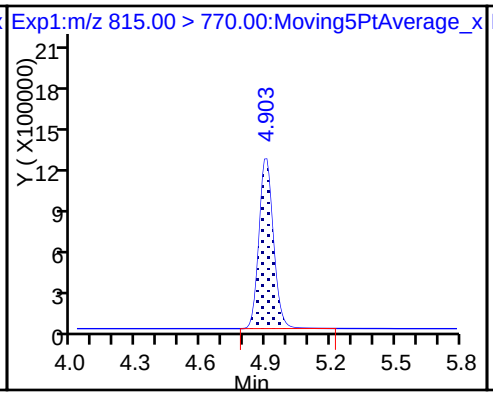
42 Perfluorotetradecanoic acid



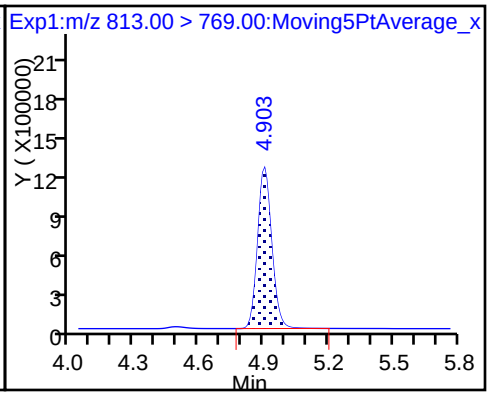
D 43 13C2-PFTeDA



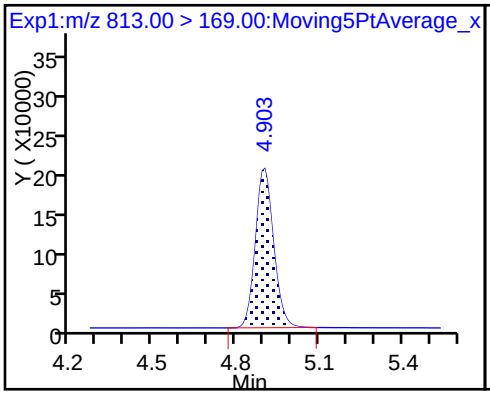
D 44 13C2-PFHxDA



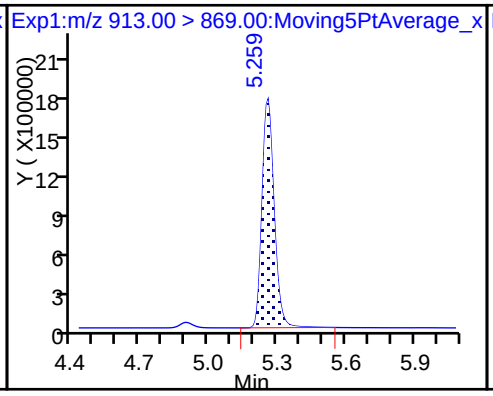
45 Perfluorohexadecanoic acid



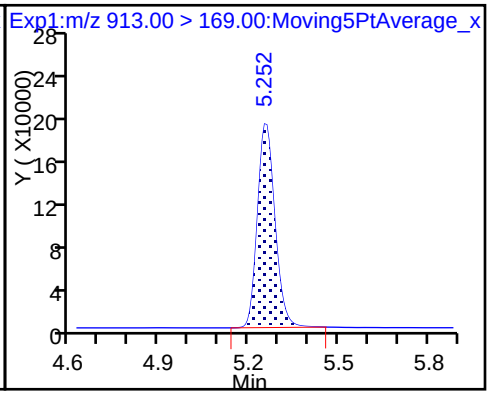
45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid



46 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_007.d
Lims ID: IC L6 Full
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 17-Jan-2018 14:58:30 ALS Bottle#: 15 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L6-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-A8_N*sub30

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 18-Jan-2018 08:22:33 Calib Date: 17-Jan-2018 15:06:20
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_008.d

Column 1 : Det: EXP1
Process Host: XAWRK019

First Level Reviewer: hannigana Date: 17-Jan-2018 16:52:45

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.408	1.411	-0.003	0.538	6889924	2.55		102	24860	
2 Perfluorobutyric acid										
212.90 > 169.00	1.408	1.413	-0.005	1.000	13027499	5.06		101	1333	
D 3 13C5-PFPeA										
267.90 > 223.00	1.654	1.659	-0.005	0.632	4122126	2.58		103	37017	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.654	1.662	-0.008	1.000	9469006	4.87		97.5	8856	
D 47 13C3-PFBS										
301.90 > 83.00	1.689	1.695	-0.006	0.646	83073	2.35		101	3063	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.689	1.697	-0.008	1.000	12635108	4.58		104	67166	
298.90 > 99.00	1.689	1.697	-0.008	1.000	5216403		2.42(1.25-3.74)	104	38944	
D 60 M2-4:2FTS										
329.00 > 81.00	1.893	1.903	-0.010	0.724	532209	NC			5682	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.893	1.903	-0.010	1.000	2364722	4.76		102	71307	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.934	1.939	-0.005	1.000	9016831	5.00		100	14315	
313.00 > 119.00	1.934	1.939	-0.005	1.000	798066		11.30(5.03-15.10)	100	11593	
D 7 13C2 PFHxA										
315.00 > 270.00	1.934	1.939	-0.005	0.739	4349882	2.52		101	38212	
D 9 13C4-PFHpA										
367.00 > 322.00	2.253	2.267	-0.014	0.861	4126515	2.52		101	26743	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.266	2.268	-0.002	1.006	9111535	5.02		100	12281	
363.00 > 169.00	2.266	2.268	-0.002	1.006	3471916		2.62(1.13-3.40)	100	17588	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.266	2.280	-0.014	0.994	9935695	4.50		98.8	14608	
399.00 > 99.00	2.279	2.280	-0.001	1.000	3253974		3.05(1.50-4.49)	98.8	12936	
D 11 18O2 PFHxS										
403.00 > 84.00	2.279	2.282	-0.003	0.871	4694368	2.32		98.3	28847	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.589	2.596	-0.007	1.000	2504300	5.10		108	26755	
D 12 M2-6:2FTS										
429.00 > 81.00	2.589	2.597	-0.008	0.990	704248	2.32		97.7	16529	
* 62 13C2-PFOA										
415.00 > 370.00	2.616	2.622	-0.006		4464823	2.50			30070	
D 14 13C4 PFOA										
417.00 > 372.00	2.616	2.622	-0.006	1.000	4052198	2.52		101	28726	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.616	2.623	-0.007	1.000	8993265	4.73		94.7	6194	
413.00 > 169.00	2.616	2.623	-0.007	1.000	4880817		1.84(0.84-2.52)	94.7	18906	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.624	2.629	-0.005	1.000	8721809	4.95		104	25354	
449.00 > 99.00	2.624	2.629	-0.005	1.000	2290639		3.81(1.94-5.82)	104	21828	
D 18 13C4 PFOS										
503.00 > 80.00	2.986	2.992	-0.006	1.141	3110246	2.43		102	18449	
20 Perfluorononanoic acid										
463.00 > 419.00	2.986	2.992	-0.006	1.000	7021740	5.19		104	19758	
463.00 > 169.00	2.986	2.992	-0.006	1.000	1682836		4.17(1.90-5.69)	104	21808	
D 19 13C5 PFNA										
468.00 > 423.00	2.986	2.992	-0.006	1.141	3273972	2.51		100	27377	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.986	2.992	-0.006	1.000	6686934	4.59		98.9	2518	
499.00 > 99.00	2.986	2.992	-0.006	1.000	1482649		4.51(2.31-6.93)	98.9	3691	
D 21 13C8 FOSA										
506.00 > 78.00	3.333	3.338	-0.005	1.274	4414446	2.46		98.2	16915	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.333	3.338	-0.005	1.000	8973330	5.17		103	25588	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.340	3.342	-0.002	1.000	1941077	5.04		105	31201	
D 26 M2-8:2FTS										
529.00 > 81.00	3.340	3.342	-0.002	1.277	757639	2.36		98.7	14043	
D 23 13C2 PFDA										
515.00 > 470.00	3.348	3.352	-0.004	1.280	2810507	2.50		99.8	24290	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.348	3.353	-0.005	1.000	5653894	5.18		104	20649	
513.00 > 169.00	3.348	3.353	-0.005	1.000	970543		5.83(2.36-7.09)	104	1919	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.500	3.507	-0.007	1.338	1419745	2.53		101	8194	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.507	3.513	-0.006	1.002	3100803	5.05		101	11526	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.664	3.666	-0.002	1.000	4067427	4.77		99.0	30816	
599.00 > 99.00	3.657	3.666	-0.009	0.998	1370708		2.97(1.39-4.16)	99.0	20723	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.671	3.672	-0.001	1.403	1408625	2.48		99.1	5938	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.671	3.678	-0.007	0.998	4341065	4.84		96.9	15505	
563.00 > 169.00	3.680	3.678	0.002	1.000	889588		4.88(0.00-0.00)	96.9	13858	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.680	3.679	0.001	1.002	2837873	5.17		103	11626	
D 30 13C2 PFUnA										
565.00 > 520.00	3.680	3.679	0.001	1.406	2170924	2.54		102	19601	
D 36 13C2 PFDoA										
615.00 > 570.00	3.972	3.979	-0.007	1.518	2348326	2.53		101	28264	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.972	3.979	-0.007	1.000	4798721	4.99		99.7	23913	
613.00 > 169.00	3.972	3.979	-0.007	1.000	1181505		4.06(2.13-6.40)	99.7	19366	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.242	4.242	0.0	1.000	5174158	4.74		94.9	17194	
663.00 > 169.00	4.242	4.242	0.0	1.000	1578141		3.28(1.25-3.76)	94.9	31724	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.472	4.483	-0.011	1.709	2973878	2.45		98.2	17211	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.472	4.483	-0.011	1.000	1437735	4.95		99.1	17780	
713.00 > 219.00	4.472	4.483	-0.011	1.000	975811		1.47(0.71-2.13)	99.1	21440	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.894	4.902	-0.008	1.000	10121041	5.03		101	6096	
813.00 > 169.00	4.894	4.902	-0.008	1.000	1702289		5.95(2.86-8.58)	101	9837	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.894	4.902	-0.008	1.871	5288590	2.45		98.0	10188	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.252	5.255	-0.003	1.000	11861271	5.32		106	1851	
913.00 > 169.00	5.245	5.255	-0.010	0.999	1442835		8.22(0.00-0.00)	106	2232	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL6_00004 Amount Added: 1.00 Units: mL

Report Date: 18-Jan-2018 08:22:33 Chrom Revision: 2.2 08-Dec-2017 11:41:26

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_007.d

Injection Date: 17-Jan-2018 14:58:30 Instrument ID: A8_N

Lims ID: IC L6 Full

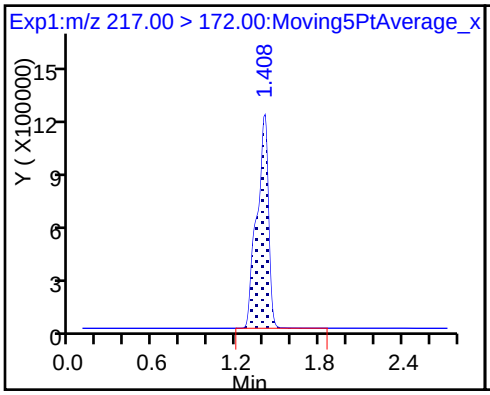
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 15 Worklist Smp#: 7

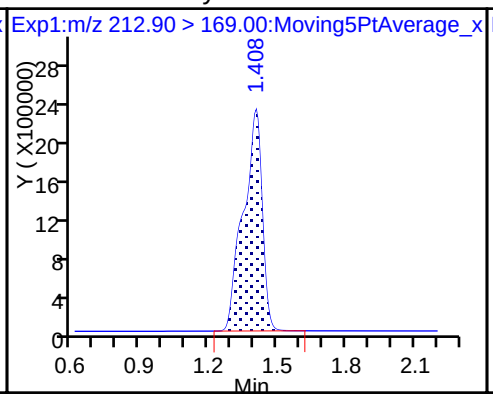
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

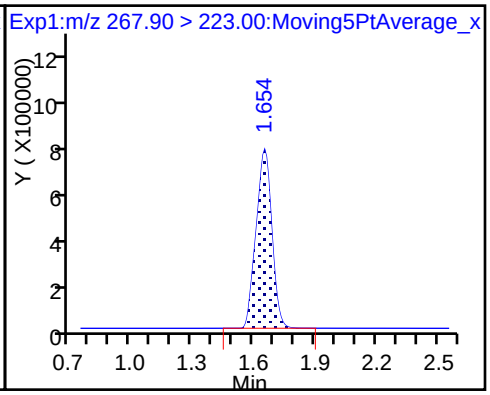
D 1 13C4 PFBA



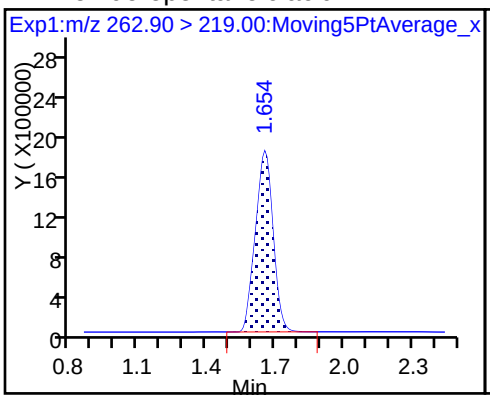
2 Perfluorobutyric acid



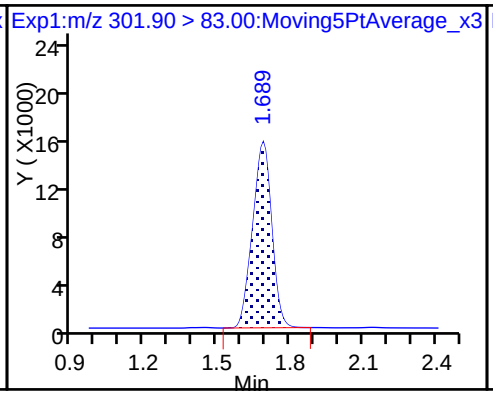
D 3 13C5-PFPeA



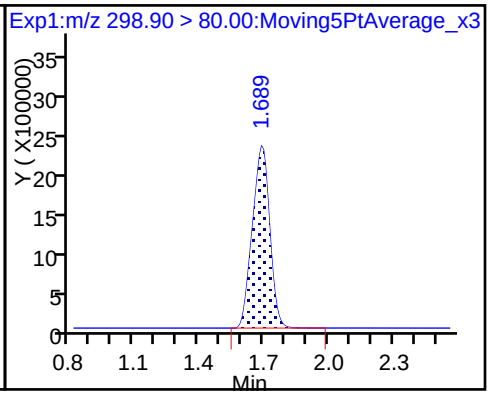
4 Perfluoropentanoic acid



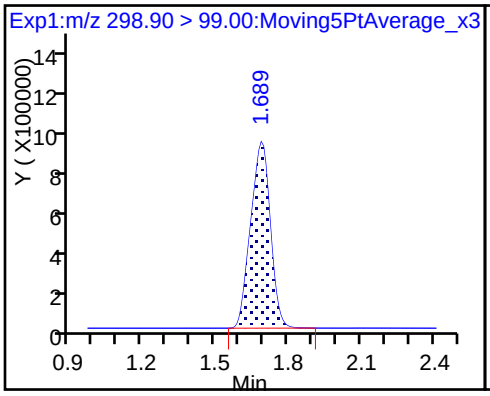
D 47 13C3-PFBS



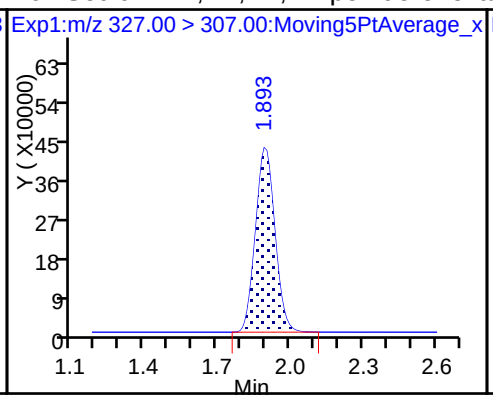
5 Perfluorobutanesulfonic acid



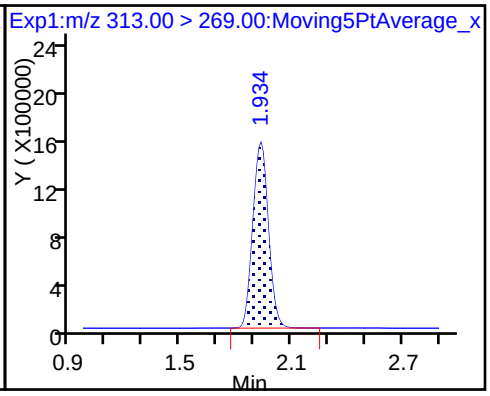
5 Perfluorobutanesulfonic acid



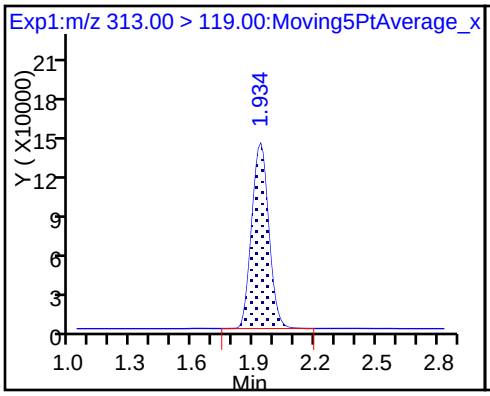
61 Sodium 1H,1H,2H,2H-perfluorohexane



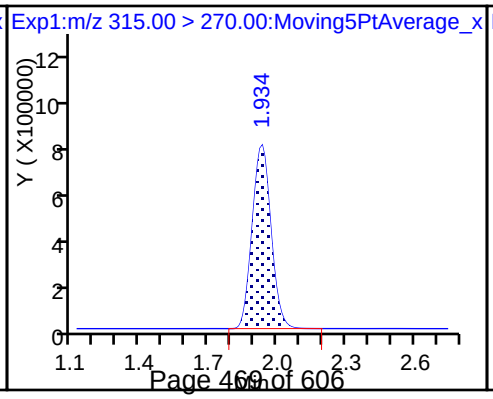
6 Perfluorohexanoic acid



6 Perfluorohexanoic acid



D 7 13C2 PFHxA



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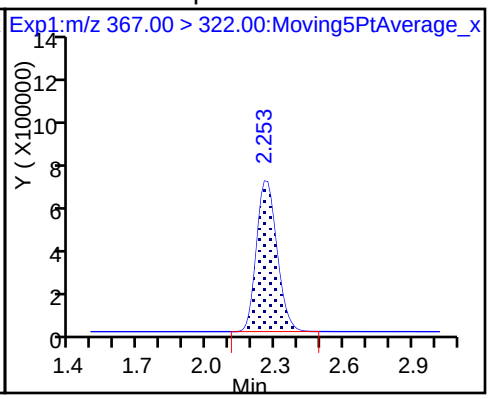
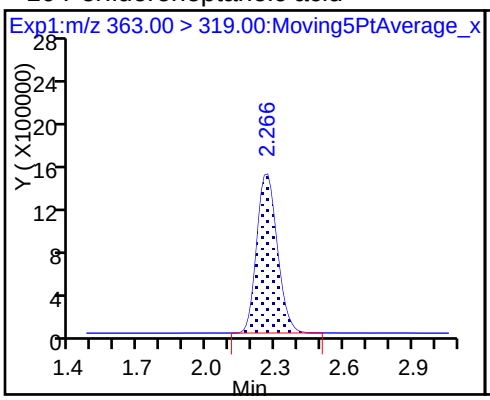
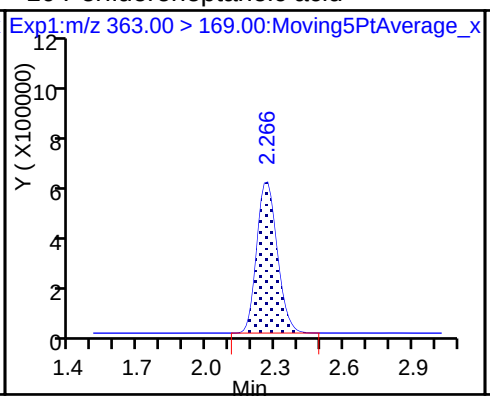


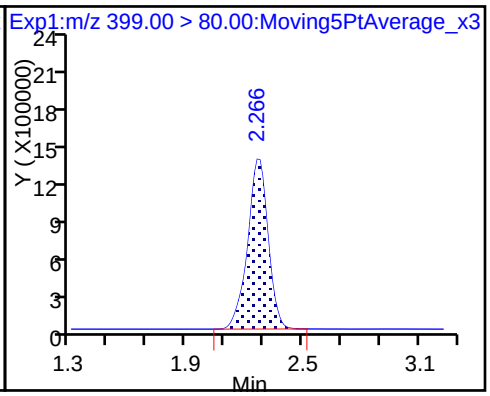
10 Perfluoroheptanoic acid



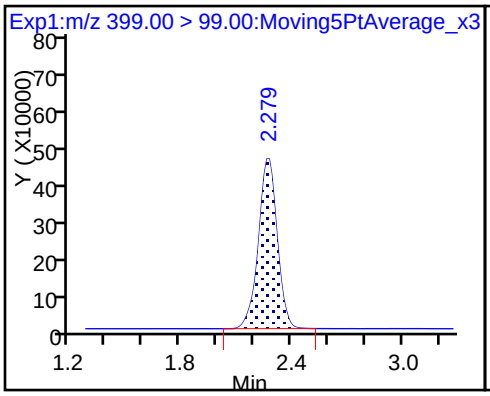
10 Perfluoroheptanoic acid



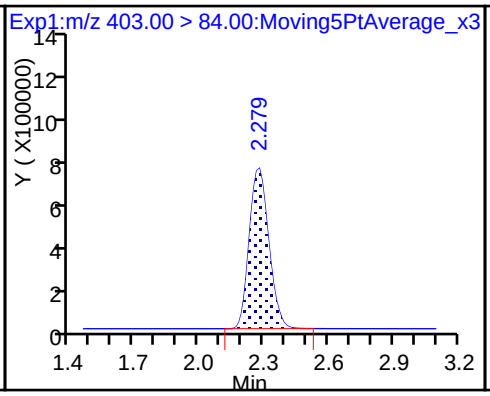
8 Perfluorohexanesulfonic acid



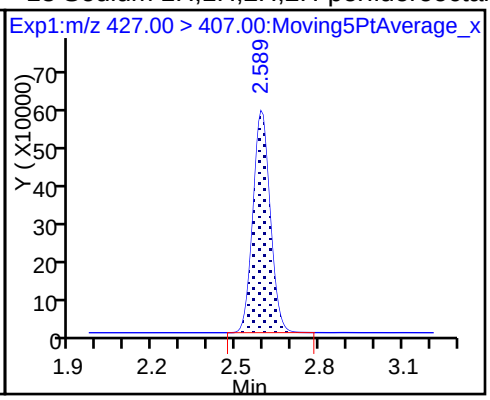
8 Perfluorohexanesulfonic acid



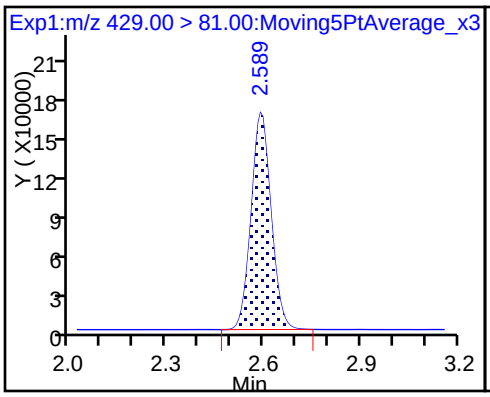
D 11 18O2 PFHxS



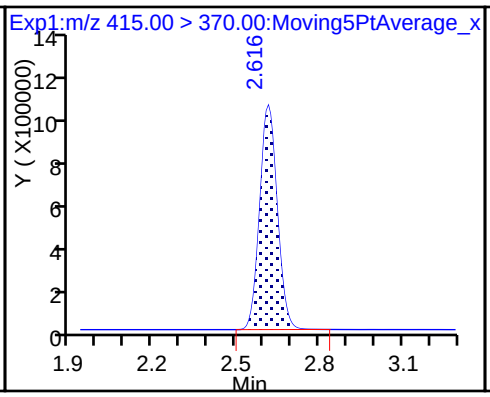
13 Sodium 1H,1H,2H,2H-perfluorooctane



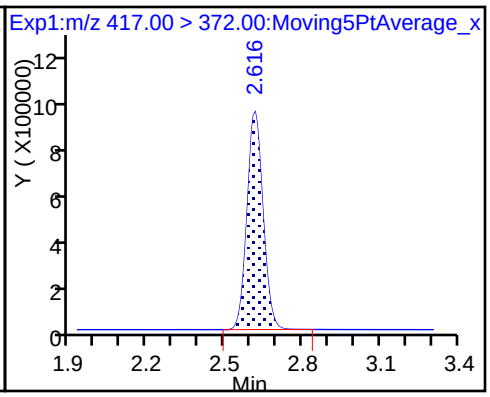
D 12 M2-6:2FTS



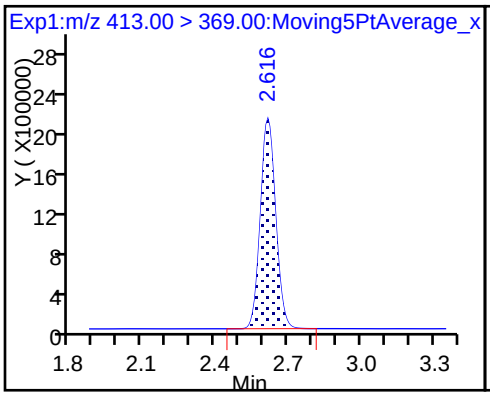
* 62 13C2-PFOA



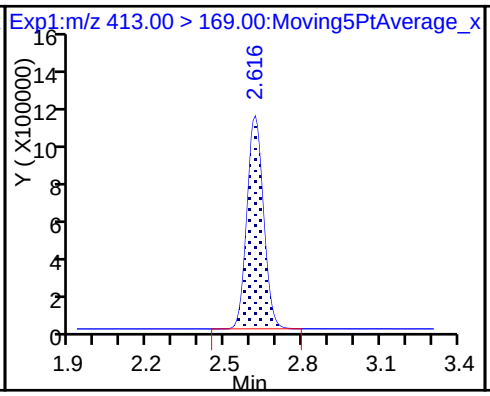
D 14 13C4 PFOA



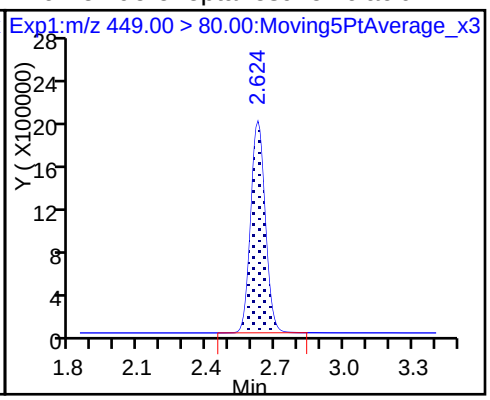
15 Perfluorooctanoic acid



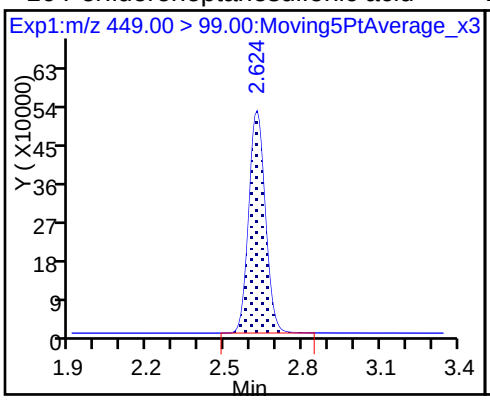
15 Perfluorooctanoic acid



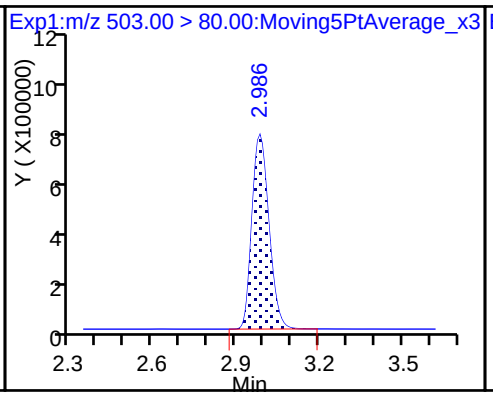
16 Perfluoroheptanesulfonic acid



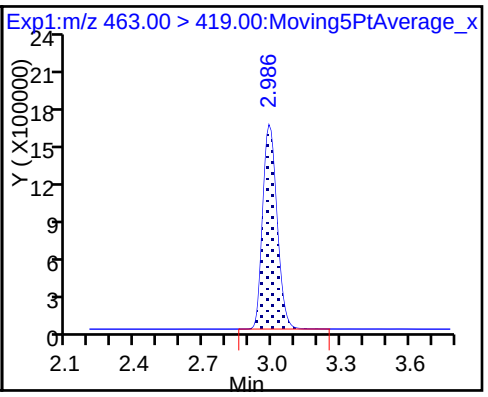
16 Perfluoroheptanesulfonic acid



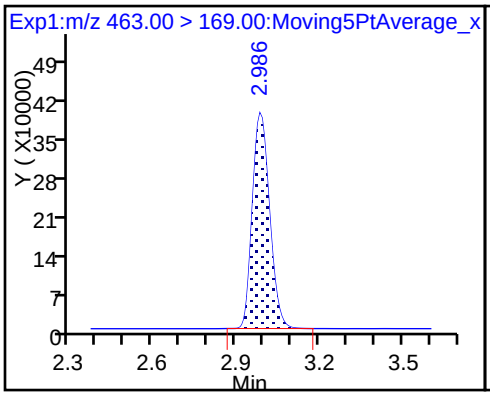
D 18 13C4 PFOS



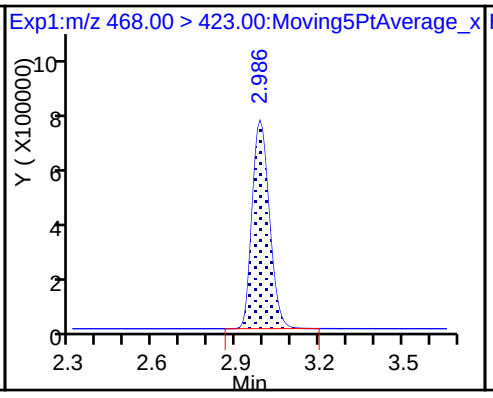
20 Perfluorononanoic acid



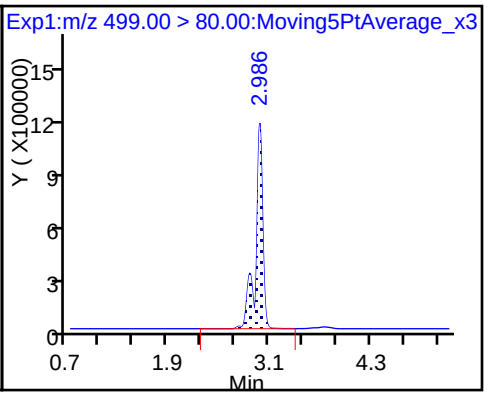
20 Perfluorononanoic acid



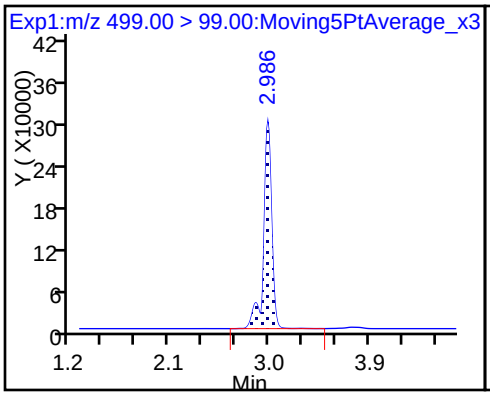
D 19 13C5 PFNA



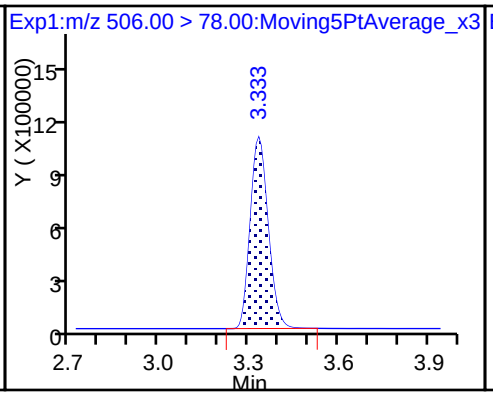
17 Perfluorooctane sulfonic acid



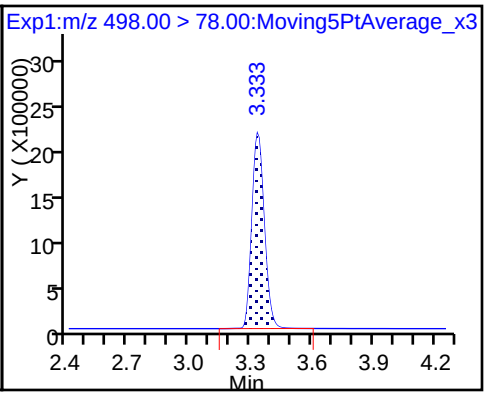
17 Perfluorooctane sulfonic acid



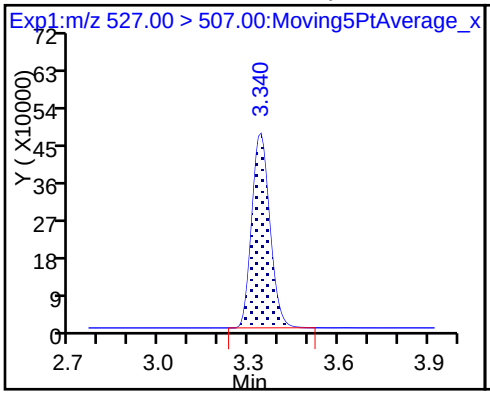
D 21 13C8 FOSA



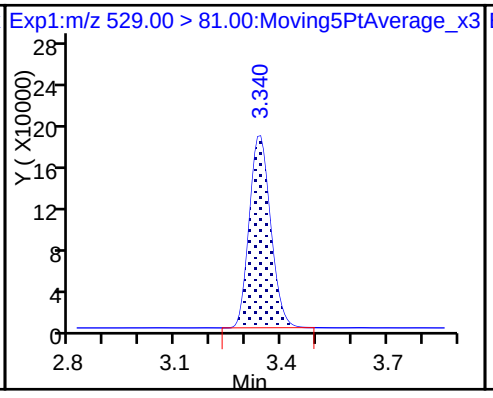
22 Perfluorooctane Sulfonamide



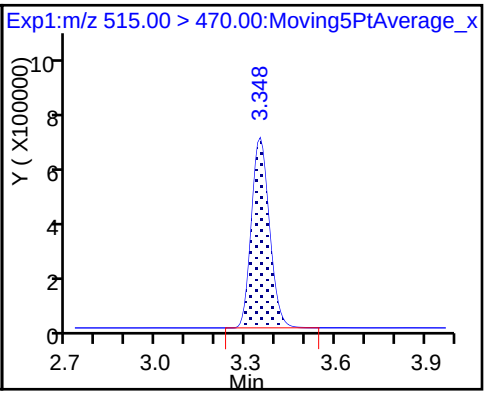
25 Sodium 1H,1H,2H,2H-perfluorodecane



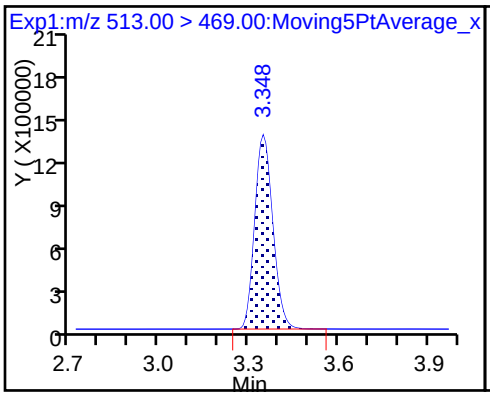
D 26 M2-8:2FTS



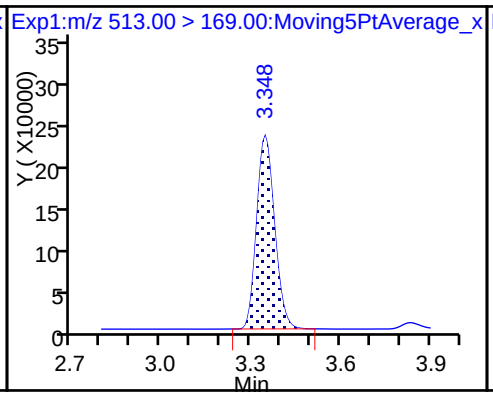
D 23 13C2 PFDA



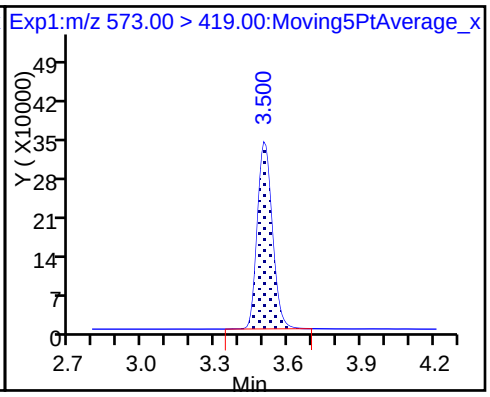
24 Perfluorodecanoic acid



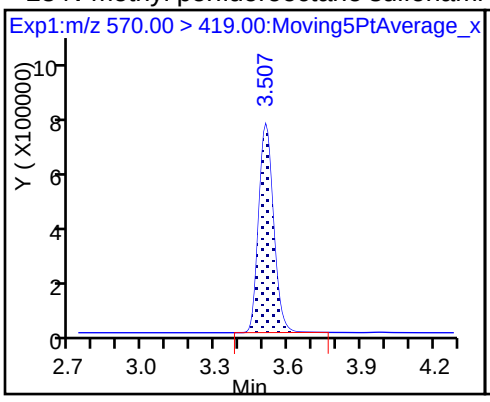
24 Perfluorodecanoic acid



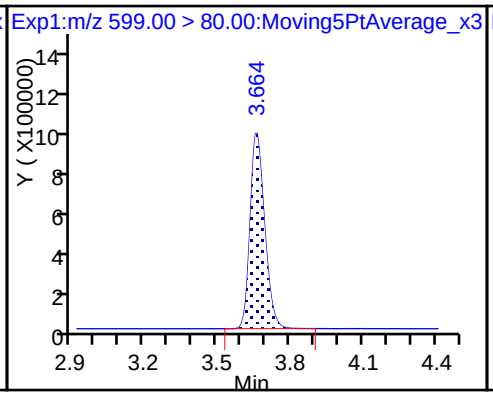
D 27 d3-NMeFOSAA



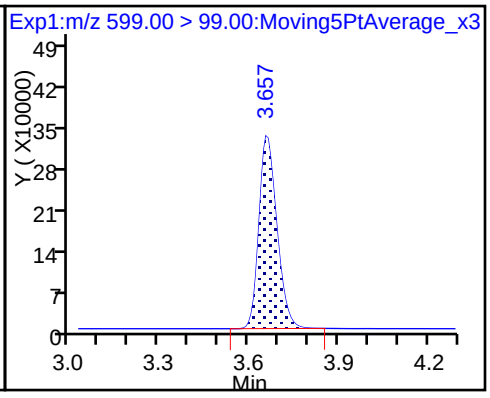
28 N-methyl perfluorooctane sulfonami



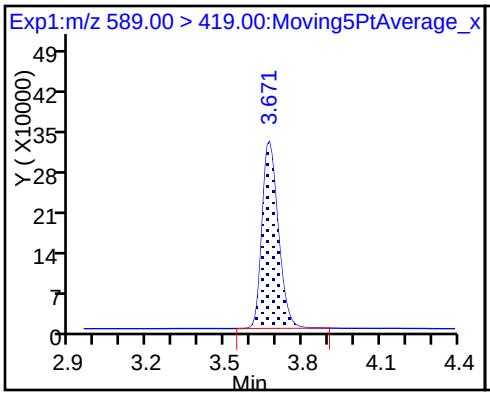
29 Perfluorodecane Sulfonic acid



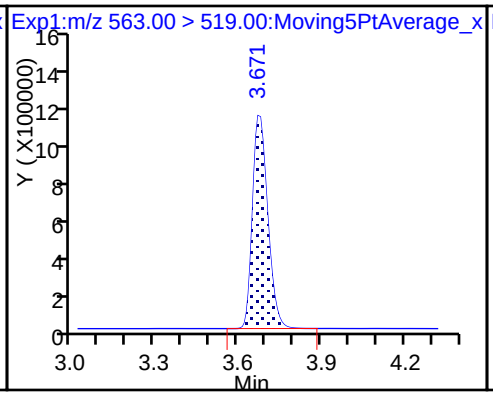
29 Perfluorodecane Sulfonic acid



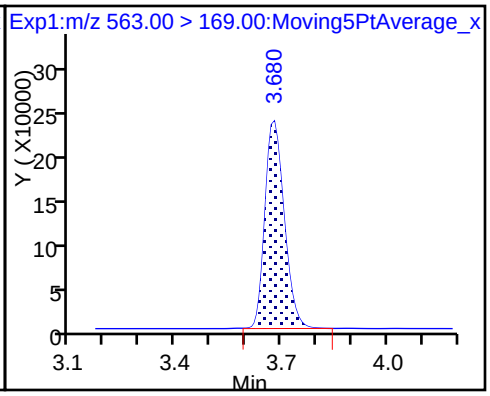
D 32 d5-NEtFOSAA



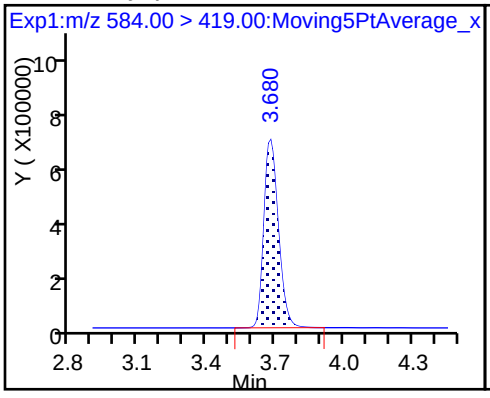
31 Perfluoroundecanoic acid



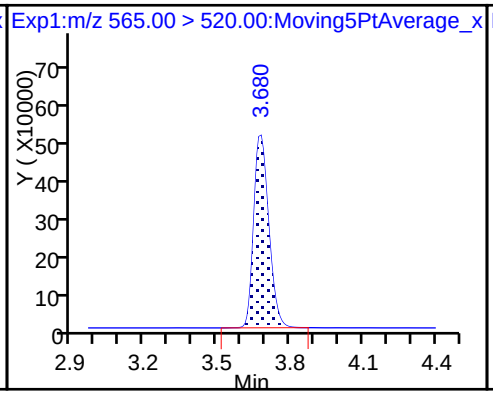
31 Perfluoroundecanoic acid



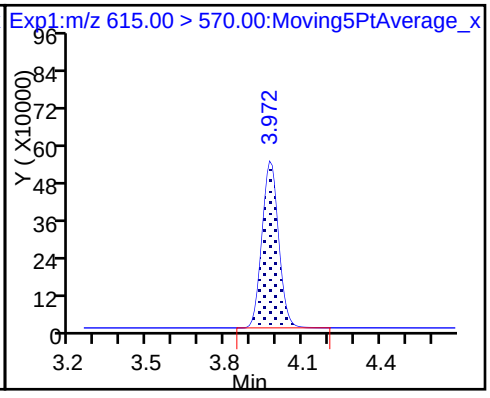
33 N-ethyl perfluorooctane sulfonamid



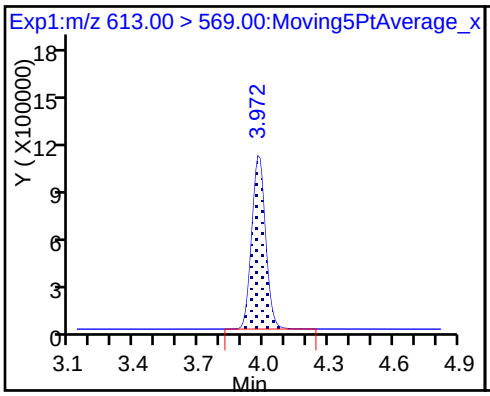
D 30 13C2 PFUnA



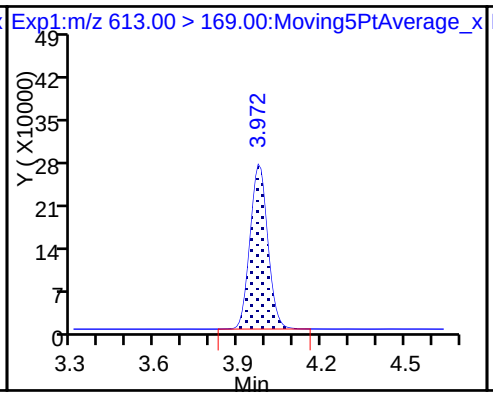
D 36 13C2 PFDoA



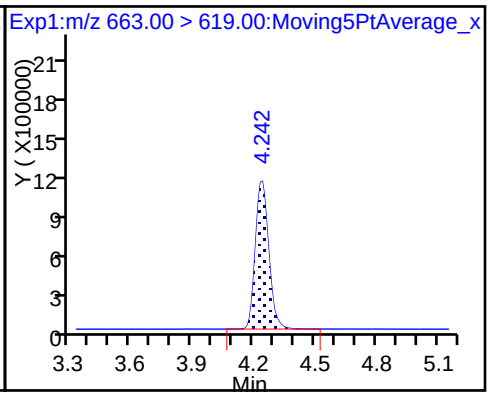
37 Perfluorododecanoic acid



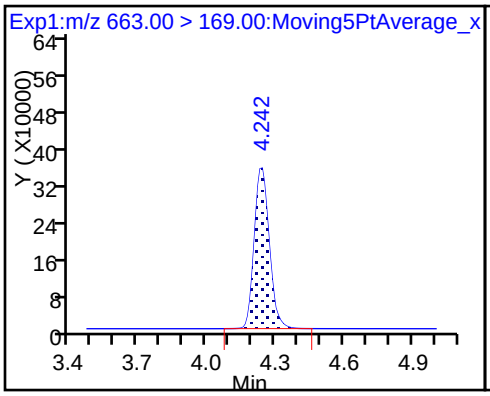
37 Perfluorododecanoic acid



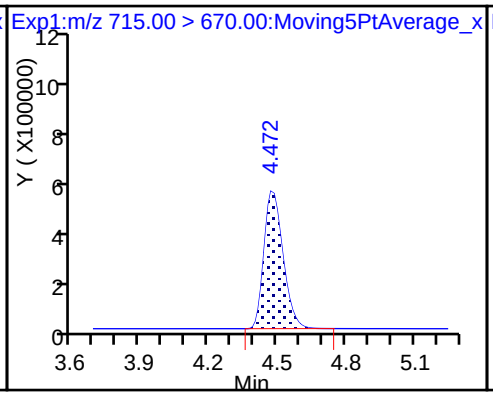
41 Perfluorotridecanoic acid



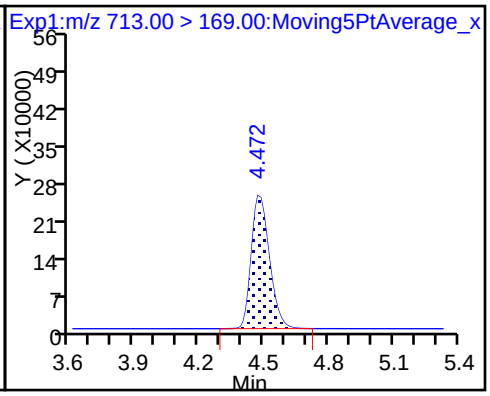
41 Perfluorotridecanoic acid



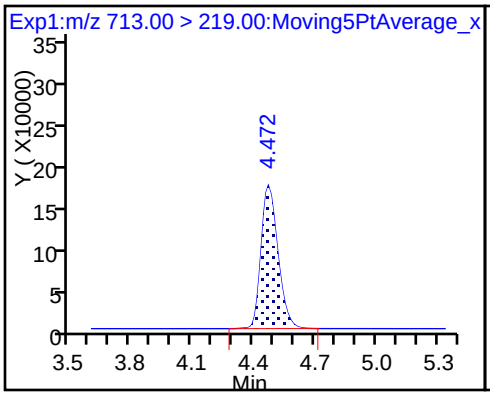
D 43 13C2-PFTeDA



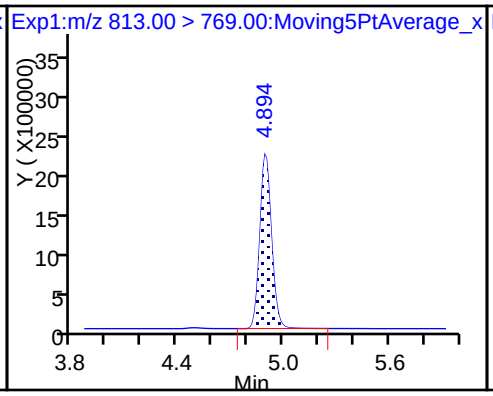
42 Perfluorotetradecanoic acid



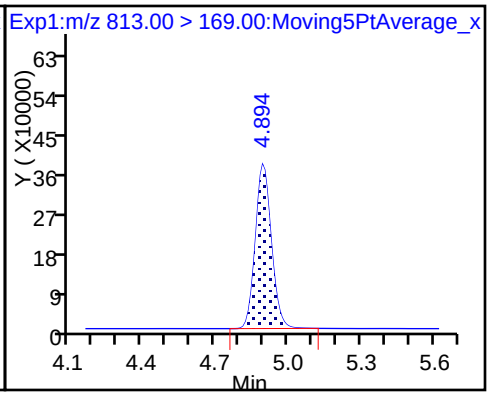
42 Perfluorotetradecanoic acid



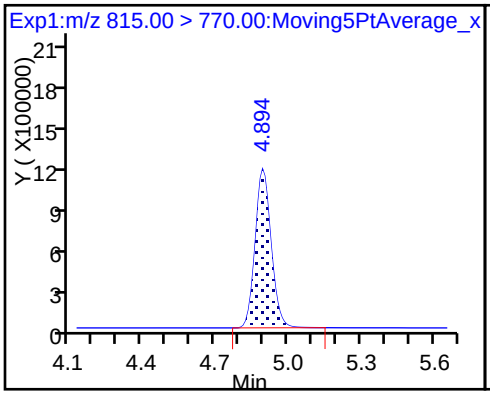
45 Perfluorohexadecanoic acid



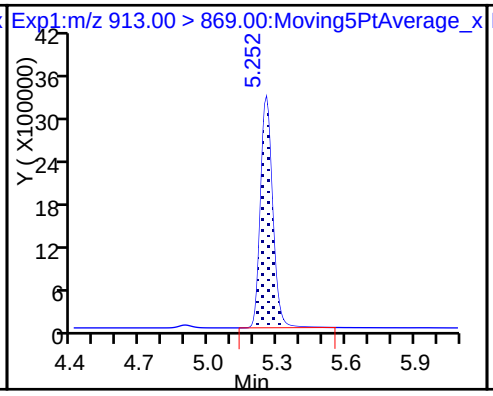
45 Perfluorohexadecanoic acid



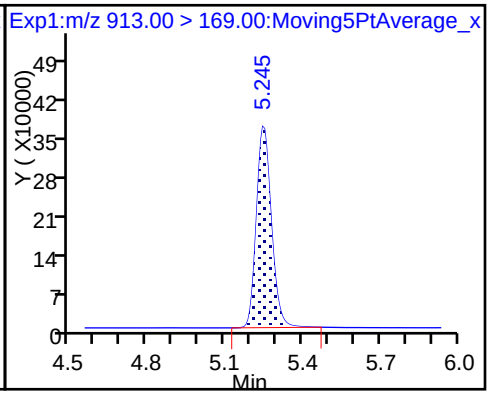
D 44 13C2-PFHxDA



46 Perfluorooctadecanoic acid



46 Perfluorooctadecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_008.d
Lims ID: IC L7 Full
Client ID:
Sample Type: IC Calib Level: 7
Inject. Date: 17-Jan-2018 15:06:20 ALS Bottle#: 16 Worklist Smp#: 8
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: L7-FULL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-A8_N*sub30

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 18-Jan-2018 08:22:36 Calib Date: 17-Jan-2018 15:06:20
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_008.d

Column 1 : Det: EXP1
Process Host: XAWRK019

First Level Reviewer: hannigana Date: 17-Jan-2018 16:53:09

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.414	1.411	0.003	0.539	6689622	2.53		101	25243	
2 Perfluorobutyric acid										
212.90 > 169.00	1.414	1.413	0.001	1.000	24898296	9.96		99.6	2914	
D 3 13C5-PFPeA										
267.90 > 223.00	1.663	1.659	0.004	0.634	3854737	2.46		98.3	39369	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.663	1.662	0.001	1.000	17890417	9.85		98.5	15819	
D 47 13C3-PFBS										
301.90 > 83.00	1.698	1.695	0.003	0.647	81139	2.34		101	2879	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.698	1.697	0.001	1.000	22970596	8.52		96.4	91802	
298.90 > 99.00	1.698	1.697	0.001	1.000	10302278		2.23(1.25-3.74)	96.4	71598	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.903	1.903	0.0	1.000	4712009	9.72		104	105462	
D 60 M2-4:2FTS										
329.00 > 81.00	1.903	1.903	0.0	0.725	503558	NC			7017	
D 7 13C2 PFHxA										
315.00 > 270.00	1.934	1.939	-0.005	0.737	4166297	2.47		98.6	28614	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.934	1.939	-0.005	1.000	16747455	9.70		97.0	32785	
313.00 > 119.00	1.945	1.939	0.006	1.005	1577842		10.61(5.03-15.10)	97.0	24719	
D 9 13C4-PFHpA										
367.00 > 322.00	2.266	2.267	-0.001	0.864	3856924	2.40		95.9	28210	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.266	2.268	-0.002	1.000	16533181	9.75		97.5	24994	
363.00 > 169.00	2.266	2.268	-0.002	1.000	6765479		2.44(1.13-3.40)	97.5	26540	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.279	2.280	-0.001	1.000	18787887	8.69		95.5	22477	
399.00 > 99.00	2.279	2.280	-0.001	1.000	6654127		2.82(1.50-4.49)	95.5	17895	
D 11 18O2 PFHxS										
403.00 > 84.00	2.279	2.282	-0.003	0.869	4592963	2.32		98.0	23679	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.596	2.596	0.0	1.000	4633505	9.66		102	36218	
D 12 M2-6:2FTS										
429.00 > 81.00	2.596	2.597	-0.001	0.990	688126	2.31		97.4	16159	
D 14 13C4 PFOA										
417.00 > 372.00	2.624	2.622	0.002	1.000	3781095	2.40		95.9	27005	
* 62 13C2-PFOA										
415.00 > 370.00	2.624	2.622	0.002		4378689	2.50			31205	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.624	2.623	0.001	1.000	17167030	9.68		96.8	11755	
413.00 > 169.00	2.624	2.623	0.001	1.000	9348745		1.84(0.84-2.52)	96.8	27736	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.631	2.629	0.002	1.000	15956747	9.69		102	37702	
449.00 > 99.00	2.631	2.629	0.002	1.000	4445483		3.59(1.94-5.82)	102	31035	
D 19 13C5 PFNA										
468.00 > 423.00	2.993	2.992	0.001	1.141	3133770	2.45		98.0	25028	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.993	2.992	0.001	1.000	12870491	9.46		102	4516	
499.00 > 99.00	2.993	2.992	0.001	1.000	2908185		4.43(2.31-6.93)	102	6965	
D 18 13C4 PFOS										
503.00 > 80.00	2.993	2.992	0.001	1.141	2906103	2.32		97.0	17739	
20 Perfluorononanoic acid										
463.00 > 419.00	2.993	2.992	0.001	1.000	12938458	10.0		100	24000	
463.00 > 169.00	2.993	2.992	0.001	1.000	3160977		4.09(1.90-5.69)	100	28300	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.340	3.338	0.002	1.000	16389523	9.88		98.8	56175	
D 21 13C8 FOSA										
506.00 > 78.00	3.340	3.338	0.002	1.273	4220474	2.39		95.7	28811	
D 26 M2-8:2FTS										
529.00 > 81.00	3.340	3.342	-0.002	1.273	762870	2.43		101	15297	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.340	3.342	-0.002	1.000	3762460	9.71		101	32197	
D 23 13C2 PFDA										
515.00 > 470.00	3.355	3.352	0.003	1.279	2706406	2.45		98.0	21712	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.355	3.353	0.002	1.000	10721843	10.2		102	25870	
513.00 > 169.00	3.355	3.353	0.002	1.000	1943855		5.52(2.36-7.09)	102	1786	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.507	3.507	0.0	1.337	1384778	2.51		100	9371	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.515	3.513	0.002	1.002	6179313	10.3		103	14700	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.664	3.666	-0.002	1.000	8022809	10.1		105	36965	
599.00 > 99.00	3.664	3.666	-0.002	1.000	2594517		3.09(1.39-4.16)	105	24126	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.671	3.672	-0.001	1.399	1301953	2.34		93.4	3892	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.680	3.678	0.002	1.000	8080078	9.91		99.1	27169	
563.00 > 169.00	3.680	3.678	0.002	1.000	1670202		4.84(0.00-0.00)	99.1	30795	
D 30 13C2 PFUnA										
565.00 > 520.00	3.680	3.679	0.001	1.403	1975688	2.36		94.3	17015	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.680	3.679	0.001	1.002	5261873	10.4		104	12712	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.981	3.979	0.002	1.000	9080911	10.2		102	31434	
613.00 > 169.00	3.981	3.979	0.002	1.000	2315217		3.92(2.13-6.40)	102	31384	
D 36 13C2 PFDoA										
615.00 > 570.00	3.981	3.979	0.002	1.517	2179814	2.40		95.9	17254	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.242	4.242	0.0	1.000	9922216	9.80		98.0	37825	
663.00 > 169.00	4.242	4.242	0.0	1.000	3182480		3.12(1.25-3.76)	98.0	41814	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.486	4.483	0.003	1.000	2672440	10.1		101	22980	
713.00 > 219.00	4.472	4.483	-0.011	0.997	1833873		1.46(0.71-2.13)	101	21207	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.486	4.483	0.003	1.710	2702115	2.27		91.0	11943	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.903	4.902	0.001	1.869	4770244	2.25		90.1	13892	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.903	4.902	0.001	1.000	17956480	9.91		99.1	9344	
813.00 > 169.00	4.903	4.902	0.001	1.000	3254432		5.52(2.86-8.58)	99.1	11679	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.260	5.255	0.005	1.000	20806019	10.3		103	3261	
913.00 > 169.00	5.252	5.255	-0.003	0.999	2748135		7.57(0.00-0.00)	103	2966	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL7_00003 Amount Added: 1.00 Units: mL

Report Date: 18-Jan-2018 08:22:36 Chrom Revision: 2.2 08-Dec-2017 11:41:26

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_008.d

Injection Date: 17-Jan-2018 15:06:20 Instrument ID: A8_N

Lims ID: IC L7 Full

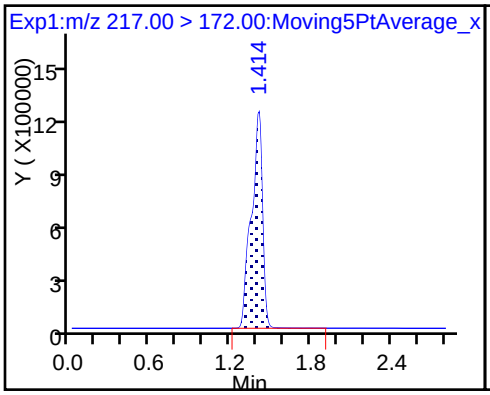
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 16 Worklist Smp#: 8

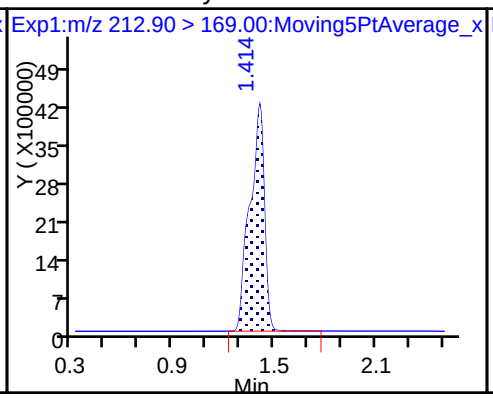
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

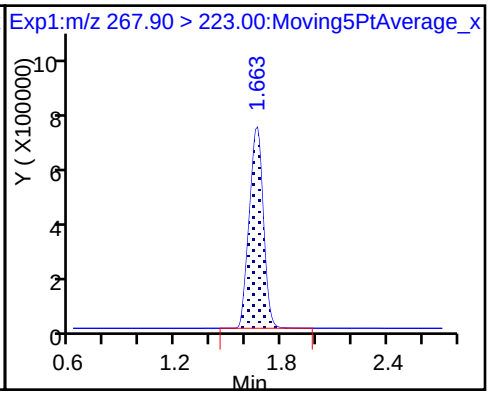
D 1 13C4 PFBA



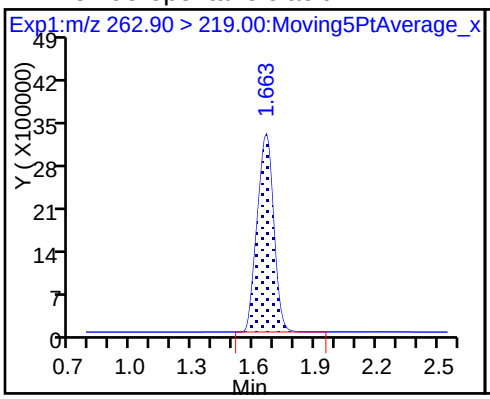
2 Perfluorobutyric acid



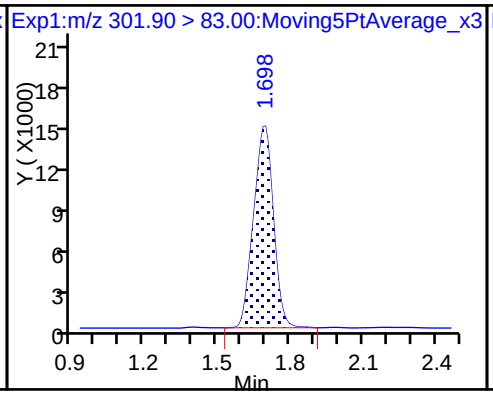
D 3 13C5-PFPeA



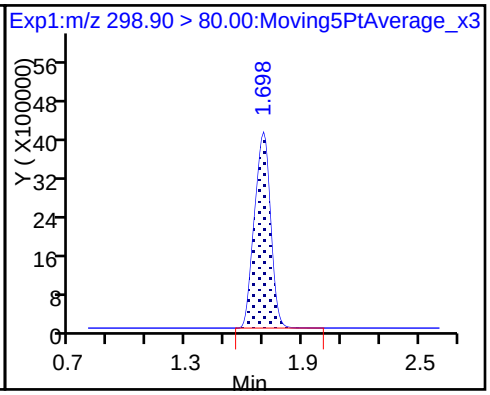
4 Perfluoropentanoic acid



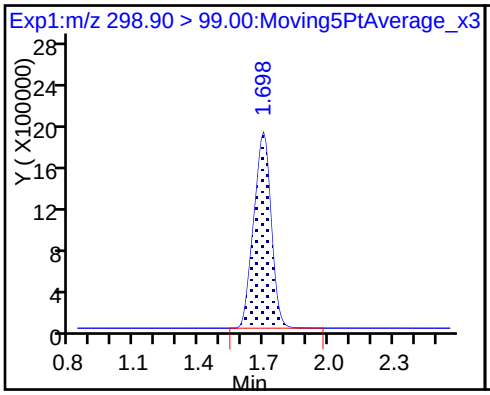
D 47 13C3-PFBS



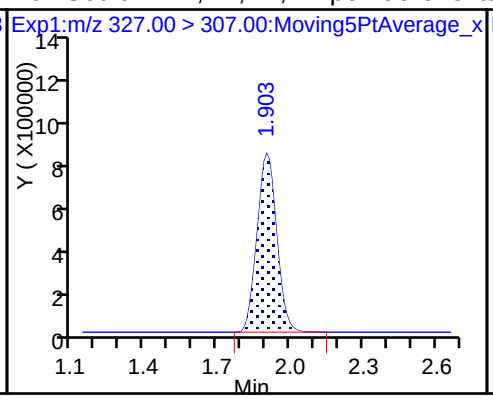
5 Perfluorobutanesulfonic acid



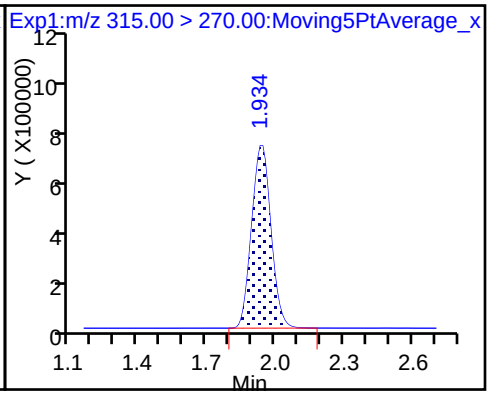
5 Perfluorobutanesulfonic acid



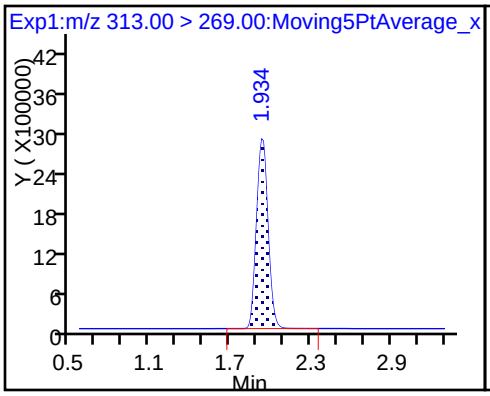
61 Sodium 1H,1H,2H,2H-perfluorohexa



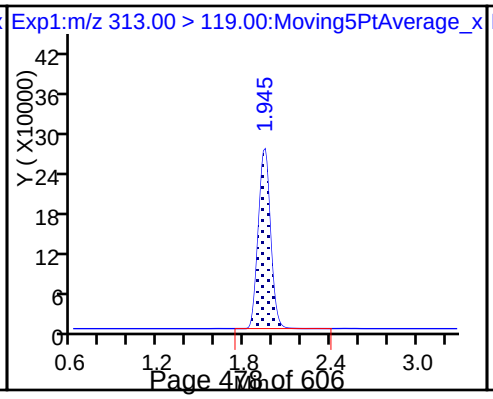
D 7 13C2 PFHxA



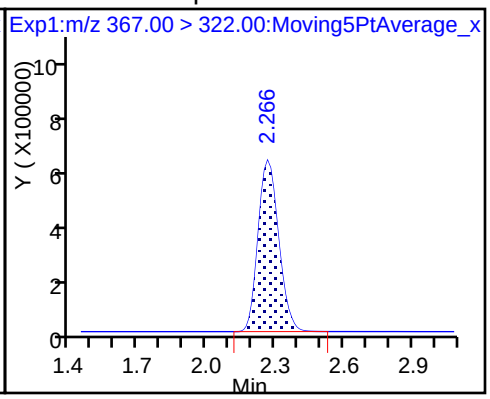
6 Perfluorohexanoic acid



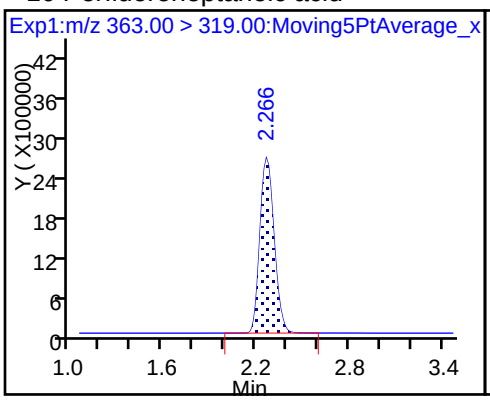
6 Perfluorohexanoic acid



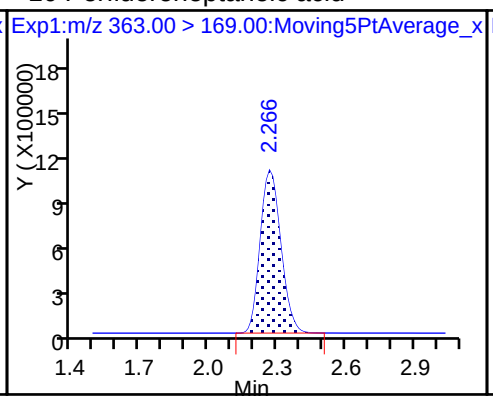
D 9 13C4-PFHpA



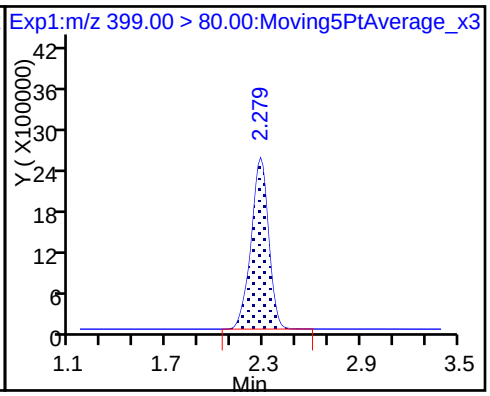
10 Perfluoroheptanoic acid



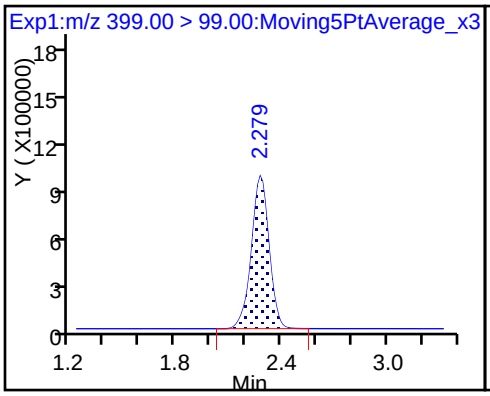
10 Perfluoroheptanoic acid



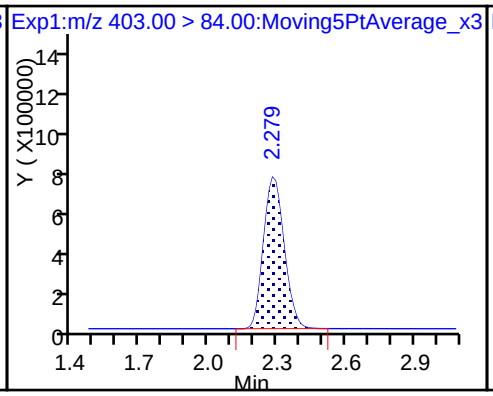
8 Perfluorohexanesulfonic acid



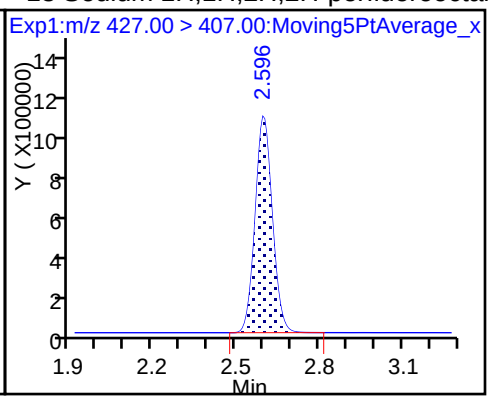
8 Perfluorohexanesulfonic acid



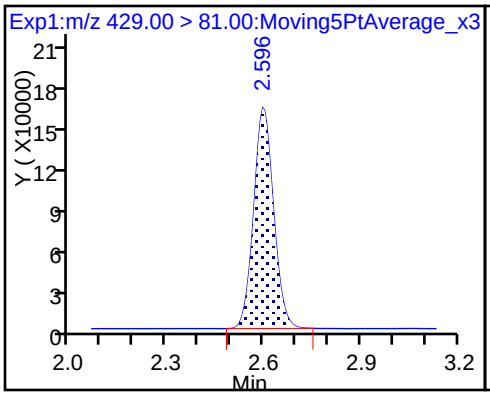
D 11 18O2 PFHxS



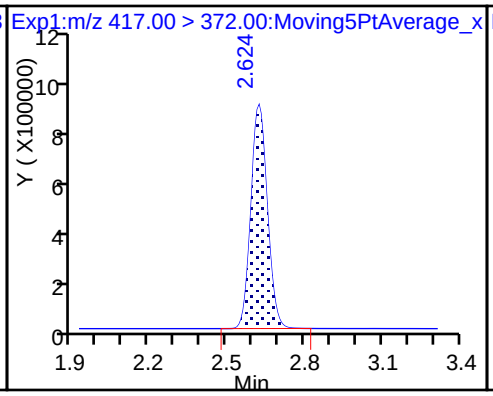
13 Sodium 1H,1H,2H,2H-perfluorooctane



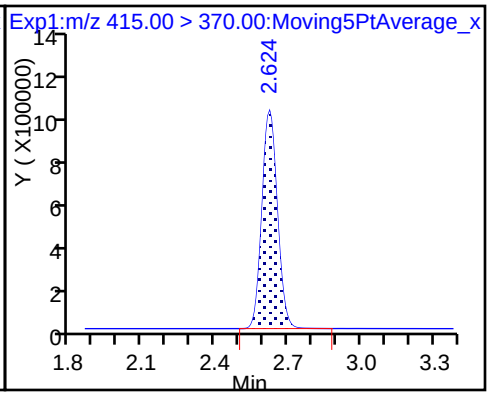
D 12 M2-6:2FTS



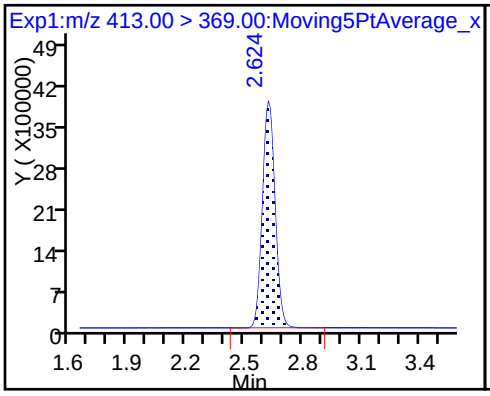
D 14 13C4 PFOA



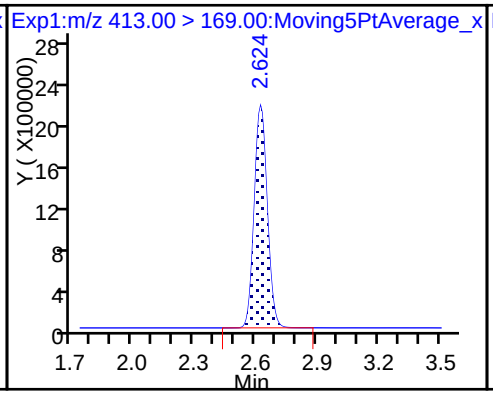
* 62 13C2-PFOA



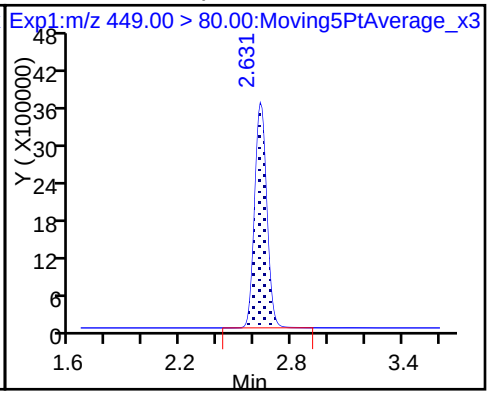
15 Perfluorooctanoic acid



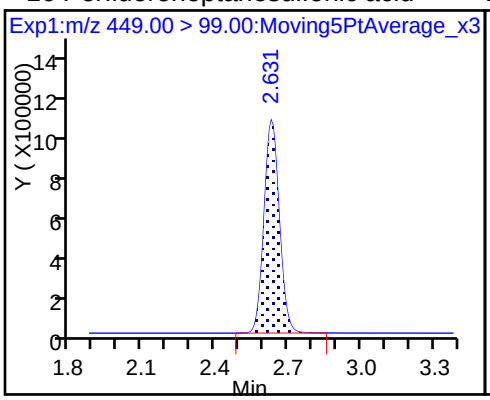
15 Perfluorooctanoic acid



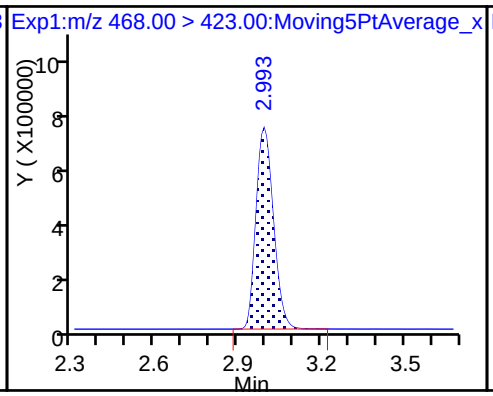
16 Perfluoroheptanesulfonic acid



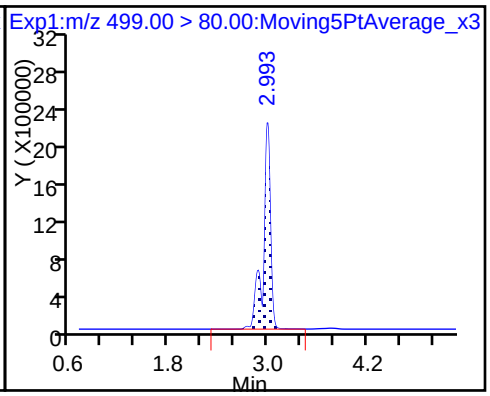
16 Perfluoroheptanesulfonic acid



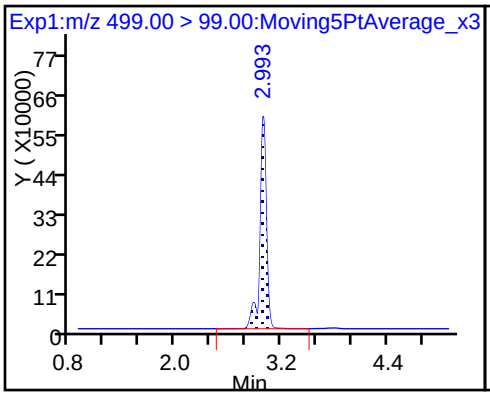
D 19 13C5 PFNA



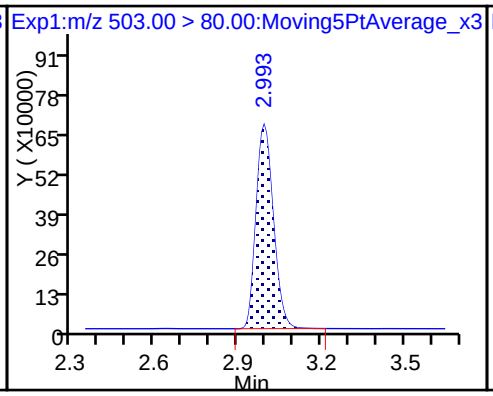
17 Perfluorooctane sulfonic acid



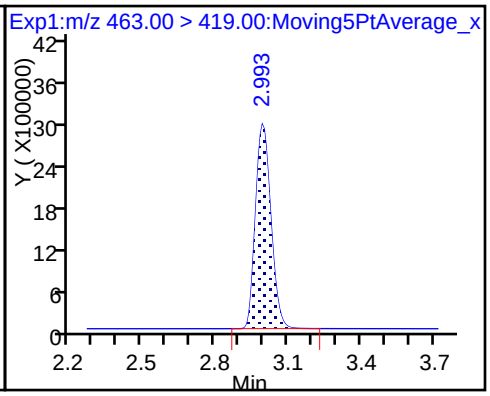
17 Perfluorooctane sulfonic acid



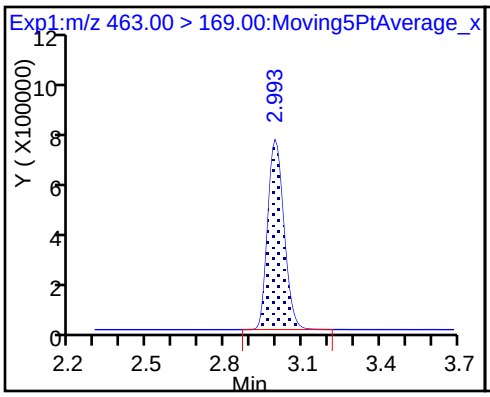
D 18 13C4 PFOS



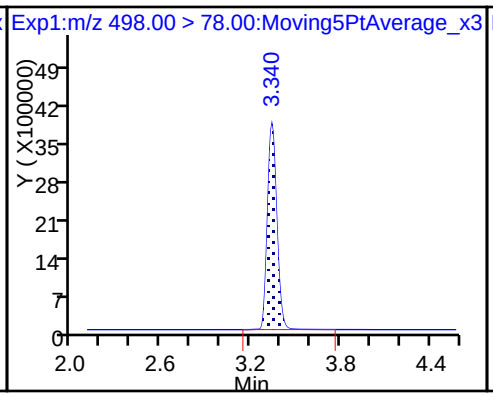
20 Perfluorononanoic acid



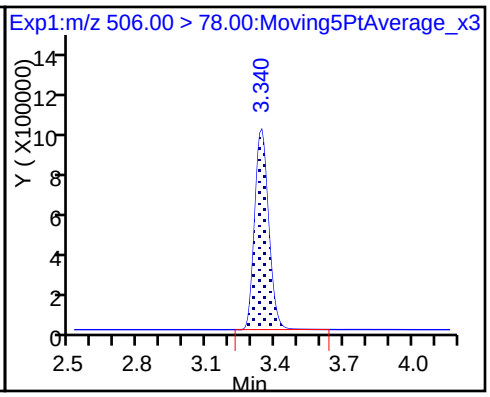
20 Perfluorononanoic acid



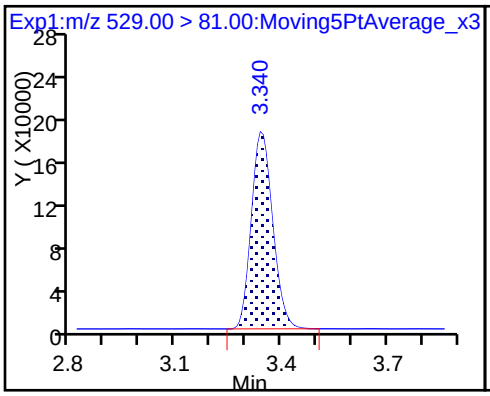
22 Perfluorooctane Sulfonamide



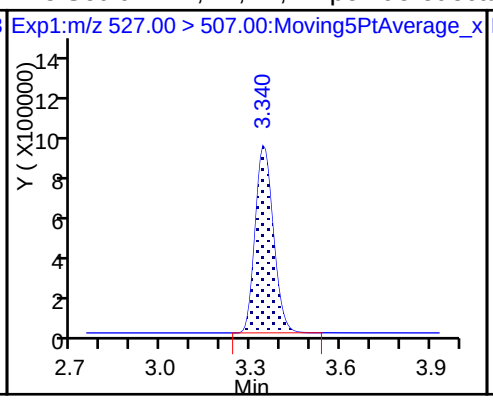
D 21 13C8 FOSA



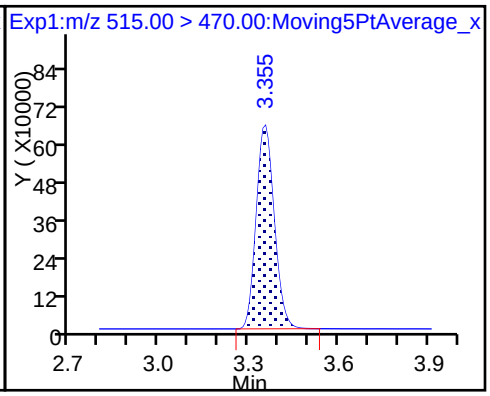
D 26 M2-8:2FTS



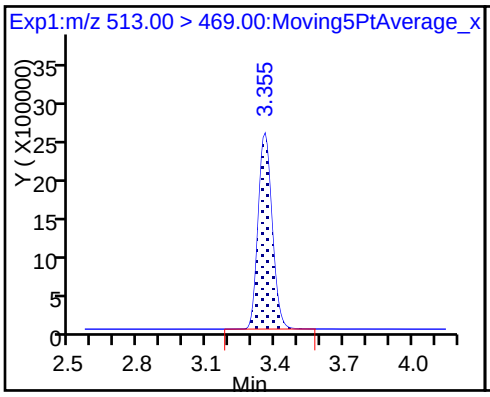
25 Sodium 1H,1H,2H,2H-perfluorodecane



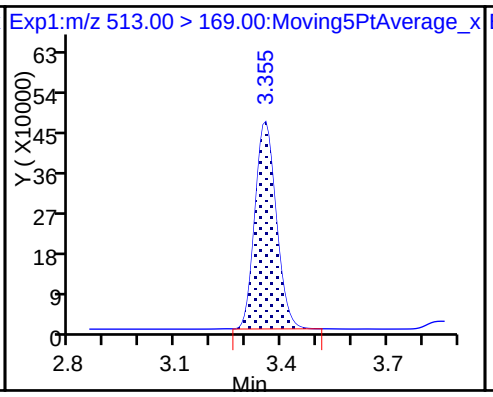
D 23 13C2 PFDA



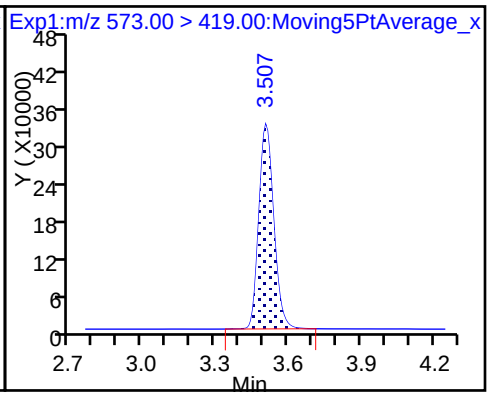
24 Perfluorodecanoic acid



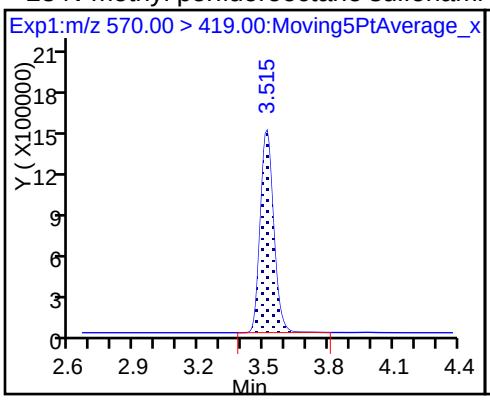
24 Perfluorodecanoic acid



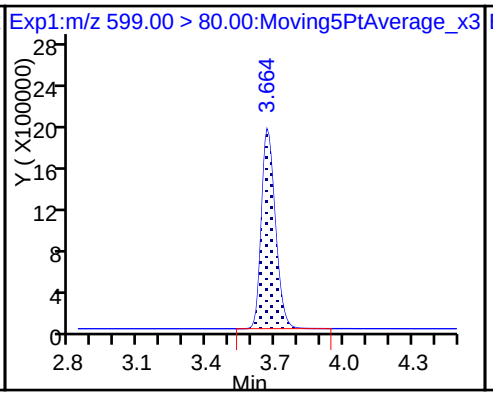
D 27 d3-NMeFOSAA



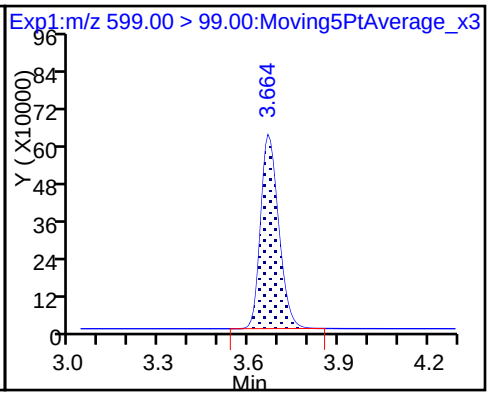
28 N-methyl perfluorooctane sulfonami



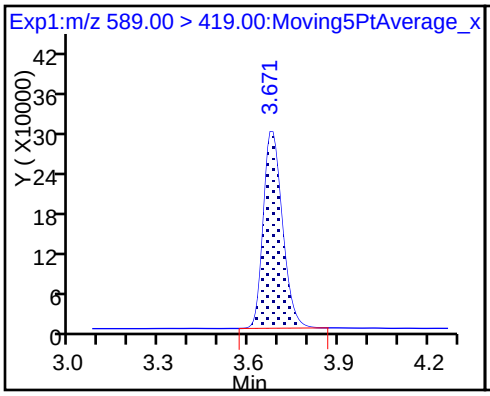
29 Perfluorodecane Sulfonic acid



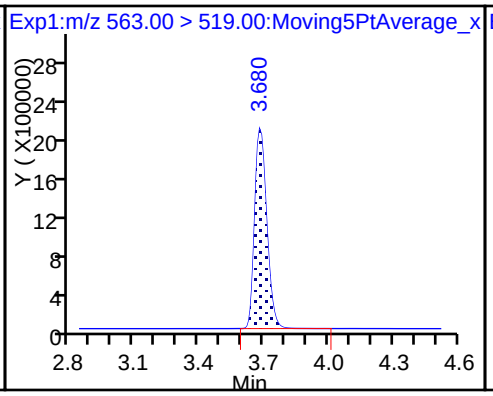
29 Perfluorodecane Sulfonic acid



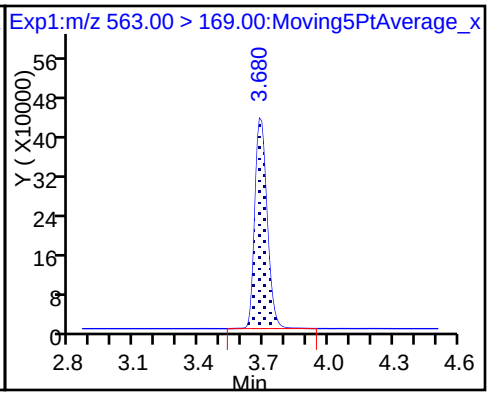
D 32 d5-NEtFOSAA



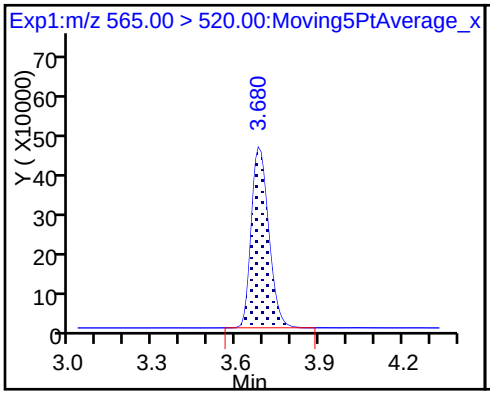
31 Perfluoroundecanoic acid



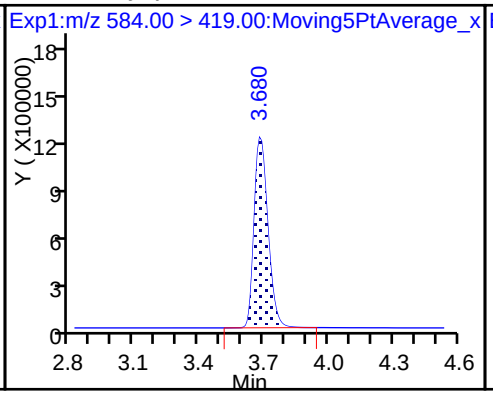
31 Perfluoroundecanoic acid



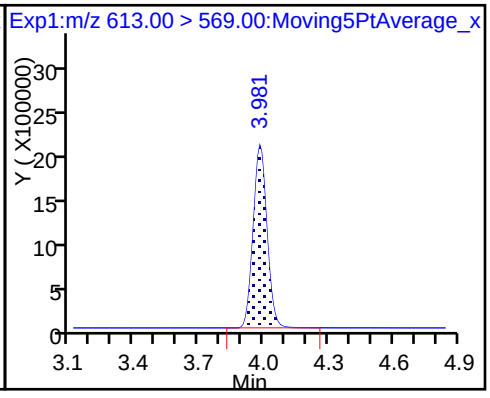
D 30 13C2 PFUnA



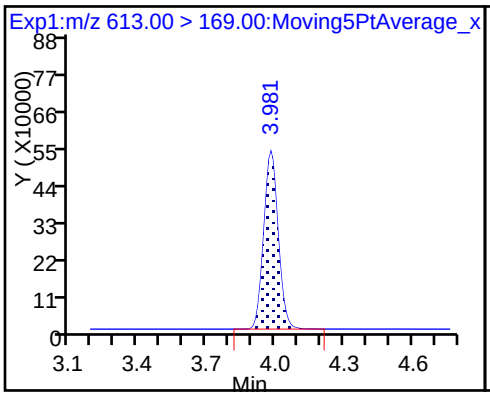
33 N-ethyl perfluorooctane sulfonamid



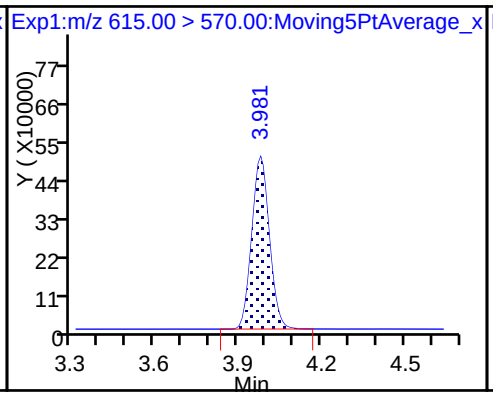
37 Perfluorododecanoic acid



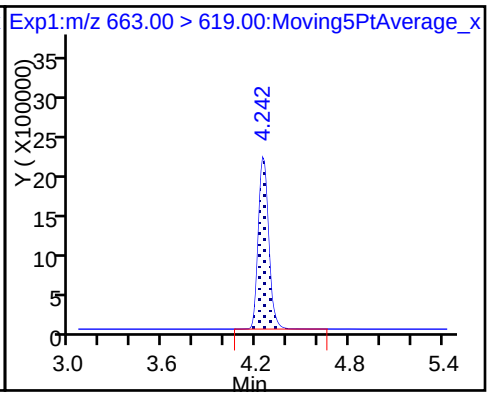
37 Perfluorododecanoic acid



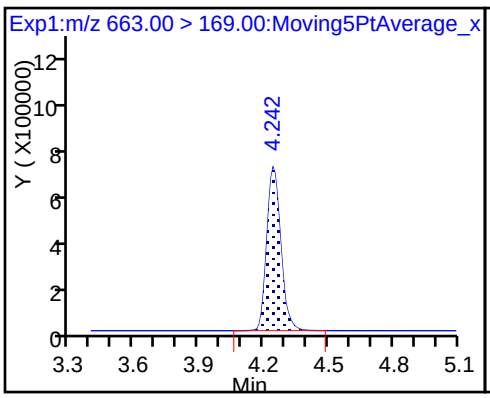
D 36 13C2 PFDoA



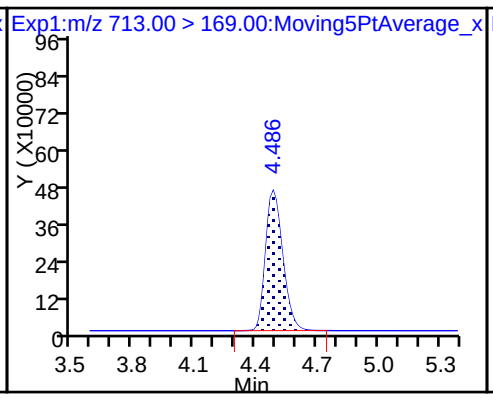
41 Perfluorotridecanoic acid



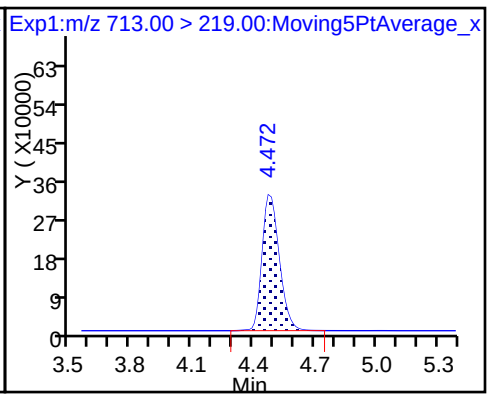
41 Perfluorotridecanoic acid



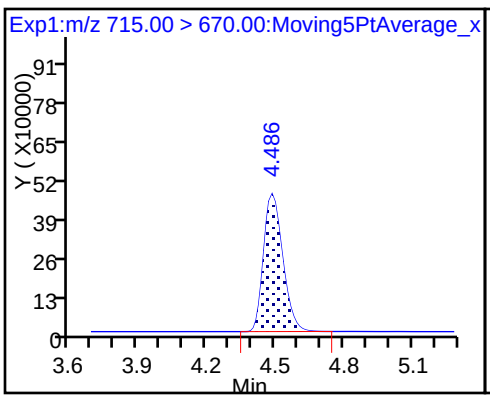
42 Perfluorotetradecanoic acid



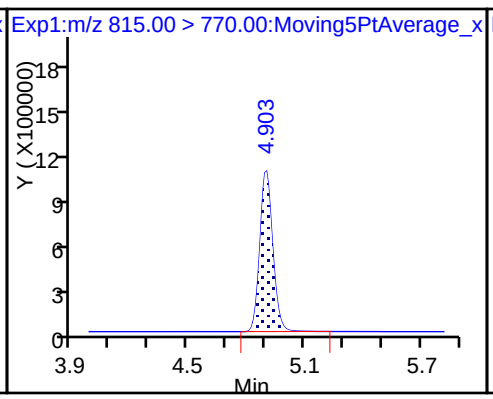
42 Perfluorotetradecanoic acid



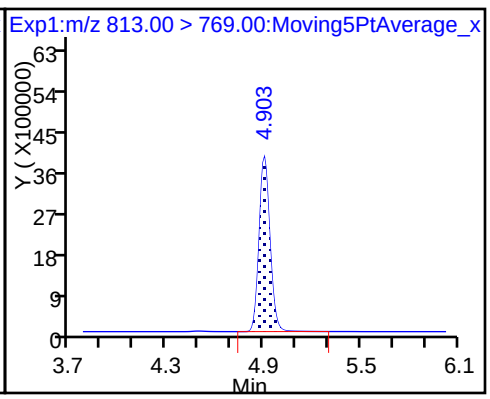
D 43 13C2-PFTeDA



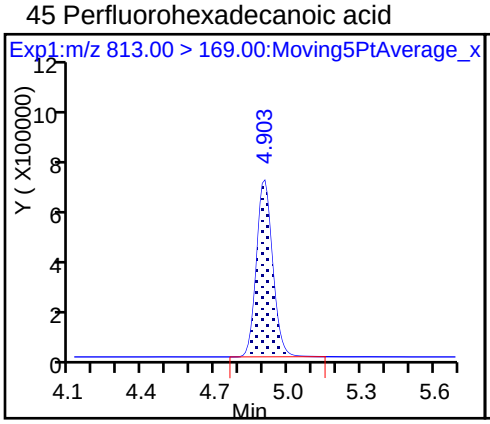
D 44 13C2-PFHxDA



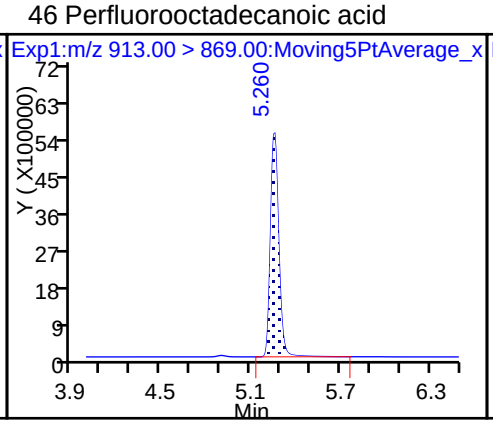
45 Perfluorohexadecanoic acid



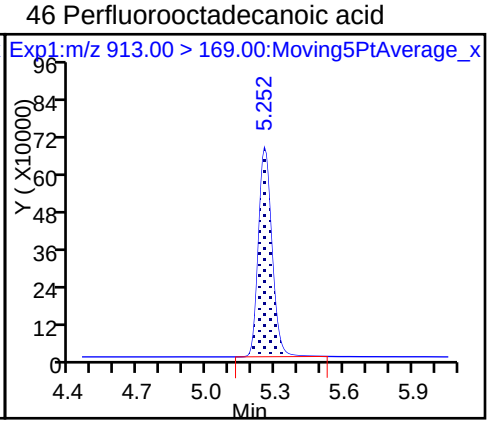
45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid



46 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Lab Sample ID: ICV 320-204375/10 Calibration Date: 01/17/2018 15:22

Instrument ID: A8_N Calib Start Date: 01/17/2018 14:19

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 01/17/2018 15:06

Lab File ID: 2018.01.17CURVELLA_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9343	0.9126		2.44	2.50	-2.3	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.178	1.142		2.42	2.50	-3.0	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	77.21	77.17		2.21	2.21	-0.0	25.0
4:2 FTS	AveID	13.89	13.58		2.28	2.34	-2.3	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.036	0.9860		2.38	2.50	-4.9	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.099	1.048		2.38	2.50	-4.7	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.113	1.050		2.15	2.28	-5.7	25.0
6:2FTS	AveID	1.655	1.696		2.43	2.38	2.4	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.172	1.068		2.28	2.50	-8.9	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.354	1.417		2.48	2.38	4.6	25.0
Perfluorononanoic acid (PFNA)	AveID	1.032	0.9807		2.38	2.50	-5.0	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.119	1.080		2.23	2.31	-3.5	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9823	0.9902		2.52	2.50	0.8	25.0
8:2FTS	AveID	1.217	1.281		2.53	2.40	5.2	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9702	0.9547		2.46	2.50	-1.6	25.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.080	1.060		2.45	2.50	-1.9	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6549	0.6815		2.51	2.41	4.1	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.032	0.9448		2.29	2.50	-8.5	25.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9739	0.9541		2.45	2.50	-2.0	25.0
Perfluorododecanoic acid (PFDoA)	AveID	1.025	1.024		2.50	2.50	-0.1	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.161	1.075		2.31	2.50	-7.4	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2440	0.2434		2.49	2.50	-0.3	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		0.8997		2.35	2.50	-5.8	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.054	1.176		2.79	2.50	11.6	25.0
13C4 PFBA	Ave	1.512	1.595		2.64	2.50	5.4	50.0
13C5 PFPeA	Ave	0.8956	0.9288		2.59	2.50	3.7	50.0
13C3-PFBS	Ave	0.0198	0.0205		2.40	2.33	3.3	50.0
13C2 PFHxA	Ave	0.9649	1.003		2.60	2.50	3.9	50.0
13C4-PFHpA	Ave	0.9187	0.9576		2.61	2.50	4.2	50.0
18O2 PFHxS	Ave	1.131	1.197		2.50	2.37	5.8	50.0
M2-6:2FTS	Ave	0.1699	0.1786		2.50	2.38	5.1	50.0

FORM VII 537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Lab Sample ID: ICV 320-204375/10 Calibration Date: 01/17/2018 15:22

Instrument ID: A8_N Calib Start Date: 01/17/2018 14:19

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 01/17/2018 15:06

Lab File ID: 2018.01.17CURVELLA_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9004	0.9552		2.65	2.50	6.1	50.0
13C4 PFOS	Ave	0.7158	0.7476		2.50	2.39	4.4	50.0
13C5 PFNA	Ave	0.7300	0.7759		2.66	2.50	6.3	50.0
13C8 FOSA	Ave	1.007	1.031		2.56	2.50	2.4	50.0
M2-8:2FTS	Ave	0.1795	0.1774		2.37	2.40	-1.2	50.0
13C2 PFDA	Ave	0.6306	0.6405		2.54	2.50	1.6	50.0
d3-NMeFOSAA	Ave	0.3147	0.3234		2.57	2.50	2.8	50.0
13C2 PFUnA	Ave	0.4783	0.5040		2.63	2.50	5.4	50.0
d5-NEtFOSAA	Ave	0.3182	0.3385		2.66	2.50	6.4	50.0
13C2 PFDoA	Ave	0.5192	0.5336		2.57	2.50	2.8	50.0
13C2-PFTeDA	Ave	0.6785	0.6646		2.45	2.50	-2.0	50.0
13C2-PFHxDA	Ave	1.209	1.217		2.52	2.50	0.7	50.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_010.d
Lims ID: ICV Full
Client ID:
Sample Type: ICV
Inject. Date: 17-Jan-2018 15:22:01 ALS Bottle#: 18 Worklist Smp#: 10
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: ICV
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist:

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 18-Jan-2018 08:23:30 Calib Date: 17-Jan-2018 15:06:20
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_008.d

Column 1 : Det: EXP1
Process Host: XAWRK019

First Level Reviewer: hannigana Date: 17-Jan-2018 16:51:39

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.414	1.411	0.003	0.540	7421777	2.64		105	23515	
2 Perfluorobutyric acid										
212.90 > 169.00	1.414	1.413	0.001	1.000	6773367	2.44			794	
D 3 13C5-PFPeA										
267.90 > 223.00	1.663	1.659	0.004	0.635	4322669	2.59		104	113476	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.663	1.662	0.001	1.000	4938303	2.42			4287	
D 47 13C3-PFBS										
301.90 > 83.00	1.698	1.695	0.003	0.649	88661	2.40		103	2674	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.698	1.697	0.001	1.000	6510885	2.21			47787	
298.90 > 99.00	1.698	1.697	0.001	1.000	2658603		2.45(1.25-3.74)		20037	
D 60 M2-4:2FTS										
329.00 > 81.00	1.903	1.903	0.0	0.727	555125	NC			6666	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.903	1.903	0.0	1.000	1210129	2.28			43190	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.944	1.939	0.005	1.000	4601877	2.38			10910	
313.00 > 119.00	1.944	1.939	0.005	1.000	426995		10.78(5.03-15.10)		6641	
D 7 13C2 PFHxA										
315.00 > 270.00	1.944	1.939	0.005	0.743	4667197	2.60		104	38991	
D 9 13C4-PFHpA										
367.00 > 322.00	2.266	2.267	-0.001	0.866	4456653	2.61		104	25881	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.266	2.268	-0.002	1.000	4669591	2.38			10337	
363.00 > 169.00	2.266	2.268	-0.002	1.000	1879500		2.48(1.13-3.40)		13339	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.279	2.280	-0.001	1.000	5333976	2.15			12311	
399.00 > 99.00	2.279	2.280	-0.001	1.000	1743366		3.06(1.50-4.49)		8734	
D 11 18O2 PFHxS										
403.00 > 84.00	2.279	2.282	-0.003	0.871	5269906	2.50		106	31626	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.596	2.596	0.0	1.000	1338935	2.43			18477	
D 12 M2-6:2FTS										
429.00 > 81.00	2.596	2.597	-0.001	0.992	789680	2.50		105	18411	
* 62 13C2-PFOA										
415.00 > 370.00	2.616	2.622	-0.006		4654102	2.50			23149	
D 14 13C4 PFOA										
417.00 > 372.00	2.616	2.622	-0.006	1.000	4445719	2.65		106	34079	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.616	2.623	-0.007	1.000	4746472	2.28			3473	
413.00 > 169.00	2.616	2.623	-0.007	1.000	2488390		1.91(0.84-2.52)		11918	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.624	2.629	-0.005	1.000	4682456	2.48			25730	
449.00 > 99.00	2.624	2.629	-0.005	1.000	1243527		3.77(1.94-5.82)		18997	
D 18 13C4 PFOS										
503.00 > 80.00	2.986	2.992	-0.006	1.141	3326395	2.50		104	21730	
20 Perfluorononanoic acid										
463.00 > 419.00	2.986	2.992	-0.006	1.000	3541195	2.38			11503	
463.00 > 169.00	2.986	2.992	-0.006	1.000	857998		4.13(1.90-5.69)		14234	
D 19 13C5 PFNA										
468.00 > 423.00	2.986	2.992	-0.006	1.141	3610875	2.66		106	30265	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.986	2.992	-0.006	1.000	3478480	2.23			1303	
499.00 > 99.00	2.986	2.992	-0.006	1.000	776619		4.48(2.31-6.93)		1713	
D 21 13C8 FOSA										
506.00 > 78.00	3.333	3.338	-0.005	1.274	4798887	2.56		102	18825	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.333	3.338	-0.005	1.000	4751952	2.52			20022	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.340	3.342	-0.002	1.000	1015315	2.53			30248	
D 26 M2-8:2FTS										
529.00 > 81.00	3.340	3.342	-0.002	1.277	791062	2.37		98.8	19021	
D 23 13C2 PFDA										
515.00 > 470.00	3.348	3.352	-0.004	1.279	2981067	2.54		102	25621	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.348	3.353	-0.005	1.000	2846152	2.46			9690	
513.00 > 169.00	3.348	3.353	-0.005	1.000	478669		5.95(2.36-7.09)		11554	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.500	3.507	-0.007	1.338	1505033	2.57		103	10745	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.507	3.513	-0.006	1.002	1594621	2.45			6933	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.664	3.666	-0.002	1.000	2288360	2.51			17426	
599.00 > 99.00	3.657	3.666	-0.009	0.998	746470		3.07(1.39-4.16)		13014	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.671	3.672	-0.001	1.403	1575202	2.66		106	6109	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.671	3.678	-0.007	1.000	2216145	2.29			8195	
563.00 > 169.00	3.680	3.678	0.002	1.002	476831		4.65(0.00-0.00)		10543	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.680	3.679	0.001	1.002	1502830	2.45			13272	
D 30 13C2 PFUnA										
565.00 > 520.00	3.671	3.679	-0.008	1.403	2345720	2.63		105	21260	
D 36 13C2 PFDoA										
615.00 > 570.00	3.972	3.979	-0.007	1.518	2483513	2.57		103	22479	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.981	3.979	0.002	1.002	2542144	2.50			11937	
613.00 > 169.00	3.972	3.979	-0.007	1.000	627983		4.05(2.13-6.40)		12905	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.242	4.242	0.0	1.000	2670293	2.31			9715	
663.00 > 169.00	4.242	4.242	0.0	1.000	815601		3.27(1.25-3.76)		15155	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.486	4.483	0.003	1.715	3093191	2.45		98.0	15682	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.486	4.483	0.003	1.000	752735	2.49			10868	
713.00 > 219.00	4.472	4.483	-0.011	0.997	479119		1.57(0.71-2.13)		10469	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.903	4.902	0.001	1.000	5096341	2.35			2824	
813.00 > 169.00	4.903	4.902	0.001	1.000	877298		5.81(2.86-8.58)		6676	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.903	4.902	0.001	1.874	5664702	2.52		101	13090	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.252	5.255	-0.003	1.000	6663291	2.79			1323	
913.00 > 169.00	5.252	5.255	-0.003	1.000	773529		8.61(0.00-0.00)		1859	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFCIC_FULL_00009 Amount Added: 1.00 Units: mL

Report Date: 18-Jan-2018 08:23:31 Chrom Revision: 2.2 08-Dec-2017 11:41:26

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_010.d

Injection Date: 17-Jan-2018 15:22:01 Instrument ID: A8_N

Lims ID: ICV Full

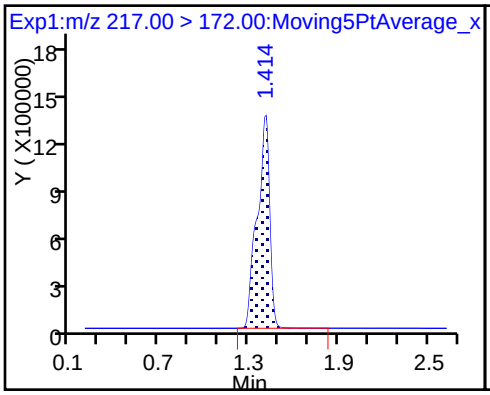
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 18 Worklist Smp#: 10

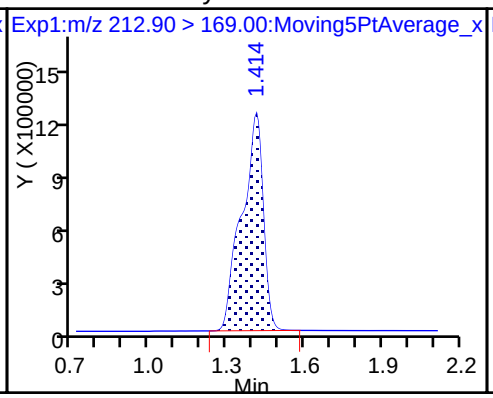
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

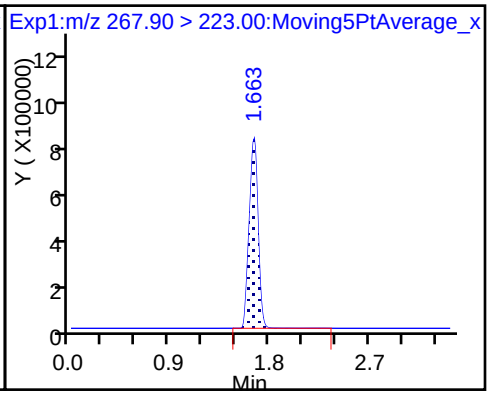
D 1 13C4 PFBA



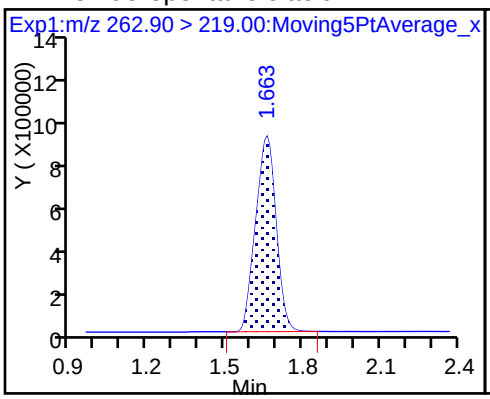
2 Perfluorobutyric acid



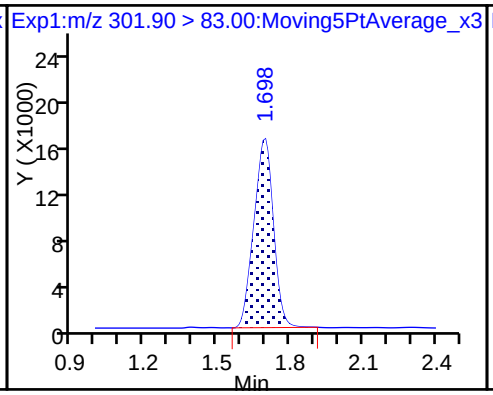
D 3 13C5-PFPeA



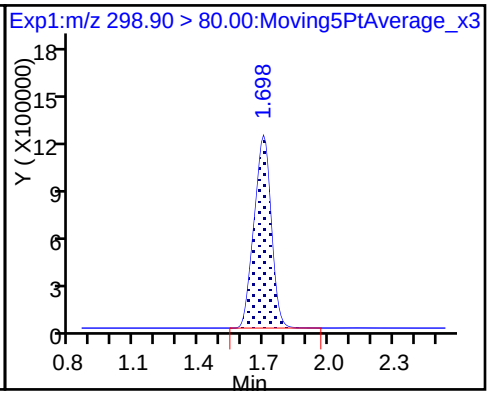
4 Perfluoropentanoic acid



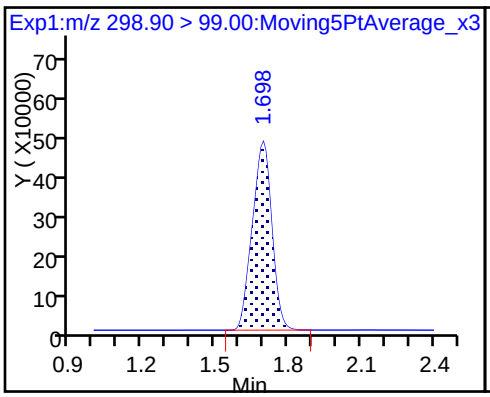
D 47 13C3-PFBS



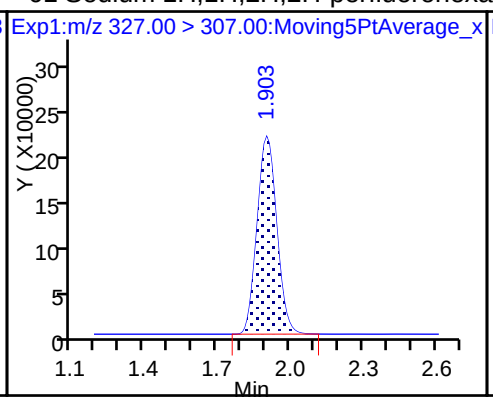
5 Perfluorobutanesulfonic acid



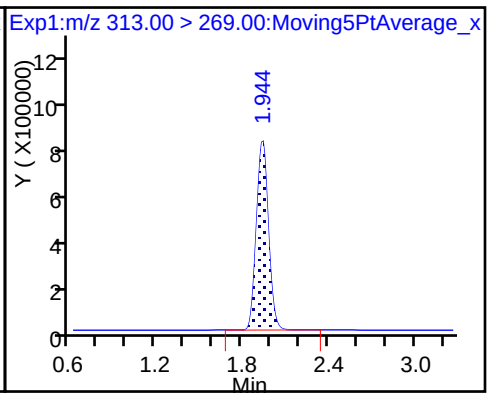
5 Perfluorobutanesulfonic acid



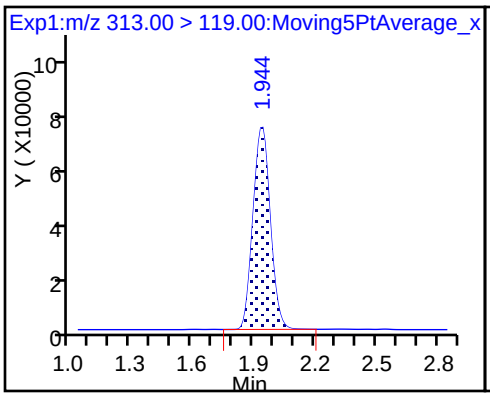
61 Sodium 1H,1H,2H,2H-perfluorohexane



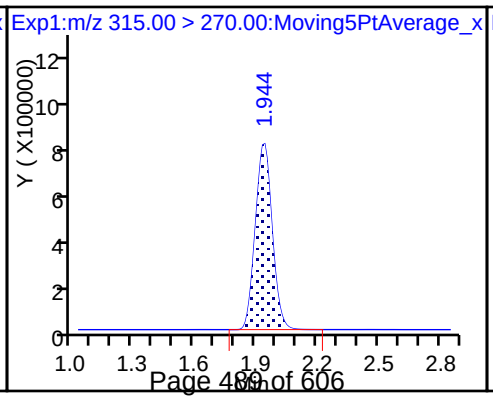
6 Perfluorohexanoic acid



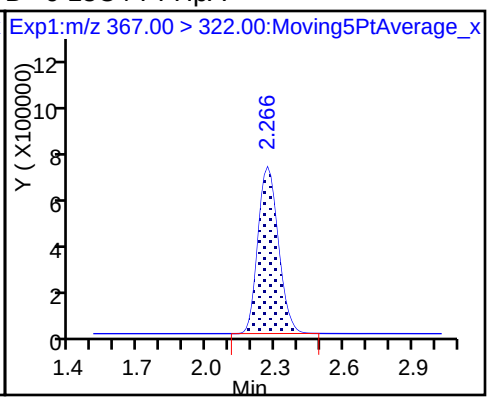
6 Perfluorohexanoic acid



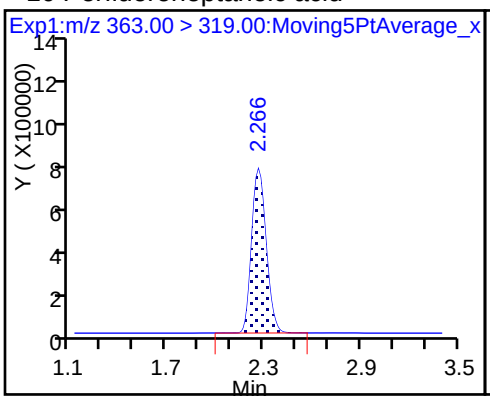
D 7 13C2 PFHxA



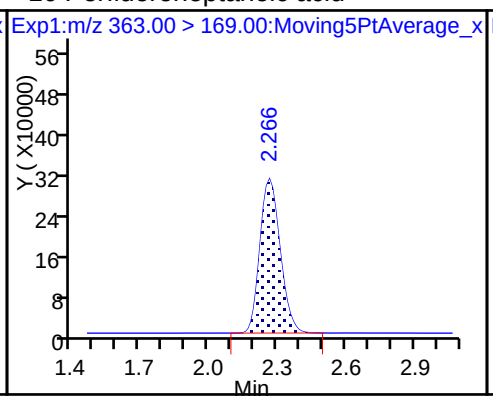
D 9 13C4-PFHpA



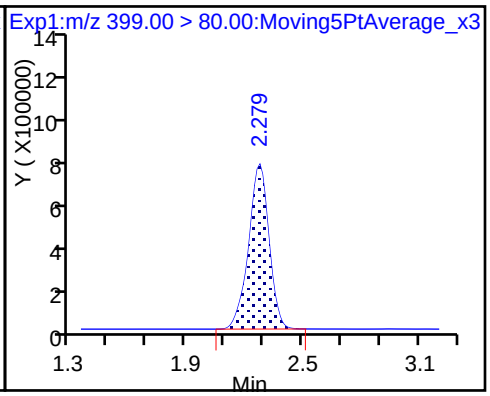
10 Perfluoroheptanoic acid



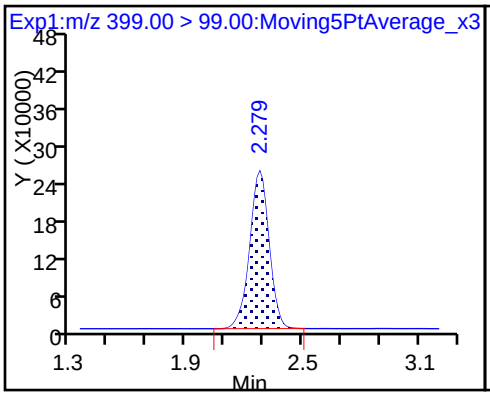
10 Perfluoroheptanoic acid



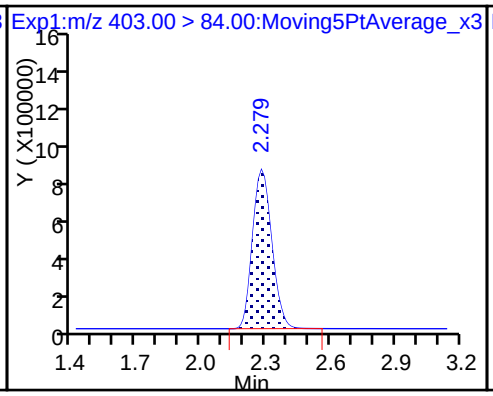
8 Perfluorohexanesulfonic acid



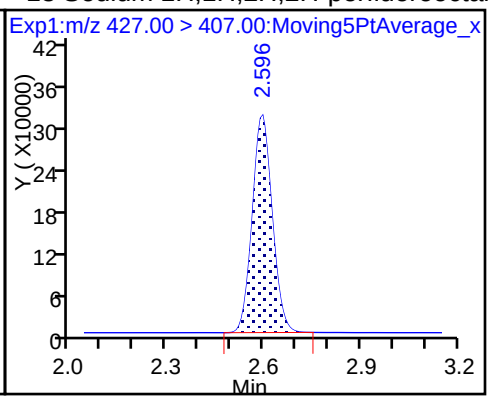
8 Perfluorohexanesulfonic acid



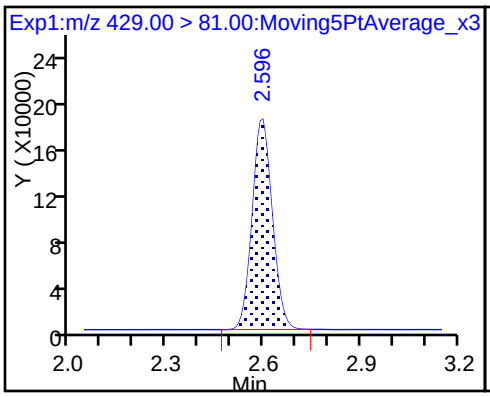
D 11 18O2 PFHxS



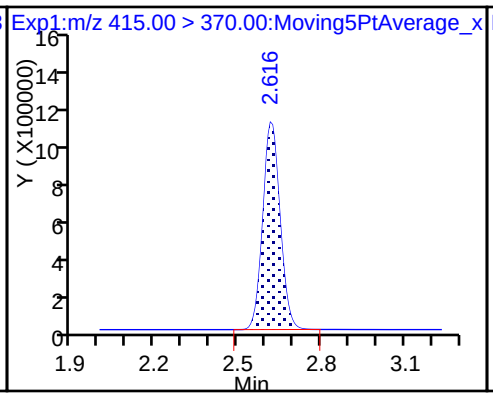
13 Sodium 1H,1H,2H,2H-perfluorooctane



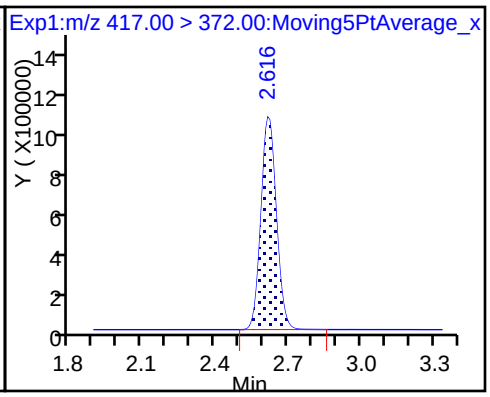
D 12 M2-6:2FTS



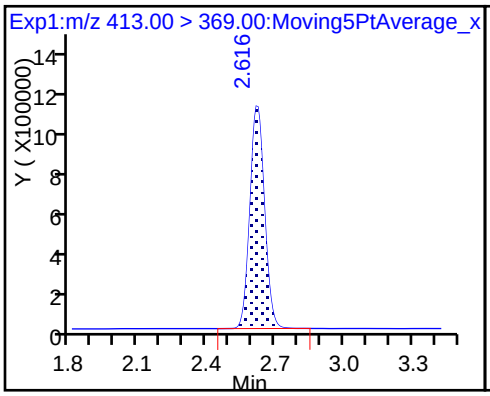
* 62 13C2-PFOA



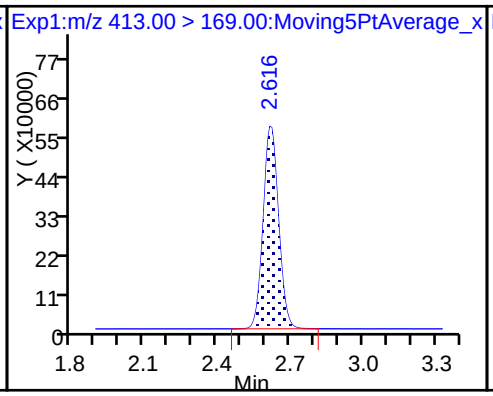
D 14 13C4 PFOA



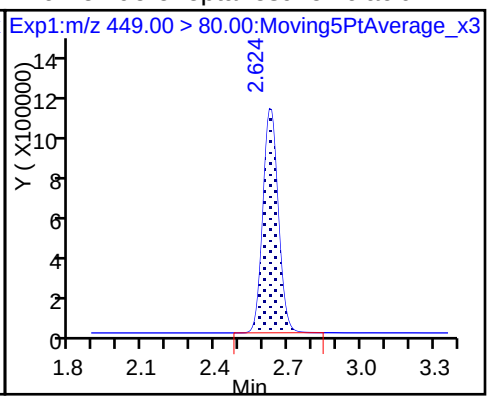
15 Perfluorooctanoic acid



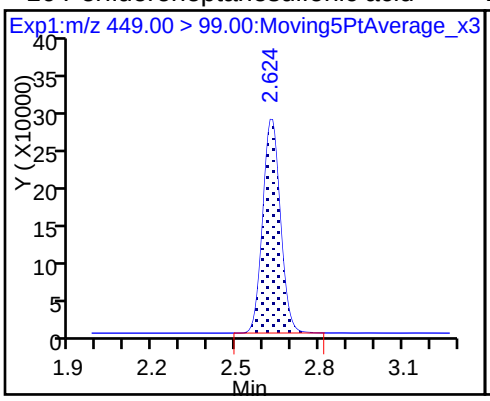
15 Perfluorooctanoic acid



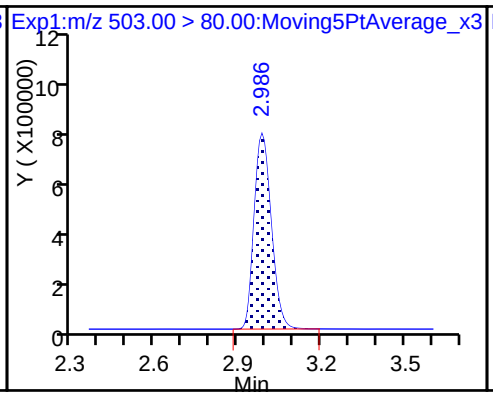
16 Perfluoroheptanesulfonic acid



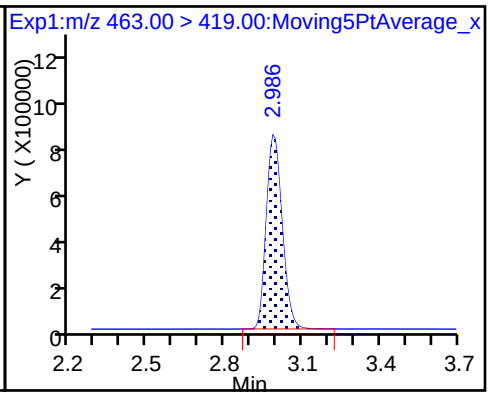
16 Perfluoroheptanesulfonic acid



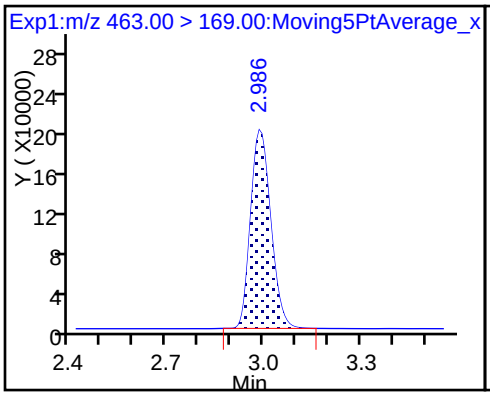
D 18 13C4 PFOS



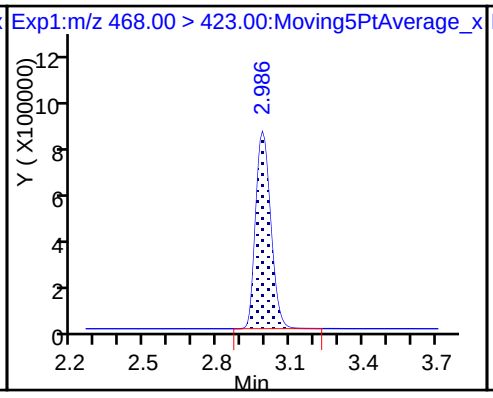
20 Perfluorononanoic acid



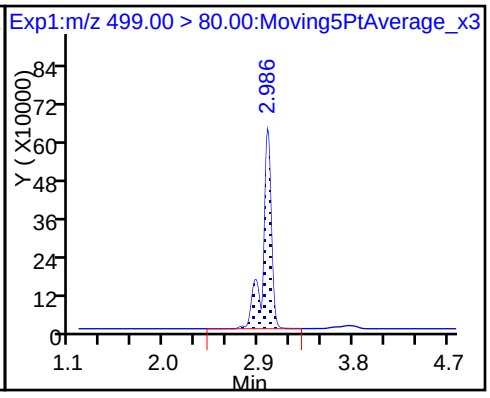
20 Perfluorononanoic acid



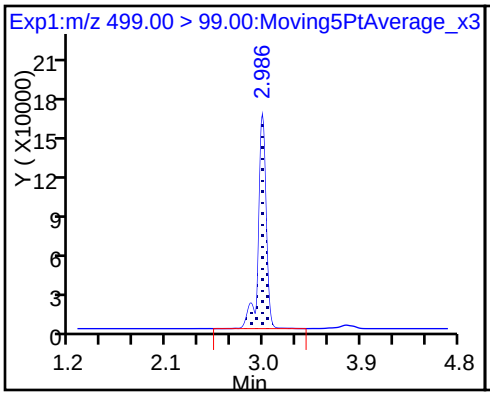
D 19 13C5 PFNA



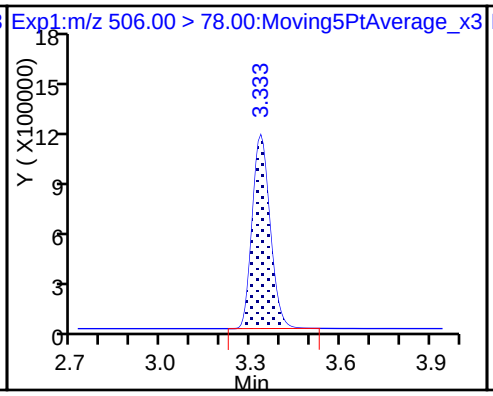
17 Perfluorooctane sulfonic acid



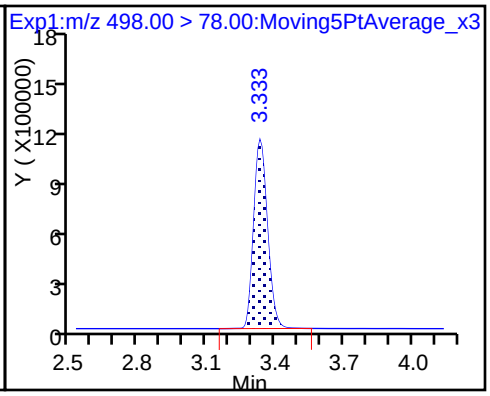
17 Perfluorooctane sulfonic acid



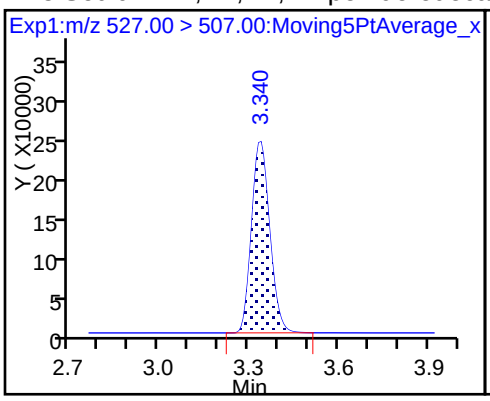
D 21 13C8 FOSA



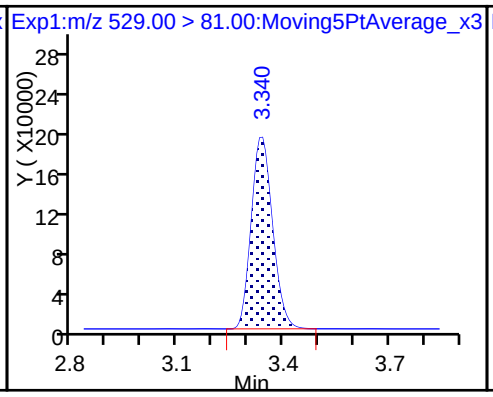
22 Perfluorooctane Sulfonamide



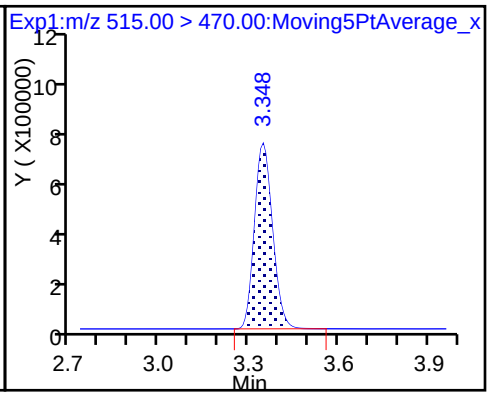
25 Sodium 1H,1H,2H,2H-perfluorodecane



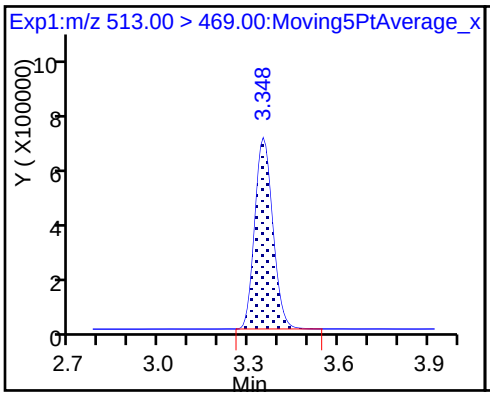
D 26 M2-8:2FTS



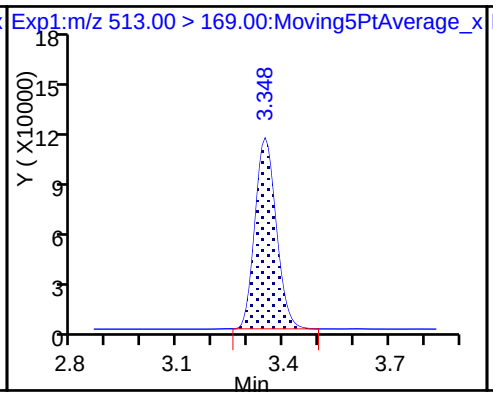
D 23 13C2 PFDA



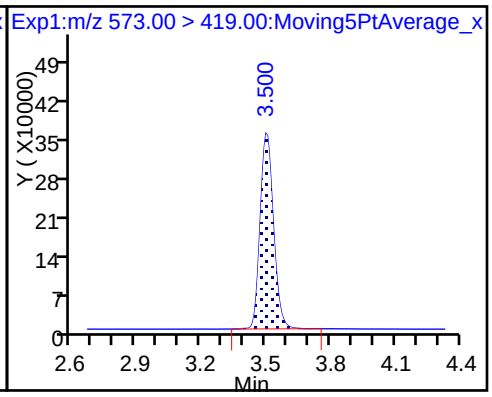
24 Perfluorodecanoic acid



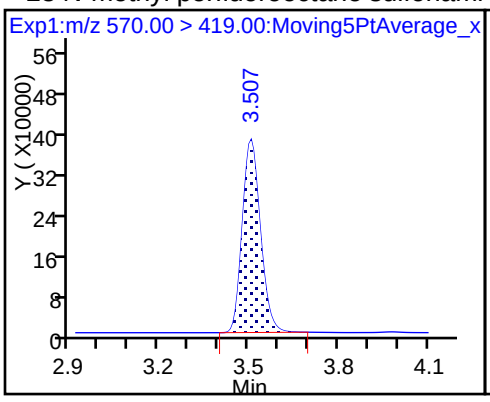
24 Perfluorodecanoic acid



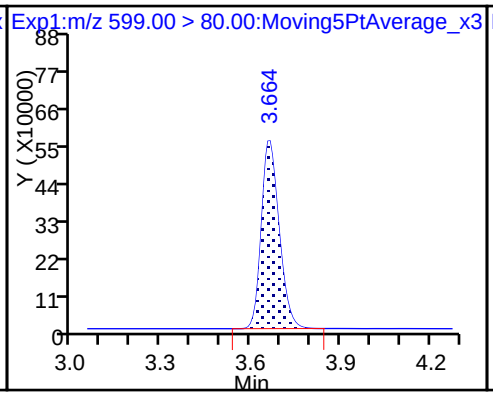
D 27 d3-NMeFOSAA



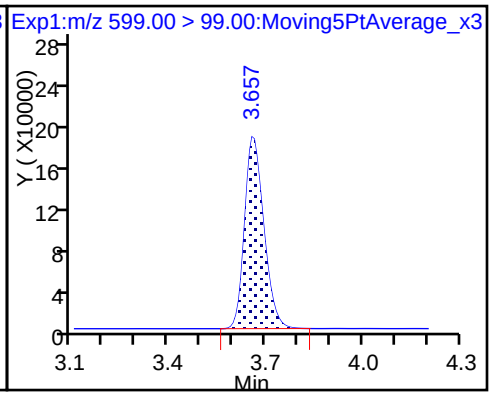
28 N-methyl perfluorooctane sulfonami



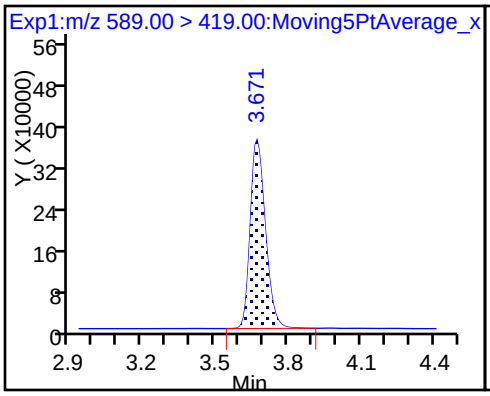
29 Perfluorodecane Sulfonic acid



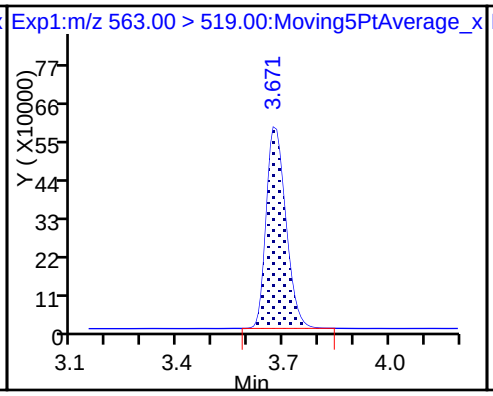
29 Perfluorodecane Sulfonic acid



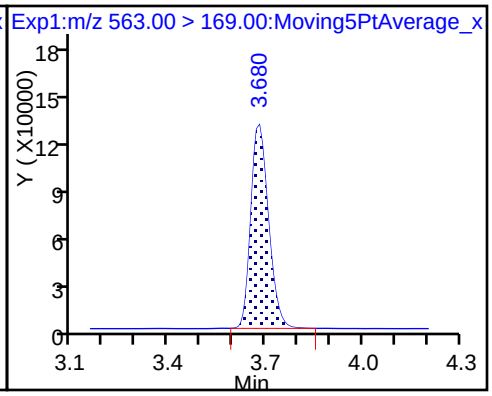
D 32 d5-NEtFOSAA



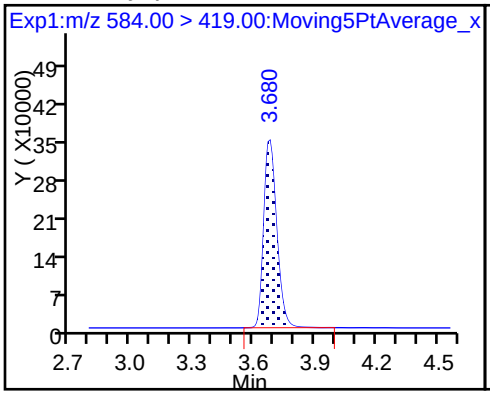
31 Perfluoroundecanoic acid



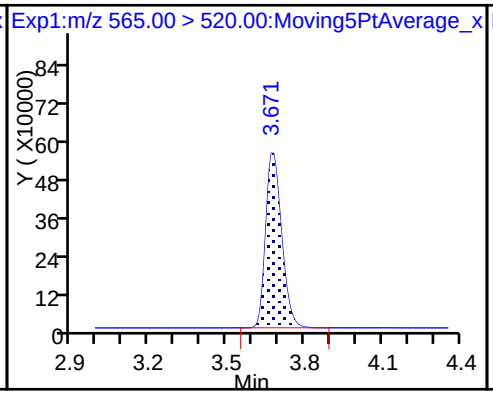
31 Perfluoroundecanoic acid



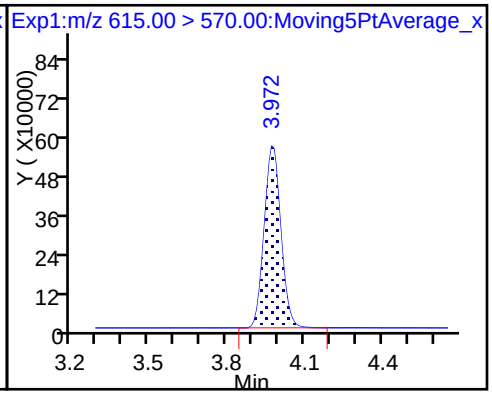
33 N-ethyl perfluorooctane sulfonamid



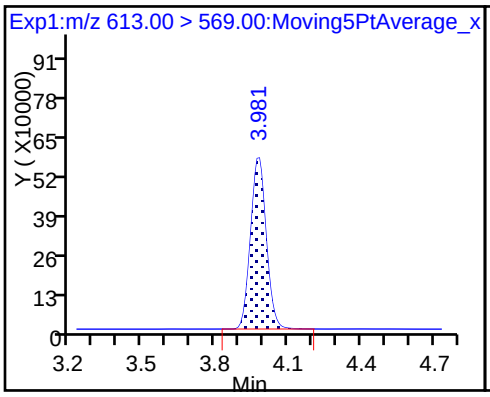
D 30 13C2 PFUnA



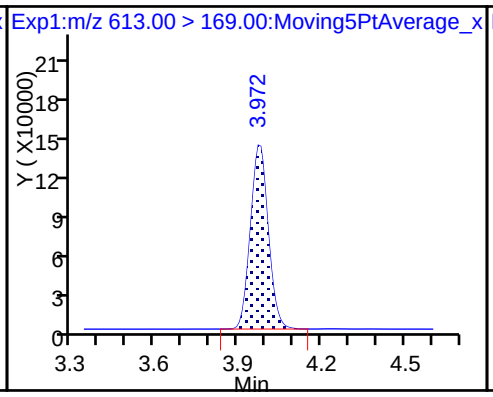
D 36 13C2 PFDoA



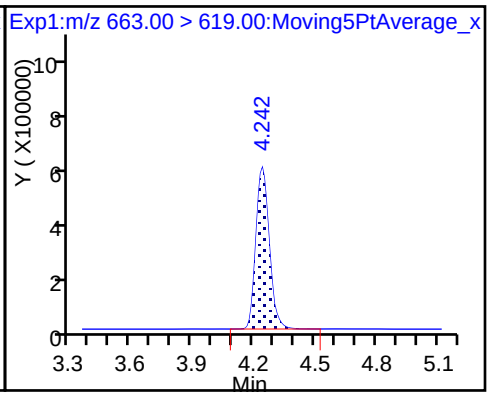
37 Perfluorododecanoic acid



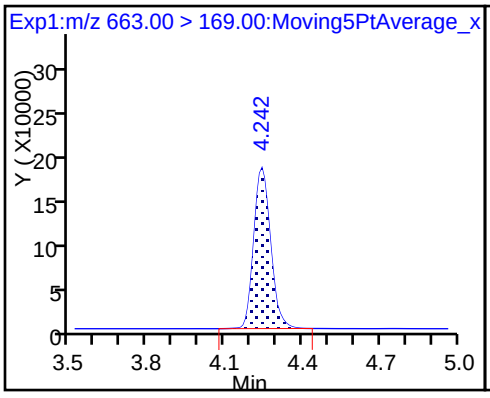
37 Perfluorododecanoic acid



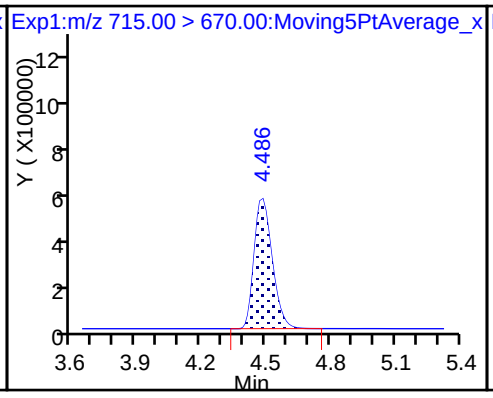
41 Perfluorotridecanoic acid



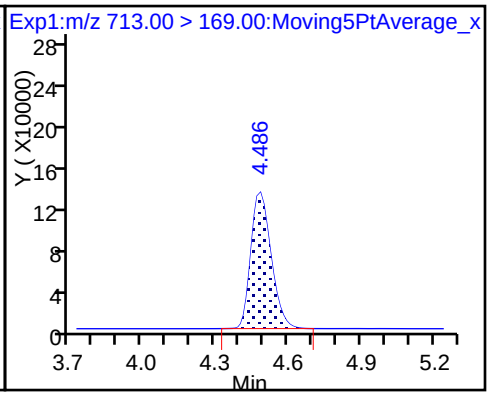
41 Perfluorotridecanoic acid



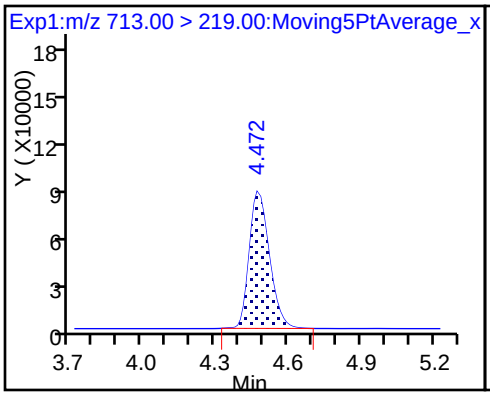
D 43 13C2-PFTeDA



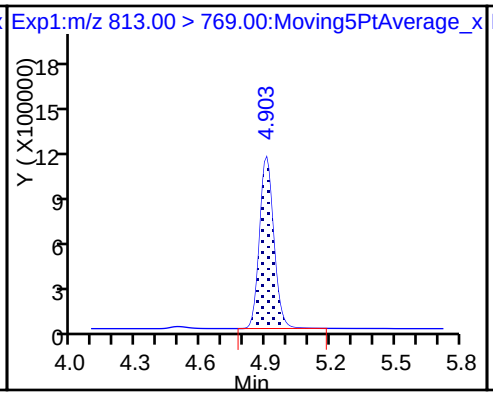
42 Perfluorotetradecanoic acid



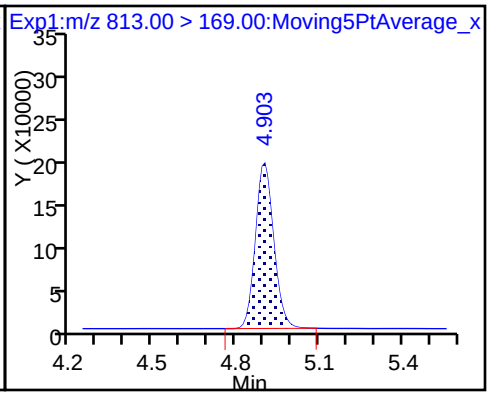
42 Perfluorotetradecanoic acid



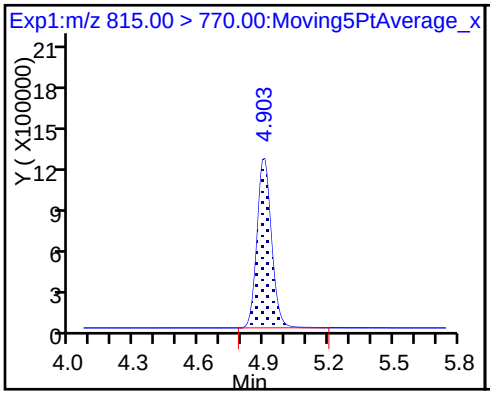
45 Perfluorohexadecanoic acid



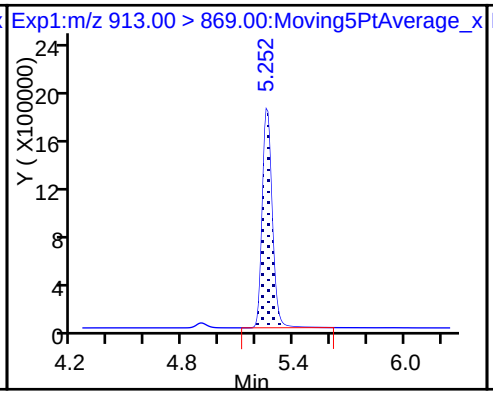
45 Perfluorohexadecanoic acid



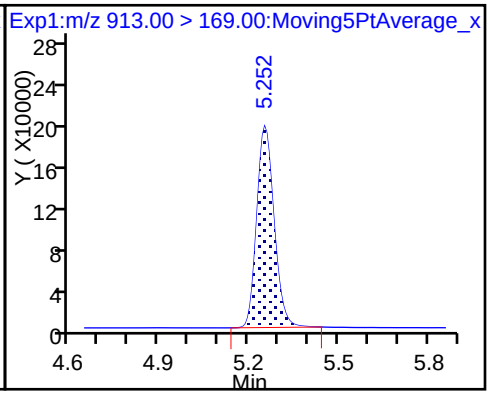
D 44 13C2-PFHxDA



46 Perfluorooctadecanoic acid



46 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Lab Sample ID: CCVL 320-204504/1 Calibration Date: 01/18/2018 10:35

Instrument ID: A8_N Calib Start Date: 01/17/2018 14:19

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 01/17/2018 15:06

Lab File ID: 2018.01.18LLC_004.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9343	0.8680		0.0465	0.0500	-7.1	50.0
Perfluoropentanoic acid (PFPeA)	AveID	1.178	1.222		0.0519	0.0500	3.7	50.0
Perfluorobutanesulfonic acid (PFBS)	AveID	77.21	74.95		0.0429	0.0442	-2.9	50.0
4:2 FTS	AveID	13.89	11.20		0.377	0.467	-19.4	50.0
Perfluorohexanoic acid (PFHxA)	AveID	1.036	0.9268		0.0447	0.0500	-10.6	50.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.099	1.051		0.0478	0.0500	-4.3	50.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.113	1.174		0.0480	0.0455	5.5	50.0
6:2FTS	AveID	1.655	2.071		0.593	0.474	25.1	50.0
Perfluorooctanoic acid (PFOA)	AveID	1.172	1.097		0.0468	0.0500	-6.4	50.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.354	1.210		0.0425	0.0476	-10.7	50.0
Perfluorononanoic acid (PFNA)	AveID	1.032	0.9026		0.0437	0.0500	-12.6	50.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.119	1.101		0.0456	0.0464	-1.7	50.0
8:2FTS	AveID	1.217	1.092		0.430	0.479	-10.3	50.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9823	0.9336		0.0475	0.0500	-5.0	50.0
Perfluorodecanoic acid (PFDA)	AveID	0.9702	0.9508		0.0490	0.0500	-2.0	50.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.080	0.999		0.462	0.500	-7.6	50.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6549	0.6052		0.0445	0.0482	-7.6	50.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9739	0.8778		0.451	0.500	-9.9	50.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.032	1.065		0.0516	0.0500	3.2	50.0
Perfluorododecanoic acid (PFDoA)	AveID	1.025	1.080		0.0527	0.0500	5.4	50.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.161	1.176		0.0506	0.0500	1.3	50.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2440	0.2516		0.0516	0.0500	3.1	50.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		1.286		0.0485	0.0500	-2.9	50.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.054	1.060		0.0503	0.0500	0.6	50.0
13C4 PFBA	Ave	1.512	1.533		2.53	2.50	1.4	50.0
13C5 PFPeA	Ave	0.8956	0.9106		2.54	2.50	1.7	50.0
13C3-PFBS	Ave	0.0198	0.0203		2.38	2.33	2.5	50.0
13C2 PFHxA	Ave	0.9649	0.9886		2.56	2.50	2.5	50.0
13C4-PFHpA	Ave	0.9187	0.9411		2.56	2.50	2.4	50.0
18O2 PFHxS	Ave	1.131	1.139		2.38	2.37	0.7	50.0
M2-6:2FTS	Ave	0.1699	0.1579		2.21	2.38	-7.0	50.0

FORM VII 537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Lab Sample ID: CCVL 320-204504/1 Calibration Date: 01/18/2018 10:35

Instrument ID: A8_N Calib Start Date: 01/17/2018 14:19

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 01/17/2018 15:06

Lab File ID: 2018.01.18LLC_004.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9004	0.9370		2.60	2.50	4.1	50.0
13C4 PFOS	Ave	0.7158	0.7233		2.42	2.39	1.1	50.0
13C5 PFNA	Ave	0.7300	0.7351		2.52	2.50	0.7	50.0
M2-8:2FTS	Ave	0.1795	0.1584		2.11	2.40	-11.8	50.0
13C2 PFDA	Ave	0.6306	0.6236		2.47	2.50	-1.1	50.0
13C8 FOSA	Ave	1.007	1.020		2.53	2.50	1.4	50.0
d3-NMeFOSAA	Ave	0.3147	0.2736		2.17	2.50	-13.0	50.0
d5-NEtFOSAA	Ave	0.3182	0.3117		2.45	2.50	-2.1	50.0
13C2 PFUnA	Ave	0.4783	0.5095		2.66	2.50	6.5	50.0
13C2 PFDoA	Ave	0.5192	0.4589		2.21	2.50	-11.6	50.0
13C2-PFTeDA	Ave	0.6785	0.5997		2.21	2.50	-11.6	50.0
13C2-PFHxDA	Ave	1.209	1.028		2.13	2.50	-15.0	50.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180118-53056.b\2018.01.18LLC_004.d
Lims ID: CCVL
Client ID:
Sample Type: CCVL
Inject. Date: 18-Jan-2018 10:35:15 ALS Bottle#: 21 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCVL
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-A8_N*sub30

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180118-53056.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 18-Jan-2018 12:27:57 Calib Date: 17-Jan-2018 15:06:20
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_008.d

Column 1 : Det: EXP1
Process Host: XAWRK005

First Level Reviewer: roycea Date: 18-Jan-2018 12:26:54

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.408	1.411	-0.003	0.539	7360257	2.53		101	21443	
2 Perfluorobutyric acid										
212.90 > 169.00	1.408	1.413	-0.005	1.000	127770	0.0465		92.9	13.0	
D 3 13C5-PFPeA										
267.90 > 223.00	1.654	1.659	-0.005	0.634	4371376	2.54		102	35500	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.654	1.662	-0.008	1.000	106841	0.0519		104	165	
D 47 13C3-PFBS										
301.90 > 83.00	1.689	1.695	-0.006	0.647	90722	2.38		103	4197	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.689	1.697	-0.008	1.000	129264	0.0429		97.1	1056	
298.90 > 99.00	1.689	1.697	-0.008	1.000	55275		2.34(1.25-3.74)		591	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.893	1.903	-0.010	1.000	204164	0.3766		80.6	9274	
D 60 M2-4:2FTS										
329.00 > 81.00	1.893	1.903	-0.010	0.726	478409	NC			5453	
D 7 13C2 PFHxA										
315.00 > 270.00	1.934	1.939	-0.005	0.741	4746044	2.56		102	30099	
6 Perfluorohexanoic acid										M
313.00 > 269.00	1.934	1.939	-0.005	1.000	87975	0.0447		89.4	132	M
313.00 > 119.00	1.924	1.939	-0.015	0.995	10152		8.67(5.03-15.10)		134	
D 9 13C4-PFHpA										
367.00 > 322.00	2.253	2.267	-0.014	0.863	4517918	2.56		102	26618	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.253	2.268	-0.015	1.000	94986	0.0478		95.7	209	
363.00 > 169.00	2.253	2.268	-0.015	1.000	32992		2.88(1.13-3.40)		260	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.266	2.280	-0.014	1.000	116896	0.0480		105	572	
399.00 > 99.00	2.266	2.280	-0.014	1.000	38946		3.00(1.50-4.49)		380	
D 11 18O2 PFHxS										
403.00 > 84.00	2.266	2.282	-0.016	0.868	5173832	2.38		101	36326	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.582	2.596	-0.014	1.000	297720	0.5931		125	6375	
D 12 M2-6:2FTS										
429.00 > 81.00	2.582	2.597	-0.015	0.990	720315	2.21		93.0	16655	
D 14 13C4 PFOA										
417.00 > 372.00	2.609	2.622	-0.013	1.000	4498527	2.60		104	22701	
* 62 13C2-PFOA										
415.00 > 370.00	2.609	2.622	-0.013		4800773	2.50			26842	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.609	2.623	-0.014	1.000	98655	0.0468		93.6	255	
413.00 > 169.00	2.609	2.623	-0.014	1.000	50917		1.94(0.84-2.52)		455	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.616	2.629	-0.013	1.000	79990	0.0425		89.3	1712	
449.00 > 99.00	2.616	2.629	-0.013	1.000	24126		3.32(1.94-5.82)		963	
D 19 13C5 PFNA										
468.00 > 423.00	2.978	2.992	-0.014	1.141	3528888	2.52		101	28005	
17 Perfluorooctane sulfonic acid										M
499.00 > 80.00	2.978	2.992	-0.014	1.000	70946	0.0456		98.3	23.4	M
499.00 > 99.00	2.978	2.992	-0.014	1.000	14423		4.92(2.31-6.93)		26.5	
D 18 13C4 PFOS										
503.00 > 80.00	2.978	2.992	-0.014	1.141	3319726	2.42		101	22735	
20 Perfluorononanoic acid										
463.00 > 419.00	2.978	2.992	-0.014	1.000	63705	0.0437		87.4	424	
463.00 > 169.00	2.978	2.992	-0.014	1.000	15917		4.00(1.90-5.69)		395	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.332	3.338	-0.006	1.000	91471	0.0475		95.0	2488	
D 21 13C8 FOSA										
506.00 > 78.00	3.332	3.338	-0.006	1.277	4898879	2.53		101	22357	
D 26 M2-8:2FTS										
529.00 > 81.00	3.325	3.342	-0.017	1.274	728368	2.11		88.2	13690	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.325	3.342	-0.017	1.000	159107	0.4299		89.7	6383	
D 23 13C2 PFDA										
515.00 > 470.00	3.332	3.352	-0.020	1.277	2993725	2.47		98.9	21979	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.340	3.353	-0.013	1.002	56931	0.0490		98.0	603	
513.00 > 169.00	3.340	3.353	-0.013	1.002	9996		5.70(2.36-7.09)		414	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.492	3.507	-0.015	1.338	1313632	2.17		87.0	9131	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.500	3.513	-0.013	1.002	262367	0.4622		92.4	1939	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.650	3.666	-0.016	1.000	40519	0.0445		92.4	1728	
599.00 > 99.00	3.650	3.666	-0.016	1.000	12575		3.22(1.39-4.16)		1038	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.657	3.672	-0.015	1.402	1496378	2.45		97.9	4895	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.663	3.678	-0.015	1.000	52088	0.0516		103	536	
563.00 > 169.00	3.663	3.678	-0.015	1.000	9676		5.38(0.00-0.00)		544	
D 30 13C2 PFUnA										
565.00 > 520.00	3.663	3.679	-0.016	1.404	2445844	2.66		107	31426	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.663	3.679	-0.016	1.002	262691	0.4507		90.1	4887	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.964	3.979	-0.015	1.000	47586	0.0527		105	374	
613.00 > 169.00	3.964	3.979	-0.015	1.000	11040		4.31(2.13-6.40)		620	
D 36 13C2 PFDoA										
615.00 > 570.00	3.964	3.979	-0.015	1.519	2203122	2.21		88.4	21446	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.224	4.242	-0.018	1.000	51826	0.0506		101	508	
663.00 > 169.00	4.224	4.242	-0.018	1.000	16421		3.16(1.25-3.76)		913	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.461	4.483	-0.022	1.000	14488	0.0516		103	657	
713.00 > 219.00	4.461	4.483	-0.022	1.000	9083		1.60(0.71-2.13)		425	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.461	4.483	-0.022	1.710	2879132	2.21		88.4	21511	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.877	4.902	-0.025	1.869	4935395	2.13		85.0	11935	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.877	4.902	-0.025	1.000	126962	0.0485		97.1	227	
813.00 > 169.00	4.877	4.902	-0.025	1.000	22719		5.59(2.86-8.58)		817	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.231	5.255	-0.024	1.000	104619	0.0503		101	44.2	
913.00 > 169.00	5.231	5.255	-0.024	1.000	12490		8.38(0.00-0.00)		292	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC_CCVL_00002 Amount Added: 1.00 Units: mL

Report Date: 18-Jan-2018 12:27:58 Chrom Revision: 2.2 08-Dec-2017 11:41:26

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180118-53056.b\2018.01.18LLC_004.d

Injection Date: 18-Jan-2018 10:35:15 Instrument ID: A8_N

Lims ID: CCVL

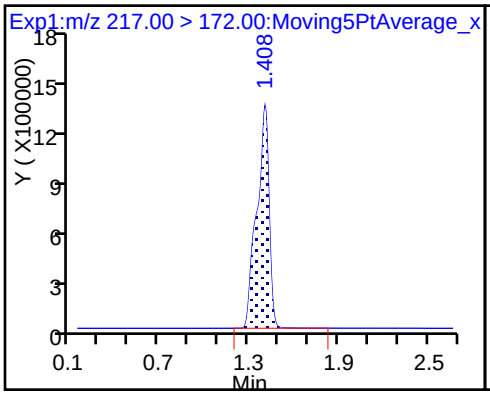
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 21 Worklist Smp#: 1

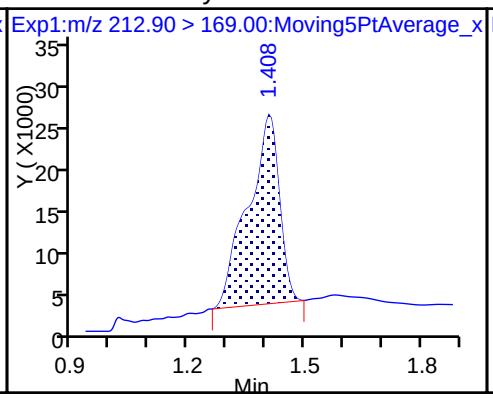
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

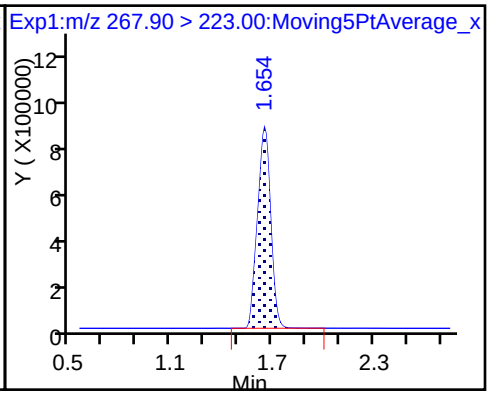
D 1 13C4 PFBA



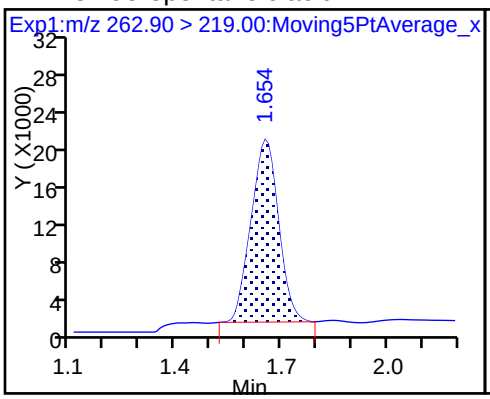
2 Perfluorobutyric acid



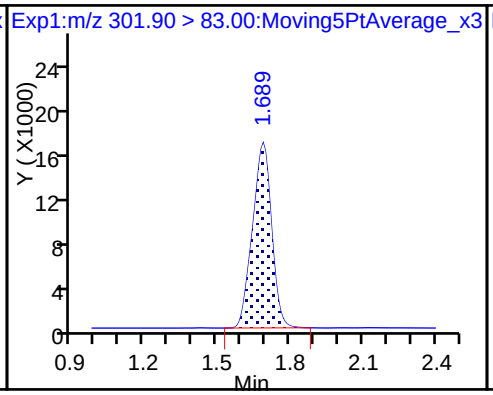
D 3 13C5-PFPeA



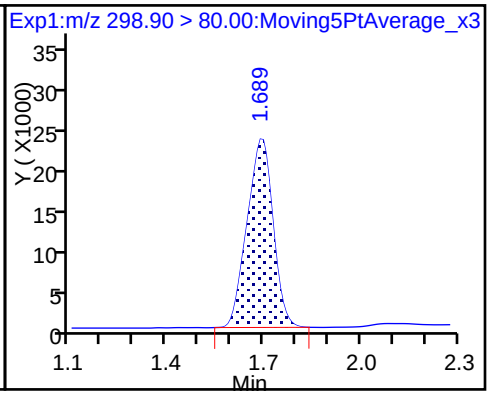
4 Perfluoropentanoic acid



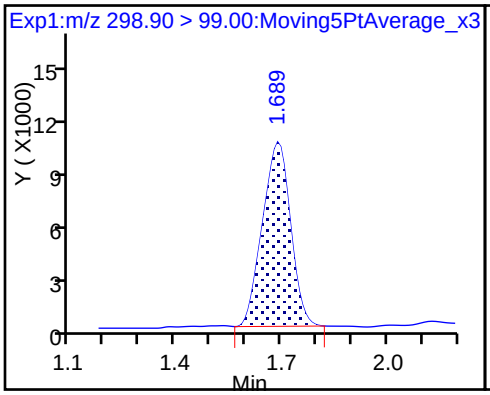
D 47 13C3-PFBS



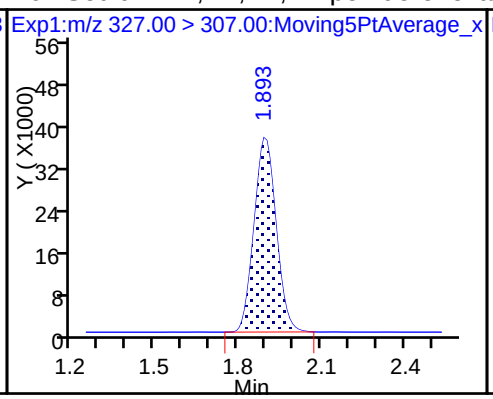
5 Perfluorobutanesulfonic acid



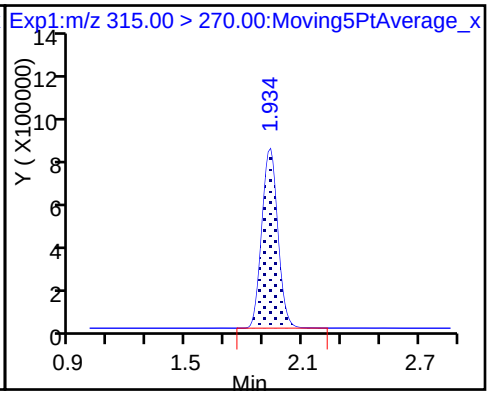
5 Perfluorobutanesulfonic acid



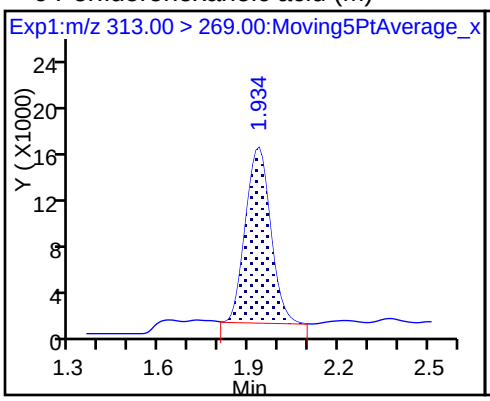
61 Sodium 1H,1H,2H,2H-perfluorohexa



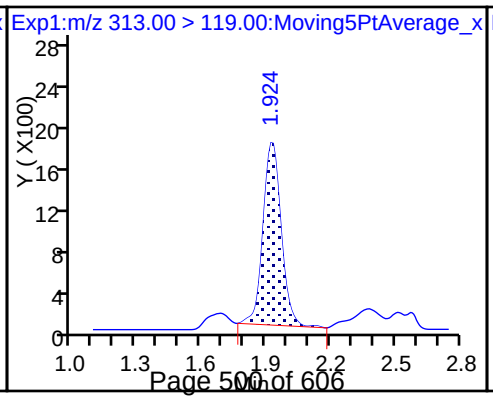
D 7 13C2 PFHxA



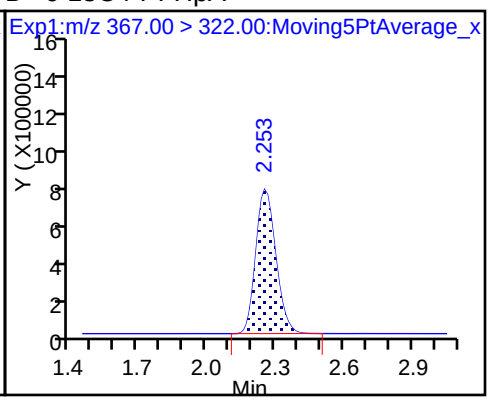
6 Perfluorohexanoic acid (M)



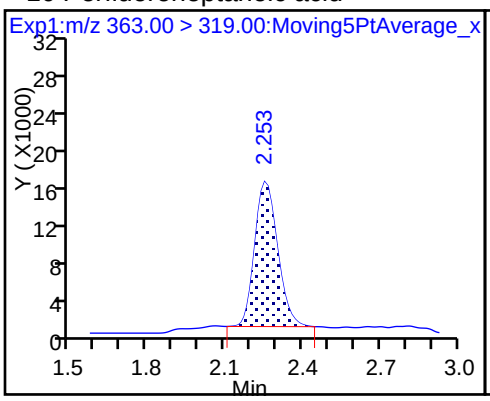
6 Perfluorohexanoic acid



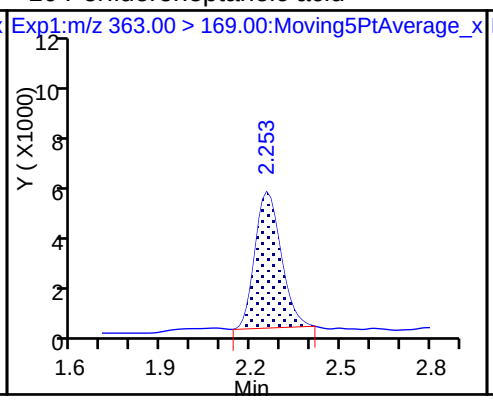
D 9 13C4-PFHpA



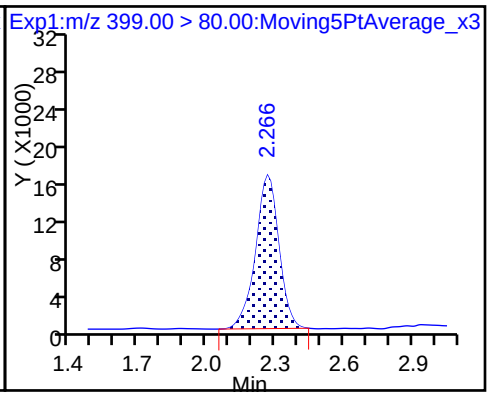
10 Perfluoroheptanoic acid



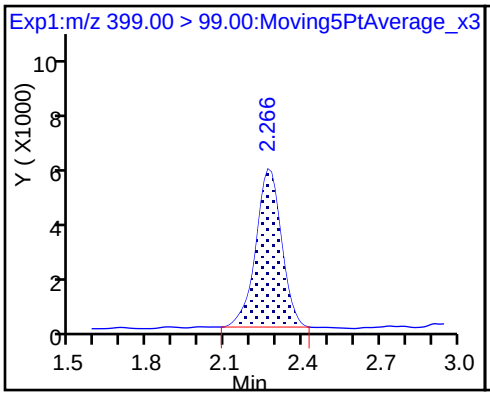
10 Perfluoroheptanoic acid



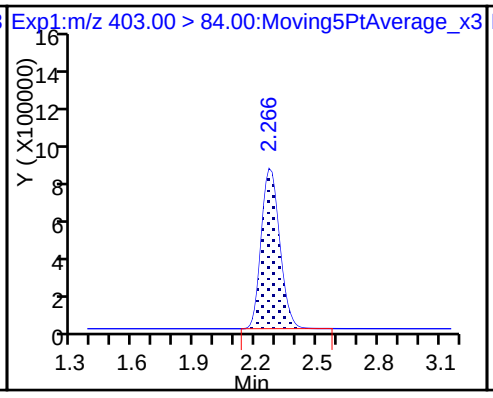
8 Perfluorohexanesulfonic acid



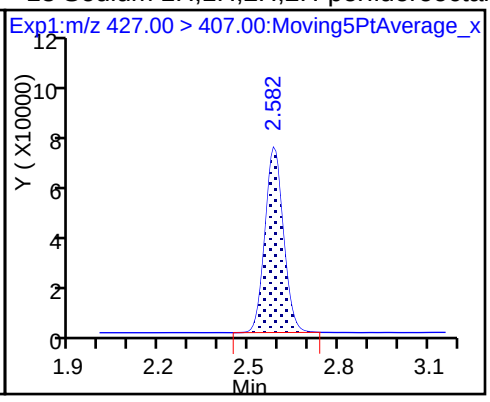
8 Perfluorohexanesulfonic acid



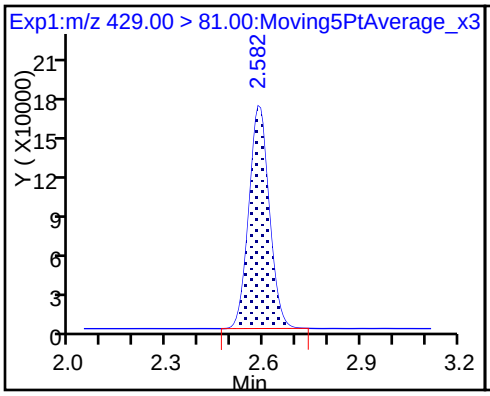
D 11 18O2 PFHxS



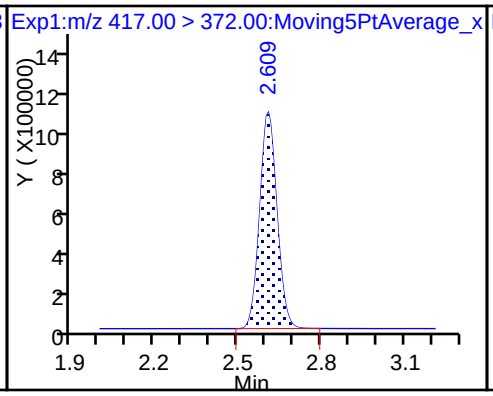
13 Sodium 1H,1H,2H,2H-perfluorooctane



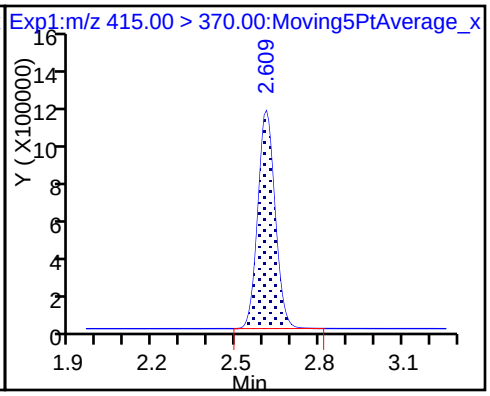
D 12 M2-6:2FTS



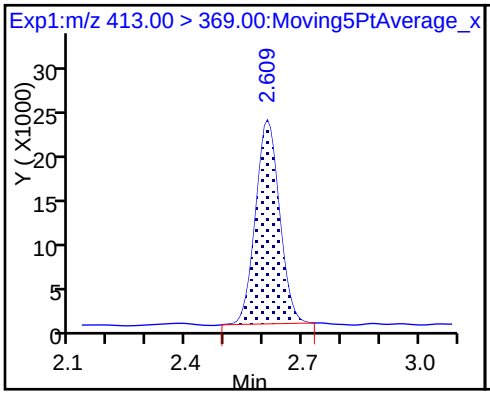
D 14 13C4 PFOA



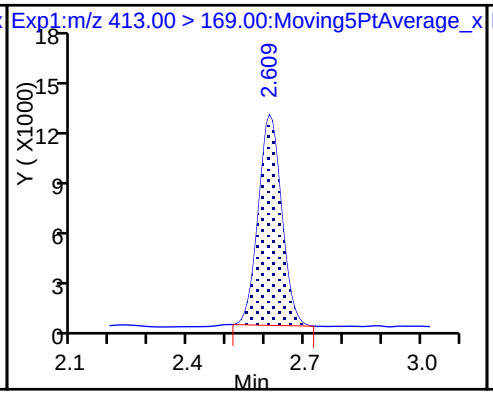
* 62 13C2-PFOA



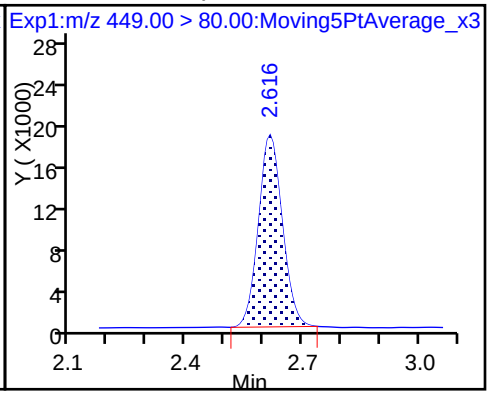
15 Perfluorooctanoic acid



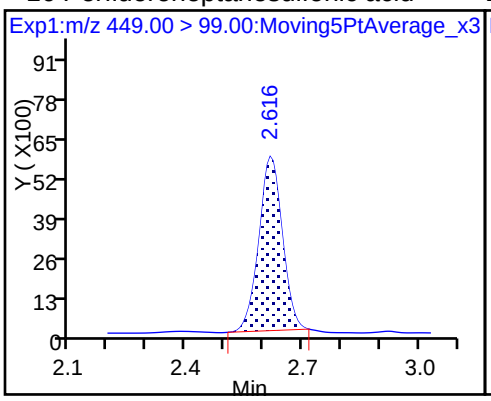
15 Perfluorooctanoic acid



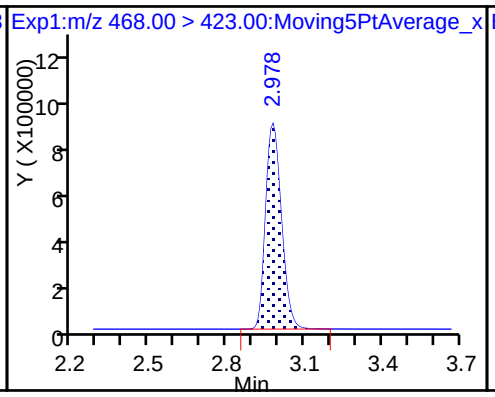
16 Perfluoroheptanesulfonic acid



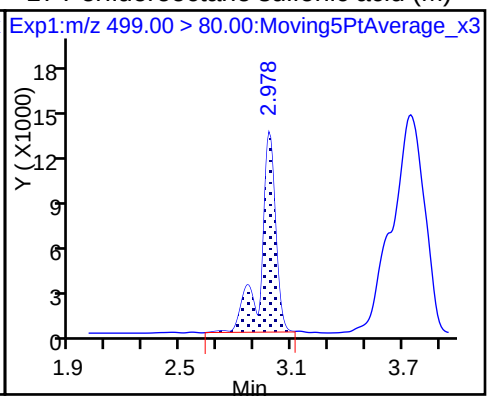
16 Perfluoroheptanesulfonic acid



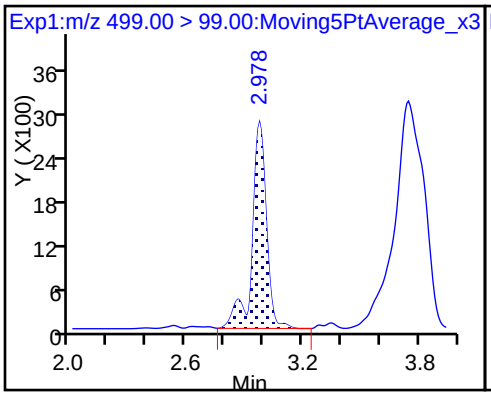
D 19 13C5 PFNA



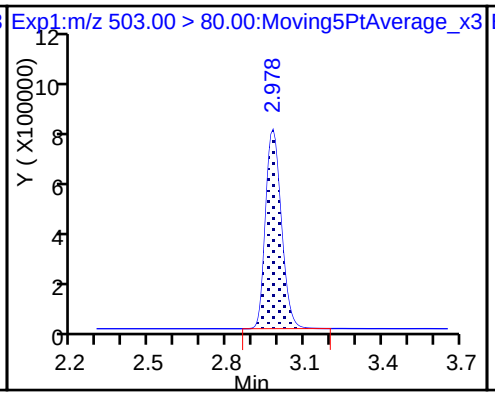
17 Perfluorooctane sulfonic acid (M)



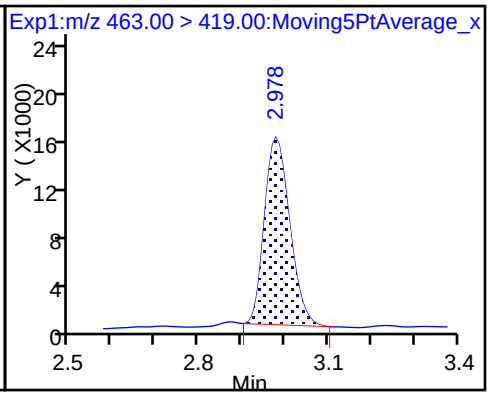
17 Perfluorooctane sulfonic acid



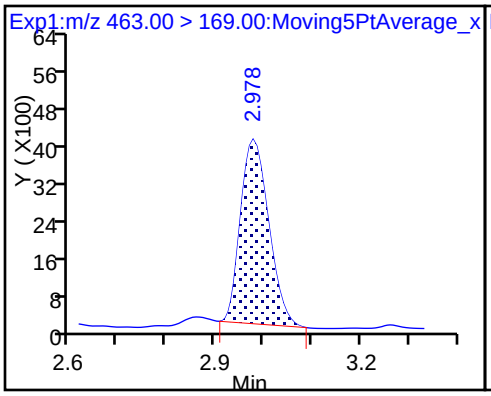
D 18 13C4 PFOS



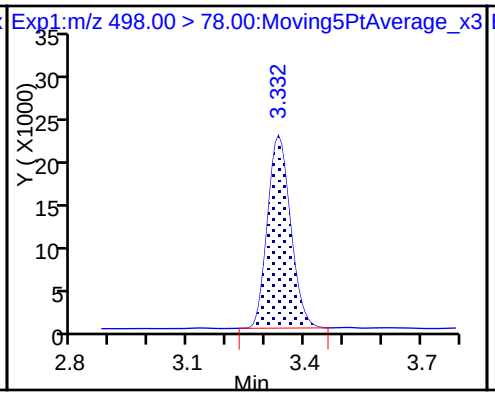
20 Perfluorononanoic acid



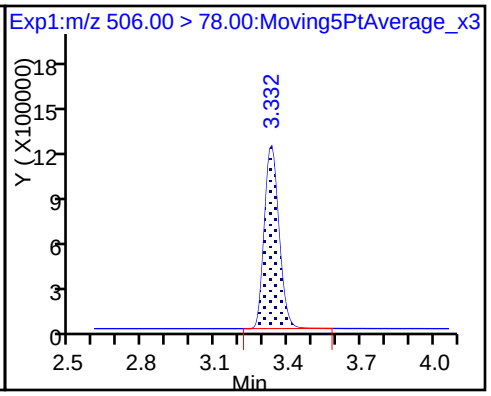
20 Perfluorononanoic acid



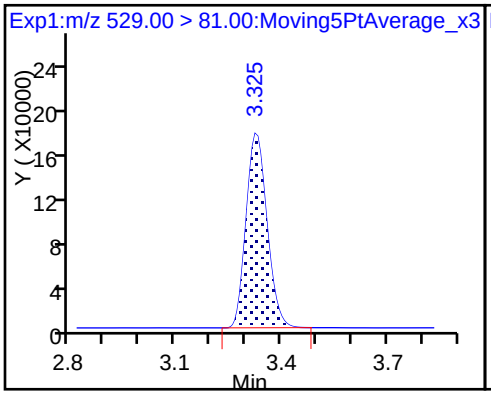
22 Perfluorooctane Sulfonamide



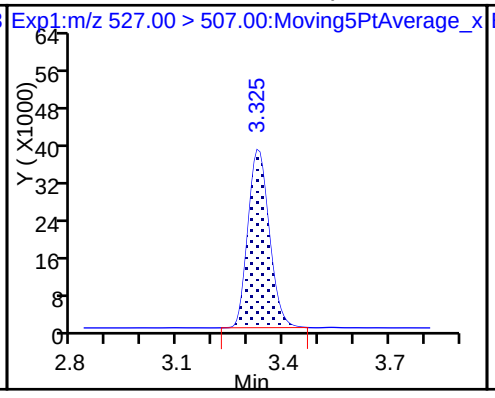
D 21 13C8 FOSA



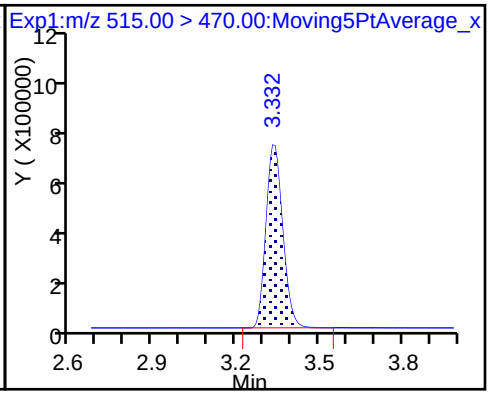
D 26 M2-8:2FTS



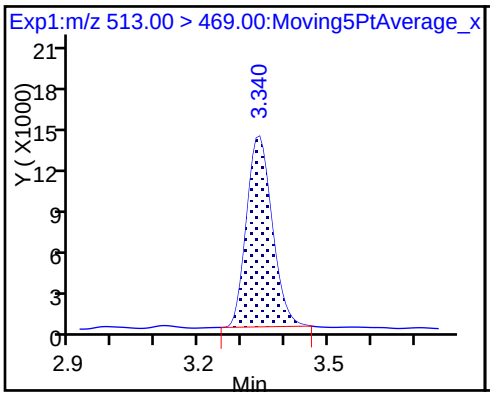
25 Sodium 1H,1H,2H,2H-perfluorodecane



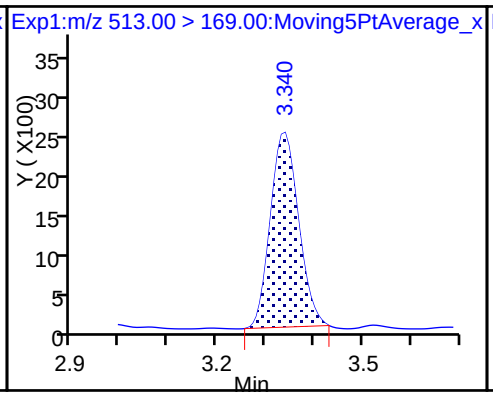
D 23 13C2 PFDA



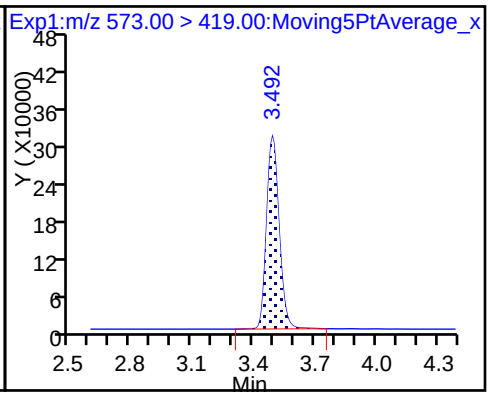
24 Perfluorodecanoic acid



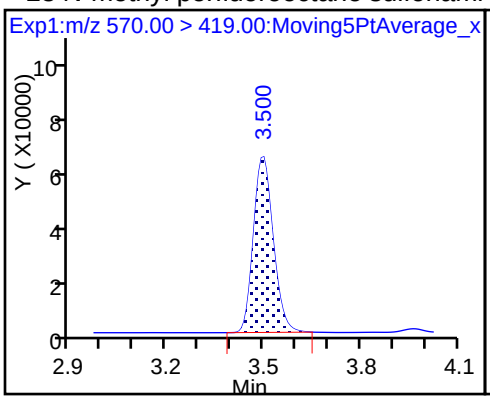
24 Perfluorodecanoic acid



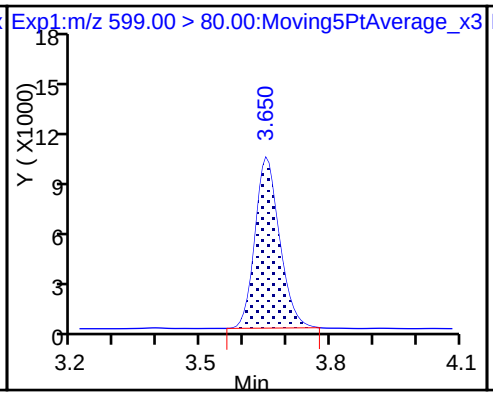
D 27 d3-NMeFOSAA



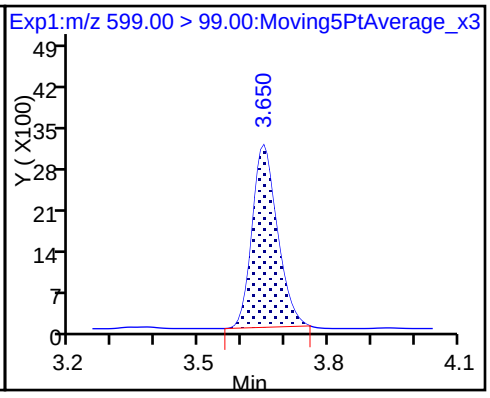
28 N-methyl perfluorooctane sulfonami



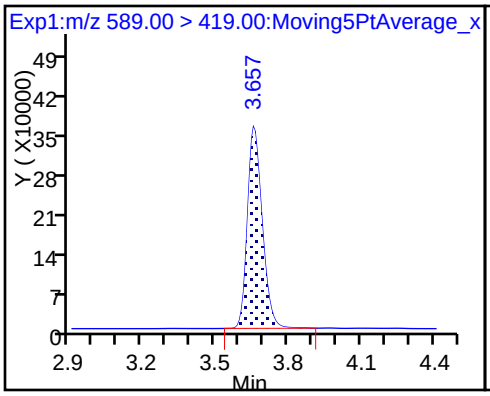
29 Perfluorodecane Sulfonic acid



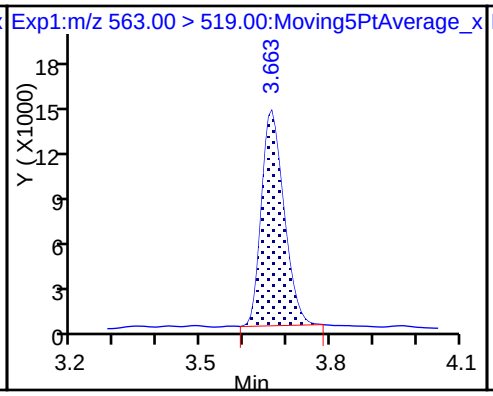
29 Perfluorodecane Sulfonic acid



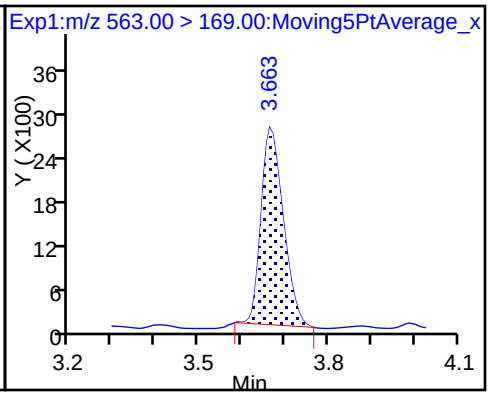
D 32 d5-NEtFOSAA



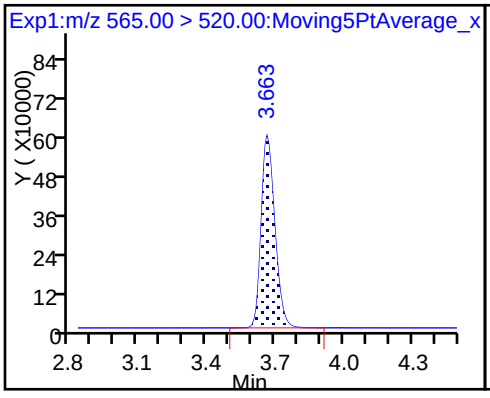
31 Perfluoroundecanoic acid



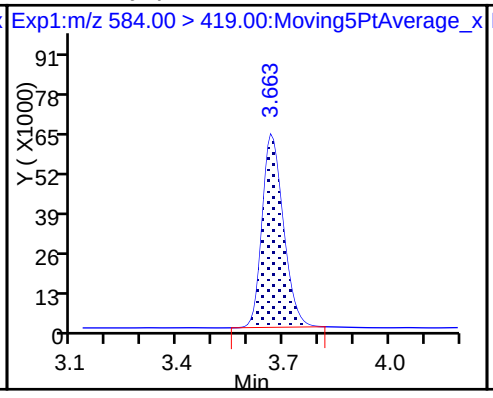
31 Perfluoroundecanoic acid



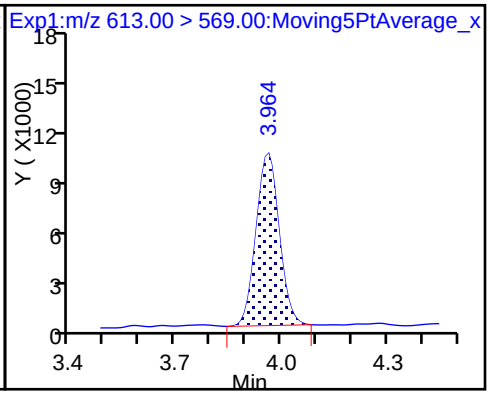
D 30 13C2 PFUnA



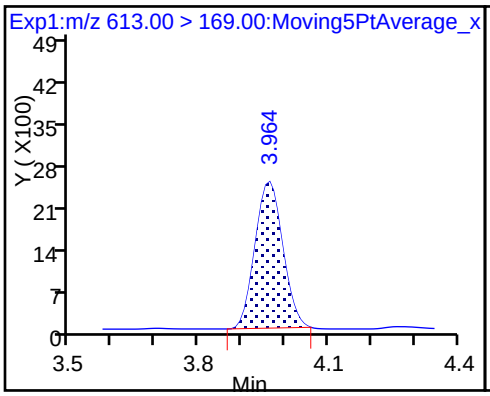
33 N-ethyl perfluorooctane sulfonamid



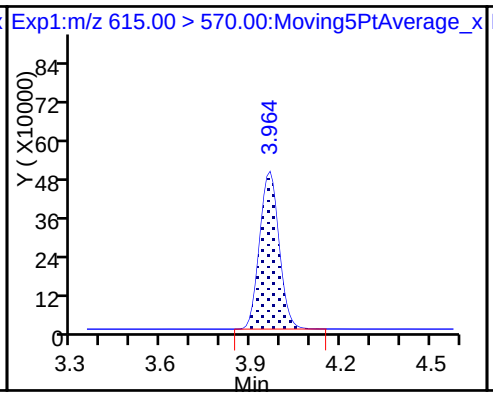
37 Perfluorododecanoic acid



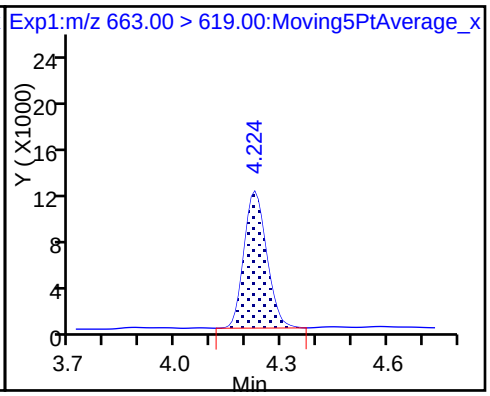
37 Perfluorododecanoic acid



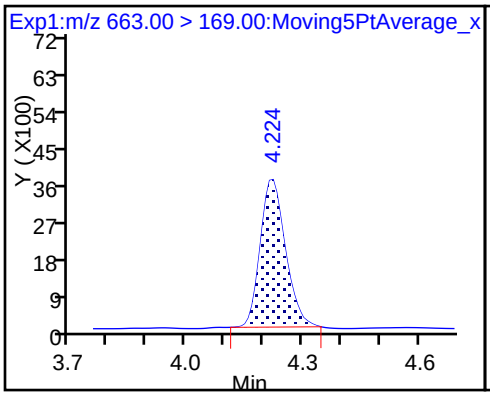
D 36 13C2 PFDoA



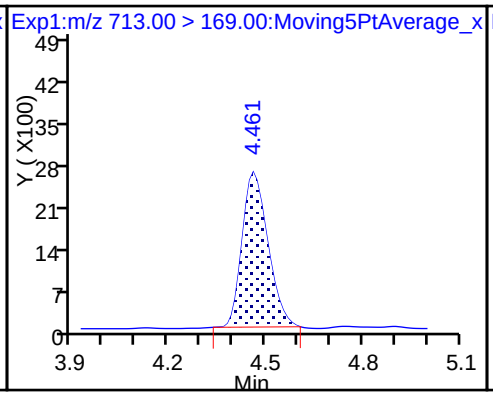
41 Perfluorotridecanoic acid



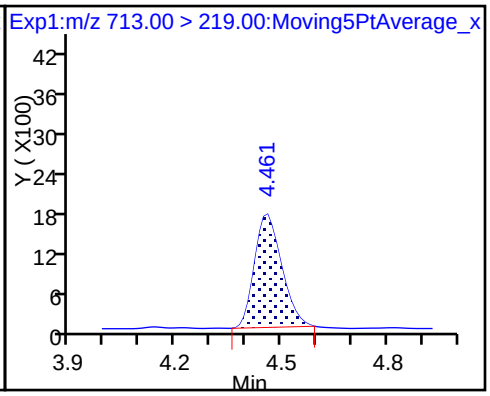
41 Perfluorotridecanoic acid



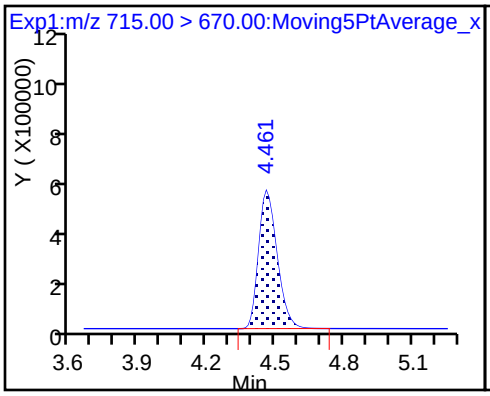
42 Perfluorotetradecanoic acid



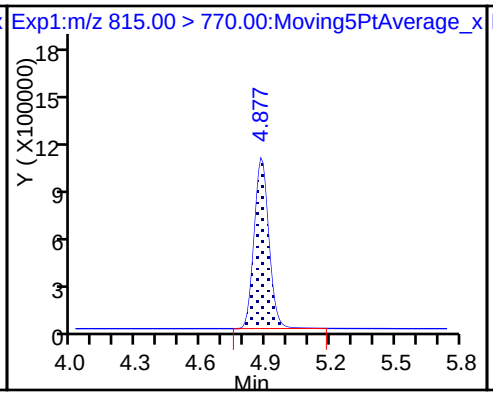
42 Perfluorotetradecanoic acid



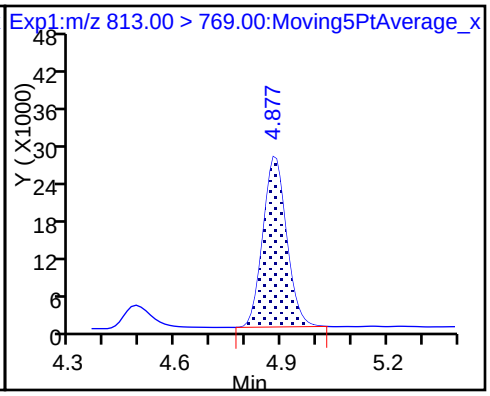
D 43 13C2-PFTeDA



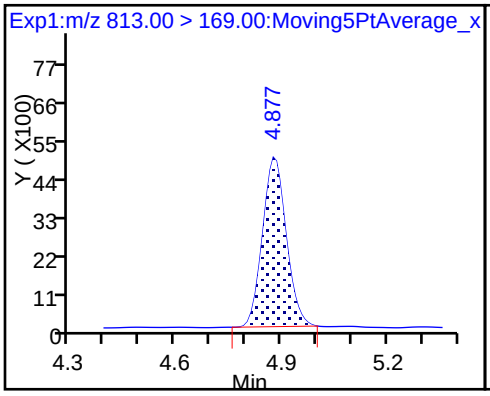
D 44 13C2-PFHxDA



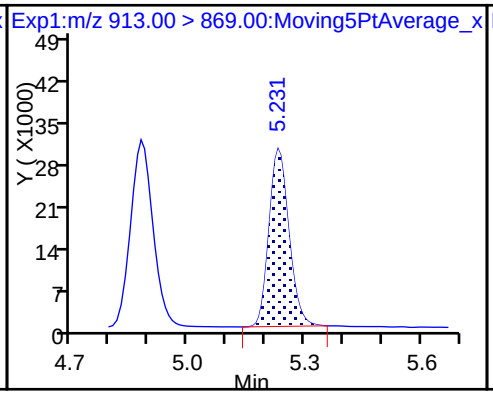
45 Perfluorohexadecanoic acid



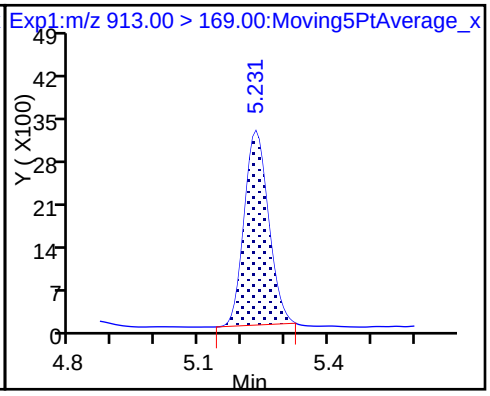
45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid



46 Perfluorooctadecanoic acid



TestAmerica Sacramento

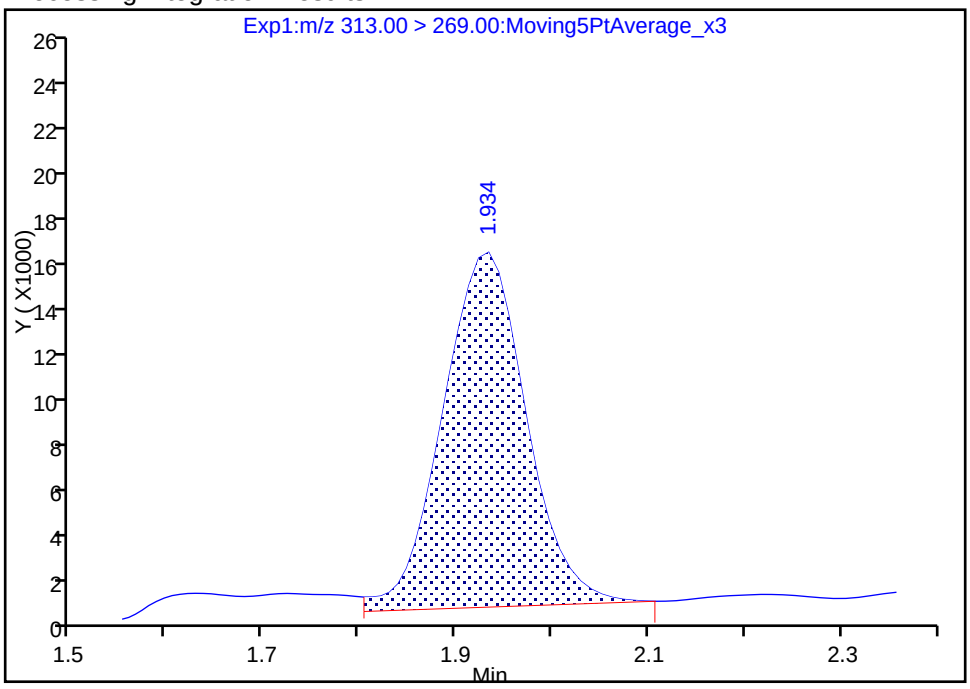
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180118-53056.b\2018.01.18LLC_004.d
Injection Date: 18-Jan-2018 10:35:15 Instrument ID: A8_N
Lims ID: CCVL
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 21 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL
Column: Detector EXP1

6 Perfluorohexanoic acid, CAS: 307-24-4

Signal: 1

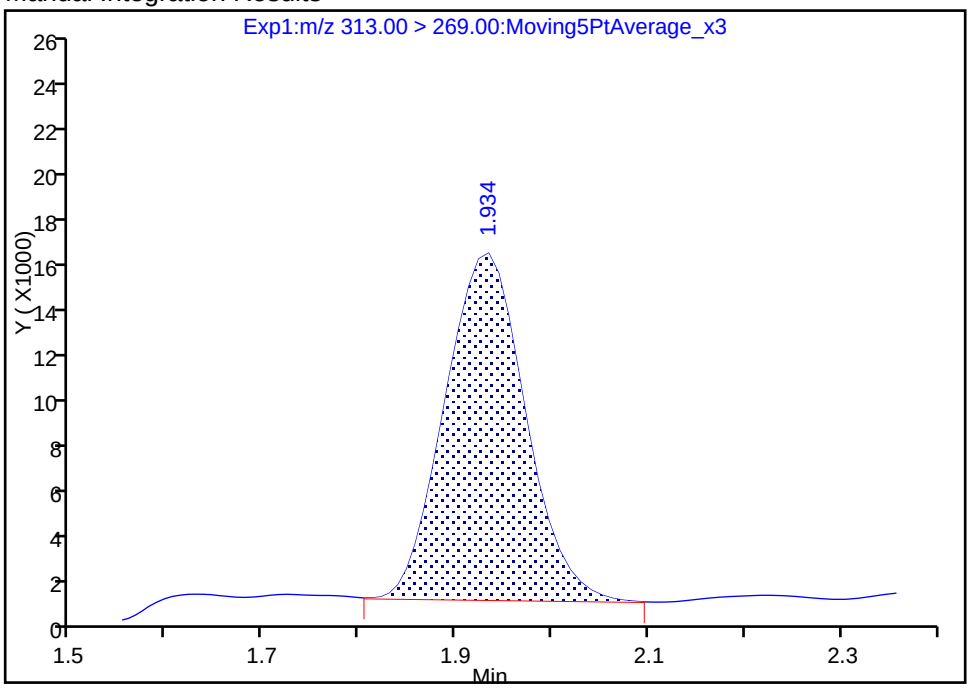
Processing Integration Results

RT: 1.93
Area: 93115
Amount: 0.047324
Amount Units: ng/ml



Manual Integration Results

RT: 1.93
Area: 87975
Amount: 0.044711
Amount Units: ng/ml



Reviewer: roycea, 18-Jan-2018 12:26:12
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

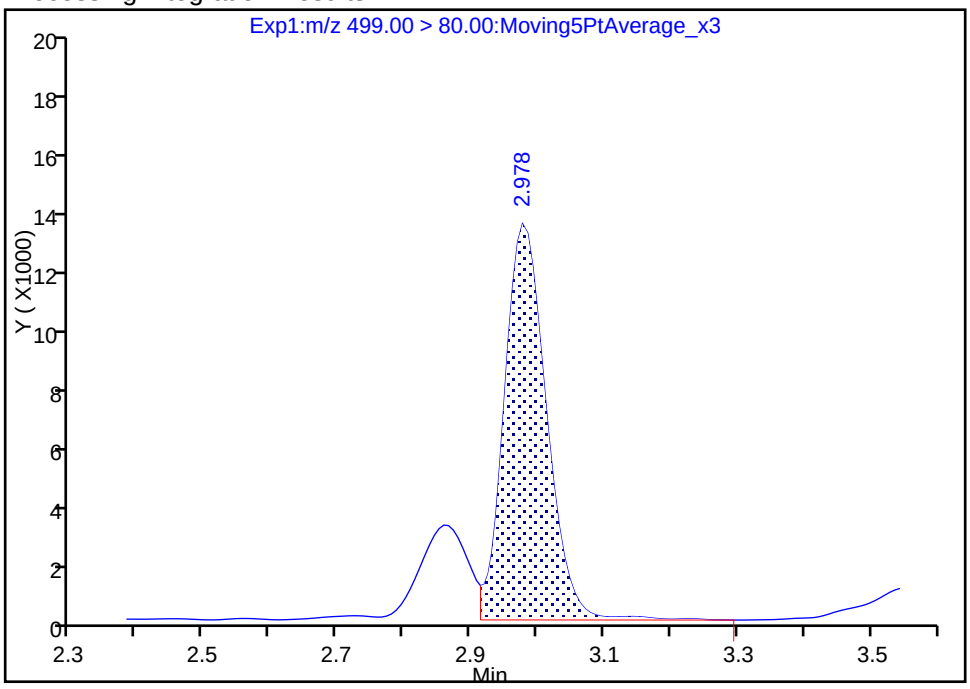
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20180118-53056.b\2018.01.18LLC_004.d				
Injection Date:	18-Jan-2018 10:35:15	Instrument ID:	A8_N		
Lims ID:	CCVL				
Client ID:					
Operator ID:	SACINSTLCMS01	ALS Bottle#:	21	Worklist Smp#:	1
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	A8_N	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	EXP1		

17 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

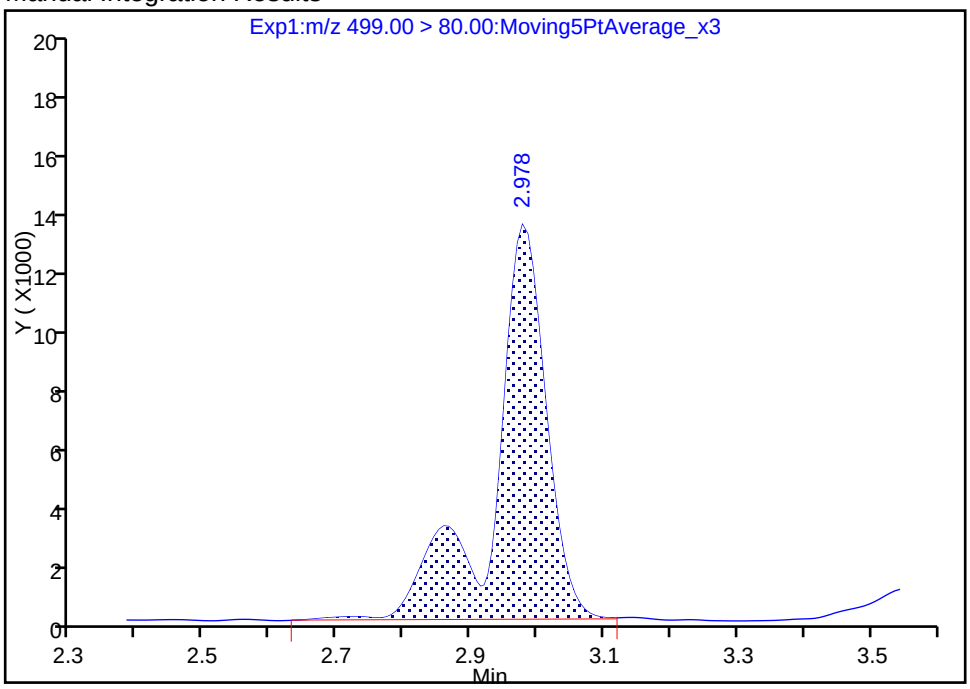
Processing Integration Results

RT: 2.98
Area: 56780
Amount: 0.036518
Amount Units: ng/ml



Manual Integration Results

RT: 2.98
Area: 70946
Amount: 0.045628
Amount Units: ng/ml



Reviewer: roycea, 18-Jan-2018 12:25:43

Audit Action: Manually Integrated Audit Reason: Isomers

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Lab Sample ID: CCV 320-204556/1 Calibration Date: 01/18/2018 17:29

Instrument ID: A8_N Calib Start Date: 01/17/2018 14:19

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 01/17/2018 15:06

Lab File ID: 2018.01.18LLA_001.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9343	0.9484		2.54	2.50	1.5	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.178	1.174		2.49	2.50	-0.4	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	77.21	79.55		2.28	2.21	3.0	25.0
4:2 FTS	AveID	13.89	14.13		2.37	2.34	1.7	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.036	1.012		2.44	2.50	-2.3	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.099	1.077		2.45	2.50	-2.0	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.113	1.061		2.17	2.28	-4.7	25.0
6:2FTS	AveID	1.655	1.894		2.71	2.37	14.5	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.172	1.128		2.41	2.50	-3.8	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.354	1.385		2.43	2.38	2.3	25.0
Perfluorononanoic acid (PFNA)	AveID	1.032	1.067		2.59	2.50	3.4	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.119	1.085		2.25	2.32	-3.1	25.0
8:2FTS	AveID	1.217	1.220		2.40	2.40	0.3	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9823	1.032		2.63	2.50	5.0	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9702	1.040		2.68	2.50	7.2	25.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.080	1.072		2.48	2.50	-0.8	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6549	0.7010		2.58	2.41	7.0	25.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9739	0.9922		2.55	2.50	1.9	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.032	0.9827		2.38	2.50	-4.8	25.0
Perfluorododecanoic acid (PFDoA)	AveID	1.025	1.068		2.61	2.50	4.2	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.161	1.061		2.28	2.50	-8.6	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2440	0.2430		2.49	2.50	-0.4	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		0.997		2.61	2.50	4.4	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.054	1.138		2.70	2.50	8.0	25.0
13C4 PFBA	Ave	1.512	1.473		2.43	2.50	-2.6	50.0
13C5 PFPeA	Ave	0.8956	0.8673		2.42	2.50	-3.2	50.0
13C3-PFBS	Ave	0.0198	0.0190		2.23	2.33	-4.1	50.0
13C2 PFHxA	Ave	0.9649	0.9571		2.48	2.50	-0.8	50.0
13C4-PFHpA	Ave	0.9187	0.8903		2.42	2.50	-3.1	50.0
18O2 PFHxS	Ave	1.131	1.094		2.29	2.37	-3.2	50.0
M2-6:2FTS	Ave	0.1699	0.1631		2.28	2.38	-4.0	50.0

FORM VII 537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Lab Sample ID: CCV 320-204556/1 Calibration Date: 01/18/2018 17:29

Instrument ID: A8_N Calib Start Date: 01/17/2018 14:19

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 01/17/2018 15:06

Lab File ID: 2018.01.18LLA_001.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9004	0.8903		2.47	2.50	-1.1	50.0
13C4 PFOS	Ave	0.7158	0.7093		2.37	2.39	-0.9	50.0
13C5 PFNA	Ave	0.7300	0.7224		2.47	2.50	-1.0	50.0
13C8 FOSA	Ave	1.007	0.9258		2.30	2.50	-8.0	50.0
M2-8:2FTS	Ave	0.1795	0.1776		2.37	2.40	-1.1	50.0
13C2 PFDA	Ave	0.6306	0.5911		2.34	2.50	-6.3	50.0
d3-NMeFOSAA	Ave	0.3147	0.3029		2.41	2.50	-3.7	50.0
d5-NEtFOSAA	Ave	0.3182	0.3070		2.41	2.50	-3.5	50.0
13C2 PFUnA	Ave	0.4783	0.4751		2.48	2.50	-0.7	50.0
13C2 PFDoA	Ave	0.5192	0.4848		2.33	2.50	-6.6	50.0
13C2-PFTeDA	Ave	0.6785	0.6259		2.31	2.50	-7.8	50.0
13C2-PFHxDA	Ave	1.209	0.9925		2.05	2.50	-17.9	50.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_001.d
Lims ID: CCV L5
Client ID:
Sample Type: CCV
Inject. Date: 18-Jan-2018 17:29:51 ALS Bottle#: 14 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L4
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-A8_N*sub30

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 19-Jan-2018 15:50:53 Calib Date: 17-Jan-2018 15:06:20
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_008.d

Column 1 : Det: EXP1
Process Host: XAWRK004

First Level Reviewer: roycea Date: 19-Jan-2018 15:46:02

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.408	1.411	-0.003	0.539	7215270	2.43		97.4	16546	
2 Perfluorobutyric acid										
212.90 > 169.00	1.414	1.413	0.001	1.004	6842720	2.54		102	899	
D 3 13C5-PFPeA										
267.90 > 223.00	1.661	1.659	0.002	0.636	4248720	2.42		96.8	52251	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.661	1.662	-0.001	1.000	4987158	2.49		99.6	5051	
D 47 13C3-PFBS										
301.90 > 83.00	1.697	1.695	0.002	0.649	86647	2.23		95.9	4045	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.697	1.697	0.0	1.000	6552217	2.28		103	29162	
298.90 > 99.00	1.697	1.697	0.0	1.000	2698619		2.43(1.25-3.74)		16604	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.902	1.903	-0.001	1.000	1229206	2.37		102	44553	
D 60 M2-4:2FTS										
329.00 > 81.00	1.902	1.903	-0.001	0.728	545344	NC			5812	
D 7 13C2 PFHxA										
315.00 > 270.00	1.933	1.939	-0.006	0.740	4688409	2.48		99.2	39512	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.933	1.939	-0.006	1.000	4745811	2.44		97.7	15295	
313.00 > 119.00	1.933	1.939	-0.006	1.000	418418		11.34(5.03-15.10)		7308	
D 9 13C4-PFHpA										
367.00 > 322.00	2.265	2.267	-0.002	0.866	4361422	2.42		96.9	26376	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.265	2.268	-0.003	1.000	4699153	2.45		98.0	7527	
363.00 > 169.00	2.265	2.268	-0.003	1.000	1806065		2.60(1.13-3.40)		10901	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.278	2.280	-0.002	1.000	5175244	2.17		95.3	15029	
399.00 > 99.00	2.278	2.280	-0.002	1.000	1680949		3.08(1.50-4.49)		8694	
D 11 18O2 PFHxS										
403.00 > 84.00	2.278	2.282	-0.004	0.871	5071806	2.29		96.8	24265	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.595	2.596	-0.001	1.000	1434962	2.71		114	17655	
D 12 M2-6:2FTS										
429.00 > 81.00	2.595	2.597	-0.002	0.993	759132	2.28		96.0	14904	
D 14 13C4 PFOA										
417.00 > 372.00	2.614	2.622	-0.008	1.000	4361309	2.47		98.9	28981	
* 62 13C2-PFOA										
415.00 > 370.00	2.614	2.622	-0.008		4898760	2.50			25865	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.614	2.623	-0.009	1.000	4919220	2.41		96.2	4009	
413.00 > 169.00	2.614	2.623	-0.009	1.000	2539137		1.94(0.84-2.52)		12556	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.621	2.629	-0.008	1.000	4582568	2.43		102	23594	
449.00 > 99.00	2.621	2.629	-0.008	1.000	1238595		3.70(1.94-5.82)		13160	
D 19 13C5 PFNA										
468.00 > 423.00	2.991	2.992	-0.001	1.144	3538605	2.47		99.0	23156	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.991	2.992	-0.001	1.000	3497746	2.25		96.9	862	
499.00 > 99.00	2.991	2.992	-0.001	1.000	756115		4.63(2.31-6.93)		1096	
D 18 13C4 PFOS										
503.00 > 80.00	2.991	2.992	-0.001	1.144	3321611	2.37		99.1	21066	
20 Perfluorononanoic acid										
463.00 > 419.00	2.991	2.992	-0.001	1.000	3777052	2.59		103	12269	
463.00 > 169.00	2.991	2.992	-0.001	1.000	890521		4.24(1.90-5.69)		12359	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.338	3.338	0.0	1.000	4679339	2.63		105	16475	
D 21 13C8 FOSA										
506.00 > 78.00	3.338	3.338	0.0	1.277	4535428	2.30		92.0	19996	
D 26 M2-8:2FTS										
529.00 > 81.00	3.338	3.342	-0.004	1.277	833328	2.37		98.9	18246	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.338	3.342	-0.004	1.000	1016882	2.40		100	16435	
D 23 13C2 PFDA										
515.00 > 470.00	3.346	3.352	-0.006	1.280	2895567	2.34		93.7	25924	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.353	3.353	0.0	1.002	3012112	2.68		107	11931	
513.00 > 169.00	3.346	3.353	-0.007	1.000	506237		5.95(2.36-7.09)		1810	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.505	3.507	-0.002	1.341	1483872	2.41		96.3	9769	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.505	3.513	-0.008	1.000	1590588	2.48		99.2	7983	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.662	3.666	-0.004	1.000	2347759	2.58		107	29289	
599.00 > 99.00	3.662	3.666	-0.004	1.000	750002		3.13(1.39-4.16)		12396	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.669	3.672	-0.003	1.404	1503861	2.41		96.5	5472	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.677	3.678	-0.001	1.000	2287099	2.38		95.2	9754	
563.00 > 169.00	3.677	3.678	-0.001	1.000	482949		4.74(0.00-0.00)		12937	
D 30 13C2 PFUnA										
565.00 > 520.00	3.677	3.679	-0.002	1.407	2327454	2.48		99.3	19255	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.677	3.679	-0.002	1.002	1492193	2.55		102	11175	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.969	3.979	-0.010	1.000	2535993	2.61		104	9827	
613.00 > 169.00	3.969	3.979	-0.010	1.000	590567		4.29(2.13-6.40)		16632	
D 36 13C2 PFDoA										
615.00 > 570.00	3.969	3.979	-0.010	1.519	2374768	2.33		93.4	16734	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.240	4.242	-0.002	1.000	2519820	2.28		91.4	9701	
663.00 > 169.00	4.240	4.242	-0.002	1.000	816734		3.09(1.25-3.76)		20215	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.477	4.483	-0.006	1.000	744915	2.49		99.6	18589	
713.00 > 219.00	4.465	4.483	-0.018	0.997	488336		1.53(0.71-2.13)		10727	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.477	4.483	-0.006	1.713	3065951	2.31		92.2	18645	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.897	4.902	-0.005	1.874	4861756	2.05		82.1	11056	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.897	4.902	-0.005	1.000	4844753	2.61		104	3543	
813.00 > 169.00	4.897	4.902	-0.005	1.000	826030		5.87(2.86-8.58)		6841	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.253	5.255	-0.002	1.000	5534270	2.70		108	1115	
913.00 > 169.00	5.246	5.255	-0.009	0.999	682047		8.11(0.00-0.00)		2086	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL5_00003 Amount Added: 1.00 Units: mL

Report Date: 19-Jan-2018 15:50:54 Chrom Revision: 2.2 08-Dec-2017 11:41:26

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_001.d

Injection Date: 18-Jan-2018 17:29:51 Instrument ID: A8_N

Lims ID: CCV L5

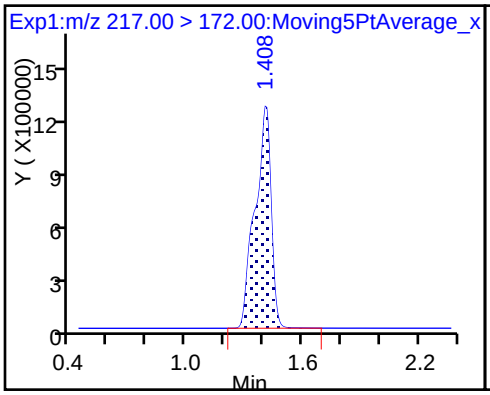
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 14 Worklist Smp#: 1

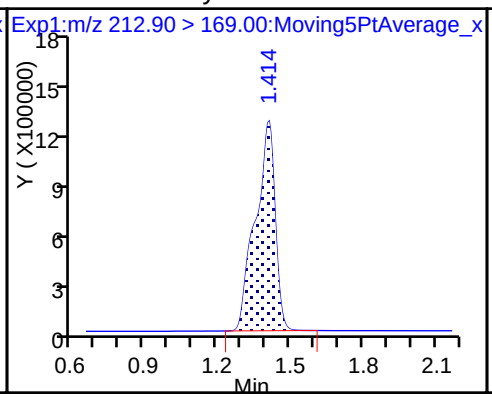
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

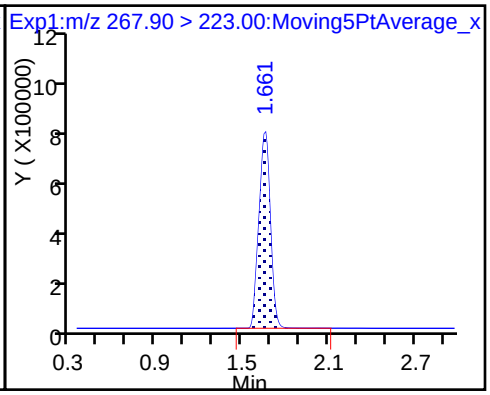
D 1 13C4 PFBA



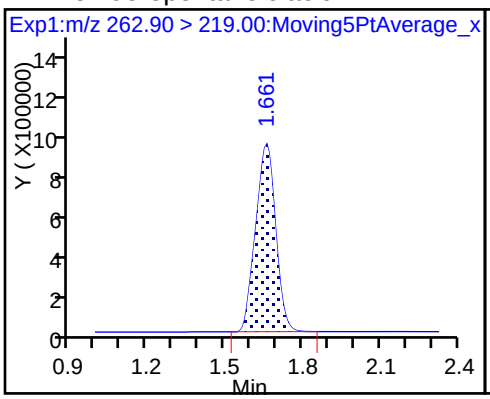
2 Perfluorobutyric acid



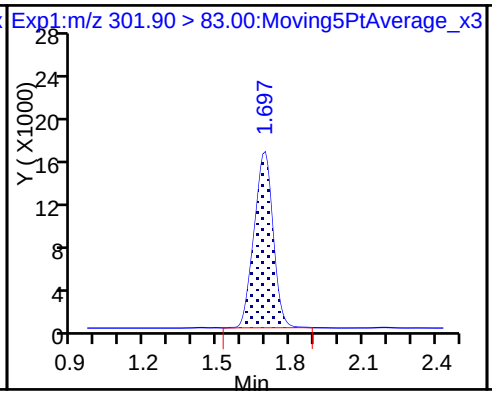
D 3 13C5-PFPeA



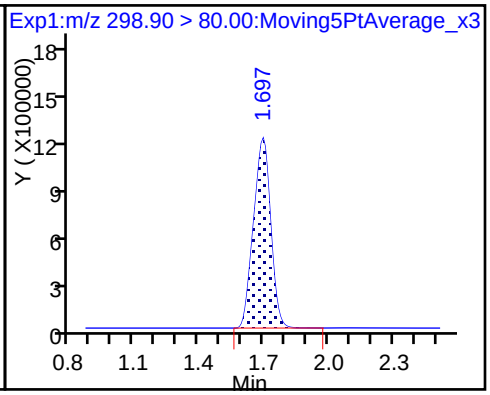
4 Perfluoropentanoic acid



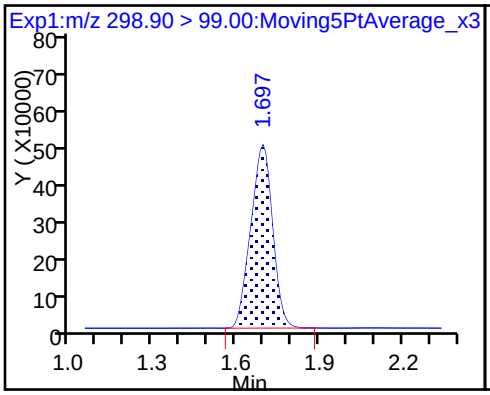
D 47 13C3-PFBS



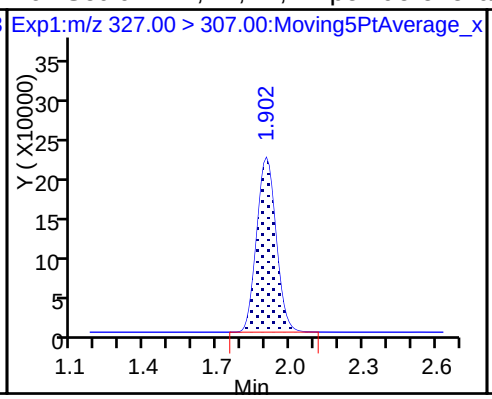
5 Perfluorobutanesulfonic acid



5 Perfluorobutanesulfonic acid



61 Sodium 1H,1H,2H,2H-perfluorohexa



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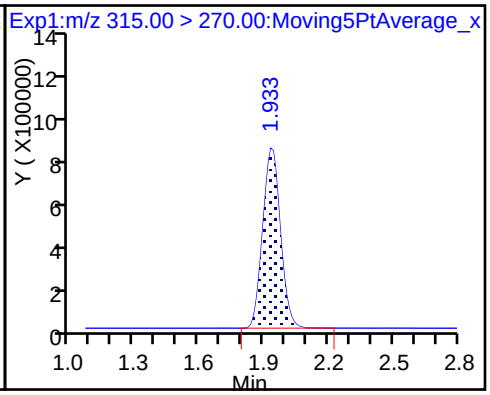
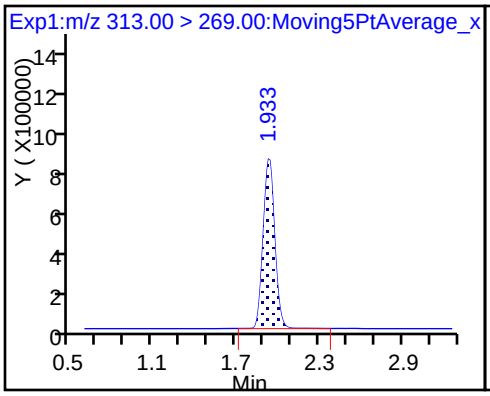
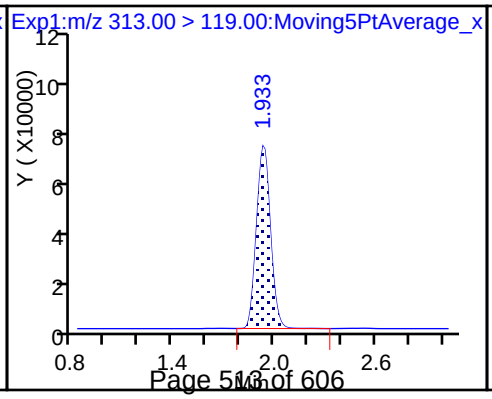


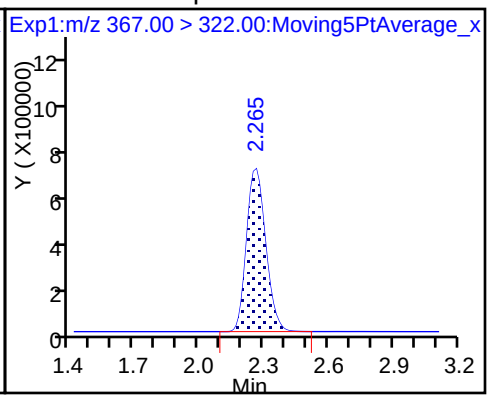
6 Perfluorohexanoic acid



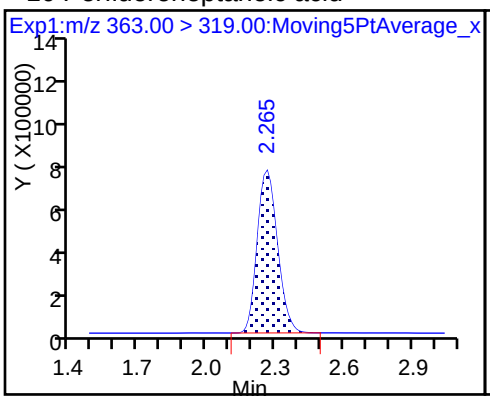
6 Perfluorohexanoic acid



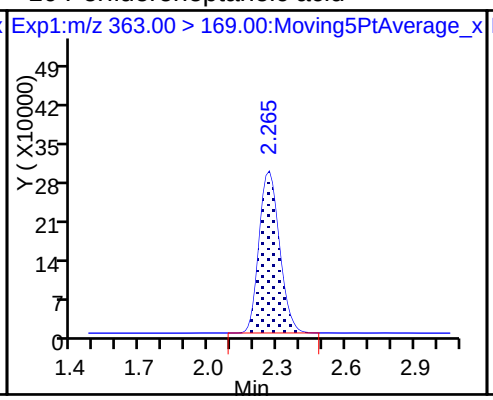
D 9 13C4-PFHpA



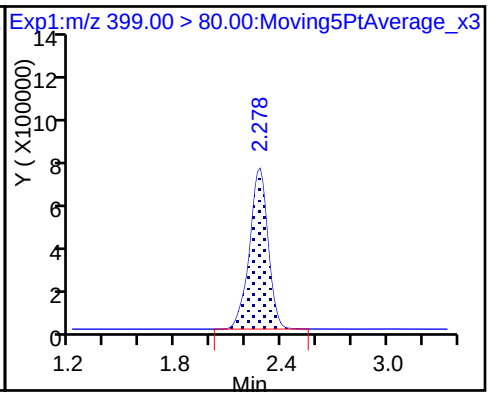
10 Perfluoroheptanoic acid



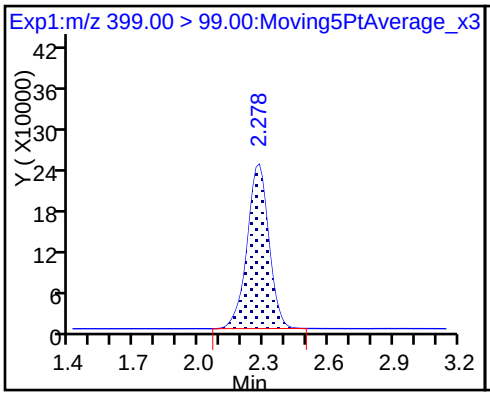
10 Perfluoroheptanoic acid



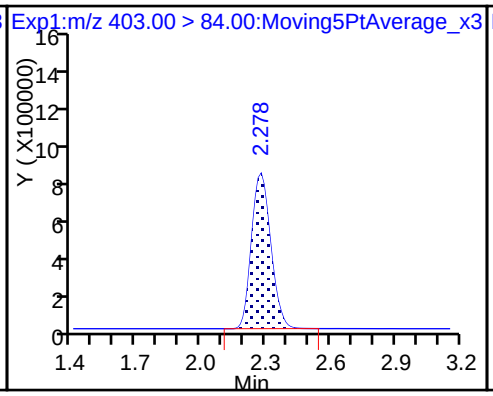
8 Perfluorohexanesulfonic acid



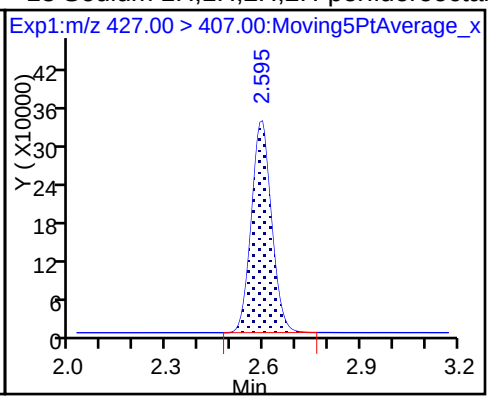
8 Perfluorohexanesulfonic acid



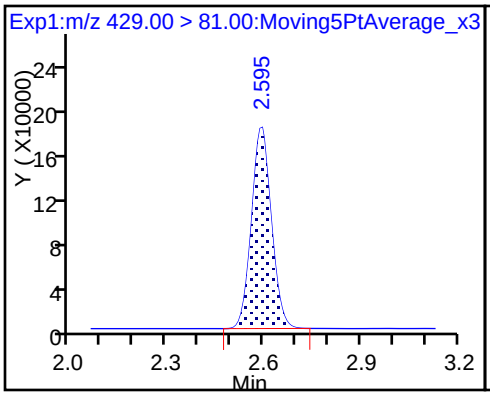
D 11 18O2 PFHxS



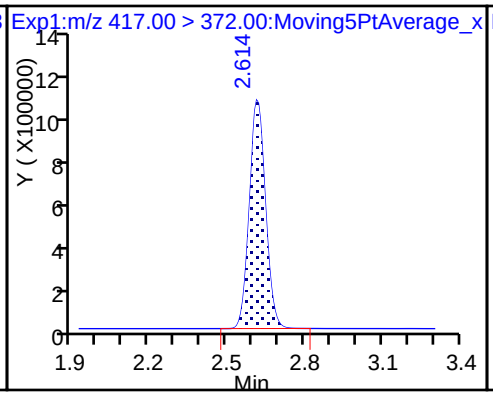
13 Sodium 1H,1H,2H,2H-perfluorooctane



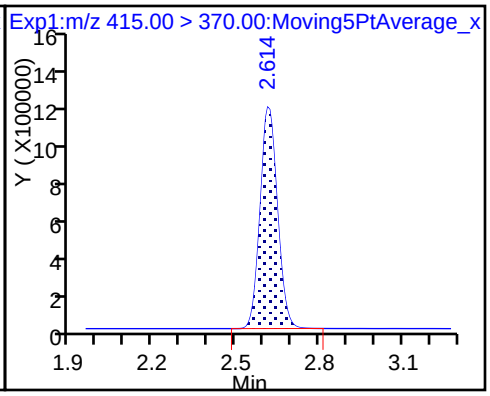
D 12 M2-6:2FTS



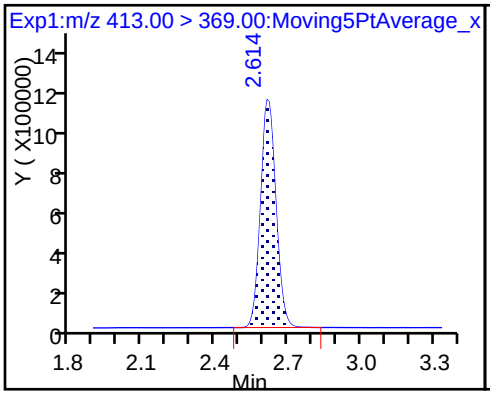
D 14 13C4 PFOA



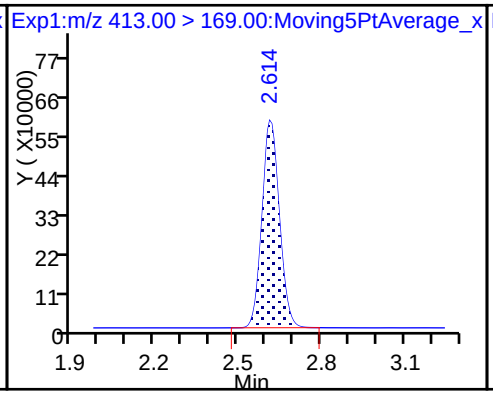
* 62 13C2-PFOA



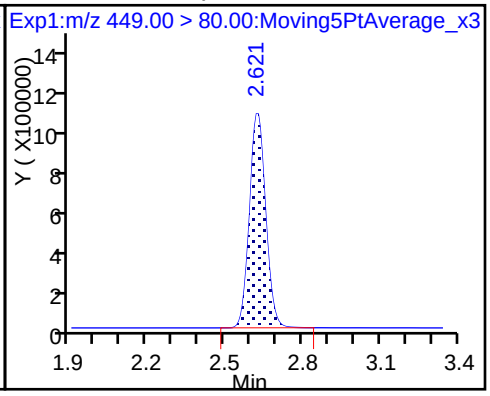
15 Perfluorooctanoic acid



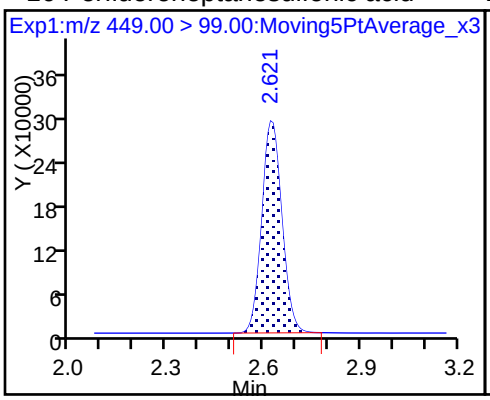
15 Perfluorooctanoic acid



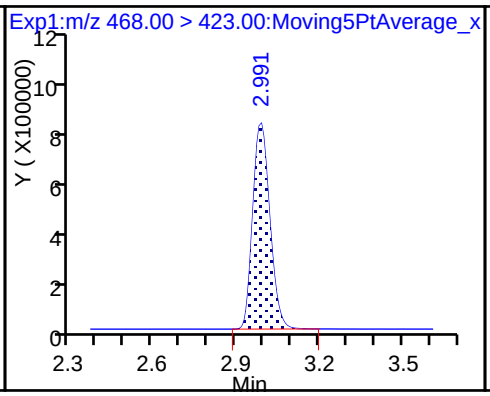
16 Perfluoroheptanesulfonic acid



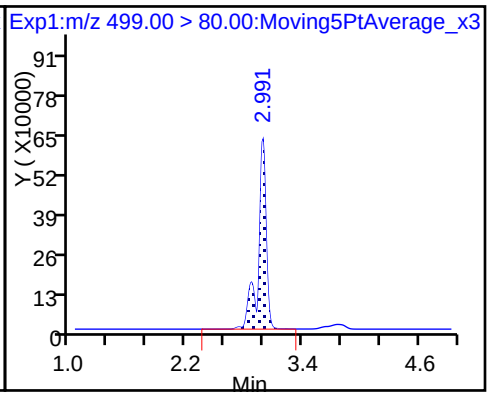
16 Perfluoroheptanesulfonic acid



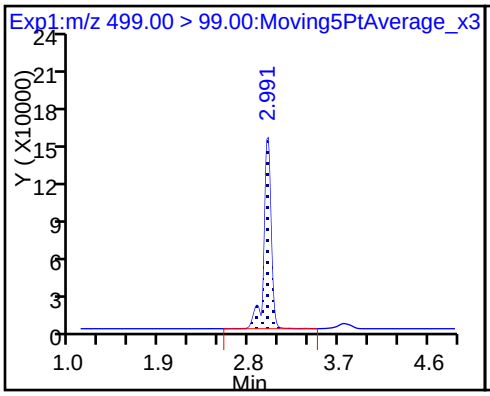
D 19 13C5 PFNA



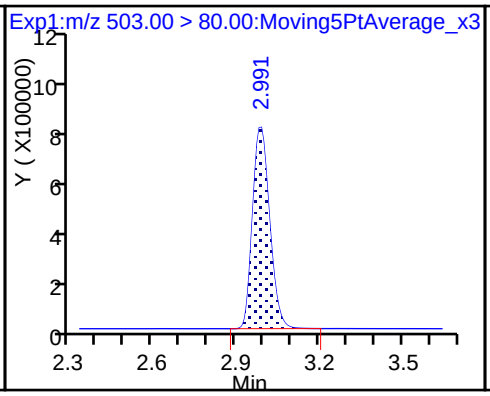
17 Perfluorooctane sulfonic acid



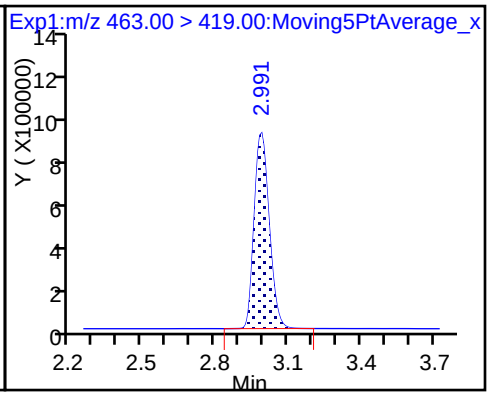
17 Perfluorooctane sulfonic acid



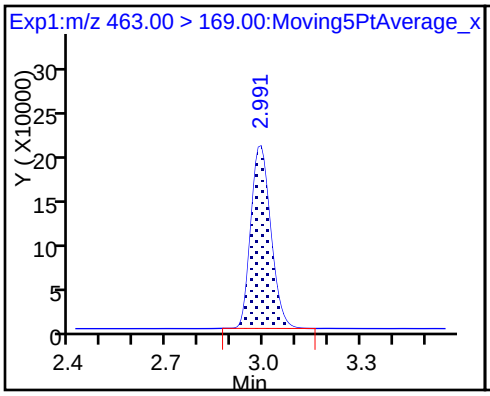
D 18 13C4 PFOS



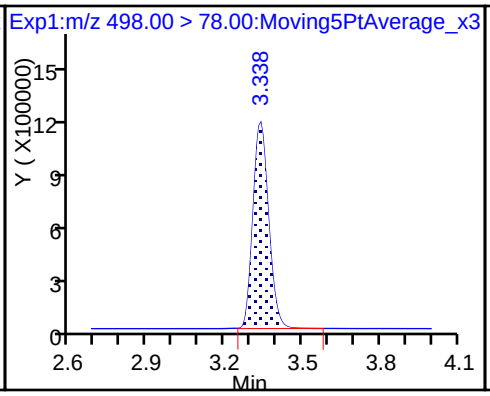
20 Perfluorononanoic acid



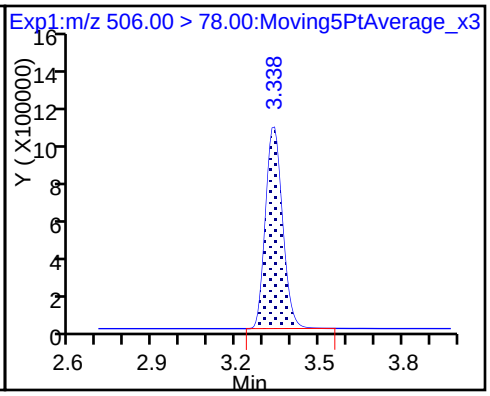
20 Perfluorononanoic acid



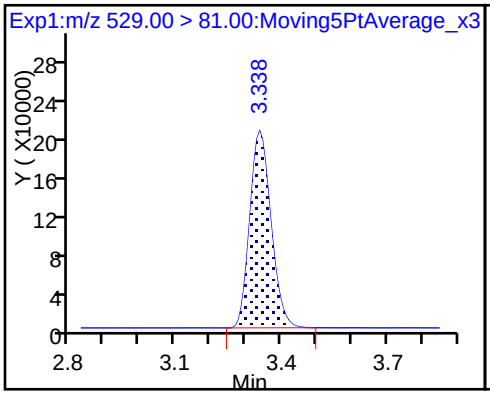
22 Perfluorooctane Sulfonamide



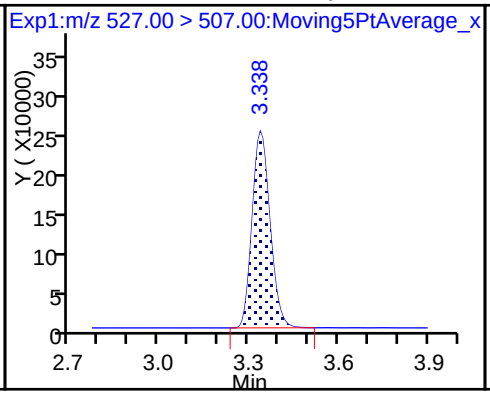
D 21 13C8 FOSA



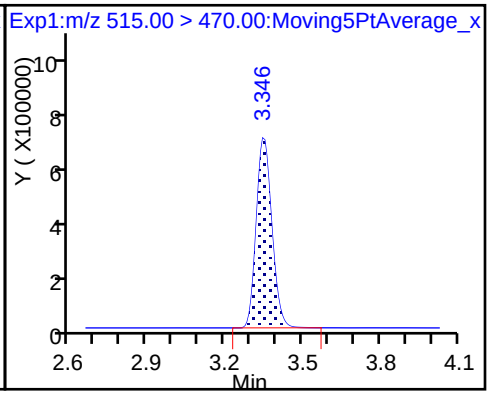
D 26 M2-8:2FTS



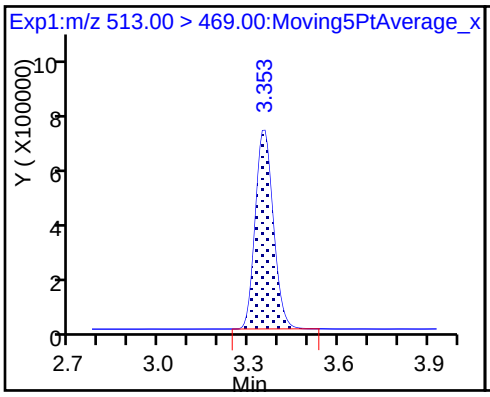
25 Sodium 1H,1H,2H,2H-perfluorodecane



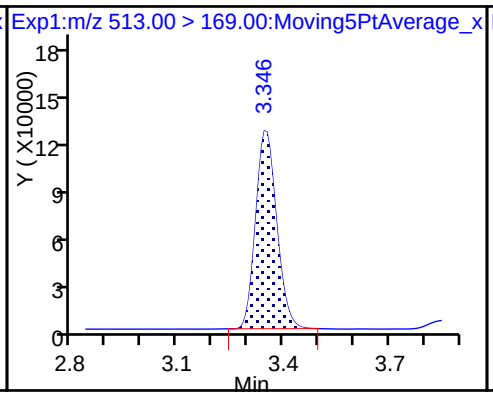
D 23 13C2 PFDA



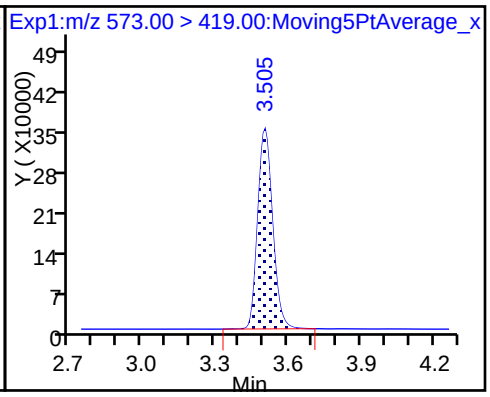
24 Perfluorodecanoic acid



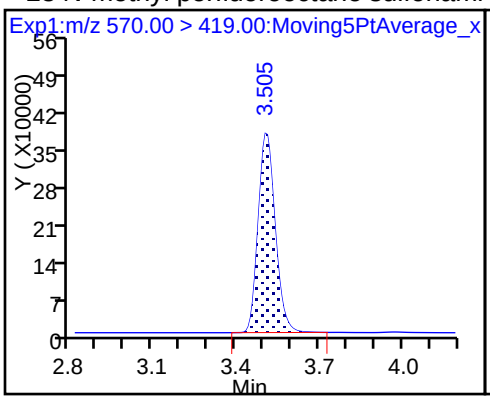
24 Perfluorodecanoic acid



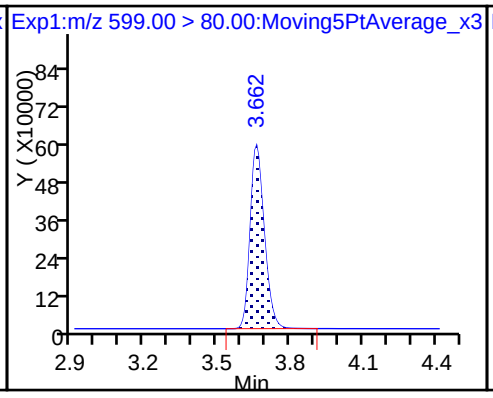
D 27 d3-NMeFOSAA



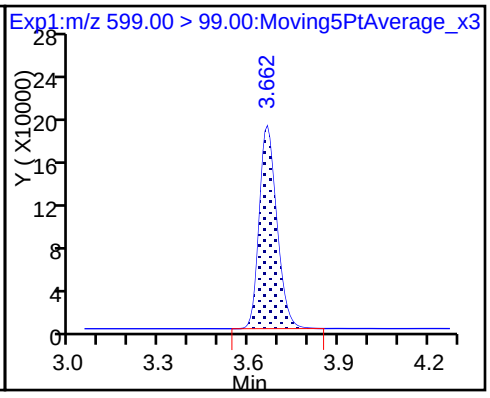
28 N-methyl perfluorooctane sulfonami



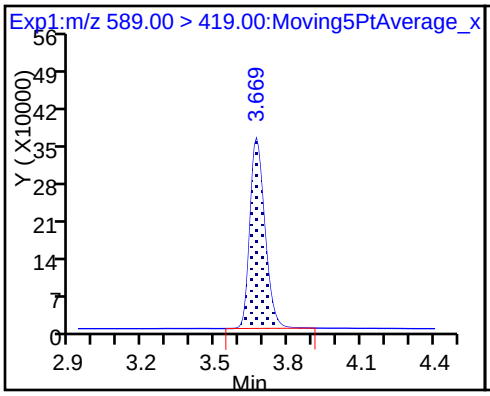
29 Perfluorodecane Sulfonic acid



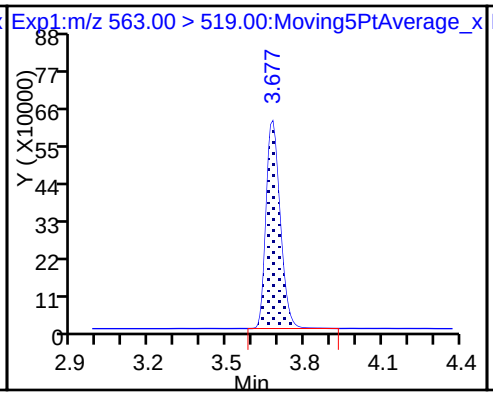
29 Perfluorodecane Sulfonic acid



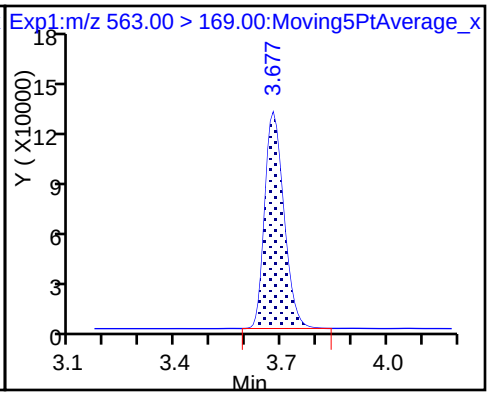
D 32 d5-NEtFOSAA



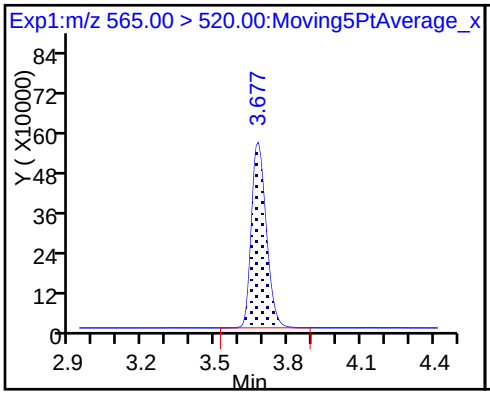
31 Perfluoroundecanoic acid



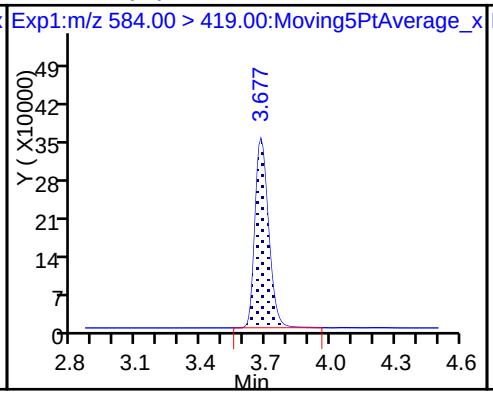
31 Perfluoroundecanoic acid



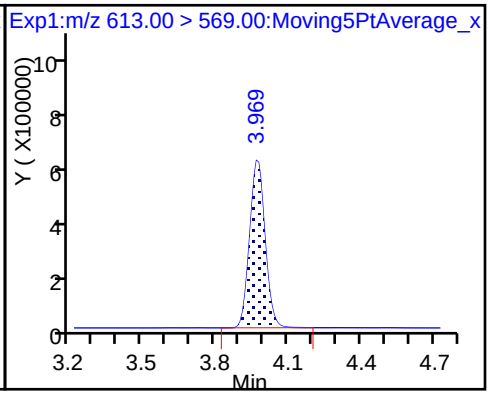
D 30 13C2 PFUnA



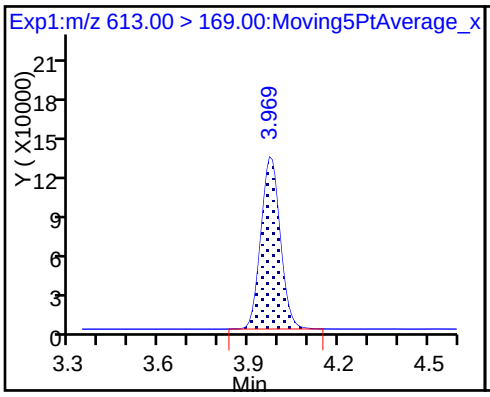
33 N-ethyl perfluorooctane sulfonamid



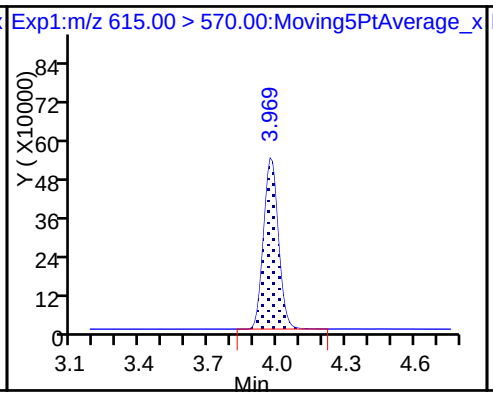
37 Perfluorododecanoic acid



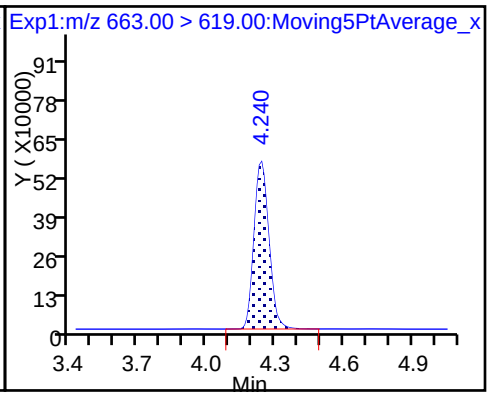
37 Perfluorododecanoic acid



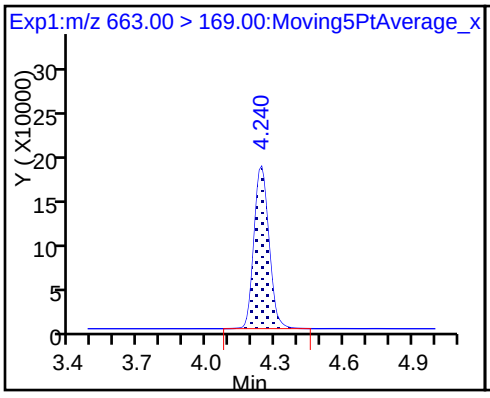
D 36 13C2 PFDoA



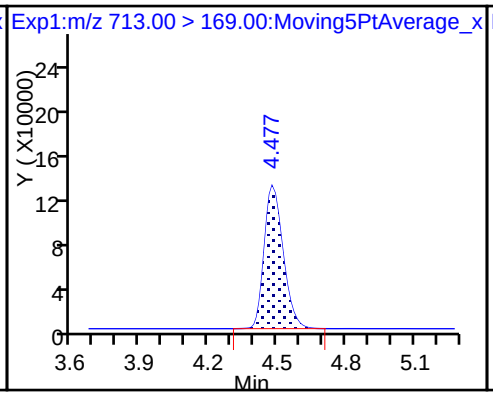
41 Perfluorotridecanoic acid



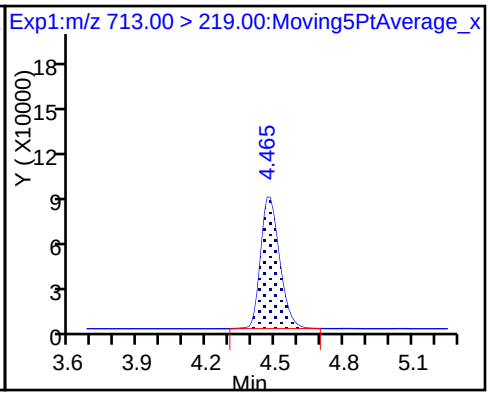
41 Perfluorotridecanoic acid



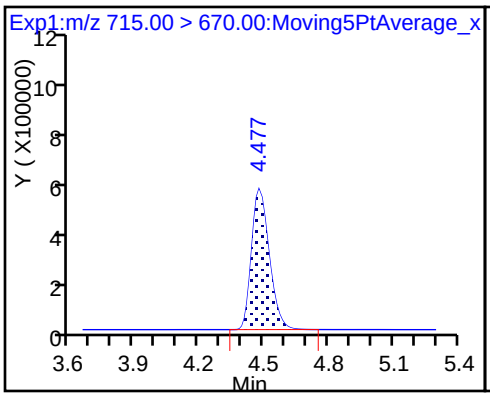
42 Perfluorotetradecanoic acid



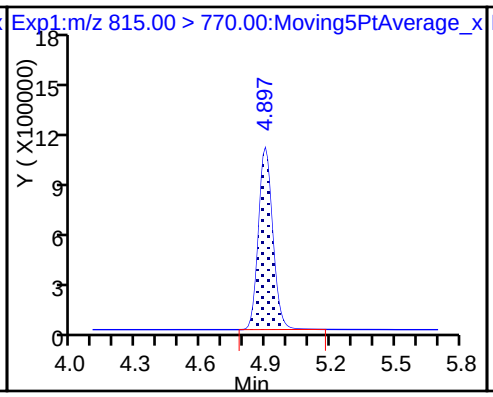
42 Perfluorotetradecanoic acid



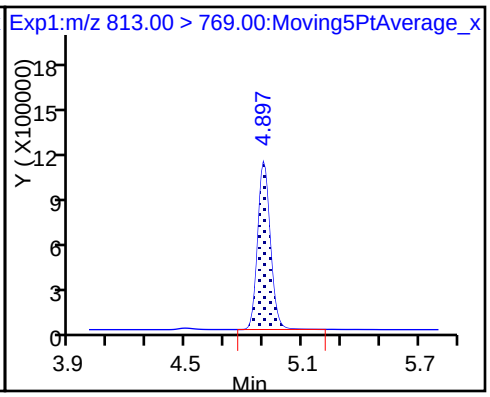
D 43 13C2-PFTeDA



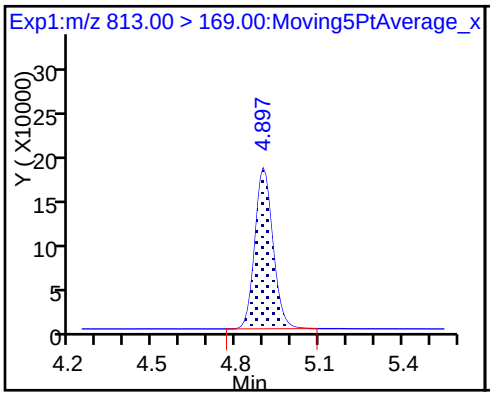
D 44 13C2-PFHxDA



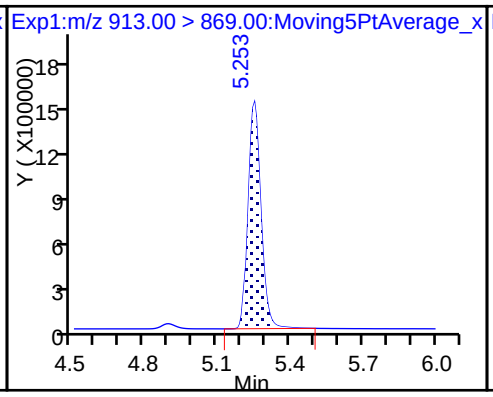
45 Perfluorohexadecanoic acid



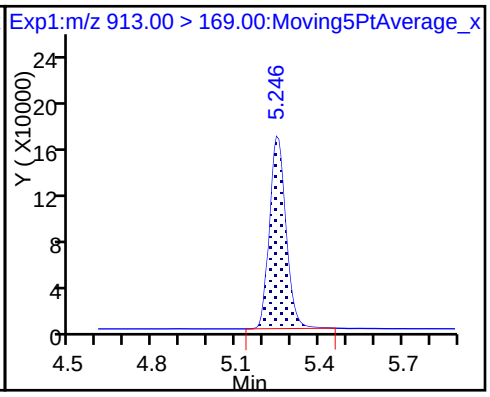
45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid



46 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Lab Sample ID: CCV 320-204556/10 Calibration Date: 01/18/2018 18:40

Instrument ID: A8_N Calib Start Date: 01/17/2018 14:19

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 01/17/2018 15:06

Lab File ID: 2018.01.18LLD_001.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9343	0.9122		0.976	1.00	-2.4	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.178	1.107		0.939	1.00	-6.1	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	77.21	77.33		0.885	0.884	0.1	25.0
4:2 FTS	AveID	13.89	14.34		0.964	0.934	3.2	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.036	0.9735		0.939	1.00	-6.1	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.099	1.054		0.959	1.00	-4.1	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.113	1.015		0.830	0.910	-8.8	25.0
6:2FTS	AveID	1.655	1.968		1.13	0.948	18.9	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.172	1.102		0.940	1.00	-6.0	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.354	1.373		0.965	0.952	1.4	25.0
Perfluorononanoic acid (PFNA)	AveID	1.032	1.073		1.04	1.00	3.9	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.119	1.102		0.914	0.928	-1.5	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9823	0.9705		0.988	1.00	-1.2	25.0
8:2FTS	AveID	1.217	1.307		1.03	0.958	7.4	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9702	0.8965		0.924	1.00	-7.6	25.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.080	1.081		1.00	1.00	0.1	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6549	0.6568		0.967	0.964	0.3	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.032	0.9267		0.898	1.00	-10.2	25.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9739	0.9608		0.987	1.00	-1.3	25.0
Perfluorododecanoic acid (PFDoA)	AveID	1.025	1.004		0.980	1.00	-2.0	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.161	1.057		0.910	1.00	-9.0	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2440	0.2430		0.996	1.00	-0.4	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		0.9423		0.975	1.00	-2.5	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.054	1.105		1.05	1.00	4.9	25.0
13C4 PFBA	Ave	1.512	1.509		2.49	2.50	-0.2	50.0
13C5 PFPeA	Ave	0.8956	0.9029		2.52	2.50	0.8	50.0
13C3-PFBS	Ave	0.0198	0.0194		2.28	2.33	-2.0	50.0
13C2 PFHxA	Ave	0.9649	0.9473		2.45	2.50	-1.8	50.0
13C4-PFHpA	Ave	0.9187	0.8834		2.40	2.50	-3.8	50.0
18O2 PFHxS	Ave	1.131	1.156		2.42	2.37	2.2	50.0
M2-6:2FTS	Ave	0.1699	0.1826		2.55	2.38	7.5	50.0

FORM VII 537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Lab Sample ID: CCV 320-204556/10 Calibration Date: 01/18/2018 18:40

Instrument ID: A8_N Calib Start Date: 01/17/2018 14:19

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 01/17/2018 15:06

Lab File ID: 2018.01.18LLD_001.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9004	0.8813		2.45	2.50	-2.1	50.0
13C4 PFOS	Ave	0.7158	0.7113		2.38	2.39	-0.6	50.0
13C5 PFNA	Ave	0.7300	0.7119		2.44	2.50	-2.5	50.0
13C8 FOSA	Ave	1.007	0.9891		2.46	2.50	-1.8	50.0
M2-8:2FTS	Ave	0.1795	0.1814		2.42	2.40	1.0	50.0
13C2 PFDA	Ave	0.6306	0.6663		2.64	2.50	5.7	50.0
d3-NMeFOSAA	Ave	0.3147	0.3181		2.53	2.50	1.1	50.0
d5-NEtFOSAA	Ave	0.3182	0.3252		2.55	2.50	2.2	50.0
13C2 PFUnA	Ave	0.4783	0.4955		2.59	2.50	3.6	50.0
13C2 PFDoA	Ave	0.5192	0.5079		2.45	2.50	-2.2	50.0
13C2-PFTeDA	Ave	0.6785	0.6420		2.37	2.50	-5.4	50.0
13C2-PFHxDA	Ave	1.209	1.076		2.22	2.50	-11.0	50.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLD_001.d
Lims ID: CCV L4
Client ID:
Sample Type: CCV
Inject. Date: 18-Jan-2018 18:40:07 ALS Bottle#: 30 Worklist Smp#: 10
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L4
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-A8_N*sub30

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 19-Jan-2018 16:34:55 Calib Date: 17-Jan-2018 15:06:20
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_008.d

Column 1 : Det: EXP1
Process Host: XAWRK004

First Level Reviewer: roycea Date: 19-Jan-2018 16:33:51

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.411	1.411	0.0	0.539	7200443	2.49		99.8	20441	
2 Perfluorobutyric acid										
212.90 > 169.00	1.411	1.413	-0.002	1.000	2627190	0.9764		97.6	368	
D 3 13C5-PFPeA										
267.90 > 223.00	1.658	1.659	-0.001	0.633	4307255	2.52		101	40563	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.658	1.662	-0.004	1.000	1906673	0.9394		93.9	1819	
D 47 13C3-PFBS										
301.90 > 83.00	1.694	1.695	-0.001	0.647	86186	2.28		98.0	4041	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.694	1.697	-0.003	1.000	2533955	0.8853		100	11800	
298.90 > 99.00	1.694	1.697	-0.003	1.000	1060532		2.39(1.25-3.74)		7352	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.908	1.903	0.005	1.000	496548	0.9641		103	22116	
D 60 M2-4:2FTS										
329.00 > 81.00	1.908	1.903	0.005	0.729	576496	NC			5143	
D 7 13C2 PFHxA										
315.00 > 270.00	1.939	1.939	0.0	0.740	4519315	2.45		98.2	35719	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.939	1.939	0.0	1.000	1759763	0.9392		93.9	3715	
313.00 > 119.00	1.939	1.939	0.0	1.000	164697		10.68(5.03-15.10)		2868	
D 9 13C4-PFHpA										
367.00 > 322.00	2.259	2.267	-0.008	0.863	4214456	2.40		96.2	21966	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.259	2.268	-0.009	1.000	1776113	0.9587		95.9	3225	
363.00 > 169.00	2.259	2.268	-0.009	1.000	733848		2.42(1.13-3.40)		5393	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.273	2.280	-0.007	0.994	2037314	0.8298		91.2	9734	
399.00 > 99.00	2.273	2.280	-0.007	0.994	660960		3.08(1.50-4.49)		5339	
D 11 18O2 PFHxS										
403.00 > 84.00	2.286	2.282	0.004	0.873	5215075	2.42		102	26154	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.598	2.596	0.002	1.000	650297	1.13		119	10342	
D 12 M2-6:2FTS										
429.00 > 81.00	2.598	2.597	0.001	0.992	827723	2.55		108	16459	
D 14 13C4 PFOA										
417.00 > 372.00	2.618	2.622	-0.004	1.000	4204168	2.45		97.9	38935	
* 62 13C2-PFOA										
415.00 > 370.00	2.618	2.622	-0.004		4770595	2.50			35155	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.618	2.623	-0.005	1.000	1852809	0.9400		94.0	1043	
413.00 > 169.00	2.618	2.623	-0.005	1.000	987759		1.88(0.84-2.52)		6876	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.625	2.629	-0.004	1.000	1774481	0.9652		101	17854	
449.00 > 99.00	2.625	2.629	-0.004	1.000	476672		3.72(1.94-5.82)		8481	
D 19 13C5 PFNA										
468.00 > 423.00	2.988	2.992	-0.004	1.141	3396174	2.44		97.5	24035	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.988	2.992	-0.004	1.000	1388670	0.9139		98.5	353	
499.00 > 99.00	2.988	2.992	-0.004	1.000	296828		4.68(2.31-6.93)		457	
D 18 13C4 PFOS										
503.00 > 80.00	2.988	2.992	-0.004	1.141	3244108	2.38		99.4	20071	
20 Perfluorononanoic acid										
463.00 > 419.00	2.988	2.992	-0.004	1.000	1457119	1.04		104	4479	
463.00 > 169.00	2.988	2.992	-0.004	1.000	334844		4.35(1.90-5.69)		5556	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.335	3.338	-0.003	1.000	1831674	0.9879		98.8	11240	
D 21 13C8 FOSA										
506.00 > 78.00	3.335	3.338	-0.003	1.274	4718627	2.46		98.2	19626	
D 26 M2-8:2FTS										
529.00 > 81.00	3.342	3.342	0.0	1.277	828834	2.42		101	14238	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.342	3.342	0.0	1.000	433411	1.03		107	10368	
D 23 13C2 PFDA										
515.00 > 470.00	3.350	3.352	-0.002	1.280	3178404	2.64		106	18256	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.350	3.353	-0.003	1.000	1139727	0.9240		92.4	5563	
513.00 > 169.00	3.350	3.353	-0.003	1.000	204288		5.58(2.36-7.09)		1451	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.503	3.507	-0.004	1.338	1517452	2.53		101	9233	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.510	3.513	-0.003	1.002	656322	1.00		100	3007	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.665	3.666	-0.001	1.000	859386	0.9668		100	16242	
599.00 > 99.00	3.665	3.666	-0.001	1.000	299261		2.87(1.39-4.16)		10384	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.673	3.672	0.001	1.403	1551155	2.55		102	6692	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.673	3.678	-0.005	0.998	876276	0.8978		89.8	3732	
563.00 > 169.00	3.681	3.678	0.003	1.000	186631		4.70(0.00-0.00)		7014	
D 30 13C2 PFUnA										
565.00 > 520.00	3.681	3.679	0.002	1.406	2363989	2.59		104	25384	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.681	3.679	0.002	1.002	596164	0.9866		98.7	6901	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.974	3.979	-0.005	1.000	972854	0.9796		98.0	3975	
613.00 > 169.00	3.974	3.979	-0.005	1.000	224821		4.33(2.13-6.40)		5685	
D 36 13C2 PFDoA										
615.00 > 570.00	3.974	3.979	-0.005	1.518	2422897	2.45		97.8	22267	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.244	4.242	0.002	1.000	1024253	0.9101		91.0	3497	
663.00 > 169.00	4.244	4.242	0.002	1.000	331855		3.09(1.25-3.76)		9256	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.473	4.483	-0.010	1.000	297635	1.00		99.6	6402	
713.00 > 219.00	4.473	4.483	-0.010	1.000	192833		1.54(0.71-2.13)		8444	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.473	4.483	-0.010	1.709	3062762	2.37		94.6	18993	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.896	4.902	-0.006	1.870	5131115	2.22		89.0	16403	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.905	4.902	0.003	1.002	1934055	0.9752		97.5	1194	
813.00 > 169.00	4.905	4.902	0.003	1.002	345350		5.60(2.86-8.58)		3629	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.254	5.255	-0.001	1.000	2268538	1.05		105	495	
913.00 > 169.00	5.254	5.255	-0.001	1.000	273496		8.29(0.00-0.00)		1184	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL4_00003 Amount Added: 1.00 Units: mL

Report Date: 19-Jan-2018 16:34:55 Chrom Revision: 2.2 08-Dec-2017 11:41:26

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLD_001.d

Injection Date: 18-Jan-2018 18:40:07 Instrument ID: A8_N

Lims ID: CCV L4

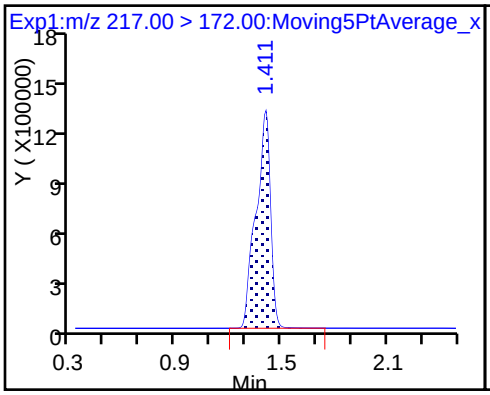
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 30 Worklist Smp#: 10

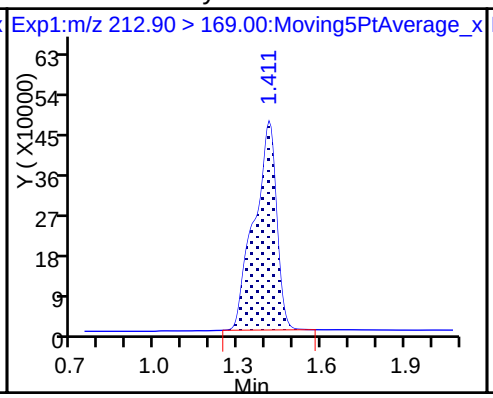
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

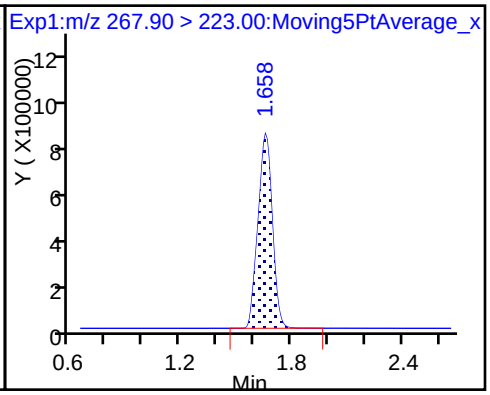
D 1 13C4 PFBA



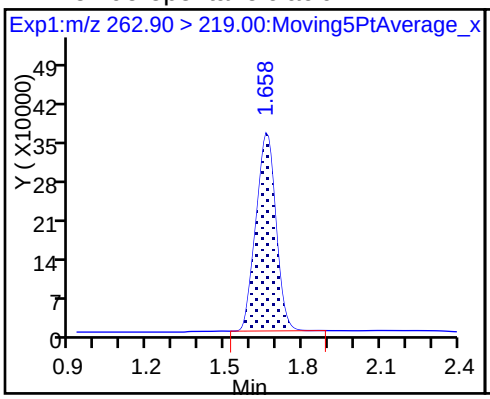
2 Perfluorobutyric acid



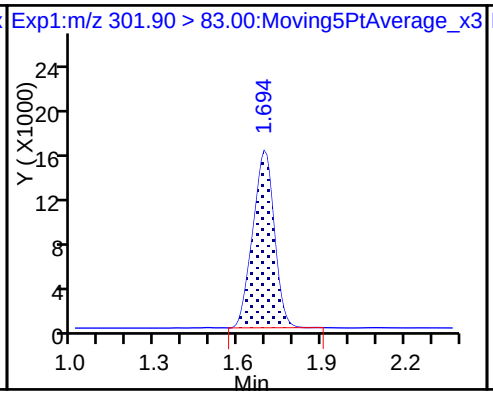
D 3 13C5-PFPeA



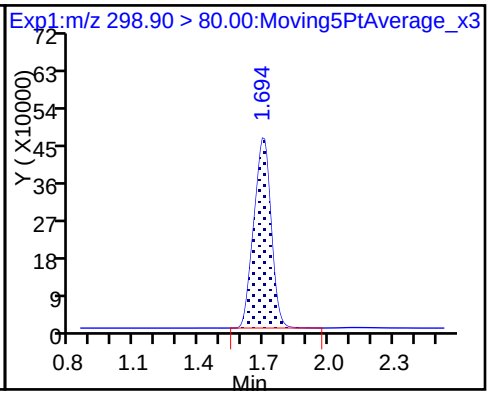
4 Perfluoropentanoic acid



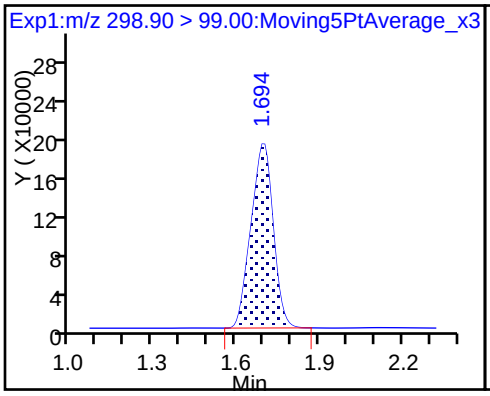
D 47 13C3-PFBS



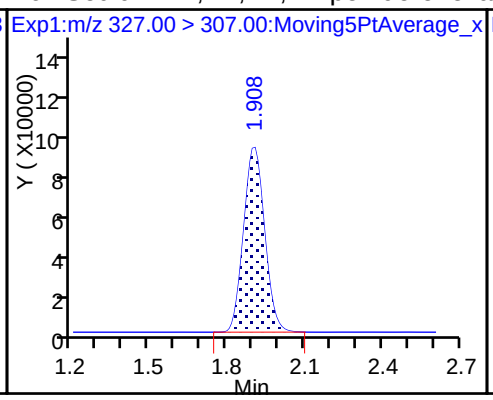
5 Perfluorobutanesulfonic acid



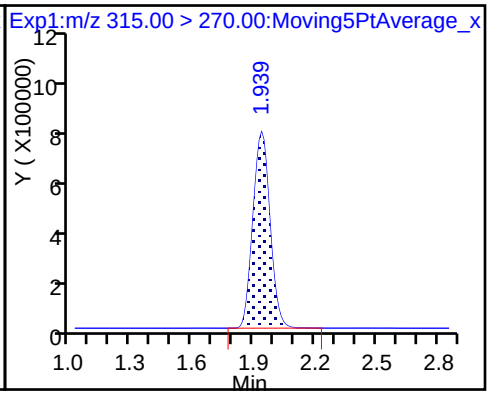
5 Perfluorobutanesulfonic acid



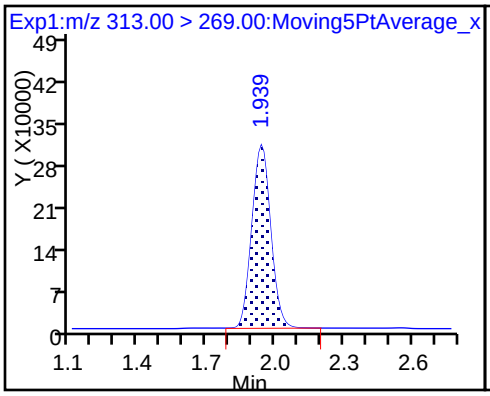
61 Sodium 1H,1H,2H,2H-perfluorohexa



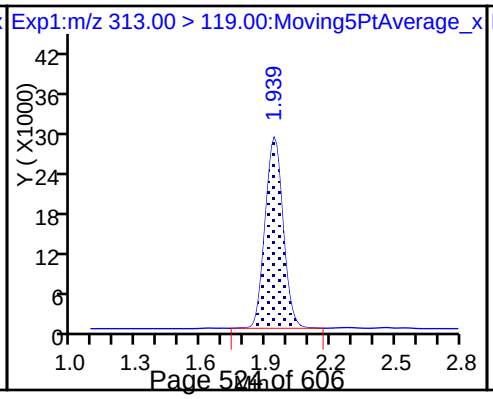
D 7 13C2 PFHxA



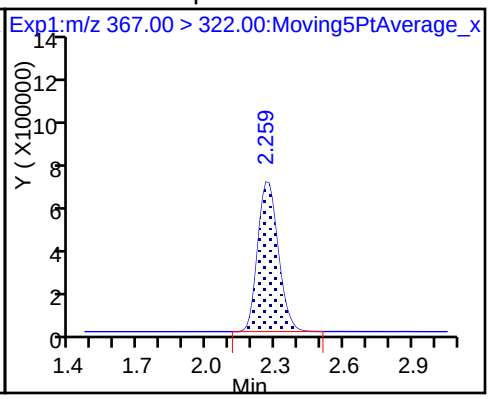
6 Perfluorohexanoic acid



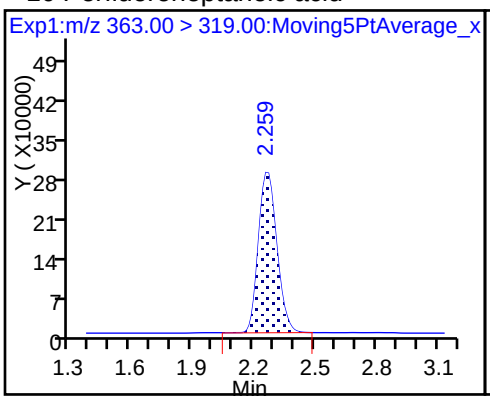
6 Perfluorohexanoic acid



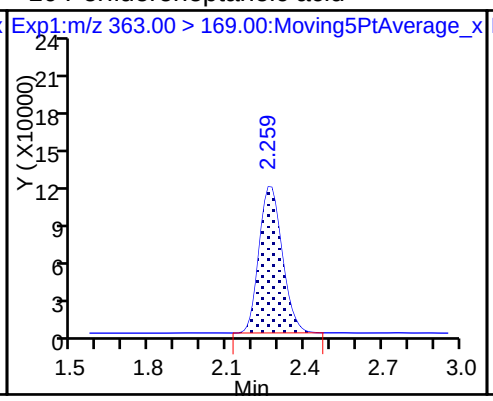
D 9 13C4-PFHpA



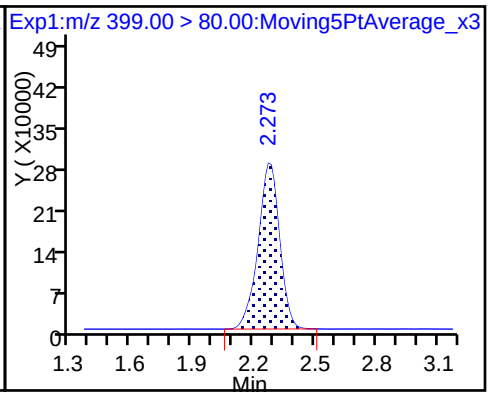
10 Perfluoroheptanoic acid



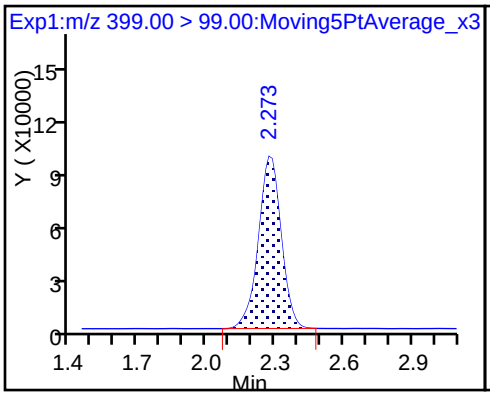
10 Perfluoroheptanoic acid



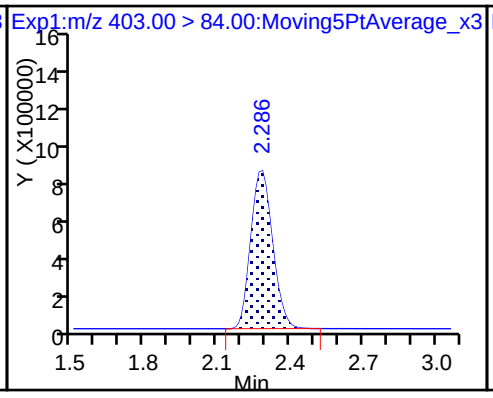
8 Perfluorohexanesulfonic acid



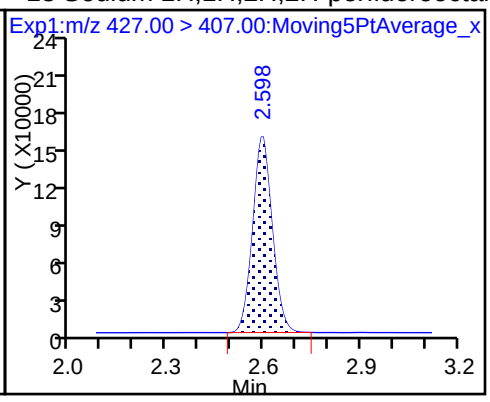
8 Perfluorohexanesulfonic acid



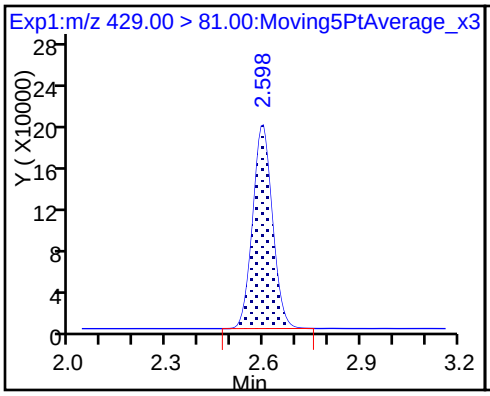
D 11 18O2 PFHxS



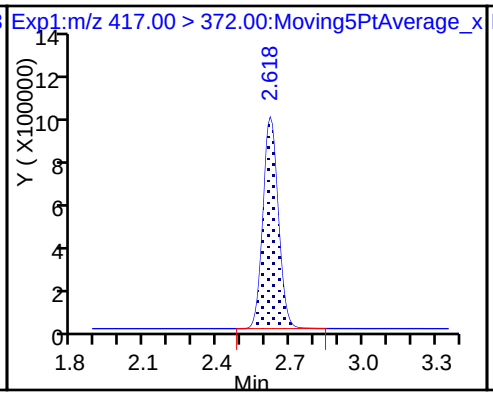
13 Sodium 1H,1H,2H,2H-perfluorooctane



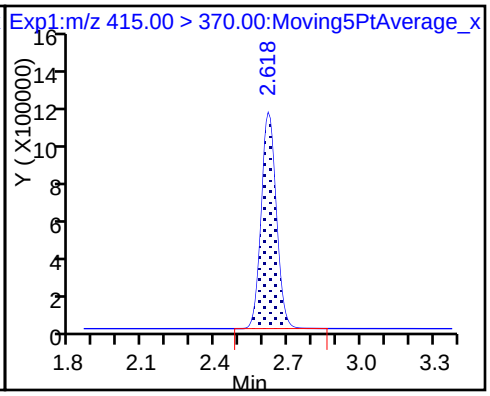
D 12 M2-6:2FTS



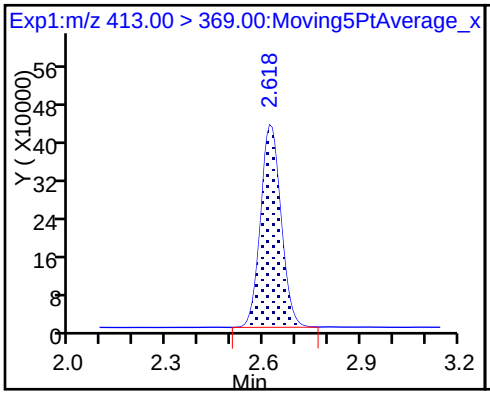
D 14 13C4 PFOA



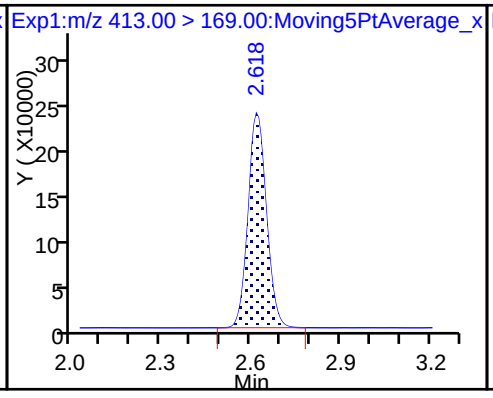
* 62 13C2-PFOA



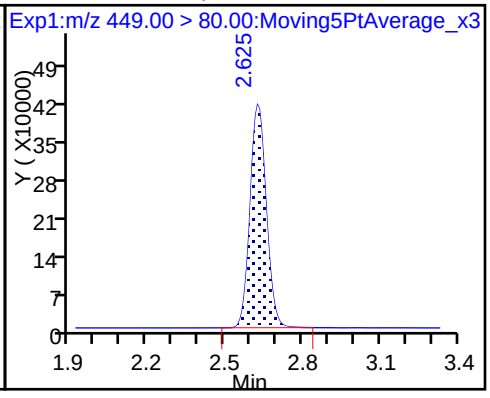
15 Perfluorooctanoic acid



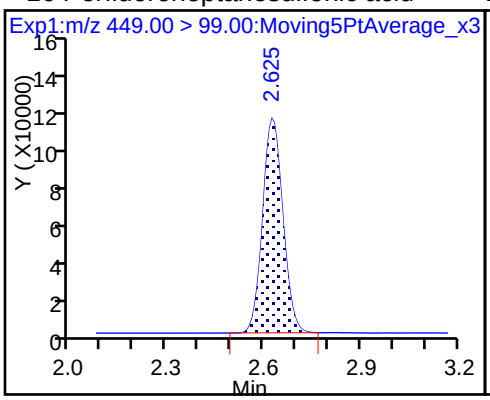
15 Perfluorooctanoic acid



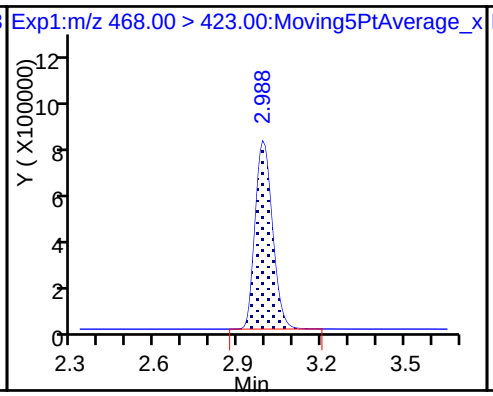
16 Perfluoroheptanesulfonic acid



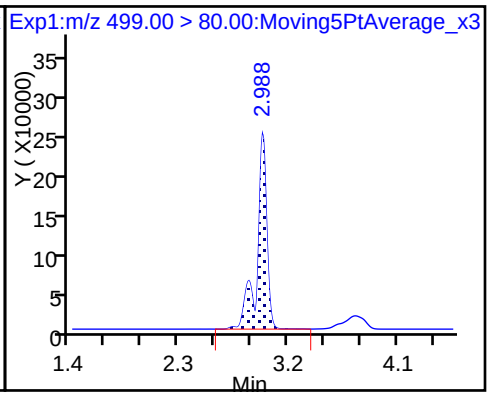
16 Perfluoroheptanesulfonic acid



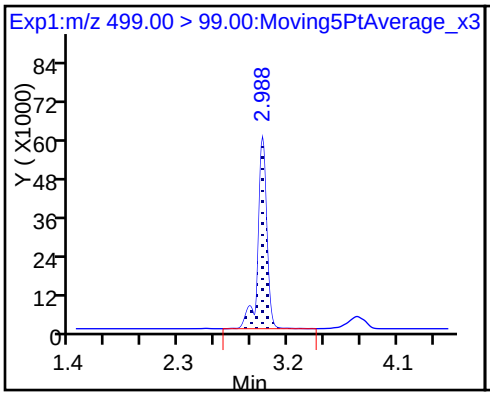
D 19 13C5 PFNA



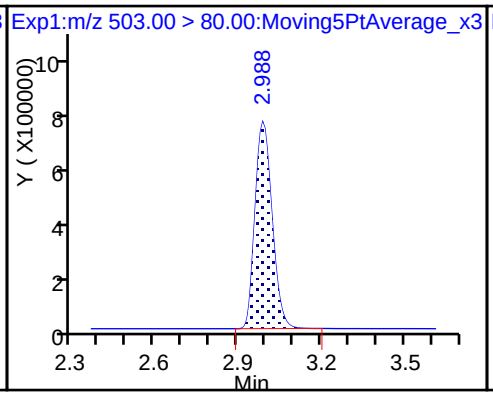
17 Perfluorooctane sulfonic acid



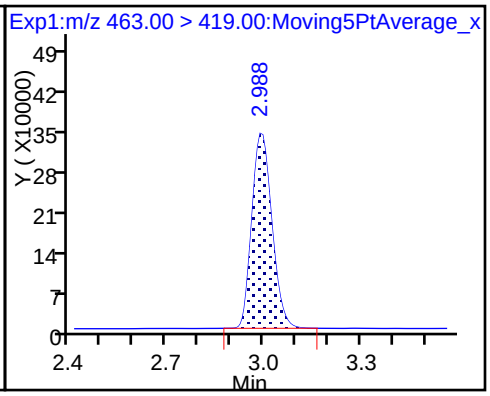
17 Perfluorooctane sulfonic acid



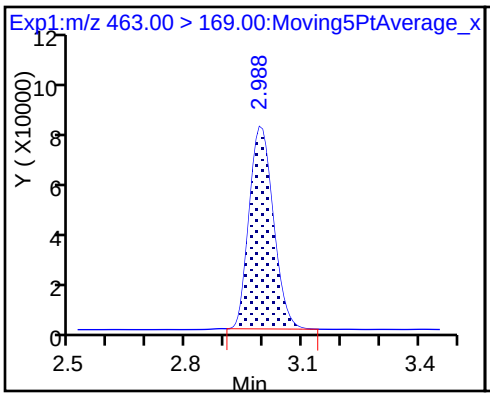
D 18 13C4 PFOS



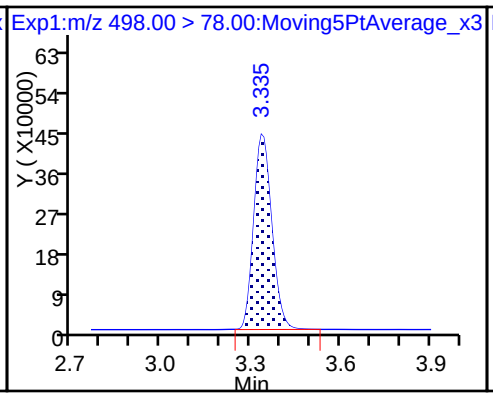
20 Perfluorononanoic acid



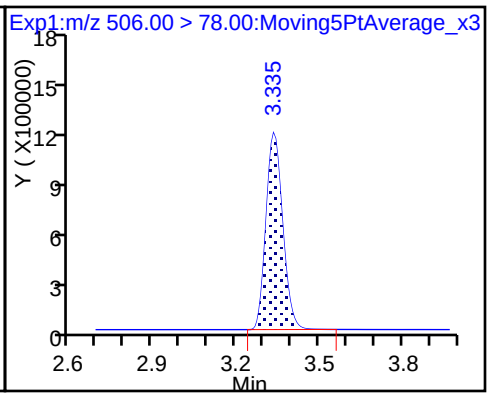
20 Perfluorononanoic acid



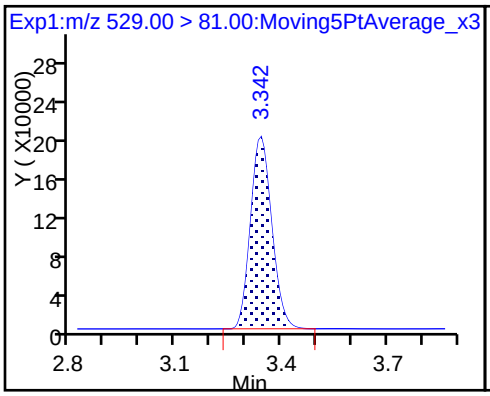
22 Perfluorooctane Sulfonamide



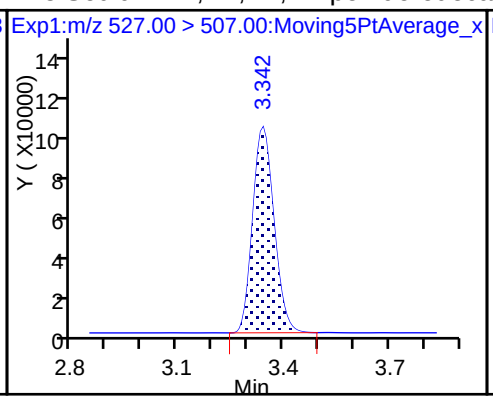
D 21 13C8 FOSA



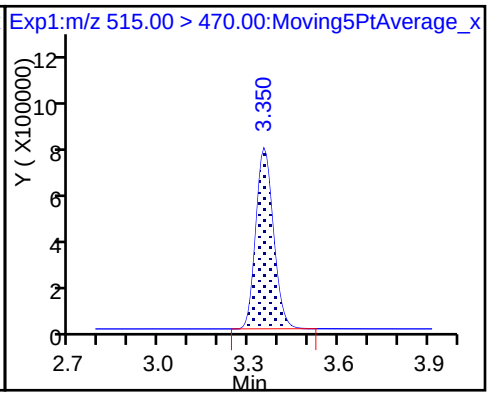
D 26 M2-8:2FTS



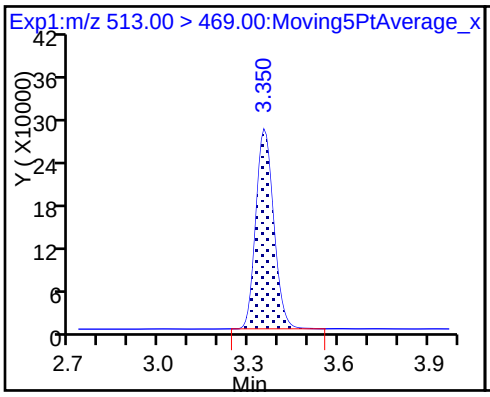
25 Sodium 1H,1H,2H,2H-perfluorodecane



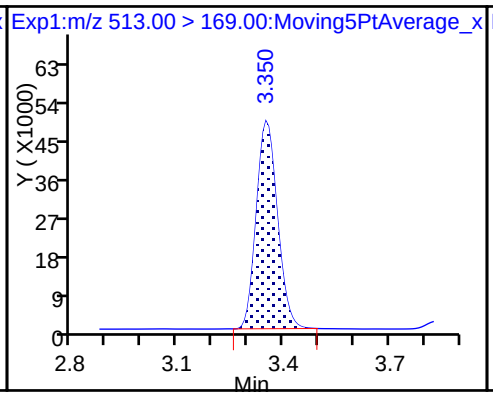
D 23 13C2 PFDA



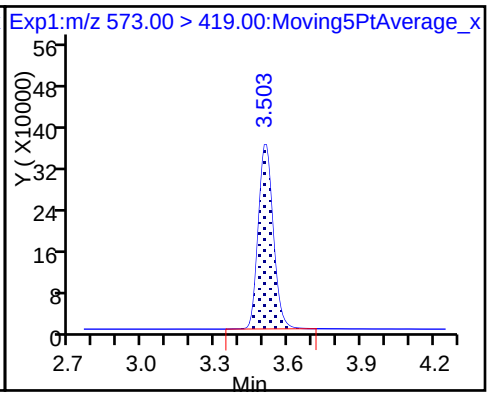
24 Perfluorodecanoic acid



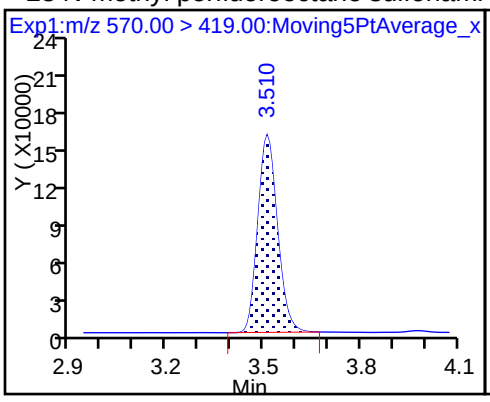
24 Perfluorodecanoic acid



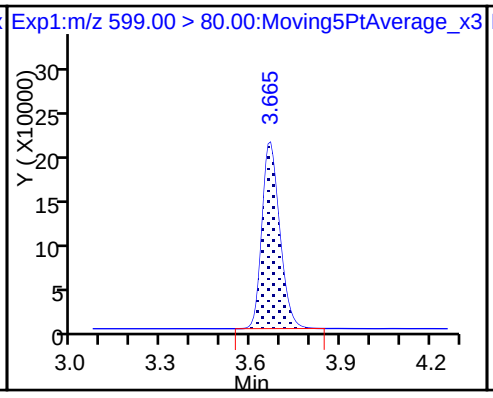
D 27 d3-NMeFOSAA



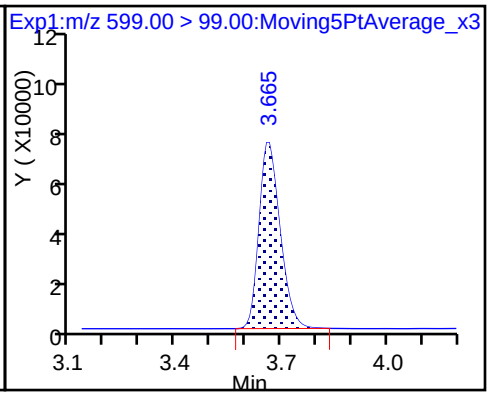
28 N-methyl perfluorooctane sulfonami



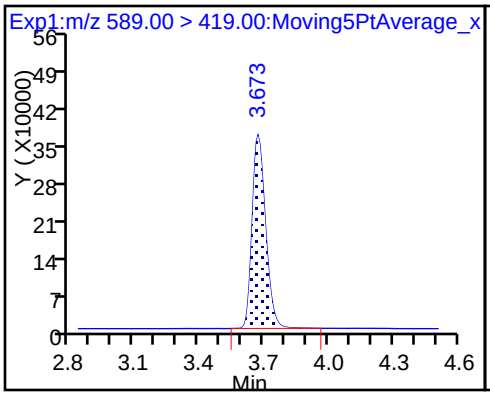
29 Perfluorodecane Sulfonic acid



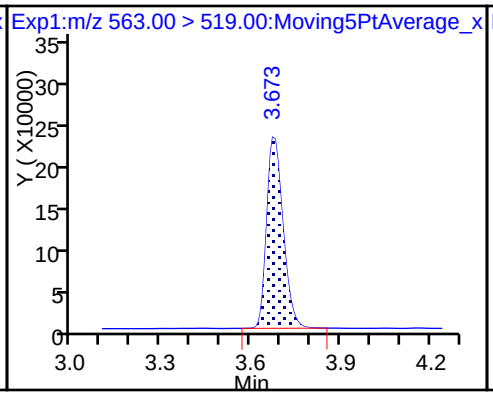
29 Perfluorodecane Sulfonic acid



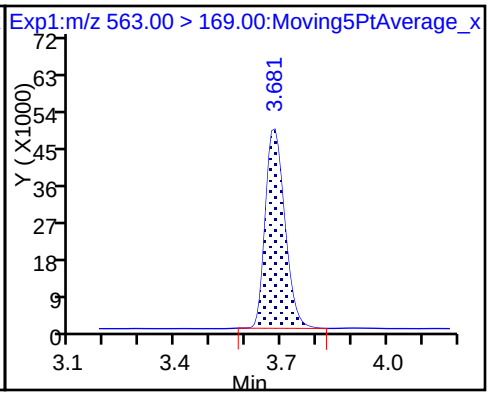
D 32 d5-NEtFOSAA



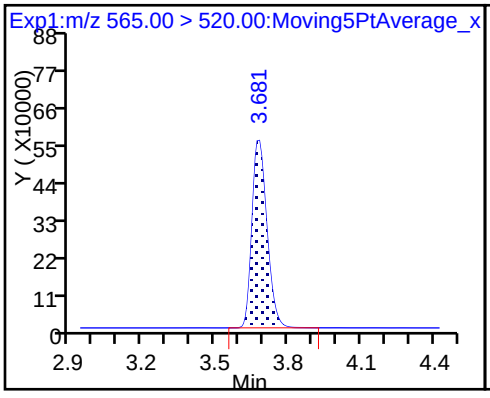
31 Perfluoroundecanoic acid



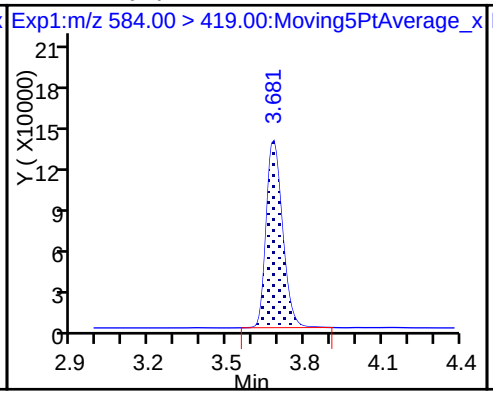
31 Perfluoroundecanoic acid



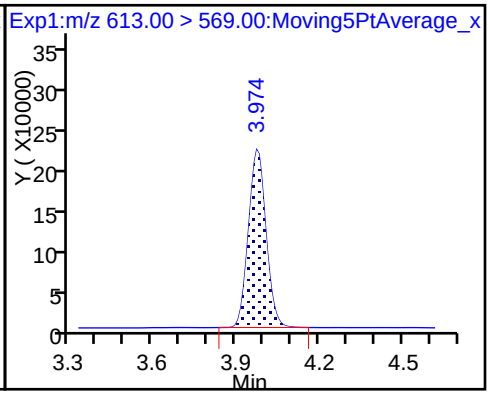
D 30 13C2 PFUnA



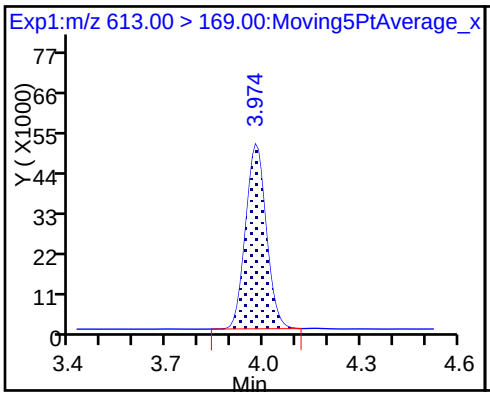
33 N-ethyl perfluorooctane sulfonamid



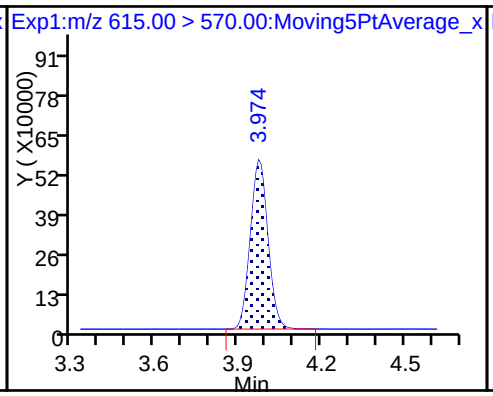
37 Perfluorododecanoic acid



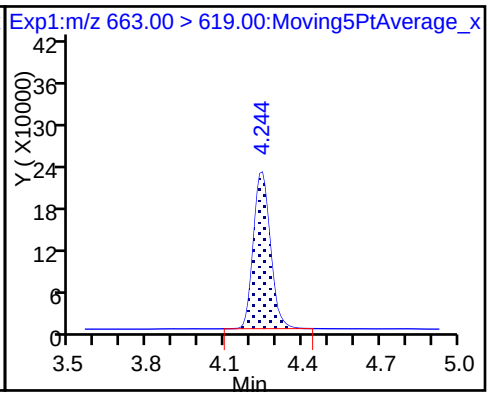
37 Perfluorododecanoic acid



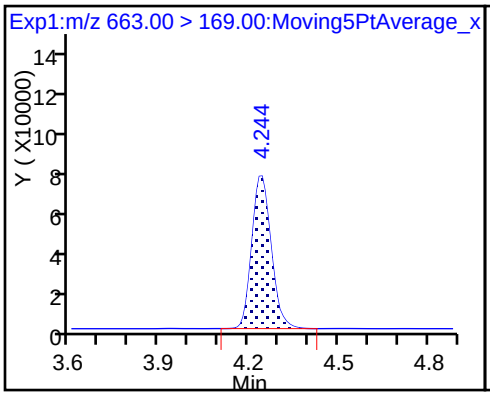
D 36 13C2 PFDoA



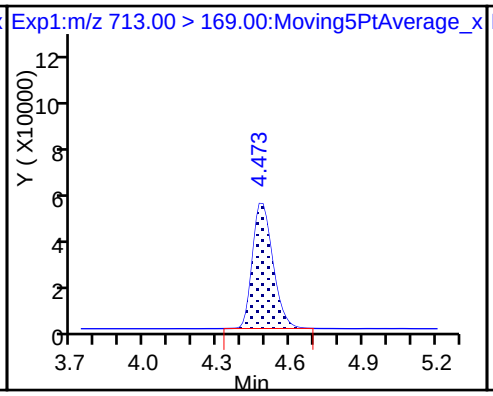
41 Perfluorotridecanoic acid



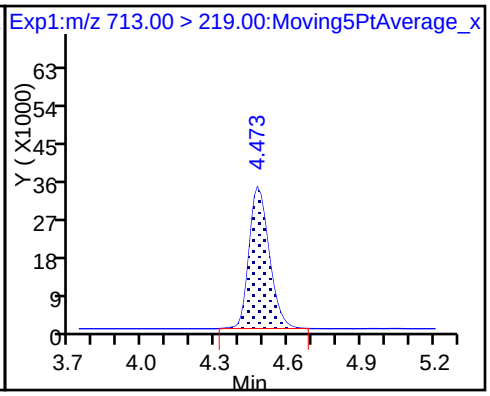
41 Perfluorotridecanoic acid



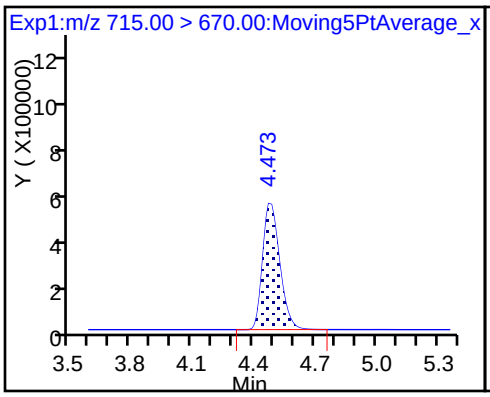
42 Perfluorotetradecanoic acid



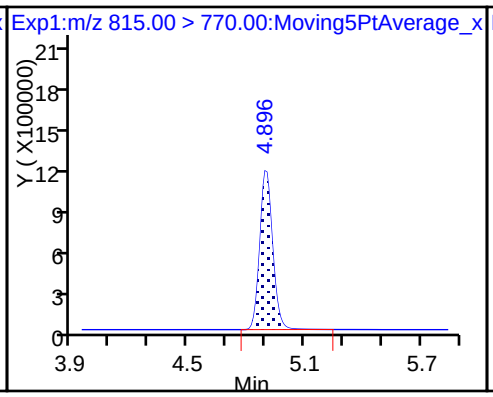
42 Perfluorotetradecanoic acid



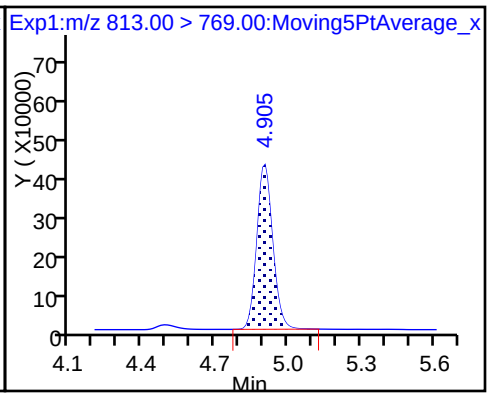
D 43 13C2-PFTeDA



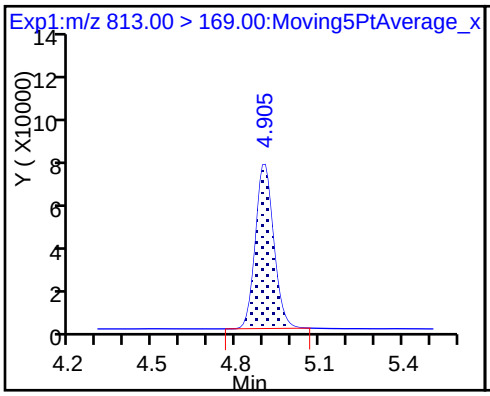
D 44 13C2-PFHxDA



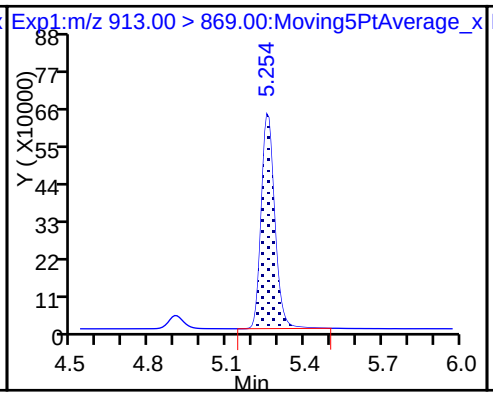
45 Perfluorohexadecanoic acid



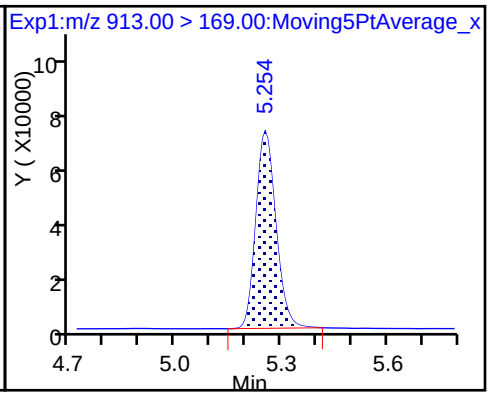
45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid



46 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Lab Sample ID: CCV 320-204757/1 Calibration Date: 01/19/2018 16:50

Instrument ID: A8_N Calib Start Date: 01/17/2018 14:19

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 01/17/2018 15:06

Lab File ID: 2018.01.19LLC_009.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9343	0.9541		2.55	2.50	2.1	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.178	1.165		2.47	2.50	-1.1	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	77.21	83.66		2.39	2.21	8.4	25.0
4:2 FTS	AveID	13.89	17.30		2.91	2.34	24.5	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.036	1.026		2.47	2.50	-1.0	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.099	1.095		2.49	2.50	-0.4	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.113	1.086		2.22	2.28	-2.5	25.0
6:2FTS	AveID	1.655	1.803		2.58	2.37	9.0	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.172	1.164		2.48	2.50	-0.7	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.354	1.386		2.43	2.38	2.3	25.0
Perfluorononanoic acid (PFNA)	AveID	1.032	1.093		2.65	2.50	5.9	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.119	1.105		2.29	2.32	-1.3	25.0
8:2FTS	AveID	1.217	1.142		2.25	2.40	-6.2	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9823	1.033		2.63	2.50	5.1	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9702	1.027		2.65	2.50	5.8	25.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.080	1.078		2.49	2.50	-0.2	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6549	0.6815		2.51	2.41	4.1	25.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9739	0.9513		2.44	2.50	-2.3	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.032	1.072		2.60	2.50	3.9	25.0
Perfluorododecanoic acid (PFDoA)	AveID	1.025	1.090		2.66	2.50	6.3	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.161	1.145		2.46	2.50	-1.4	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2440	0.2381		2.44	2.50	-2.4	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		0.9352		2.45	2.50	-2.1	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.054	1.093		2.59	2.50	3.7	25.0
13C4 PFBA	Ave	1.512	1.482		2.45	2.50	-2.0	50.0
13C5 PFPeA	Ave	0.8956	0.8970		2.50	2.50	0.2	50.0
13C3-PFBS	Ave	0.0198	0.0189		2.21	2.33	-4.9	50.0
13C2 PFHxA	Ave	0.9649	0.9676		2.51	2.50	0.3	50.0
13C4-PFHpA	Ave	0.9187	0.9002		2.45	2.50	-2.0	50.0
18O2 PFHxS	Ave	1.131	1.101		2.30	2.37	-2.7	50.0
M2-6:2FTS	Ave	0.1699	0.1972		2.76	2.38	16.1	50.0

FORM VII 537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Lab Sample ID: CCV 320-204757/1 Calibration Date: 01/19/2018 16:50

Instrument ID: A8_N Calib Start Date: 01/17/2018 14:19

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 01/17/2018 15:06

Lab File ID: 2018.01.19LLC_009.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9004	0.8985		2.49	2.50	-0.2	50.0
13C4 PFOS	Ave	0.7158	0.7403		2.47	2.39	3.4	50.0
13C5 PFNA	Ave	0.7300	0.7346		2.52	2.50	0.6	50.0
13C8 FOSA	Ave	1.007	0.999		2.48	2.50	-0.8	50.0
M2-8:2FTS	Ave	0.1795	0.2287		3.05	2.40	27.4	50.0
13C2 PFDA	Ave	0.6306	0.6203		2.46	2.50	-1.6	50.0
d3-NMeFOSAA	Ave	0.3147	0.3523		2.80	2.50	12.0	50.0
d5-NEtFOSAA	Ave	0.3182	0.3602		2.83	2.50	13.2	50.0
13C2 PFUnA	Ave	0.4783	0.4916		2.57	2.50	2.8	50.0
13C2 PFDoA	Ave	0.5192	0.4895		2.36	2.50	-5.7	50.0
13C2-PFTeDA	Ave	0.6785	0.6797		2.50	2.50	0.2	50.0
13C2-PFHxDA	Ave	1.209	1.092		2.26	2.50	-9.7	50.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180119-53121.b\2018.01.19LLC_009.d
Lims ID: CCV L5
Client ID:
Sample Type: CCV
Inject. Date: 19-Jan-2018 16:50:30 ALS Bottle#: 14 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L5
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-A8_N*sub30

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180119-53121.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 22-Jan-2018 09:49:04 Calib Date: 17-Jan-2018 15:06:20
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_008.d

Column 1 : Det: EXP1
Process Host: XAWRK027

First Level Reviewer: phomsophat Date: 20-Jan-2018 11:06:11

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.408	1.411	-0.003	0.538	7179978	2.45		98.0	28389	
2 Perfluorobutyric acid										
212.90 > 169.00	1.408	1.413	-0.005	1.000	6850527	2.55		102	1075	
D 3 13C5-PFPeA										
267.90 > 223.00	1.654	1.659	-0.005	0.632	4344856	2.50		100	62327	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.663	1.662	0.001	1.005	5061742	2.47		98.9	3459	
D 47 13C3-PFBS										
301.90 > 83.00	1.690	1.695	-0.005	0.646	84918	2.21		95.1	2208	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.699	1.697	0.002	1.005	6753212	2.39		108	25654	
298.90 > 99.00	1.699	1.697	0.002	1.005	2809879		2.40(1.25-3.74)		18079	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.904	1.903	0.001	1.000	1475122	2.91		124	67147	
D 60 M2-4:2FTS										
329.00 > 81.00	1.904	1.903	0.001	0.728	655220	NC			6294	
D 7 13C2 PFHxA										
315.00 > 270.00	1.935	1.939	-0.004	0.740	4686939	2.51		100	45586	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.935	1.939	-0.004	1.000	4809083	2.47		99.0	14382	
313.00 > 119.00	1.935	1.939	-0.004	1.000	453492		10.60(5.03-15.10)		7967	
D 9 13C4-PFHpA										
367.00 > 322.00	2.253	2.267	-0.014	0.861	4360392	2.45		98.0	26179	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.266	2.268	-0.002	1.006	4773602	2.49		99.6	7064	
363.00 > 169.00	2.266	2.268	-0.002	1.006	1984940		2.40(1.13-3.40)		14655	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.266	2.280	-0.014	0.994	5266956	2.22		97.5	14067	
399.00 > 99.00	2.266	2.280	-0.014	0.994	1791386		2.94(1.50-4.49)		9645	
D 11 18O2 PFHxS										
403.00 > 84.00	2.280	2.282	-0.002	0.872	5043338	2.30		97.3	21385	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.596	2.596	0.0	1.000	1633150	2.58		109	19802	
D 12 M2-6:2FTS										
429.00 > 81.00	2.596	2.597	-0.001	0.992	907471	2.76		116	17694	
D 14 13C4 PFOA										
417.00 > 372.00	2.616	2.622	-0.006	1.000	4352452	2.49		99.8	32628	
* 62 13C2-PFOA										
415.00 > 370.00	2.616	2.622	-0.006		4844000	2.50			37778	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.616	2.623	-0.007	1.000	5065773	2.48		99.3	1912	
413.00 > 169.00	2.616	2.623	-0.007	1.000	2630592		1.93(0.84-2.52)		14379	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.623	2.629	-0.006	1.000	4730181	2.43		102	29894	
449.00 > 99.00	2.623	2.629	-0.006	1.000	1249060		3.79(1.94-5.82)		12046	
D 19 13C5 PFNA										
468.00 > 423.00	2.985	2.992	-0.007	1.141	3558301	2.52		101	21617	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.985	2.992	-0.007	1.000	3678370	2.29		98.7	1545	
499.00 > 99.00	2.985	2.992	-0.007	1.000	788927		4.66(2.31-6.93)		1739	
D 18 13C4 PFOS										
503.00 > 80.00	2.985	2.992	-0.007	1.141	3428226	2.47		103	17116	
20 Perfluorononanoic acid										
463.00 > 419.00	2.985	2.992	-0.007	1.000	3890886	2.65		106	10833	
463.00 > 169.00	2.985	2.992	-0.007	1.000	932874		4.17(1.90-5.69)		14592	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.332	3.338	-0.006	1.000	4997673	2.63		105	17649	
D 21 13C8 FOSA										
506.00 > 78.00	3.332	3.338	-0.006	1.274	4838893	2.48		99.2	20051	
D 26 M2-8:2FTS										
529.00 > 81.00	3.332	3.342	-0.010	1.274	1061500	3.05		127	16312	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.332	3.342	-0.010	1.000	1211917	2.25		93.8	16958	
D 23 13C2 PFDA										
515.00 > 470.00	3.347	3.352	-0.005	1.280	3004624	2.46		98.4	17768	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.347	3.353	-0.006	1.000	3085543	2.65		106	10801	
513.00 > 169.00	3.347	3.353	-0.006	1.000	527536		5.85(2.36-7.09)		1938	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.499	3.507	-0.008	1.338	1706690	2.80		112	12050	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.507	3.513	-0.006	1.002	1839826	2.49		99.8	9944	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.656	3.666	-0.010	1.000	2355743	2.51		104	25807	
599.00 > 99.00	3.656	3.666	-0.010	1.000	760971		3.10(1.39-4.16)		17283	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.663	3.672	-0.009	1.400	1744726	2.83		113	6994	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.671	3.678	-0.007	1.000	2552871	2.60		104	10853	
563.00 > 169.00	3.671	3.678	-0.007	1.000	468606		5.45(0.00-0.00)		14019	
D 30 13C2 PFUnA										
565.00 > 520.00	3.671	3.679	-0.008	1.403	2381231	2.57		103	16747	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.671	3.679	-0.008	1.002	1659759	2.44		97.7	15614	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.971	3.979	-0.008	1.000	2583214	2.66		106	11052	
613.00 > 169.00	3.971	3.979	-0.008	1.000	615772		4.20(2.13-6.40)		13854	
D 36 13C2 PFDoA										
615.00 > 570.00	3.971	3.979	-0.008	1.518	2370973	2.36		94.3	13407	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.232	4.242	-0.010	1.000	2713975	2.46		98.6	6350	
663.00 > 169.00	4.232	4.242	-0.010	1.000	873592		3.11(1.25-3.76)		27893	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.471	4.483	-0.012	1.000	783943	2.44		97.6	19788	
713.00 > 219.00	4.460	4.483	-0.023	0.997	543919		1.44(0.71-2.13)		12016	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.471	4.483	-0.012	1.709	3292516	2.50		100	22453	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.885	4.902	-0.017	1.868	5289757	2.26		90.3	14998	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.885	4.902	-0.017	1.000	4946777	2.45		97.9	2945	
813.00 > 169.00	4.885	4.902	-0.017	1.000	890775		5.55(2.86-8.58)		6962	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.238	5.255	-0.017	1.000	5780831	2.59		104	1026	
913.00 > 169.00	5.238	5.255	-0.017	1.000	716381		8.07(0.00-0.00)		2148	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL5_00003 Amount Added: 1.00 Units: mL

Report Date: 22-Jan-2018 09:49:05 Chrom Revision: 2.2 08-Dec-2017 11:41:26

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180119-53121.b\2018.01.19LLC_009.d

Injection Date: 19-Jan-2018 16:50:30 Instrument ID: A8_N

Lims ID: CCV L5

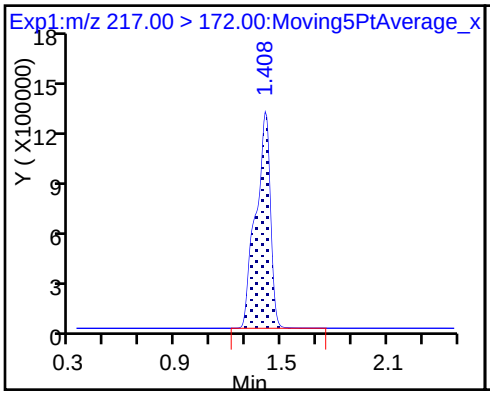
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 14 Worklist Smp#: 1

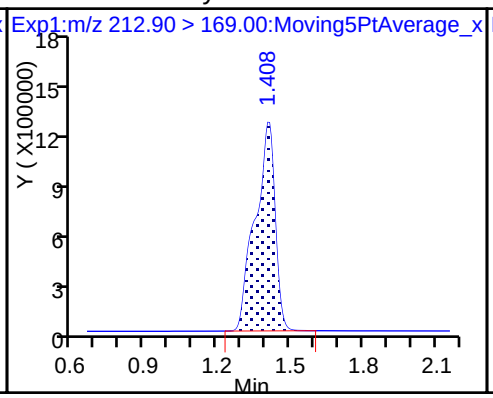
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

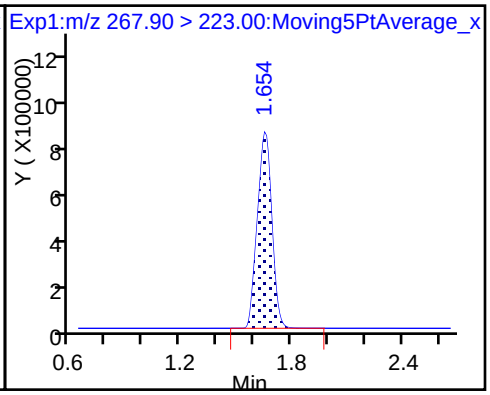
D 1 13C4 PFBA



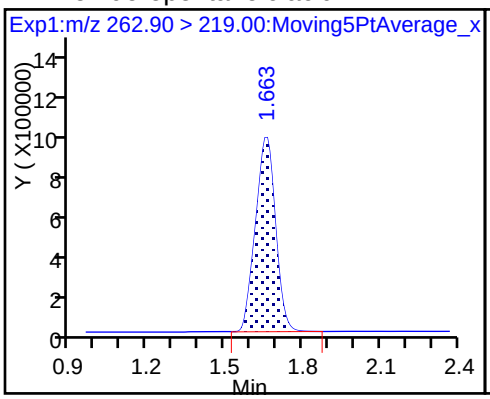
2 Perfluorobutyric acid



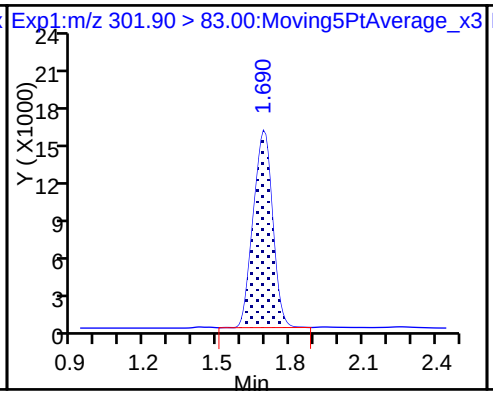
D 3 13C5-PFPeA



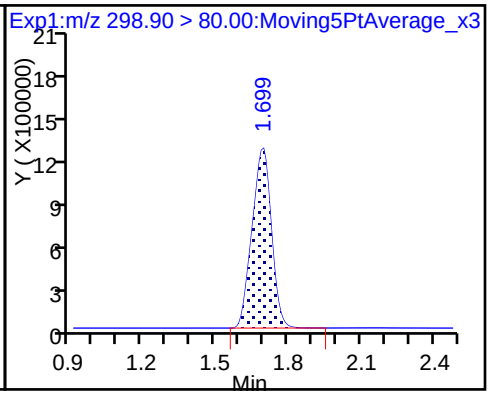
4 Perfluoropentanoic acid



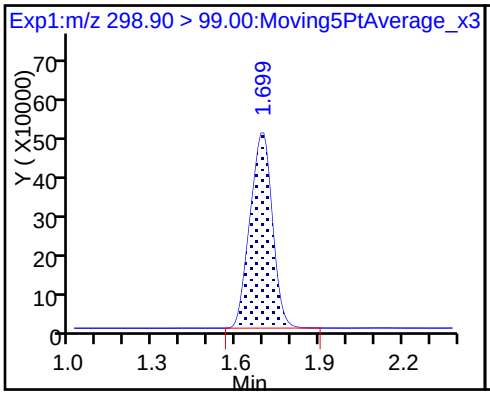
D 47 13C3-PFBS



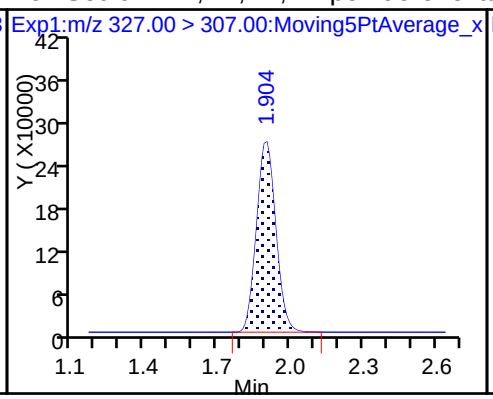
5 Perfluorobutanesulfonic acid



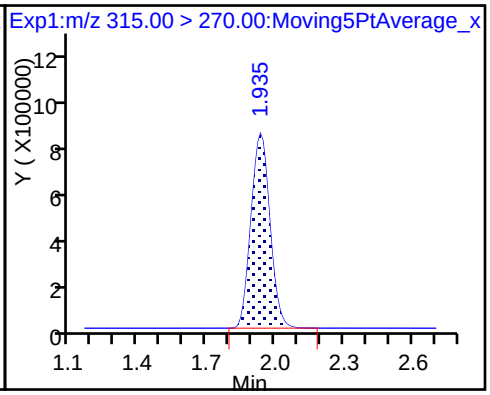
5 Perfluorobutanesulfonic acid



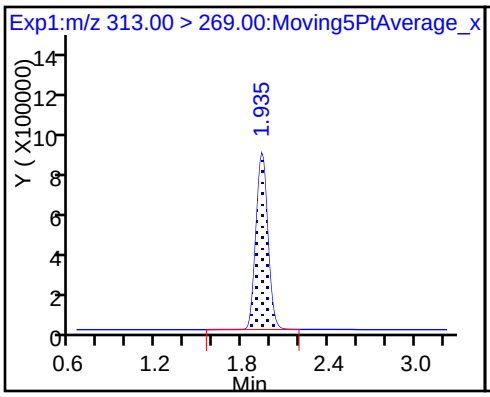
61 Sodium 1H,1H,2H,2H-perfluorohexa



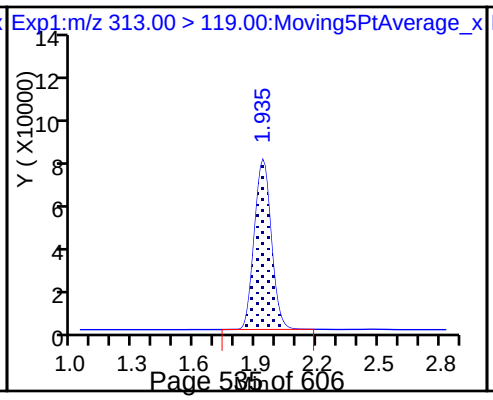
D 7 13C2 PFHxA



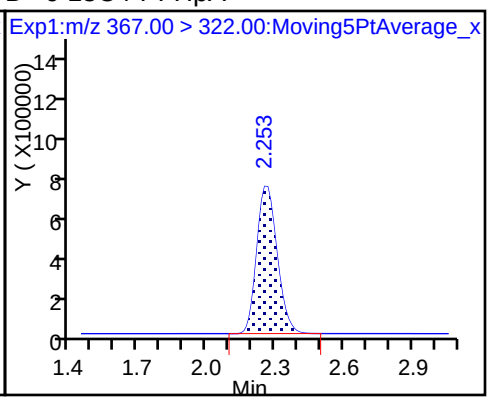
6 Perfluorohexanoic acid



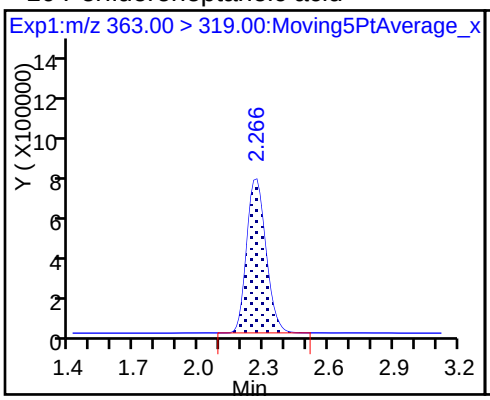
6 Perfluorohexanoic acid



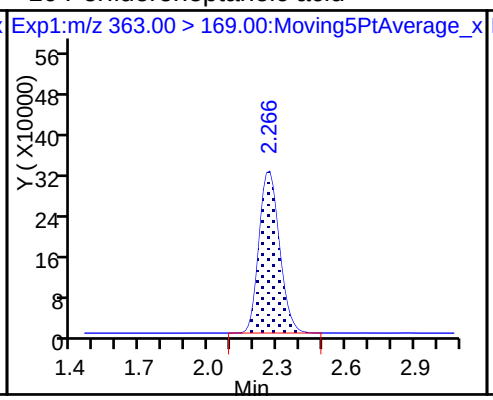
D 9 13C4-PFHpA



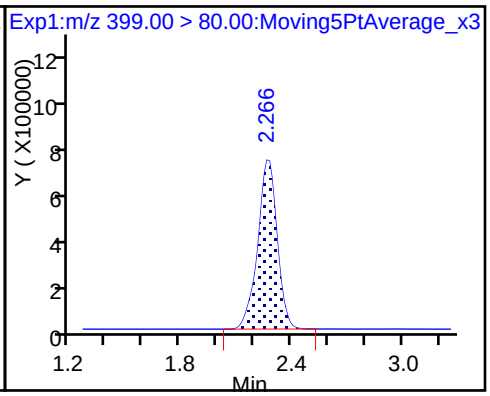
10 Perfluoroheptanoic acid



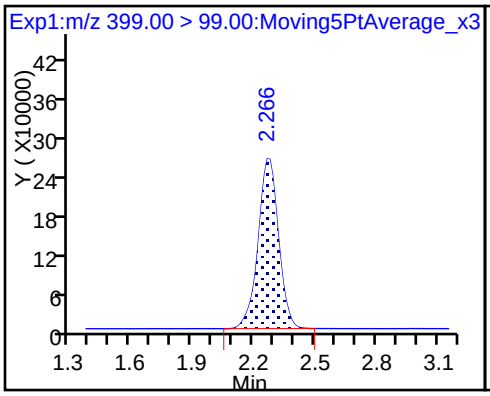
10 Perfluoroheptanoic acid



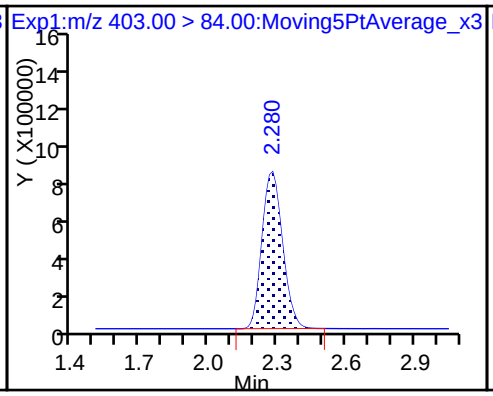
8 Perfluorohexanesulfonic acid



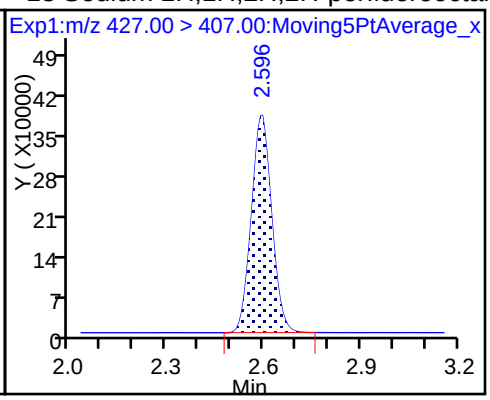
8 Perfluorohexanesulfonic acid



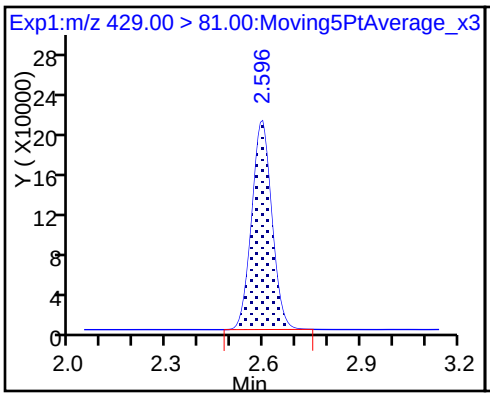
D 11 18O2 PFHxS



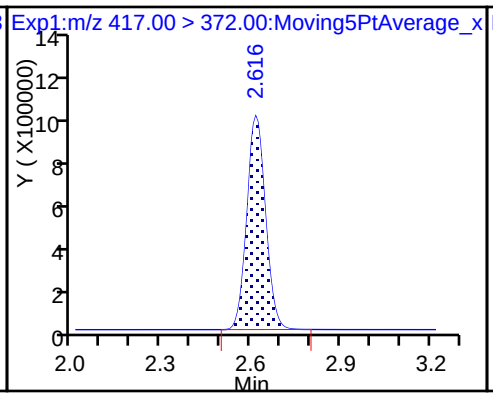
13 Sodium 1H,1H,2H,2H-perfluorooctane



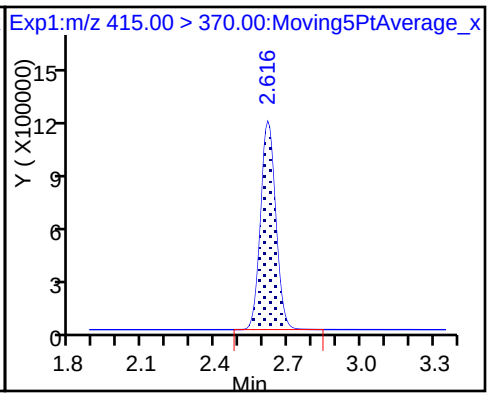
D 12 M2-6:2FTS



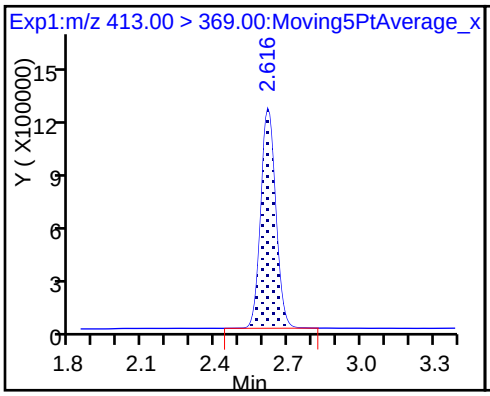
D 14 13C4 PFOA



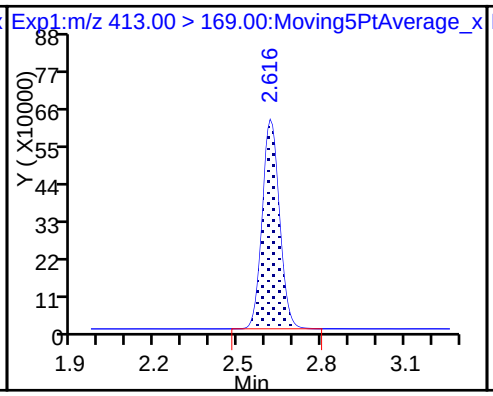
* 62 13C2-PFOA



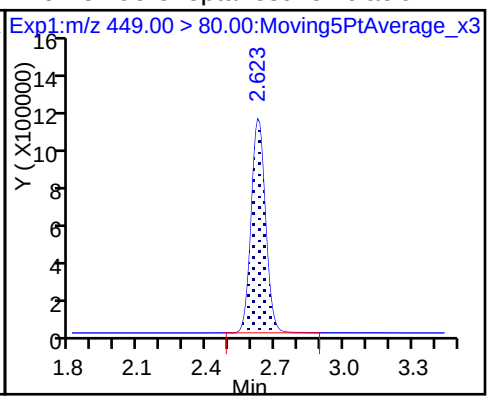
15 Perfluorooctanoic acid



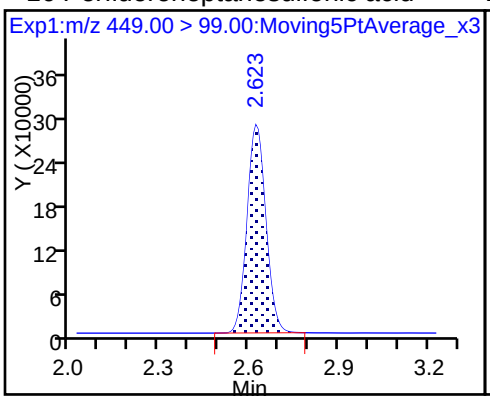
15 Perfluorooctanoic acid



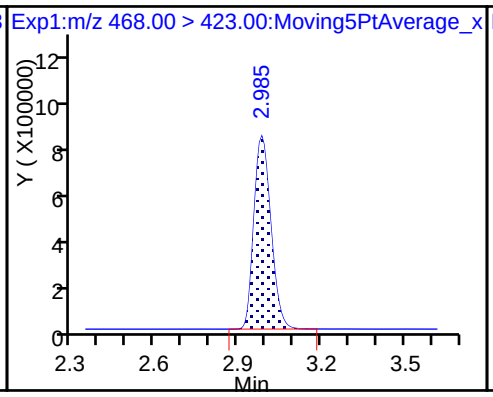
16 Perfluoroheptanesulfonic acid



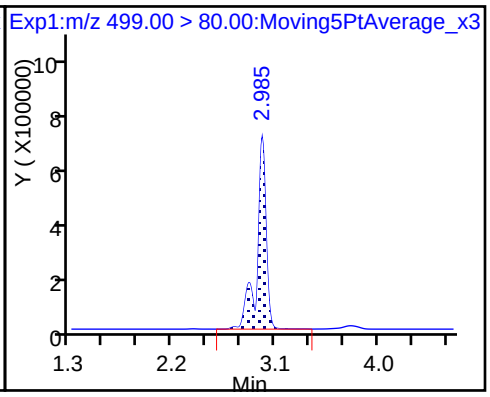
16 Perfluoroheptanesulfonic acid



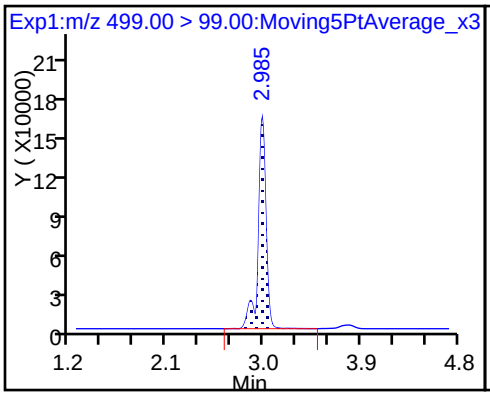
D 19 13C5 PFNA



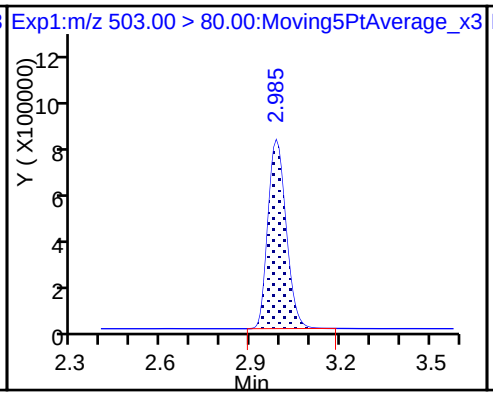
17 Perfluorooctane sulfonic acid



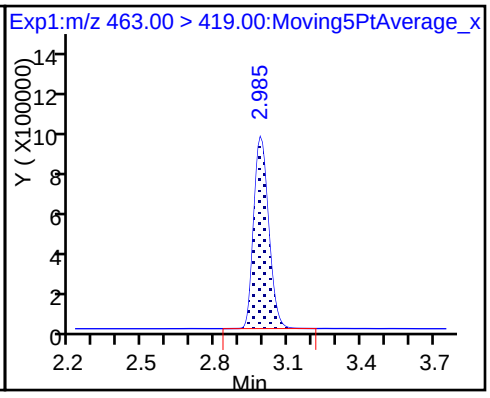
17 Perfluorooctane sulfonic acid



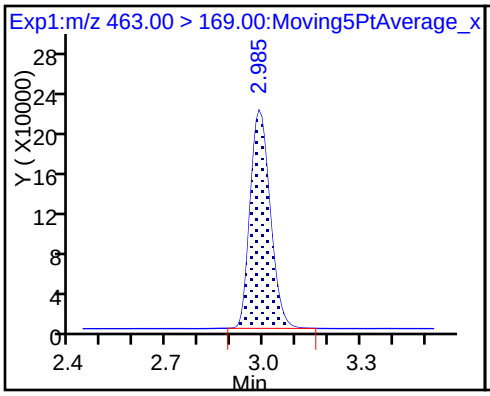
D 18 13C4 PFOS



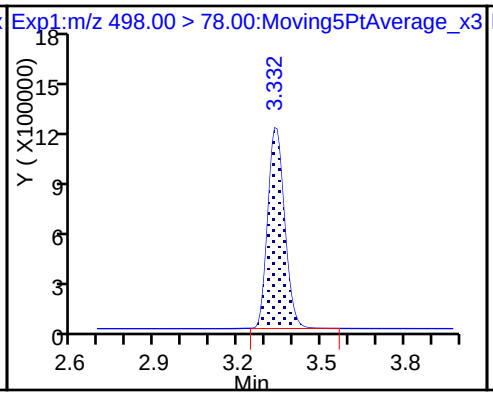
20 Perfluorononanoic acid



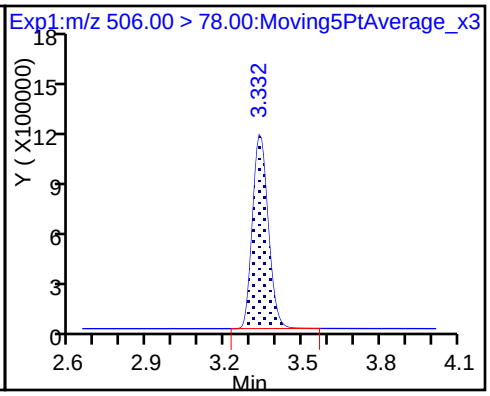
20 Perfluorononanoic acid



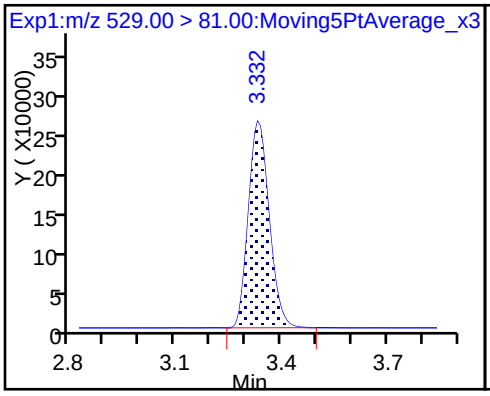
22 Perfluorooctane Sulfonamide



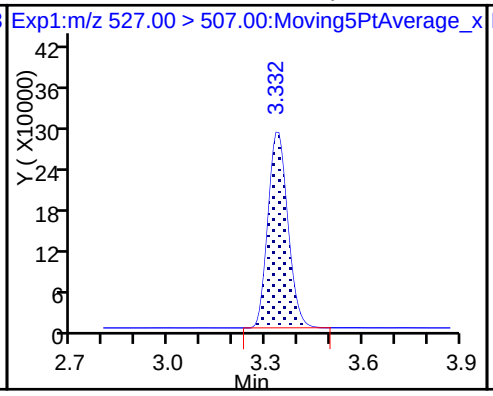
D 21 13C8 FOSA



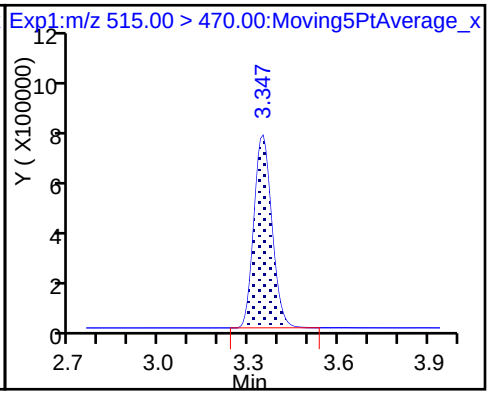
D 26 M2-8:2FTS



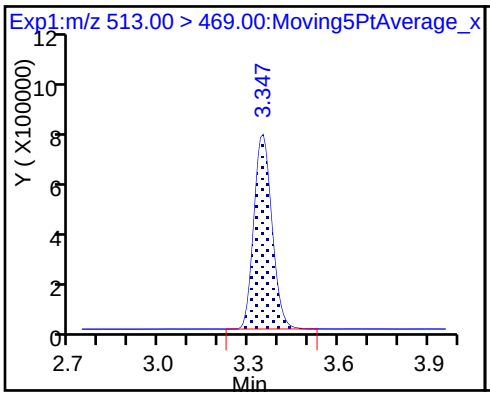
25 Sodium 1H,1H,2H,2H-perfluorodecane



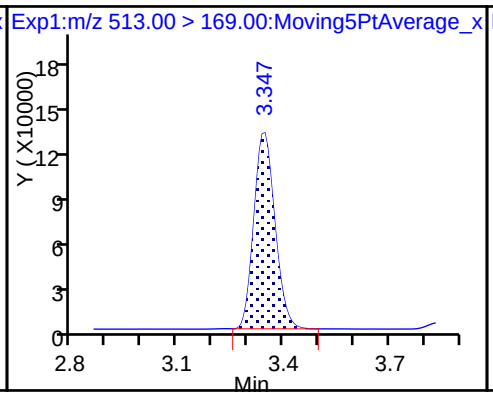
D 23 13C2 PFDA



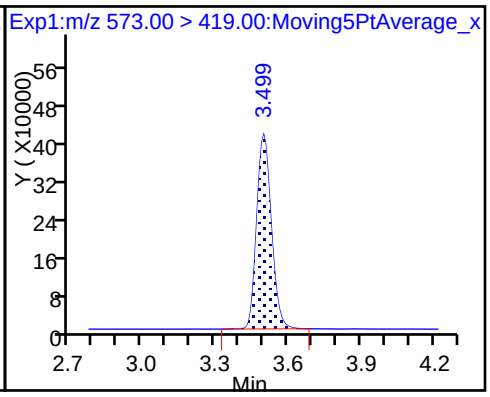
24 Perfluorodecanoic acid



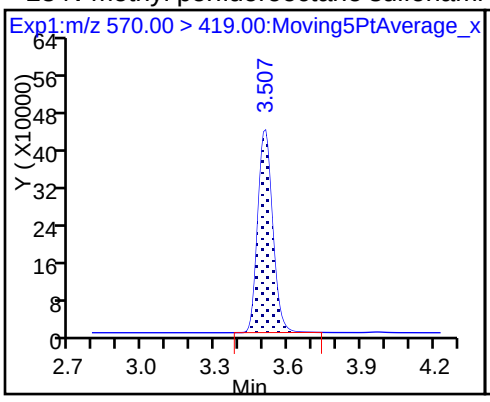
24 Perfluorodecanoic acid



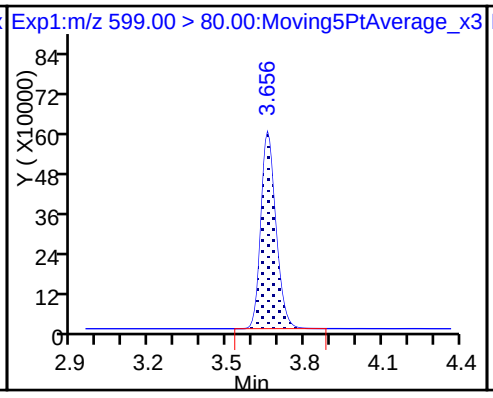
D 27 d3-NMeFOSAA



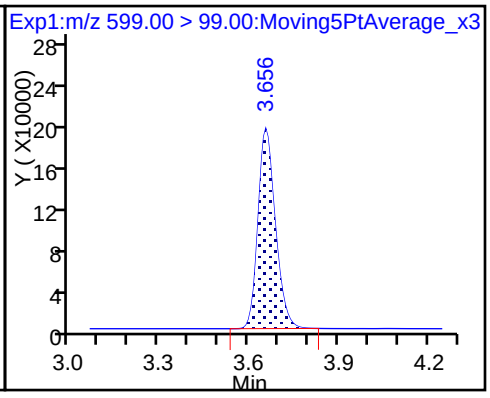
28 N-methyl perfluorooctane sulfonami



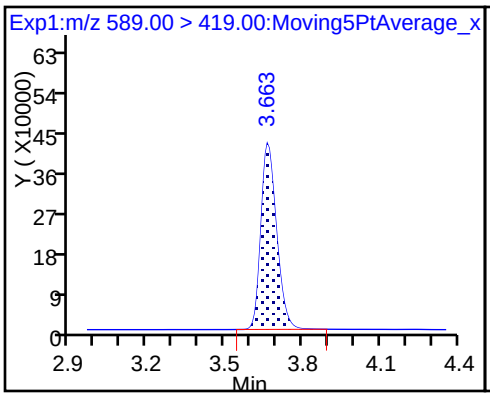
29 Perfluorodecane Sulfonic acid



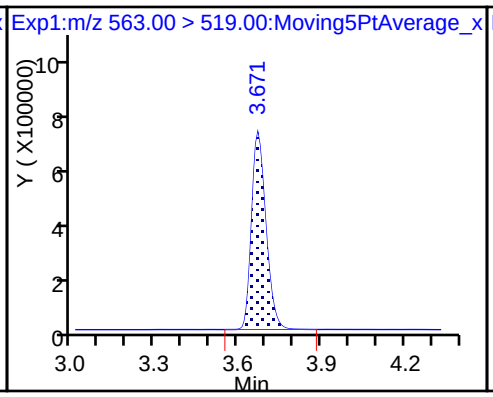
29 Perfluorodecane Sulfonic acid



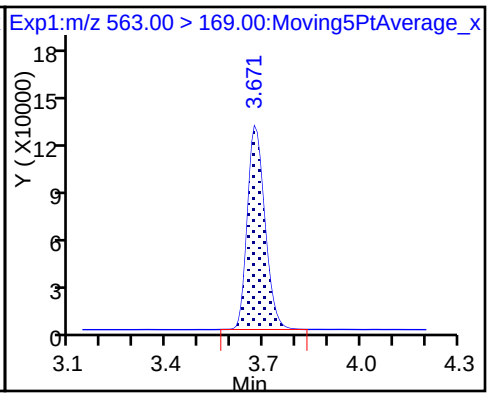
D 32 d5-NEtFOSAA



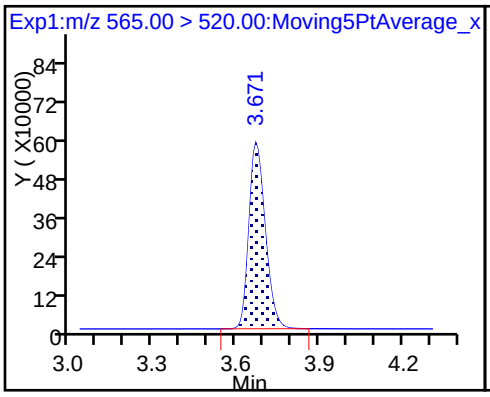
31 Perfluoroundecanoic acid



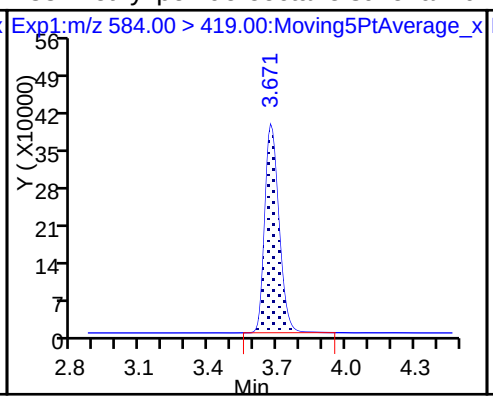
31 Perfluoroundecanoic acid



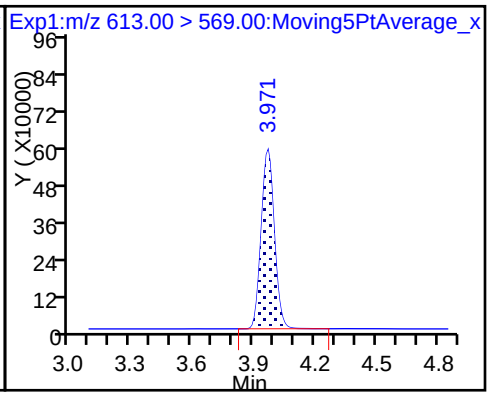
D 30 13C2 PFUnA



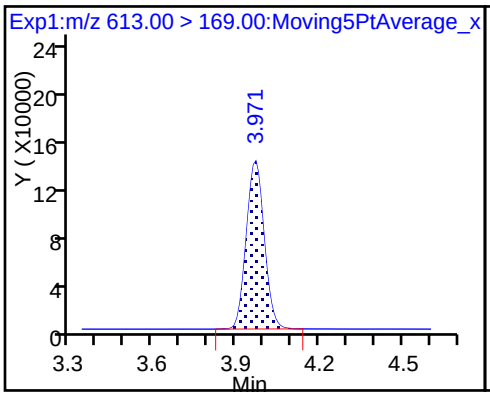
33 N-ethyl perfluorooctane sulfonamid



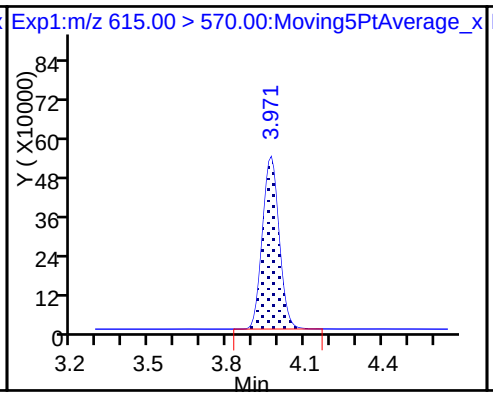
37 Perfluorododecanoic acid



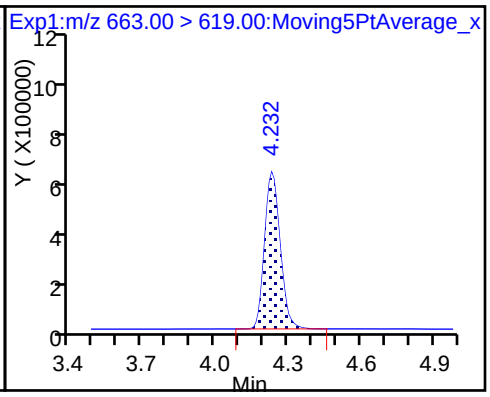
37 Perfluorododecanoic acid



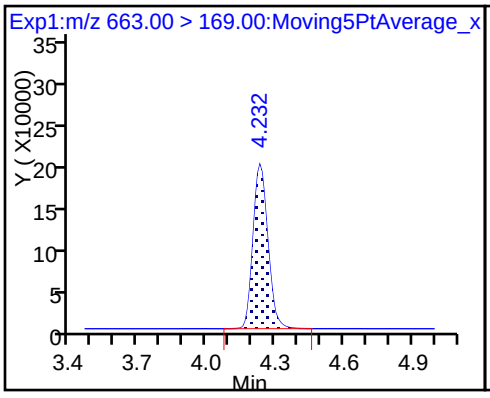
D 36 13C2 PFDoA



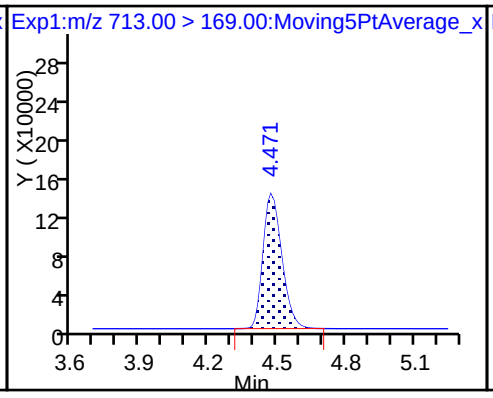
41 Perfluorotridecanoic acid



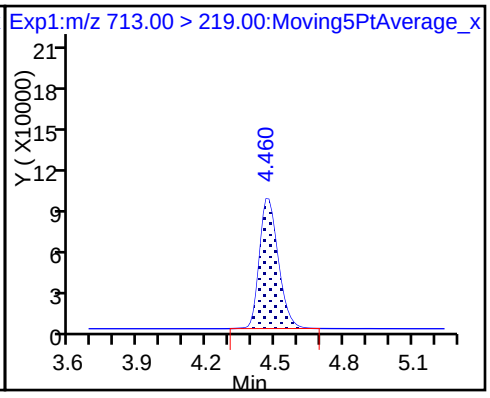
41 Perfluorotridecanoic acid



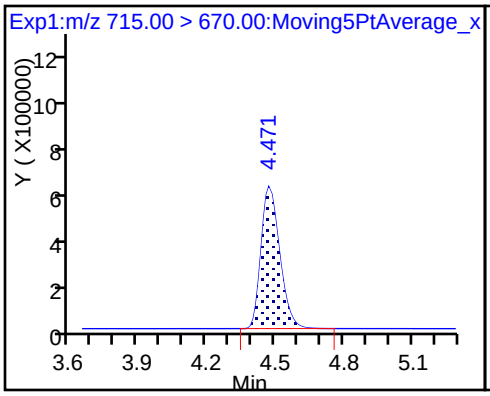
42 Perfluorotetradecanoic acid



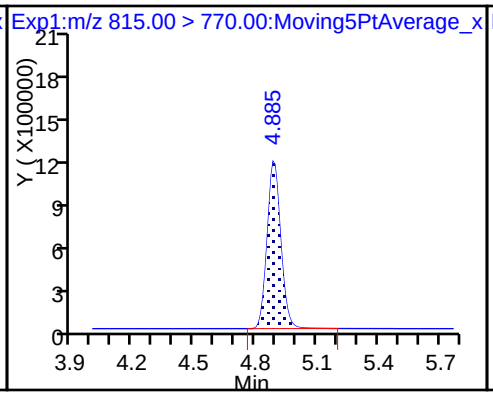
42 Perfluorotetradecanoic acid



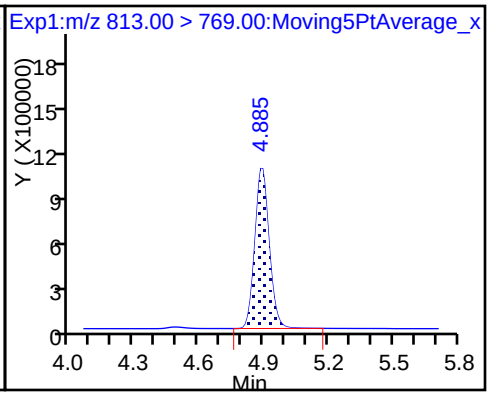
D 43 13C2-PFTeDA



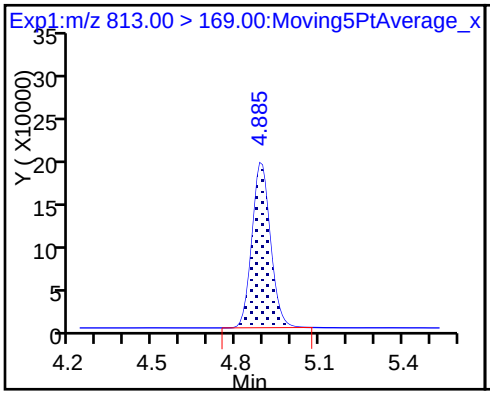
D 44 13C2-PFHxDA



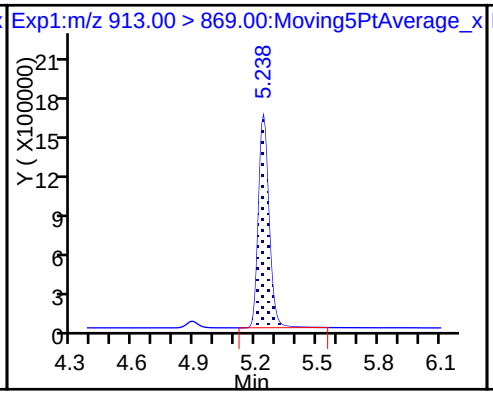
45 Perfluorohexadecanoic acid



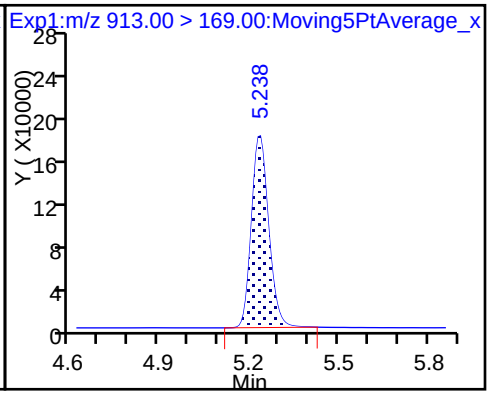
45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid



46 Perfluorooctadecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Lab Sample ID: CCV 320-204757/4 Calibration Date: 01/19/2018 17:13

Instrument ID: A8_N Calib Start Date: 01/17/2018 14:19

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 01/17/2018 15:06

Lab File ID: 2018.01.19LLC_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9343	0.9181		0.983	1.00	-1.7	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.178	1.096		0.930	1.00	-7.0	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	77.21	79.38		0.909	0.884	2.8	25.0
4:2 FTS	AveID	13.89	15.58		1.05	0.934	12.1	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.036	0.9706		0.936	1.00	-6.4	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.099	1.086		0.988	1.00	-1.2	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.113	1.095		0.895	0.910	-1.6	25.0
6:2FTS	AveID	1.655	1.739		0.996	0.948	5.1	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.172	1.098		0.937	1.00	-6.3	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.354	1.400		0.984	0.952	3.4	25.0
Perfluorononanoic acid (PFNA)	AveID	1.032	1.030		0.998	1.00	-0.2	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.119	1.091		0.904	0.928	-2.6	25.0
8:2FTS	AveID	1.217	1.100		0.866	0.958	-9.6	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9823	1.011		1.03	1.00	3.0	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9702	0.9368		0.965	1.00	-3.5	25.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.080	0.9785		0.906	1.00	-9.4	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6549	0.6870		1.01	0.964	4.9	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.032	0.9616		0.932	1.00	-6.8	25.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9739	0.9028		0.927	1.00	-7.3	25.0
Perfluorododecanoic acid (PFDoA)	AveID	1.025	1.029		1.00	1.00	0.4	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.161	1.095		0.943	1.00	-5.7	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2440	0.2410		0.988	1.00	-1.2	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		0.9328		0.965	1.00	-3.5	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.054	1.026		0.974	1.00	-2.6	25.0
13C4 PFBA	Ave	1.512	1.464		2.42	2.50	-3.2	50.0
13C5 PFPeA	Ave	0.8956	0.8847		2.47	2.50	-1.2	50.0
13C3-PFBS	Ave	0.0198	0.0193		2.26	2.33	-2.7	50.0
13C2 PFHxA	Ave	0.9649	0.9644		2.50	2.50	-0.0	50.0
13C4-PFHpA	Ave	0.9187	0.9102		2.48	2.50	-0.9	50.0
18O2 PFHxS	Ave	1.131	1.098		2.30	2.37	-2.9	50.0
M2-6:2FTS	Ave	0.1699	0.2028		2.83	2.38	19.4	50.0

FORM VII 537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Lab Sample ID: CCV 320-204757/4 Calibration Date: 01/19/2018 17:13

Instrument ID: A8_N Calib Start Date: 01/17/2018 14:19

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 01/17/2018 15:06

Lab File ID: 2018.01.19LLC_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9004	0.9031		2.51	2.50	0.3	50.0
13C4 PFOS	Ave	0.7158	0.7027		2.35	2.39	-1.8	50.0
13C5 PFNA	Ave	0.7300	0.7264		2.49	2.50	-0.5	50.0
13C8 FOSA	Ave	1.007	0.9702		2.41	2.50	-3.6	50.0
M2-8:2FTS	Ave	0.1795	0.2206		2.94	2.40	22.8	50.0
13C2 PFDA	Ave	0.6306	0.6162		2.44	2.50	-2.3	50.0
d3-NMeFOSAA	Ave	0.3147	0.3480		2.76	2.50	10.6	50.0
d5-NEtFOSAA	Ave	0.3182	0.3620		2.84	2.50	13.8	50.0
13C2 PFUnA	Ave	0.4783	0.5040		2.63	2.50	5.4	50.0
13C2 PFDoA	Ave	0.5192	0.4992		2.40	2.50	-3.9	50.0
13C2-PFTeDA	Ave	0.6785	0.6407		2.36	2.50	-5.6	50.0
13C2-PFHxDA	Ave	1.209	1.092		2.26	2.50	-9.7	50.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180119-53121.b\2018.01.19LLC_012.d
Lims ID: CCV L4
Client ID:
Sample Type: CCV
Inject. Date: 19-Jan-2018 17:13:58 ALS Bottle#: 13 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: CCV L4
Misc. Info.: Plate: 1 Rack: 1
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Sublist: chrom-A8_N*sub30

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180119-53121.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 22-Jan-2018 09:48:51 Calib Date: 17-Jan-2018 15:06:20
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_008.d

Column 1 : Det: EXP1
Process Host: XAWRK027

First Level Reviewer: phomsophat Date: 20-Jan-2018 11:06:44

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.412	1.411	0.001	0.540	7285808	2.42		96.8	42498	
2 Perfluorobutyric acid										
212.90 > 169.00	1.412	1.413	-0.001	1.000	2675738	0.9827		98.3	495	
D 3 13C5-PFPeA										
267.90 > 223.00	1.660	1.659	0.001	0.635	4401836	2.47		98.8	82403	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.660	1.662	-0.002	1.000	1929983	0.9305		93.0	1207	
D 47 13C3-PFBS										
301.90 > 83.00	1.696	1.695	0.001	0.649	89257	2.26		97.3	2683	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.696	1.697	-0.001	1.000	2693821	0.9088		103	12402	
298.90 > 99.00	1.696	1.697	-0.001	1.000	1093391		2.46(1.25-3.74)		7113	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.900	1.903	-0.003	1.000	558599	1.05		112	20641	
D 60 M2-4:2FTS										
329.00 > 81.00	1.900	1.903	-0.003	0.727	680984	NC			6891	
D 7 13C2 PFHxA										
315.00 > 270.00	1.940	1.939	0.001	0.742	4798480	2.50		99.9	44420	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.930	1.939	-0.009	0.995	1862864	0.9364		93.6	5024	
313.00 > 119.00	1.940	1.939	0.001	1.000	175823		10.60(5.03-15.10)		3092	
D 9 13C4-PFHpA										
367.00 > 322.00	2.262	2.267	-0.005	0.866	4528781	2.48		99.1	25535	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.262	2.268	-0.006	1.000	1967286	0.9881		98.8	3560	
363.00 > 169.00	2.262	2.268	-0.006	1.000	742882		2.65(1.13-3.40)		4825	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.275	2.280	-0.005	1.000	2178074	0.8953		98.4	8537	
399.00 > 99.00	2.275	2.280	-0.005	1.000	673051		3.24(1.50-4.49)		5399	
D 11 18O2 PFHxS										
403.00 > 84.00	2.275	2.282	-0.007	0.871	5167408	2.30		97.1	24628	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.588	2.596	-0.008	1.000	665385	1.00		105	17359	
D 12 M2-6:2FTS										
429.00 > 81.00	2.588	2.597	-0.009	0.990	958387	2.83		119	22303	
D 14 13C4 PFOA										
417.00 > 372.00	2.613	2.622	-0.009	1.000	4493738	2.51		100	35317	
* 62 13C2-PFOA										
415.00 > 370.00	2.613	2.622	-0.009		4975745	2.50			32619	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.613	2.623	-0.010	1.000	1974081	0.9370		93.7	702	
413.00 > 169.00	2.613	2.623	-0.010	1.000	1009153		1.96(0.84-2.52)		7912	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.621	2.629	-0.008	1.000	1864206	0.9841		103	17884	
449.00 > 99.00	2.621	2.629	-0.008	1.000	506488		3.68(1.94-5.82)		9863	
D 19 13C5 PFNA										
468.00 > 423.00	2.976	2.992	-0.016	1.139	3614522	2.49		99.5	30940	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.976	2.992	-0.016	1.000	1415631	0.9042		97.4	564	
499.00 > 99.00	2.976	2.992	-0.016	1.000	313646		4.51(2.31-6.93)		712	
D 18 13C4 PFOS										
503.00 > 80.00	2.976	2.992	-0.016	1.139	3342601	2.35		98.2	18743	
20 Perfluorononanoic acid										
463.00 > 419.00	2.976	2.992	-0.016	1.000	1489145	1.00		99.8	3878	
463.00 > 169.00	2.976	2.992	-0.016	1.000	354736		4.20(1.90-5.69)		7407	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.335	3.338	-0.003	1.002	1953008	1.03		103	13420	
D 21 13C8 FOSA										
506.00 > 78.00	3.327	3.338	-0.011	1.273	4827202	2.41		96.4	17059	
D 26 M2-8:2FTS										
529.00 > 81.00	3.327	3.342	-0.015	1.273	1051298	2.94		123	16034	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.327	3.342	-0.015	1.000	462617	0.8660		90.4	9971	
D 23 13C2 PFDA										
515.00 > 470.00	3.343	3.352	-0.009	1.279	3065986	2.44		97.7	16701	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.343	3.353	-0.010	1.000	1148845	0.9655		96.5	5344	
513.00 > 169.00	3.343	3.353	-0.010	1.000	219314		5.24(2.36-7.09)		1665	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.495	3.507	-0.012	1.337	1731681	2.76		111	12421	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.503	3.513	-0.010	1.002	677806	0.9059		90.6	4202	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.652	3.666	-0.014	1.000	926182	1.01		105	16499	
599.00 > 99.00	3.652	3.666	-0.014	1.000	317351		2.92(1.39-4.16)		13177	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.665	3.672	-0.007	1.403	1801296	2.84		114	7198	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.665	3.678	-0.013	0.998	964546	0.9316		93.2	4510	
563.00 > 169.00	3.673	3.678	-0.005	1.000	200156		4.82(0.00-0.00)		10768	
D 30 13C2 PFUnA										
565.00 > 520.00	3.673	3.679	-0.006	1.405	2507711	2.63		105	24134	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.673	3.679	-0.006	1.002	650504	0.9271		92.7	5417	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.974	3.979	-0.005	1.002	1022592	1.00		100	3742	
613.00 > 169.00	3.966	3.979	-0.013	1.000	246803		4.14(2.13-6.40)		10886	
D 36 13C2 PFDoA										
615.00 > 570.00	3.966	3.979	-0.013	1.517	2483937	2.40		96.1	16037	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.235	4.242	-0.007	1.000	1087621	0.9427		94.3	2441	
663.00 > 169.00	4.235	4.242	-0.007	1.000	331948		3.28(1.25-3.76)		10737	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.473	4.483	-0.010	1.000	307356	0.9878		98.8	9035	
713.00 > 219.00	4.462	4.483	-0.021	0.997	208975		1.47(0.71-2.13)		6198	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.473	4.483	-0.010	1.712	3187877	2.36		94.4	16656	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.887	4.902	-0.015	1.870	5435423	2.26		90.3	11425	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.887	4.902	-0.015	1.000	2028147	0.9652		96.5	1438	
813.00 > 169.00	4.887	4.902	-0.015	1.000	363020		5.59(2.86-8.58)		5379	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.239	5.255	-0.016	1.000	2231372	0.9741		97.4	453	
913.00 > 169.00	5.232	5.255	-0.023	0.999	284821		7.83(0.00-0.00)		1548	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC_LL4_00003 Amount Added: 1.00 Units: mL

Report Date: 22-Jan-2018 09:48:52 Chrom Revision: 2.2 08-Dec-2017 11:41:26

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180119-53121.b\2018.01.19LLC_012.d

Injection Date: 19-Jan-2018 17:13:58 Instrument ID: A8_N

Lims ID: CCV L4

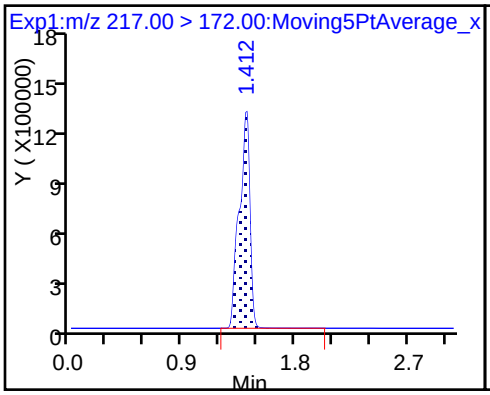
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 13 Worklist Smp#: 4

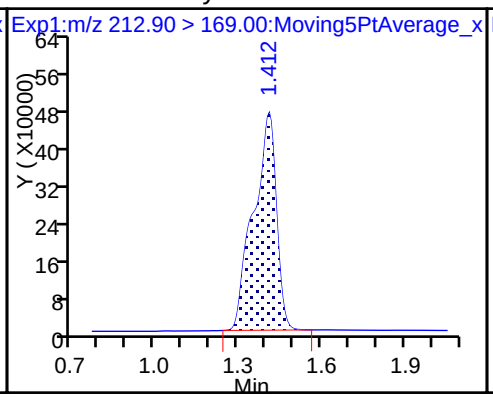
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

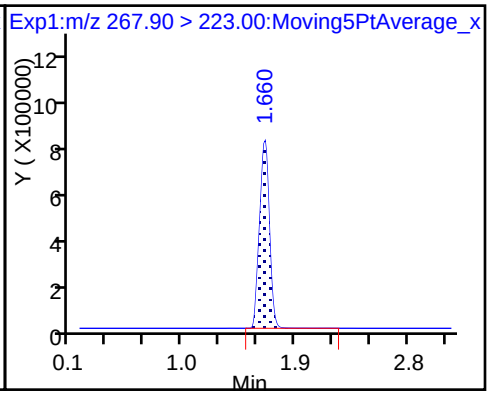
D 1 13C4 PFBA



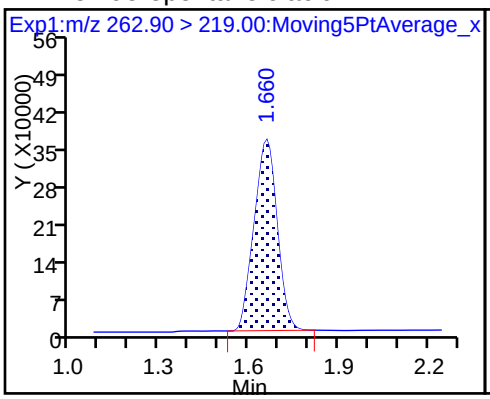
2 Perfluorobutyric acid



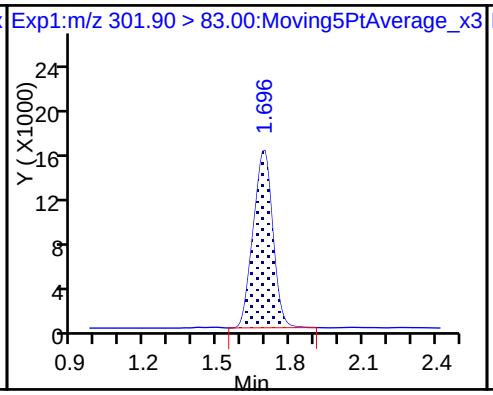
D 3 13C5-PFPeA



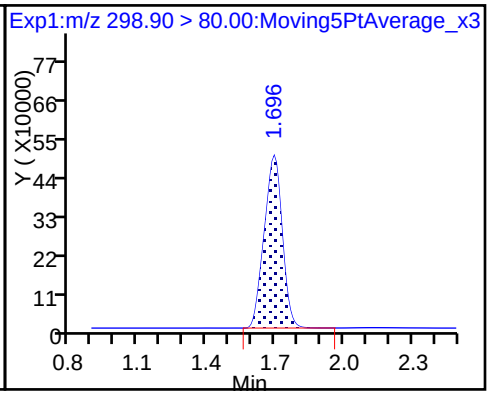
4 Perfluoropentanoic acid



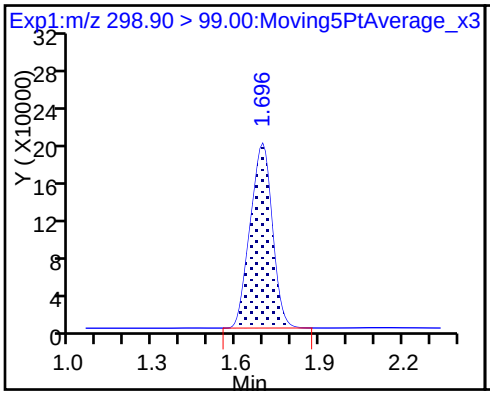
D 47 13C3-PFBS



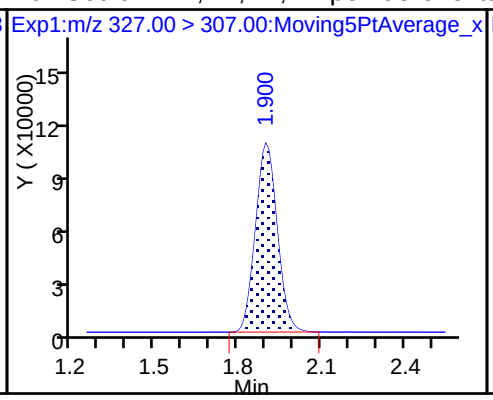
5 Perfluorobutanesulfonic acid



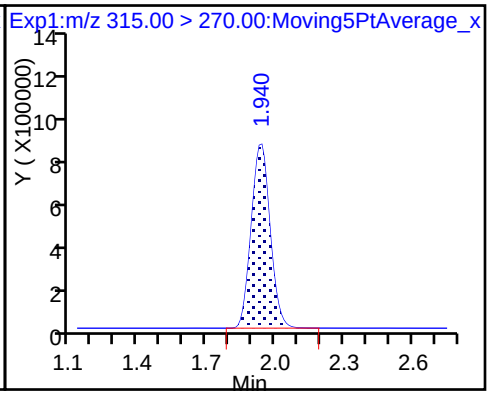
5 Perfluorobutanesulfonic acid



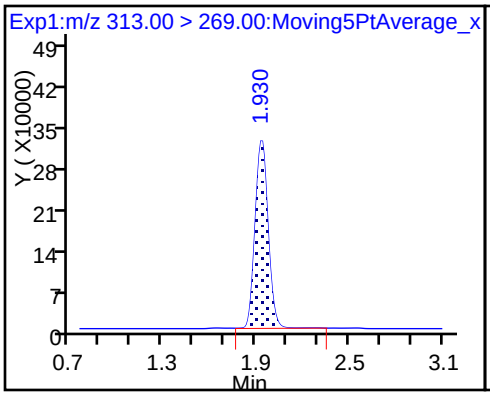
61 Sodium 1H,1H,2H,2H-perfluorohexa



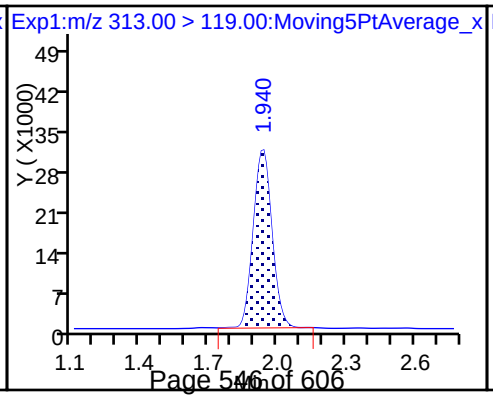
D 7 13C2 PFHxA



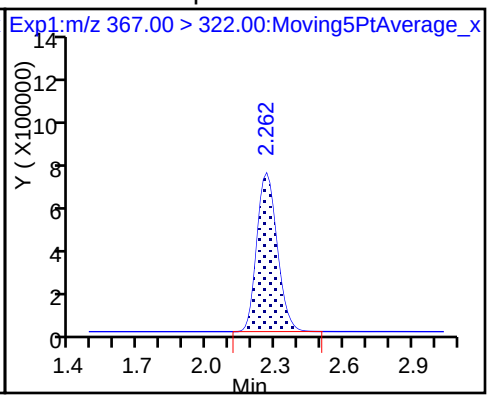
6 Perfluorohexanoic acid



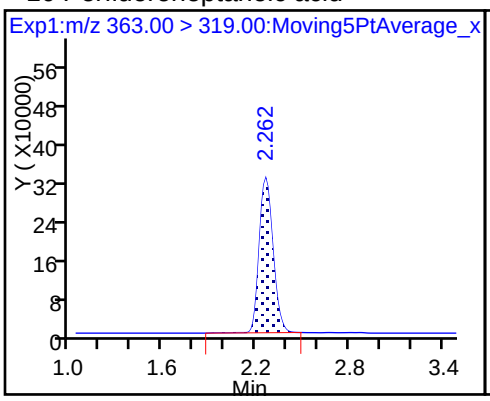
6 Perfluorohexanoic acid



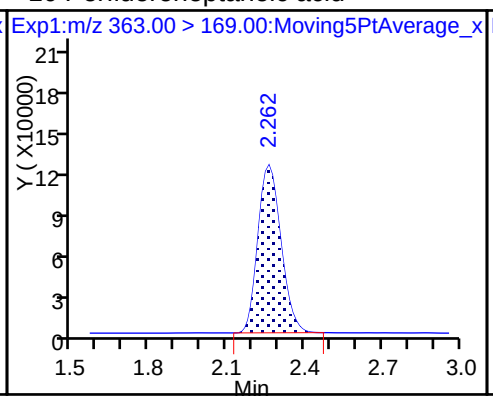
D 9 13C4-PFHpA



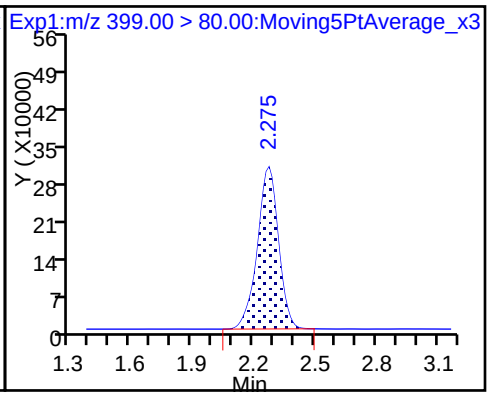
10 Perfluoroheptanoic acid



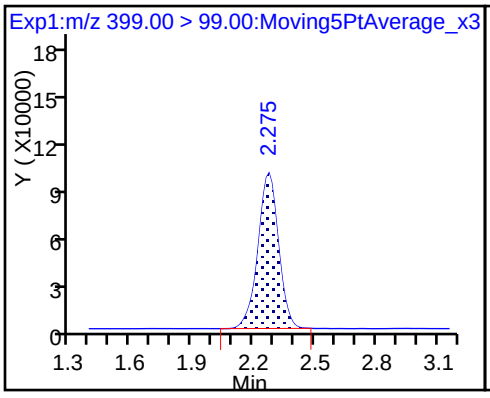
10 Perfluoroheptanoic acid



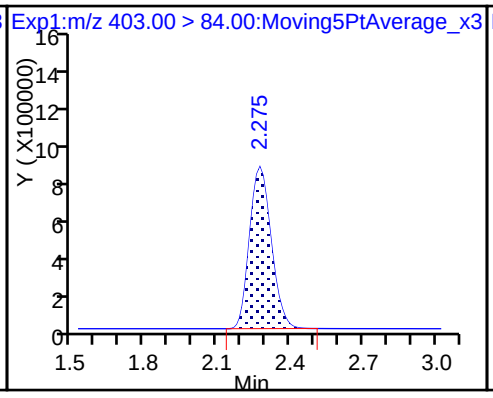
8 Perfluorohexanesulfonic acid



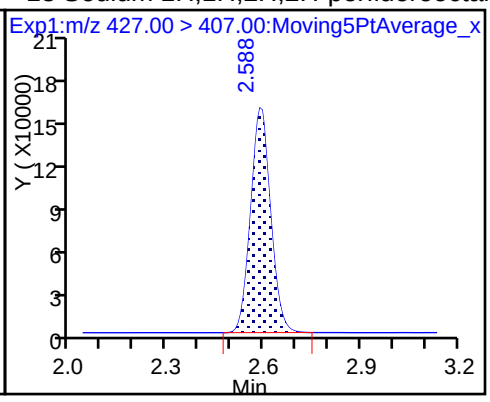
8 Perfluorohexanesulfonic acid



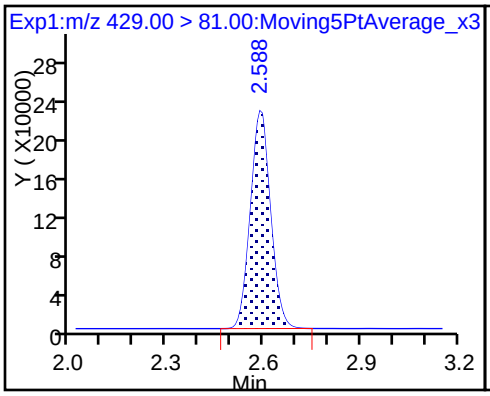
D 11 18O2 PFHxS



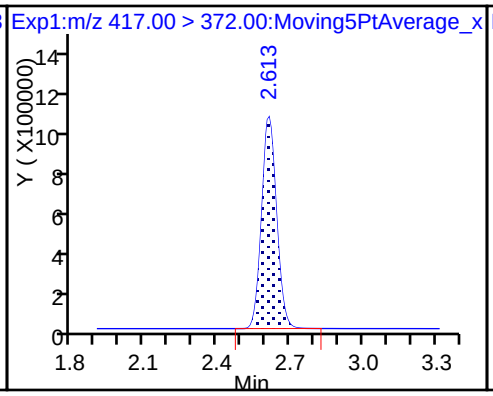
13 Sodium 1H,1H,2H,2H-perfluorooctane



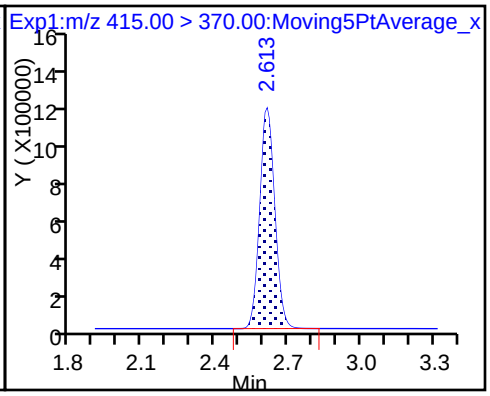
D 12 M2-6:2FTS



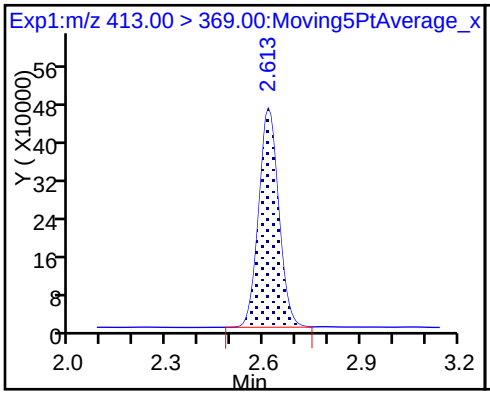
D 14 13C4 PFOA



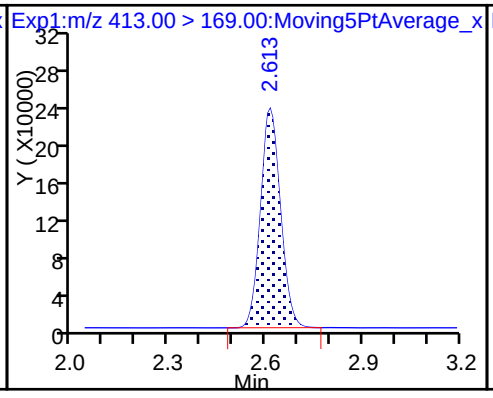
* 62 13C2-PFOA



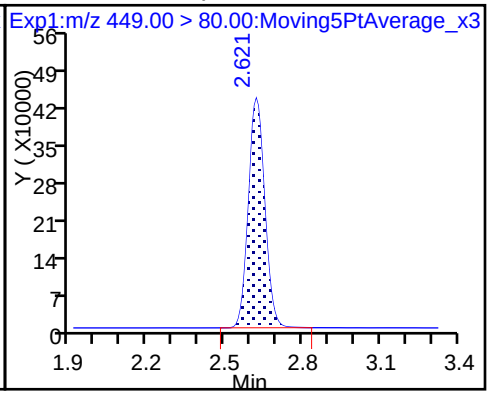
15 Perfluorooctanoic acid



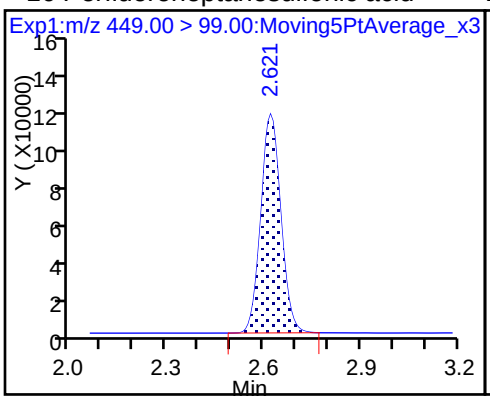
15 Perfluorooctanoic acid



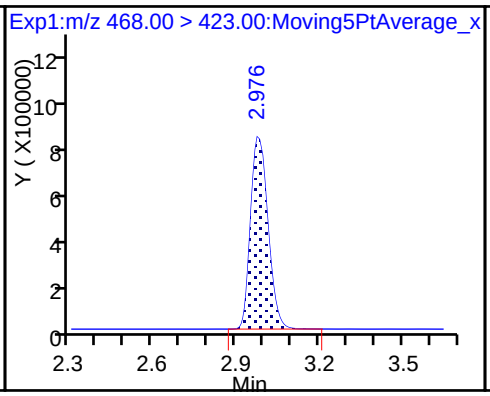
16 Perfluoroheptanesulfonic acid



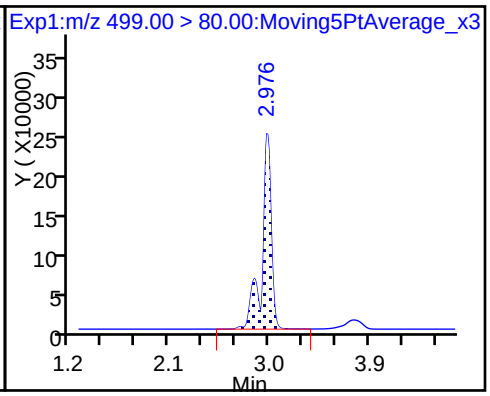
16 Perfluoroheptanesulfonic acid



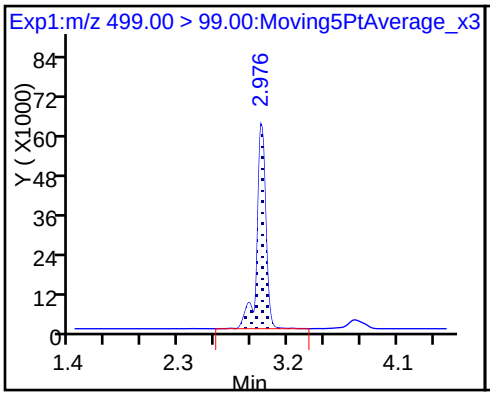
D 19 13C5 PFNA



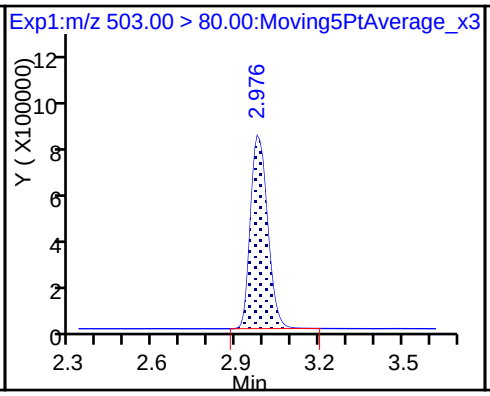
17 Perfluorooctane sulfonic acid



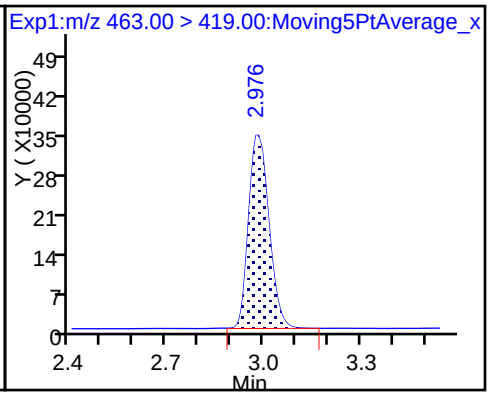
17 Perfluorooctane sulfonic acid



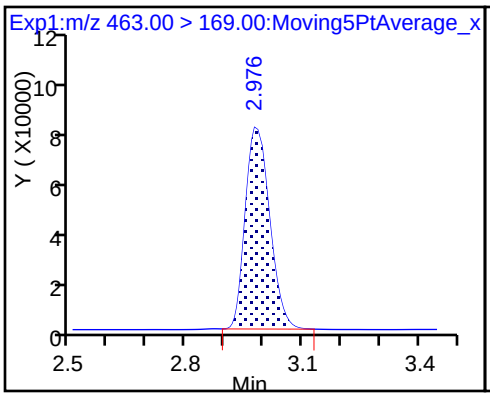
D 18 13C4 PFOS



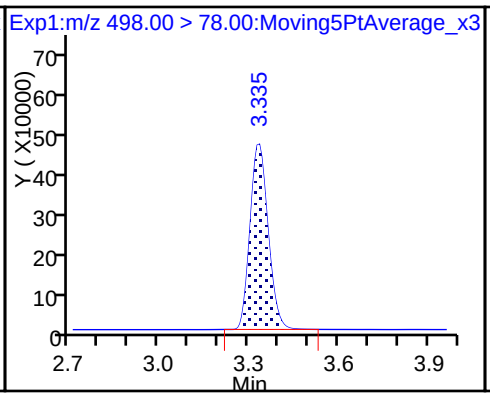
20 Perfluorononanoic acid



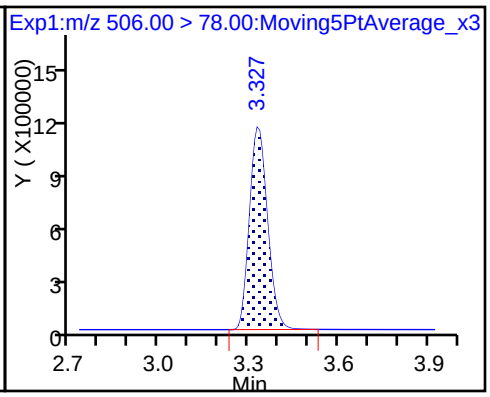
20 Perfluorononanoic acid



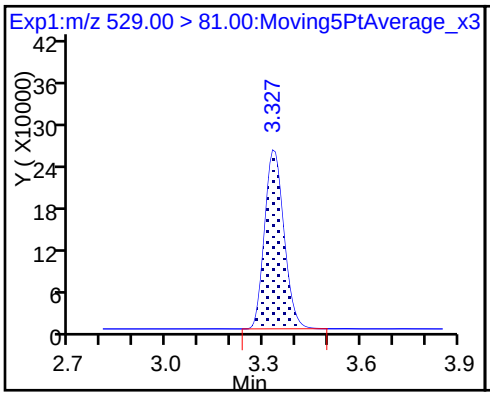
22 Perfluorooctane Sulfonamide



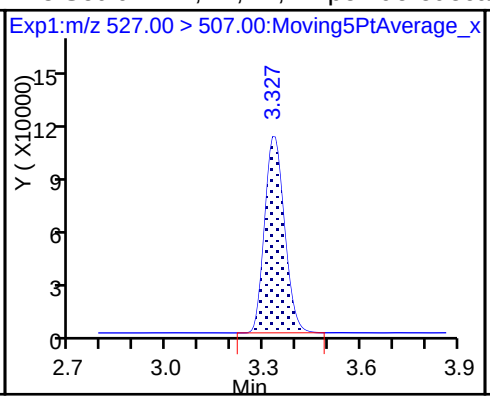
D 21 13C8 FOSA



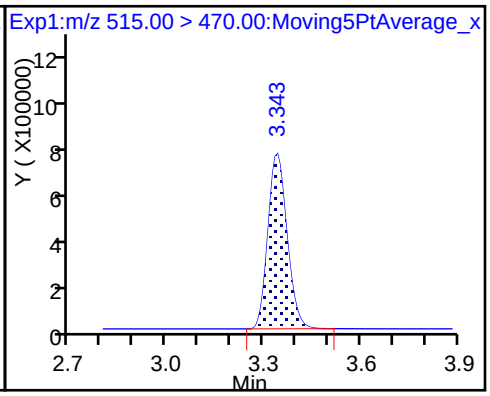
D 26 M2-8:2FTS



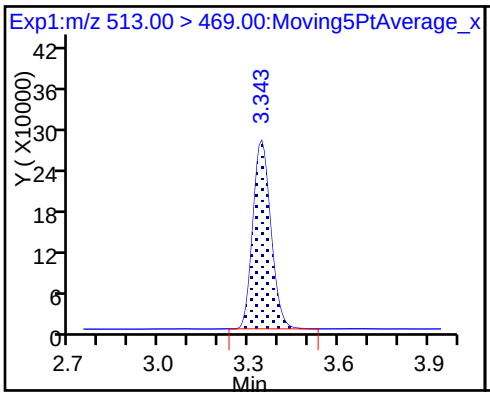
25 Sodium 1H,1H,2H,2H-perfluorodecane



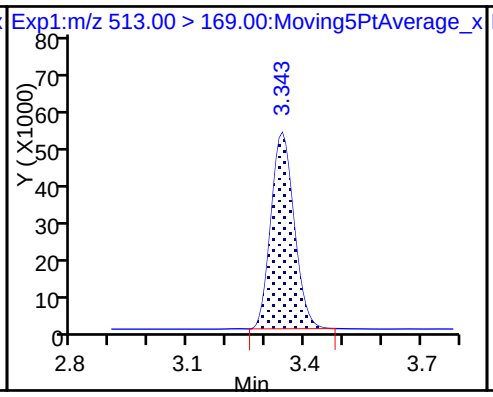
D 23 13C2 PFDA



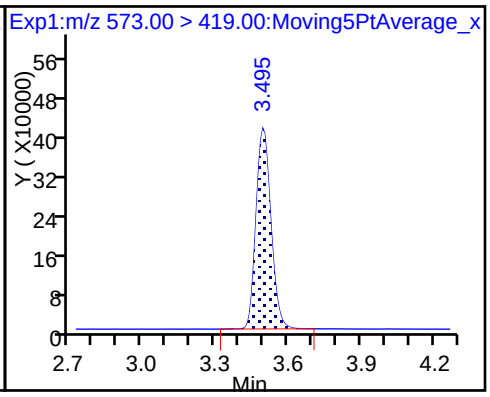
24 Perfluorodecanoic acid



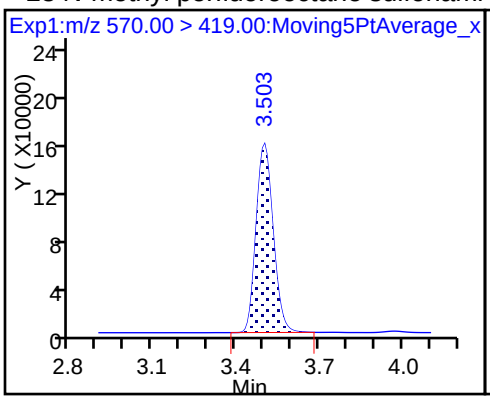
24 Perfluorodecanoic acid



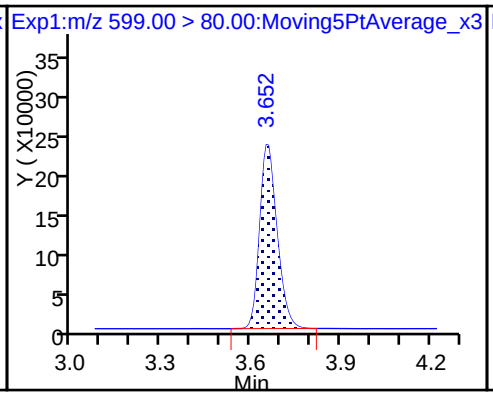
D 27 d3-NMeFOSAA



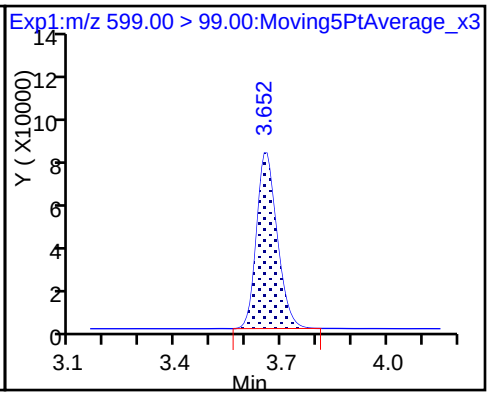
28 N-methyl perfluorooctane sulfonami



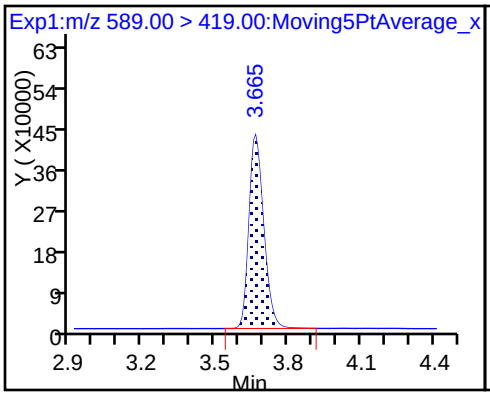
29 Perfluorodecane Sulfonic acid



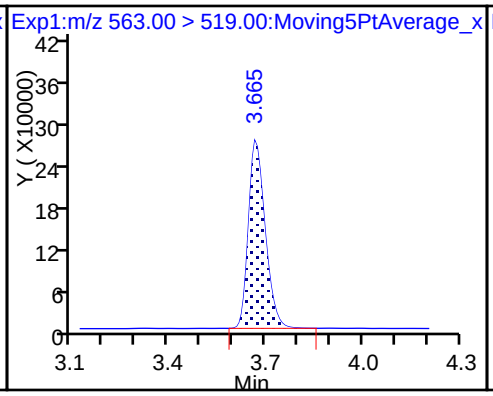
29 Perfluorodecane Sulfonic acid



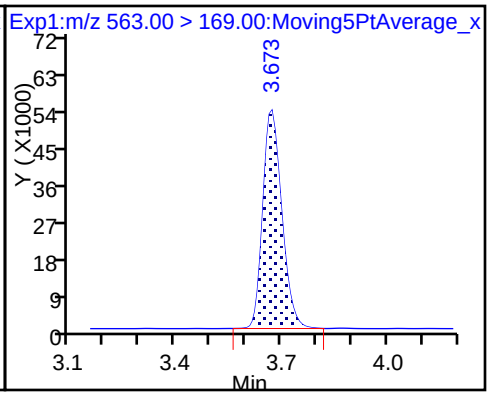
D 32 d5-NEtFOSAA



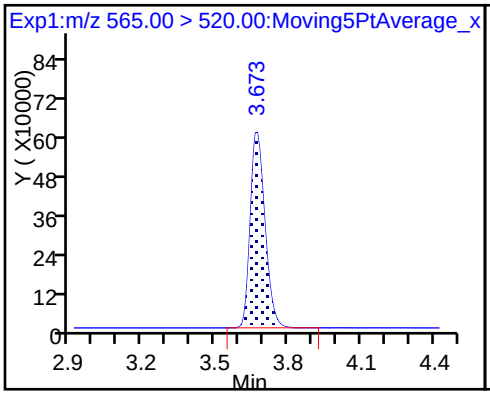
31 Perfluoroundecanoic acid



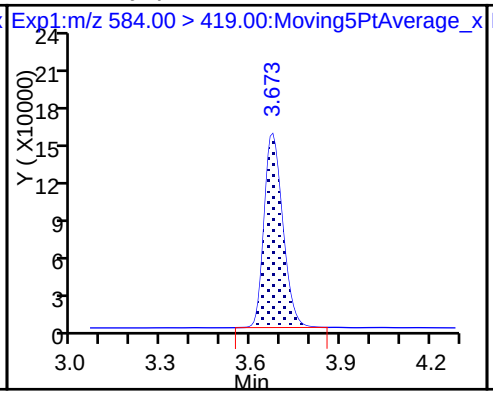
31 Perfluoroundecanoic acid



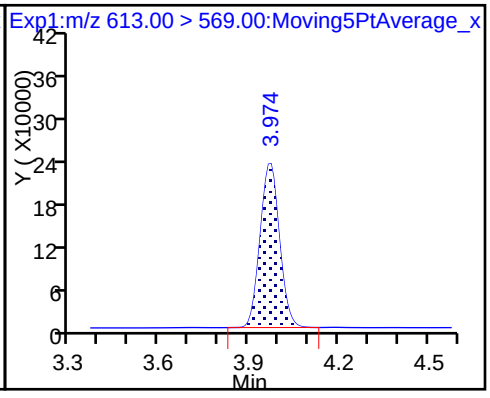
D 30 13C2 PFUnA



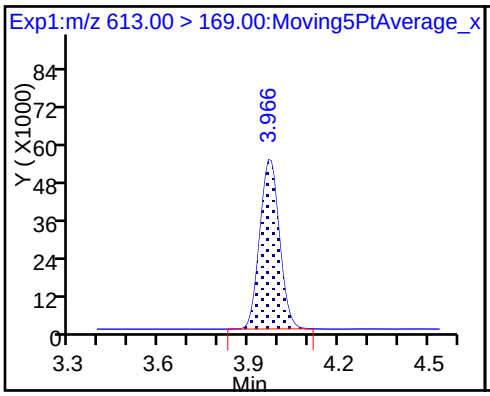
33 N-ethyl perfluorooctane sulfonamid



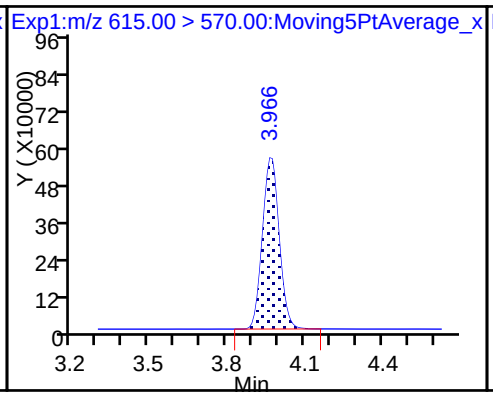
37 Perfluorododecanoic acid



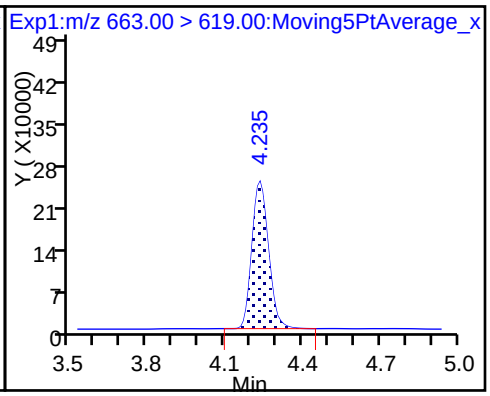
37 Perfluorododecanoic acid



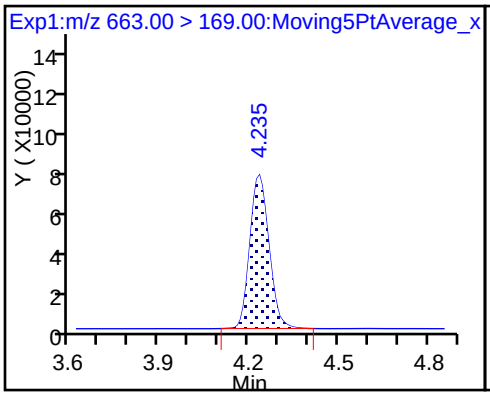
D 36 13C2 PFDoA



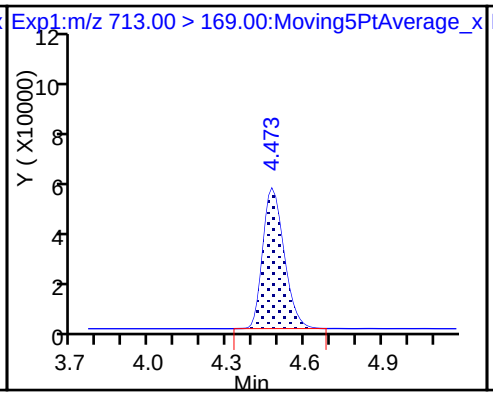
41 Perfluorotridecanoic acid



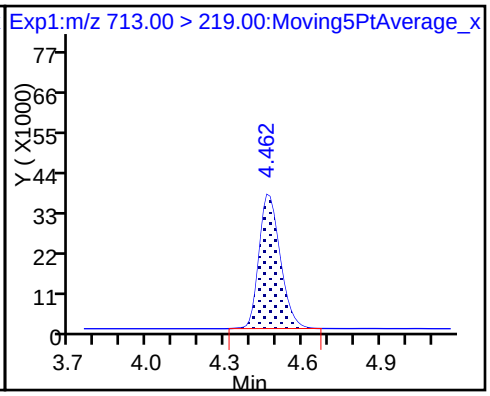
41 Perfluorotridecanoic acid



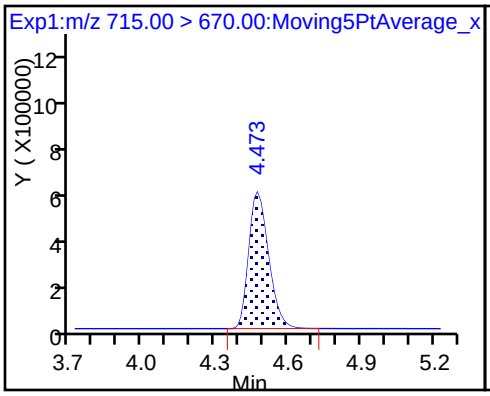
42 Perfluorotetradecanoic acid



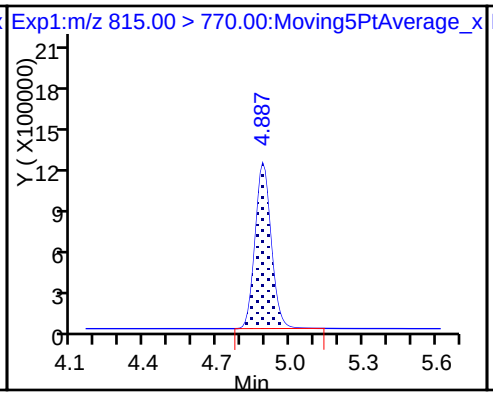
42 Perfluorotetradecanoic acid



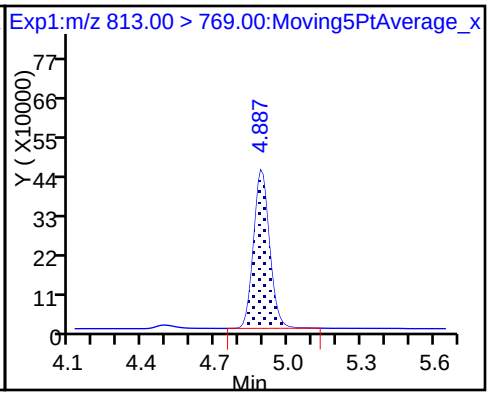
D 43 13C2-PFTeDA



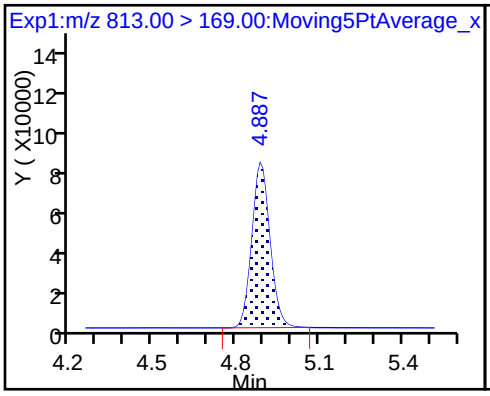
D 44 13C2-PFHxDA



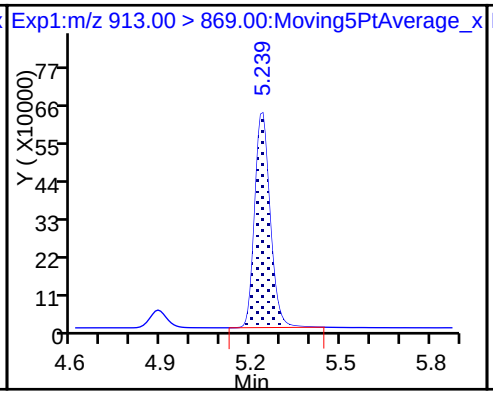
45 Perfluorohexadecanoic acid



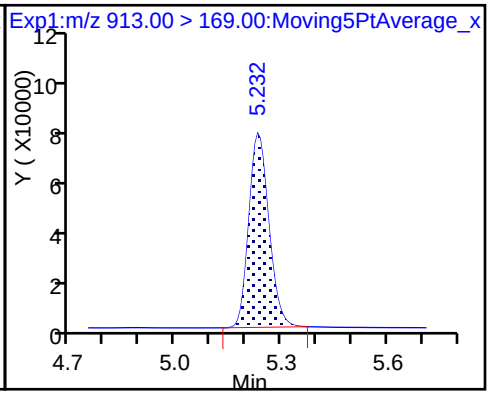
45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid



46 Perfluorooctadecanoic acid



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35042-1

SDG No.:

Client Sample ID: | Lab Sample ID: MB 320-204105/1-A

Matrix: Water | Lab File ID: 2018.01.18LLA_002.d

Analysis Method: 537 (modified) | Date Collected:

Extraction Method: 3535 | Date Extracted: 01/16/2018 09:18

Sample wt/vol: 250(mL) | Date Analyzed: 01/18/2018 17:37

Con. Extract Vol.: 10.0(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 204556 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	1.0	U	2.0	1.0	0.35
2706-90-3	Perfluoropentanoic acid (PFPeA)	1.0	U	2.0	1.0	0.49
307-24-4	Perfluorohexanoic acid (PFHxA)	2.0	U	4.0	2.0	0.58
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.0	U	2.0	1.0	0.25
335-67-1	Perfluorooctanoic acid (PFOA)	2.0	U	4.0	2.0	0.85
375-95-1	Perfluorononanoic acid (PFNA)	1.0	U	2.0	1.0	0.27
335-76-2	Perfluorodecanoic acid (PFDA)	1.0	U	2.0	1.0	0.31
2058-94-8	Perfluoroundecanoic acid (PFUnA)	3.0	U	4.0	3.0	1.1
307-55-1	Perfluorododecanoic acid (PFDoA)	2.0	U	4.0	2.0	0.55
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	3.0	U	4.0	3.0	1.3
376-06-7	Perfluorotetradecanoic acid (PFTeA)	1.0	U	2.0	1.0	0.29
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.0	U	2.0	1.0	0.30
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.0	U	2.0	1.0	0.30
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	1.0	U	2.0	1.0	0.30
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.0	U	4.0	2.0	0.54
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.0	U	2.0	1.0	0.32
754-91-6	Perfluorooctane Sulfonamide (FOSA)	1.0	U	2.0	1.0	0.35

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Client Sample ID: Lab Sample ID: MB 320-204105/1-A

Matrix: Water Lab File ID: 2018.01.18LLA_002.d

Analysis Method: 537 (modified) Date Collected:

Extraction Method: 3535 Date Extracted: 01/16/2018 09:18

Sample wt/vol: 250(mL) Date Analyzed: 01/18/2018 17:37

Con. Extract Vol.: 10.0(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 204556 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	91		25-150
STL00992	13C4 PFBA	104		25-150
STL00993	13C2 PFHxA	102		25-150
STL00990	13C4 PFOA	102		25-150
STL00995	13C5 PFNA	106		25-150
STL00996	13C2 PFDA	100		25-150
STL00997	13C2 PFUnA	107		25-150
STL00998	13C2 PFDoA	96		25-150
STL00994	18O2 PFHxS	104		25-150
STL00991	13C4 PFOS	104		25-150
STL02116	13C2-PFTeDA	98		25-150
STL01892	13C4-PFHpA	101		25-150
STL01893	13C5 PFPeA	108		25-150
STL02337	13C3-PFBS	101		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_002.d
Lims ID: MB 320-204105/1-A
Client ID:
Sample Type: MB
Inject. Date: 18-Jan-2018 17:37:41 ALS Bottle#: 41 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: mb 320-204105/1-a
Misc. Info.: Plate: 1 Rack: 5
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 19-Jan-2018 15:50:53 Calib Date: 17-Jan-2018 15:06:20
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_008.d

Column 1 : Det: EXP1
Process Host: XAWRK004

First Level Reviewer: roycea Date: 19-Jan-2018 15:46:51

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.405	1.411	-0.006	0.537	8068189	2.60		104	23833	
2 Perfluorobutyric acid										
212.90 > 169.00	1.405	1.413	-0.008	1.000	6929	0.002298			1.1	
D 3 13C5-PFPeA										
267.90 > 223.00	1.657	1.659	-0.002	0.633	4952911	2.70		108	41040	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.649	1.662	-0.013	0.995	8935	0.003828			8.5	
D 47 13C3-PFBS										
301.90 > 83.00	1.684	1.695	-0.011	0.643	95661	2.35		101	4863	
D 7 13C2 PFHxA										
315.00 > 270.00	1.938	1.939	-0.001	0.740	5033677	2.54		102	37665	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.927	1.939	-0.012	0.995	8071	0.003868			15.8	
313.00 > 119.00	1.948	1.939	0.009	1.005	1137		7.10(5.03-15.10)		17.5	
D 9 13C4-PFHpA										
367.00 > 322.00	2.271	2.267	0.004	0.868	4749565	2.52		101	33521	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.284	2.280	0.004	1.000	17700	0.006585			96.4	
399.00 > 99.00	2.284	2.280	0.004	1.000	6158		2.87(1.50-4.49)		58.4	
D 11 18O2 PFHxS										
403.00 > 84.00	2.284	2.282	0.002	0.873	5709381	2.46		104	42506	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.597	2.596	0.001	1.000	100967	0.1526			1949	
D 12 M2-6:2FTS										
429.00 > 81.00	2.597	2.597	0.0	0.992	949595	2.73		115	20089	
D 14 13C4 PFOA										
417.00 > 372.00	2.617	2.622	-0.005	1.000	4721642	2.56		102	39115	

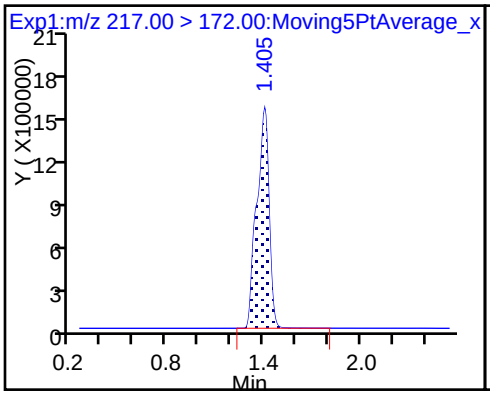
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
* 62 13C2-PFOA										
415.00 > 370.00	2.617	2.622	-0.005		5128534	2.50			30972	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.624	2.623	0.001	1.003	16152	0.007296			12.8	
413.00 > 169.00	2.617	2.623	-0.006	1.000	5374		3.01(0.84-2.52)		46.9	
D 19 13C5 PFNA										
468.00 > 423.00	2.987	2.992	-0.005	1.141	3978558	2.66		106	32289	
D 18 13C4 PFOS										
503.00 > 80.00	2.987	2.992	-0.005	1.141	3651397	2.49		104	23790	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.335	3.338	-0.003	1.002	3241	0.001750			77.6	
D 21 13C8 FOSA										
506.00 > 78.00	3.327	3.338	-0.011	1.271	4713458	2.28		91.3	22435	
D 26 M2-8:2FTS										
529.00 > 81.00	3.335	3.342	-0.007	1.274	970530	2.64		110	17090	
D 23 13C2 PFDA										
515.00 > 470.00	3.342	3.352	-0.010	1.277	3223387	2.49		99.7	24933	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.502	3.507	-0.005	1.338	1582220	2.45		98.0	10174	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.509	3.513	-0.004	1.002	5458	0.007983			44.4	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.666	3.672	-0.006	1.401	1706450	2.61		105	7034	
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.666	3.678	-0.012	0.998	9020	0.008315			44.8	
563.00 > 169.00	3.673	3.678	-0.005	1.000	1788		5.04(0.00-0.00)		89.0	
D 30 13C2 PFUnA										
565.00 > 520.00	3.673	3.679	-0.006	1.404	2627387	2.68		107	18459	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.673	3.679	-0.006	1.002	7069	0.0106			128	
D 36 13C2 PFDoA										
615.00 > 570.00	3.975	3.979	-0.004	1.519	2557236	2.40		96.0	25236	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.473	4.483	-0.010	1.709	3424042	2.46		98.4	24169	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.887	4.902	-0.015	1.868	6050479	2.44		97.6	15246	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.887	4.902	-0.015	1.000	56512	0.005293			46.2	
813.00 > 169.00	4.887	4.902	-0.015	1.000	9486		5.96(2.86-8.58)		240	

Report Date: 19-Jan-2018 15:50:55 Chrom Revision: 2.2 08-Dec-2017 11:41:26

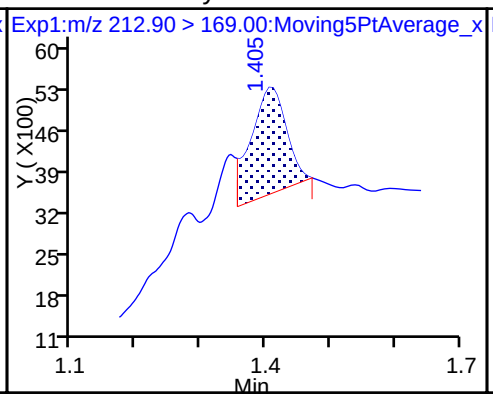
TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_002.d
Injection Date: 18-Jan-2018 17:37:41 Instrument ID: A8_N
Lims ID: MB 320-204105/1-A
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 41 Worklist Smp#: 2
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: A8_N Limit Group: LC PFC_DOD ICAL

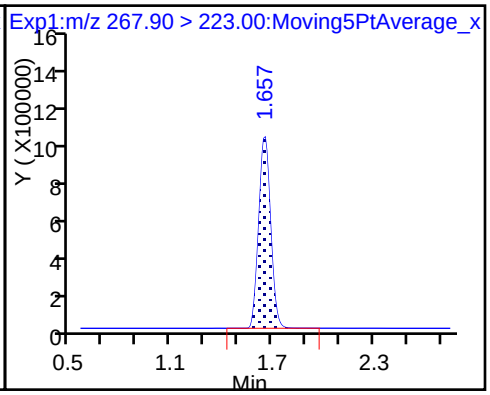
D 1 13C4 PFBA



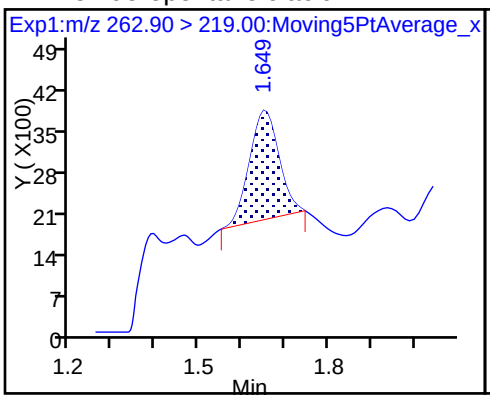
2 Perfluorobutyric acid



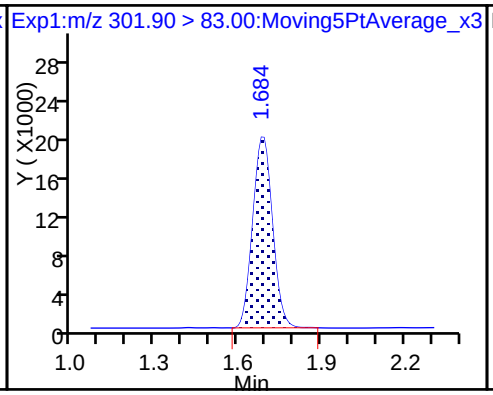
D 3 13C5-PFPeA



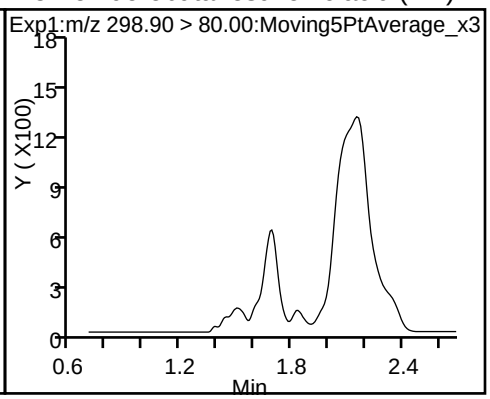
4 Perfluoropentanoic acid



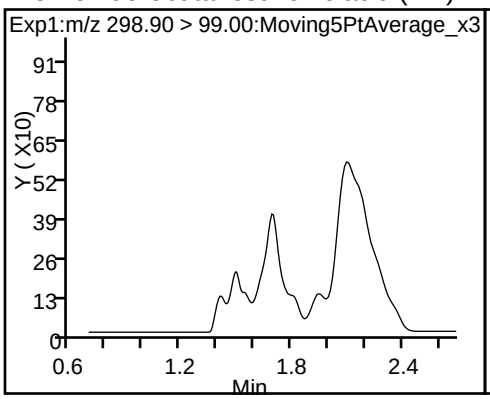
D 47 13C3-PFBS



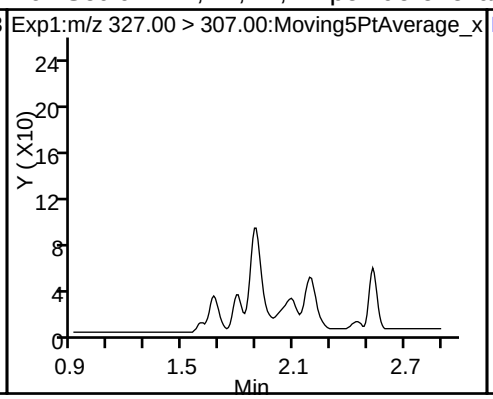
5 Perfluorobutanesulfonic acid (ND)



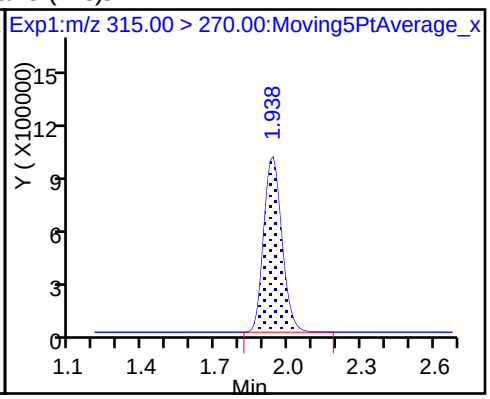
5 Perfluorobutanesulfonic acid (ND)



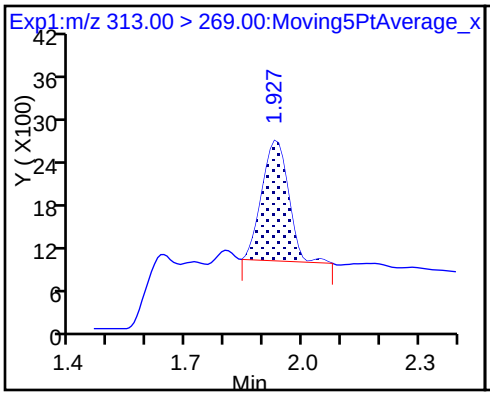
61 Sodium 1H,1H,2H,2H-perfluorohexane (ND)



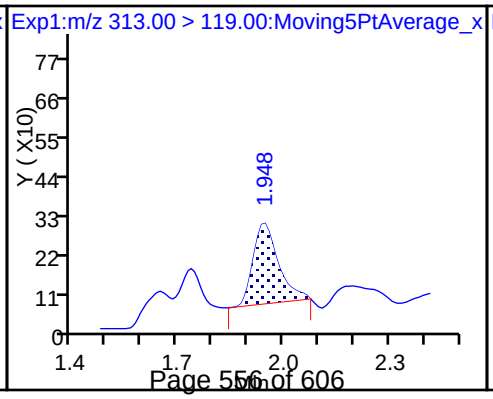
D 13C2 PFHxA



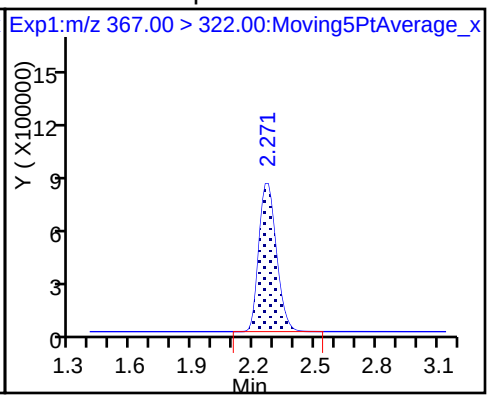
6 Perfluorohexanoic acid



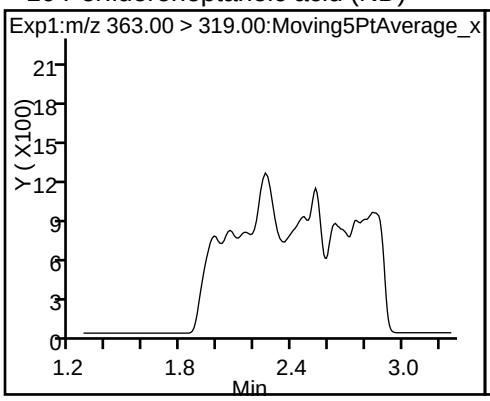
6 Perfluorohexanoic acid



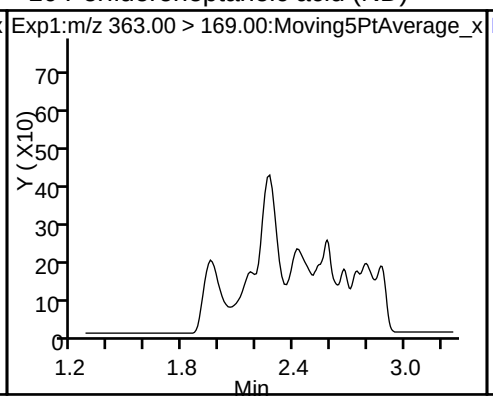
D 9 13C4-PFHpA



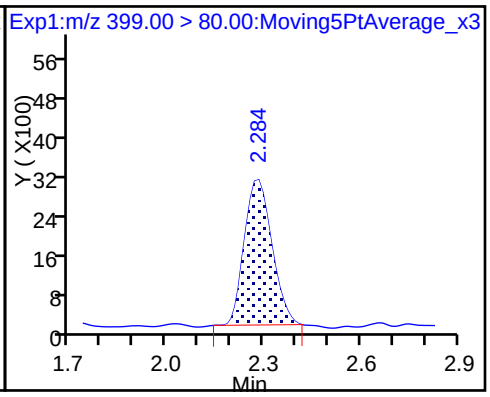
10 Perfluoroheptanoic acid (ND)



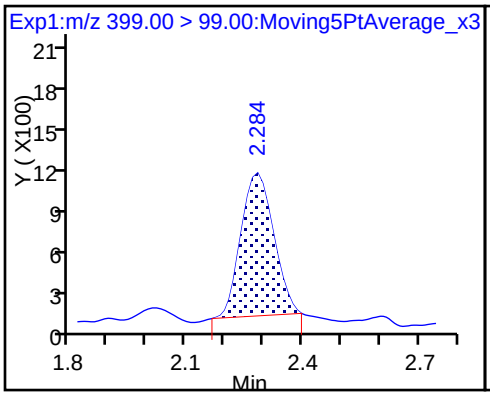
10 Perfluoroheptanoic acid (ND)



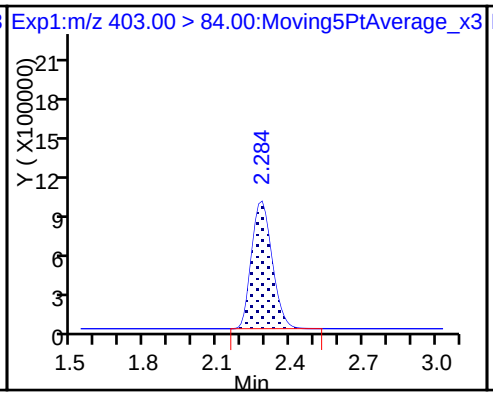
8 Perfluorohexanesulfonic acid



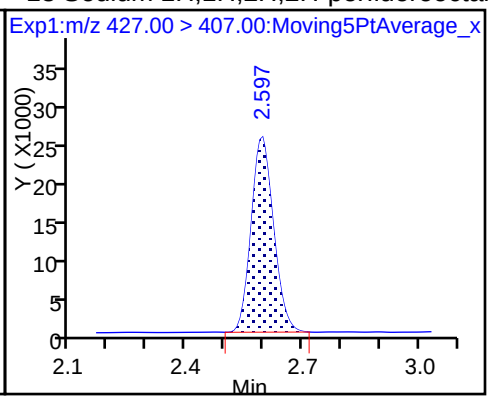
8 Perfluorohexanesulfonic acid



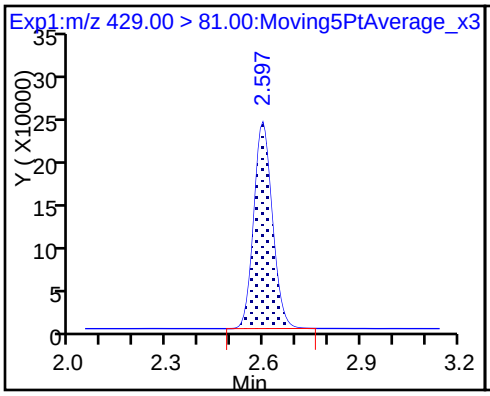
D 11 18O2 PFHxS



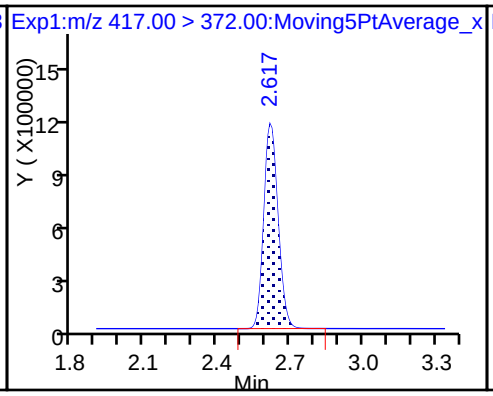
13 Sodium 1H,1H,2H,2H-perfluorooctane



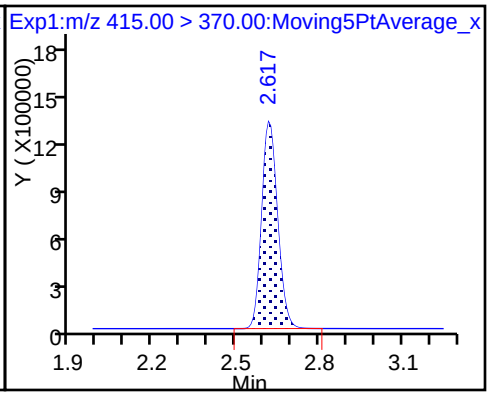
D 12 M2-6:2FTS



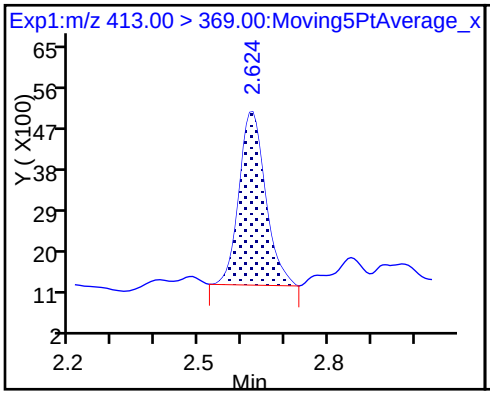
D 14 13C4 PFOA



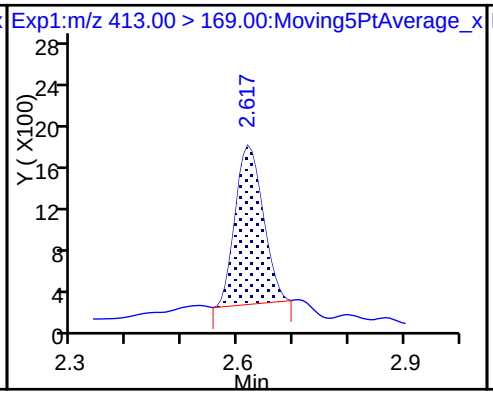
* 62 13C2-PFOA



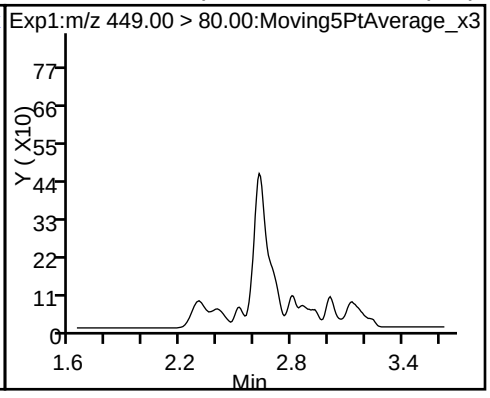
15 Perfluorooctanoic acid



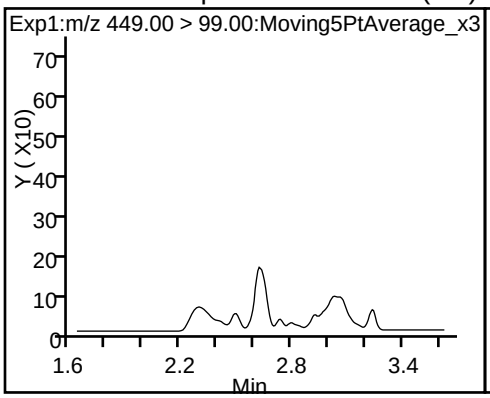
15 Perfluorooctanoic acid



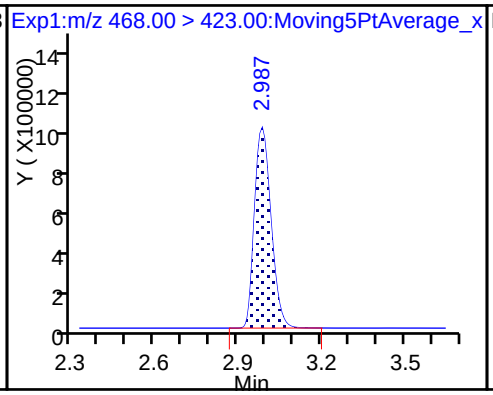
16 Perfluoroheptanesulfonic acid (ND)



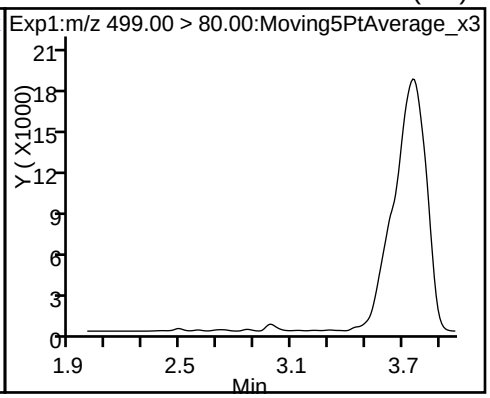
16 Perfluoroheptanesulfonic acid (ND)



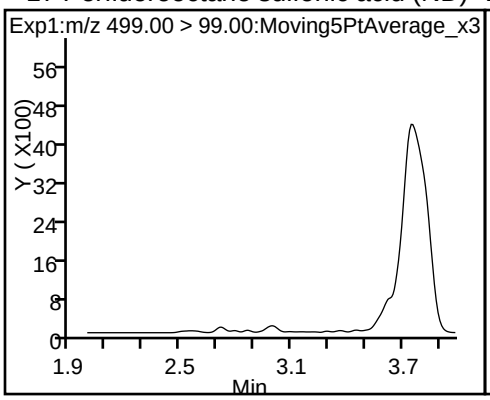
D 19 13C5 PFNA



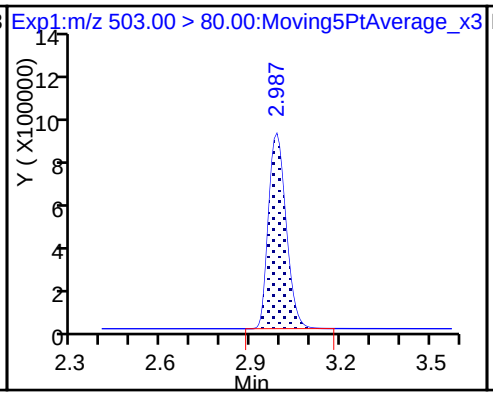
17 Perfluorooctane sulfonic acid (ND)



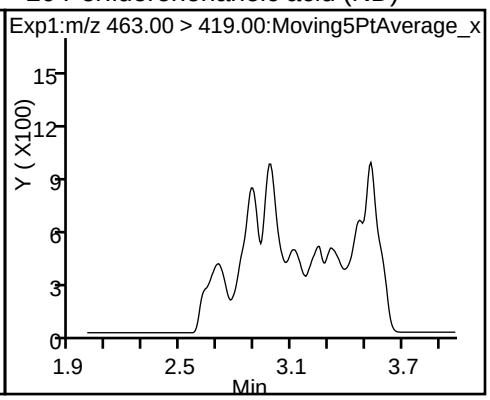
17 Perfluorooctane sulfonic acid (ND)



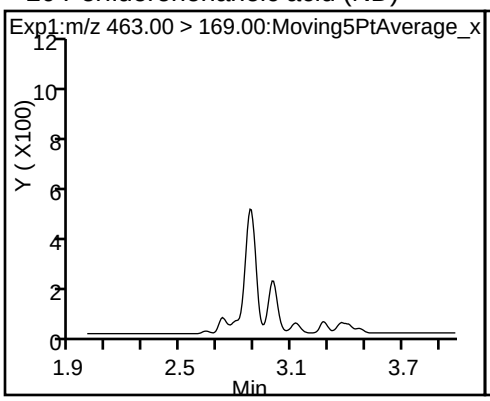
D 18 13C4 PFOS



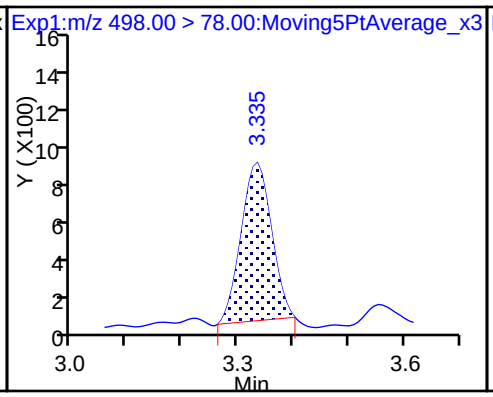
20 Perfluorononanoic acid (ND)



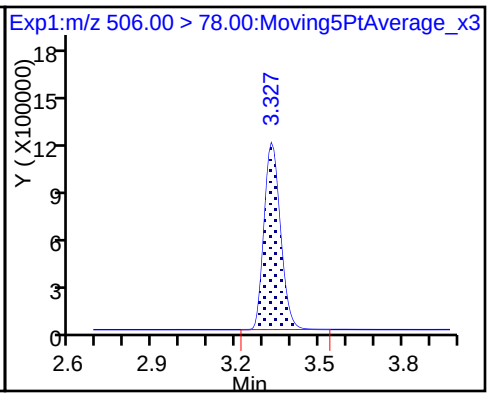
20 Perfluorononanoic acid (ND)



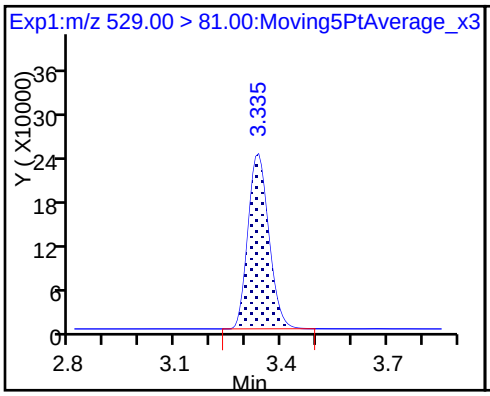
22 Perfluorooctane Sulfonamide



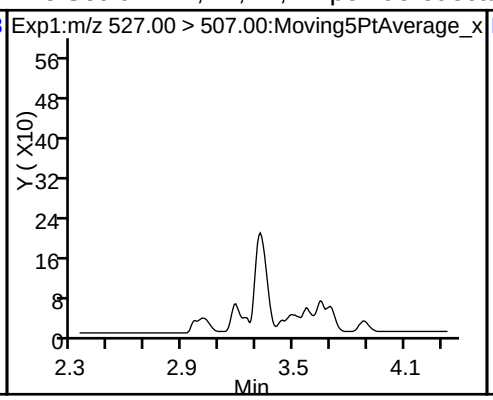
D 21 13C8 FOSA



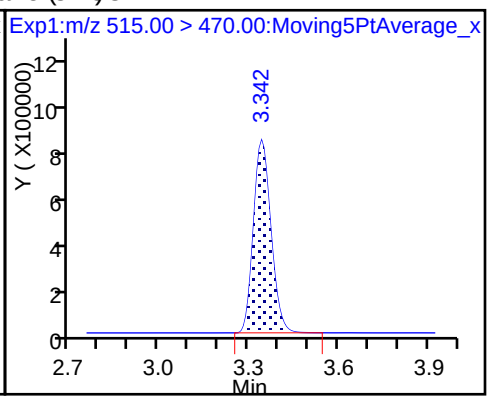
D 26 M2-8:2FTS



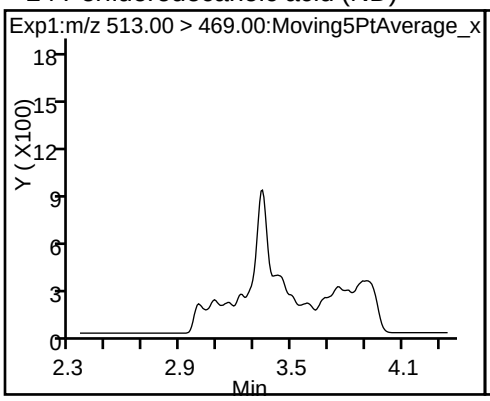
25 Sodium 1H,1H,2H,2H-perfluorodecanesulfonate (ND)



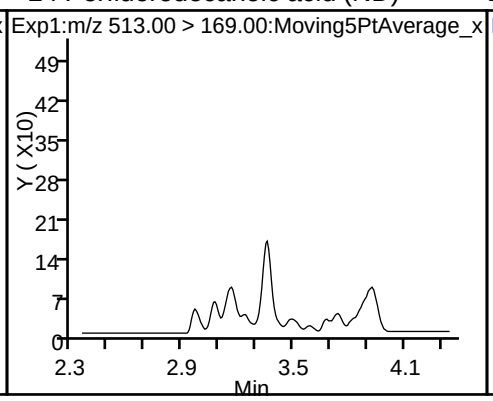
D 23 13C2 PFDA



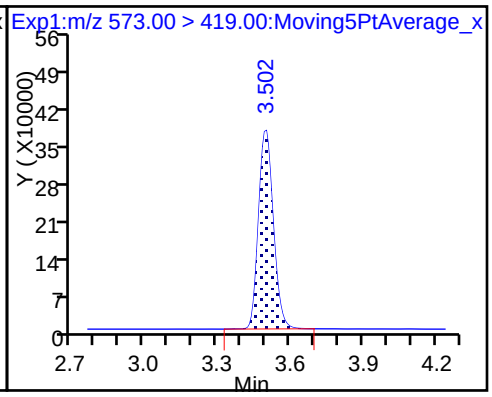
24 Perfluorodecanoic acid (ND)



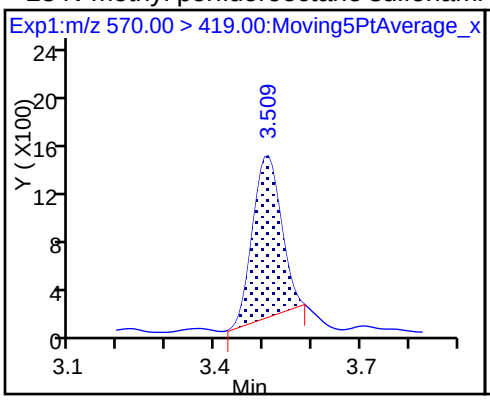
24 Perfluorodecanoic acid (ND)



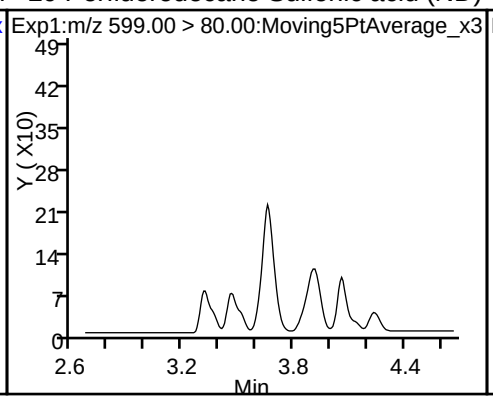
D 27 d3-NMeFOSAA



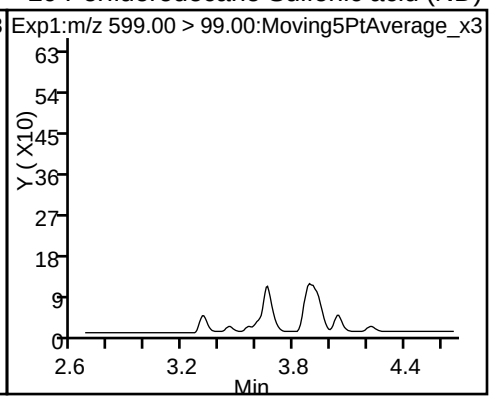
28 N-methyl perfluorooctane sulfonami



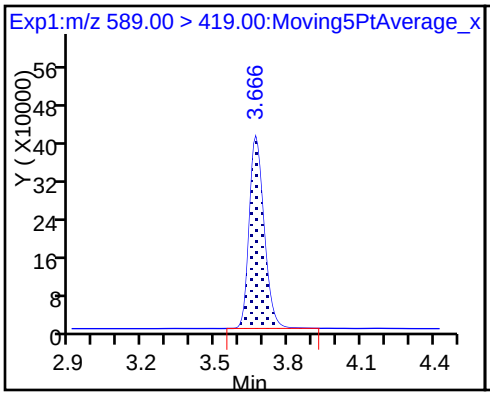
29 Perfluorodecane Sulfonic acid (ND)



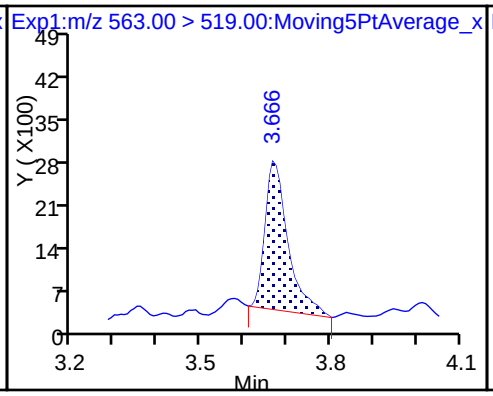
29 Perfluorodecane Sulfonic acid (ND)



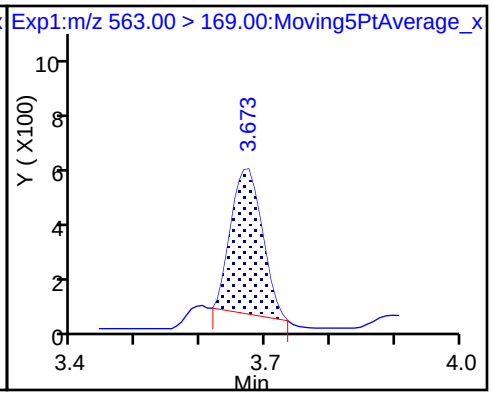
D 32 d5-NEtFOSAA



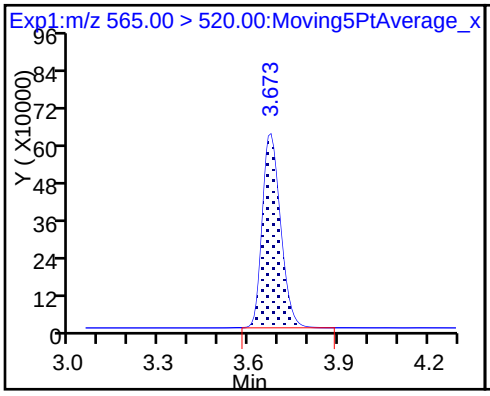
31 Perfluoroundecanoic acid



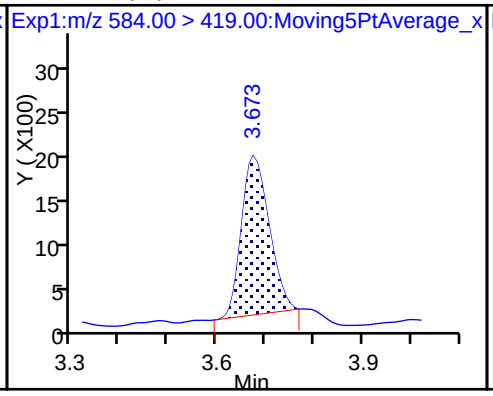
31 Perfluoroundecanoic acid



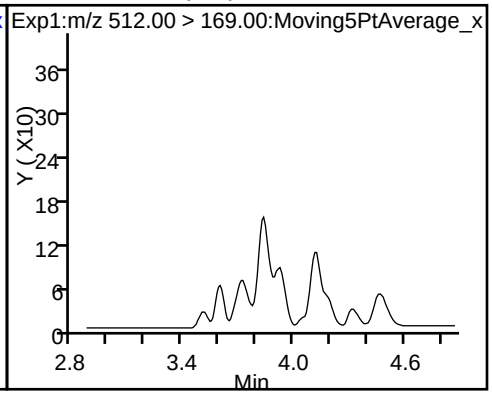
D 30 13C2 PFUnA



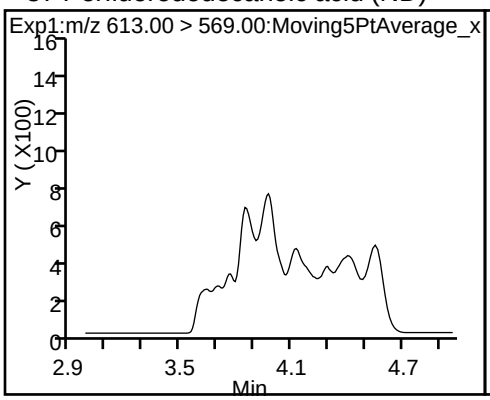
33 N-ethyl perfluorooctane sulfonamid



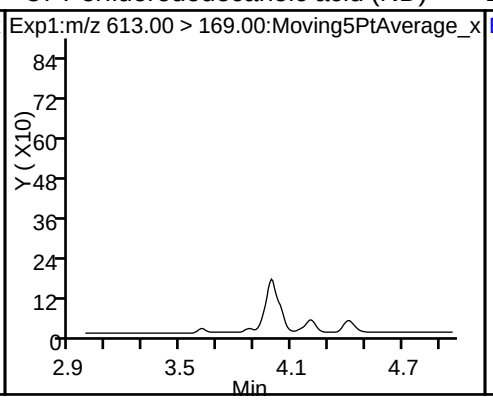
35 MeFOSA (ND)



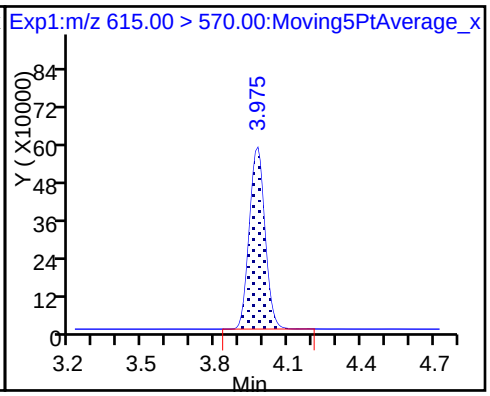
37 Perfluorododecanoic acid (ND)



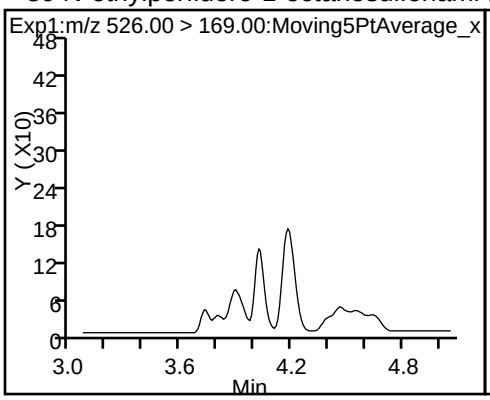
37 Perfluorododecanoic acid (ND)



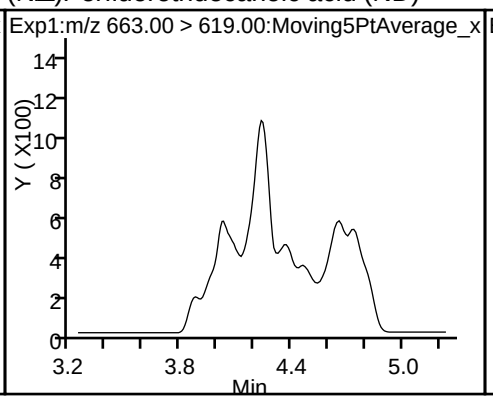
D 36 13C2 PFDoA



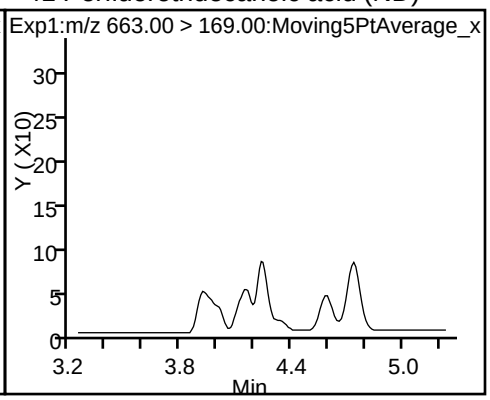
39 N-ethylperfluoro-1-octanesulfonami (ND)



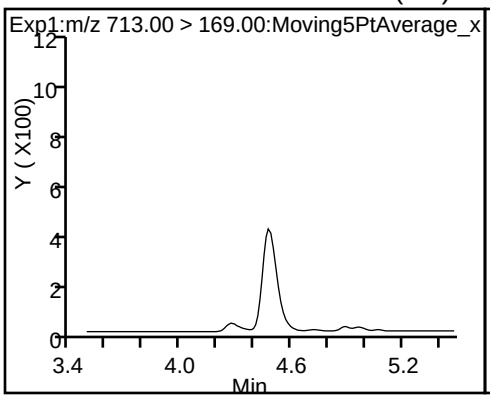
41 Perfluorotridecanoic acid (ND)



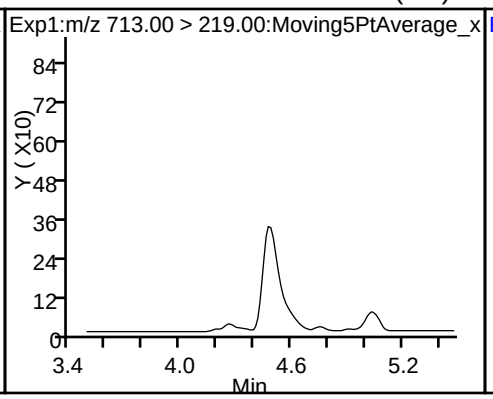
41 Perfluorotridecanoic acid (ND)



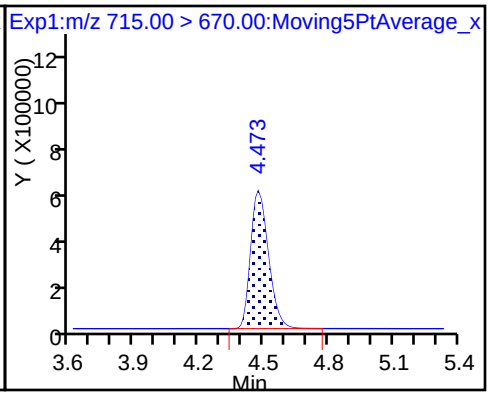
42 Perfluorotetradecanoic acid (ND)



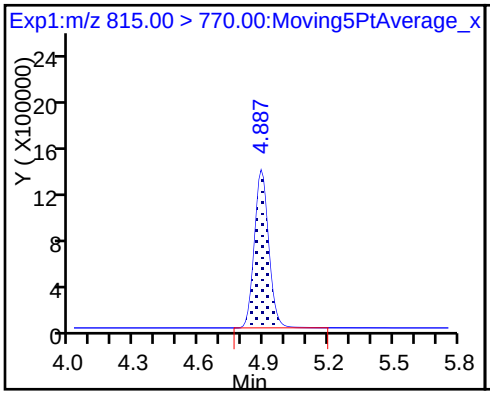
42 Perfluorotetradecanoic acid (ND)



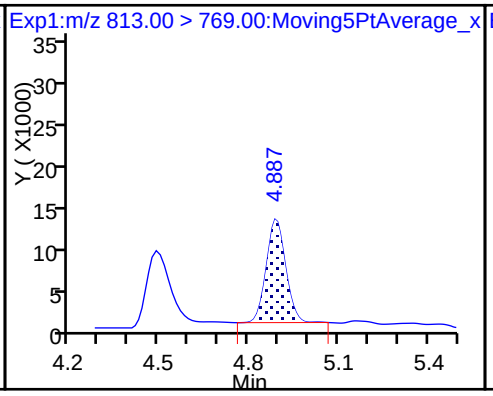
D 43 13C2-PFTeDA



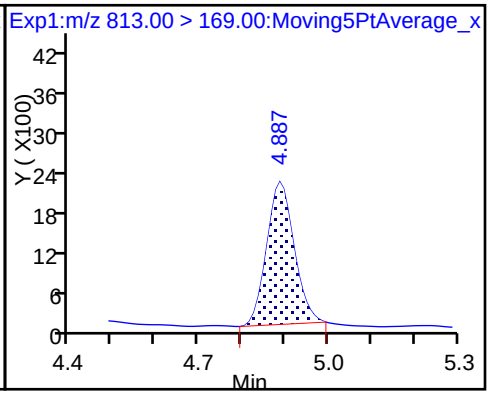
D 44 13C2-PFHxDA



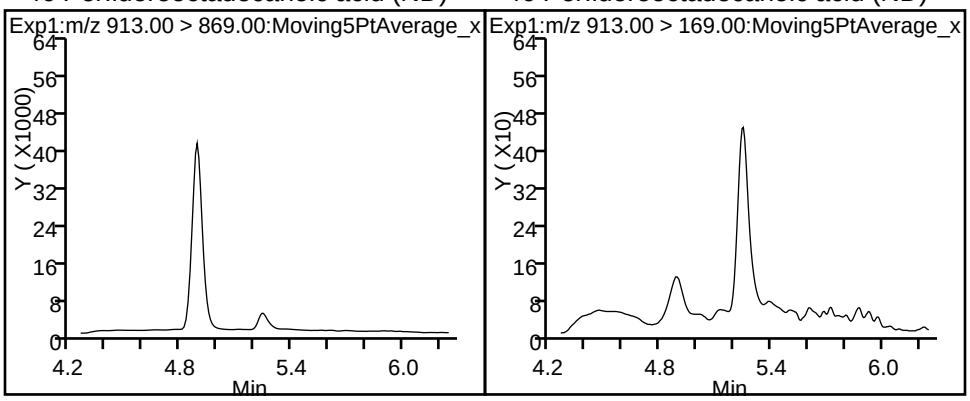
45 Perfluorohexadecanoic acid



45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid (ND) 46 Perfluorooctadecanoic acid (ND)



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35042-1

SDG No.:

Client Sample ID: | Lab Sample ID: LCS 320-204105/2-A

Matrix: Water | Lab File ID: 2018.01.18LLA_003.d

Analysis Method: 537 (modified) | Date Collected:

Extraction Method: 3535 | Date Extracted: 01/16/2018 09:18

Sample wt/vol: 250(mL) | Date Analyzed: 01/18/2018 17:45

Con. Extract Vol.: 10.0(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 204556 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	39.2		2.0	1.0	0.35
2706-90-3	Perfluoropentanoic acid (PFPeA)	36.2		2.0	1.0	0.49
307-24-4	Perfluorohexanoic acid (PFHxA)	36.9		4.0	2.0	0.58
375-85-9	Perfluoroheptanoic acid (PFHpA)	38.0		2.0	1.0	0.25
335-67-1	Perfluorooctanoic acid (PFOA)	36.9		4.0	2.0	0.85
375-95-1	Perfluorononanoic acid (PFNA)	38.8		2.0	1.0	0.27
335-76-2	Perfluorodecanoic acid (PFDA)	40.0		2.0	1.0	0.31
2058-94-8	Perfluoroundecanoic acid (PFUnA)	34.4		4.0	3.0	1.1
307-55-1	Perfluorododecanoic acid (PFDoA)	40.3		4.0	2.0	0.55
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	39.4		4.0	3.0	1.3
376-06-7	Perfluorotetradecanoic acid (PFTeA)	40.7		2.0	1.0	0.29
375-73-5	Perfluorobutanesulfonic acid (PFBS)	34.9		2.0	1.0	0.30
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	34.8		2.0	1.0	0.30
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	38.0		2.0	1.0	0.30
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	36.0		4.0	2.0	0.54
335-77-3	Perfluorodecanesulfonic acid (PFDS)	40.0		2.0	1.0	0.32
754-91-6	Perfluorooctane Sulfonamide (FOSA)	39.5		2.0	1.0	0.35

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Client Sample ID: Lab Sample ID: LCS 320-204105/2-A

Matrix: Water Lab File ID: 2018.01.18LLA_003.d

Analysis Method: 537 (modified) Date Collected:

Extraction Method: 3535 Date Extracted: 01/16/2018 09:18

Sample wt/vol: 250(mL) Date Analyzed: 01/18/2018 17:45

Con. Extract Vol.: 10.0(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 204556 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	84		25-150
STL00992	13C4 PFBA	98		25-150
STL00993	13C2 PFHxA	97		25-150
STL00990	13C4 PFOA	100		25-150
STL00995	13C5 PFNA	95		25-150
STL00996	13C2 PFDA	94		25-150
STL00997	13C2 PFUnA	100		25-150
STL00998	13C2 PFDoA	91		25-150
STL00994	18O2 PFHxS	94		25-150
STL00991	13C4 PFOS	93		25-150
STL02116	13C2-PFTeDA	92		25-150
STL01892	13C4-PFHpA	97		25-150
STL01893	13C5 PFPeA	101		25-150
STL02337	13C3-PFBS	96		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_003.d
Lims ID: LCS 320-204105/2-A
Client ID:
Sample Type: LCS
Inject. Date: 18-Jan-2018 17:45:29 ALS Bottle#: 42 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: lcs 320-204105/2-a
Misc. Info.: Plate: 1 Rack: 5
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 19-Jan-2018 15:50:53 Calib Date: 17-Jan-2018 15:06:20
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_008.d

Column 1 : Det: EXP1
Process Host: XAWRK004

First Level Reviewer: roycea Date: 19-Jan-2018 15:47:43

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.408	1.411	-0.003	0.538	7755854	2.46		98.4	19219	
2 Perfluorobutyric acid										
212.90 > 169.00	1.408	1.413	-0.005	1.000	2838911	0.9795		97.9	341	
D 3 13C5-PFPeA										
267.90 > 223.00	1.654	1.659	-0.005	0.632	4730292	2.53		101	37700	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.654	1.662	-0.008	1.000	2016482	0.9047		90.5	2049	
D 47 13C3-PFBS										
301.90 > 83.00	1.690	1.695	-0.005	0.646	92378	2.23		96.1	4757	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.699	1.697	0.002	1.005	2676753	0.8725		98.7	14845	
298.90 > 99.00	1.699	1.697	0.002	1.005	1108508		2.41(1.25-3.74)		8706	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.904	1.903	0.001	1.000	552520	1.00		107	27813	
D 7 13C2 PFHxA										
315.00 > 270.00	1.935	1.939	-0.004	0.739	4872768	2.42		96.9	52494	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.935	1.939	-0.004	1.000	1865552	0.9235		92.3	3481	
313.00 > 119.00	1.935	1.939	-0.004	1.000	174320		10.70(5.03-15.10)		4251	
D 9 13C4-PFHpA										
367.00 > 322.00	2.267	2.267	0.0	0.866	4666892	2.44		97.4	29869	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.267	2.268	-0.001	1.000	1947832	0.9494		94.9	4261	
363.00 > 169.00	2.267	2.268	-0.001	1.000	779704		2.50(1.13-3.40)		7100	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.280	2.280	0.0	1.000	2150040	0.8699		95.6	7656	
399.00 > 99.00	2.280	2.280	0.0	1.000	717561		3.00(1.50-4.49)		6998	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 11 18O2 PFHxS										
403.00 > 84.00	2.280	2.282	-0.002	0.871	5249709	2.23		94.1	39047	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.597	2.596	0.001	1.000	649463	1.06		112	13602	
D 12 M2-6:2FTS										
429.00 > 81.00	2.597	2.597	0.0	0.992	876396	2.47		104	27241	
D 14 13C4 PFOA										
417.00 > 372.00	2.617	2.622	-0.005	1.000	4692080	2.50		99.9	38195	
* 62 13C2-PFOA										
415.00 > 370.00	2.617	2.622	-0.005		5214087	2.50			34790	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.617	2.623	-0.006	1.000	2029730	0.9227		92.3	1733	
413.00 > 169.00	2.617	2.623	-0.006	1.000	1043219		1.95(0.84-2.52)		7504	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.624	2.629	-0.005	1.000	1793085	0.9509		99.9	18790	
449.00 > 99.00	2.624	2.629	-0.005	1.000	503866		3.56(1.94-5.82)		12550	
D 19 13C5 PFNA										
468.00 > 423.00	2.987	2.992	-0.005	1.141	3608573	2.37		94.8	27258	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.987	2.992	-0.005	1.000	1402892	0.9002		97.0	352	
499.00 > 99.00	2.987	2.992	-0.005	1.000	300616		4.67(2.31-6.93)		486	
D 18 13C4 PFOS										
503.00 > 80.00	2.987	2.992	-0.005	1.141	3327335	2.23		93.3	26395	
20 Perfluorononanoic acid										
463.00 > 419.00	2.987	2.992	-0.005	1.000	1444056	0.9692		96.9	4571	
463.00 > 169.00	2.987	2.992	-0.005	1.000	353124		4.09(1.90-5.69)		8556	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.335	3.338	-0.003	1.000	1702510	0.9868		98.7	14344	
D 21 13C8 FOSA										
506.00 > 78.00	3.335	3.338	-0.003	1.274	4390673	2.09		83.6	23114	
D 26 M2-8:2FTS										
529.00 > 81.00	3.342	3.342	0.0	1.277	915480	2.44		102	16147	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.342	3.342	0.0	1.000	449847	0.9670		101	10985	
D 23 13C2 PFDA										
515.00 > 470.00	3.350	3.352	-0.002	1.280	3086625	2.35		93.9	21121	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.350	3.353	-0.003	1.000	1199181	1.00		100	5865	
513.00 > 169.00	3.350	3.353	-0.003	1.000	212576		5.64(2.36-7.09)		2121	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.502	3.507	-0.005	1.338	1613196	2.46		98.3	13386	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.509	3.513	-0.004	1.002	649935	0.9324		93.2	4404	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.666	3.666	0.0	1.000	911136	1.00		104	20360	
599.00 > 99.00	3.659	3.666	-0.007	0.998	307600		2.96(1.39-4.16)		10997	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.673	3.672	0.001	1.404	1539071	2.32		92.8	6344	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.682	3.678	0.004	1.000	882042	0.8608		86.1	3899	
563.00 > 169.00	3.682	3.678	0.004	1.000	181576		4.86(0.00-0.00)		5393	
D 30 13C2 PFUnA										
565.00 > 520.00	3.682	3.679	0.003	1.407	2481720	2.49		99.5	24842	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.682	3.679	0.003	1.002	591326	0.9863		98.6	8680	
35 MeFOSA										
512.00 > 169.00	3.837	3.875	-0.038		405611	NR		0.0	2688	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.975	3.979	-0.004	1.000	1013815	1.01		101	3920	
613.00 > 169.00	3.975	3.979	-0.004	1.000	241525		4.20(2.13-6.40)		9239	
D 36 13C2 PFDoA										
615.00 > 570.00	3.975	3.979	-0.004	1.519	2453962	2.27		90.6	33119	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.030	4.066	-0.036		401757	NR		0.0	2649	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.235	4.242	-0.007	1.000	1123414	0.9856		98.6	3969	
663.00 > 169.00	4.235	4.242	-0.007	1.000	357171		3.15(1.25-3.76)		13449	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.473	4.483	-0.010	1.000	321390	1.02		102	8036	
713.00 > 219.00	4.473	4.483	-0.010	1.000	225259		1.43(0.71-2.13)		6644	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.473	4.483	-0.010	1.709	3237319	2.29		91.5	17740	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.896	4.902	-0.006	1.871	5453522	2.16		86.5	11544	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.896	4.902	-0.006	1.000	2037554	0.9665		96.7	1342	
813.00 > 169.00	4.896	4.902	-0.006	1.000	343377		5.93(2.86-8.58)		4499	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.247	5.255	-0.008	1.000	2426552	1.06		106	530	
913.00 > 169.00	5.240	5.255	-0.015	0.999	292966		8.28(0.00-0.00)		1601	

QC Flag Legend

Processing Flags

NR - Missing Quant Standard

Report Date: 19-Jan-2018 15:50:57 Chrom Revision: 2.2 08-Dec-2017 11:41:26

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_003.d

Injection Date: 18-Jan-2018 17:45:29 Instrument ID: A8_N

Lims ID: LCS 320-204105/2-A

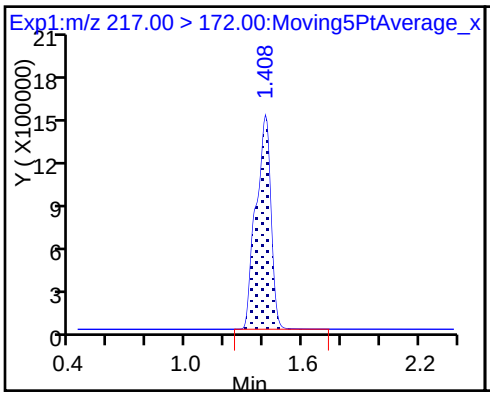
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 42 Worklist Smp#: 3

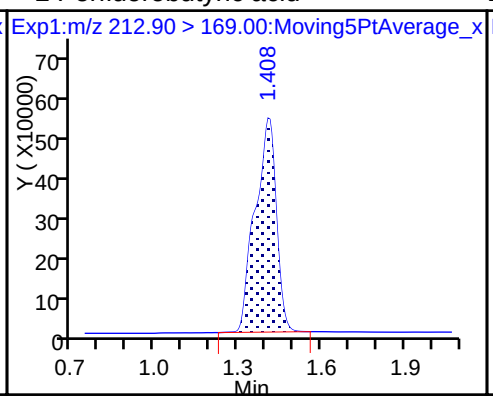
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

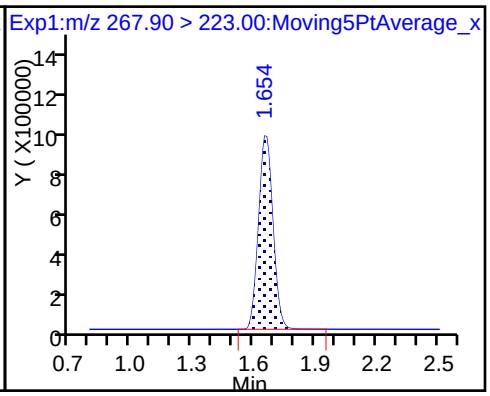
D 1 13C4 PFBA



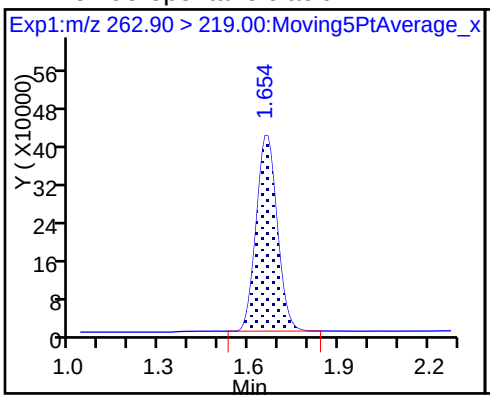
2 Perfluorobutyric acid



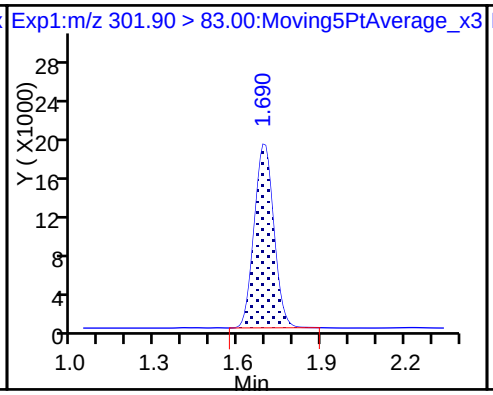
D 3 13C5-PFPeA



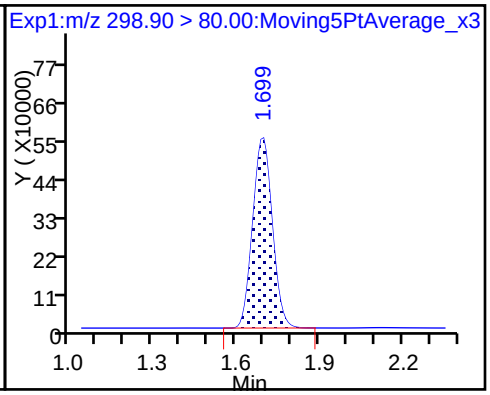
4 Perfluoropentanoic acid



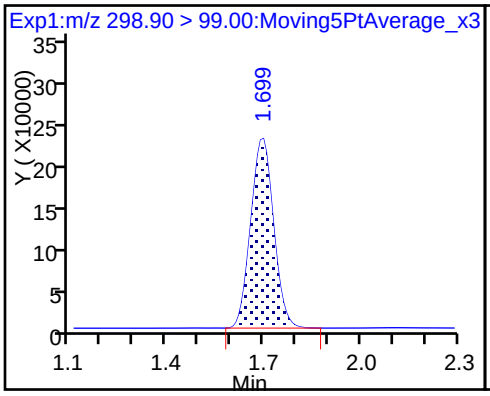
D 47 13C3-PFBS



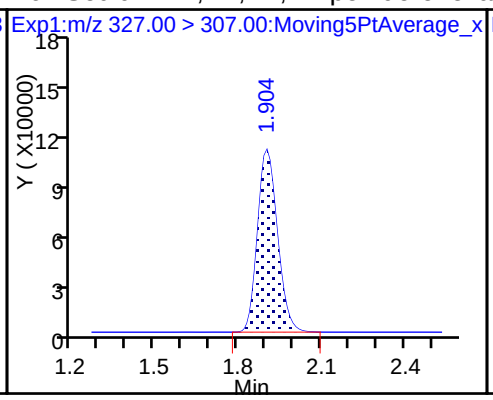
5 Perfluorobutanesulfonic acid



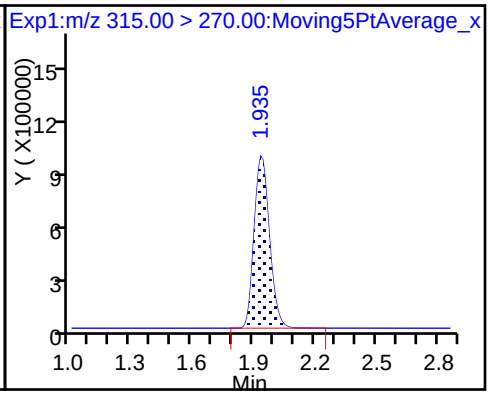
5 Perfluorobutanesulfonic acid



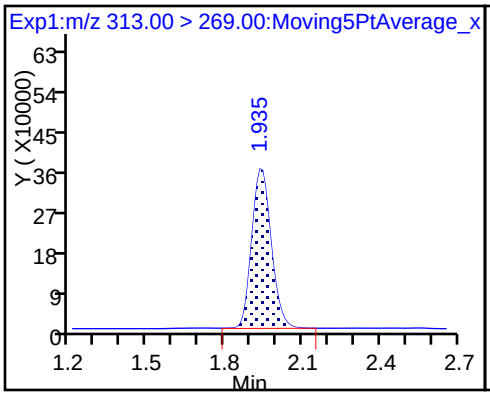
61 Sodium 1H,1H,2H,2H-perfluorohexa



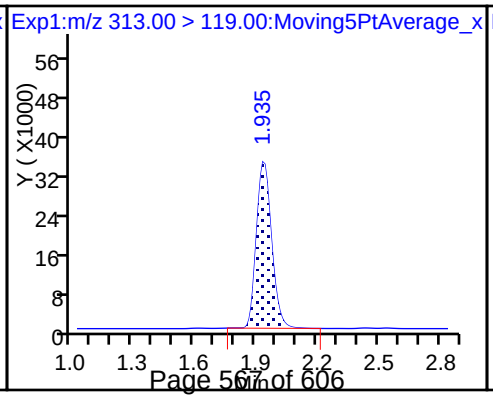
D 7 13C2 PFHxA



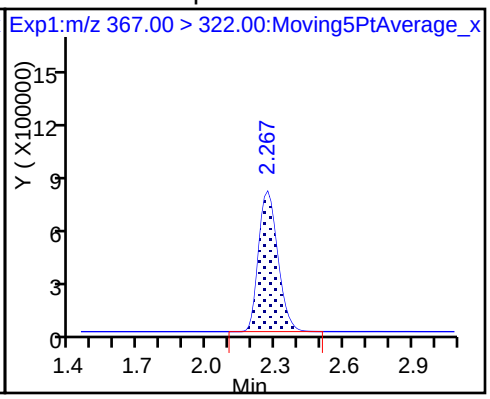
6 Perfluorohexanoic acid



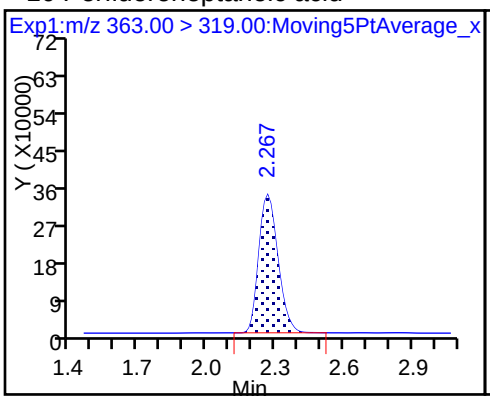
6 Perfluorohexanoic acid



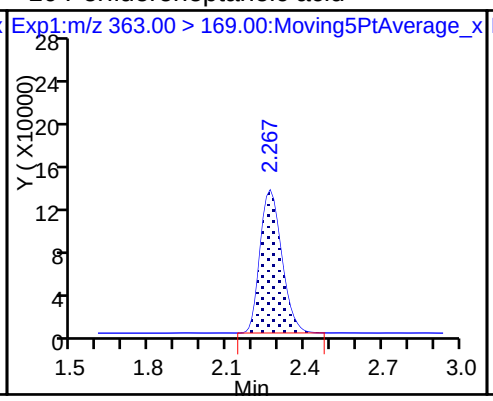
D 9 13C4-PFHpA



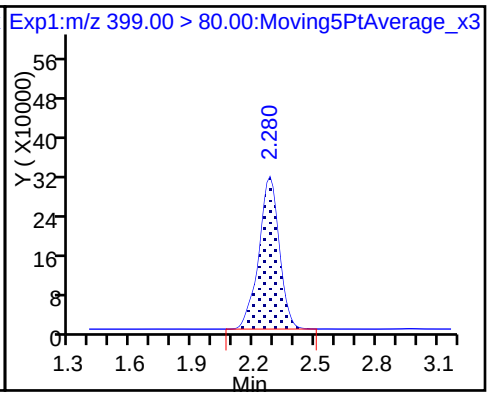
10 Perfluoroheptanoic acid



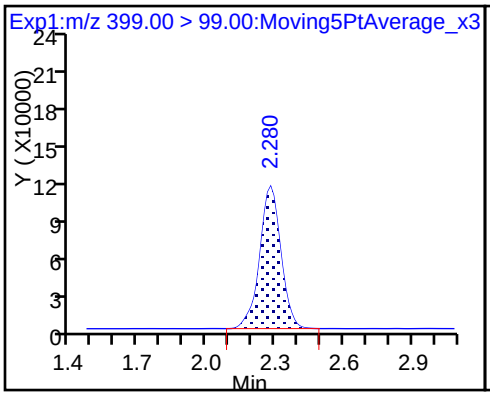
10 Perfluoroheptanoic acid



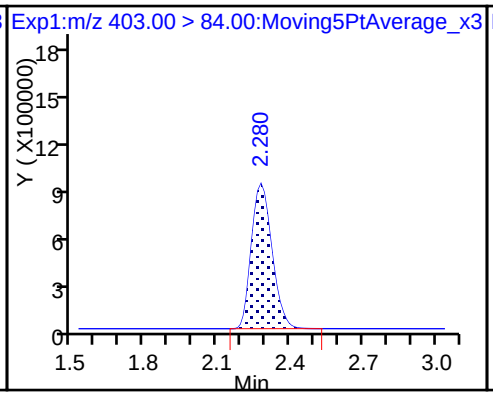
8 Perfluorohexanesulfonic acid



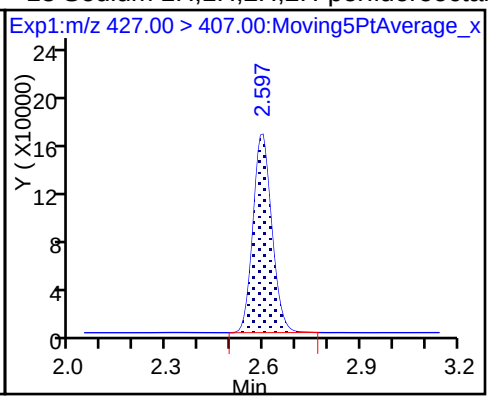
8 Perfluorohexanesulfonic acid



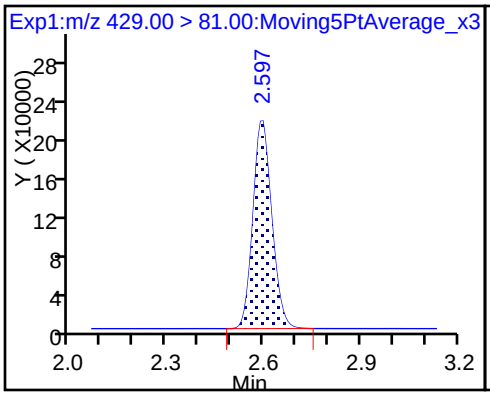
D 11 18O2 PFHxS



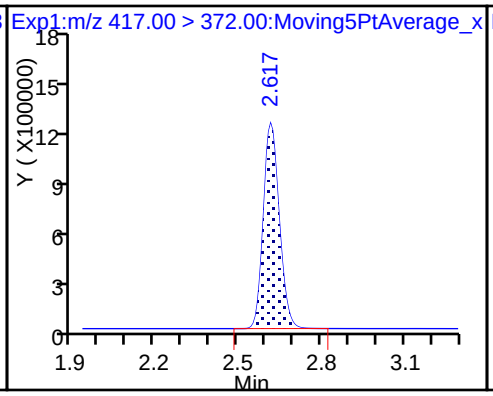
13 Sodium 1H,1H,2H,2H-perfluorooctane



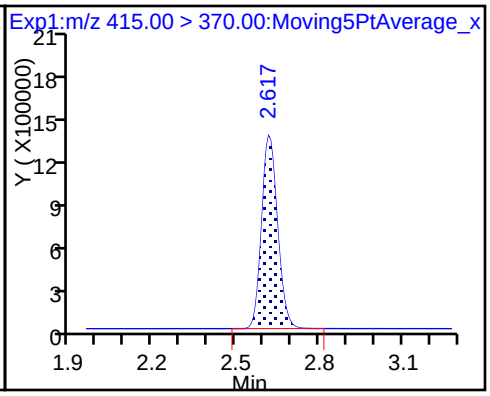
D 12 M2-6:2FTS



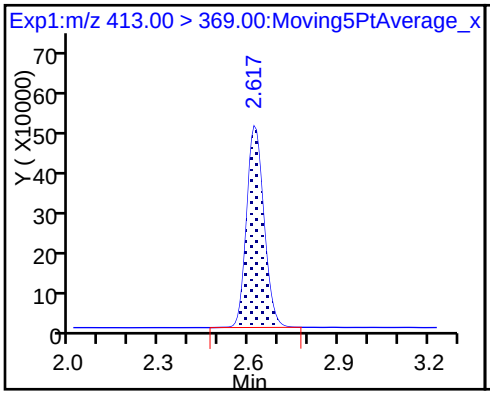
D 14 13C4 PFOA



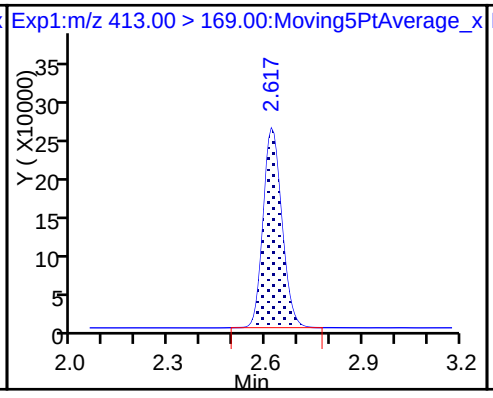
* 62 13C2-PFOA



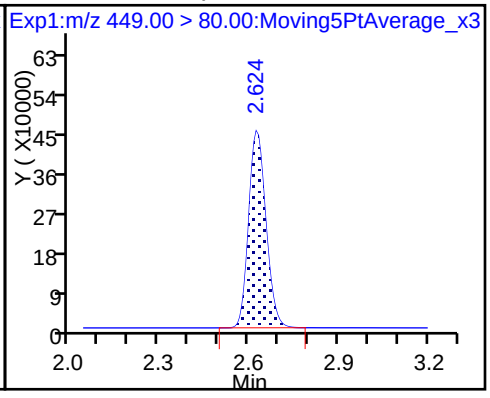
15 Perfluorooctanoic acid



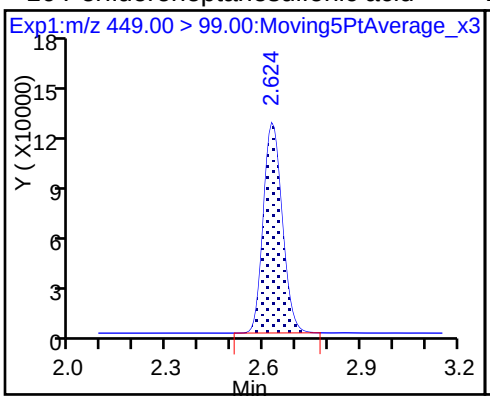
15 Perfluorooctanoic acid



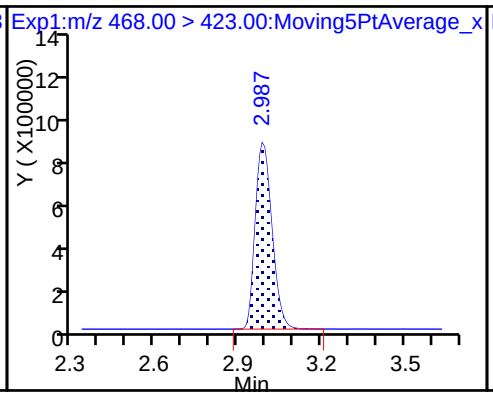
16 Perfluoroheptanesulfonic acid



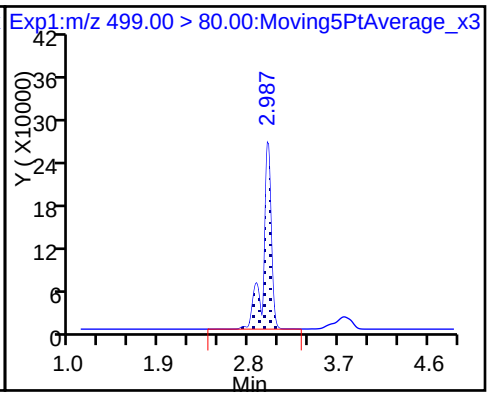
16 Perfluoroheptanesulfonic acid



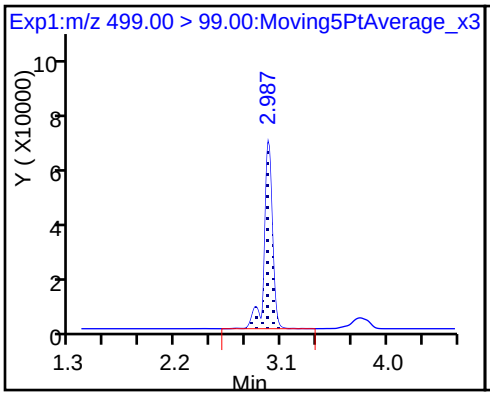
D 19 13C5 PFNA



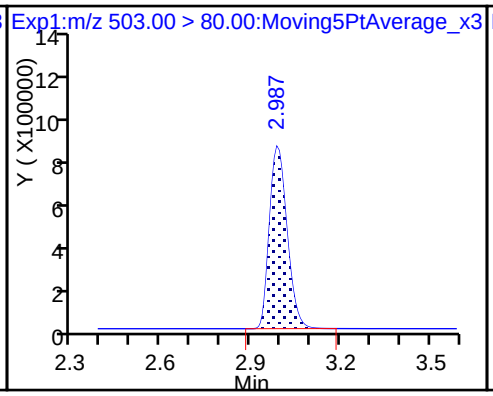
17 Perfluorooctane sulfonic acid



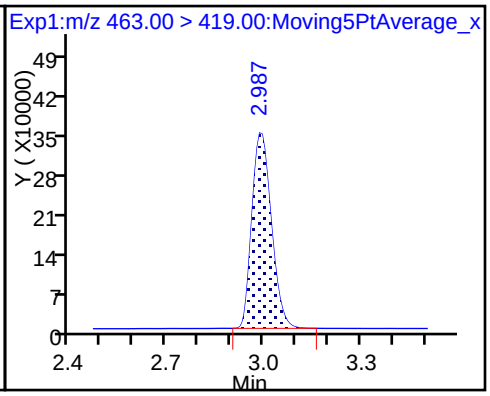
17 Perfluorooctane sulfonic acid



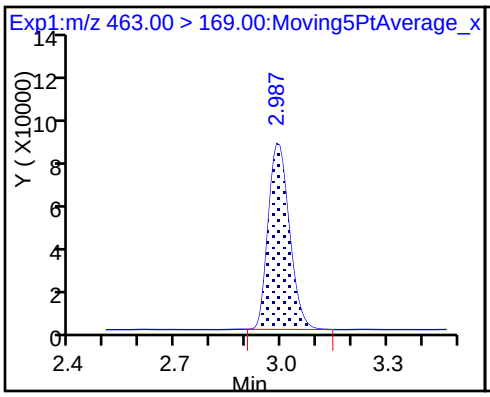
D 18 13C4 PFOS



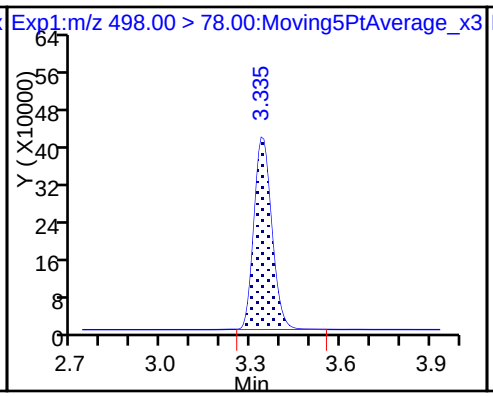
20 Perfluorononanoic acid



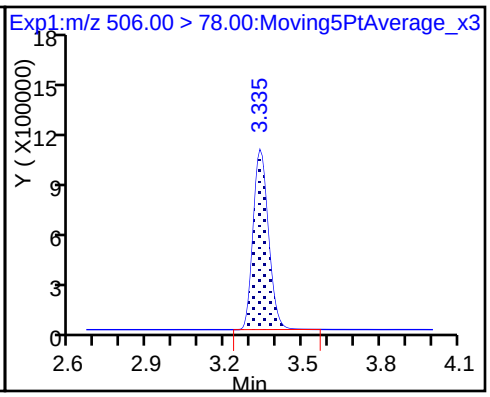
20 Perfluorononanoic acid



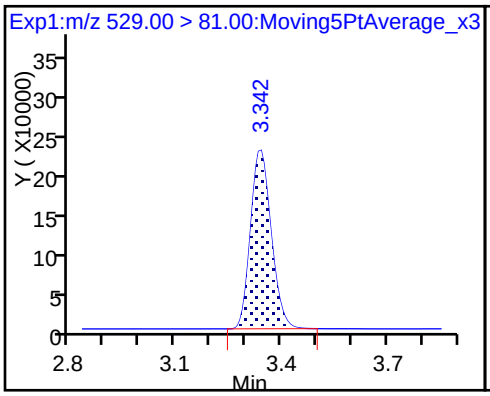
22 Perfluorooctane Sulfonamide



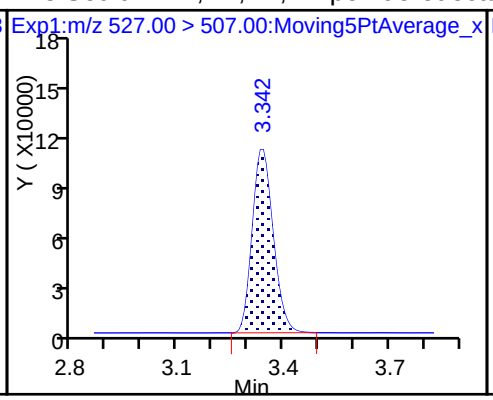
D 21 13C8 FOSA



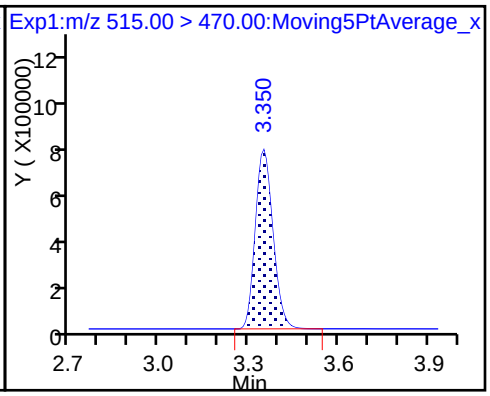
D 26 M2-8:2FTS



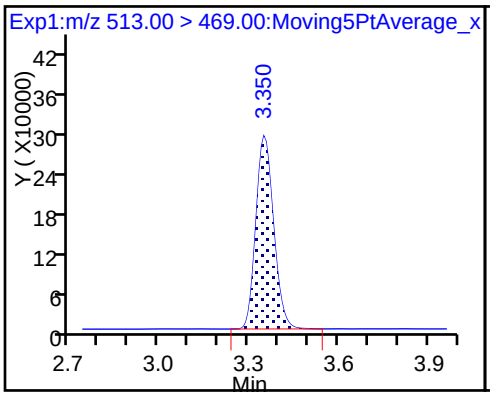
25 Sodium 1H,1H,2H,2H-perfluorodecane



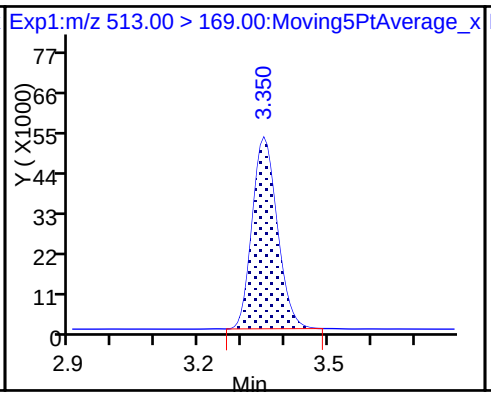
D 23 13C2 PFDA



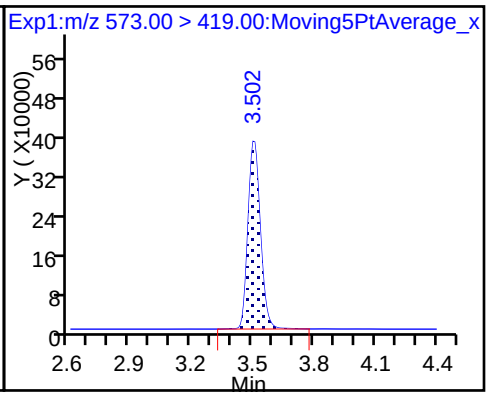
24 Perfluorodecanoic acid



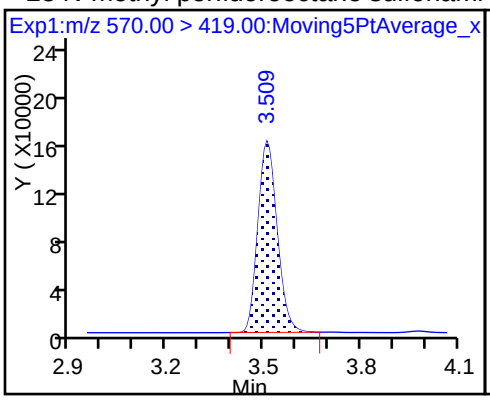
24 Perfluorodecanoic acid



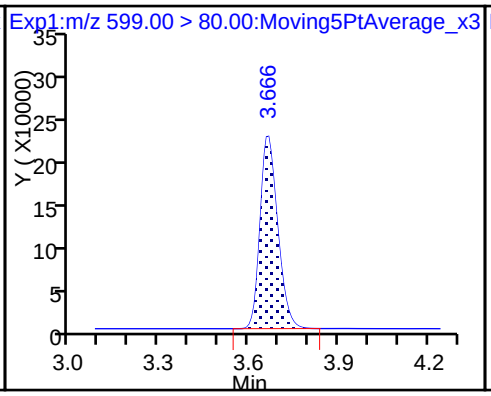
D 27 d3-NMeFOSAA



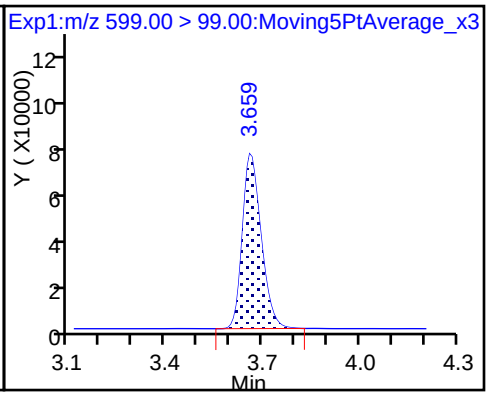
28 N-methyl perfluorooctane sulfonami



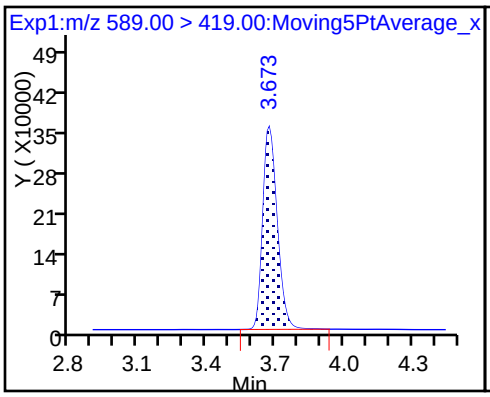
29 Perfluorodecane Sulfonic acid



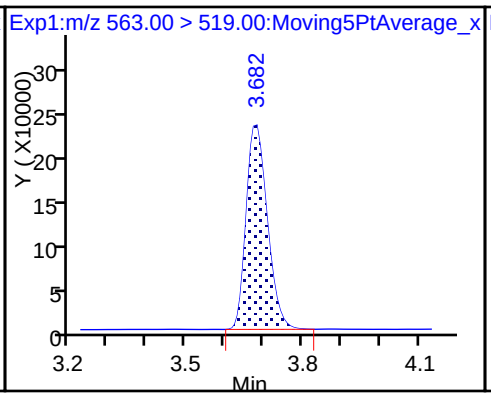
29 Perfluorodecane Sulfonic acid



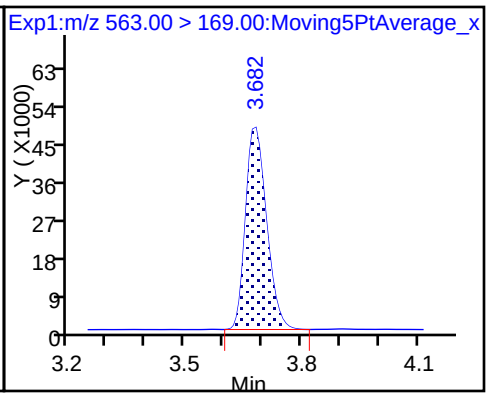
D 32 d5-NEtFOSAA



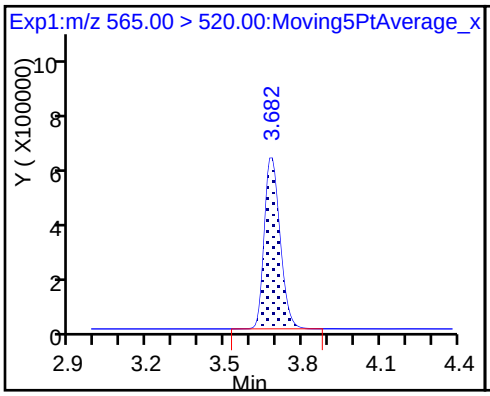
31 Perfluoroundecanoic acid



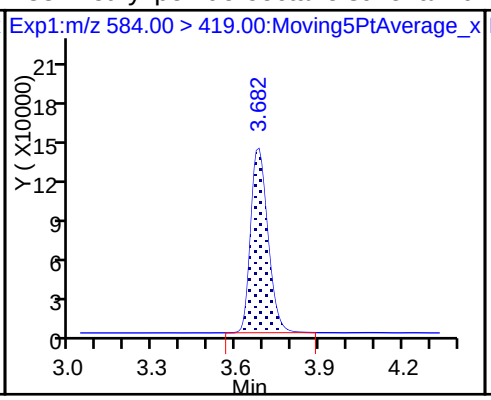
31 Perfluoroundecanoic acid



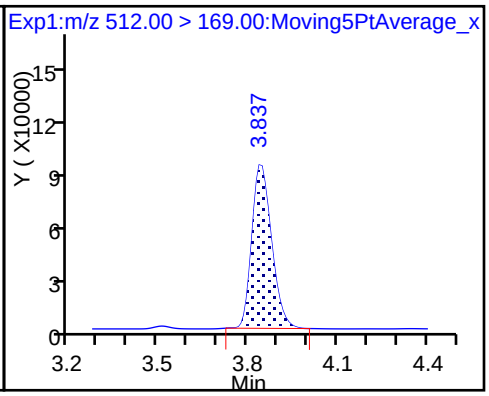
D 30 13C2 PFUnA



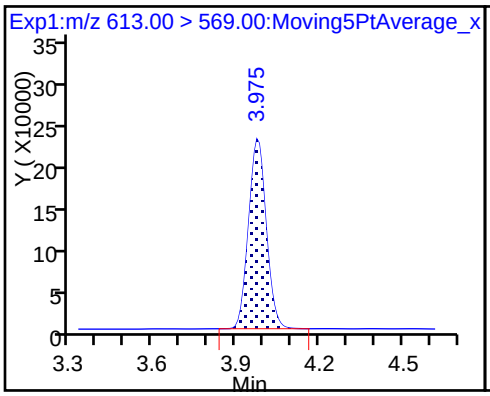
33 N-ethyl perfluorooctane sulfonamid



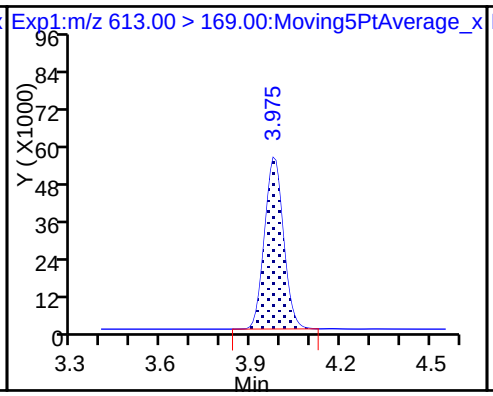
35 MeFOSA



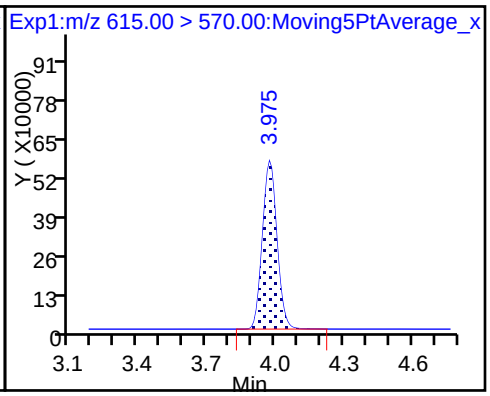
37 Perfluorododecanoic acid



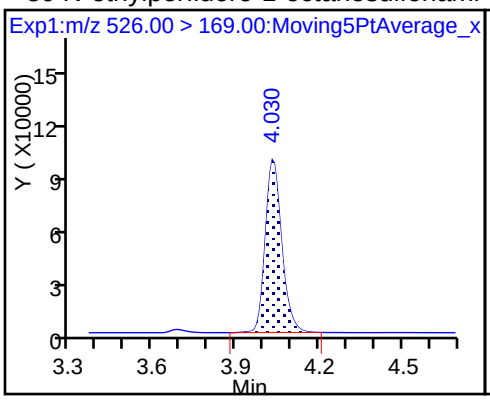
37 Perfluorododecanoic acid



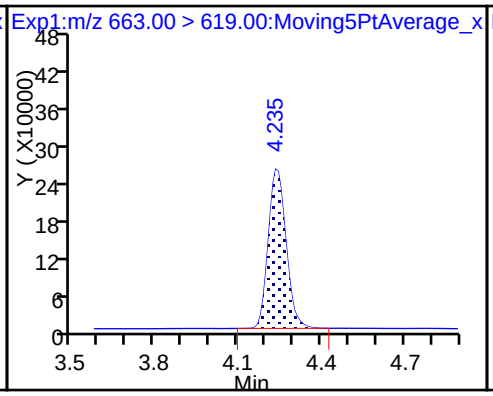
D 36 13C2 PFDoA



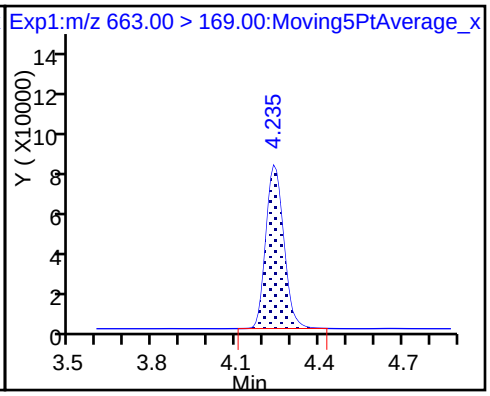
39 N-ethylperfluoro-1-octanesulfonami



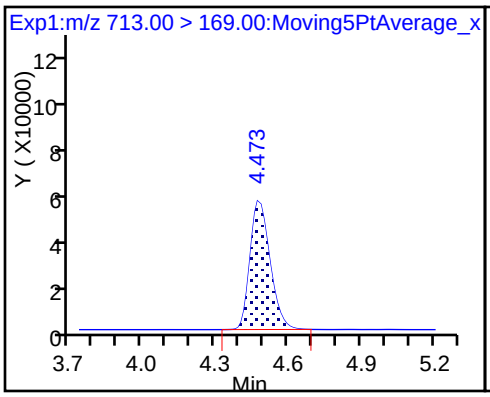
41 Perfluorotridecanoic acid



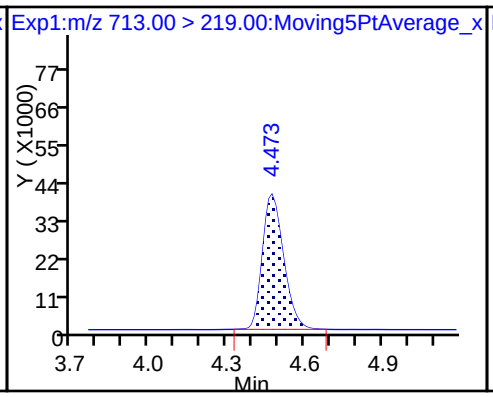
41 Perfluorotridecanoic acid



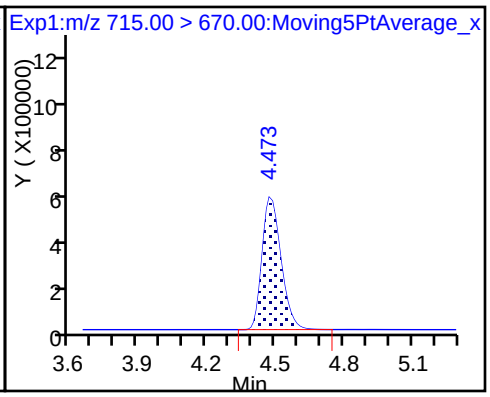
42 Perfluorotetradecanoic acid



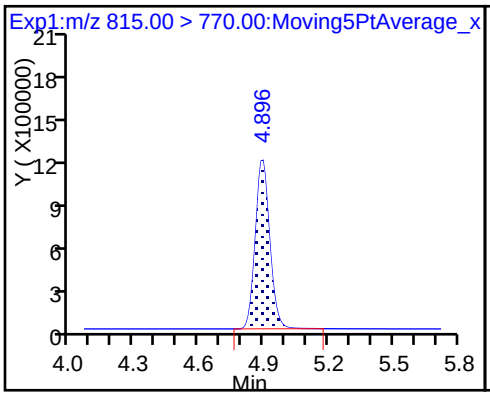
42 Perfluorotetradecanoic acid



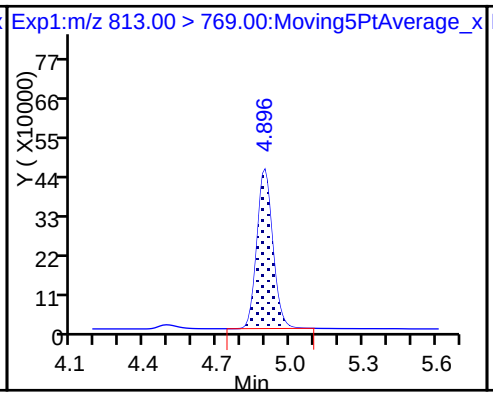
D 43 13C2-PFTeDA



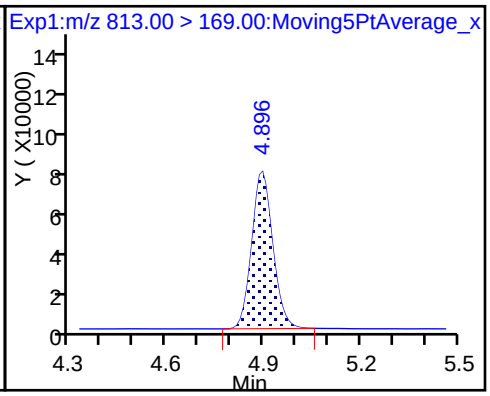
D 44 13C2-PFHxDA



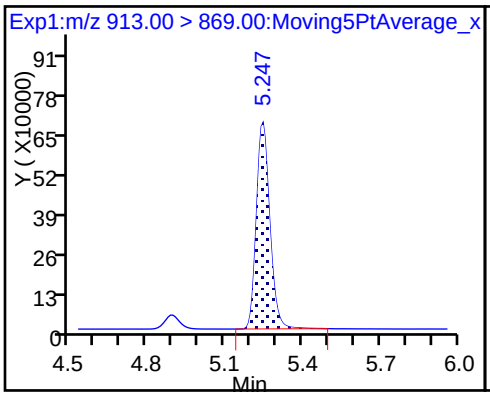
45 Perfluorohexadecanoic acid



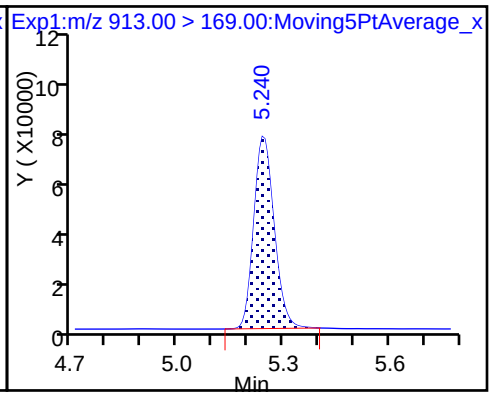
45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid



46 Perfluorooctadecanoic acid



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35042-1

SDG No.:

Client Sample ID: | Lab Sample ID: LCSD 320-204105/3-A

Matrix: Water | Lab File ID: 2018.01.18LLA_004.d

Analysis Method: 537 (modified) | Date Collected:

Extraction Method: 3535 | Date Extracted: 01/16/2018 09:18

Sample wt/vol: 250(mL) | Date Analyzed: 01/18/2018 17:53

Con. Extract Vol.: 10.0(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 204556 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	38.1		2.0	1.0	0.35
2706-90-3	Perfluoropentanoic acid (PFPeA)	35.9		2.0	1.0	0.49
307-24-4	Perfluorohexanoic acid (PFHxA)	35.7		4.0	2.0	0.58
375-85-9	Perfluoroheptanoic acid (PFHpA)	37.2		2.0	1.0	0.25
335-67-1	Perfluorooctanoic acid (PFOA)	37.8		4.0	2.0	0.85
375-95-1	Perfluorononanoic acid (PFNA)	37.5		2.0	1.0	0.27
335-76-2	Perfluorodecanoic acid (PFDA)	37.9		2.0	1.0	0.31
2058-94-8	Perfluoroundecanoic acid (PFUnA)	37.2		4.0	3.0	1.1
307-55-1	Perfluorododecanoic acid (PFDoA)	39.8		4.0	2.0	0.55
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	38.6		4.0	3.0	1.3
376-06-7	Perfluorotetradecanoic acid (PFTeA)	40.7		2.0	1.0	0.29
375-73-5	Perfluorobutanesulfonic acid (PFBS)	33.8		2.0	1.0	0.30
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	33.8		2.0	1.0	0.30
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	37.5		2.0	1.0	0.30
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	34.3		4.0	2.0	0.54
335-77-3	Perfluorodecanesulfonic acid (PFDS)	36.9		2.0	1.0	0.32
754-91-6	Perfluorooctane Sulfonamide (FOSA)	36.6		2.0	1.0	0.35

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Client Sample ID: Lab Sample ID: LCSD 320-204105/3-A

Matrix: Water Lab File ID: 2018.01.18LLA_004.d

Analysis Method: 537 (modified) Date Collected:

Extraction Method: 3535 Date Extracted: 01/16/2018 09:18

Sample wt/vol: 250(mL) Date Analyzed: 01/18/2018 17:53

Con. Extract Vol.: 10.0(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 204556 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	92		25-150
STL00992	13C4 PFBA	104		25-150
STL00993	13C2 PFHxA	108		25-150
STL00990	13C4 PFOA	104		25-150
STL00995	13C5 PFNA	103		25-150
STL00996	13C2 PFDA	102		25-150
STL00997	13C2 PFUnA	99		25-150
STL00998	13C2 PFDoA	94		25-150
STL00994	18O2 PFHxS	100		25-150
STL00991	13C4 PFOS	101		25-150
STL02116	13C2-PFTeDA	99		25-150
STL01892	13C4-PFHpA	104		25-150
STL01893	13C5 PFPeA	106		25-150
STL02337	13C3-PFBS	105		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_004.d
Lims ID: LCSD 320-204105/3-A
Client ID:
Sample Type: LCSD
Inject. Date: 18-Jan-2018 17:53:18 ALS Bottle#: 43 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: lcsd 320-204105/3-a
Misc. Info.: Plate: 1 Rack: 5
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\A8_N.m
Limit Group: LC PFC_DOD ICAL
Last Update: 19-Jan-2018 15:50:53 Calib Date: 17-Jan-2018 15:06:20
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20180117-53019.b\2018.01.17CURVELLA_008.d

Column 1 : Det: EXP1
Process Host: XAWRK004

First Level Reviewer: roycea Date: 19-Jan-2018 15:48:26

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.00 > 172.00	1.407	1.411	-0.004	0.537	7845450	2.61		104	18191	
2 Perfluorobutyric acid										
212.90 > 169.00	1.407	1.413	-0.006	1.000	2789122	0.9513		95.1	386	
D 3 13C5-PFPeA										
267.90 > 223.00	1.661	1.659	0.002	0.633	4702258	2.64		106	53008	
4 Perfluoropentanoic acid										
262.90 > 219.00	1.661	1.662	-0.001	1.000	1987582	0.8970		89.7	2033	
D 47 13C3-PFBS										
301.90 > 83.00	1.688	1.695	-0.007	0.643	96441	2.45		105	4909	
5 Perfluorobutanesulfonic acid										
298.90 > 80.00	1.696	1.697	-0.001	1.005	2707707	0.8454		95.6	12594	
298.90 > 99.00	1.696	1.697	-0.001	1.005	1126078		2.40(1.25-3.74)		9515	
61 Sodium 1H,1H,2H,2H-perfluorohexane										
327.00 > 307.00	1.902	1.903	-0.001	1.000	533292	0.9254		99.1	26470	
D 7 13C2 PFHxA										
315.00 > 270.00	1.943	1.939	0.004	0.741	5174775	2.70		108	38476	
6 Perfluorohexanoic acid										
313.00 > 269.00	1.943	1.939	0.004	1.000	1913305	0.8918		89.2	4837	
313.00 > 119.00	1.943	1.939	0.004	1.000	181769		10.53(5.03-15.10)		3175	
D 9 13C4-PFHpA										
367.00 > 322.00	2.264	2.267	-0.003	0.863	4746132	2.60		104	28099	
10 Perfluoroheptanoic acid										
363.00 > 319.00	2.264	2.268	-0.004	1.000	1940679	0.9301		93.0	3970	
363.00 > 169.00	2.264	2.268	-0.004	1.000	729010		2.66(1.13-3.40)		6565	
8 Perfluorohexanesulfonic acid										
399.00 > 80.00	2.277	2.280	-0.003	1.000	2116894	0.8440		92.7	8622	
399.00 > 99.00	2.277	2.280	-0.003	1.000	689054		3.07(1.50-4.49)		5857	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 11 18O2 PFHxS										
403.00 > 84.00	2.277	2.282	-0.005	0.868	5327402	2.37		100	50201	
13 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.595	2.596	-0.001	1.000	670262	1.06		112	8995	
D 12 M2-6:2FTS										
429.00 > 81.00	2.595	2.597	-0.002	0.990	907665	2.69		113	25717	
D 14 13C4 PFOA										
417.00 > 372.00	2.623	2.622	0.001	1.000	4668901	2.61		104	36318	
* 62 13C2-PFOA										
415.00 > 370.00	2.623	2.622	0.001		4965525	2.50			31608	
15 Perfluorooctanoic acid										
413.00 > 369.00	2.623	2.623	0.0	1.000	2066479	0.9441		94.4	1555	
413.00 > 169.00	2.623	2.623	0.0	1.000	1011023		2.04(0.84-2.52)		7611	
16 Perfluoroheptanesulfonic acid										
449.00 > 80.00	2.630	2.629	0.001	1.000	1825523	0.9363		98.4	20104	
449.00 > 99.00	2.630	2.629	0.001	1.000	510307		3.58(1.94-5.82)		12725	
D 19 13C5 PFNA										
468.00 > 423.00	2.993	2.992	0.001	1.141	3725676	2.57		103	23212	
17 Perfluorooctane sulfonic acid										
499.00 > 80.00	2.993	2.992	0.001	1.000	1383490	0.8586		92.5	352	
499.00 > 99.00	2.993	2.992	0.001	1.000	303294		4.56(2.31-6.93)		478	
D 18 13C4 PFOS										
503.00 > 80.00	2.993	2.992	0.001	1.141	3440172	2.42		101	29250	
20 Perfluorononanoic acid										
463.00 > 419.00	2.993	2.992	0.001	1.000	1442224	0.9375		93.8	3875	
463.00 > 169.00	2.993	2.992	0.001	1.000	345437		4.18(1.90-5.69)		5171	
22 Perfluorooctane Sulfonamide										
498.00 > 78.00	3.339	3.338	0.001	1.000	1654943	0.9153		91.5	9939	
D 21 13C8 FOSA										
506.00 > 78.00	3.339	3.338	0.001	1.273	4601425	2.30		92.0	23110	
D 26 M2-8:2FTS										
529.00 > 81.00	3.339	3.342	-0.003	1.273	912391	2.56		107	15904	
25 Sodium 1H,1H,2H,2H-perfluorodecane										
527.00 > 507.00	3.339	3.342	-0.003	1.000	435273	0.9389		98.0	11892	
D 23 13C2 PFDA										
515.00 > 470.00	3.347	3.352	-0.005	1.276	3206271	2.56		102	26221	
24 Perfluorodecanoic acid										
513.00 > 469.00	3.355	3.353	0.002	1.002	1178381	0.9470		94.7	6034	
513.00 > 169.00	3.355	3.353	0.002	1.002	202358		5.82(2.36-7.09)		1845	
D 27 d3-NMeFOSAA										
573.00 > 419.00	3.507	3.507	0.0	1.337	1512298	2.42		96.8	9053	
28 N-methyl perfluorooctane sulfonami										
570.00 > 419.00	3.514	3.513	0.001	1.002	632440	0.9678		96.8	4135	
29 Perfluorodecane Sulfonic acid										
599.00 > 80.00	3.663	3.666	-0.003	1.000	870026	0.9230		95.7	15505	
599.00 > 99.00	3.663	3.666	-0.003	1.000	289862		3.00(1.39-4.16)		6566	
D 32 d5-NEtFOSAA										
589.00 > 419.00	3.671	3.672	-0.002	1.399	1585894	2.51		100	7195	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
31 Perfluoroundecanoic acid										
563.00 > 519.00	3.678	3.678	0.0	1.000	899044	0.9305		93.1	3823	
563.00 > 169.00	3.678	3.678	0.0	1.000	176705		5.09(0.00-0.00)		8023	
D 30 13C2 PFUnA										
565.00 > 520.00	3.678	3.679	-0.001	1.402	2340146	2.46		98.5	24761	
33 N-ethyl perfluorooctane sulfonamid										
584.00 > 419.00	3.678	3.679	-0.001	1.002	596021	0.9648		96.5	7436	
35 MeFOSA										
512.00 > 169.00	3.843	3.875	-0.032		420394	NR		0.0	2343	
37 Perfluorododecanoic acid										
613.00 > 569.00	3.979	3.979	0.0	1.000	992087	1.00		99.6	4871	
613.00 > 169.00	3.979	3.979	0.0	1.000	247387		4.01(2.13-6.40)		9393	
D 36 13C2 PFDoA										
615.00 > 570.00	3.979	3.979	0.0	1.517	2430069	2.36		94.3	22274	
39 N-ethylperfluoro-1-octanesulfonami										
526.00 > 169.00	4.035	4.066	-0.031		418933	NR		0.0	2497	
41 Perfluorotridecanoic acid										
663.00 > 619.00	4.241	4.242	-0.001	1.000	1090051	0.9657		96.6	3949	
663.00 > 169.00	4.241	4.242	-0.001	1.000	342828		3.18(1.25-3.76)		9584	
42 Perfluorotetradecanoic acid										
713.00 > 169.00	4.471	4.483	-0.012	1.000	330043	1.02		102	7214	
713.00 > 219.00	4.471	4.483	-0.012	1.000	213570		1.55(0.71-2.13)		6332	
D 43 13C2-PFTeDA										
715.00 > 670.00	4.471	4.483	-0.012	1.705	3320329	2.46		98.6	23350	
D 44 13C2-PFHxDA										
815.00 > 770.00	4.894	4.902	-0.008	1.866	5411847	2.25		90.1	13622	
45 Perfluorohexadecanoic acid										
813.00 > 769.00	4.894	4.902	-0.008	1.000	1941175	0.9271		92.7	1325	
813.00 > 169.00	4.894	4.902	-0.008	1.000	314724		6.17(2.86-8.58)		4112	
46 Perfluorooctadecanoic acid										
913.00 > 869.00	5.245	5.255	-0.010	1.000	2255124	0.9888		98.9	487	
913.00 > 169.00	5.245	5.255	-0.010	1.000	279921		8.06(0.00-0.00)		1549	

QC Flag Legend

Processing Flags

NR - Missing Quant Standard

Report Date: 19-Jan-2018 15:50:58 Chrom Revision: 2.2 08-Dec-2017 11:41:26

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b\2018.01.18LLA_004.d

Injection Date: 18-Jan-2018 17:53:18 Instrument ID: A8_N

Lims ID: LCSD 320-204105/3-A

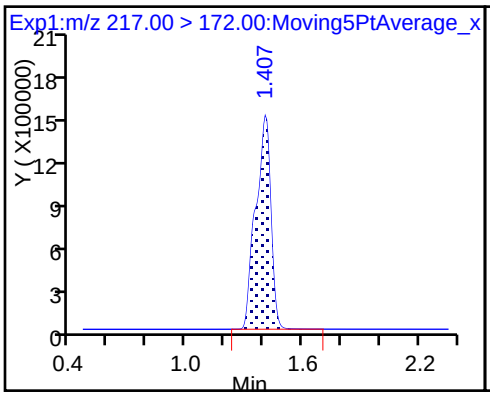
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 43 Worklist Smp#: 4

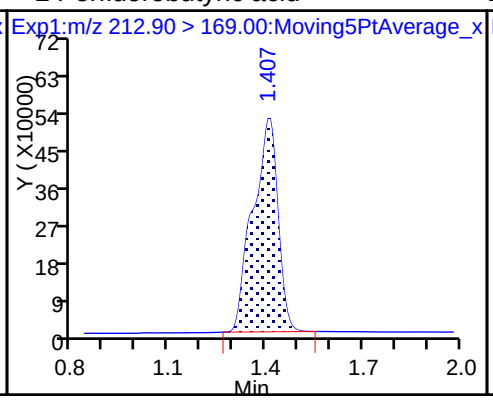
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

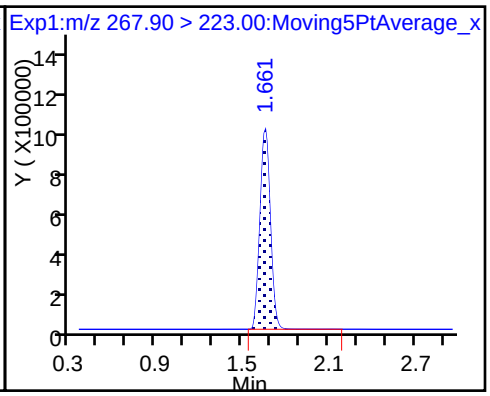
D 1 13C4 PFBA



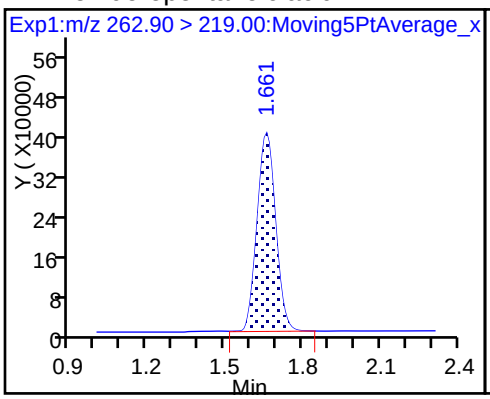
2 Perfluorobutyric acid



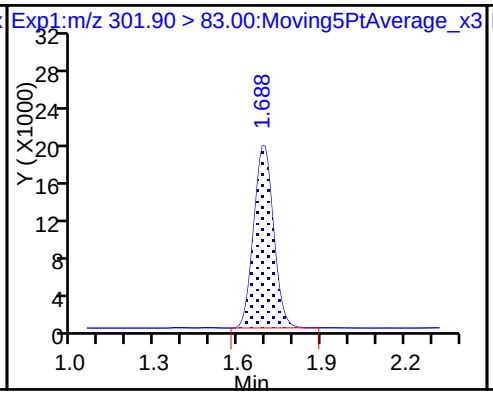
D 3 13C5-PFPeA



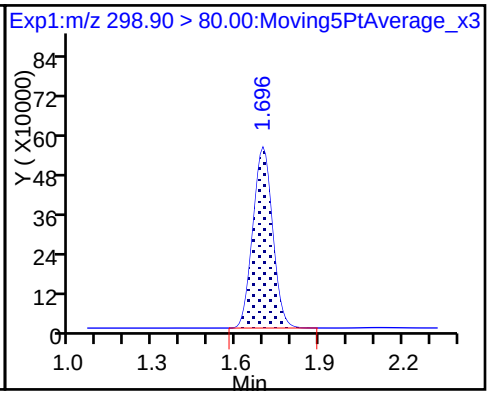
4 Perfluoropentanoic acid



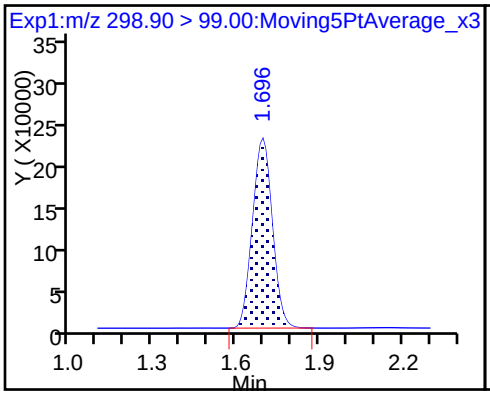
D 47 13C3-PFBS



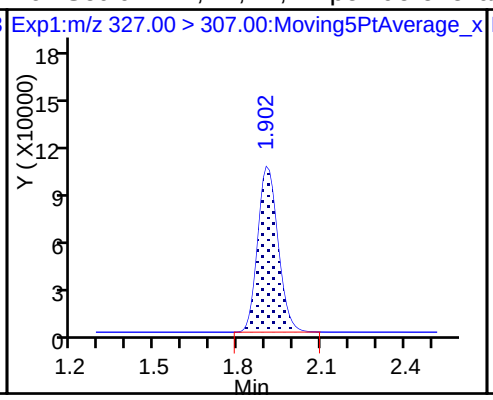
5 Perfluorobutanesulfonic acid



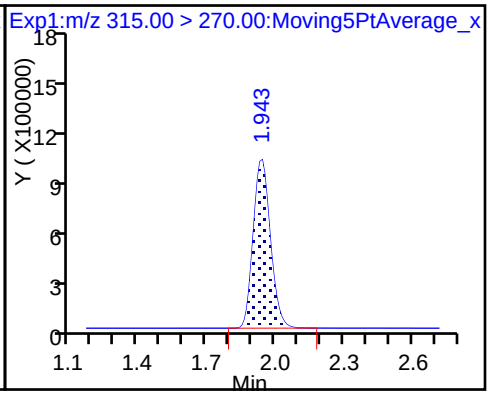
5 Perfluorobutanesulfonic acid



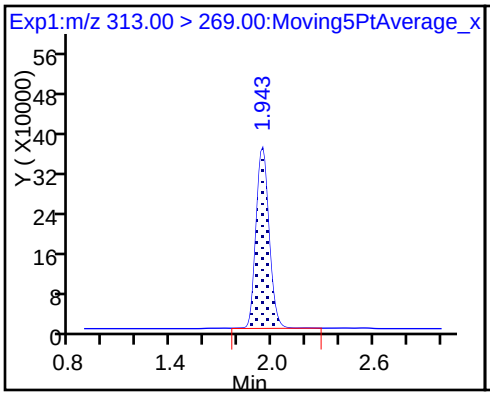
61 Sodium 1H,1H,2H,2H-perfluorohexa



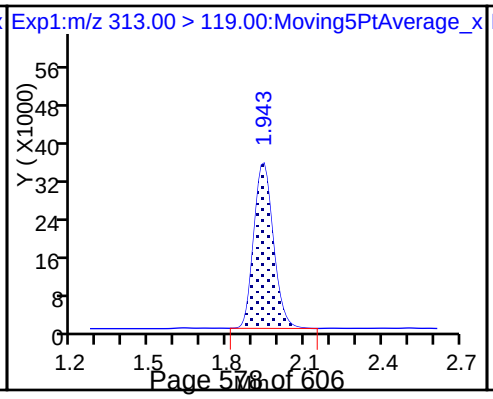
D 7 13C2 PFHxA



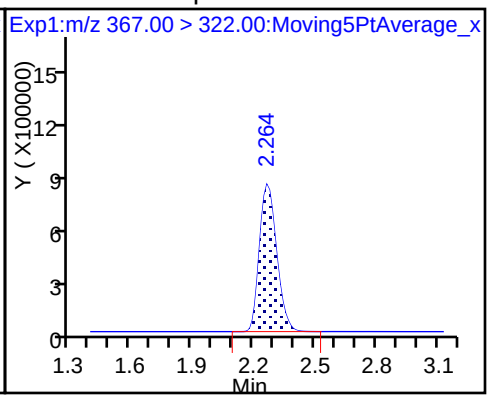
6 Perfluorohexanoic acid



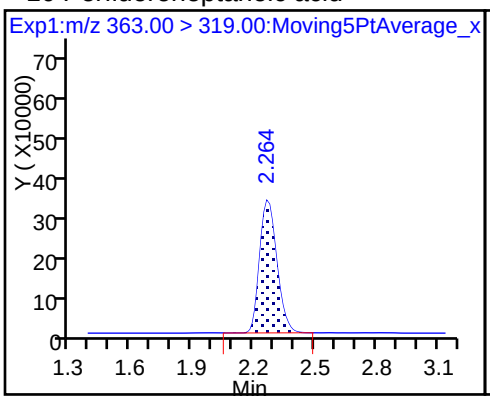
6 Perfluorohexanoic acid



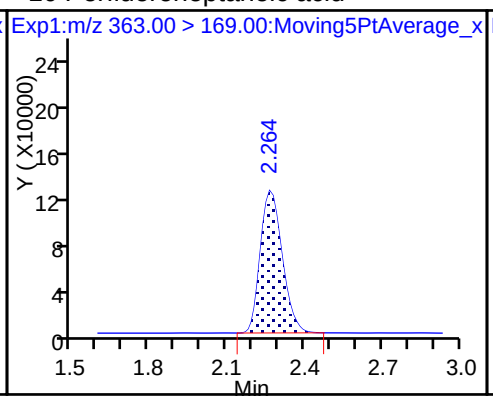
D 9 13C4-PFHpA



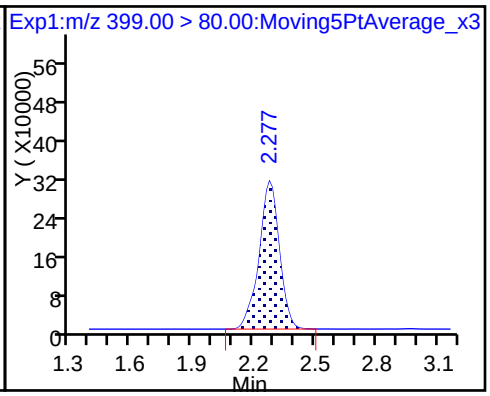
10 Perfluoroheptanoic acid



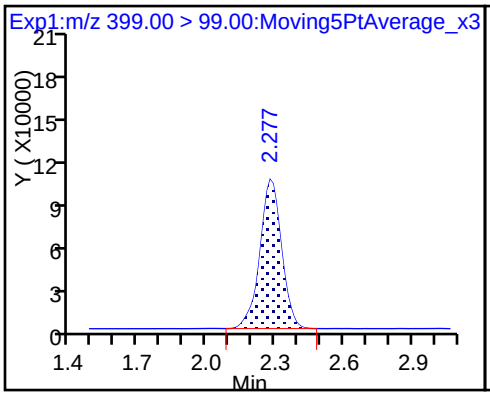
10 Perfluoroheptanoic acid



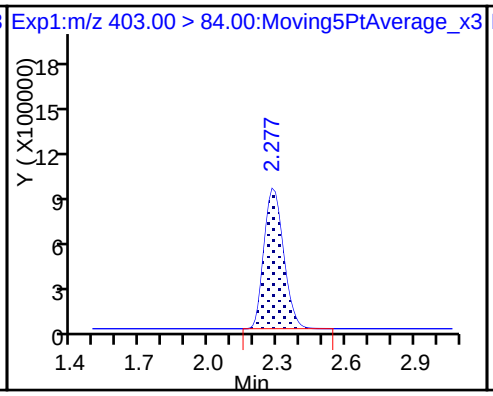
8 Perfluorohexanesulfonic acid



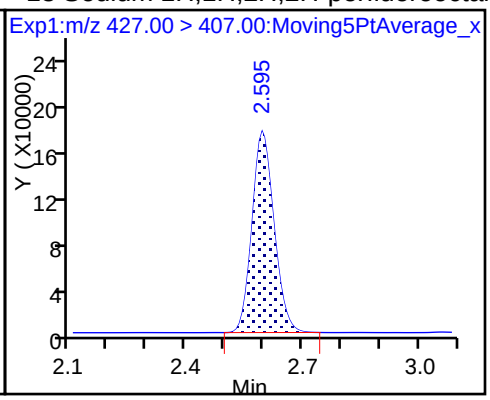
8 Perfluorohexanesulfonic acid



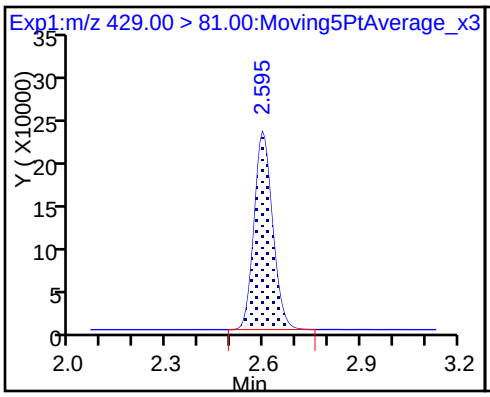
D 11 18O2 PFHxS



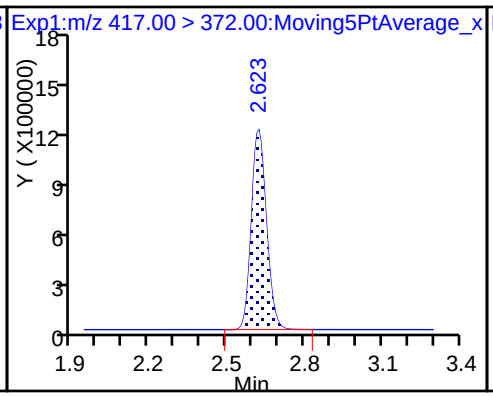
13 Sodium 1H,1H,2H,2H-perfluorooctane



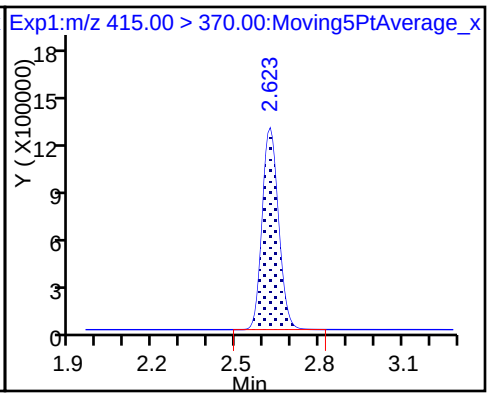
D 12 M2-6:2FTS



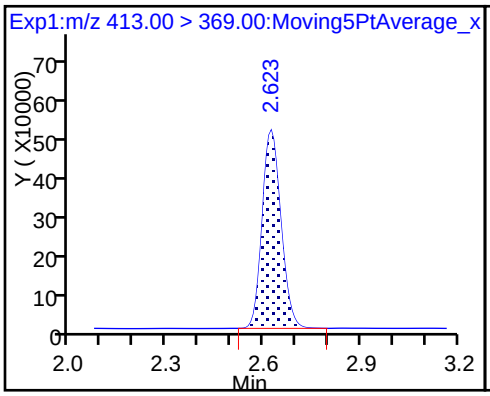
D 14 13C4 PFOA



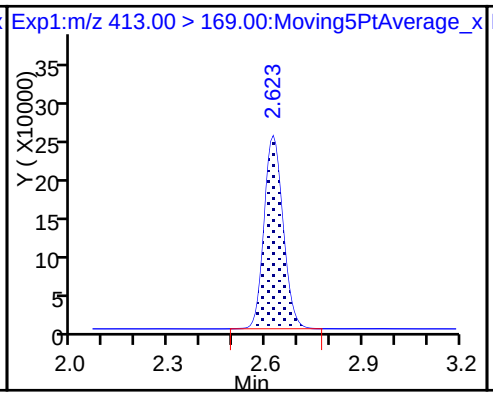
* 62 13C2-PFOA



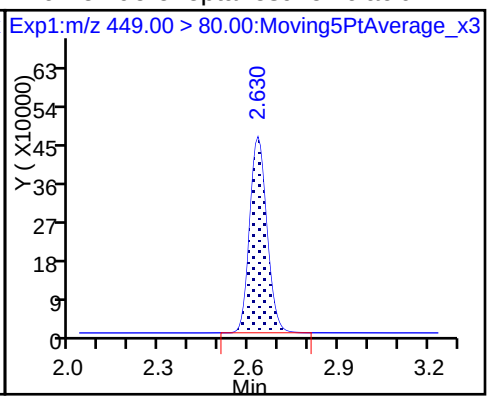
15 Perfluorooctanoic acid



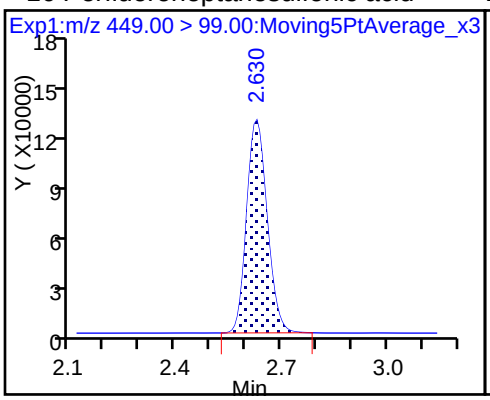
15 Perfluorooctanoic acid



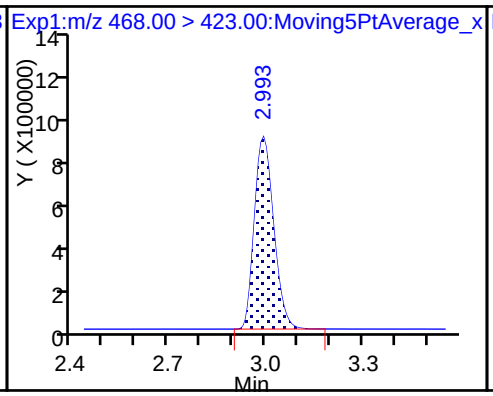
16 Perfluoroheptanesulfonic acid



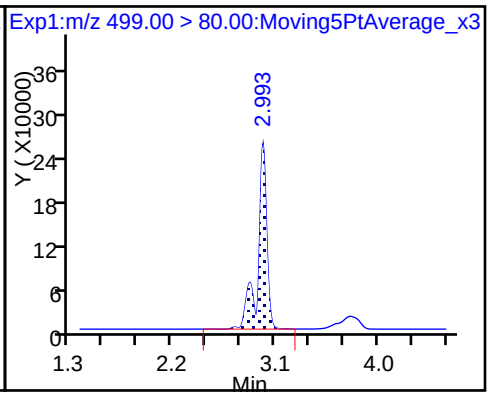
16 Perfluoroheptanesulfonic acid



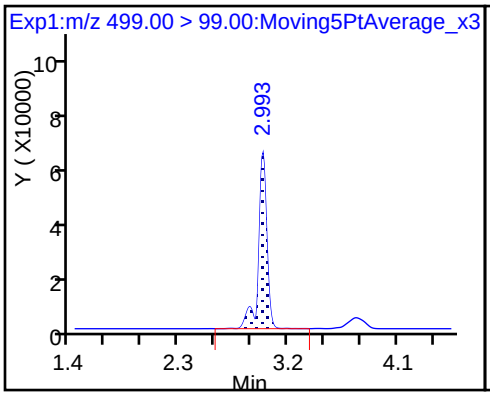
D 19 13C5 PFNA



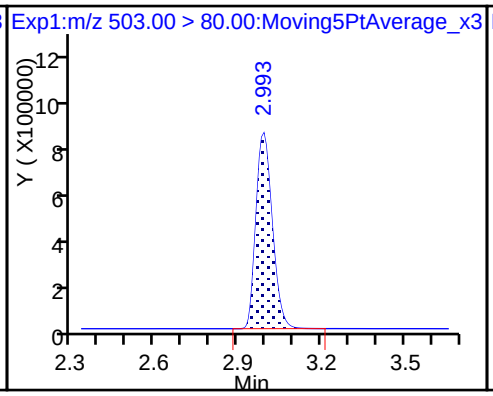
17 Perfluorooctane sulfonic acid



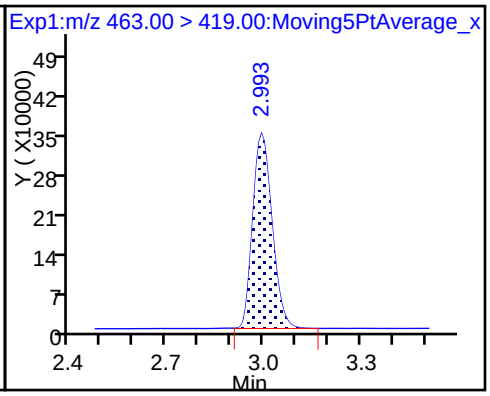
17 Perfluorooctane sulfonic acid



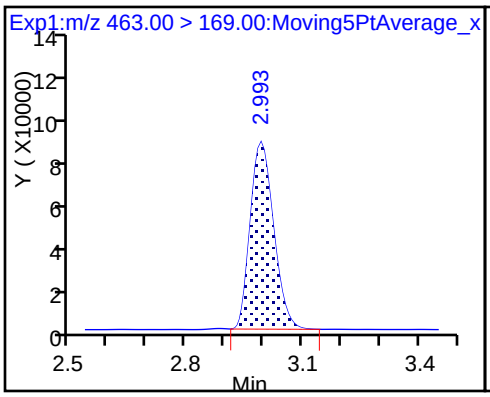
D 18 13C4 PFOS



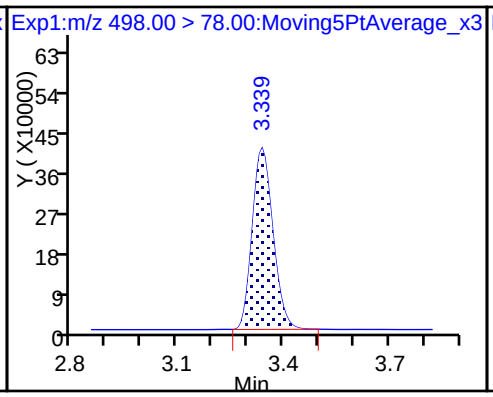
20 Perfluorononanoic acid



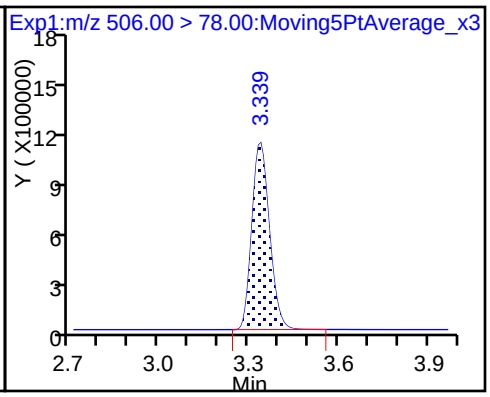
20 Perfluorononanoic acid



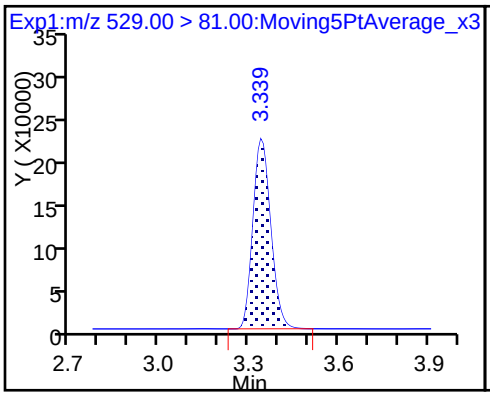
22 Perfluorooctane Sulfonamide



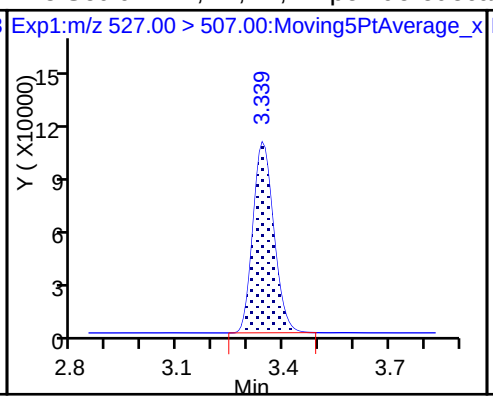
D 21 13C8 FOSA



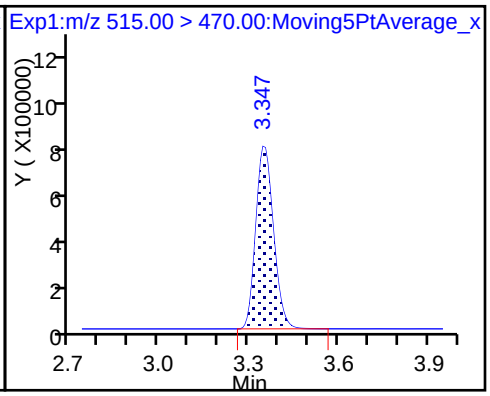
D 26 M2-8:2FTS



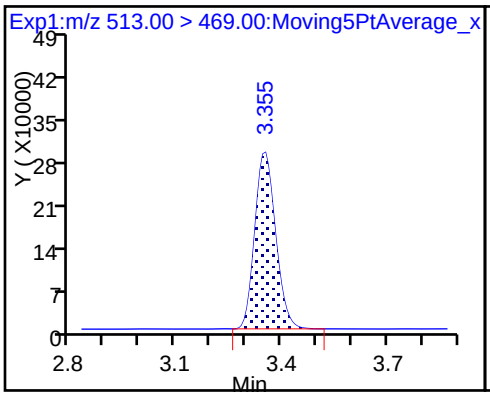
25 Sodium 1H,1H,2H,2H-perfluorodecane



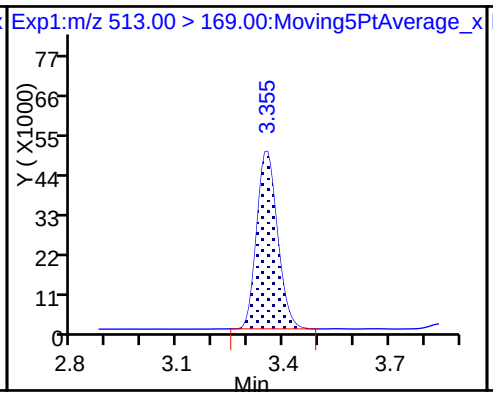
D 23 13C2 PFDA



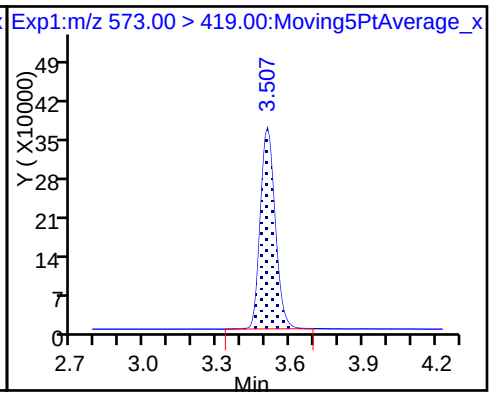
24 Perfluorodecanoic acid



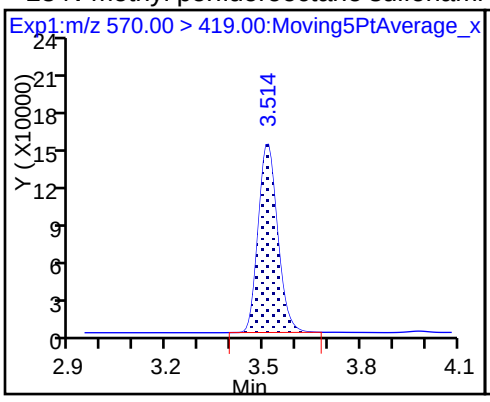
24 Perfluorodecanoic acid



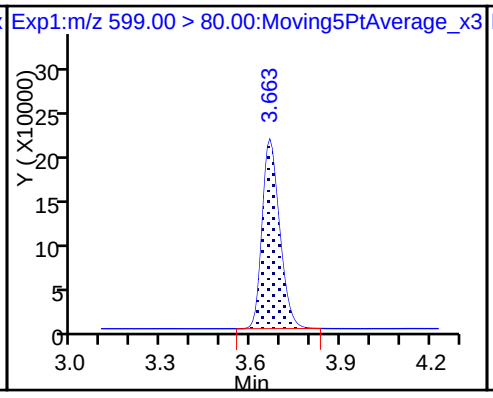
D 27 d3-NMeFOSAA



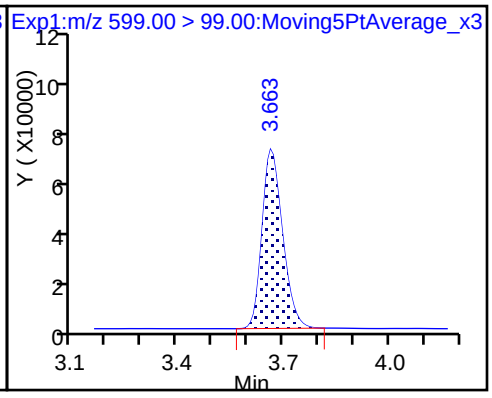
28 N-methyl perfluorooctane sulfonami



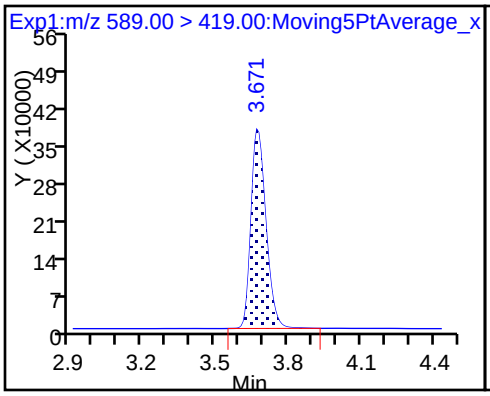
29 Perfluorodecane Sulfonic acid



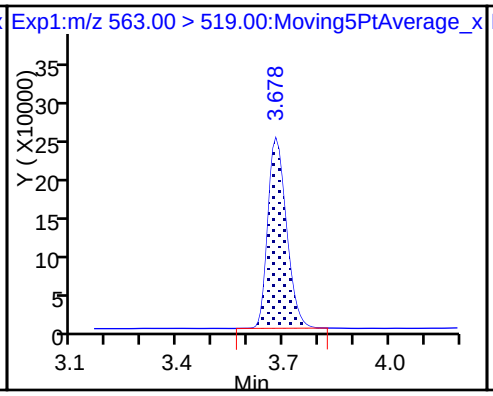
29 Perfluorodecane Sulfonic acid



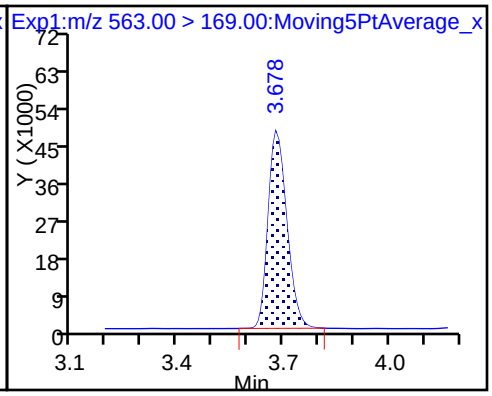
D 32 d5-NEtFOSAA



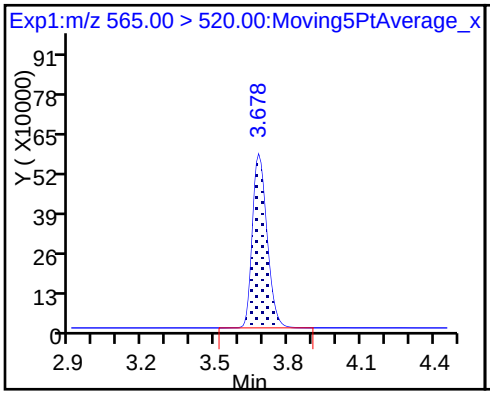
31 Perfluoroundecanoic acid



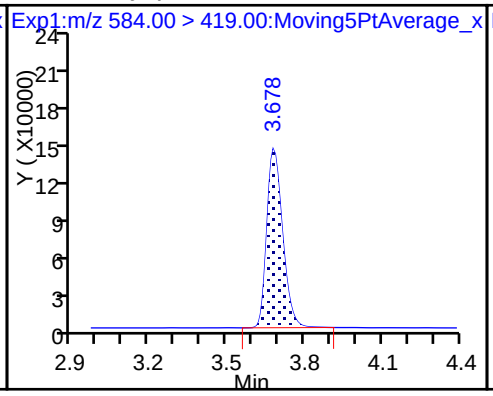
31 Perfluoroundecanoic acid



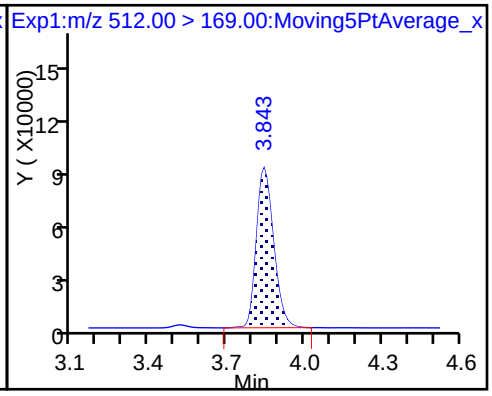
D 30 13C2 PFUnA



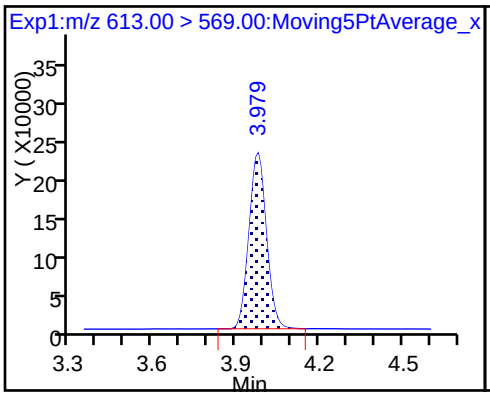
33 N-ethyl perfluorooctane sulfonamid



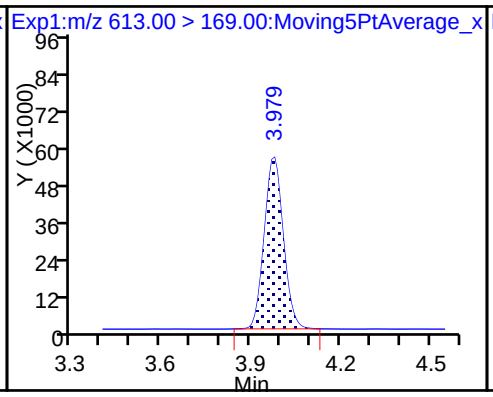
35 MeFOSA



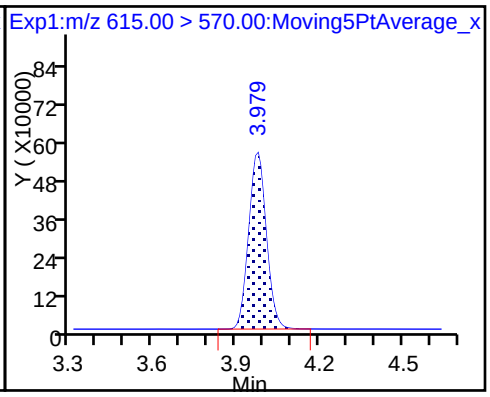
37 Perfluorododecanoic acid



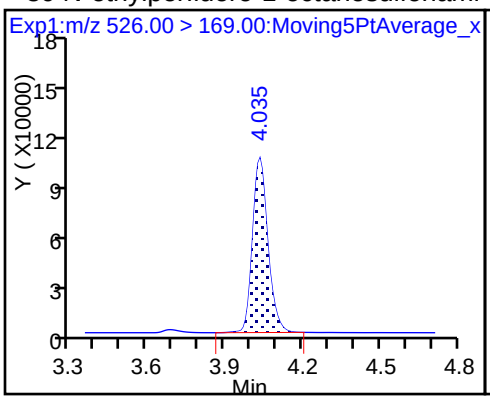
37 Perfluorododecanoic acid



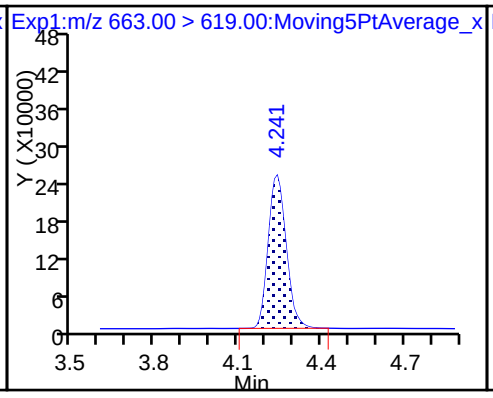
D 36 13C2 PFDoA



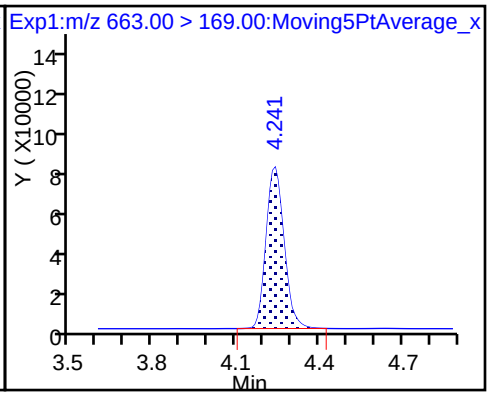
39 N-ethylperfluoro-1-octanesulfonami



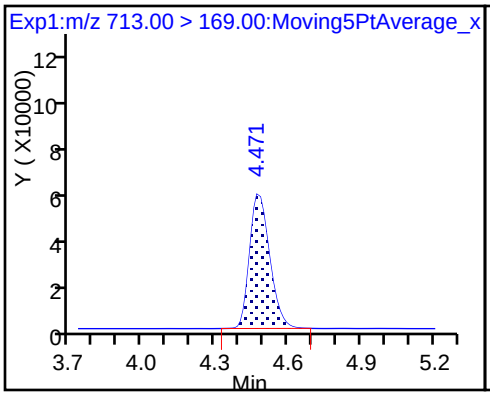
41 Perfluorotridecanoic acid



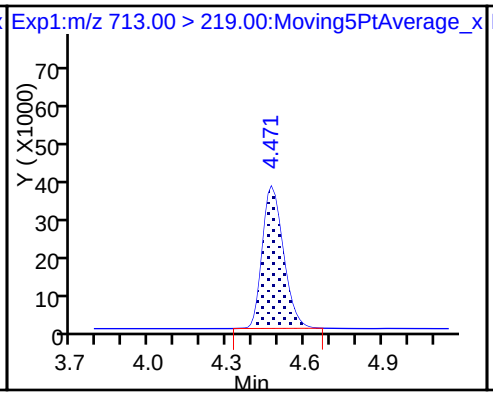
41 Perfluorotridecanoic acid



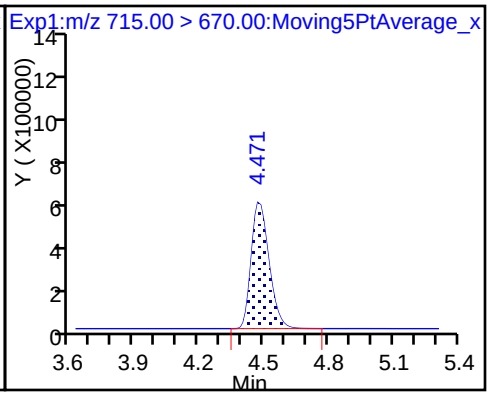
42 Perfluorotetradecanoic acid



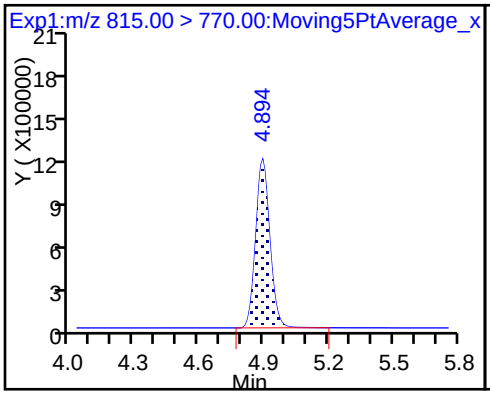
42 Perfluorotetradecanoic acid



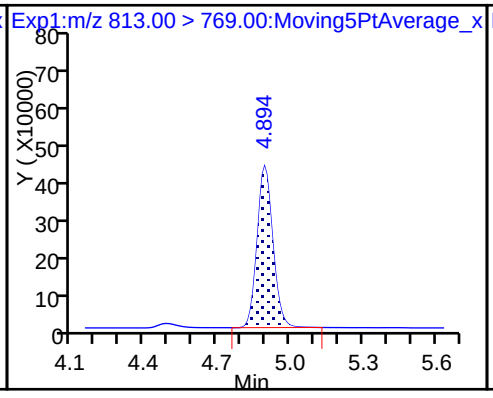
D 43 13C2-PFTeDA



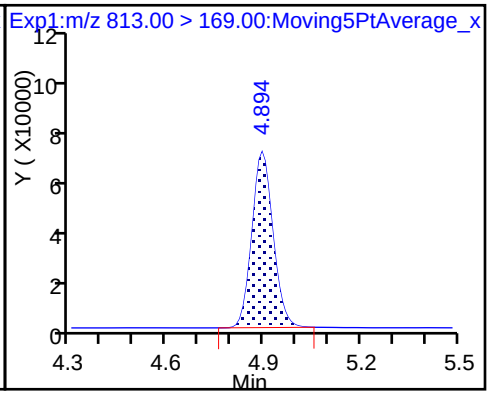
D 44 13C2-PFHxDA



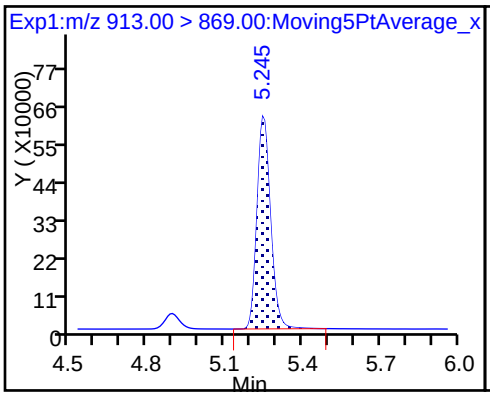
45 Perfluorohexadecanoic acid



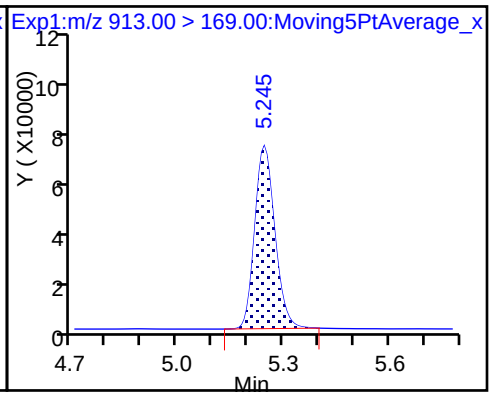
45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid



46 Perfluorooctadecanoic acid



LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Instrument ID: A8_N Start Date: 01/17/2018 14:19

Analysis Batch Number: 204375 End Date: 01/17/2018 15:22

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-204375/2		01/17/2018 14:19	1	2018.01.17CURVE LLA 002.d	GeminiC18 3x100 3(mm)
IC 320-204375/3		01/17/2018 14:27	1	2018.01.17CURVE LLA 003.d	GeminiC18 3x100 3(mm)
IC 320-204375/4		01/17/2018 14:35	1	2018.01.17CURVE LLA 004.d	GeminiC18 3x100 3(mm)
IC 320-204375/5		01/17/2018 14:42	1	2018.01.17CURVE LLA 005.d	GeminiC18 3x100 3(mm)
IC 320-204375/6		01/17/2018 14:50	1	2018.01.17CURVE LLA 006.d	GeminiC18 3x100 3(mm)
IC 320-204375/7		01/17/2018 14:58	1	2018.01.17CURVE LLA 007.d	GeminiC18 3x100 3(mm)
IC 320-204375/8		01/17/2018 15:06	1	2018.01.17CURVE LLA 008.d	GeminiC18 3x100 3(mm)
ICB 320-204375/9		01/17/2018 15:14	1		GeminiC18 3x100 3(mm)
ICV 320-204375/10		01/17/2018 15:22	1	2018.01.17CURVE LLA 010.d	GeminiC18 3x100 3(mm)

537 (modified)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Instrument ID: A8_N Start Date: 01/18/2018 10:35

Analysis Batch Number: 204504 End Date: 01/18/2018 15:01

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCVL 320-204504/1		01/18/2018 10:35	1	2018.01.18LLC_004.d	GeminiC18 3x100 3(mm)
CCV 320-204504/2		01/18/2018 10:43	1		GeminiC18 3x100 3(mm)
ZZZZZ		01/18/2018 10:50	1		GeminiC18 3x100 3(mm)
CCV 320-204504/14		01/18/2018 12:17	1		GeminiC18 3x100 3(mm)
CCV 320-204504/25		01/18/2018 13:43	1		GeminiC18 3x100 3(mm)
CCV 320-204504/35		01/18/2018 15:01	1		GeminiC18 3x100 3(mm)

537 (modified)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Instrument ID: A8_N Start Date: 01/18/2018 17:29

Analysis Batch Number: 204556 End Date: 01/18/2018 18:40

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-204556/1		01/18/2018 17:29	1	2018.01.18LLA_001.d	GeminiC18 3x100 3(mm)
MB 320-204105/1-A		01/18/2018 17:37	1	2018.01.18LLA_002.d	GeminiC18 3x100 3(mm)
LCS 320-204105/2-A		01/18/2018 17:45	1	2018.01.18LLA_003.d	GeminiC18 3x100 3(mm)
LCSD 320-204105/3-A		01/18/2018 17:53	1	2018.01.18LLA_004.d	GeminiC18 3x100 3(mm)
320-35042-1		01/18/2018 18:01	1	2018.01.18LLA_005.d	GeminiC18 3x100 3(mm)
320-35042-2		01/18/2018 18:08	1	2018.01.18LLA_006.d	GeminiC18 3x100 3(mm)
320-35042-3		01/18/2018 18:16	1	2018.01.18LLA_007.d	GeminiC18 3x100 3(mm)
320-35042-4		01/18/2018 18:24	1	2018.01.18LLA_008.d	GeminiC18 3x100 3(mm)
CCV 320-204556/10		01/18/2018 18:40	1	2018.01.18LLD_001.d	GeminiC18 3x100 3(mm)

537 (modified)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Instrument ID: A8_N Start Date: 01/19/2018 16:50

Analysis Batch Number: 204757 End Date: 01/19/2018 17:13

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-204757/1		01/19/2018 16:50	1	2018.01.19LLC_009.d	GeminiC18 3x100 3(mm)
320-35042-1 DL		01/19/2018 16:58	10	2018.01.19LLC_010.d	GeminiC18 3x100 3(mm)
ZZZZZ		01/19/2018 17:06	1		GeminiC18 3x100 3(mm)
CCV 320-204757/4		01/19/2018 17:13	1	2018.01.19LLC_012.d	GeminiC18 3x100 3(mm)

537 (modified)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Batch Number: 204105 Batch Start Date: 01/16/18 09:18 Batch Analyst: Branscum, Cassie

Batch Method: 3535 Batch End Date: 01/16/18 14:28

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	LCMPFC_ALL_SU 00031	LCPFC-IS 00020
MB 320-204105/1		3535, 537 (modified)				250 mL	10.0 mL	500 uL	500 uL
LCS 320-204105/2		3535, 537 (modified)				250 mL	10.0 mL	500 uL	500 uL
LCSD 320-204105/3		3535, 537 (modified)				250 mL	10.0 mL	500 uL	500 uL
320-35042-A-1	TP-PFC-025-TPI	3535, 537 (modified)	T	283.44 g	27.22 g	256.2 mL	10.0 mL	500 uL	500 uL
320-35042-A-2	TP-PFC-025-MID-CARBON	3535, 537 (modified)	T	280.89 g	27.04 g	253.9 mL	10.0 mL	500 uL	500 uL
320-35042-A-3	TP-PFC-025-TPE	3535, 537 (modified)	T	284.26 g	27.55 g	256.7 mL	10.0 mL	500 uL	500 uL
320-35042-A-4	TP-PFC-025-TPE-D	3535, 537 (modified)	T	280.26 g	27.26 g	253 mL	10.0 mL	500 uL	500 uL

Lab Sample ID	Client Sample ID	Method Chain	Basis	LCPFCSP 00119					
MB 320-204105/1		3535, 537 (modified)							
LCS 320-204105/2		3535, 537 (modified)		500 uL					
LCSD 320-204105/3		3535, 537 (modified)		500 uL					
320-35042-A-1	TP-PFC-025-TPI	3535, 537 (modified)	T						
320-35042-A-2	TP-PFC-025-MID-CARBON	3535, 537 (modified)	T						
320-35042-A-3	TP-PFC-025-TPE	3535, 537 (modified)	T						
320-35042-A-4	TP-PFC-025-TPE-D	3535, 537 (modified)	T						

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Batch Number: 204105 Batch Start Date: 01/16/18 09:18 Batch Analyst: Branscum, Cassie

Batch Method: 3535 Batch End Date: 01/16/18 14:28

Batch Notes	
Analyst ID - Aliquot Step	skd
Balance ID	QA-070
Batch Comment	Sample labels match client IDs: ccb 1/16/18
Analyst ID - Final Volume Step	ccb
H2O ID	1/11/17
Hexane ID	1095480
Internal Standard ID#	1125650
Manifold ID	8
Methanol ID	1127833
Sodium Hydroxide ID	1132905
Pipette ID	I46370G
Analyst ID - Reagent Drop	CCB
Analyst ID - IS Reagent Drop	ccb
Analyst ID - IS Reagent Drop Witness	kmk
Analyst ID - SU Reagent Drop	CCB
Analyst ID - SU Reagent Drop Witness	HJA
Solvent Lot #	1131945
Solvent Name	0.3% NH4OH/MeOH
SOP Number	WS-LC-0025
SPE Cartridge Type	WAX 500mg
Solid Phase Extraction Disk ID	003337172A

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): 35042 Work List ID(s): 53066, 53121

Extraction Batch: 204105 Analysis Batch(es): 204556, 204757

Delivery Rank 4 Due Date: 1/22/18

A. Calibration/Instrument Run QC	1st Level	2nd Level	N/A
1. ICAL locked in Chrom and TALS? ICAL Batch# 204375	✓	✓	
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# 114124, 114188	✓	✓	
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): CAR Date: 1/22/18

2nd Level Reviewer: MLWolf Date: 1/22/2018

TestAmerica Laboratories
Worklist QC Batch Report

Worklist Name: 18JAN2018NCC_PFC Worklist Number: 53066
Instrument Name: A8_N Chrom Method: A8_N
Data Directory: \\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b
QC Batching: Disabled Limit Group Batching: Enabled

QC Batch: 1	LC PFC_DOD ICAL Raw Batch: 204556
# 1 CCV L5	# 1 CCV L5
# 2 MB 320-204105/1-A	# 2 MB 320-204105/1-A
# 3 LCS 320-204105/2-A	# 3 LCS 320-204105/2-A
# 4 LCSD 320-204105/3-A	# 4 LCSD 320-204105/3-A
# 5 320-35042-A-1-A	# 5 320-35042-A-1-A
# 6 320-35042-A-2-A	# 6 320-35042-A-2-A
# 7 320-35042-A-3-A	# 7 320-35042-A-3-A
# 8 320-35042-A-4-A	# 8 320-35042-A-4-A
# 9 QC L6	# 9 QC L6
#10 CCV L4	#10 CCV L4

ICAL: 204375
CCVL: 204504

TestAmerica Laboratories
Worklist QC Batch Report

Worklist Name: 19JAN2018NCE_PFC Worklist Number: 53121
Instrument Name: A8_N Chrom Method: A8_N
Data Directory: \\ChromNa\Sacramento\ChromData\A8_N\20180119-53121.b
QC Batching: Disabled Limit Group Batching: Enabled

QC Batch: 1	LC PFC ICAL Raw Batch: 204756	LC PFC_DOD ICAL Raw Batch: 204757
# 1 CCV L5	# 1 CCV L5	# 1 CCV L5
# 2 320-35042-A-1-A		# 2 320-35042-A-1-A
# 3 320-35042-A-2-A		# 3 320-35042-A-2-A
# 4 CCV L4	# 4 CCV L4	# 4 CCV L4

CCV L: 204655
ICAL: 204375

TestAmerica Laboratories
Worklist Run Log Report

Worklist Name: 18JAN2018NCA_PFC Worklist Num: 53056
Instrument: A8_N Method: A8_N
Batch Directory: \\ChromNa\Sacramento\ChromData\A8_N\20180118-53056.b
Anaylysis Type: SemiVOA Creator: Royce, Amani A
Inj Volume: 2.00 Inj Vol Units: ul

Lab ID	Worklist ID	Sample Type	Inj Date/Time	File Name	Vial	Dil Factor	Client ID	Fract
CCVL	320-0053056-001	CCVL	18-Jan-2018 10:35:15	2018.01.18LLC_004.d	21	1.0		sv
CCV L4	320-0053056-002	CCV	18-Jan-2018 10:43:07	2018.01.18LLC_005.d	30	1.0		sv
RB	320-0053056-003	RB	18-Jan-2018 10:50:56	2018.01.18LLC_006.d	20	1.0		sv
MB 320-204033/1-A	320-0053056-004	MB	18-Jan-2018 10:58:44	2018.01.18LLC_007.d	13	1.0		sv
LCS 320-204033/2-A	320-0053056-005	LCS	18-Jan-2018 11:06:33	2018.01.18LLC_008.d	14	1.0		sv
LCSSRM 320-204033/3-A	320-0053056-006	LCSSRM	18-Jan-2018 11:14:21	2018.01.18LLC_009.d	15	1.0		sv
320-34271-A-21-B	320-0053056-007	Client	18-Jan-2018 11:22:12	2018.01.18LLC_010.d	16	1.0	BG-CR008-B	sv
320-34271-A-22-B	320-0053056-008	Client	18-Jan-2018 11:30:00	2018.01.18LLC_011.d	17	1.0	BG-CR008-C	sv
320-34271-A-23-B	320-0053056-009	Client	18-Jan-2018 11:37:51	2018.01.18LLC_012.d	18	1.0	BG-CR008-D	sv
320-34271-A-24-B	320-0053056-010	Client	18-Jan-2018 11:45:41	2018.01.18LLC_013.d	19	1.0	BG-CR008-E	sv
320-34271-A-25-B	320-0053056-011	Client	18-Jan-2018 11:53:33	2018.01.18LLC_014.d	20	1.0	BG-CR008-F	sv
320-34271-A-26-B	320-0053056-012	Client	18-Jan-2018 12:01:25	2018.01.18LLC_015.d	21	1.0	BG-CR008-G	sv
RB	320-0053056-013	RB	18-Jan-2018 12:09:17	2018.01.18LLC_016.d	20	1.0		sv
CCV L5	320-0053056-014	CCV	18-Jan-2018 12:17:05	2018.01.18LLC_017.d	31	1.0		sv
320-34271-A-27-B	320-0053056-015	Client	18-Jan-2018 12:24:52	2018.01.18LLC_018.d	22	1.0	BG-CR008-H	sv
320-34271-A-28-B	320-0053056-016	Client	18-Jan-2018 12:32:41	2018.01.18LLC_019.d	23	1.0	BG-CR008-I	sv
320-34271-A-29-B	320-0053056-017	Client	18-Jan-2018 12:40:29	2018.01.18LLC_020.d	24	1.0	BG-CR008-J	sv
320-34271-A-30-B	320-0053056-018	Client	18-Jan-2018 12:48:18	2018.01.18LLC_021.d	25	1.0	AE-CR008-A	sv
320-34271-A-31-B	320-0053056-019	Client	18-Jan-2018 12:56:06	2018.01.18LLC_022.d	26	1.0	AE-CR008-B	sv
320-34271-A-32-B	320-0053056-020	Client	18-Jan-2018 13:03:56	2018.01.18LLC_023.d	27	1.0	AE-CR008-C	sv
320-34271-A-33-D	320-0053056-021	Client	18-Jan-2018 13:11:47	2018.01.18LLC_024.d	28	1.0	AE-CR008-D	sv
320-34271-A-33-E MS	320-0053056-022	MS	18-Jan-2018 13:19:38	2018.01.18LLC_025.d	29	1.0	AE-CR008-D	sv
320-34271-A-33-F MSD	320-0053056-023	MSD	18-Jan-2018 13:27:29	2018.01.18LLC_026.d	30	1.0	AE-CR008-D	sv
RB	320-0053056-024	RB	18-Jan-2018 13:35:18	2018.01.18LLC_027.d	20	1.0		sv
CCV L4	320-0053056-025	CCV	18-Jan-2018 13:43:06	2018.01.18LLC_028.d	30	1.0		sv
320-34271-A-34-B	320-0053056-026	Client	18-Jan-2018 13:50:54	2018.01.18LLC_029.d	31	1.0	AE-CR008-E	sv
320-34271-A-35-C	320-0053056-027	Client	18-Jan-2018 13:58:43	2018.01.18LLC_030.d	32	1.0	AE-CR008-F	sv
320-34271-A-35-D DU	320-0053056-028	DU	18-Jan-2018 14:06:33	2018.01.18LLC_031.d	33	1.0	AE-CR008-F	sv
320-34271-A-36-B	320-0053056-029	Client	18-Jan-2018 14:14:21	2018.01.18LLC_032.d	34	1.0	AE-CR008-G	sv
320-34271-A-37-B	320-0053056-030	Client	18-Jan-2018 14:22:08	2018.01.18LLC_033.d	35	1.0	AE-CR008-H	sv
320-34271-A-38-B	320-0053056-031	Client	18-Jan-2018 14:29:59	2018.01.18LLC_034.d	36	1.0	AE-CR008-I	sv
320-34271-A-39-B	320-0053056-032	Client	18-Jan-2018 14:37:51	2018.01.18LLC_035.d	37	1.0	AE-CR008-J	sv
320-34271-A-40-B	320-0053056-033	Client	18-Jan-2018 14:45:41	2018.01.18LLC_036.d	38	1.0	WP-CR001-A	sv
RB	320-0053056-034	RB	18-Jan-2018 14:53:33	2018.01.18LLC_037.d	20	1.0		sv
CCV L5	320-0053056-035	CCV	18-Jan-2018 15:01:25	2018.01.18LLC_038.d	31	1.0		sv

TestAmerica Laboratories
Worklist Run Log Report

Worklist Name: 18JAN2018NCC_PFC Worklist Num: 53066
Instrument: A8_N Method: A8_N
Batch Directory: \\ChromNa\Sacramento\ChromData\A8_N\20180118-53066.b
Anaylysis Type: SemiVOA Creator: Hannigan, Alyssa B
Inj Volume: 2.00 Inj Vol Units: ul

Lab ID	Worklist ID	Sample Type	Inj Date/Time	File Name	Vial	Dil Factor	Client ID	Fract
CCV L5	320-0053066-001	CCV	18-Jan-2018 17:29:51	2018.01.18LLA_001.d	14	1.0		sv
MB 320-204105/1-A	320-0053066-002	MB	18-Jan-2018 17:37:41	2018.01.18LLA_002.d	41	1.0		sv
LCS 320-204105/2-A	320-0053066-003	LCS	18-Jan-2018 17:45:29	2018.01.18LLA_003.d	42	1.0		sv
LCSD 320-204105/3-A	320-0053066-004	LCSD	18-Jan-2018 17:53:18	2018.01.18LLA_004.d	43	1.0		sv
320-35042-A-1-A	320-0053066-005	Client	18-Jan-2018 18:01:06	2018.01.18LLA_005.d	44	1.0	TP-PFC-025-TPI	sv
320-35042-A-2-A	320-0053066-006	Client	18-Jan-2018 18:08:54	2018.01.18LLA_006.d	45	1.0	TP-PFC-025-MID-CARBON	sv
320-35042-A-3-A	320-0053066-007	Client	18-Jan-2018 18:16:42	2018.01.18LLA_007.d	46	1.0	TP-PFC-025-TPE	sv
320-35042-A-4-A	320-0053066-008	Client	18-Jan-2018 18:24:31	2018.01.18LLA_008.d	47	1.0	TP-PFC-025-TPE-D	sv
QC L6	320-0053066-009	QC	18-Jan-2018 18:32:19	2018.01.18LLA_009.d	15	1.0		sv
CCV L4	320-0053066-010	CCV	18-Jan-2018 18:40:07	2018.01.18LLD_001.d	30	1.0		sv

TestAmerica Laboratories
Worklist Run Log Report

Worklist Name: 19JAN2018NCA_PFC Worklist Num: 53092
Instrument: A8_N Method: A8_N
Batch Directory: \\ChromNa\Sacramento\ChromData\A8_N\20180119-53092.b
Anaylysis Type: SemiVOA Creator: Royce, Amani A
Inj Volume: 2.00 Inj Vol Units: ul

Lab ID	Worklist ID	Sample Type	Inj Date/Time	File Name	Vial	Dil Factor	Fract
CCVL	320-0053092-001	CCVL	19-Jan-2018 09:58:51	2018.01.19LLA_005.d	21	1.0	sv
CCV L4	320-0053092-002	CCV	19-Jan-2018 10:06:40	2018.01.19LLA_006.d	32	1.0	sv
RB	320-0053092-003	RB	19-Jan-2018 10:14:30	2018.01.19LLA_007.d	20	1.0	sv
TOPS MANIFOLD QC PORT 1	320-0053092-004	Client	19-Jan-2018 10:22:22	2018.01.19LLA_029.d	45	1.0	sv
CCV L5	320-0053092-005	CCV	19-Jan-2018 10:30:13	2018.01.19LLA_030.d	33	1.0	sv

TestAmerica Laboratories
Worklist Run Log Report

Worklist Name: 19JAN2018NCE_PFC Worklist Num: 53121
Instrument: A8_N Method: A8_N
Batch Directory: \\ChromNa\Sacramento\ChromData\A8_N\20180119-53121.b
Anaylysis Type: SemiVOA Creator: Royce, Amani A
Inj Volume: 2.00 Inj Vol Units: ul

Lab ID	Worklist ID	Sample Type	Inj Date/Time	File Name	Vial	Dil Factor	Client ID	Fract
CCV L5	320-0053121-001	CCV	19-Jan-2018 16:50:30	2018.01.19LLC_009.d	14	1.0		sv
320-35042-A-1-A	320-0053121-002	Client	19-Jan-2018 16:58:19	2018.01.19LLC_010.d	4	10.0	TP-PFC-025-TPI	sv
320-35042-A-2-A	320-0053121-003	Client	19-Jan-2018 17:06:08	2018.01.19LLC_011.d	5	1.0	TP-PFC-025-MID-CARBON	sv
CCV L4	320-0053121-004	CCV	19-Jan-2018 17:13:58	2018.01.19LLC_012.d	13	1.0		sv

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Test America – Sacramento

Sample Dilution Record

Method ID PFC-IDA **Lot #** See below

Analyst (Print Name) Amani Royce **Analyst Initials** AR

Date 1/19/18

Job #	Sample #	Original F.V. (uL)	Aliquot (uL)	Dilution F.V. (uL)	Dilution Factor
480-130086	1	10,000	30	300	10X
↓	1 MS	↓	↓	↓	↓
↓	1 MSD	↓	↓	↓	↓
320-35042	1	↓	↓	↓	↓
320-34937	3	↓	15	1500	100X
320-34936	1	↓	15	300	20X
320-34922	2	↓	60	300	5X
↓	2 MS	↓	↓	↓	↓
↓	2 MSD	↓	↓	↓	↓
320-34922	2	↓	30	300	10X

AR 1/19/18

Comments:

AR 1/19/18

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

51

AS 1/16/18 acr 1/19/18 1/19/18 AS 1/19/18

Batch Number: 320-204105
Analyst: Branscum, Cassie
Batch Open: 1/16/2018 9:18:00AM
Method Code: 320-3535_PFC-320
Batch End: 1/16/2018 2:28:00PM

Solid-Phase Extraction (SPE)

Due: 1/22

	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~320-204105/1 N/A	N/A		250 mL	na			N/A	N/A	N/A		MB 320-204105/1-A
				10.0 mL								
2	LCS~320-204105/2 N/A	N/A		250 mL	na			N/A	N/A	N/A		LCS 320-204105/2-A
				10.0 mL								
3	LCSD~320-204105/3 N/A	N/A		250 mL	na			N/A	N/A	N/A		LCSD 320-204105/3-A
				10.0 mL								
4	320-35042-A-1 (PFC_IDA_DOD5)	N/A (320-35042-1)	283.44 g	256.2 mL	na			1/20/18	8_Days	4	10X	320-35042-A-1-A
			27.22 g	10.0 mL								
5	320-35042-A-2 (PFC_IDA_DOD5)	N/A (320-35042-1)	280.89 g	253.9 mL	na			1/20/18	8_Days	4	R1	320-35042-A-2-A
			27.04 g	10.0 mL								
6	320-35042-A-3 (PFC_IDA_DOD5)	N/A (320-35042-1)	284.26 g	256.7 mL	na			1/20/18	8_Days	4		320-35042-A-3-A
			27.55 g	10.0 mL								
7	320-35042-A-4 (PFC_IDA_DOD5)	N/A (320-35042-1)	280.26 g	253 mL	na			1/20/18	8_Days	4		320-35042-A-4-A
			27.26 g	10.0 mL								

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-204105 Analyst: Branscum, Cassie Batch Open: 1/16/2018 9:18:00AM

Method Code: 320-3535_PFC-320 Batch End: 1/16/2018 2:28:00PM

Batch Notes

Manifold ID	8
Methanol ID	1127833
Hexane ID	1095480
Sodium Hydroxide ID	1132905
First Start time	NA
First End time	NA
SPE Cartridge Type	WAX 500mg
Solid Phase Extraction Disk ID	003337172A
Balance ID	QA-070
H2O ID	1/11/17
Pipette ID	I46370G
Solvent Name	0.3% NH4OH/MeOH
Solvent Lot #	1131945
Analyst ID - Reagent Drop	CCB
Analyst ID - SU Reagent Drop	CCB
Analyst ID - SU Reagent Drop Witness	HJA
Acid Name	NA
Acid ID	NA
Reagent ID	NA
Reagent Lot Number	NA
Analyst ID - IS Reagent Drop	ccb

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-204105 Analyst: Branscum, Cassie Batch Open: 1/16/2018 9:18:00AM

Method Code: 320-3535_PFC-320 Batch End: 1/16/2018 2:28:00PM

Analyst ID - IS Reagent Drop Witness	kmk
Internal Standard ID#	1125650
Analyst ID - Concentration	NA
Analyst ID - Aliquot Step	skd
Analyst ID - Final Volume Step	ccb
SOP Number	WS-LC-0025
Batch Comment	Sample labels match client IDs: ccb 1/16/18

Comments

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-204105
Analyst: Branscum, Cassie
Batch Open: 1/16/2018 9:18:00AM

Method Code: 320-3535_PFC-320
Batch End: 1/16/18 2:28 pm

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-204105/1	LCMPFC_ALL_SU_00031	500 uL	10.0 mL	CSB 1-16-18	HJA 1-16-18
LCS 320-204105/2	LCMPFC_ALL_SU_00031	500 uL	10.0 mL		
LCS 320-204105/2	LCPFCSP_00119	500 uL	10.0 mL		
LCSD 320-204105/3	LCMPFC_ALL_SU_00031	500 uL	10.0 mL		
LCSD 320-204105/3	LCPFCSP_00119	500 uL	10.0 mL		
320-35042-A-1	LCMPFC_ALL_SU_00031	500 uL	10.0 mL		
320-35042-A-2	LCMPFC_ALL_SU_00031	500 uL	10.0 mL		
320-35042-A-3	LCMPFC_ALL_SU_00031	500 uL	10.0 mL		
320-35042-A-4	LCMPFC_ALL_SU_00031	500 uL	10.0 mL		

Other Reagents:

Reagent	Amount/Units	Lot#:

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Sacramento
Preparation Data Review Checklist

Preparation Batch Number(s) 320-204105 Test 3535-PFC

Earliest Holding Time 1-24-18

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	✓	✓
BD, FV, and AL initials are transcribed into the batch comment	✓	✓
Sample List Tab	**1st Level Reviewer**	**2nd Level Reviewer**
Samples identified to the correct method	✓	✓
Holding time violation NCM filed	NA	NA
MS/MSD or MS/DU NCM filed	✓	✓
NCM for any anomalies filed	NA	NA
All NCMs include method code, matrix, and prep batch	✓	✓
Method/sample/login/QAS checked and correct	✓	✓
Batch contains no more than 20 live samples	✓	✓
Worksheet Tab	**1st Level Reviewer**	**2nd Level Reviewer**
All samples properly preserved	✓	✓
Weights in anticipated range and not targeted	✓	✓
All additional test requirements performed, documented, and uploaded to TALS correctly (e.g. final amount, initial amount, turbidity, and CI Check)	✓	✓
The pH is transcribed properly in TALS	NA	NA
All additional information is transcribed into TALS and is correct and raw data is attached	✓	✓
Comments/Observations are transcribed correctly in TALS	✓	✓
Reagents Tab	**1st Level Reviewer**	**2nd Level Reviewer**
All necessary reagents not expired and checked into TALS	✓	✓
All spike amounts correct and added to necessary samples and QC	✓	✓
Internal Standard is added to the reagents	✓	✓
All units are correctly transcribed into TALS	✓	✓

1st Level Reviewer: [illegible] Date: 1-16-18

2nd Level Reviewer: VPM Date: 1/16/18

Comments:

Shipping and Receiving Documents

TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Phone: 916.373.5600 Fax:

Chain of Custody Record 242315

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
TestAmerica Laboratories, Inc.

TAL-8210 (0713)

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

Client Contact	Project Manager: Jeff Orient	Site Contact: Ken Lamontagne	Date: 1/11/2018	COC No: 242315
Company Name: Tetra Tech	Tel/Fax: (412)921-8650	Lab Contact: David Alt Tucker	Carrier: Fed Ex	1 of 1 COCs
Address: 881 Anderson Dr Foster Plaza 7	Analysis Turnaround Time			Sampler: K Lamontagne
City/State/Zip: Pittsburg, PA 15220-2700	☑ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
Phone: (412) 921-8650	TAT if different from Below			Walk-in Client:
Fax:	☑ 2 weeks			Lab Sampling:
Project Name: Brunswick GWETs	☐ 1 week			
Site: Former NAS Brunswick GWETs	☐ 2 days			Job / SDG No.:
PO # 112G20B005-WE21	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	PFC (Full List) LC/MS/MS	Sample Specific Notes:
TP-PFC-025-TP1	1/11/18	0900	G	W	4	N	N	+	
TP-PFC-025-MID-CARBON		0905			4	N	N	+	
TP-PFC-025-TPE		0910			4	N	N	+	
TP-PFC-025-TPE-D		0000			4	N	N	+	

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☑ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments: ⓐ Sid not sign Relinquish original version, signed on 1/15/2018 at 1400

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd: _____ Corr'd: _____ | Therm ID No.: _____

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	Tetra Tech	1/11/18 ⓐ			
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Phone: 916.373.5600 Fax:

Chain of Custody Record 242315

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
TestAmerica Laboratories, Inc.
TAL-8210 (0713)

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

Client Contact	Project Manager: Jeff Orient	Site Contact: Kevin Lamontagne	Date: 1/11/2018	COC No: 242315
Company Name: Tetra Tech	Tel/Fax: (412) 921-8650	Lab Contact: David Alltucker	Carrier: Fed Ex	1 of 1 COCs
Address: 881 Anderson Dr Foster Plaza 7	Analysis Turnaround Time			Sampler: K. Lamontagne
City/State/Zip: Pittsburg, PA 15220-2700	☑ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
Phone: (412) 921-8650	TAT if different from Below			Walk-in Client:
Fax:	☑ 2 weeks			Lab Sampling:
Project Name: Brunswick GWETs	☐ 1 week			
Site: Former NAS Brunswick GWETs	☐ 2 days			Job / SDG No.:
PO# 112G08005-WE21	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	PFC (Full List) LC/MS/MS	Sample Specific Notes:
TP-PFC-025-TP1	1/11/18	0900	G	W	4	N	N	+	
TP-PFC-025-MID-CARBON		0905			4	N	N	+	
TP-PFC-025-TPE		0910			4	N	N	+	
TP-PFC-025-TPE-D		0000			4	N	N	+	

320-35042 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☑ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments:

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd: 5.2 Corr'd: — | Therm ID No.: AR-3

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
				TA-SAC	01/12/18 1320
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Login Sample Receipt Checklist

Client: Tetra Tech, Inc.

Job Number: 320-35042-1

Login Number: 35042
List Number: 1
Creator: Turpen, Troy

List Source: TestAmerica Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	False	COC not relinquished by client.
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	

"TP-PFC-025-TPI","537 (modified)","DL","320-35042-1","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","340","ng/L","D","5.3","DL","","TRG","","","39","LOQ","NO","-99","","256.2","10.0","20",""
"TP-PFC-025-TPI","537 (modified)","DL","320-35042-1","TALSAC","2058-94-8","Perfluoroundecanoic acid (PFUnA)","29","ng/L","U","11","DL","","TRG","","","39","LOQ","NO","-99","","256.2","10.0","29",""
"TP-PFC-025-TPI","537 (modified)","DL","320-35042-1","TALSAC","2706-90-3","Perfluoropentanoic acid (PFPeA)","200","ng/L","D","4.8","DL","","TRG","","","20","LOQ","NO","-99","","256.2","10.0","9.8",""
"TP-PFC-025-TPI","537 (modified)","DL","320-35042-1","TALSAC","307-24-4","Perfluorohexanoic acid (PFHxA)","350","ng/L","D","5.7","DL","","TRG","","","39","LOQ","NO","-99","","256.2","10.0","20",""
"TP-PFC-025-TPI","537 (modified)","DL","320-35042-1","TALSAC","307-55-1","Perfluorododecanoic acid (PFDoA)","20","ng/L","U","5.4","DL","","TRG","","","39","LOQ","NO","-99","","256.2","10.0","20",""
"TP-PFC-025-TPI","537 (modified)","DL","320-35042-1","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","1800","ng/L","D M","8.3","DL","","TRG","","","39","LOQ","YES","-99","","256.2","10.0","20",""
"TP-PFC-025-TPI","537 (modified)","DL","320-35042-1","TALSAC","335-76-2","Perfluorodecanoic acid (PFDA)","9.8","ng/L","U","3.0","DL","","TRG","","","20","LOQ","NO","-99","","256.2","10.0","9.8",""
"TP-PFC-025-TPI","537 (modified)","DL","320-35042-1","TALSAC","335-77-3","Perfluorodecanesulfonic acid (PFDS)","9.8","ng/L","U","3.1","DL","","TRG","","","20","LOQ","NO","-99","","256.2","10.0","9.8",""
"TP-PFC-025-TPI","537 (modified)","DL","320-35042-1","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","410","ng/L","D","2.9","DL","","TRG","","","20","LOQ","YES","-99","","256.2","10.0","9.8",""
"TP-PFC-025-TPI","537 (modified)","DL","320-35042-1","TALSAC","375-22-4","Perfluorobutanoic acid (PFBA)","74","ng/L","D","3.4","DL","","TRG","","","20","LOQ","NO","-99","","256.2","10.0","9.8",""
"TP-PFC-025-TPI","537 (modified)","DL","320-35042-1","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","41","ng/L","D","2.9","DL","","TRG","","","20","LOQ","NO","-99","","256.2","10.0","9.8",""
"TP-PFC-025-TPI","537 (modified)","DL","320-35042-1","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","75","ng/L","D","2.4","DL","","TRG","","","20","LOQ","NO","-99","","256.2","10.0","9.8",""
"TP-PFC-025-TPI","537 (modified)","DL","320-35042-1","TALSAC","375-92-8","Perfluoroheptanesulfonic Acid (PFHpS)","8.7","ng/L","J D","2.9","DL","","TRG","","","20","LOQ","NO","-99","","256.2","10.0","9.8",""
"TP-PFC-025-TPI","537 (modified)","DL","320-35042-1","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","9.8","ng/L","U","2.6","DL","","TRG","","","20","LOQ","NO","-99","","256.2","10.0","9.8",""
"TP-PFC-025-TPI","537 (modified)","DL","320-35042-1","TALSAC","376-06-7","Perfluorotetradecanoic acid (PFTeA)","9.8","ng/L","U","2.8","DL","","TRG","","","20","LOQ","NO","-99","","256.2","10.0","9.8",""
"TP-PFC-025-TPI","537 (modified)","DL","320-35042-1","TALSAC","72629-94-8","Perfluorotridecanoic Acid (PFTriA)","29","ng/L","U","13","DL","","TRG","","","39","LOQ","NO","-99","","256.2","10.0","29",""
"TP-PFC-025-TPI","537 (modified)","DL","320-35042-1","TALSAC","754-91-6","Perfluorooctane Sulfonamide (FOSA)","9.8","ng/L","U","3.4","DL","","TRG","","","20","LOQ","NO","-99","","256.2","10.0","9.8",""
"TP-PFC-025-TPI","537 (modified)","DL","320-35042-1","TALSAC","STL00990","13C4 PFOA","100","ng/L","","-99","DL","","TRG","103","","-99","LOQ","YES","97.6","","256.2","10.0","980",""
"TP-PFC-025-TPI","537 (modified)","DL","320-35042-1","TALSAC","STL00991","13C4 PFOS","94","ng/L","","-99","DL","","TRG","101","","-99","LOQ","NO","93.3","","256.2","10.0","980",""
"TP-PFC-025-TPI","537 (modified)","DL","320-35042-1","TALSAC","STL00992","13C4 PFBA","99","ng/L","","-99","DL","","TRG","101","","-99","LOQ","NO","97.6","","256.2","10.0","980",""
"TP-PFC-025-TPI","537 (modified)","DL","320-35042-1","TALSAC","STL00993","13C2 PFHxA","98","ng/L","","-99","DL","","TRG","101","","-99","LOQ","NO","97.6","","256.2","10.0","980",""
"TP-PFC-025-TPI","537 (modified)","DL","320-35042-1","TALSAC","STL00994","18O2 PFHxS","91","ng/L","","-99","DL","","TRG","99","","-99","LOQ","YES","92.3","","256.2","10.0","980",""
"TP-PFC-025-TPI","537 (modified)","DL","320-35042-1","TALSAC","STL00995","13C5 PFNA","98","ng/L","","-99","DL","","TRG","100","","-99","LOQ","NO","97.6","","256.2","10.0","980",""
"TP-PFC-025-TPI","537 (modified)","DL","320-35042-1","TALSAC","STL00996","13C2 PFDA","99","ng/L","","-99","DL","","TRG","102","","-99","LOQ","NO","97.6","","256.2","10.0","980",""
"TP-PFC-025-TPI","537 (modified)","DL","320-35042-1","TALSAC","STL00997","13C2 PFUnA","100","ng/L","","-99","DL","","TRG","106","","-99","LOQ","NO","97.6","","256.2","10.0","980",""
"TP-PFC-025-TPI","537 (modified)","DL","320-35042-1","TALSAC","STL00998","13C2 PFDoA","92","ng/L","","-99","DL","","TRG","94","","-99","LOQ","NO","97.6","","256.2","10.0","980",""
"TP-PFC-025-TPI","537 (modified)","DL","320-35042-1","TALSAC","STL01056","13C8

FOSA","93","ng/L","","-99","DL","","TRG","95","","-99","LOQ","NO","97.6","","256.2","10.0","980",""
"TP-PFC-025-TPI","537 (modified)","DL","320-35042-1","TALSAC","STL01892","13C4-
PFHpA","94","ng/L","","-99","DL","","TRG","96","","-99","LOQ","NO","97.6","","256.2","10.0","980",""
"TP-PFC-025-TPI","537 (modified)","DL","320-35042-1","TALSAC","STL01893","13C5
PFPeA","100","ng/L","","-99","DL","","TRG","104","","-99","LOQ","NO","97.6","","256.2","10.0","980",""
"TP-PFC-025-TPI","537 (modified)","DL","320-35042-1","TALSAC","STL02116","13C2-
PFTeDA","93","ng/L","","-99","DL","","TRG","95","","-99","LOQ","NO","97.6","","256.2","10.0","980",""
"TP-PFC-025-TPI","537 (modified)","DL","320-35042-1","TALSAC","STL02337","13C3-
PFBS","110","ng/L","","-99","DL","","TRG","118","","-99","LOQ","NO","90.7","","256.2","10.0","980",""
"TP-PFC-025-TPI","537 (modified)","RES","320-35042-1","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","340","ng/L","","0.53","DL","","TRG","","","3.9","LOQ","YES","-99","","256.2","10.0","2.0",""
"TP-PFC-025-TPI","537 (modified)","RES","320-35042-1","TALSAC","2058-94-8","Perfluoroundecanoic acid
(PFUnA)","2.9","ng/L","U","1.1","DL","","TRG","","","3.9","LOQ","YES","-99","","256.2","10.0","2.9",""
"TP-PFC-025-TPI","537 (modified)","RES","320-35042-1","TALSAC","2706-90-3","Perfluoropentanoic acid
(PFPeA)","190","ng/L","","0.48","DL","","TRG","","","2.0","LOQ","YES","-99","","256.2","10.0","0.98",""
"TP-PFC-025-TPI","537 (modified)","RES","320-35042-1","TALSAC","307-24-4","Perfluorohexanoic acid
(PFHxA)","340","ng/L","","0.57","DL","","TRG","","","3.9","LOQ","YES","-99","","256.2","10.0","2.0",""
"TP-PFC-025-TPI","537 (modified)","RES","320-35042-1","TALSAC","307-55-1","Perfluorododecanoic acid
(PFDoA)","2.0","ng/L","U","0.54","DL","","TRG","","","3.9","LOQ","YES","-99","","256.2","10.0","2.0",""
"TP-PFC-025-TPI","537 (modified)","RES","320-35042-1","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","1300","ng/L","M E","0.83","DL","","TRG","","","3.9","LOQ","NO","-99","","256.2","10.0","2.0",""
"TP-PFC-025-TPI","537 (modified)","RES","320-35042-1","TALSAC","335-76-2","Perfluorodecanoic acid
(PFDA)","0.89","ng/L","J","0.30","DL","","TRG","","","2.0","LOQ","YES","-99","","256.2","10.0","0.98",""
"TP-PFC-025-TPI","537 (modified)","RES","320-35042-1","TALSAC","335-77-3","Perfluorodecanesulfonic acid
(PFDS)","0.98","ng/L","U","0.31","DL","","TRG","","","2.0","LOQ","YES","-99","","256.2","10.0","0.98",""
"TP-PFC-025-TPI","537 (modified)","RES","320-35042-1","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","360","ng/L","E","0.29","DL","","TRG","","","2.0","LOQ","NO","-99","","256.2","10.0","0.98",""
"TP-PFC-025-TPI","537 (modified)","RES","320-35042-1","TALSAC","375-22-4","Perfluorobutanoic acid
(PFBA)","73","ng/L","","0.34","DL","","TRG","","","2.0","LOQ","YES","-99","","256.2","10.0","0.98",""
"TP-PFC-025-TPI","537 (modified)","RES","320-35042-1","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","51","ng/L","","0.29","DL","","TRG","","","2.0","LOQ","YES","-99","","256.2","10.0","0.98",""
"TP-PFC-025-TPI","537 (modified)","RES","320-35042-1","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","67","ng/L","","0.24","DL","","TRG","","","2.0","LOQ","YES","-99","","256.2","10.0","0.98",""
"TP-PFC-025-TPI","537 (modified)","RES","320-35042-1","TALSAC","375-92-8","Perfluoroheptanesulfonic Acid
(PFHpS)","7.1","ng/L","","0.29","DL","","TRG","","","2.0","LOQ","YES","-99","","256.2","10.0","0.98",""
"TP-PFC-025-TPI","537 (modified)","RES","320-35042-1","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","2.4","ng/L","","0.26","DL","","TRG","","","2.0","LOQ","YES","-99","","256.2","10.0","0.98",""
"TP-PFC-025-TPI","537 (modified)","RES","320-35042-1","TALSAC","376-06-7","Perfluorotetradecanoic acid
(PFTeA)","0.98","ng/L","U","0.28","DL","","TRG","","","2.0","LOQ","YES","-99","","256.2","10.0","0.98",""
"TP-PFC-025-TPI","537 (modified)","RES","320-35042-1","TALSAC","72629-94-8","Perfluorotridecanoic Acid
(PFTriA)","2.9","ng/L","U","1.3","DL","","TRG","","","3.9","LOQ","YES","-99","","256.2","10.0","2.9",""
"TP-PFC-025-TPI","537 (modified)","RES","320-35042-1","TALSAC","754-91-6","Perfluorooctane Sulfonamide
(FOSA)","0.98","ng/L","U","0.34","DL","","TRG","","","2.0","LOQ","YES","-99","","256.2","10.0","0.98",""
"TP-PFC-025-TPI","537 (modified)","RES","320-35042-1","TALSAC","STL00990","13C4
PFOA","100","ng/L","","-99","DL","","TRG","103","","-99","LOQ","NO","97.6","","256.2","10.0","98",""
"TP-PFC-025-TPI","537 (modified)","RES","320-35042-1","TALSAC","STL00991","13C4
PFOS","120","ng/L","","-99","DL","","TRG","124","","-99","LOQ","YES","93.3","","256.2","10.0","98",""
"TP-PFC-025-TPI","537 (modified)","RES","320-35042-1","TALSAC","STL00992","13C4
PFBA","110","ng/L","","-99","DL","","TRG","114","","-99","LOQ","YES","97.6","","256.2","10.0","98",""
"TP-PFC-025-TPI","537 (modified)","RES","320-35042-1","TALSAC","STL00993","13C2
PFHxA","120","ng/L","","-99","DL","","TRG","118","","-99","LOQ","YES","97.6","","256.2","10.0","98",""
"TP-PFC-025-TPI","537 (modified)","RES","320-35042-1","TALSAC","STL00994","18O2
PFHxS","110","ng/L","","-99","DL","","TRG","122","","-99","LOQ","NO","92.3","","256.2","10.0","98",""
"TP-PFC-025-TPI","537 (modified)","RES","320-35042-1","TALSAC","STL00995","13C5

PFNA","120","ng/L","","-99","DL","","TRG","124","","-99","LOQ","YES","97.6","","256.2","10.0","98",""
"TP-PFC-025-TPI","537 (modified)","RES","320-35042-1","TALSAC","STL00996","13C2
PFDA","120","ng/L","","-99","DL","","TRG","125","","-99","LOQ","YES","97.6","","256.2","10.0","98",""
"TP-PFC-025-TPI","537 (modified)","RES","320-35042-1","TALSAC","STL00997","13C2
PFUnA","130","ng/L","","-99","DL","","TRG","128","","-99","LOQ","YES","97.6","","256.2","10.0","98",""
"TP-PFC-025-TPI","537 (modified)","RES","320-35042-1","TALSAC","STL00998","13C2
PFDoA","110","ng/L","","-99","DL","","TRG","109","","-99","LOQ","YES","97.6","","256.2","10.0","98",""
"TP-PFC-025-TPI","537 (modified)","RES","320-35042-1","TALSAC","STL01056","13C8
FOSA","110","ng/L","","-99","DL","","TRG","112","","-99","LOQ","YES","97.6","","256.2","10.0","98",""
"TP-PFC-025-TPI","537 (modified)","RES","320-35042-1","TALSAC","STL01892","13C4-
PFHpA","120","ng/L","","-99","DL","","TRG","121","","-99","LOQ","YES","97.6","","256.2","10.0","98",""
"TP-PFC-025-TPI","537 (modified)","RES","320-35042-1","TALSAC","STL01893","13C5
PFPeA","140","ng/L","","-99","DL","","TRG","141","","-99","LOQ","YES","97.6","","256.2","10.0","98",""
"TP-PFC-025-TPI","537 (modified)","RES","320-35042-1","TALSAC","STL02116","13C2-
PFTeDA","110","ng/L","","-99","DL","","TRG","108","","-99","LOQ","YES","97.6","","256.2","10.0","98",""
"TP-PFC-025-TPI","537 (modified)","RES","320-35042-1","TALSAC","STL02337","13C3-
PFBS","110","ng/L","","-99","DL","","TRG","123","","-99","LOQ","YES","90.7","","256.2","10.0","98",""
"TP-PFC-025-MID-CARBON","537 (modified)","RES","320-35042-2","TALSAC","1763-23-
1","Perfluorooctanesulfonic acid
(PFOS)","2.0","ng/L","U","0.53","DL","","TRG","","","3.9","LOQ","YES","-99","","253.9","10.0","2.0",""
"TP-PFC-025-MID-CARBON","537 (modified)","RES","320-35042-2","TALSAC","2058-94-8","Perfluoroundecanoic
acid (PFUnA)","3.0","ng/L","U","1.1","DL","","TRG","","","3.9","LOQ","YES","-99","","253.9","10.0","3.0",""
"TP-PFC-025-MID-CARBON","537 (modified)","RES","320-35042-2","TALSAC","2706-90-3","Perfluoropentanoic
acid (PFPeA)","170","ng/L","","0.48","DL","","TRG","","","2.0","LOQ","YES","-99","","253.9","10.0","0.98",""
"TP-PFC-025-MID-CARBON","537 (modified)","RES","320-35042-2","TALSAC","307-24-4","Perfluorohexanoic
acid (PFHxA)","72","ng/L","","0.57","DL","","TRG","","","3.9","LOQ","YES","-99","","253.9","10.0","2.0",""
"TP-PFC-025-MID-CARBON","537 (modified)","RES","320-35042-2","TALSAC","307-55-1","Perfluorododecanoic
acid (PFDoA)","2.0","ng/L","U","0.54","DL","","TRG","","","3.9","LOQ","YES","-99","","253.9","10.0","2.0",""
"TP-PFC-025-MID-CARBON","537 (modified)","RES","320-35042-2","TALSAC","335-67-1","Perfluorooctanoic
acid (PFOA)","13","ng/L","M","0.84","DL","","TRG","","","3.9","LOQ","YES","-99","","253.9","10.0","2.0",""
"TP-PFC-025-MID-CARBON","537 (modified)","RES","320-35042-2","TALSAC","335-76-2","Perfluorodecanoic
acid (PFDA)","0.98","ng/L","U","0.31","DL","","TRG","","","2.0","LOQ","YES","-99","","253.9","10.0","0.98",""
"TP-PFC-025-MID-CARBON","537 (modified)","RES","320-35042-2","TALSAC","335-77-
3","Perfluorodecanesulfonic acid
(PFDS)","0.98","ng/L","U","0.32","DL","","TRG","","","2.0","LOQ","YES","-99","","253.9","10.0","0.98",""
"TP-PFC-025-MID-CARBON","537 (modified)","RES","320-35042-2","TALSAC","355-46-
4","Perfluorohexanesulfonic acid
(PFHxS)","1.0","ng/L","J","0.30","DL","","TRG","","","2.0","LOQ","YES","-99","","253.9","10.0","0.98",""
"TP-PFC-025-MID-CARBON","537 (modified)","RES","320-35042-2","TALSAC","375-22-4","Perfluorobutanoic
acid (PFBA)","130","ng/L","","0.34","DL","","TRG","","","2.0","LOQ","YES","-99","","253.9","10.0","0.98",""
"TP-PFC-025-MID-CARBON","537 (modified)","RES","320-35042-2","TALSAC","375-73-
5","Perfluorobutanesulfonic acid
(PFBS)","1.6","ng/L","J","0.30","DL","","TRG","","","2.0","LOQ","YES","-99","","253.9","10.0","0.98",""
"TP-PFC-025-MID-CARBON","537 (modified)","RES","320-35042-2","TALSAC","375-85-9","Perfluoroheptanoic
acid (PFHpA)","2.3","ng/L","M","0.25","DL","","TRG","","","2.0","LOQ","YES","-99","","253.9","10.0","0.98",""
"TP-PFC-025-MID-CARBON","537 (modified)","RES","320-35042-2","TALSAC","375-92-
8","Perfluoroheptanesulfonic Acid
(PFHpS)","0.98","ng/L","U","0.30","DL","","TRG","","","2.0","LOQ","YES","-99","","253.9","10.0","0.98",""
"TP-PFC-025-MID-CARBON","537 (modified)","RES","320-35042-2","TALSAC","375-95-1","Perfluorononanoic
acid (PFNA)","0.98","ng/L","U","0.27","DL","","TRG","","","2.0","LOQ","YES","-99","","253.9","10.0","0.98",""
"TP-PFC-025-MID-CARBON","537 (modified)","RES","320-35042-2","TALSAC","376-06-
7","Perfluorotetradecanoic acid
(PFTeA)","0.98","ng/L","U","0.29","DL","","TRG","","","2.0","LOQ","YES","-99","","253.9","10.0","0.98",""
"TP-PFC-025-MID-CARBON","537 (modified)","RES","320-35042-2","TALSAC","72629-94-

8","Perfluorotridecanoic Acid
(PFTriA)","3.0","ng/L","U","1.3","DL","","TRG","","","3.9","LOQ","YES","-99","","253.9","10.0","3.0",""
"TP-PFC-025-MID-CARBON","537 (modified)","RES","320-35042-2","TALSAC","754-91-6","Perfluorooctane
Sulfonamide
(FOSA)","0.98","ng/L","U","0.34","DL","","TRG","","","2.0","LOQ","YES","-99","","253.9","10.0","0.98",""
"TP-PFC-025-MID-CARBON","537 (modified)","RES","320-35042-2","TALSAC","STL00990","13C4
PFOA","100","ng/L","","-99","DL","","TRG","102","","-99","LOQ","YES","98.5","","253.9","10.0","98",""
"TP-PFC-025-MID-CARBON","537 (modified)","RES","320-35042-2","TALSAC","STL00991","13C4
PFOS","94","ng/L","","-99","DL","","TRG","100","","-99","LOQ","YES","94.1","","253.9","10.0","98",""
"TP-PFC-025-MID-CARBON","537 (modified)","RES","320-35042-2","TALSAC","STL00992","13C4
PFBA","100","ng/L","","-99","DL","","TRG","104","","-99","LOQ","YES","98.5","","253.9","10.0","98",""
"TP-PFC-025-MID-CARBON","537 (modified)","RES","320-35042-2","TALSAC","STL00993","13C2
PFHxA","96","ng/L","","-99","DL","","TRG","98","","-99","LOQ","YES","98.5","","253.9","10.0","98",""
"TP-PFC-025-MID-CARBON","537 (modified)","RES","320-35042-2","TALSAC","STL00994","18O2
PFHxS","92","ng/L","","-99","DL","","TRG","99","","-99","LOQ","YES","93.1","","253.9","10.0","98",""
"TP-PFC-025-MID-CARBON","537 (modified)","RES","320-35042-2","TALSAC","STL00995","13C5
PFNA","100","ng/L","","-99","DL","","TRG","104","","-99","LOQ","YES","98.5","","253.9","10.0","98",""
"TP-PFC-025-MID-CARBON","537 (modified)","RES","320-35042-2","TALSAC","STL00996","13C2
PFDA","95","ng/L","","-99","DL","","TRG","97","","-99","LOQ","YES","98.5","","253.9","10.0","98",""
"TP-PFC-025-MID-CARBON","537 (modified)","RES","320-35042-2","TALSAC","STL00997","13C2
PFUnA","98","ng/L","","-99","DL","","TRG","100","","-99","LOQ","YES","98.5","","253.9","10.0","98",""
"TP-PFC-025-MID-CARBON","537 (modified)","RES","320-35042-2","TALSAC","STL00998","13C2
PFDoA","88","ng/L","","-99","DL","","TRG","90","","-99","LOQ","YES","98.5","","253.9","10.0","98",""
"TP-PFC-025-MID-CARBON","537 (modified)","RES","320-35042-2","TALSAC","STL01056","13C8
FOSA","90","ng/L","","-99","DL","","TRG","92","","-99","LOQ","YES","98.5","","253.9","10.0","98",""
"TP-PFC-025-MID-CARBON","537 (modified)","RES","320-35042-2","TALSAC","STL01892","13C4-
PFHpA","98","ng/L","","-99","DL","","TRG","100","","-99","LOQ","YES","98.5","","253.9","10.0","98",""
"TP-PFC-025-MID-CARBON","537 (modified)","RES","320-35042-2","TALSAC","STL01893","13C5
PFPeA","100","ng/L","","-99","DL","","TRG","102","","-99","LOQ","YES","98.5","","253.9","10.0","98",""
"TP-PFC-025-MID-CARBON","537 (modified)","RES","320-35042-2","TALSAC","STL02116","13C2-
PFTeDA","92","ng/L","","-99","DL","","TRG","94","","-99","LOQ","YES","98.5","","253.9","10.0","98",""
"TP-PFC-025-MID-CARBON","537 (modified)","RES","320-35042-2","TALSAC","STL02337","13C3-
PFBS","90","ng/L","","-99","DL","","TRG","98","","-99","LOQ","YES","91.6","","253.9","10.0","98",""
"TP-PFC-025-TPE","537 (modified)","RES","320-35042-3","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","1.9","ng/L","U","0.53","DL","","TRG","","","3.9","LOQ","YES","-99","","256.7","10.0","1.9",""
"TP-PFC-025-TPE","537 (modified)","RES","320-35042-3","TALSAC","2058-94-8","Perfluoroundecanoic acid
(PFUnA)","2.9","ng/L","U","1.1","DL","","TRG","","","3.9","LOQ","YES","-99","","256.7","10.0","2.9",""
"TP-PFC-025-TPE","537 (modified)","RES","320-35042-3","TALSAC","2706-90-3","Perfluoropentanoic acid
(PFPeA)","110","ng/L","","0.48","DL","","TRG","","","1.9","LOQ","YES","-99","","256.7","10.0","0.97",""
"TP-PFC-025-TPE","537 (modified)","RES","320-35042-3","TALSAC","307-24-4","Perfluorohexanoic acid
(PFHxA)","25","ng/L","","0.56","DL","","TRG","","","3.9","LOQ","YES","-99","","256.7","10.0","1.9",""
"TP-PFC-025-TPE","537 (modified)","RES","320-35042-3","TALSAC","307-55-1","Perfluorododecanoic acid
(PFDoA)","1.9","ng/L","U","0.54","DL","","TRG","","","3.9","LOQ","YES","-99","","256.7","10.0","1.9",""
"TP-PFC-025-TPE","537 (modified)","RES","320-35042-3","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","1.1","ng/L","J M","0.83","DL","","TRG","","","3.9","LOQ","YES","-99","","256.7","10.0","1.9",""
"TP-PFC-025-TPE","537 (modified)","RES","320-35042-3","TALSAC","335-76-2","Perfluorodecanoic acid
(PFDA)","0.97","ng/L","U","0.30","DL","","TRG","","","1.9","LOQ","YES","-99","","256.7","10.0","0.97",""
"TP-PFC-025-TPE","537 (modified)","RES","320-35042-3","TALSAC","335-77-3","Perfluorodecanesulfonic acid
(PFDS)","0.97","ng/L","U","0.31","DL","","TRG","","","1.9","LOQ","YES","-99","","256.7","10.0","0.97",""
"TP-PFC-025-TPE","537 (modified)","RES","320-35042-3","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","0.38","ng/L","J","0.29","DL","","TRG","","","1.9","LOQ","YES","-99","","256.7","10.0","0.97",""
"TP-PFC-025-TPE","537 (modified)","RES","320-35042-3","TALSAC","375-22-4","Perfluorobutanoic acid
(PFBA)","130","ng/L","","0.34","DL","","TRG","","","1.9","LOQ","YES","-99","","256.7","10.0","0.97",""
"TP-PFC-025-TPE","537 (modified)","RES","320-35042-3","TALSAC","375-73-5","Perfluorobutanesulfonic acid

(PFBS)","0.38","ng/L","J","0.29","DL","","TRG","","","1.9","LOQ","YES","-99","","256.7","10.0","0.97",""
"TP-PFC-025-TPE","537 (modified)","RES","320-35042-3","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","0.43","ng/L","J M","0.24","DL","","TRG","","","1.9","LOQ","YES","-99","","256.7","10.0","0.97",""
"TP-PFC-025-TPE","537 (modified)","RES","320-35042-3","TALSAC","375-92-8","Perfluoroheptanesulfonic Acid
(PFHpS)","0.97","ng/L","U","0.29","DL","","TRG","","","1.9","LOQ","YES","-99","","256.7","10.0","0.97",""
"TP-PFC-025-TPE","537 (modified)","RES","320-35042-3","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","0.97","ng/L","U","0.26","DL","","TRG","","","1.9","LOQ","YES","-99","","256.7","10.0","0.97",""
"TP-PFC-025-TPE","537 (modified)","RES","320-35042-3","TALSAC","376-06-7","Perfluorotetradecanoic acid
(PFTeA)","0.97","ng/L","U","0.28","DL","","TRG","","","1.9","LOQ","YES","-99","","256.7","10.0","0.97",""
"TP-PFC-025-TPE","537 (modified)","RES","320-35042-3","TALSAC","72629-94-8","Perfluorotridecanoic Acid
(PFTriA)","2.9","ng/L","U","1.3","DL","","TRG","","","3.9","LOQ","YES","-99","","256.7","10.0","2.9",""
"TP-PFC-025-TPE","537 (modified)","RES","320-35042-3","TALSAC","754-91-6","Perfluorooctane Sulfonamide
(FOSA)","0.97","ng/L","U","0.34","DL","","TRG","","","1.9","LOQ","YES","-99","","256.7","10.0","0.97",""
"TP-PFC-025-TPE","537 (modified)","RES","320-35042-3","TALSAC","STL00990","13C4
PFOA","100","ng/L","","-99","DL","","TRG","107","","-99","LOQ","YES","97.4","","256.7","10.0","97",""
"TP-PFC-025-TPE","537 (modified)","RES","320-35042-3","TALSAC","STL00991","13C4
PFOS","93","ng/L","","-99","DL","","TRG","100","","-99","LOQ","YES","93.1","","256.7","10.0","97",""
"TP-PFC-025-TPE","537 (modified)","RES","320-35042-3","TALSAC","STL00992","13C4
PFBA","100","ng/L","","-99","DL","","TRG","105","","-99","LOQ","YES","97.4","","256.7","10.0","97",""
"TP-PFC-025-TPE","537 (modified)","RES","320-35042-3","TALSAC","STL00993","13C2
PFHxA","98","ng/L","","-99","DL","","TRG","101","","-99","LOQ","YES","97.4","","256.7","10.0","97",""
"TP-PFC-025-TPE","537 (modified)","RES","320-35042-3","TALSAC","STL00994","18O2
PFHxS","94","ng/L","","-99","DL","","TRG","102","","-99","LOQ","YES","92.1","","256.7","10.0","97",""
"TP-PFC-025-TPE","537 (modified)","RES","320-35042-3","TALSAC","STL00995","13C5
PFNA","100","ng/L","","-99","DL","","TRG","106","","-99","LOQ","YES","97.4","","256.7","10.0","97",""
"TP-PFC-025-TPE","537 (modified)","RES","320-35042-3","TALSAC","STL00996","13C2
PFDA","87","ng/L","","-99","DL","","TRG","89","","-99","LOQ","YES","97.4","","256.7","10.0","97",""
"TP-PFC-025-TPE","537 (modified)","RES","320-35042-3","TALSAC","STL00997","13C2
PFUnA","97","ng/L","","-99","DL","","TRG","99","","-99","LOQ","YES","97.4","","256.7","10.0","97",""
"TP-PFC-025-TPE","537 (modified)","RES","320-35042-3","TALSAC","STL00998","13C2
PFDoA","90","ng/L","","-99","DL","","TRG","93","","-99","LOQ","YES","97.4","","256.7","10.0","97",""
"TP-PFC-025-TPE","537 (modified)","RES","320-35042-3","TALSAC","STL01056","13C8
FOSA","85","ng/L","","-99","DL","","TRG","87","","-99","LOQ","YES","97.4","","256.7","10.0","97",""
"TP-PFC-025-TPE","537 (modified)","RES","320-35042-3","TALSAC","STL01892","13C4-
PFHpA","110","ng/L","","-99","DL","","TRG","110","","-99","LOQ","YES","97.4","","256.7","10.0","97",""
"TP-PFC-025-TPE","537 (modified)","RES","320-35042-3","TALSAC","STL01893","13C5
PFPeA","100","ng/L","","-99","DL","","TRG","107","","-99","LOQ","YES","97.4","","256.7","10.0","97",""
"TP-PFC-025-TPE","537 (modified)","RES","320-35042-3","TALSAC","STL02116","13C2-
PFTeDA","91","ng/L","","-99","DL","","TRG","94","","-99","LOQ","YES","97.4","","256.7","10.0","97",""
"TP-PFC-025-TPE","537 (modified)","RES","320-35042-3","TALSAC","STL02337","13C3-
PFBS","90","ng/L","","-99","DL","","TRG","99","","-99","LOQ","YES","90.6","","256.7","10.0","97",""
"TP-PFC-025-TPE-D","537 (modified)","RES","320-35042-4","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","2.0","ng/L","U","0.53","DL","","TRG","","","4.0","LOQ","YES","-99","","253","10.0","2.0",""
"TP-PFC-025-TPE-D","537 (modified)","RES","320-35042-4","TALSAC","2058-94-8","Perfluoroundecanoic acid
(PFUnA)","3.0","ng/L","U","1.1","DL","","TRG","","","4.0","LOQ","YES","-99","","253","10.0","3.0",""
"TP-PFC-025-TPE-D","537 (modified)","RES","320-35042-4","TALSAC","2706-90-3","Perfluoropentanoic acid
(PFPeA)","110","ng/L","","0.48","DL","","TRG","","","2.0","LOQ","YES","-99","","253","10.0","0.99",""
"TP-PFC-025-TPE-D","537 (modified)","RES","320-35042-4","TALSAC","307-24-4","Perfluorohexanoic acid
(PFHxA)","25","ng/L","","0.57","DL","","TRG","","","4.0","LOQ","YES","-99","","253","10.0","2.0",""
"TP-PFC-025-TPE-D","537 (modified)","RES","320-35042-4","TALSAC","307-55-1","Perfluorododecanoic acid
(PFDoA)","2.0","ng/L","U","0.54","DL","","TRG","","","4.0","LOQ","YES","-99","","253","10.0","2.0",""
"TP-PFC-025-TPE-D","537 (modified)","RES","320-35042-4","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","1.1","ng/L","J M","0.84","DL","","TRG","","","4.0","LOQ","YES","-99","","253","10.0","2.0",""
"TP-PFC-025-TPE-D","537 (modified)","RES","320-35042-4","TALSAC","335-76-2","Perfluorodecanoic acid

(PFDA)","0.99","ng/L","U","0.31","DL","","TRG","","","2.0","LOQ","YES","-99","","253","10.0","0.99",""
"TP-PFC-025-TPE-D","537 (modified)","RES","320-35042-4","TALSAC","335-77-3","Perfluorodecanesulfonic acid
(PFDS)","0.99","ng/L","U","0.32","DL","","TRG","","","2.0","LOQ","YES","-99","","253","10.0","0.99",""
"TP-PFC-025-TPE-D","537 (modified)","RES","320-35042-4","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","0.32","ng/L","J","0.30","DL","","TRG","","","2.0","LOQ","YES","-99","","253","10.0","0.99",""
"TP-PFC-025-TPE-D","537 (modified)","RES","320-35042-4","TALSAC","375-22-4","Perfluorobutanoic acid
(PFBA)","130","ng/L","","0.35","DL","","TRG","","","2.0","LOQ","YES","-99","","253","10.0","0.99",""
"TP-PFC-025-TPE-D","537 (modified)","RES","320-35042-4","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","0.45","ng/L","J","0.30","DL","","TRG","","","2.0","LOQ","YES","-99","","253","10.0","0.99",""
"TP-PFC-025-TPE-D","537 (modified)","RES","320-35042-4","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","0.43","ng/L","J M","0.25","DL","","TRG","","","2.0","LOQ","YES","-99","","253","10.0","0.99",""
"TP-PFC-025-TPE-D","537 (modified)","RES","320-35042-4","TALSAC","375-92-8","Perfluoroheptanesulfonic Acid
(PFHpS)","0.99","ng/L","U","0.30","DL","","TRG","","","2.0","LOQ","YES","-99","","253","10.0","0.99",""
"TP-PFC-025-TPE-D","537 (modified)","RES","320-35042-4","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","0.99","ng/L","U","0.27","DL","","TRG","","","2.0","LOQ","YES","-99","","253","10.0","0.99",""
"TP-PFC-025-TPE-D","537 (modified)","RES","320-35042-4","TALSAC","376-06-7","Perfluorotetradecanoic acid
(PFTeA)","0.99","ng/L","U","0.29","DL","","TRG","","","2.0","LOQ","YES","-99","","253","10.0","0.99",""
"TP-PFC-025-TPE-D","537 (modified)","RES","320-35042-4","TALSAC","72629-94-8","Perfluorotridecanoic Acid
(PFTriA)","3.0","ng/L","U","1.3","DL","","TRG","","","4.0","LOQ","YES","-99","","253","10.0","3.0",""
"TP-PFC-025-TPE-D","537 (modified)","RES","320-35042-4","TALSAC","754-91-6","Perfluorooctane Sulfonamide
(FOSA)","0.99","ng/L","U","0.35","DL","","TRG","","","2.0","LOQ","YES","-99","","253","10.0","0.99",""
"TP-PFC-025-TPE-D","537 (modified)","RES","320-35042-4","TALSAC","STL00990","13C4
PFOA","110","ng/L","","-99","DL","","TRG","107","","-99","LOQ","YES","98.8","","253","10.0","99",""
"TP-PFC-025-TPE-D","537 (modified)","RES","320-35042-4","TALSAC","STL00991","13C4
PFOS","100","ng/L","","-99","DL","","TRG","108","","-99","LOQ","YES","94.5","","253","10.0","99",""
"TP-PFC-025-TPE-D","537 (modified)","RES","320-35042-4","TALSAC","STL00992","13C4
PFBA","100","ng/L","","-99","DL","","TRG","105","","-99","LOQ","YES","98.8","","253","10.0","99",""
"TP-PFC-025-TPE-D","537 (modified)","RES","320-35042-4","TALSAC","STL00993","13C2
PFHxA","110","ng/L","","-99","DL","","TRG","108","","-99","LOQ","YES","98.8","","253","10.0","99",""
"TP-PFC-025-TPE-D","537 (modified)","RES","320-35042-4","TALSAC","STL00994","18O2
PFHxS","97","ng/L","","-99","DL","","TRG","103","","-99","LOQ","YES","93.5","","253","10.0","99",""
"TP-PFC-025-TPE-D","537 (modified)","RES","320-35042-4","TALSAC","STL00995","13C5
PFNA","110","ng/L","","-99","DL","","TRG","107","","-99","LOQ","YES","98.8","","253","10.0","99",""
"TP-PFC-025-TPE-D","537 (modified)","RES","320-35042-4","TALSAC","STL00996","13C2
PFDA","100","ng/L","","-99","DL","","TRG","102","","-99","LOQ","YES","98.8","","253","10.0","99",""
"TP-PFC-025-TPE-D","537 (modified)","RES","320-35042-4","TALSAC","STL00997","13C2
PFUnA","110","ng/L","","-99","DL","","TRG","108","","-99","LOQ","YES","98.8","","253","10.0","99",""
"TP-PFC-025-TPE-D","537 (modified)","RES","320-35042-4","TALSAC","STL00998","13C2
PFDoA","100","ng/L","","-99","DL","","TRG","102","","-99","LOQ","YES","98.8","","253","10.0","99",""
"TP-PFC-025-TPE-D","537 (modified)","RES","320-35042-4","TALSAC","STL01056","13C8
FOSA","97","ng/L","","-99","DL","","TRG","98","","-99","LOQ","YES","98.8","","253","10.0","99",""
"TP-PFC-025-TPE-D","537 (modified)","RES","320-35042-4","TALSAC","STL01892","13C4-
PFHpA","110","ng/L","","-99","DL","","TRG","108","","-99","LOQ","YES","98.8","","253","10.0","99",""
"TP-PFC-025-TPE-D","537 (modified)","RES","320-35042-4","TALSAC","STL01893","13C5
PFPeA","110","ng/L","","-99","DL","","TRG","109","","-99","LOQ","YES","98.8","","253","10.0","99",""
"TP-PFC-025-TPE-D","537 (modified)","RES","320-35042-4","TALSAC","STL02116","13C2-
PFTeDA","98","ng/L","","-99","DL","","TRG","99","","-99","LOQ","YES","98.8","","253","10.0","99",""
"TP-PFC-025-TPE-D","537 (modified)","RES","320-35042-4","TALSAC","STL02337","13C3-
PFBS","91","ng/L","","-99","DL","","TRG","99","","-99","LOQ","YES","91.9","","253","10.0","99",""
"LCS 320-204105/2-A","537 (modified)","RES","LCS 320-204105/2-A","TALSAC","1763-23-
1","Perfluorooctanesulfonic acid
(PFOS)","36.0","ng/L","","0.54","DL","","SPK","97","","4.0","LOQ","YES","37.1","","250","10.0","2.0",""
"LCS 320-204105/2-A","537 (modified)","RES","LCS 320-204105/2-A","TALSAC","2058-94-
8","Perfluoroundecanoic acid

(PFUnA)","34.4","ng/L","","1.1","DL","","SPK","86","","4.0","LOQ","YES","40.0","","250","10.0","3.0",""
"LCS 320-204105/2-A","537 (modified)","RES","LCS 320-204105/2-A","TALSAC","2706-90-3","Perfluoropentanoic
acid (PFPeA)","36.2","ng/L","","0.49","DL","","SPK","90","","2.0","LOQ","YES","40.0","","250","10.0","1.0",""
"LCS 320-204105/2-A","537 (modified)","RES","LCS 320-204105/2-A","TALSAC","307-24-4","Perfluorohexanoic
acid (PFHxA)","36.9","ng/L","","0.58","DL","","SPK","92","","4.0","LOQ","YES","40.0","","250","10.0","2.0",""
"LCS 320-204105/2-A","537 (modified)","RES","LCS 320-204105/2-A","TALSAC","307-55-1","Perfluorododecanoic
acid (PFDoA)","40.3","ng/L","","0.55","DL","","SPK","101","","4.0","LOQ","YES","40.0","","250","10.0","2.0",""
"LCS 320-204105/2-A","537 (modified)","RES","LCS 320-204105/2-A","TALSAC","335-67-1","Perfluorooctanoic
acid (PFOA)","36.9","ng/L","","0.85","DL","","SPK","92","","4.0","LOQ","YES","40.0","","250","10.0","2.0",""
"LCS 320-204105/2-A","537 (modified)","RES","LCS 320-204105/2-A","TALSAC","335-76-2","Perfluorodecanoic
acid (PFDA)","40.0","ng/L","","0.31","DL","","SPK","100","","2.0","LOQ","YES","40.0","","250","10.0","1.0",""
"LCS 320-204105/2-A","537 (modified)","RES","LCS 320-204105/2-A","TALSAC","335-77-
3","Perfluorodecanesulfonic acid
(PFDS)","40.0","ng/L","","0.32","DL","","SPK","104","","2.0","LOQ","YES","38.6","","250","10.0","1.0",""
"LCS 320-204105/2-A","537 (modified)","RES","LCS 320-204105/2-A","TALSAC","355-46-
4","Perfluorohexanesulfonic acid
(PFHxS)","34.8","ng/L","","0.30","DL","","SPK","96","","2.0","LOQ","YES","36.4","","250","10.0","1.0",""
"LCS 320-204105/2-A","537 (modified)","RES","LCS 320-204105/2-A","TALSAC","375-22-4","Perfluorobutanoic
acid (PFBA)","39.2","ng/L","","0.35","DL","","SPK","98","","2.0","LOQ","YES","40.0","","250","10.0","1.0",""
"LCS 320-204105/2-A","537 (modified)","RES","LCS 320-204105/2-A","TALSAC","375-73-
5","Perfluorobutanesulfonic acid
(PFBS)","34.9","ng/L","","0.30","DL","","SPK","99","","2.0","LOQ","YES","35.4","","250","10.0","1.0",""
"LCS 320-204105/2-A","537 (modified)","RES","LCS 320-204105/2-A","TALSAC","375-85-9","Perfluoroheptanoic
acid (PFHpA)","38.0","ng/L","","0.25","DL","","SPK","95","","2.0","LOQ","YES","40.0","","250","10.0","1.0",""
"LCS 320-204105/2-A","537 (modified)","RES","LCS 320-204105/2-A","TALSAC","375-92-
8","Perfluoroheptanesulfonic Acid
(PFHpS)","38.0","ng/L","","0.30","DL","","SPK","100","","2.0","LOQ","YES","38.1","","250","10.0","1.0",""
"LCS 320-204105/2-A","537 (modified)","RES","LCS 320-204105/2-A","TALSAC","375-95-1","Perfluorononanoic
acid (PFNA)","38.8","ng/L","","0.27","DL","","SPK","97","","2.0","LOQ","YES","40.0","","250","10.0","1.0",""
"LCS 320-204105/2-A","537 (modified)","RES","LCS 320-204105/2-A","TALSAC","376-06-
7","Perfluorotetradecanoic acid
(PFTeA)","40.7","ng/L","","0.29","DL","","SPK","102","","2.0","LOQ","YES","40.0","","250","10.0","1.0",""
"LCS 320-204105/2-A","537 (modified)","RES","LCS 320-204105/2-A","TALSAC","72629-94-
8","Perfluorotridecanoic Acid
(PFTriA)","39.4","ng/L","","1.3","DL","","SPK","99","","4.0","LOQ","YES","40.0","","250","10.0","3.0",""
"LCS 320-204105/2-A","537 (modified)","RES","LCS 320-204105/2-A","TALSAC","754-91-6","Perfluorooctane
Sulfonamide
(FOSA)","39.5","ng/L","","0.35","DL","","SPK","99","","2.0","LOQ","YES","40.0","","250","10.0","1.0",""
"LCS 320-204105/2-A","537 (modified)","RES","LCS 320-204105/2-A","TALSAC","STL00990","13C4
PFOA","99.9","ng/L","","-99","DL","","SPK","100","","-99","LOQ","YES","100","","250","10.0","100",""
"LCS 320-204105/2-A","537 (modified)","RES","LCS 320-204105/2-A","TALSAC","STL00991","13C4
PFOS","89.2","ng/L","","-99","DL","","SPK","93","","-99","LOQ","YES","95.6","","250","10.0","100",""
"LCS 320-204105/2-A","537 (modified)","RES","LCS 320-204105/2-A","TALSAC","STL00992","13C4
PFBA","98.4","ng/L","","-99","DL","","SPK","98","","-99","LOQ","YES","100","","250","10.0","100",""
"LCS 320-204105/2-A","537 (modified)","RES","LCS 320-204105/2-A","TALSAC","STL00993","13C2
PFHxA","96.9","ng/L","","-99","DL","","SPK","97","","-99","LOQ","YES","100","","250","10.0","100",""
"LCS 320-204105/2-A","537 (modified)","RES","LCS 320-204105/2-A","TALSAC","STL00994","18O2
PFHxS","89.0","ng/L","","-99","DL","","SPK","94","","-99","LOQ","YES","94.6","","250","10.0","100",""
"LCS 320-204105/2-A","537 (modified)","RES","LCS 320-204105/2-A","TALSAC","STL00995","13C5
PFNA","94.8","ng/L","","-99","DL","","SPK","95","","-99","LOQ","YES","100","","250","10.0","100",""
"LCS 320-204105/2-A","537 (modified)","RES","LCS 320-204105/2-A","TALSAC","STL00996","13C2
PFDA","93.9","ng/L","","-99","DL","","SPK","94","","-99","LOQ","YES","100","","250","10.0","100",""
"LCS 320-204105/2-A","537 (modified)","RES","LCS 320-204105/2-A","TALSAC","STL00997","13C2
PFUnA","99.5","ng/L","","-99","DL","","SPK","100","","-99","LOQ","YES","100","","250","10.0","100",""

"LCS 320-204105/2-A","537 (modified)","RES","LCS 320-204105/2-A","TALSAC","STL00998","13C2 PFDoA","90.6","ng/L","","-99","DL","","SPK","91","","-99","LOQ","YES","100","","250","10.0","100",""
"LCS 320-204105/2-A","537 (modified)","RES","LCS 320-204105/2-A","TALSAC","STL01056","13C8 FOSA","83.6","ng/L","","-99","DL","","SPK","84","","-99","LOQ","YES","100","","250","10.0","100",""
"LCS 320-204105/2-A","537 (modified)","RES","LCS 320-204105/2-A","TALSAC","STL01892","13C4-PFHpA","97.4","ng/L","","-99","DL","","SPK","97","","-99","LOQ","YES","100","","250","10.0","100",""
"LCS 320-204105/2-A","537 (modified)","RES","LCS 320-204105/2-A","TALSAC","STL01893","13C5 PFPeA","101","ng/L","","-99","DL","","SPK","101","","-99","LOQ","YES","100","","250","10.0","100",""
"LCS 320-204105/2-A","537 (modified)","RES","LCS 320-204105/2-A","TALSAC","STL02116","13C2-PFTeDA","91.5","ng/L","","-99","DL","","SPK","92","","-99","LOQ","YES","100","","250","10.0","100",""
"LCS 320-204105/2-A","537 (modified)","RES","LCS 320-204105/2-A","TALSAC","STL02337","13C3-PFBS","89.4","ng/L","","-99","DL","","SPK","96","","-99","LOQ","YES","93.0","","250","10.0","100",""
"LCSD 320-204105/3-A","537 (modified)","RES","LCSD 320-204105/3-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","34.3","ng/L","","0.54","DL","","SPK","93","5","4.0","LOQ","YES","37.1","LCS 320-204105/2-A","250","10.0","2.0",""
"LCSD 320-204105/3-A","537 (modified)","RES","LCSD 320-204105/3-A","TALSAC","2058-94-8","Perfluoroundecanoic acid (PFUnA)","37.2","ng/L","","1.1","DL","","SPK","93","8","4.0","LOQ","YES","40.0","LCS 320-204105/2-A","250","10.0","3.0",""
"LCSD 320-204105/3-A","537 (modified)","RES","LCSD 320-204105/3-A","TALSAC","2706-90-3","Perfluoropentanoic acid (PFPeA)","35.9","ng/L","","0.49","DL","","SPK","90","1","2.0","LOQ","YES","40.0","LCS 320-204105/2-A","250","10.0","1.0",""
"LCSD 320-204105/3-A","537 (modified)","RES","LCSD 320-204105/3-A","TALSAC","307-24-4","Perfluorohexanoic acid (PFHxA)","35.7","ng/L","","0.58","DL","","SPK","89","3","4.0","LOQ","YES","40.0","LCS 320-204105/2-A","250","10.0","2.0",""
"LCSD 320-204105/3-A","537 (modified)","RES","LCSD 320-204105/3-A","TALSAC","307-55-1","Perfluorododecanoic acid (PFDoA)","39.8","ng/L","","0.55","DL","","SPK","100","1","4.0","LOQ","YES","40.0","LCS 320-204105/2-A","250","10.0","2.0",""
"LCSD 320-204105/3-A","537 (modified)","RES","LCSD 320-204105/3-A","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","37.8","ng/L","","0.85","DL","","SPK","94","2","4.0","LOQ","YES","40.0","LCS 320-204105/2-A","250","10.0","2.0",""
"LCSD 320-204105/3-A","537 (modified)","RES","LCSD 320-204105/3-A","TALSAC","335-76-2","Perfluorodecanoic acid (PFDA)","37.9","ng/L","","0.31","DL","","SPK","95","6","2.0","LOQ","YES","40.0","LCS 320-204105/2-A","250","10.0","1.0",""
"LCSD 320-204105/3-A","537 (modified)","RES","LCSD 320-204105/3-A","TALSAC","335-77-3","Perfluorodecanesulfonic acid (PFDS)","36.9","ng/L","","0.32","DL","","SPK","96","8","2.0","LOQ","YES","38.6","LCS 320-204105/2-A","250","10.0","1.0",""
"LCSD 320-204105/3-A","537 (modified)","RES","LCSD 320-204105/3-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","33.8","ng/L","","0.30","DL","","SPK","93","3","2.0","LOQ","YES","36.4","LCS 320-204105/2-A","250","10.0","1.0",""
"LCSD 320-204105/3-A","537 (modified)","RES","LCSD 320-204105/3-A","TALSAC","375-22-4","Perfluorobutanoic acid (PFBA)","38.1","ng/L","","0.35","DL","","SPK","95","3","2.0","LOQ","YES","40.0","LCS 320-204105/2-A","250","10.0","1.0",""
"LCSD 320-204105/3-A","537 (modified)","RES","LCSD 320-204105/3-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","33.8","ng/L","","0.30","DL","","SPK","96","3","2.0","LOQ","YES","35.4","LCS 320-204105/2-A","250","10.0","1.0",""
"LCSD 320-204105/3-A","537 (modified)","RES","LCSD 320-204105/3-A","TALSAC","375-85-

9","Perfluoroheptanoic acid
(PFHpA)","37.2","ng/L","","0.25","DL","","SPK","93","2","2.0","LOQ","YES","40.0","LCS 320-204105/2-
A","250","10.0","1.0",""
"LCSD 320-204105/3-A","537 (modified)","RES","LCSD 320-204105/3-A","TALSAC","375-92-
8","Perfluoroheptanesulfonic Acid
(PFHpS)","37.5","ng/L","","0.30","DL","","SPK","98","2","2.0","LOQ","YES","38.1","LCS 320-204105/2-
A","250","10.0","1.0",""
"LCSD 320-204105/3-A","537 (modified)","RES","LCSD 320-204105/3-A","TALSAC","375-95-
1","Perfluorononanoic acid (PFNA)","37.5","ng/L","","0.27","DL","","SPK","94","3","2.0","LOQ","YES","40.0","LCS
320-204105/2-A","250","10.0","1.0",""
"LCSD 320-204105/3-A","537 (modified)","RES","LCSD 320-204105/3-A","TALSAC","376-06-
7","Perfluorotetradecanoic acid
(PFTeA)","40.7","ng/L","","0.29","DL","","SPK","102","0","2.0","LOQ","YES","40.0","LCS 320-204105/2-
A","250","10.0","1.0",""
"LCSD 320-204105/3-A","537 (modified)","RES","LCSD 320-204105/3-A","TALSAC","72629-94-
8","Perfluorotridecanoic Acid
(PFTriA)","38.6","ng/L","","1.3","DL","","SPK","97","2","4.0","LOQ","YES","40.0","LCS 320-204105/2-
A","250","10.0","3.0",""
"LCSD 320-204105/3-A","537 (modified)","RES","LCSD 320-204105/3-A","TALSAC","754-91-6","Perfluorooctane
Sulfonamide (FOSA)","36.6","ng/L","","0.35","DL","","SPK","92","8","2.0","LOQ","YES","40.0","LCS 320-
204105/2-A","250","10.0","1.0",""
"LCSD 320-204105/3-A","537 (modified)","RES","LCSD 320-204105/3-A","TALSAC","STL00990","13C4
PFOA","104","ng/L","","-99","DL","","SPK","104","","-99","LOQ","YES","100","LCS 320-204105/2-
A","250","10.0","100",""
"LCSD 320-204105/3-A","537 (modified)","RES","LCSD 320-204105/3-A","TALSAC","STL00991","13C4
PFOS","96.8","ng/L","","-99","DL","","SPK","101","","-99","LOQ","YES","95.6","LCS 320-204105/2-
A","250","10.0","100",""
"LCSD 320-204105/3-A","537 (modified)","RES","LCSD 320-204105/3-A","TALSAC","STL00992","13C4
PFBA","104","ng/L","","-99","DL","","SPK","104","","-99","LOQ","YES","100","LCS 320-204105/2-
A","250","10.0","100",""
"LCSD 320-204105/3-A","537 (modified)","RES","LCSD 320-204105/3-A","TALSAC","STL00993","13C2
PFHxA","108","ng/L","","-99","DL","","SPK","108","","-99","LOQ","YES","100","LCS 320-204105/2-
A","250","10.0","100",""
"LCSD 320-204105/3-A","537 (modified)","RES","LCSD 320-204105/3-A","TALSAC","STL00994","18O2
PFHxS","94.8","ng/L","","-99","DL","","SPK","100","","-99","LOQ","YES","94.6","LCS 320-204105/2-
A","250","10.0","100",""
"LCSD 320-204105/3-A","537 (modified)","RES","LCSD 320-204105/3-A","TALSAC","STL00995","13C5
PFNA","103","ng/L","","-99","DL","","SPK","103","","-99","LOQ","YES","100","LCS 320-204105/2-
A","250","10.0","100",""
"LCSD 320-204105/3-A","537 (modified)","RES","LCSD 320-204105/3-A","TALSAC","STL00996","13C2
PFDA","102","ng/L","","-99","DL","","SPK","102","","-99","LOQ","YES","100","LCS 320-204105/2-
A","250","10.0","100",""
"LCSD 320-204105/3-A","537 (modified)","RES","LCSD 320-204105/3-A","TALSAC","STL00997","13C2
PFUnA","98.5","ng/L","","-99","DL","","SPK","99","","-99","LOQ","YES","100","LCS 320-204105/2-
A","250","10.0","100",""
"LCSD 320-204105/3-A","537 (modified)","RES","LCSD 320-204105/3-A","TALSAC","STL00998","13C2
PFDoA","94.3","ng/L","","-99","DL","","SPK","94","","-99","LOQ","YES","100","LCS 320-204105/2-
A","250","10.0","100",""
"LCSD 320-204105/3-A","537 (modified)","RES","LCSD 320-204105/3-A","TALSAC","STL01056","13C8
FOSA","92.0","ng/L","","-99","DL","","SPK","92","","-99","LOQ","YES","100","LCS 320-204105/2-
A","250","10.0","100",""
"LCSD 320-204105/3-A","537 (modified)","RES","LCSD 320-204105/3-A","TALSAC","STL01892","13C4-
PFHpA","104","ng/L","","-99","DL","","SPK","104","","-99","LOQ","YES","100","LCS 320-204105/2-
A","250","10.0","100",""

"LCSD 320-204105/3-A","537 (modified)","RES","LCSD 320-204105/3-A","TALSAC","STL01893","13C5 PFPeA","106","ng/L","","-99","DL","","SPK","106","","-99","LOQ","YES","100","LCS 320-204105/2-A","250","10.0","100",""
"LCSD 320-204105/3-A","537 (modified)","RES","LCSD 320-204105/3-A","TALSAC","STL02116","13C2-PFTeDA","98.6","ng/L","","-99","DL","","SPK","99","","-99","LOQ","YES","100","LCS 320-204105/2-A","250","10.0","100",""
"LCSD 320-204105/3-A","537 (modified)","RES","LCSD 320-204105/3-A","TALSAC","STL02337","13C3-PFBS","98.0","ng/L","","-99","DL","","SPK","105","","-99","LOQ","YES","93.0","LCS 320-204105/2-A","250","10.0","100",""
"MB 320-204105/1-A","537 (modified)","RES","MB 320-204105/1-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","2.0","ng/L","U","0.54","DL","","TRG","","","4.0","LOQ","YES","-99","","250","10.0","2.0",""
"MB 320-204105/1-A","537 (modified)","RES","MB 320-204105/1-A","TALSAC","2058-94-8","Perfluoroundecanoic acid (PFUnA)","3.0","ng/L","U","1.1","DL","","TRG","","","4.0","LOQ","YES","-99","","250","10.0","3.0",""
"MB 320-204105/1-A","537 (modified)","RES","MB 320-204105/1-A","TALSAC","2706-90-3","Perfluoropentanoic acid (PFPeA)","1.0","ng/L","U","0.49","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.0","1.0",""
"MB 320-204105/1-A","537 (modified)","RES","MB 320-204105/1-A","TALSAC","307-24-4","Perfluorohexanoic acid (PFHxA)","2.0","ng/L","U","0.58","DL","","TRG","","","4.0","LOQ","YES","-99","","250","10.0","2.0",""
"MB 320-204105/1-A","537 (modified)","RES","MB 320-204105/1-A","TALSAC","307-55-1","Perfluorododecanoic acid (PFDoA)","2.0","ng/L","U","0.55","DL","","TRG","","","4.0","LOQ","YES","-99","","250","10.0","2.0",""
"MB 320-204105/1-A","537 (modified)","RES","MB 320-204105/1-A","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","2.0","ng/L","U","0.85","DL","","TRG","","","4.0","LOQ","YES","-99","","250","10.0","2.0",""
"MB 320-204105/1-A","537 (modified)","RES","MB 320-204105/1-A","TALSAC","335-76-2","Perfluorodecanoic acid (PFDA)","1.0","ng/L","U","0.31","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.0","1.0",""
"MB 320-204105/1-A","537 (modified)","RES","MB 320-204105/1-A","TALSAC","335-77-3","Perfluorodecanesulfonic acid (PFDS)","1.0","ng/L","U","0.32","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.0","1.0",""
"MB 320-204105/1-A","537 (modified)","RES","MB 320-204105/1-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","1.0","ng/L","U","0.30","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.0","1.0",""
"MB 320-204105/1-A","537 (modified)","RES","MB 320-204105/1-A","TALSAC","375-22-4","Perfluorobutanoic acid (PFBA)","1.0","ng/L","U","0.35","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.0","1.0",""
"MB 320-204105/1-A","537 (modified)","RES","MB 320-204105/1-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","1.0","ng/L","U","0.30","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.0","1.0",""
"MB 320-204105/1-A","537 (modified)","RES","MB 320-204105/1-A","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","1.0","ng/L","U","0.25","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.0","1.0",""
"MB 320-204105/1-A","537 (modified)","RES","MB 320-204105/1-A","TALSAC","375-92-8","Perfluoroheptanesulfonic Acid (PFHpS)","1.0","ng/L","U","0.30","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.0","1.0",""
"MB 320-204105/1-A","537 (modified)","RES","MB 320-204105/1-A","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","1.0","ng/L","U","0.27","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.0","1.0",""
"MB 320-204105/1-A","537 (modified)","RES","MB 320-204105/1-A","TALSAC","376-06-7","Perfluorotetradecanoic acid (PFTeA)","1.0","ng/L","U","0.29","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.0","1.0",""
"MB 320-204105/1-A","537 (modified)","RES","MB 320-204105/1-A","TALSAC","72629-94-8","Perfluorotridecanoic Acid (PFTriA)","3.0","ng/L","U","1.3","DL","","TRG","","","4.0","LOQ","YES","-99","","250","10.0","3.0",""
"MB 320-204105/1-A","537 (modified)","RES","MB 320-204105/1-A","TALSAC","754-91-6","Perfluorooctane Sulfonamide (FOSA)","1.0","ng/L","U","0.35","DL","","TRG","","","2.0","LOQ","YES","-99","","250","10.0","1.0",""
"MB 320-204105/1-A","537 (modified)","RES","MB 320-204105/1-A","TALSAC","STL00990","13C4 PFOA","102","ng/L","","-99","DL","","TRG","102","","-99","LOQ","YES","100","","250","10.0","100",""
"MB 320-204105/1-A","537 (modified)","RES","MB 320-204105/1-A","TALSAC","STL00991","13C4 PFOS","99.5","ng/L","","-99","DL","","TRG","104","","-99","LOQ","YES","95.6","","250","10.0","100",""
"MB 320-204105/1-A","537 (modified)","RES","MB 320-204105/1-A","TALSAC","STL00992","13C4

PFBA","104","ng/L","","-99","DL","","TRG","104","","-99","LOQ","YES","100","","250","10.0","100",""
"MB 320-204105/1-A","537 (modified)","RES","MB 320-204105/1-A","TALSAC","STL00993","13C2
PFHxA","102","ng/L","","-99","DL","","TRG","102","","-99","LOQ","YES","100","","250","10.0","100",""
"MB 320-204105/1-A","537 (modified)","RES","MB 320-204105/1-A","TALSAC","STL00994","18O2
PFHxS","98.4","ng/L","","-99","DL","","TRG","104","","-99","LOQ","YES","94.6","","250","10.0","100",""
"MB 320-204105/1-A","537 (modified)","RES","MB 320-204105/1-A","TALSAC","STL00995","13C5
PFNA","106","ng/L","","-99","DL","","TRG","106","","-99","LOQ","YES","100","","250","10.0","100",""
"MB 320-204105/1-A","537 (modified)","RES","MB 320-204105/1-A","TALSAC","STL00996","13C2
PFDA","99.7","ng/L","","-99","DL","","TRG","100","","-99","LOQ","YES","100","","250","10.0","100",""
"MB 320-204105/1-A","537 (modified)","RES","MB 320-204105/1-A","TALSAC","STL00997","13C2
PFUnA","107","ng/L","","-99","DL","","TRG","107","","-99","LOQ","YES","100","","250","10.0","100",""
"MB 320-204105/1-A","537 (modified)","RES","MB 320-204105/1-A","TALSAC","STL00998","13C2
PFDoA","96.0","ng/L","","-99","DL","","TRG","96","","-99","LOQ","YES","100","","250","10.0","100",""
"MB 320-204105/1-A","537 (modified)","RES","MB 320-204105/1-A","TALSAC","STL01056","13C8
FOSA","91.3","ng/L","","-99","DL","","TRG","91","","-99","LOQ","YES","100","","250","10.0","100",""
"MB 320-204105/1-A","537 (modified)","RES","MB 320-204105/1-A","TALSAC","STL01892","13C4-
PFHpA","101","ng/L","","-99","DL","","TRG","101","","-99","LOQ","YES","100","","250","10.0","100",""
"MB 320-204105/1-A","537 (modified)","RES","MB 320-204105/1-A","TALSAC","STL01893","13C5
PFPeA","108","ng/L","","-99","DL","","TRG","108","","-99","LOQ","YES","100","","250","10.0","100",""
"MB 320-204105/1-A","537 (modified)","RES","MB 320-204105/1-A","TALSAC","STL02116","13C2-
PFTeDA","98.4","ng/L","","-99","DL","","TRG","98","","-99","LOQ","YES","100","","250","10.0","100",""
"MB 320-204105/1-A","537 (modified)","RES","MB 320-204105/1-A","TALSAC","STL02337","13C3-
PFBS","94.1","ng/L","","-99","DL","","TRG","101","","-99","LOQ","YES","93.0","","250","10.0","100",""
"Unknown","Unknown","TP-PFC-025-TPI","01/11/2018 09:00","AQ","320-35042-1","NM","","5.20","537
(modified)","3535","RES","01/16/2018 09:18","01/18/2018
18:01","TALSAC","COA","WET","NA","1","NA","NA","","100","320-204105","320-204105","NA","320-
204556","320-35042-1","01/12/2018 13:20","01/12/2018 17:30",""
"Unknown","Unknown","TP-PFC-025-TPI","01/11/2018 09:00","AQ","320-35042-1","NM","","5.20","537
(modified)","3535","DL","01/16/2018 09:18","01/19/2018
16:58","TALSAC","COA","WET","NA","10","NA","NA","","100","320-204105","320-204105","NA","320-
204757","320-35042-1","01/12/2018 13:20","01/12/2018 17:30",""
"Unknown","Unknown","TP-PFC-025-MID-CARBON","01/11/2018 09:05","AQ","320-35042-
2","NM","","5.20","537 (modified)","3535","RES","01/16/2018 09:18","01/18/2018
18:08","TALSAC","COA","WET","NA","1","NA","NA","","100","320-204105","320-204105","NA","320-
204556","320-35042-1","01/12/2018 13:20","01/12/2018 17:30",""
"Unknown","Unknown","TP-PFC-025-TPE","01/11/2018 09:10","AQ","320-35042-3","NM","","5.20","537
(modified)","3535","RES","01/16/2018 09:18","01/18/2018
18:16","TALSAC","COA","WET","NA","1","NA","NA","","100","320-204105","320-204105","NA","320-
204556","320-35042-1","01/12/2018 13:20","01/12/2018 17:30",""
"Unknown","Unknown","TP-PFC-025-TPE-D","01/11/2018 00:00","AQ","320-35042-4","FD","","5.20","537
(modified)","3535","RES","01/16/2018 09:18","01/18/2018
18:24","TALSAC","COA","WET","NA","1","NA","NA","","100","320-204105","320-204105","NA","320-
204556","320-35042-1","01/12/2018 13:20","01/12/2018 17:30",""
"Unknown","Unknown","LCS 320-204105/2-A","","AQ","LCS 320-204105/2-A","LCS","","-99","537
(modified)","3535","RES","01/16/2018 09:18","01/18/2018
17:45","TALSAC","COA","WET","NA","1","NA","NA","","100","320-204105","320-204105","NA","320-
204556","320-35042-1","01/16/2018 09:18","01/12/2018 17:30",""
"Unknown","Unknown","LCSD 320-204105/3-A","","AQ","LCSD 320-204105/3-A","LCSD","","-99","537
(modified)","3535","RES","01/16/2018 09:18","01/18/2018
17:53","TALSAC","COA","WET","NA","1","NA","NA","","100","320-204105","320-204105","NA","320-
204556","320-35042-1","01/16/2018 09:18","01/12/2018 17:30",""
"Unknown","Unknown","MB 320-204105/1-A","","AQ","MB 320-204105/1-A","MB","","-99","537
(modified)","3535","RES","01/16/2018 09:18","01/18/2018
17:37","TALSAC","COA","WET","NA","1","NA","NA","","100","320-204105","320-204105","NA","320-

204556","320-35042-1","01/16/2018 09:18","01/12/2018 17:30",""

TETRA TECH **INTERNAL CORRESPONDENCE**

TO: **J. ORIENT** **DATE:** **FEBRUARY 8, 2018**

FROM: **MICHELLE L. WOEBER** **COPIES:** **DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION – POLYFLUOROALKYL SUBSTANCES (PFAS)**
FORMER NAVAL AIR STATION (NAS) BRUNSWICK, BRUNSWICK, ME
CTO WE21 PFC ASSESSMENT
SAMPLE DELIVERY GROUP (SDG) 320-35042-1

SAMPLES: 4/Aqueous/PFAS

TP-PFC-025-MID-CARBON TP-PFC-025-TPE TP-PFC-025-TPE-D
TP-PFC-025-TPI

Overview

The sample set for former NAS Brunswick, SDG 320-35042-1 consisted of four (4) aqueous environmental samples. All four (4) aqueous samples were analyzed for Polyfluoroalkyl Substances (PFAS). One field duplicate pair was included in this SDG: TP-PFC-025-TPE/TP-PFC-025-TPE-D.

The samples were collected by Tetra Tech, Inc. on January 11, 2018 and analyzed by Test America, Inc. The analyses were conducted using EPA Method 537 (Modified) analytical and reporting protocols. The data was evaluated based on the following parameters:

* • Data Completeness
* • Holding Times/Sample Preservation
* • LC/MS Tuning
* • Initial and Continuing Calibration Results
* • Laboratory Method Blank Results
* • Surrogate Spike Recoveries
* • Laboratory Control Sample/Laboratory Control Sample Duplicate Results
* • Field Duplicate Precision
* • Detection Limits
* • Compound Identification and Quantification

The asterisk (*) indicates that all quality control criteria were met for this parameter. Qualified (if applicable) analytical results are summarized in Appendix A. Results as reported by the laboratory are presented in Appendix B, and Appendix C contains the documentation to support the findings as discussed in this data validation report. An EPA Region 1 tier II validation was performed on the data in this SDG. The text of this report has been formulated to address only those areas affecting data quality.

NOTES

Field Reagent Blanks (FRBs) were not provided with the environmental samples.

The concentrations of pentadecafluorooctanoic acid (perfluorooctanoic acid (PFOA)) and perfluorohexanesulfonic acid (PFHxS) exceeded the instrument calibration range in sample TP-PFC-025-TPI. The sample was reanalyzed at a 10X dilution. The result for this compound from the dilution was used in the data validation.

Detected results reported below the LOQ but above the Detection Limit (DL) were qualified as estimated, (J). Non-detected results are reported to the Limit of Detection (LOD).

EXECUTIVE SUMMARY

Laboratory Performance: None.

Other Factors Affecting Data Quality: One sample was further diluted. Detected results below the LOQ were estimated.

The data for these analyses were reviewed with reference to the EPA New England Environmental Data Review Supplement for Regional Data Review Elements Superfund Guidance/Procedures (April 2013), National Functional Guidelines for Organic Data Validation (January 2017), and the Department of Defense (DoD) document entitled, "Quality Systems Manual (QSM) for Environmental Laboratories" (July 2013). The text of this report has been formulated to address only those areas affecting data quality.

Michelle L. Woeber

_____
Tetra Tech, Inc.
Michelle L. Woeber
Environmental Chemist

_____
Tetra Tech, Inc.
Joseph A. Samchuck
Data Validation Manager

Attachments:

Appendix A - Qualified Analytical Results
Appendix B - Results as reported by the Laboratory
Appendix C - Support Documentation

Data Qualifier Definitions

The following definitions provide brief explanations of the validation qualifiers assigned to results in the data review process.

U	The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted method detection limit for sample and method.
J	The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the reporting limit).
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
UJ	The analyte was analyzed for, but was not detected. The reported detection limit is approximate and may be inaccurate or imprecise.
R	The sample result (detected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
UR	The sample result (nondetected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.

APPENDIX A

QUALIFIED LABORATORY RESULTS

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration Noncompliance (i.e., % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
C01 = GC/MS Tuning Noncompliance
D = MS/MSD Recovery Noncompliance
E = LCS/LCSD Recovery Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = ICP PDS Recovery Noncompliance; MSA's $r < 0.995$
K = ICP Interference - includes ICS % R Noncompliance
L = Instrument Calibration Range Exceedance
M = Sample Preservation Noncompliance
N = Internal Standard Noncompliance
N01 = Internal Standard Recovery Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues; i.e.chromatography,interferences, etc.)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = RPD between columns/detectors >40% for positive results determined via GC/HPLC
V = Non-linear calibrations; correlation coefficient $r < 0.995$
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 standard deviations is greater than sample activity
Z1 = Tentatively Identified Compound considered presumptively present
Z2 = Tentatively Identified Compound column bleed
Z3 = Tentatively Identified Compound aldol condensate
Z4 = Sample activity is less than the at uncertainty at 3 standard deviations and greater than the MDC
Z5 = Sample activity is less than the at uncertainty at 3 standard deviations and less than the MDC

PROJ_NO: 08005-WE21	NSAMPLE	TP-PFC-025-MID-CARBON			TP-PFC-025-TPE			TP-PFC-025-TPE-D			TP-PFC-025-TPI		
SDG: 320-35042-1	LAB_ID	320-35042-2			320-35042-3			320-35042-4			320-35042-1		
FRACTION: PFAS	SAMP_DATE	1/11/2018			1/11/2018			1/11/2018			1/11/2018		
MEDIA: WATER	QC_TYPE	NM			NM			FD			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF							TP-PFC-025-TPE					
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PENTADECAFLUOROOCTANOIC ACID		13			1.1	J	P	1.1	J	P			
PERFLUOROBUTANESULFONIC ACID		1.6	J	P	0.38	J	P	0.45	J	P	51		
PERFLUOROBUTANOIC ACID		130			130			130			73		
PERFLUORODECANE SULFONIC ACID		0.98	U		0.97	U		0.99	U		0.98	U	
PERFLUORODECANOIC ACID		0.98	U		0.97	U		0.99	U		0.89	J	P
PERFLUORODODECANOIC ACID		2	U		1.9	U		2	U		2	U	
PERFLUOROHEPTANESULFONIC ACID		0.98	U		0.97	U		0.99	U		7.1		
PERFLUOROHEPTANOIC ACID		2.3			0.43	J	P	0.43	J	P	67		
PERFLUOROHEXANESULFONIC ACID		1	J	P	0.38	J	P	0.32	J	P			
PERFLUOROHEXANOIC ACID		72			25			25			340		
PERFLUORONONANOIC ACID		0.98	U		0.97	U		0.99	U		2.4		
PERFLUOROOCTANE SULFONAMIDE		0.98	U		0.97	U		0.99	U		0.98	U	
PERFLUOROOCTANE SULFONIC ACID		2	U		1.9	U		2	U		340		
PERFLUOROPENTANOIC ACID		170			110			110			190		
PERFLUOROTETRADECANOIC ACID		0.98	U		0.97	U		0.99	U		0.98	U	
PERFLUOROTRIDECANOIC ACID		3	U		2.9	U		3	U		2.9	U	
PERFLUOROUNDECANOIC ACID		3	U		2.9	U		3	U		2.9	U	

PROJ_NO: 08005-WE21	NSAMPLE	TP-PFC-025-TPI-DL		
SDG: 320-35042-1	LAB_ID	320-35042-1		
FRACTION: PFAS	SAMP_DATE	1/11/2018		
MEDIA: WATER	QC_TYPE	NM		
	UNITS	NG/L		
	PCT_SOLIDS	0.0		
	DUP_OF			
PARAMETER		RESULT	VQL	QLCD
PENTADECAFLUOROOCTANOIC ACID		1800		
PERFLUOROBUTANESULFONIC ACID				
PERFLUOROBUTANOIC ACID				
PERFLUORODECANE SULFONIC ACID				
PERFLUORODECANOIC ACID				
PERFLUORODODECANOIC ACID				
PERFLUOROHEPTANESULFONIC ACID				
PERFLUOROHEPTANOIC ACID				
PERFLUOROHEXANESULFONIC ACID		410		
PERFLUOROHEXANOIC ACID				
PERFLUORONONANOIC ACID				
PERFLUOROOCTANE SULFONAMIDE				
PERFLUOROOCTANE SULFONIC ACID				
PERFLUOROPENTANOIC ACID				
PERFLUOROTETRADECANOIC ACID				
PERFLUOROTRIDECANOIC ACID				
PERFLUOROUNDECANOIC ACID				

APPENDIX B

RESULTS AS REPORTED BY THE LABORATORY

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35042-1

SDG No.:

Client Sample ID: TP-PFC-025-TPI | Lab Sample ID: 320-35042-1

Matrix: Water | Lab File ID: 2018.01.18LLA_005.d

Analysis Method: 537 (modified) | Date Collected: 01/11/2018 09:00

Extraction Method: 3535 | Date Extracted: 01/16/2018 09:18

Sample wt/vol: 256.2(mL) | Date Analyzed: 01/18/2018 18:01

Con. Extract Vol.: 10.0(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 204556 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	73		2.0	0.98	0.34
2706-90-3	Perfluoropentanoic acid (PFPeA)	190		2.0	0.98	0.48
307-24-4	Perfluorohexanoic acid (PFHxA)	340		3.9	2.0	0.57
375-85-9	Perfluoroheptanoic acid (PFHpA)	67		2.0	0.98	0.24
335-67-1	*Perfluorooctanoic acid (PFOA)*	*1300*	*M E*	*3.9*	2.0	*0.83*
375-95-1	Perfluorononanoic acid (PFNA)	2.4		2.0	0.98	0.26
335-76-2	Perfluorodecanoic acid (PFDA)	0.89	J	2.0	0.98	0.30
2058-94-8	Perfluoroundecanoic acid (PFUnA)	2.9	U	3.9	2.9	1.1
307-55-1	Perfluorododecanoic acid (PFDoA)	2.0	U	3.9	2.0	0.54
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.9	U	3.9	2.9	1.3
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.98	U	2.0	0.98	0.28
375-73-5	Perfluorobutanesulfonic acid (PFBS)	51		2.0	0.98	0.29
355-46-4	*Perfluorohexanesulfonic acid (PFHxS)*	*360*	*E*	*2.0*	0.98	*0.29*
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	7.1		2.0	0.98	0.29
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	340		3.9	2.0	0.53
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.98	U	2.0	0.98	0.31
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.98	U	2.0	0.98	0.34

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35042-1

SDG No.:

Client Sample ID: TP-PFC-025-TPI | Lab Sample ID: 320-35042-1

Matrix: Water | Lab File ID: 2018.01.18LLA_005.d

Analysis Method: 537 (modified) | Date Collected: 01/11/2018 09:00

Extraction Method: 3535 | Date Extracted: 01/16/2018 09:18

Sample wt/vol: 256.2(mL) | Date Analyzed: 01/18/2018 18:01

Con. Extract Vol.: 10.0(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 204556 | Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	112		25-150
STL00992	13C4 PFBA	114		25-150
STL00993	13C2 PFHxA	118		25-150
STL00990	13C4 PFOA	103		25-150
STL00995	13C5 PFNA	124		25-150
STL00996	13C2 PFDA	125		25-150
STL00997	13C2 PFUnA	128		25-150
STL00998	13C2 PFDoA	109		25-150
STL00994	18O2 PFHxS	122		25-150
STL00991	13C4 PFOS	124		25-150
STL02116	13C2-PFTeDA	108		25-150
STL01892	13C4-PFHpA	121		25-150
STL01893	13C5 PFPeA	141		25-150
STL02337	13C3-PFBS	123		25-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35042-1

SDG No.:

Client Sample ID: TP-PFC-025-TPI DL | Lab Sample ID: 320-35042-1 DL

Matrix: Water | Lab File ID: 2018.01.19LLC_010.d

Analysis Method: 537 (modified) | Date Collected: 01/11/2018 09:00

Extraction Method: 3535 | Date Extracted: 01/16/2018 09:18

Sample wt/vol: 256.2(mL) | Date Analyzed: 01/19/2018 16:58

Con. Extract Vol.: 10.0(mL) | Dilution Factor: 10

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 204757 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	*Perfluorobutanoic acid (PFBA)*	*74*	*D*	*20*	9.8	*3.4*
2706-90-3	*Perfluoropentanoic acid (PFPeA)*	*200*	*D*	*20*	9.8	*4.8*
307-24-4	*Perfluorohexanoic acid (PFHxA)*	*350*	*D*	*39*	20	*5.7*
375-85-9	*Perfluoroheptanoic acid (PFHpA)*	*75*	*D*	*20*	9.8	*2.4*
335-67-1	Perfluorooctanoic acid (PFOA)	1800	D M	39	20	8.3
375-95-1	*Perfluorononanoic acid (PFNA)*	*9.8*	*U*	*20*	9.8	*2.6*
335-76-2	*Perfluorodecanoic acid (PFDA)*	*9.8*	*U*	*20*	9.8	*3.0*
2058-94-8	*Perfluoroundecanoic acid (PFUnA)*	*29*	*U*	*39*	29	*11*
307-55-1	*Perfluorododecanoic acid (PFDoA)*	*20*	*U*	*39*	20	*5.4*
72629-94-8	*Perfluorotridecanoic Acid (PFTriA)*	*29*	*U*	*39*	29	*13*
376-06-7	*Perfluorotetradecanoic acid (PFTeA)*	*9.8*	*U*	*20*	9.8	*2.8*
375-73-5	*Perfluorobutanesulfonic acid (PFBS)*	*41*	*D*	*20*	9.8	*2.9*
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	410	D	20	9.8	2.9
375-92-8	*Perfluoroheptanesulfonic Acid (PFHpS)*	*8.7*	*J D*	*20*	9.8	*2.9*
1763-23-1	*Perfluorooctanesulfonic acid (PFOS)*	*340*	*D*	*39*	20	*5.3*
335-77-3	*Perfluorodecanesulfonic acid (PFDS)*	*9.8*	*U*	*20*	9.8	*3.1*
754-91-6	*Perfluorooctane Sulfonamide (FOSA)*	*9.8*	*U*	*20*	9.8	*3.4*

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35042-1

SDG No.:

Client Sample ID: TP-PFC-025-TPI DL | Lab Sample ID: 320-35042-1 DL

Matrix: Water | Lab File ID: 2018.01.19LLC_010.d

Analysis Method: 537 (modified) | Date Collected: 01/11/2018 09:00

Extraction Method: 3535 | Date Extracted: 01/16/2018 09:18

Sample wt/vol: 256.2(mL) | Date Analyzed: 01/19/2018 16:58

Con. Extract Vol.: 10.0(mL) | Dilution Factor: 10

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 204757 | Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	95		25-150
STL00992	13C4 PFBA	101		25-150
STL00993	13C2 PFHxA	101		25-150
STL00990	13C4 PFOA	103		25-150
STL00995	13C5 PFNA	100		25-150
STL00996	13C2 PFDA	102		25-150
STL00997	13C2 PFUnA	106		25-150
STL00998	13C2 PFDoA	94		25-150
STL00994	18O2 PFHxS	99		25-150
STL00991	13C4 PFOS	101		25-150
STL02116	13C2-PFTeDA	95		25-150
STL01892	13C4-PFHpA	96		25-150
STL01893	13C5 PFPeA	104		25-150
STL02337	13C3-PFBS	118		25-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35042-1

SDG No.:

Client Sample ID: TP-PFC-025-MID-CARBON | Lab Sample ID: 320-35042-2

Matrix: Water | Lab File ID: 2018.01.18LLA_006.d

Analysis Method: 537 (modified) | Date Collected: 01/11/2018 09:05

Extraction Method: 3535 | Date Extracted: 01/16/2018 09:18

Sample wt/vol: 253.9(mL) | Date Analyzed: 01/18/2018 18:08

Con. Extract Vol.: 10.0(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 204556 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	130		2.0	0.98	0.34
2706-90-3	Perfluoropentanoic acid (PFPeA)	170		2.0	0.98	0.48
307-24-4	Perfluorohexanoic acid (PFHxA)	72		3.9	2.0	0.57
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.3	M	2.0	0.98	0.25
335-67-1	Perfluorooctanoic acid (PFOA)	13	M	3.9	2.0	0.84
375-95-1	Perfluorononanoic acid (PFNA)	0.98	U	2.0	0.98	0.27
335-76-2	Perfluorodecanoic acid (PFDA)	0.98	U	2.0	0.98	0.31
2058-94-8	Perfluoroundecanoic acid (PFUnA)	3.0	U	3.9	3.0	1.1
307-55-1	Perfluorododecanoic acid (PFDoA)	2.0	U	3.9	2.0	0.54
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	3.0	U	3.9	3.0	1.3
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.98	U	2.0	0.98	0.29
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.6	J	2.0	0.98	0.30
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.0	J	2.0	0.98	0.30
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.98	U	2.0	0.98	0.30
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.0	U	3.9	2.0	0.53
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.98	U	2.0	0.98	0.32
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.98	U	2.0	0.98	0.34

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35042-1

SDG No.:

Client Sample ID: TP-PFC-025-MID-CARBON | Lab Sample ID: 320-35042-2

Matrix: Water | Lab File ID: 2018.01.18LLA_006.d

Analysis Method: 537 (modified) | Date Collected: 01/11/2018 09:05

Extraction Method: 3535 | Date Extracted: 01/16/2018 09:18

Sample wt/vol: 253.9(mL) | Date Analyzed: 01/18/2018 18:08

Con. Extract Vol.: 10.0(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 204556 | Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	92		25-150
STL00992	13C4 PFBA	104		25-150
STL00993	13C2 PFHxA	98		25-150
STL00990	13C4 PFOA	102		25-150
STL00995	13C5 PFNA	104		25-150
STL00996	13C2 PFDA	97		25-150
STL00997	13C2 PFUnA	100		25-150
STL00998	13C2 PFDoA	90		25-150
STL00994	18O2 PFHxS	99		25-150
STL00991	13C4 PFOS	100		25-150
STL02116	13C2-PFTeDA	94		25-150
STL01892	13C4-PFHpA	100		25-150
STL01893	13C5 PFPeA	102		25-150
STL02337	13C3-PFBS	98		25-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35042-1

SDG No.:

Client Sample ID: TP-PFC-025-TPE | Lab Sample ID: 320-35042-3

Matrix: Water | Lab File ID: 2018.01.18LLA_007.d

Analysis Method: 537 (modified) | Date Collected: 01/11/2018 09:10

Extraction Method: 3535 | Date Extracted: 01/16/2018 09:18

Sample wt/vol: 256.7(mL) | Date Analyzed: 01/18/2018 18:16

Con. Extract Vol.: 10.0(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 204556 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	130		1.9	0.97	0.34
2706-90-3	Perfluoropentanoic acid (PFPeA)	110		1.9	0.97	0.48
307-24-4	Perfluorohexanoic acid (PFHxA)	25		3.9	1.9	0.56
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.43	J M	1.9	0.97	0.24
335-67-1	Perfluorooctanoic acid (PFOA)	1.1	J M	3.9	1.9	0.83
375-95-1	Perfluorononanoic acid (PFNA)	0.97	U	1.9	0.97	0.26
335-76-2	Perfluorodecanoic acid (PFDA)	0.97	U	1.9	0.97	0.30
2058-94-8	Perfluoroundecanoic acid (PFUnA)	2.9	U	3.9	2.9	1.1
307-55-1	Perfluorododecanoic acid (PFDoA)	1.9	U	3.9	1.9	0.54
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	2.9	U	3.9	2.9	1.3
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.97	U	1.9	0.97	0.28
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.38	J	1.9	0.97	0.29
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.38	J	1.9	0.97	0.29
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.97	U	1.9	0.97	0.29
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	1.9	U	3.9	1.9	0.53
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.97	U	1.9	0.97	0.31
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.97	U	1.9	0.97	0.34

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35042-1

SDG No.:

Client Sample ID: TP-PFC-025-TPE | Lab Sample ID: 320-35042-3

Matrix: Water | Lab File ID: 2018.01.18LLA_007.d

Analysis Method: 537 (modified) | Date Collected: 01/11/2018 09:10

Extraction Method: 3535 | Date Extracted: 01/16/2018 09:18

Sample wt/vol: 256.7(mL) | Date Analyzed: 01/18/2018 18:16

Con. Extract Vol.: 10.0(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 204556 | Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	87		25-150
STL00992	13C4 PFBA	105		25-150
STL00993	13C2 PFHxA	101		25-150
STL00990	13C4 PFOA	107		25-150
STL00995	13C5 PFNA	106		25-150
STL00996	13C2 PFDA	89		25-150
STL00997	13C2 PFUnA	99		25-150
STL00998	13C2 PFDoA	93		25-150
STL00994	18O2 PFHxS	102		25-150
STL00991	13C4 PFOS	100		25-150
STL02116	13C2-PFTeDA	94		25-150
STL01892	13C4-PFHpA	110		25-150
STL01893	13C5 PFPeA	107		25-150
STL02337	13C3-PFBS	99		25-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35042-1

SDG No.:

Client Sample ID: TP-PFC-025-TPE-D | Lab Sample ID: 320-35042-4

Matrix: Water | Lab File ID: 2018.01.18LLA_008.d

Analysis Method: 537 (modified) | Date Collected: 01/11/2018 00:00

Extraction Method: 3535 | Date Extracted: 01/16/2018 09:18

Sample wt/vol: 253(mL) | Date Analyzed: 01/18/2018 18:24

Con. Extract Vol.: 10.0(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 204556 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	130		2.0	0.99	0.35
2706-90-3	Perfluoropentanoic acid (PFPeA)	110		2.0	0.99	0.48
307-24-4	Perfluorohexanoic acid (PFHxA)	25		4.0	2.0	0.57
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.43	J M	2.0	0.99	0.25
335-67-1	Perfluorooctanoic acid (PFOA)	1.1	J M	4.0	2.0	0.84
375-95-1	Perfluorononanoic acid (PFNA)	0.99	U	2.0	0.99	0.27
335-76-2	Perfluorodecanoic acid (PFDA)	0.99	U	2.0	0.99	0.31
2058-94-8	Perfluoroundecanoic acid (PFUnA)	3.0	U	4.0	3.0	1.1
307-55-1	Perfluorododecanoic acid (PFDoA)	2.0	U	4.0	2.0	0.54
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	3.0	U	4.0	3.0	1.3
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.99	U	2.0	0.99	0.29
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.45	J	2.0	0.99	0.30
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.32	J	2.0	0.99	0.30
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	0.99	U	2.0	0.99	0.30
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.0	U	4.0	2.0	0.53
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.99	U	2.0	0.99	0.32
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.99	U	2.0	0.99	0.35

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35042-1

SDG No.:

Client Sample ID: TP-PFC-025-TPE-D | Lab Sample ID: 320-35042-4

Matrix: Water | Lab File ID: 2018.01.18LLA_008.d

Analysis Method: 537 (modified) | Date Collected: 01/11/2018 00:00

Extraction Method: 3535 | Date Extracted: 01/16/2018 09:18

Sample wt/vol: 253(mL) | Date Analyzed: 01/18/2018 18:24

Con. Extract Vol.: 10.0(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 204556 | Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	98		25-150
STL00992	13C4 PFBA	105		25-150
STL00993	13C2 PFHxA	108		25-150
STL00990	13C4 PFOA	107		25-150
STL00995	13C5 PFNA	107		25-150
STL00996	13C2 PFDA	102		25-150
STL00997	13C2 PFUnA	108		25-150
STL00998	13C2 PFDoA	102		25-150
STL00994	18O2 PFHxS	103		25-150
STL00991	13C4 PFOS	108		25-150
STL02116	13C2-PFTeDA	99		25-150
STL01892	13C4-PFHpA	108		25-150
STL01893	13C5 PFPeA	109		25-150
STL02337	13C3-PFBS	99		25-150

APPENDIX C

SUPPORT DOCUMENTATION

TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Phone: 916.373.5600 Fax:

Chain of Custody Record 242315

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
TestAmerica Laboratories, Inc.

TAL-8210 (0713)

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

Client Contact	Project Manager: Jeff Orient	Site Contact: Ken Lamontagne	Date: 1/11/2018	COC No: 242315
Company Name: Tetra Tech	Tel/Fax: (412)921-8650	Lab Contact: David Alt Tucker	Carrier: Fed Ex	1 of 1 COCs
Address: 881 Anderson Dr Foster Plaza 7	Analysis Turnaround Time			Sampler: K Lamontagne
City/State/Zip: Pittsburg, PA 15220-2700	☑ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
Phone: (412) 921-8650	TAT if different from Below			Walk-in Client:
Fax:	☑ 2 weeks			Lab Sampling:
Project Name: Brunswick GWETs	☐ 1 week			
Site: Former NAS Brunswick GWETs	☐ 2 days			Job / SDG No.:
PO # 112G20B005-WE21	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	PFC (Full List) LC/MS/MS	Sample Specific Notes:
TP-PFC-025-TP1	1/11/18	0900	G	W	4	N	N	+	
TP-PFC-025-MID-CARBON		0905			4	N	N	+	
TP-PFC-025-TPE		0910			4	N	N	+	
TP-PFC-025-TPE-D		0000			4	N	N	+	

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☑ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments: ⓐ Sid not sign Relinquish original version, signed on 1/15/2018 at 1400

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd: _____ Corr'd: _____ | Therm ID No.: _____

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	Tetra Tech	1/11/18 ⓐ			
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Phone: 916.373.5600 Fax:

Chain of Custody Record 242315

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
TestAmerica Laboratories, Inc.
TAL-8210 (0713)

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

Client Contact	Project Manager: Jeff Orient	Site Contact: Kevin Lamontagne	Date: 1/11/2018	COC No: 242315
Company Name: Tetra Tech	Tel/Fax: (412) 921-8650	Lab Contact: David Alltucker	Carrier: Fed Ex	1 of 1 COCs
Address: 881 Anderson Dr Foster Plaza 7	Analysis Turnaround Time			Sampler: K. Lamontagne
City/State/Zip: Pittsburg, PA 15220-2700	☑ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
Phone: (412) 921-8650	TAT if different from Below			Walk-in Client:
Fax:	☑ 2 weeks			Lab Sampling:
Project Name: Brunswick GWETs	☐ 1 week			
Site: Former NAS Brunswick GWETs	☐ 2 days			Job / SDG No.:
PO# 112G08005-WE21	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	PFC (Full List) LC/MS/MS	Sample Specific Notes:
TP-PFC-025-TP1	1/11/18	0900	G	W	4	N	N	+	
TP-PFC-025-MID-CARBON		0905			4	N	N	+	
TP-PFC-025-TPE		0910			4	N	N	+	
TP-PFC-025-TPE-D		0000			4	N	N	+	

320-35042 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☑ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments:

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd: 5.2 Corr'd: — | Therm ID No.: AR-3

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
				TA-SAC	01/12/18 1320
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Login Sample Receipt Checklist

Client: Tetra Tech, Inc.

Job Number: 320-35042-1

Login Number: 35042
List Number: 1
Creator: Turpen, Troy

List Source: TestAmerica Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	False	COC not relinquished by client.
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	

Job Narrative
320-35042-1

Receipt
The samples were received on 1/12/2018 1:20 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 5.2º C.

Receipt Exceptions
The Chain-of-Custody (COC) was not reliquished. A revised CoC was received from the client and both will be included in the report.

LCMS
Method(s) 537 (modified): The first level standard from the initial calibration curve is used to evaluate the tune criteria. The instrument mass windows are set at +/- 0.5amu; therefore, detection of the analyte serves as verification that the assigned mass is within +/- 0.5amu of the true value, which meets the DoD/DOE QSM tune criterion.

Method(s) 537 (modified): The following sample was diluted to bring the concentration of Perfluorooctanoic acid (PFOA) and Perfluorohexanesulfonic acid (PFHxS) within the calibration range: TP-PFC-025-TPI (320-35042-1). Elevated reporting limits (RLs) are provided.

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

Organic Prep
Method(s) 3535: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-204105.

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

Qualifiers

LCMS

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

Glossary

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

Sample Summary

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

TestAmerica Job ID: 320-35042-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-35042-1	TP-PFC-025-TPI	Water	01/11/18 09:00	01/12/18 13:20
320-35042-2	TP-PFC-025-MID-CARBON	Water	01/11/18 09:05	01/12/18 13:20
320-35042-3	TP-PFC-025-TPE	Water	01/11/18 09:10	01/12/18 13:20
320-35042-4	TP-PFC-025-TPE-D	Water	01/11/18 00:00	01/12/18 13:20

Method Summary

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

TestAmerica Job ID: 320-35042-1

Method	Method Description	Protocol	Laboratory
537 (modified)	Fluorinated Alkyl Substances	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

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Matrix: Water Level: Low

GC Column (1): GeminiC18 3 ID: 3 (mm)

Client Sample ID	Lab Sample ID	PFBA #	PFPeA #	PFBS #	PFHxA #	PFHpA #	PFHxS #	PFOA #	PFNA #
TP-PFC-025-TPI	320-35042-1	114	141	123	118	121	122	103	124
TP-PFC-025-TPI DL	320-35042-1 DL	101	104	118	101	96	99	103	100
TP-PFC-025-MID-CARBON	320-35042-2	104	102	98	98	100	99	102	104
TP-PFC-025-TPE	320-35042-3	105	107	99	101	110	102	107	106
TP-PFC-025-TPE-D	320-35042-4	105	109	99	108	108	103	107	107
	MB 320-204105/1-A	104	108	101	102	101	104	102	106
	LCS 320-204105/2-A	98	101	96	97	97	94	100	95
	LCSD 320-204105/3-A	104	106	105	108	104	100	104	103

	QC LIMITS
PFBA = 13C4 PFBA	25-150
PFPeA = 13C5 PFPeA	25-150
PFBS = 13C3-PFBS	25-150
PFHxA = 13C2 PFHxA	25-150
PFHpA = 13C4-PFHpA	25-150
PFHxS = 18O2 PFHxS	25-150
PFOA = 13C4 PFOA	25-150
PFNA = 13C5 PFNA	25-150

Column to be used to flag recovery values

FORM II 537 (modified)

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Matrix: Water Level: Low

GC Column (1): GeminiC18 3 ID: 3 (mm)

Client Sample ID	Lab Sample ID	PFOS #	PFOSA #	PFDA #	PFUnA #	PFDoA #	PFTDA #
TP-PFC-025-TPI	320-35042-1	124	112	125	128	109	108
TP-PFC-025-TPI DL	320-35042-1 DL	101	95	102	106	94	95
TP-PFC-025-MID-CARBON	320-35042-2	100	92	97	100	90	94
TP-PFC-025-TPE	320-35042-3	100	87	89	99	93	94
TP-PFC-025-TPE-D	320-35042-4	108	98	102	108	102	99
	MB 320-204105/1-A	104	91	100	107	96	98
	LCS 320-204105/2-A	93	84	94	100	91	92
	LCSD 320-204105/3-A	101	92	102	99	94	99

	QC LIMITS
PFOS = 13C4 PFOS	25-150
PFOSA = 13C8 FOSA	25-150
PFDA = 13C2 PFDA	25-150
PFUnA = 13C2 PFUnA	25-150
PFDoA = 13C2 PFDoA	25-150
PFTDA = 13C2-PFTeDA	25-150

Column to be used to flag recovery values

FORM II 537 (modified)

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Lab File ID: 2018.01.18LLA_002.d Lab Sample ID: MB 320-204105/1-A

Matrix: Water Date Extracted: 01/16/2018 09:18

Instrument ID: A8_N Date Analyzed: 01/18/2018 17:37

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-204105/2-A	2018.01.18LLA_003.d	01/18/2018 17:45
	LCSD 320-204105/3-A	2018.01.18LLA_004.d	01/18/2018 17:53
TP-PFC-025-TPI	320-35042-1	2018.01.18LLA_005.d	01/18/2018 18:01
TP-PFC-025-MID-CARBON	320-35042-2	2018.01.18LLA_006.d	01/18/2018 18:08
TP-PFC-025-TPE	320-35042-3	2018.01.18LLA_007.d	01/18/2018 18:16
TP-PFC-025-TPE-D	320-35042-4	2018.01.18LLA_008.d	01/18/2018 18:24
TP-PFC-025-TPI DL	320-35042-1 DL	2018.01.19LLC_010.d	01/19/2018 16:58

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-35042-1

SDG No.:

Client Sample ID: | Lab Sample ID: MB 320-204105/1-A

Matrix: Water | Lab File ID: 2018.01.18LLA_002.d

Analysis Method: 537 (modified) | Date Collected:

Extraction Method: 3535 | Date Extracted: 01/16/2018 09:18

Sample wt/vol: 250(mL) | Date Analyzed: 01/18/2018 17:37

Con. Extract Vol.: 10.0(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 204556 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	1.0	U	2.0	1.0	0.35
2706-90-3	Perfluoropentanoic acid (PFPeA)	1.0	U	2.0	1.0	0.49
307-24-4	Perfluorohexanoic acid (PFHxA)	2.0	U	4.0	2.0	0.58
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.0	U	2.0	1.0	0.25
335-67-1	Perfluorooctanoic acid (PFOA)	2.0	U	4.0	2.0	0.85
375-95-1	Perfluorononanoic acid (PFNA)	1.0	U	2.0	1.0	0.27
335-76-2	Perfluorodecanoic acid (PFDA)	1.0	U	2.0	1.0	0.31
2058-94-8	Perfluoroundecanoic acid (PFUnA)	3.0	U	4.0	3.0	1.1
307-55-1	Perfluorododecanoic acid (PFDoA)	2.0	U	4.0	2.0	0.55
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	3.0	U	4.0	3.0	1.3
376-06-7	Perfluorotetradecanoic acid (PFTeA)	1.0	U	2.0	1.0	0.29
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.0	U	2.0	1.0	0.30
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.0	U	2.0	1.0	0.30
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	1.0	U	2.0	1.0	0.30
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.0	U	4.0	2.0	0.54
335-77-3	Perfluorodecanesulfonic acid (PFDS)	1.0	U	2.0	1.0	0.32
754-91-6	Perfluorooctane Sulfonamide (FOSA)	1.0	U	2.0	1.0	0.35

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Client Sample ID: Lab Sample ID: MB 320-204105/1-A

Matrix: Water Lab File ID: 2018.01.18LLA_002.d

Analysis Method: 537 (modified) Date Collected:

Extraction Method: 3535 Date Extracted: 01/16/2018 09:18

Sample wt/vol: 250(mL) Date Analyzed: 01/18/2018 17:37

Con. Extract Vol.: 10.0(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 204556 Units: ng/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	91		25-150
STL00992	13C4 PFBA	104		25-150
STL00993	13C2 PFHxA	102		25-150
STL00990	13C4 PFOA	102		25-150
STL00995	13C5 PFNA	106		25-150
STL00996	13C2 PFDA	100		25-150
STL00997	13C2 PFUnA	107		25-150
STL00998	13C2 PFDoA	96		25-150
STL00994	18O2 PFHxS	104		25-150
STL00991	13C4 PFOS	104		25-150
STL02116	13C2-PFTeDA	98		25-150
STL01892	13C4-PFHpA	101		25-150
STL01893	13C5 PFPeA	108		25-150
STL02337	13C3-PFBS	101		25-150

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2018.01.18LLA_003.d

Lab ID: LCS 320-204105/2-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
Perfluorobutanoic acid (PFBA)	40.0	39.2	98	89-128	
Perfluoropentanoic acid (PFPeA)	40.0	36.2	90	66-136	
Perfluorohexanoic acid (PFHxA)	40.0	36.9	92	86-126	
Perfluoroheptanoic acid (PFHpA)	40.0	38.0	95	89-127	
Perfluorooctanoic acid (PFOA)	40.0	36.9	92	80-120	
Perfluorononanoic acid (PFNA)	40.0	38.8	97	77-137	
Perfluorodecanoic acid (PFDA)	40.0	40.0	100	84-123	
Perfluoroundecanoic acid (PFUnA)	40.0	34.4	86	73-122	
Perfluorododecanoic acid (PFDoA)	40.0	40.3	101	82-122	
Perfluorotridecanoic Acid (PFTriA)	40.0	39.4	99	56-163	
Perfluorotetradecanoic acid (PFTeA)	40.0	40.7	102	66-120	
Perfluorobutanesulfonic acid (PFBS)	35.4	34.9	99	88-130	
Perfluorohexanesulfonic acid (PFHxS)	36.4	34.8	96	87-126	
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	38.0	100	92-135	
Perfluorooctanesulfonic acid (PFOS)	37.1	36.0	97	83-126	
Perfluorodecanesulfonic acid (PFDS)	38.6	40.0	104	80-129	
Perfluorooctane Sulfonamide (FOSA)	40.0	39.5	99	91-133	
13C8 FOSA	100	83.6	84	25-150	
13C4 PFBA	100	98.4	98	25-150	
13C2 PFHxA	100	96.9	97	25-150	
13C4 PFOA	100	99.9	100	25-150	
13C5 PFNA	100	94.8	95	25-150	
13C2 PFDA	100	93.9	94	25-150	
13C2 PFUnA	100	99.5	100	25-150	
13C2 PFDoA	100	90.6	91	25-150	
18O2 PFHxS	94.6	89.0	94	25-150	
13C4 PFOS	95.6	89.2	93	25-150	
13C2-PFTeDA	100	91.5	92	25-150	
13C4-PFHpA	100	97.4	97	25-150	
13C5 PFPeA	100	101	101	25-150	
13C3-PFBS	93.0	89.4	96	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.: 320-35042-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2018.01.18LLA_004.d

Lab ID: LCSD 320-204105/3-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LCSD CONCENTRATION (ng/L)	LCSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Perfluorobutanoic acid (PFBA)	40.0	38.1	95	3	30	89-128	
Perfluoropentanoic acid (PFPeA)	40.0	35.9	90	1	30	66-136	
Perfluorohexanoic acid (PFHxA)	40.0	35.7	89	3	30	86-126	
Perfluoroheptanoic acid (PFHpA)	40.0	37.2	93	2	30	89-127	
Perfluorooctanoic acid (PFOA)	40.0	37.8	94	2	30	80-120	
Perfluorononanoic acid (PFNA)	40.0	37.5	94	3	30	77-137	
Perfluorodecanoic acid (PFDA)	40.0	37.9	95	6	30	84-123	
Perfluoroundecanoic acid (PFUnA)	40.0	37.2	93	8	30	73-122	
Perfluorododecanoic acid (PFDoA)	40.0	39.8	100	1	30	82-122	
Perfluorotridecanoic Acid (PFTriA)	40.0	38.6	97	2	30	56-163	
Perfluorotetradecanoic acid (PFTeA)	40.0	40.7	102	0	30	66-120	
Perfluorobutanesulfonic acid (PFBS)	35.4	33.8	96	3	30	88-130	
Perfluorohexanesulfonic acid (PFHxS)	36.4	33.8	93	3	30	87-126	
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	37.5	98	2	30	92-135	
Perfluorooctanesulfonic acid (PFOS)	37.1	34.3	93	5	30	83-126	
Perfluorodecanesulfonic acid (PFDS)	38.6	36.9	96	8	30	80-129	
Perfluorooctane Sulfonamide (FOSA)	40.0	36.6	92	8	30	91-133	
13C8 FOSA	100	92.0	92			25-150	
13C4 PFBA	100	104	104			25-150	
13C2 PFHxA	100	108	108			25-150	
13C4 PFOA	100	104	104			25-150	
13C5 PFNA	100	103	103			25-150	
13C2 PFDA	100	102	102			25-150	
13C2 PFUnA	100	98.5	99			25-150	
13C2 PFDoA	100	94.3	94			25-150	
18O2 PFHxS	94.6	94.8	100			25-150	
13C4 PFOS	95.6	96.8	101			25-150	
13C2-PFTeDA	100	98.6	99			25-150	
13C4-PFHpA	100	104	104			25-150	
13C5 PFPeA	100	106	106			25-150	
13C3-PFBS	93.0	98.0	105			25-150	

Column to be used to flag recovery and RPD values

FORM III 537 (modified)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Instrument ID: A8_N Start Date: 01/17/2018 14:19

Analysis Batch Number: 204375 End Date: 01/17/2018 15:22

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-204375/2		01/17/2018 14:19	1	2018.01.17CURVE LLA 002.d	GeminiC18 3x100 3(mm)
IC 320-204375/3		01/17/2018 14:27	1	2018.01.17CURVE LLA 003.d	GeminiC18 3x100 3(mm)
IC 320-204375/4		01/17/2018 14:35	1	2018.01.17CURVE LLA 004.d	GeminiC18 3x100 3(mm)
IC 320-204375/5		01/17/2018 14:42	1	2018.01.17CURVE LLA 005.d	GeminiC18 3x100 3(mm)
IC 320-204375/6		01/17/2018 14:50	1	2018.01.17CURVE LLA 006.d	GeminiC18 3x100 3(mm)
IC 320-204375/7		01/17/2018 14:58	1	2018.01.17CURVE LLA 007.d	GeminiC18 3x100 3(mm)
IC 320-204375/8		01/17/2018 15:06	1	2018.01.17CURVE LLA 008.d	GeminiC18 3x100 3(mm)
ICB 320-204375/9		01/17/2018 15:14	1		GeminiC18 3x100 3(mm)
ICV 320-204375/10		01/17/2018 15:22	1	2018.01.17CURVE LLA 010.d	GeminiC18 3x100 3(mm)

537 (modified)

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1 Analy Batch No.: 204375

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/17/2018 14:19 Calibration End Date: 01/17/2018 15:06 Calibration ID: 37572

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-204375/2	2018.01.17CURVELLA_002.d
Level 2	IC 320-204375/3	2018.01.17CURVELLA_003.d
Level 3	IC 320-204375/4	2018.01.17CURVELLA_004.d
Level 4	IC 320-204375/5	2018.01.17CURVELLA_005.d
Level 5	IC 320-204375/6	2018.01.17CURVELLA_006.d
Level 6	IC 320-204375/7	2018.01.17CURVELLA_007.d
Level 7	IC 320-204375/8	2018.01.17CURVELLA_008.d

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Perfluorobutanoic acid (PFBA)	0.9492 0.9454	0.9387 0.9305	0.9217	0.9121	0.9423	AveID		0.9343				1.4		35.0			
Perfluoropentanoic acid (PFPeA)	1.2629 1.1486	1.1820 1.1603	1.1793	1.1351	1.1782	AveID		1.1781				3.5		35.0			
Perfluorobutanesulfonic acid (PFBS)	77.125 80.005	75.338 74.458	80.939	77.763	74.861	AveID		77.213				3.3		50.0			
4:2 FTS	14.861 14.172	13.294 14.456	13.574	13.365	13.533	AveID		13.894				4.4		35.0			
Perfluorohexanoic acid (PFHxA)	1.1691 1.0364	1.0016 1.0049	1.0117	1.0418	0.9896	AveID		1.0365				5.9		35.0			
Perfluoroheptanoic acid (PFHpA)	1.0781 1.1040	1.1090 1.0717	1.2181	1.0322	1.0801	AveID		1.0990				5.3		35.0			
Perfluorohexanesulfonic acid (PFHxS)	1.2907 1.1001	1.1727 1.0631	1.0672	1.0113	1.0892	AveID		1.1135				8.3		35.0			
6:2FTS	1.8237 1.7817	1.5350 1.6869	1.5599	1.5572	1.6409	AveID		1.6551				6.9		35.0			
Perfluorooctanoic acid (PFOA)	1.3391 1.1097	1.2175 1.1351	1.1389	1.1301	1.1344	AveID		1.1721				6.9		35.0			
Perfluoroheptanesulfonic Acid (PFHpS)	1.2991 1.4080	1.3017 1.3785	1.3248	1.3329	1.4365	AveID		1.3545				4.0		50.0			
Perfluorononanoic acid (PFNA)	1.0065 1.0724	0.9779 1.0322	1.0085	1.0513	1.0771	AveID		1.0323				3.6		35.0			
Perfluorooctanesulfonic acid (PFOS)	1.1888 1.1074	1.1027 1.1406	1.0854	1.0789	1.1321	AveID		1.1194				3.4		35.0			
Perfluorooctane Sulfonamide (FOSA)	0.9734 1.0164	0.9422 0.9708	0.9781	0.9630	1.0326	AveID		0.9823				3.2		35.0			
8:2FTS	1.1123 1.2810	1.2494 1.2330	1.2204	1.1973	1.2254	AveID		1.2170				4.4		35.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1 Analy Batch No.: 204375

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/17/2018 14:19 Calibration End Date: 01/17/2018 15:06 Calibration ID: 37572

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Perfluorodecanoic acid (PFDA)	0.9958 1.0058	0.9255 0.9904	0.9962	0.9341	0.9440	AveID		0.9702				3.5		35.0			
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	1.1587 1.0920	1.0556 1.1156	1.0118	1.0520	1.0759	AveID		1.0802				4.4		35.0			
Perfluorodecanesulfonic acid (PFDS)	0.6602 0.6484	0.5989 0.6844	0.6566	0.6572	0.6784	AveID		0.6549				4.2		50.0			
Perfluoroundecanoic acid (PFUnA)	1.2159 0.9998	1.0169 1.0224	1.0056	0.9503	1.0142	AveID		1.0322				8.2		35.0			
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	0.9515 1.0073	0.9715 1.0104	0.9434	0.9222	1.0107	AveID		0.9739				3.7		35.0			
Perfluorododecanoic acid (PFDoA)	0.9260 1.0217	1.0424 1.0415	1.0407	1.0402	1.0605	AveID		1.0247				4.4		35.0			
Perfluorotridecanoic Acid (PFTriA)	1.3513 1.1017	1.1184 1.1380	1.0705	1.1935	1.1553	AveID		1.1612				8.0		50.0			
Perfluorotetradecanoic acid (PFTeA)	0.2670 0.2417	0.2330 0.2473	0.2354	0.2343	0.2495	AveID		0.2440				4.9		50.0			
Perfluoro-n-hexadecanoic acid (PFHxDA)	+++++ 0.9569	1.3189 0.9411	0.9976	0.9485	0.9929	L2ID	0.0183	0.9474							0.9990		0.9900
Perfluoro-n-octadecanoic acid (PFODA)	1.0044 1.1214	0.9618 1.0904	1.0301	1.0498	1.1172	AveID		1.0536				5.7		50.0			
13C4 PFBA	1.5259 1.5432	1.4941 1.5278	1.4952	1.4862	1.5144	Ave		1.5124				1.4		50.0			
13C5 PFPeA	0.8953 0.9232	0.9039 0.8803	0.8845	0.8952	0.8865	Ave		0.8956				1.6		50.0			
13C3-PFBS	0.0201 0.0200	0.0191 0.0199	0.0196	0.0193	0.0207	Ave		0.0198				2.7		50.0			
13C2 PFHxA	0.9582 0.9743	0.9588 0.9515	0.9851	0.9384	0.9878	Ave		0.9649				1.9		50.0			
13C4-PFHpA	0.9403 0.9242	0.9318 0.8808	0.9077	0.9173	0.9288	Ave		0.9187				2.1		50.0			
18O2 PFHxS	1.1706 1.1114	1.1402 1.1088	1.1523	1.1305	1.1042	Ave		1.1311				2.2		50.0			
M2-6:2FTS	0.1667 0.1660	0.1714 0.1654	0.1731	0.1738	0.1725	Ave		0.1699				2.1		50.0			
13C4 PFOA	0.9250 0.9076	0.8991 0.8635	0.9088	0.8785	0.9201	Ave		0.9004				2.5		50.0			
13C4 PFOS	0.7222 0.7287	0.7129 0.6942	0.7303	0.7109	0.7113	Ave		0.7158				1.7		50.0			
13C5 PFNA	0.7504 0.7333	0.7406 0.7157	0.7466	0.7136	0.7096	Ave		0.7300				2.3		50.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1 Analy Batch No.: 204375

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/17/2018 14:19 Calibration End Date: 01/17/2018 15:06 Calibration ID: 37572

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
13C8 FOSA	1.0308 0.9887	1.0350 0.9639	1.0156	1.0178	0.9955	Ave		1.0067				2.5		50.0			
M2-8:2FTS	0.1862 0.1771	0.1796 0.1819	0.1811	0.1727	0.1782	Ave		0.1795				2.3		50.0			
13C2 PFDA	0.6444 0.6295	0.6287 0.6181	0.6279	0.6313	0.6343	Ave		0.6306				1.2		50.0			
d3-NMeFOSAA	0.3174 0.3180	0.3130 0.3163	0.3169	0.3149	0.3063	Ave		0.3147				1.3		50.0			
d5-NEtFOSAA	0.3461 0.3155	0.3243 0.2973	0.3232	0.3158	0.3054	Ave		0.3182				4.9		50.0			
13C2 PFUnA	0.4983 0.4862	0.4847 0.4512	0.4836	0.4728	0.4716	Ave		0.4783				3.1		50.0			
13C2 PFDoA	0.5470 0.5260	0.5388 0.4978	0.5263	0.4927	0.5060	Ave		0.5192				4.0		50.0			
13C2-PFTeDA	0.7322 0.6661	0.7412 0.6171	0.6868	0.6615	0.6446	Ave		0.6785				6.7		50.0			
13C2-PFHxDA	1.2777 1.1845	1.2965 1.0894	1.2016	1.2154	1.1984	Ave		1.2091				5.6		50.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1 Analy Batch No.: 204375

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/17/2018 14:19 Calibration End Date: 01/17/2018 15:06 Calibration ID: 37572

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-204375/2	2018.01.17CURVELLA_002.d
Level 2	IC 320-204375/3	2018.01.17CURVELLA_003.d
Level 3	IC 320-204375/4	2018.01.17CURVELLA_004.d
Level 4	IC 320-204375/5	2018.01.17CURVELLA_005.d
Level 5	IC 320-204375/6	2018.01.17CURVELLA_006.d
Level 6	IC 320-204375/7	2018.01.17CURVELLA_007.d
Level 7	IC 320-204375/8	2018.01.17CURVELLA_008.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Perfluorobutanoic acid (PFBA)		AveID	71970 13027499	134919 24898296	645094	2581287	6694565	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoropentanoic acid (PFPeA)		AveID	56184 9469006	102787 17890417	488305	1934955	4900043	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorobutanesulfonic acid (PFBS)		AveID	67976 12635108	122306 22970596	656362	2532634	6433939	0.0221 4.42	0.0442 8.84	0.221	0.884	2.21
4:2 FTS		AveID	13839 2364722	22803 4712009	116305	459884	1228862	0.0234 4.67	0.0467 9.34	0.234	0.934	2.34
Perfluorohexanoic acid (PFHxA)		AveID	55664 9016831	92376 16747455	466560	1861593	4586272	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoroheptanoic acid (PFHpA)		AveID	50371 9111535	99406 16533181	517603	1803022	4706368	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorohexanesulfonic acid (PFHxS)		AveID	68319 9935695	117059 18787887	523793	1981094	5134885	0.0228 4.55	0.0455 9.10	0.228	0.910	2.28
6:2FTS		AveID	14322 2504300	23999 4633505	119814	488565	1258940	0.0237 4.74	0.0474 9.48	0.237	0.948	2.37
Perfluorooctanoic acid (PFOA)		AveID	61549 8993265	105297 17167030	484462	1890626	4896648	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoroheptanesulfonic Acid (PFHpS)		AveID	44381 8721809	84987 15956747	431169	1717801	4563453	0.0238 4.76	0.0476 9.52	0.238	0.952	2.38
Perfluorononanoic acid (PFNA)		AveID	37531 7021740	69666 12938458	352431	1428679	3585870	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorooctanesulfonic acid (PFOS)		AveID	39589 6686934	70183 12870491	344328	1355316	3505745	0.0232 4.64	0.0464 9.28	0.232	0.928	2.32
Perfluorooctane Sulfonamide (FOSA)		AveID	49852 8973330	93805 16389523	464966	1866404	4822749	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
8:2FTS		AveID	9860 1941077	20684 3762460	99090	377296	981168	0.0240 4.79	0.0479 9.58	0.240	0.958	2.40
Perfluorodecanoic acid (PFDA)		AveID	31882 5653894	55975 10721843	292799	1122840	2809263	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1 Analy Batch No.: 204375

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/17/2018 14:19 Calibration End Date: 01/17/2018 15:06 Calibration ID: 37572

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)		AveID	18275 3100803	31785 6179313	150110	630879	1546077	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorodecanesulfonic acid (PFDS)		AveID	22837 4067427	39594 8022809	216397	857674	2182261	0.0241 4.82	0.0482 9.64	0.241	0.964	2.41
Perfluoroundecanoic acid (PFUnA)		AveID	30104 4341065	47415 8080078	227630	855685	2244135	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)		AveID	16362 2837873	30312 5261873	142743	554613	1447969	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorododecanoic acid (PFDoA)		AveID	25166 4798721	54026 9080911	256381	975905	2517800	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorotridecanoic Acid (PFTriA)		AveID	36726 5174158	57967 9922216	263708	1119808	2742788	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorotetradecanoic acid (PFTeA)		AveID	9714 1437735	16612 2672440	75670	295170	754490	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoro-n-hexadecanoic acid (PFHxDA)		L2ID	+++++ 10121041	164489 17956480	561148	2195395	5582637	+++++ 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluoro-n-octadecanoic acid (PFODA)		AveID	63769 11861271	119958 20806019	579412	2429777	6281608	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
13C4 PFBA	13PFOA	Ave	7581930 6889924	7186789 6689622	6999196	7075449	7104763	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C5 PFPeA	13PFOA	Ave	4448756 4122126	4347864 3854737	4140508	4261723	4159040	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C3-PFBS	13PFOA	Ave	92724 83073	85395 81139	85313	85658	90418	2.33 2.33	2.33 2.33	2.33	2.33	2.33
13C2 PFHxA	13PFOA	Ave	4761111 4349882	4611605 4166297	4611448	4467394	4634604	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C4-PFHpA	13PFOA	Ave	4672251 4126515	4481837 3856924	4249130	4367056	4357423	2.50 2.50	2.50 2.50	2.50	2.50	2.50
18O2 PFHxS	13PFOA	Ave	5502563 4694368	5188305 4592963	5102469	5091273	4900649	2.37 2.37	2.37 2.37	2.37	2.37	2.37
M2-6:2FTS	13PFOA	Ave	786962 704248	783363 688126	769728	786039	768843	2.38 2.38	2.38 2.38	2.38	2.38	2.38
13C4 PFOA	13PFOA	Ave	4596206 4052198	4324416 3781095	4253926	4182465	4316678	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C4 PFOS	13PFOA	Ave	3430582 3110246	3278250 2906103	3268191	3235344	3190243	2.39 2.39	2.39 2.39	2.39	2.39	2.39
13C5 PFNA	13PFOA	Ave	3728829 3273972	3562167 3133770	3494654	3397294	3329183	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C8 FOSA	13PFOA	Ave	5121669 4414446	4978224 4220474	4753896	4845519	4670673	2.50 2.50	2.50 2.50	2.50	2.50	2.50
M2-8:2FTS	13PFOA	Ave	886480 757639	827776 762870	811941	787775	800715	2.40 2.40	2.40 2.40	2.40	2.40	2.40

FORM VI
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1 Analy Batch No.: 204375

SDG No.:

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/17/2018 14:19 Calibration End Date: 01/17/2018 15:06 Calibration ID: 37572

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
13C2 PFDA	13PF OA	Ave	3201735 2810507	3024128 2706406	2939305	3005224	2975947	2.50 2.50	2.50 2.50	2.50	2.50	2.50
d3-NMeFOSAA	13PF OA	Ave	1577189 1419745	1505517 1384778	1483575	1499251	1437020	2.50 2.50	2.50 2.50	2.50	2.50	2.50
d5-NEtFOSAA	13PF OA	Ave	1719534 1408625	1560100 1301953	1512999	1503508	1432688	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2 PFUnA	13PF OA	Ave	2475898 2170924	2331330 1975688	2263551	2250985	2212774	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2 PFDoA	13PF OA	Ave	2717793 2348326	2591482 2179814	2463501	2345552	2374065	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2-PFTeDA	13PF OA	Ave	3638245 2973878	3565275 2702115	3214801	3148987	3024149	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2-PFHxDA	13PF OA	Ave	6348846 5288590	6235993 4770244	5624728	5786263	5622608	2.50 2.50	2.50 2.50	2.50	2.50	2.50

Curve Type Legend:

Ave = Average ISTD
AveID = Average isotope dilution
L2ID = Linear 1/conc^2 IsoDil

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Lab Sample ID: ICV 320-204375/10 Calibration Date: 01/17/2018 15:22

Instrument ID: A8_N Calib Start Date: 01/17/2018 14:19

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 01/17/2018 15:06

Lab File ID: 2018.01.17CURVELLA_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9343	0.9126		2.44	2.50	-2.3	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.178	1.142		2.42	2.50	-3.0	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	77.21	77.17		2.21	2.21	-0.0	25.0
4:2 FTS	AveID	13.89	13.58		2.28	2.34	-2.3	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.036	0.9860		2.38	2.50	-4.9	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.099	1.048		2.38	2.50	-4.7	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.113	1.050		2.15	2.28	-5.7	25.0
6:2FTS	AveID	1.655	1.696		2.43	2.38	2.4	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.172	1.068		2.28	2.50	-8.9	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.354	1.417		2.48	2.38	4.6	25.0
Perfluorononanoic acid (PFNA)	AveID	1.032	0.9807		2.38	2.50	-5.0	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.119	1.080		2.23	2.31	-3.5	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9823	0.9902		2.52	2.50	0.8	25.0
8:2FTS	AveID	1.217	1.281		2.53	2.40	5.2	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9702	0.9547		2.46	2.50	-1.6	25.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.080	1.060		2.45	2.50	-1.9	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6549	0.6815		2.51	2.41	4.1	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.032	0.9448		2.29	2.50	-8.5	25.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9739	0.9541		2.45	2.50	-2.0	25.0
Perfluorododecanoic acid (PFDoA)	AveID	1.025	1.024		2.50	2.50	-0.1	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.161	1.075		2.31	2.50	-7.4	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2440	0.2434		2.49	2.50	-0.3	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		0.8997		2.35	2.50	-5.8	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.054	1.176		2.79	2.50	11.6	25.0
13C4 PFBA	Ave	1.512	1.595		2.64	2.50	5.4	50.0
13C5 PFPeA	Ave	0.8956	0.9288		2.59	2.50	3.7	50.0
13C3-PFBS	Ave	0.0198	0.0205		2.40	2.33	3.3	50.0
13C2 PFHxA	Ave	0.9649	1.003		2.60	2.50	3.9	50.0
13C4-PFHpA	Ave	0.9187	0.9576		2.61	2.50	4.2	50.0
18O2 PFHxS	Ave	1.131	1.197		2.50	2.37	5.8	50.0
M2-6:2FTS	Ave	0.1699	0.1786		2.50	2.38	5.1	50.0

FORM VII 537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Lab Sample ID: ICV 320-204375/10 Calibration Date: 01/17/2018 15:22

Instrument ID: A8_N Calib Start Date: 01/17/2018 14:19

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 01/17/2018 15:06

Lab File ID: 2018.01.17CURVELLA_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9004	0.9552		2.65	2.50	6.1	50.0
13C4 PFOS	Ave	0.7158	0.7476		2.50	2.39	4.4	50.0
13C5 PFNA	Ave	0.7300	0.7759		2.66	2.50	6.3	50.0
13C8 FOSA	Ave	1.007	1.031		2.56	2.50	2.4	50.0
M2-8:2FTS	Ave	0.1795	0.1774		2.37	2.40	-1.2	50.0
13C2 PFDA	Ave	0.6306	0.6405		2.54	2.50	1.6	50.0
d3-NMeFOSAA	Ave	0.3147	0.3234		2.57	2.50	2.8	50.0
13C2 PFUnA	Ave	0.4783	0.5040		2.63	2.50	5.4	50.0
d5-NEtFOSAA	Ave	0.3182	0.3385		2.66	2.50	6.4	50.0
13C2 PFDoA	Ave	0.5192	0.5336		2.57	2.50	2.8	50.0
13C2-PFTeDA	Ave	0.6785	0.6646		2.45	2.50	-2.0	50.0
13C2-PFHxDA	Ave	1.209	1.217		2.52	2.50	0.7	50.0

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Instrument ID: A8_N Start Date: 01/18/2018 10:35

Analysis Batch Number: 204504 End Date: 01/18/2018 15:01

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCVL 320-204504/1		01/18/2018 10:35	1	2018.01.18LLC_004.d	GeminiC18 3x100 3(mm)
CCV 320-204504/2		01/18/2018 10:43	1		GeminiC18 3x100 3(mm)
ZZZZZ		01/18/2018 10:50	1		GeminiC18 3x100 3(mm)
CCV 320-204504/14		01/18/2018 12:17	1		GeminiC18 3x100 3(mm)
CCV 320-204504/25		01/18/2018 13:43	1		GeminiC18 3x100 3(mm)
CCV 320-204504/35		01/18/2018 15:01	1		GeminiC18 3x100 3(mm)

537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Lab Sample ID: CCVL 320-204504/1 Calibration Date: 01/18/2018 10:35

Instrument ID: A8_N Calib Start Date: 01/17/2018 14:19

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 01/17/2018 15:06

Lab File ID: 2018.01.18LLC_004.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9343	0.8680		0.0465	0.0500	-7.1	50.0
Perfluoropentanoic acid (PFPeA)	AveID	1.178	1.222		0.0519	0.0500	3.7	50.0
Perfluorobutanesulfonic acid (PFBS)	AveID	77.21	74.95		0.0429	0.0442	-2.9	50.0
4:2 FTS	AveID	13.89	11.20		0.377	0.467	-19.4	50.0
Perfluorohexanoic acid (PFHxA)	AveID	1.036	0.9268		0.0447	0.0500	-10.6	50.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.099	1.051		0.0478	0.0500	-4.3	50.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.113	1.174		0.0480	0.0455	5.5	50.0
6:2FTS	AveID	1.655	2.071		0.593	0.474	25.1	50.0
Perfluorooctanoic acid (PFOA)	AveID	1.172	1.097		0.0468	0.0500	-6.4	50.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.354	1.210		0.0425	0.0476	-10.7	50.0
Perfluorononanoic acid (PFNA)	AveID	1.032	0.9026		0.0437	0.0500	-12.6	50.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.119	1.101		0.0456	0.0464	-1.7	50.0
8:2FTS	AveID	1.217	1.092		0.430	0.479	-10.3	50.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9823	0.9336		0.0475	0.0500	-5.0	50.0
Perfluorodecanoic acid (PFDA)	AveID	0.9702	0.9508		0.0490	0.0500	-2.0	50.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.080	0.999		0.462	0.500	-7.6	50.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6549	0.6052		0.0445	0.0482	-7.6	50.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9739	0.8778		0.451	0.500	-9.9	50.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.032	1.065		0.0516	0.0500	3.2	50.0
Perfluorododecanoic acid (PFDoA)	AveID	1.025	1.080		0.0527	0.0500	5.4	50.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.161	1.176		0.0506	0.0500	1.3	50.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2440	0.2516		0.0516	0.0500	3.1	50.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		1.286		0.0485	0.0500	-2.9	50.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.054	1.060		0.0503	0.0500	0.6	50.0
13C4 PFBA	Ave	1.512	1.533		2.53	2.50	1.4	50.0
13C5 PFPeA	Ave	0.8956	0.9106		2.54	2.50	1.7	50.0
13C3-PFBS	Ave	0.0198	0.0203		2.38	2.33	2.5	50.0
13C2 PFHxA	Ave	0.9649	0.9886		2.56	2.50	2.5	50.0
13C4-PFHpA	Ave	0.9187	0.9411		2.56	2.50	2.4	50.0
18O2 PFHxS	Ave	1.131	1.139		2.38	2.37	0.7	50.0
M2-6:2FTS	Ave	0.1699	0.1579		2.21	2.38	-7.0	50.0

FORM VII 537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Lab Sample ID: CCVL 320-204504/1 Calibration Date: 01/18/2018 10:35

Instrument ID: A8_N Calib Start Date: 01/17/2018 14:19

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 01/17/2018 15:06

Lab File ID: 2018.01.18LLC_004.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9004	0.9370		2.60	2.50	4.1	50.0
13C4 PFOS	Ave	0.7158	0.7233		2.42	2.39	1.1	50.0
13C5 PFNA	Ave	0.7300	0.7351		2.52	2.50	0.7	50.0
M2-8:2FTS	Ave	0.1795	0.1584		2.11	2.40	-11.8	50.0
13C2 PFDA	Ave	0.6306	0.6236		2.47	2.50	-1.1	50.0
13C8 FOSA	Ave	1.007	1.020		2.53	2.50	1.4	50.0
d3-NMeFOSAA	Ave	0.3147	0.2736		2.17	2.50	-13.0	50.0
d5-NEtFOSAA	Ave	0.3182	0.3117		2.45	2.50	-2.1	50.0
13C2 PFUnA	Ave	0.4783	0.5095		2.66	2.50	6.5	50.0
13C2 PFDoA	Ave	0.5192	0.4589		2.21	2.50	-11.6	50.0
13C2-PFTeDA	Ave	0.6785	0.5997		2.21	2.50	-11.6	50.0
13C2-PFHxDA	Ave	1.209	1.028		2.13	2.50	-15.0	50.0

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Instrument ID: A8_N Start Date: 01/18/2018 17:29

Analysis Batch Number: 204556 End Date: 01/18/2018 18:40

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-204556/1		01/18/2018 17:29	1	2018.01.18LLA_001.d	GeminiC18 3x100 3(mm)
MB 320-204105/1-A		01/18/2018 17:37	1	2018.01.18LLA_002.d	GeminiC18 3x100 3(mm)
LCS 320-204105/2-A		01/18/2018 17:45	1	2018.01.18LLA_003.d	GeminiC18 3x100 3(mm)
LCSD 320-204105/3-A		01/18/2018 17:53	1	2018.01.18LLA_004.d	GeminiC18 3x100 3(mm)
320-35042-1		01/18/2018 18:01	1	2018.01.18LLA_005.d	GeminiC18 3x100 3(mm)
320-35042-2		01/18/2018 18:08	1	2018.01.18LLA_006.d	GeminiC18 3x100 3(mm)
320-35042-3		01/18/2018 18:16	1	2018.01.18LLA_007.d	GeminiC18 3x100 3(mm)
320-35042-4		01/18/2018 18:24	1	2018.01.18LLA_008.d	GeminiC18 3x100 3(mm)
CCV 320-204556/10		01/18/2018 18:40	1	2018.01.18LLD_001.d	GeminiC18 3x100 3(mm)

537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Lab Sample ID: CCV 320-204556/1 Calibration Date: 01/18/2018 17:29

Instrument ID: A8_N Calib Start Date: 01/17/2018 14:19

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 01/17/2018 15:06

Lab File ID: 2018.01.18LLA_001.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9343	0.9484		2.54	2.50	1.5	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.178	1.174		2.49	2.50	-0.4	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	77.21	79.55		2.28	2.21	3.0	25.0
4:2 FTS	AveID	13.89	14.13		2.37	2.34	1.7	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.036	1.012		2.44	2.50	-2.3	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.099	1.077		2.45	2.50	-2.0	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.113	1.061		2.17	2.28	-4.7	25.0
6:2FTS	AveID	1.655	1.894		2.71	2.37	14.5	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.172	1.128		2.41	2.50	-3.8	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.354	1.385		2.43	2.38	2.3	25.0
Perfluorononanoic acid (PFNA)	AveID	1.032	1.067		2.59	2.50	3.4	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.119	1.085		2.25	2.32	-3.1	25.0
8:2FTS	AveID	1.217	1.220		2.40	2.40	0.3	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9823	1.032		2.63	2.50	5.0	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9702	1.040		2.68	2.50	7.2	25.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.080	1.072		2.48	2.50	-0.8	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6549	0.7010		2.58	2.41	7.0	25.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9739	0.9922		2.55	2.50	1.9	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.032	0.9827		2.38	2.50	-4.8	25.0
Perfluorododecanoic acid (PFDoA)	AveID	1.025	1.068		2.61	2.50	4.2	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.161	1.061		2.28	2.50	-8.6	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2440	0.2430		2.49	2.50	-0.4	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		0.997		2.61	2.50	4.4	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.054	1.138		2.70	2.50	8.0	25.0
13C4 PFBA	Ave	1.512	1.473		2.43	2.50	-2.6	50.0
13C5 PFPeA	Ave	0.8956	0.8673		2.42	2.50	-3.2	50.0
13C3-PFBS	Ave	0.0198	0.0190		2.23	2.33	-4.1	50.0
13C2 PFHxA	Ave	0.9649	0.9571		2.48	2.50	-0.8	50.0
13C4-PFHpA	Ave	0.9187	0.8903		2.42	2.50	-3.1	50.0
18O2 PFHxS	Ave	1.131	1.094		2.29	2.37	-3.2	50.0
M2-6:2FTS	Ave	0.1699	0.1631		2.28	2.38	-4.0	50.0

FORM VII 537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Lab Sample ID: CCV 320-204556/1 Calibration Date: 01/18/2018 17:29

Instrument ID: A8_N Calib Start Date: 01/17/2018 14:19

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 01/17/2018 15:06

Lab File ID: 2018.01.18LLA_001.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9004	0.8903		2.47	2.50	-1.1	50.0
13C4 PFOS	Ave	0.7158	0.7093		2.37	2.39	-0.9	50.0
13C5 PFNA	Ave	0.7300	0.7224		2.47	2.50	-1.0	50.0
13C8 FOSA	Ave	1.007	0.9258		2.30	2.50	-8.0	50.0
M2-8:2FTS	Ave	0.1795	0.1776		2.37	2.40	-1.1	50.0
13C2 PFDA	Ave	0.6306	0.5911		2.34	2.50	-6.3	50.0
d3-NMeFOSAA	Ave	0.3147	0.3029		2.41	2.50	-3.7	50.0
d5-NEtFOSAA	Ave	0.3182	0.3070		2.41	2.50	-3.5	50.0
13C2 PFUnA	Ave	0.4783	0.4751		2.48	2.50	-0.7	50.0
13C2 PFDoA	Ave	0.5192	0.4848		2.33	2.50	-6.6	50.0
13C2-PFTeDA	Ave	0.6785	0.6259		2.31	2.50	-7.8	50.0
13C2-PFHxDA	Ave	1.209	0.9925		2.05	2.50	-17.9	50.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Lab Sample ID: CCV 320-204556/10 Calibration Date: 01/18/2018 18:40

Instrument ID: A8_N Calib Start Date: 01/17/2018 14:19

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 01/17/2018 15:06

Lab File ID: 2018.01.18LLD_001.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9343	0.9122		0.976	1.00	-2.4	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.178	1.107		0.939	1.00	-6.1	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	77.21	77.33		0.885	0.884	0.1	25.0
4:2 FTS	AveID	13.89	14.34		0.964	0.934	3.2	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.036	0.9735		0.939	1.00	-6.1	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.099	1.054		0.959	1.00	-4.1	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.113	1.015		0.830	0.910	-8.8	25.0
6:2FTS	AveID	1.655	1.968		1.13	0.948	18.9	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.172	1.102		0.940	1.00	-6.0	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.354	1.373		0.965	0.952	1.4	25.0
Perfluorononanoic acid (PFNA)	AveID	1.032	1.073		1.04	1.00	3.9	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.119	1.102		0.914	0.928	-1.5	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9823	0.9705		0.988	1.00	-1.2	25.0
8:2FTS	AveID	1.217	1.307		1.03	0.958	7.4	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9702	0.8965		0.924	1.00	-7.6	25.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.080	1.081		1.00	1.00	0.1	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6549	0.6568		0.967	0.964	0.3	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.032	0.9267		0.898	1.00	-10.2	25.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9739	0.9608		0.987	1.00	-1.3	25.0
Perfluorododecanoic acid (PFDoA)	AveID	1.025	1.004		0.980	1.00	-2.0	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.161	1.057		0.910	1.00	-9.0	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2440	0.2430		0.996	1.00	-0.4	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		0.9423		0.975	1.00	-2.5	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.054	1.105		1.05	1.00	4.9	25.0
13C4 PFBA	Ave	1.512	1.509		2.49	2.50	-0.2	50.0
13C5 PFPeA	Ave	0.8956	0.9029		2.52	2.50	0.8	50.0
13C3-PFBS	Ave	0.0198	0.0194		2.28	2.33	-2.0	50.0
13C2 PFHxA	Ave	0.9649	0.9473		2.45	2.50	-1.8	50.0
13C4-PFHpA	Ave	0.9187	0.8834		2.40	2.50	-3.8	50.0
18O2 PFHxS	Ave	1.131	1.156		2.42	2.37	2.2	50.0
M2-6:2FTS	Ave	0.1699	0.1826		2.55	2.38	7.5	50.0

FORM VII 537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Lab Sample ID: CCV 320-204556/10 Calibration Date: 01/18/2018 18:40

Instrument ID: A8_N Calib Start Date: 01/17/2018 14:19

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 01/17/2018 15:06

Lab File ID: 2018.01.18LLD_001.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9004	0.8813		2.45	2.50	-2.1	50.0
13C4 PFOS	Ave	0.7158	0.7113		2.38	2.39	-0.6	50.0
13C5 PFNA	Ave	0.7300	0.7119		2.44	2.50	-2.5	50.0
13C8 FOSA	Ave	1.007	0.9891		2.46	2.50	-1.8	50.0
M2-8:2FTS	Ave	0.1795	0.1814		2.42	2.40	1.0	50.0
13C2 PFDA	Ave	0.6306	0.6663		2.64	2.50	5.7	50.0
d3-NMeFOSAA	Ave	0.3147	0.3181		2.53	2.50	1.1	50.0
d5-NEtFOSAA	Ave	0.3182	0.3252		2.55	2.50	2.2	50.0
13C2 PFUnA	Ave	0.4783	0.4955		2.59	2.50	3.6	50.0
13C2 PFDoA	Ave	0.5192	0.5079		2.45	2.50	-2.2	50.0
13C2-PFTeDA	Ave	0.6785	0.6420		2.37	2.50	-5.4	50.0
13C2-PFHxDA	Ave	1.209	1.076		2.22	2.50	-11.0	50.0

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Instrument ID: A8_N Start Date: 01/19/2018 16:50

Analysis Batch Number: 204757 End Date: 01/19/2018 17:13

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-204757/1		01/19/2018 16:50	1	2018.01.19LLC_009.d	GeminiC18 3x100 3(mm)
320-35042-1 DL		01/19/2018 16:58	10	2018.01.19LLC_010.d	GeminiC18 3x100 3(mm)
ZZZZZ		01/19/2018 17:06	1		GeminiC18 3x100 3(mm)
CCV 320-204757/4		01/19/2018 17:13	1	2018.01.19LLC_012.d	GeminiC18 3x100 3(mm)

537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Lab Sample ID: CCV 320-204757/1 Calibration Date: 01/19/2018 16:50

Instrument ID: A8_N Calib Start Date: 01/17/2018 14:19

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 01/17/2018 15:06

Lab File ID: 2018.01.19LLC_009.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9343	0.9541		2.55	2.50	2.1	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.178	1.165		2.47	2.50	-1.1	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	77.21	83.66		2.39	2.21	8.4	25.0
4:2 FTS	AveID	13.89	17.30		2.91	2.34	24.5	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.036	1.026		2.47	2.50	-1.0	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.099	1.095		2.49	2.50	-0.4	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.113	1.086		2.22	2.28	-2.5	25.0
6:2FTS	AveID	1.655	1.803		2.58	2.37	9.0	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.172	1.164		2.48	2.50	-0.7	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.354	1.386		2.43	2.38	2.3	25.0
Perfluorononanoic acid (PFNA)	AveID	1.032	1.093		2.65	2.50	5.9	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.119	1.105		2.29	2.32	-1.3	25.0
8:2FTS	AveID	1.217	1.142		2.25	2.40	-6.2	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9823	1.033		2.63	2.50	5.1	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9702	1.027		2.65	2.50	5.8	25.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.080	1.078		2.49	2.50	-0.2	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6549	0.6815		2.51	2.41	4.1	25.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9739	0.9513		2.44	2.50	-2.3	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.032	1.072		2.60	2.50	3.9	25.0
Perfluorododecanoic acid (PFDoA)	AveID	1.025	1.090		2.66	2.50	6.3	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.161	1.145		2.46	2.50	-1.4	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2440	0.2381		2.44	2.50	-2.4	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		0.9352		2.45	2.50	-2.1	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.054	1.093		2.59	2.50	3.7	25.0
13C4 PFBA	Ave	1.512	1.482		2.45	2.50	-2.0	50.0
13C5 PFPeA	Ave	0.8956	0.8970		2.50	2.50	0.2	50.0
13C3-PFBS	Ave	0.0198	0.0189		2.21	2.33	-4.9	50.0
13C2 PFHxA	Ave	0.9649	0.9676		2.51	2.50	0.3	50.0
13C4-PFHpA	Ave	0.9187	0.9002		2.45	2.50	-2.0	50.0
18O2 PFHxS	Ave	1.131	1.101		2.30	2.37	-2.7	50.0
M2-6:2FTS	Ave	0.1699	0.1972		2.76	2.38	16.1	50.0

FORM VII 537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Lab Sample ID: CCV 320-204757/1 Calibration Date: 01/19/2018 16:50

Instrument ID: A8_N Calib Start Date: 01/17/2018 14:19

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 01/17/2018 15:06

Lab File ID: 2018.01.19LLC_009.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9004	0.8985		2.49	2.50	-0.2	50.0
13C4 PFOS	Ave	0.7158	0.7403		2.47	2.39	3.4	50.0
13C5 PFNA	Ave	0.7300	0.7346		2.52	2.50	0.6	50.0
13C8 FOSA	Ave	1.007	0.999		2.48	2.50	-0.8	50.0
M2-8:2FTS	Ave	0.1795	0.2287		3.05	2.40	27.4	50.0
13C2 PFDA	Ave	0.6306	0.6203		2.46	2.50	-1.6	50.0
d3-NMeFOSAA	Ave	0.3147	0.3523		2.80	2.50	12.0	50.0
d5-NEtFOSAA	Ave	0.3182	0.3602		2.83	2.50	13.2	50.0
13C2 PFUnA	Ave	0.4783	0.4916		2.57	2.50	2.8	50.0
13C2 PFDoA	Ave	0.5192	0.4895		2.36	2.50	-5.7	50.0
13C2-PFTeDA	Ave	0.6785	0.6797		2.50	2.50	0.2	50.0
13C2-PFHxDA	Ave	1.209	1.092		2.26	2.50	-9.7	50.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Lab Sample ID: CCV 320-204757/4 Calibration Date: 01/19/2018 17:13

Instrument ID: A8_N Calib Start Date: 01/17/2018 14:19

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 01/17/2018 15:06

Lab File ID: 2018.01.19LLC_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.9343	0.9181		0.983	1.00	-1.7	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.178	1.096		0.930	1.00	-7.0	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	77.21	79.38		0.909	0.884	2.8	25.0
4:2 FTS	AveID	13.89	15.58		1.05	0.934	12.1	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.036	0.9706		0.936	1.00	-6.4	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.099	1.086		0.988	1.00	-1.2	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.113	1.095		0.895	0.910	-1.6	25.0
6:2FTS	AveID	1.655	1.739		0.996	0.948	5.1	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.172	1.098		0.937	1.00	-6.3	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.354	1.400		0.984	0.952	3.4	25.0
Perfluorononanoic acid (PFNA)	AveID	1.032	1.030		0.998	1.00	-0.2	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.119	1.091		0.904	0.928	-2.6	25.0
8:2FTS	AveID	1.217	1.100		0.866	0.958	-9.6	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9823	1.011		1.03	1.00	3.0	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9702	0.9368		0.965	1.00	-3.5	25.0
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	AveID	1.080	0.9785		0.906	1.00	-9.4	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6549	0.6870		1.01	0.964	4.9	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.032	0.9616		0.932	1.00	-6.8	25.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	AveID	0.9739	0.9028		0.927	1.00	-7.3	25.0
Perfluorododecanoic acid (PFDoA)	AveID	1.025	1.029		1.00	1.00	0.4	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.161	1.095		0.943	1.00	-5.7	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.2440	0.2410		0.988	1.00	-1.2	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		0.9328		0.965	1.00	-3.5	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.054	1.026		0.974	1.00	-2.6	25.0
13C4 PFBA	Ave	1.512	1.464		2.42	2.50	-3.2	50.0
13C5 PFPeA	Ave	0.8956	0.8847		2.47	2.50	-1.2	50.0
13C3-PFBS	Ave	0.0198	0.0193		2.26	2.33	-2.7	50.0
13C2 PFHxA	Ave	0.9649	0.9644		2.50	2.50	-0.0	50.0
13C4-PFHpA	Ave	0.9187	0.9102		2.48	2.50	-0.9	50.0
18O2 PFHxS	Ave	1.131	1.098		2.30	2.37	-2.9	50.0
M2-6:2FTS	Ave	0.1699	0.2028		2.83	2.38	19.4	50.0

FORM VII 537 (modified)

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-35042-1

SDG No.:

Lab Sample ID: CCV 320-204757/4 Calibration Date: 01/19/2018 17:13

Instrument ID: A8_N Calib Start Date: 01/17/2018 14:19

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 01/17/2018 15:06

Lab File ID: 2018.01.19LLC_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
13C4 PFOA	Ave	0.9004	0.9031		2.51	2.50	0.3	50.0
13C4 PFOS	Ave	0.7158	0.7027		2.35	2.39	-1.8	50.0
13C5 PFNA	Ave	0.7300	0.7264		2.49	2.50	-0.5	50.0
13C8 FOSA	Ave	1.007	0.9702		2.41	2.50	-3.6	50.0
M2-8:2FTS	Ave	0.1795	0.2206		2.94	2.40	22.8	50.0
13C2 PFDA	Ave	0.6306	0.6162		2.44	2.50	-2.3	50.0
d3-NMeFOSAA	Ave	0.3147	0.3480		2.76	2.50	10.6	50.0
d5-NEtFOSAA	Ave	0.3182	0.3620		2.84	2.50	13.8	50.0
13C2 PFUnA	Ave	0.4783	0.5040		2.63	2.50	5.4	50.0
13C2 PFDoA	Ave	0.5192	0.4992		2.40	2.50	-3.9	50.0
13C2-PFTeDA	Ave	0.6785	0.6407		2.36	2.50	-5.6	50.0
13C2-PFHxDA	Ave	1.209	1.092		2.26	2.50	-9.7	50.0

DODCMD_ID	INSTALLATION_ID	SDG	SITE_NAME	NORM_SITE_NAME	LOCATION_NAME	LOCATION_TYPE_DESC	COORD_X	COORD_Y	CONTRACT_ID	DO_CTO_NUMBER	CONTR_NAME	SAMPLE_NAME	SAMPLE_MATRIX_DESC	SAMPLE_TYPE_DESC	COLLECT_DATE	ANALYTICAL_METHOD	ANALYTICAL_METHOD_GRP_DESC
MID_ATLANTIC	BRUNSWICK_NAS	320-35042-1	SITE 00011	SITE 00011	TP-PFC-MIDPOINT	Monitoring well	3015831.52	384866.155	N6247016D9008	WE21	TETRA TECH, INC.	TP-PFC-025-MID-CARBON	Ground water	Normal (Regular)	11-Jan-18	537	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	320-35042-1	SITE 00011	SITE 00011	TP-PFC-EFFLUENT	Monitoring well	3015831.52	384866.155	N6247016D9008	WE21	TETRA TECH, INC.	TP-PFC-025-TPE-D	Ground water	Field duplicate	11-Jan-18	537	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	320-35042-1	SITE 00011	SITE 00011	TP-PFC-EFFLUENT	Monitoring well	3015831.52	384866.155	N6247016D9008	WE21	TETRA TECH, INC.	TP-PFC-025-TPE	Ground water	Normal (Regular)	11-Jan-18	537	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	320-35042-1	SITE 00011	SITE 00011	TP-PFC-INFLUENT	Monitoring well	3015831.52	384866.155	N6247016D9008	WE21	TETRA TECH, INC.	TP-PFC-025-TPI	Ground water	Normal (Regular)	11-Jan-18	537	Perfluoroalkyl Compounds