NAVFAC
Naval Facilities Engineering Command

Off-Base Drinking Water Sample Results, Level 2 Laboratory Report, Level 4 Laboratory Report, Electronic Data Deliverable, Data Validation Report, and the Sample Location Figure, SDG J17154-1

Naval Air Station Oceana
Virginia Beach, Virginia

July 2019

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Tel: (916)373-5600

TestAmerica Job ID: 320-17154-1
TestAmerica SDG: CTO WE7G PFC Sampling
Client Project/Site: CTO WE7G PFC Sampling
Revision: 1

For:
CH2M Hill, Inc.
5701 Cleveland Street
Suite 200
Virginia Beach, Virginia 23462

Attn: Laurie George

Authorized for release by:
3/22/2016 12:42:28 PM

Laura Turpen, Project Manager I
(916)374-4414
laura.turpen@testamericainc.com

Table of Contents

Definitions/Glossary

Client: CH2M Hill, Inc.
Project/Site: CTO WE7G PFC Sampling

TestAmerica Job ID: 320-17154-1
SDG: CTO WE7G PFC Sampling

Qualifiers

LCMS

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

Glossary

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

Job ID: 320-17154-1

Laboratory: TestAmerica Sacramento

Narrative

CASE NARRATIVE

Client: CH2M Hill, Inc.

Project: CTO WE7G PFC Sampling

Report Number: 320-17154-1

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

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

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

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

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

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

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

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

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

Revision
This report was revised March 22, 2016 to include all method blank data for all analytes and to remove the B qualifiers from the LCS/LCSD in batch 100093. No other data has changed as a result of this revision.

RECEIPT
The samples were received on 02/04/2016; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 0.3 C.

PFC
Samples OF-FB09-0216 (320-17154-1), OF-FB37-0216 (320-17154-3), OF-FB11-0216 (320-17154-6), OF-FB28-0216 (320-17154-8) and OF-FB67-0216 (320-17154-10) were analyzed for PFC in accordance with PFC. The samples were prepared on 02/09/2016 and 02/10/2016 and analyzed on 02/20/2016.

Job ID: 320-17154-1 (Continued)

Laboratory: TestAmerica Sacramento (Continued)

No 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 batch 320-100093

Method(s) 3535: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with batch 320-100147.

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

Subcontract Work
PFC: This method was subcontracted to Maxxam Analytics Inc.. The subcontract laboratory certification is different from that of the facility issuing the final report. Any analytical or quality issues are noted in the subcontract portion of the report.

The DL/LOD/LOQ limits for Maxxam, along with information on the data qualifiers, are included in the narrative (Page 8 of 143 of the subcontract report; page 494 of 632 of the entire report).

Detection Summary

Client: CH2M Hill, Inc.
Project/Site: CTO WE7G PFC Sampling

TestAmerica Job ID: 320-17154-1
SDG: CTO WE7G PFC Sampling

Client Sample ID: OF-FB09-0216 — Lab Sample ID: 320-17154-1

No Detections.

Client Sample ID: OF-RW09-0216 — Lab Sample ID: 320-17154-2

No Detections.

Client Sample ID: OF-FB37-0216 — Lab Sample ID: 320-17154-3

No Detections.

Client Sample ID: OF-RW37-0216 — Lab Sample ID: 320-17154-4

No Detections.

Client Sample ID: OF-RW11-0216 — Lab Sample ID: 320-17154-5

No Detections.

Client Sample ID: OF-FB11-0216 — Lab Sample ID: 320-17154-6

No Detections.

Client Sample ID: OF-RW28-0216 — Lab Sample ID: 320-17154-7

No Detections.

Client Sample ID: OF-FB28-0216 — Lab Sample ID: 320-17154-8

No Detections.

Client Sample ID: OF-RW67-0216 — Lab Sample ID: 320-17154-9

No Detections.

Client Sample ID: OF-FB67-0216 — Lab Sample ID: 320-17154-10

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample ID: OF-FB09-0216

Lab Sample ID: 320-17154-1

Date Collected: 02/03/16 16:40
Matrix: Water
Date Received: 02/04/16 09:45

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.0020	U	0.0025	0.00079	ug/L		02/09/16 10:23	02/20/16 10:16	1
Perfluorooctanoic acid (PFOA)	0.0020	U	0.0025	0.00074	ug/L		02/09/16 10:23	02/20/16 10:16	1
Perfluorononanoic acid (PFNA)	0.0020	U	0.0025	0.00065	ug/L		02/09/16 10:23	02/20/16 10:16	1
Perfluorobutanesulfonic acid (PFBS)	0.0020	U	0.0025	0.00091	ug/L		02/09/16 10:23	02/20/16 10:16	1
Perfluorohexanesulfonic acid (PFHxS)	0.0020	U	0.0025	0.00086	ug/L		02/09/16 10:23	02/20/16 10:16	1
Perfluorooctanesulfonic acid (PFOS)	0.0030	U	0.0040	0.0013	ug/L		02/09/16 10:23	02/20/16 10:16	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4-PFHpA	*122*		*25 - 150*	*02/09/16 10:23*	*02/20/16 10:16*	*1*
13C4 PFOA	*126*		*25 - 150*	*02/09/16 10:23*	*02/20/16 10:16*	*1*
13C5 PFNA	*127*		*25 - 150*	*02/09/16 10:23*	*02/20/16 10:16*	*1*
18O2 PFHxS	*113*		*25 - 150*	*02/09/16 10:23*	*02/20/16 10:16*	*1*
13C4 PFOS	*107*		*25 - 150*	*02/09/16 10:23*	*02/20/16 10:16*	*1*

Client Sample ID: OF-FB37-0216

Lab Sample ID: 320-17154-3

Date Collected: 02/03/16 17:20
Matrix: Water
Date Received: 02/04/16 09:45

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.0018	U	0.0023	0.00073	ug/L		02/09/16 10:23	02/20/16 10:37	1
Perfluorooctanoic acid (PFOA)	0.0018	U	0.0023	0.00068	ug/L		02/09/16 10:23	02/20/16 10:37	1
Perfluorononanoic acid (PFNA)	0.0018	U	0.0023	0.00059	ug/L		02/09/16 10:23	02/20/16 10:37	1
Perfluorobutanesulfonic acid (PFBS)	0.0018	U	0.0023	0.00083	ug/L		02/09/16 10:23	02/20/16 10:37	1
Perfluorohexanesulfonic acid (PFHxS)	0.0018	U	0.0023	0.00079	ug/L		02/09/16 10:23	02/20/16 10:37	1
Perfluorooctanesulfonic acid (PFOS)	0.0027	U	0.0036	0.0012	ug/L		02/09/16 10:23	02/20/16 10:37	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4-PFHpA	*107*		*25 - 150*	*02/09/16 10:23*	*02/20/16 10:37*	*1*
13C4 PFOA	*111*		*25 - 150*	*02/09/16 10:23*	*02/20/16 10:37*	*1*
13C5 PFNA	*113*		*25 - 150*	*02/09/16 10:23*	*02/20/16 10:37*	*1*
18O2 PFHxS	*100*		*25 - 150*	*02/09/16 10:23*	*02/20/16 10:37*	*1*
13C4 PFOS	*95*		*25 - 150*	*02/09/16 10:23*	*02/20/16 10:37*	*1*

Client Sample ID: OF-FB11-0216

Lab Sample ID: 320-17154-6

Date Collected: 02/03/16 16:10
Matrix: Water
Date Received: 02/04/16 09:45

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.0018	U	0.0023	0.00073	ug/L		02/09/16 10:23	02/20/16 10:58	1
Perfluorooctanoic acid (PFOA)	0.0018	U	0.0023	0.00068	ug/L		02/09/16 10:23	02/20/16 10:58	1
Perfluorononanoic acid (PFNA)	0.0018	U	0.0023	0.00059	ug/L		02/09/16 10:23	02/20/16 10:58	1
Perfluorobutanesulfonic acid (PFBS)	0.0018	U	0.0023	0.00083	ug/L		02/09/16 10:23	02/20/16 10:58	1
Perfluorohexanesulfonic acid (PFHxS)	0.0018	U	0.0023	0.00079	ug/L		02/09/16 10:23	02/20/16 10:58	1
Perfluorooctanesulfonic acid (PFOS)	0.0027	U	0.0036	0.0012	ug/L		02/09/16 10:23	02/20/16 10:58	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4-PFHpA	*111*		*25 - 150*	*02/09/16 10:23*	*02/20/16 10:58*	*1*
13C4 PFOA	*113*		*25 - 150*	*02/09/16 10:23*	*02/20/16 10:58*	*1*
13C5 PFNA	*116*		*25 - 150*	*02/09/16 10:23*	*02/20/16 10:58*	*1*
18O2 PFHxS	*95*		*25 - 150*	*02/09/16 10:23*	*02/20/16 10:58*	*1*

Client Sample ID: OF-FB11-0216

Lab Sample ID: 320-17154-6
Date Collected: 02/03/16 16:10
Matrix: Water
Date Received: 02/04/16 09:45

Method: WS-LC-0025 - Perfluorinated Hydrocarbons (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFOS	93		25 - 150	02/09/16 10:23	02/20/16 10:58	1

Client Sample ID: OF-FB28-0216

Lab Sample ID: 320-17154-8
Date Collected: 02/03/16 17:43
Matrix: Water
Date Received: 02/04/16 09:45

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.0019	U	0.0024	0.00077	ug/L		02/10/16 07:14	02/20/16 12:23	1
Perfluorooctanoic acid (PFOA)	0.0019	U	0.0024	0.00072	ug/L		02/10/16 07:14	02/20/16 12:23	1
Perfluorononanoic acid (PFNA)	0.0019	U	0.0024	0.00063	ug/L		02/10/16 07:14	02/20/16 12:23	1
Perfluorobutanesulfonic acid (PFBS)	0.0019	U	0.0024	0.00088	ug/L		02/10/16 07:14	02/20/16 12:23	1
Perfluorohexanesulfonic acid (PFHxS)	0.0019	U	0.0024	0.00083	ug/L		02/10/16 07:14	02/20/16 12:23	1
Perfluorooctanesulfonic acid (PFOS)	0.0029	U	0.0038	0.0012	ug/L		02/10/16 07:14	02/20/16 12:23	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4-PFHpA	124		25 - 150	02/10/16 07:14	02/20/16 12:23	1
13C4 PFOA	132		25 - 150	02/10/16 07:14	02/20/16 12:23	1
13C5 PFNA	137		25 - 150	02/10/16 07:14	02/20/16 12:23	1
18O2 PFHxS	113		25 - 150	02/10/16 07:14	02/20/16 12:23	1
13C4 PFOS	108		25 - 150	02/10/16 07:14	02/20/16 12:23	1

Client Sample ID: OF-FB67-0216

Lab Sample ID: 320-17154-10
Date Collected: 02/03/16 18:21
Matrix: Water
Date Received: 02/04/16 09:45

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.0019	U	0.0023	0.00075	ug/L		02/10/16 07:14	02/20/16 12:45	1
Perfluorooctanoic acid (PFOA)	0.0019	U	0.0023	0.00070	ug/L		02/10/16 07:14	02/20/16 12:45	1
Perfluorononanoic acid (PFNA)	0.0019	U	0.0023	0.00061	ug/L		02/10/16 07:14	02/20/16 12:45	1
Perfluorobutanesulfonic acid (PFBS)	0.0019	U	0.0023	0.00086	ug/L		02/10/16 07:14	02/20/16 12:45	1
Perfluorohexanesulfonic acid (PFHxS)	0.0019	U	0.0023	0.00081	ug/L		02/10/16 07:14	02/20/16 12:45	1
Perfluorooctanesulfonic acid (PFOS)	0.0028	U	0.0037	0.0012	ug/L		02/10/16 07:14	02/20/16 12:45	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4-PFHpA	126		25 - 150	02/10/16 07:14	02/20/16 12:45	1
13C4 PFOA	131		25 - 150	02/10/16 07:14	02/20/16 12:45	1
13C5 PFNA	130		25 - 150	02/10/16 07:14	02/20/16 12:45	1
18O2 PFHxS	113		25 - 150	02/10/16 07:14	02/20/16 12:45	1
13C4 PFOS	112		25 - 150	02/10/16 07:14	02/20/16 12:45	1

Isotope Dilution Summary

Client: CH2M Hill, Inc.
Project/Site: CTO WE7G PFC Sampling

TestAmerica Job ID: 320-17154-1
SDG: CTO WE7G PFC Sampling

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

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

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	3C4-PFHp (25-150)	3C4 PFO/ (25-150)	3C5 PFN/ (25-150)	3O2 PFHx (25-150)	3C4 PFOS (25-150)			
320-17154-1	OF-FB09-0216	122	126	127	113	107			
320-17154-3	OF-FB37-0216	107	111	113	100	95			
320-17154-6	OF-FB11-0216	111	113	116	95	93			
320-17154-8	OF-FB28-0216	124	132	137	113	108			
320-17154-10	OF-FB67-0216	126	131	130	113	112			
LCS 320-100093/2-A	Lab Control Sample	95	95	98	90	82			
LCS 320-100147/2-A	Lab Control Sample	124	119	117	108	99			
LCSD 320-100093/3-A	Lab Control Sample Dup	95	88	91	86	80			
LCSD 320-100147/3-A	Lab Control Sample Dup	123	115	116	107	100			
MB 320-100093/1-A	Method Blank				95				
MB 320-100093/1-A	Method Blank	103	101	103		92			
MB 320-100147/1-A	Method Blank	118	114	118	97	98			

Surrogate Legend

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

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Lab Sample ID: MB 320-100093/1-A
Matrix: Water
Analysis Batch: 100305

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 100093

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanesulfonic acid (PFHxS)	0.0020	U	0.0025	0.00087	ug/L		02/09/16 10:23	02/13/16 00:22	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*95*		*25 - 150*	*02/09/16 10:23*	*02/13/16 00:22*	*1*

Lab Sample ID: MB 320-100093/1-A
Matrix: Water
Analysis Batch: 100906

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 100093

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.0020	U	0.0025	0.00080	ug/L		02/09/16 10:23	02/20/16 06:23	1
Perfluorooctanoic acid (PFOA)	0.0020	U	0.0025	0.00075	ug/L		02/09/16 10:23	02/20/16 06:23	1
Perfluorononanoic acid (PFNA)	0.0020	U	0.0025	0.00065	ug/L		02/09/16 10:23	02/20/16 06:23	1
Perfluorobutanesulfonic acid (PFBS)	0.0020	U	0.0025	0.00092	ug/L		02/09/16 10:23	02/20/16 06:23	1
Perfluorooctanesulfonic acid (PFOS)	0.00143	J	0.0040	0.0013	ug/L		02/09/16 10:23	02/20/16 06:23	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4-PFHpA	*103*		*25 - 150*	*02/09/16 10:23*	*02/20/16 06:23*	*1*
13C4 PFOA	*101*		*25 - 150*	*02/09/16 10:23*	*02/20/16 06:23*	*1*
13C5 PFNA	*103*		*25 - 150*	*02/09/16 10:23*	*02/20/16 06:23*	*1*
13C4 PFOS	*92*		*25 - 150*	*02/09/16 10:23*	*02/20/16 06:23*	*1*

Lab Sample ID: LCS 320-100093/2-A
Matrix: Water
Analysis Batch: 100906

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 100093

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluoroheptanoic acid (PFHpA)	0.0400	0.0513		ug/L		128	60 - 140
Perfluorooctanoic acid (PFOA)	0.0400	0.0485		ug/L		121	60 - 140
Perfluorononanoic acid (PFNA)	0.0400	0.0537		ug/L		134	60 - 140
Perfluorobutanesulfonic acid (PFBS)	0.0354	0.0459		ug/L		130	50 - 150
Perfluorohexanesulfonic acid (PFHxS)	0.0378	0.0480		ug/L		127	60 - 140
Perfluorooctanesulfonic acid (PFOS)	0.0382	0.0515		ug/L		135	60 - 140

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C4-PFHpA	*95*		*25 - 150*
13C4 PFOA	*95*		*25 - 150*
13C5 PFNA	*98*		*25 - 150*
18O2 PFHxS	*90*		*25 - 150*
13C4 PFOS	*82*		*25 - 150*

Method: WS-LC-0025 - Perfluorinated Hydrocarbons (Continued)

Lab Sample ID: LCSD 320-100093/3-A
Matrix: Water
Analysis Batch: 100906

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 100093

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluoroheptanoic acid (PFHpA)	0.0400	0.0506		ug/L		126	60 - 140	1	30
Perfluorooctanoic acid (PFOA)	0.0400	0.0493		ug/L		123	60 - 140	2	30
Perfluorononanoic acid (PFNA)	0.0400	0.0517		ug/L		129	60 - 140	4	30
Perfluorobutanesulfonic acid (PFBS)	0.0354	0.0472		ug/L		133	50 - 150	3	30
Perfluorohexanesulfonic acid (PFHxS)	0.0378	0.0486		ug/L		128	60 - 140	1	30
Perfluorooctanesulfonic acid (PFOS)	0.0382	0.0452		ug/L		118	60 - 140	13	30

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C4-PFHpA	*95*		*25 - 150*
13C4 PFOA	*88*		*25 - 150*
13C5 PFNA	*91*		*25 - 150*
18O2 PFHxS	*86*		*25 - 150*
13C4 PFOS	*80*		*25 - 150*

Lab Sample ID: MB 320-100147/1-A
Matrix: Water
Analysis Batch: 100906

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 100147

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.0020	U	0.0025	0.00080	ug/L		02/10/16 07:14	02/20/16 11:20	1
Perfluorooctanoic acid (PFOA)	0.0020	U	0.0025	0.00075	ug/L		02/10/16 07:14	02/20/16 11:20	1
Perfluorononanoic acid (PFNA)	0.0020	U	0.0025	0.00065	ug/L		02/10/16 07:14	02/20/16 11:20	1
Perfluorobutanesulfonic acid (PFBS)	0.0020	U	0.0025	0.00092	ug/L		02/10/16 07:14	02/20/16 11:20	1
Perfluorohexanesulfonic acid (PFHxS)	0.0020	U	0.0025	0.00087	ug/L		02/10/16 07:14	02/20/16 11:20	1
Perfluorooctanesulfonic acid (PFOS)	0.0030	U	0.0040	0.0013	ug/L		02/10/16 07:14	02/20/16 11:20	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4-PFHpA	*118*		*25 - 150*	*02/10/16 07:14*	*02/20/16 11:20*	*1*
13C4 PFOA	*114*		*25 - 150*	*02/10/16 07:14*	*02/20/16 11:20*	*1*
13C5 PFNA	*118*		*25 - 150*	*02/10/16 07:14*	*02/20/16 11:20*	*1*
18O2 PFHxS	*97*		*25 - 150*	*02/10/16 07:14*	*02/20/16 11:20*	*1*
13C4 PFOS	*98*		*25 - 150*	*02/10/16 07:14*	*02/20/16 11:20*	*1*

Lab Sample ID: LCS 320-100147/2-A
Matrix: Water
Analysis Batch: 100906

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 100147

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluoroheptanoic acid (PFHpA)	0.0400	0.0498		ug/L		124	60 - 140
Perfluorooctanoic acid (PFOA)	0.0400	0.0476		ug/L		119	60 - 140
Perfluorononanoic acid (PFNA)	0.0400	0.0528		ug/L		132	60 - 140
Perfluorobutanesulfonic acid (PFBS)	0.0354	0.0412		ug/L		116	50 - 150
Perfluorohexanesulfonic acid (PFHxS)	0.0378	0.0503		ug/L		133	60 - 140
Perfluorooctanesulfonic acid (PFOS)	0.0382	0.0529		ug/L		138	60 - 140

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C4-PFHpA	*124*		*25 - 150*
13C4 PFOA	*119*		*25 - 150*
13C5 PFNA	*117*		*25 - 150*
18O2 PFHxS	*108*		*25 - 150*
13C4 PFOS	*99*		*25 - 150*

Lab Sample ID: LCSD 320-100147/3-A
Matrix: Water
Analysis Batch: 100906

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 100147

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluoroheptanoic acid (PFHpA)			0.0400	0.0461		ug/L		115	60 - 140	8	30
Perfluorooctanoic acid (PFOA)			0.0400	0.0488		ug/L		122	60 - 140	2	30
Perfluorononanoic acid (PFNA)			0.0400	0.0534		ug/L		133	60 - 140	1	30
Perfluorobutanesulfonic acid (PFBS)			0.0354	0.0461		ug/L		130	50 - 150	11	30
Perfluorohexanesulfonic acid (PFHxS)			0.0378	0.0473		ug/L		125	60 - 140	6	30
Perfluorooctanesulfonic acid (PFOS)			0.0382	0.0502		ug/L		131	60 - 140	5	30

Isotope Dilution	LCSD %Recovery	LCSD Qualifier	Limits
13C4-PFHpA	*123*		*25 - 150*
13C4 PFOA	*115*		*25 - 150*
13C5 PFNA	*116*		*25 - 150*
18O2 PFHxS	*107*		*25 - 150*
13C4 PFOS	*100*		*25 - 150*

QC Association Summary

Client: CH2M Hill, Inc.
Project/Site: CTO WE7G PFC Sampling

TestAmerica Job ID: 320-17154-1
SDG: CTO WE7G PFC Sampling

LCMS

Prep Batch: 100093

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-17154-1	OF-FB09-0216	Total/NA	Water	3535	
320-17154-3	OF-FB37-0216	Total/NA	Water	3535	
320-17154-6	OF-FB11-0216	Total/NA	Water	3535	
LCS 320-100093/2-A	Lab Control Sample	Total/NA	Water	3535	
LCSD 320-100093/3-A	Lab Control Sample Dup	Total/NA	Water	3535	
MB 320-100093/1-A	Method Blank	Total/NA	Water	3535	

Prep Batch: 100147

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-17154-8	OF-FB28-0216	Total/NA	Water	3535	
320-17154-10	OF-FB67-0216	Total/NA	Water	3535	
LCS 320-100147/2-A	Lab Control Sample	Total/NA	Water	3535	
LCSD 320-100147/3-A	Lab Control Sample Dup	Total/NA	Water	3535	
MB 320-100147/1-A	Method Blank	Total/NA	Water	3535	

Analysis Batch: 100305

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 320-100093/1-A	Method Blank	Total/NA	Water	WS-LC-0025	100093

Analysis Batch: 100906

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-17154-1	OF-FB09-0216	Total/NA	Water	WS-LC-0025	100093
320-17154-3	OF-FB37-0216	Total/NA	Water	WS-LC-0025	100093
320-17154-6	OF-FB11-0216	Total/NA	Water	WS-LC-0025	100093
320-17154-8	OF-FB28-0216	Total/NA	Water	WS-LC-0025	100147
320-17154-10	OF-FB67-0216	Total/NA	Water	WS-LC-0025	100147
LCS 320-100093/2-A	Lab Control Sample	Total/NA	Water	WS-LC-0025	100093
LCS 320-100147/2-A	Lab Control Sample	Total/NA	Water	WS-LC-0025	100147
LCSD 320-100093/3-A	Lab Control Sample Dup	Total/NA	Water	WS-LC-0025	100093
LCSD 320-100147/3-A	Lab Control Sample Dup	Total/NA	Water	WS-LC-0025	100147
MB 320-100093/1-A	Method Blank	Total/NA	Water	WS-LC-0025	100093
MB 320-100147/1-A	Method Blank	Total/NA	Water	WS-LC-0025	100147

Lab Chronicle

Client: CH2M Hill, Inc.
Project/Site: CTO WE7G PFC Sampling

TestAmerica Job ID: 320-17154-1
SDG: CTO WE7G PFC Sampling

Client Sample ID: OF-FB09-0216
Date Collected: 02/03/16 16:40
Date Received: 02/04/16 09:45

Lab Sample ID: 320-17154-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			504.9 mL	1.00 mL	100093	02/09/16 10:23	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	504.9 mL	1.00 mL	100906	02/20/16 10:16	JRB	TAL SAC

Client Sample ID: OF-FB37-0216
Date Collected: 02/03/16 17:20
Date Received: 02/04/16 09:45

Lab Sample ID: 320-17154-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			550.7 mL	1.00 mL	100093	02/09/16 10:23	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	550.7 mL	1.00 mL	100906	02/20/16 10:37	JRB	TAL SAC

Client Sample ID: OF-FB11-0216
Date Collected: 02/03/16 16:10
Date Received: 02/04/16 09:45

Lab Sample ID: 320-17154-6
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			551.4 mL	1.00 mL	100093	02/09/16 10:23	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	551.4 mL	1.00 mL	100906	02/20/16 10:58	JRB	TAL SAC

Client Sample ID: OF-FB28-0216
Date Collected: 02/03/16 17:43
Date Received: 02/04/16 09:45

Lab Sample ID: 320-17154-8
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			521.6 mL	1.00 mL	100147	02/10/16 07:14	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	521.6 mL	1.00 mL	100906	02/20/16 12:23	JRB	TAL SAC

Client Sample ID: OF-FB67-0216
Date Collected: 02/03/16 18:21
Date Received: 02/04/16 09:45

Lab Sample ID: 320-17154-10
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			535.9 mL	1.00 mL	100147	02/10/16 07:14	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	535.9 mL	1.00 mL	100906	02/20/16 12:45	JRB	TAL SAC

Laboratory References:

Maxxam = Maxxam Analytics Inc., PO BOX 57437, Postal Station A, Toronto, Ontario M5W 5M5

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

Certification Summary

Client: CH2M Hill, Inc.
Project/Site: CTO WE7G PFC Sampling

TestAmerica Job ID: 320-17154-1
SDG: CTO WE7G PFC Sampling

Laboratory: TestAmerica Sacramento

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
A2LA	DoD ELAP		2928-01	01-31-17
Oregon	NELAP	10	CA200005	01-29-17

The following analytes are included in this report, but are not certified under this certification:

Analysis Method	Prep Method	Matrix	Analyte
WS-LC-0025	3535	Water	Perfluoroheptanoic acid (PFHpA)
WS-LC-0025	3535	Water	Perfluorononanoic acid (PFNA)
WS-LC-0025	3535	Water	Perfluorooctanoic acid (PFOA)

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

Analysis Method	Prep Method	Matrix	Analyte
WS-LC-0025	3535	Water	Perfluorobutanesulfonic acid (PFBS)
WS-LC-0025	3535	Water	Perfluorohexanesulfonic acid (PFHxS)
WS-LC-0025	3535	Water	Perfluorooctanesulfonic acid (PFOS)

Laboratory: TestAmerica Denver

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
A2LA	DoD ELAP		2907.01	10-31-17
Oregon	NELAP	10	4025	01-09-17

Method Summary

Client: CH2M Hill, Inc.
Project/Site: CTO WE7G PFC Sampling

TestAmerica Job ID: 320-17154-1
SDG: CTO WE7G PFC Sampling

Method	Method Description	Protocol	Laboratory
WS-LC-0025	Perfluorinated Hydrocarbons	TAL SOP	TAL SAC
PFOA - PFOA	PFOA	NONE	Maxxam

Protocol References:

NONE = NONE

TAL SOP = TestAmerica Laboratories, Standard Operating Procedure

Laboratory References:

Maxxam = Maxxam Analytics Inc., PO BOX 57437, Postal Station A, Toronto, Ontario M5W 5M5

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

Sample Summary

Client: CH2M Hill, Inc.
Project/Site: CTO WE7G PFC Sampling

TestAmerica Job ID: 320-17154-1
SDG: CTO WE7G PFC Sampling

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-17154-1	OF-FB09-0216	Water	02/03/16 16:40	02/04/16 09:45
320-17154-2	OF-RW09-0216	Water	02/03/16 16:45	02/04/16 09:45
320-17154-3	OF-FB37-0216	Water	02/03/16 17:20	02/04/16 09:45
320-17154-4	OF-RW37-0216	Water	02/03/16 17:28	02/04/16 09:45
320-17154-5	OF-RW11-0216	Water	02/03/16 16:04	02/04/16 09:45
320-17154-6	OF-FB11-0216	Water	02/03/16 16:10	02/04/16 09:45
320-17154-7	OF-RW28-0216	Water	02/03/16 17:41	02/04/16 09:45
320-17154-8	OF-FB28-0216	Water	02/03/16 17:43	02/04/16 09:45
320-17154-9	OF-RW67-0216	Water	02/03/16 18:19	02/04/16 09:45
320-17154-10	OF-FB67-0216	Water	02/03/16 18:21	02/04/16 09:45

Maxxam
A Bureau Veritas Group Company

Your Project #: 320-17154
Your C.O.C. #: 283602

Attention:PFC Reporting Group

TestAmerica
Sacramento
880 Riverside Parkway
West Sacramento, CA
USA 95605

Report Date: 2016/02/26
Report #: R3909946
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B630797
Received: 2016/02/13, 13:40

Sample Matrix: Water
Samples Received: 5

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Low level PFOS and PFOA in water	5	2016/02/18	2016/02/19	CAM SOP-00894	EPA 537 m

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

U = Undetected at the limit of quantitation.
J = Estimated concentration between the EDL & RDL.
B = Blank Contamination.
Q = One or more quality control criteria failed.
E = Analyte concentration exceeds the maximum concentration level.
K = Estimated maximum possible concentration due to ion abundance ratio failure.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Melissa DiGrazia, Project Manager - ATUT
Email: MDiGrazia@maxxam.ca
Phone# (905) 817-5700

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B630797
Report Date: 2016/02/26

TestAmerica
Client Project #: 320-17154

RESULTS OF ANALYSES OF WATER

Maxxam ID		BVX826	BVX827	BVX828	BVX829	BVX830			
Sampling Date		2016/02/03 16:45	2016/02/03 17:28	2016/02/03 16:04	2016/02/03 17:41	2016/02/03 18:19			
COC Number		283602	283602	283602	283602	283602			
	UNITS	OF-RW09-0216	OF-RW37-0216	OF-RW11-0216	OF-RW28-0216	OF-RW67-0216	MDL	QC Batch	RDL
Perfluorobutane Sulfonate (PFBS)	ng/L	0.27 U	0.79 J	0.27 U	0.27 U	0.97 J	0.27	4386408	2.0
Perfluoroheptanoic Acid (PFHpA)	ng/L	0.39 U	0.46 J	0.39 U	0.39 U	0.39 U	0.39	4386408	2.0
Perfluorohexane Sulfonate (PFHxS)	ng/L	0.71 J	3.3	0.75 J	0.75 J	0.40 U	0.40	4386408	2.0
Perfluoro-n-Octanoic Acid (PFOA)	ng/L	0.41 J	7.2	0.39 U	0.39 U	0.39 U	0.39	4386408	2.0
Perfluorononanoic Acid (PFNA)	ng/L	0.33 U	0.33 U	0.33 U	0.37 J	0.33 U	0.33	4386408	2.0
Perfluorooctane Sulfonate (PFOS)	ng/L	0.32 J	0.81 J	0.87 J	0.30 U	0.30 U	0.30	4386408	2.0
Surrogate Recovery (%)									
13C4-Perfluoroheptanoic acid	%	54	52	55	54	48 (1)	N/A	4386408	N/A
13C4-Perfluorooctanesulfonate	%	59	64	54	59	51	N/A	4386408	N/A
13C4-Perfluorooctanoic acid	%	58	57	59	54	51	N/A	4386408	N/A
13C5-Perfluorononanoic acid	%	62	65	61	57	55	N/A	4386408	N/A
18O2-Perfluorohexanesulfonate	%	69	64	60	50	56	N/A	4386408	N/A

QC Batch = Quality Control Batch

N/A = Not Applicable

(1) Surrogate recovery was below the defined lower control limit (LCL). Laboratory spiked water resulted in satisfactory recovery of the surrogate. When considered together, these QC data suggest that matrix interferences may be biasing the data low. Because quantitation is performed using isotope dilution techniques, any losses of the native compound that may occur during any of the sample preparation, extraction, cleanup or determinative steps will be mirrored by a similar loss of the labeled standard, and as such can be accounted for and corrected. Therefore, the quantification of these target compounds is not affected by the low surrogate recovery.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B630797
Report Date: 2016/02/26

TestAmerica
Client Project #: 320-17154

TEST SUMMARY

Maxxam ID: BVX826
Sample ID: OF-RW09-0216
Matrix: Water

Collected: 2016/02/03
Shipped:
Received: 2016/02/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Low level PFOS and PFOA in water	LCMS	4386408	2016/02/18	2016/02/19	Colm McNamara

Maxxam ID: BVX827
Sample ID: OF-RW37-0216
Matrix: Water

Collected: 2016/02/03
Shipped:
Received: 2016/02/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Low level PFOS and PFOA in water	LCMS	4386408	2016/02/18	2016/02/19	Colm McNamara

Maxxam ID: BVX828
Sample ID: OF-RW11-0216
Matrix: Water

Collected: 2016/02/03
Shipped:
Received: 2016/02/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Low level PFOS and PFOA in water	LCMS	4386408	2016/02/18	2016/02/19	Colm McNamara

Maxxam ID: BVX829
Sample ID: OF-RW28-0216
Matrix: Water

Collected: 2016/02/03
Shipped:
Received: 2016/02/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Low level PFOS and PFOA in water	LCMS	4386408	2016/02/18	2016/02/19	Colm McNamara

Maxxam ID: BVX830
Sample ID: OF-RW67-0216
Matrix: Water

Collected: 2016/02/03
Shipped:
Received: 2016/02/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Low level PFOS and PFOA in water	LCMS	4386408	2016/02/18	2016/02/19	Colm McNamara

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

GENERAL COMMENTS

Perfluorinated Compounds (PFCs):

Perfluoroheptanoic acid (PFHpA) MDL = 0.39, LOD = 1.0, LOQ = 2.0
Perfluorooctanoic acid (PFOA) MDL = 0.39, LOD = 1.0, LOQ = 2.0
Perfluorononanoic acid (PFNA) MDL = 0.33, LOD = 1.0, LOQ = 2.0
Perfluorobutane sulfonate (PFBS) MDL = 0.27, LOD = 1.0, LOQ = 2.0
Perfluorohexane sulfonate (PFHxA) MDL = 0.40, LOD = 1.0, LOQ = 2.0
Perfluorooctane sulfonate (PFOS) MDL = 0.30, LOD = 1.0, LOQ = 2.0
All Units are in ng/L

Results relate only to the items tested.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B630797
Report Date: 2016/02/26

TestAmerica
Client Project #: 320-17154

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
4386408	CM5	Matrix Spike	13C4-Perfluoroheptanoic acid	2016/02/19		50	%	50 - 130
			13C4-Perfluorooctanesulfonate	2016/02/19		59	%	50 - 130
			13C4-Perfluorooctanoic acid	2016/02/19		58	%	50 - 130
			13C5-Perfluorononanoic acid	2016/02/19		61	%	50 - 130
			18O2-Perfluorohexanesulfonate	2016/02/19		53	%	50 - 130
			Perfluorobutane Sulfonate (PFBS)	2016/02/19		157 (1)	%	70 - 130
			Perfluoroheptanoic Acid (PFHpA)	2016/02/19		133 (1)	%	70 - 130
			Perfluorohexane Sulfonate (PFHxS)	2016/02/19		148 (1)	%	70 - 130
			Perfluorononanoic Acid (PFNA)	2016/02/19		120	%	70 - 130
			Perfluoro-n-Octanoic Acid (PFOA)	2016/02/19		125	%	70 - 130
			Perfluorooctane Sulfonate (PFOS)	2016/02/19		116	%	70 - 130
4386408	CM5	Matrix Spike DUP	13C4-Perfluoroheptanoic acid	2016/02/19		52	%	50 - 130
			13C4-Perfluorooctanesulfonate	2016/02/19		64	%	50 - 130
			13C4-Perfluorooctanoic acid	2016/02/19		66	%	50 - 130
			13C5-Perfluorononanoic acid	2016/02/19		70	%	50 - 130
			18O2-Perfluorohexanesulfonate	2016/02/19		58	%	50 - 130
			Perfluorobutane Sulfonate (PFBS)	2016/02/19		150 (1)	%	70 - 130
			Perfluoroheptanoic Acid (PFHpA)	2016/02/19		125	%	70 - 130
			Perfluorohexane Sulfonate (PFHxS)	2016/02/19		133 (1)	%	70 - 130
			Perfluorononanoic Acid (PFNA)	2016/02/19		104	%	70 - 130
			Perfluoro-n-Octanoic Acid (PFOA)	2016/02/19		114	%	70 - 130
			Perfluorooctane Sulfonate (PFOS)	2016/02/19		109	%	70 - 130
4386408	CM5	MS/MSD RPD	Perfluorobutane Sulfonate (PFBS)	2016/02/19	4.2		%	30
			Perfluoroheptanoic Acid (PFHpA)	2016/02/19	6.2		%	30
			Perfluorohexane Sulfonate (PFHxS)	2016/02/19	11		%	30
			Perfluorononanoic Acid (PFNA)	2016/02/19	14		%	30
			Perfluoro-n-Octanoic Acid (PFOA)	2016/02/19	8.5		%	30
			Perfluorooctane Sulfonate (PFOS)	2016/02/19	6.4		%	30
4386408	CM5	Spiked Blank	13C4-Perfluoroheptanoic acid	2016/02/19		67	%	50 - 130
			13C4-Perfluorooctanesulfonate	2016/02/19		77	%	50 - 130
			13C4-Perfluorooctanoic acid	2016/02/19		70	%	50 - 130
			13C5-Perfluorononanoic acid	2016/02/19		73	%	50 - 130
			18O2-Perfluorohexanesulfonate	2016/02/19		83	%	50 - 130
			Perfluorobutane Sulfonate (PFBS)	2016/02/19		107	%	70 - 130
			Perfluoroheptanoic Acid (PFHpA)	2016/02/19		121	%	70 - 130
			Perfluorohexane Sulfonate (PFHxS)	2016/02/19		115	%	70 - 130
			Perfluorononanoic Acid (PFNA)	2016/02/19		118	%	70 - 130
			Perfluoro-n-Octanoic Acid (PFOA)	2016/02/19		124	%	70 - 130
			Perfluorooctane Sulfonate (PFOS)	2016/02/19		112	%	70 - 130
4386408	CM5	Method Blank	13C4-Perfluoroheptanoic acid	2016/02/19		74	%	50 - 130
			13C4-Perfluorooctanesulfonate	2016/02/19		82	%	50 - 130
			13C4-Perfluorooctanoic acid	2016/02/19		74	%	50 - 130
			13C5-Perfluorononanoic acid	2016/02/19		76	%	50 - 130
			18O2-Perfluorohexanesulfonate	2016/02/19		86	%	50 - 130
			Perfluorobutane Sulfonate (PFBS)	2016/02/19	0.27 U, MDL=0.27		ng/L	
			Perfluoroheptanoic Acid (PFHpA)	2016/02/19	0.39 U, MDL=0.39		ng/L	
			Perfluorohexane Sulfonate (PFHxS)	2016/02/19	0.40 U, MDL=0.40		ng/L	
			Perfluorononanoic Acid (PFNA)	2016/02/19	0.33 U, MDL=0.33		ng/L	
			Perfluoro-n-Octanoic Acid (PFOA)	2016/02/19	0.39 U, MDL=0.39		ng/L	

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Perfluorooctane Sulfonate (PFOS)	2016/02/19	0.30 U, MDL=0.30		ng/L	

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

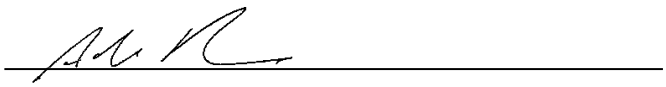
Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B630797
Report Date: 2016/02/26

TestAmerica
Client Project #: 320-17154

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Adam Robinson, Supervisor, LC/MS/MS

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Chain of Custody Record

Temperature on Receipt _____

Drinking Water? Yes ☒ No ☐

320-17154 Chain of Custody

CTO WE7G

TAL-4124 (1007)

Client	Project Manager	Date	Chain of Custody Number
CH2M Hill	Bill Friedmann	02/03/16	283602
Address	**Telephone Number (Area Code)/Fax Number**	**Lab Number**	**Page** 1 of 1
5701 Cleveland St, Suite 200	757-671-6223		
City / **State** / **Zip Code**	**Site Contact**	**Lab Contact**	
Virginia Beach / VA / 23462			
Project Name and Location (State)	**Carrier/Waybill Number**		
CTO WE7G PFC Sampling	FedEx		
Contract/Purchase Order/Quote No.			
PO# 938652			

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Analysis (Attach list if more space is needed): Select PFCs	Special Instructions/ Conditions of Receipt
OF-FB09-0216	02/03/16	1640		X			X						1	
OF-RW09-0216		1645											2	
OF-FB37-0216		1720											1	
OF-RW37-0216		1728											2	
OF-RW11-0216		1604											2	
OF-FB11-0216		1610											1	
OF-RW28-0216		1741											2	
OF-FB28-0216		1743											1	
OF-RW67-0216		1819											2	
OF-FB67-0216		1821											1	

Page 25 of 27

Possible Hazard Identification

☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal

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

Turn Around Time Required

☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☐ Other _____

QC Requirements (Specify)

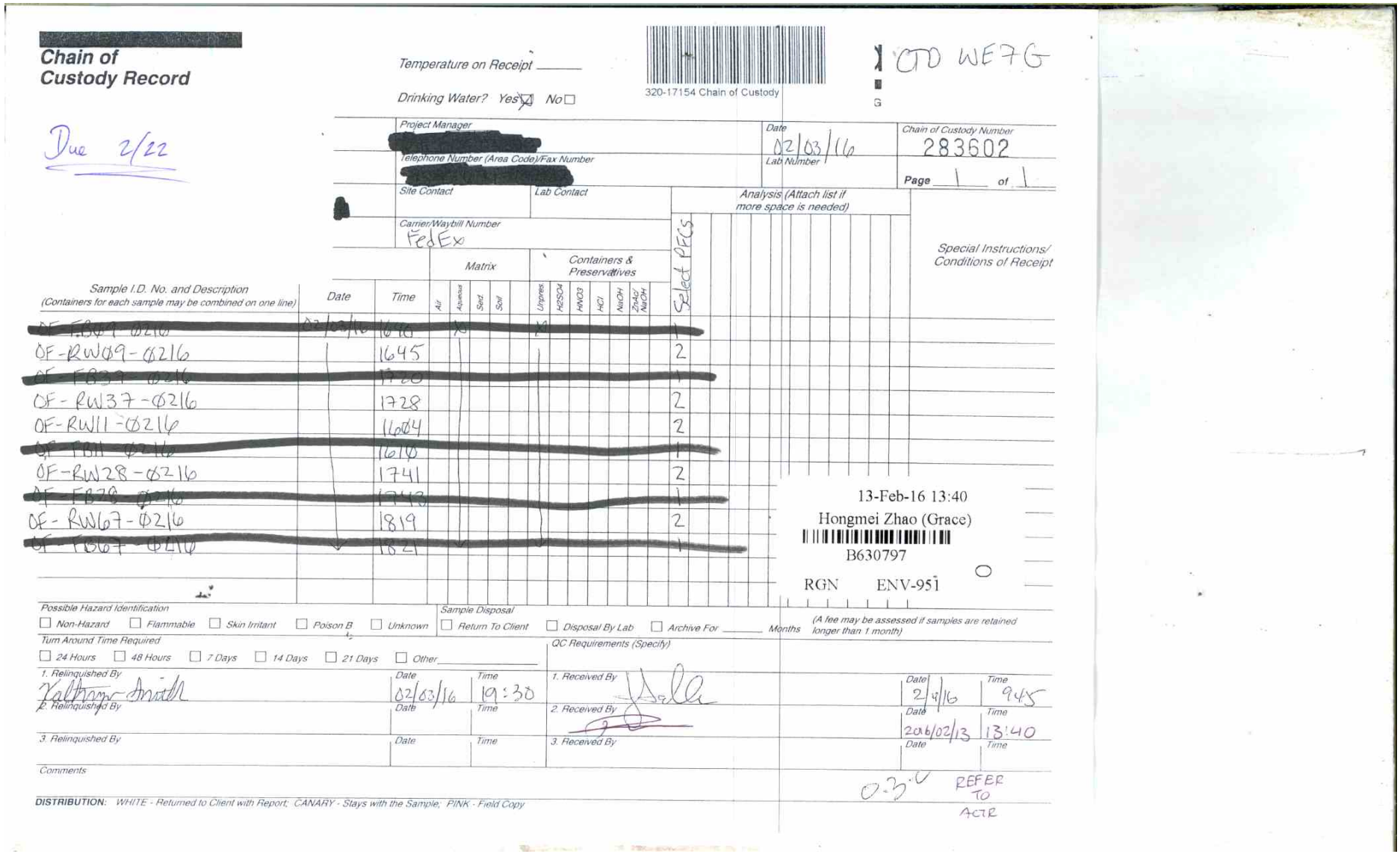
	Date	Time		Date	Time
1. Relinquished By: Kathryn Arnold	02/03/16	19:30	1. Received By:	2/4/16	945
2. Relinquished By			2. Received By		
3. Relinquished By			3 Received By		

Comments

0.3°C

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

3/22/2016



Chain of Custody Record

Temperature on Receipt _____

Drinking Water? Yes ☒ No ☐

320-17154 Chain of Custody

CTO WE76

Due 2/22

Project Manager [redacted]	Date 02/03/16	Chain of Custody Number 283602
Telephone Number (Area Code)/Fax Number [redacted]	Lab Number	Page 1 of 1
Site Contact	Lab Contact	Analysis (Attach list if more space is needed)
Carrier/Waybill Number FedEx		Special Instructions/ Conditions of Receipt

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H_2SO_4	HNO_3	HCl	NaOH	$ZnAc/NaOH$	Select PFCs
OF-FB09-Ø216	02/03/16	1610		X			X						1
OF-RW09-Ø216		1645											2
OF-FB37-Ø216		1720											1
OF-RW37-Ø216		1728											2
OF-RW11-Ø216		1604											2
OF-FB11-Ø216		1610											1
OF-RW28-Ø216		1741											2
OF-FB28-Ø216		1748											1
OF-RW67-Ø216		1819											2
OF-FB67-Ø216		1821											1

13-Feb-16 13:40
Hongmei Zhao (Grace)
B630797
RGN ENV-951

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

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

Turn Around Time Required
☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☐ Other _____

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished By Kathryn Smith	02/03/16	19:30	1. Received By	2/4/16	945
2. Relinquished By			2. Received By	2016/02/13	13:40
3. Relinquished By			3. Received By		

Comments

0.3 V REFER TO ACR

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

Login Sample Receipt Checklist

Client: CH2M Hill, Inc.

Job Number: 320-17154-1
SDG Number: CTO WE7G PFC Sampling

Login Number: 17154
List Number: 1
Creator: Nelson, Kym D

List Source: TestAmerica Sacramento

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

ANALYTICAL REPORT

Job Number: 320-17154-1

SDG Number: CTO WE7G PFC Sampling

Job Description: CTO WE7G PFC Sampling

For:
CH2M Hill, Inc.
5701 Cleveland Street
Suite 200
Virginia Beach, VA 23462

Attention: Laurie George

Approved for release.
Laura Turpen
Project Manager I
3/22/2016 12:44 PM

Laura Turpen, Project Manager I
880 Riverside Parkway, West Sacramento, CA, 95605
(916)374-4414
laura.turpen@testamericainc.com
03/22/2016
Revision: 1

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

The Lab Certification ID# is 4025.

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

Table of Contents

Table of Contents

Qualifiers

LCMS

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

Glossary

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

CASE NARRATIVE

Client: CH2M Hill, Inc.

Project: CTO WE7G PFC Sampling

Report Number: 320-17154-1

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

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

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

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

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

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

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

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

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

Revision
This report was revised March 22, 2016 to include all method blank data for all analytes and to remove the B qualifiers from the LCS/LCSD in batch 100093. No other data has changed as a result of this revision.

RECEIPT
The samples were received on 02/04/2016; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 0.3 C.

PFC
Samples OF-FB09-0216 (320-17154-1), OF-FB37-0216 (320-17154-3), OF-FB11-0216 (320-17154-6), OF-FB28-0216 (320-17154-8) and OF-FB67-0216 (320-17154-10) were analyzed for PFC in accordance with PFC. The samples were prepared on 02/09/2016 and 02/10/2016 and analyzed on 02/20/2016.

No 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 batch 320-100093

Method(s) 3535: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with batch 320-100147.

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

Subcontract Work

PFC: This method was subcontracted to Maxxam Analytics Inc.. The subcontract laboratory certification is different from that of the facility issuing the final report. Any analytical or quality issues are noted in the subcontract portion of the report.

The DL/LOD/LOQ limits for Maxxam, along with information on the data qualifiers, are included in the narrative (Page 8 of 143 of the subcontract report; page 494 of 632 of the entire report).

Detection Summary

Client: CH2M Hill, Inc.
Project/Site: CTO WE7G PFC Sampling

TestAmerica Job ID: 320-17154-1
SDG: CTO WE7G PFC Sampling

Client Sample ID: OF-FB09-0216 — Lab Sample ID: 320-17154-1

No Detections.

Client Sample ID: OF-RW09-0216 — Lab Sample ID: 320-17154-2

No Detections.

Client Sample ID: OF-FB37-0216 — Lab Sample ID: 320-17154-3

No Detections.

Client Sample ID: OF-RW37-0216 — Lab Sample ID: 320-17154-4

No Detections.

Client Sample ID: OF-RW11-0216 — Lab Sample ID: 320-17154-5

No Detections.

Client Sample ID: OF-FB11-0216 — Lab Sample ID: 320-17154-6

No Detections.

Client Sample ID: OF-RW28-0216 — Lab Sample ID: 320-17154-7

No Detections.

Client Sample ID: OF-FB28-0216 — Lab Sample ID: 320-17154-8

No Detections.

Client Sample ID: OF-RW67-0216 — Lab Sample ID: 320-17154-9

No Detections.

Client Sample ID: OF-FB67-0216 — Lab Sample ID: 320-17154-10

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample ID: OF-FB09-0216

Lab Sample ID: 320-17154-1

Date Collected: 02/03/16 16:40
Matrix: Water
Date Received: 02/04/16 09:45

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.0020	U	0.0025	0.00079	ug/L		02/09/16 10:23	02/20/16 10:16	1
Perfluorooctanoic acid (PFOA)	0.0020	U	0.0025	0.00074	ug/L		02/09/16 10:23	02/20/16 10:16	1
Perfluorononanoic acid (PFNA)	0.0020	U	0.0025	0.00065	ug/L		02/09/16 10:23	02/20/16 10:16	1
Perfluorobutanesulfonic acid (PFBS)	0.0020	U	0.0025	0.00091	ug/L		02/09/16 10:23	02/20/16 10:16	1
Perfluorohexanesulfonic acid (PFHxS)	0.0020	U	0.0025	0.00086	ug/L		02/09/16 10:23	02/20/16 10:16	1
Perfluorooctanesulfonic acid (PFOS)	0.0030	U	0.0040	0.0013	ug/L		02/09/16 10:23	02/20/16 10:16	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4-PFHpA	*122*		*25 - 150*	*02/09/16 10:23*	*02/20/16 10:16*	*1*
13C4 PFOA	*126*		*25 - 150*	*02/09/16 10:23*	*02/20/16 10:16*	*1*
13C5 PFNA	*127*		*25 - 150*	*02/09/16 10:23*	*02/20/16 10:16*	*1*
18O2 PFHxS	*113*		*25 - 150*	*02/09/16 10:23*	*02/20/16 10:16*	*1*
13C4 PFOS	*107*		*25 - 150*	*02/09/16 10:23*	*02/20/16 10:16*	*1*

Client Sample ID: OF-FB37-0216

Lab Sample ID: 320-17154-3

Date Collected: 02/03/16 17:20
Matrix: Water
Date Received: 02/04/16 09:45

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.0018	U	0.0023	0.00073	ug/L		02/09/16 10:23	02/20/16 10:37	1
Perfluorooctanoic acid (PFOA)	0.0018	U	0.0023	0.00068	ug/L		02/09/16 10:23	02/20/16 10:37	1
Perfluorononanoic acid (PFNA)	0.0018	U	0.0023	0.00059	ug/L		02/09/16 10:23	02/20/16 10:37	1
Perfluorobutanesulfonic acid (PFBS)	0.0018	U	0.0023	0.00083	ug/L		02/09/16 10:23	02/20/16 10:37	1
Perfluorohexanesulfonic acid (PFHxS)	0.0018	U	0.0023	0.00079	ug/L		02/09/16 10:23	02/20/16 10:37	1
Perfluorooctanesulfonic acid (PFOS)	0.0027	U	0.0036	0.0012	ug/L		02/09/16 10:23	02/20/16 10:37	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4-PFHpA	*107*		*25 - 150*	*02/09/16 10:23*	*02/20/16 10:37*	*1*
13C4 PFOA	*111*		*25 - 150*	*02/09/16 10:23*	*02/20/16 10:37*	*1*
13C5 PFNA	*113*		*25 - 150*	*02/09/16 10:23*	*02/20/16 10:37*	*1*
18O2 PFHxS	*100*		*25 - 150*	*02/09/16 10:23*	*02/20/16 10:37*	*1*
13C4 PFOS	*95*		*25 - 150*	*02/09/16 10:23*	*02/20/16 10:37*	*1*

Client Sample ID: OF-FB11-0216

Lab Sample ID: 320-17154-6

Date Collected: 02/03/16 16:10
Matrix: Water
Date Received: 02/04/16 09:45

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.0018	U	0.0023	0.00073	ug/L		02/09/16 10:23	02/20/16 10:58	1
Perfluorooctanoic acid (PFOA)	0.0018	U	0.0023	0.00068	ug/L		02/09/16 10:23	02/20/16 10:58	1
Perfluorononanoic acid (PFNA)	0.0018	U	0.0023	0.00059	ug/L		02/09/16 10:23	02/20/16 10:58	1
Perfluorobutanesulfonic acid (PFBS)	0.0018	U	0.0023	0.00083	ug/L		02/09/16 10:23	02/20/16 10:58	1
Perfluorohexanesulfonic acid (PFHxS)	0.0018	U	0.0023	0.00079	ug/L		02/09/16 10:23	02/20/16 10:58	1
Perfluorooctanesulfonic acid (PFOS)	0.0027	U	0.0036	0.0012	ug/L		02/09/16 10:23	02/20/16 10:58	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4-PFHpA	*111*		*25 - 150*	*02/09/16 10:23*	*02/20/16 10:58*	*1*
13C4 PFOA	*113*		*25 - 150*	*02/09/16 10:23*	*02/20/16 10:58*	*1*
13C5 PFNA	*116*		*25 - 150*	*02/09/16 10:23*	*02/20/16 10:58*	*1*
18O2 PFHxS	*95*		*25 - 150*	*02/09/16 10:23*	*02/20/16 10:58*	*1*

Client Sample ID: OF-FB11-0216

Lab Sample ID: 320-17154-6

Date Collected: 02/03/16 16:10
Matrix: Water
Date Received: 02/04/16 09:45

Method: WS-LC-0025 - Perfluorinated Hydrocarbons (Continued)

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOS	*93*		*25 - 150*	*02/09/16 10:23*	*02/20/16 10:58*	*1*

Client Sample ID: OF-FB28-0216

Lab Sample ID: 320-17154-8

Date Collected: 02/03/16 17:43
Matrix: Water
Date Received: 02/04/16 09:45

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.0019	U	0.0024	0.00077	ug/L		02/10/16 07:14	02/20/16 12:23	1
Perfluorooctanoic acid (PFOA)	0.0019	U	0.0024	0.00072	ug/L		02/10/16 07:14	02/20/16 12:23	1
Perfluorononanoic acid (PFNA)	0.0019	U	0.0024	0.00063	ug/L		02/10/16 07:14	02/20/16 12:23	1
Perfluorobutanesulfonic acid (PFBS)	0.0019	U	0.0024	0.00088	ug/L		02/10/16 07:14	02/20/16 12:23	1
Perfluorohexanesulfonic acid (PFHxS)	0.0019	U	0.0024	0.00083	ug/L		02/10/16 07:14	02/20/16 12:23	1
Perfluorooctanesulfonic acid (PFOS)	0.0029	U	0.0038	0.0012	ug/L		02/10/16 07:14	02/20/16 12:23	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4-PFHpA	*124*		*25 - 150*	*02/10/16 07:14*	*02/20/16 12:23*	*1*
13C4 PFOA	*132*		*25 - 150*	*02/10/16 07:14*	*02/20/16 12:23*	*1*
13C5 PFNA	*137*		*25 - 150*	*02/10/16 07:14*	*02/20/16 12:23*	*1*
18O2 PFHxS	*113*		*25 - 150*	*02/10/16 07:14*	*02/20/16 12:23*	*1*
13C4 PFOS	*108*		*25 - 150*	*02/10/16 07:14*	*02/20/16 12:23*	*1*

Client Sample ID: OF-FB67-0216

Lab Sample ID: 320-17154-10

Date Collected: 02/03/16 18:21
Matrix: Water
Date Received: 02/04/16 09:45

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.0019	U	0.0023	0.00075	ug/L		02/10/16 07:14	02/20/16 12:45	1
Perfluorooctanoic acid (PFOA)	0.0019	U	0.0023	0.00070	ug/L		02/10/16 07:14	02/20/16 12:45	1
Perfluorononanoic acid (PFNA)	0.0019	U	0.0023	0.00061	ug/L		02/10/16 07:14	02/20/16 12:45	1
Perfluorobutanesulfonic acid (PFBS)	0.0019	U	0.0023	0.00086	ug/L		02/10/16 07:14	02/20/16 12:45	1
Perfluorohexanesulfonic acid (PFHxS)	0.0019	U	0.0023	0.00081	ug/L		02/10/16 07:14	02/20/16 12:45	1
Perfluorooctanesulfonic acid (PFOS)	0.0028	U	0.0037	0.0012	ug/L		02/10/16 07:14	02/20/16 12:45	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4-PFHpA	*126*		*25 - 150*	*02/10/16 07:14*	*02/20/16 12:45*	*1*
13C4 PFOA	*131*		*25 - 150*	*02/10/16 07:14*	*02/20/16 12:45*	*1*
13C5 PFNA	*130*		*25 - 150*	*02/10/16 07:14*	*02/20/16 12:45*	*1*
18O2 PFHxS	*113*		*25 - 150*	*02/10/16 07:14*	*02/20/16 12:45*	*1*
13C4 PFOS	*112*		*25 - 150*	*02/10/16 07:14*	*02/20/16 12:45*	*1*

Default Detection Limits

Client: CH2M Hill, Inc.
Project/Site: CTO WE7G PFC Sampling

TestAmerica Job ID: 320-17154-1
SDG: CTO WE7G PFC Sampling

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	LOQ	DL	Units	Method
Perfluorobutanesulfonic acid (PFBS)	0.0025	0.00092	ug/L	WS-LC-0025
Perfluoroheptanoic acid (PFHpA)	0.0025	0.00080	ug/L	WS-LC-0025
Perfluorohexanesulfonic acid (PFHxS)	0.0025	0.00087	ug/L	WS-LC-0025
Perfluorononanoic acid (PFNA)	0.0025	0.00065	ug/L	WS-LC-0025
Perfluorooctanesulfonic acid (PFOS)	0.0040	0.0013	ug/L	WS-LC-0025
Perfluorooctanoic acid (PFOA)	0.0025	0.00075	ug/L	WS-LC-0025

Isotope Dilution Summary

Client: CH2M Hill, Inc.
Project/Site: CTO WE7G PFC Sampling

TestAmerica Job ID: 320-17154-1
SDG: CTO WE7G PFC Sampling

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

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

		Percent Isotope Dilution Recovery (Acceptance Limits)							
		3C4-PFHp	3C4 PFO/	3C5 PFN/	3O2 PFHx	3C4 PFOS			
Lab Sample ID	Client Sample ID	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)			
320-17154-1	OF-FB09-0216	122	126	127	113	107			
320-17154-3	OF-FB37-0216	107	111	113	100	95			
320-17154-6	OF-FB11-0216	111	113	116	95	93			
320-17154-8	OF-FB28-0216	124	132	137	113	108			
320-17154-10	OF-FB67-0216	126	131	130	113	112			
LCS 320-100093/2-A	Lab Control Sample	95	95	98	90	82			
LCS 320-100147/2-A	Lab Control Sample	124	119	117	108	99			
LCSD 320-100093/3-A	Lab Control Sample Dup	95	88	91	86	80			
LCSD 320-100147/3-A	Lab Control Sample Dup	123	115	116	107	100			
MB 320-100093/1-A	Method Blank				95				
MB 320-100093/1-A	Method Blank	103	101	103		92			
MB 320-100147/1-A	Method Blank	118	114	118	97	98			

Surrogate Legend

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

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Lab Sample ID: MB 320-100093/1-A
Matrix: Water
Analysis Batch: 100305

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 100093

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanesulfonic acid (PFHxS)	0.0020	U	0.0025	0.00087	ug/L		02/09/16 10:23	02/13/16 00:22	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*95*		*25 - 150*	*02/09/16 10:23*	*02/13/16 00:22*	*1*

Lab Sample ID: MB 320-100093/1-A
Matrix: Water
Analysis Batch: 100906

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 100093

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.0020	U	0.0025	0.00080	ug/L		02/09/16 10:23	02/20/16 06:23	1
Perfluorooctanoic acid (PFOA)	0.0020	U	0.0025	0.00075	ug/L		02/09/16 10:23	02/20/16 06:23	1
Perfluorononanoic acid (PFNA)	0.0020	U	0.0025	0.00065	ug/L		02/09/16 10:23	02/20/16 06:23	1
Perfluorobutanesulfonic acid (PFBS)	0.0020	U	0.0025	0.00092	ug/L		02/09/16 10:23	02/20/16 06:23	1
Perfluorooctanesulfonic acid (PFOS)	0.00143	J	0.0040	0.0013	ug/L		02/09/16 10:23	02/20/16 06:23	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4-PFHpA	*103*		*25 - 150*	*02/09/16 10:23*	*02/20/16 06:23*	*1*
13C4 PFOA	*101*		*25 - 150*	*02/09/16 10:23*	*02/20/16 06:23*	*1*
13C5 PFNA	*103*		*25 - 150*	*02/09/16 10:23*	*02/20/16 06:23*	*1*
13C4 PFOS	*92*		*25 - 150*	*02/09/16 10:23*	*02/20/16 06:23*	*1*

Lab Sample ID: LCS 320-100093/2-A
Matrix: Water
Analysis Batch: 100906

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 100093

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluoroheptanoic acid (PFHpA)	0.0400	0.0513		ug/L		128	60 - 140
Perfluorooctanoic acid (PFOA)	0.0400	0.0485		ug/L		121	60 - 140
Perfluorononanoic acid (PFNA)	0.0400	0.0537		ug/L		134	60 - 140
Perfluorobutanesulfonic acid (PFBS)	0.0354	0.0459		ug/L		130	50 - 150
Perfluorohexanesulfonic acid (PFHxS)	0.0378	0.0480		ug/L		127	60 - 140
Perfluorooctanesulfonic acid (PFOS)	0.0382	0.0515		ug/L		135	60 - 140

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C4-PFHpA	*95*		*25 - 150*
13C4 PFOA	*95*		*25 - 150*
13C5 PFNA	*98*		*25 - 150*
18O2 PFHxS	*90*		*25 - 150*
13C4 PFOS	*82*		*25 - 150*

Method: WS-LC-0025 - Perfluorinated Hydrocarbons (Continued)

Lab Sample ID: LCSD 320-100093/3-A
Matrix: Water
Analysis Batch: 100906

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 100093

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluoroheptanoic acid (PFHpA)			0.0400	0.0506		ug/L		126	60 - 140	1	30
Perfluorooctanoic acid (PFOA)			0.0400	0.0493		ug/L		123	60 - 140	2	30
Perfluorononanoic acid (PFNA)			0.0400	0.0517		ug/L		129	60 - 140	4	30
Perfluorobutanesulfonic acid (PFBS)			0.0354	0.0472		ug/L		133	50 - 150	3	30
Perfluorohexanesulfonic acid (PFHxS)			0.0378	0.0486		ug/L		128	60 - 140	1	30
Perfluorooctanesulfonic acid (PFOS)			0.0382	0.0452		ug/L		118	60 - 140	13	30

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C4-PFHpA	*95*		*25 - 150*
13C4 PFOA	*88*		*25 - 150*
13C5 PFNA	*91*		*25 - 150*
18O2 PFHxS	*86*		*25 - 150*
13C4 PFOS	*80*		*25 - 150*

Lab Sample ID: MB 320-100147/1-A
Matrix: Water
Analysis Batch: 100906

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 100147

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.0020	U	0.0025	0.00080	ug/L		02/10/16 07:14	02/20/16 11:20	1
Perfluorooctanoic acid (PFOA)	0.0020	U	0.0025	0.00075	ug/L		02/10/16 07:14	02/20/16 11:20	1
Perfluorononanoic acid (PFNA)	0.0020	U	0.0025	0.00065	ug/L		02/10/16 07:14	02/20/16 11:20	1
Perfluorobutanesulfonic acid (PFBS)	0.0020	U	0.0025	0.00092	ug/L		02/10/16 07:14	02/20/16 11:20	1
Perfluorohexanesulfonic acid (PFHxS)	0.0020	U	0.0025	0.00087	ug/L		02/10/16 07:14	02/20/16 11:20	1
Perfluorooctanesulfonic acid (PFOS)	0.0030	U	0.0040	0.0013	ug/L		02/10/16 07:14	02/20/16 11:20	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4-PFHpA	*118*		*25 - 150*	*02/10/16 07:14*	*02/20/16 11:20*	*1*
13C4 PFOA	*114*		*25 - 150*	*02/10/16 07:14*	*02/20/16 11:20*	*1*
13C5 PFNA	*118*		*25 - 150*	*02/10/16 07:14*	*02/20/16 11:20*	*1*
18O2 PFHxS	*97*		*25 - 150*	*02/10/16 07:14*	*02/20/16 11:20*	*1*
13C4 PFOS	*98*		*25 - 150*	*02/10/16 07:14*	*02/20/16 11:20*	*1*

Lab Sample ID: LCS 320-100147/2-A
Matrix: Water
Analysis Batch: 100906

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 100147

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Perfluoroheptanoic acid (PFHpA)			0.0400	0.0498		ug/L		124	60 - 140		
Perfluorooctanoic acid (PFOA)			0.0400	0.0476		ug/L		119	60 - 140		
Perfluorononanoic acid (PFNA)			0.0400	0.0528		ug/L		132	60 - 140		
Perfluorobutanesulfonic acid (PFBS)			0.0354	0.0412		ug/L		116	50 - 150		
Perfluorohexanesulfonic acid (PFHxS)			0.0378	0.0503		ug/L		133	60 - 140		
Perfluorooctanesulfonic acid (PFOS)			0.0382	0.0529		ug/L		138	60 - 140		

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C4-PFHpA	124		25 - 150
13C4 PFOA	119		25 - 150
13C5 PFNA	117		25 - 150
18O2 PFHxS	108		25 - 150
13C4 PFOS	99		25 - 150

Lab Sample ID: LCSD 320-100147/3-A
Matrix: Water
Analysis Batch: 100906

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 100147

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluoroheptanoic acid (PFHpA)			0.0400	0.0461		ug/L		115	60 - 140	8	30
Perfluorooctanoic acid (PFOA)			0.0400	0.0488		ug/L		122	60 - 140	2	30
Perfluorononanoic acid (PFNA)			0.0400	0.0534		ug/L		133	60 - 140	1	30
Perfluorobutanesulfonic acid (PFBS)			0.0354	0.0461		ug/L		130	50 - 150	11	30
Perfluorohexanesulfonic acid (PFHxS)			0.0378	0.0473		ug/L		125	60 - 140	6	30
Perfluorooctanesulfonic acid (PFOS)			0.0382	0.0502		ug/L		131	60 - 140	5	30

Isotope Dilution	LCSD %Recovery	LCSD Qualifier	Limits
13C4-PFHpA	123		25 - 150
13C4 PFOA	115		25 - 150
13C5 PFNA	116		25 - 150
18O2 PFHxS	107		25 - 150
13C4 PFOS	100		25 - 150

LCMS

Prep Batch: 100093

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-17154-1	OF-FB09-0216	Total/NA	Water	3535	
320-17154-3	OF-FB37-0216	Total/NA	Water	3535	
320-17154-6	OF-FB11-0216	Total/NA	Water	3535	
LCS 320-100093/2-A	Lab Control Sample	Total/NA	Water	3535	
LCSD 320-100093/3-A	Lab Control Sample Dup	Total/NA	Water	3535	
MB 320-100093/1-A	Method Blank	Total/NA	Water	3535	

Prep Batch: 100147

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-17154-8	OF-FB28-0216	Total/NA	Water	3535	
320-17154-10	OF-FB67-0216	Total/NA	Water	3535	
LCS 320-100147/2-A	Lab Control Sample	Total/NA	Water	3535	
LCSD 320-100147/3-A	Lab Control Sample Dup	Total/NA	Water	3535	
MB 320-100147/1-A	Method Blank	Total/NA	Water	3535	

Analysis Batch: 100305

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 320-100093/1-A	Method Blank	Total/NA	Water	WS-LC-0025	100093

Analysis Batch: 100906

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-17154-1	OF-FB09-0216	Total/NA	Water	WS-LC-0025	100093
320-17154-3	OF-FB37-0216	Total/NA	Water	WS-LC-0025	100093
320-17154-6	OF-FB11-0216	Total/NA	Water	WS-LC-0025	100093
320-17154-8	OF-FB28-0216	Total/NA	Water	WS-LC-0025	100147
320-17154-10	OF-FB67-0216	Total/NA	Water	WS-LC-0025	100147
LCS 320-100093/2-A	Lab Control Sample	Total/NA	Water	WS-LC-0025	100093
LCS 320-100147/2-A	Lab Control Sample	Total/NA	Water	WS-LC-0025	100147
LCSD 320-100093/3-A	Lab Control Sample Dup	Total/NA	Water	WS-LC-0025	100093
LCSD 320-100147/3-A	Lab Control Sample Dup	Total/NA	Water	WS-LC-0025	100147
MB 320-100093/1-A	Method Blank	Total/NA	Water	WS-LC-0025	100093
MB 320-100147/1-A	Method Blank	Total/NA	Water	WS-LC-0025	100147

Client Sample ID: OF-FB09-0216
Lab Sample ID: 320-17154-1
Date Collected: 02/03/16 16:40
Matrix: Water
Date Received: 02/04/16 09:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			100093	02/09/16 10:23	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	100906	02/20/16 10:16	JRB	TAL SAC

Client Sample ID: OF-FB37-0216
Lab Sample ID: 320-17154-3
Date Collected: 02/03/16 17:20
Matrix: Water
Date Received: 02/04/16 09:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			100093	02/09/16 10:23	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	100906	02/20/16 10:37	JRB	TAL SAC

Client Sample ID: OF-FB11-0216
Lab Sample ID: 320-17154-6
Date Collected: 02/03/16 16:10
Matrix: Water
Date Received: 02/04/16 09:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			100093	02/09/16 10:23	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	100906	02/20/16 10:58	JRB	TAL SAC

Client Sample ID: OF-FB28-0216
Lab Sample ID: 320-17154-8
Date Collected: 02/03/16 17:43
Matrix: Water
Date Received: 02/04/16 09:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			100147	02/10/16 07:14	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	100906	02/20/16 12:23	JRB	TAL SAC

Client Sample ID: OF-FB67-0216
Lab Sample ID: 320-17154-10
Date Collected: 02/03/16 18:21
Matrix: Water
Date Received: 02/04/16 09:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			100147	02/10/16 07:14	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	100906	02/20/16 12:45	JRB	TAL SAC

Laboratory References:

Maxxam = Maxxam Analytics Inc., PO BOX 57437, Postal Station A, Toronto, Ontario M5W 5M5

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

Certification Summary

Client: CH2M Hill, Inc.
Project/Site: CTO WE7G PFC Sampling

TestAmerica Job ID: 320-17154-1
SDG: CTO WE7G PFC Sampling

Laboratory: TestAmerica Sacramento

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
A2LA	DoD ELAP		2928-01	01-31-17
Oregon	NELAP	10	CA200005	01-29-17

The following analytes are included in this report, but are not certified under this certification:

Analysis Method	Prep Method	Matrix	Analyte
WS-LC-0025	3535	Water	Perfluoroheptanoic acid (PFHpA)
WS-LC-0025	3535	Water	Perfluorononanoic acid (PFNA)
WS-LC-0025	3535	Water	Perfluorooctanoic acid (PFOA)

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

Analysis Method	Prep Method	Matrix	Analyte
WS-LC-0025	3535	Water	Perfluorobutanesulfonic acid (PFBS)
WS-LC-0025	3535	Water	Perfluorohexanesulfonic acid (PFHxS)
WS-LC-0025	3535	Water	Perfluorooctanesulfonic acid (PFOS)

Laboratory: TestAmerica Denver

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
A2LA	DoD ELAP		2907.01	10-31-17
Oregon	NELAP	10	4025	01-09-17

Method Summary

Client: CH2M Hill, Inc.
Project/Site: CTO WE7G PFC Sampling

TestAmerica Job ID: 320-17154-1
SDG: CTO WE7G PFC Sampling

Method	Method Description	Protocol	Laboratory
WS-LC-0025	Perfluorinated Hydrocarbons	TAL SOP	TAL SAC
PFOA - PFOA	PFOA	NONE	Maxxam

Protocol References:

NONE = NONE

TAL SOP = TestAmerica Laboratories, Standard Operating Procedure

Laboratory References:

Maxxam = Maxxam Analytics Inc., PO BOX 57437, Postal Station A, Toronto, Ontario M5W 5M5

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

Sample Summary

Client: CH2M Hill, Inc.
Project/Site: CTO WE7G PFC Sampling

TestAmerica Job ID: 320-17154-1
SDG: CTO WE7G PFC Sampling

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-17154-1	OF-FB09-0216	Water	02/03/16 16:40	02/04/16 09:45
320-17154-2	OF-RW09-0216	Water	02/03/16 16:45	02/04/16 09:45
320-17154-3	OF-FB37-0216	Water	02/03/16 17:20	02/04/16 09:45
320-17154-4	OF-RW37-0216	Water	02/03/16 17:28	02/04/16 09:45
320-17154-5	OF-RW11-0216	Water	02/03/16 16:04	02/04/16 09:45
320-17154-6	OF-FB11-0216	Water	02/03/16 16:10	02/04/16 09:45
320-17154-7	OF-RW28-0216	Water	02/03/16 17:41	02/04/16 09:45
320-17154-8	OF-FB28-0216	Water	02/03/16 17:43	02/04/16 09:45
320-17154-9	OF-RW67-0216	Water	02/03/16 18:19	02/04/16 09:45
320-17154-10	OF-FB67-0216	Water	02/03/16 18:21	02/04/16 09:45

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Instrument ID: A4 Analysis Batch Number: 100305

Lab Sample ID: STD 320-100305/3 IC Client Sample ID:

Date Analyzed: 02/12/16 10:56 Lab File ID: 12FEB2016A4A_004.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanoic acid (PFBA)	5.69	Baseline	westendorfc	02/15/16 08:14
Perfluorooctanesulfonic acid (PFOS)	11.58	Baseline	westendorfc	02/15/16 08:20
Perfluorononanoic acid (PFNA)	11.60	Baseline	westendorfc	02/15/16 08:20

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
LCMPFCSU_00025	07/29/16	01/29/16	Methanol, Lot Baker 115491	5 mL	LCM2PFHxDA_00003	0.1 mL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00003	0.1 mL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00003	0.1 mL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00004	0.1 mL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00006	0.1 mL	13C8 FOSA	1 ug/mL
					LCMPFBA_00004	0.1 mL	13C4 PFBA	1 ug/mL
					LCMPFDA_00004	0.1 mL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00004	0.1 mL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00005	0.1 mL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00004	0.1 mL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00003	0.1 mL	13C5 PFNA	1 ug/mL
					LCMPFOA_00007	0.1 mL	13C4 PFOA	1 ug/mL
					LCMPFOS_00009	0.1 mL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00005	0.1 mL	13C2 PFUnA	1 ug/mL
.LCM2PFHxDA_00003	11/29/17	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
.LCM2PFTeDA_00003	11/29/17	Wellington Laboratories, Lot M2PFTeDA1112			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
.LCM4PFHPA_00003	05/22/20	Wellington Laboratories, Lot M4PFHpA0515			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
.LCM5PFPEA_00004	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
.LCM8FOSA_00006	12/15/16	Wellington Laboratories, Lot M8FOSA1214I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
.LCMPFBA_00004	10/31/19	Wellington Laboratories, Lot MPFBA1014			(Purchased Reagent)		13C4 PFBA	50 ug/mL
.LCMPFDA_00004	04/13/19	Wellington Laboratories, Lot MPFDA0414			(Purchased Reagent)		13C2 PFDA	50 ug/mL
.LCMPFDoA_00004	07/17/19	Wellington Laboratories, Lot MPFDoA0714			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
.LCMPFHxA_00005	04/13/19	Wellington Laboratories, Lot MPFHxA0414			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
.LCMPFHxS_00004	07/25/18	Wellington Laboratories, Lot MPFHxS0713			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
.LCMPFNA_00003	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
.LCMPFOA_00007	04/10/20	Wellington Laboratories, Lot MPFOA0415			(Purchased Reagent)		13C4 PFOA	50 ug/mL
.LCMPFOS_00009	05/15/20	Wellington Laboratories, Lot MPFOS0515			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LCMPFUdA_00005	10/31/19	Wellington Laboratories, Lot MPFUdA1014			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
LCPFC-L1_00018	06/29/16	12/30/15	MeOH/H2O, Lot 90285	5 mL	LCMPFCSU_00024	250 uL	13C2-PFHxDA	50 ng/mL
							13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5-PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							18O2 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	50 ng/mL
					LCPFCSP_00040	25 uL	Perfluorobutyric acid	0.5 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.442 ng/mL
							Perfluorodecanoic acid	0.5 ng/mL

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorododecanoic acid	0.5 ng/mL
							Perfluorodecane Sulfonic acid	0.482 ng/mL
							Perfluoroheptanoic acid (PFHpA)	0.5 ng/mL
							Perfluoroheptanesulfonic Acid	0.476 ng/mL
							Perfluorohexanoic acid	0.5 ng/mL
							Perfluorohexadecanoic acid	0.5 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.473 ng/mL
							Perfluorononanoic acid (PFNA)	0.5 ng/mL
							Perfluorooctanoic acid (PFOA)	0.5 ng/mL
							Perfluorooctandecanoic acid	0.5 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.478 ng/mL
							Perfluorooctane Sulfonamide	0.5 ng/mL
							Perfluoropentanoic acid	0.5 ng/mL
							Perfluorotetradecanoic acid	0.5 ng/mL
							Perfluorotridecanoic acid	0.5 ng/mL
							Perfluoroundecanoic acid	0.5 ng/mL
.LCMPFCSU_00024	06/29/16	12/29/15	Methanol, Lot Baker 115491	10 mL	LCM2PFHxDA_00003	0.2 mL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00003	0.2 mL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00003	0.2 mL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00004	0.2 mL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00006	0.2 mL	13C8 FOSA	1 ug/mL
					LCMPFBA_00004	0.2 mL	13C4 PFBA	1 ug/mL
					LCMPFDA_00004	0.2 mL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00004	0.2 mL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00005	0.2 mL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00004	0.2 mL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00003	0.2 mL	13C5 PFNA	1 ug/mL
					LCMPFOA_00007	0.2 mL	13C4 PFOA	1 ug/mL
					LCMPFOS_00009	0.2 mL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00005	0.2 mL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00003	11/29/17	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00003	11/29/17	Wellington Laboratories, Lot M2PFTeDA1112			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00003	05/22/20	Wellington Laboratories, Lot M4PFHpA0515			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00004	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00006	12/15/16	Wellington Laboratories, Lot M8FOSA1214I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00004	10/31/19	Wellington Laboratories, Lot MPFBA1014			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00004	04/13/19	Wellington Laboratories, Lot MPFDA0414			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00004	07/17/19	Wellington Laboratories, Lot MPFDoA0714			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00005	04/13/19	Wellington Laboratories, Lot MPFHxA0414			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00004	07/25/18	Wellington Laboratories, Lot MPFHxS0713			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00003	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00007	04/10/20	Wellington Laboratories, Lot MPFOA0415			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00009	05/15/20	Wellington Laboratories, Lot MPFOS0515			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00005	10/31/19	Wellington Laboratories, Lot MPFUdA1014			(Purchased Reagent)		13C2 PFUnA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LCPFCSP_00040	06/30/16	12/30/15	Methanol, Lot 090285	5 mL	LCPFCSP_00039	0.5 mL	Perfluorobutyric acid	0.1 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0884 ug/mL
							Perfluorodecanoic acid	0.1 ug/mL
							Perfluorododecanoic acid	0.1 ug/mL
							Perfluorodecane Sulfonic acid	0.0964 ug/mL
							Perfluoroheptanoic acid (PFHpA)	0.1 ug/mL
							Perfluoroheptanesulfonic Acid	0.0952 ug/mL
							Perfluorohexanoic acid	0.1 ug/mL
							Perfluorohexadecanoic acid	0.1 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.0946 ug/mL
							Perfluorononanoic acid (PFNA)	0.1 ug/mL
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL
							Perfluorooctandecanoic acid	0.1 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0956 ug/mL
							Perfluorooctane Sulfonamide	0.1 ug/mL
							Perfluoropentanoic acid	0.1 ug/mL
							Perfluorotetradecanoic acid	0.1 ug/mL
							Perfluorotridecanoic acid	0.1 ug/mL
							Perfluoroundecanoic acid	0.1 ug/mL
..LCPFCSP_00039	06/30/16	12/30/15	Methanol, Lot 090285	5 mL	LCPFBA_00003	0.1 mL	Perfluorobutyric acid	1 ug/mL
					LCPFBSA_00001	0.1 mL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00003	0.1 mL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00003	0.1 mL	Perfluorododecanoic acid	1 ug/mL
					LCPFDSA_00001	0.1 mL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00004	0.1 mL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00001	0.1 mL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00003	0.1 mL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	0.1 mL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxSA_00001	0.1 mL	Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/mL
					LCPFNA_00004	0.1 mL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00004	0.1 mL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00004	0.1 mL	Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS_00004	0.1 mL	Perfluorooctanesulfonic acid (PFOS)	0.956 ug/mL
					LCPFOSA_00005	0.1 mL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00003	0.1 mL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00003	0.1 mL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00003	0.1 mL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00003	0.1 mL	Perfluoroundecanoic acid	1 ug/mL
...LCPFBA_00003	03/05/18	Wellington Laboratories, Lot PFBA0313			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
...LCPFBSA_00001	10/09/19	Wellington Laboratories, Lot LPFBS1014			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LCPFDA_00003	06/18/18	Wellington Laboratories, Lot PFDA0613			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
...LCPFDoA_00003	01/03/18	Wellington Laboratories, Lot PFDoA0113			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
...LCPFDSA_00001	09/13/18	Wellington Laboratories, Lot LPFDS0913			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
...LCPFHpA_00004	05/09/19	Wellington Laboratories, Lot PFHpA0514			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
...LCPFHpSA_00001	11/21/17	Wellington Laboratories, Lot LPFHpS1112			(Purchased Reagent)		Perfluoroheptanesulfonic Acid	47.6 ug/mL
...LCPFHxA_00003	05/09/19	Wellington Laboratories, Lot PFHxA0514			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
...LCPFHxDA_00004	11/28/17	Wellington Laboratories, Lot PFHxDA0707			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
...LCPFHxSA_00001	05/09/19	Wellington Laboratories, Lot LPFHxS0514			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	47.3 ug/mL
...LCPFNA_00004	05/09/19	Wellington Laboratories, Lot PFNA0514			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
...LCPFOA_00004	10/11/18	Wellington Laboratories, Lot PFOA1013			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
...LCPFODA_00004	04/25/17	Wellington Laboratories, Lot PFODA0807			(Purchased Reagent)		Perfluorooctandecanoic acid	50 ug/mL
...LCPFOS_00004	06/20/19	Wellington Laboratories, Lot LPFOS0614			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	47.8 ug/mL
...LCPFOSA_00005	07/31/18	Wellington Laboratories, Lot FOSA0714I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
...LCPFPeA_00003	01/03/18	Wellington Laboratories, Lot PFPeA0113			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
...LCPFTeDA_00003	06/19/18	Wellington Laboratories, Lot PFTeDA0613			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
...LCPFTrDA_00003	12/10/18	Wellington Laboratories, Lot PFTrDA1213			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
...LCPFUdA_00003	06/19/18	Wellington Laboratories, Lot PFUdA0613			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC-L2_00018	06/29/16	12/30/15	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00024	250 uL	13C2-PFHxDA	50 ng/mL
							13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5-PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							18O2 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	50 ng/mL
					LCPFCSP_00040	50 uL	Perfluorobutyric acid	1 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.884 ng/mL
							Perfluorodecanoic acid	1 ng/mL
							Perfluorododecanoic acid	1 ng/mL
							Perfluorodecane Sulfonic acid	0.964 ng/mL
							Perfluoroheptanoic acid (PFHpA)	1 ng/mL
							Perfluoroheptanesulfonic Acid	0.952 ng/mL
							Perfluorohexanoic acid	1 ng/mL
							Perfluorohexadecanoic acid	1 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.946 ng/mL
							Perfluorononanoic acid (PFNA)	1 ng/mL

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorooctanoic acid (PFOA)	1 ng/mL
							Perfluorooctandecanoic acid	1 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.956 ng/mL
							Perfluorooctane Sulfonamide	1 ng/mL
							Perfluoropentanoic acid	1 ng/mL
							Perfluorotetradecanoic acid	1 ng/mL
							Perfluorotridecanoic acid	1 ng/mL
							Perfluoroundecanoic acid	1 ng/mL
.LCMPFCSU_00024	06/29/16	12/29/15	Methanol, Lot Baker 115491	10 mL	LCM2PFHxDA_00003	0.2 mL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00003	0.2 mL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00003	0.2 mL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00004	0.2 mL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00006	0.2 mL	13C8 FOSA	1 ug/mL
					LCMPFBA_00004	0.2 mL	13C4 PFBA	1 ug/mL
					LCMPFDA_00004	0.2 mL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00004	0.2 mL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00005	0.2 mL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00004	0.2 mL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00003	0.2 mL	13C5 PFNA	1 ug/mL
					LCMPFOA_00007	0.2 mL	13C4 PFOA	1 ug/mL
					LCMPFOS_00009	0.2 mL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00005	0.2 mL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00003	11/29/17	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00003	11/29/17	Wellington Laboratories, Lot M2PFTeDA1112			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00003	05/22/20	Wellington Laboratories, Lot M4PFHpA0515			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00004	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00006	12/15/16	Wellington Laboratories, Lot M8FOSA1214I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00004	10/31/19	Wellington Laboratories, Lot MPFBA1014			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00004	04/13/19	Wellington Laboratories, Lot MPFDA0414			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00004	07/17/19	Wellington Laboratories, Lot MPFDoA0714			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00005	04/13/19	Wellington Laboratories, Lot MPFHxA0414			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00004	07/25/18	Wellington Laboratories, Lot MPFHxS0713			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00003	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00007	04/10/20	Wellington Laboratories, Lot MPFOA0415			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00009	05/15/20	Wellington Laboratories, Lot MPFOS0515			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00005	10/31/19	Wellington Laboratories, Lot MPFUdA1014			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00040	06/30/16	12/30/15	Methanol, Lot 090285	5 mL	LCPFCSP_00039	0.5 mL	Perfluorobutyric acid	0.1 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0884 ug/mL
							Perfluorodecanoic acid	0.1 ug/mL
							Perfluorododecanoic acid	0.1 ug/mL
							Perfluorodecane Sulfonic acid	0.0964 ug/mL
							Perfluoroheptanoic acid (PFHpA)	0.1 ug/mL
							Perfluoroheptanesulfonic Acid	0.0952 ug/mL
							Perfluorohexanoic acid	0.1 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorohexadecanoic acid	0.1 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.0946 ug/mL
							Perfluorononanoic acid (PFNA)	0.1 ug/mL
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL
							Perfluorooctandecanoic acid	0.1 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0956 ug/mL
							Perfluorooctane Sulfonamide	0.1 ug/mL
							Perfluoropentanoic acid	0.1 ug/mL
							Perfluorotetradecanoic acid	0.1 ug/mL
							Perfluorotridecanoic acid	0.1 ug/mL
							Perfluoroundecanoic acid	0.1 ug/mL
..LCPFCSP_00039	06/30/16	12/30/15	Methanol, Lot 090285	5 mL	LCPFBA_00003	0.1 mL	Perfluorobutyric acid	1 ug/mL
					LCPFBSA_00001	0.1 mL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00003	0.1 mL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00003	0.1 mL	Perfluorododecanoic acid	1 ug/mL
					LCPFDSA_00001	0.1 mL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00004	0.1 mL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00001	0.1 mL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00003	0.1 mL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	0.1 mL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxSA_00001	0.1 mL	Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/mL
					LCPFNA_00004	0.1 mL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00004	0.1 mL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00004	0.1 mL	Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS_00004	0.1 mL	Perfluorooctanesulfonic acid (PFOS)	0.956 ug/mL
					LCPFOSA_00005	0.1 mL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00003	0.1 mL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00003	0.1 mL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00003	0.1 mL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00003	0.1 mL	Perfluoroundecanoic acid	1 ug/mL
...LCPFBA_00003	03/05/18	Wellington Laboratories, Lot PFBA0313			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
...LCPFBSA_00001	10/09/19	Wellington Laboratories, Lot LPFBS1014			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
...LCPFDA_00003	06/18/18	Wellington Laboratories, Lot PFDA0613			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
...LCPFDoA_00003	01/03/18	Wellington Laboratories, Lot PFDoA0113			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
...LCPFDSA_00001	09/13/18	Wellington Laboratories, Lot LPFDS0913			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
...LCPFHpA_00004	05/09/19	Wellington Laboratories, Lot PFHpA0514			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
...LCPFHpSA_00001	11/21/17	Wellington Laboratories, Lot LPFHpS1112			(Purchased Reagent)		Perfluoroheptanesulfonic Acid	47.6 ug/mL
...LCPFHxA_00003	05/09/19	Wellington Laboratories, Lot PFHxA0514			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
...LCPFHxDA_00004	11/28/17	Wellington Laboratories, Lot PFHxDA0707			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
...LCPFHxSA_00001	05/09/19	Wellington Laboratories, Lot LPFHxS0514			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	47.3 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LCPFNA_00004	05/09/19	Wellington Laboratories, Lot PFNA0514			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
...LCPFOA_00004	10/11/18	Wellington Laboratories, Lot PFOA1013			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
...LCPFODA_00004	04/25/17	Wellington Laboratories, Lot PFODA0807			(Purchased Reagent)		Perfluorooctandecanoic acid	50 ug/mL
...LCPFOS_00004	06/20/19	Wellington Laboratories, Lot LPFOS0614			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	47.8 ug/mL
...LCPFOSA_00005	07/31/18	Wellington Laboratories, Lot FOSA0714I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
...LCPFPeA_00003	01/03/18	Wellington Laboratories, Lot PFPeA0113			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
...LCPFTeDA_00003	06/19/18	Wellington Laboratories, Lot PFTeDA0613			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
...LCPFTrDA_00003	12/10/18	Wellington Laboratories, Lot PFTrDA1213			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
...LCPFUdA_00003	06/19/18	Wellington Laboratories, Lot PFUdA0613			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC-L2_00019	06/29/16	01/08/16	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00024	250 uL	13C2-PFHxDA	50 ng/mL
							13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5-PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							18O2 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	50 ng/mL
					LCPFCSP_00040	50 uL	Perfluorobutyric acid	1 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.884 ng/mL
							Perfluorodecanoic acid	1 ng/mL
							Perfluorododecanoic acid	1 ng/mL
							Perfluorodecane Sulfonic acid	0.964 ng/mL
							Perfluoroheptanoic acid (PFHpA)	1 ng/mL
							Perfluoroheptanesulfonic Acid	0.952 ng/mL
							Perfluorohexanoic acid	1 ng/mL
							Perfluorohexadecanoic acid	1 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.946 ng/mL
							Perfluorononanoic acid (PFNA)	1 ng/mL
							Perfluorooctanoic acid (PFOA)	1 ng/mL
							Perfluorooctandecanoic acid	1 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.956 ng/mL
							Perfluorooctane Sulfonamide	1 ng/mL
							Perfluoropentanoic acid	1 ng/mL
							Perfluorotetradecanoic acid	1 ng/mL
							Perfluorotridecanoic acid	1 ng/mL
							Perfluoroundecanoic acid	1 ng/mL

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LCMPFCSU_00024	06/29/16	12/29/15	Methanol, Lot Baker 115491	10 mL	LCM2PFHxDA_00003	0.2 mL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00003	0.2 mL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00003	0.2 mL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00004	0.2 mL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00006	0.2 mL	13C8 FOSA	1 ug/mL
					LCMPFBA_00004	0.2 mL	13C4 PFBA	1 ug/mL
					LCMPFDA_00004	0.2 mL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00004	0.2 mL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00005	0.2 mL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00004	0.2 mL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00003	0.2 mL	13C5 PFNA	1 ug/mL
					LCMPFOA_00007	0.2 mL	13C4 PFOA	1 ug/mL
					LCMPFOS_00009	0.2 mL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00005	0.2 mL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00003	11/29/17	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00003	11/29/17	Wellington Laboratories, Lot M2PFTeDA1112			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00003	05/22/20	Wellington Laboratories, Lot M4PFHpA0515			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00004	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00006	12/15/16	Wellington Laboratories, Lot M8FOSA1214I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00004	10/31/19	Wellington Laboratories, Lot MPFBA1014			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00004	04/13/19	Wellington Laboratories, Lot MPFDA0414			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00004	07/17/19	Wellington Laboratories, Lot MPFDoA0714			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00005	04/13/19	Wellington Laboratories, Lot MPFHxA0414			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00004	07/25/18	Wellington Laboratories, Lot MPFHxS0713			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00003	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00007	04/10/20	Wellington Laboratories, Lot MPFOA0415			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00009	05/15/20	Wellington Laboratories, Lot MPFOS0515			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00005	10/31/19	Wellington Laboratories, Lot MPFUdA1014			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00040	06/30/16	12/30/15	Methanol, Lot 090285	5 mL	LCPFCSP_00039	0.5 mL	Perfluorobutyric acid	0.1 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0884 ug/mL
							Perfluorodecanoic acid	0.1 ug/mL
							Perfluorododecanoic acid	0.1 ug/mL
							Perfluorodecane Sulfonic acid	0.0964 ug/mL
							Perfluoroheptanoic acid (PFHpA)	0.1 ug/mL
							Perfluoroheptanesulfonic Acid	0.0952 ug/mL
							Perfluorohexanoic acid	0.1 ug/mL
							Perfluorohexadecanoic acid	0.1 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.0946 ug/mL
							Perfluorononanoic acid (PFNA)	0.1 ug/mL
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL
							Perfluorooctandecanoic acid	0.1 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0956 ug/mL
							Perfluorooctane Sulfonamide	0.1 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluoropentanoic acid	0.1 ug/mL
							Perfluorotetradecanoic acid	0.1 ug/mL
							Perfluorotridecanoic acid	0.1 ug/mL
							Perfluoroundecanoic acid	0.1 ug/mL
..LCPFCSP_00039	06/30/16	12/30/15	Methanol, Lot 090285	5 mL	LCPFBA_00003	0.1 mL	Perfluorobutyric acid	1 ug/mL
					LCPFBSA_00001	0.1 mL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00003	0.1 mL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00003	0.1 mL	Perfluorododecanoic acid	1 ug/mL
					LCPFDSA_00001	0.1 mL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00004	0.1 mL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00001	0.1 mL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00003	0.1 mL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	0.1 mL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxSA_00001	0.1 mL	Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/mL
					LCPFNA_00004	0.1 mL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00004	0.1 mL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00004	0.1 mL	Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS_00004	0.1 mL	Perfluorooctanesulfonic acid (PFOS)	0.956 ug/mL
					LCPFOSA_00005	0.1 mL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00003	0.1 mL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00003	0.1 mL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00003	0.1 mL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00003	0.1 mL	Perfluoroundecanoic acid	1 ug/mL
...LCPFBA_00003	03/05/18	Wellington Laboratories, Lot PFBA0313			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
...LCPFBSA_00001	10/09/19	Wellington Laboratories, Lot LPFBS1014			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
...LCPFDA_00003	06/18/18	Wellington Laboratories, Lot PFDA0613			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
...LCPFDoA_00003	01/03/18	Wellington Laboratories, Lot PFDoA0113			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
...LCPFDSA_00001	09/13/18	Wellington Laboratories, Lot LPFDS0913			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
...LCPFHpA_00004	05/09/19	Wellington Laboratories, Lot PFHpA0514			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
...LCPFHpSA_00001	11/21/17	Wellington Laboratories, Lot LPFHpS1112			(Purchased Reagent)		Perfluoroheptanesulfonic Acid	47.6 ug/mL
...LCPFHxA_00003	05/09/19	Wellington Laboratories, Lot PFHxA0514			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
...LCPFHxDA_00004	11/28/17	Wellington Laboratories, Lot PFHxDA0707			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
...LCPFHxSA_00001	05/09/19	Wellington Laboratories, Lot LPFHxS0514			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	47.3 ug/mL
...LCPFNA_00004	05/09/19	Wellington Laboratories, Lot PFNA0514			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
...LCPFOA_00004	10/11/18	Wellington Laboratories, Lot PFOA1013			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
...LCPFODA_00004	04/25/17	Wellington Laboratories, Lot PFODA0807			(Purchased Reagent)		Perfluorooctandecanoic acid	50 ug/mL
...LCPFOS_00004	06/20/19	Wellington Laboratories, Lot LPFOS0614			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	47.8 ug/mL
...LCPFOSA_00005	07/31/18	Wellington Laboratories, Lot FOSA0714I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
...LCPFPeA_00003	01/03/18	Wellington Laboratories, Lot PFPeA0113			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
...LCPFTeDA_00003	06/19/18	Wellington Laboratories, Lot PFTeDA0613			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
...LCPFTrDA_00003	12/10/18	Wellington Laboratories, Lot PFTrDA1213			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LCPFUdA_00003	06/19/18	Wellington Laboratories, Lot PFUdA0613			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC-L3_00016	06/29/16	12/30/15	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00024	250 uL	13C2-PFHxDA	50 ng/mL
							13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5-PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							18O2 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	50 ng/mL
					LCPFCSP_00040	250 uL	Perfluorobutyric acid	5 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	4.42 ng/mL
							Perfluorodecanoic acid	5 ng/mL
							Perfluorododecanoic acid	5 ng/mL
							Perfluorodecane Sulfonic acid	4.82 ng/mL
							Perfluoroheptanoic acid (PFHpA)	5 ng/mL
							Perfluoroheptanesulfonic Acid	4.76 ng/mL
							Perfluorohexanoic acid	5 ng/mL
							Perfluorohexadecanoic acid	5 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	4.73 ng/mL
							Perfluorononanoic acid (PFNA)	5 ng/mL
							Perfluorooctanoic acid (PFOA)	5 ng/mL
							Perfluorooctandecanoic acid	5 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	4.78 ng/mL
							Perfluorooctane Sulfonamide	5 ng/mL
							Perfluoropentanoic acid	5 ng/mL
							Perfluorotetradecanoic acid	5 ng/mL
							Perfluorotridecanoic acid	5 ng/mL
							Perfluoroundecanoic acid	5 ng/mL
.LCMPFCSU_00024	06/29/16	12/29/15	Methanol, Lot Baker 115491	10 mL	LCM2PFHxDA_00003	0.2 mL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00003	0.2 mL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00003	0.2 mL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00004	0.2 mL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00006	0.2 mL	13C8 FOSA	1 ug/mL
					LCMPFBA_00004	0.2 mL	13C4 PFBA	1 ug/mL
					LCMPFDA_00004	0.2 mL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00004	0.2 mL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00005	0.2 mL	13C2 PFHxA	1 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCMPFHxS_00004	0.2 mL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00003	0.2 mL	13C5 PFNA	1 ug/mL
					LCMPFOA_00007	0.2 mL	13C4 PFOA	1 ug/mL
					LCMPFOS_00009	0.2 mL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00005	0.2 mL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00003	11/29/17	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00003	11/29/17	Wellington Laboratories, Lot M2PFTeDA1112			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00003	05/22/20	Wellington Laboratories, Lot M4PFHpA0515			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00004	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00006	12/15/16	Wellington Laboratories, Lot M8FOSA1214I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00004	10/31/19	Wellington Laboratories, Lot MPFBA1014			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00004	04/13/19	Wellington Laboratories, Lot MPFDA0414			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00004	07/17/19	Wellington Laboratories, Lot MPFDoA0714			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00005	04/13/19	Wellington Laboratories, Lot MPFHxA0414			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00004	07/25/18	Wellington Laboratories, Lot MPFHxS0713			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00003	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00007	04/10/20	Wellington Laboratories, Lot MPFOA0415			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00009	05/15/20	Wellington Laboratories, Lot MPFOS0515			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00005	10/31/19	Wellington Laboratories, Lot MPFUdA1014			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00040	06/30/16	12/30/15	Methanol, Lot 090285	5 mL	LCPFCSP_00039	0.5 mL	Perfluorobutyric acid	0.1 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0884 ug/mL
							Perfluorodecanoic acid	0.1 ug/mL
							Perfluorododecanoic acid	0.1 ug/mL
							Perfluorodecane Sulfonic acid	0.0964 ug/mL
							Perfluoroheptanoic acid (PFHpA)	0.1 ug/mL
							Perfluoroheptanesulfonic Acid	0.0952 ug/mL
							Perfluorohexanoic acid	0.1 ug/mL
							Perfluorohexadecanoic acid	0.1 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.0946 ug/mL
							Perfluorononanoic acid (PFNA)	0.1 ug/mL
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL
							Perfluorooctandecanoic acid	0.1 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0956 ug/mL
							Perfluorooctane Sulfonamide	0.1 ug/mL
							Perfluoropentanoic acid	0.1 ug/mL
							Perfluorotetradecanoic acid	0.1 ug/mL
							Perfluorotridecanoic acid	0.1 ug/mL
							Perfluoroundecanoic acid	0.1 ug/mL
..LCPFCSP_00039	06/30/16	12/30/15	Methanol, Lot 090285	5 mL	LCPFBA_00003	0.1 mL	Perfluorobutyric acid	1 ug/mL
					LCPFBSA_00001	0.1 mL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00003	0.1 mL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00003	0.1 mL	Perfluorododecanoic acid	1 ug/mL
					LCPFDSA_00001	0.1 mL	Perfluorodecane Sulfonic acid	0.964 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFHpA_00004	0.1 mL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00001	0.1 mL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00003	0.1 mL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	0.1 mL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxSA_00001	0.1 mL	Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/mL
					LCPFNA_00004	0.1 mL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00004	0.1 mL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00004	0.1 mL	Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS_00004	0.1 mL	Perfluorooctanesulfonic acid (PFOS)	0.956 ug/mL
					LCPFOSA_00005	0.1 mL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00003	0.1 mL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00003	0.1 mL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00003	0.1 mL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00003	0.1 mL	Perfluoroundecanoic acid	1 ug/mL
...LCPFBA_00003	03/05/18	Wellington Laboratories, Lot PFBA0313			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
...LCPFBSA_00001	10/09/19	Wellington Laboratories, Lot LPFBS1014			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
...LCPFDA_00003	06/18/18	Wellington Laboratories, Lot PFDA0613			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
...LCPFDoA_00003	01/03/18	Wellington Laboratories, Lot PFDoA0113			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
...LCPFDSA_00001	09/13/18	Wellington Laboratories, Lot LPFDS0913			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
...LCPFHpA_00004	05/09/19	Wellington Laboratories, Lot PFHpA0514			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
...LCPFHpSA_00001	11/21/17	Wellington Laboratories, Lot LPFHpS1112			(Purchased Reagent)		Perfluoroheptanesulfonic Acid	47.6 ug/mL
...LCPFHxA_00003	05/09/19	Wellington Laboratories, Lot PFHxA0514			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
...LCPFHxDA_00004	11/28/17	Wellington Laboratories, Lot PFHxDA0707			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
...LCPFHxSA_00001	05/09/19	Wellington Laboratories, Lot LPFHxS0514			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	47.3 ug/mL
...LCPFNA_00004	05/09/19	Wellington Laboratories, Lot PFNA0514			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
...LCPFOA_00004	10/11/18	Wellington Laboratories, Lot PFOA1013			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
...LCPFODA_00004	04/25/17	Wellington Laboratories, Lot PFODA0807			(Purchased Reagent)		Perfluorooctandecanoic acid	50 ug/mL
...LCPFOS_00004	06/20/19	Wellington Laboratories, Lot LPFOS0614			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	47.8 ug/mL
...LCPFOSA_00005	07/31/18	Wellington Laboratories, Lot FOSA0714I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
...LCPFPeA_00003	01/03/18	Wellington Laboratories, Lot PFPeA0113			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
...LCPFTeDA_00003	06/19/18	Wellington Laboratories, Lot PFTeDA0613			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
...LCPFTrDA_00003	12/10/18	Wellington Laboratories, Lot PFTrDA1213			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
...LCPFUdA_00003	06/19/18	Wellington Laboratories, Lot PFUdA0613			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC-L4_00017	06/29/16	12/30/15	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00024	250 uL	13C2-PFHxDA	50 ng/mL
							13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5-PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							13C2 PFHxA	50 ng/mL
							18O2 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	50 ng/mL
					LCPFCSP_00039	100 uL	Perfluorobutyric acid	20 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	17.68 ng/mL
							Perfluorodecanoic acid	20 ng/mL
							Perfluorododecanoic acid	20 ng/mL
							Perfluorodecane Sulfonic acid	19.28 ng/mL
							Perfluoroheptanoic acid (PFHpA)	20 ng/mL
							Perfluoroheptanesulfonic Acid	19.04 ng/mL
							Perfluorohexanoic acid	20 ng/mL
							Perfluorohexadecanoic acid	20 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	18.92 ng/mL
							Perfluorononanoic acid (PFNA)	20 ng/mL
							Perfluorooctanoic acid (PFOA)	20 ng/mL
							Perfluorooctandecanoic acid	20 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	19.12 ng/mL
							Perfluorooctane Sulfonamide	20 ng/mL
							Perfluoropentanoic acid	20 ng/mL
							Perfluorotetradecanoic acid	20 ng/mL
							Perfluorotridecanoic acid	20 ng/mL
							Perfluoroundecanoic acid	20 ng/mL
.LCMPFCSU_00024	06/29/16	12/29/15	Methanol, Lot Baker 115491	10 mL	LCM2PFHxDA_00003	0.2 mL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00003	0.2 mL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00003	0.2 mL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00004	0.2 mL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00006	0.2 mL	13C8 FOSA	1 ug/mL
					LCMPFBA_00004	0.2 mL	13C4 PFBA	1 ug/mL
					LCMPFDA_00004	0.2 mL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00004	0.2 mL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00005	0.2 mL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00004	0.2 mL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00003	0.2 mL	13C5 PFNA	1 ug/mL
					LCMPFOA_00007	0.2 mL	13C4 PFOA	1 ug/mL
					LCMPFOS_00009	0.2 mL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00005	0.2 mL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00003	11/29/17	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00003	11/29/17	Wellington Laboratories, Lot M2PFTeDA1112			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00003	05/22/20	Wellington Laboratories, Lot M4PFHpA0515			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00004	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCM8FOSA_00006	12/15/16	Wellington Laboratories, Lot M8FOSA1214I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00004	10/31/19	Wellington Laboratories, Lot MPFBA1014			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00004	04/13/19	Wellington Laboratories, Lot MPFDA0414			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00004	07/17/19	Wellington Laboratories, Lot MPFDoA0714			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00005	04/13/19	Wellington Laboratories, Lot MPFHxA0414			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00004	07/25/18	Wellington Laboratories, Lot MPFHxS0713			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00003	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00007	04/10/20	Wellington Laboratories, Lot MPFOA0415			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00009	05/15/20	Wellington Laboratories, Lot MPFOS0515			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00005	10/31/19	Wellington Laboratories, Lot MPFUdA1014			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00039	06/30/16	12/30/15	Methanol, Lot 090285	5 mL	LCPFBA_00003	0.1 mL	Perfluorobutyric acid	1 ug/mL
					LCPFBSA_00001	0.1 mL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00003	0.1 mL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00003	0.1 mL	Perfluorododecanoic acid	1 ug/mL
					LCPFDSA_00001	0.1 mL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00004	0.1 mL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00001	0.1 mL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00003	0.1 mL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	0.1 mL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxSA_00001	0.1 mL	Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/mL
					LCPFNA_00004	0.1 mL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00004	0.1 mL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00004	0.1 mL	Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS_00004	0.1 mL	Perfluorooctanesulfonic acid (PFOS)	0.956 ug/mL
					LCPFOSA_00005	0.1 mL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00003	0.1 mL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00003	0.1 mL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00003	0.1 mL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00003	0.1 mL	Perfluoroundecanoic acid	1 ug/mL
..LCPFBA_00003	03/05/18	Wellington Laboratories, Lot PFBA0313			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
..LCPFBSA_00001	10/09/19	Wellington Laboratories, Lot LPFBS1014			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00003	06/18/18	Wellington Laboratories, Lot PFDA0613			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
..LCPFDoA_00003	01/03/18	Wellington Laboratories, Lot PFDoA0113			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
..LCPFDSA_00001	09/13/18	Wellington Laboratories, Lot LPFDS0913			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
..LCPFHpA_00004	05/09/19	Wellington Laboratories, Lot PFHpA0514			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpSA_00001	11/21/17	Wellington Laboratories, Lot LPFHpS1112			(Purchased Reagent)		Perfluoroheptanesulfonic Acid	47.6 ug/mL
..LCPFHxA_00003	05/09/19	Wellington Laboratories, Lot PFHxA0514			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
..LCPFHxDA_00004	11/28/17	Wellington Laboratories, Lot PFHxDA0707			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
..LCPFHxSA_00001	05/09/19	Wellington Laboratories, Lot LPFHxS0514			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	47.3 ug/mL
..LCPFNA_00004	05/09/19	Wellington Laboratories, Lot PFNA0514			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFOA_00004	10/11/18	Wellington Laboratories, Lot PFOA1013			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFODA_00004	04/25/17	Wellington Laboratories, Lot PFODA0807			(Purchased Reagent)		Perfluorooctandecanoic acid	50 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFOS_00004	06/20/19	Wellington Laboratories, Lot LPFOS0614			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	47.8 ug/mL
..LCPFOSA_00005	07/31/18	Wellington Laboratories, Lot FOSA0714I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
..LCPFPeA_00003	01/03/18	Wellington Laboratories, Lot PFPeA0113			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFTeDA_00003	06/19/18	Wellington Laboratories, Lot PFTeDA0613			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
..LCPFTrDA_00003	12/10/18	Wellington Laboratories, Lot PFTrDA1213			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
..LCPFUdA_00003	06/19/18	Wellington Laboratories, Lot PFUdA0613			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC-L5_00016	06/29/16	12/30/15	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00024	250 uL	13C2-PFHxDA	50 ng/mL
							13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5-PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							18O2 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	50 ng/mL
					LCPFCSP_00039	250 uL	Perfluorobutyric acid	50 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	44.2 ng/mL
							Perfluorodecanoic acid	50 ng/mL
							Perfluorododecanoic acid	50 ng/mL
							Perfluorodecane Sulfonic acid	48.2 ng/mL
							Perfluoroheptanoic acid (PFHpA)	50 ng/mL
							Perfluoroheptanesulfonic Acid	47.6 ng/mL
							Perfluorohexanoic acid	50 ng/mL
							Perfluorohexadecanoic acid	50 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	47.3 ng/mL
							Perfluorononanoic acid (PFNA)	50 ng/mL
							Perfluorooctanoic acid (PFOA)	50 ng/mL
							Perfluorooctandecanoic acid	50 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	47.8 ng/mL
							Perfluorooctane Sulfonamide	50 ng/mL
							Perfluoropentanoic acid	50 ng/mL
							Perfluorotetradecanoic acid	50 ng/mL
							Perfluorotridecanoic acid	50 ng/mL
							Perfluoroundecanoic acid	50 ng/mL
.LCMPFCSU_00024	06/29/16	12/29/15	Methanol, Lot Baker 115491	10 mL	LCM2PFHxDA_00003	0.2 mL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00003	0.2 mL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00003	0.2 mL	13C4-PFHpA	1 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCM5PFPEA_00004	0.2 mL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00006	0.2 mL	13C8 FOSA	1 ug/mL
					LCMPFBA_00004	0.2 mL	13C4 PFBA	1 ug/mL
					LCMPFDA_00004	0.2 mL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00004	0.2 mL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00005	0.2 mL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00004	0.2 mL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00003	0.2 mL	13C5 PFNA	1 ug/mL
					LCMPFOA_00007	0.2 mL	13C4 PFOA	1 ug/mL
					LCMPFOS_00009	0.2 mL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00005	0.2 mL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00003	11/29/17	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00003	11/29/17	Wellington Laboratories, Lot M2PFTeDA1112			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00003	05/22/20	Wellington Laboratories, Lot M4PFHpA0515			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00004	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00006	12/15/16	Wellington Laboratories, Lot M8FOSA1214I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00004	10/31/19	Wellington Laboratories, Lot MPFBA1014			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00004	04/13/19	Wellington Laboratories, Lot MPFDA0414			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00004	07/17/19	Wellington Laboratories, Lot MPFDoA0714			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00005	04/13/19	Wellington Laboratories, Lot MPFHxA0414			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00004	07/25/18	Wellington Laboratories, Lot MPFHxS0713			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00003	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00007	04/10/20	Wellington Laboratories, Lot MPFOA0415			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00009	05/15/20	Wellington Laboratories, Lot MPFOS0515			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00005	10/31/19	Wellington Laboratories, Lot MPFUdA1014			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00039	06/30/16	12/30/15	Methanol, Lot 090285	5 mL	LCPFBA_00003	0.1 mL	Perfluorobutyric acid	1 ug/mL
					LCPFBSA_00001	0.1 mL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00003	0.1 mL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00003	0.1 mL	Perfluorododecanoic acid	1 ug/mL
					LCPFDSA_00001	0.1 mL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00004	0.1 mL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00001	0.1 mL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00003	0.1 mL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	0.1 mL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxSA_00001	0.1 mL	Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/mL
					LCPFNA_00004	0.1 mL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00004	0.1 mL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00004	0.1 mL	Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS_00004	0.1 mL	Perfluorooctanesulfonic acid (PFOS)	0.956 ug/mL
					LCPFOSA_00005	0.1 mL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00003	0.1 mL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00003	0.1 mL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00003	0.1 mL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00003	0.1 mL	Perfluoroundecanoic acid	1 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFBA_00003	03/05/18	Wellington Laboratories, Lot PFBA0313			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
..LCPFBSA_00001	10/09/19	Wellington Laboratories, Lot LPFBS1014			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00003	06/18/18	Wellington Laboratories, Lot PFDA0613			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
..LCPFDoA_00003	01/03/18	Wellington Laboratories, Lot PFDoA0113			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
..LCPFDSA_00001	09/13/18	Wellington Laboratories, Lot LPFDS0913			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
..LCPFHpA_00004	05/09/19	Wellington Laboratories, Lot PFHpA0514			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpSA_00001	11/21/17	Wellington Laboratories, Lot LPFHpS1112			(Purchased Reagent)		Perfluoroheptanesulfonic Acid	47.6 ug/mL
..LCPFHxA_00003	05/09/19	Wellington Laboratories, Lot PFHxA0514			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
..LCPFHxDA_00004	11/28/17	Wellington Laboratories, Lot PFHxDA0707			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
..LCPFHxSA_00001	05/09/19	Wellington Laboratories, Lot LPFHxS0514			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	47.3 ug/mL
..LCPFNA_00004	05/09/19	Wellington Laboratories, Lot PFNA0514			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFOA_00004	10/11/18	Wellington Laboratories, Lot PFOA1013			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFODA_00004	04/25/17	Wellington Laboratories, Lot PFODA0807			(Purchased Reagent)		Perfluorooctandecanoic acid	50 ug/mL
..LCPFOS_00004	06/20/19	Wellington Laboratories, Lot LPFOS0614			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	47.8 ug/mL
..LCPFOSA_00005	07/31/18	Wellington Laboratories, Lot FOSA0714I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
..LCPFPeA_00003	01/03/18	Wellington Laboratories, Lot PFPeA0113			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFTeDA_00003	06/19/18	Wellington Laboratories, Lot PFTeDA0613			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
..LCPFTrDA_00003	12/10/18	Wellington Laboratories, Lot PFTrDA1213			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
..LCPFUdA_00003	06/19/18	Wellington Laboratories, Lot PFUdA0613			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC-L6_00015	06/29/16	12/30/15	MeOH/H2O, Lot 090285	2 mL	LCMPFCSU_00024	100 uL	13C2-PFHxDA	50 ng/mL
							13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5-PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							18O2 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	50 ng/mL
					LCPFCSP_00039	400 uL	Perfluorobutyric acid	200 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	176.8 ng/mL
							Perfluorodecanoic acid	200 ng/mL
							Perfluorododecanoic acid	200 ng/mL
							Perfluorodecane Sulfonic acid	192.8 ng/mL
							Perfluoroheptanoic acid (PFHpA)	200 ng/mL
							Perfluoroheptanesulfonic Acid	190.4 ng/mL
							Perfluorohexanoic acid	200 ng/mL
							Perfluorohexadecanoic acid	200 ng/mL

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorohexanesulfonic acid (PFHxS)	189.2 ng/mL
							Perfluorononanoic acid (PFNA)	200 ng/mL
							Perfluorooctanoic acid (PFOA)	200 ng/mL
							Perfluorooctandecanoic acid	200 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	191.2 ng/mL
							Perfluorooctane Sulfonamide	200 ng/mL
							Perfluoropentanoic acid	200 ng/mL
							Perfluorotetradecanoic acid	200 ng/mL
							Perfluorotridecanoic acid	200 ng/mL
							Perfluoroundecanoic acid	200 ng/mL
.LCMPFCSU_00024	06/29/16	12/29/15	Methanol, Lot Baker 115491	10 mL	LCM2PFHxDA_00003	0.2 mL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00003	0.2 mL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00003	0.2 mL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00004	0.2 mL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00006	0.2 mL	13C8 FOSA	1 ug/mL
					LCMPFBA_00004	0.2 mL	13C4 PFBA	1 ug/mL
					LCMPFDA_00004	0.2 mL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00004	0.2 mL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00005	0.2 mL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00004	0.2 mL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00003	0.2 mL	13C5 PFNA	1 ug/mL
					LCMPFOA_00007	0.2 mL	13C4 PFOA	1 ug/mL
					LCMPFOS_00009	0.2 mL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00005	0.2 mL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00003	11/29/17	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00003	11/29/17	Wellington Laboratories, Lot M2PFTeDA1112			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00003	05/22/20	Wellington Laboratories, Lot M4PFHpA0515			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00004	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00006	12/15/16	Wellington Laboratories, Lot M8FOSA1214I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00004	10/31/19	Wellington Laboratories, Lot MPFBA1014			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00004	04/13/19	Wellington Laboratories, Lot MPFDA0414			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00004	07/17/19	Wellington Laboratories, Lot MPFDoA0714			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00005	04/13/19	Wellington Laboratories, Lot MPFHxA0414			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00004	07/25/18	Wellington Laboratories, Lot MPFHxS0713			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00003	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00007	04/10/20	Wellington Laboratories, Lot MPFOA0415			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00009	05/15/20	Wellington Laboratories, Lot MPFOS0515			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00005	10/31/19	Wellington Laboratories, Lot MPFUdA1014			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00039	06/30/16	12/30/15	Methanol, Lot 090285	5 mL	LCPFBA_00003	0.1 mL	Perfluorobutyric acid	1 ug/mL
					LCPFBSA_00001	0.1 mL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00003	0.1 mL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00003	0.1 mL	Perfluorododecanoic acid	1 ug/mL
					LCPFDSA_00001	0.1 mL	Perfluorodecane Sulfonic acid	0.964 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFHpA_00004	0.1 mL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00001	0.1 mL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00003	0.1 mL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	0.1 mL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxSA_00001	0.1 mL	Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/mL
					LCPFNA_00004	0.1 mL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00004	0.1 mL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00004	0.1 mL	Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS_00004	0.1 mL	Perfluorooctanesulfonic acid (PFOS)	0.956 ug/mL
					LCPFOSA_00005	0.1 mL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00003	0.1 mL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00003	0.1 mL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00003	0.1 mL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00003	0.1 mL	Perfluoroundecanoic acid	1 ug/mL
..LCPFBA_00003	03/05/18	Wellington Laboratories, Lot PFBA0313			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
..LCPFBSA_00001	10/09/19	Wellington Laboratories, Lot LPFBS1014			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00003	06/18/18	Wellington Laboratories, Lot PFDA0613			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
..LCPFDoA_00003	01/03/18	Wellington Laboratories, Lot PFDoA0113			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
..LCPFDSA_00001	09/13/18	Wellington Laboratories, Lot LPFDS0913			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
..LCPFHpA_00004	05/09/19	Wellington Laboratories, Lot PFHpA0514			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpSA_00001	11/21/17	Wellington Laboratories, Lot LPFHpS1112			(Purchased Reagent)		Perfluoroheptanesulfonic Acid	47.6 ug/mL
..LCPFHxA_00003	05/09/19	Wellington Laboratories, Lot PFHxA0514			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
..LCPFHxDA_00004	11/28/17	Wellington Laboratories, Lot PFHxDA0707			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
..LCPFHxSA_00001	05/09/19	Wellington Laboratories, Lot LPFHxS0514			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	47.3 ug/mL
..LCPFNA_00004	05/09/19	Wellington Laboratories, Lot PFNA0514			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFOA_00004	10/11/18	Wellington Laboratories, Lot PFOA1013			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFODA_00004	04/25/17	Wellington Laboratories, Lot PFODA0807			(Purchased Reagent)		Perfluorooctandecanoic acid	50 ug/mL
..LCPFOS_00004	06/20/19	Wellington Laboratories, Lot LPFOS0614			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	47.8 ug/mL
..LCPFOSA_00005	07/31/18	Wellington Laboratories, Lot FOSA0714I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
..LCPFPeA_00003	01/03/18	Wellington Laboratories, Lot PFPeA0113			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFTeDA_00003	06/19/18	Wellington Laboratories, Lot PFTeDA0613			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
..LCPFTrDA_00003	12/10/18	Wellington Laboratories, Lot PFTrDA1213			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
..LCPFUdA_00003	06/19/18	Wellington Laboratories, Lot PFUdA0613			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC-L7_00015	06/29/16	12/30/15	MeOH/H2O, Lot 090285	2 mL	LCMPFCSU_00024	100 uL	13C2-PFHxDA	50 ng/mL
							13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5-PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							13C2 PFHxA	50 ng/mL
							18O2 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	50 ng/mL
					LCPFCSP_00039	800 uL	Perfluorobutyric acid	400 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	353.6 ng/mL
							Perfluorodecanoic acid	400 ng/mL
							Perfluorododecanoic acid	400 ng/mL
							Perfluorodecane Sulfonic acid	385.6 ng/mL
							Perfluoroheptanoic acid (PFHpA)	400 ng/mL
							Perfluoroheptanesulfonic Acid	380.8 ng/mL
							Perfluorohexanoic acid	400 ng/mL
							Perfluorohexadecanoic acid	400 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	378.4 ng/mL
							Perfluorononanoic acid (PFNA)	400 ng/mL
							Perfluorooctanoic acid (PFOA)	400 ng/mL
							Perfluorooctandecanoic acid	400 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	382.4 ng/mL
							Perfluorooctane Sulfonamide	400 ng/mL
							Perfluoropentanoic acid	400 ng/mL
							Perfluorotetradecanoic acid	400 ng/mL
							Perfluorotridecanoic acid	400 ng/mL
							Perfluoroundecanoic acid	400 ng/mL
.LCMPFCSU_00024	06/29/16	12/29/15	Methanol, Lot Baker 115491	10 mL	LCM2PFHxDA_00003	0.2 mL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00003	0.2 mL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00003	0.2 mL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00004	0.2 mL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00006	0.2 mL	13C8 FOSA	1 ug/mL
					LCMPFBA_00004	0.2 mL	13C4 PFBA	1 ug/mL
					LCMPFDA_00004	0.2 mL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00004	0.2 mL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00005	0.2 mL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00004	0.2 mL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00003	0.2 mL	13C5 PFNA	1 ug/mL
					LCMPFOA_00007	0.2 mL	13C4 PFOA	1 ug/mL
					LCMPFOS_00009	0.2 mL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00005	0.2 mL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00003	11/29/17	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00003	11/29/17	Wellington Laboratories, Lot M2PFTeDA1112			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00003	05/22/20	Wellington Laboratories, Lot M4PFHpA0515			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00004	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCM8FOSA_00006	12/15/16	Wellington Laboratories, Lot M8FOSA1214I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00004	10/31/19	Wellington Laboratories, Lot MPFBA1014			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00004	04/13/19	Wellington Laboratories, Lot MPFDA0414			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00004	07/17/19	Wellington Laboratories, Lot MPFDoA0714			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00005	04/13/19	Wellington Laboratories, Lot MPFHxA0414			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00004	07/25/18	Wellington Laboratories, Lot MPFHxS0713			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00003	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00007	04/10/20	Wellington Laboratories, Lot MPFOA0415			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00009	05/15/20	Wellington Laboratories, Lot MPFOS0515			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00005	10/31/19	Wellington Laboratories, Lot MPFUdA1014			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00039	06/30/16	12/30/15	Methanol, Lot 090285	5 mL	LCPFBA_00003	0.1 mL	Perfluorobutyric acid	1 ug/mL
					LCPFBSA_00001	0.1 mL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00003	0.1 mL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00003	0.1 mL	Perfluorododecanoic acid	1 ug/mL
					LCPFDSA_00001	0.1 mL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00004	0.1 mL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00001	0.1 mL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00003	0.1 mL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	0.1 mL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxSA_00001	0.1 mL	Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/mL
					LCPFNA_00004	0.1 mL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00004	0.1 mL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00004	0.1 mL	Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS_00004	0.1 mL	Perfluorooctanesulfonic acid (PFOS)	0.956 ug/mL
					LCPFOSA_00005	0.1 mL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00003	0.1 mL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00003	0.1 mL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00003	0.1 mL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00003	0.1 mL	Perfluoroundecanoic acid	1 ug/mL
..LCPFBA_00003	03/05/18	Wellington Laboratories, Lot PFBA0313			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
..LCPFBSA_00001	10/09/19	Wellington Laboratories, Lot LPFBS1014			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00003	06/18/18	Wellington Laboratories, Lot PFDA0613			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
..LCPFDoA_00003	01/03/18	Wellington Laboratories, Lot PFDoA0113			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
..LCPFDSA_00001	09/13/18	Wellington Laboratories, Lot LPFDS0913			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
..LCPFHpA_00004	05/09/19	Wellington Laboratories, Lot PFHpA0514			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpSA_00001	11/21/17	Wellington Laboratories, Lot LPFHpS1112			(Purchased Reagent)		Perfluoroheptanesulfonic Acid	47.6 ug/mL
..LCPFHxA_00003	05/09/19	Wellington Laboratories, Lot PFHxA0514			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
..LCPFHxDA_00004	11/28/17	Wellington Laboratories, Lot PFHxDA0707			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
..LCPFHxSA_00001	05/09/19	Wellington Laboratories, Lot LPFHxS0514			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	47.3 ug/mL
..LCPFNA_00004	05/09/19	Wellington Laboratories, Lot PFNA0514			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFOA_00004	10/11/18	Wellington Laboratories, Lot PFOA1013			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFODA_00004	04/25/17	Wellington Laboratories, Lot PFODA0807			(Purchased Reagent)		Perfluorooctandecanoic acid	50 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFOS_00004	06/20/19	Wellington Laboratories, Lot LPFOS0614			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	47.8 ug/mL
..LCPFOSA_00005	07/31/18	Wellington Laboratories, Lot FOSA0714I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
..LCPFPeA_00003	01/03/18	Wellington Laboratories, Lot PFPeA0113			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFTeDA_00003	06/19/18	Wellington Laboratories, Lot PFTeDA0613			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
..LCPFTrDA_00003	12/10/18	Wellington Laboratories, Lot PFTrDA1213			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
..LCPFUdA_00003	06/19/18	Wellington Laboratories, Lot PFUdA0613			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFCIC_00014	03/15/16	09/15/15	MeOH/H2O, Lot 09285	5 mL	LCMPFCSU_00018	250 uL	18O2 PFHxS	47.3 ng/mL
					LCPFACMXB_00006	125 uL	Perfluorohexanesulfonic acid (PFHxS)	47.25 ng/mL
.LCMPFCSU_00018	03/15/16	09/15/15	Methanol, Lot Fisher 153635	10 mL	LCMPFHxS_00003	0.2 mL	18O2 PFHxS	0.946 ug/mL
..LCMPFHxS_00003	07/25/18	Wellington Laboratories, Lot MPFHxS0713			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
.LCPFACMXB_00006	01/08/18	Wellington Laboratories, Lot PFACMXB0312			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	1.89 ug/mL
LCPFCIC_00016	06/16/16	12/22/15	MeOH/H2O, Lot 09285	5 mL	LCMPFCSU_00023	250 uL	13C2-PFHxDA	50 ng/mL
							13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5-PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							18O2 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	50 ng/mL
					LCPFACMXB_00008	125 uL	Perfluorobutanesulfonic acid (PFBS)	44.25 ng/mL
							Perfluoroheptanoic acid (PFHpA)	50 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	47.25 ng/mL
							Perfluorononanoic acid (PFNA)	50 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	47.75 ng/mL
							Perfluorooctanoic acid (PFOA)	50 ng/mL
.LCMPFCSU_00023	06/21/16	12/21/15	Methanol, Lot Baker 115491	5 mL	LCM2PFHxDA_00002	0.1 mL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00003	0.1 mL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00003	0.1 mL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00004	0.1 mL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00006	0.1 mL	13C8 FOSA	1 ug/mL
					LCMPFBA_00004	0.1 mL	13C4 PFBA	1 ug/mL
					LCMPFDA_00005	0.1 mL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00003	0.1 mL	13C2 PFDoA	1 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCMPFHxA_00006	0.1 mL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00004	0.1 mL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00003	0.1 mL	13C5 PFNA	1 ug/mL
					LCMPFOA_00007	0.1 mL	13C4 PFOA	1 ug/mL
					LCMPFOS_00009	0.1 mL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00004	0.1 mL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00002	11/29/17	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00003	11/29/17	Wellington Laboratories, Lot M2PFTeDA1112			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00003	05/22/20	Wellington Laboratories, Lot M4PFHpA0515			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00004	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00006	12/15/16	Wellington Laboratories, Lot M8FOSA1214I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00004	10/31/19	Wellington Laboratories, Lot MPFBA1014			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00005	04/13/19	Wellington Laboratories, Lot MPFDA0414			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00003	07/17/19	Wellington Laboratories, Lot MPFDoA0714			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00006	04/13/19	Wellington Laboratories, Lot MPFHxA0414			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00004	07/25/18	Wellington Laboratories, Lot MPFHxS0713			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00003	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00007	04/10/20	Wellington Laboratories, Lot MPFOA0415			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00009	05/15/20	Wellington Laboratories, Lot MPFOS0515			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00004	10/31/19	Wellington Laboratories, Lot MPFUdA1014			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFACMXB_00008	06/20/19	Wellington Laboratories, Lot PFACMXB0614			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1.77 ug/mL
							Perfluoroheptanoic acid (PFHpA)	2 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	1.89 ug/mL
							Perfluorononanoic acid (PFNA)	2 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	1.91 ug/mL
							Perfluorooctanoic acid (PFOA)	2 ug/mL
LCPFCSP_00039	06/30/16	12/30/15	Methanol, Lot 090285	5 mL	LCPFBA_00003	0.1 mL	Perfluorobutyric acid	1 ug/mL
					LCPFBS_00003	0.1 mL	Perfluorobutane Sulfonate	0.884 ug/mL
					LCPFBSA_00001	0.1 mL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00003	0.1 mL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00003	0.1 mL	Perfluorododecanoic acid	1 ug/mL
					LCPFDoS_00003	0.1 mL	PFDoS (Perflouro-1-dodecanesulfonate)	0.968 ug/mL
					LCPFDS_00003	0.1 mL	Perfluorodecane Sulfonate	0.964 ug/mL
					LCPFDSA_00001	0.1 mL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00004	0.1 mL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpS_00005	0.1 mL	Perfluoroheptane Sulfonate	0.952 ug/mL
					LCPFHpSA_00001	0.1 mL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00003	0.1 mL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	0.1 mL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS_00003	0.1 mL	Perfluorohexane Sulfonate	0.946 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFHxSA_00001	0.1 mL	Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/mL
					LCPFNA_00004	0.1 mL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFNS_00002	0.1 mL	PFNS (Perflouro-1-nonanesulfonate)	0.96 ug/mL
					LCPFOA_00004	0.1 mL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00004	0.1 mL	Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS_00004	0.1 mL	Perfluorooctanesulfonic acid (PFOS)	0.956 ug/mL
					LCPFOSA_00005	0.1 mL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00003	0.1 mL	Perfluoropentanoic acid	1 ug/mL
					LCPFPeS_00002	0.1 mL	PFPeS (Perflouro-1-pentanesulfonate)	0.938 ug/mL
					LCPFTeDA_00003	0.1 mL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00003	0.1 mL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00003	0.1 mL	Perfluoroundecanoic acid	1 ug/mL
.LCPFBA_00003	03/05/18	Wellington Laboratories, Lot PFBA0313			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
.LCPFBS_00003	10/09/19	Wellington Laboratories, Lot LPFBS1014			(Purchased Reagent)		Perfluorobutane Sulfonate	44.2 ug/mL
.LCPFBSA_00001	10/09/19	Wellington Laboratories, Lot LPFBS1014			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
.LCPFDA_00003	06/18/18	Wellington Laboratories, Lot PFDA0613			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
.LCPFDoA_00003	01/03/18	Wellington Laboratories, Lot PFDoA0113			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
.LCPFDoS_00003	10/06/16	Wellington Laboratories, Lot LPFDoS1011			(Purchased Reagent)		PFDoS (Perflouro-1-dodecanesulfonate)	48.4 ug/mL
.LCPFDS_00003	09/13/18	Wellington Laboratories, Lot LPFDS0913			(Purchased Reagent)		Perfluorodecane Sulfonate	48.2 ug/mL
.LCPFDSA_00001	09/13/18	Wellington Laboratories, Lot LPFDS0913			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
.LCPFHpA_00004	05/09/19	Wellington Laboratories, Lot PFHpA0514			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
.LCPFHpS_00005	01/28/19	Wellington Laboratories, Lot LPFHpS0114			(Purchased Reagent)		Perfluoroheptane Sulfonate	47.6 ug/mL
.LCPFHpSA_00001	11/21/17	Wellington Laboratories, Lot LPFHpS1112			(Purchased Reagent)		Perfluoroheptanesulfonic Acid	47.6 ug/mL
.LCPFHxA_00003	05/09/19	Wellington Laboratories, Lot PFHxA0514			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
.LCPFHxDA_00004	11/28/17	Wellington Laboratories, Lot PFHxDA0707			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
.LCPFHxS_00003	05/09/19	Wellington Laboratories, Lot LPFHxS0514			(Purchased Reagent)		Perfluorohexane Sulfonate	47.3 ug/mL
.LCPFHxSA_00001	05/09/19	Wellington Laboratories, Lot LPFHxS0514			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	47.3 ug/mL
.LCPFNA_00004	05/09/19	Wellington Laboratories, Lot PFNA0514			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
.LCPFNS_00002	07/04/17	Wellington Laboratories, Lot LPFNS0712			(Purchased Reagent)		PFNS (Perflouro-1-nonanesulfonate)	48 ug/mL
.LCPFOA_00004	10/11/18	Wellington Laboratories, Lot PFOA1013			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
.LCPFODA_00004	04/25/17	Wellington Laboratories, Lot PFODA0807			(Purchased Reagent)		Perfluorooctandecanoic acid	50 ug/mL
.LCPFOS_00004	06/20/19	Wellington Laboratories, Lot LPFOS0614			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	47.8 ug/mL
.LCPFOSA_00005	07/31/18	Wellington Laboratories, Lot FOSA0714I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
.LCPFPeA_00003	01/03/18	Wellington Laboratories, Lot PFPeA0113			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
.LCPFPeS_00002	07/04/17	Wellington Laboratories, Lot LPFPeS0712			(Purchased Reagent)		PFPeS (Perflouro-1-pentanesulfonate)	46.9 ug/mL
.LCPFTeDA_00003	06/19/18	Wellington Laboratories, Lot PFTeDA0613			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
.LCPFTrDA_00003	12/10/18	Wellington Laboratories, Lot PFTrDA1213			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LCPFUdA_00003	06/19/18	Wellington Laboratories, Lot PFUdA0613			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL

Reagent

LCM2PFHxDA_00002

Rec: 8/14/14 SKV

Scanned: 8/18/14 STV

318141
ID: LCM2PFHxDA_00002
Exp: 11/29/17 Prpd: SKV
13C2-PFHxDA at 50ug/mL

WELLINGTON LABORATORIES

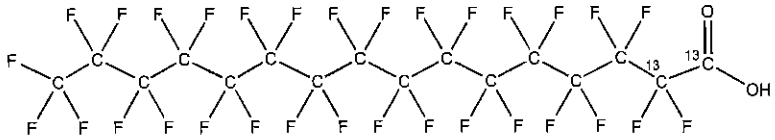
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M2PFHxDA
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]hexadecanoic acid

LOT NUMBER: M2PFHxDA1112

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_{14}HF_{31}O_2$	**MOLECULAR WEIGHT:**	816.11
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	11/29/2012		
EXPIRY DATE: (mm/dd/yyyy)	11/29/2017		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 01/10/2013 (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. They are designed to be used as reference standards for the identification and/or quantification of specific chemical compound(s).

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. Material Safety Data Sheets (MSDSs) 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, 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 and/or LC/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 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 17025:2005 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 for the period of time specified by the 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:

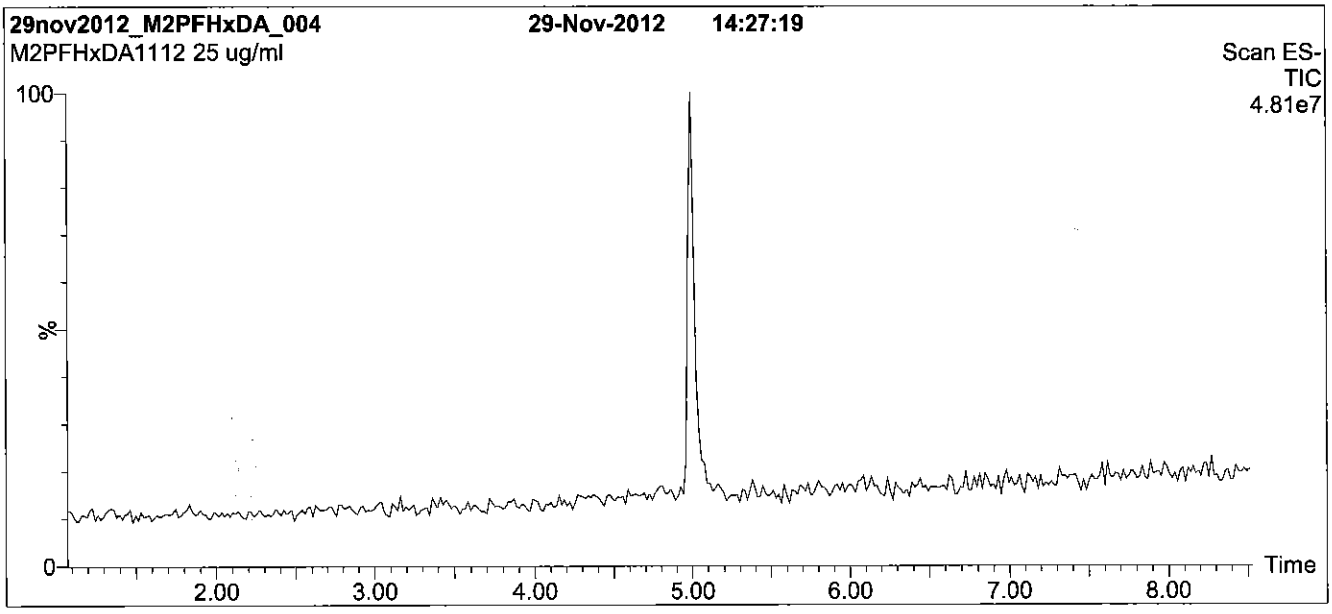
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

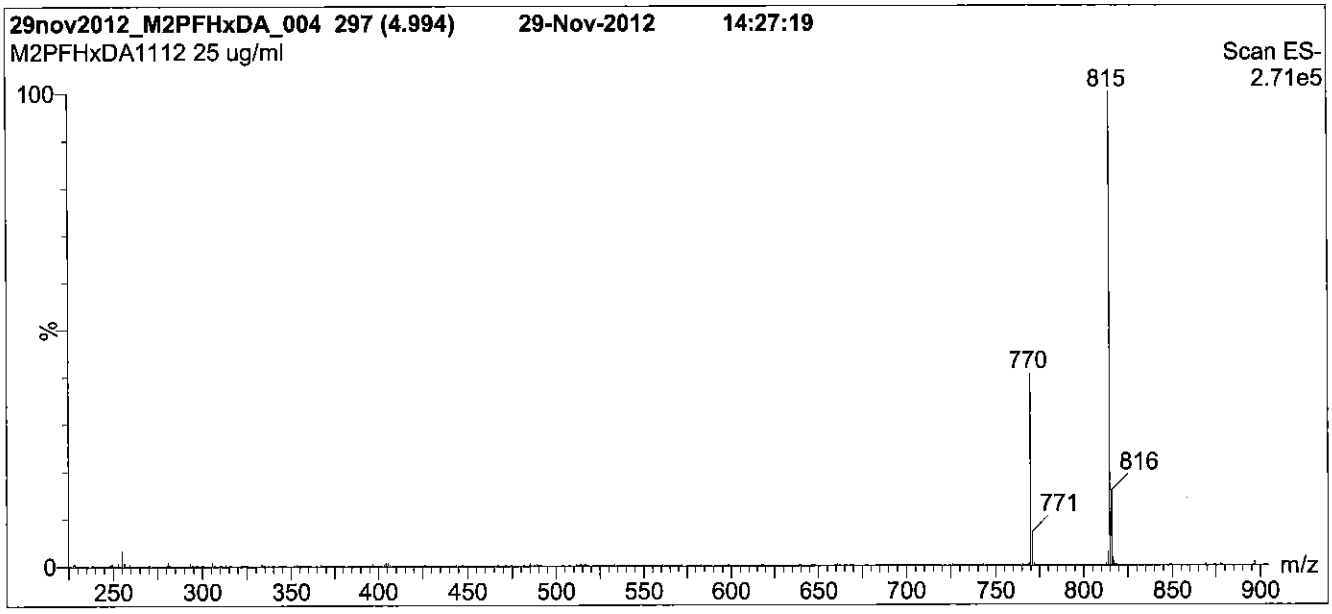
CALA Testing Accreditation No. A1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

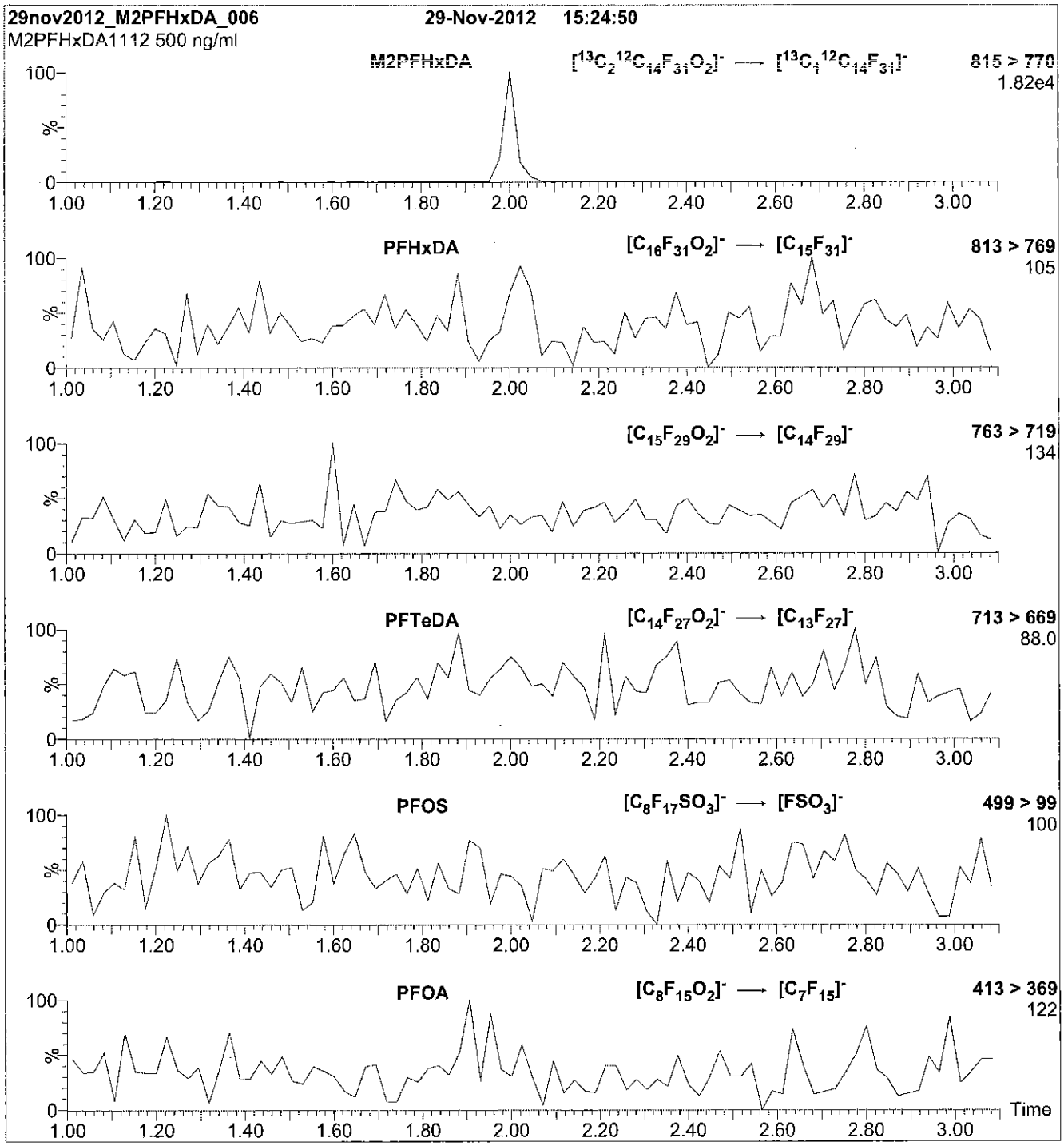
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 1200 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCM2PFHxDA_00003

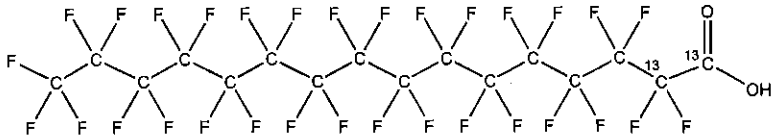
r: 12/9/15 SW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2PFHxDA
LOT NUMBER: M2PFHxDA1112
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]hexadecanoic acid

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_{14}HF_{31}O_2$	**MOLECULAR WEIGHT:**	816.11
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	11/29/2012		
EXPIRY DATE: (mm/dd/yyyy)	11/29/2017		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

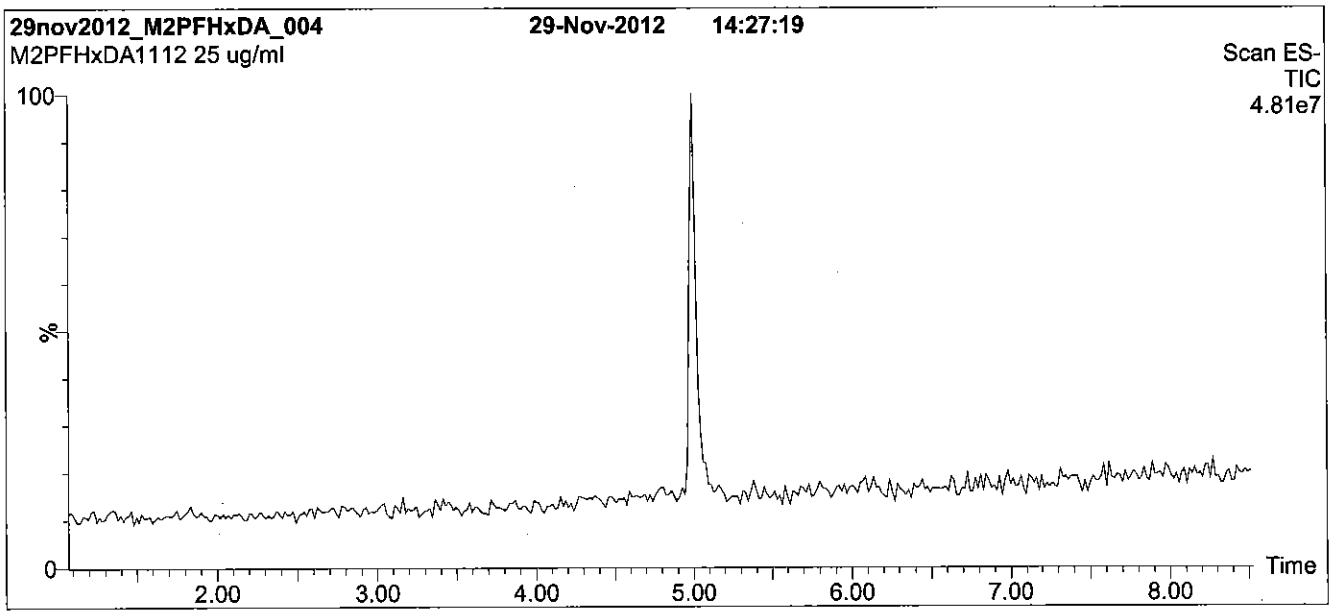
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

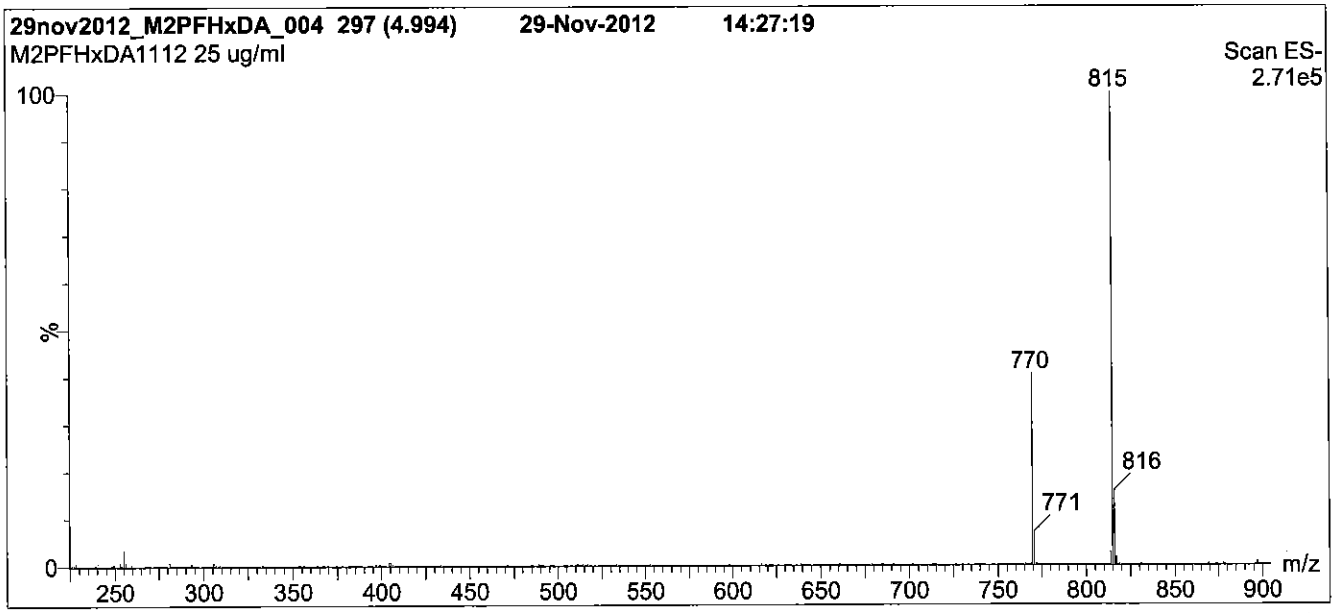
CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

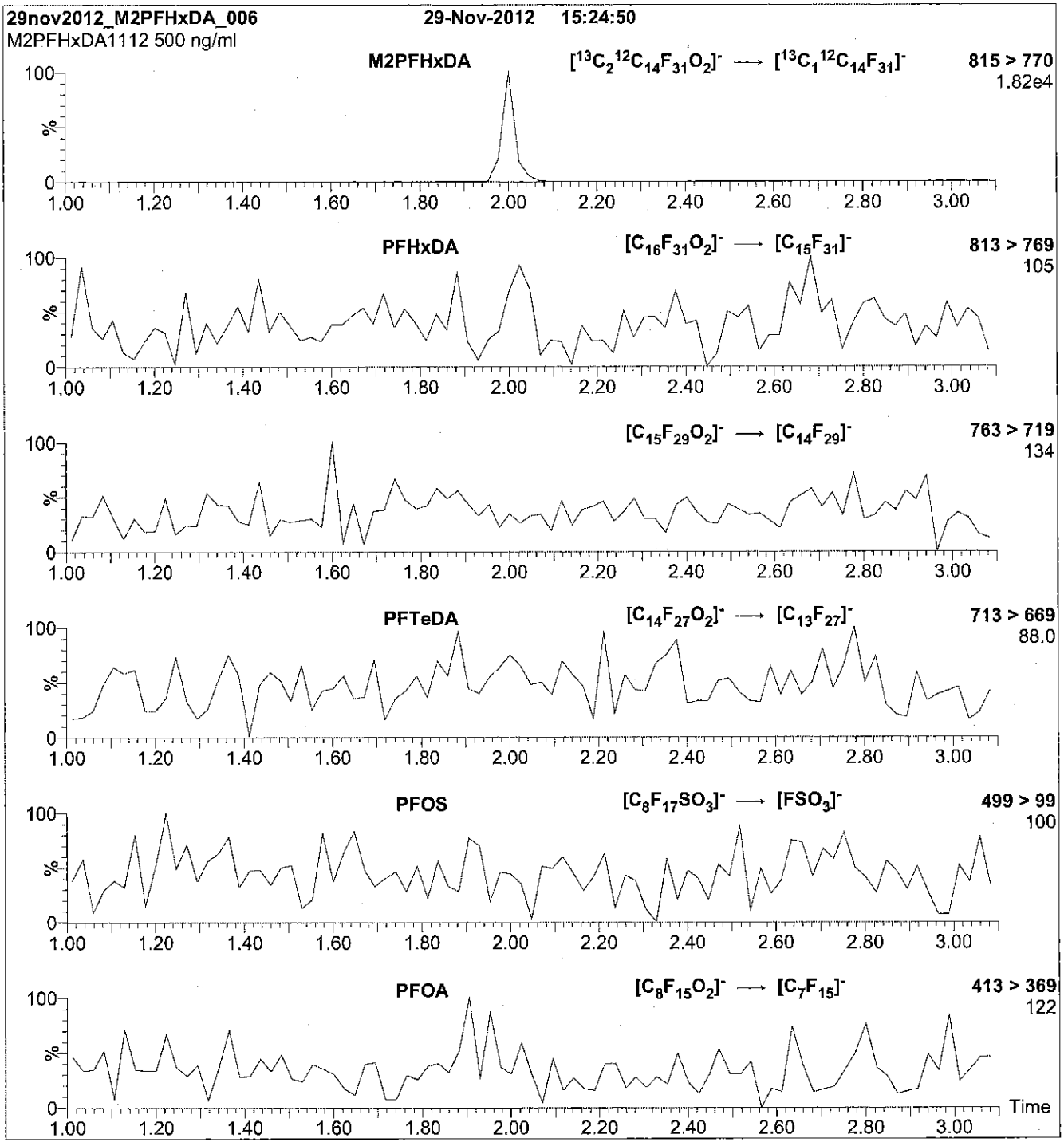
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 1200 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

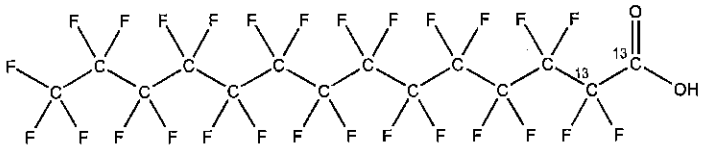
LCM2PFTeDA_00003

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M2PFTeDA
LOT NUMBER: M2PFTeDA1112
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)	11/29/2012		
EXPIRY DATE: (mm/dd/yyyy)	11/29/2017		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

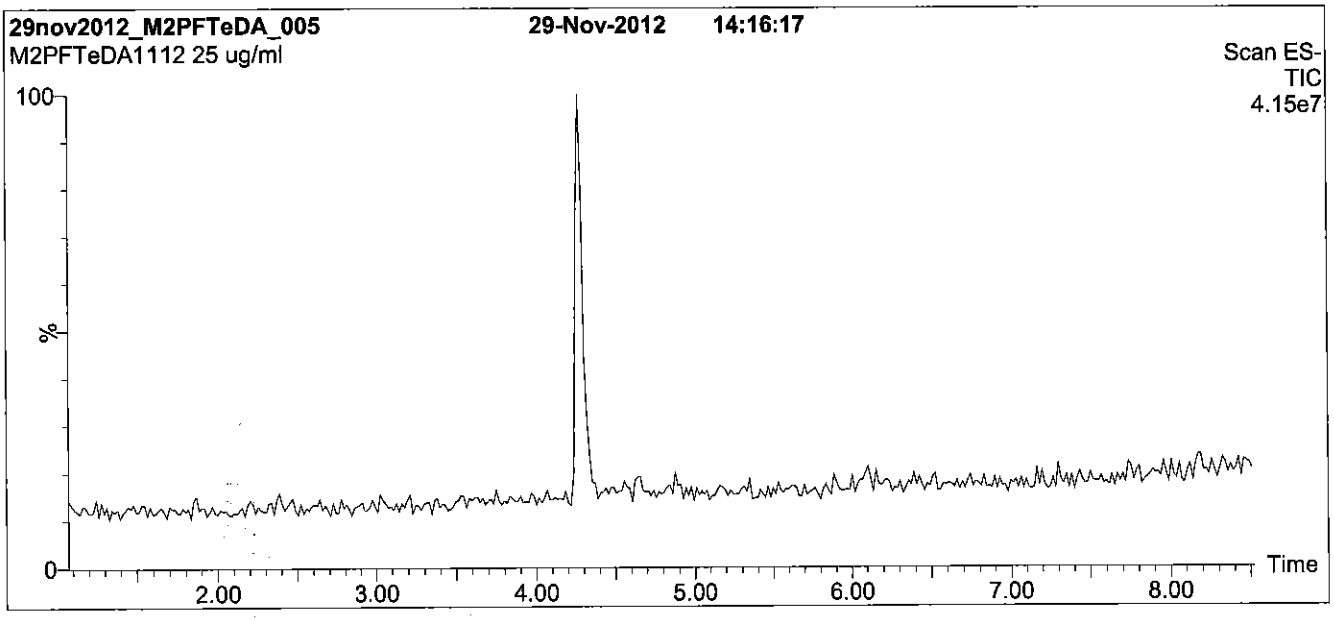
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

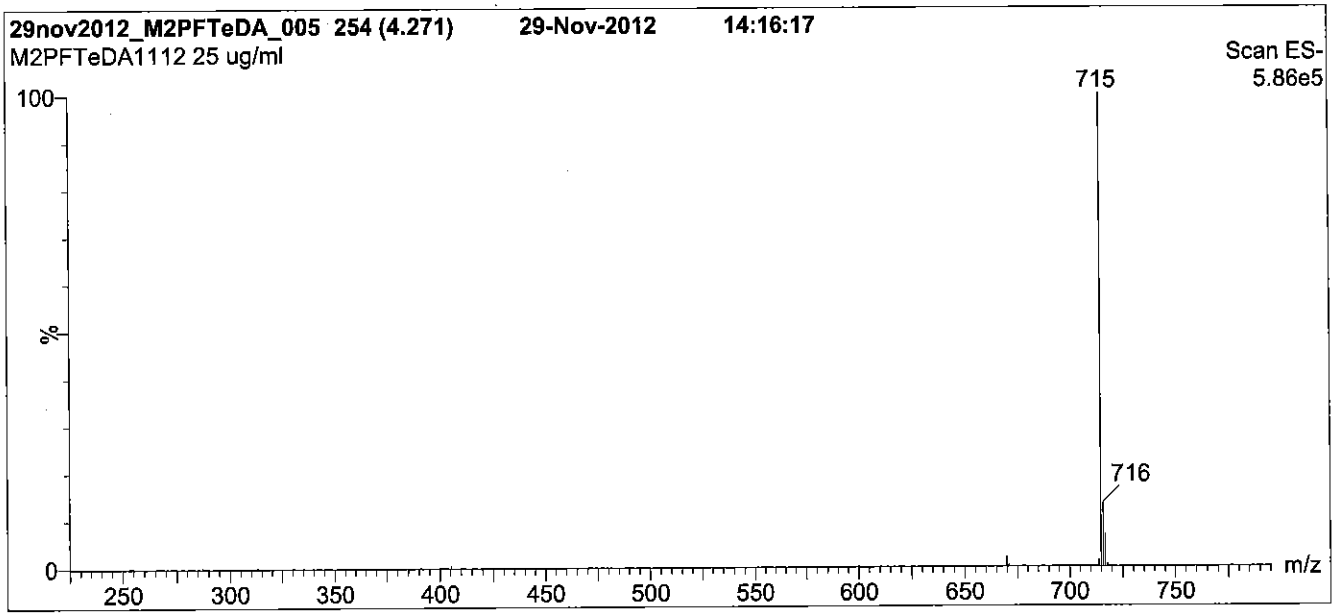
CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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

Figure 1: **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: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 100% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

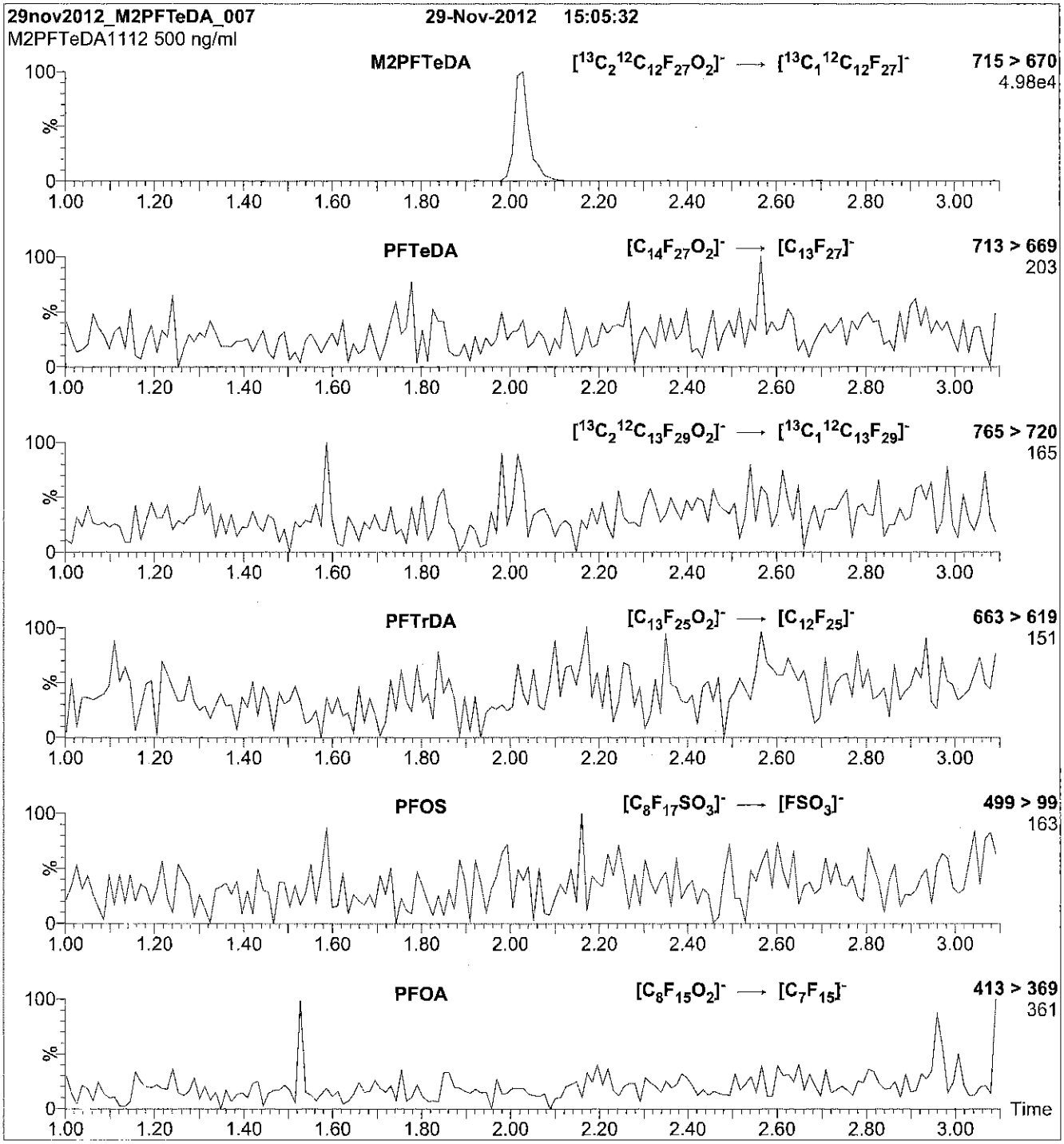
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 1200 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.66e-3
Collision Energy (eV) = 14

Reagent

LCM4PFHPA_00003

V: 11/10/15 SEV

WELLINGTON LABORATORIES

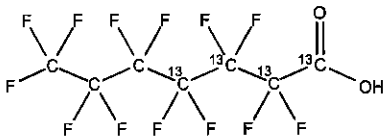
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

LOT NUMBER: M4PFHpA0515

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_4{}^{12}C_3HF_{13}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 05/22/2015
EXPIRY DATE: (mm/dd/yyyy) 05/22/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

MOLECULAR WEIGHT: 368.03
SOLVENT(S): Methanol
Water (<1%)

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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

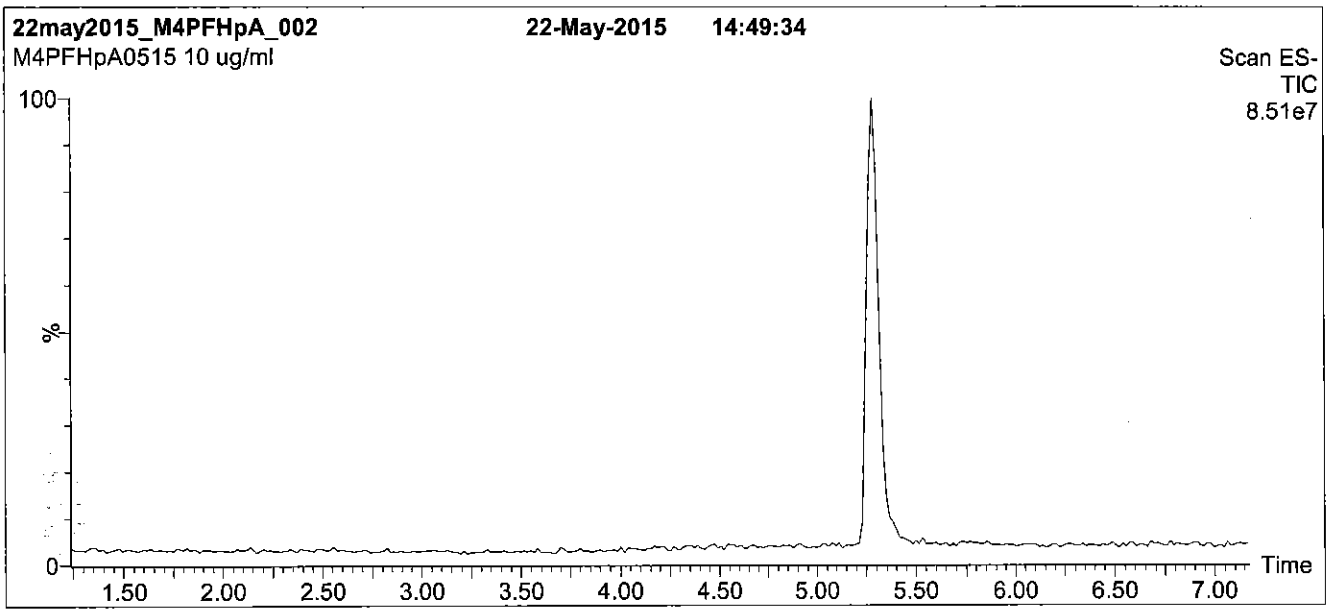
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

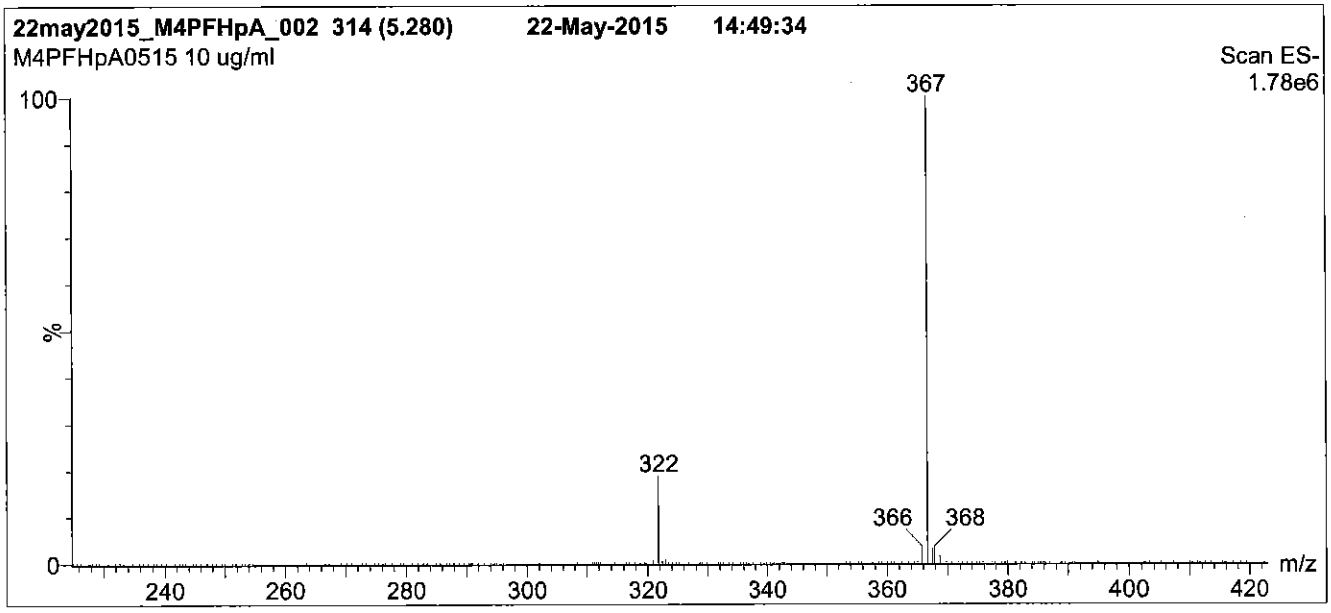
CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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

Figure 1: **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: 40% (80:20 MeOH:ACN) / 60% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

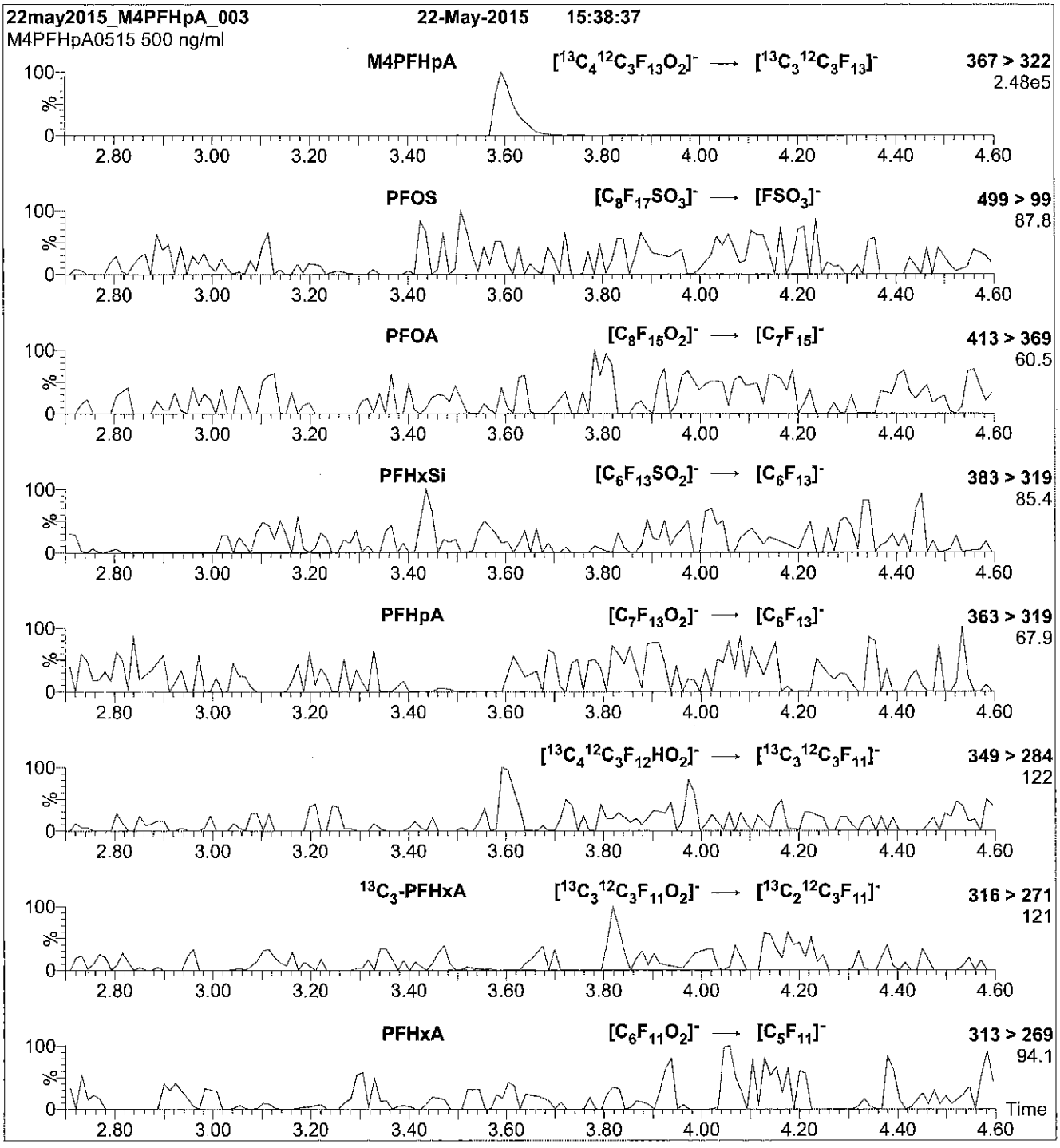
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCM5PFPEA_00004

V1 11/10/15 SRA

WELLINGTON LABORATORIES

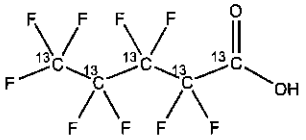
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M5PFPeA
COMPOUND: Perfluoro-n-[$^{13}C_5$]pentanoic acid

LOT NUMBER: M5PFPeA0515

STRUCTURE:

CAS #: Not available



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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

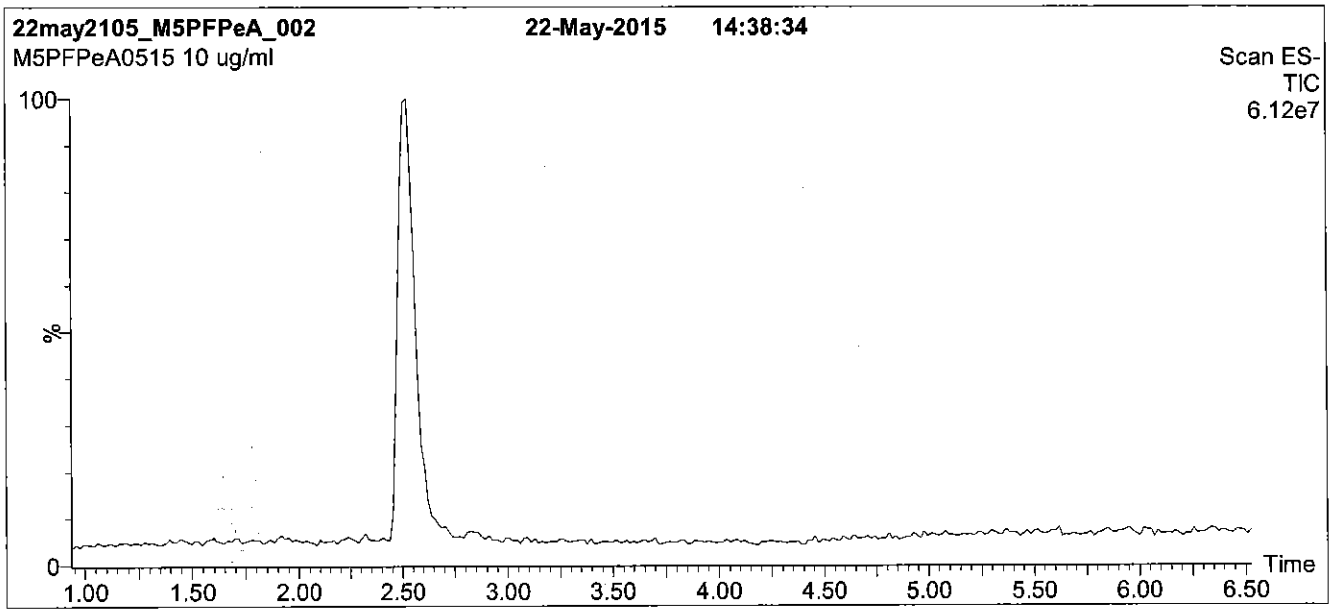
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

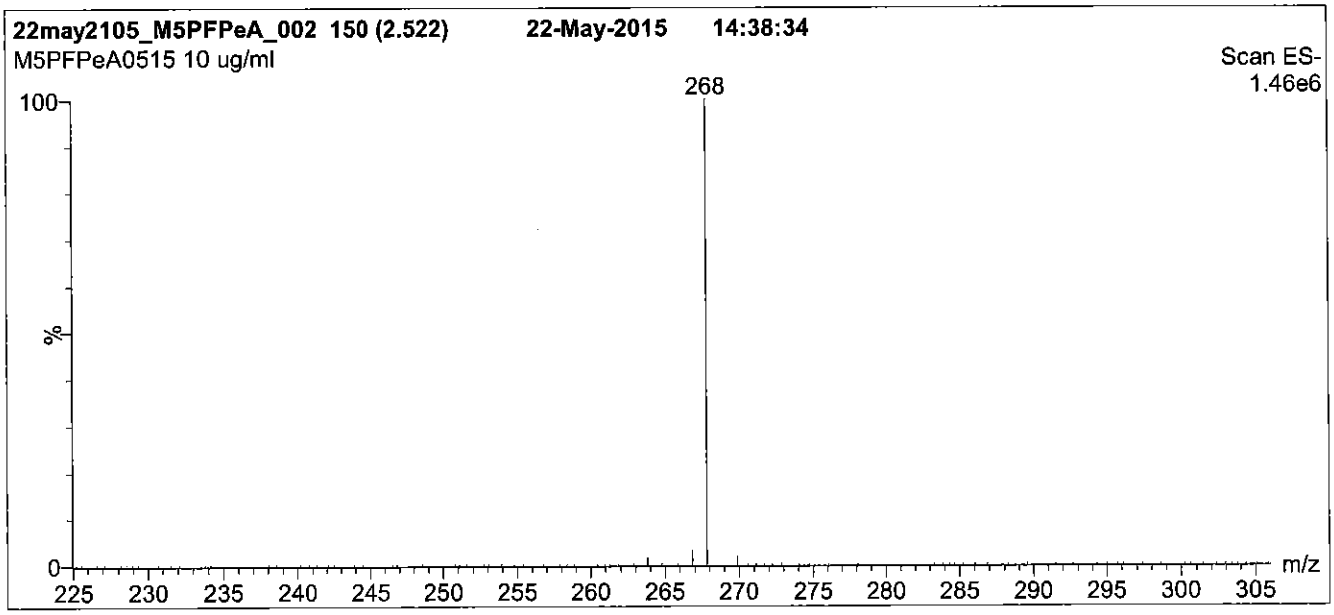
CALA Testing Accreditation No.: A 1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

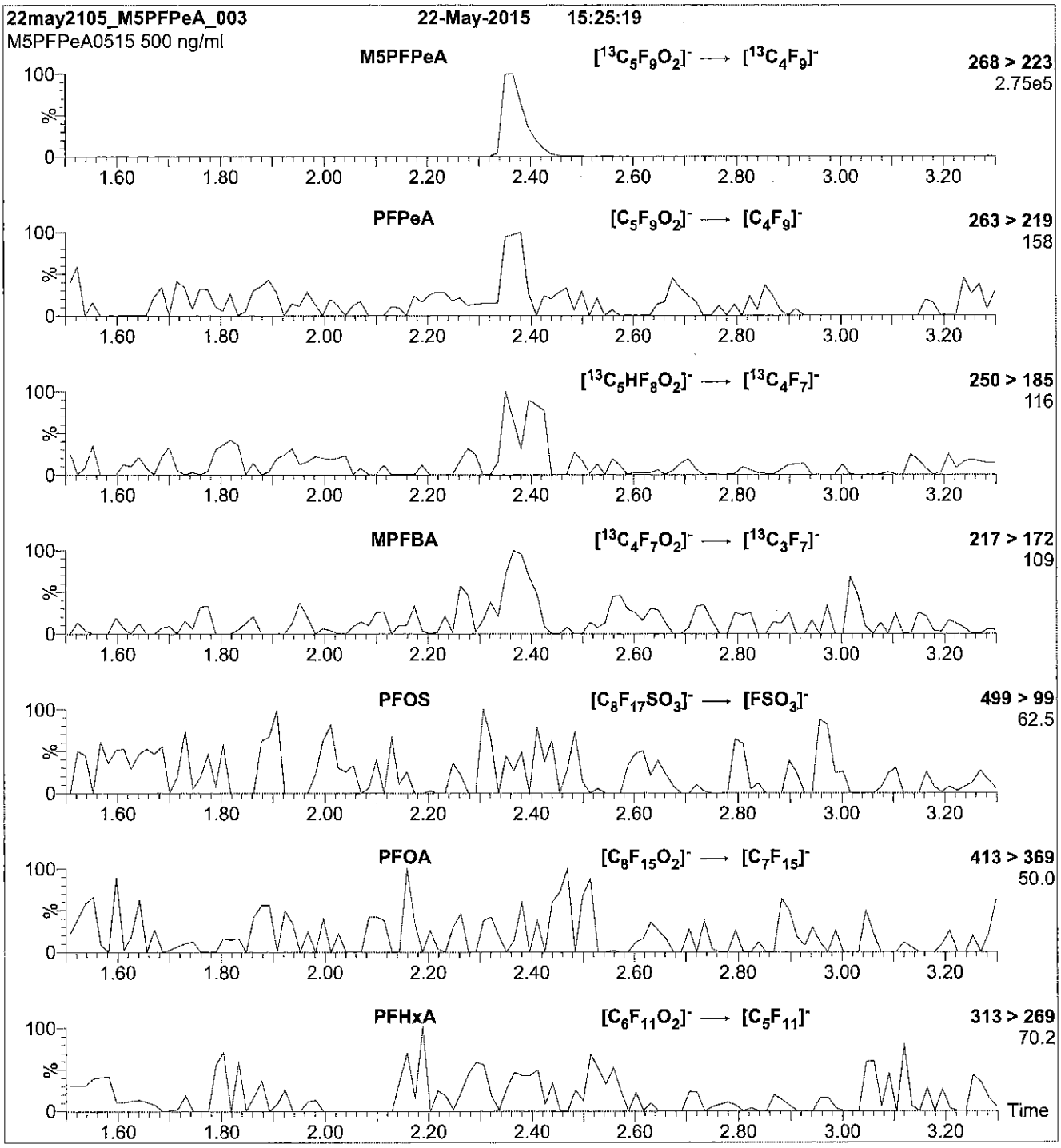
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCM8FOSA_00006

Rec: 9/15/15 SV

WELLINGTON LABORATORIES

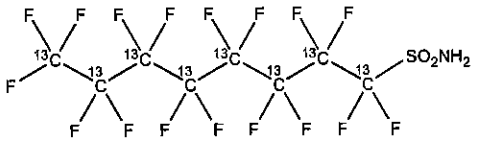
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

LOT NUMBER: M8FOSA1214I

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_8H_2F_{17}NO_2S$	**MOLECULAR WEIGHT:**	507.09
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Isopropanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($^{13}C_8$)
LAST TESTED: (mm/dd/yyyy)	12/15/2014		
EXPIRY DATE: (mm/dd/yyyy)	12/15/2016		
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:** 04/01/2015 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

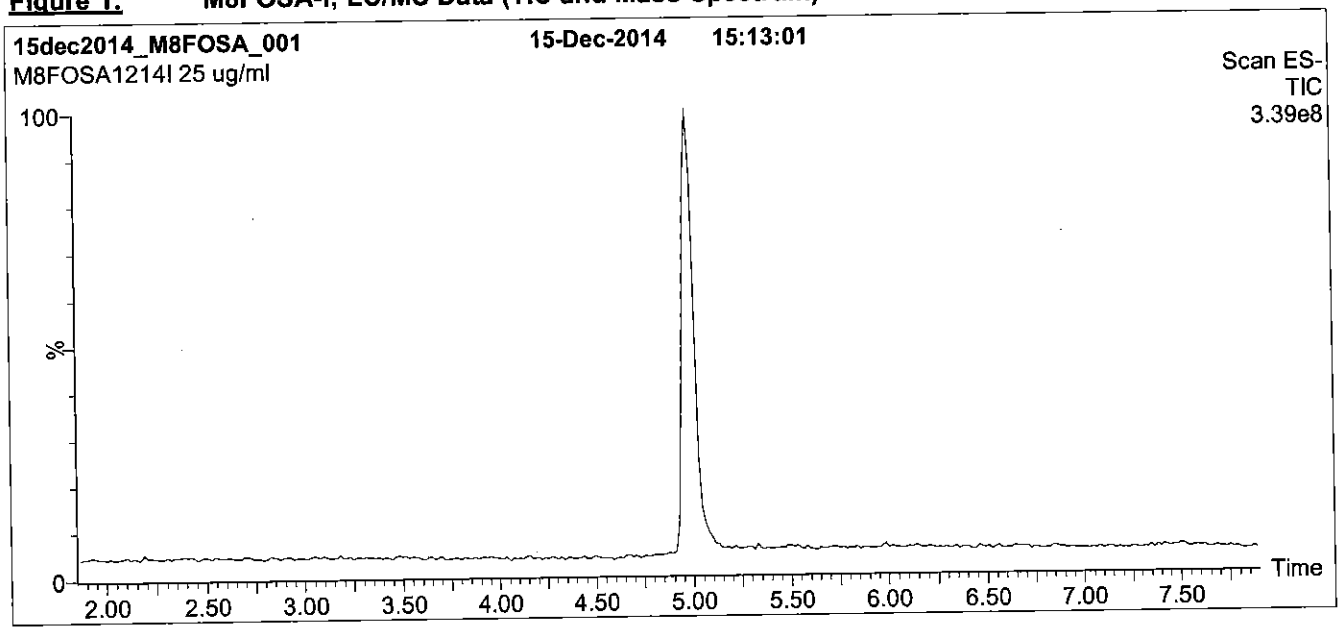
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

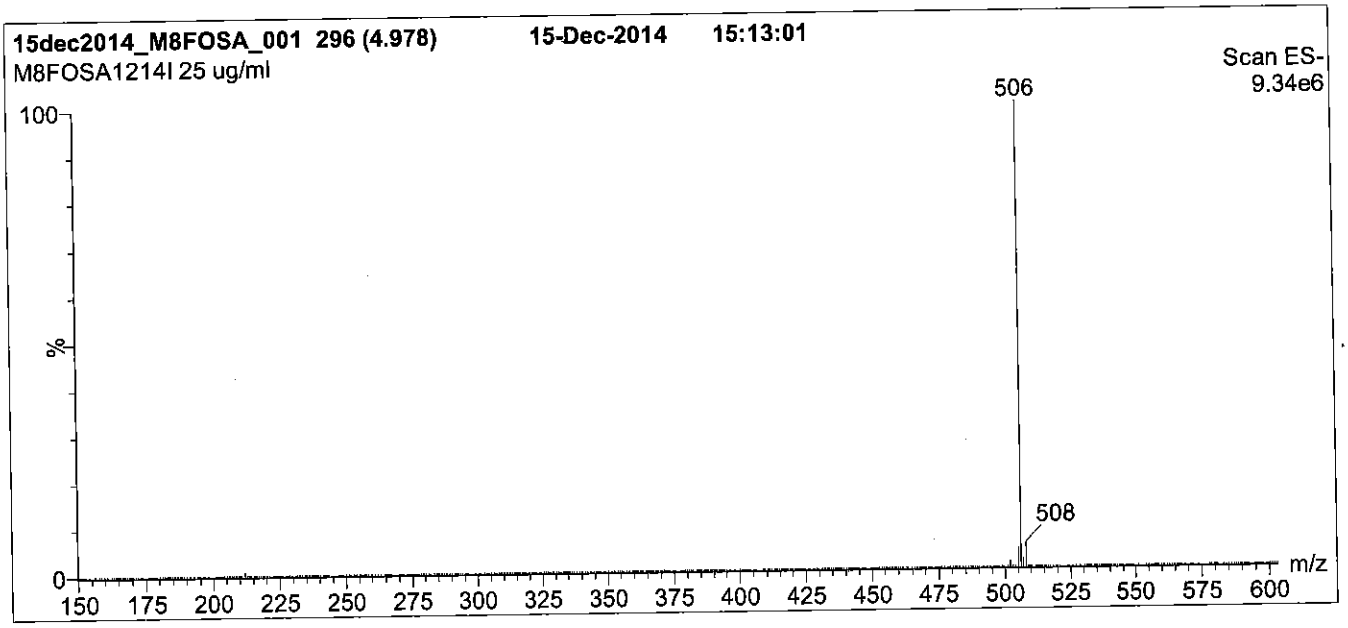
CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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

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





Condltions 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 min
before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

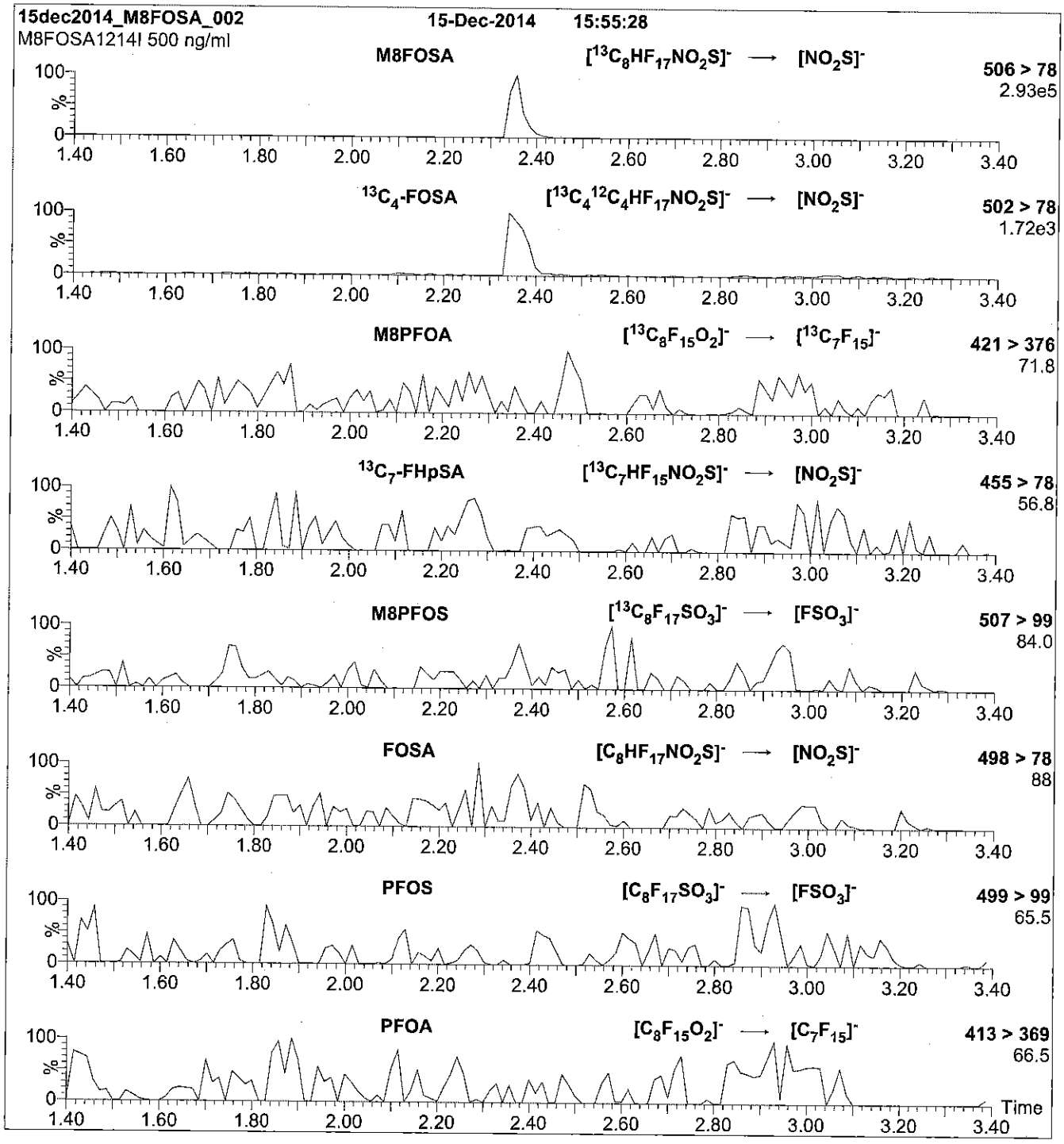
MS Parameters

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

Form#:27, Issued 2004-11-10
Revision#:3, Revised 2015-03-24

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) = 3.31e-3
Collision Energy (eV) = 30

Reagent

LCMPFBA_00004

R: 12/9/15 SEJ

WELLINGTON LABORATORIES

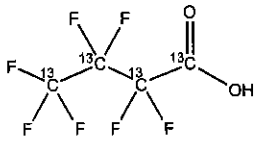
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

LOT NUMBER: MPFBA1014

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_4HF_7O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 218.01
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 10/31/2014
EXPIRY DATE: (mm/dd/yyyy) 10/31/2019
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 03/31/2015 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

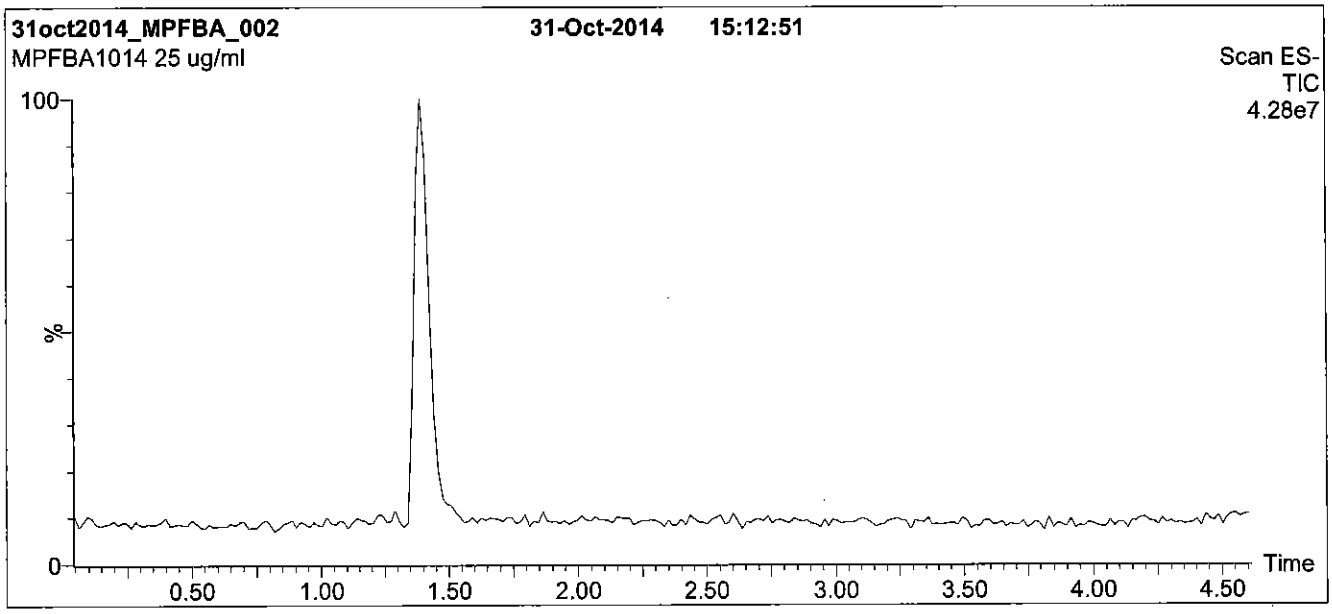
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

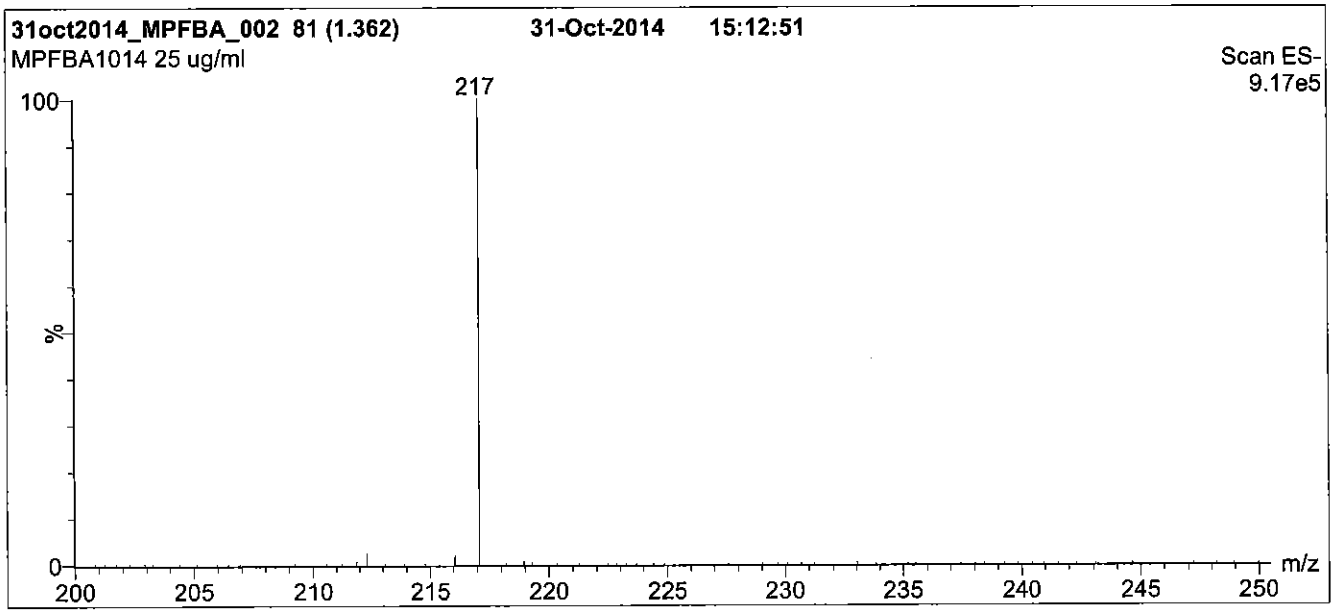
CALA Testing Accreditation No. A 1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

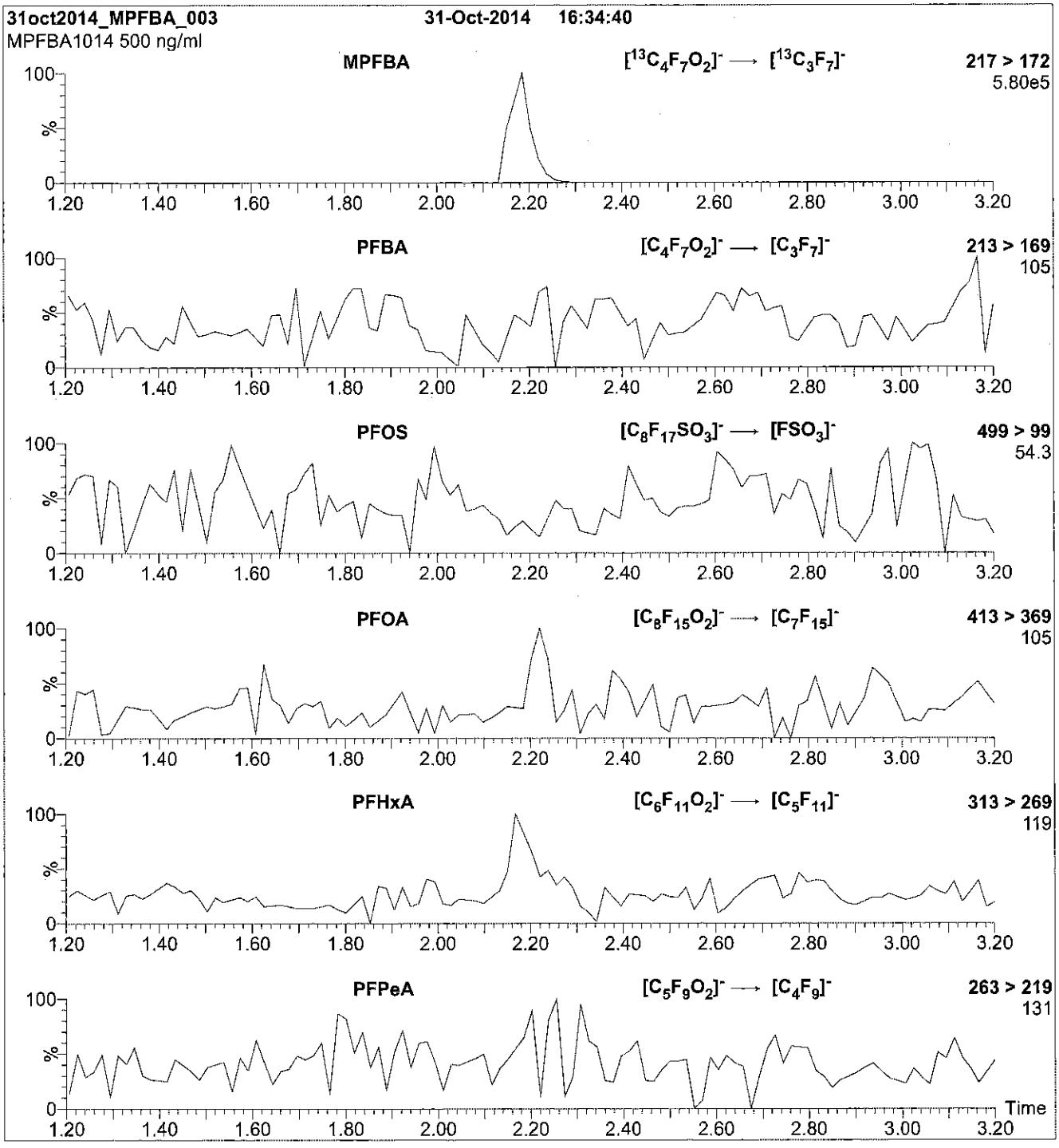
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (200 - 850 amu)

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

Figure 2: **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) = 3.28e-3
Collision Energy (eV) = 10

Reagent

LCMPFDA_00004

R: 10-20-2011 (was 2012)

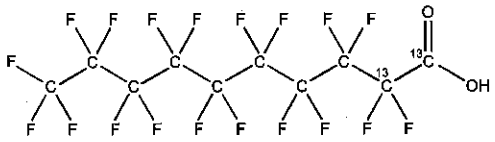
Rec. 10-20-2011

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

12LCMS0262
LCMPFDA_00001

PRODUCT CODE:	MPFDA	**LOT NUMBER:**	MPFDA0411
COMPOUND:	Perfluoro-n-[1,2-$^{13}C_2$]decanoic acid		
STRUCTURE:		**CAS #**	Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_8HF_{19}O_2$	**MOLECULAR WEIGHT:**	516.07
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	04/07/2011		
EXPIRY DATE: (mm/dd/yyyy)	04/07/2014		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 04/19/2011 (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. They are designed to be used as reference standards for the identification and/or quantification of specific chemical compound(s).

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. Material Safety Data Sheets (MSDSs) 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, 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 and/or LC/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 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 17025:2005 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:

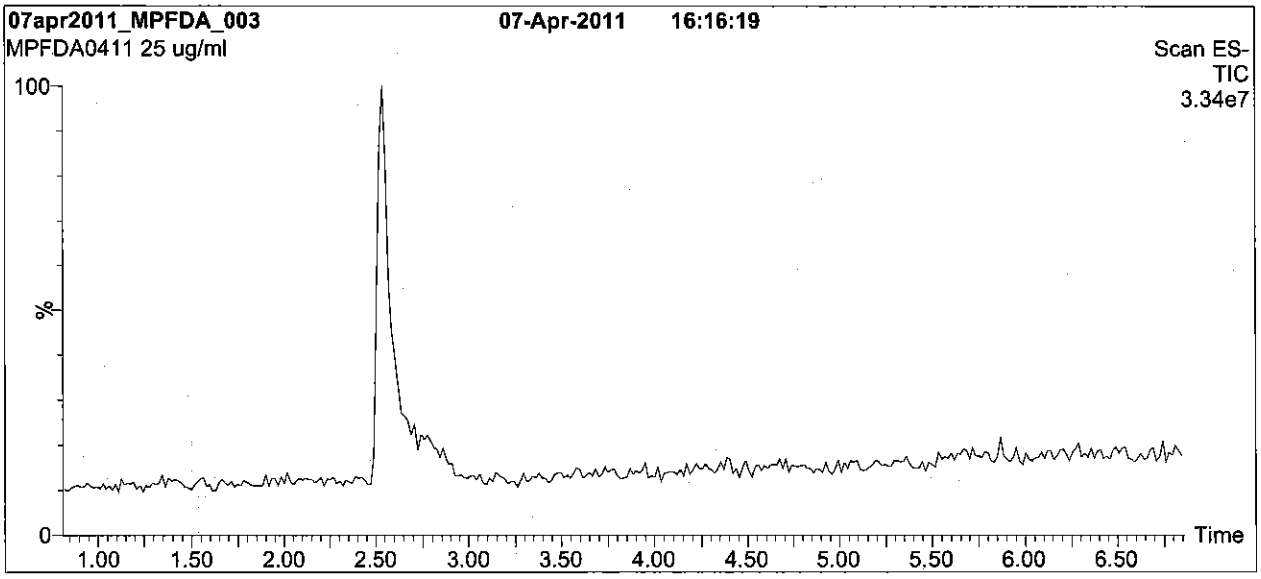
Ongoing stability studies of this product have demonstrated stability in its composition and concentration for the period of time specified by the expiry date in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

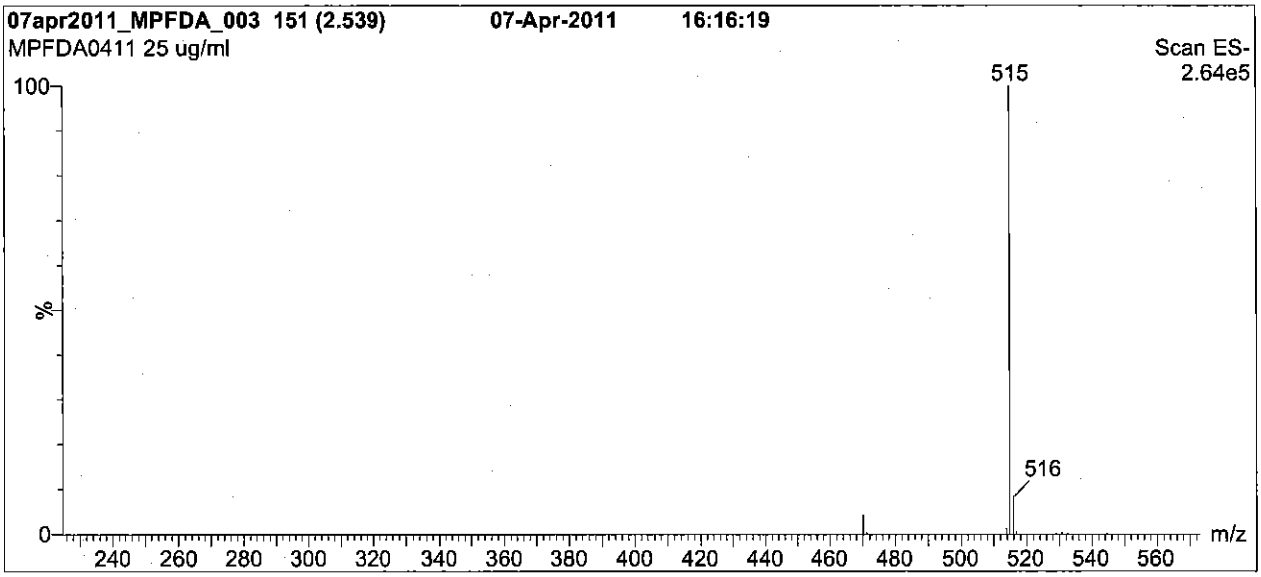
LIMITED WARRANTY:

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.

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: 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

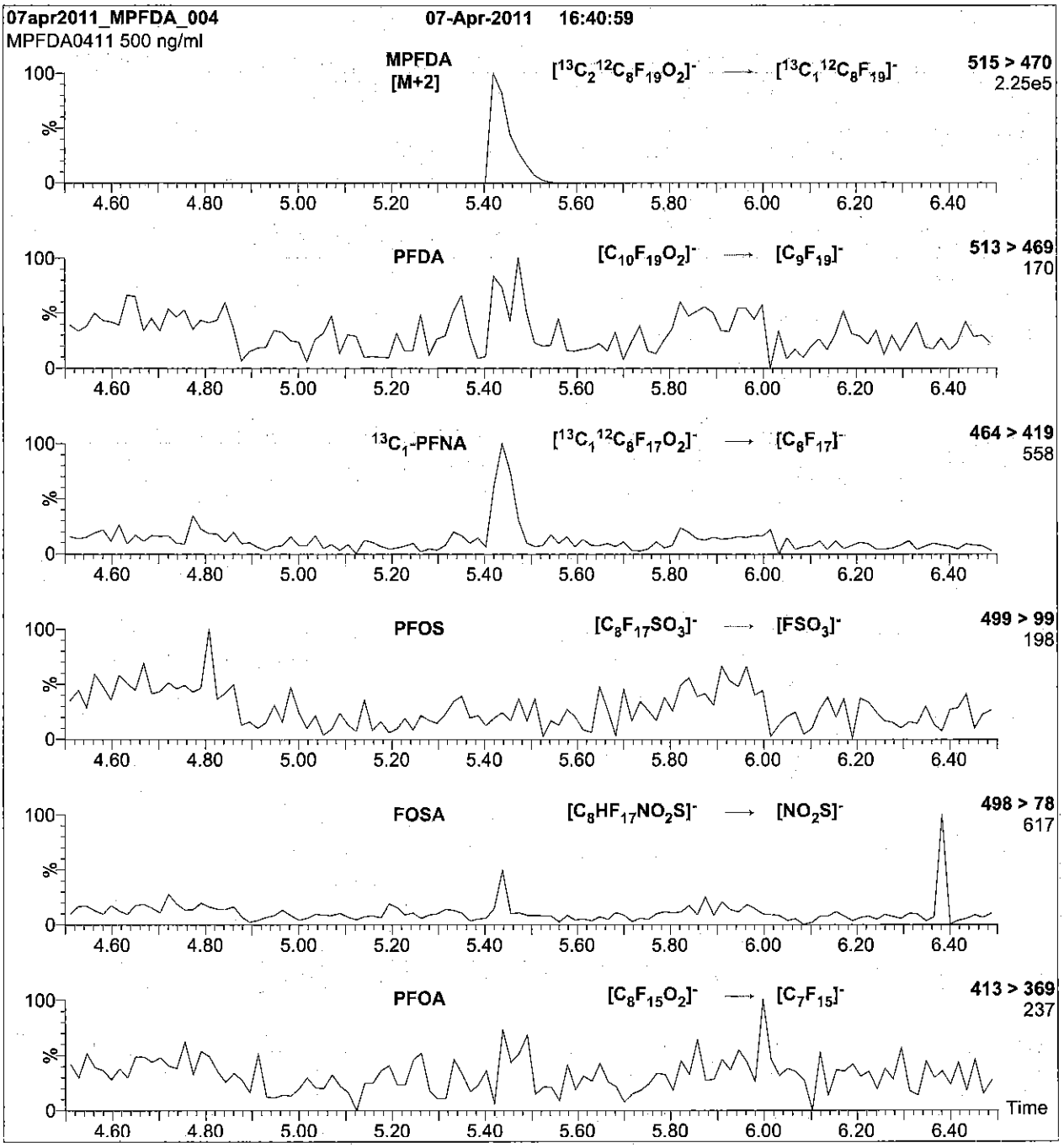
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 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 70% (80:20 MeOH:ACN) / 30% 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

LCMPFDA_00005

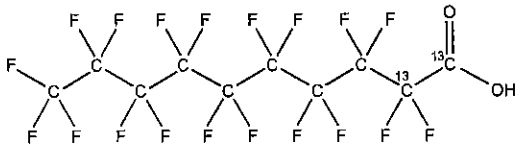
RL 4/15/15 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFDA
LOT NUMBER: MPFDA0414
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) 04/13/2014
EXPIRY DATE: (mm/dd/yyyy) 04/13/2019
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 04/15/2014 (mm/dd/yyyy)
B.G. Chittim

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

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. They are designed to be used as reference standards for the identification and/or quantification of specific chemical compound(s).

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. Material Safety Data Sheets (MSDSs) 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, 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 and/or LC/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 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 17025:2005 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 for the period of time specified by the 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:

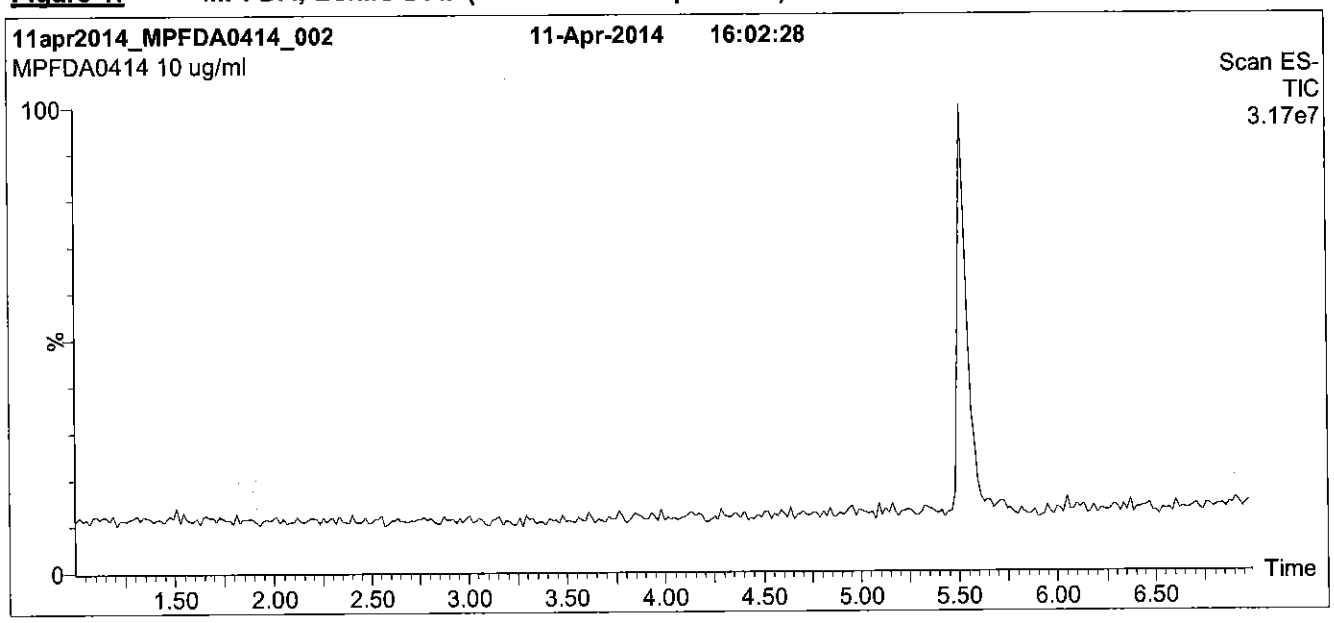
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

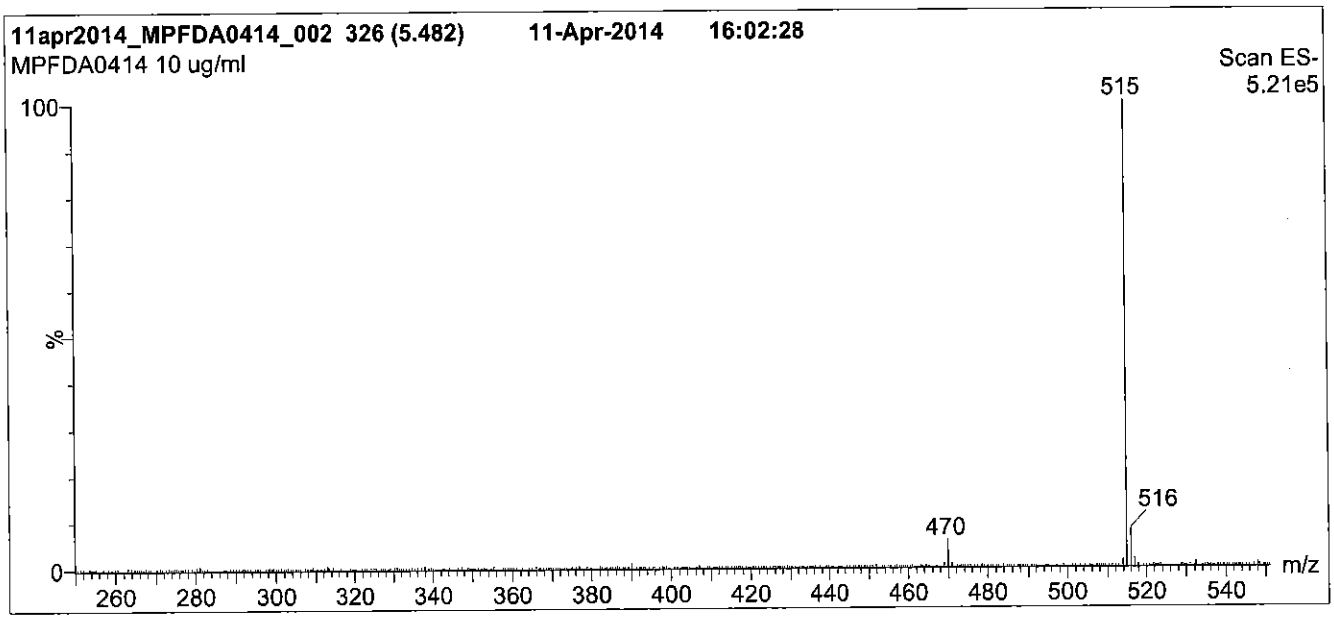
CALA Testing Accreditation No. A1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

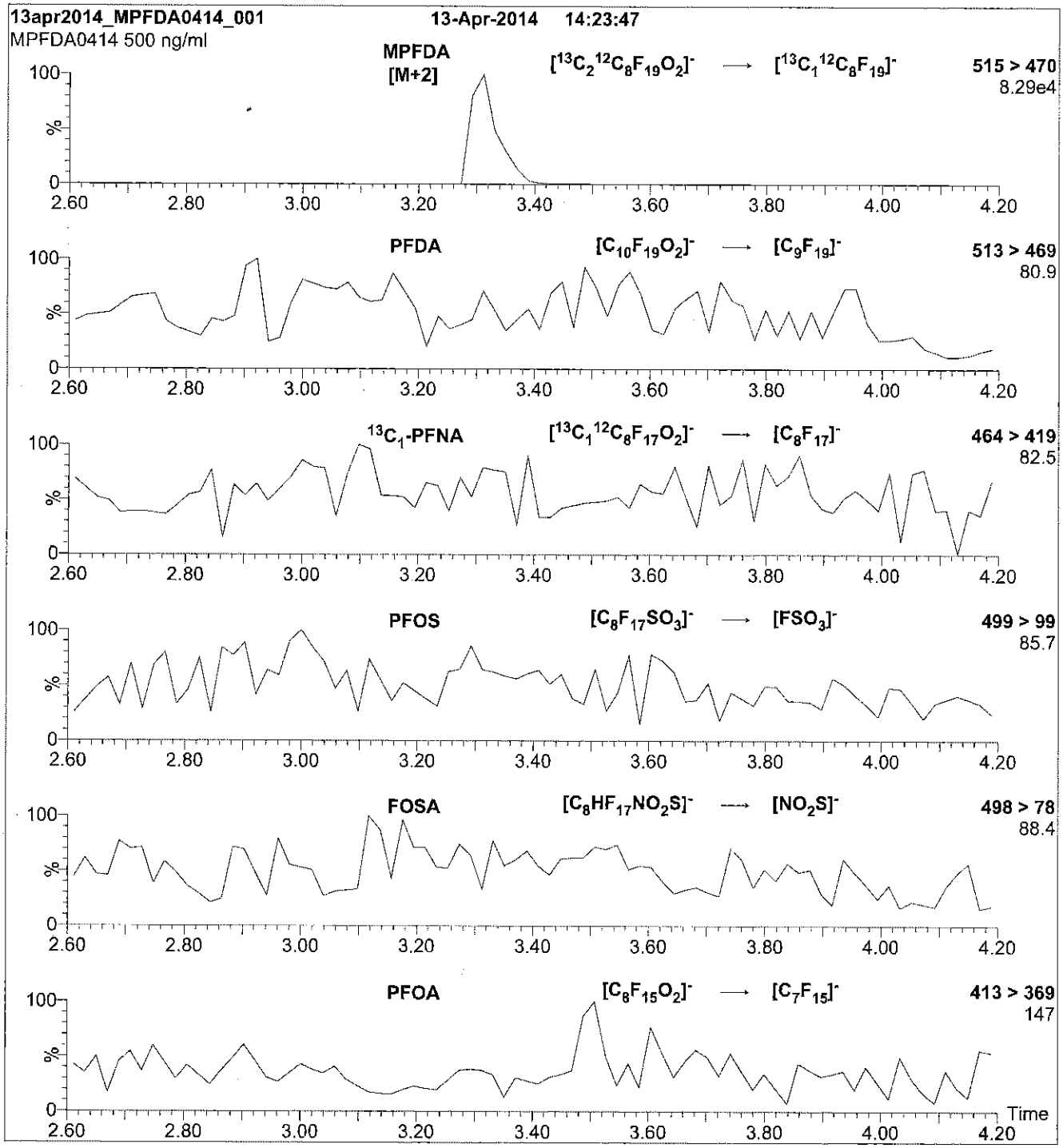
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 850 amu)

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

Figure 2: **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) = 3.31e-3
Collision Energy (eV) = 13

Reagent

LCMPFDoA_00003

P. 2/11/15 SRV

WELLINGTON LABORATORIES

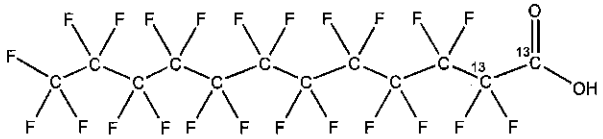
CERTIFICATE OF ANALYSIS DOCUMENTATION

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

LOT NUMBER: MPFDoA0714

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)	07/17/2014		
EXPIRY DATE: (mm/dd/yyyy)	07/17/2019		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 07/21/2014 (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. They are designed to be used as reference standards for the identification and/or quantification of specific chemical compound(s).

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. Material Safety Data Sheets (MSDSs) 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, 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 and/or LC/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 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 17025:2005 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 for the period of time specified by the 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:

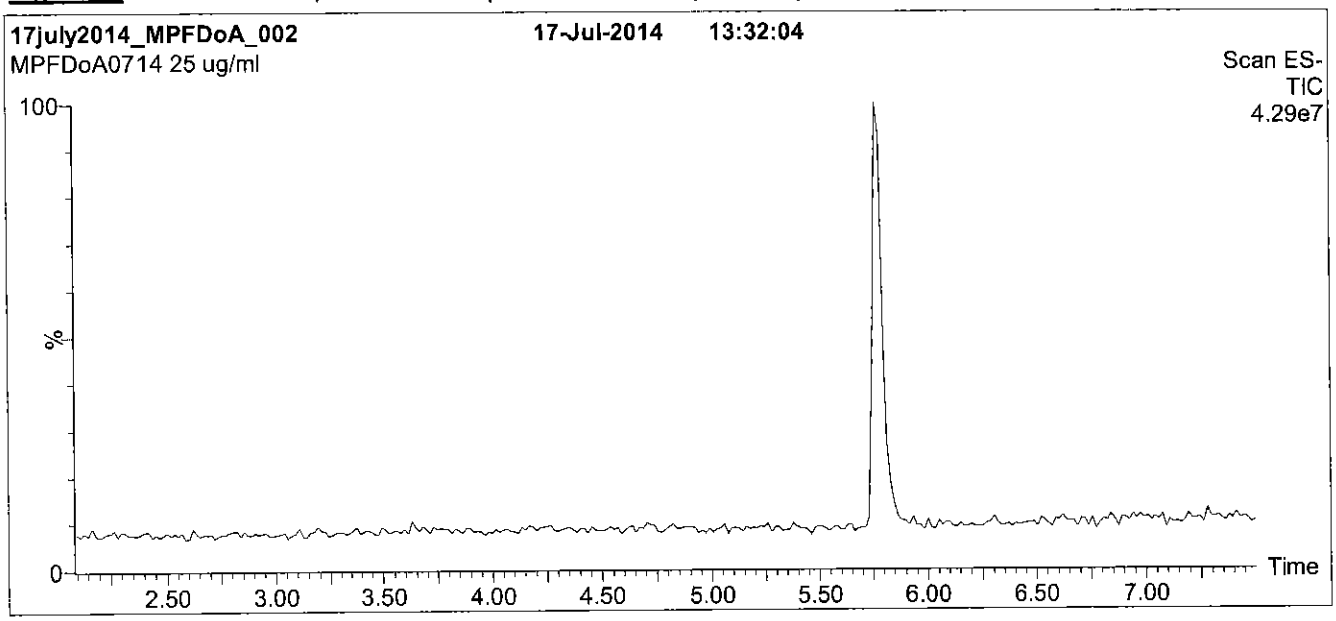
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

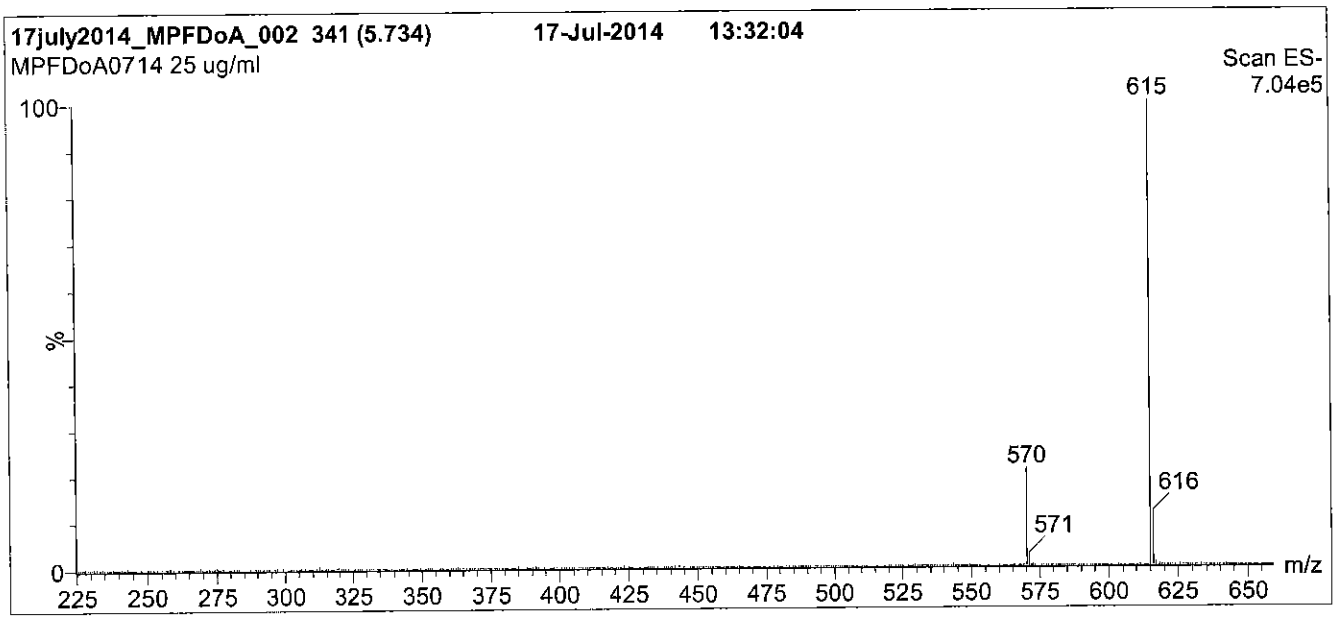
CALA Testing Accreditation No. A 1226

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

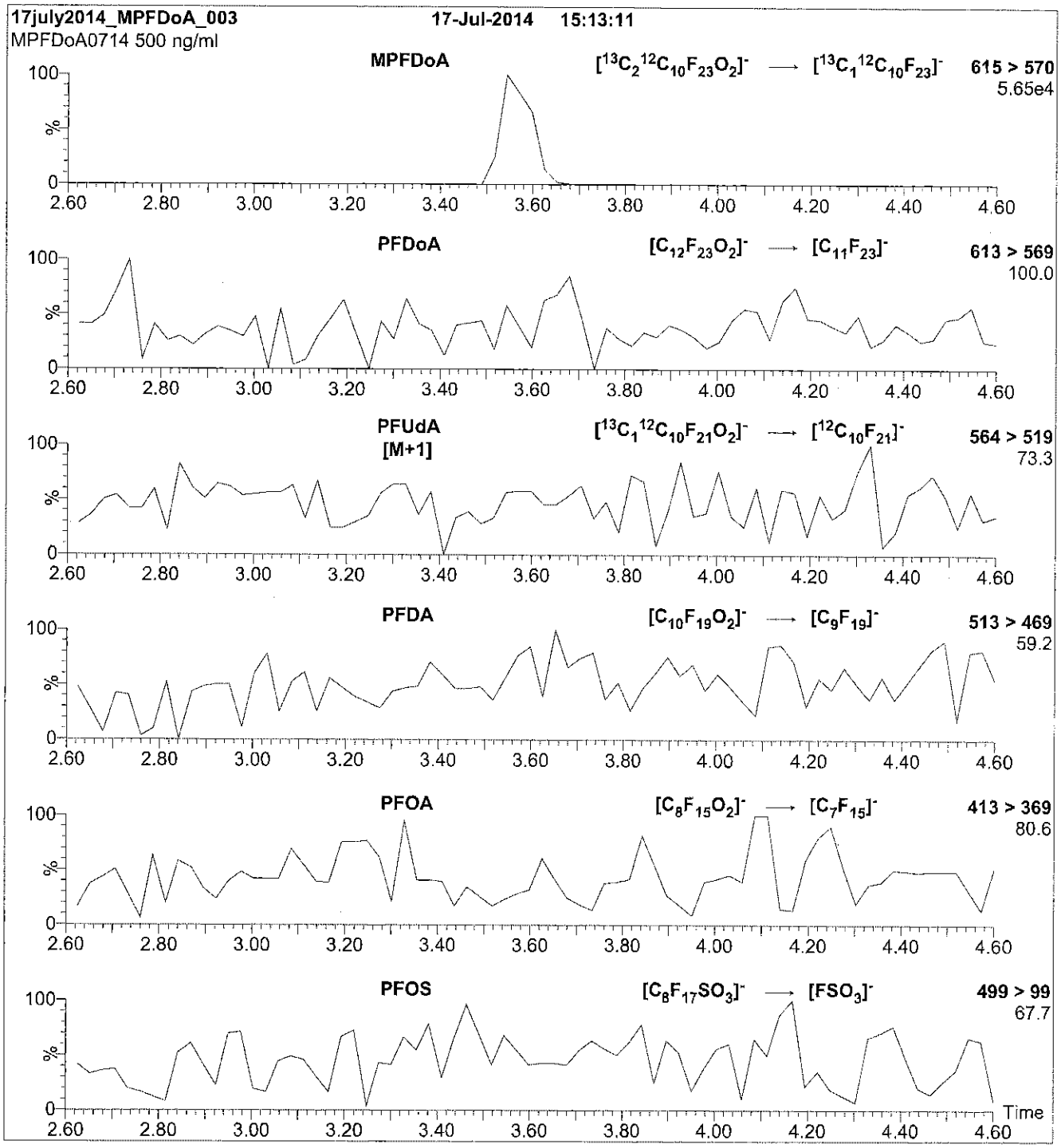
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 950 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 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) = 3.43e-3
Collision Energy (eV) = 13

Reagent

LCMPFDoA_00004

V : 14/10/15 JKV

WELLINGTON LABORATORIES

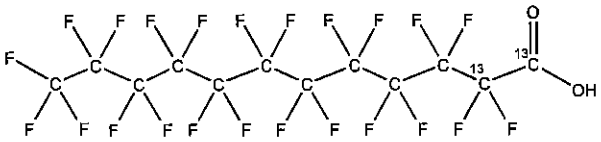
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

LOT NUMBER: MPFDoA0714

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_{10}HF_{23}O_2$	**MOLECULAR WEIGHT:**	616.08
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	07/17/2014		
EXPIRY DATE: (mm/dd/yyyy)	07/17/2019		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

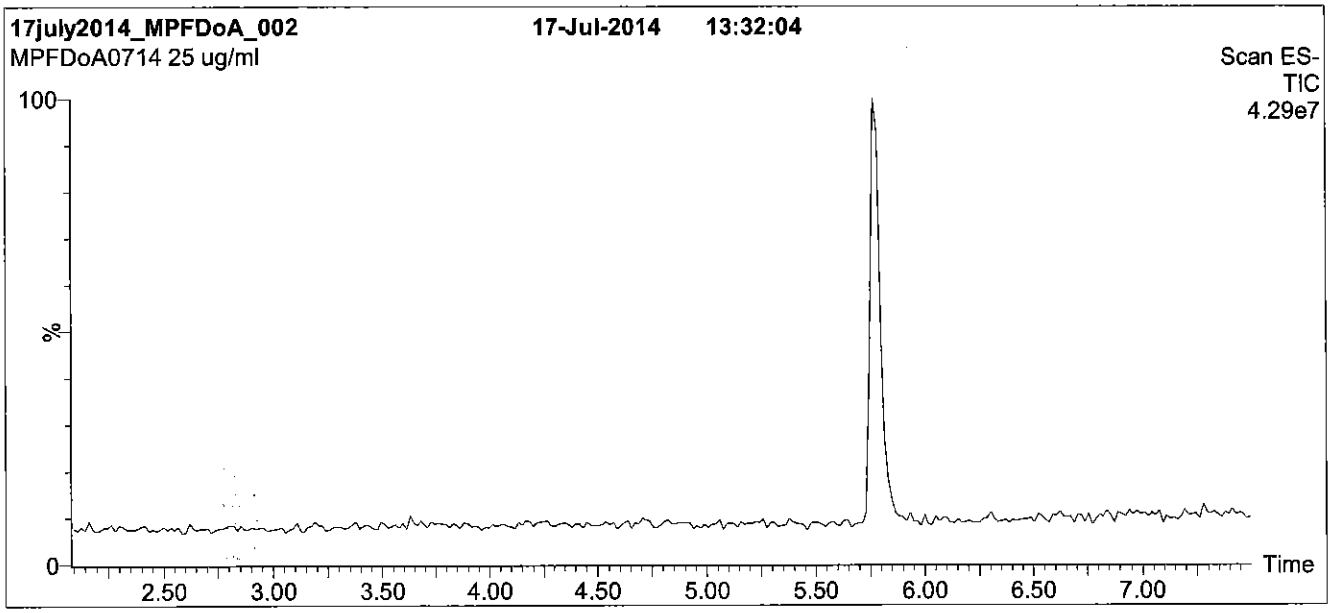
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

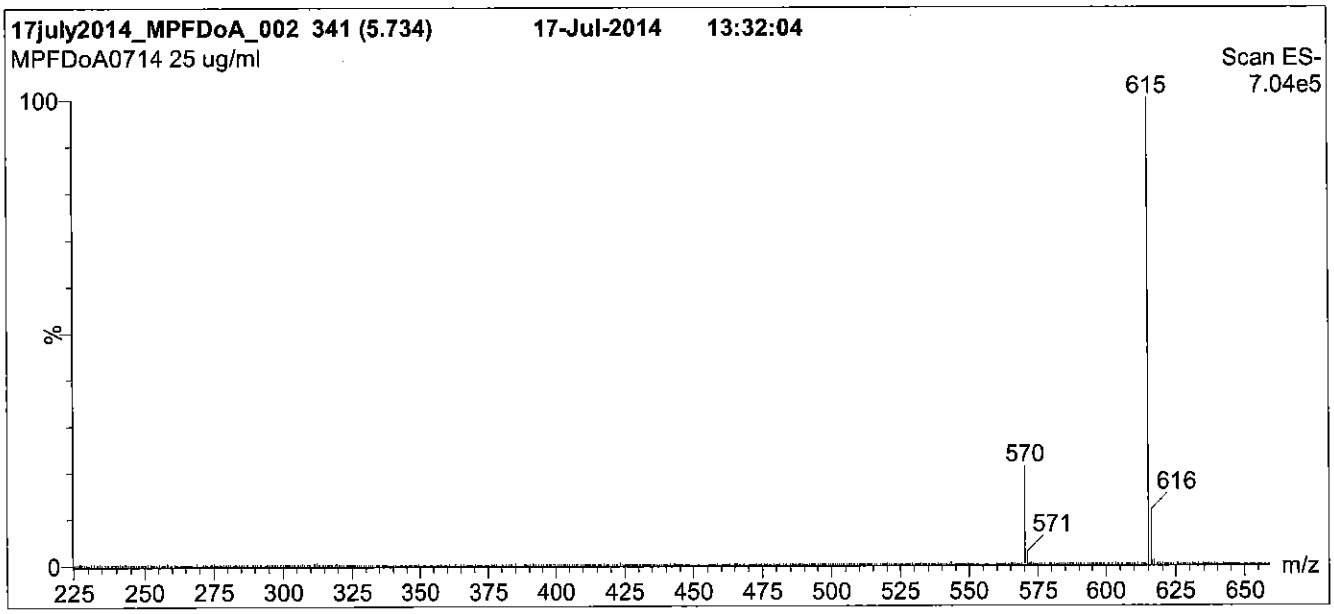
CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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

Figure 1: **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: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

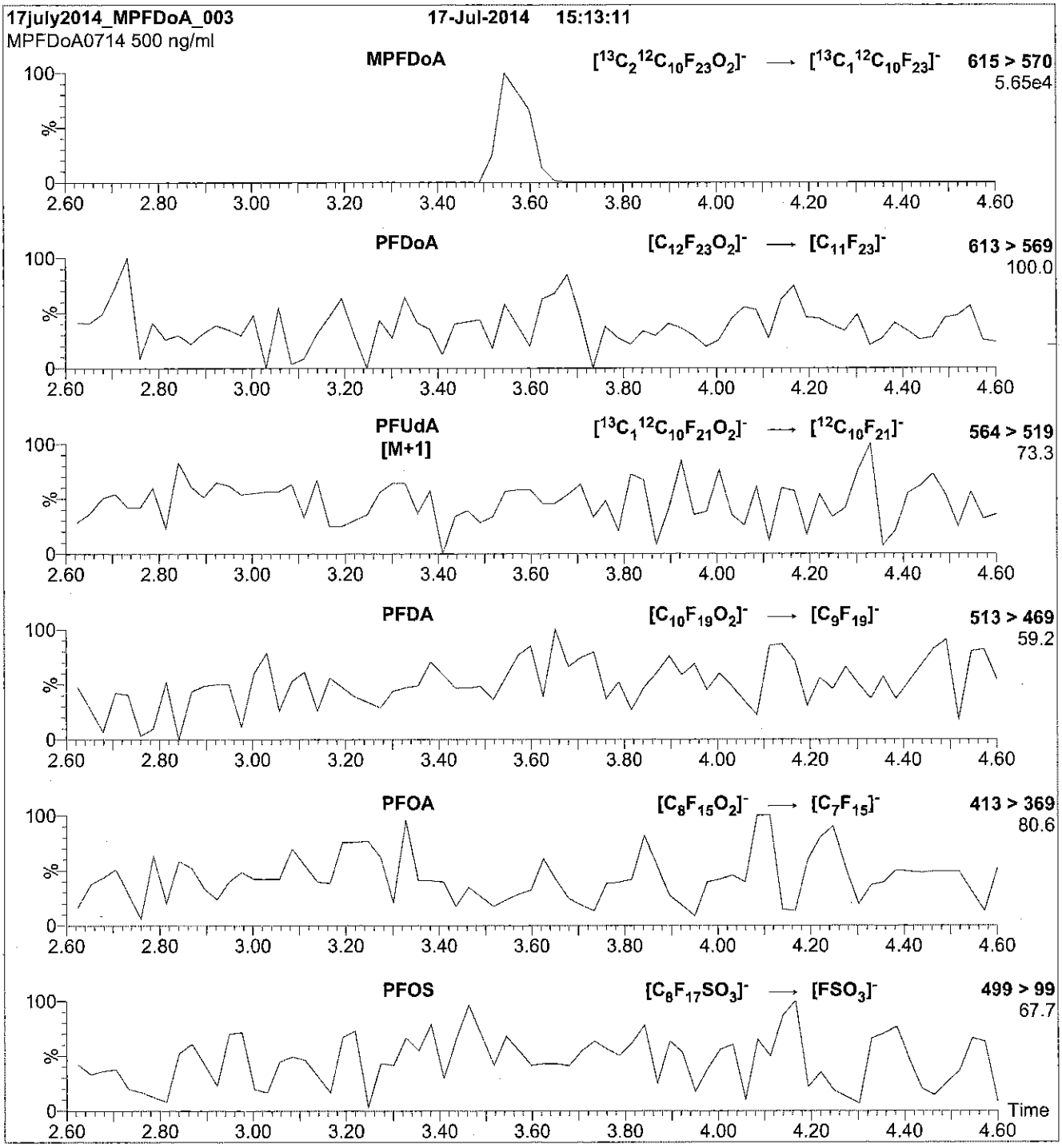
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 950 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 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) = 3.43e-3
Collision Energy (eV) = 13

Reagent

LCMPFHxA_00006

P: 4/15/15 SKV

WELLINGTON LABORATORIES

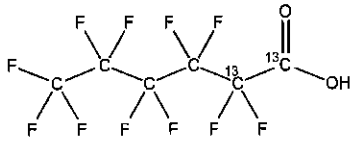
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

LOT NUMBER: MPFHxA0414

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_4HF_{11}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

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

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 04/13/2014
EXPIRY DATE: (mm/dd/yyyy) 04/13/2019
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

ISOTOPIC PURITY: ≥99% ^{13}C ($1,2\text{-}^{13}C_2$)

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 04/15/2014 (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. They are designed to be used as reference standards for the identification and/or quantification of specific chemical compound(s).

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. Material Safety Data Sheets (MSDSs) 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, 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 and/or LC/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 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 17025:2005 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 for the period of time specified by the 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:

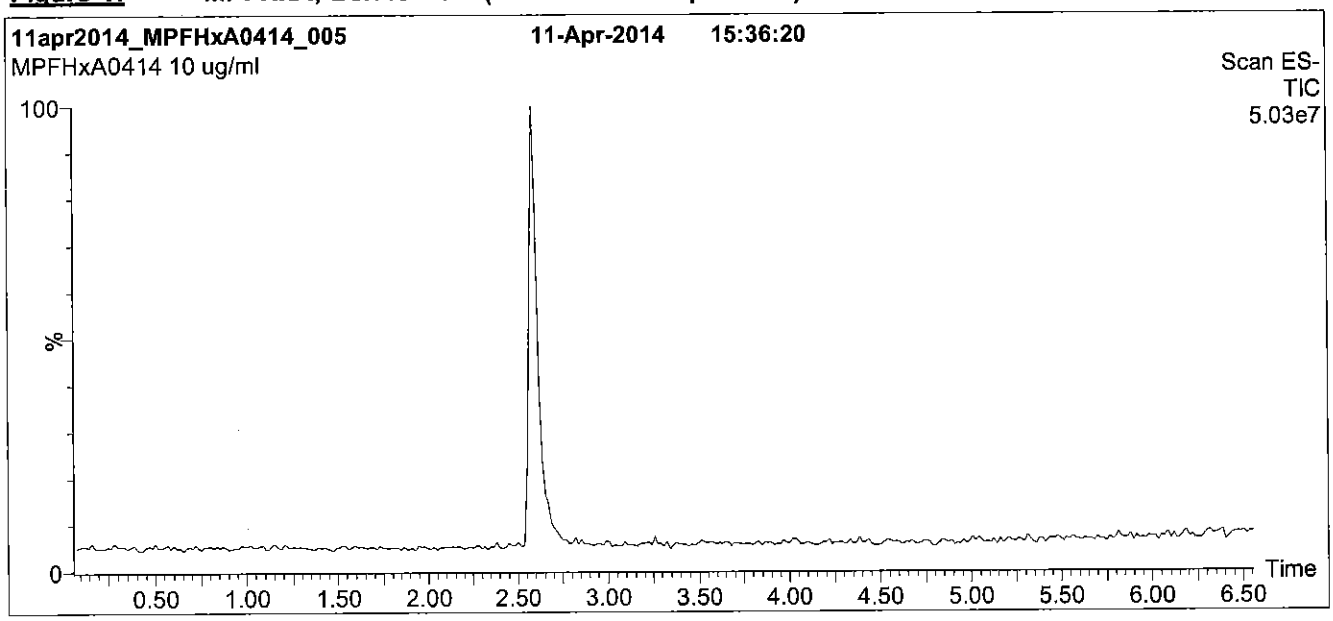
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

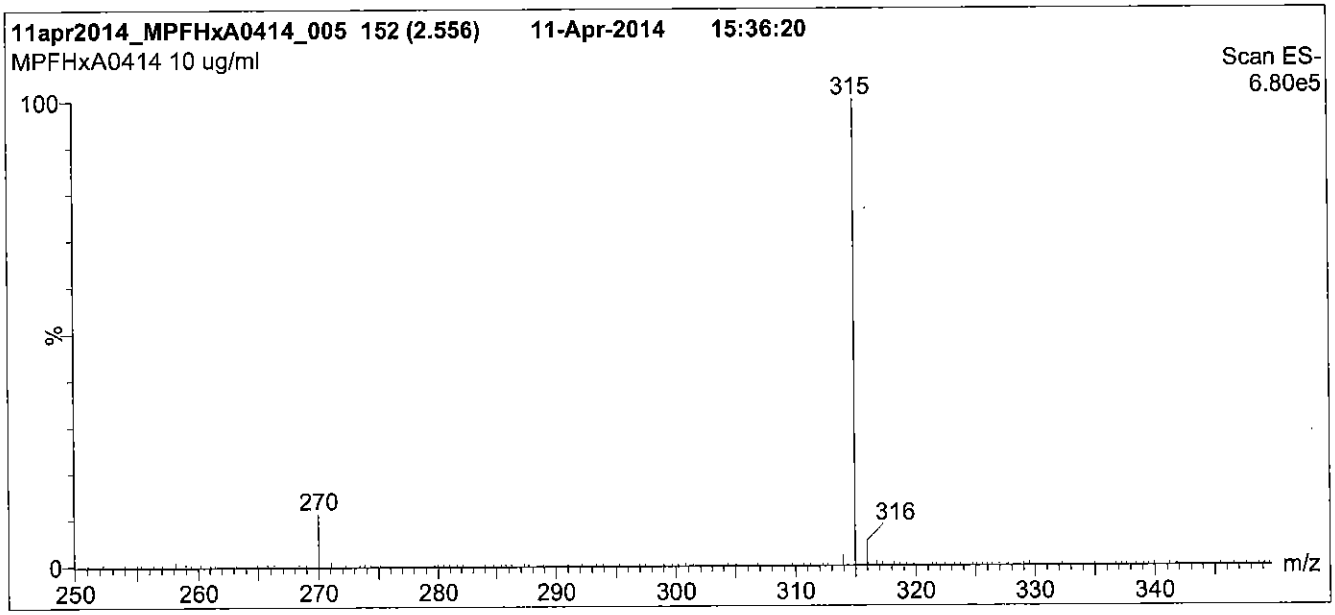
CALA Testing Accreditation No. A 0226

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

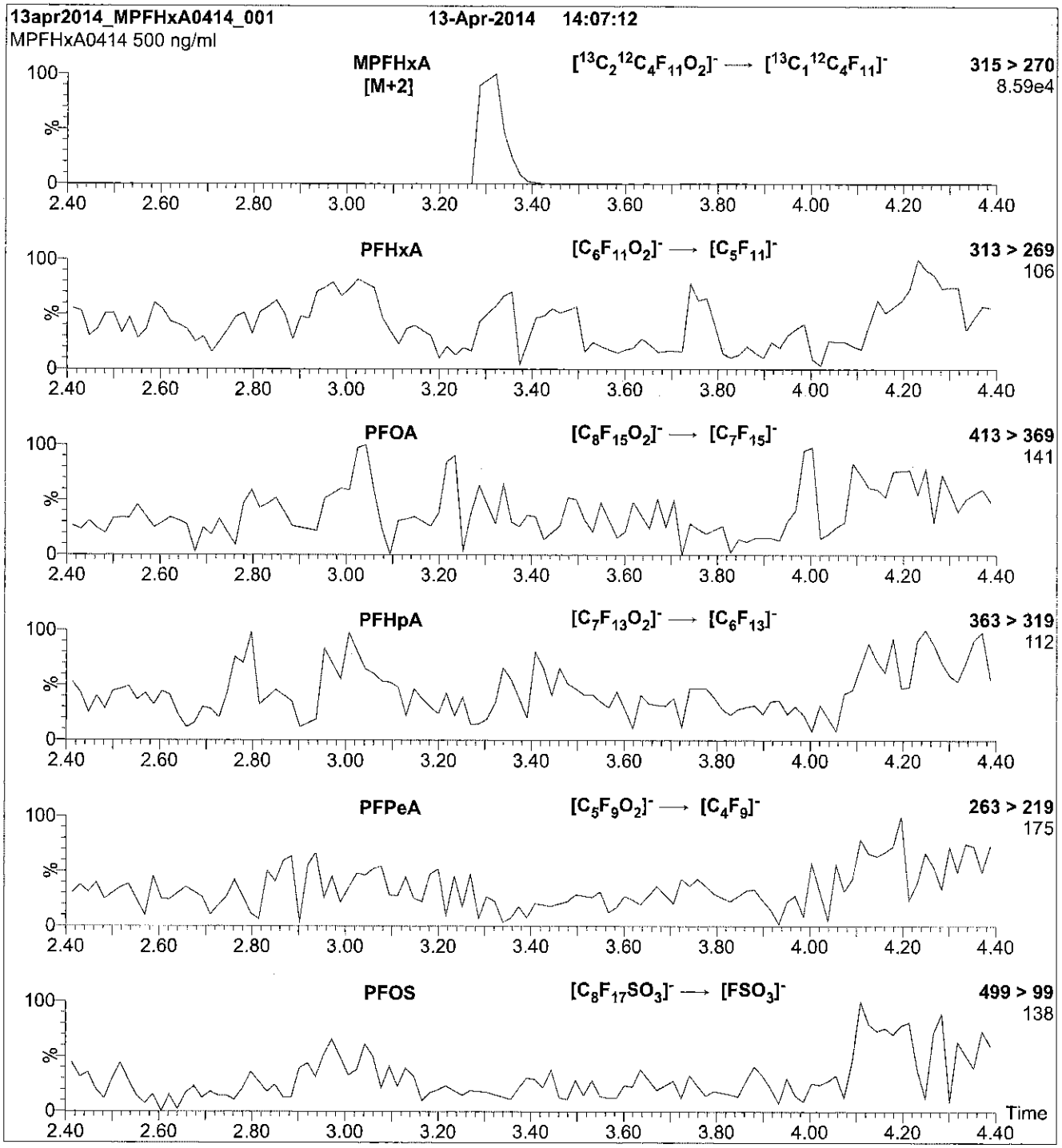
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 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) = 3.43e-3
Collision Energy (eV) = 10

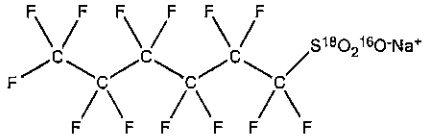
Reagent

LCMPFHxS_00003

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	MPFHxS	**LOT NUMBER:**	MPFHxS0713
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)	07/25/2013		
EXPIRY DATE: (mm/dd/yyyy)	07/25/2018		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 04/15/2014 (mm/dd/yyyy)
B.G. Chittim

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

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. They are designed to be used as reference standards for the identification and/or quantification of specific chemical compound(s).

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. Material Safety Data Sheets (MSDSs) 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, 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 and/or LC/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 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 17025:2005 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 for the period of time specified by the 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:

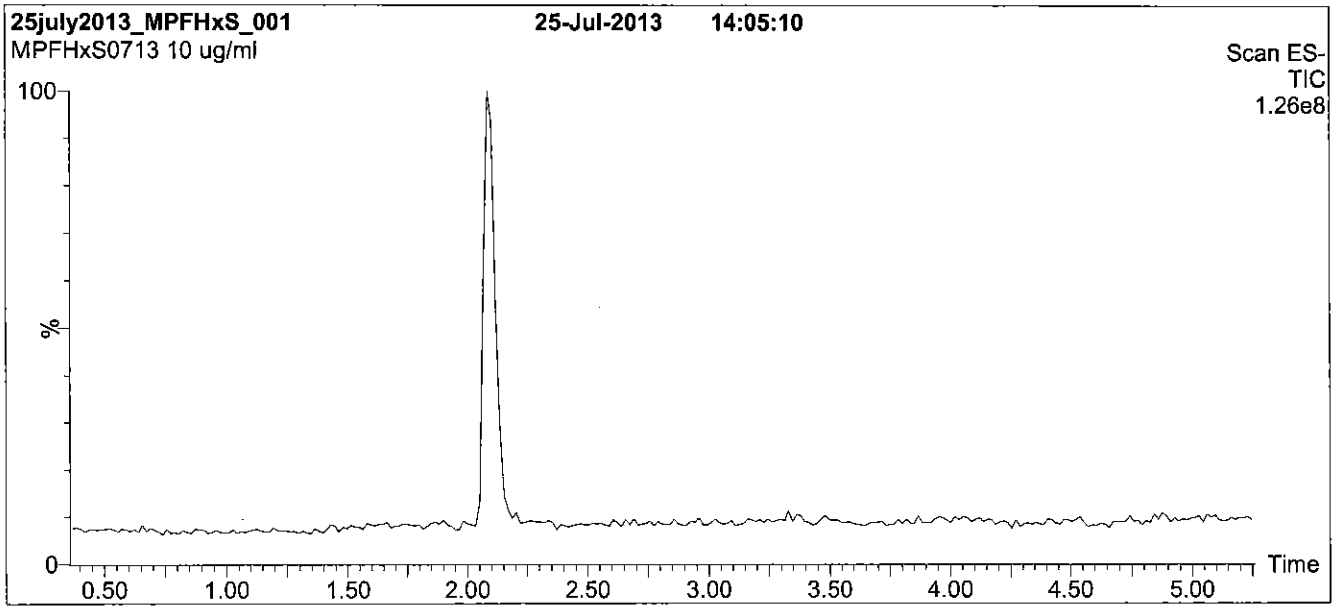
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

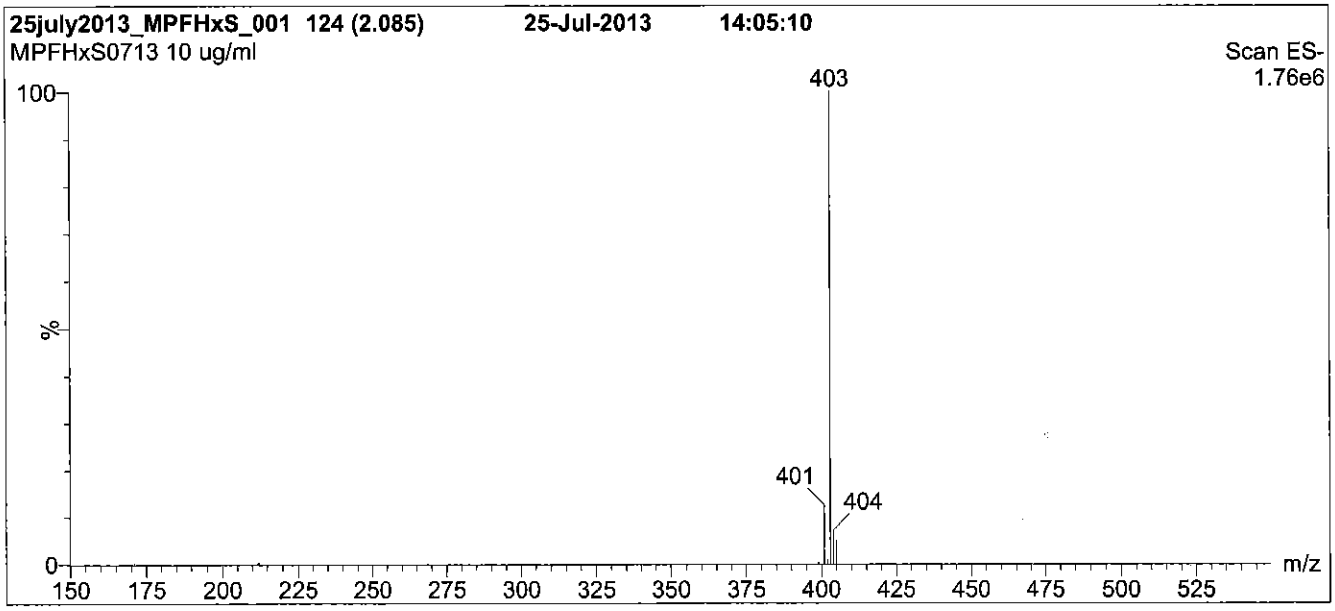
CALA Testing Accreditation No. A1226

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

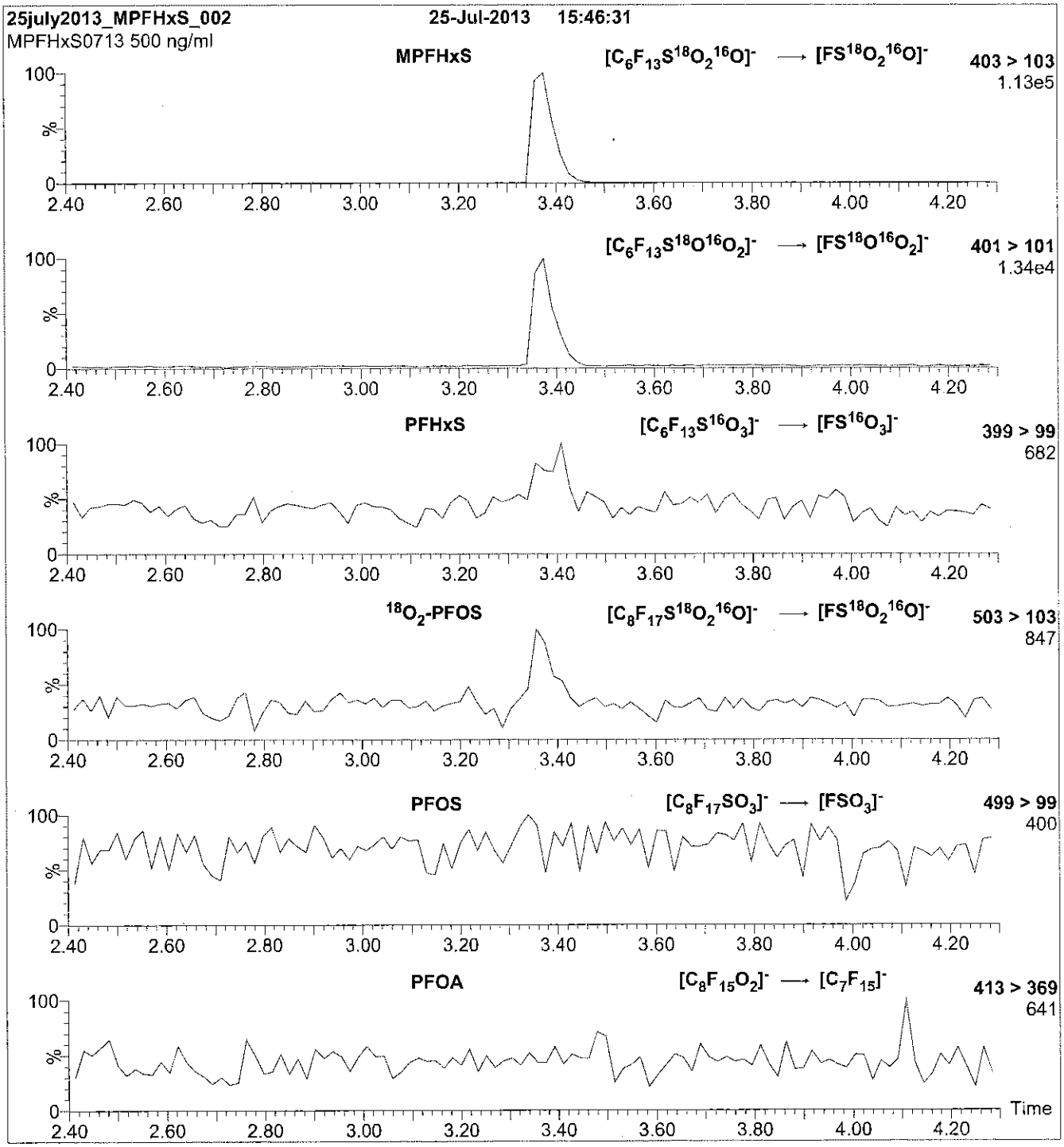
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 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) = 3.58e-3
Collision Energy (eV) = 30

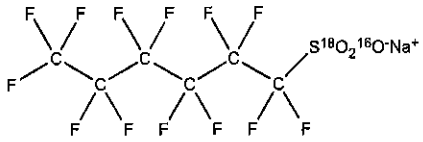
Reagent

LCMPFHxS_00004

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MPFHxS	**LOT NUMBER:**	MPFHxS0713
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)	07/25/2013		
EXPIRY DATE: (mm/dd/yyyy)	07/25/2018		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 03/30/2015 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

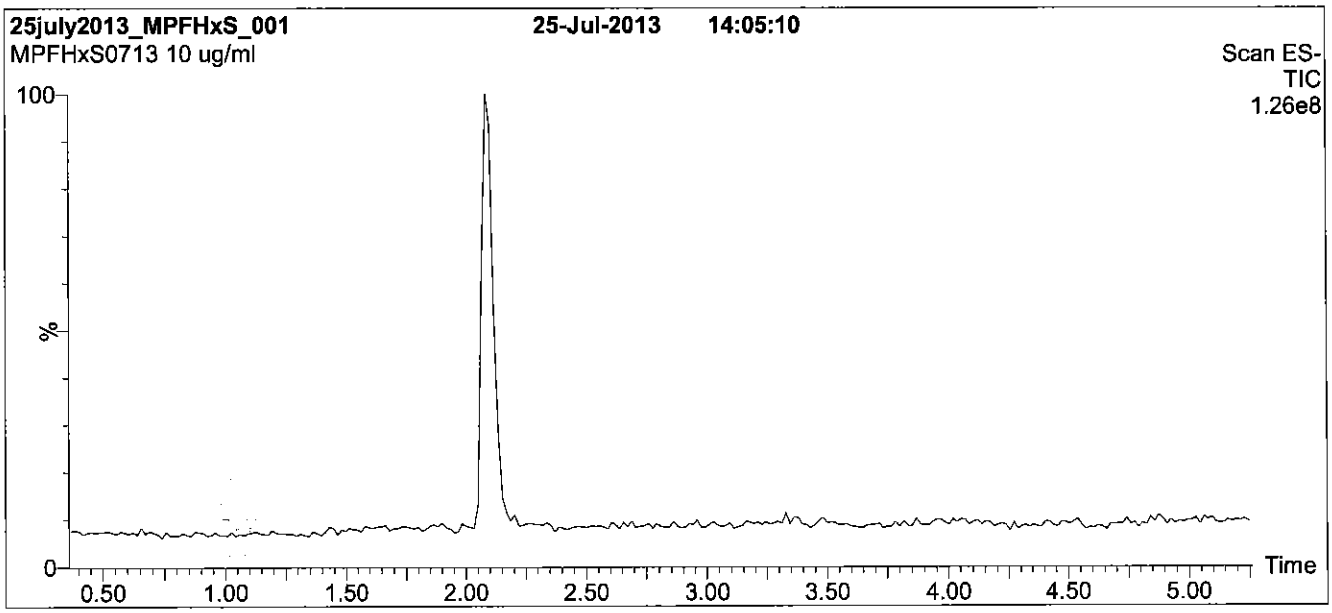
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

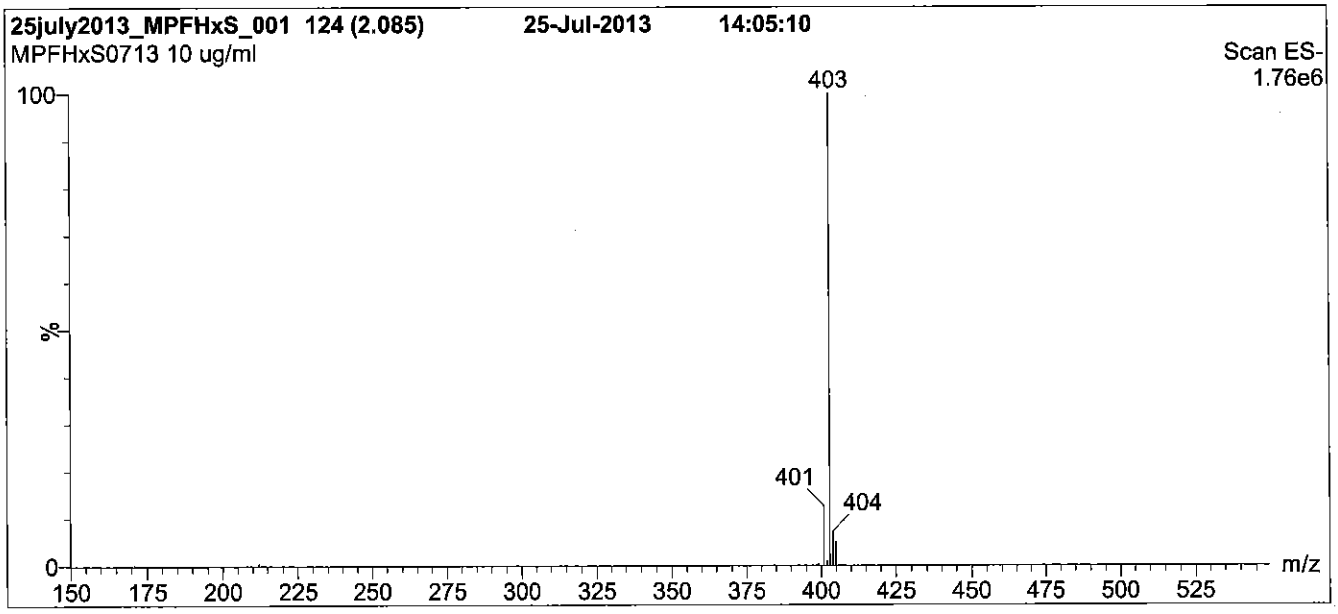
CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

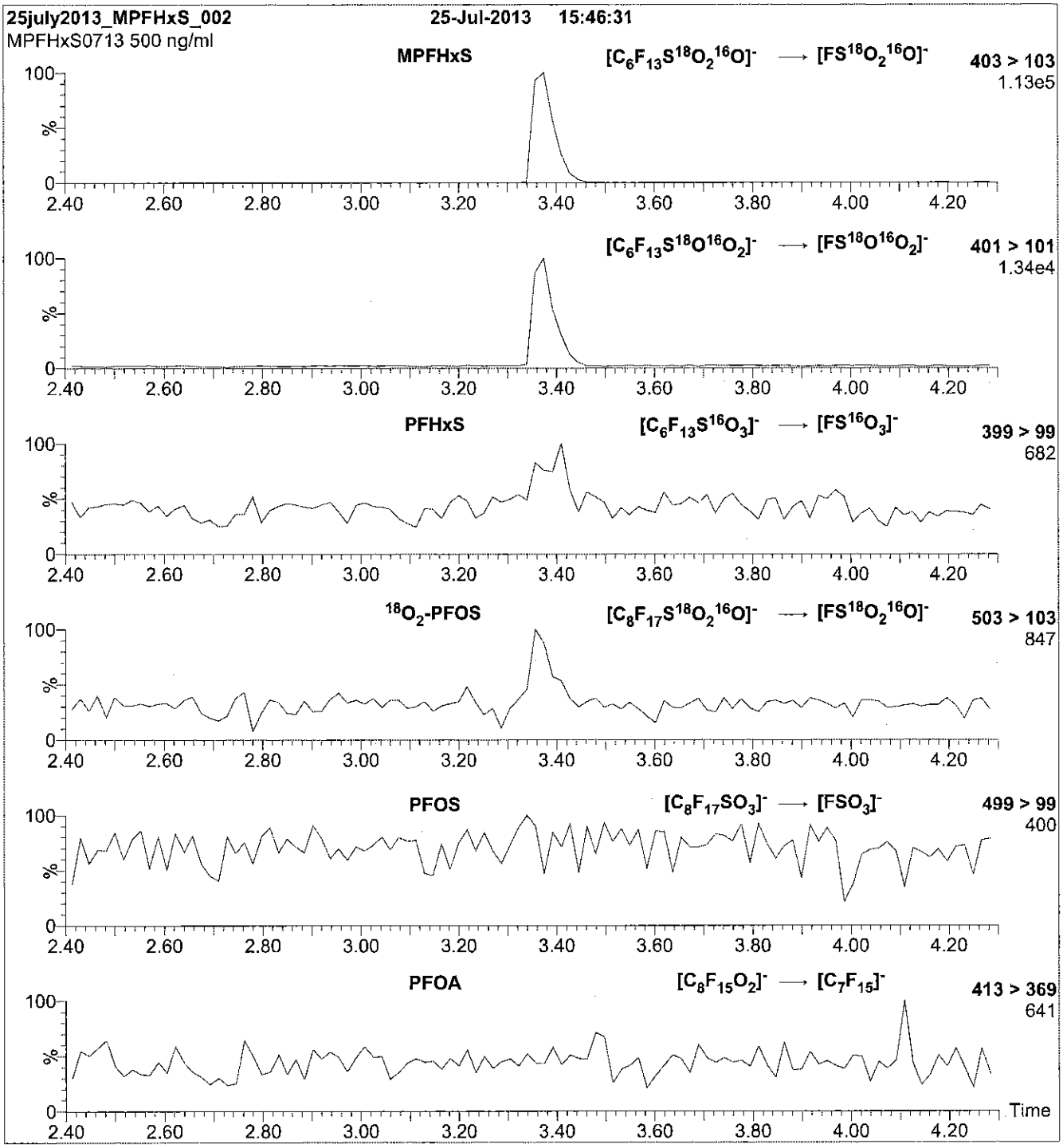
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 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) = 3.58e-3
Collision Energy (eV) = 30

Reagent

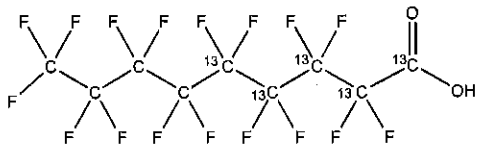
LCMPFNA_00003

V- 2/11/15 SRV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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



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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 04/13/2014 (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. They are designed to be used as reference standards for the identification and/or quantification of specific chemical compound(s).

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. Material Safety Data Sheets (MSDSs) 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, 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 and/or LC/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 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 17025:2005 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 for the period of time specified by the 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:

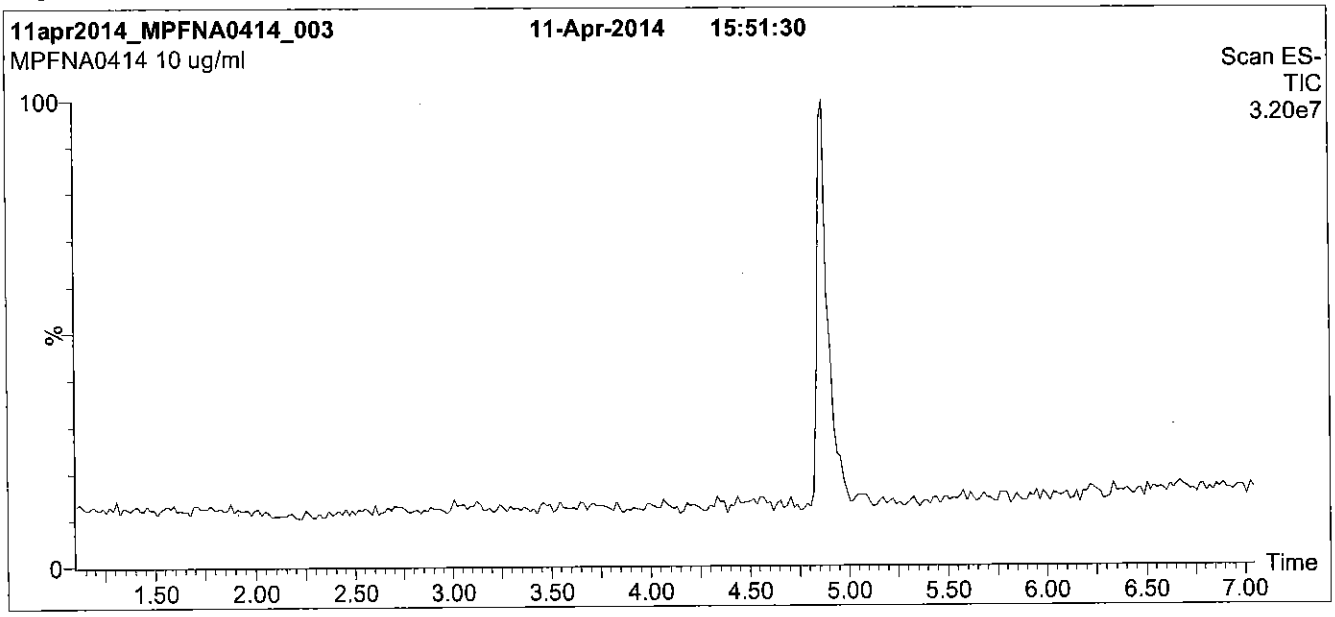
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

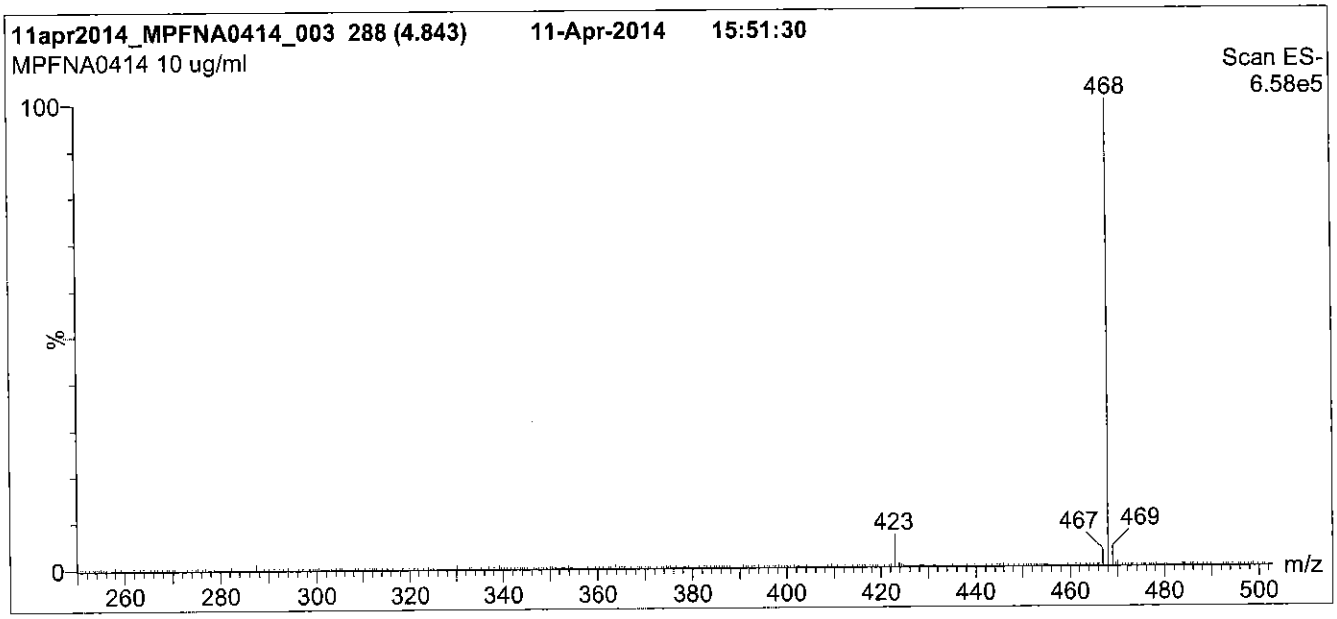
CALA Testing Accreditation No. A 1226

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

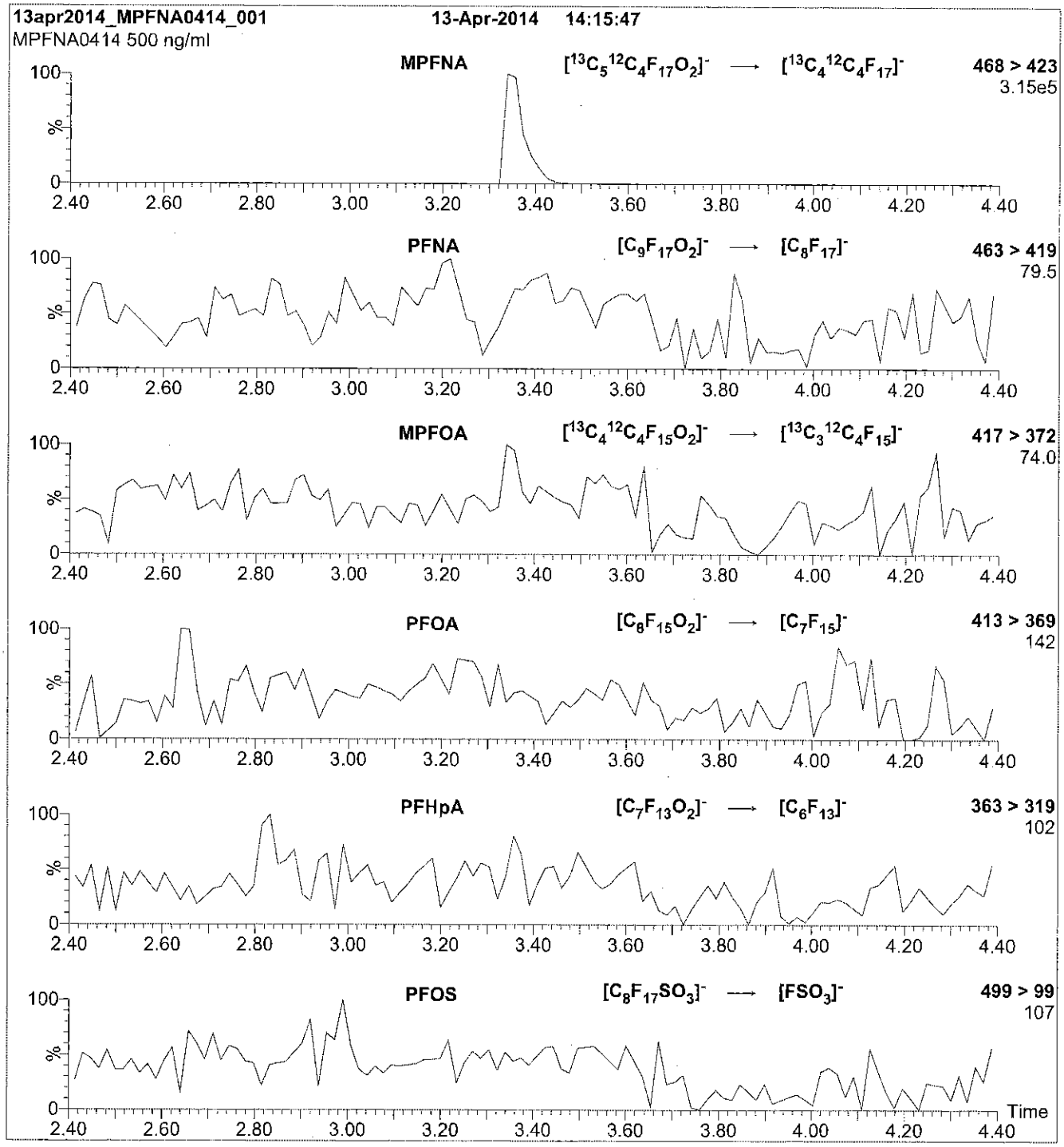
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCMPFOA_00007

V: 9/15/15 BV

WELLINGTON LABORATORIES

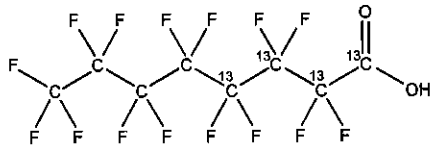
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

LOT NUMBER: MPFOA0415

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_4{}^{12}C_4HF_{15}O_2$	**MOLECULAR WEIGHT:**	418.04
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2,3,4$-$^{13}C_4$)
LAST TESTED: (mm/dd/yyyy)	04/10/2015		
EXPIRY DATE: (mm/dd/yyyy)	04/10/2020		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 04/10/2015 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

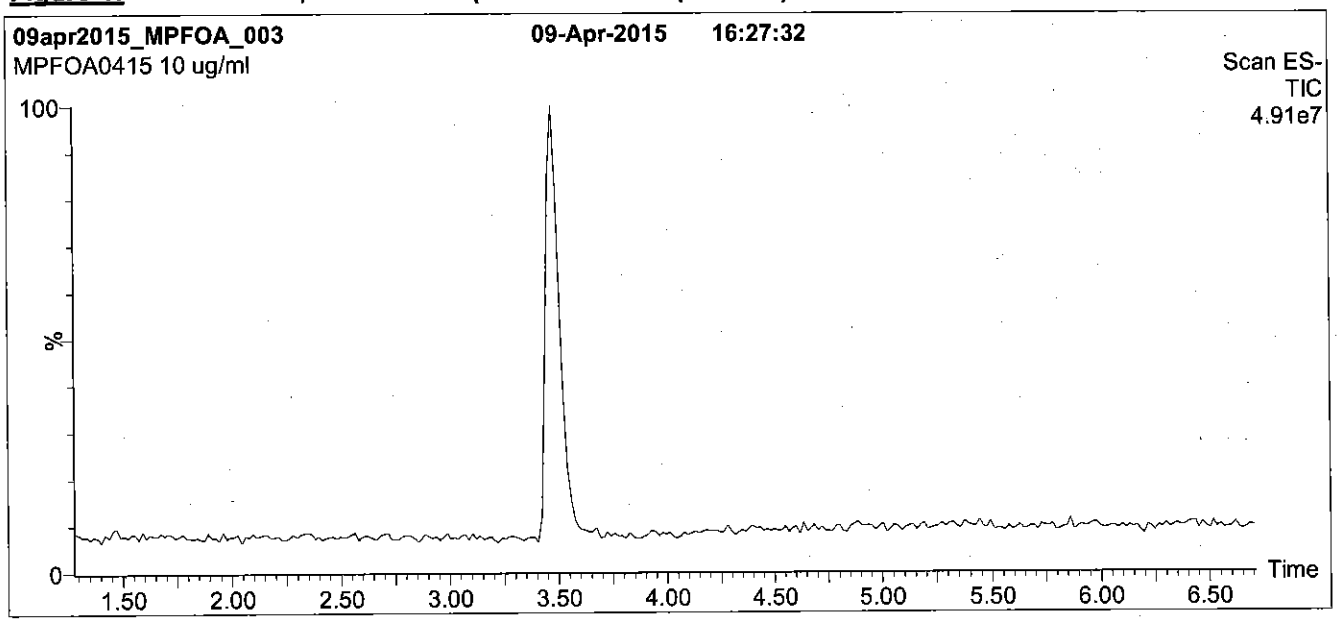
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

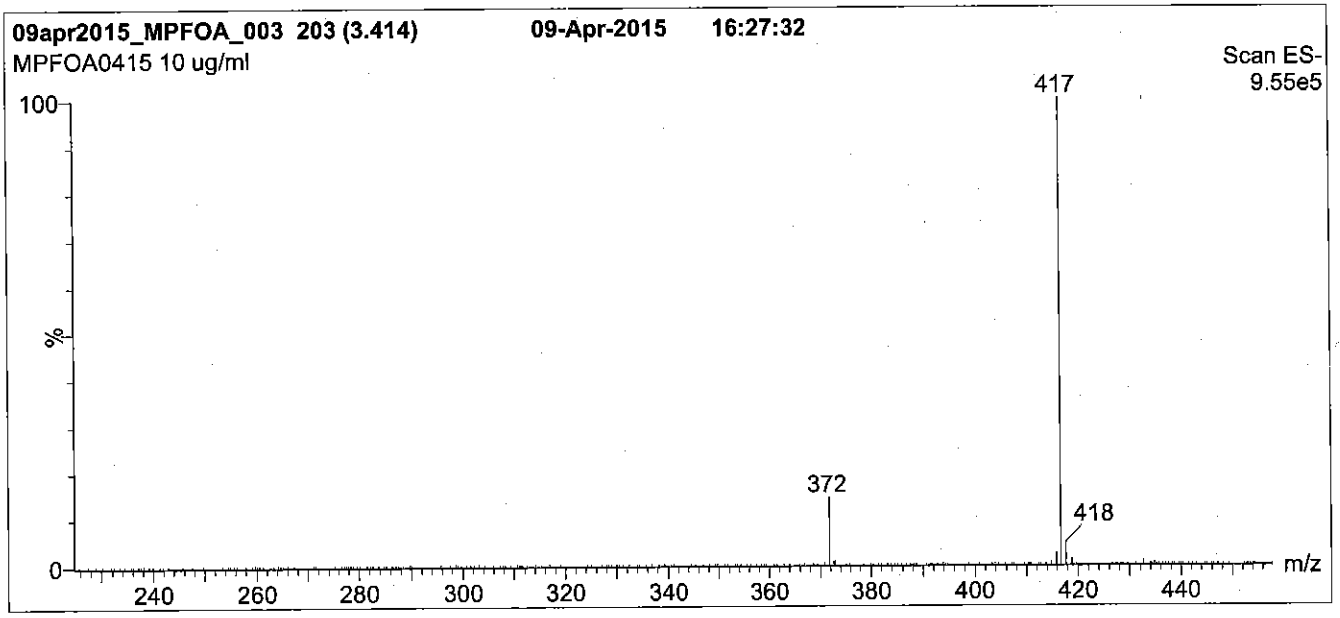
CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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

Figure 1: **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

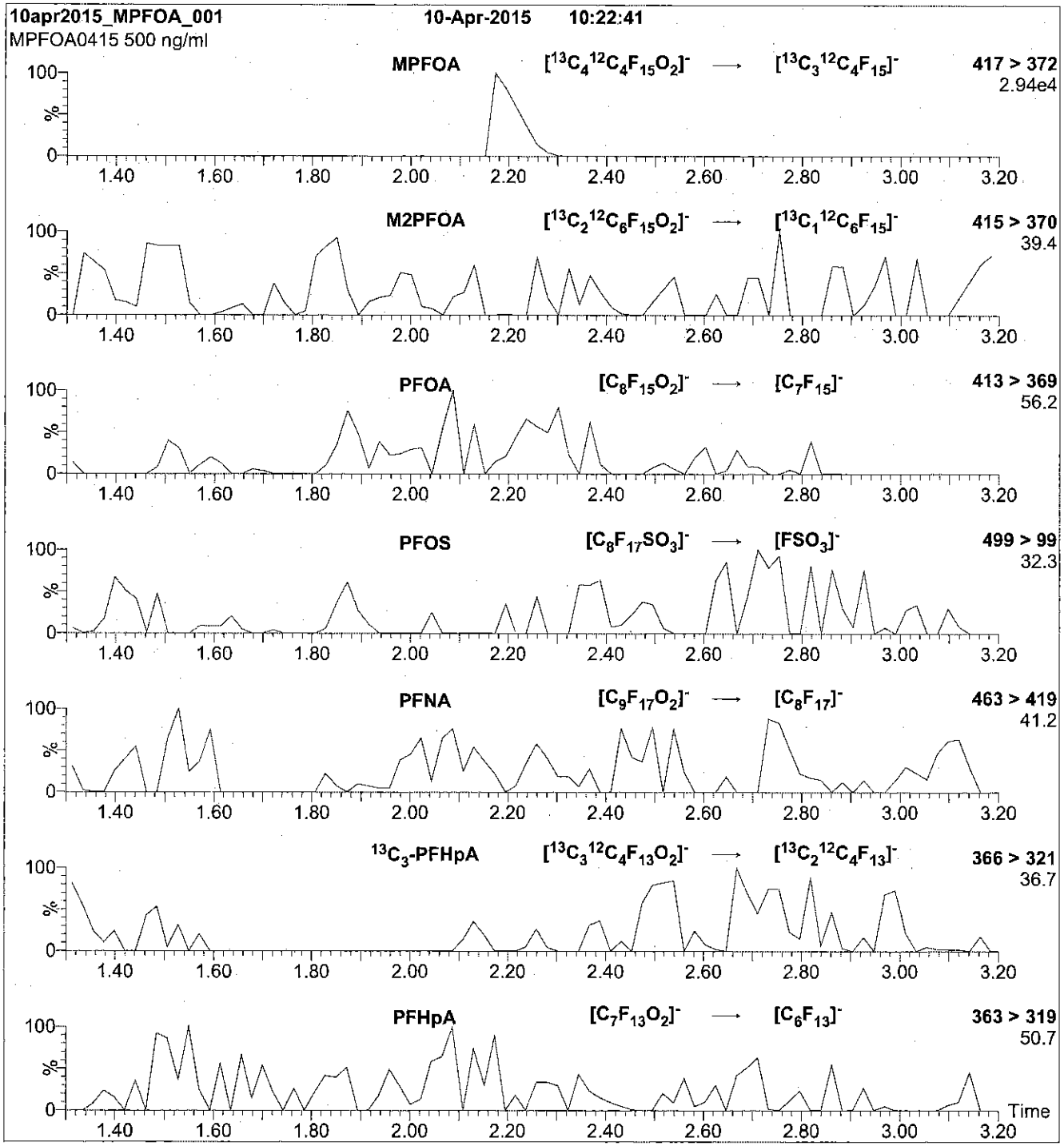
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
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) = 3.24e-3
Collision Energy (eV) = 11

Reagent

LCMPFOS_00009

V: 9/15/15 GV

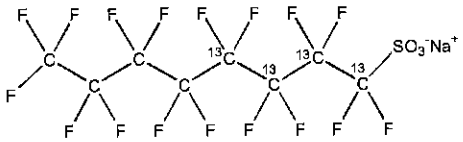
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFOS **LOT NUMBER:** MPFOS0515

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 ($1,2,3,4$-$^{13}C_4$)
LAST TESTED: (mm/dd/yyyy)	05/15/2015		
EXPIRY DATE: (mm/dd/yyyy)	05/15/2020		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 05/28/2015 (mm/dd/yyyy)

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

Form#:27, Issued 2004-11-10
Revision#:3, Revised 2015-03-24

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

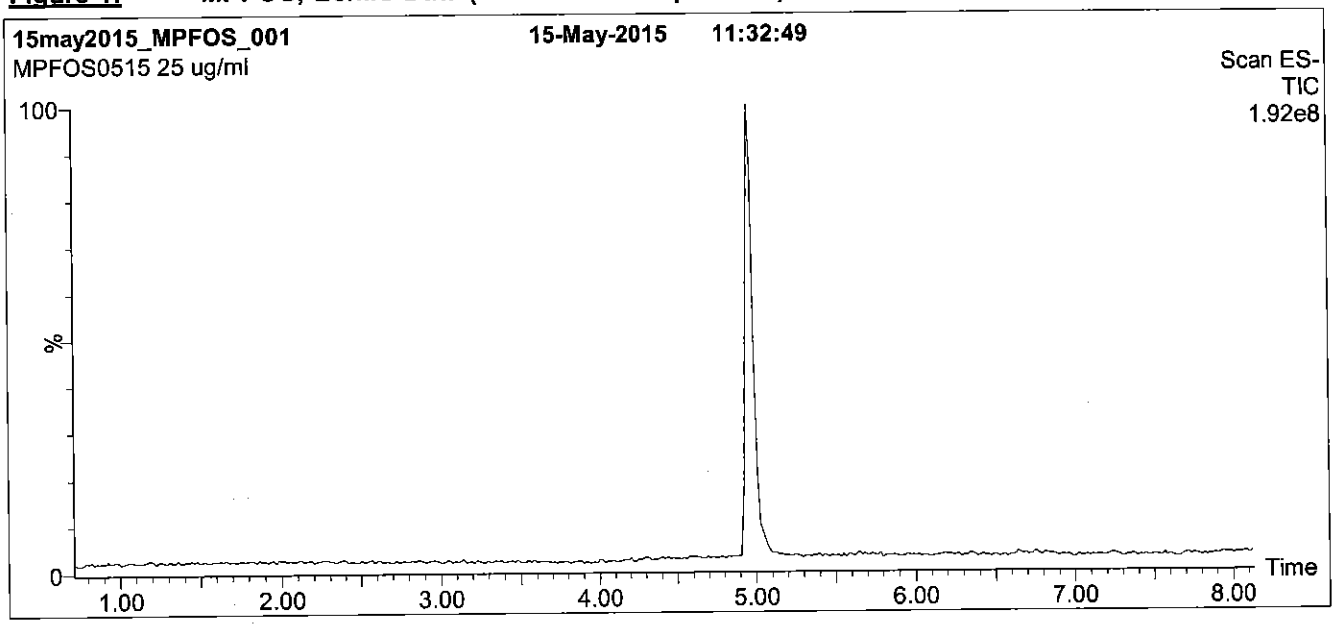
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

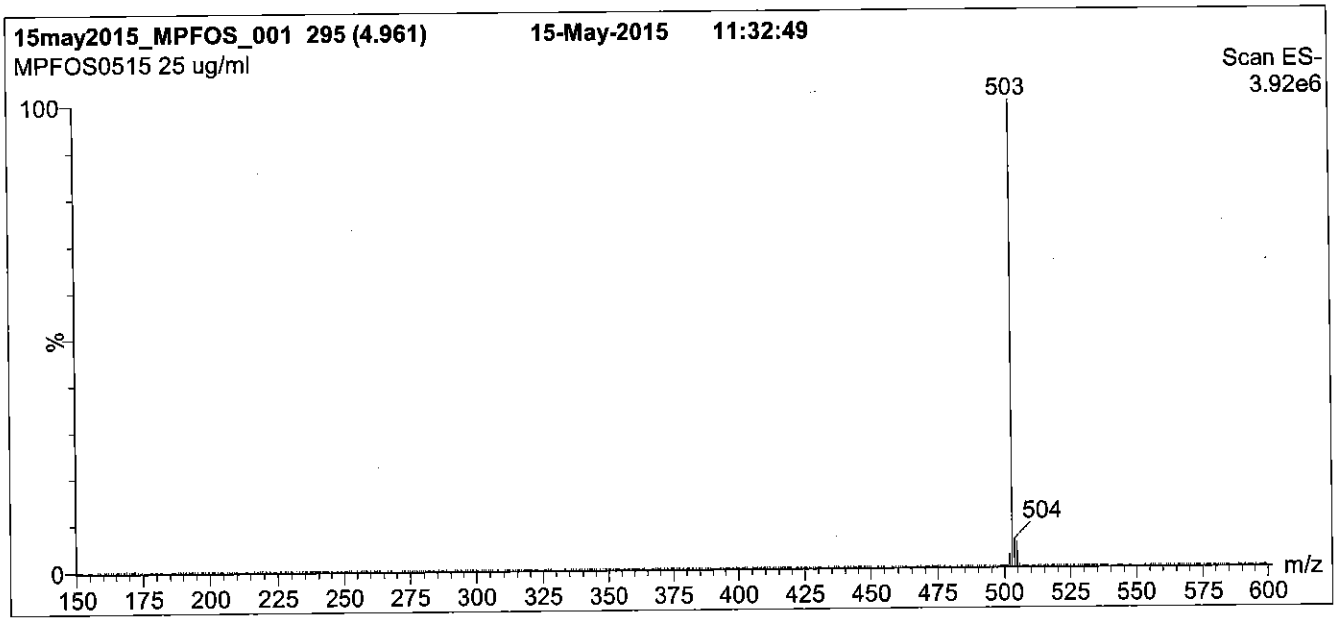
CALA Testing Accreditation No.: A 1226

ANAB ACCREDITED 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: **MPFOS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

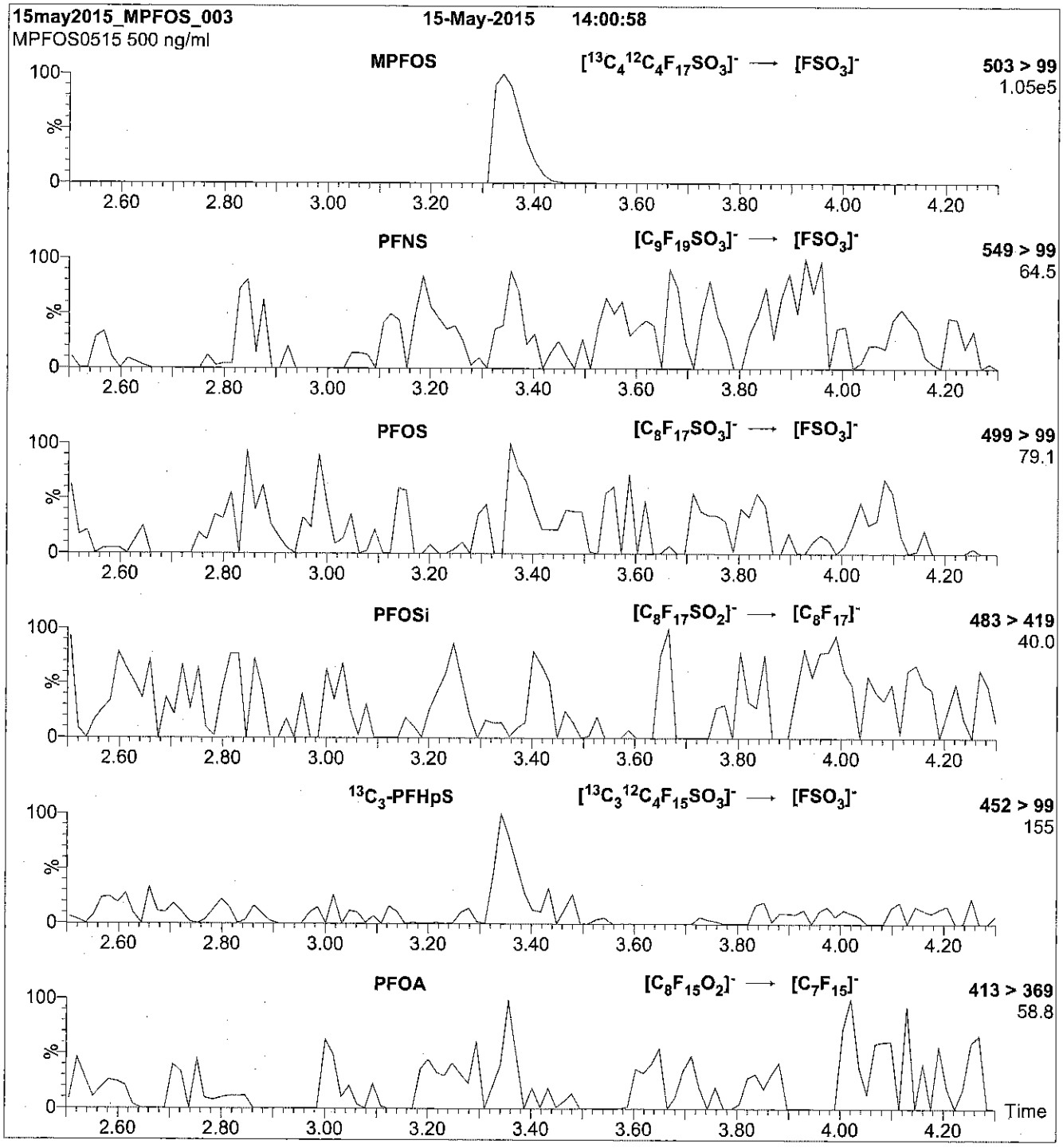
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (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: **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) = 3.35e-3
Collision Energy (eV) = 40

Reagent

LCMPFUdA_00004

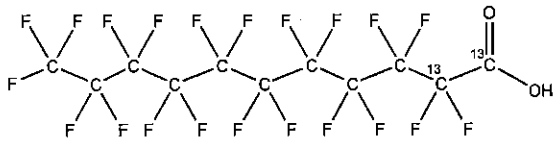
r:4/15/15 SKU

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFUdA
LOT NUMBER: MPFUdA1014
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]undecanoic acid

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_9HF_{21}O_2$	**MOLECULAR WEIGHT:**	566.08
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	10/31/2014		
EXPIRY DATE: (mm/dd/yyyy)	10/31/2019		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- 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:** 11/03/2014 (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. They are designed to be used as reference standards for the identification and/or quantification of specific chemical compound(s).

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. Material Safety Data Sheets (MSDSs) 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, 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 and/or LC/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 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 17025:2005 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 for the period of time specified by the 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:

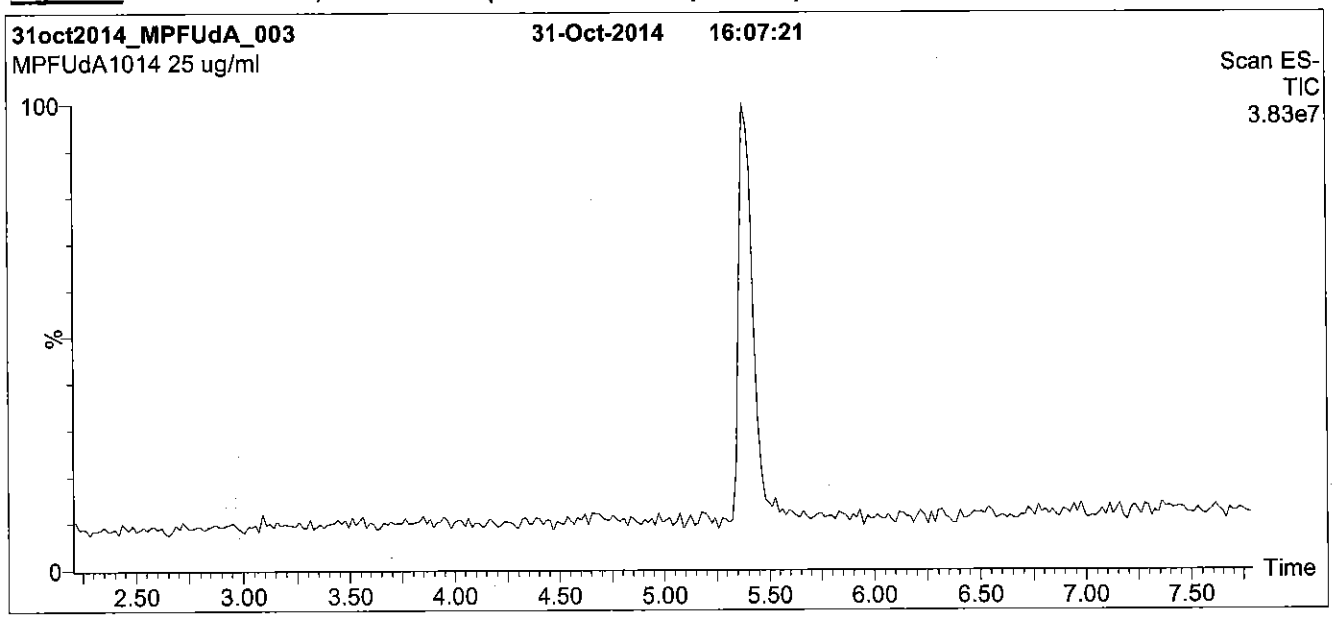
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

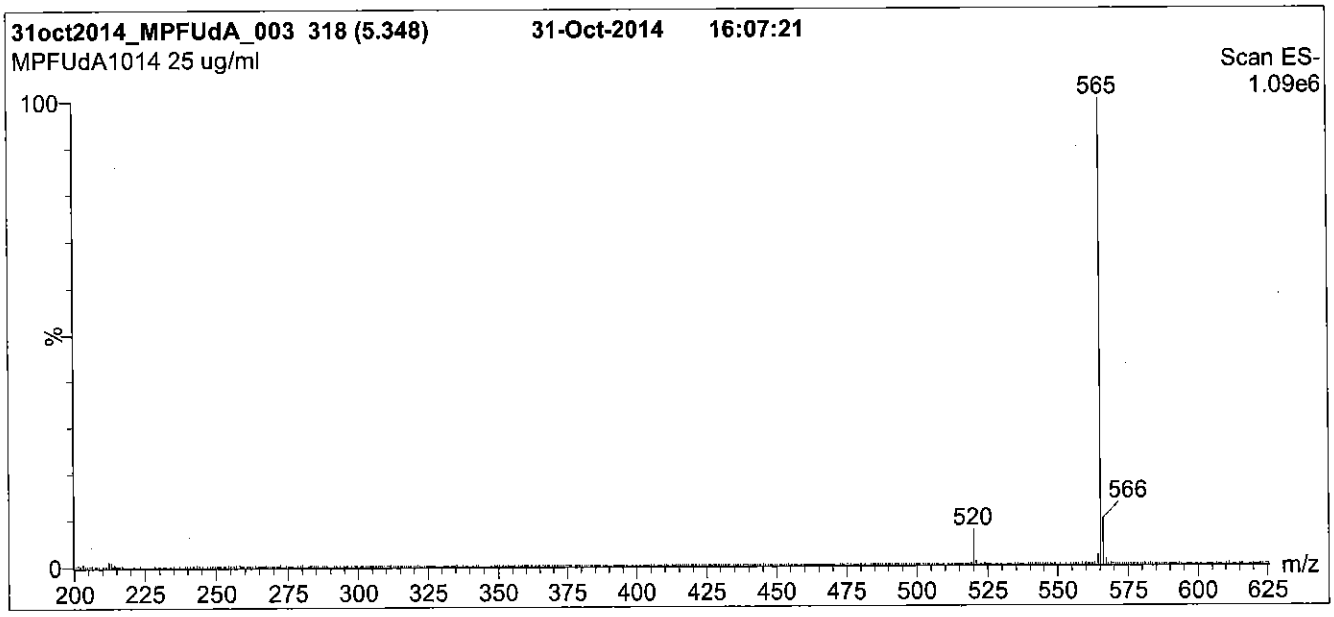
CALA Testing Accreditation No. A1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 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

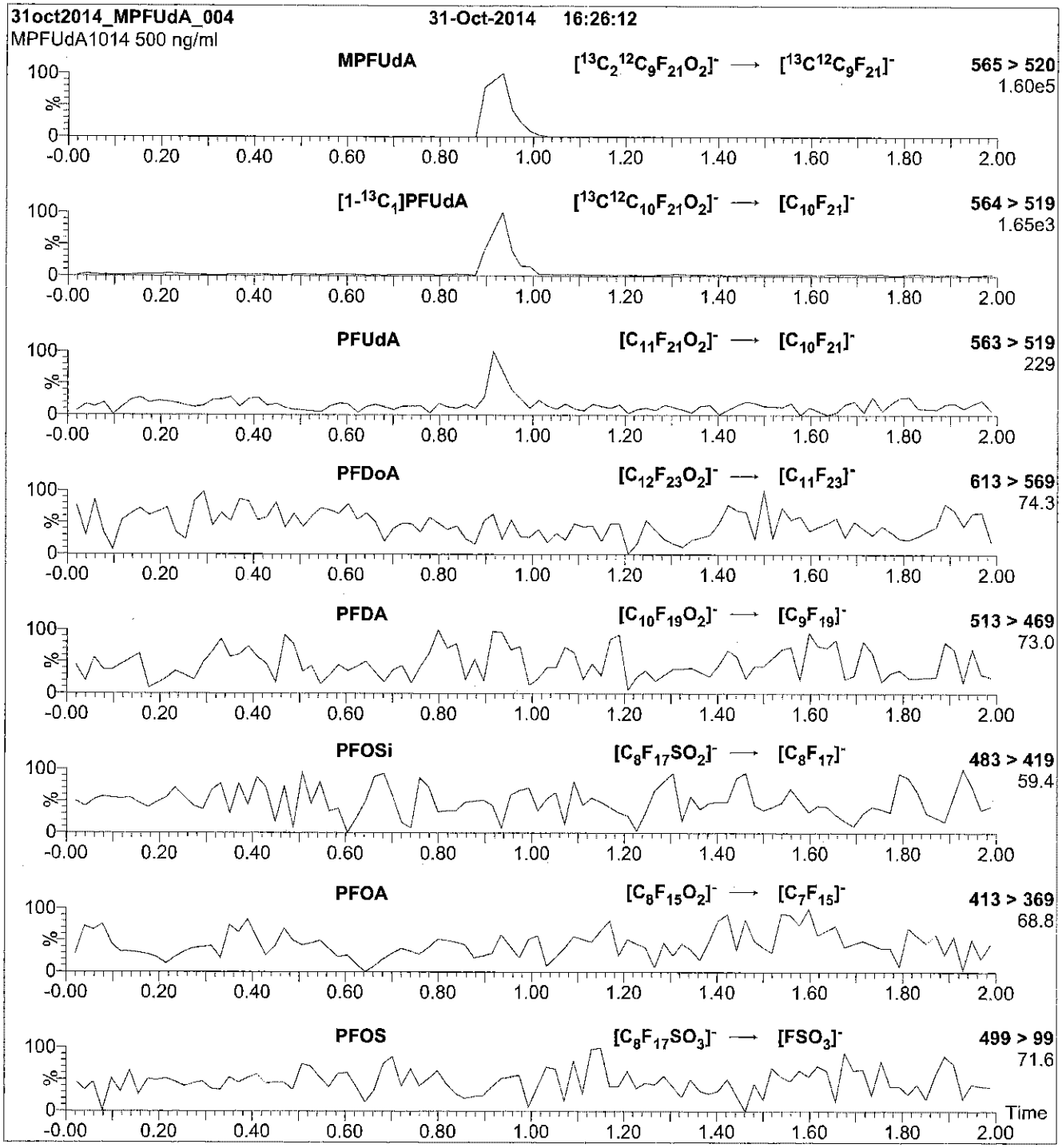
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (200 - 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

LCMPFUdA_00005

V: 12/9/15 SEV

WELLINGTON LABORATORIES

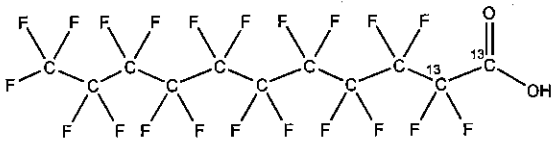
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

LOT NUMBER: MPFUdA1014

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)	10/31/2014		
EXPIRY DATE: (mm/dd/yyyy)	10/31/2019		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- 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:** 04/01/2015 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

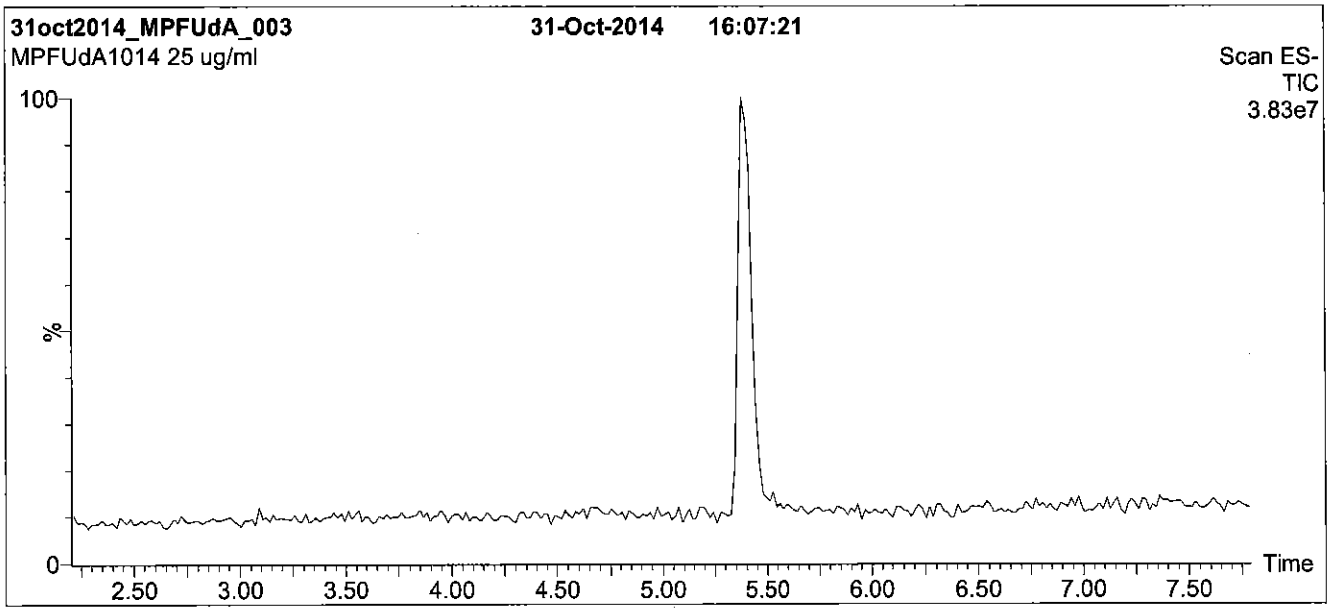
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

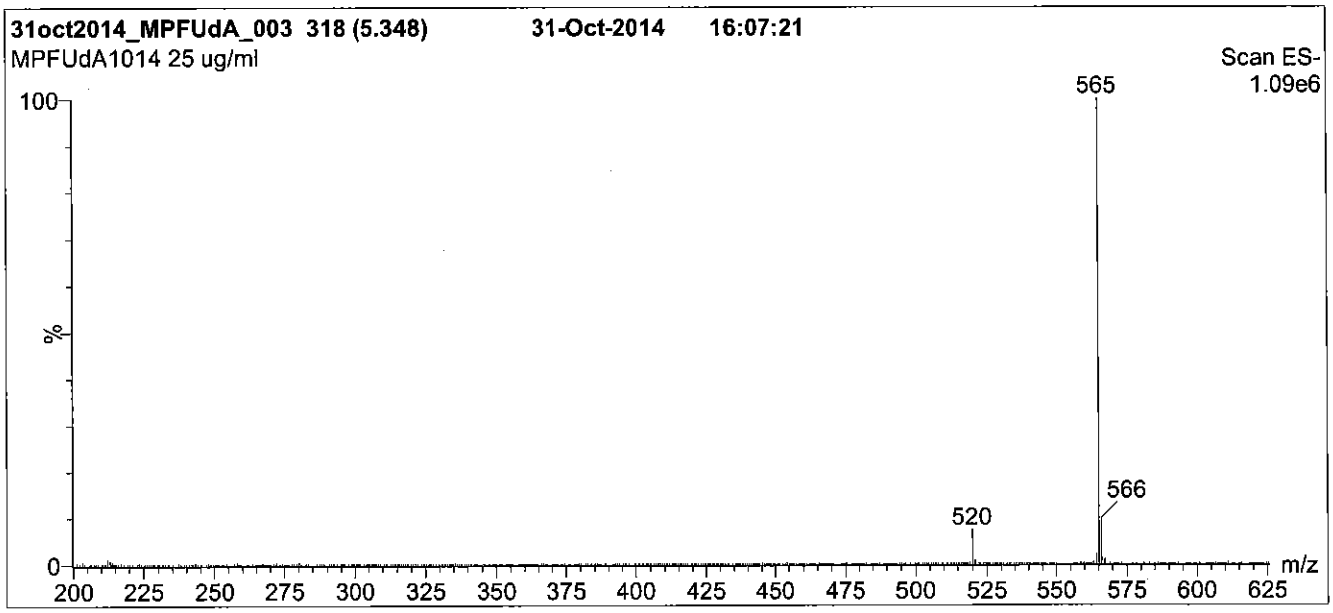
CALA Testing Accreditation No. A 1226

ANAB ACCREDITED Accredited REFERENCE MATERIAL PRODUCER

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 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

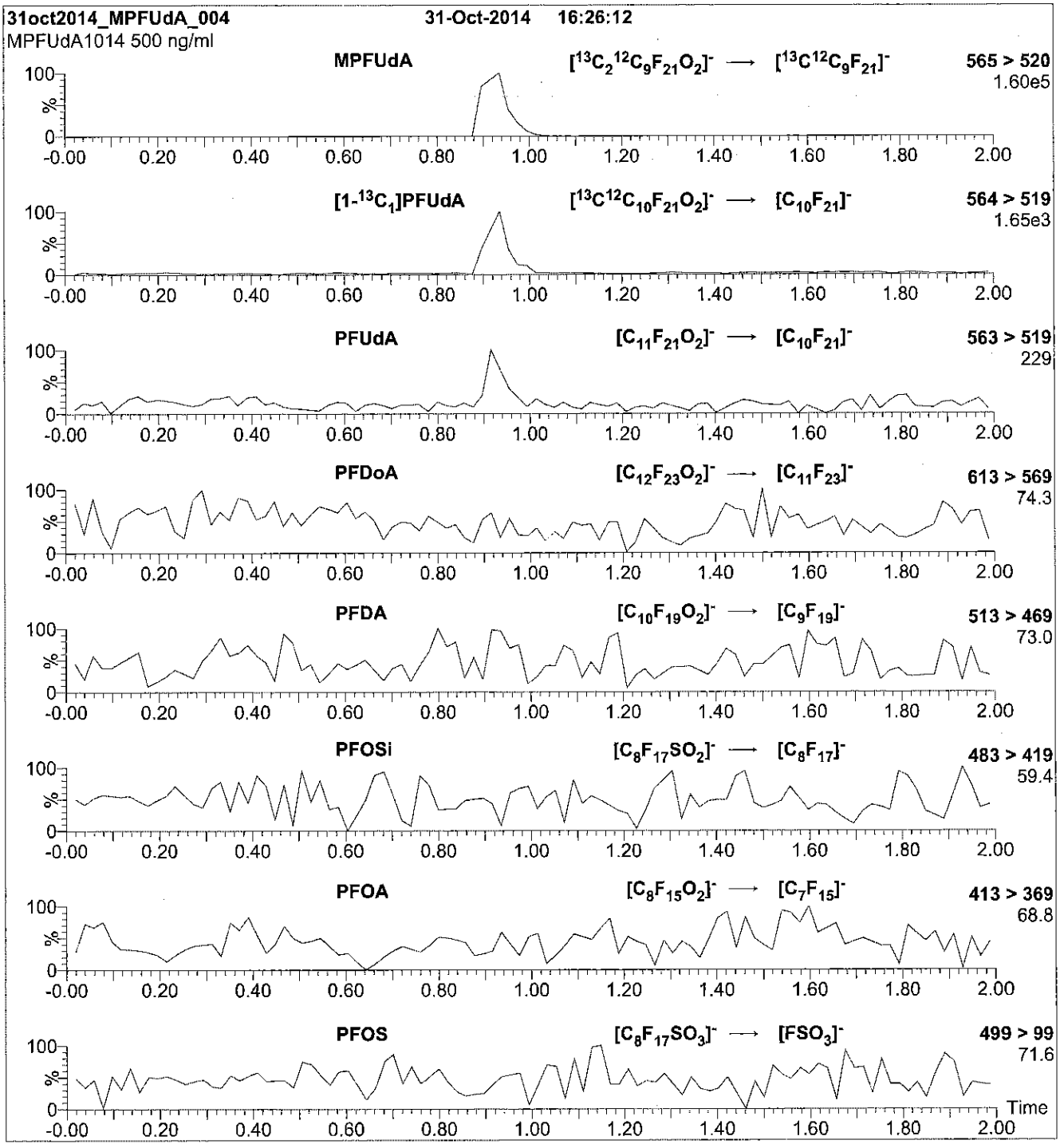
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (200 - 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

LCPFBA_00003

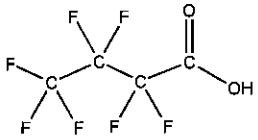
rec 7/15/14

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFBA
COMPOUND: Perfluoro-n-butanoic acid
LOT NUMBER: PFBA0313

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) 03/05/2013
EXPIRY DATE: (mm/dd/yyyy) 03/05/2018
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 03/06/2013 (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. They are designed to be used as reference standards for the identification and/or quantification of specific chemical compound(s).

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. Material Safety Data Sheets (MSDSs) 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, 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 and/or LC/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 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 17025:2005 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 for the period of time specified by the 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:

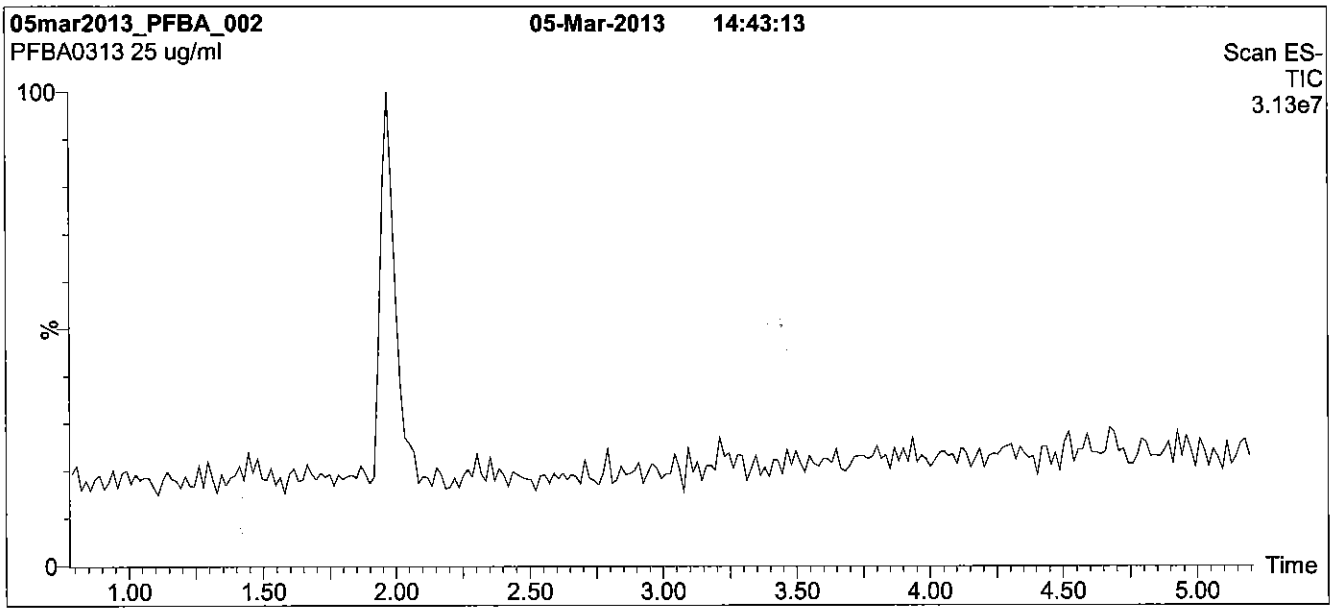
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

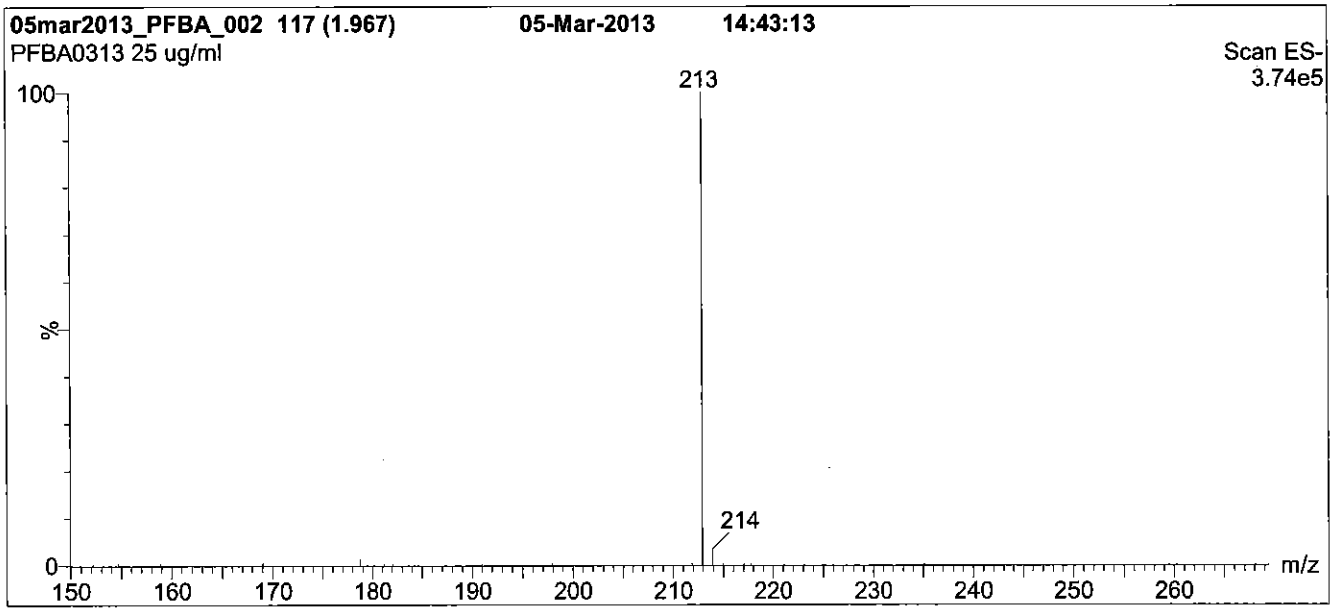
CALA Testing Accreditation No. A1226

ACLASS 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: **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: 25% (80:20 MeOH:ACN) / 75% 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

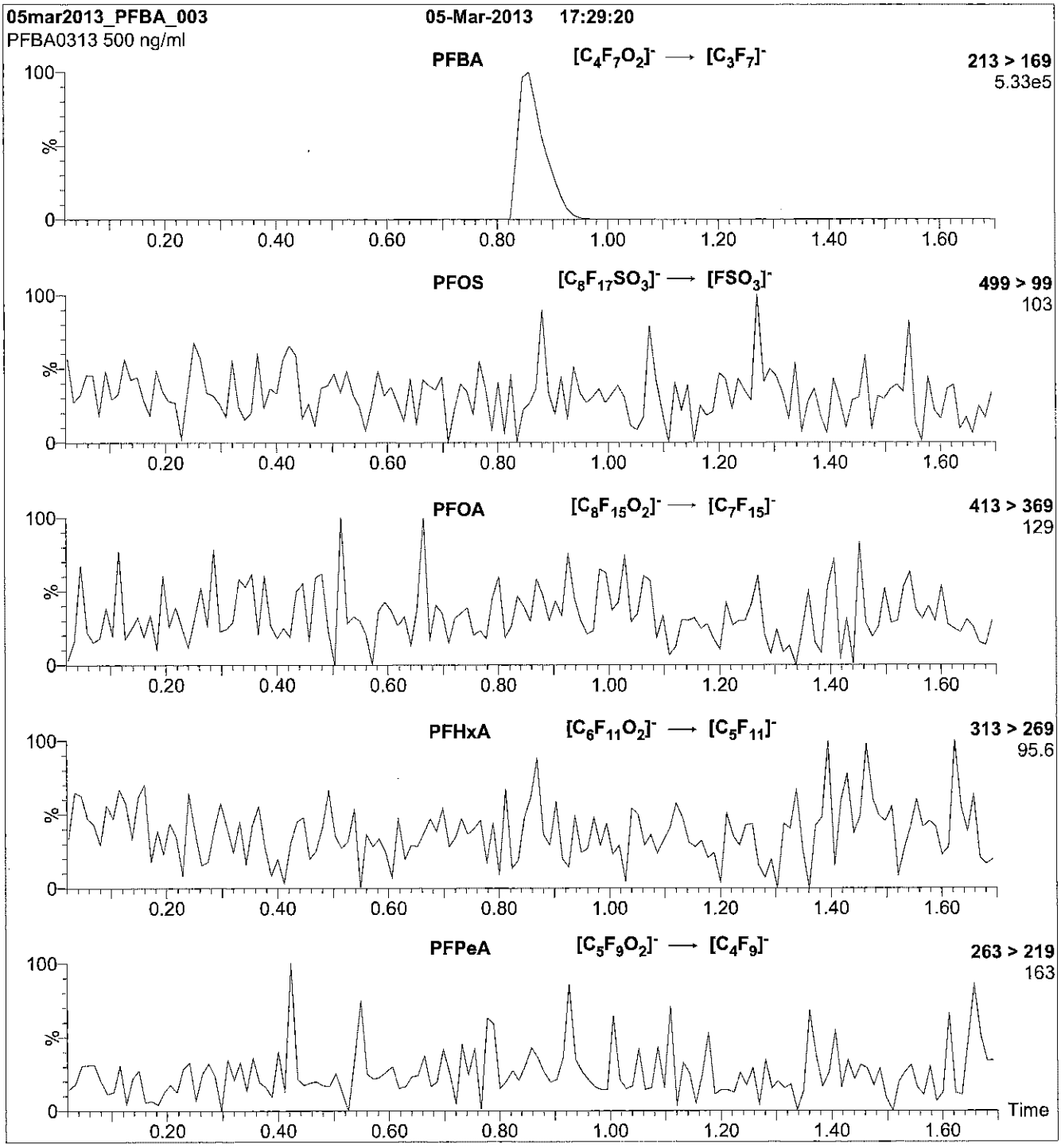
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

Injection: Direct loop injection
10 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) = 3.70e-3
Collision Energy (eV) = 10

Reagent

LCPFBS_00003

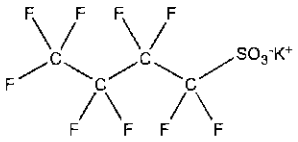
r. 2/11/15

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: L-PFBS
LOT NUMBER: LPFBS1014
COMPOUND: Potassium perfluoro-1-butanesulfonate

STRUCTURE:
CAS #: 29420-49-3



MOLECULAR FORMULA: $C_4F_9SO_3K$
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) 10/09/2014
EXPIRY DATE: (mm/dd/yyyy) 10/09/2019
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 10/17/2014 (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. They are designed to be used as reference standards for the identification and/or quantification of specific chemical compound(s).

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. Material Safety Data Sheets (MSDSs) 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, 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 and/or LC/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

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

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

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

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

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all 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 17025:2005 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 for the period of time specified by the 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:

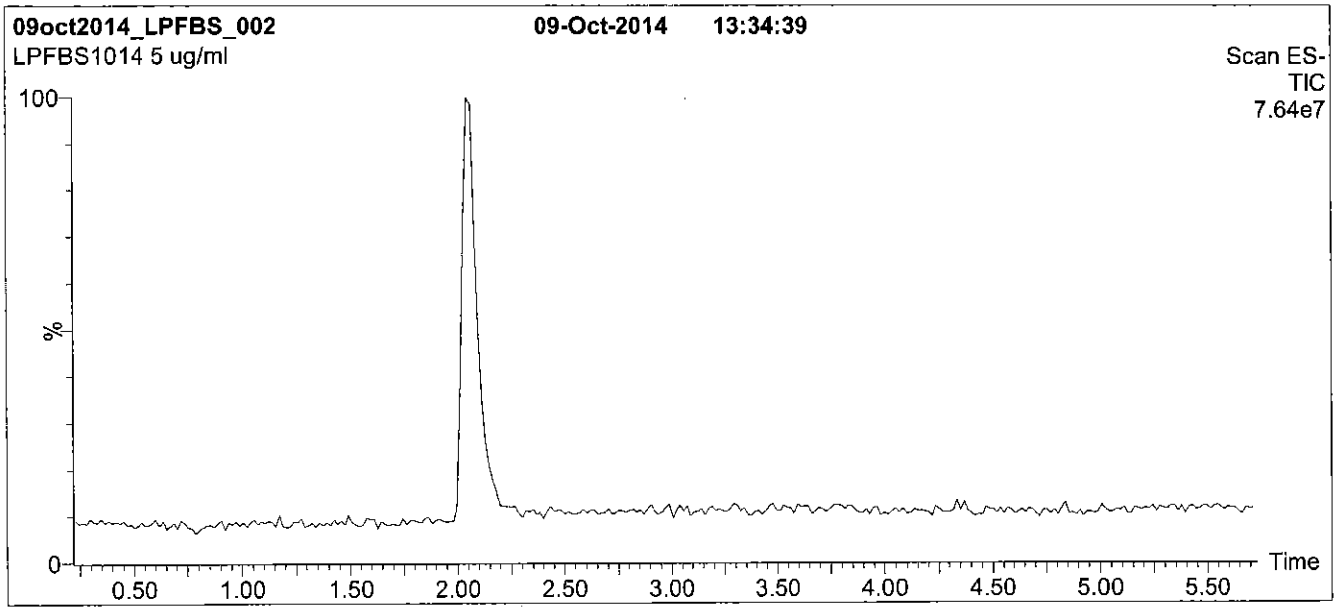
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

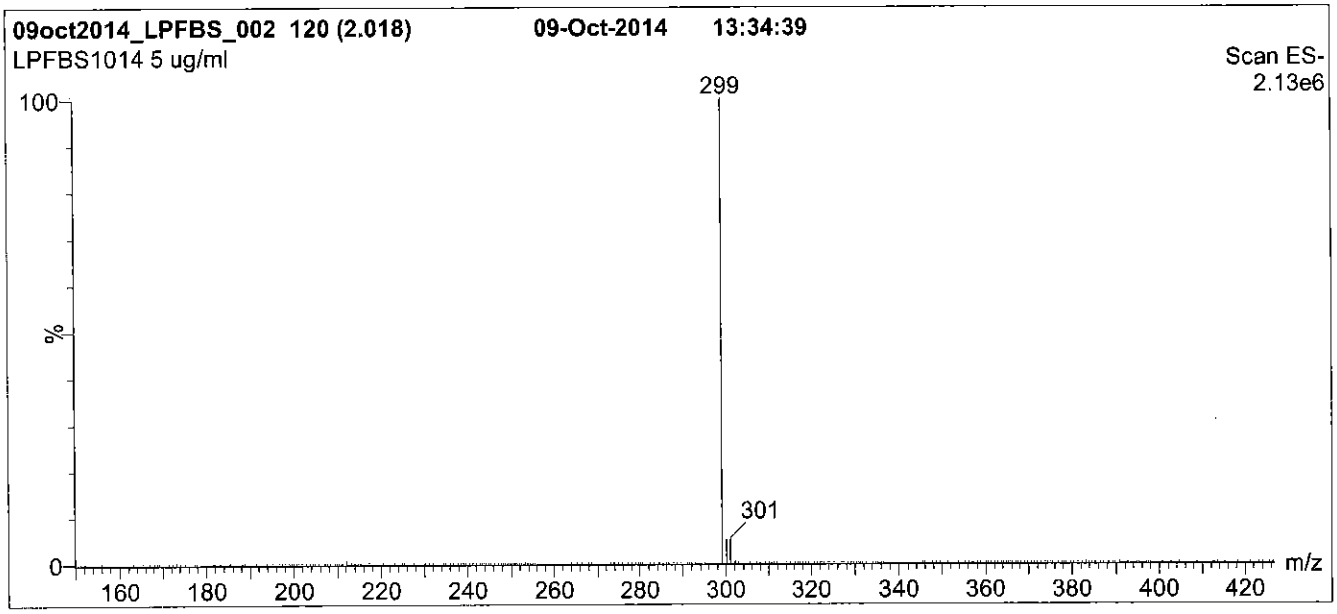
CALA Testing Accreditation No: A 1226

ACLASS 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-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

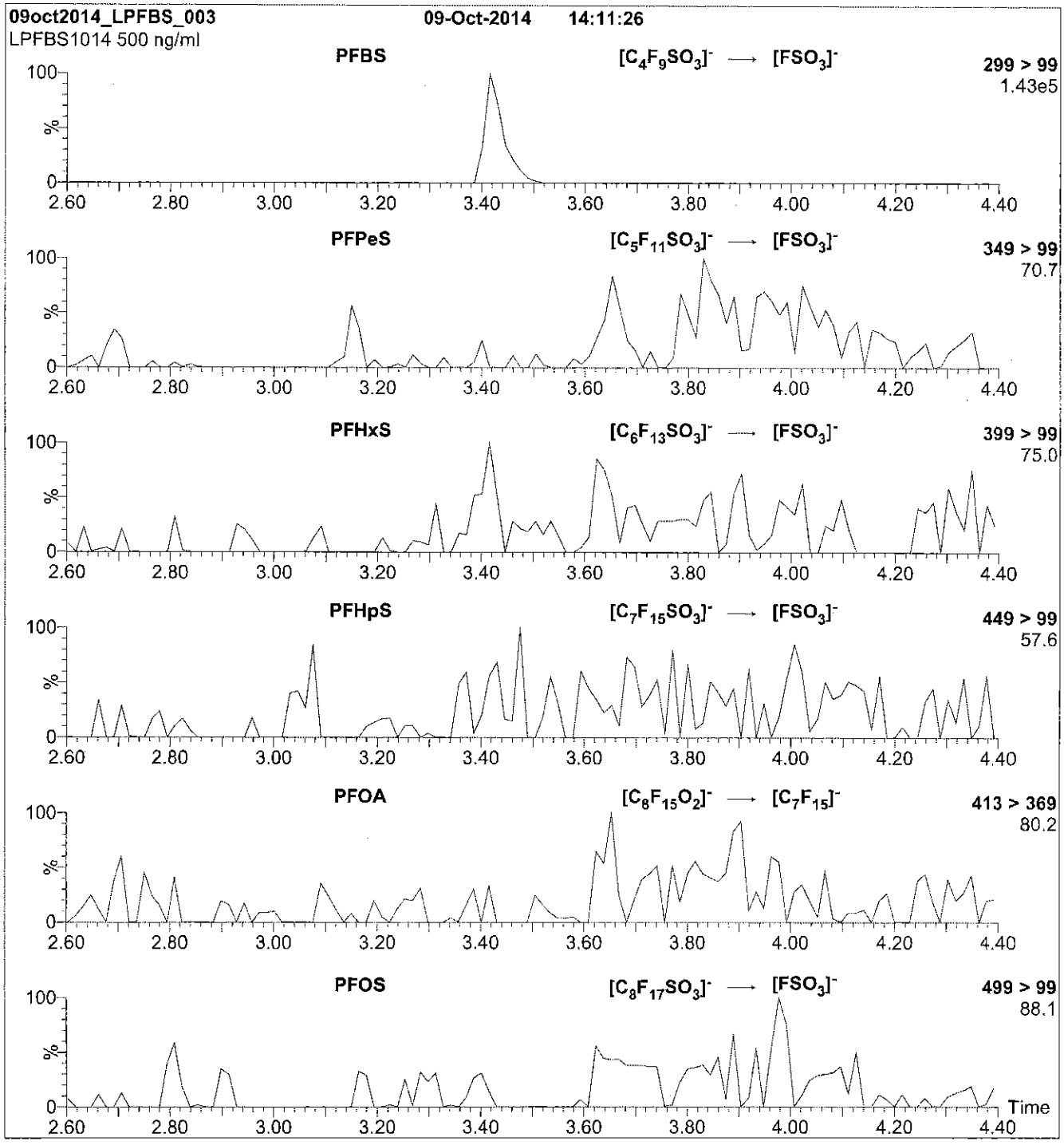
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

Injection:	Direct loop injection 10 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) = 3.43e-3
Collision Energy (eV) = 25

Reagent

LCPFDA_00003

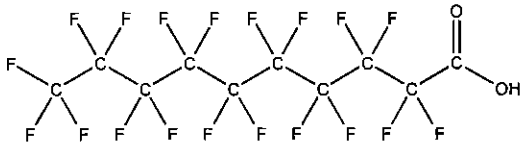
rec 7/16/14

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFDA
COMPOUND: Perfluoro-n-decanoic acid
LOT NUMBER: PFDA0613

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) 06/19/2013
EXPIRY DATE: (mm/dd/yyyy) 06/19/2018
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.4% PFNA and ~ 0.1% PFOA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 07/03/2013 (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. They are designed to be used as reference standards for the identification and/or quantification of specific chemical compound(s).

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. Material Safety Data Sheets (MSDSs) 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, 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 and/or LC/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 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 17025:2005 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 for the period of time specified by the 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:

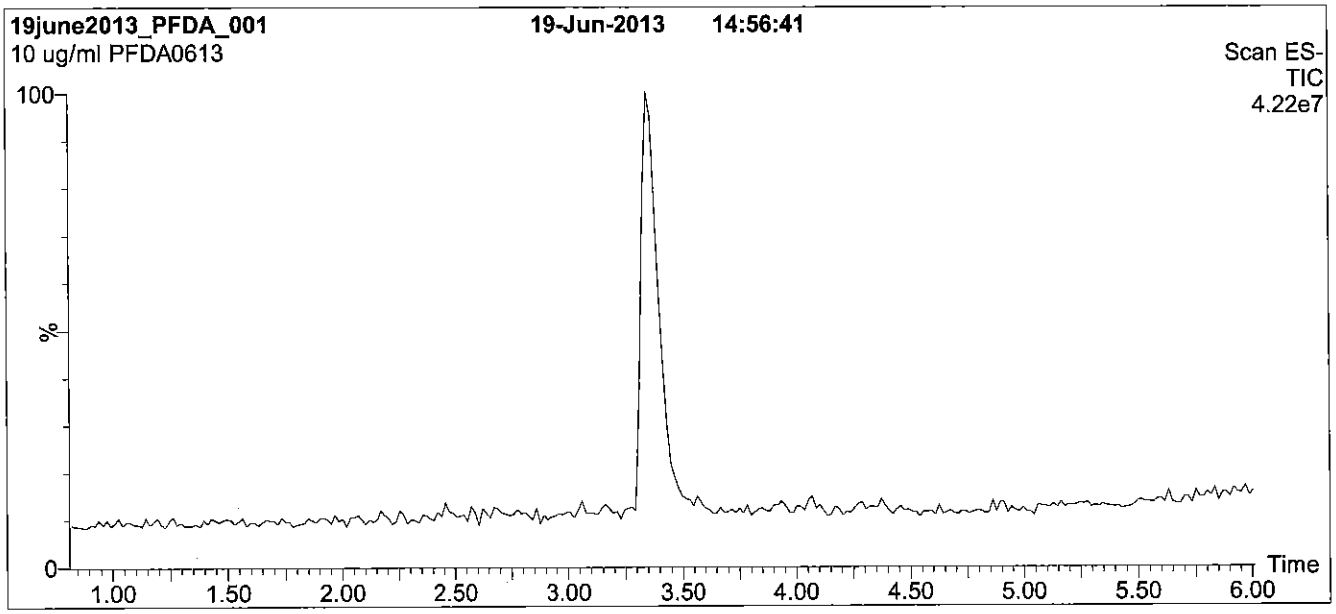
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

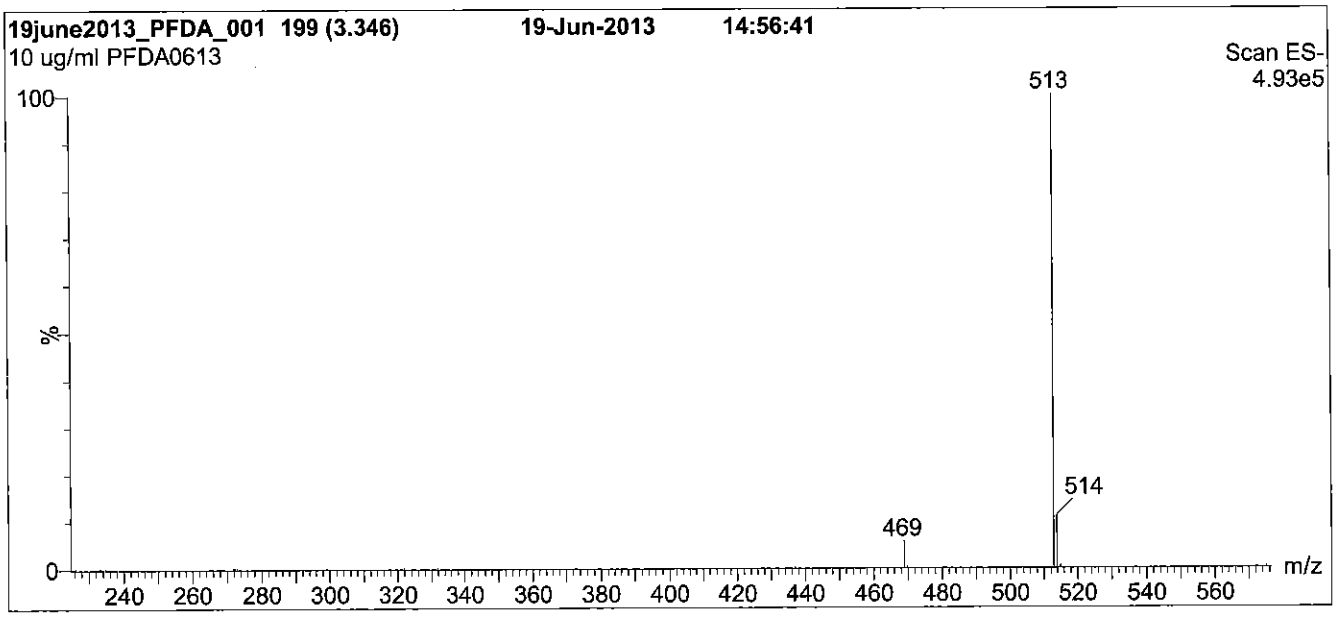
CALA Testing Accreditation No. A1226

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 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

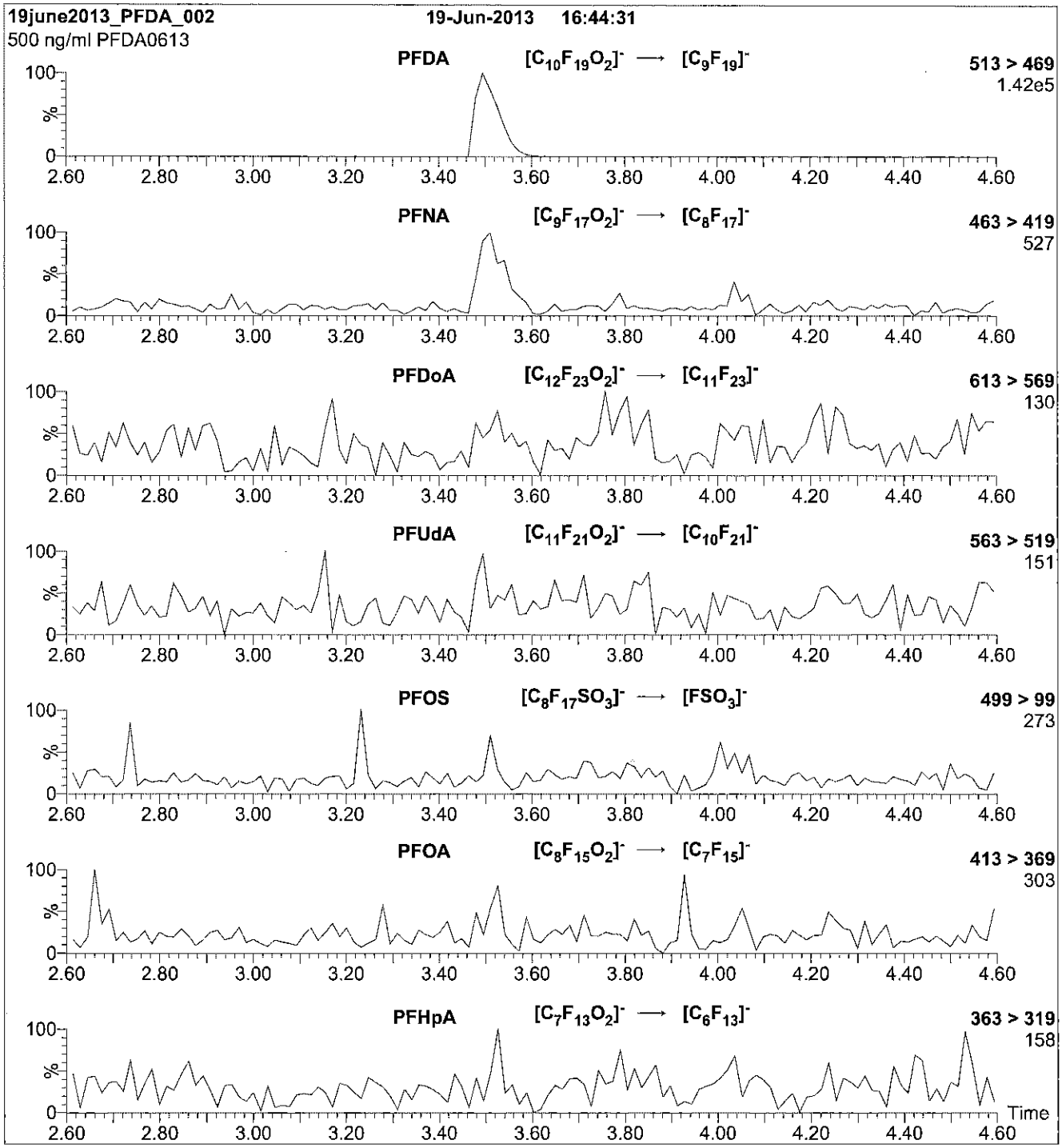
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 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) = 3.58e-3
Collision Energy (eV) = 13

Reagent

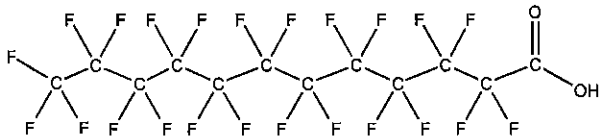
LCPFDoA_00003

Rec 7/14/15

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFDoA	**LOT NUMBER:**	PFDoA0113
COMPOUND:	Perfluoro-n-dodecanoic acid		
STRUCTURE:		**CAS #:**	307-55-1



MOLECULAR FORMULA:	$C_{12}HF_{23}O_2$	**MOLECULAR WEIGHT:**	614.10
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	01/03/2013		
EXPIRY DATE: (mm/dd/yyyy)	01/03/2018		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

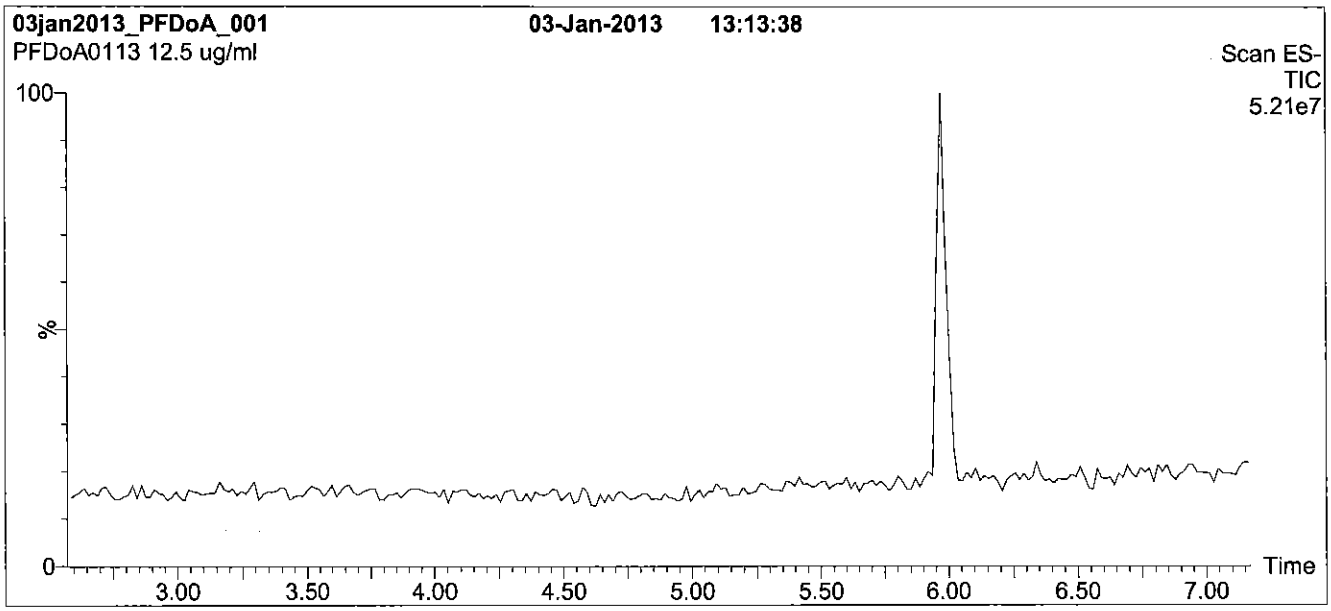
- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

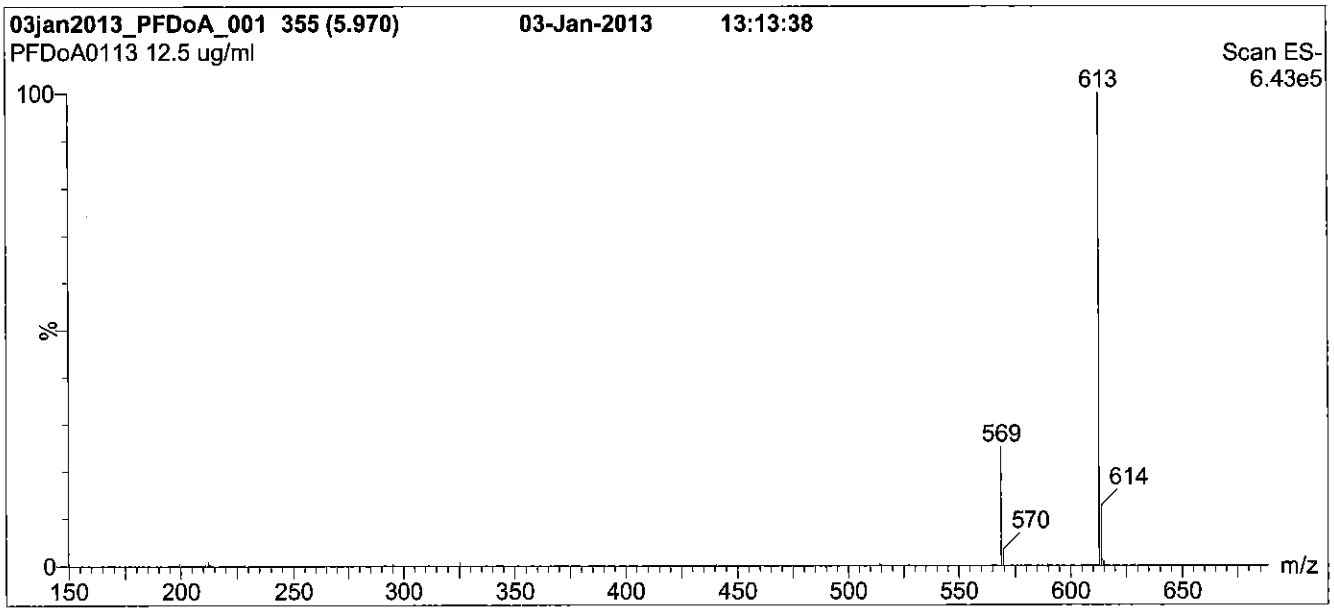
FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 02/01/2013 (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

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: 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.
Return to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

Reagent

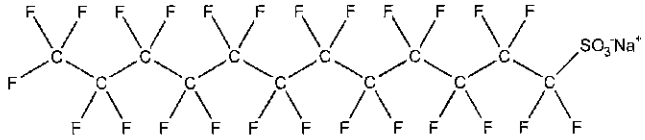
LCPFDoS_00003

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: L-PFDoS
LOT NUMBER: LPFDoS1011
COMPOUND: Sodium perfluoro-1-dodecanesulfonate

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA:	$C_{12}F_{25}SO_3Na$	**MOLECULAR WEIGHT:**	722.14
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt)	**SOLVENT(S):**	Methanol
	48.4 ± 2.4 µg/ml (PFDoS anion)		
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	10/06/2011		
EXPIRY DATE: (mm/dd/yyyy)	10/06/2016		
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 ~ 0.3% of sodium perfluoro-1-tetradecanesulfonate and ~ 0.8% of perfluoro-n-dodecanoic acid (PFDoA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 01/15/2013 (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. They are designed to be used as reference standards for the identification and/or quantification of specific chemical compound(s).

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. Material Safety Data Sheets (MSDSs) 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, 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 and/or LC/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 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 17025:2005 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 for the period of time specified by the 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:

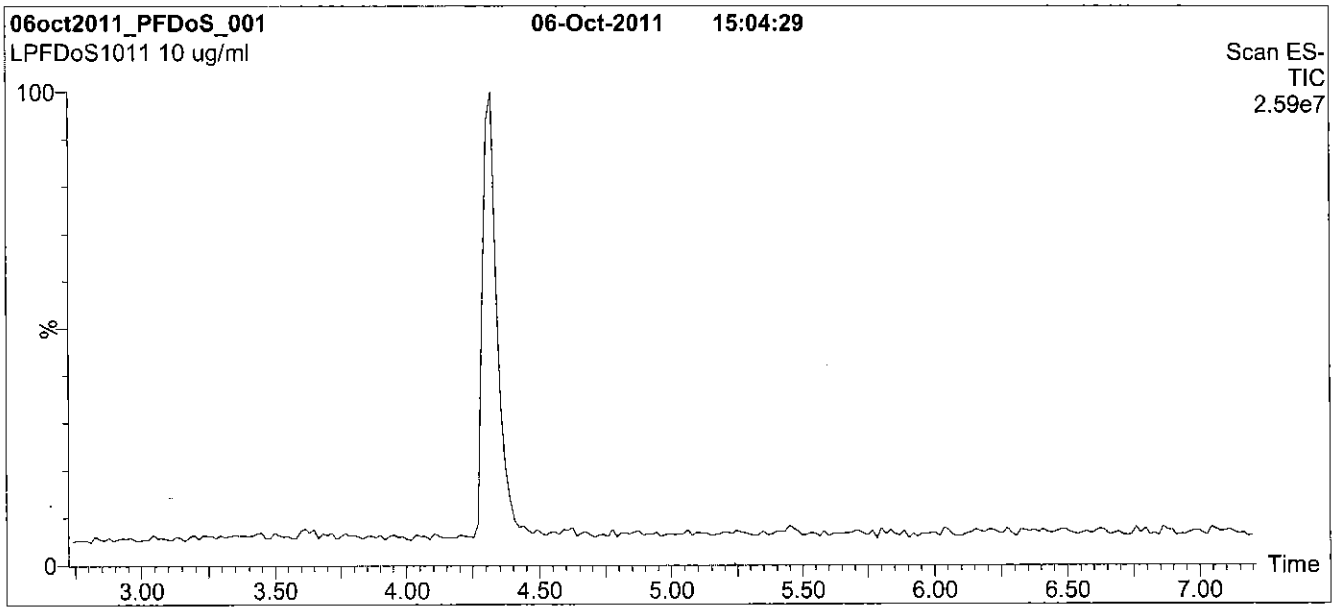
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

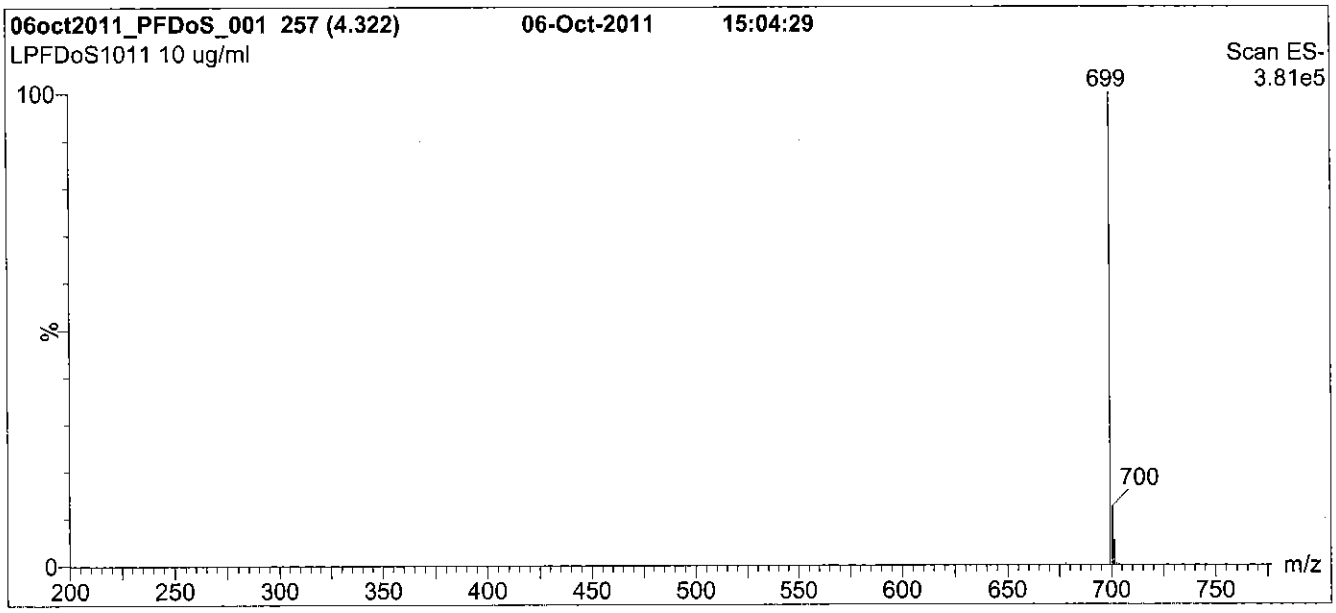
CALA Testing Accreditation No. A 1226

ACLASS 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-PFDoS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

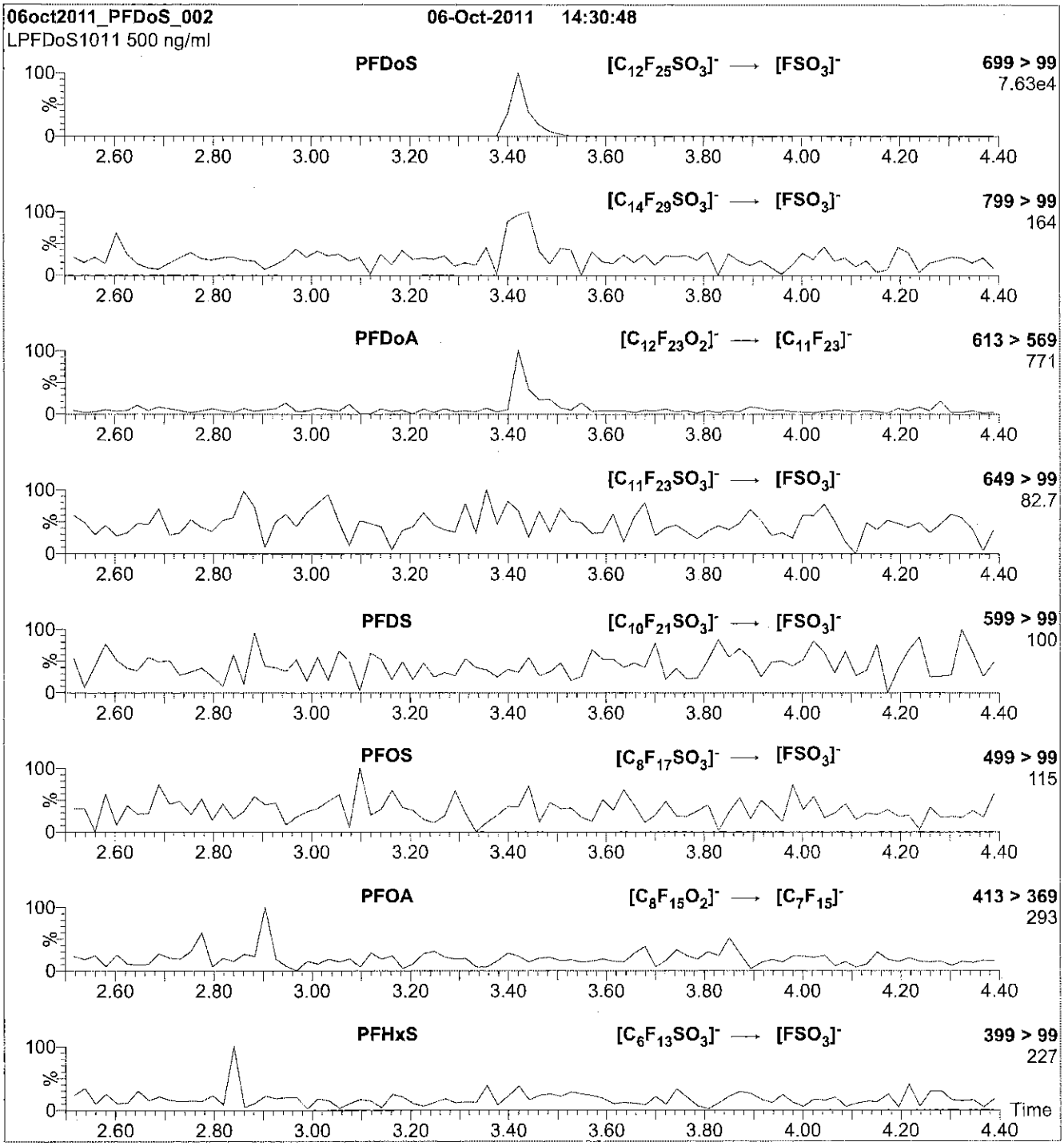
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (200 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 80.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCPFDS_00003

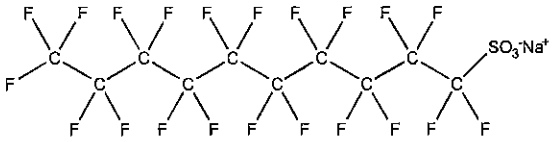
Γ: 2/11/15 SV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: L-PFDS
LOT NUMBER: LPFDS0913
COMPOUND: Sodium perfluoro-1-decanesulfonate

STRUCTURE:
CAS #: Not available



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)	09/13/2013		
EXPIRY DATE: (mm/dd/yyyy)	09/13/2018		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 09/23/2013 (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. They are designed to be used as reference standards for the identification and/or quantification of specific chemical compound(s).

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. Material Safety Data Sheets (MSDSs) 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, 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 and/or LC/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 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 17025:2005 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 for the period of time specified by the 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:

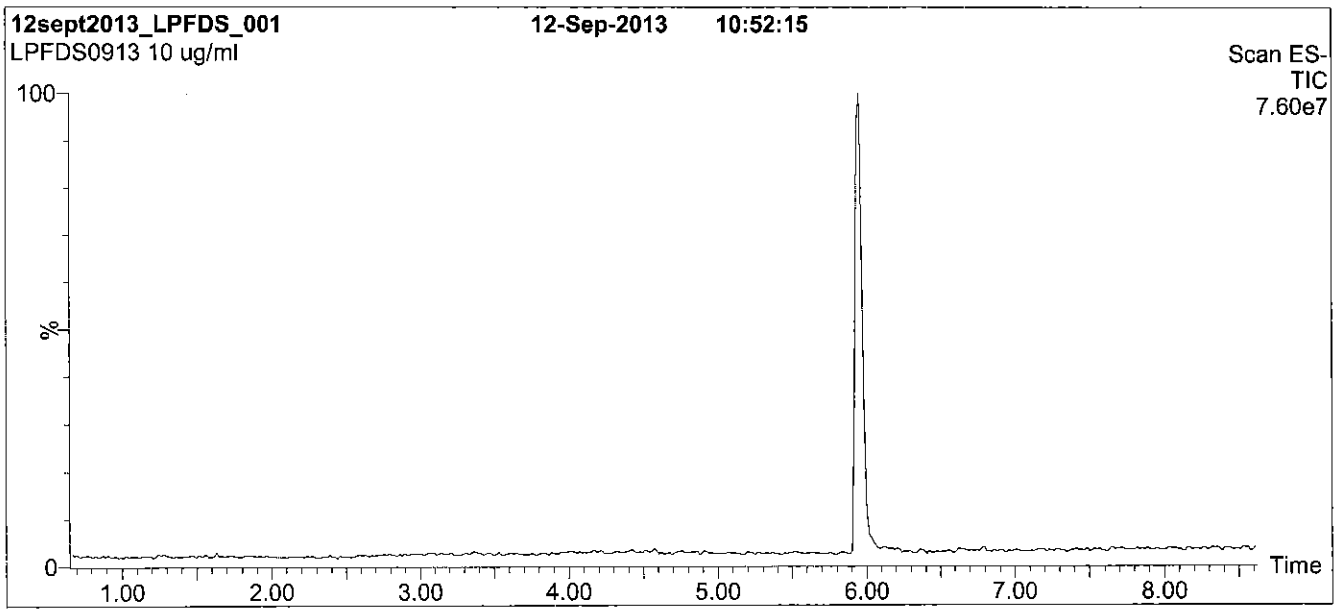
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

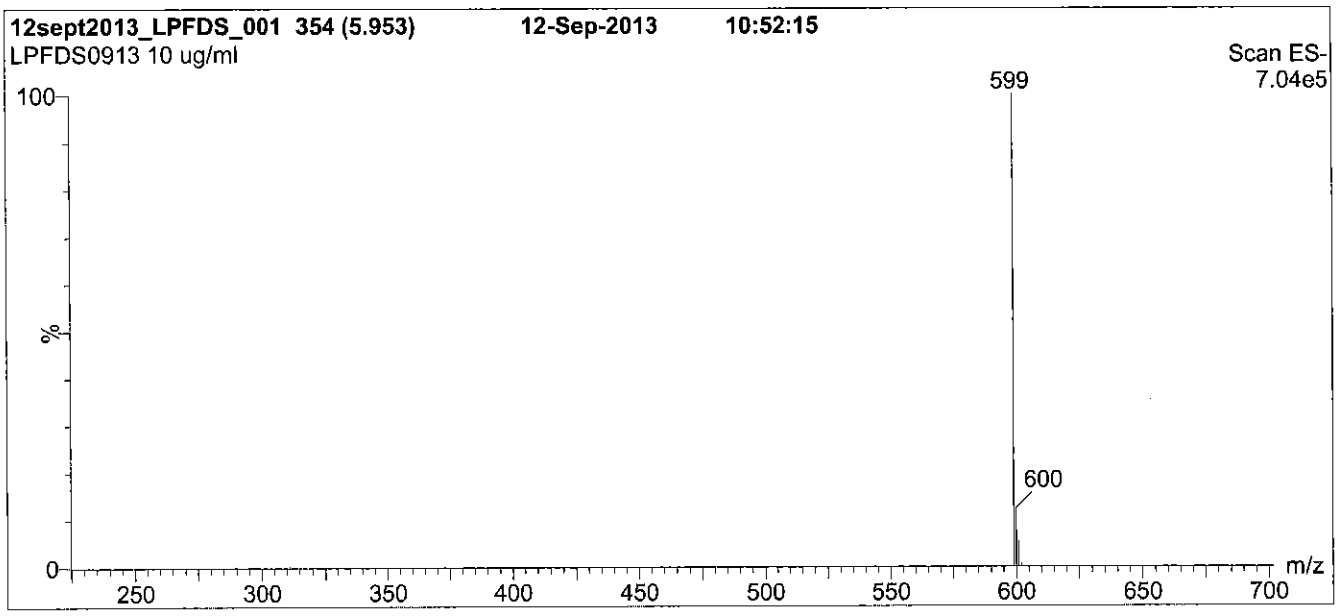
CALA Testing Accreditation No. A 1226

ACLASS 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-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: 45% (80:20 MeOH:ACN) / 55% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
1.5 min before returning to initial conditions in 0.5 min.
Time: 11 min

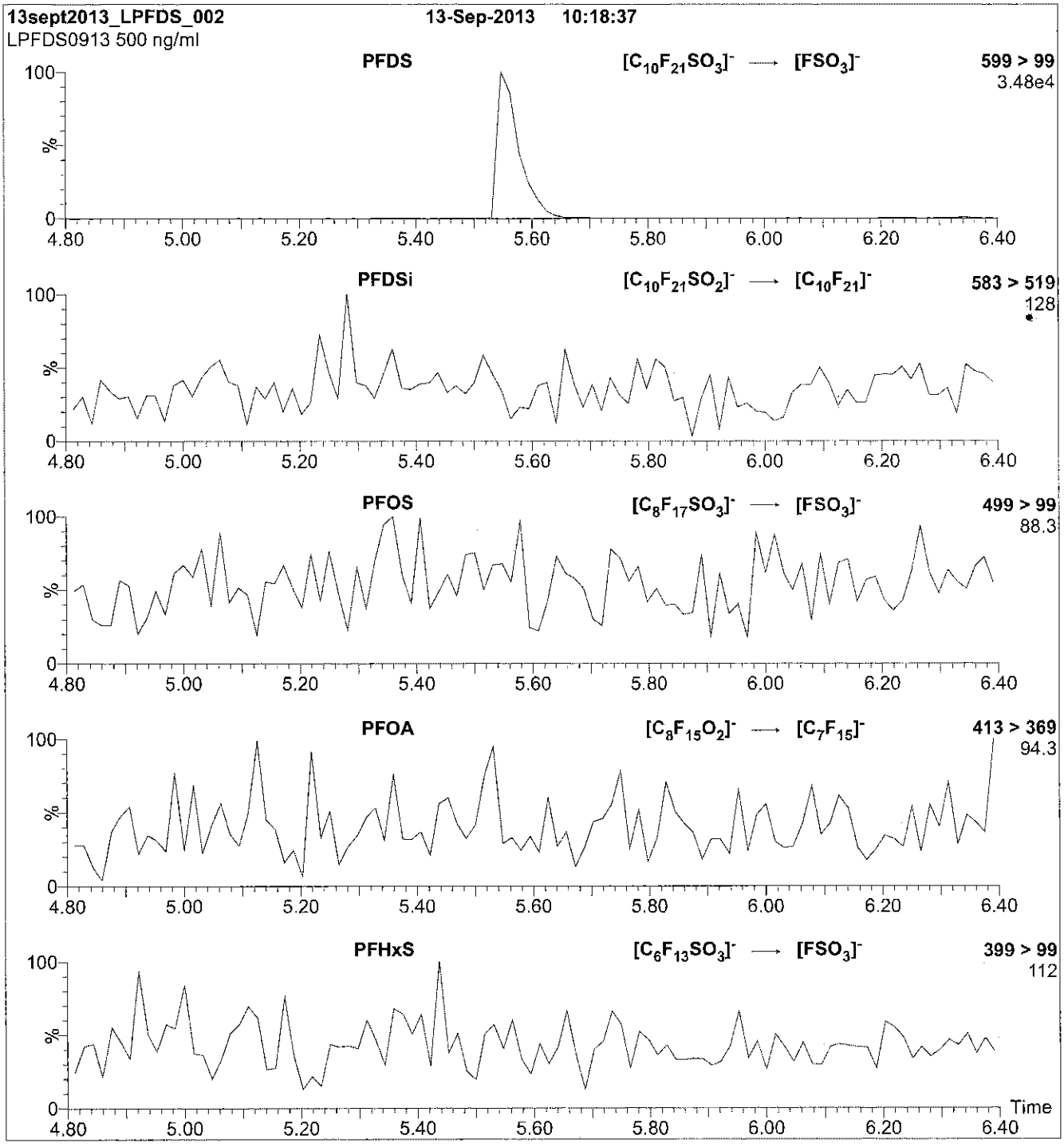
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 70.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 650

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) = 3.78e-3
Collision Energy (eV) = 50

Reagent

LCPFHpA_00004

WELLINGTON LABORATORIES

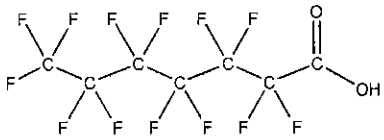
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

LOT NUMBER: PFHpA0514

STRUCTURE:

CAS #: 375-85-9



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

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

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 05/09/2014
EXPIRY DATE: (mm/dd/yyyy) 05/09/2019
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- 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:** 05/22/2014 (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. They are designed to be used as reference standards for the identification and/or quantification of specific chemical compound(s).

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. Material Safety Data Sheets (MSDSs) 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, 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 and/or LC/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

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

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

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

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

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all 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 17025:2005 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 for the period of time specified by the 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:

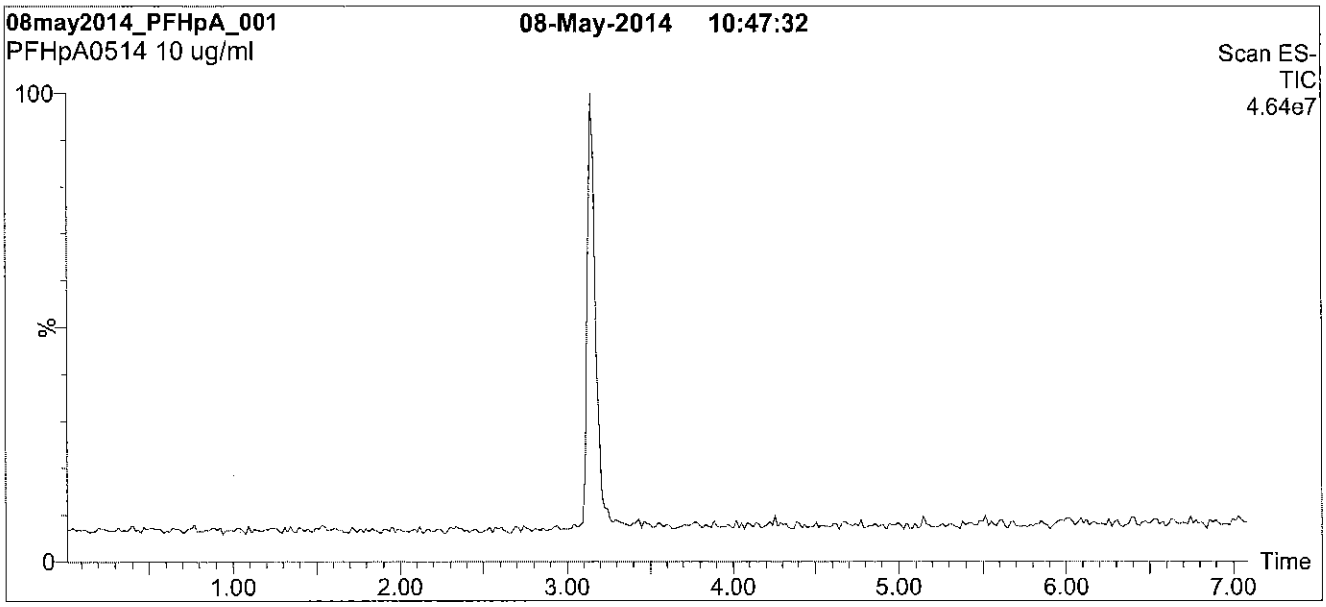
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

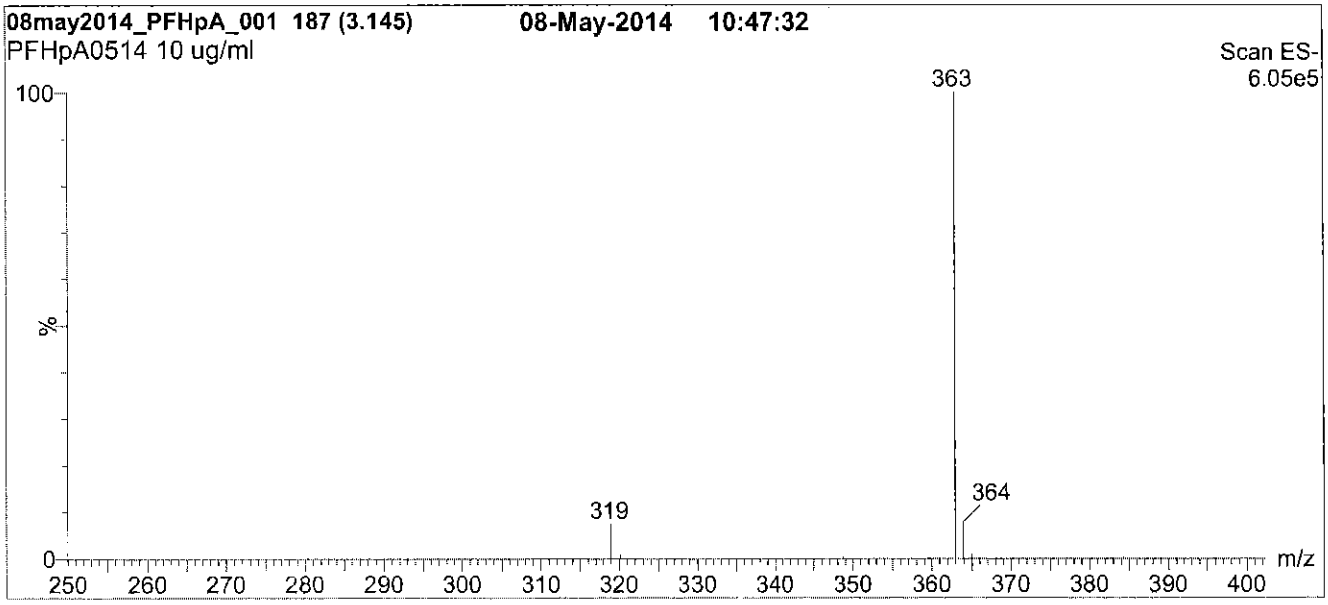
CALA Testing Accreditation No. A1226

ACLASS 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: **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 C_{18}
1.7 µm, 2.1 x 100 mm

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

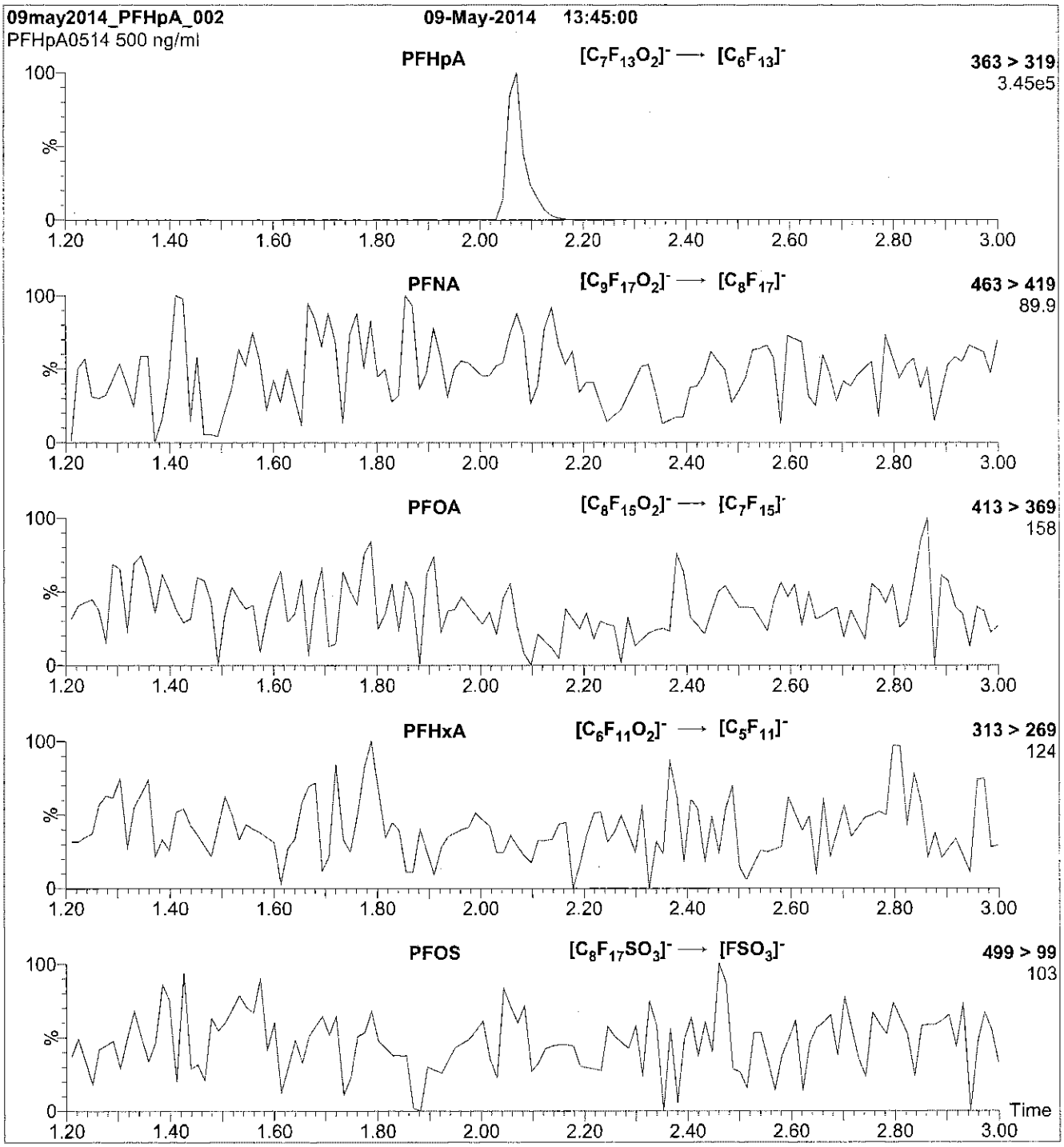
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 950 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) = 3.24e-3
Collision Energy (eV) = 11

Reagent

LCPFHpS_00005

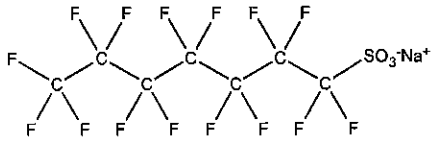
P: 4/15/15 SK

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: L-PFHpS
COMPOUND: Sodium perfluoro-1-heptanesulfonate
LOT NUMBER: LPFHpS0114

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)	01/28/2014		
EXPIRY DATE: (mm/dd/yyyy)	01/28/2019		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

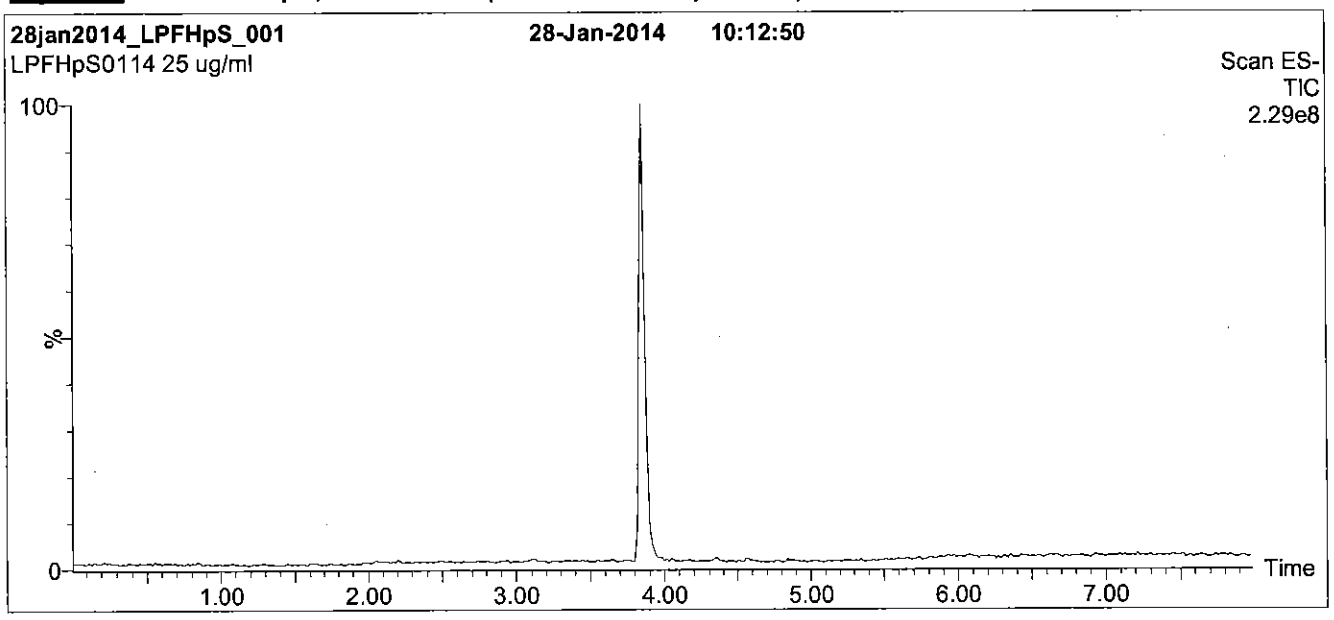
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

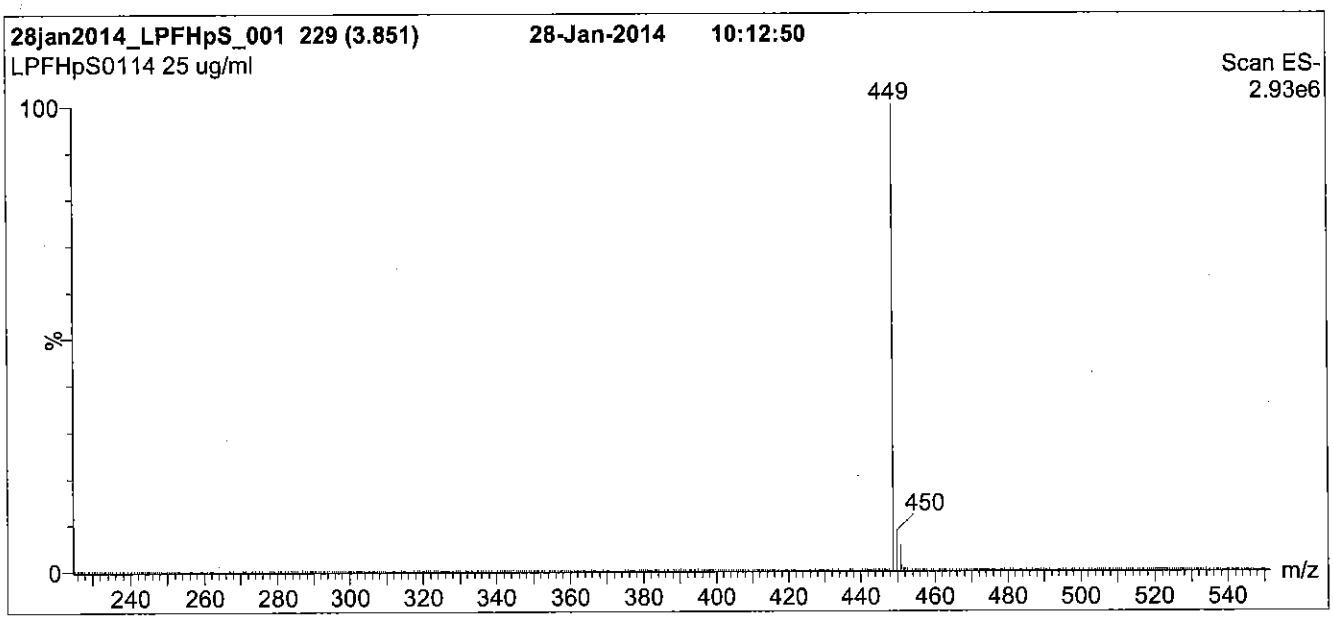
CALA Testing Accreditation No. A1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

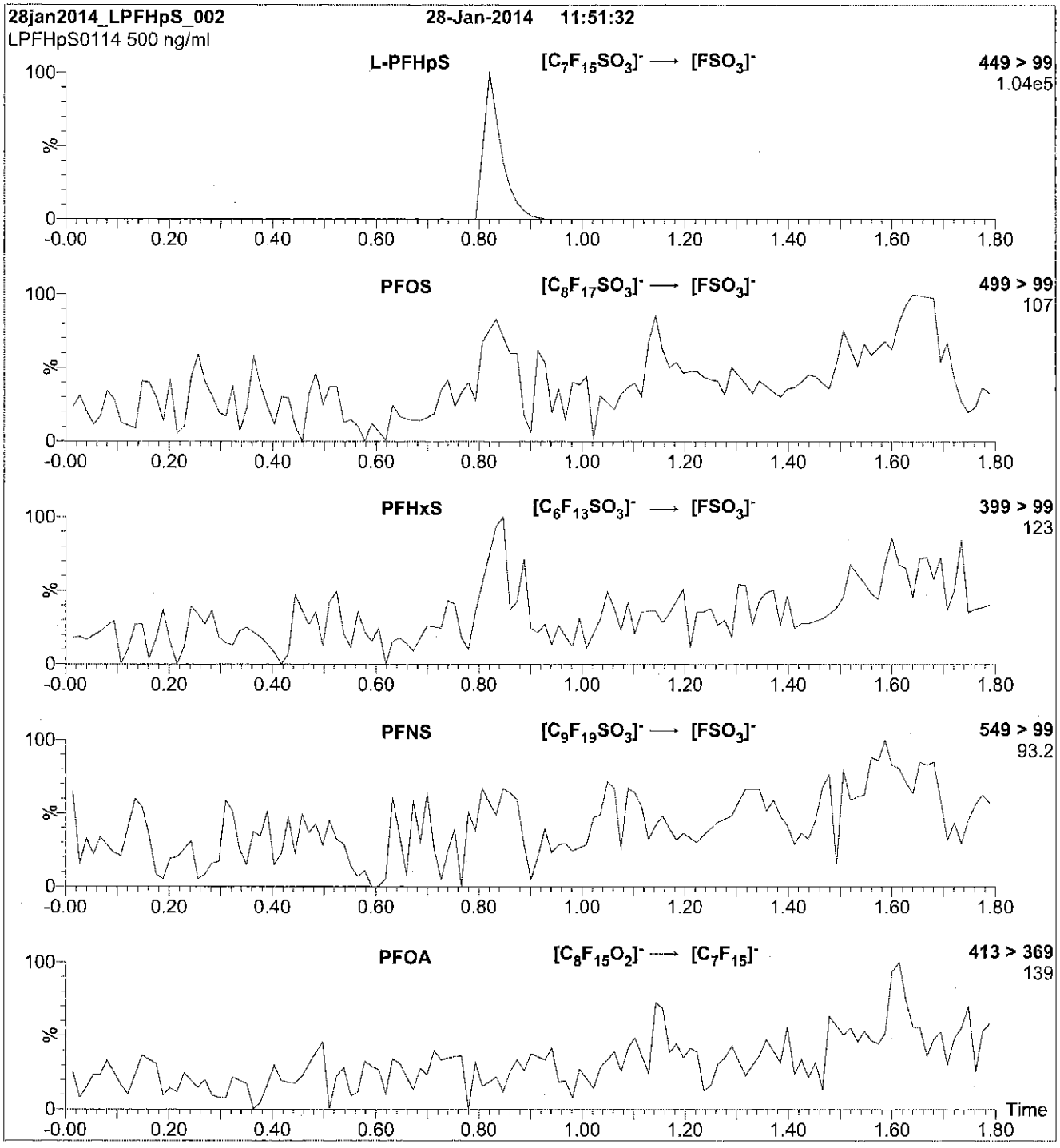
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 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) = 3.66e-3
Collision Energy (eV) = 35

Reagent

LCPFHxA_00003

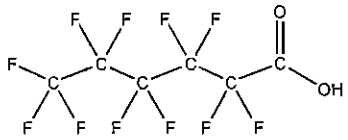
V: 2/11/15 SW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFHxA
COMPOUND: Perfluoro-n-hexanoic acid
LOT NUMBER: PFHxA0514

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) 05/09/2014
EXPIRY DATE: (mm/dd/yyyy) 05/09/2019
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- 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:** 05/22/2014 (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. They are designed to be used as reference standards for the identification and/or quantification of specific chemical compound(s).

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. Material Safety Data Sheets (MSDSs) 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, 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 and/or LC/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

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

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

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

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

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all 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 17025:2005 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 for the period of time specified by the 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:

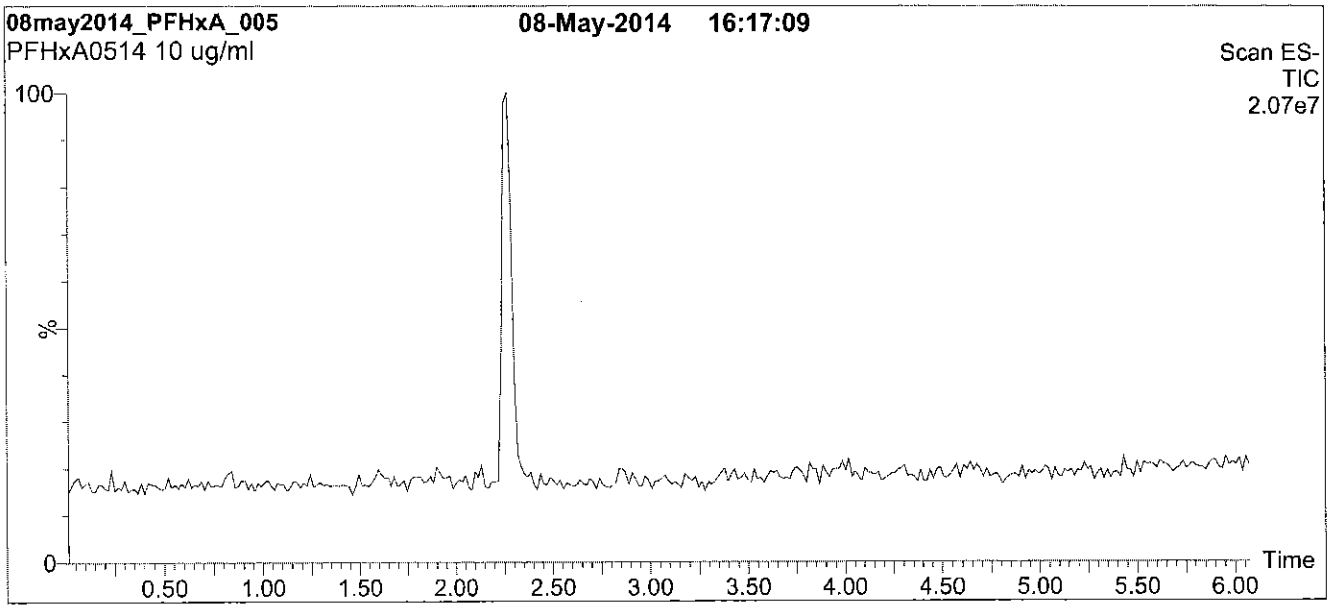
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

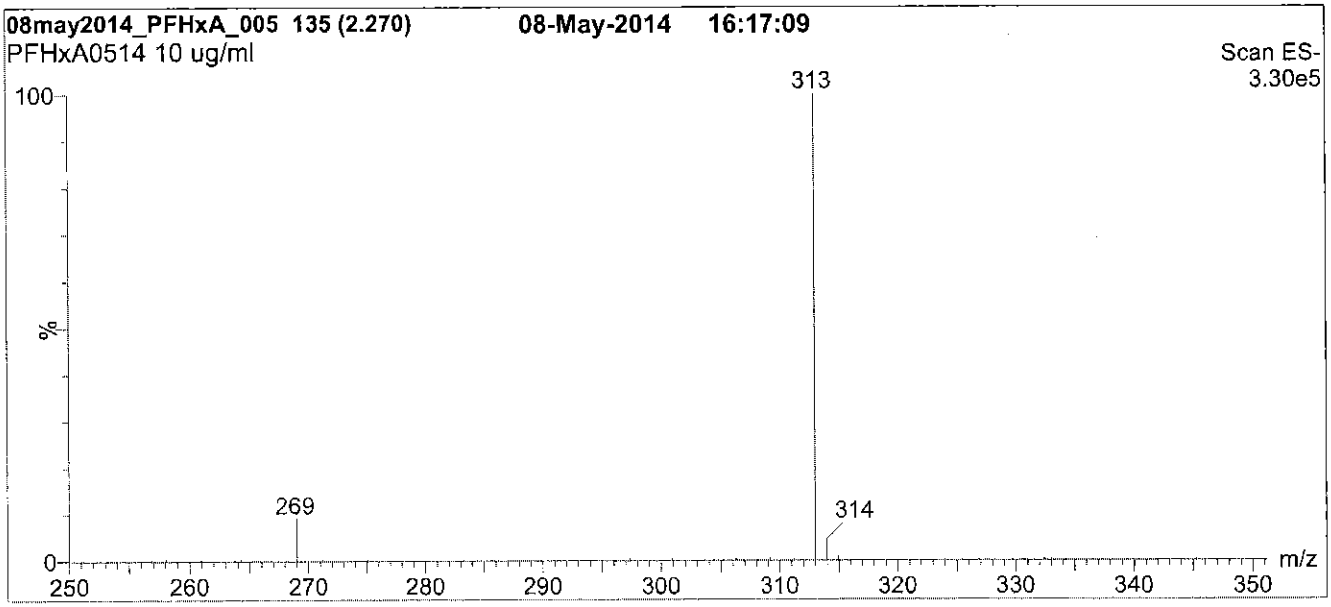
CALA Testing Accreditation No. A1226

ACLASS 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 C_{18}
1.7 µm, 2.1 x 100 mm

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

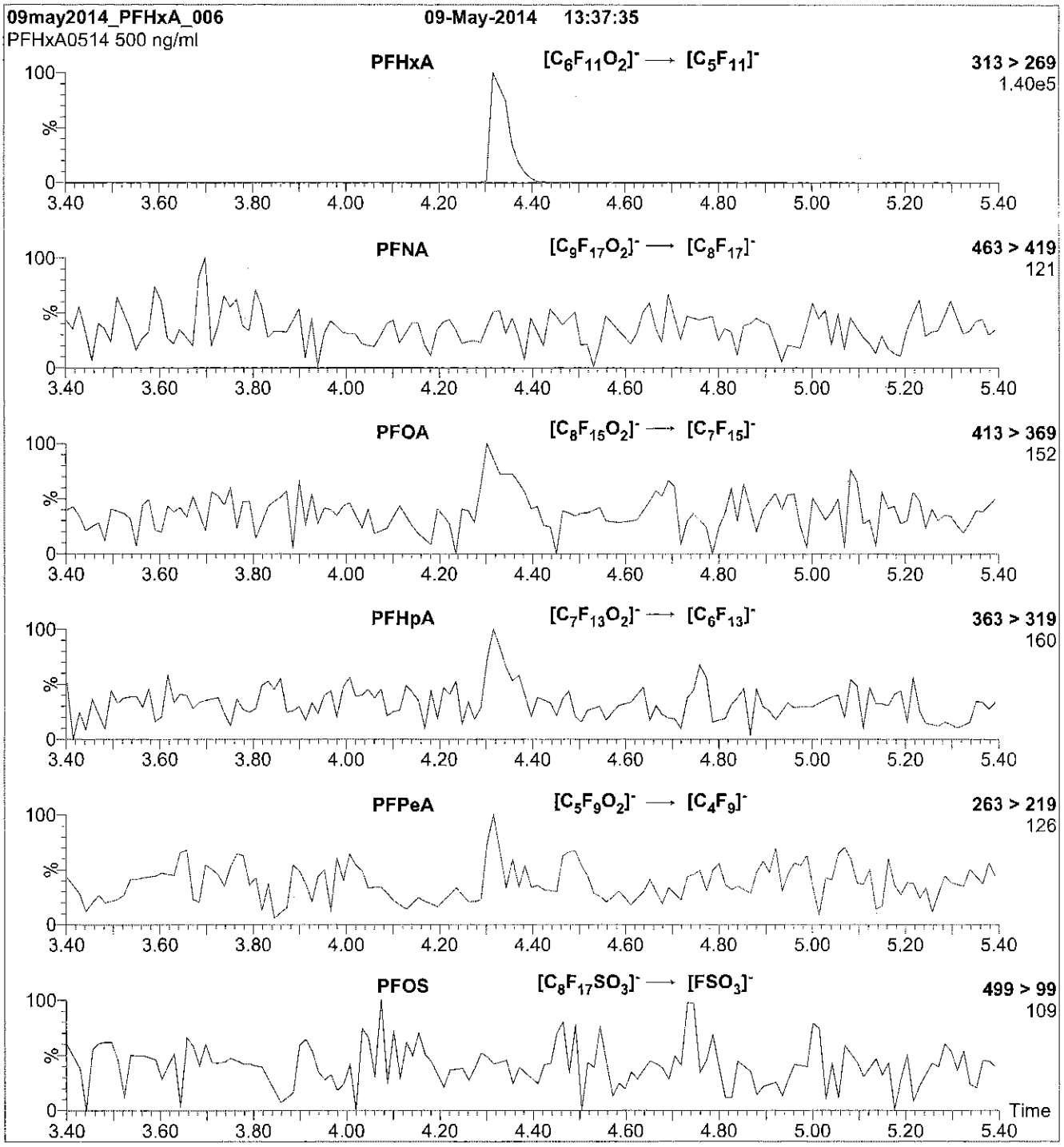
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 950 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) = 3.24e-3
Collision Energy (eV) = 10

Reagent

LCPFHxS_00003

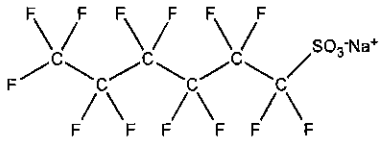
VR 2/11/15 GV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: L-PFHxS
LOT NUMBER: LPFHxS0514
COMPOUND: Sodium perfluoro-1-hexanesulfonate

STRUCTURE:
CAS #: 82382-12-5



MOLECULAR FORMULA:	$C_6F_{13}SO_3Na$	**MOLECULAR WEIGHT:**	422.10
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.3 ± 2.4 µg/ml (PFHxS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	05/09/2014		
EXPIRY DATE: (mm/dd/yyyy)	05/09/2019		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 05/16/2014 (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. They are designed to be used as reference standards for the identification and/or quantification of specific chemical compound(s).

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. Material Safety Data Sheets (MSDSs) 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, 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 and/or LC/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:

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

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 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 17025:2005 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 for the period of time specified by the 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:

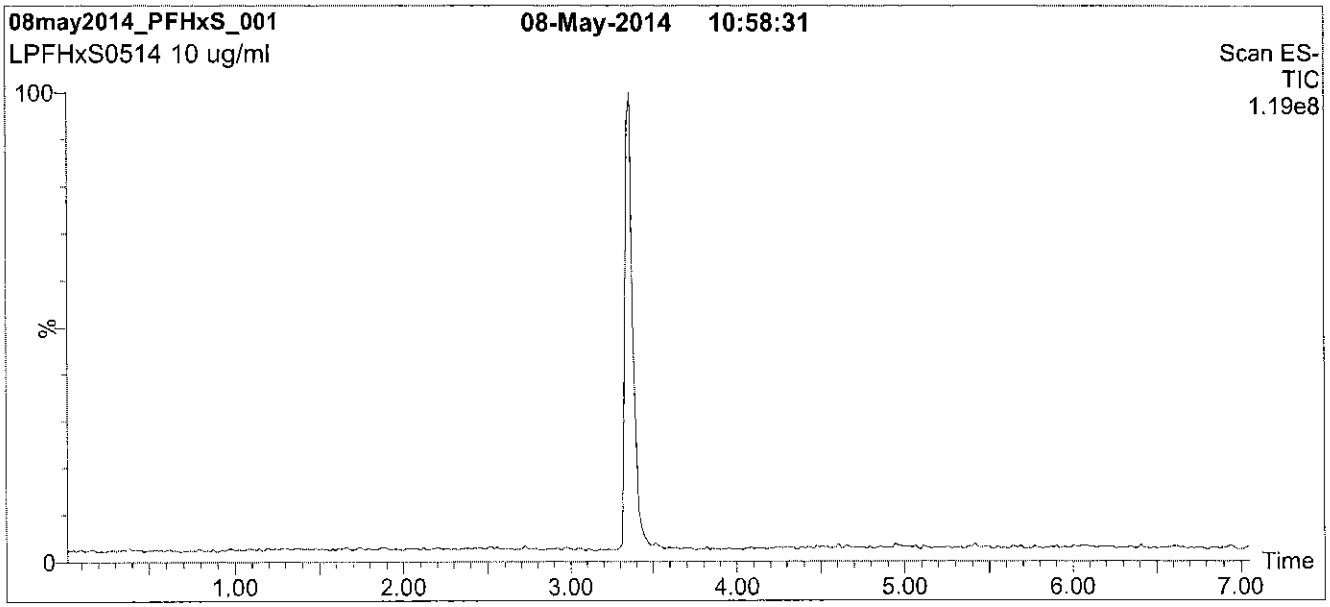
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

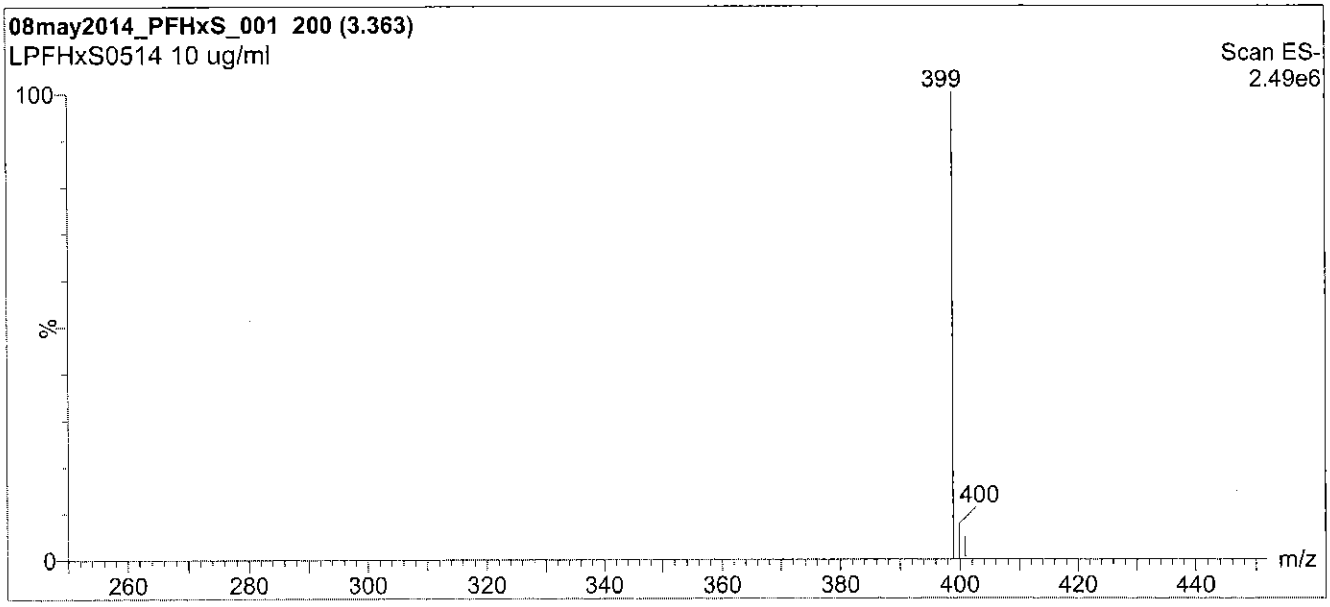
CALA Testing Accreditation No. A1226

ACLASS 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-PFHxS; 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 C_{18}
1.7 µm, 2.1 x 100 mm

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

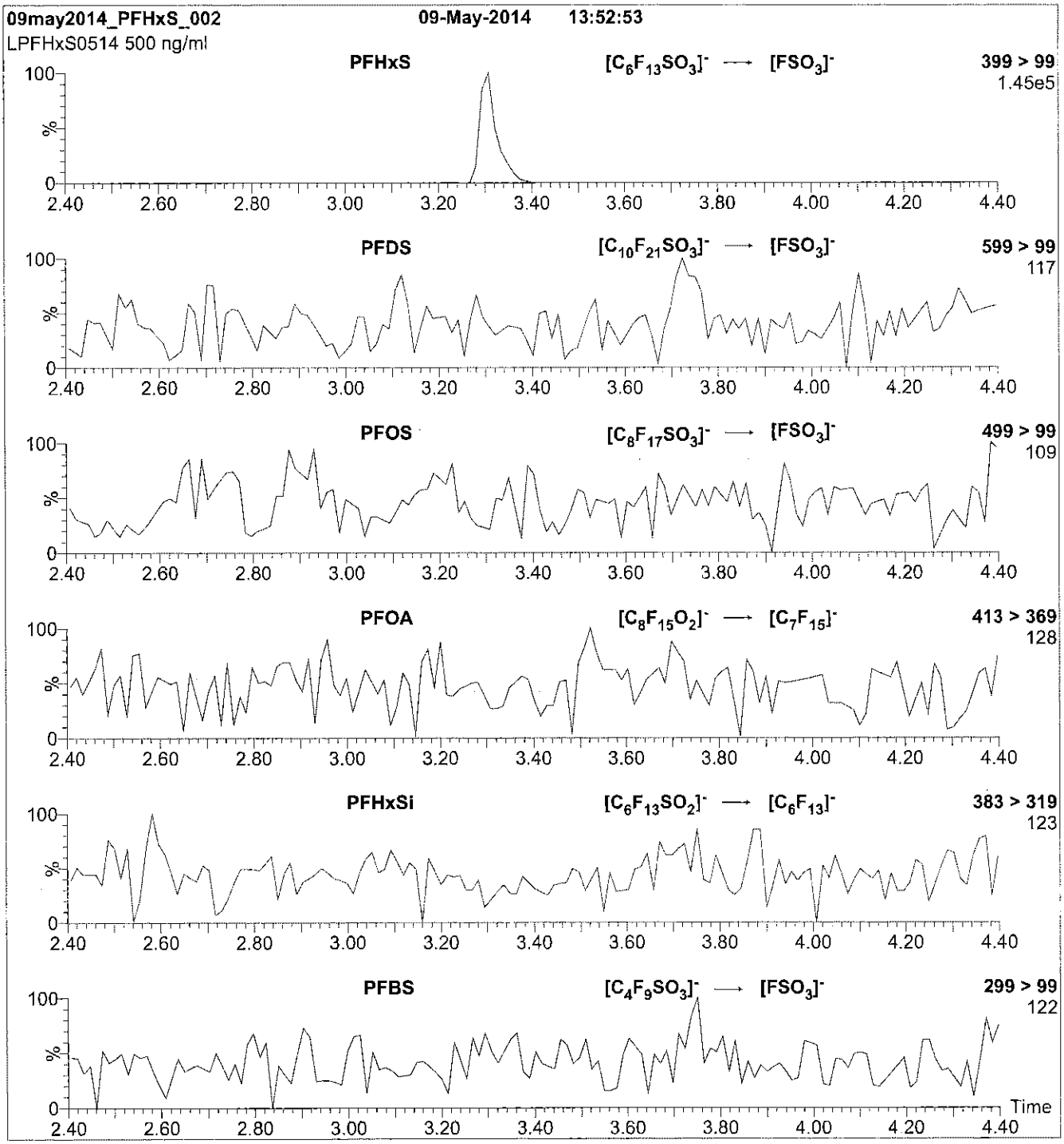
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 950 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 50.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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) = 30

Reagent

LCPFNA_00004

P: 3/27/15 sv

S:

WELLINGTON LABORATORIES

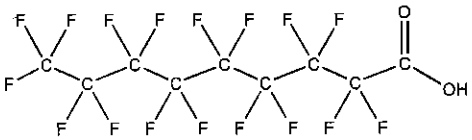
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFNA
COMPOUND: Perfluoro-n-nonanoic acid

LOT NUMBER: PFNA0514

STRUCTURE:

CAS #: 375-95-1



MOLECULAR FORMULA: $C_9HF_{17}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 464.08
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 05/09/2014
EXPIRY DATE: (mm/dd/yyyy) 05/09/2019
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 05/22/2014 (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. They are designed to be used as reference standards for the identification and/or quantification of specific chemical compound(s).

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. Material Safety Data Sheets (MSDSs) 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, 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 and/or LC/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 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 17025:2005 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 for the period of time specified by the 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:

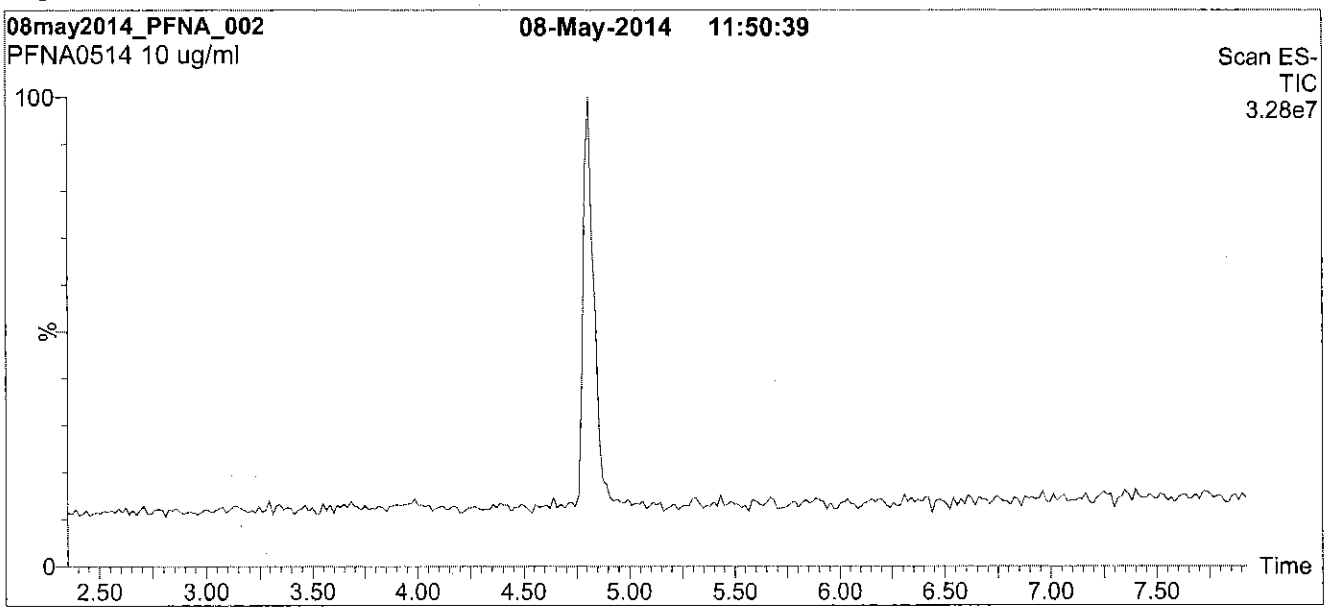
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

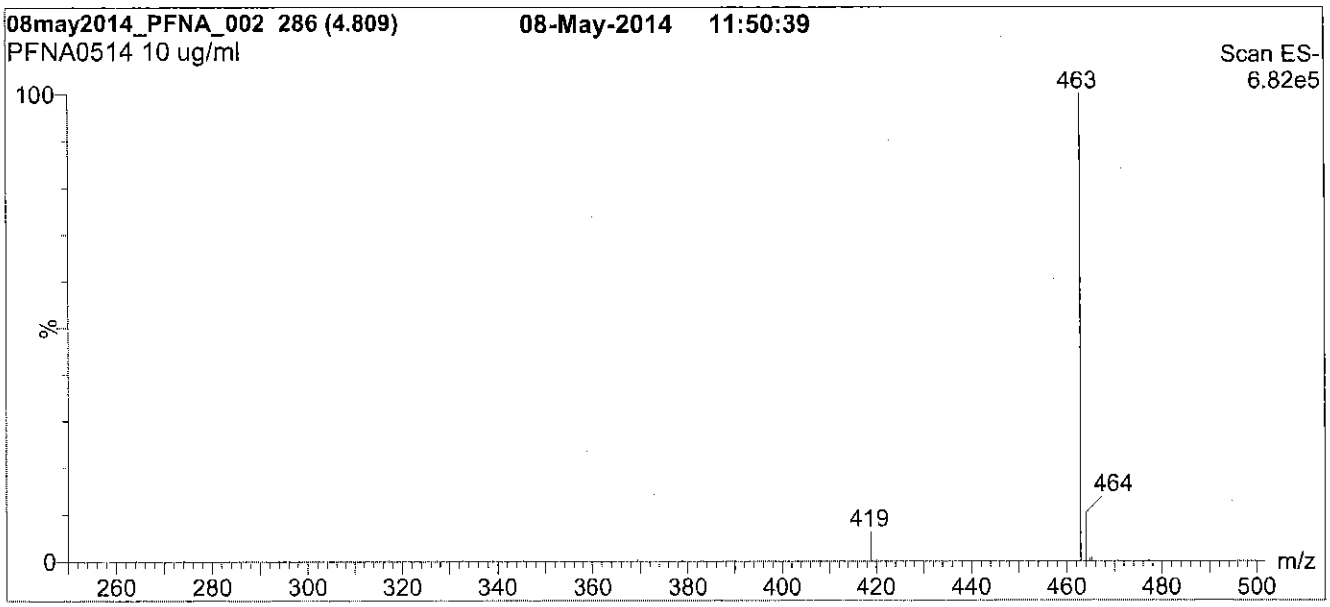
CALA Testing Accreditation No. A 1226

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

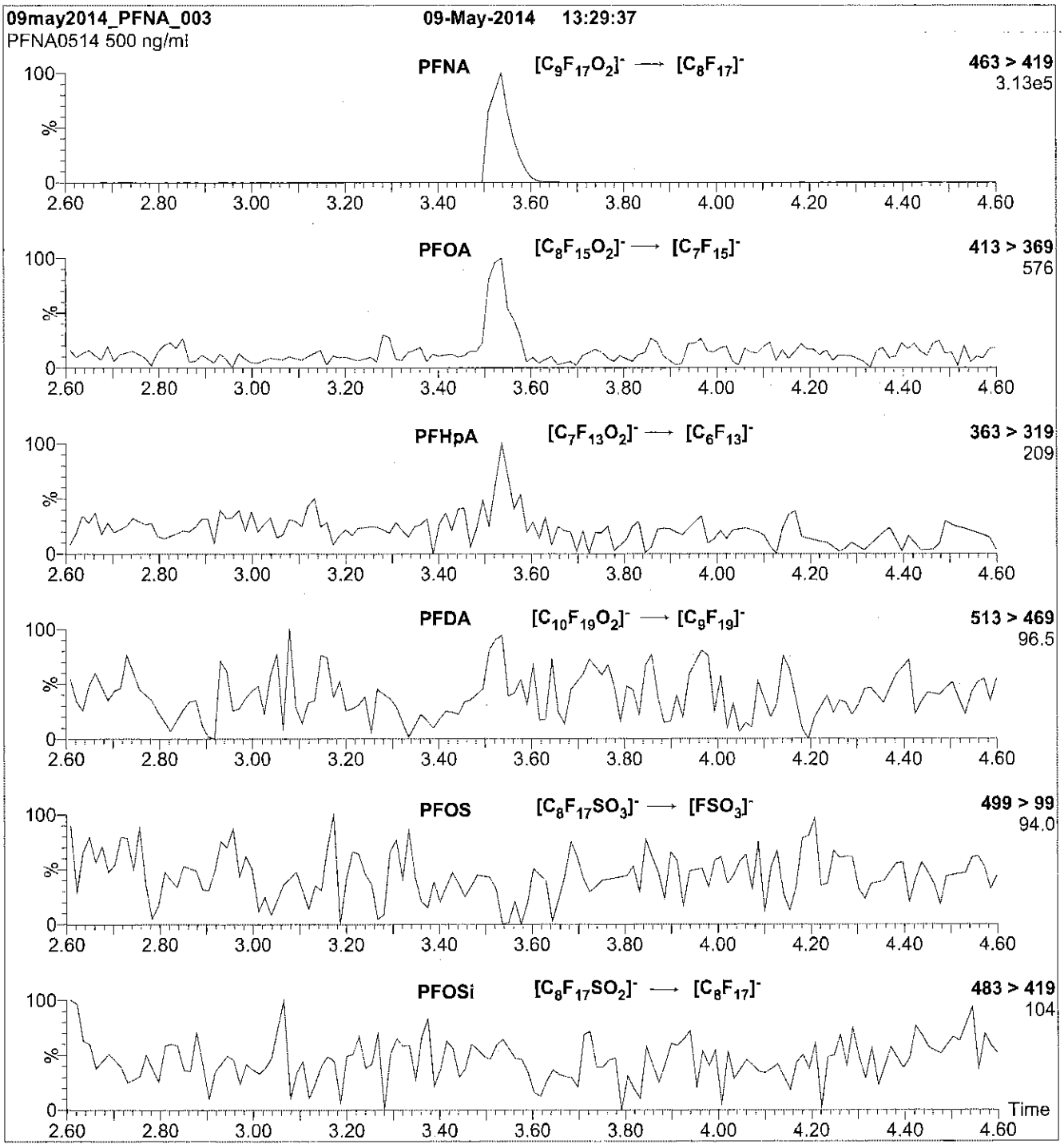
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 950 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) = 3.17e-3
Collision Energy (eV) = 11

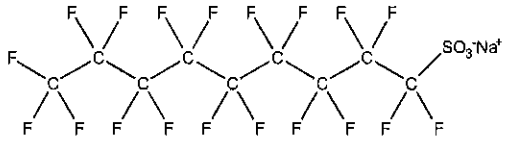
Reagent

LCPFNS_00002

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: L-PFNS
COMPOUND: Sodium perfluoro-1-nonanesulfonate
LOT NUMBER: LPFNS0712
STRUCTURE:
CAS #: 98789-57-2



MOLECULAR FORMULA:	$C_9F_{19}SO_3Na$	**MOLECULAR WEIGHT:**	572.12
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 48.0 ± 2.4 µg/ml (PFNS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	07/04/2012		
EXPIRY DATE: (mm/dd/yyyy)	07/04/2017		
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:** 01/15/2013 (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. They are designed to be used as reference standards for the identification and/or quantification of specific chemical compound(s).

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. Material Safety Data Sheets (MSDSs) 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, 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 and/or LC/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 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 17025:2005 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 for the period of time specified by the 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:

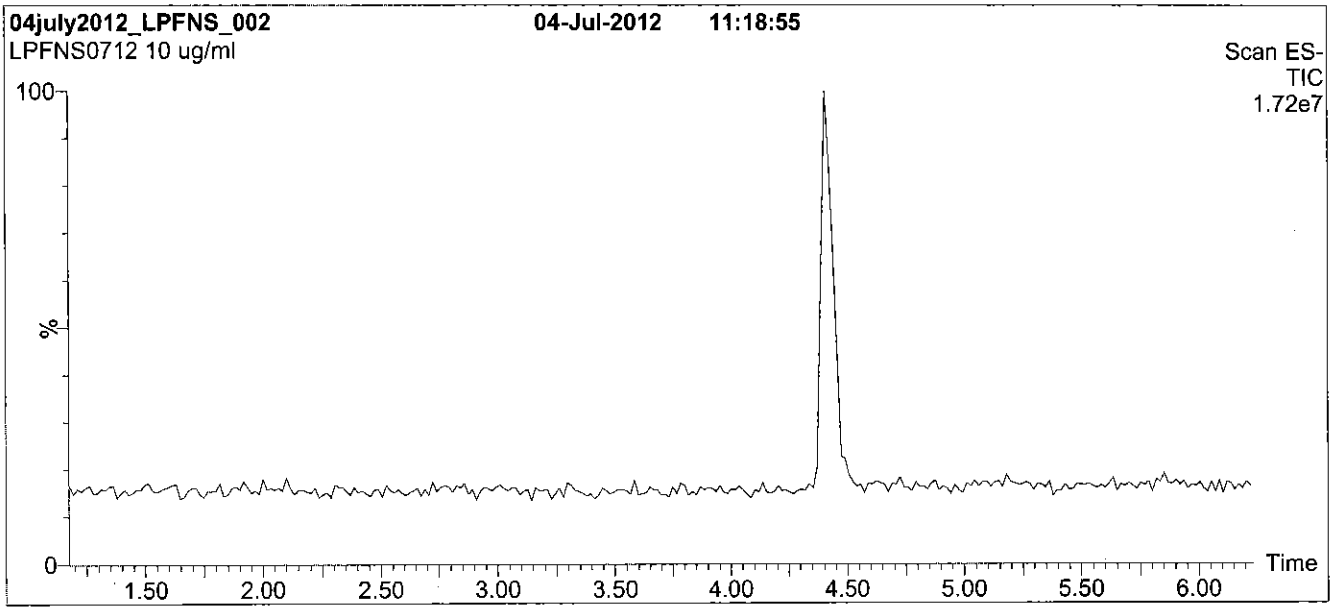
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

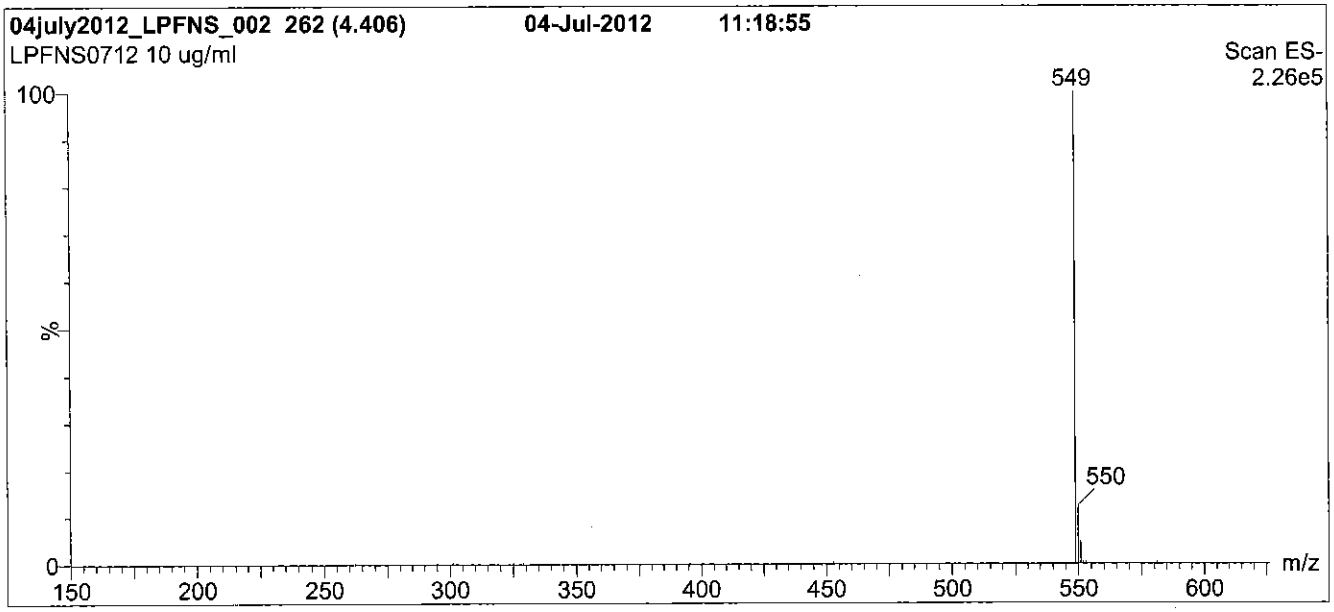
CALA Testing Accreditation No. A1226

ACLASS 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-PFNS; 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 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

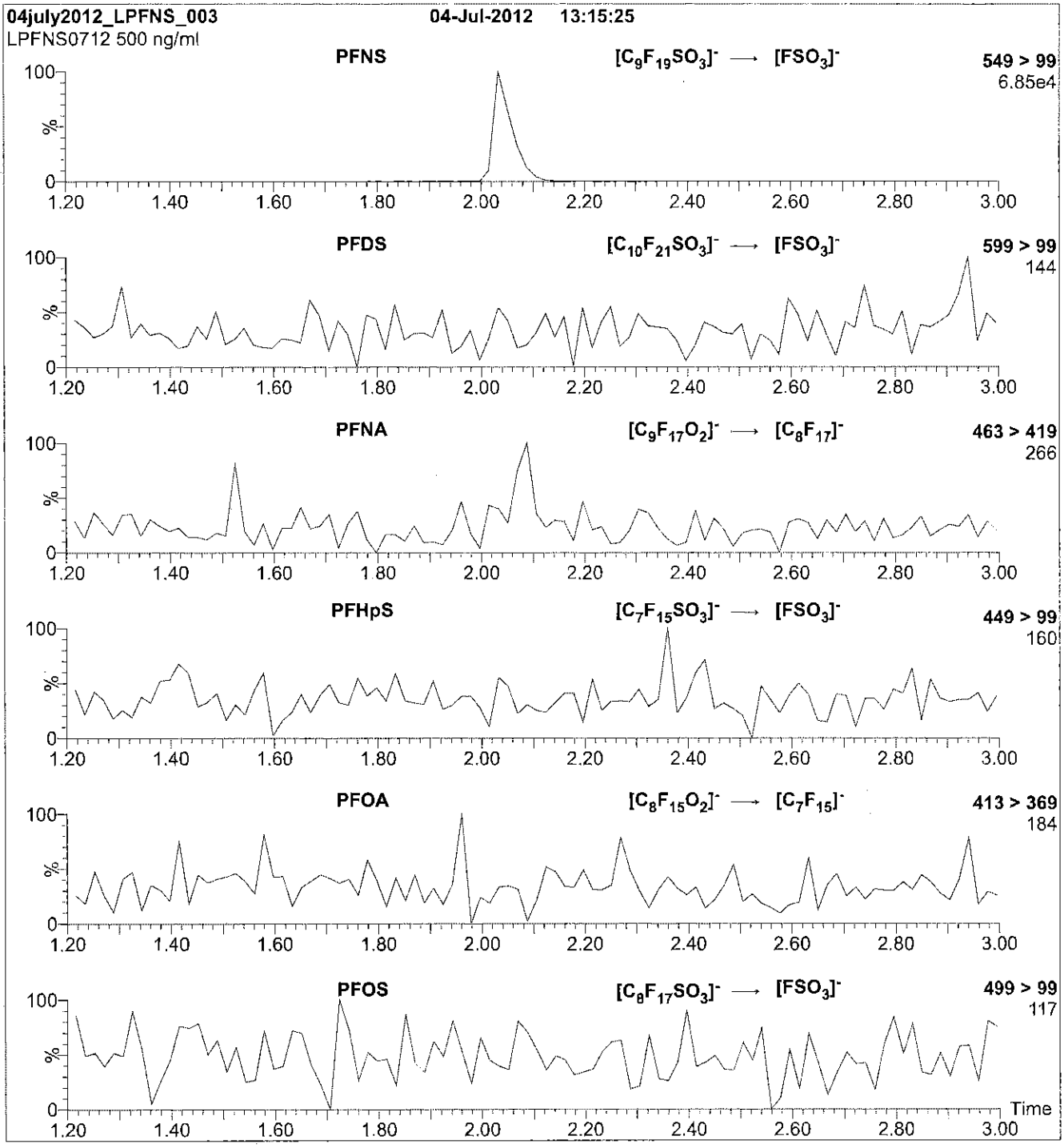
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 65.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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) = 45

Reagent

LCPFOA_00004

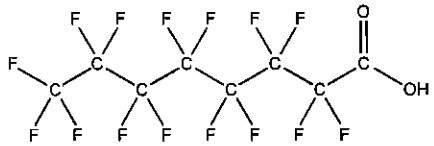
Rec 7/15/14

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFOA
COMPOUND: Perfluoro-n-octanoic acid
LOT NUMBER: PFOA1013

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) 10/11/2013
EXPIRY DATE: (mm/dd/yyyy) 10/11/2018
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 10/18/2013 (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. They are designed to be used as reference standards for the identification and/or quantification of specific chemical compound(s).

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. Material Safety Data Sheets (MSDSs) 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, 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 and/or LC/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 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 17025:2005 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 for the period of time specified by the 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:

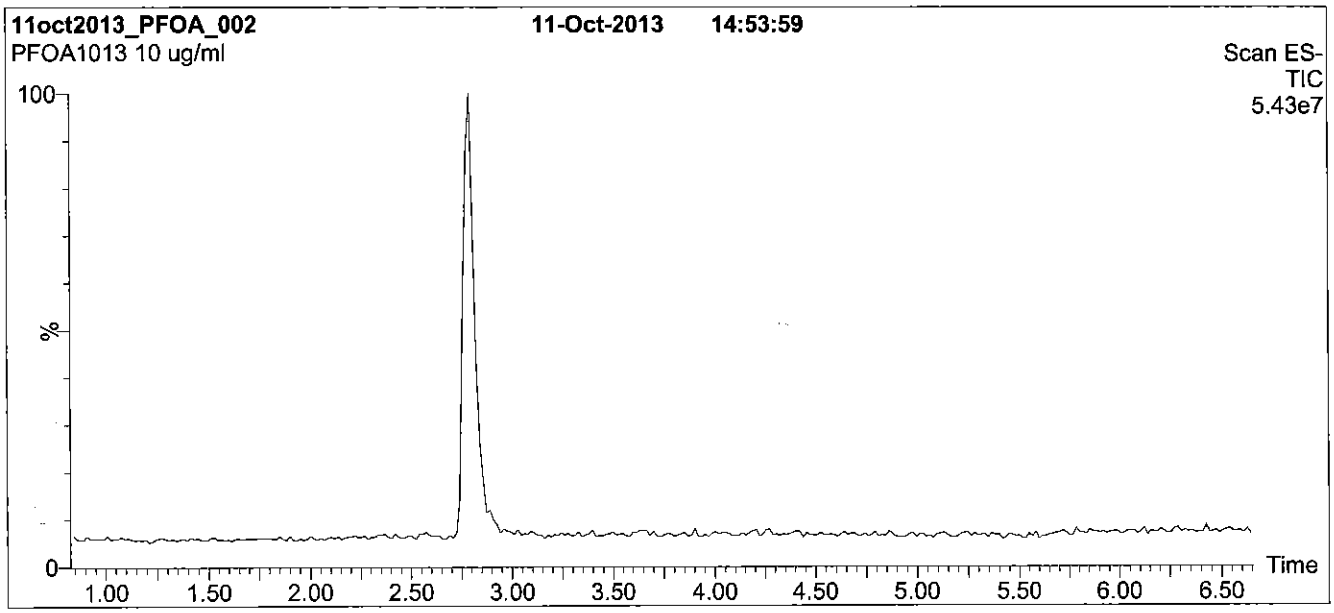
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

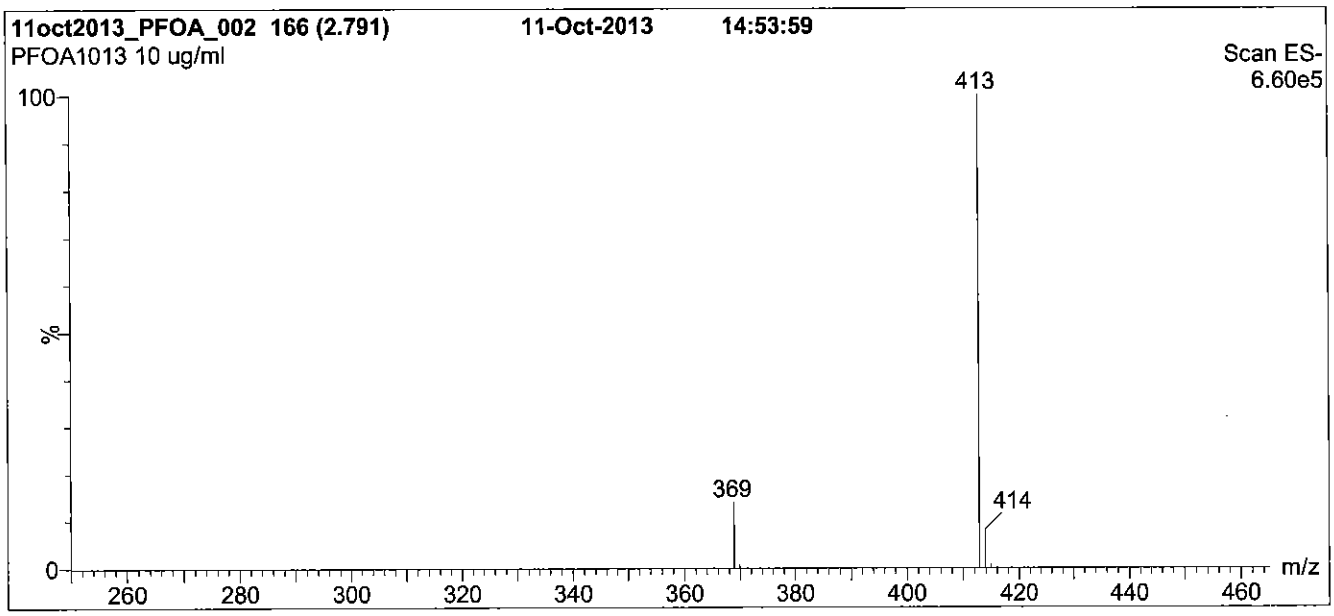
CALA Testing Accreditation No. A 1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 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 min before returning to initial conditions in 0.5 min.
Time: 10 min

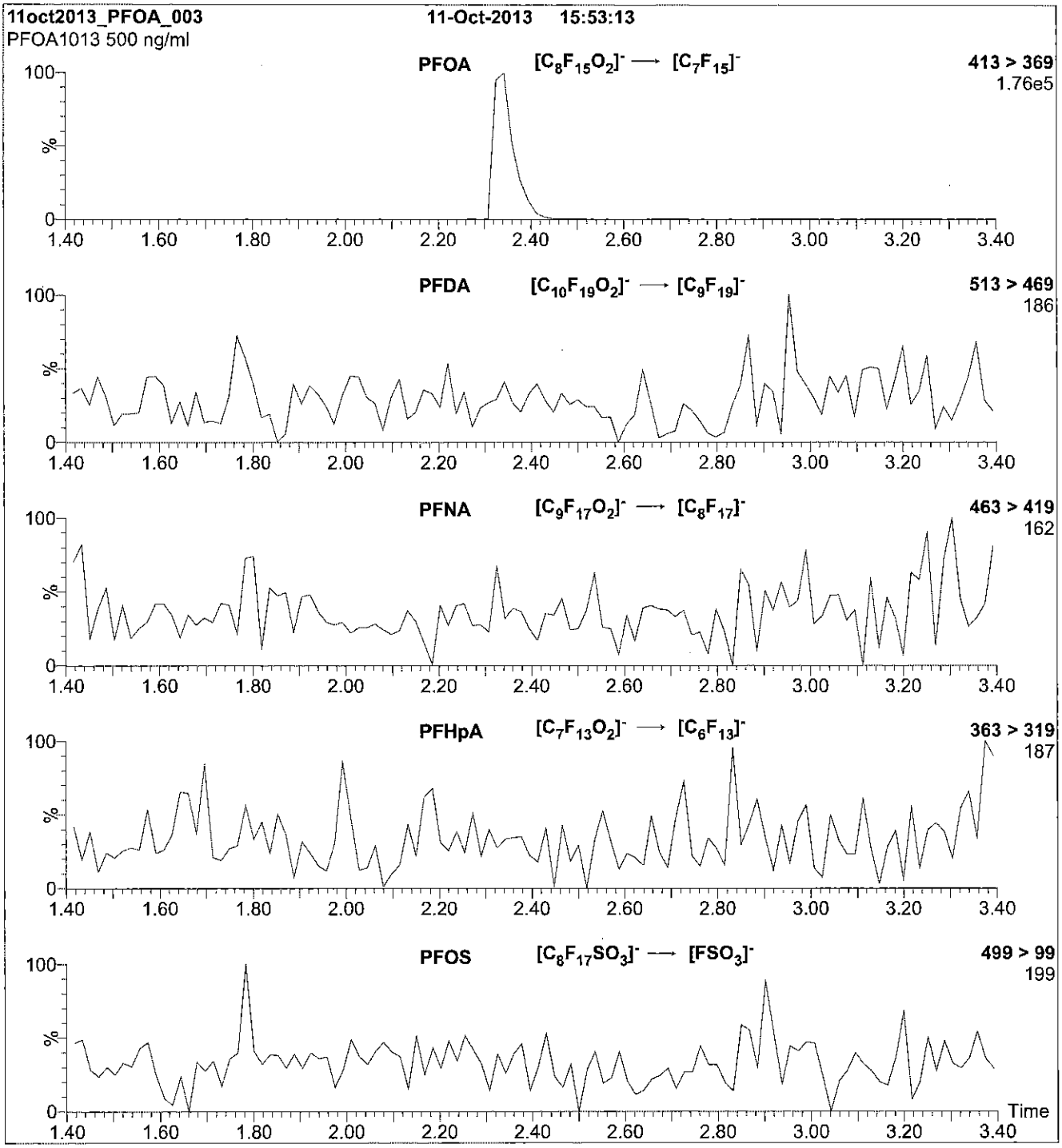
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 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) = 3.28e-3
Collision Energy (eV) = 11

Reagent

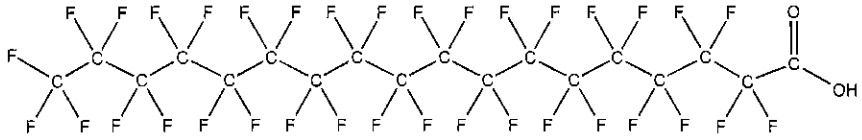
LCPFODA_00004

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFODA
COMPOUND: Perfluoro-n-octadecanoic acid
LOT NUMBER: PFODA0807

STRUCTURE:
CAS #: 16517-11-6



MOLECULAR FORMULA: $C_{18}HF_{35}O_2$
MOLECULAR WEIGHT: 914.15
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (4%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 04/25/2014
EXPIRY DATE: (mm/dd/yyyy) 04/25/2017
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 04/28/2014 (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. They are designed to be used as reference standards for the identification and/or quantification of specific chemical compound(s).

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. Material Safety Data Sheets (MSDSs) 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, 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 and/or LC/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 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 17025:2005 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 for the period of time specified by the 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:

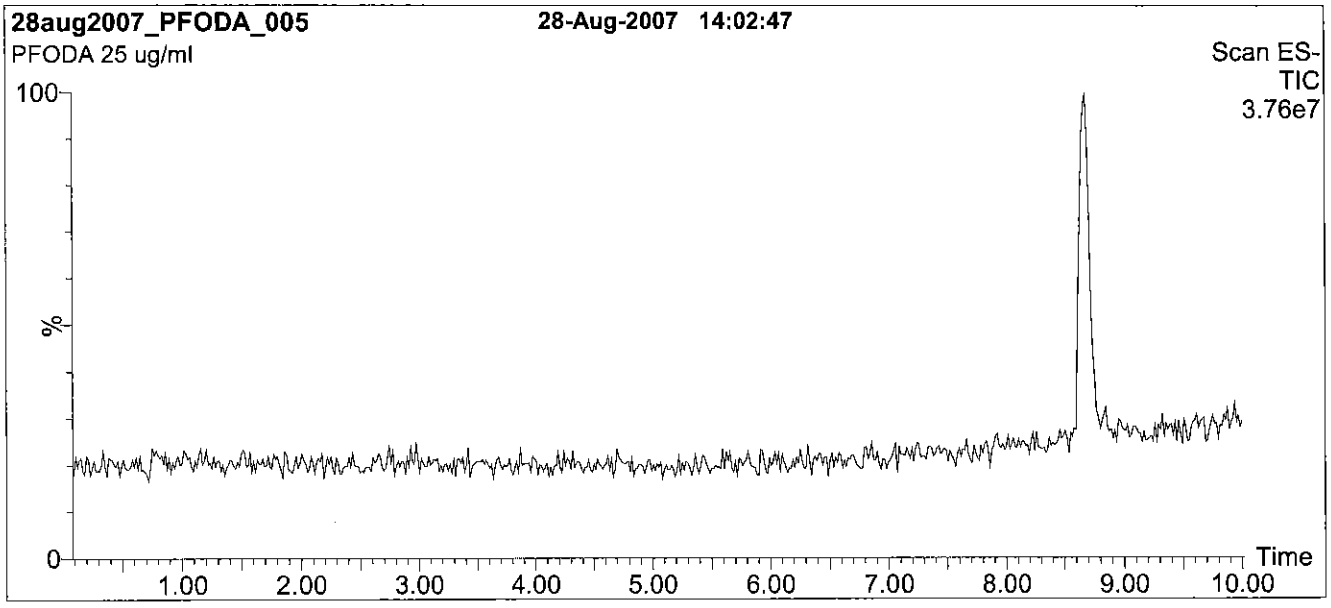
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

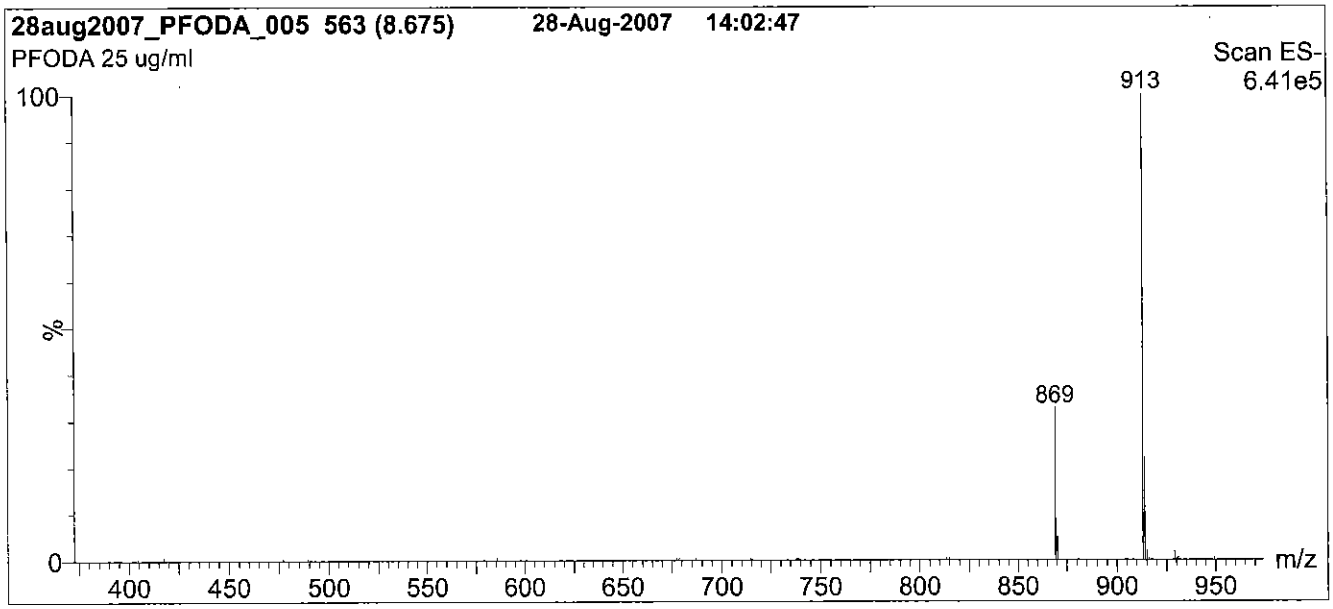
CALA Testing Accredited Méthodes No. A1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 75% (80:20 MeOH:ACN) / 25% H_2O
(both with 10 mM NH_4OAc buffer)
Hold 5 min. Ramp to 100% organic over 6 min.
Hold 3 min before returning to initial conditions.
Time: 16 min

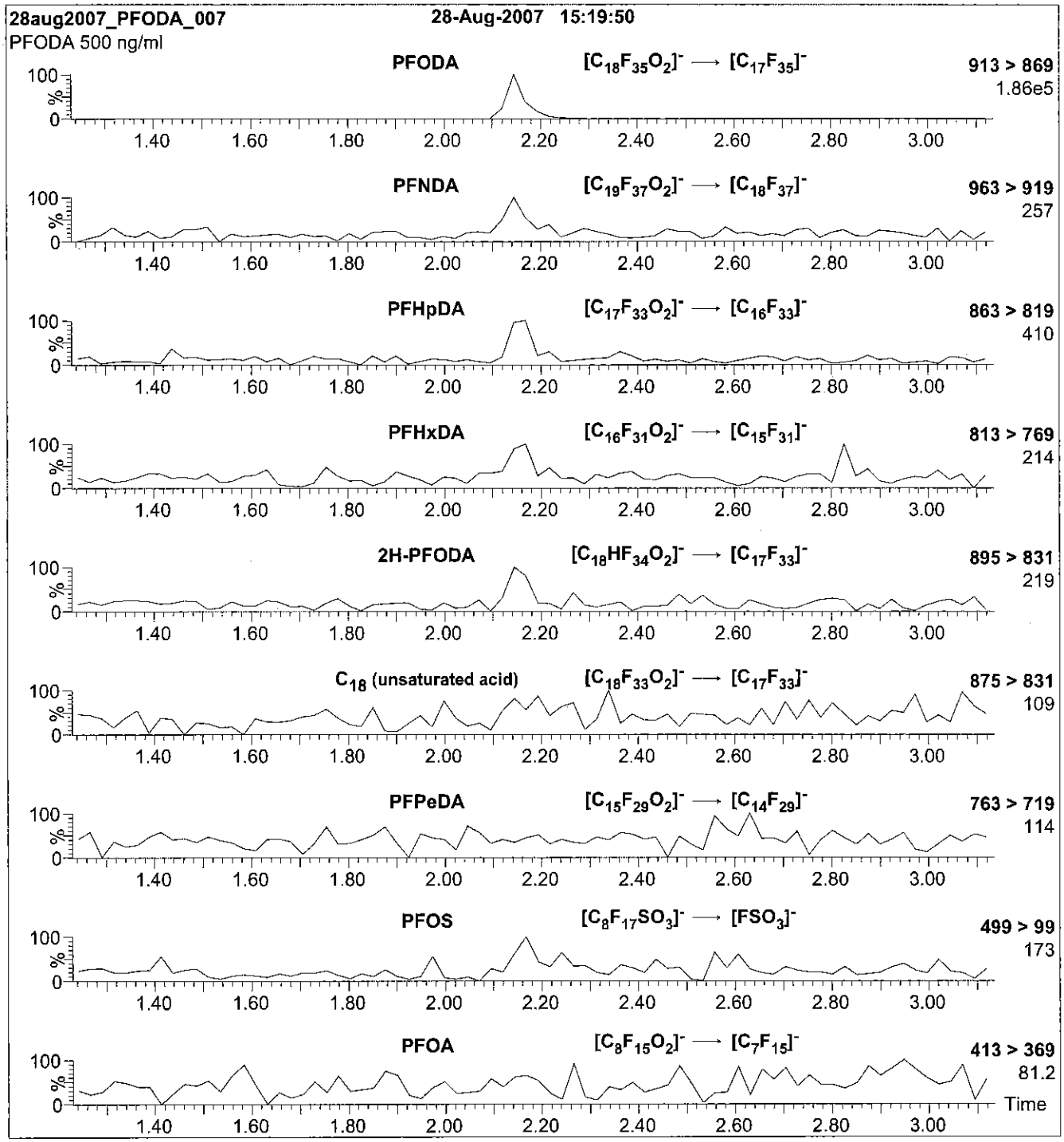
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 1100 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 25.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 650

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 75% (80:20 MeOH:ACN) / 25% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.58e-3
Collision Energy (eV) = 15

Reagent

LCPFOS_00004

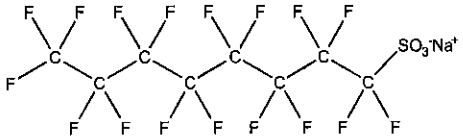
C 3/17/15 SV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: L-PFOS
LOT NUMBER: LPFOS0614
COMPOUND: Sodium perfluoro-1-octanesulfonate

STRUCTURE:



CAS #: 4021-47-0

MOLECULAR FORMULA:	$C_8F_{17}SO_3Na$	**MOLECULAR WEIGHT:**	522.11
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.8 ± 2.4 µg/ml (PFOS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	06/20/2014		
EXPIRY DATE: (mm/dd/yyyy)	06/20/2019		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 10/27/2014 (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. They are designed to be used as reference standards for the identification and/or quantification of specific chemical compound(s).

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. Material Safety Data Sheets (MSDSs) 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, 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 and/or LC/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 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 17025:2005 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 for the period of time specified by the 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:

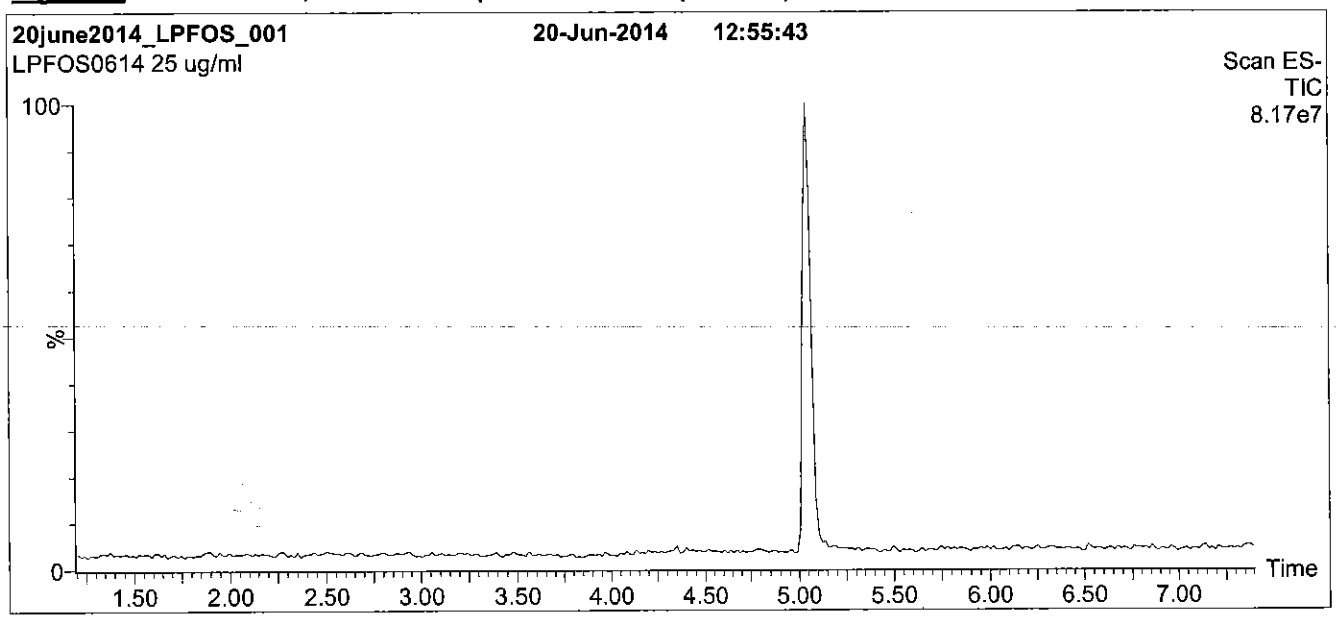
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

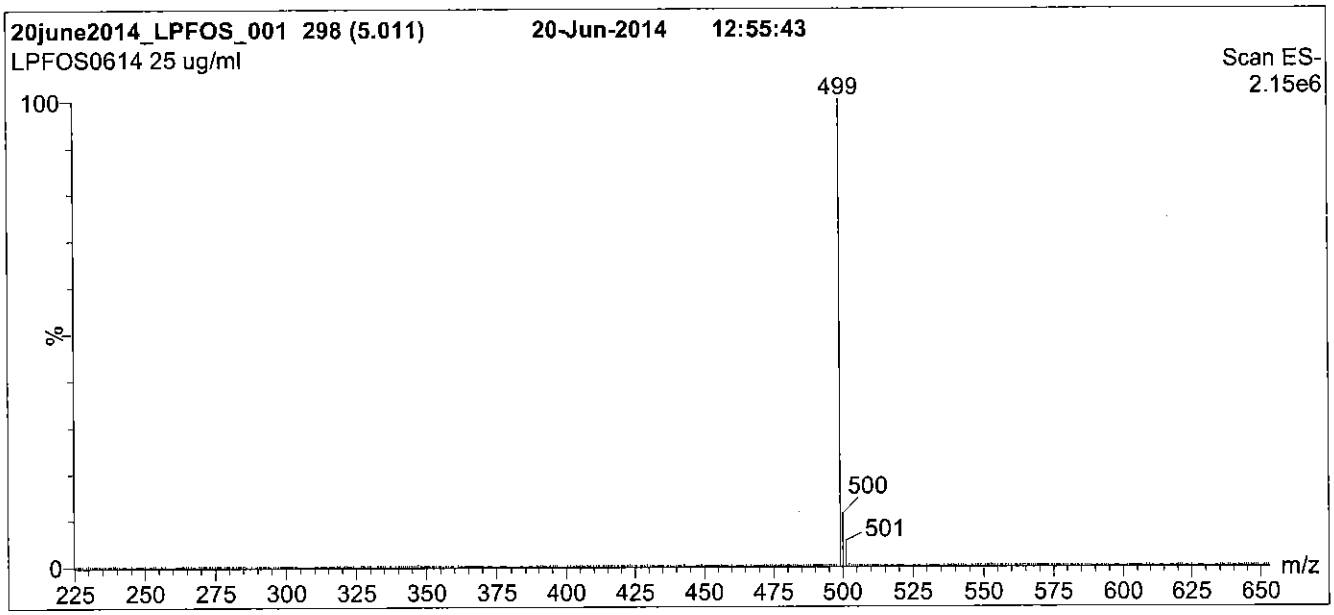
CALA Testing Accreditation No. A 1226

ACLASS 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-PFOS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

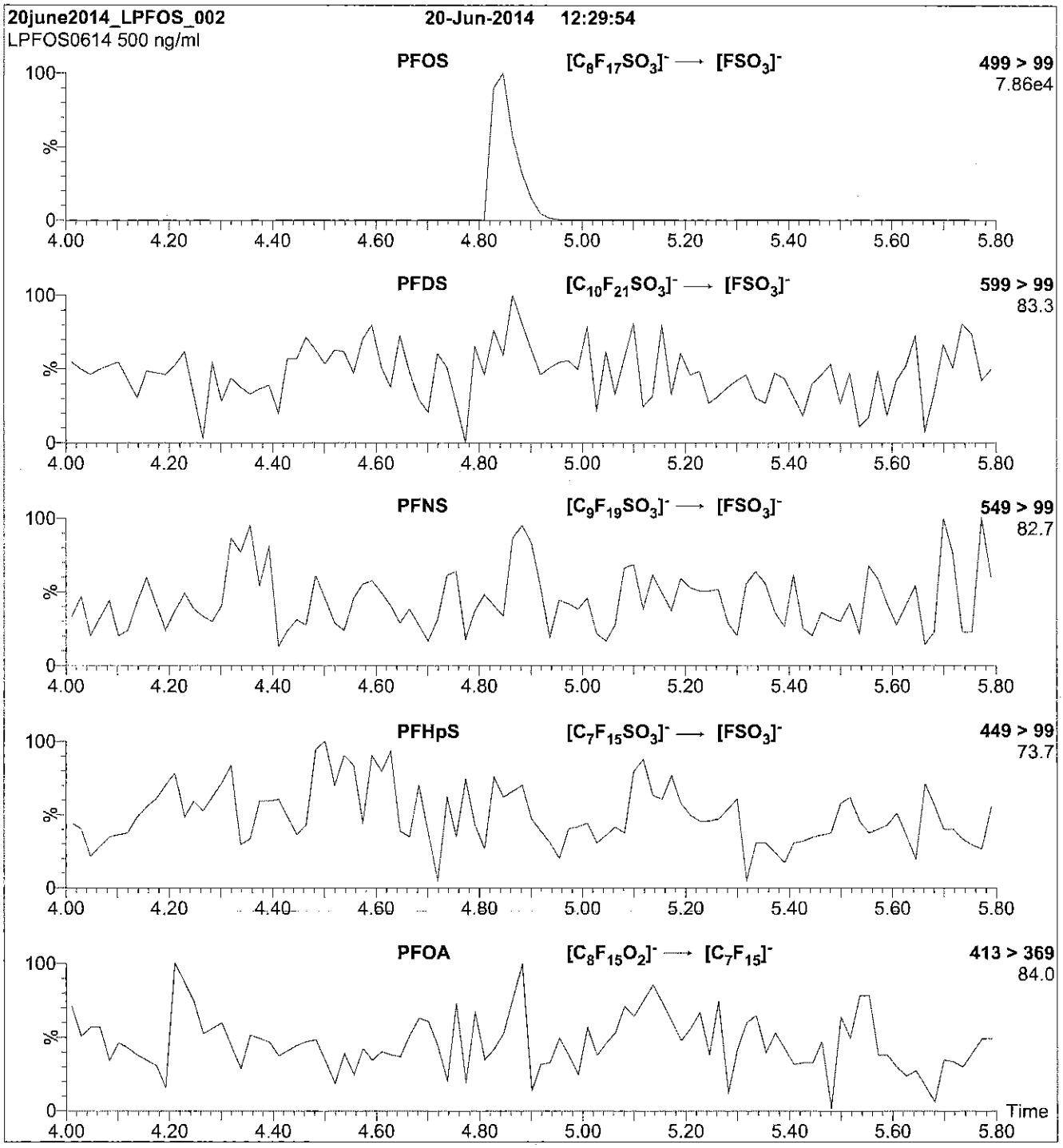
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 950 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: **L-PFOS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

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

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) = 40

Reagent

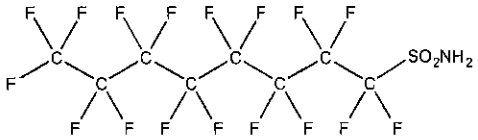
LCPFOSA_00005

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: FOSA-I
COMPOUND: Perfluoro-1-octanesulfonamide
LOT NUMBER: FOSA0714I

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)	07/31/2014		
EXPIRY DATE: (mm/dd/yyyy)	Stability studies ongoing		
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:** 08/05/2014 (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. They are designed to be used as reference standards for the identification and/or quantification of specific chemical compound(s).

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. Material Safety Data Sheets (MSDSs) 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, 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 and/or LC/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 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 17025:2005 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 for the period of time specified by the 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:

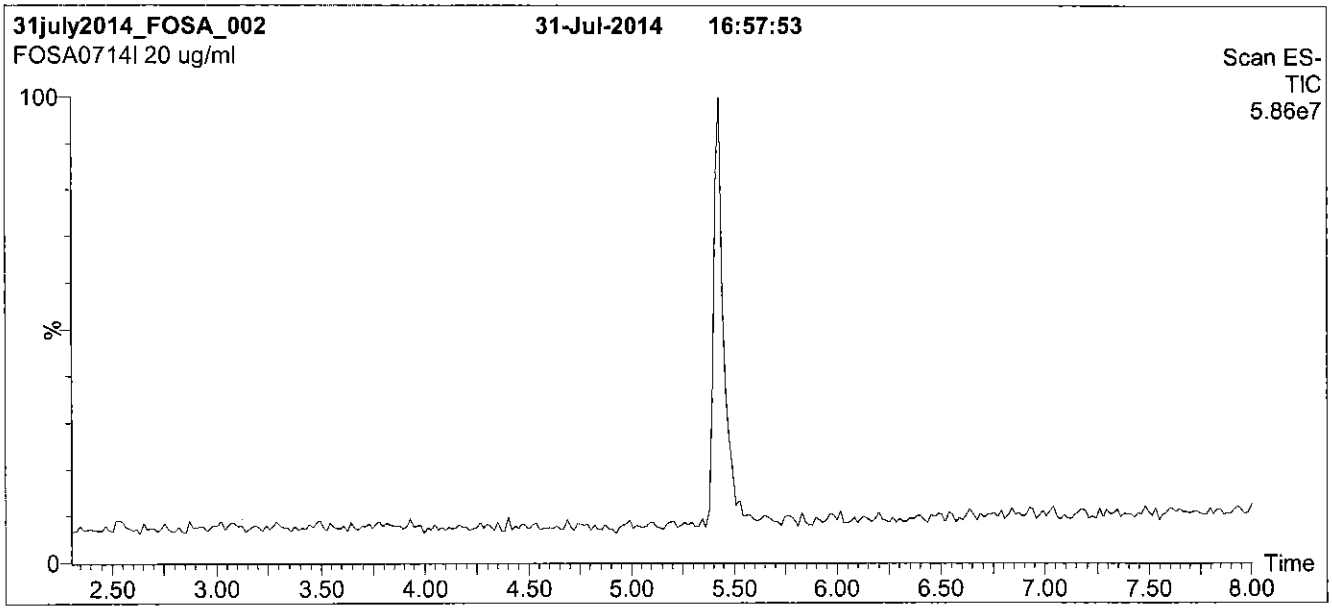
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

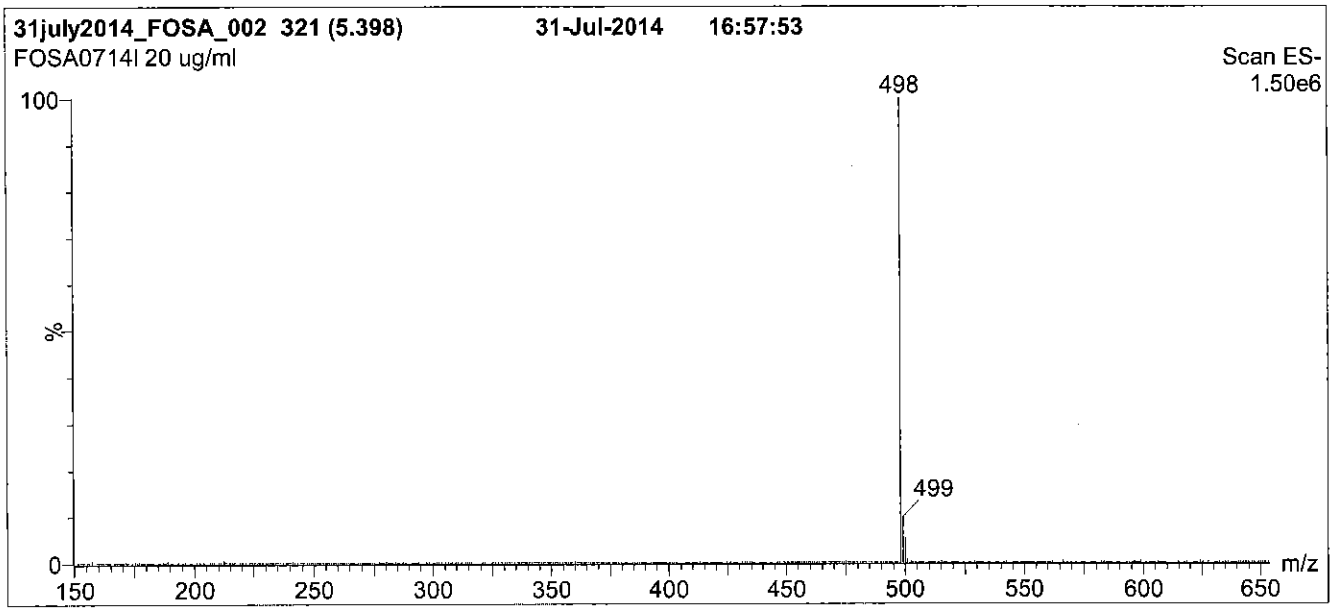
CALA Testing Accreditation No. A1226

ACLASS 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: **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 C_{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

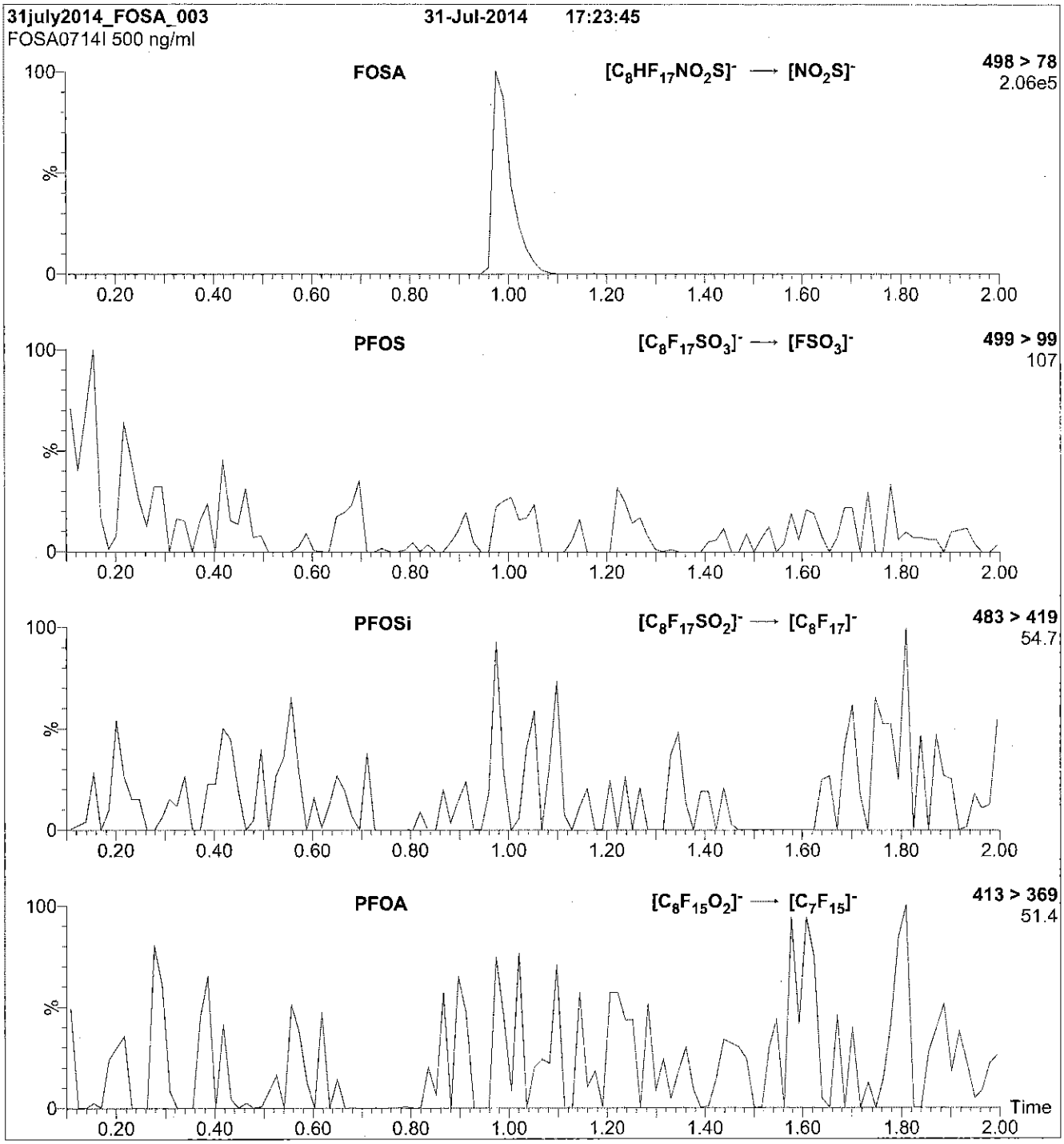
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 950 amu)

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

Figure 2: **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) = 3.58e-3
Collision Energy (eV) = 30

Reagent

LCPFPeA_00003

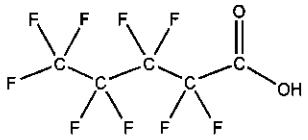
Rec 7/15/14

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFPeA
COMPOUND: Perfluoro-n-pentanoic acid
LOT NUMBER: PFPeA0113

STRUCTURE:
CAS #: 2706-90-3



MOLECULAR FORMULA: $C_5HF_9O_2$
MOLECULAR WEIGHT: 264.05
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 01/03/2013
EXPIRY DATE: (mm/dd/yyyy) 01/03/2018
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.3% 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:** 01/14/2013 (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. They are designed to be used as reference standards for the identification and/or quantification of specific chemical compound(s).

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. Material Safety Data Sheets (MSDSs) 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, 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 and/or LC/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 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 17025:2005 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 for the period of time specified by the 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:

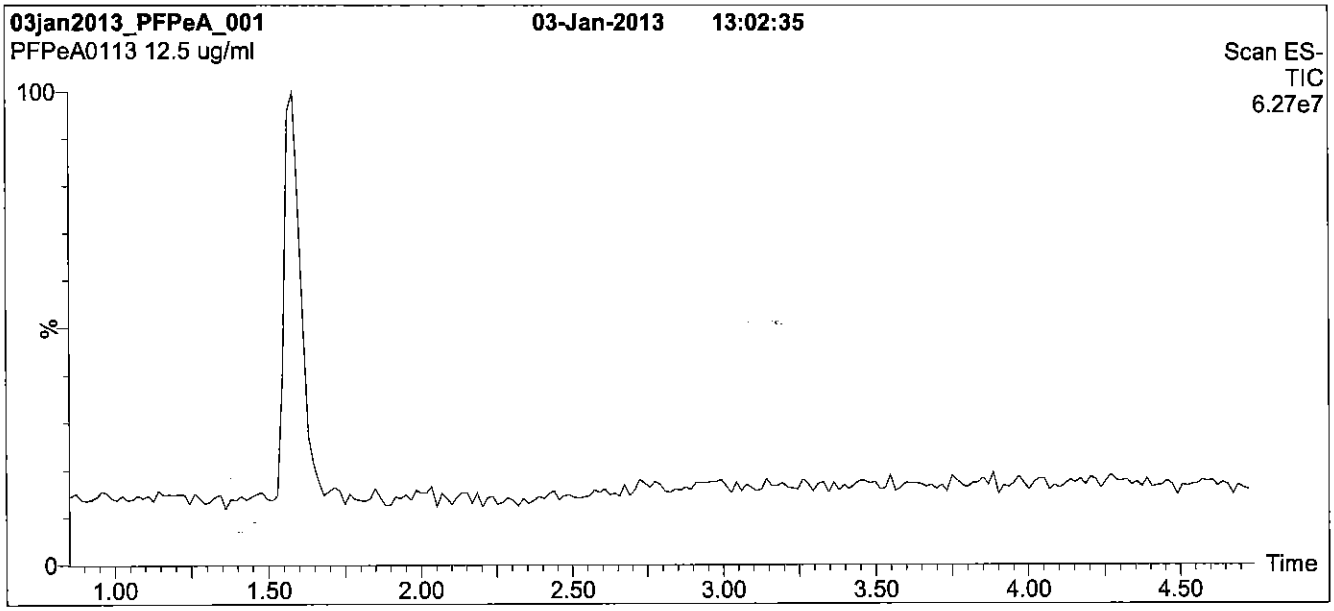
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

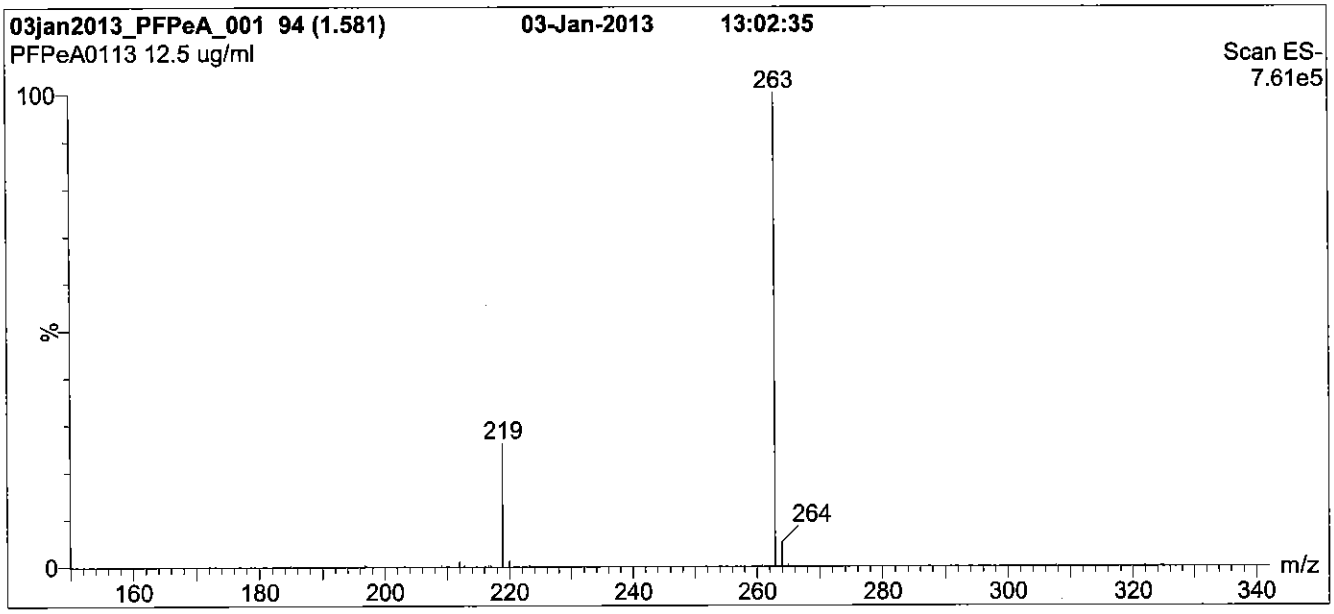
CALA Testing Accreditation No. A 1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 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

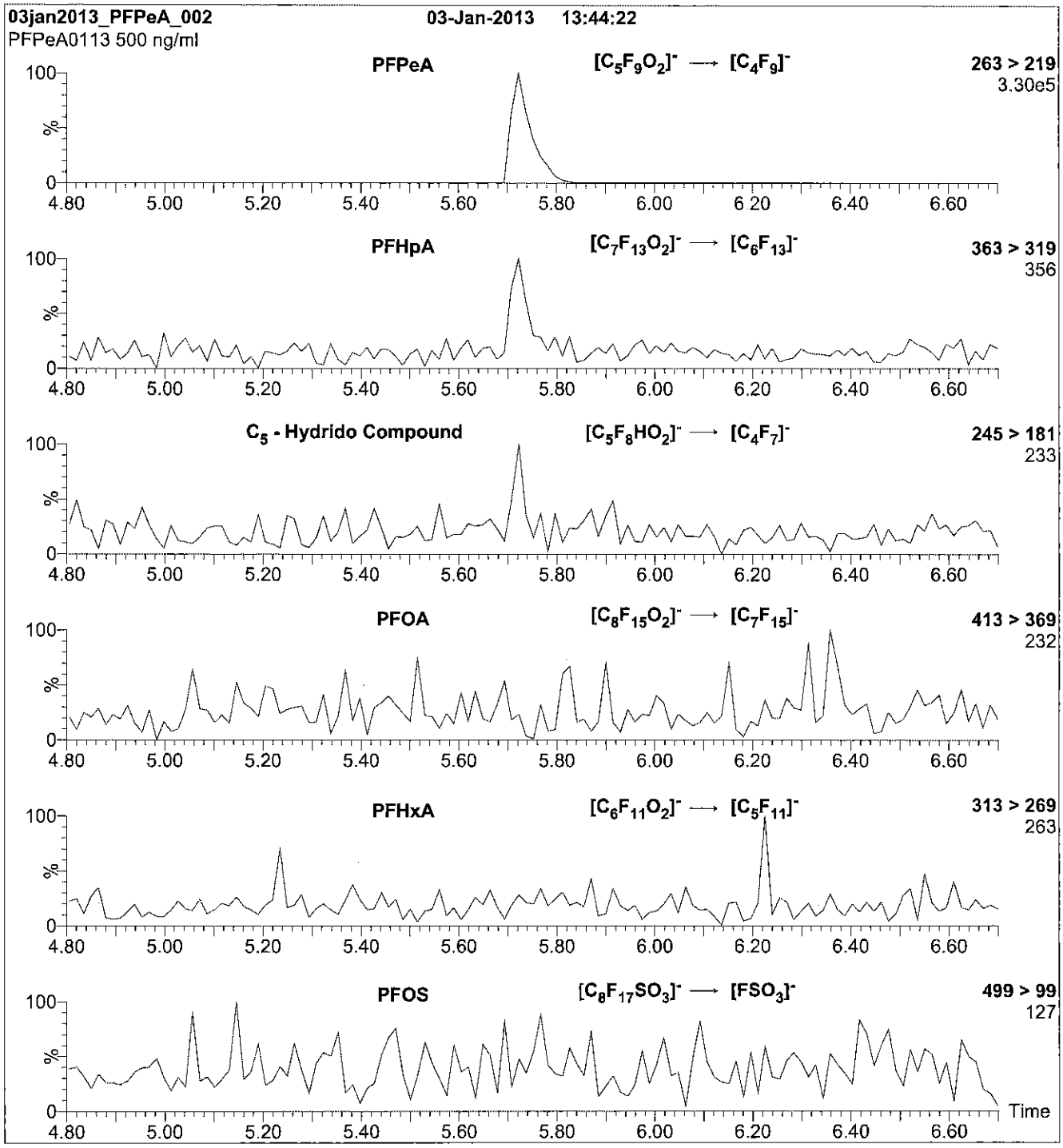
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 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 70% (80:20 MeOH:ACN) / 30% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

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

Reagent

LCPFPeS_00002

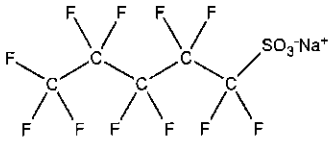
R 24hrs ow

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: L-PFPeS
COMPOUND: Sodium perfluoro-1-pentanesulfonate
LOT NUMBER: LPFPeS0712

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA:	$C_5F_{11}SO_3Na$	**MOLECULAR WEIGHT:**	372.09
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 46.9 ± 2.3 µg/ml (PFPeS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	07/04/2012		
EXPIRY DATE: (mm/dd/yyyy)	07/04/2017		
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:** 01/15/2013 (mm/dd/yyyy)
B.G. Chittim

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

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. They are designed to be used as reference standards for the identification and/or quantification of specific chemical compound(s).

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. Material Safety Data Sheets (MSDSs) 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, 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 and/or LC/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

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

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

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

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

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all 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 17025:2005 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 for the period of time specified by the 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:

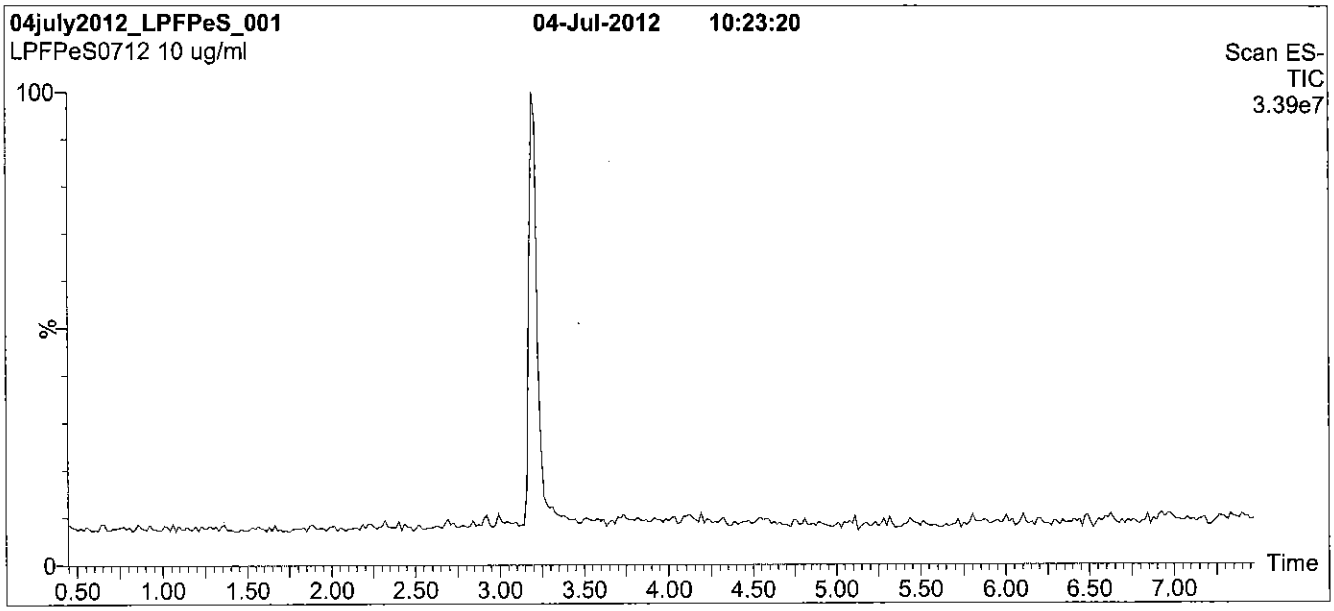
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

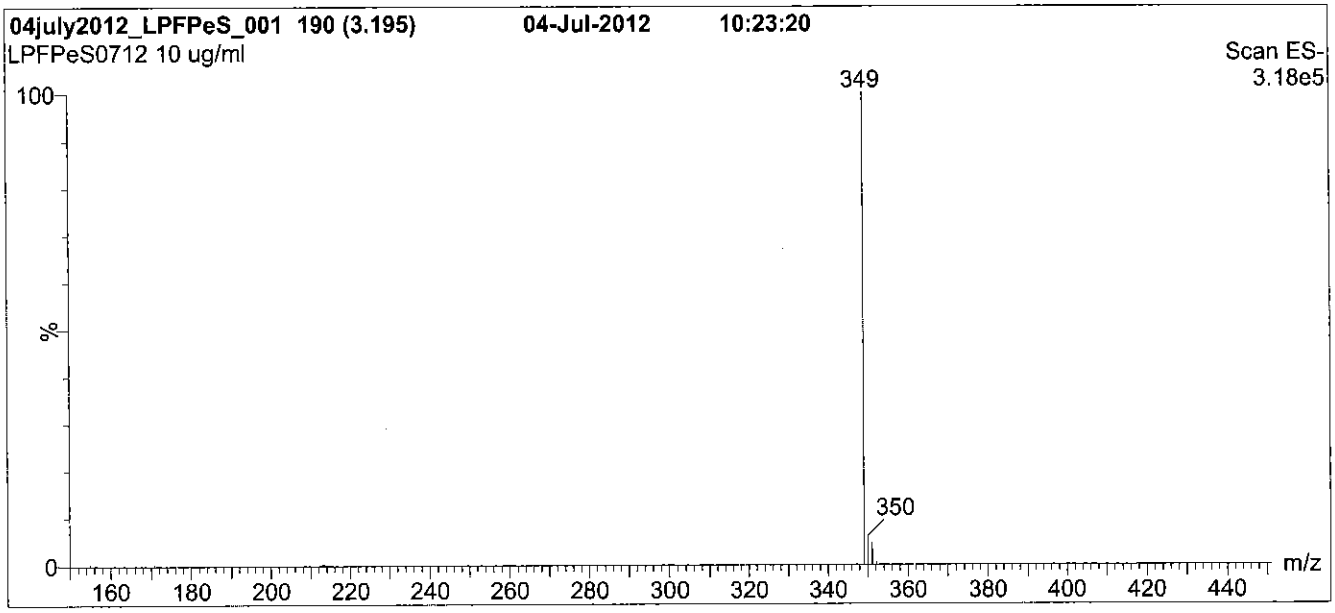
CALA Testing Accreditation No. A 1226

ACLASS 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-PFPeS; 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 over 0.5 min.
Time: 10 min

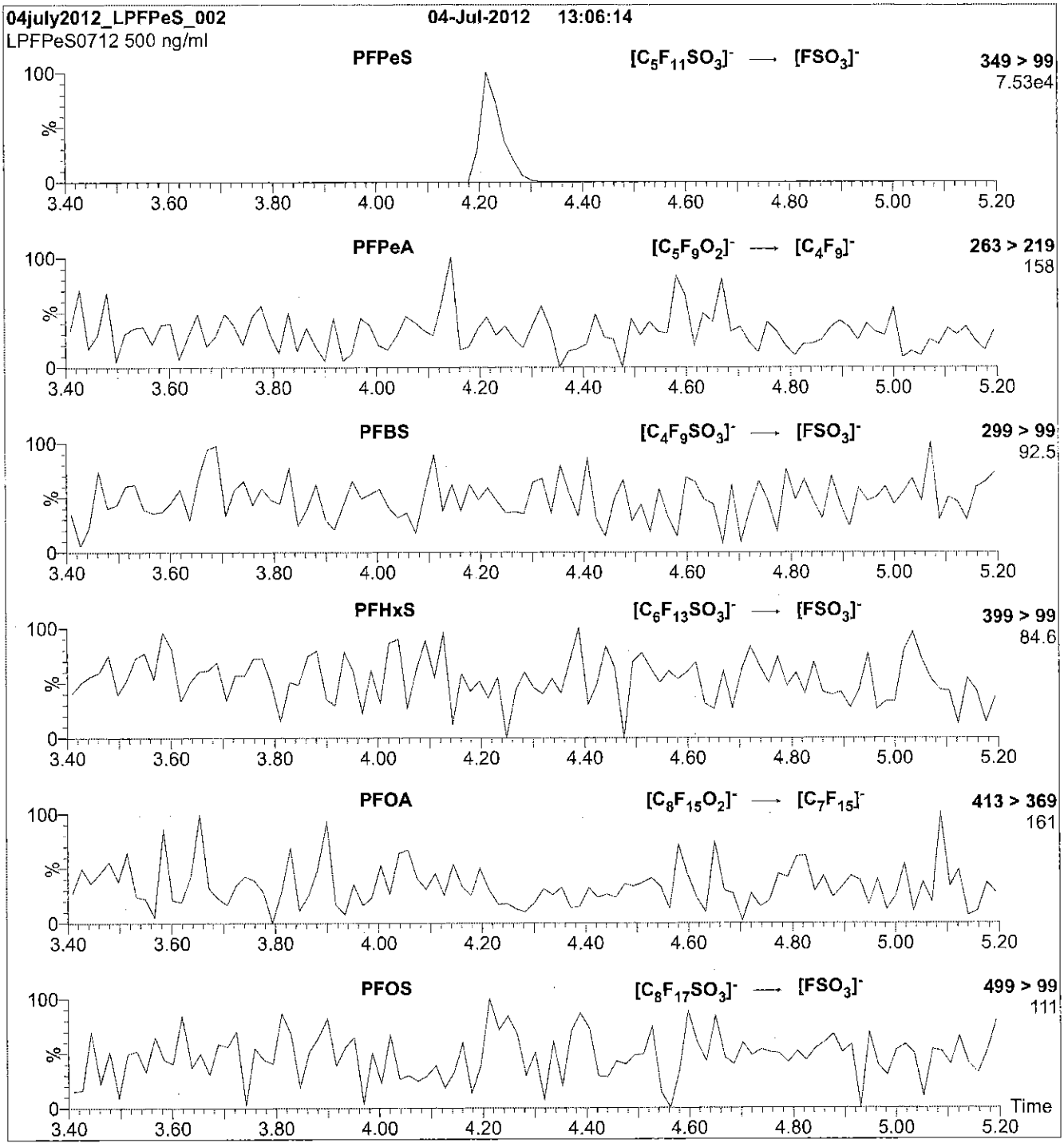
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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) = 30

Reagent

LCPFTeDA_00003

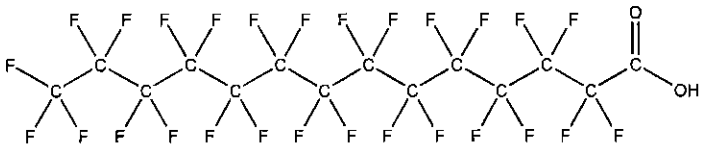
V: 2/11/15 SRV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFTeDA
LOT NUMBER: PFTeDA0613
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) 06/19/2013
EXPIRY DATE: (mm/dd/yyyy) 06/19/2018
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.2% 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:** 07/17/2013 (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. They are designed to be used as reference standards for the identification and/or quantification of specific chemical compound(s).

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. Material Safety Data Sheets (MSDSs) 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, 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 and/or LC/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 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 17025:2005 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 for the period of time specified by the 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:

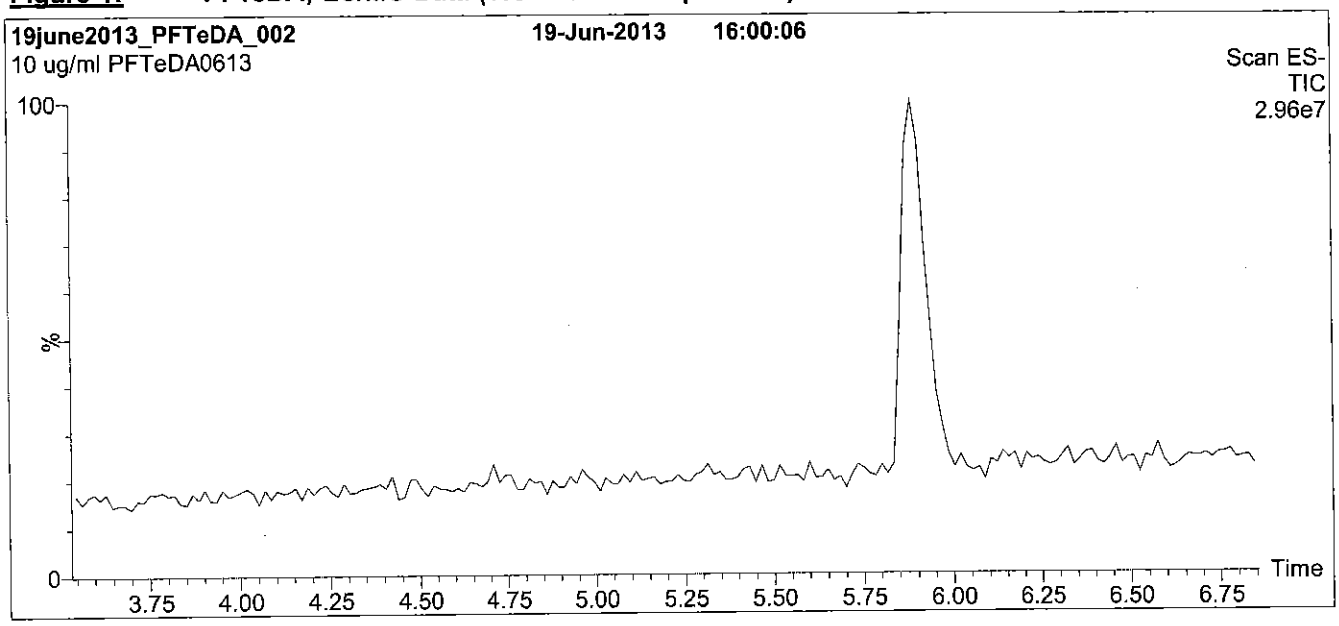
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

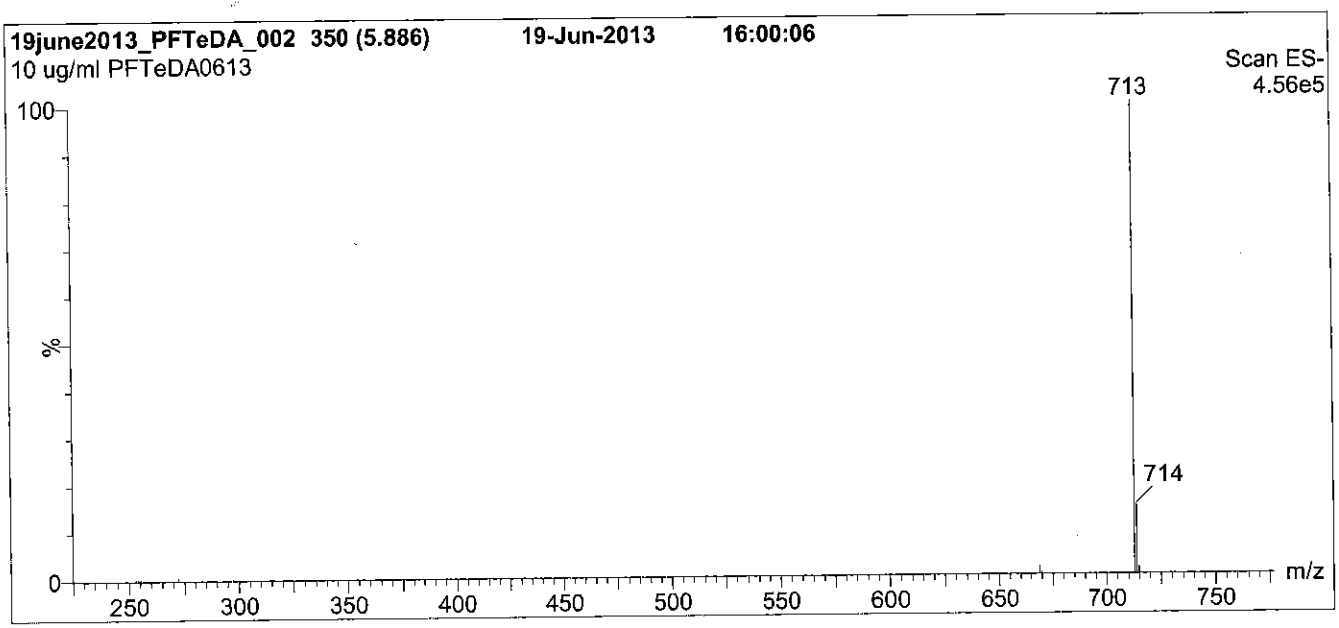
CALA Testing Accredited Lab. No. A1226

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 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 0.50 min.
Time: 10 min

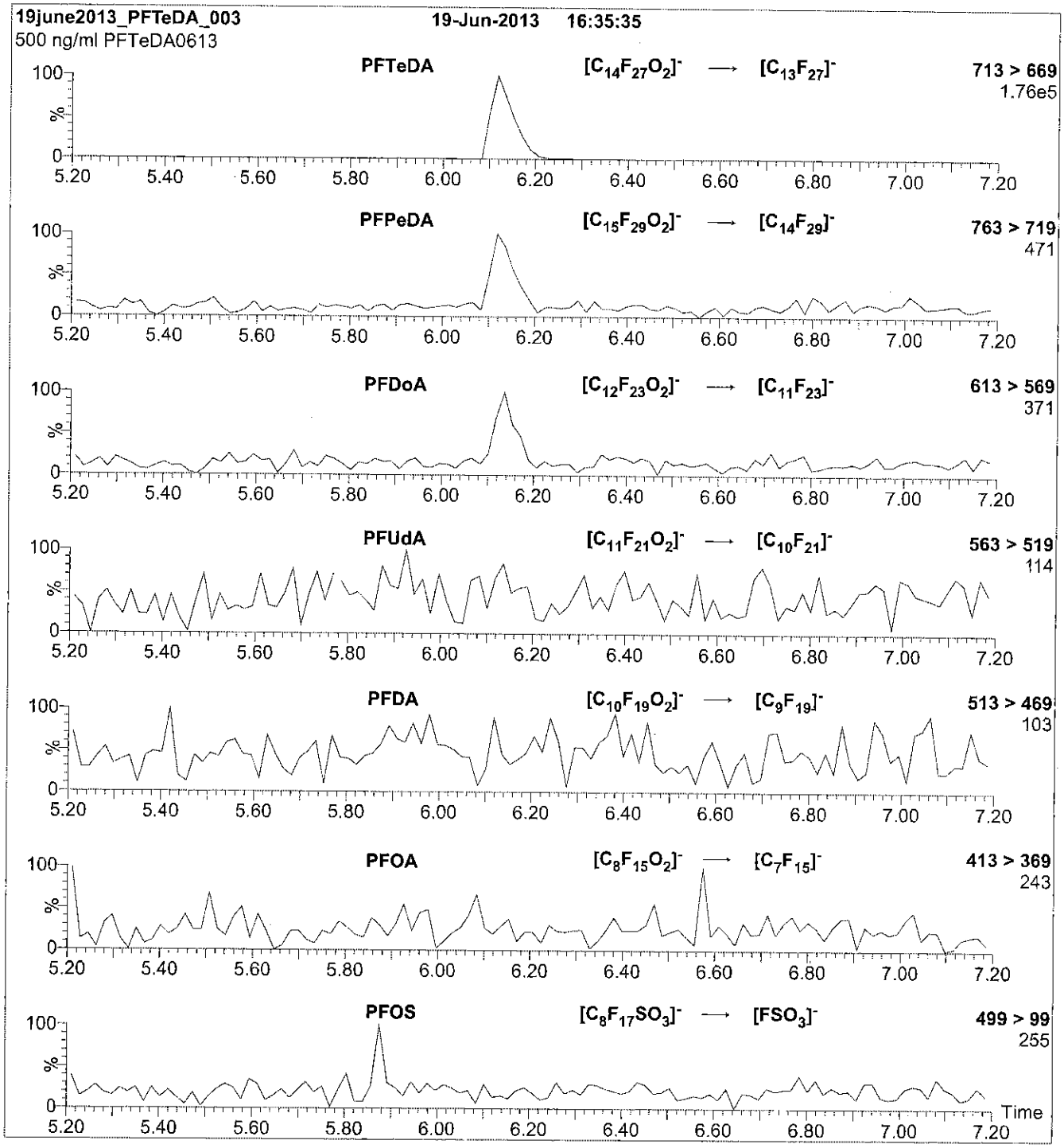
Flow: 300 µl/min

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: **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) = 3.50e-3
Collision Energy (eV) = 14

Reagent

LCPFTrDA_00003

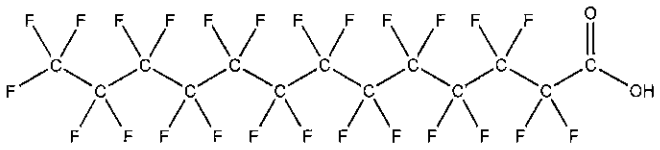
V. 2/11/15 CTN

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFTrDA
LOT NUMBER: PFTrDA1213
COMPOUND: Perfluoro-n-tridecanoic acid

STRUCTURE:
CAS #: 72629-94-8



MOLECULAR FORMULA: $C_{13}HF_{25}O_2$
MOLECULAR WEIGHT: 664.11
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 12/10/2013
EXPIRY DATE: (mm/dd/yyyy) 12/10/2018
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.1% of PFUdA ($C_{11}HF_{21}O_2$), ~ 0.4% of PFDoA ($C_{12}HF_{23}O_2$), and ~ 0.1% of PFTeDA ($C_{14}HF_{27}O_2$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 12/11/2013 (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. They are designed to be used as reference standards for the identification and/or quantification of specific chemical compound(s).

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. Material Safety Data Sheets (MSDSs) 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, 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 and/or LC/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 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 17025:2005 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 for the period of time specified by the 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:

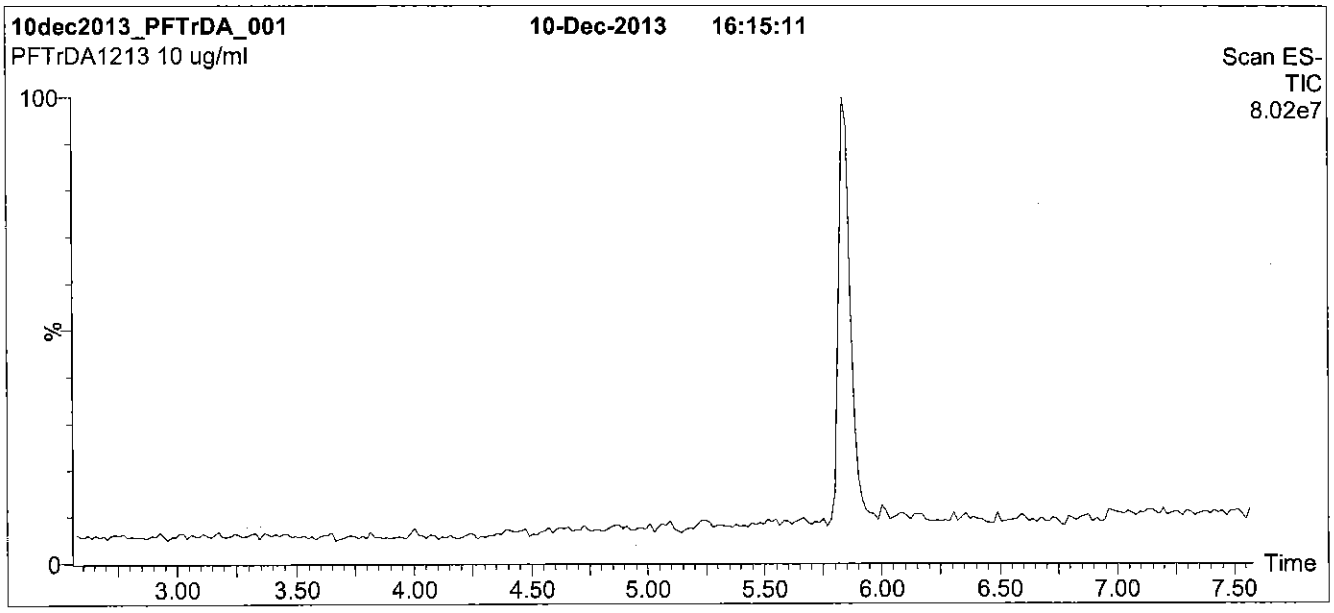
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

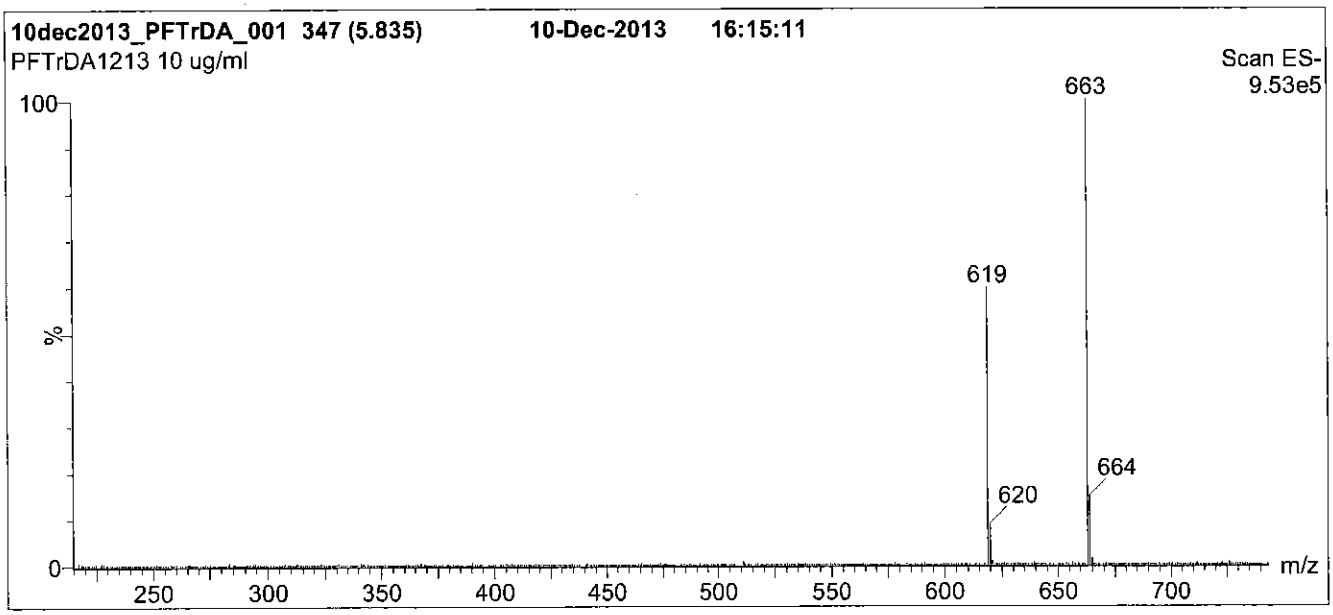
CALA Testing Accreditation No. A 1226

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

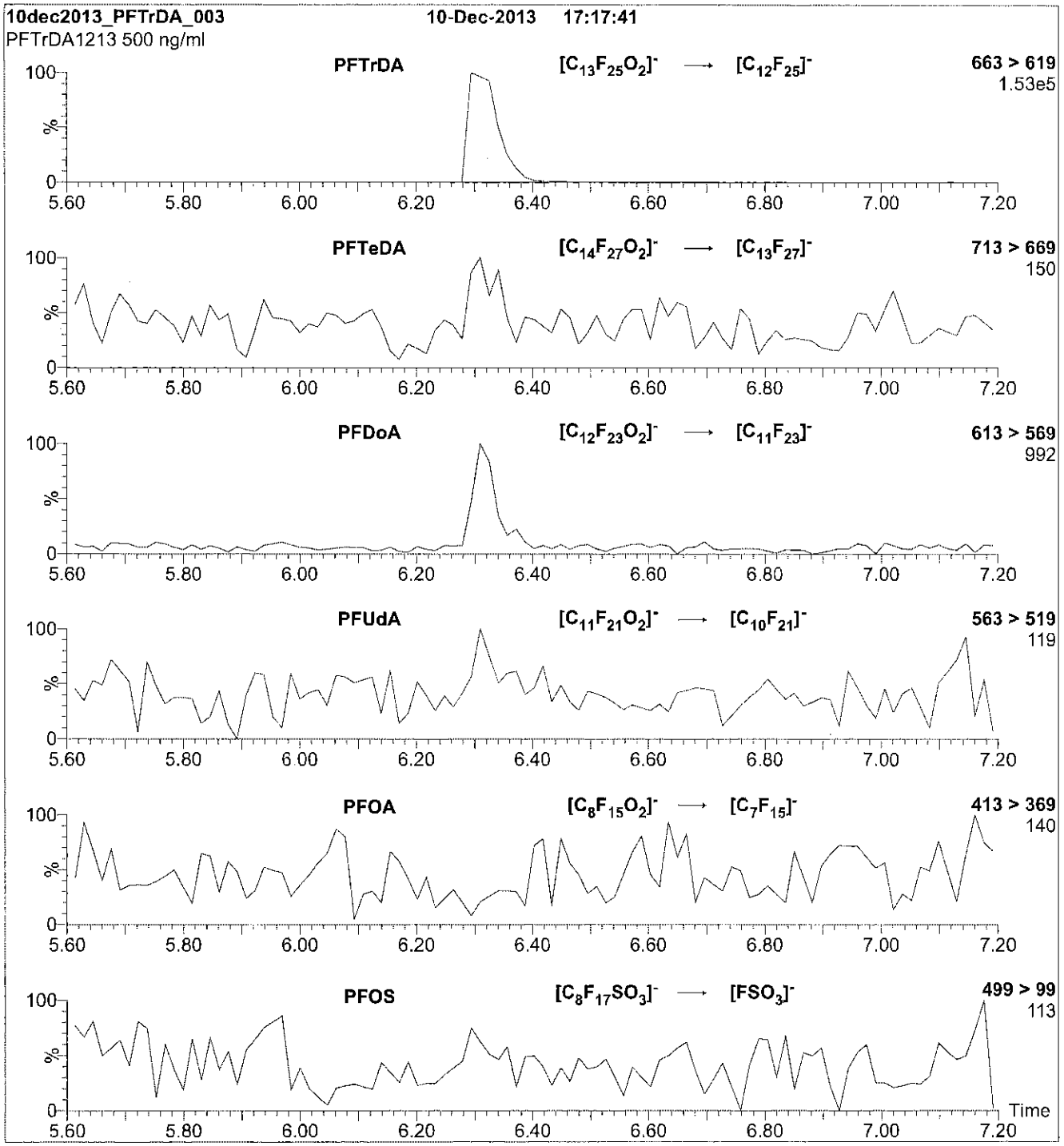
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (215 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 22.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 650

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCPFUdA_00003

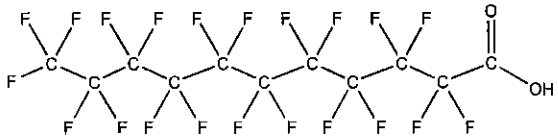
R. 2/11/15 SFV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFUdA
COMPOUND: Perfluoro-n-undecanoic acid
LOT NUMBER: PFUdA0613

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) 06/19/2013
EXPIRY DATE: (mm/dd/yyyy) 06/19/2018
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 07/03/2013 (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. They are designed to be used as reference standards for the identification and/or quantification of specific chemical compound(s).

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. Material Safety Data Sheets (MSDSs) 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, 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 and/or LC/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 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 17025:2005 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 for the period of time specified by the 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:

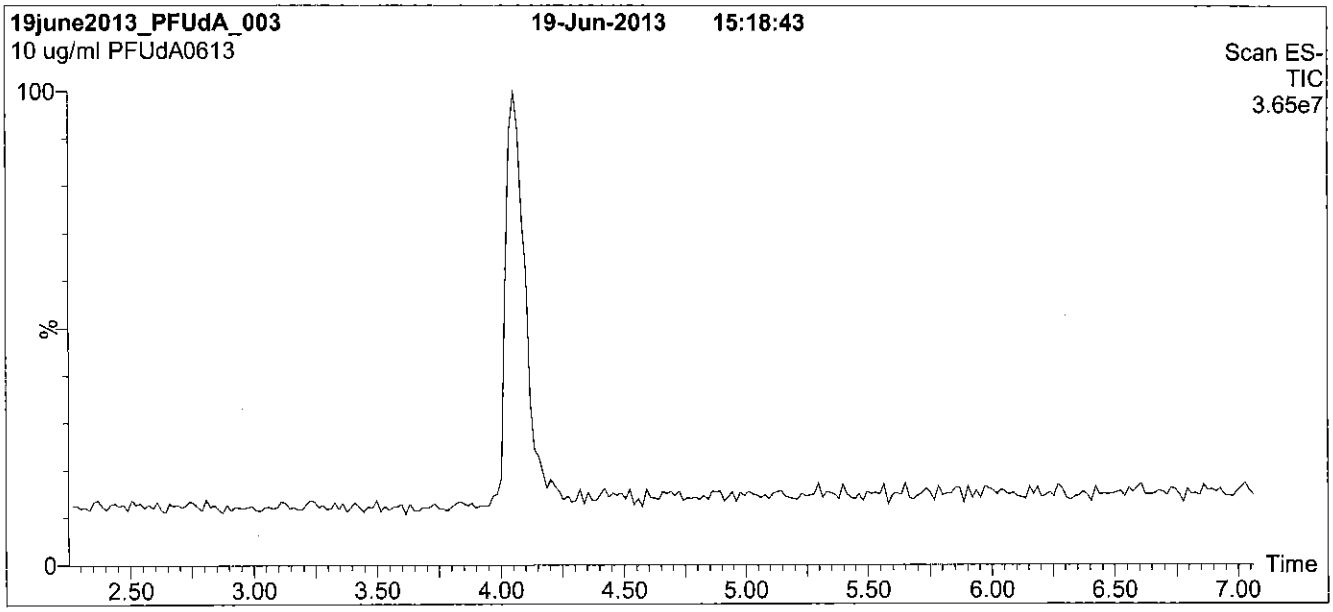
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

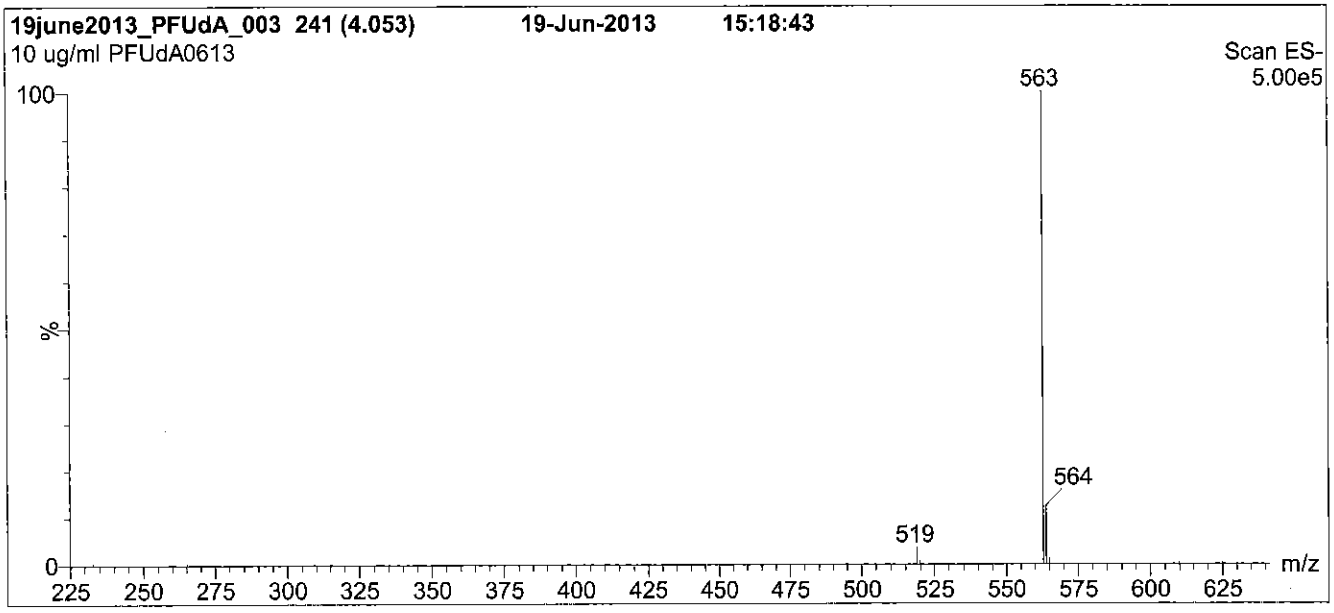
CALA Testing Accreditation No. A1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 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

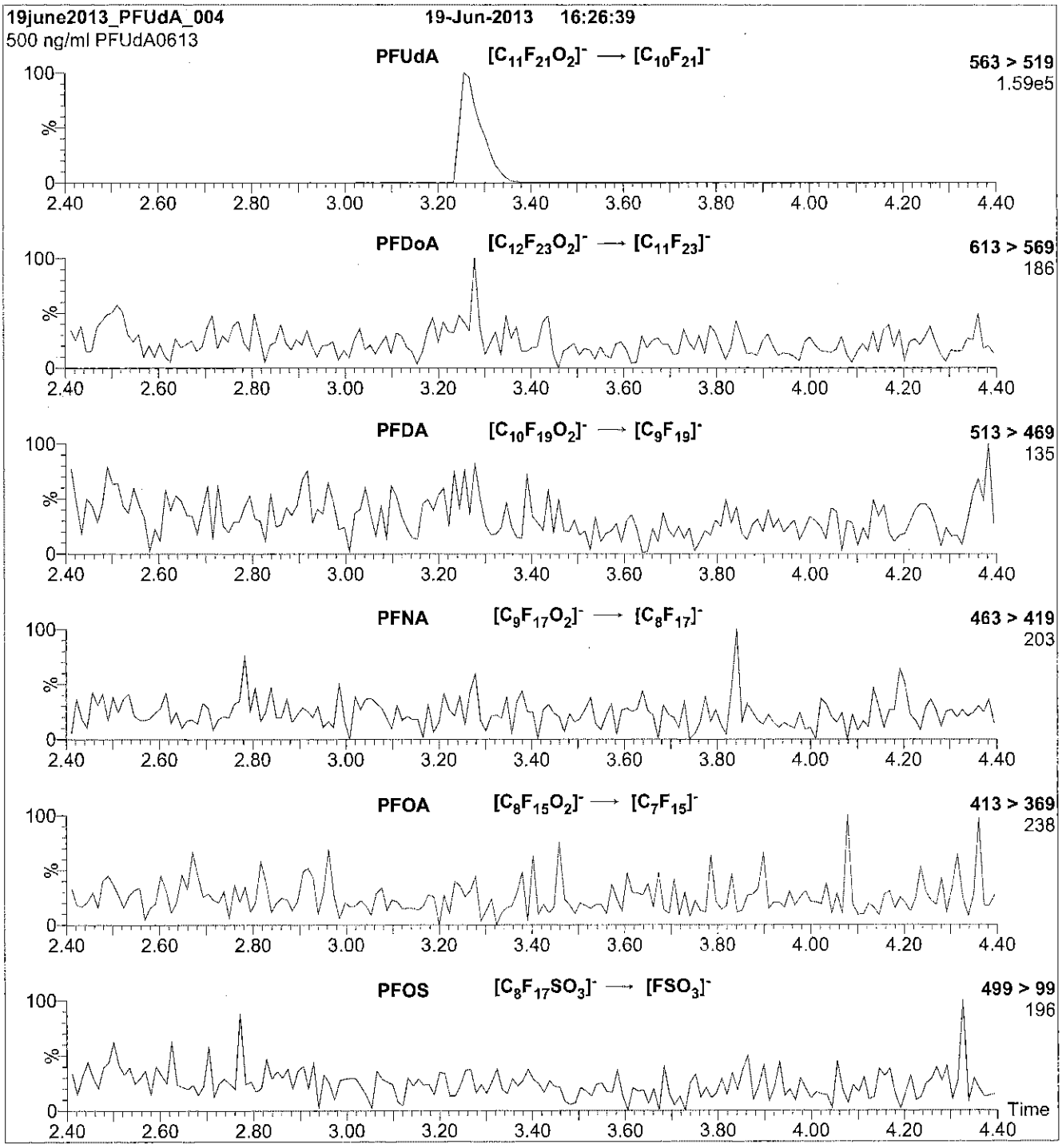
Flow: 300 µl/min

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) = 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) = 3.46e-3
Collision Energy (eV) = 11

Method PFC DOD

Perfluronated Hydrocarbons (LC/MS) by Method PFC_DOD

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Matrix: Water Level: Low

GC Column (1): Acquity ID: 2.1 (mm)

Client Sample ID	Lab Sample ID	13CHpA #	PFHxS #	PFOA #	PFOS #	PFNA #
OF-FB09-0216	320-17154-1	122	113	126	107	127
OF-FB11-0216	320-17154-6	111	95	113	93	116
OF-FB28-0216	320-17154-8	124	113	132	108	137
OF-FB67-0216	320-17154-10	126	113	131	112	130
	MB 320-100147/1-A	118	97	114	98	118
	LCS 320-100093/2-A	95	90	95	82	98
	LCS 320-100147/2-A	124	108	119	99	117
	LCSD 320-100093/3-A	95	86	88	80	91
	LCSD 320-100147/3-A	123	107	115	100	116

	QC LIMITS
13CHpA = 13C4-PFHpA	25-150
PFHxS = 18O2 PFHxS	25-150
PFOA = 13C4 PFOA	25-150
PFOS = 13C4 PFOS	25-150
PFNA = 13C5 PFNA	25-150

Column to be used to flag recovery values

FORM II WS-LC-0025

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Matrix: Water Level: Low

GC Column (1): Acquity ID: 2.1 (mm)

Client Sample ID	Lab Sample ID	13CHpA #	PFOA #	PFOS #	PFNA #
	MB 320-100093/1-A	103	101	92	103

	QC LIMITS
13CHpA = 13C4-PFHpA	25-150
PFOA = 13C4 PFOA	25-150
PFOS = 13C4 PFOS	25-150
PFNA = 13C5 PFNA	25-150

Column to be used to flag recovery values

FORM II WS-LC-0025

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Matrix: Water Level: Low

GC Column (1): Acquity ID: 2.1 (mm)

Client Sample ID	Lab Sample ID	PFHxS #
	MB 320-100093/1-A	95

	QC LIMITS
PFHxS = 18O2 PFHxS	25-150

Column to be used to flag recovery values

FORM II WS-LC-0025

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Matrix: Water Level: Low

GC Column (1): Acquity ID: 2.1 (mm)

Client Sample ID	Lab Sample ID	PFHxS #	13CHpA #	PFOA #	PFOS #	PFNA #
OF-FB37-0216	320-17154-3	100	107	111	95	113

	QC LIMITS
PFHxS = 18O2 PFHxS	25-150
13CHpA = 13C4-PFHpA	25-150
PFOA = 13C4 PFOA	25-150
PFOS = 13C4 PFOS	25-150
PFNA = 13C5 PFNA	25-150

Column to be used to flag recovery values

FORM II WS-LC-0025

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Matrix: Water Level: Low Lab File ID: 19FEB2016A6A_048.d

Lab ID: LCS 320-100093/2-A Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
Perfluoroheptanoic acid (PFHpA)	0.0400	0.0513	128	60-140	
Perfluorooctanoic acid (PFOA)	0.0400	0.0485	121	60-140	
Perfluorononanoic acid (PFNA)	0.0400	0.0537	134	60-140	
Perfluorobutanesulfonic acid (PFBS)	0.0354	0.0459	130	50-150	
Perfluorohexanesulfonic acid (PFHxS)	0.0378	0.0480	127	60-140	
Perfluorooctanesulfonic acid (PFOS)	0.0382	0.0515	135	60-140	
13C4-PFHpA	0.100	0.0955	95	25-150	
13C4 PFOA	0.100	0.0945	95	25-150	
13C5 PFNA	0.100	0.0975	98	25-150	
18O2 PFHxS	0.0946	0.0852	90	25-150	
13C4 PFOS	0.0956	0.0783	82	25-150	

Column to be used to flag recovery and RPD values

FORM III WS-LC-0025

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Matrix: Water Level: Low Lab File ID: 19FEB2016A6A_062.d

Lab ID: LCS 320-100147/2-A Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
Perfluoroheptanoic acid (PFHpA)	0.0400	0.0498	124	60-140	
Perfluorooctanoic acid (PFOA)	0.0400	0.0476	119	60-140	
Perfluorononanoic acid (PFNA)	0.0400	0.0528	132	60-140	
Perfluorobutanesulfonic acid (PFBS)	0.0354	0.0412	116	50-150	
Perfluorohexanesulfonic acid (PFHxS)	0.0378	0.0503	133	60-140	
Perfluorooctanesulfonic acid (PFOS)	0.0382	0.0529	138	60-140	
13C4-PFHpA	0.100	0.124	124	25-150	
13C4 PFOA	0.100	0.119	119	25-150	
13C5 PFNA	0.100	0.117	117	25-150	
18O2 PFHxS	0.0946	0.102	108	25-150	
13C4 PFOS	0.0956	0.0948	99	25-150	

Column to be used to flag recovery and RPD values

FORM III WS-LC-0025

FORM III
LCMS LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Matrix: Water Level: Low Lab File ID: 19FEB2016A6A_049.d

Lab ID: LCSD 320-100093/3-A Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Perfluoroheptanoic acid (PFHpA)	0.0400	0.0506	126	1	30	60-140	
Perfluorooctanoic acid (PFOA)	0.0400	0.0493	123	2	30	60-140	
Perfluorononanoic acid (PFNA)	0.0400	0.0517	129	4	30	60-140	
Perfluorobutanesulfonic acid (PFBS)	0.0354	0.0472	133	3	30	50-150	
Perfluorohexanesulfonic acid (PFHxS)	0.0378	0.0486	128	1	30	60-140	
Perfluorooctanesulfonic acid (PFOS)	0.0382	0.0452	118	13	30	60-140	
13C4-PFHpA	0.100	0.0955	95			25-150	
13C4 PFOA	0.100	0.0880	88			25-150	
13C5 PFNA	0.100	0.0909	91			25-150	
18O2 PFHxS	0.0946	0.0810	86			25-150	
13C4 PFOS	0.0956	0.0761	80			25-150	

Column to be used to flag recovery and RPD values

FORM III WS-LC-0025

FORM III
LCMS LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Matrix: Water Level: Low Lab File ID: 19FEB2016A6A_063.d

Lab ID: LCSD 320-100147/3-A Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Perfluoroheptanoic acid (PFHpA)	0.0400	0.0461	115	8	30	60-140	
Perfluorooctanoic acid (PFOA)	0.0400	0.0488	122	2	30	60-140	
Perfluorononanoic acid (PFNA)	0.0400	0.0534	133	1	30	60-140	
Perfluorobutanesulfonic acid (PFBS)	0.0354	0.0461	130	11	30	50-150	
Perfluorohexanesulfonic acid (PFHxS)	0.0378	0.0473	125	6	30	60-140	
Perfluorooctanesulfonic acid (PFOS)	0.0382	0.0502	131	5	30	60-140	
13C4-PFHpA	0.100	0.123	123			25-150	
13C4 PFOA	0.100	0.115	115			25-150	
13C5 PFNA	0.100	0.116	116			25-150	
18O2 PFHxS	0.0946	0.101	107			25-150	
13C4 PFOS	0.0956	0.0953	100			25-150	

Column to be used to flag recovery and RPD values

FORM III WS-LC-0025

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Lab File ID: 12FEB2016A4A_042.d Lab Sample ID: MB 320-100093/1-A

Matrix: Water Date Extracted: 02/09/2016 10:23

Instrument ID: A4 Date Analyzed: 02/13/2016 00:22

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-100093/2-A	19FEB2016A6_A_048.d	02/20/2016 06:44
	LCSD 320-100093/3-A	19FEB2016A6_A_049.d	02/20/2016 07:05
OF-FB09-0216	320-17154-1	19FEB2016A6_A_058.d	02/20/2016 10:16
OF-FB37-0216	320-17154-3	19FEB2016A6_A_059.d	02/20/2016 10:37
OF-FB11-0216	320-17154-6	19FEB2016A6_A_060.d	02/20/2016 10:58

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Lab File ID: 19FEB2016A6A_047.d Lab Sample ID: MB 320-100093/1-A

Matrix: Water Date Extracted: 02/09/2016 10:23

Instrument ID: A6 Date Analyzed: 02/20/2016 06:23

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED

CLIENT SAMPLE ID	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Lab File ID: 19FEB2016A6A_061.d Lab Sample ID: MB 320-100147/1-A

Matrix: Water Date Extracted: 02/10/2016 07:14

Instrument ID: A6 Date Analyzed: 02/20/2016 11:20

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-100147/2-A	19FEB2016A6A_062.d	02/20/2016 11:41
	LCSD 320-100147/3-A	19FEB2016A6A_063.d	02/20/2016 12:02
OF-FB28-0216	320-17154-8	19FEB2016A6A_064.d	02/20/2016 12:23
OF-FB67-0216	320-17154-10	19FEB2016A6A_065.d	02/20/2016 12:45

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Client Sample ID: OF-FB09-0216 | Lab Sample ID: 320-17154-1

Matrix: Water | Lab File ID: 19FEB2016A6A_058.d

Analysis Method: WS-LC-0025 | Date Collected: 02/03/2016 16:40

Extraction Method: 3535 | Date Extracted: 02/09/2016 10:23

Sample wt/vol: 504.9(mL) | Date Analyzed: 02/20/2016 10:16

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 15(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 100906 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0020	U	0.0025	0.0020	0.00079
335-67-1	Perfluorooctanoic acid (PFOA)	0.0020	U	0.0025	0.0020	0.00074
375-95-1	Perfluorononanoic acid (PFNA)	0.0020	U	0.0025	0.0020	0.00065
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0020	U	0.0025	0.0020	0.00091
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.0020	U	0.0025	0.0020	0.00086
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0030	U	0.0040	0.0030	0.0013

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01892	13C4-PFHpA	122		25-150
STL00990	13C4 PFOA	126		25-150
STL00995	13C5 PFNA	127		25-150
STL00994	18O2 PFHxS	113		25-150
STL00991	13C4 PFOS	107		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_058.d
Lims ID: 320-17154-A-1-A Lab Sample ID: 320-17154-1
Client ID: OF-FB09-0216
Sample Type: Client
Inject. Date: 20-Feb-2016 10:16:31 ALS Bottle#: 11 Worklist Smp#: 56
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: 320-17154-A-1-A
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
Operator ID: JRB Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\PFAC_A6.m
Limit Group: LC PFC_DOD ICAL
Last Update: 22-Feb-2016 13:06:10 Calib Date: 19-Feb-2016 17:15:39
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_010.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK010

First Level Reviewer: barnettj Date: 22-Feb-2016 13:16:45

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 8 13C4-PFHpA										
367.0 > 322.0	9.294	9.322	-0.028		1879807	61.0		122	7119	
D 11 18O2 PFHxS										
403.0 > 84.0	9.329	9.358	-0.029		797748	53.3		113	3508	
41 Perfluorohexanesulfonic acid										
399.0 > 80.0	9.305	9.364	-0.059	1.000	1469	0.1290				
D 12 13C4 PFOA										
417.0 > 372.0	10.419	10.450	-0.031		2152297	63.0		126	8027	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.426	10.450	-0.024	1.000	2132	0.0493			2.6	
D 16 13C4 PFOS										
503.0 > 80.0	11.385	11.414	-0.029		930905	51.2		107	3639	
D 17 13C5 PFNA										
468.0 > 423.0	11.408	11.434	-0.026		1792957	63.6		127	4359	

Report Date: 22-Feb-2016 13:16:47 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_058.d

Injection Date: 20-Feb-2016 10:16:31 Instrument ID: A6

Lims ID: 320-17154-A-1-A Lab Sample ID: 320-17154-1

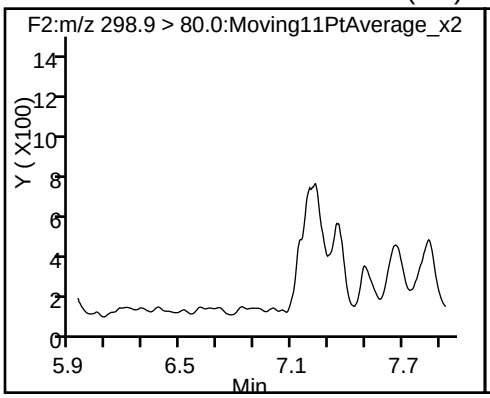
Client ID: OF-FB09-0216

Operator ID: JRB ALS Bottle#: 11 Worklist Smp#: 56

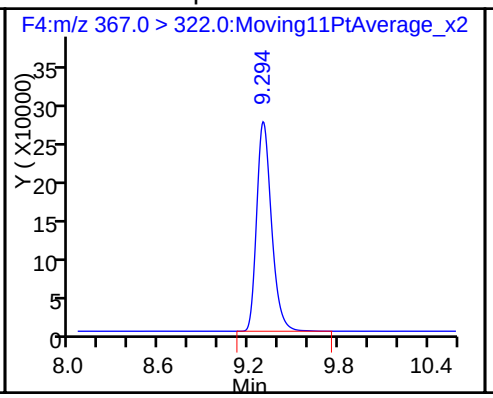
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

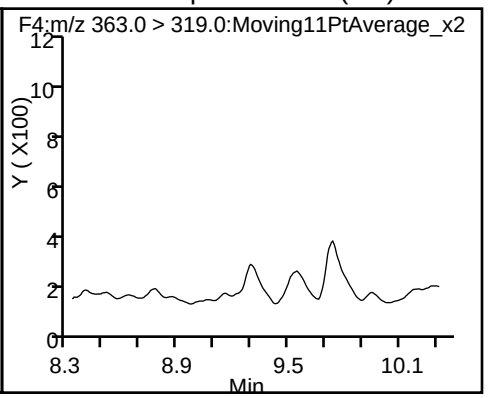
40 Perfluorobutanesulfonic acid (ND)



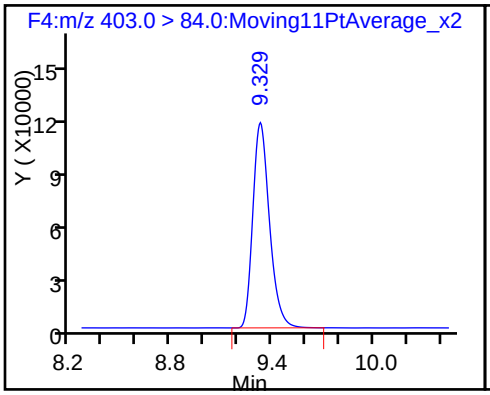
D 8 13C4-PFHpA



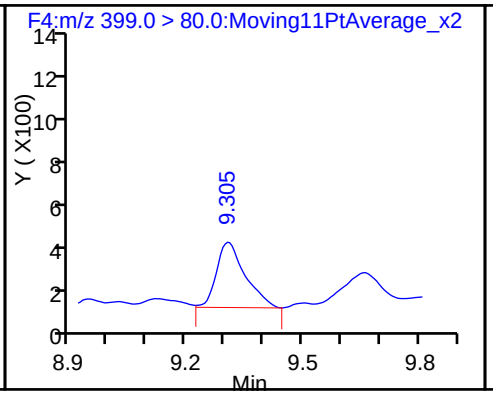
9 Perfluoroheptanoic acid (ND)



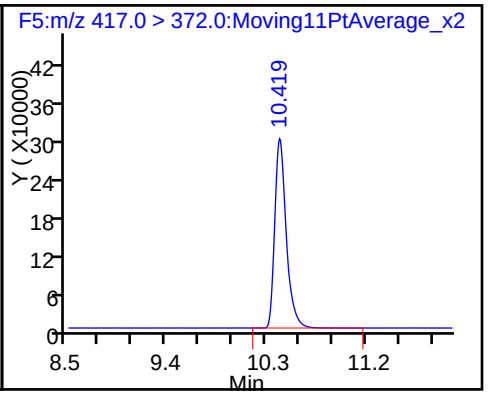
D 11 18O2 PFHxS



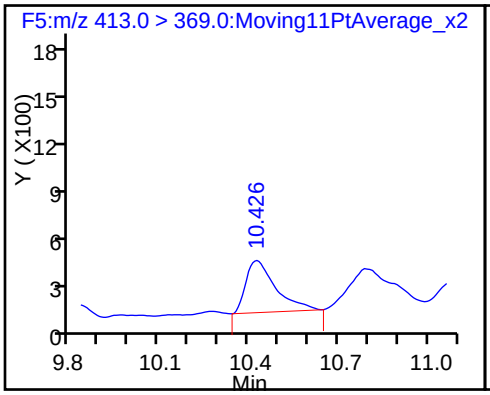
41 Perfluorohexanesulfonic acid



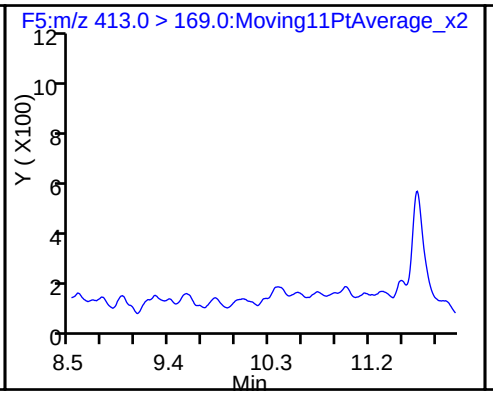
D 12 13C4 PFOA



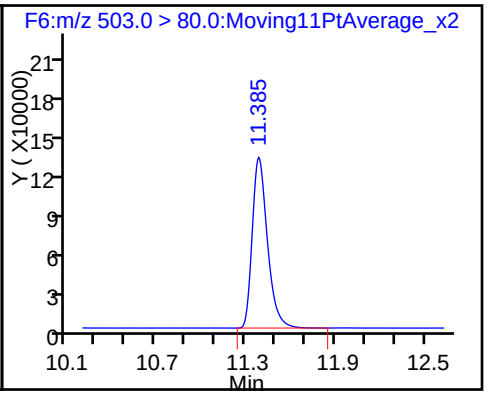
13 Perfluorooctanoic acid



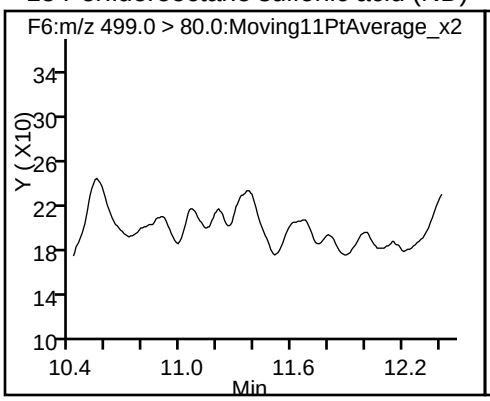
13 Perfluorooctanoic acid



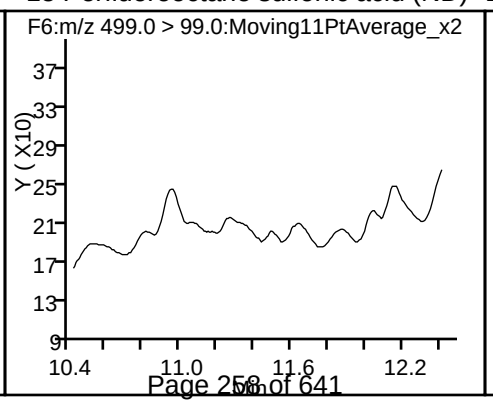
D 16 13C4 PFOS



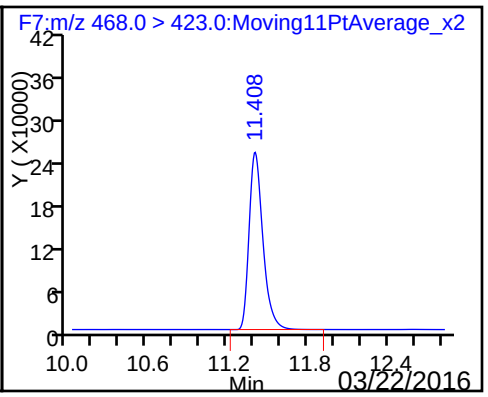
15 Perfluorooctane sulfonic acid (ND)



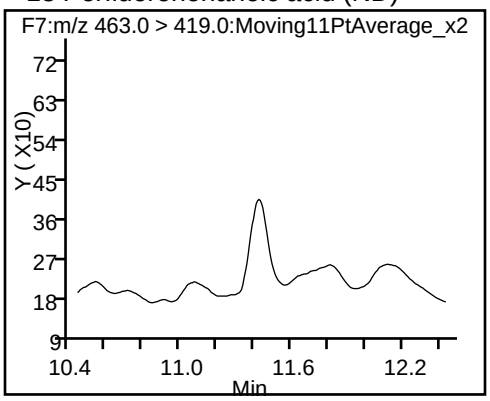
15 Perfluorooctane sulfonic acid (ND)



D 17 13C5 PFNA



18 Perfluorononanoic acid (ND)



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Client Sample ID: OF-FB37-0216 | Lab Sample ID: 320-17154-3

Matrix: Water | Lab File ID: 19FEB2016A6A_059.d

Analysis Method: WS-LC-0025 | Date Collected: 02/03/2016 17:20

Extraction Method: 3535 | Date Extracted: 02/09/2016 10:23

Sample wt/vol: 550.7(mL) | Date Analyzed: 02/20/2016 10:37

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 15(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 100906 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0018	U	0.0023	0.0018	0.00073
335-67-1	Perfluorooctanoic acid (PFOA)	0.0018	U	0.0023	0.0018	0.00068
375-95-1	Perfluorononanoic acid (PFNA)	0.0018	U	0.0023	0.0018	0.00059
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0018	U	0.0023	0.0018	0.00083
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.0018	U	0.0023	0.0018	0.00079
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0027	U	0.0036	0.0027	0.0012

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01892	13C4-PFHpA	107		25-150
STL00990	13C4 PFOA	111		25-150
STL00995	13C5 PFNA	113		25-150
STL00994	18O2 PFHxS	100		25-150
STL00991	13C4 PFOS	95		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_059.d
Lims ID: 320-17154-A-3-A Lab Sample ID: 320-17154-3
Client ID: OF-FB37-0216
Sample Type: Client
Inject. Date: 20-Feb-2016 10:37:44 ALS Bottle#: 12 Worklist Smp#: 57
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: 320-17154-A-3-A
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
Operator ID: JRB Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\PFAC_A6.m
Limit Group: LC PFC_DOD ICAL
Last Update: 22-Feb-2016 13:06:10 Calib Date: 19-Feb-2016 17:15:39
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_010.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK010

First Level Reviewer: barnettj Date: 22-Feb-2016 13:17:16

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 8 13C4-PFHpA										
367.0 > 322.0	9.300	9.322	-0.022		1644356	53.3		107	5755	
D 11 18O2 PFHxS										
403.0 > 84.0	9.335	9.358	-0.023		707917	47.3		100	2549	
41 Perfluorohexanesulfonic acid										
399.0 > 80.0	9.364	9.364	0.0	1.000	905	0.0895				
D 12 13C4 PFOA										
417.0 > 372.0	10.426	10.450	-0.024		1890597	55.4		111	7276	
D 16 13C4 PFOS										
503.0 > 80.0	11.392	11.414	-0.022		825359	45.4		95.0	4506	
D 17 13C5 PFNA										
468.0 > 423.0	11.408	11.434	-0.026		1597035	56.7		113	3808	

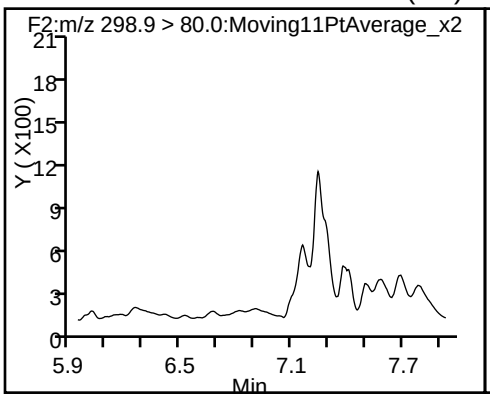
Report Date: 22-Feb-2016 13:17:19 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

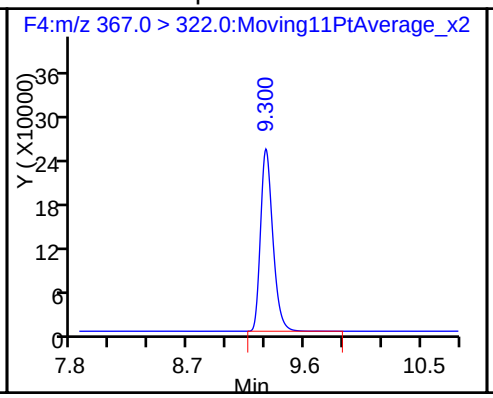
Data File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_059.d

Injection Date:	20-Feb-2016 10:37:44	Instrument ID:	A6		
Lims ID:	320-17154-A-3-A	Lab Sample ID:	320-17154-3		
Client ID:	OF-FB37-0216				
Operator ID:	JRB	ALS Bottle#:	12	Worklist Smp#:	57
Injection Vol:	15.0 ul	Dil. Factor:	1.0000		
Method:	PFAC_A6	Limit Group:	LC PFC_DOD ICAL		

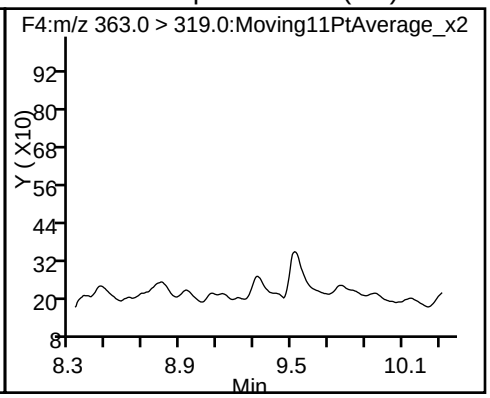
40 Perfluorobutanesulfonic acid (ND)



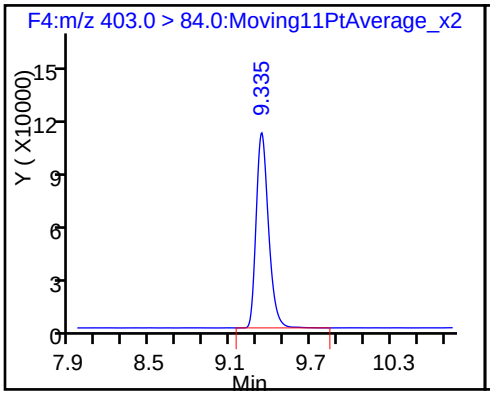
D 8 13C4-PFHpA



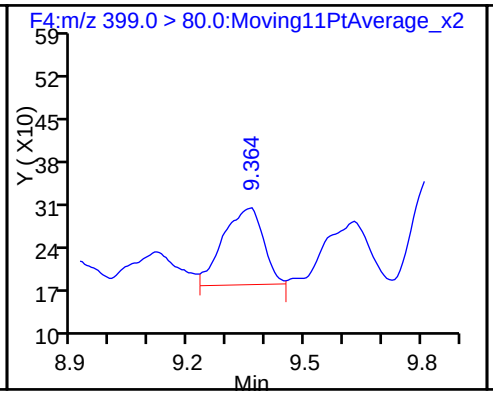
9 Perfluoroheptanoic acid (ND)



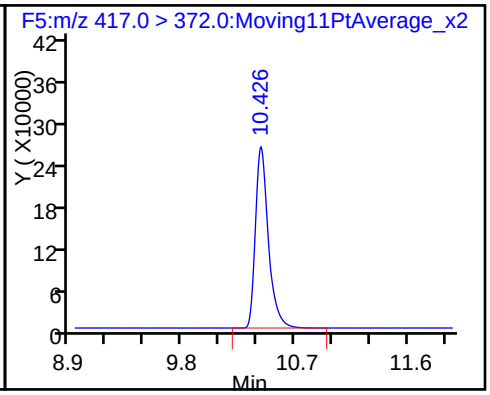
D 11 18O2 PFHxS



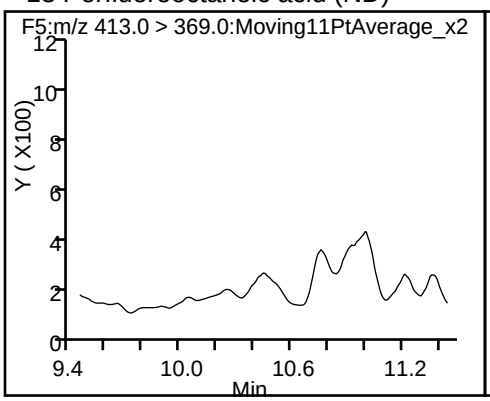
41 Perfluorohexanesulfonic acid



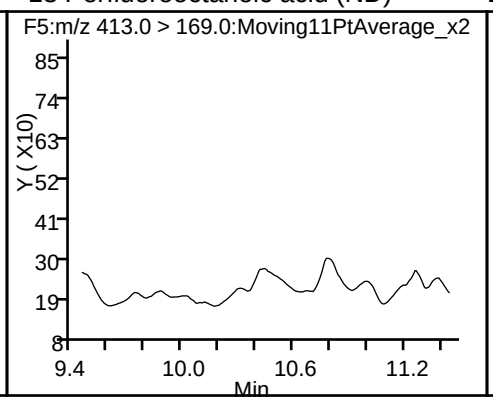
D 12 13C4 PFOA



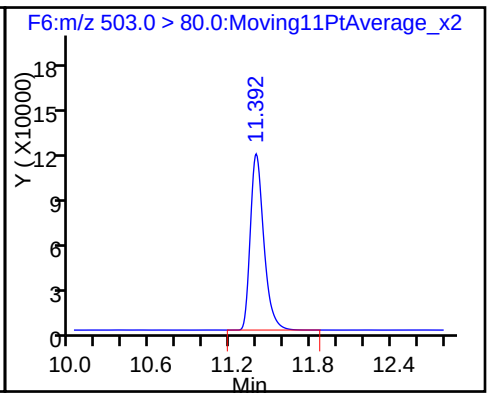
13 Perfluorooctanoic acid (ND)



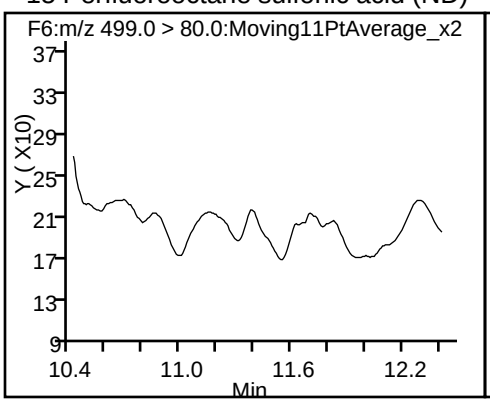
13 Perfluorooctanoic acid (ND)



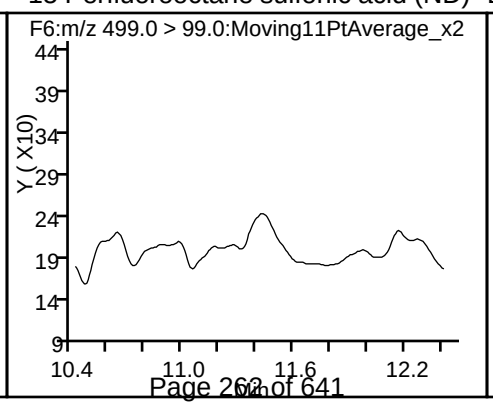
D 16 13C4 PFOS



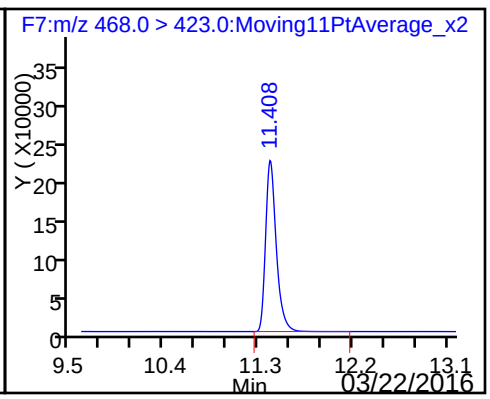
15 Perfluorooctane sulfonic acid (ND)



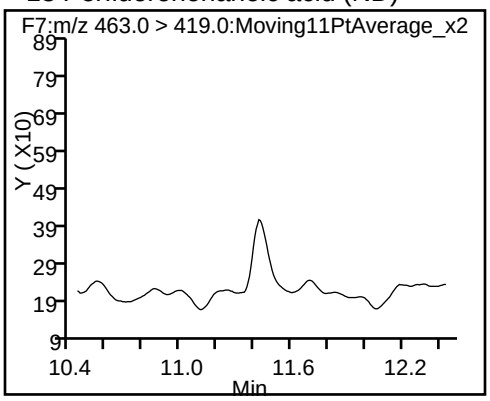
15 Perfluorooctane sulfonic acid (ND)



D 17 13C5 PFNA



18 Perfluorononanoic acid (ND)



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Client Sample ID: OF-FB11-0216 | Lab Sample ID: 320-17154-6

Matrix: Water | Lab File ID: 19FEB2016A6A_060.d

Analysis Method: WS-LC-0025 | Date Collected: 02/03/2016 16:10

Extraction Method: 3535 | Date Extracted: 02/09/2016 10:23

Sample wt/vol: 551.4(mL) | Date Analyzed: 02/20/2016 10:58

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 15(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 100906 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0018	U	0.0023	0.0018	0.00073
335-67-1	Perfluorooctanoic acid (PFOA)	0.0018	U	0.0023	0.0018	0.00068
375-95-1	Perfluorononanoic acid (PFNA)	0.0018	U	0.0023	0.0018	0.00059
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0018	U	0.0023	0.0018	0.00083
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.0018	U	0.0023	0.0018	0.00079
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0027	U	0.0036	0.0027	0.0012

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01892	13C4-PFHpA	111		25-150
STL00990	13C4 PFOA	113		25-150
STL00995	13C5 PFNA	116		25-150
STL00994	18O2 PFHxS	95		25-150
STL00991	13C4 PFOS	93		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_060.d
Lims ID: 320-17154-A-6-A Lab Sample ID: 320-17154-6
Client ID: OF-FB11-0216
Sample Type: Client
Inject. Date: 20-Feb-2016 10:58:58 ALS Bottle#: 13 Worklist Smp#: 58
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: 320-17154-A-6-A
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
Operator ID: JRB Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\PFAC_A6.m
Limit Group: LC PFC_DOD ICAL
Last Update: 22-Feb-2016 13:06:10 Calib Date: 19-Feb-2016 17:15:39
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_010.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK010

First Level Reviewer: barnettj Date: 22-Feb-2016 13:17:44

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	7.130	6.939	0.191	1.000	704	0.0499				
D 8 13C4-PFHpA										
367.0 > 322.0	9.299	9.322	-0.023		1708012	55.4		111	6858	
D 11 18O2 PFHxS										
403.0 > 84.0	9.334	9.358	-0.024		671948	44.9		94.9	2363	
41 Perfluorohexanesulfonic acid										
399.0 > 80.0	9.346	9.364	-0.018	1.000	1160	0.1209				
D 12 13C4 PFOA										
417.0 > 372.0	10.426	10.450	-0.024		1920771	56.3		113	8928	
D 16 13C4 PFOS										
503.0 > 80.0	11.391	11.414	-0.023		808180	44.4		93.0	2623	
D 17 13C5 PFNA										
468.0 > 423.0	11.414	11.434	-0.020		1630852	57.8		116	5881	

Report Date: 22-Feb-2016 13:17:46 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_060.d

Injection Date: 20-Feb-2016 10:58:58 Instrument ID: A6

Lims ID: 320-17154-A-6-A Lab Sample ID: 320-17154-6

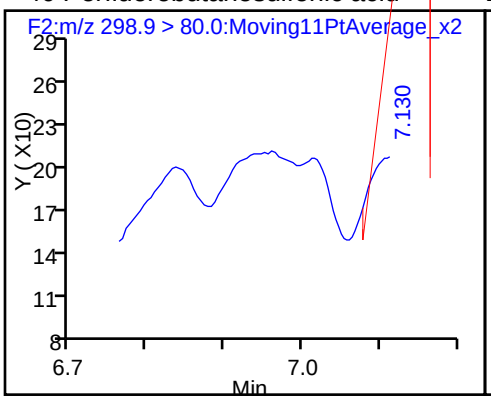
Client ID: OF-FB11-0216

Operator ID: JRB ALS Bottle#: 13 Worklist Smp#: 58

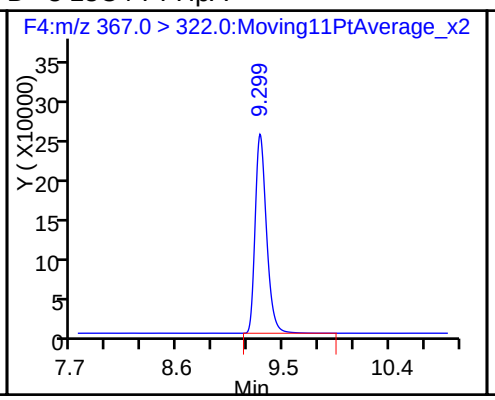
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

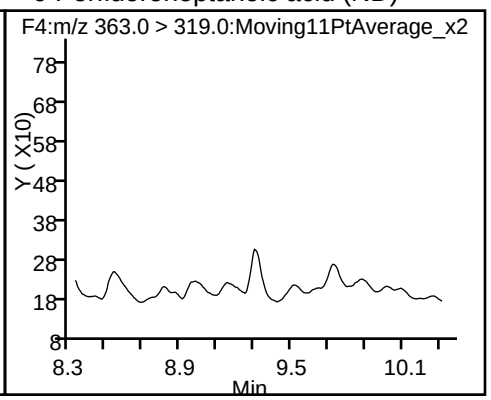
40 Perfluorobutanesulfonic acid



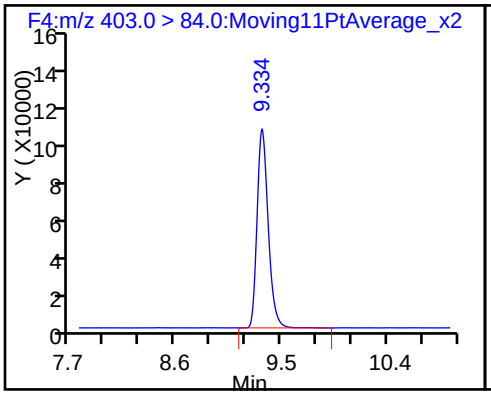
D 8 13C4-PFHpA



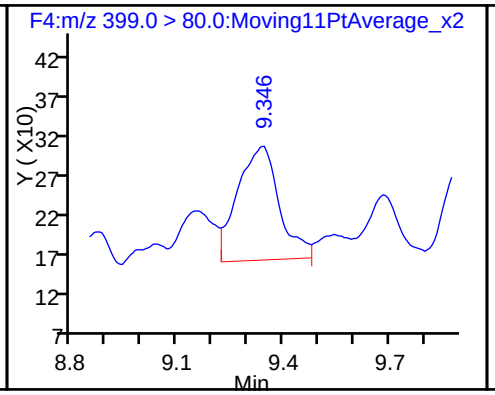
9 Perfluoroheptanoic acid (ND)



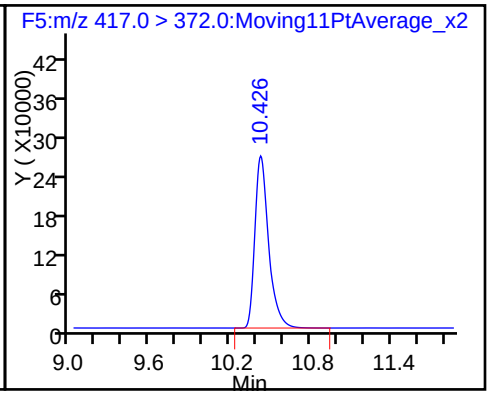
D 11 18O2 PFHxS



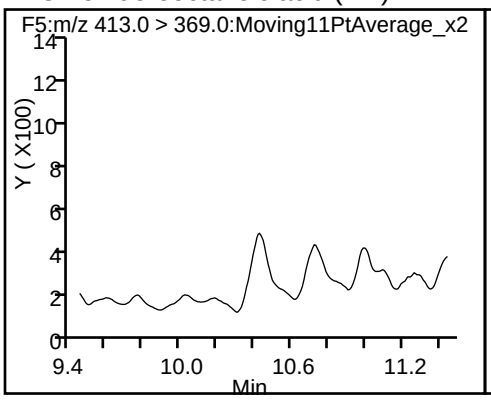
41 Perfluorohexanesulfonic acid



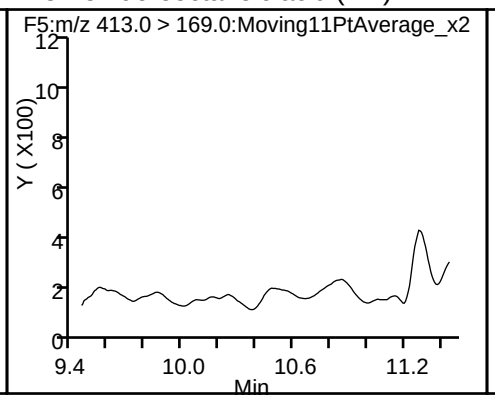
D 12 13C4 PFOA



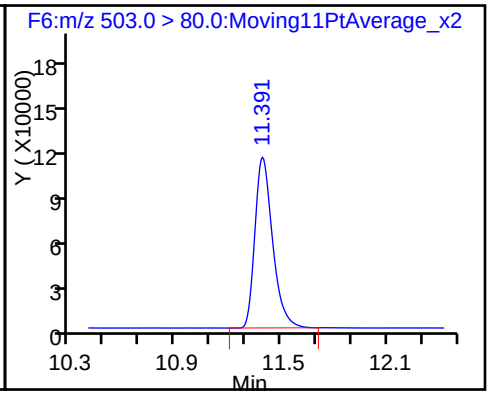
13 Perfluorooctanoic acid (ND)



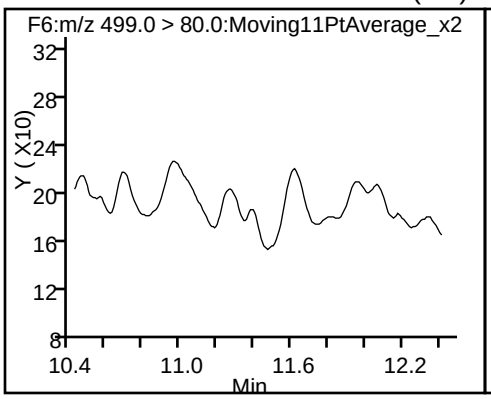
13 Perfluorooctanoic acid (ND)



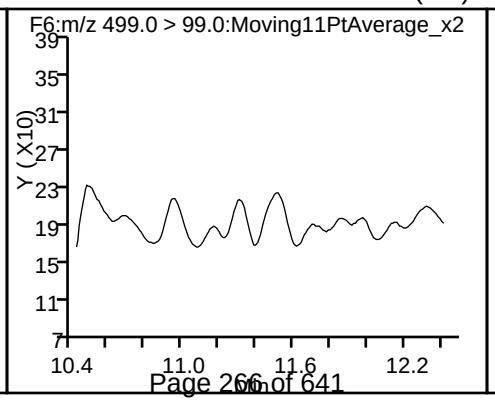
D 16 13C4 PFOS



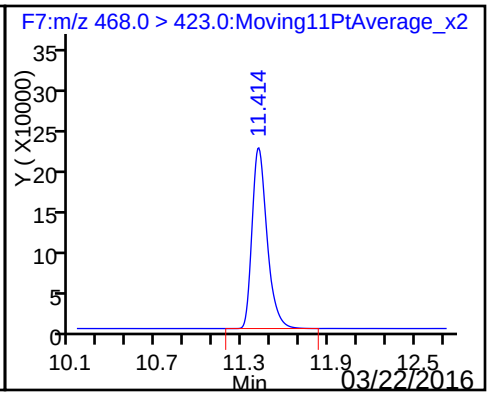
15 Perfluorooctane sulfonic acid (ND)



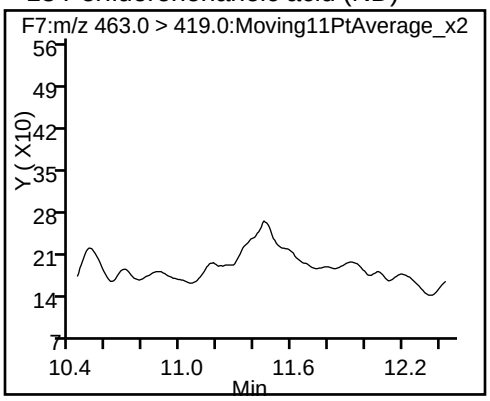
15 Perfluorooctane sulfonic acid (ND)



D 17 13C5 PFNA



18 Perfluorononanoic acid (ND)



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Client Sample ID: OF-FB28-0216 | Lab Sample ID: 320-17154-8

Matrix: Water | Lab File ID: 19FEB2016A6A_064.d

Analysis Method: WS-LC-0025 | Date Collected: 02/03/2016 17:43

Extraction Method: 3535 | Date Extracted: 02/10/2016 07:14

Sample wt/vol: 521.6(mL) | Date Analyzed: 02/20/2016 12:23

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 15(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 100906 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0019	U	0.0024	0.0019	0.00077
335-67-1	Perfluorooctanoic acid (PFOA)	0.0019	U	0.0024	0.0019	0.00072
375-95-1	Perfluorononanoic acid (PFNA)	0.0019	U	0.0024	0.0019	0.00063
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0019	U	0.0024	0.0019	0.00088
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.0019	U	0.0024	0.0019	0.00083
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0029	U	0.0038	0.0029	0.0012

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01892	13C4-PFHpA	124		25-150
STL00990	13C4 PFOA	132		25-150
STL00995	13C5 PFNA	137		25-150
STL00994	18O2 PFHxS	113		25-150
STL00991	13C4 PFOS	108		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_064.d
Lims ID: 320-17154-A-8-A Lab Sample ID: 320-17154-8
Client ID: OF-FB28-0216
Sample Type: Client
Inject. Date: 20-Feb-2016 12:23:54 ALS Bottle#: 17 Worklist Smp#: 62
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: 320-17154-A-8-A
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
Operator ID: JRB Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\PFAC_A6.m
Limit Group: LC PFC_DOD ICAL
Last Update: 22-Feb-2016 13:06:10 Calib Date: 19-Feb-2016 17:15:39
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_010.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK010

First Level Reviewer: barnettj Date: 22-Feb-2016 13:19:52

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	7.164	6.939	0.225	1.000	1108	0.0660				
D 8 13C4-PFHpA										
367.0 > 322.0	9.297	9.322	-0.025		1912777	62.1		124	6834	
D 11 18O2 PFHxS										
403.0 > 84.0	9.332	9.358	-0.026		799552	53.4		113	3404	
41 Perfluorohexanesulfonic acid										
399.0 > 80.0	9.315	9.364	-0.049	1.000	1461	0.1280				
D 12 13C4 PFOA										
417.0 > 372.0	10.428	10.450	-0.022		2253482	66.0		132	10985	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.428	10.450	-0.022	1.000	2011	0.0445			3.1	
D 16 13C4 PFOS										
503.0 > 80.0	11.393	11.414	-0.021		942004	51.8		108	3289	
D 17 13C5 PFNA										
468.0 > 423.0	11.408	11.434	-0.026		1937075	68.7		137	6887	

Report Date: 22-Feb-2016 13:19:53 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_064.d

Injection Date: 20-Feb-2016 12:23:54 Instrument ID: A6

Lims ID: 320-17154-A-8-A Lab Sample ID: 320-17154-8

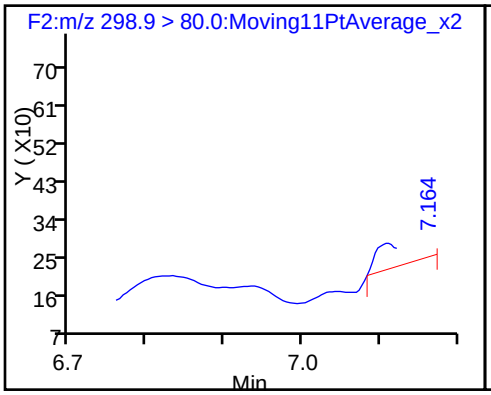
Client ID: OF-FB28-0216

Operator ID: JRB ALS Bottle#: 17 Worklist Smp#: 62

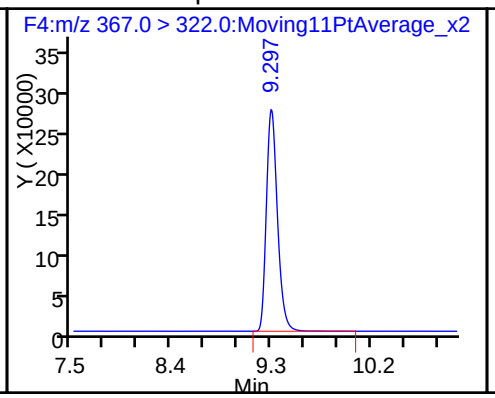
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

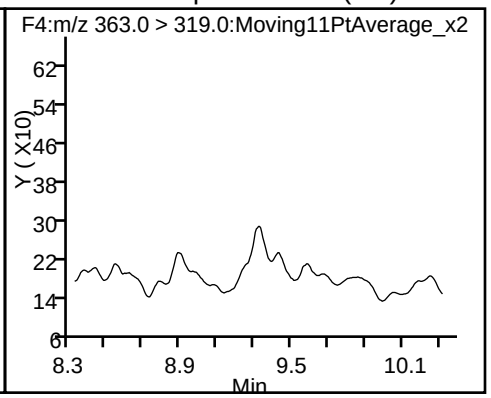
40 Perfluorobutanesulfonic acid



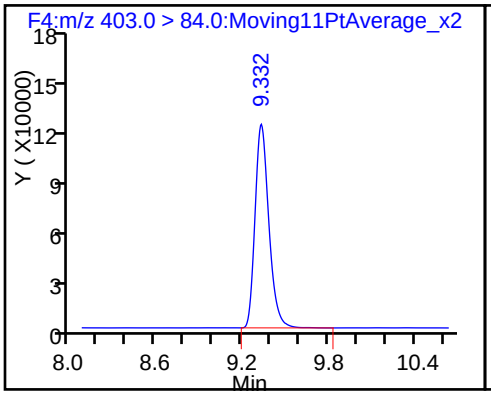
D 8 13C4-PFHpA



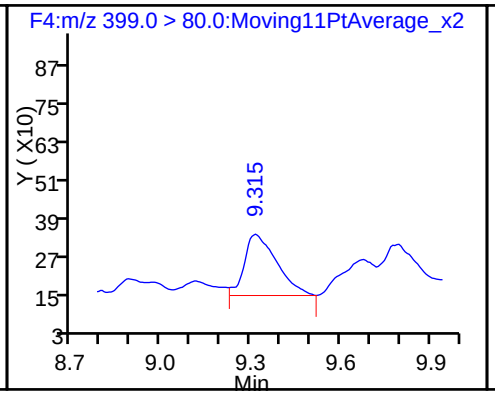
9 Perfluoroheptanoic acid (ND)



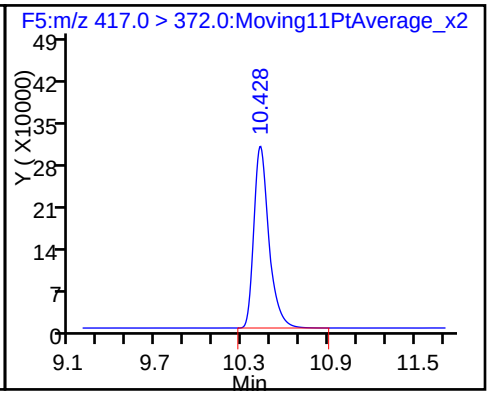
D 11 18O2 PFHxS



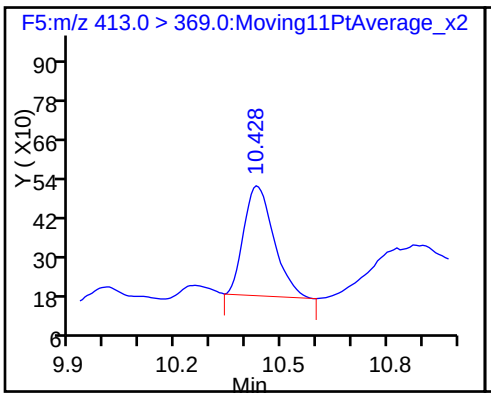
41 Perfluorohexanesulfonic acid



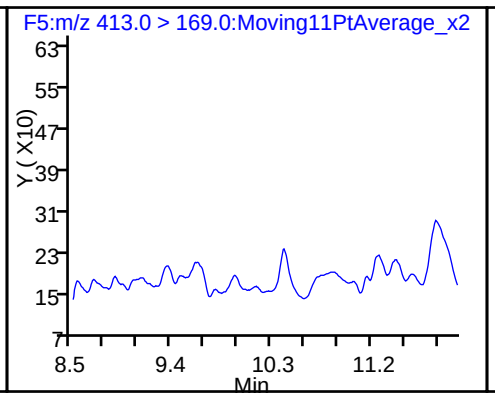
D 12 13C4 PFOA



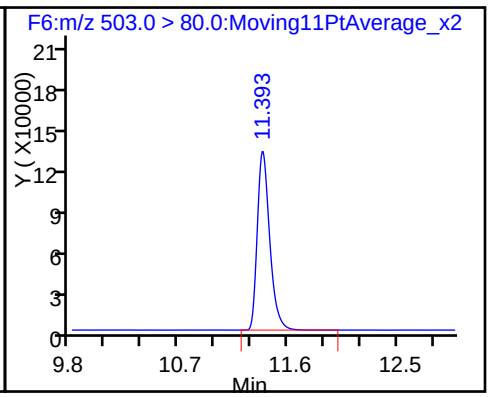
13 Perfluorooctanoic acid



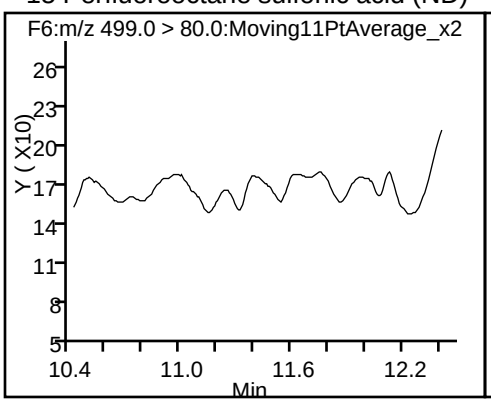
13 Perfluorooctanoic acid



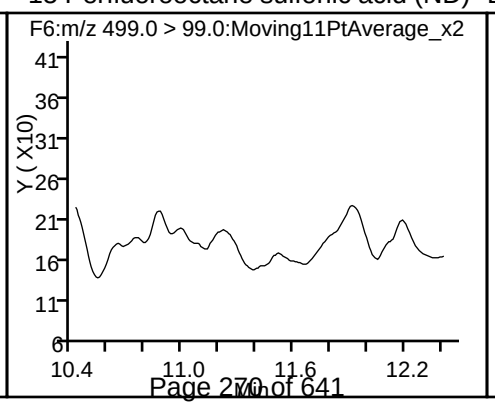
D 16 13C4 PFOS



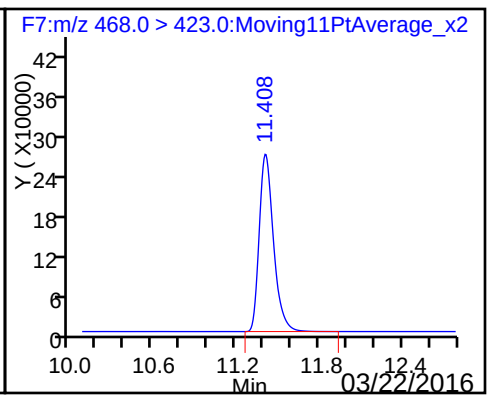
15 Perfluorooctane sulfonic acid (ND)



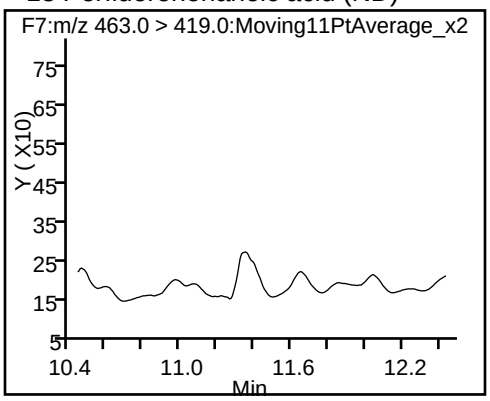
15 Perfluorooctane sulfonic acid (ND)



D 17 13C5 PFNA



18 Perfluorononanoic acid (ND)



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Client Sample ID: OF-FB67-0216 | Lab Sample ID: 320-17154-10

Matrix: Water | Lab File ID: 19FEB2016A6A_065.d

Analysis Method: WS-LC-0025 | Date Collected: 02/03/2016 18:21

Extraction Method: 3535 | Date Extracted: 02/10/2016 07:14

Sample wt/vol: 535.9(mL) | Date Analyzed: 02/20/2016 12:45

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 15(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 100906 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0019	U	0.0023	0.0019	0.00075
335-67-1	Perfluorooctanoic acid (PFOA)	0.0019	U	0.0023	0.0019	0.00070
375-95-1	Perfluorononanoic acid (PFNA)	0.0019	U	0.0023	0.0019	0.00061
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0019	U	0.0023	0.0019	0.00086
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.0019	U	0.0023	0.0019	0.00081
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0028	U	0.0037	0.0028	0.0012

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01892	13C4-PFHpA	126		25-150
STL00990	13C4 PFOA	131		25-150
STL00995	13C5 PFNA	130		25-150
STL00994	18O2 PFHxS	113		25-150
STL00991	13C4 PFOS	112		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_065.d
Lims ID: 320-17154-A-10-A Lab Sample ID: 320-17154-10
Client ID: OF-FB67-0216
Sample Type: Client
Inject. Date: 20-Feb-2016 12:45:07 ALS Bottle#: 18 Worklist Smp#: 63
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: 320-17154-A-10-A
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
Operator ID: JRB Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\PFAC_A6.m
Limit Group: LC PFC_DOD ICAL
Last Update: 22-Feb-2016 13:06:10 Calib Date: 19-Feb-2016 17:15:39
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_010.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK010

First Level Reviewer: barnettj Date: 22-Feb-2016 13:21:03

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	7.167	6.939	0.228	1.000	3013	0.1791				
D 8 13C4-PFHpA										
367.0 > 322.0	9.299	9.322	-0.023		1943094	63.0		126	7526	
D 11 18O2 PFHxS										
403.0 > 84.0	9.334	9.358	-0.024		801416	53.5		113	4035	
41 Perfluorohexanesulfonic acid										
399.0 > 80.0	9.387	9.364	0.023	1.000	1955	0.1709				
D 12 13C4 PFOA										
417.0 > 372.0	10.426	10.450	-0.024		2233440	65.4		131	8349	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.426	10.450	-0.024	1.000	2584	0.0576			4.0	
D 16 13C4 PFOS										
503.0 > 80.0	11.392	11.414	-0.022		977166	53.7		112	3816	
D 17 13C5 PFNA										
468.0 > 423.0	11.415	11.434	-0.019		1830448	64.9		130	10168	

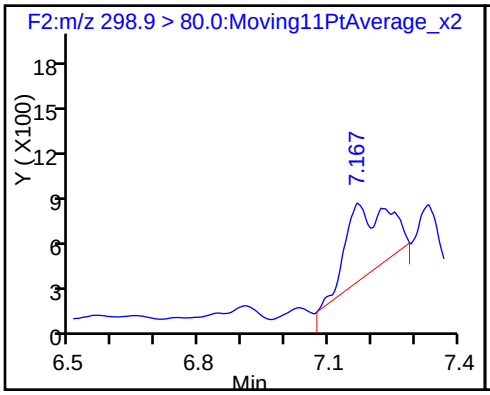
Report Date: 22-Feb-2016 13:21:04 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

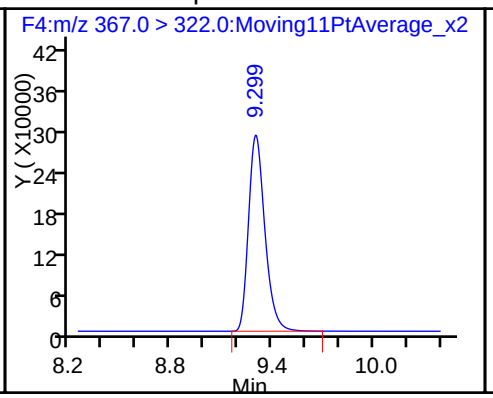
Data File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_065.d

Injection Date:	20-Feb-2016 12:45:07	Instrument ID:	A6		
Lims ID:	320-17154-A-10-A	Lab Sample ID:	320-17154-10		
Client ID:	OF-FB67-0216				
Operator ID:	JRB	ALS Bottle#:	18	Worklist Smp#:	63
Injection Vol:	15.0 ul	Dil. Factor:	1.0000		
Method:	PFAC_A6	Limit Group:	LC PFC_DOD ICAL		

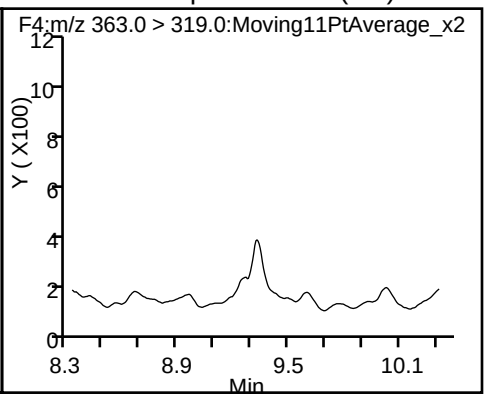
40 Perfluorobutanesulfonic acid



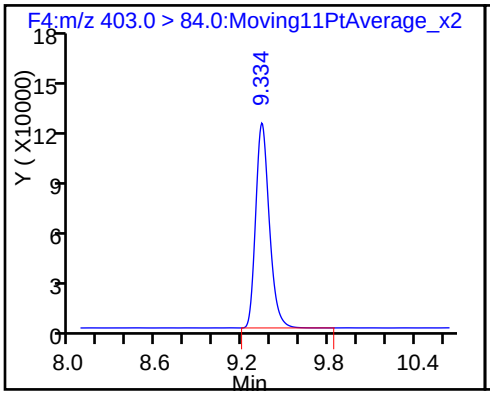
D 8 13C4-PFHpA



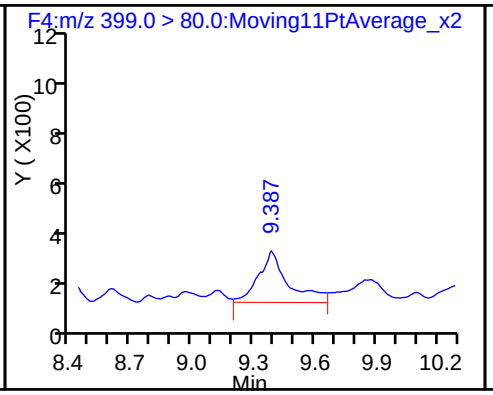
9 Perfluoroheptanoic acid (ND)



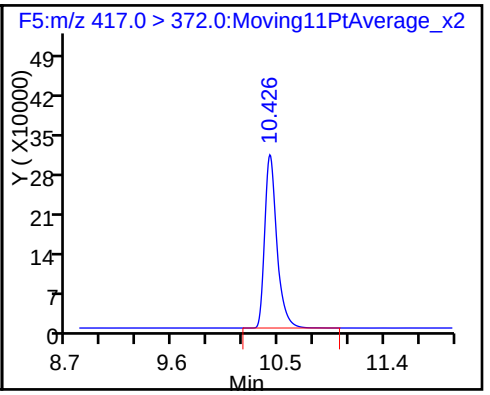
D 11 18O2 PFHxS



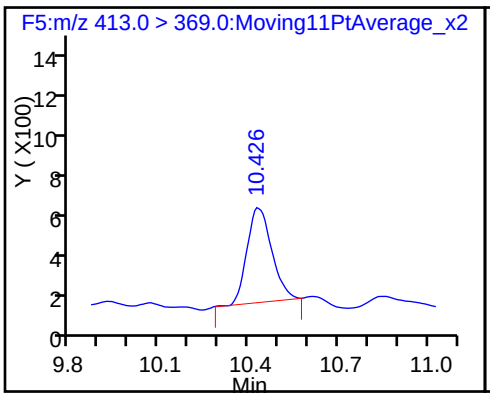
41 Perfluorohexanesulfonic acid



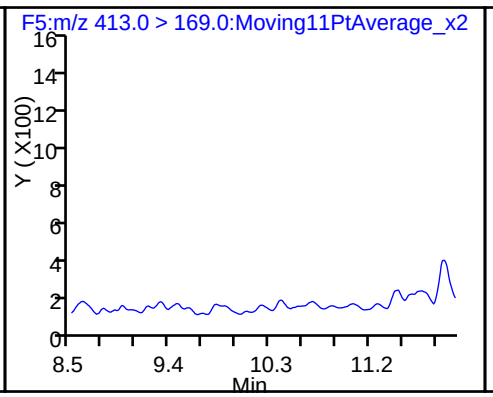
D 12 13C4 PFOA



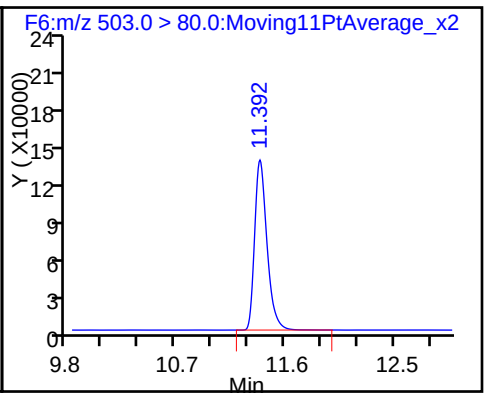
13 Perfluorooctanoic acid



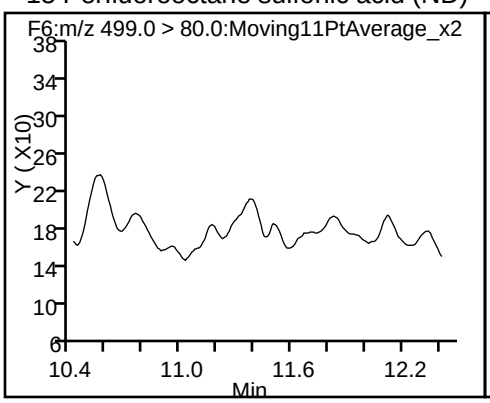
13 Perfluorooctanoic acid



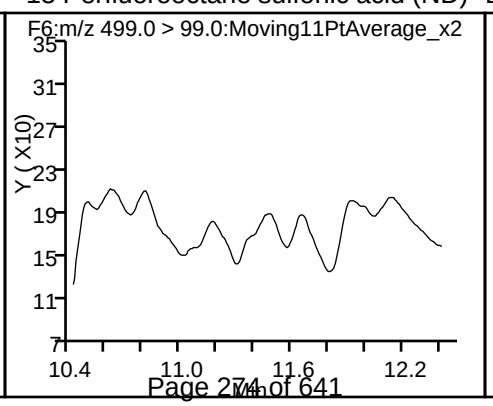
D 16 13C4 PFOS



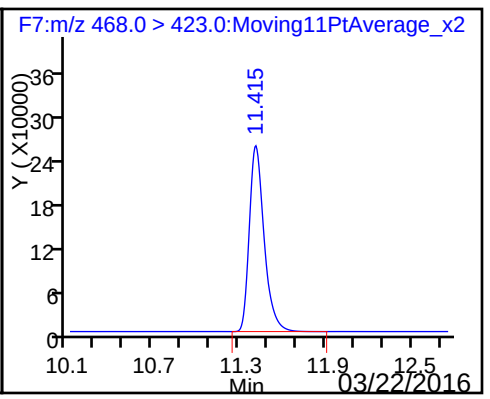
15 Perfluorooctane sulfonic acid (ND)



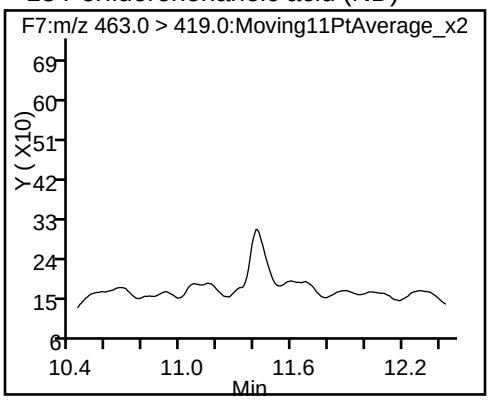
15 Perfluorooctane sulfonic acid (ND)



D 17 13C5 PFNA



18 Perfluorononanoic acid (ND)



FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1 Analy Batch No.: 100305

SDG No.: CTO WE7G PFC Sampling

Instrument ID: A4 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 02/12/2016 10:35 Calibration End Date: 02/12/2016 12:42 Calibration ID: 18968

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-100305/2	12FEB2016A4A_003.d
Level 2	STD 320-100305/3	12FEB2016A4A_004.d
Level 3	STD 320-100305/4	12FEB2016A4A_005.d
Level 4	STD 320-100305/5	12FEB2016A4A_006.d
Level 5	STD 320-100305/6	12FEB2016A4A_007.d
Level 6	STD 320-100305/7	12FEB2016A4A_008.d
Level 7	STD 320-100305/8	12FEB2016A4A_009.d

ANALYTE	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7				RT WINDOW	AVG RT
Perfluorobutanoic acid (PFBA)	5.653	5.692	5.655	5.753	5.735	5.750	5.747				5.403 - 5.903	5.712
Perfluoropentanoic acid (PFPeA)	6.907	6.943	6.897	7.058	7.015	7.043	7.039				6.657 - 7.157	6.986
Perfluorobutanesulfonic acid (PFBS)	+++++	7.074	7.025	7.190	7.144	7.179	7.171				6.769 - 7.269	7.131
Perfluorohexanoic acid (PFHxA)	8.291	8.317	8.327	8.432	8.393	8.409	8.414				8.041 - 8.541	8.369
Perfluoroheptanoic acid (PFHpA)	+++++	9.567	9.630	9.692	9.663	9.665	9.672				9.337 - 9.837	9.648
Perfluorohexanesulfonic acid (PFHxS)	+++++	9.595	9.665	9.720	9.698	9.707	9.714				9.379 - 9.879	9.683
Perfluorooctanoic acid (PFOA)	10.715	10.670	10.753	10.770	10.760	10.762	10.771				10.465 - 10.965	10.743
Perfluoroheptanesulfonic Acid (PFHpS)	+++++	10.661	10.753	10.770	10.760	10.762	10.771				10.455 - 10.955	10.746
Perfluorooctanesulfonic acid (PFOS)	+++++	11.578	11.678	11.677	11.676	11.670	11.678				11.385 - 11.885	11.660
Perfluorononanoic acid (PFNA)	11.652	11.604	11.704	11.703	11.694	11.696	11.704				11.402 - 11.902	11.680
Perfluorodecanoic acid (PFDA)	12.445	12.404	12.508	12.496	12.493	12.487	12.498				12.195 - 12.695	12.476
Perfluorooctane Sulfonamide (FOSA)	12.963	12.912	13.021	13.013	13.010	13.004	13.012				12.713 - 13.213	12.991
Perfluorodecane Sulfonic acid	+++++	13.040	13.128	13.111	13.116	13.102	+++++				12.826 - 13.326	13.099
Perfluoroundecanoic acid (PFUnA)	+++++	13.075	13.181	13.163	13.169	13.154	13.163				12.870 - 13.370	13.151
Perfluorododecanoic acid (PFDoA)	13.694	13.655	13.749	13.730	13.727	13.721	13.728				13.444 - 13.944	13.715
Perfluorotridecanoic Acid (PFTriA)	14.174	14.135	14.220	14.205	14.210	14.197	14.211				13.924 - 14.424	14.193
Perfluorotetradecanoic acid (PFTeA)	+++++	14.555	14.635	14.615	14.613	14.609	14.614				14.339 - 14.839	14.607
Perfluoro-n-hexadecanoic acid (PFHxDA)	+++++	15.103	15.159	15.144	15.146	15.144	15.143				14.884 - 15.384	15.140
Perfluoro-n-octandecanoic acid (PFODA)	+++++	15.414	15.461	15.446	15.448	15.441	15.444				15.191 - 15.691	15.442
13C4 PFBA	5.650	5.695	5.652	5.757	5.735	5.747	5.744				5.400 - 5.900	5.711
13C5-PFPeA	6.893	6.953	6.902	7.058	7.018	7.043	7.039				6.643 - 7.143	6.987
13C2 PFHxA	8.285	8.311	8.327	8.432	8.393	8.409	8.414				8.035 - 8.535	8.367
13C4-PFHpA	9.587	9.567	9.630	9.685	9.663	9.665	9.672				9.337 - 9.837	9.638
18O2 PFHxS	9.629	9.595	9.665	9.720	9.698	9.707	9.714				9.379 - 9.879	9.675
13C4 PFOA	10.705	10.661	10.762	10.779	10.760	10.762	10.771				10.455 - 10.955	10.743
13C4 PFOS	11.626	11.578	11.678	11.677	11.668	11.661	11.670				11.376 - 11.876	11.651
13C5 PFNA	11.652	11.604	11.704	11.703	11.694	11.687	11.704				11.402 - 11.902	11.678
13C2 PFDA	12.445	12.394	12.508	12.486	12.493	12.487	12.498				12.195 - 12.695	12.473
13C8 FOSA	12.963	12.912	13.021	13.013	13.010	13.004	13.012				12.713 - 13.213	12.991
13C2 PFUnA	13.120	13.075	13.181	13.163	13.169	13.154	13.163				12.870 - 13.370	13.146
13C2 PFDoA	13.694	13.655	13.739	13.730	13.727	13.721	13.728				13.444 - 13.944	13.713
13C2-PFTeDA	14.589	14.549	14.635	14.615	14.613	14.609	14.614				14.339 - 14.839	14.603
13C2-PFHxDA	15.134	15.103	15.159	15.144	15.146	15.139	15.143				14.884 - 15.384	15.138

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1 Analy Batch No.: 100305

SDG No.: CTO WE7G PFC Sampling

Instrument ID: A4 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 02/12/2016 10:35 Calibration End Date: 02/12/2016 12:42 Calibration ID: 18968

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-100305/2	12FEB2016A4A_003.d
Level 2	STD 320-100305/3	12FEB2016A4A_004.d
Level 3	STD 320-100305/4	12FEB2016A4A_005.d
Level 4	STD 320-100305/5	12FEB2016A4A_006.d
Level 5	STD 320-100305/6	12FEB2016A4A_007.d
Level 6	STD 320-100305/7	12FEB2016A4A_008.d
Level 7	STD 320-100305/8	12FEB2016A4A_009.d

ANALYTE	CF				CURVE TYPE	COEFFICIENT			#	MIN CF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 5	LVL 2 LVL 6	LVL 3 LVL 7	LVL 4		B	M1	M2								
13C4 PFBA	43724 41504	46913 34216	43598 29068	45047	Ave		40581.3800				16.0		50.0			
13C5-PFPeA	34451 34059	36054 25700	36127 21962	35638	Ave		31998.7971				17.9		50.0			
13C2 PFHxA	42875 39681	45781 30298	44064 25927	45494	Ave		39160.1943				20.2		50.0			
13C4-PFHpA	45778 38237	47959 29360	43311 25753	42221	Ave		38945.7029				21.6		50.0			
18O2 PFHxS	23364 23478	27260 19068	26027 14366	25183	Ave		22677.9734				19.9		50.0			
13C4 PFOA	50863 41293	54619 29554	51061 24910	45734	Ave		42576.1771				26.8		50.0			
13C4 PFOS	6706.5 14179	9113.2 10098	10718 7313.8	12758	Ave		10126.7065				26.8		50.0			
13C5 PFNA	49362 39695	50456 33048	47231 27979	43449	Ave		41602.7543				20.5		50.0			
13C2 PFDA	71267 52112	78190 41272	71755 34061	62533	Ave		58741.3229				28.5		50.0			
13C8 FOSA	83903 96232	95349 77442	103205 64546	104593	Ave		89324.3886				16.4		50.0			
13C2 PFUnA	66421 51422	75174 41670	75316 36091	63423	Ave		58502.3943				26.9		50.0			
13C2 PFDoA	77834 69585	85784 59877	82255 48230	74292	Ave		71122.3257				18.6		50.0			
13C2-PFTeDA	60474 65785	71408 55680	71741 46948	71576	Ave		63373.0086				15.0		50.0			
13C2-PFHxDA	18269 36603	26650 30116	31998 27510	36475	Ave		29660.1057				21.5		50.0			

Note: The m1 coefficient is the same as Ave CF for an Ave curve type.

FORM VI

CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1 Analy Batch No.: 100305

SDG No.: CTO WE7G PFC Sampling

Instrument ID: A4 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 02/12/2016 10:35 Calibration End Date: 02/12/2016 12:42 Calibration ID: 18968

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)	21468 17932	17082 14917	23371	22403	20967	AveID		0.4901				11.8		35.0			
Perfluoropentanoic acid (PFPeA)	14714 12496	15934 10441	18319	17191	16202	AveID		0.4708				5.8		35.0			
Perfluorobutanesulfonic acid (PFBS)	+++++ 12952	293560 9193.1	68810	28987	21233	L1ID	9.0196	0.6255							0.9990		0.9900
Perfluorohexanoic acid (PFHxA)	18078 14787	16971 11751	17710	19721	17723	AveID		0.4308				8.8		35.0			
Perfluoroheptanoic acid (PFHpA)	+++++ 15469	27094 12225	21661	21923	18594	AveID		0.5120				6.3		35.0			
Perfluorohexanesulfonic acid (PFHxS)	+++++ 20390	40225 16108	33916	28150	25209	L2ID	0.3646	1.1114							0.9970		0.9900
Perfluorooctanoic acid (PFOA)	25262 15958	27408 11088	26323	21407	19390	AveID		0.4910				6.6		35.0			
Perfluoroheptanesulfonic Acid (PFHpS)	+++++ 20276	29776 15686	35251	33157	27743	AveID		2.5441				24.1		50.0			
Perfluorooctanesulfonic acid (PFOS)	+++++ 35089	48115 28814	56672	52312	49745	AveID		4.2651				19.3		35.0			
Perfluorononanoic acid (PFNA)	50318 34992	35930 29202	46019	49227	41117	L1ID	-0.115	1.0504							1.0000		0.9900
Perfluorodecanoic acid (PFDA)	70648 39007	63644 30089	65736	56732	49103	AveID		0.9142				6.1		35.0			
Perfluorooctane Sulfonamide (FOSA)	76012 79257	77919 63244	99217	99139	94248	AveID		0.9450				7.1		35.0			
Perfluorodecane Sulfonic acid	+++++ 15557	20133 +++++	26070	24253	21983	AveID		1.9267				20.5		50.0			
Perfluoroundecanoic acid (PFUnA)	+++++ 44481	76032 36825	77350	65907	54388	AveID		1.0372				2.1		35.0			
Perfluorododecanoic acid (PFDoA)	60746 50354	55500 40018	69542	62698	59128	AveID		0.8053				9.2		35.0			
Perfluorotridecanoic Acid (PFTriA)	67684 44810	64724 37595	75645	70540	57551	L2ID	0.0026	0.8342							0.9890	*	0.9900
Perfluorotetradecanoic acid (PFTeA)	+++++ 22265	40494 19239	30339	28687	26823	L2ID	0.0885	0.3784							0.9980		0.9900
Perfluoro-n-hexadecanoic acid (PFHxDA)	+++++ 61764	118084 53490	85190	80025	72186	L1ID	0.1544	1.0783							0.9990		0.9900
Perfluoro-n-octandecanoic acid (PFODA)	+++++ 57356	51667 50328	68278	73440	66807	L1ID	-0.544	1.0130							0.9980		0.9900

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1 Analy Batch No.: 100305

SDG No.: CTO WE7G PFC Sampling

Instrument ID: A4 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 02/12/2016 10:35 Calibration End Date: 02/12/2016 12:42 Calibration ID: 18968

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-100305/2	12FEB2016A4A_003.d
Level 2	STD 320-100305/3	12FEB2016A4A_004.d
Level 3	STD 320-100305/4	12FEB2016A4A_005.d
Level 4	STD 320-100305/5	12FEB2016A4A_006.d
Level 5	STD 320-100305/6	12FEB2016A4A_007.d
Level 6	STD 320-100305/7	12FEB2016A4A_008.d
Level 7	STD 320-100305/8	12FEB2016A4A_009.d

ANALYTE	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
13C4 PFBA	Ave	2186199 1710809	2345669 1453408	2179878	2252325	2075195	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C5-PFPeA	Ave	1722572 1285003	1802713 1098104	1806356	1781896	1702935	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C2 PFHxA	Ave	2143754 1514915	2289067 1296336	2203221	2274718	1984057	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C4-PFHpA	Ave	2288897 1467997	2397972 1287645	2165567	2111070	1911848	50.0 50.0	50.0 50.0	50.0	50.0	50.0
18O2 PFHxS	Ave	1105120 901928	1289379 679535	1231093	1191134	1110488	47.3 47.3	47.3 47.3	47.3	47.3	47.3
13C4 PFOA	Ave	2543127 1477697	2730942 1245478	2553061	2286718	2064639	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C4 PFOS	Ave	320573 482668	435612 349599	512338	609839	677767	47.8 47.8	47.8 47.8	47.8	47.8	47.8
13C5 PFNA	Ave	2468093 1652409	2522779 1398930	2361526	2172455	1984772	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C2 PFDA	Ave	3563348 2063584	3909475 1703065	3587771	3126636	2605584	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C8 FOSA	Ave	4195173 3872124	4767443 3227314	5160232	5229659	4811591	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C2 PFUnA	Ave	3321059 2083502	3758689 1804563	3765798	3171146	2571081	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C2 PFDoA	Ave	3891686 2993831	4289188 2411510	4112735	3714597	3479267	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C2-PFTeDA	Ave	3023681 2783983	3570399 2347410	3587033	3578785	3289262	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C2-PFHxDA	Ave	913455 1505780	1332475 1375507	1599911	1823759	1830150	50.0 50.0	50.0 50.0	50.0	50.0	50.0

Curve Type Legend:
Ave = Average

RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1 Analy Batch No.: 100305

SDG No.: CTO WE7G PFC Sampling

Instrument ID: A4 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 02/12/2016 10:35 Calibration End Date: 02/12/2016 12:42 Calibration ID: 18968

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-100305/2	12FEB2016A4A_003.d
Level 2	STD 320-100305/3	12FEB2016A4A_004.d
Level 3	STD 320-100305/4	12FEB2016A4A_005.d
Level 4	STD 320-100305/5	12FEB2016A4A_006.d
Level 5	STD 320-100305/6	12FEB2016A4A_007.d
Level 6	STD 320-100305/7	12FEB2016A4A_008.d
Level 7	STD 320-100305/8	12FEB2016A4A_009.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	10734 3586362	17082 5966668	116853	448061	1048362	0.500 200	1.00 400	5.00	20.0	50.0
Perfluoropentanoic acid (PFPeA)		AveID	7357 2499117	15934 4176286	91597	343823	810081	0.500 200	1.00 400	5.00	20.0	50.0
Perfluorobutanesulfonic acid (PFBS)		L1ID	+++++ 2289993	259507 3250684	304142	512492	938494	+++++ 177	0.884 354	4.42	17.7	44.2
Perfluorohexanoic acid (PFHxA)		AveID	9039 2957321	16971 4700473	88552	394416	886159	0.500 200	1.00 400	5.00	20.0	50.0
Perfluoroheptanoic acid (PFHpA)		AveID	+++++ 3093796	27094 4889892	108307	438459	929700	+++++ 200	1.00 400	5.00	20.0	50.0
Perfluorohexanesulfonic acid (PFHxS)		L2ID	+++++ 3857794	38053 6095086	160421	532601	1192387	+++++ 189	0.946 378	4.73	18.9	47.3
Perfluorooctanoic acid (PFOA)		AveID	12631 3191541	27408 4435164	131613	428131	969508	0.500 200	1.00 400	5.00	20.0	50.0
Perfluoroheptanesulfonic Acid (PFHpS)		AveID	+++++ 3860458	28347 5973185	167796	631312	1320551	+++++ 190	0.952 381	4.76	19.0	47.6
Perfluorooctanesulfonic acid (PFOS)		AveID	+++++ 6709046	45998 11018460	270891	1000210	2377814	+++++ 191	0.956 382	4.78	19.1	47.8
Perfluorononanoic acid (PFNA)		L1ID	25159 6998423	35930 11680686	230097	984533	2055860	0.500 200	1.00 400	5.00	20.0	50.0
Perfluorodecanoic acid (PFDA)		AveID	35324 7801447	63644 12035423	328682	1134637	2455156	0.500 200	1.00 400	5.00	20.0	50.0
Perfluorooctane Sulfonamide (FOSA)		AveID	38006 15851344	77919 25297572	496084	1982787	4712375	0.500 200	1.00 400	5.00	20.0	50.0
Perfluorodecane Sulfonic acid		AveID	+++++ 2999356	19408 +++++	125658	467598	1059583	+++++ 193	0.964 +++++	4.82	19.3	48.2
Perfluoroundecanoic acid (PFUnA)		AveID	+++++ 8896158	76032 14730079	386752	1318141	2719401	+++++ 200	1.00 400	5.00	20.0	50.0
Perfluorododecanoic acid (PFDoA)		AveID	30373 10070858	55500 16007183	347709	1253957	2956390	0.500 200	1.00 400	5.00	20.0	50.0

RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1 Analy Batch No.: 100305

SDG No.: CTO WE7G PFC Sampling

Instrument ID: A4 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 02/12/2016 10:35 Calibration End Date: 02/12/2016 12:42 Calibration ID: 18968

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
Perfluorotridecanoic Acid (PFTriA)		L2ID	33842 8962091	64724 15038082	378224	1410790	2877547	0.500 200	1.00 400	5.00	20.0	50.0
Perfluorotetradecanoic acid (PFTeA)		L2ID	+++++ 4452926	40494 7695775	151695	573742	1341162	+++++ 200	1.00 400	5.00	20.0	50.0
Perfluoro-n-hexadecanoic acid (PFHxDA)		L1ID	+++++ 12352725	118084 21395824	425951	1600494	3609294	+++++ 200	1.00 400	5.00	20.0	50.0
Perfluoro-n-octandecanoic acid (PFODA)		L1ID	+++++ 11471145	51667 20131167	341392	1468803	3340365	+++++ 200	1.00 400	5.00	20.0	50.0

Curve Type Legend:

AveID = Average isotope dilution
L1ID = Linear 1/conc IsoDil
L2ID = Linear 1/conc^2 IsoDil

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160212-28353.b\12FEB2016A4A_003.d
Lims ID: Std L1
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 12-Feb-2016 10:35:33 ALS Bottle#: 2 Worklist Smp#: 2
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: STD L1
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4
Sublist: chrom-PFAC_A4*sub12

Method: \\ChromNA\Sacramento\ChromData\A4\20160212-28353.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 15-Feb-2016 10:02:02 Calib Date: 12-Feb-2016 12:42:35
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160212-28353.b\12FEB2016A4A_009.d

Column 1 : Det: F1:MRM
Process Host: XAWRK007

First Level Reviewer: barnettj Date: 12-Feb-2016 14:29:46

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
216.7 > 171.5	5.650	5.650	0.0		2186199	53.9		108	6396	
2 Perfluorobutyric acid										
212.7 > 168.6	5.653	5.653	0.0	1.000	10734	0.5009		100	50.1	
D 3 13C5-PFPeA										
267.6 > 222.7	6.893	6.893	0.0		1722572	53.8		108	2771	
4 Perfluoropentanoic acid										
262.9 > 218.7	6.907	6.907	0.0	1.000	7357	0.4536		90.7	7.2	
5 Perfluorobutane Sulfonate										
298.8 > 79.6	7.019	7.019	0.0	1.000	222434	NC			147	
298.8 > 98.6	7.016	7.019	-0.003	1.000	135664		1.64(0.00-0.00)		111	
51 Perfluorobutanesulfonic acid										
298.8 > 79.6	7.019	7.019	0.0	1.000	222434	0.8005		181		
D 6 13C2 PFHxA										
314.6 > 269.7	8.285	8.285	0.0		2143754	54.7		109	7491	
7 Perfluorohexanoic acid										
312.9 > 268.7	8.291	8.291	0.0	1.000	9039	0.4894		97.9	41.0	
D 8 13C4-PFHpA										
366.6 > 321.6	9.587	9.587	0.0		2288897	58.8		118	5094	
9 Perfluoroheptanoic acid										
362.8 > 318.7	9.587	9.587	0.0	1.000	22979	0.9804		196	70.4	
58 Perfluorohexanesulfonic acid										
398.3 > 79.2	9.629	9.629	0.0	1.000	23477	0.5761		122		
10 Perfluorohexane Sulfonate										
398.3 > 79.2	9.629	9.629	0.0	1.000	23477	NC			99.2	
D 11 18O2 PFHxS										
402.5 > 83.6	9.629	9.629	0.0		1105120	48.7		103	2974	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
39 Perfluoroheptanesulfonic Acid										
448.3 > 79.2	10.705	10.705	0.0	1.000	17930	1.05		221		
14 Perfluoroheptane Sulfonate										
448.3 > 79.2	10.705	10.705	0.0	1.000	17930	NC			110	
D 12 13C4 PFOA										
416.5 > 371.6	10.705	10.705	0.0		2543127	59.7		119	4035	
13 Perfluorooctanoic acid										
412.8 > 368.8	10.715	10.715	0.0	1.000	12631	0.5058		101	36.0	
D 16 13C4 PFOS										
502.4 > 79.7	11.626	11.626	0.0		320573	31.7		66.2	1287	
15 Perfluorooctane sulfonic acid										
498.3 > 79.2	11.635	11.635	0.0	1.000	32518	1.14		238	55.9	
D 17 13C5 PFNA										
467.5 > 422.6	11.652	11.652	0.0		2468093	59.3		119	4243	
18 Perfluorononanoic acid										
462.5 > 418.6	11.652	11.652	0.0	1.000	25159	0.5943		119	68.9	
D 19 13C2 PFDA										
514.4 > 469.5	12.445	12.445	0.0		3563348	60.7		121	4269	
20 Perfluorodecanoic acid										
512.5 > 468.5	12.445	12.445	0.0	1.000	35324	0.5422		108	88.0	
24 Perfluorooctane Sulfonamide										
497.5 > 77.6	12.963	12.963	0.0	1.000	38006	0.4793		95.9	123	
D 23 13C8 FOSA										
505.4 > 77.6	12.963	12.963	0.0		4195173	47.0		93.9	2466	
25 Perfluorodecane Sulfonate										
598.4 > 79.6	13.076	13.076	0.0	1.000	9585	NC			49.5	
49 Perfluorodecane Sulfonic acid										
598.4 > 79.6	13.076	13.076	0.0	1.000	9585	0.7418		154		
D 26 13C2 PFUnA										
564.3 > 519.5	13.120	13.120	0.0		3321059	56.8		114	5418	
27 Perfluoroundecanoic acid										
562.4 > 518.5	13.120	13.120	0.0	1.000	38320	0.5562		111	74.8	
D 28 13C2 PFDoA										
614.4 > 569.4	13.694	13.694	0.0		3891686	54.7		109	4817	
29 Perfluorododecanoic acid										
612.4 > 568.6	13.694	13.694	0.0	1.000	30373	0.4846		96.9	22.7	
30 Perfluorotridecanoic acid										
662.4 > 618.5	14.174	14.174	0.0	1.000	33842	0.5181		104	25.8	
D 33 13C2-PFTeDA										
714.5 > 669.5	14.589	14.589	0.0		3023681	47.7		95.4	4248	
32 Perfluorotetradecanoic acid										
712.6 > 668.5	14.589	14.589	0.0	1.000	22501	0.5301		106	21.1	
D 35 13C2-PFHxDA										
814.8 > 769.6	15.134	15.134	0.0		913455	30.8		61.6	3550	
34 Perfluorohexadecanoic acid										
812.6 > 768.6	15.134	15.134	0.0	1.000	89904	0.9280		186	133	
36 Perfluorooctandecanoic acid										
912.7 > 868.6	15.441	15.441	0.0	1.000	22526	0.8231		165	32.7	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L1_00018 Amount Added: 1.00 Units: mL

Report Date: 15-Feb-2016 10:02:03 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160212-28353.b\12FEB2016A4A_003.d

Injection Date: 12-Feb-2016 10:35:33 Instrument ID: A4

Lims ID: Std L1

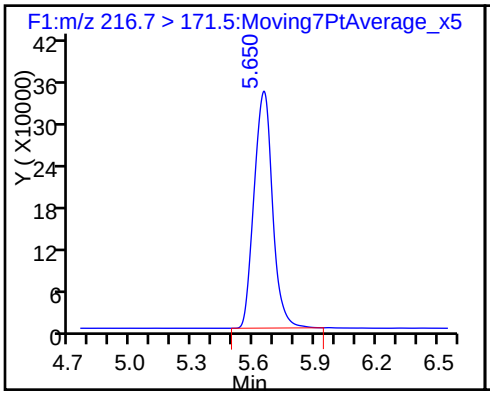
Client ID:

Operator ID: JRB ALS Bottle#: 2 Worklist Smp#: 2

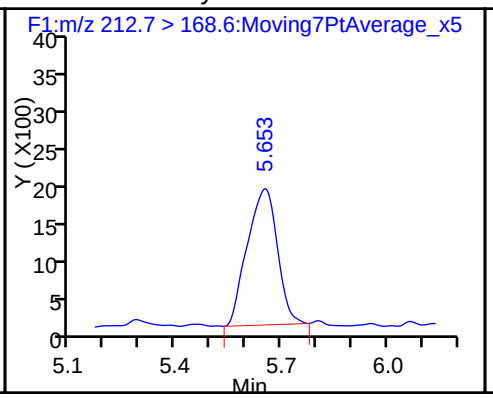
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

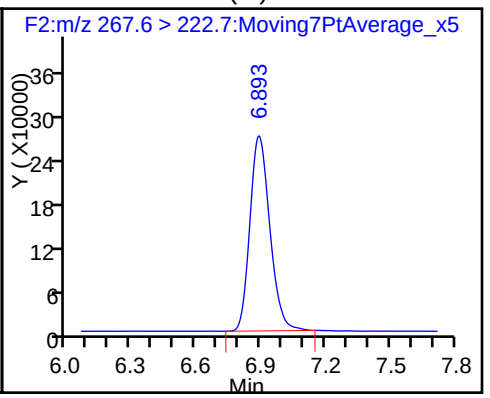
D 1 13C4 PFBA



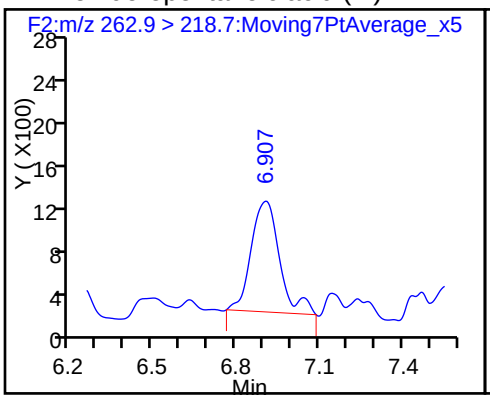
2 Perfluorobutyric acid



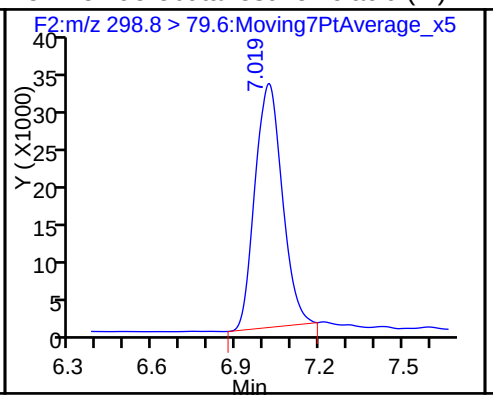
D 3 13C5-PFPeA (M)



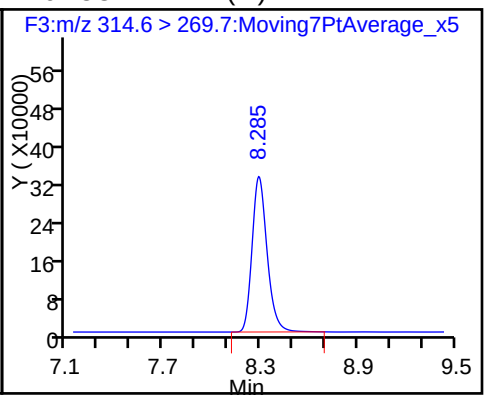
4 Perfluoropentanoic acid (M)



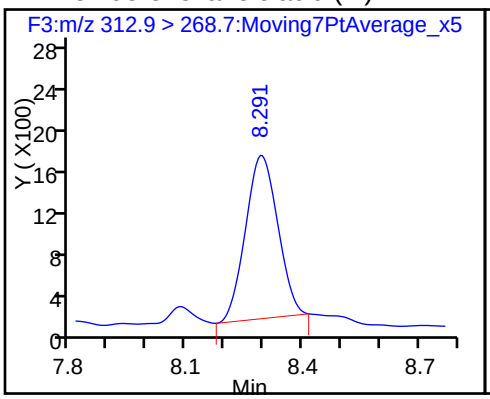
51 Perfluorobutanesulfonic acid (M)



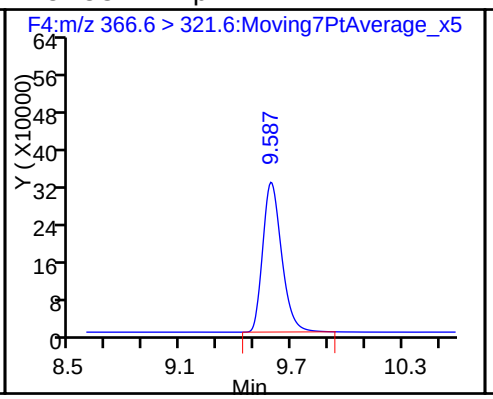
D 6 13C2 PFHxA (M)



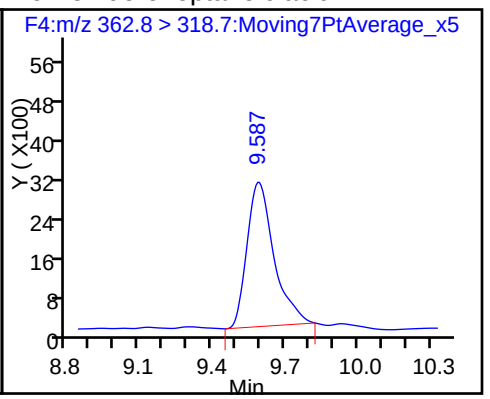
7 Perfluorohexanoic acid (M)



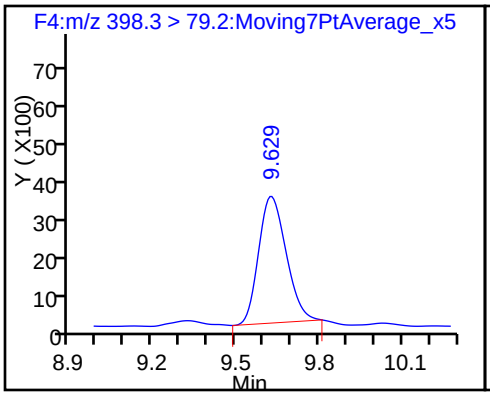
D 8 13C4-PFHpA



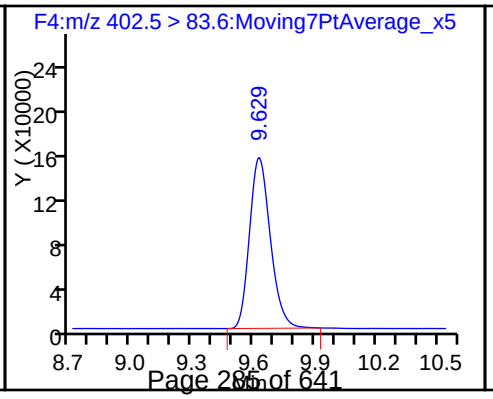
9 Perfluoroheptanoic acid



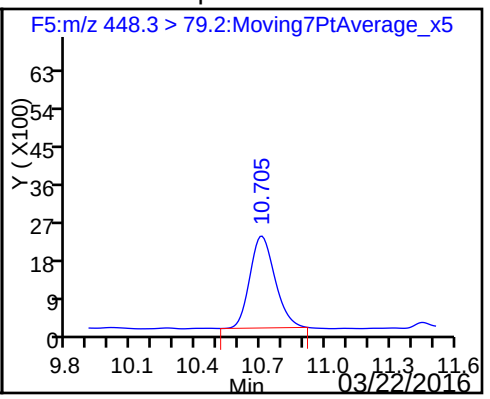
58 Perfluorohexanesulfonic acid



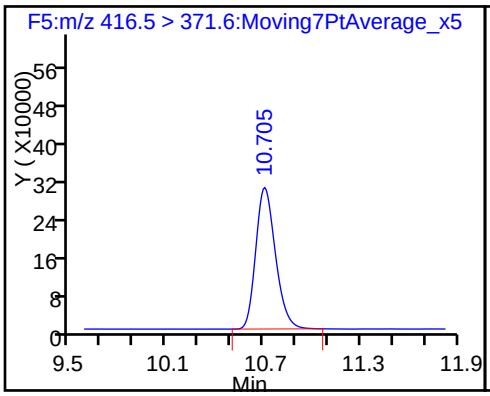
D 11 18O2 PFHxS



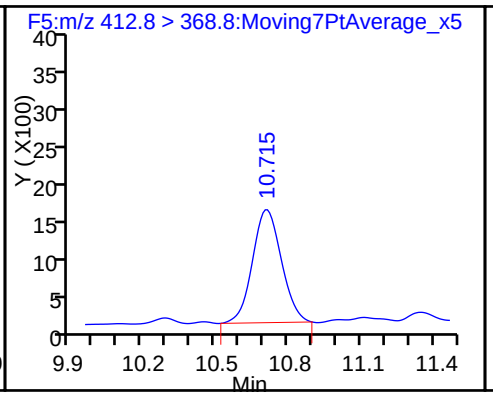
39 Perfluoroheptanesulfonic Acid



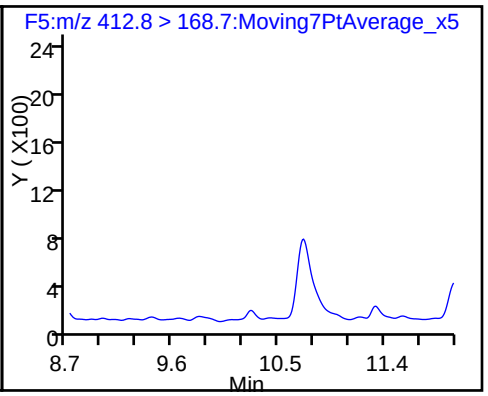
D 12 13C4 PFOA



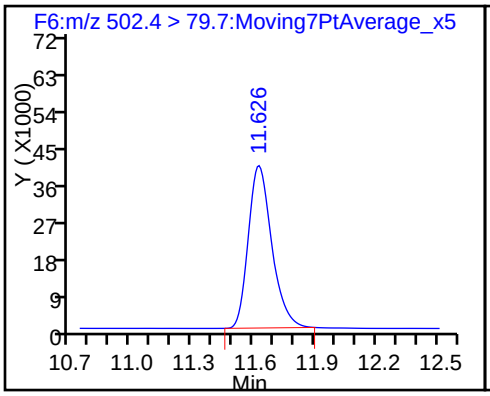
13 Perfluorooctanoic acid



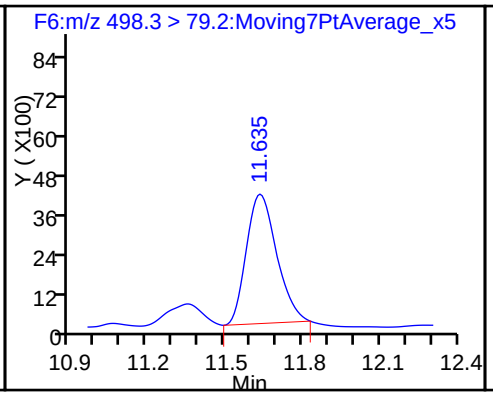
13 Perfluorooctanoic acid



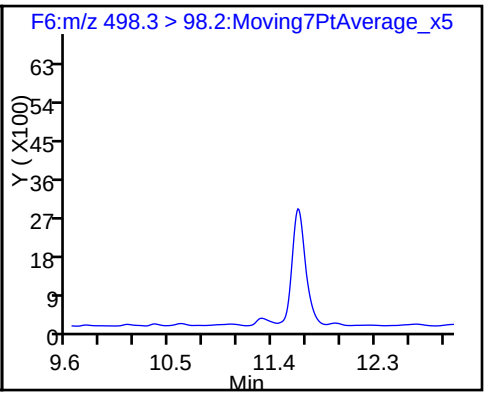
D 16 13C4 PFOS



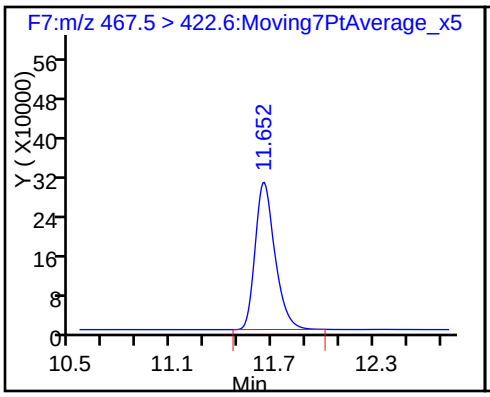
15 Perfluorooctane sulfonic acid



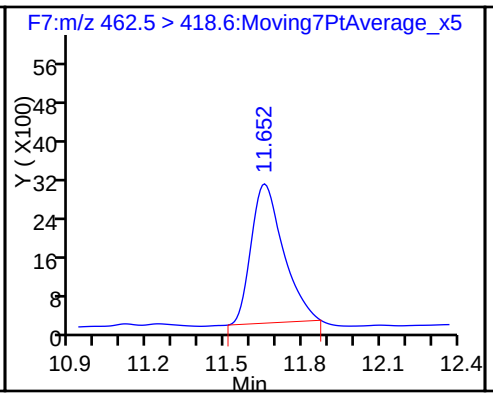
15 Perfluorooctane sulfonic acid



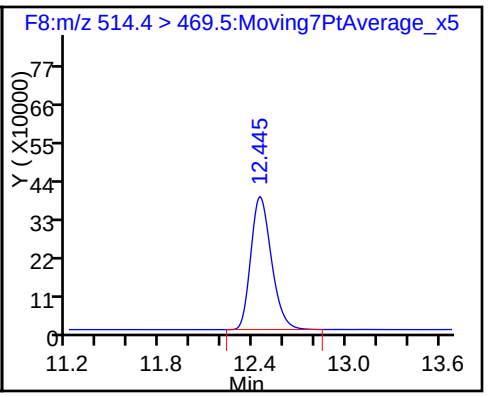
D 17 13C5 PFNA



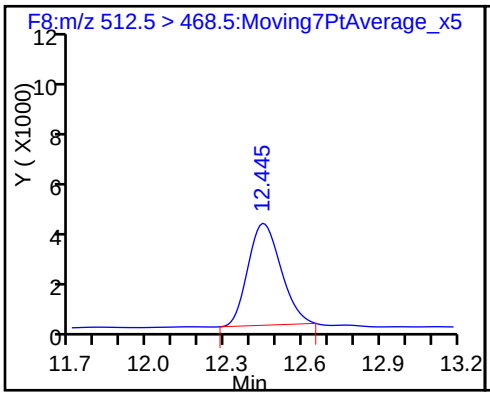
18 Perfluorononanoic acid



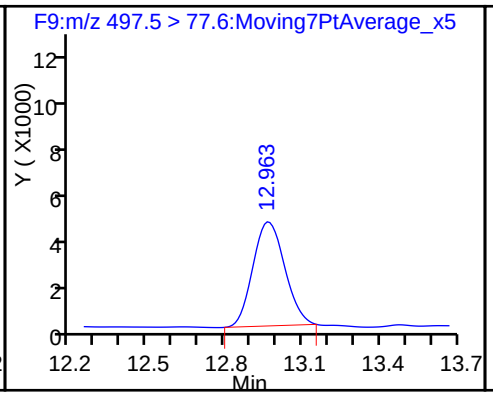
D 19 13C2 PFDA



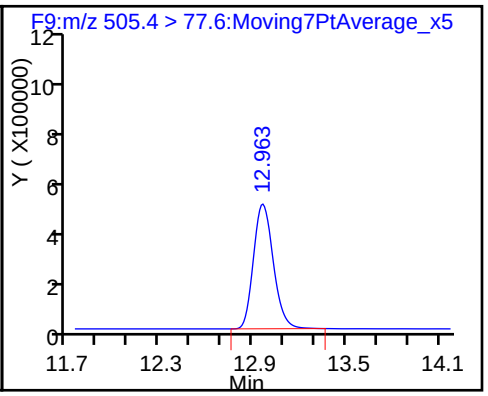
20 Perfluorodecanoic acid



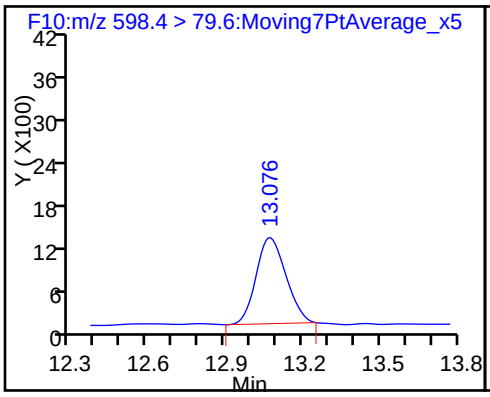
24 Perfluorooctane Sulfonamide



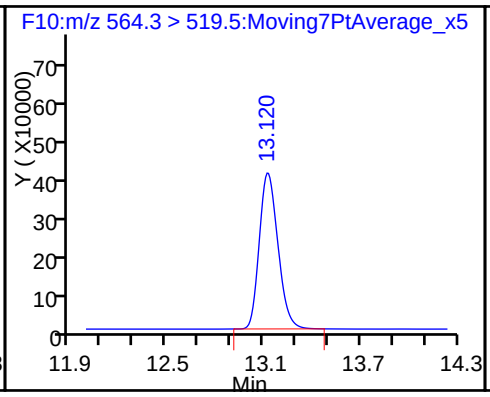
D 23 13C8 FOSA



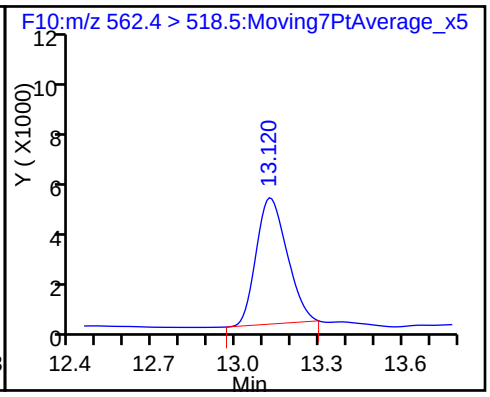
49 Perfluorodecane Sulfonic acid



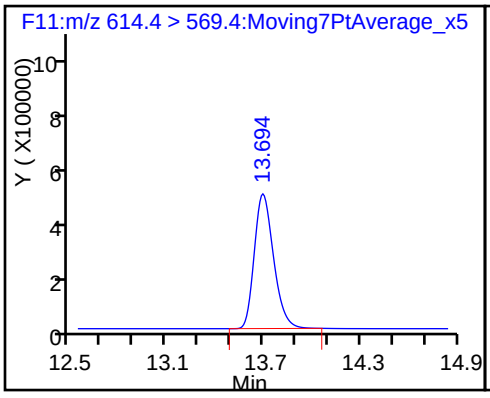
D 26 13C2 PFUnA



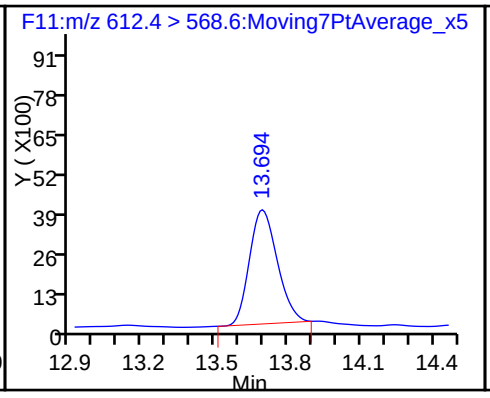
27 Perfluoroundecanoic acid



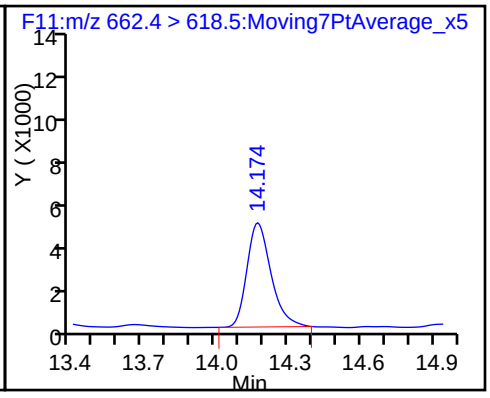
D 28 13C2 PFDoA



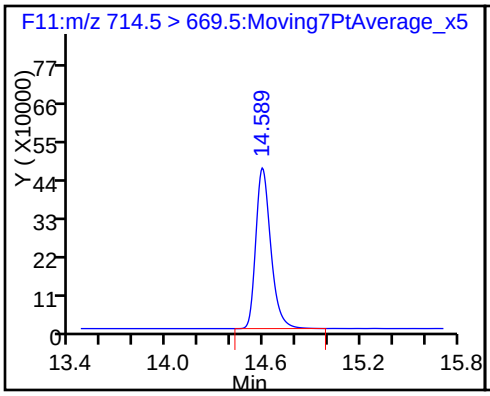
29 Perfluorododecanoic acid



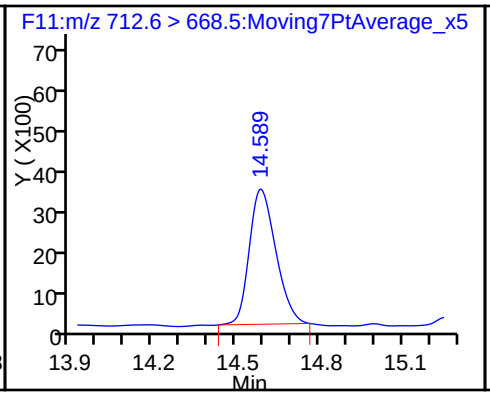
30 Perfluorotridecanoic acid



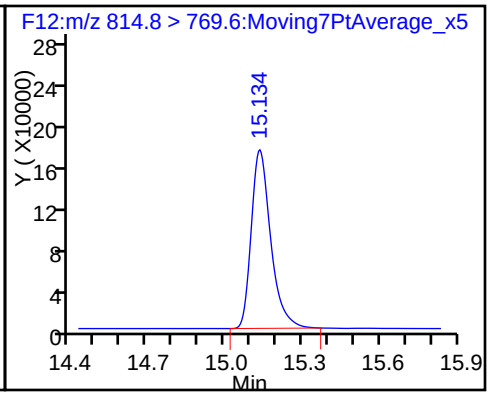
D 33 13C2-PFTeDA



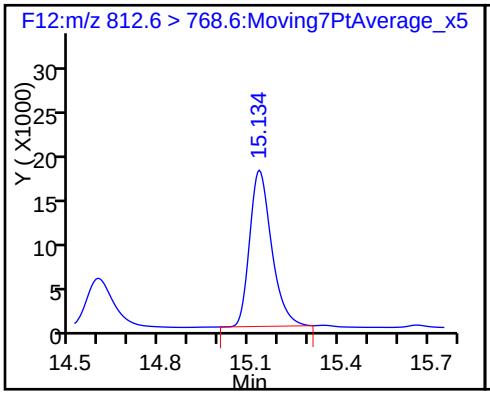
32 Perfluorotetradecanoic acid



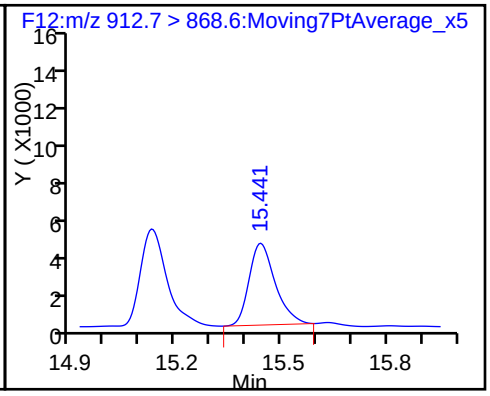
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160212-28353.b\12FEB2016A4A_004.d
Lims ID: Std L2
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 12-Feb-2016 10:56:41 ALS Bottle#: 3 Worklist Smp#: 3
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: STD L2
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4
Sublist: chrom-PFAC_A4*sub12

Method: \\ChromNA\Sacramento\ChromData\A4\20160212-28353.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 15-Feb-2016 10:02:12 Calib Date: 12-Feb-2016 12:42:35
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160212-28353.b\12FEB2016A4A_009.d

Column 1 : Det: F1:MRM
Process Host: XAWRK007

First Level Reviewer: barnettj Date: 12-Feb-2016 14:30:24

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
216.7 > 171.5	5.695	5.650	0.045		2345669	57.8		116	7846	
2 Perfluorobutyric acid										M
212.7 > 168.6	5.692	5.653	0.039	1.000	17082	0.7429		74.3	61.2	M
D 3 13C5-PFPeA										
267.6 > 222.7	6.953	6.893	0.060		1802713	56.3		113	4423	
4 Perfluoropentanoic acid										
262.9 > 218.7	6.943	6.907	0.036	1.000	15934	0.9387		93.9	13.6	
5 Perfluorobutane Sulfonate										
298.8 > 79.6	7.074	7.019	0.055	1.000	259507	NC			152	
298.8 > 98.6	7.077	7.019	0.058	1.000	164915		1.57(0.00-0.00)		141	
51 Perfluorobutanesulfonic acid										
298.8 > 79.6	7.074	7.019	0.055	1.000	259507	0.7997		90.5		
D 6 13C2 PFHxA										
314.6 > 269.7	8.311	8.285	0.026		2289067	58.5		117	5220	
7 Perfluorohexanoic acid										
312.9 > 268.7	8.317	8.291	0.026	1.000	16971	0.8605		86.0	101	
D 8 13C4-PFHpA										
366.6 > 321.6	9.567	9.587	-0.020		2397972	61.6		123	4912	
9 Perfluoroheptanoic acid										
362.8 > 318.7	9.567	9.587	-0.020	1.000	27094	1.10		110	78.7	
58 Perfluorohexanesulfonic acid										
398.3 > 79.2	9.595	9.629	-0.034	1.000	38053	0.9280		98.1		
10 Perfluorohexane Sulfonate										
398.3 > 79.2	9.595	9.629	-0.034	1.000	38053	NC			152	
D 11 18O2 PFHxS										
402.5 > 83.6	9.595	9.629	-0.034		1289379	56.9		120	3861	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
39 Perfluoroheptanesulfonic Acid										
448.3 > 79.2	10.661	10.705	-0.044	1.000	28347	1.22		128		
14 Perfluoroheptane Sulfonate										
448.3 > 79.2	10.661	10.705	-0.044	1.000	28347	NC			141	
D 12 13C4 PFOA										
416.5 > 371.6	10.661	10.705	-0.044		2730942	64.1		128	4248	
13 Perfluorooctanoic acid										
412.8 > 368.8	10.670	10.715	-0.045	1.000	27408	1.02		102	65.6	
412.8 > 168.7	10.661	10.715	-0.054	0.999	9428		2.91(0.00-0.00)	102	37.6	
D 16 13C4 PFOS										
502.4 > 79.7	11.578	11.626	-0.048		435612	43.0		90.0	1752	
15 Perfluorooctane sulfonic acid										M
498.3 > 79.2	11.578	11.635	-0.057	1.000	45998	1.18		124	252	M
498.3 > 98.2	11.578	11.635	-0.057	1.000	28574		1.61(0.00-0.00)	124	92.1	M
D 17 13C5 PFNA										
467.5 > 422.6	11.604	11.652	-0.048		2522779	60.6		121	4314	
18 Perfluorononanoic acid										M
462.5 > 418.6	11.604	11.652	-0.048	1.000	35930	0.7871		78.7	77.9	M
D 19 13C2 PFDA										
514.4 > 469.5	12.394	12.445	-0.051		3909475	66.6		133	4885	
20 Perfluorodecanoic acid										
512.5 > 468.5	12.404	12.445	-0.041	1.000	63644	0.8904		89.0	147	
24 Perfluorooctane Sulfonamide										
497.5 > 77.6	12.912	12.963	-0.051	1.000	77919	0.8648		86.5	257	
D 23 13C8 FOSA										
505.4 > 77.6	12.912	12.963	-0.051		4767443	53.4		107	2131	
25 Perfluorodecane Sulfonate										
598.4 > 79.6	13.040	13.076	-0.036	1.000	19408	NC			118	
49 Perfluorodecane Sulfonic acid										
598.4 > 79.6	13.040	13.076	-0.036	1.000	19408	1.11		115		
D 26 13C2 PFUnA										
564.3 > 519.5	13.075	13.120	-0.045		3758689	64.2		128	4185	
27 Perfluoroundecanoic acid										
562.4 > 518.5	13.075	13.120	-0.045	1.000	76032	0.9752		97.5	138	
D 28 13C2 PFDoA										
614.4 > 569.4	13.655	13.694	-0.039		4289188	60.3		121	4771	
29 Perfluorododecanoic acid										
612.4 > 568.6	13.655	13.694	-0.039	1.000	55500	0.8034		80.3	34.0	
30 Perfluorotridecanoic acid										
662.4 > 618.5	14.135	14.174	-0.039	1.000	64724	0.9013		90.1	36.6	
D 33 13C2-PFTeDA										
714.5 > 669.5	14.549	14.589	-0.040		3570399	56.3		113	4342	
32 Perfluorotetradecanoic acid										
712.6 > 668.5	14.555	14.589	-0.034	1.000	40494	1.01		101	30.6	
D 35 13C2-PFHxDA										
814.8 > 769.6	15.103	15.134	-0.031		1332475	44.9		89.8	3351	
34 Perfluorohexadecanoic acid										
812.6 > 768.6	15.103	15.134	-0.031	1.000	118084	1.13		113	128	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
36 Perfluorooctandecanoic acid										
912.7 > 868.6	15.414	15.441	-0.027	1.000	51667	1.13		113	53.3	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC-L2_00018 Amount Added: 1.00 Units: mL

Report Date: 15-Feb-2016 10:02:13 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160212-28353.b\12FEB2016A4A_004.d

Injection Date: 12-Feb-2016 10:56:41 Instrument ID: A4

Lims ID: Std L2

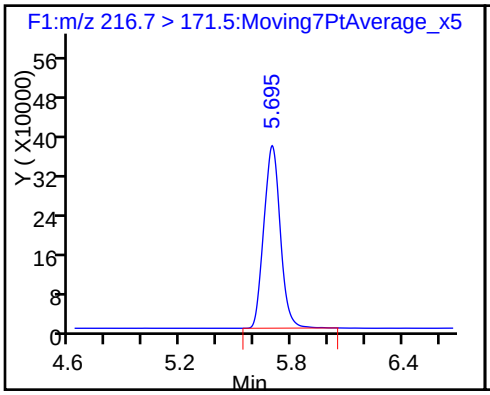
Client ID:

Operator ID: JRB ALS Bottle#: 3 Worklist Smp#: 3

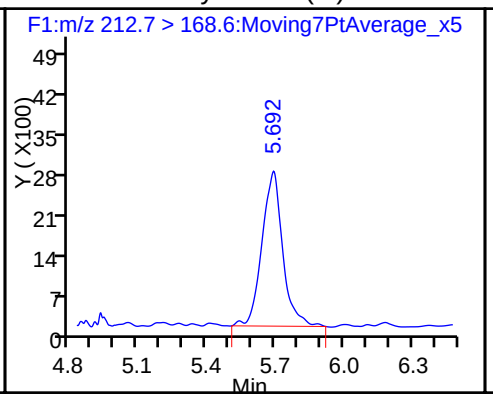
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

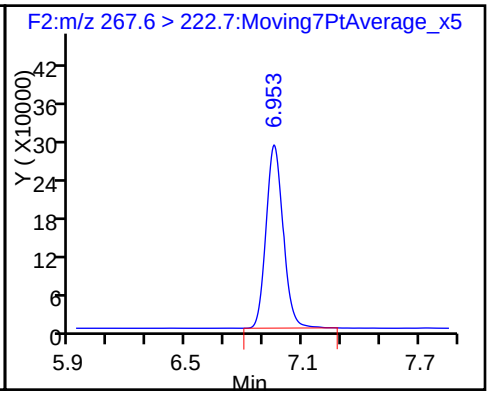
D 1 13C4 PFBA



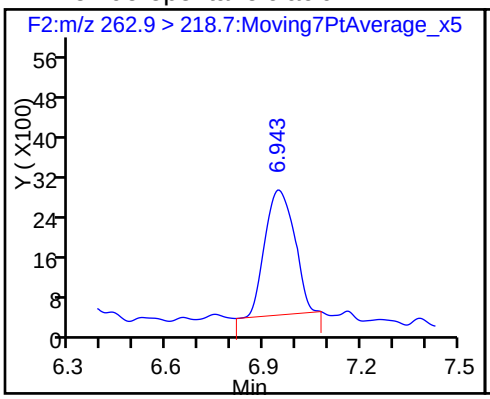
2 Perfluorobutyric acid (M)



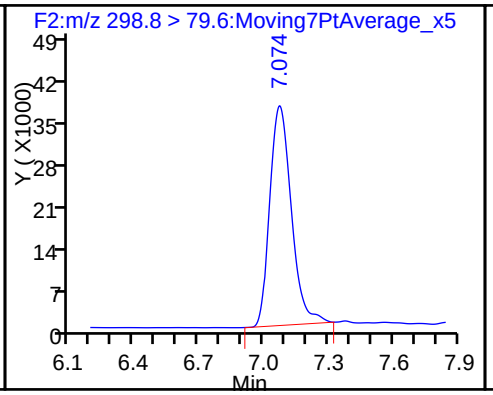
D 3 13C5-PFPeA



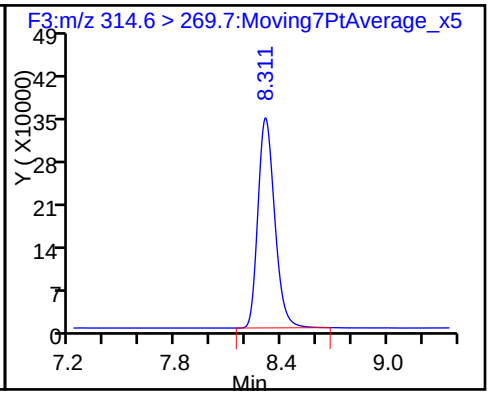
4 Perfluoropentanoic acid



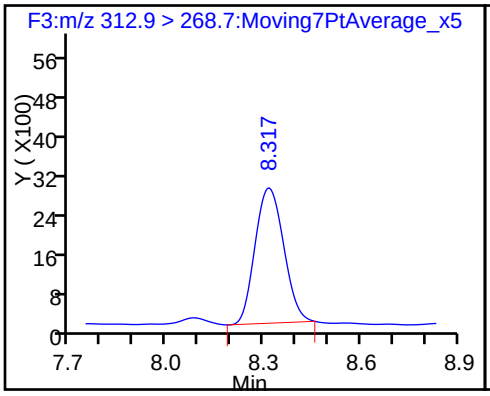
51 Perfluorobutanesulfonic acid



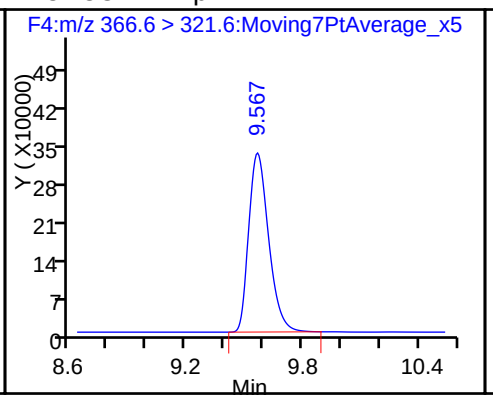
D 6 13C2 PFHxA



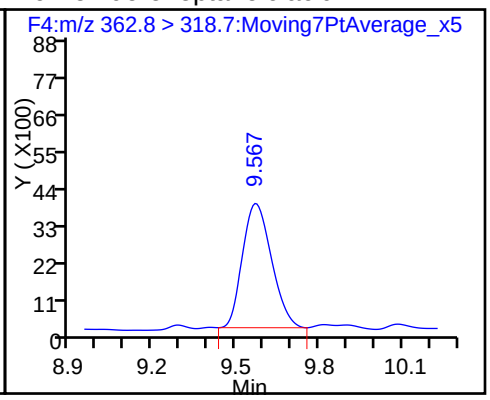
7 Perfluorohexanoic acid



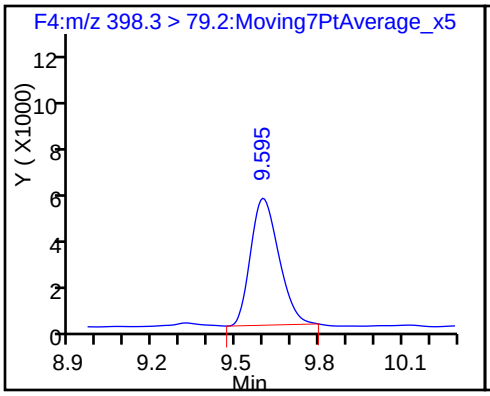
D 8 13C4-PFHpA



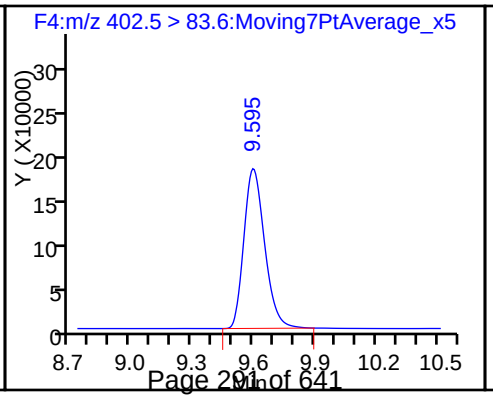
9 Perfluoroheptanoic acid



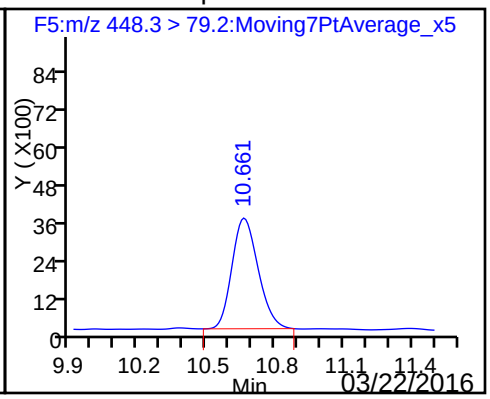
58 Perfluorohexanesulfonic acid



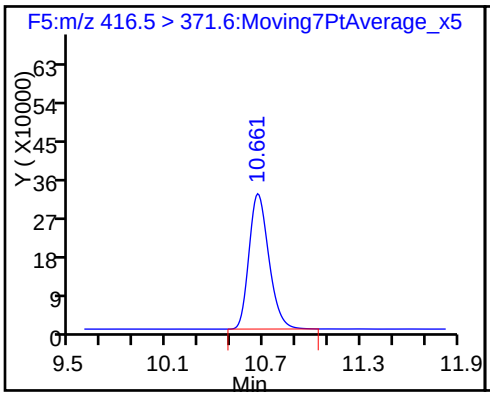
D 11 18O2 PFHxS



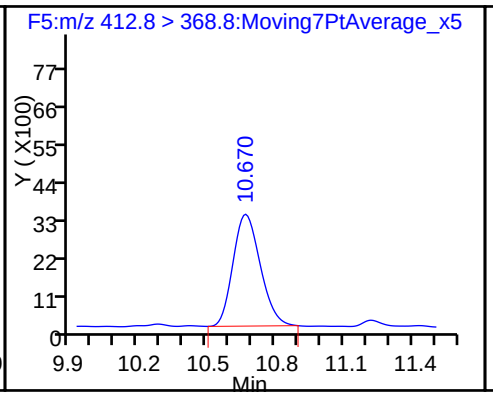
39 Perfluoroheptanesulfonic Acid



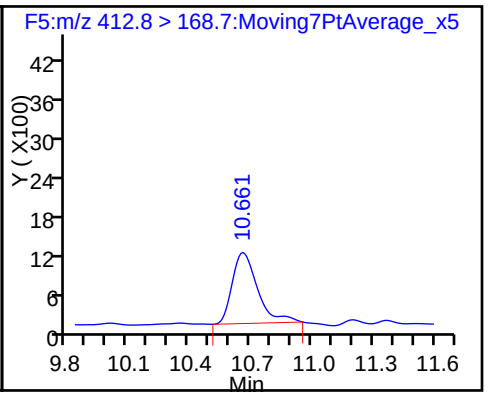
D 12 13C4 PFOA



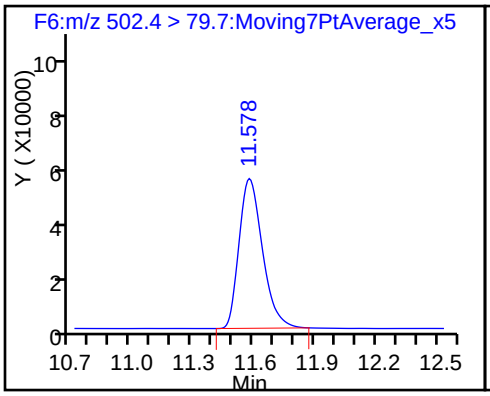
13 Perfluorooctanoic acid



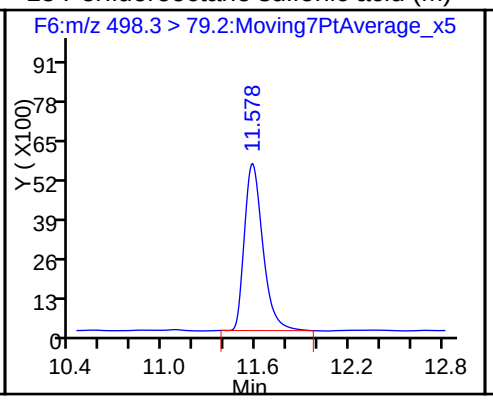
13 Perfluorooctanoic acid



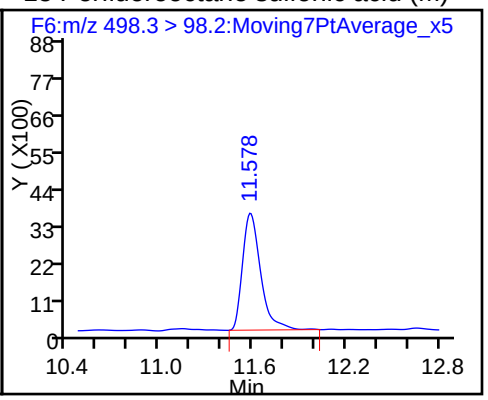
D 16 13C4 PFOS



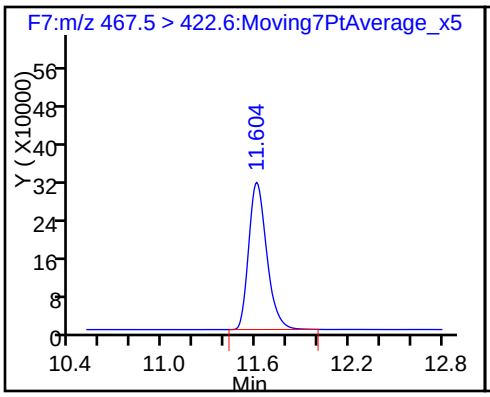
15 Perfluorooctane sulfonic acid (M)



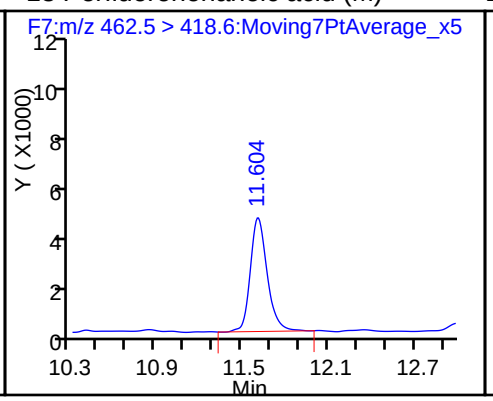
15 Perfluorooctane sulfonic acid (M)



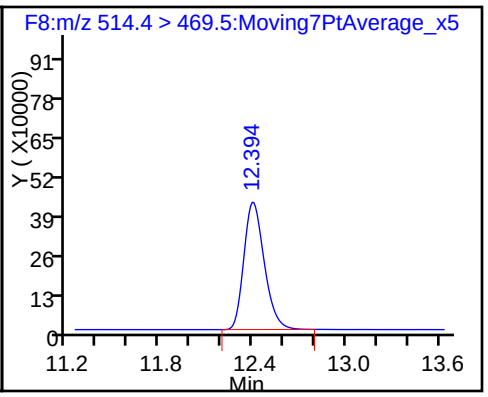
D 17 13C5 PFNA



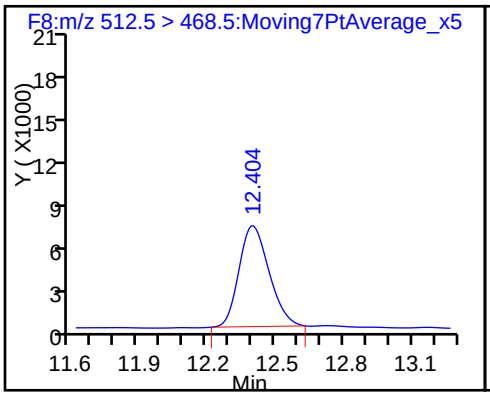
18 Perfluorononanoic acid (M)



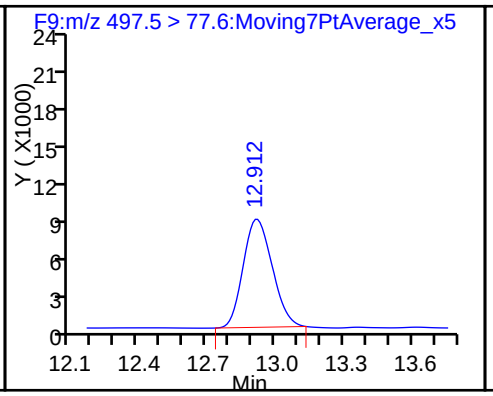
D 19 13C2 PFDA



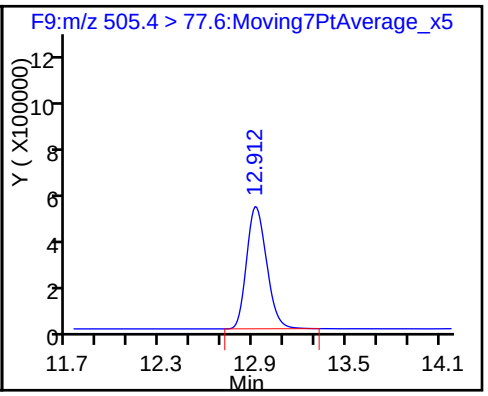
20 Perfluorodecanoic acid



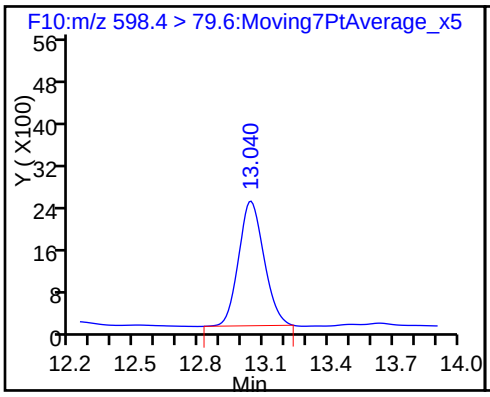
24 Perfluorooctane Sulfonamide



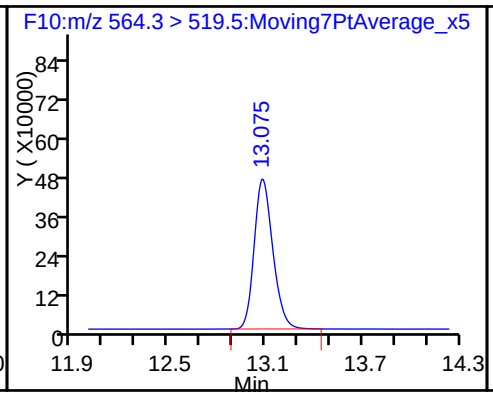
D 23 13C8 FOSA



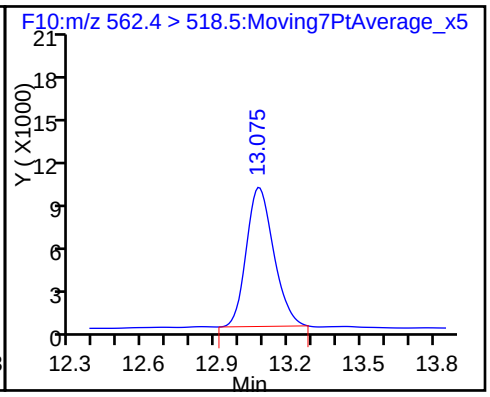
49 Perfluorodecane Sulfonic acid



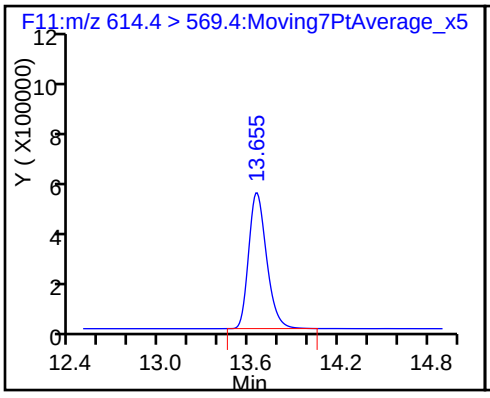
D 26 13C2 PFUnA



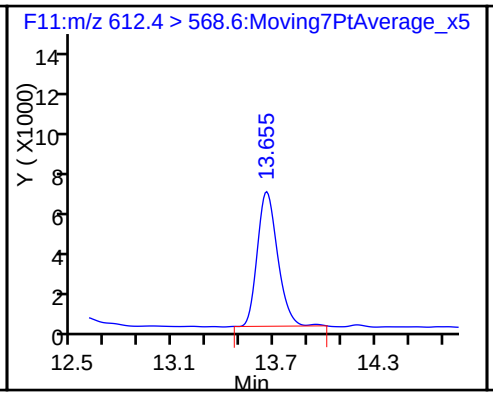
27 Perfluoroundecanoic acid



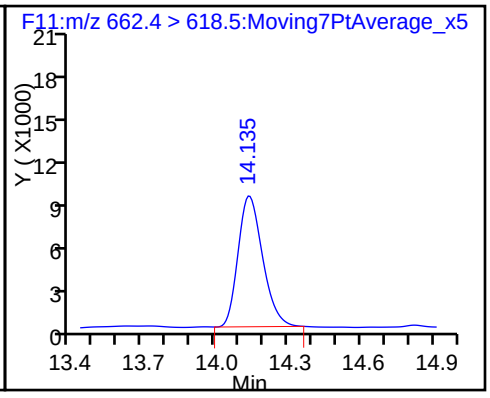
D 28 13C2 PFDoA



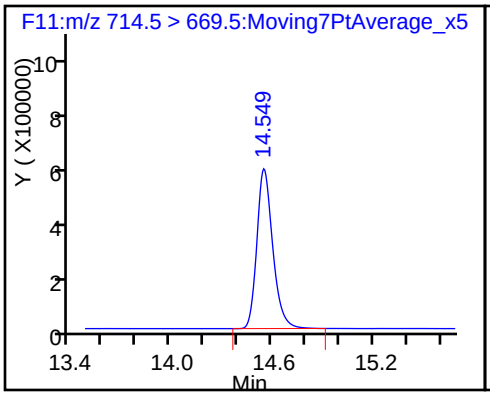
29 Perfluorododecanoic acid



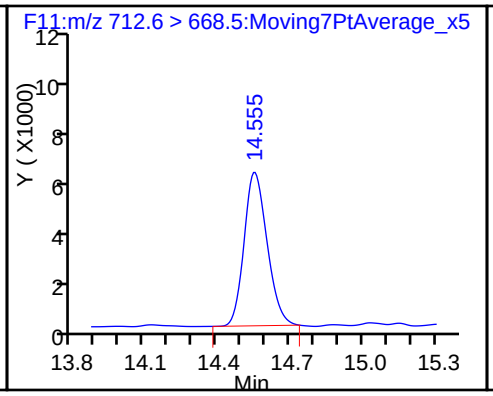
30 Perfluorotridecanoic acid



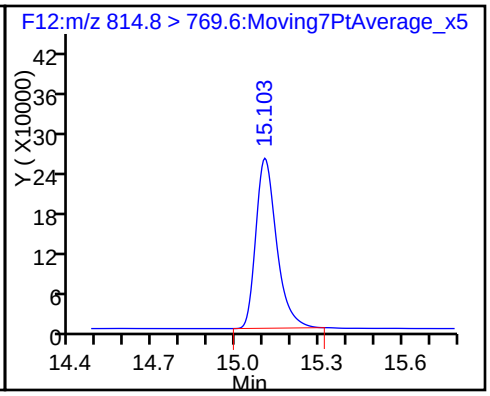
D 33 13C2-PFTeDA



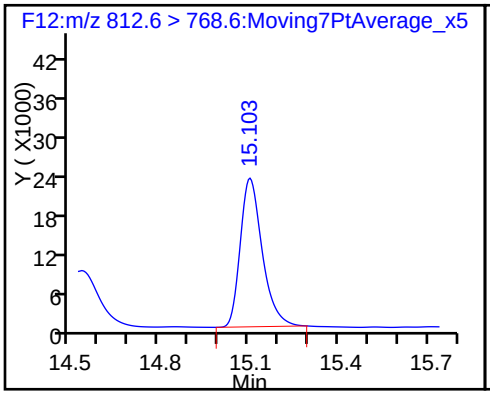
32 Perfluorotetradecanoic acid



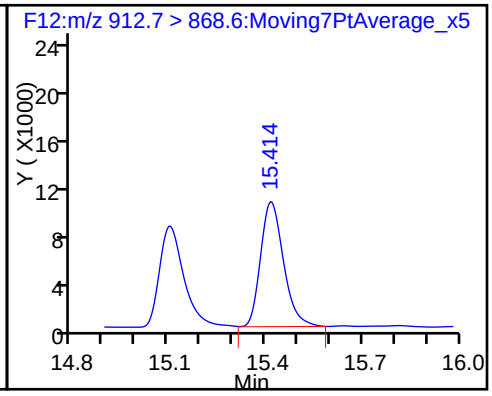
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



Manual Integration/User Assign Peak Report

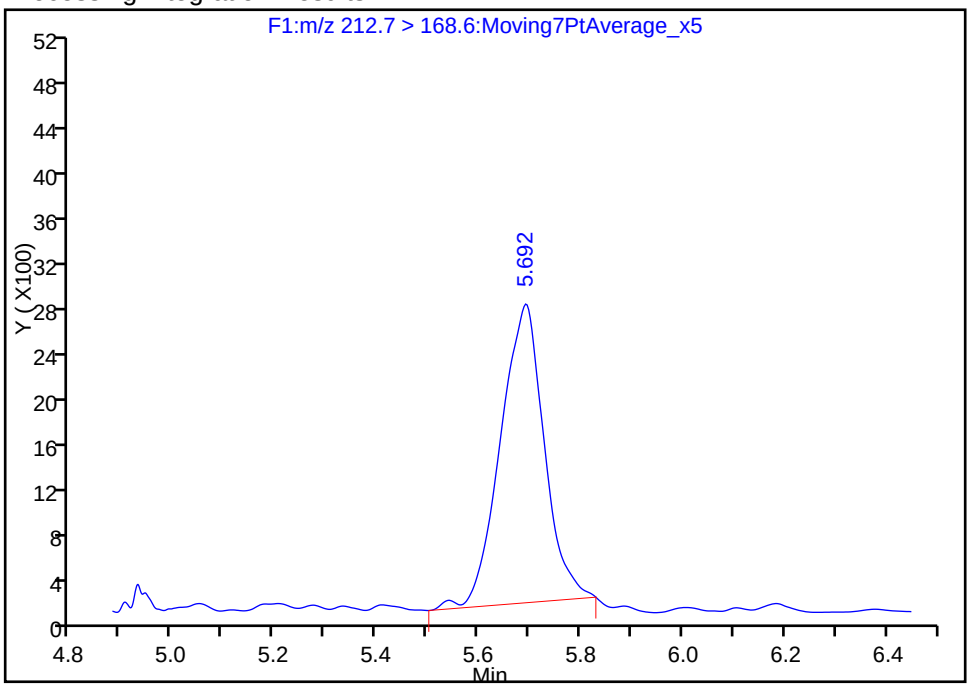
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160212-28353.b\12FEB2016A4A_004.d
Injection Date: 12-Feb-2016 10:56:41 Instrument ID: A4
Lims ID: Std L2
Client ID:
Operator ID: JRB ALS Bottle#: 3 Worklist Smp#: 3
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL
Column: Detector F1:MRM

2 Perfluorobutyric acid, CAS: 375-22-4

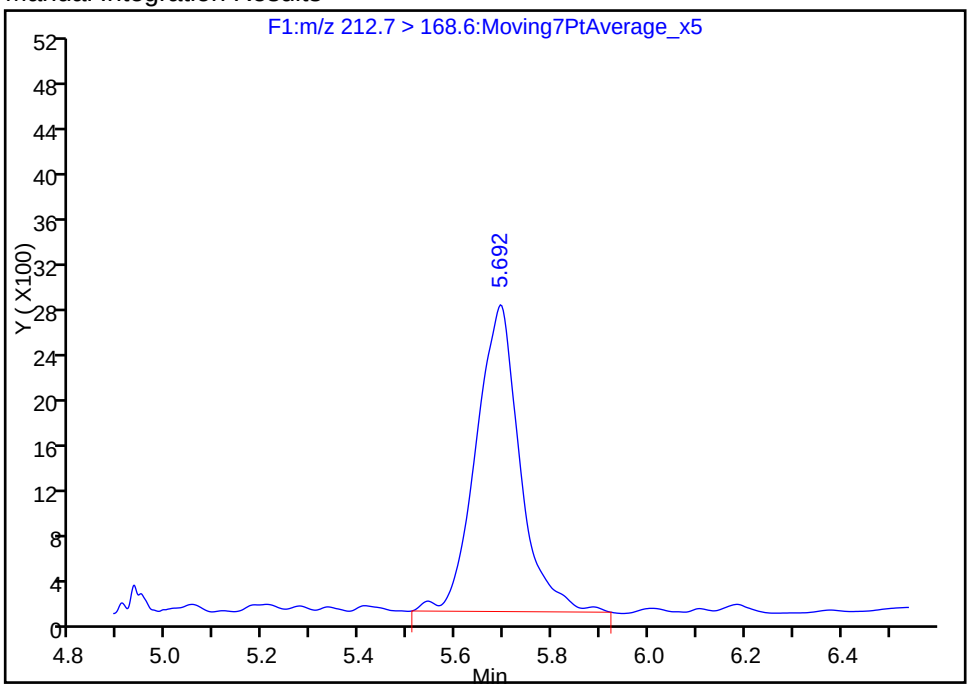
Processing Integration Results

RT: 5.69
Area: 15671
Amount: 0.687562
Amount Units: ng/ml



Manual Integration Results

RT: 5.69
Area: 17082
Amount: 0.742900
Amount Units: ng/ml



Reviewer: westendorfc, 15-Feb-2016 08:14:55
Audit Action: Manually Integrated
Audit Reason: Baseline

Manual Integration/User Assign Peak Report

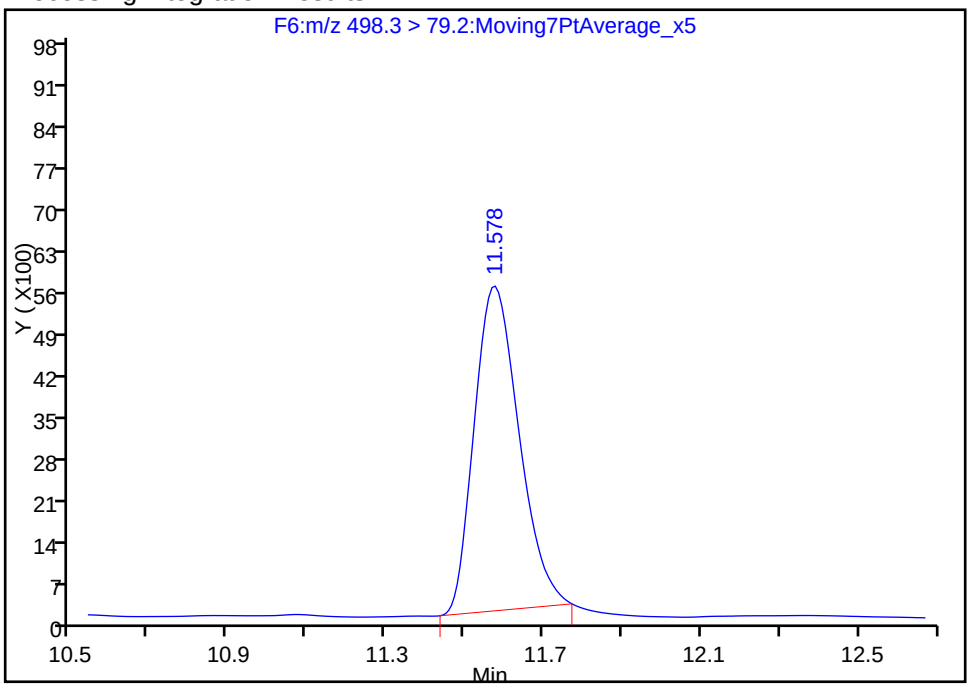
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160212-28353.b\12FEB2016A4A_004.d
Injection Date: 12-Feb-2016 10:56:41 Instrument ID: A4
Lims ID: Std L2
Client ID:
Operator ID: JRB ALS Bottle#: 3 Worklist Smp#: 3
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL
Column: Detector F6:MRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

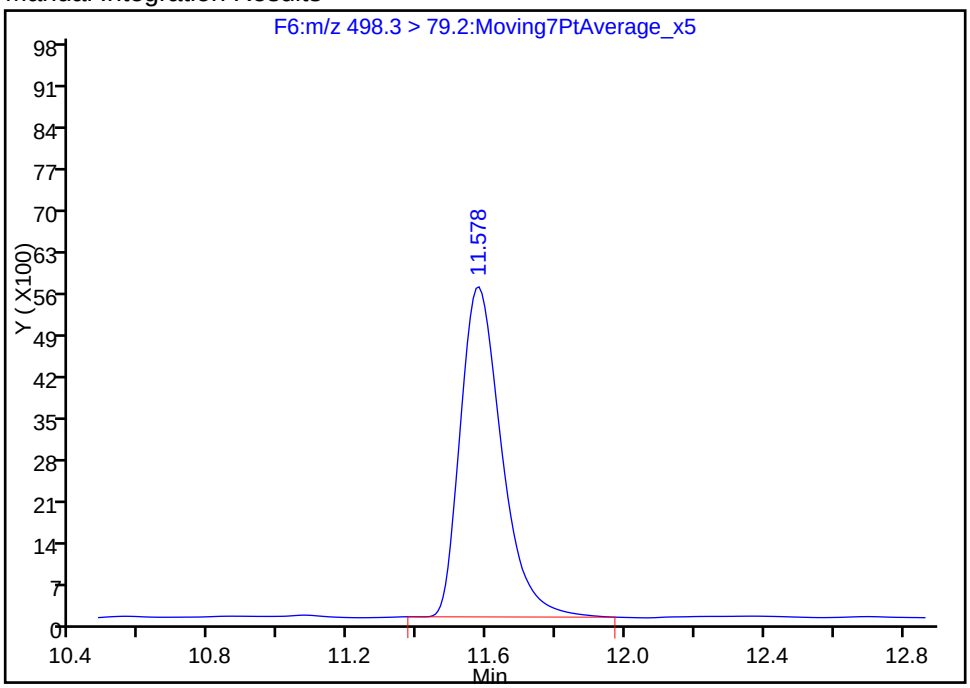
Processing Integration Results

RT: 11.58
Area: 43067
Amount: 1.122782
Amount Units: ng/ml



Manual Integration Results

RT: 11.58
Area: 45998
Amount: 1.183430
Amount Units: ng/ml



Reviewer: westendorfc, 15-Feb-2016 08:20:55
Audit Action: Manually Integrated
Audit Reason: Baseline

Manual Integration/User Assign Peak Report

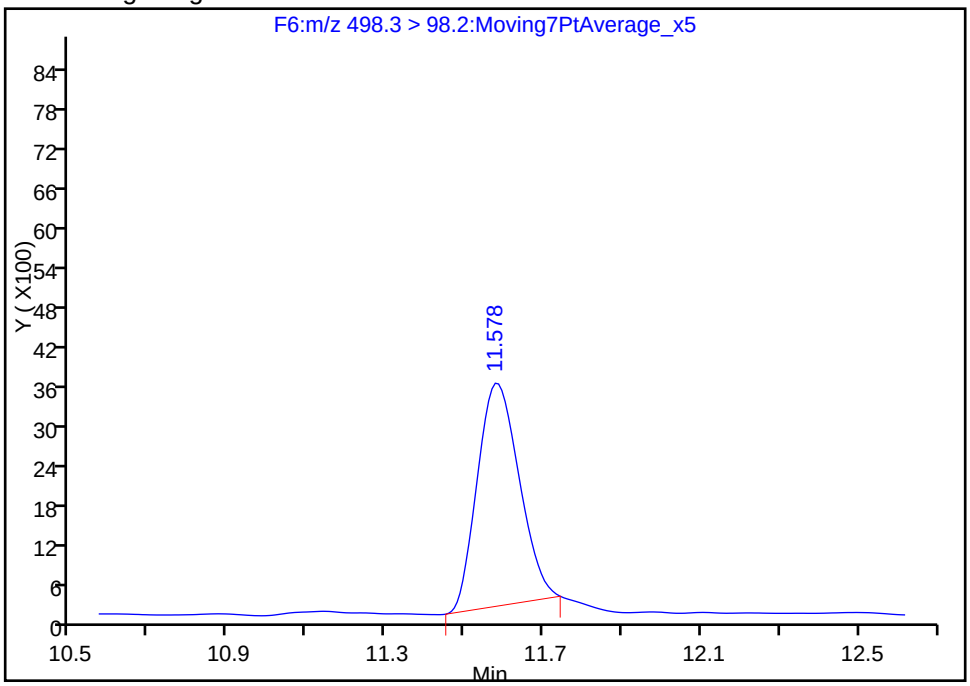
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160212-28353.b\12FEB2016A4A_004.d
Injection Date: 12-Feb-2016 10:56:41 Instrument ID: A4
Lims ID: Std L2
Client ID:
Operator ID: JRB ALS Bottle#: 3 Worklist Smp#: 3
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL
Column: Detector F6:MRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

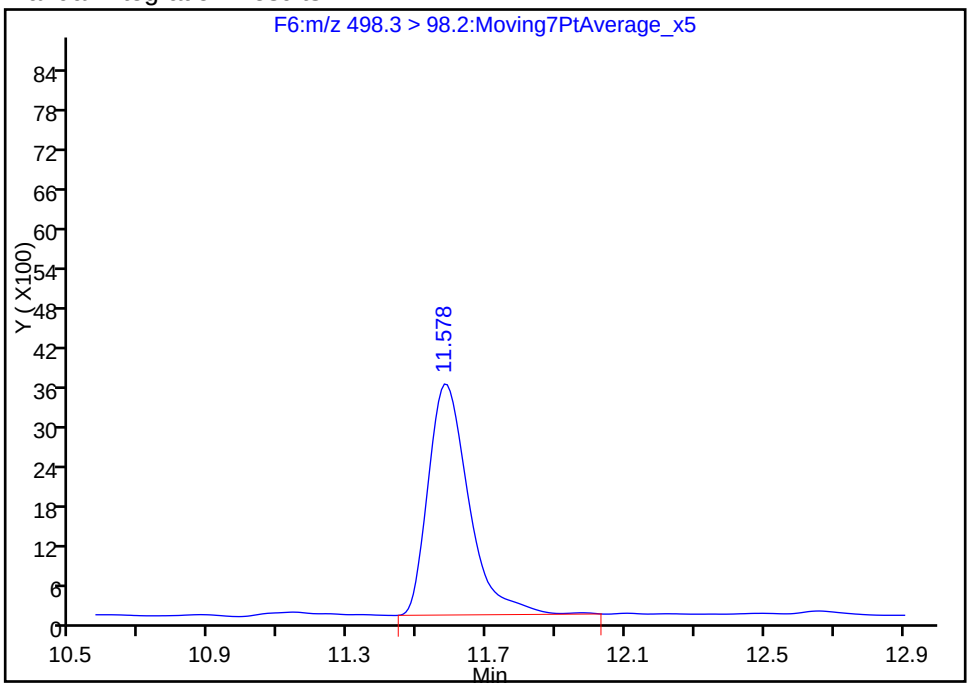
Processing Integration Results

RT: 11.58
Area: 24986
Amount: 1.122782
Amount Units: ng/ml



Manual Integration Results

RT: 11.58
Area: 28574
Amount: 1.183430
Amount Units: ng/ml



Reviewer: westendorfc, 15-Feb-2016 08:20:55
Audit Action: Manually Integrated
Audit Reason: Baseline

Manual Integration/User Assign Peak Report

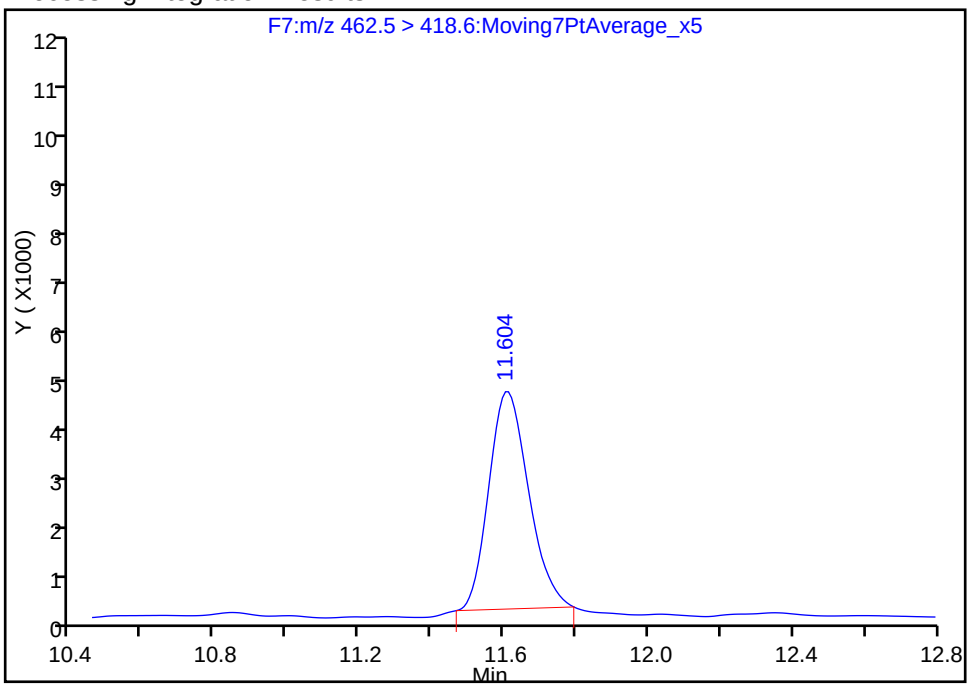
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160212-28353.b\12FEB2016A4A_004.d
Injection Date: 12-Feb-2016 10:56:41 Instrument ID: A4
Lims ID: Std L2
Client ID:
Operator ID: JRB ALS Bottle#: 3 Worklist Smp#: 3
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL
Column: Detector F7:MRM

18 Perfluorononanoic acid, CAS: 375-95-1

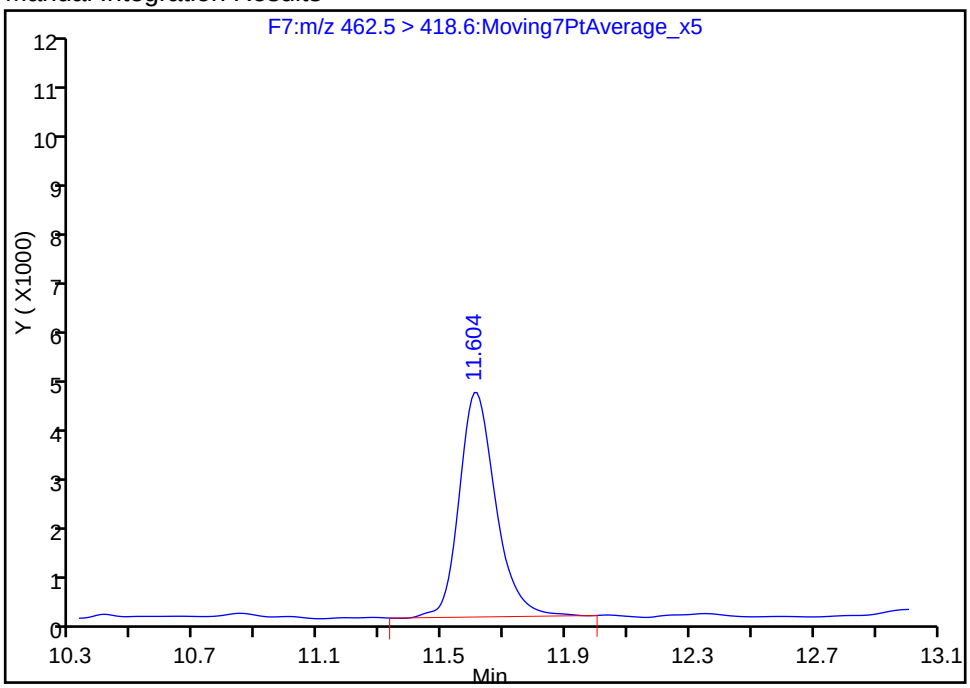
Processing Integration Results

RT: 11.60
Area: 32399
Amount: 0.654364
Amount Units: ng/ml



Manual Integration Results

RT: 11.60
Area: 35930
Amount: 0.787056
Amount Units: ng/ml



Reviewer: westendorfc, 15-Feb-2016 08:20:55
Audit Action: Manually Integrated
Audit Reason: Baseline

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160212-28353.b\12FEB2016A4A_005.d
Lims ID: Std L3
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 12-Feb-2016 11:17:51 ALS Bottle#: 4 Worklist Smp#: 4
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: STD L3
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4
Sublist: chrom-PFAC_A4*sub12

Method: \\ChromNA\Sacramento\ChromData\A4\20160212-28353.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 15-Feb-2016 10:02:20 Calib Date: 12-Feb-2016 12:42:35
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160212-28353.b\12FEB2016A4A_009.d

Column 1 : Det: F1:MRM
Process Host: XAWRK007

First Level Reviewer: barnettj Date: 12-Feb-2016 14:30:58

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
216.7 > 171.5	5.652	5.673	-0.021		2179878	53.7		107	8464	
2 Perfluorobutyric acid										
212.7 > 168.6	5.655	5.673	-0.018	1.000	116853	5.47		109	411	
D 3 13C5-PFPeA										
267.6 > 222.7	6.902	6.923	-0.021		1806356	56.5		113	4928	
4 Perfluoropentanoic acid										
262.9 > 218.7	6.897	6.925	-0.028	1.000	91597	5.38		108	86.2	
5 Perfluorobutane Sulfonate										
298.8 > 79.6	7.025	7.047	-0.022	1.000	304142	NC			171	
298.8 > 98.6	7.025	7.047	-0.022	1.000	183928		1.65(0.00-0.00)		131	
51 Perfluorobutanesulfonic acid										
298.8 > 79.6	7.025	7.047	-0.022	1.000	304142	4.26		96.4		
D 6 13C2 PFHxA										
314.6 > 269.7	8.327	8.298	0.029		2203221	56.3		113	6734	
7 Perfluorohexanoic acid										
312.9 > 268.7	8.327	8.304	0.023	1.000	88552	4.66		93.3	460	
D 8 13C4-PFHpA										
366.6 > 321.6	9.630	9.577	0.053		2165567	55.6		111	4351	
9 Perfluoroheptanoic acid										
362.8 > 318.7	9.630	9.577	0.053	1.000	108307	4.88		97.7	279	
58 Perfluorohexanesulfonic acid										
398.3 > 79.2	9.665	9.612	0.053	1.000	160421	5.22		110		
10 Perfluorohexane Sulfonate										
398.3 > 79.2	9.665	9.612	0.053	1.000	160421	NC			398	
D 11 18O2 PFHxS										
402.5 > 83.6	9.665	9.612	0.053		1231093	54.3		115	3907	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
39 Perfluoroheptanesulfonic Acid										
448.3 > 79.2	10.753	10.683	0.070	1.000	167796	6.15		129		
14 Perfluoroheptane Sulfonate										
448.3 > 79.2	10.753	10.683	0.070	1.000	167796	NC			913	
D 12 13C4 PFOA										
416.5 > 371.6	10.762	10.683	0.079		2553061	60.0		120	4746	
13 Perfluorooctanoic acid										
412.8 > 368.8	10.753	10.692	0.061	1.000	131613	5.25		105	261	
412.8 > 168.7	10.762	10.692	0.070	1.001	41266		3.19(0.00-0.00)	105	123	
D 16 13C4 PFOS										
502.4 > 79.7	11.678	11.602	0.076		512338	50.6		106	1864	
15 Perfluorooctane sulfonic acid										
498.3 > 79.2	11.678	11.606	0.072	1.000	270891	5.93		124	1015	
498.3 > 98.2	11.678	11.606	0.072	1.000	170527		1.59(0.00-0.00)	124	450	
D 17 13C5 PFNA										
467.5 > 422.6	11.704	11.628	0.076		2361526	56.8		114	3847	
18 Perfluorononanoic acid										
462.5 > 418.6	11.704	11.628	0.076	1.000	230097	4.75		94.9	411	
D 19 13C2 PFDA										
514.4 > 469.5	12.508	12.419	0.089		3587771	61.1		122	5014	
20 Perfluorodecanoic acid										
512.5 > 468.5	12.508	12.424	0.084	1.000	328682	5.01		100	1356	
24 Perfluorooctane Sulfonamide										
497.5 > 77.6	13.021	12.937	0.084	1.000	496084	5.09		102	1219	
D 23 13C8 FOSA										
505.4 > 77.6	13.021	12.937	0.084		5160232	57.8		116	2642	
25 Perfluorodecane Sulfonate										
598.4 > 79.6	13.128	13.058	0.070	1.000	125658	NC			467	
49 Perfluorodecane Sulfonic acid										
598.4 > 79.6	13.128	13.058	0.070	1.000	125658	6.08		126		
D 26 13C2 PFUnA										
564.3 > 519.5	13.181	13.097	0.084		3765798	64.4		129	5102	
27 Perfluoroundecanoic acid										
562.4 > 518.5	13.181	13.097	0.084	1.000	386752	4.95		99.0	505	
D 28 13C2 PFDoA										
614.4 > 569.4	13.739	13.674	0.065		4112735	57.8		116	5008	
29 Perfluorododecanoic acid										
612.4 > 568.6	13.749	13.674	0.075	1.000	347709	5.25		105	222	
30 Perfluorotridecanoic acid										
662.4 > 618.5	14.220	14.155	0.065	1.000	378224	5.51		110	270	
D 33 13C2-PFTeDA										
714.5 > 669.5	14.635	14.569	0.066		3587033	56.6		113	4316	
32 Perfluorotetradecanoic acid										
712.6 > 668.5	14.635	14.572	0.063	1.000	151695	4.64		92.8	100	
D 35 13C2-PFHxDA										
814.8 > 769.6	15.159	15.119	0.040		1599911	53.9		108	3273	
34 Perfluorohexadecanoic acid										
812.6 > 768.6	15.159	15.119	0.040	1.000	425951	4.66		93.2	417	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
36 Perfluorooctandecanoic acid										
912.7 > 868.6	15.461	15.428	0.033	1.000	341392	4.63		92.7	331	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L3_00016 Amount Added: 1.00 Units: mL

Report Date: 15-Feb-2016 10:02:21 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160212-28353.b\12FEB2016A4A_005.d

Injection Date: 12-Feb-2016 11:17:51 Instrument ID: A4

Lims ID: Std L3

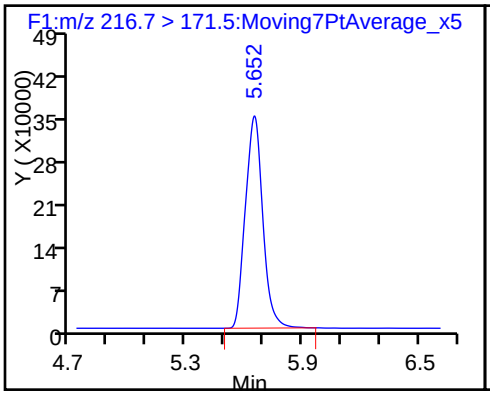
Client ID:

Operator ID: JRB ALS Bottle#: 4 Worklist Smp#: 4

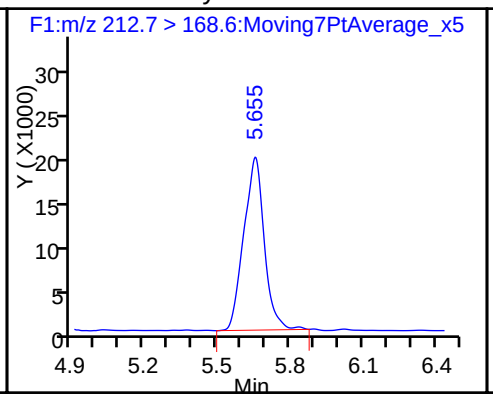
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

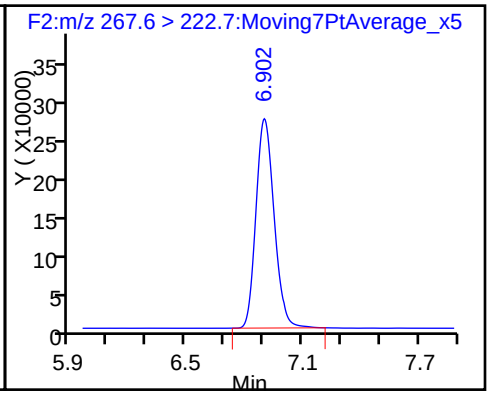
D 1 13C4 PFBA



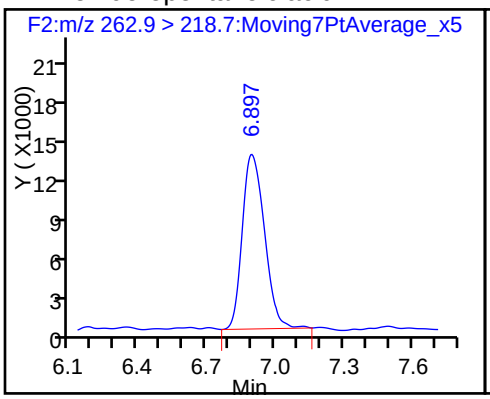
2 Perfluorobutyric acid



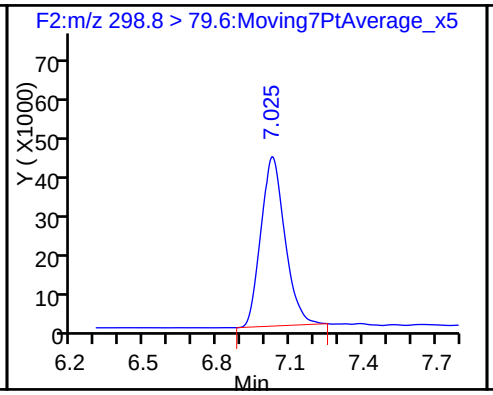
D 3 13C5-PFPeA



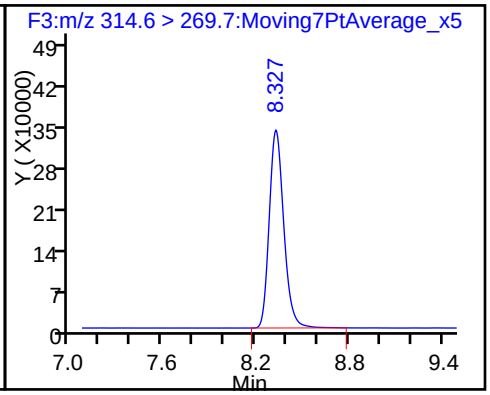
4 Perfluoropentanoic acid



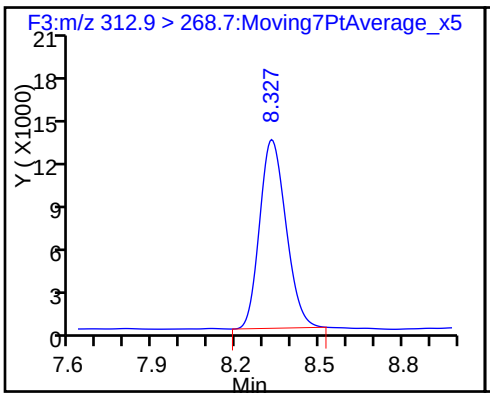
51 Perfluorobutanesulfonic acid



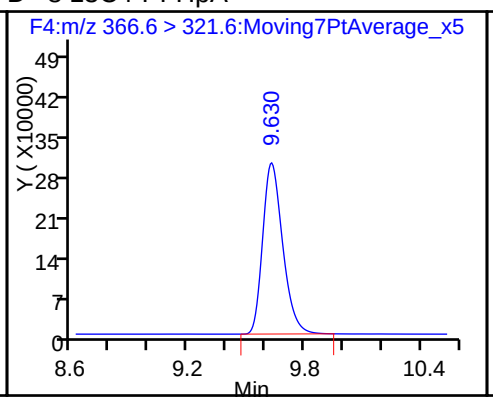
D 6 13C2 PFHxA



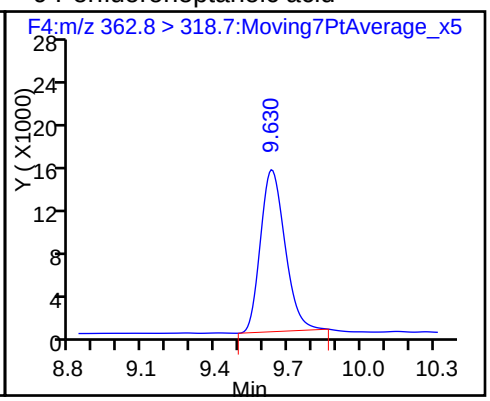
7 Perfluorohexanoic acid



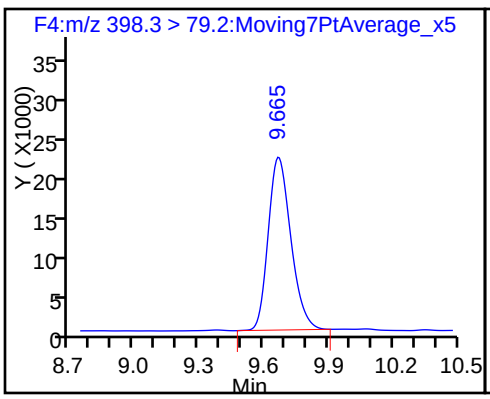
D 8 13C4-PFHpA



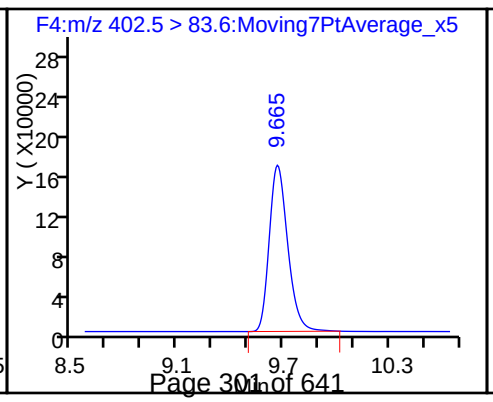
9 Perfluoroheptanoic acid



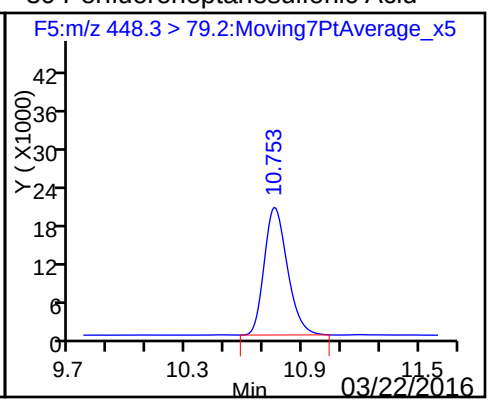
58 Perfluorohexanesulfonic acid



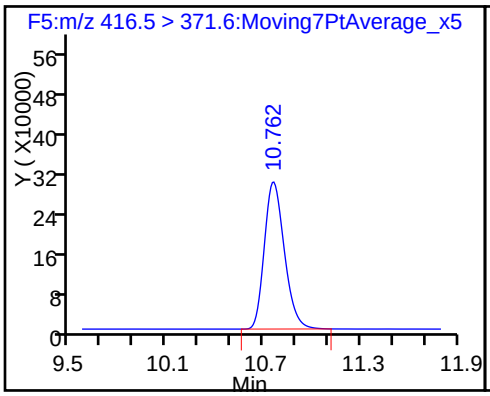
D 11 18O2 PFHxS



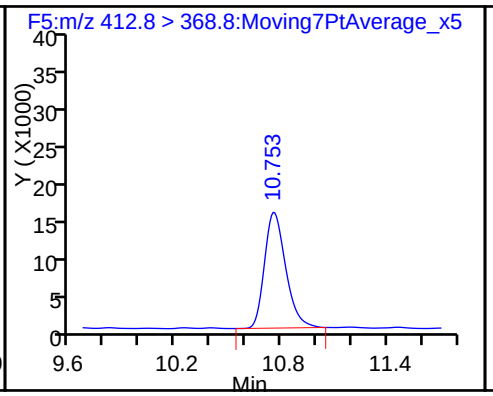
39 Perfluoroheptanesulfonic Acid



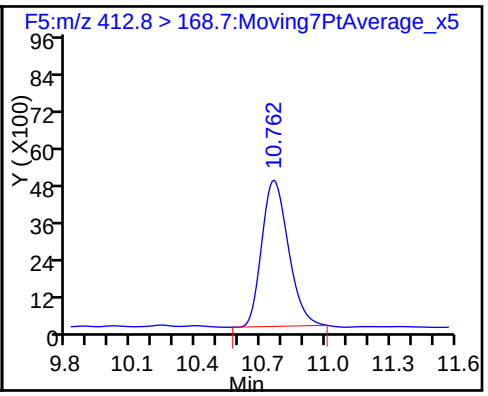
D 12 13C4 PFOA



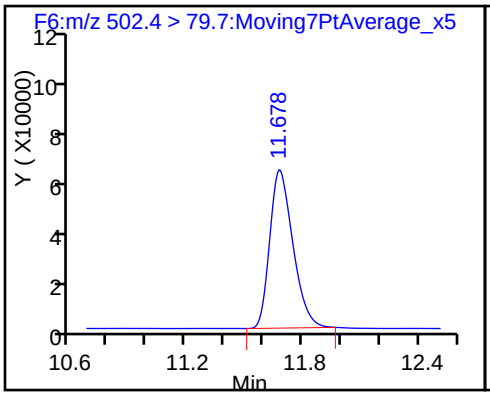
13 Perfluorooctanoic acid



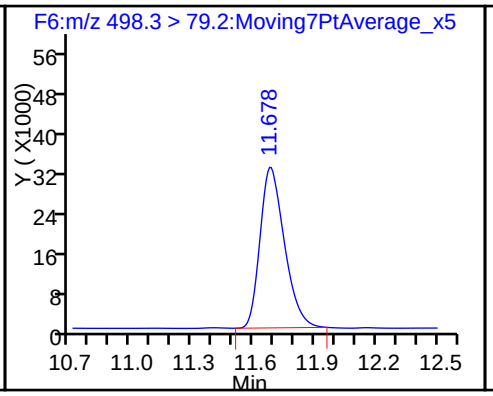
13 Perfluorooctanoic acid



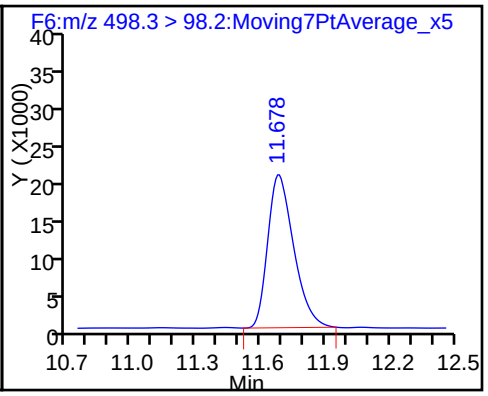
D 16 13C4 PFOS



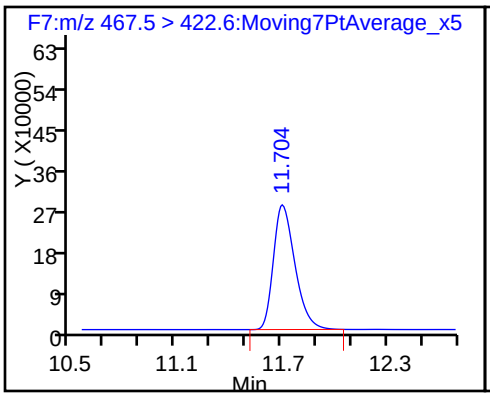
15 Perfluorooctane sulfonic acid



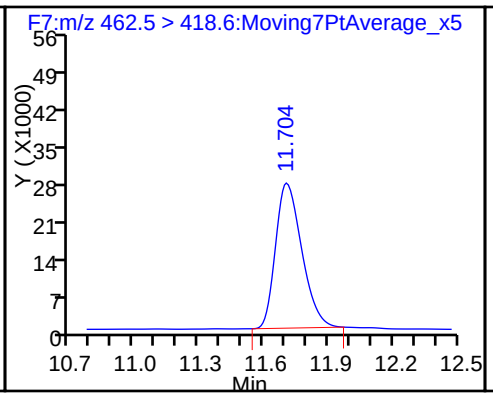
15 Perfluorooctane sulfonic acid



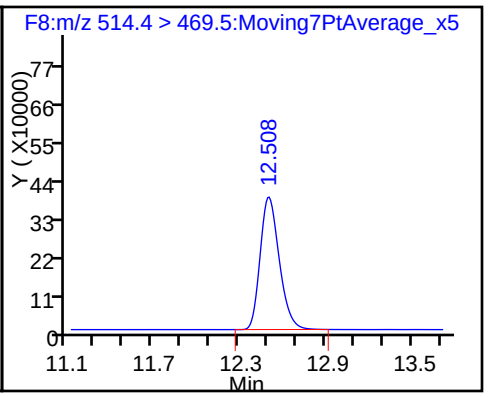
D 17 13C5 PFNA



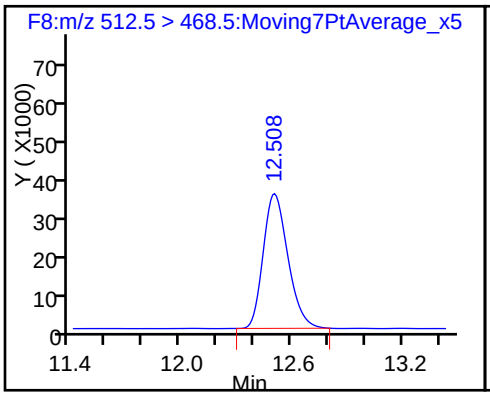
18 Perfluorononanoic acid



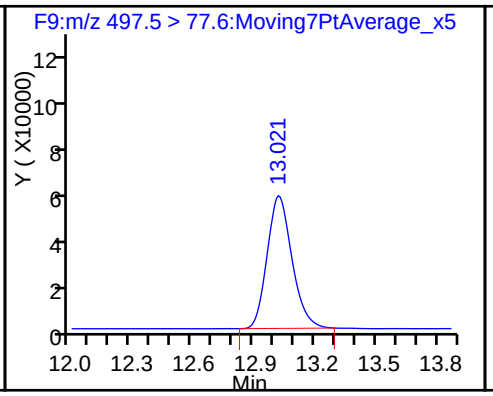
D 19 13C2 PFDA



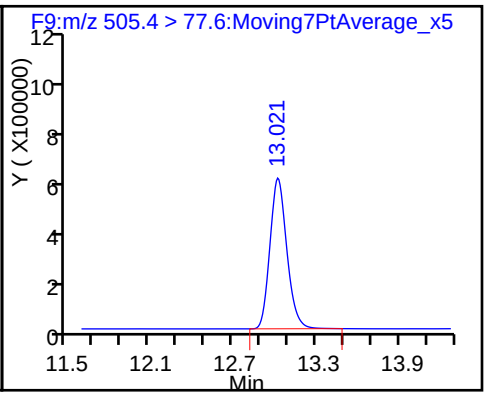
20 Perfluorodecanoic acid



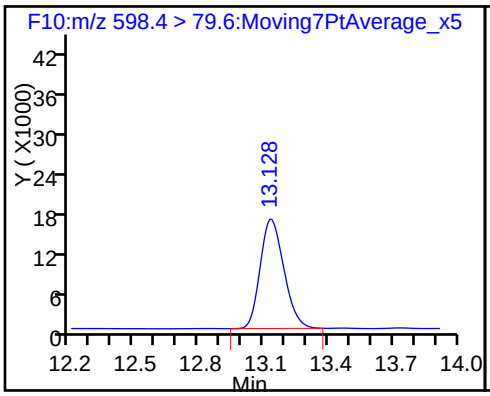
24 Perfluorooctane Sulfonamide



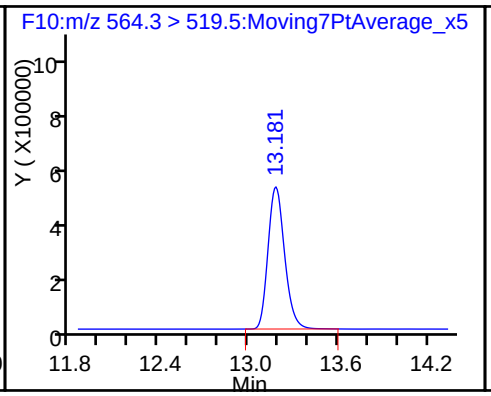
D 23 13C8 FOSA



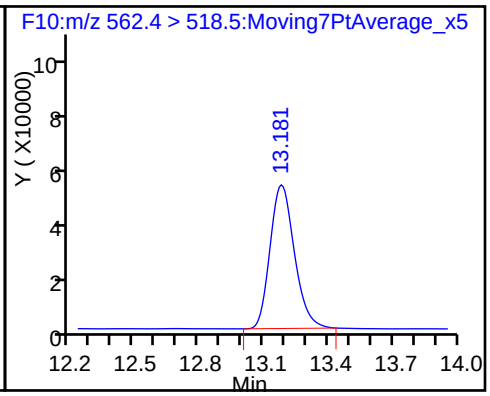
49 Perfluorodecane Sulfonic acid



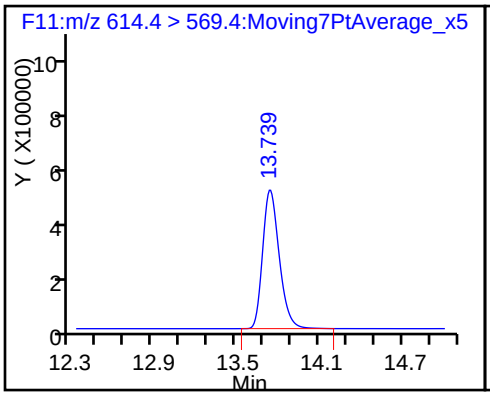
D 26 13C2 PFUnA



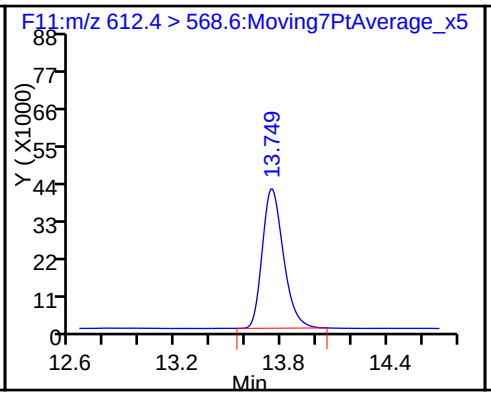
27 Perfluoroundecanoic acid



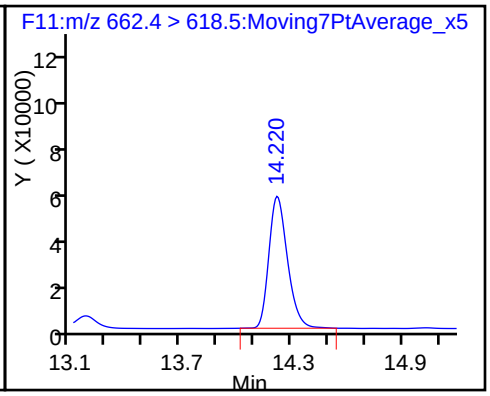
D 28 13C2 PFDoA



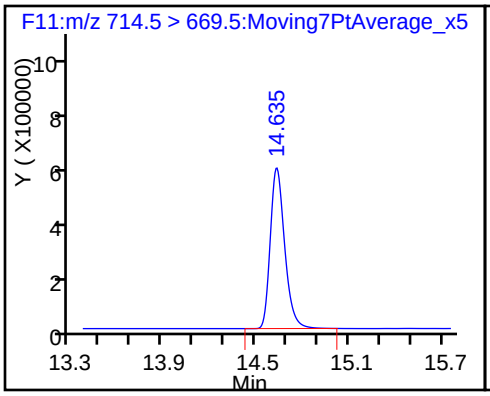
29 Perfluorododecanoic acid



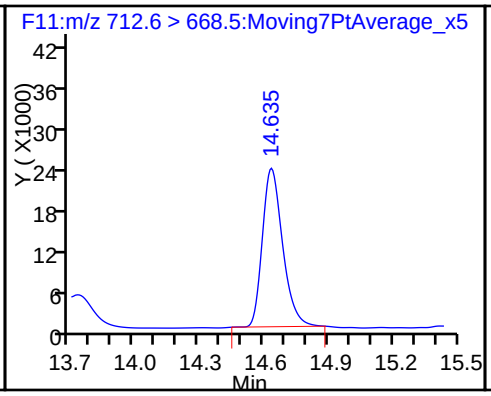
30 Perfluorotridecanoic acid



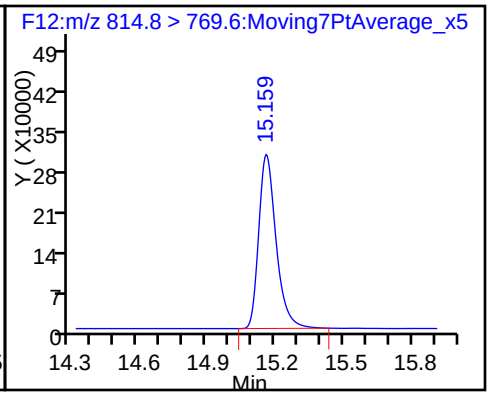
D 33 13C2-PFTeDA



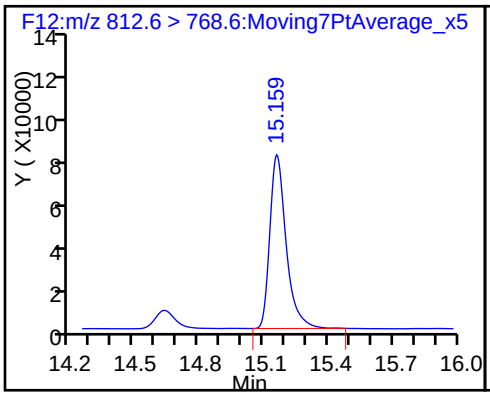
32 Perfluorotetradecanoic acid



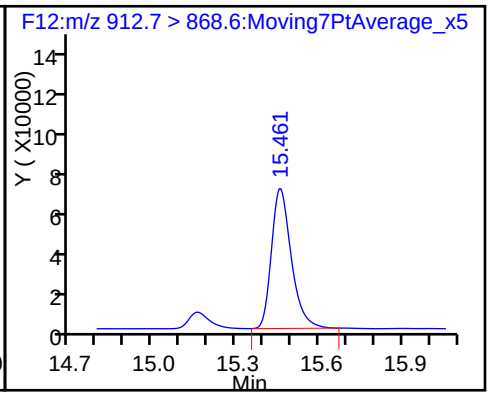
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160212-28353.b\12FEB2016A4A_006.d
Lims ID: Std L4
Client ID:
Sample Type: IC Calib Level: 4
Inject. Date: 12-Feb-2016 11:39:03 ALS Bottle#: 5 Worklist Smp#: 5
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: STD L4
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4
Sublist: chrom-PFAC_A4*sub12

Method: \\ChromNA\Sacramento\ChromData\A4\20160212-28353.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 15-Feb-2016 11:03:53 Calib Date: 12-Feb-2016 12:42:35
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160212-28353.b\12FEB2016A4A_009.d

Column 1 : Det: F1:MRM
Process Host: XAWRK007

First Level Reviewer: westendorfc Date: 15-Feb-2016 11:03:53

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
216.7 > 171.5	5.757	5.712	0.045		2252325	55.5		111	6938	
2 Perfluorobutyric acid										
212.7 > 168.6	5.753	5.712	0.041	1.000	448061	20.3		101	1325	
4 Perfluoropentanoic acid										
262.9 > 218.7	7.058	6.986	0.072	1.000	343823	20.5		102	278	
D 3 13C5-PFPeA										
267.6 > 222.7	7.058	6.986	0.072		1781896	55.7		111	4204	
5 Perfluorobutane Sulfonate										
298.8 > 79.6	7.190	7.115	0.075	1.000	512492	NC			346	
298.8 > 98.6	7.187	7.115	0.072	1.000	330932		1.55(0.00-0.00)		261	
51 Perfluorobutanesulfonic acid										
298.8 > 79.6	7.190	7.115	0.075	1.000	512492	18.1		102		
D 6 13C2 PFHxA										
314.6 > 269.7	8.432	8.367	0.065		2274718	58.1		116	6607	
7 Perfluorohexanoic acid										
312.9 > 268.7	8.432	8.369	0.063	1.000	394416	20.1		101	1381	
D 8 13C4-PFHpA										
366.6 > 321.6	9.685	9.639	0.046		2111070	54.2		108	4381	
9 Perfluoroheptanoic acid										
362.8 > 318.7	9.692	9.640	0.052	1.000	438459	20.3		101	1619	
58 Perfluorohexanesulfonic acid										
398.3 > 79.2	9.720	9.675	0.045	1.000	532601	18.7		98.8		
10 Perfluorohexane Sulfonate										
398.3 > 79.2	9.720	9.675	0.045	1.000	532601	NC			1420	
D 11 18O2 PFHxS										
402.5 > 83.6	9.720	9.675	0.045		1191134	52.5		111	2897	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
39 Perfluoroheptanesulfonic Acid										
448.3 > 79.2	10.770	10.740	0.030	1.000	631312	19.5		102		
14 Perfluoroheptane Sulfonate										
448.3 > 79.2	10.770	10.740	0.030	1.000	631312	NC			2265	
D 12 13C4 PFOA										
416.5 > 371.6	10.779	10.743	0.036		2286718	53.7		107	3668	
13 Perfluorooctanoic acid										
412.8 > 368.8	10.770	10.743	0.027	1.000	428131	19.1		95.3	775	
412.8 > 168.7	10.779	10.743	0.036	1.001	164089		2.61(0.00-0.00)	95.3	523	
D 16 13C4 PFOS										
502.4 > 79.7	11.677	11.651	0.026		609839	60.2		126	2302	
15 Perfluorooctane sulfonic acid										
498.3 > 79.2	11.677	11.656	0.021	1.000	1000210	18.4		96.1	2032	
498.3 > 98.2	11.677	11.656	0.021	1.000	596288		1.68(0.00-0.00)	96.1	1477	
D 17 13C5 PFNA										
467.5 > 422.6	11.703	11.678	0.025		2172455	52.2		104	3784	
18 Perfluorononanoic acid										
462.5 > 418.6	11.703	11.680	0.023	1.000	984533	21.7		108	1232	
D 19 13C2 PFDA										
514.4 > 469.5	12.486	12.473	0.013		3126636	53.2		106	4935	
20 Perfluorodecanoic acid										
512.5 > 468.5	12.496	12.476	0.020	1.000	1134637	19.8		99.2	2598	
24 Perfluorooctane Sulfonamide										
497.5 > 77.6	13.013	12.991	0.022	1.000	1982787	20.1		100	2317	
D 23 13C8 FOSA										
505.4 > 77.6	13.013	12.991	0.022		5229659	58.5		117	2282	
25 Perfluorodecane Sulfonate										
598.4 > 79.6	13.111	13.098	0.013	1.000	467598	NC			1809	
49 Perfluorodecane Sulfonic acid										
598.4 > 79.6	13.111	13.098	0.013	1.000	467598	19.0		98.7		
D 26 13C2 PFUnA										
564.3 > 519.5	13.163	13.146	0.017		3171146	54.2		108	3316	
27 Perfluoroundecanoic acid										
562.4 > 518.5	13.163	13.146	0.017	1.000	1318141	20.0		100	1564	
D 28 13C2 PFDoA										
614.4 > 569.4	13.730	13.713	0.017		3714597	52.2		104	3490	
29 Perfluorododecanoic acid										
612.4 > 568.6	13.730	13.715	0.015	1.000	1253957	21.0		105	682	
30 Perfluorotridecanoic acid										
662.4 > 618.5	14.205	14.193	0.012	1.000	1410790	22.8		114	894	
D 33 13C2-PFTeDA										
714.5 > 669.5	14.615	14.603	0.012		3578785	56.5		113	4100	
32 Perfluorotetradecanoic acid										
712.6 > 668.5	14.615	14.604	0.011	1.000	573742	20.2		101	358	
D 35 13C2-PFHxDA										
814.8 > 769.6	15.144	15.138	0.006		1823759	61.5		123	3523	
34 Perfluorohexadecanoic acid										
812.6 > 768.6	15.144	15.139	0.005	1.000	1600494	19.8		99.2	1464	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
36 Perfluorooctandecanoic acid										
912.7 > 868.6	15.446	15.442	0.004	1.000	1468803	20.1		100	1170	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L4_00017 Amount Added: 1.00 Units: mL

Report Date: 15-Feb-2016 11:03:54 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160212-28353.b\12FEB2016A4A_006.d

Injection Date: 12-Feb-2016 11:39:03 Instrument ID: A4

Lims ID: Std L4

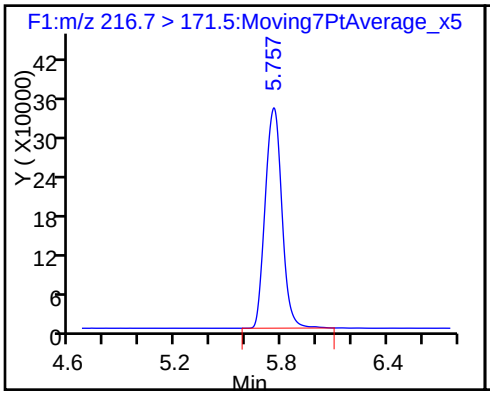
Client ID:

Operator ID: JRB ALS Bottle#: 5 Worklist Smp#: 5

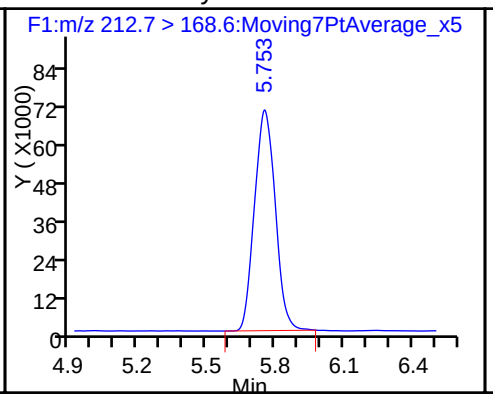
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

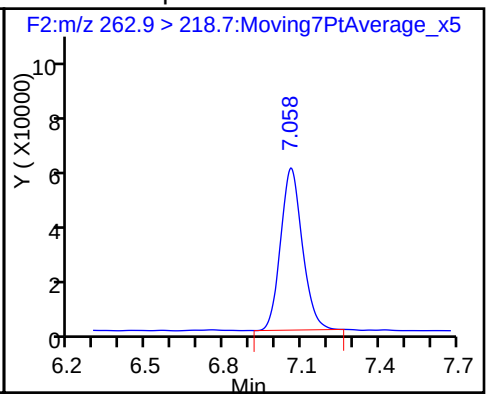
D 1 13C4 PFBA



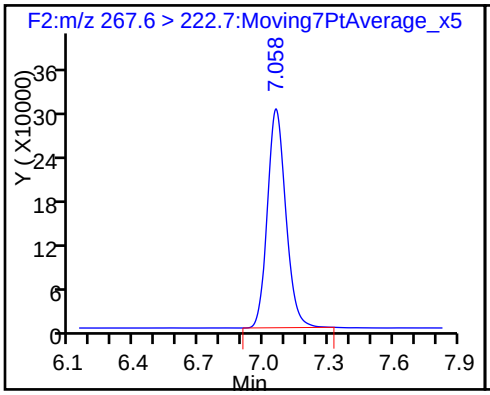
2 Perfluorobutyric acid



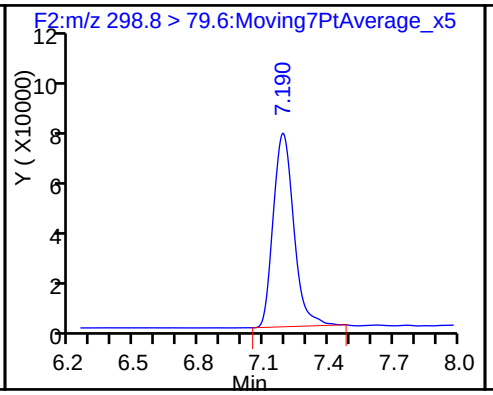
4 Perfluoropentanoic acid



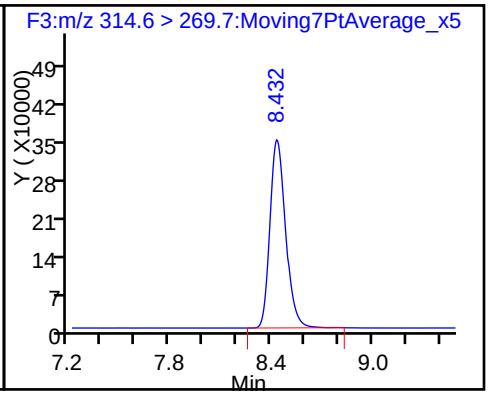
D 3 13C5-PFPeA



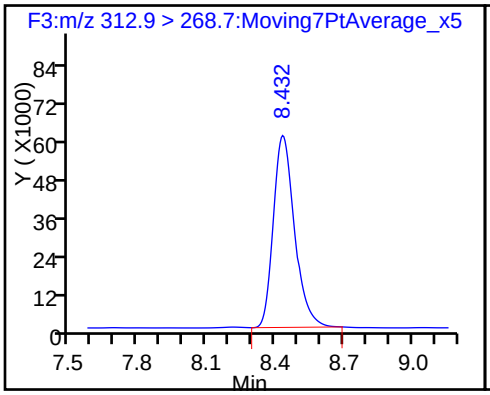
51 Perfluorobutanesulfonic acid



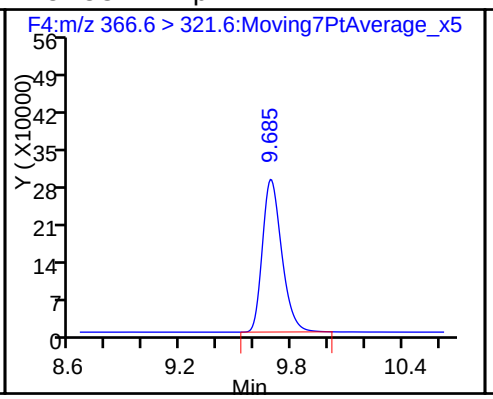
D 6 13C2 PFHxA



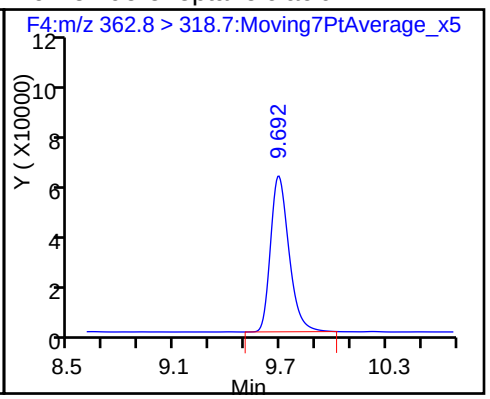
7 Perfluorohexanoic acid



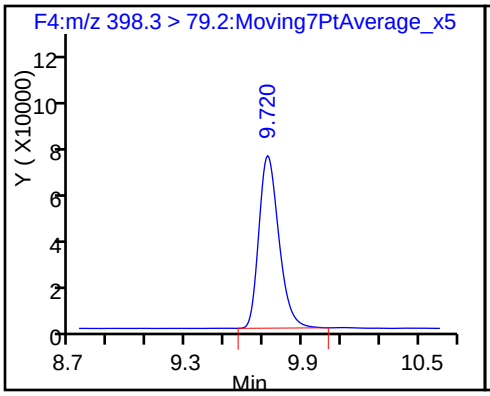
D 8 13C4-PFHpA



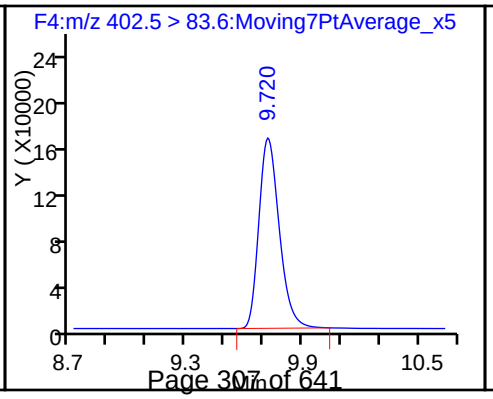
9 Perfluoroheptanoic acid



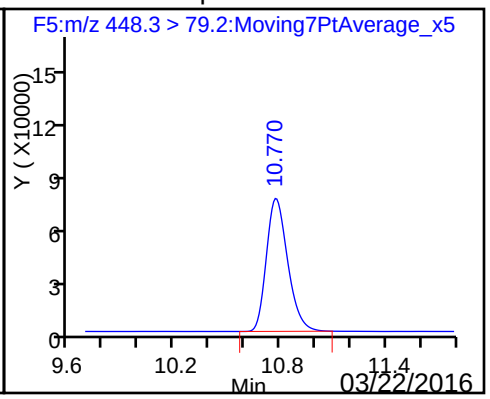
58 Perfluorohexanesulfonic acid



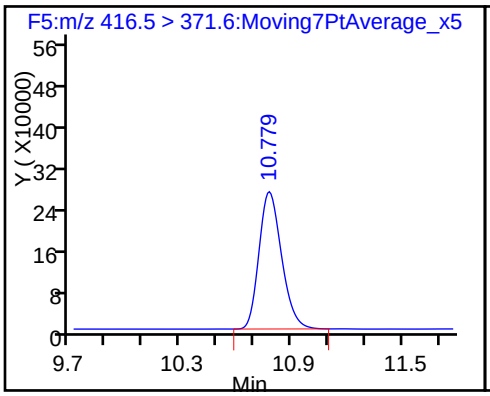
D 11 18O2 PFHxS



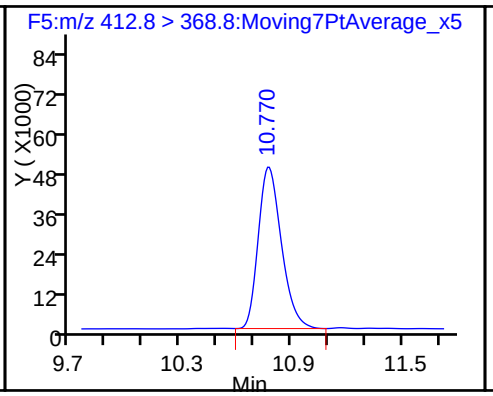
39 Perfluoroheptanesulfonic Acid



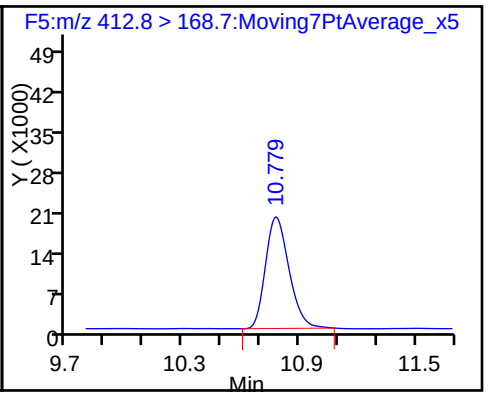
D 12 13C4 PFOA



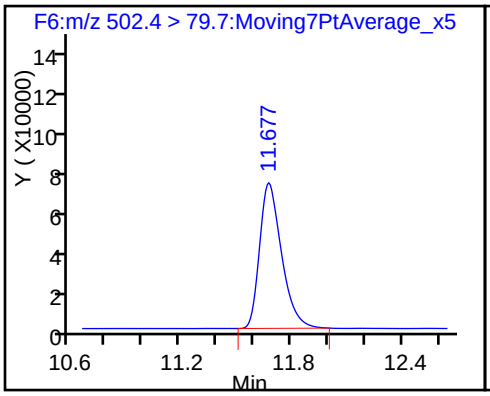
13 Perfluorooctanoic acid



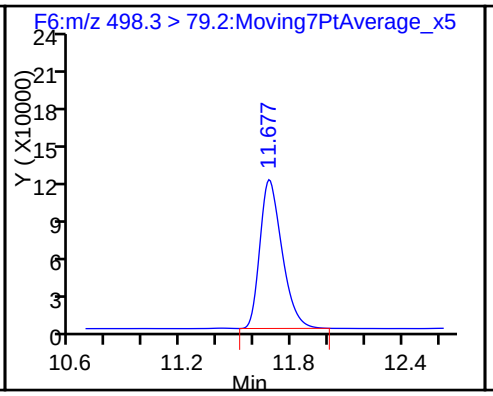
13 Perfluorooctanoic acid



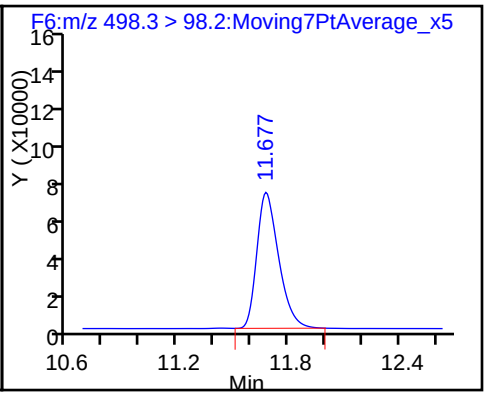
D 16 13C4 PFOS



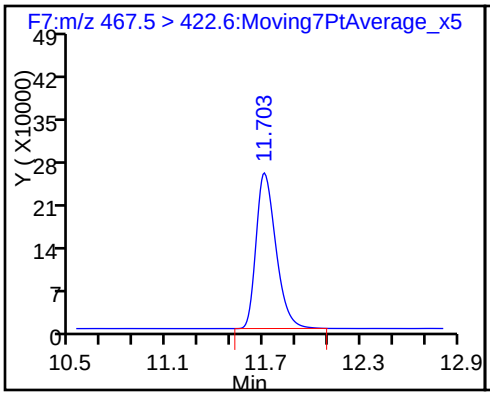
15 Perfluorooctane sulfonic acid



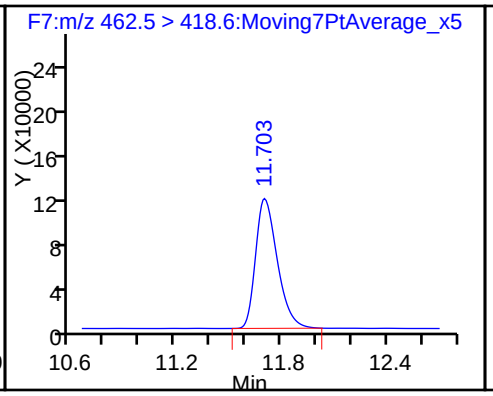
15 Perfluorooctane sulfonic acid



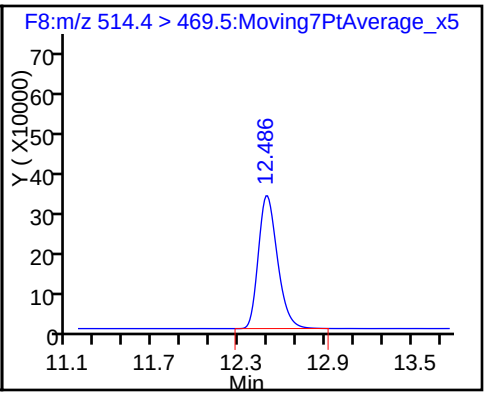
D 17 13C5 PFNA



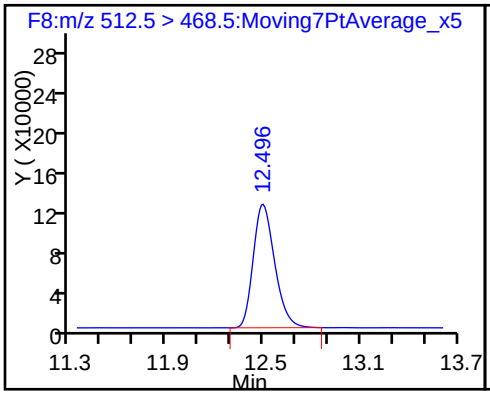
18 Perfluorononanoic acid



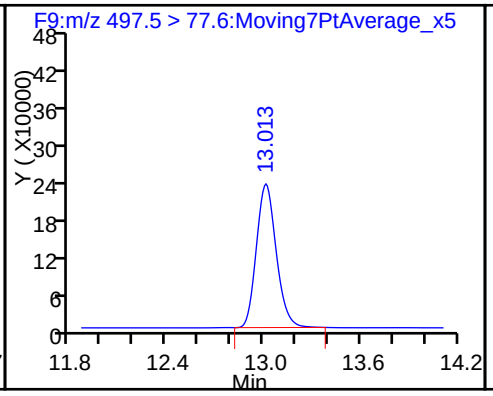
D 19 13C2 PFDA



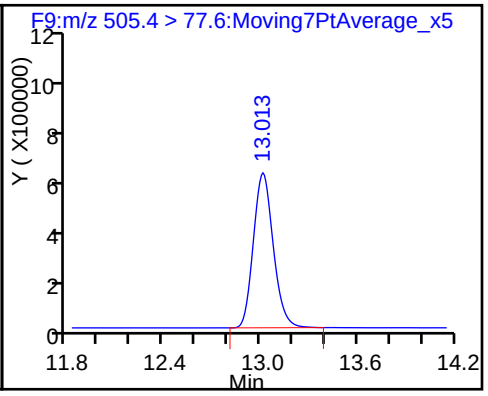
20 Perfluorodecanoic acid



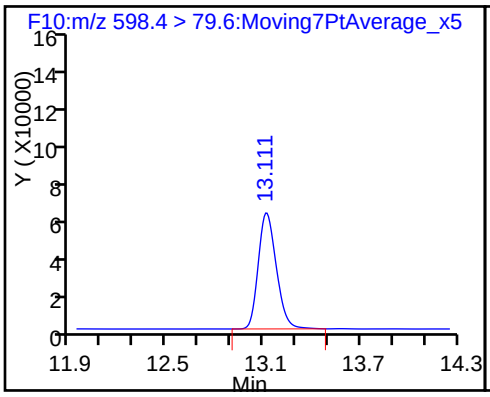
24 Perfluorooctane Sulfonamide



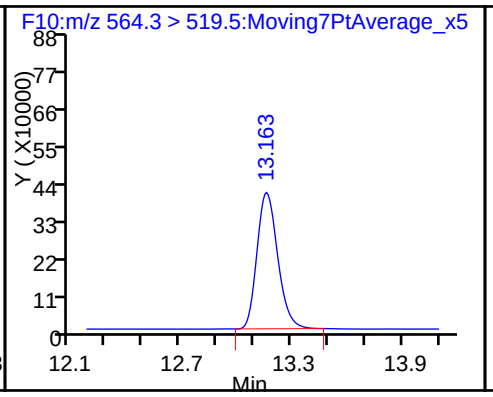
D 23 13C8 FOSA



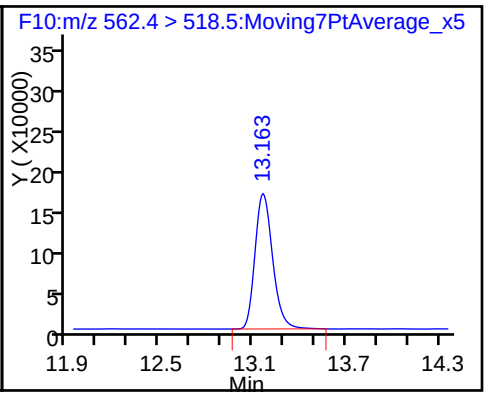
49 Perfluorodecane Sulfonic acid



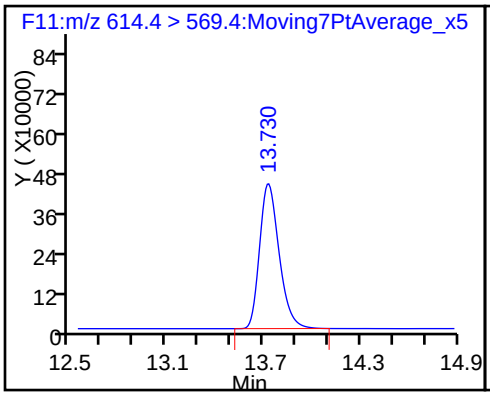
D 26 13C2 PFUnA



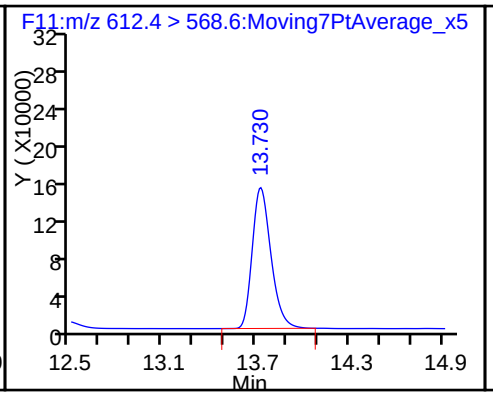
27 Perfluoroundecanoic acid



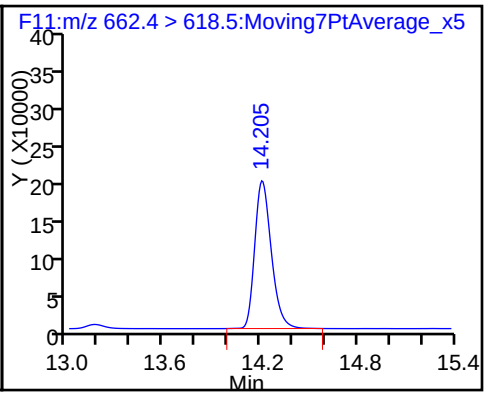
D 28 13C2 PFDoA



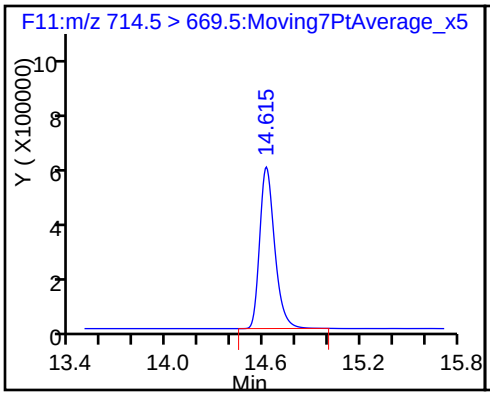
29 Perfluorododecanoic acid



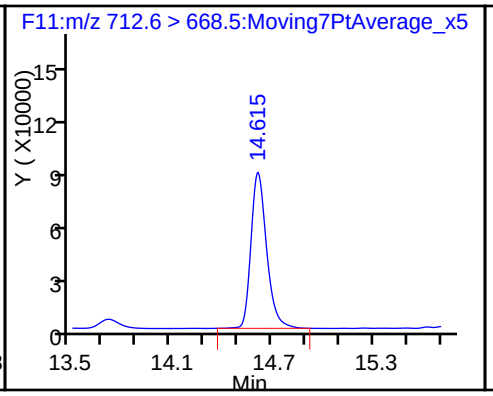
30 Perfluorotridecanoic acid



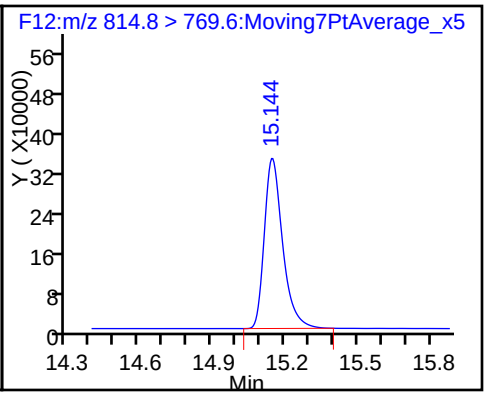
D 33 13C2-PFTeDA



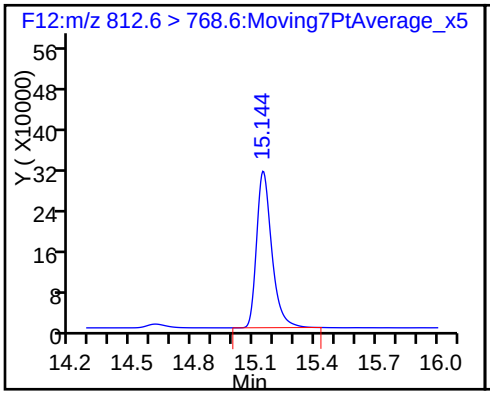
32 Perfluorotetradecanoic acid



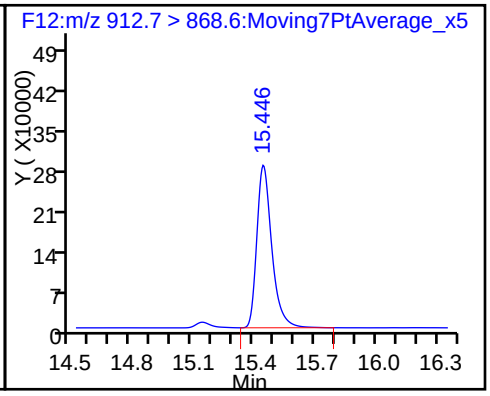
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160212-28353.b\12FEB2016A4A_007.d
Lims ID: Std L5
Client ID:
Sample Type: IC Calib Level: 5
Inject. Date: 12-Feb-2016 12:00:14 ALS Bottle#: 6 Worklist Smp#: 6
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: STD L5
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4
Sublist: chrom-PFAC_A4*sub12

Method: \\ChromNA\Sacramento\ChromData\A4\20160212-28353.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 15-Feb-2016 10:31:48 Calib Date: 12-Feb-2016 12:42:35
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160212-28353.b\12FEB2016A4A_009.d

Column 1 : Det: F1:MRM
Process Host: XAWRK007

First Level Reviewer: barnettj Date: 12-Feb-2016 14:27:49

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
216.7 > 171.5	5.735	5.712	0.023		2075195	51.1		102	6828	
2 Perfluorobutyric acid										
212.7 > 168.6	5.735	5.712	0.023	1.000	1048362	51.5		103	2760	
4 Perfluoropentanoic acid										
262.9 > 218.7	7.015	6.986	0.029	1.000	810081	50.5		101	925	
D 3 13C5-PFPeA										
267.6 > 222.7	7.018	6.986	0.032		1702935	53.2		106	4252	
5 Perfluorobutane Sulfonate										
298.8 > 79.6	7.144	7.115	0.029	1.000	938494	NC			632	
298.8 > 98.6	7.147	7.115	0.032	1.000	594597		1.58(0.00-0.00)		483	
51 Perfluorobutanesulfonic acid										
298.8 > 79.6	7.144	7.115	0.029	1.000	938494	49.5		112		
D 6 13C2 PFHxA										
314.6 > 269.7	8.393	8.367	0.026		1984057	50.7		101	4591	
7 Perfluorohexanoic acid										
312.9 > 268.7	8.393	8.369	0.024	1.000	886159	51.8		104	1218	
D 8 13C4-PFHpA										
366.6 > 321.6	9.663	9.639	0.024		1911848	49.1		98.2	3668	
9 Perfluoroheptanoic acid										
362.8 > 318.7	9.663	9.640	0.023	1.000	929700	47.5		95.0	1818	
58 Perfluorohexanesulfonic acid										
398.3 > 79.2	9.698	9.675	0.023	1.000	1192387	45.4		95.9		
10 Perfluorohexane Sulfonate										
398.3 > 79.2	9.698	9.675	0.023	1.000	1192387	NC			2528	
D 11 18O2 PFHxS										
402.5 > 83.6	9.698	9.675	0.023		1110488	49.0		104	3185	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
39 Perfluoroheptanesulfonic Acid										
448.3 > 79.2	10.760	10.740	0.020	1.000	1320551	36.6		76.9		
14 Perfluoroheptane Sulfonate										
448.3 > 79.2	10.760	10.740	0.020	1.000	1320551	NC			3285	
D 12 13C4 PFOA										
416.5 > 371.6	10.760	10.743	0.017		2064639	48.5		97.0	4189	
13 Perfluorooctanoic acid										
412.8 > 368.8	10.760	10.743	0.017	1.000	969508	47.8		95.6	1437	
412.8 > 168.7	10.770	10.743	0.027	1.001	375980		2.58(0.00-0.00)	95.6	1362	
D 16 13C4 PFOS										
502.4 > 79.7	11.668	11.651	0.017		677767	66.9		140	1996	
15 Perfluorooctane sulfonic acid										
498.3 > 79.2	11.676	11.656	0.020	1.000	2377814	39.3		82.3	2245	
498.3 > 98.2	11.676	11.656	0.020	1.000	1271737		1.87(0.00-0.00)	82.3	2060	
D 17 13C5 PFNA										
467.5 > 422.6	11.694	11.678	0.016		1984772	47.7		95.4	2612	
18 Perfluorononanoic acid										
462.5 > 418.6	11.694	11.680	0.014	1.000	2055860	49.4		98.8	1799	
D 19 13C2 PFDA										
514.4 > 469.5	12.493	12.473	0.020		2605584	44.4		88.7	3301	
20 Perfluorodecanoic acid										
512.5 > 468.5	12.493	12.476	0.017	1.000	2455156	51.5		103	4334	
24 Perfluorooctane Sulfonamide										
497.5 > 77.6	13.010	12.991	0.019	1.000	4712375	51.8		104	2004	
D 23 13C8 FOSA										
505.4 > 77.6	13.010	12.991	0.019		4811591	53.9		108	2184	
25 Perfluorodecane Sulfonate										
598.4 > 79.6	13.116	13.098	0.018	1.000	1059583	NC			2639	
49 Perfluorodecane Sulfonic acid										
598.4 > 79.6	13.116	13.098	0.018	1.000	1059583	38.8		80.5		
D 26 13C2 PFUnA										
564.3 > 519.5	13.169	13.146	0.023		2571081	43.9		87.9	3012	
27 Perfluoroundecanoic acid										
562.4 > 518.5	13.169	13.146	0.023	1.000	2719401	51.0		102	2174	
D 28 13C2 PFDoA										
614.4 > 569.4	13.727	13.713	0.014		3479267	48.9		97.8	3001	
29 Perfluorododecanoic acid										
612.4 > 568.6	13.727	13.715	0.012	1.000	2956390	52.8		106	1702	
30 Perfluorotridecanoic acid										
662.4 > 618.5	14.210	14.193	0.017	1.000	2877547	49.6		99.1	1541	
D 33 13C2-PFTeDA										
714.5 > 669.5	14.613	14.603	0.010		3289262	51.9		104	4573	
32 Perfluorotetradecanoic acid										
712.6 > 668.5	14.613	14.604	0.009	1.000	1341162	50.7		101	826	
D 35 13C2-PFHxDA										
814.8 > 769.6	15.146	15.138	0.008		1830150	61.7		123	3757	
34 Perfluorohexadecanoic acid										
812.6 > 768.6	15.146	15.139	0.007	1.000	3609294	48.0		95.9	2731	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
36 Perfluorooctandecanoic acid										
912.7 > 868.6	15.448	15.442	0.006	1.000	3340365	47.9		95.9	2275	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L5_00016 Amount Added: 1.00 Units: mL

Report Date: 15-Feb-2016 10:31:51 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160212-28353.b\12FEB2016A4A_007.d

Injection Date: 12-Feb-2016 12:00:14 Instrument ID: A4

Lims ID: Std L5

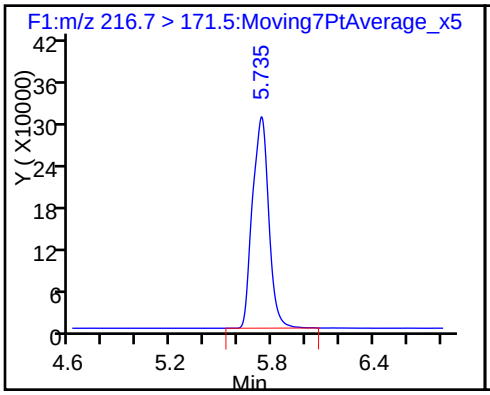
Client ID:

Operator ID: JRB ALS Bottle#: 6 Worklist Smp#: 6

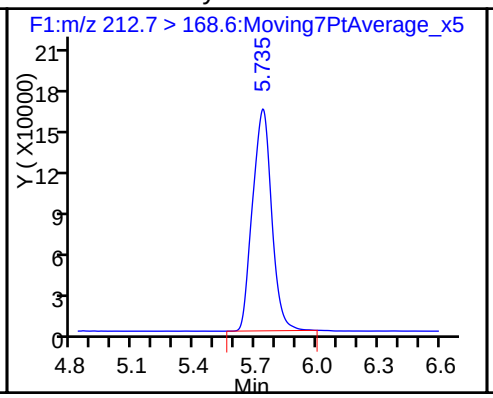
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

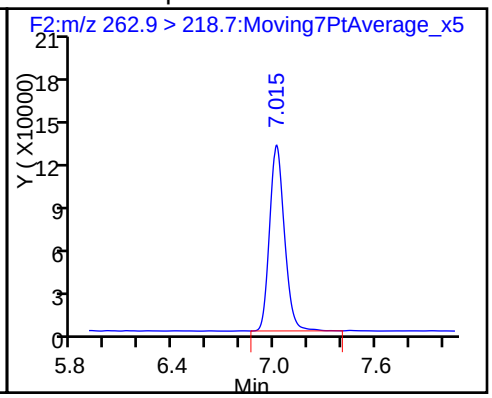
D 1 13C4 PFBA



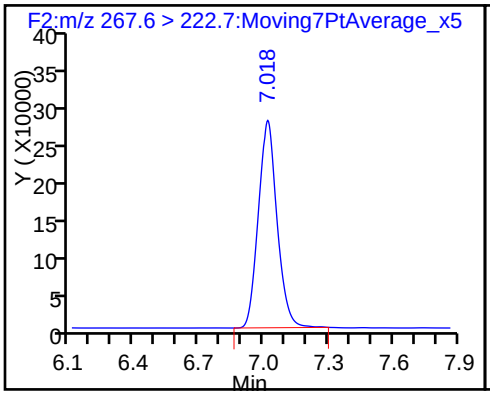
2 Perfluorobutyric acid



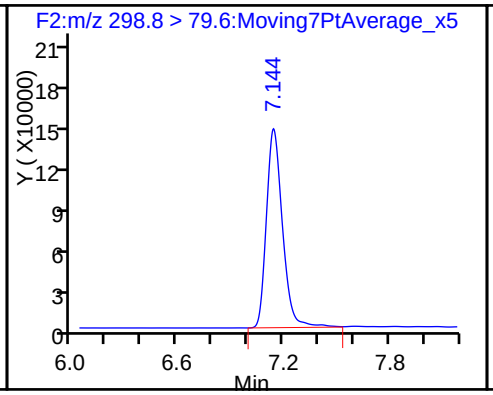
4 Perfluoropentanoic acid



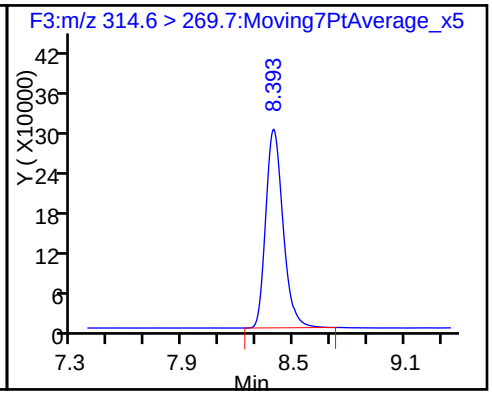
D 3 13C5-PFPeA



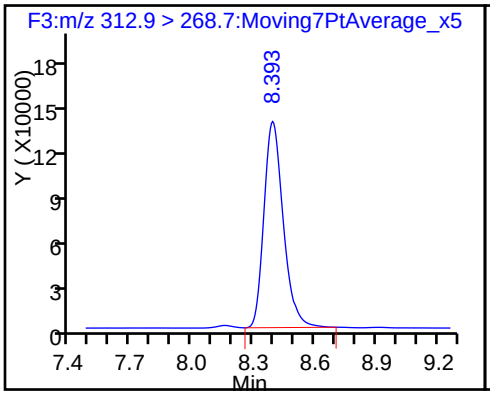
51 Perfluorobutanesulfonic acid



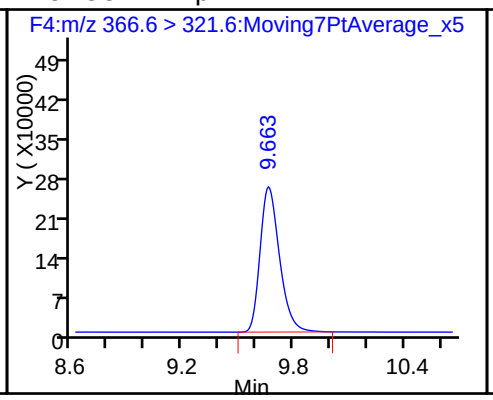
D 6 13C2 PFHxA



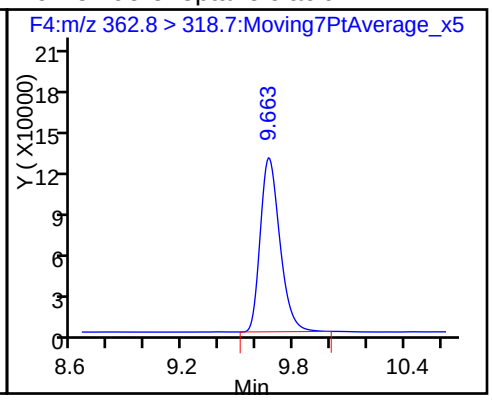
7 Perfluorohexanoic acid



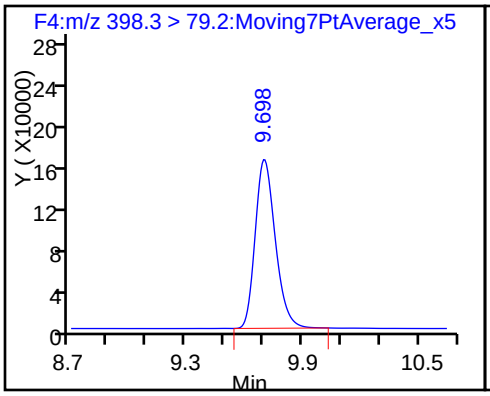
D 8 13C4-PFHpA



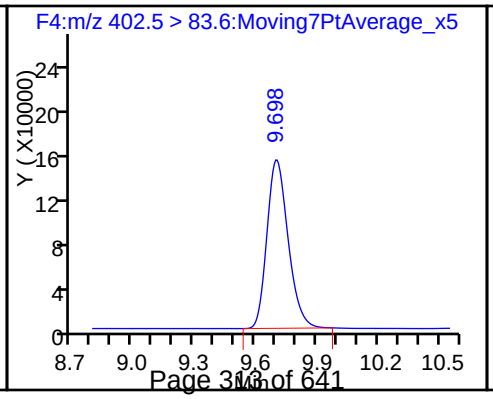
9 Perfluoroheptanoic acid



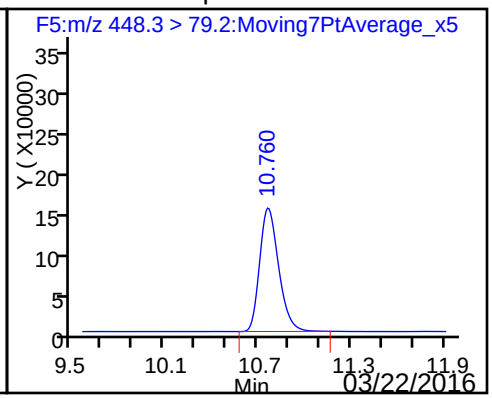
58 Perfluorohexanesulfonic acid



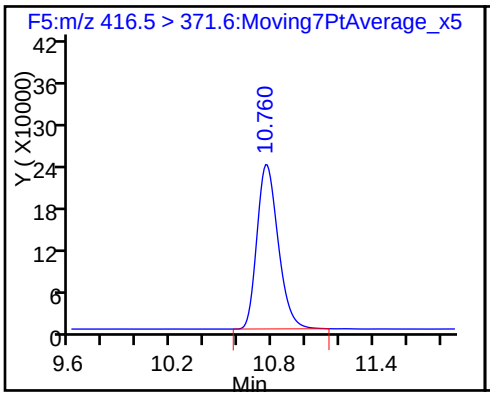
D 11 18O2 PFHxS



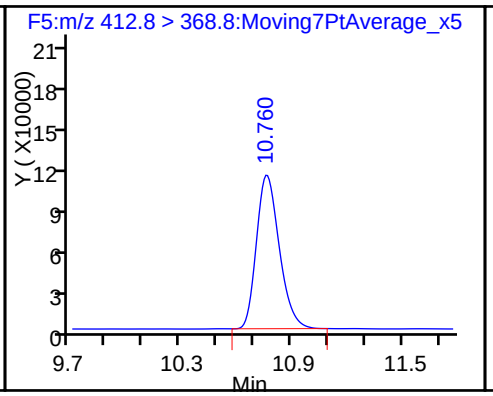
39 Perfluoroheptanesulfonic Acid



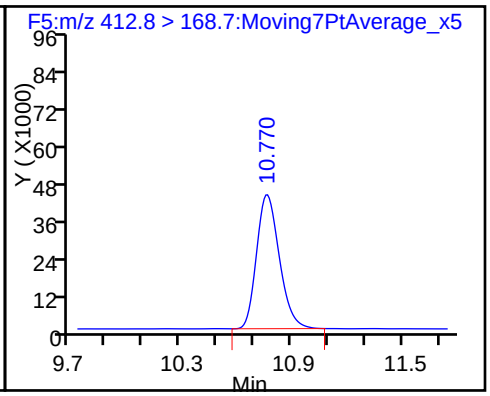
D 12 13C4 PFOA



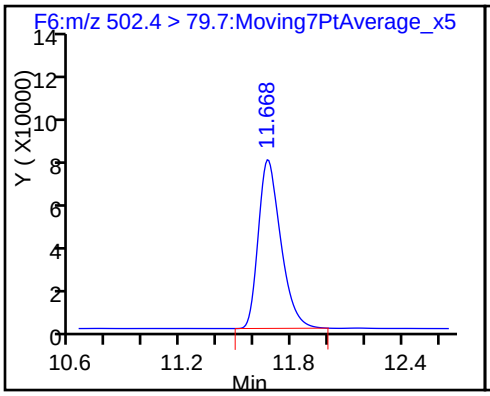
13 Perfluorooctanoic acid



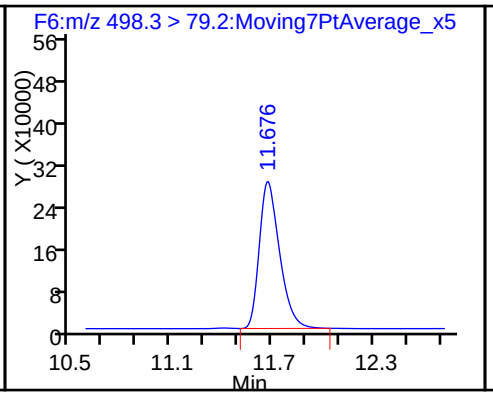
13 Perfluorooctanoic acid



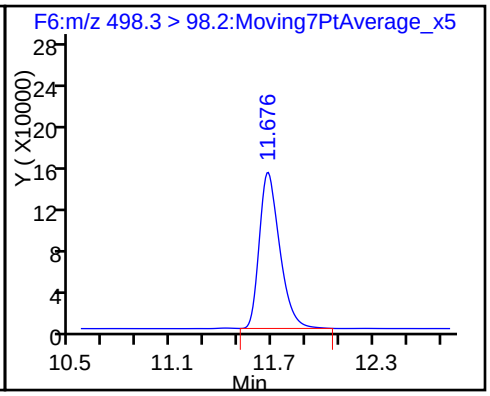
D 16 13C4 PFOS



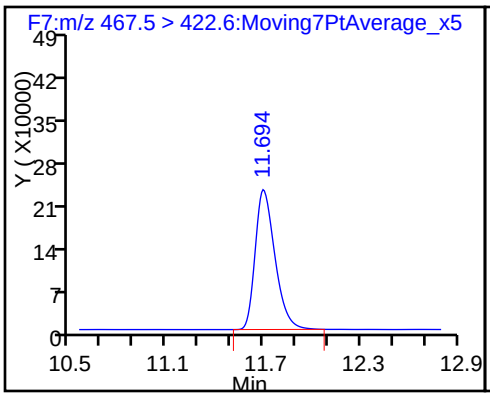
15 Perfluorooctane sulfonic acid



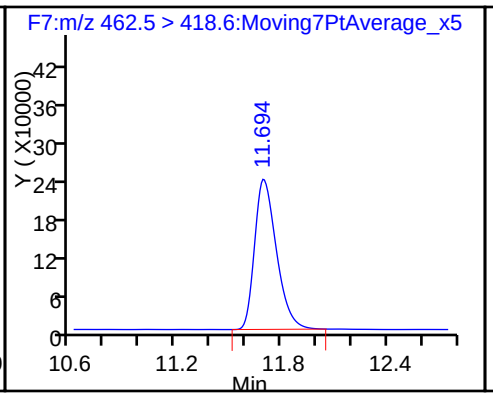
15 Perfluorooctane sulfonic acid



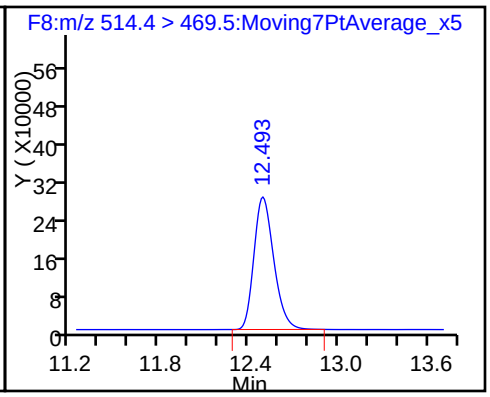
D 17 13C5 PFNA



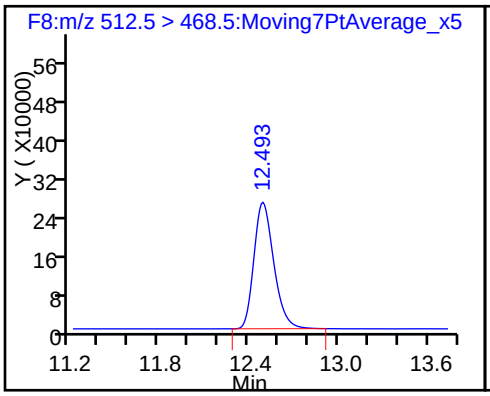
18 Perfluorononanoic acid



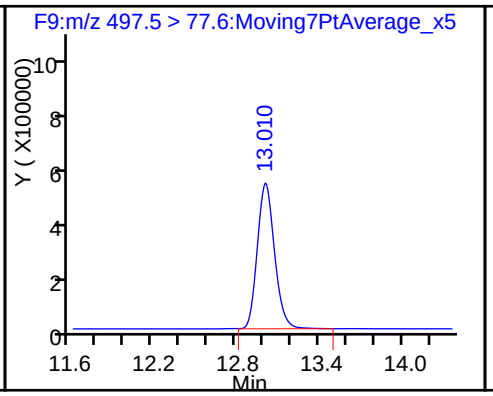
D 19 13C2 PFDA



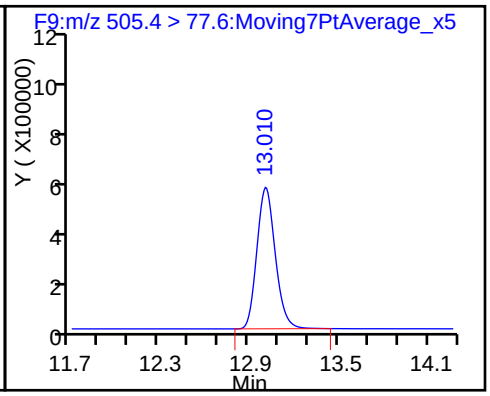
20 Perfluorodecanoic acid



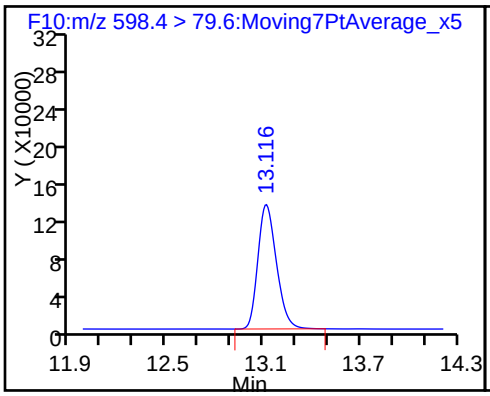
24 Perfluorooctane Sulfonamide



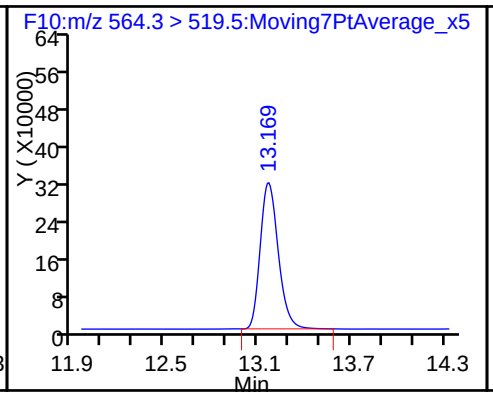
D 23 13C8 FOSA



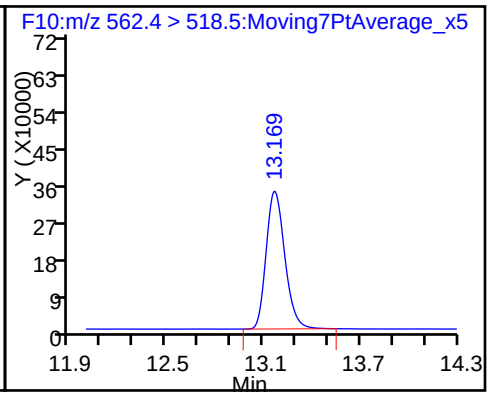
49 Perfluorodecane Sulfonic acid



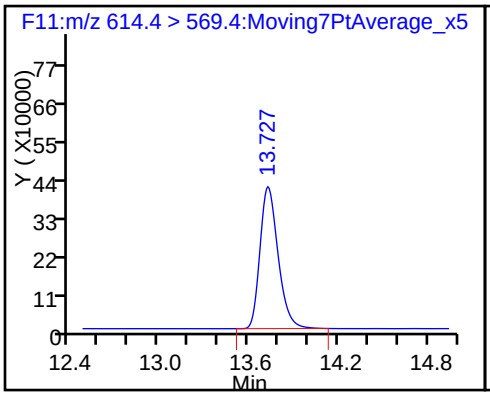
D 26 13C2 PFUnA



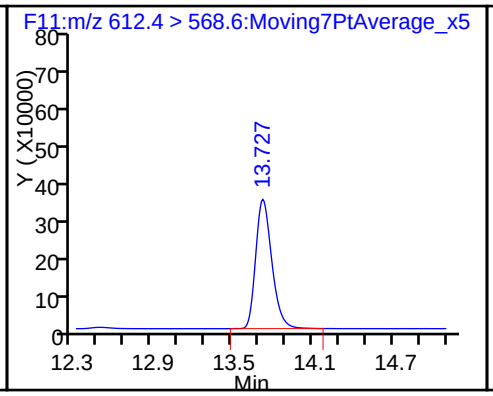
27 Perfluoroundecanoic acid



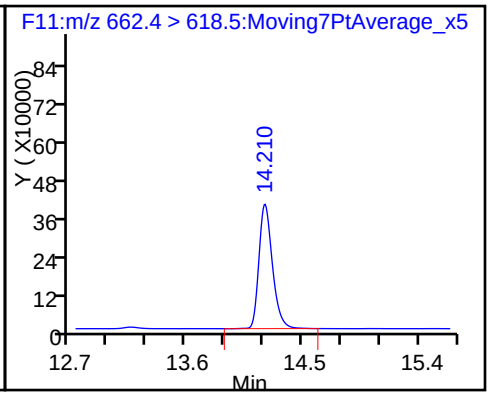
D 28 13C2 PFDoA



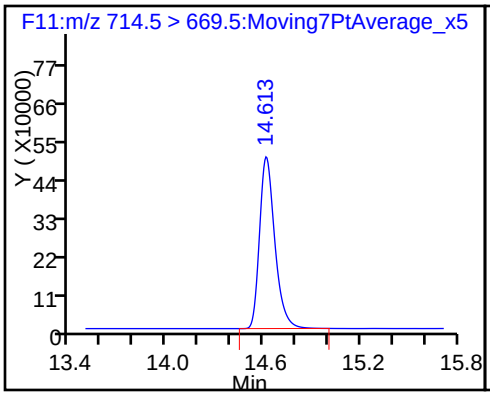
29 Perfluorododecanoic acid



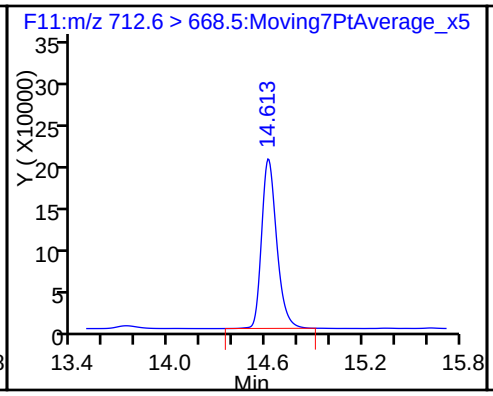
30 Perfluorotridecanoic acid



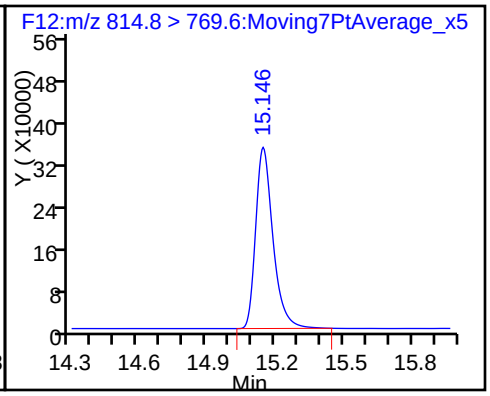
D 33 13C2-PFTeDA



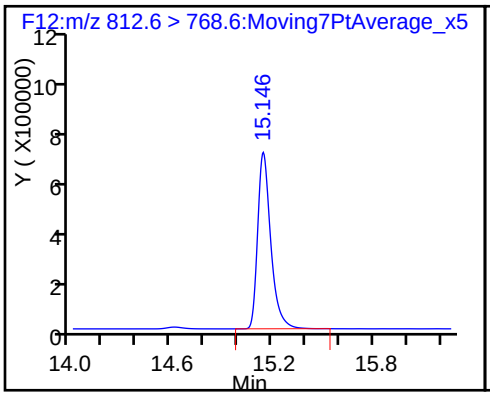
32 Perfluorotetradecanoic acid



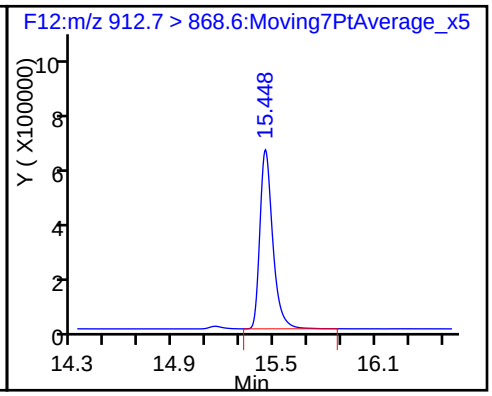
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160212-28353.b\12FEB2016A4A_008.d
Lims ID: Std L6
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 12-Feb-2016 12:21:25 ALS Bottle#: 7 Worklist Smp#: 7
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: STD L6
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4
Sublist: chrom-PFAC_A4*sub12

Method: \\ChromNA\Sacramento\ChromData\A4\20160212-28353.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 15-Feb-2016 10:02:34 Calib Date: 12-Feb-2016 12:42:35
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160212-28353.b\12FEB2016A4A_009.d

Column 1 : Det: F1:MRM
Process Host: XAWRK007

First Level Reviewer: barnettj Date: 12-Feb-2016 14:28:17

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
216.7 > 171.5	5.747	5.698	0.049		1710809	42.2		84.3	4990	
2 Perfluorobutyric acid										
212.7 > 168.6	5.750	5.698	0.052	1.000	3586362	213.9		107	8559	
4 Perfluoropentanoic acid										
262.9 > 218.7	7.043	6.964	0.079	1.000	2499117	206.5		103	1697	
D 3 13C5-PFPeA										
267.6 > 222.7	7.043	6.965	0.078		1285003	40.2		80.3	3117	
5 Perfluorobutane Sulfonate										
298.8 > 79.6	7.179	7.090	0.089	1.000	2289993	NC			1422	
298.8 > 98.6	7.175	7.090	0.085	0.999	1487976		1.54(0.00-0.00)		1019	
51 Perfluorobutanesulfonic acid										
298.8 > 79.6	7.179	7.090	0.089	1.000	2289993	177.6		100		
D 6 13C2 PFHxA										
314.6 > 269.7	8.409	8.350	0.059		1514915	38.7		77.4	3765	
7 Perfluorohexanoic acid										
312.9 > 268.7	8.409	8.352	0.057	1.000	2957321	226.6		113	1691	
D 8 13C4-PFHpA										
366.6 > 321.6	9.665	9.627	0.038		1467997	37.7		75.4	3017	
9 Perfluoroheptanoic acid										
362.8 > 318.7	9.665	9.628	0.037	1.000	3093796	205.8		103	4736	
58 Perfluorohexanesulfonic acid										
398.3 > 79.2	9.707	9.661	0.046	1.000	3857794	181.7		96.0		
10 Perfluorohexane Sulfonate										
398.3 > 79.2	9.707	9.661	0.046	1.000	3857794	NC			4285	
D 11 18O2 PFHxS										
402.5 > 83.6	9.707	9.661	0.046		901928	39.8		84.1	2021	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
39 Perfluoroheptanesulfonic Acid										
448.3 > 79.2	10.762	10.730	0.032	1.000	3860458	150.3		78.9		
14 Perfluoroheptane Sulfonate										
448.3 > 79.2	10.762	10.730	0.032	1.000	3860458	NC			6106	
D 12 13C4 PFOA										
416.5 > 371.6	10.762	10.734	0.028		1477697	34.7		69.4	2215	
13 Perfluorooctanoic acid										
412.8 > 368.8	10.762	10.734	0.028	1.000	3191541	220.0		110	3328	
412.8 > 168.7	10.762	10.734	0.028	1.000	1130700		2.82(0.00-0.00)	110	1579	
D 16 13C4 PFOS										
502.4 > 79.7	11.661	11.645	0.016		482668	47.7		99.7	1298	
15 Perfluorooctane sulfonic acid										
498.3 > 79.2	11.670	11.649	0.021	1.000	6709046	155.8		81.5	2708	
498.3 > 98.2	11.670	11.649	0.021	1.000	4029707		1.66(0.00-0.00)	81.5	3419	
D 17 13C5 PFNA										
467.5 > 422.6	11.687	11.671	0.016		1652409	39.7		79.4	2660	
18 Perfluorononanoic acid										
462.5 > 418.6	11.696	11.671	0.025	1.000	6998423	201.7		101	3885	
D 19 13C2 PFDA										
514.4 > 469.5	12.487	12.465	0.022		2063584	35.1		70.3	3127	
20 Perfluorodecanoic acid										
512.5 > 468.5	12.487	12.469	0.018	1.000	7801447	206.8		103	6956	
24 Perfluorooctane Sulfonamide										
497.5 > 77.6	13.004	12.984	0.020	1.000	15851344	216.6		108	2457	
D 23 13C8 FOSA										
505.4 > 77.6	13.004	12.984	0.020		3872124	43.3		86.7	1580	
25 Perfluorodecane Sulfonate										
598.4 > 79.6	13.102	13.094	0.008	1.000	2999356	NC			3842	
49 Perfluorodecane Sulfonic acid										
598.4 > 79.6	13.102	13.094	0.008	1.000	2999356	154.2		80.0		
D 26 13C2 PFUnA										
564.3 > 519.5	13.154	13.142	0.012		2083502	35.6		71.2	3105	
27 Perfluoroundecanoic acid										
562.4 > 518.5	13.154	13.142	0.012	1.000	8896158	205.8		103	3584	
D 28 13C2 PFDoA										
614.4 > 569.4	13.721	13.709	0.012		2993831	42.1		84.2	2833	
29 Perfluorododecanoic acid										
612.4 > 568.6	13.721	13.711	0.010	1.000	10070858	208.9		104	3017	
30 Perfluorotridecanoic acid										
662.4 > 618.5	14.197	14.189	0.008	1.000	8962091	179.4		89.7	2919	
D 33 13C2-PFTeDA										
714.5 > 669.5	14.609	14.600	0.009		2783983	43.9		87.9	2979	
32 Perfluorotetradecanoic acid										
712.6 > 668.5	14.609	14.601	0.008	1.000	4452926	196.3		98.2	1728	
D 35 13C2-PFHxDA										
814.8 > 769.6	15.139	15.137	0.002		1505780	50.8		102	2855	
34 Perfluorohexadecanoic acid										
812.6 > 768.6	15.144	15.137	0.007	1.000	12352725	191.2		95.6	4106	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
36 Perfluorooctandecanoic acid										
912.7 > 868.6	15.441	15.442	-0.001	1.000	11471145	189.7		94.8	4361	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L6_00015 Amount Added: 1.00 Units: mL

Report Date: 15-Feb-2016 10:02:36 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160212-28353.b\12FEB2016A4A_008.d

Injection Date: 12-Feb-2016 12:21:25 Instrument ID: A4

Lims ID: Std L6

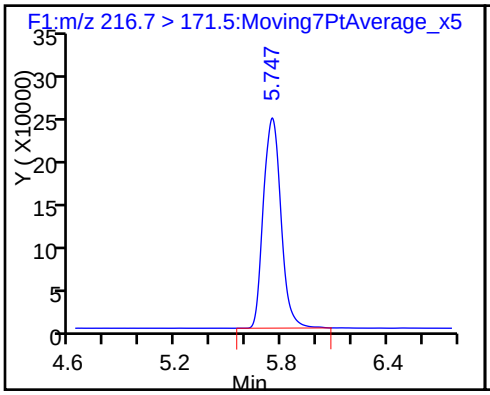
Client ID:

Operator ID: JRB ALS Bottle#: 7 Worklist Smp#: 7

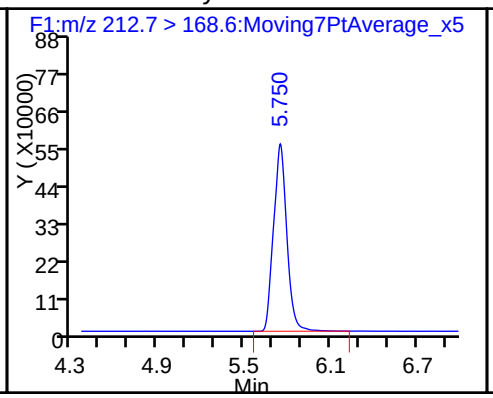
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

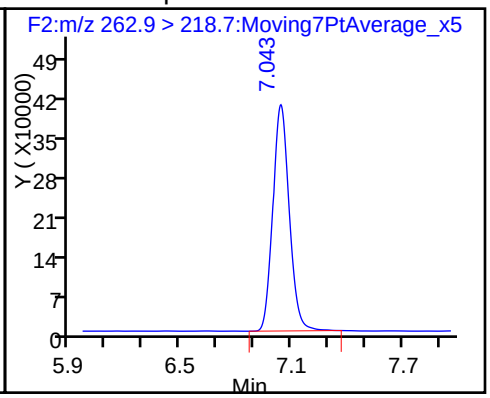
D 1 13C4 PFBA



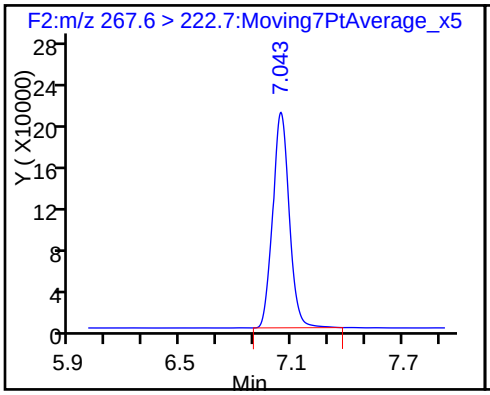
2 Perfluorobutyric acid



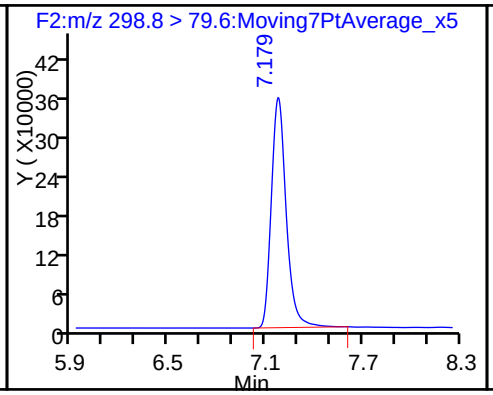
4 Perfluoropentanoic acid



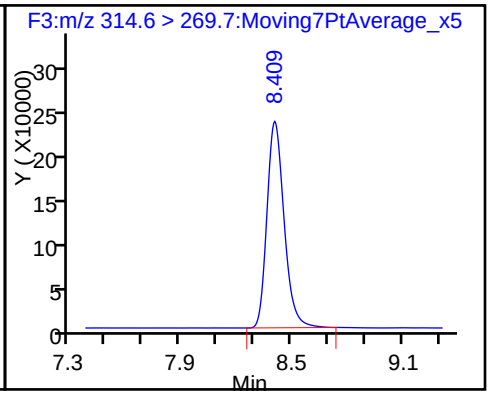
D 3 13C5-PFPeA



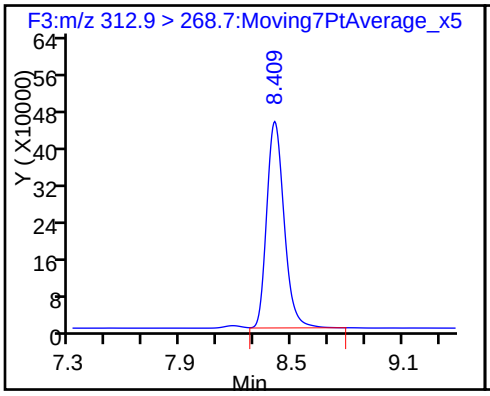
51 Perfluorobutanesulfonic acid



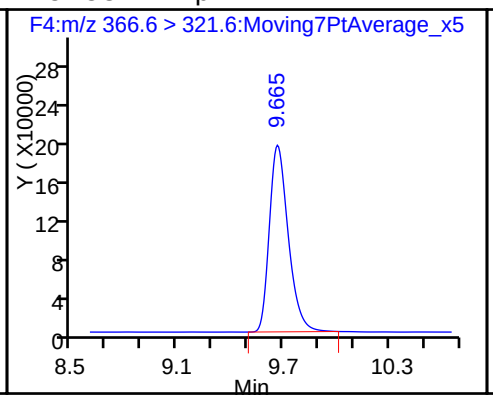
D 6 13C2 PFHxA



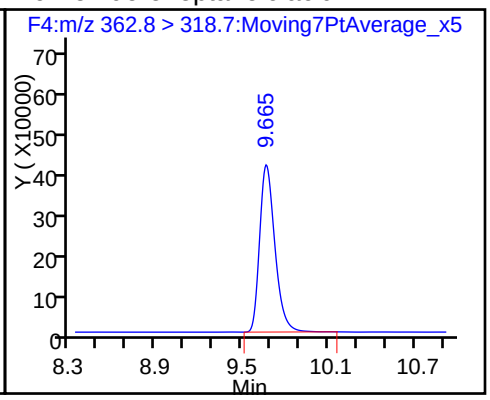
7 Perfluorohexanoic acid



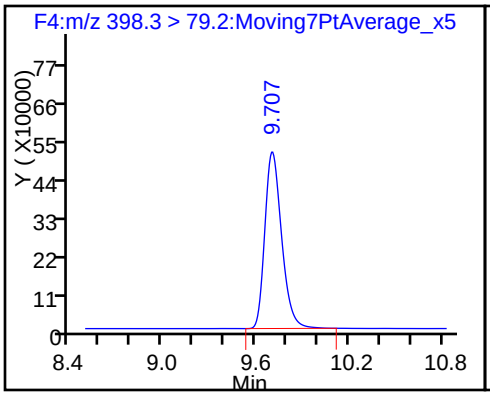
D 8 13C4-PFHpA



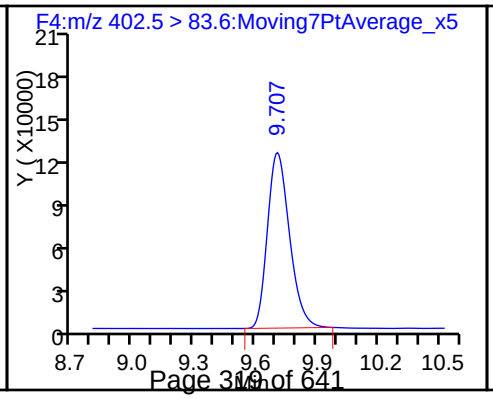
9 Perfluoroheptanoic acid



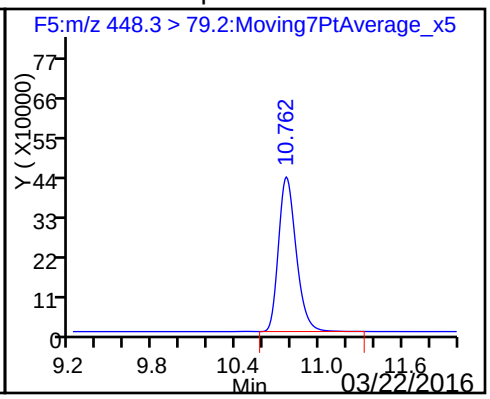
58 Perfluorohexanesulfonic acid



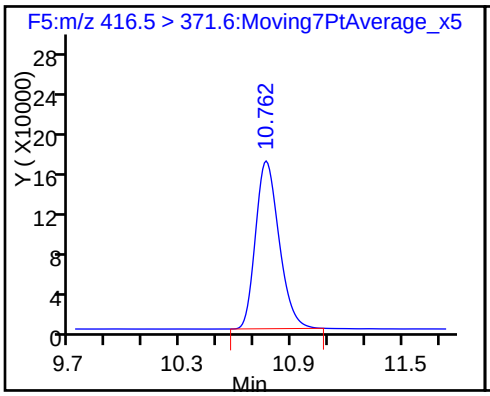
D 11 18O2 PFHxS



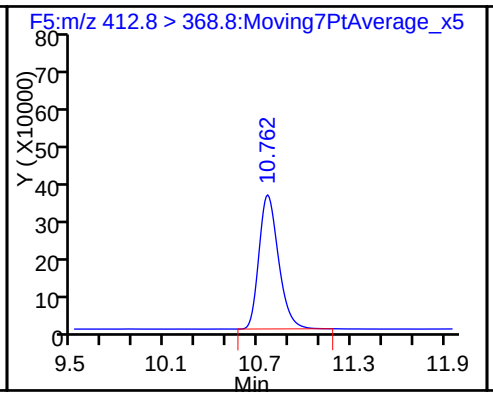
39 Perfluoroheptanesulfonic Acid



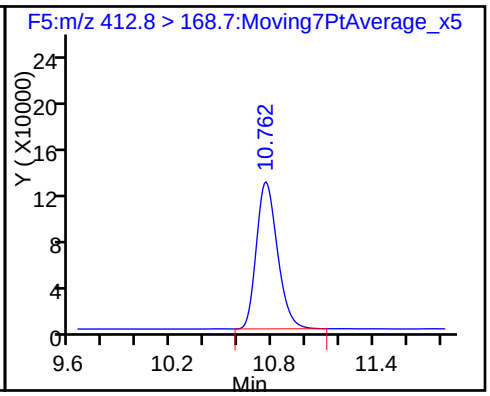
D 12 13C4 PFOA



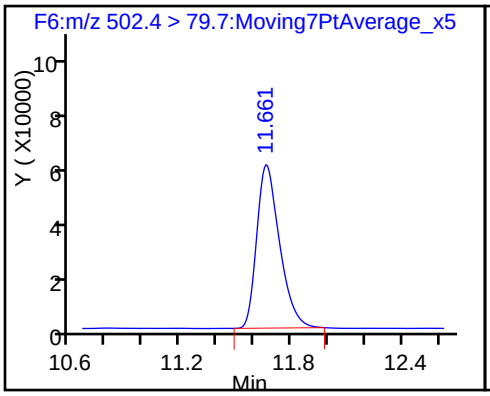
13 Perfluorooctanoic acid



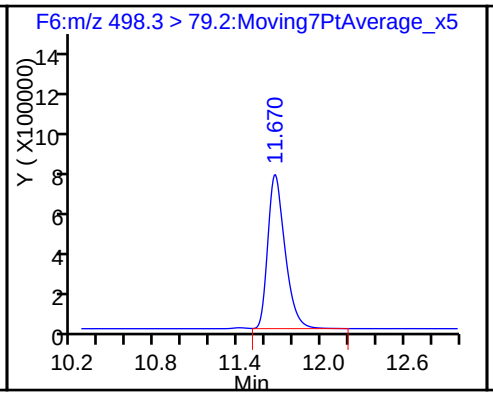
13 Perfluorooctanoic acid



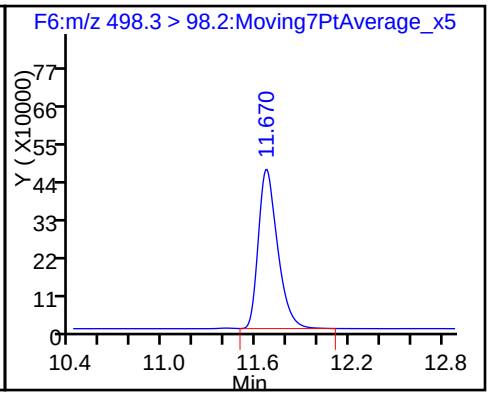
D 16 13C4 PFOS



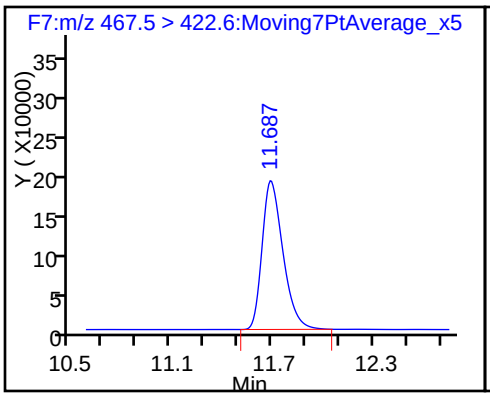
15 Perfluorooctane sulfonic acid



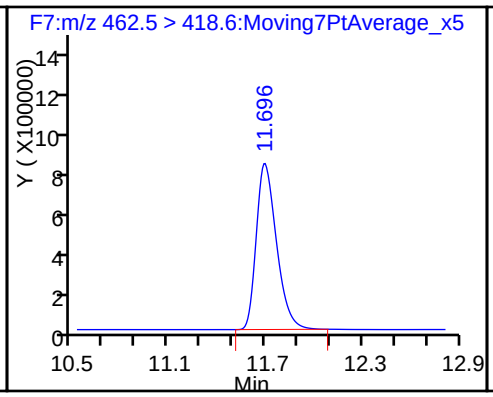
15 Perfluorooctane sulfonic acid



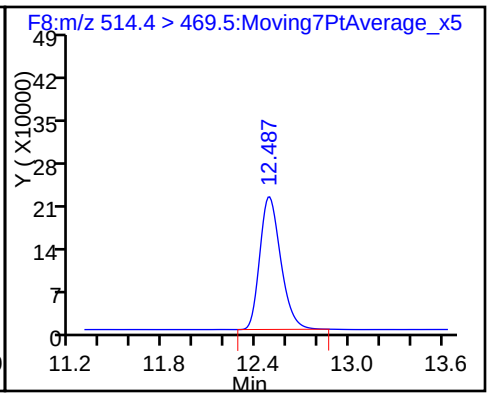
D 17 13C5 PFNA



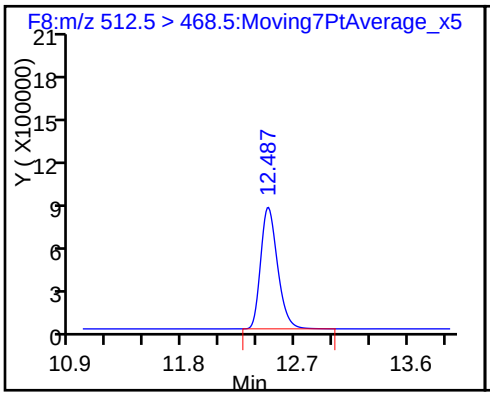
18 Perfluorononanoic acid



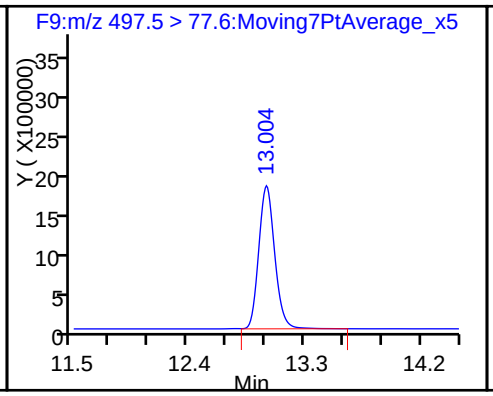
D 19 13C2 PFDA



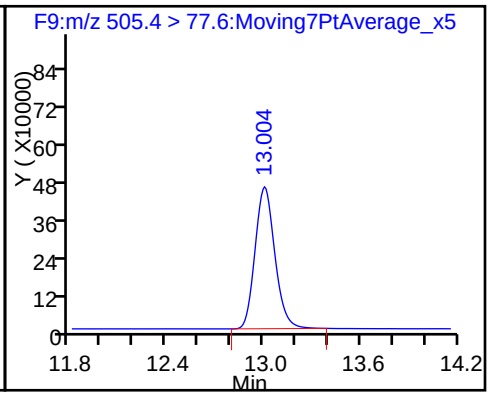
20 Perfluorodecanoic acid



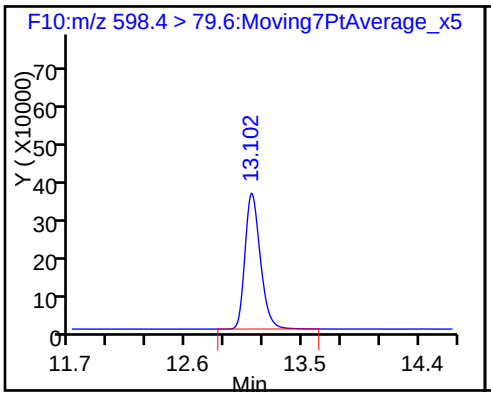
24 Perfluorooctane Sulfonamide



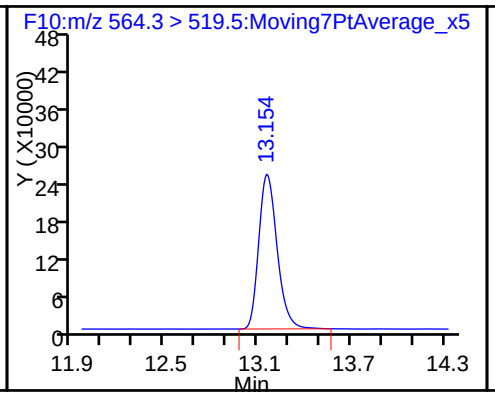
D 23 13C8 FOSA



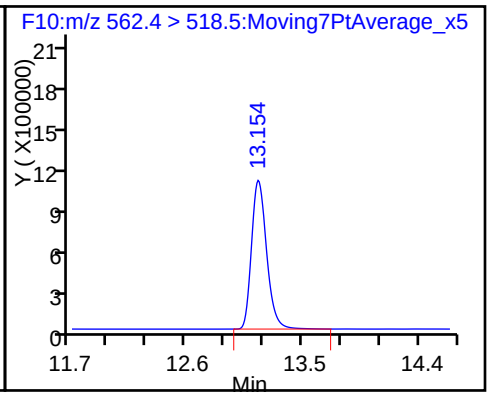
49 Perfluorodecane Sulfonic acid



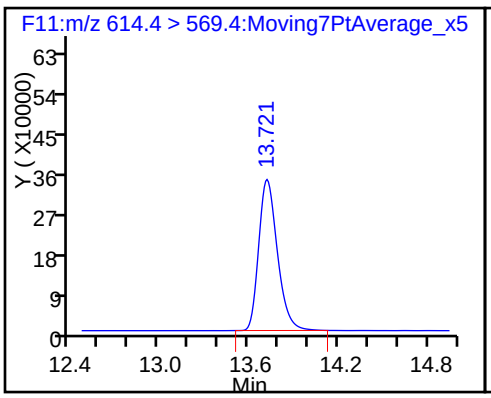
D 26 13C2 PFUnA



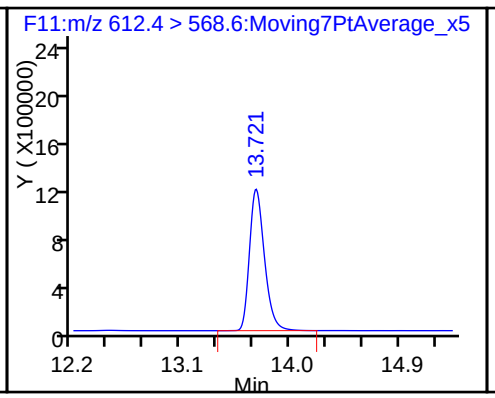
27 Perfluoroundecanoic acid



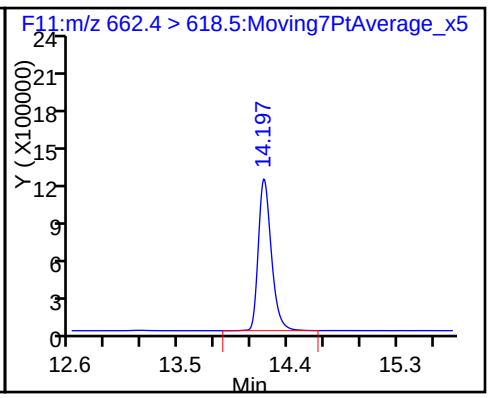
D 28 13C2 PFDoA



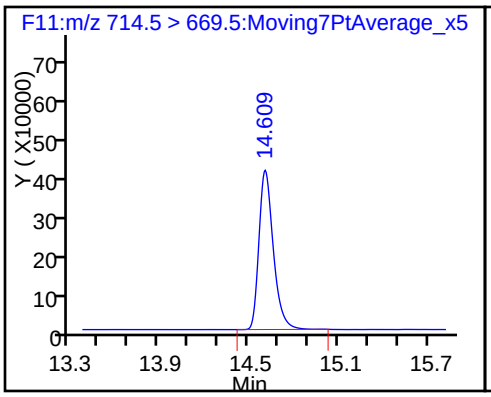
29 Perfluorododecanoic acid



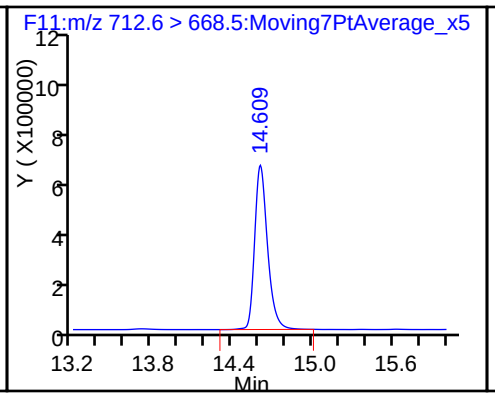
30 Perfluorotridecanoic acid



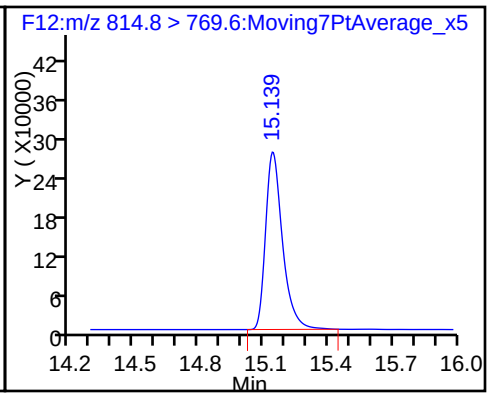
D 33 13C2-PFTeDA



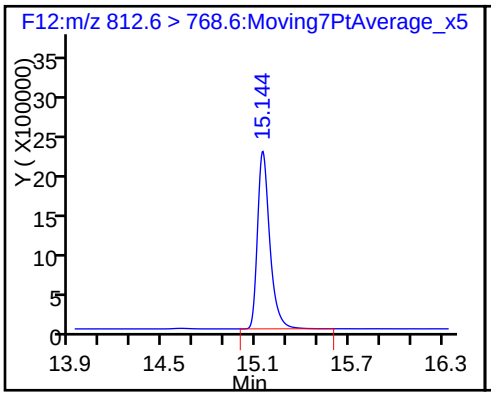
32 Perfluorotetradecanoic acid



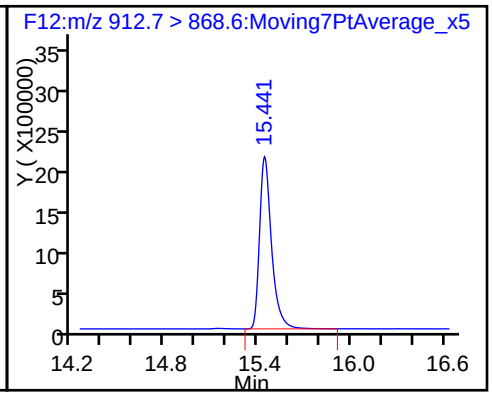
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160212-28353.b\12FEB2016A4A_009.d
Lims ID: Std L7
Client ID:
Sample Type: IC Calib Level: 7
Inject. Date: 12-Feb-2016 12:42:35 ALS Bottle#: 8 Worklist Smp#: 8
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: STD L7
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4
Sublist: chrom-PFAC_A4*sub12

Method: \\ChromNA\Sacramento\ChromData\A4\20160212-28353.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 15-Feb-2016 10:02:48 Calib Date: 12-Feb-2016 12:42:35
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160212-28353.b\12FEB2016A4A_009.d

Column 1 : Det: F1:MRM
Process Host: XAWRK007

First Level Reviewer: barnettj Date: 12-Feb-2016 15:06:52

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
216.7 > 171.5	5.744	5.706	0.038		1453408	35.8		71.6	4360	
2 Perfluorobutyric acid										
212.7 > 168.6	5.747	5.707	0.040	1.000	5966668	418.8		105	12387	
4 Perfluoropentanoic acid										
262.9 > 218.7	7.039	6.977	0.062	1.000	4176286	403.9		101	2638	
D 3 13C5-PFPeA										
267.6 > 222.7	7.039	6.978	0.061		1098104	34.3		68.6	1891	
5 Perfluorobutane Sulfonate										
298.8 > 79.6	7.171	7.105	0.066	1.000	3250684	NC			2170	
298.8 > 98.6	7.175	7.105	0.070	1.000	2095043		1.55(0.00-0.00)		1686	
51 Perfluorobutanesulfonic acid										
298.8 > 79.6	7.171	7.105	0.066	1.000	3250684	347.3		98.2		
D 6 13C2 PFHxA										
314.6 > 269.7	8.414	8.360	0.054		1296336	33.1		66.2	2926	
7 Perfluorohexanoic acid										
312.9 > 268.7	8.414	8.361	0.053	1.000	4700473	420.8		105	1630	
D 8 13C4-PFHpA										
366.6 > 321.6	9.672	9.633	0.039		1287645	33.1		66.1	2298	
9 Perfluoroheptanoic acid										
362.8 > 318.7	9.672	9.634	0.038	1.000	4889892	370.8		92.7	6483	
58 Perfluorohexanesulfonic acid										
398.3 > 79.2	9.714	9.669	0.045	1.000	6095086	381.4		101		
10 Perfluorohexane Sulfonate										
398.3 > 79.2	9.714	9.669	0.045	1.000	6095086	NC			10374	
D 11 18O2 PFHxS										
402.5 > 83.6	9.714	9.669	0.045		679535	30.0		63.3	1556	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
39 Perfluoroheptanesulfonic Acid										
448.3 > 79.2	10.771	10.735	0.036	1.000	5973185	321.0		84.3		
14 Perfluoroheptane Sulfonate										
448.3 > 79.2	10.771	10.735	0.036	1.000	5973185	NC			4795	
D 12 13C4 PFOA										
416.5 > 371.6	10.771	10.738	0.033		1245478	29.3		58.5	1870	
13 Perfluorooctanoic acid										
412.8 > 368.8	10.771	10.738	0.033	1.000	4435164	362.7		90.7	3425	
412.8 > 168.7	10.771	10.738	0.033	1.000	1788026		2.48(0.00-0.00)	90.7	2827	
D 16 13C4 PFOS										
502.4 > 79.7	11.670	11.648	0.022		349599	34.5		72.2	975	
15 Perfluorooctane sulfonic acid										
498.3 > 79.2	11.678	11.652	0.026	1.000	11018460	353.2		92.4	2325	
498.3 > 98.2	11.678	11.652	0.026	1.000	6440011		1.71(0.00-0.00)	92.4	2904	
D 17 13C5 PFNA										
467.5 > 422.6	11.704	11.674	0.030		1398930	33.6		67.3	2237	
18 Perfluorononanoic acid										
462.5 > 418.6	11.704	11.676	0.028	1.000	11680686	397.6		99.4	5214	
D 19 13C2 PFDA										
514.4 > 469.5	12.498	12.469	0.029		1703065	29.0		58.0	2597	
20 Perfluorodecanoic acid										
512.5 > 468.5	12.498	12.472	0.026	1.000	12035423	386.5		96.6	4443	
24 Perfluorooctane Sulfonamide										
497.5 > 77.6	13.012	12.987	0.025	1.000	25297572	414.7		104	2260	
D 23 13C8 FOSA										
505.4 > 77.6	13.012	12.987	0.025		3227314	36.1		72.3	1770	
25 Perfluorodecane Sulfonate										
598.4 > 79.6	13.110	13.095	0.015	1.000	4169586	NC			3632	
49 Perfluorodecane Sulfonic acid										
598.4 > 79.6	13.110	13.095	0.015	1.000	4169586	295.9		76.7		
D 26 13C2 PFUnA										
564.3 > 519.5	13.163	13.144	0.019		1804563	30.8		61.7	2231	
27 Perfluoroundecanoic acid										
562.4 > 518.5	13.163	13.144	0.019	1.000	14730079	393.5		98.4	3663	
D 28 13C2 PFDoA										
614.4 > 569.4	13.728	13.711	0.017		2411510	33.9		67.8	2447	
29 Perfluorododecanoic acid										
612.4 > 568.6	13.728	13.712	0.016	1.000	16007183	412.1		103	3036	
30 Perfluorotridecanoic acid										
662.4 > 618.5	14.211	14.190	0.021	1.000	15038082	373.8		93.4	3203	
D 33 13C2-PFTeDA										
714.5 > 669.5	14.614	14.602	0.012		2347410	37.0		74.1	2618	
32 Perfluorotetradecanoic acid										
712.6 > 668.5	14.614	14.603	0.011	1.000	7695775	421.5		105	2631	
D 35 13C2-PFHxDA										
814.8 > 769.6	15.143	15.138	0.005		1375507	46.4		92.8	3945	
34 Perfluorohexadecanoic acid										
812.6 > 768.6	15.143	15.139	0.004	1.000	21395824	411.2		103	3796	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
36 Perfluorooctandecanoic acid										
912.7 > 868.6	15.444	15.442	0.002	1.000	20131167	412.6		103	4762	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L7_00015 Amount Added: 1.00 Units: mL

Report Date: 15-Feb-2016 10:02:49 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160212-28353.b\12FEB2016A4A_009.d

Injection Date: 12-Feb-2016 12:42:35 Instrument ID: A4

Lims ID: Std L7

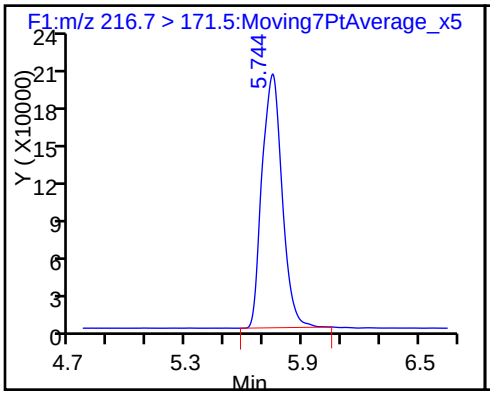
Client ID:

Operator ID: JRB ALS Bottle#: 8 Worklist Smp#: 8

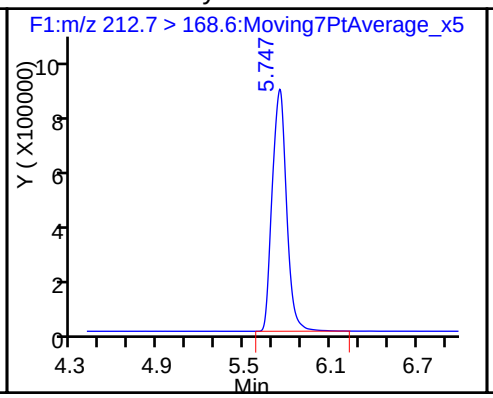
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

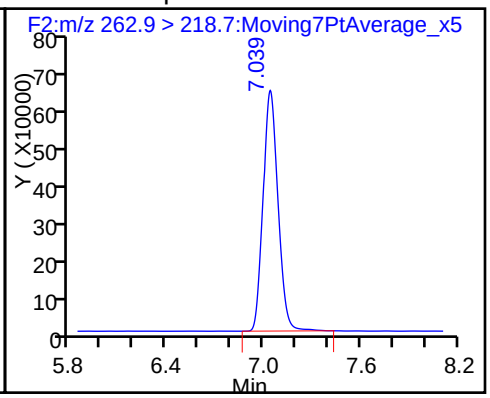
D 1 13C4 PFBA



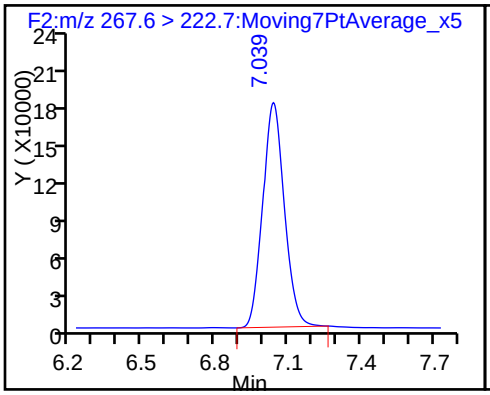
2 Perfluorobutyric acid



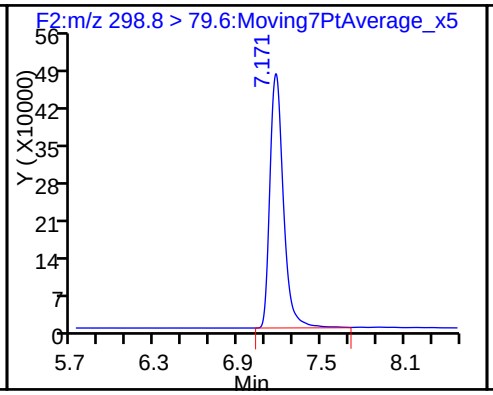
4 Perfluoropentanoic acid



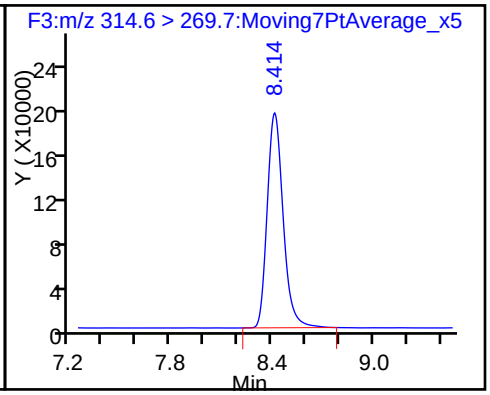
D 3 13C5-PFPeA



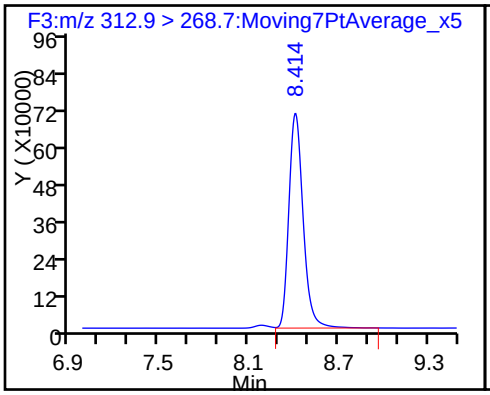
51 Perfluorobutanesulfonic acid



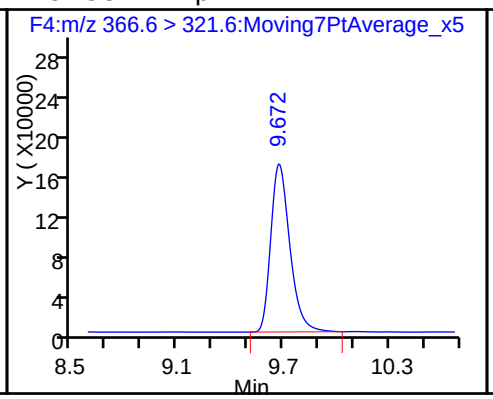
D 6 13C2 PFHxA



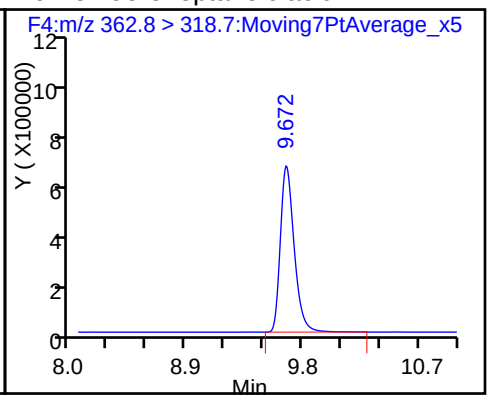
7 Perfluorohexanoic acid



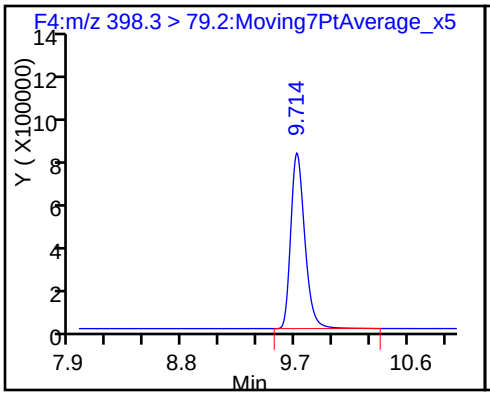
D 8 13C4-PFHpA



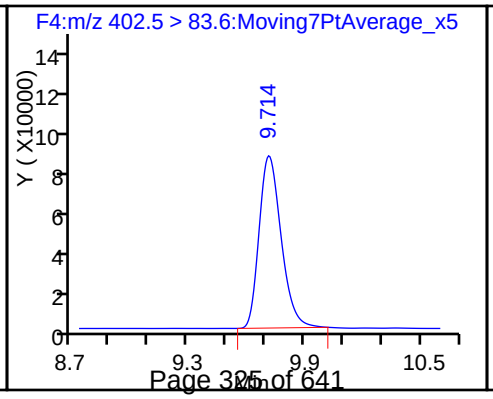
9 Perfluoroheptanoic acid



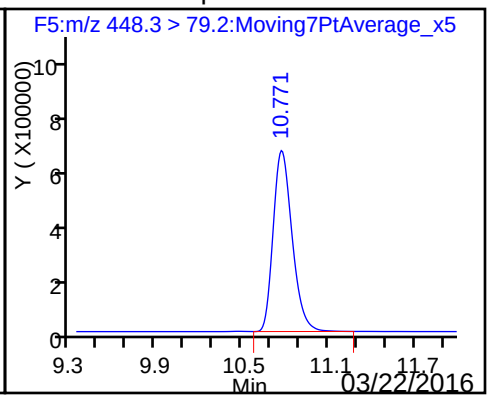
58 Perfluorohexanesulfonic acid



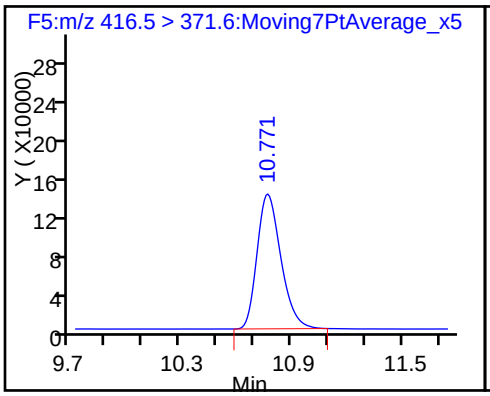
D 11 18O2 PFHxS



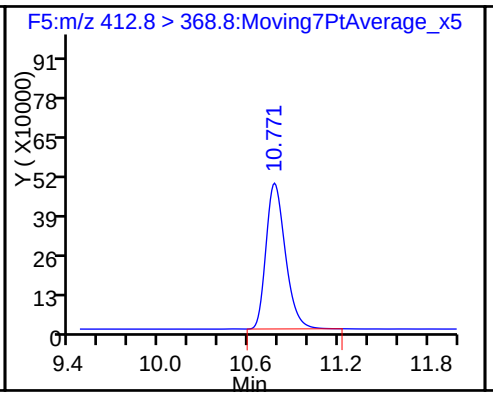
39 Perfluoroheptanesulfonic Acid



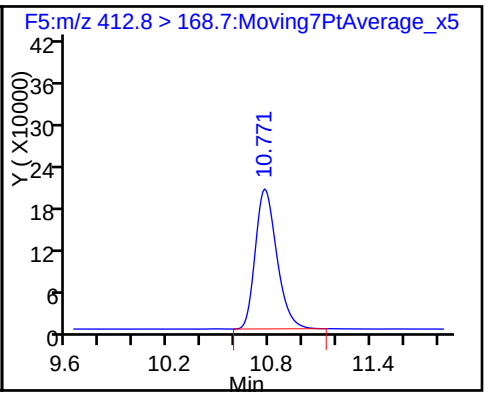
D 12 13C4 PFOA



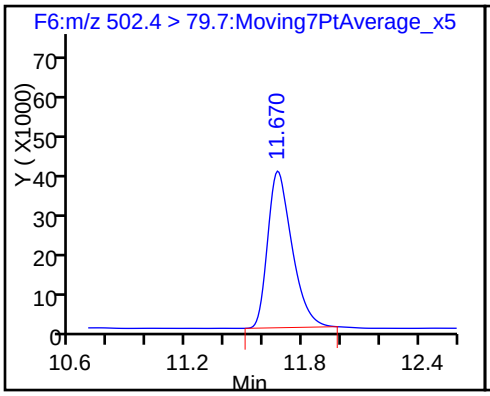
13 Perfluorooctanoic acid



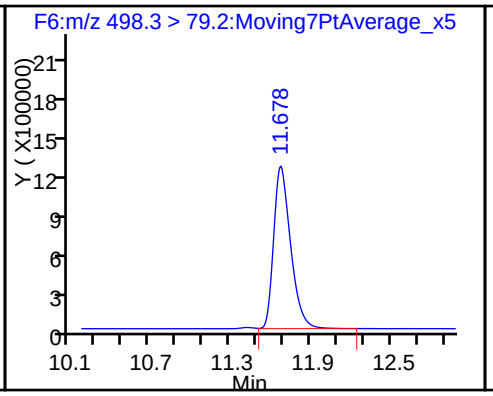
13 Perfluorooctanoic acid



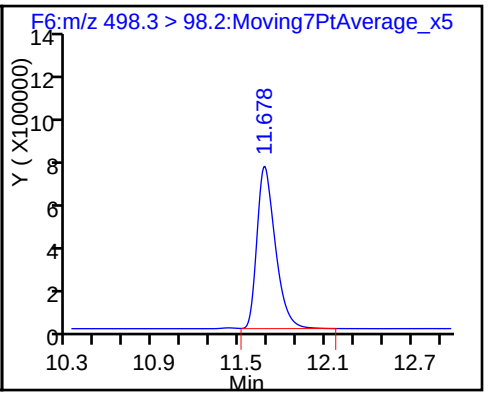
D 16 13C4 PFOS



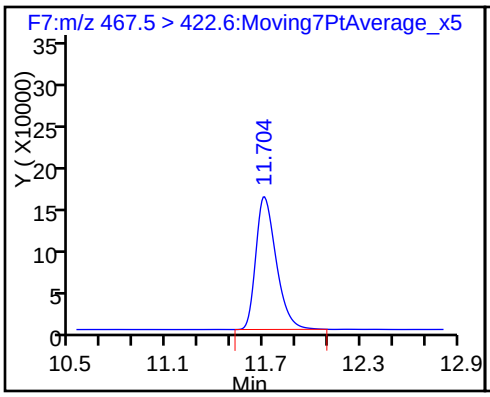
15 Perfluorooctane sulfonic acid



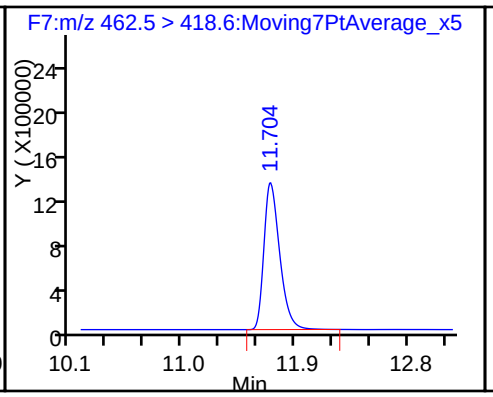
15 Perfluorooctane sulfonic acid



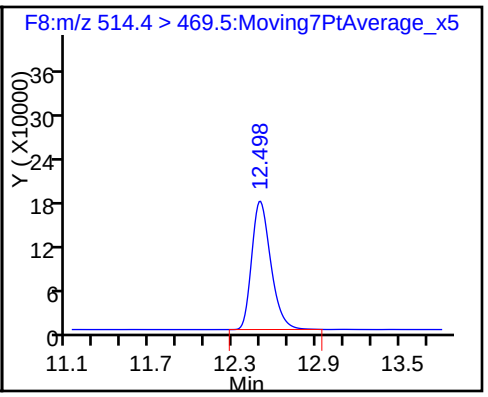
D 17 13C5 PFNA



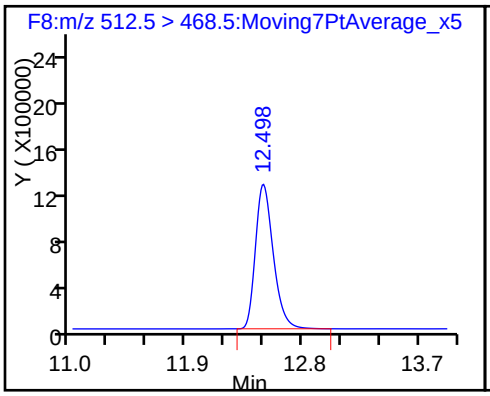
18 Perfluorononanoic acid



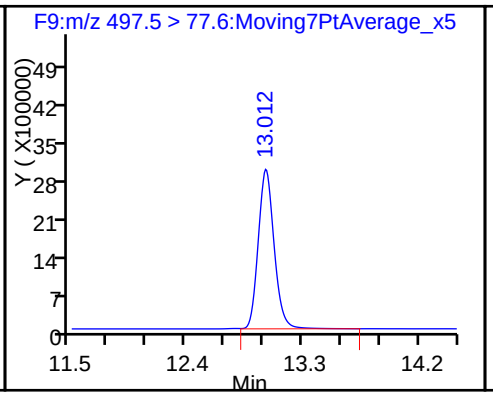
D 19 13C2 PFDA



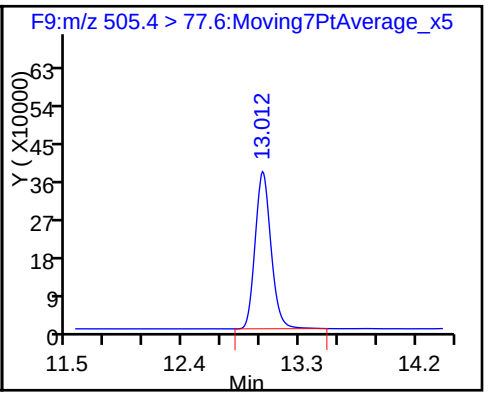
20 Perfluorodecanoic acid



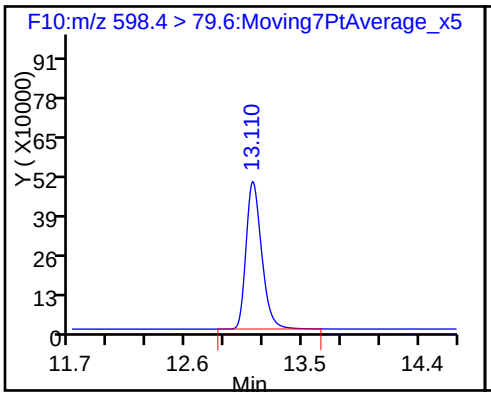
24 Perfluorooctane Sulfonamide



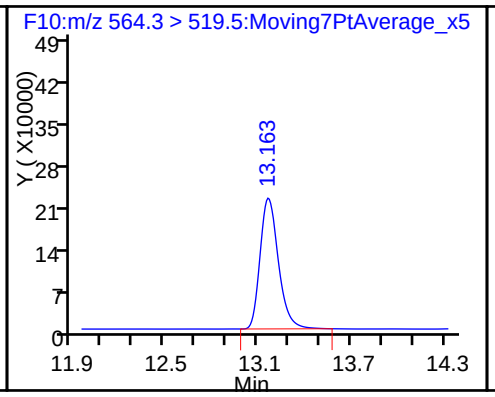
D 23 13C8 FOSA



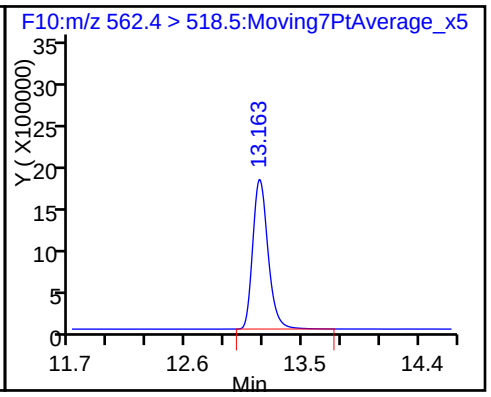
49 Perfluorodecane Sulfonic acid



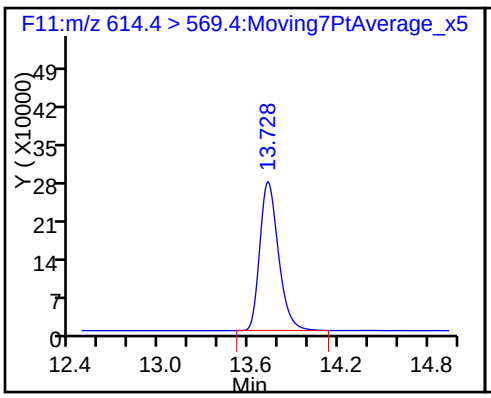
D 26 13C2 PFUnA



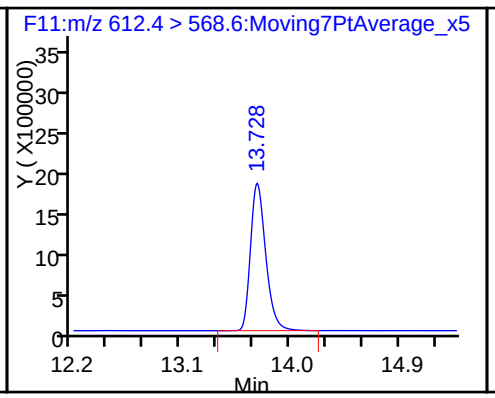
27 Perfluoroundecanoic acid



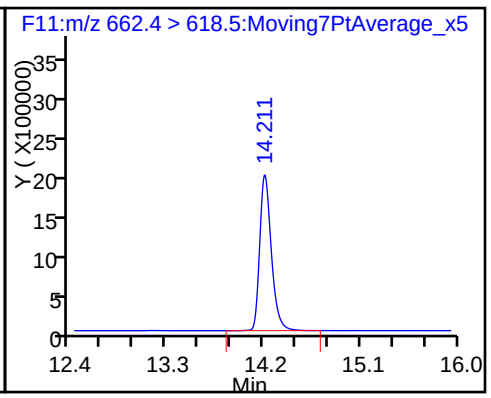
D 28 13C2 PFDoA



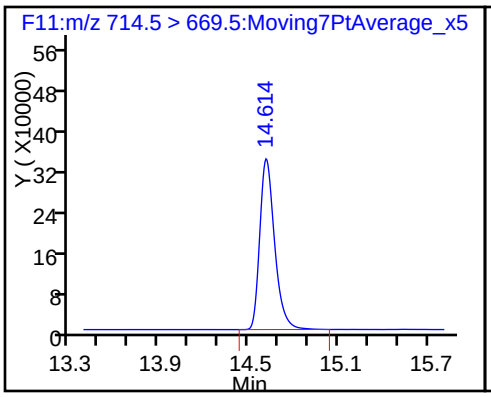
29 Perfluorododecanoic acid



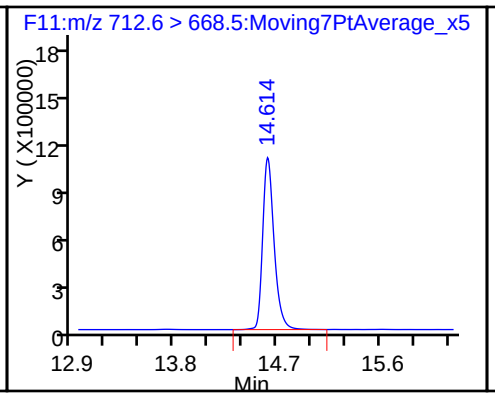
30 Perfluorotridecanoic acid



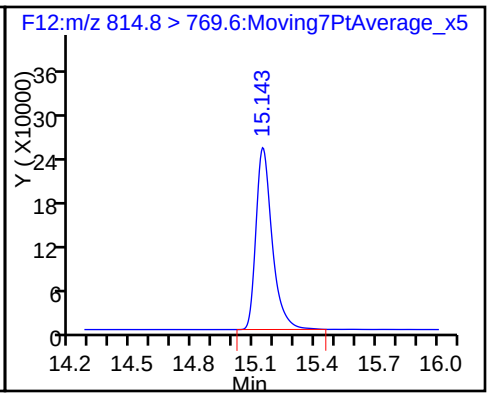
D 33 13C2-PFTeDA



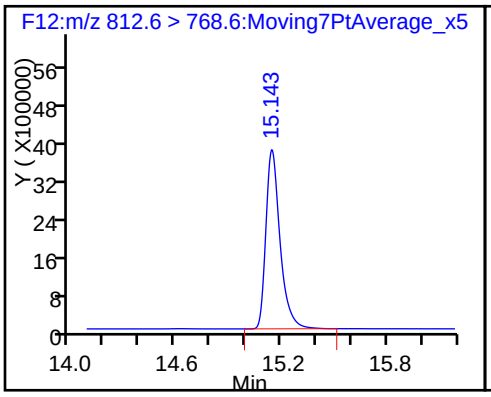
32 Perfluorotetradecanoic acid



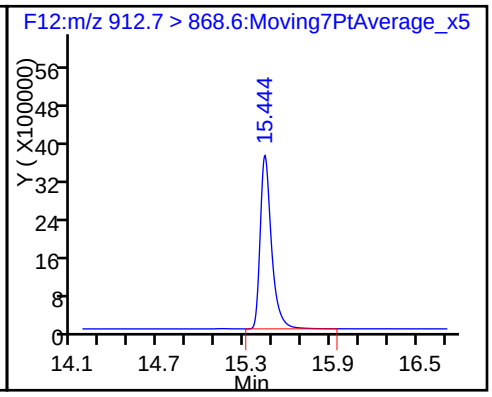
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1 Analy Batch No.: 100906

SDG No.: CTO WE7G PFC Sampling

Instrument ID: A6 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 02/19/2016 15:08 Calibration End Date: 02/19/2016 17:15 Calibration ID: 19191

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-100906/2	19FEB2016A6A_004.d
Level 2	STD 320-100906/3	19FEB2016A6A_005.d
Level 3	STD 320-100906/4	19FEB2016A6A_006.d
Level 4	STD 320-100906/5	19FEB2016A6A_007.d
Level 5	STD 320-100906/6	19FEB2016A6A_008.d
Level 6	STD 320-100906/7	19FEB2016A6A_009.d
Level 7	STD 320-100906/8	19FEB2016A6A_010.d

ANALYTE	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7				RT WINDOW	AVG RT
Perfluorobutanoic acid (PFBA)	5.724	5.706	5.718	5.715	5.715	5.712	5.712				5.465 - 5.965	5.715
Perfluoropentanoic acid (PFPeA)	+++++	6.837	6.842	6.828	6.828	6.819	6.818				6.578 - 7.078	6.829
Perfluorobutanesulfonic acid (PFBS)	+++++	6.943	6.939	6.942	6.938	6.934	+++++				6.689 - 7.189	6.939
Perfluorohexanoic acid (PFHxA)	+++++	8.087	8.084	8.082	8.077	8.067	8.065				7.828 - 8.328	8.077
Perfluoroheptanoic acid (PFHpA)	+++++	9.334	9.328	9.323	9.323	9.310	9.305				9.072 - 9.572	9.321
Perfluorohexanesulfonic acid (PFHxS)	+++++	9.387	9.363	9.358	9.364	9.346	+++++				9.114 - 9.614	9.364
Perfluorooctanoic acid (PFOA)	10.453	10.461	10.453	10.454	10.454	10.439	+++++				10.200 - 10.700	10.452
Perfluoroheptanesulfonic Acid (PFHpS)	+++++	10.475	10.461	10.461	10.461	10.439	+++++				10.207 - 10.707	10.459
Perfluorooctanesulfonic acid (PFOS)	+++++	11.436	11.420	11.421	11.422	11.399	+++++				11.167 - 11.667	11.420
Perfluorononanoic acid (PFNA)	+++++	11.451	11.443	11.437	11.437	11.421	11.422				11.189 - 11.689	11.435
Perfluorodecanoic acid (PFDA)	+++++	12.296	12.286	12.276	12.280	12.254	+++++				12.026 - 12.526	12.278
Perfluorooctane Sulfonamide (FOSA)	+++++	12.824	12.814	12.814	12.818	12.793	12.793				12.562 - 13.062	12.809
Perfluorodecane Sulfonic acid	+++++	12.970	12.960	12.950	12.954	12.929	+++++				12.699 - 13.199	12.953
Perfluoroundecanoic acid (PFUnA)	13.010	13.010	13.010	13.002	13.005	12.981	+++++				12.750 - 13.250	13.003
Perfluorododecanoic acid (PFDoA)	13.625	13.624	13.615	13.615	13.620	13.588	13.588				13.361 - 13.861	13.611
Perfluorotridecanoic Acid (PFTriA)	14.147	14.139	14.139	14.132	14.136	14.109	14.109				13.880 - 14.380	14.130
Perfluorotetradecanoic acid (PFTeA)	14.585	14.585	14.578	14.572	14.576	14.552	14.552				14.321 - 14.821	14.571
Perfluoro-n-hexadecanoic acid (PFHxDA)	+++++	15.218	15.213	15.213	15.210	15.193	15.193				14.958 - 15.458	15.207
Perfluoro-n-octandecanoic acid (PFODA)	15.557	15.549	15.544	15.544	15.546	15.529	15.529				15.293 - 15.793	15.543
13C4 PFBA	5.718	5.718	5.712	5.709	5.709	5.709	5.709				5.462 - 5.962	5.712
13C5-PFPeA	6.832	6.837	6.828	6.828	6.823	6.819	6.818				6.577 - 7.077	6.826
13C2 PFHxA	8.087	8.093	8.084	8.082	8.082	8.067	8.065				7.830 - 8.330	8.080
13C4-PFHpA	9.328	9.334	9.328	9.323	9.323	9.310	9.305				9.072 - 9.572	9.322
18O2 PFHxS	9.363	9.369	9.363	9.358	9.358	9.346	+++++				9.108 - 9.608	9.360
13C4 PFOA	10.453	10.468	10.453	10.454	10.454	10.432	+++++				10.200 - 10.700	10.452
13C4 PFOS	11.421	11.428	11.420	11.414	11.422	11.399	+++++				11.164 - 11.664	11.417
13C5 PFNA	11.444	11.451	11.443	11.437	11.437	11.414	11.415				11.184 - 11.684	11.434
13C2 PFDA	12.286	12.286	12.286	12.276	12.280	12.254	+++++				12.025 - 12.525	12.278
13C8 FOSA	12.814	12.824	12.814	12.814	12.818	12.793	12.793				12.560 - 13.060	12.810
13C2 PFUnA	13.010	13.010	13.010	13.002	13.005	12.981	+++++				12.750 - 13.250	13.003
13C2 PFDoA	13.616	13.624	13.615	13.615	13.620	13.588	13.588				13.359 - 13.859	13.609
13C2-PFTeDA	14.579	14.585	14.578	14.579	14.576	14.552	14.552				14.321 - 14.821	14.572
13C2-PFHxDA	15.216	15.218	15.213	15.213	15.210	15.188	15.193				14.957 - 15.457	15.207

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1 Analy Batch No.: 100906

SDG No.: CTO WE7G PFC Sampling

Instrument ID: A6 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 02/19/2016 15:08 Calibration End Date: 02/19/2016 17:15 Calibration ID: 19191

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-100906/2	19FEB2016A6A_004.d
Level 2	STD 320-100906/3	19FEB2016A6A_005.d
Level 3	STD 320-100906/4	19FEB2016A6A_006.d
Level 4	STD 320-100906/5	19FEB2016A6A_007.d
Level 5	STD 320-100906/6	19FEB2016A6A_008.d
Level 6	STD 320-100906/7	19FEB2016A6A_009.d
Level 7	STD 320-100906/8	19FEB2016A6A_010.d

ANALYTE	CF				CURVE TYPE	COEFFICIENT			#	MIN CF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 5	LVL 2 LVL 6	LVL 3 LVL 7	LVL 4		B	M1	M2								
13C4 PFBA	17215 15573	18158 14290	17652 12637	16479	Ave		16000.4800				12.4		50.0			
13C5-PFPeA	33132 32092	37596 25883	31200 23439	31979	Ave		30760.1743				15.3		50.0			
13C2 PFHxA	31151 28249	32712 25751	29384 20807	30249	Ave		28328.9429				14.1		50.0			
13C4-PFHpA	33720 29961	37160 26279	32774 21986	33895	Ave		30825.1286				16.8		50.0			
18O2 PFHxS	16445 14414	15937 12069	15300 +++++	15633	Ave		14966.2297				10.5		50.0			
13C4 PFOA	36851 31471	39431 26220	35009 +++++	35877	Ave		34143.1967				13.7		50.0			
13C4 PFOS	19998 17191	20738 13980	18794 +++++	18393	Ave		18182.3013				13.2		50.0			
13C5 PFNA	32640 27720	35233 22861	29495 20201	29189	Ave		28191.1457				18.6		50.0			
13C2 PFDA	30433 26439	32141 20971	31311 +++++	30484	Ave		28629.7300				14.8		50.0			
13C8 FOSA	45384 42557	44125 37994	44477 31983	43988	Ave		41501.0343				11.7		50.0			
13C2 PFUnA	40172 34391	42368 28219	39609 +++++	39503	Ave		37377.2300				13.9		50.0			
13C2 PFDoA	43990 39123	44852 34183	40349 29026	42305	Ave		39118.3029				14.6		50.0			
13C2-PFTeDA	37943 36827	39228 31852	37299 30439	37717	Ave		35900.7657				9.3		50.0			
13C2-PFHxDA	45996 43682	46879 39154	44036 36320	45657	Ave		43103.4314				9.1		50.0			

Note: The m1 coefficient is the same as Ave CF for an Ave curve type.

CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1 Analy Batch No.: 100906

SDG No.: CTO WE7G PFC Sampling

Instrument ID: A6 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 02/19/2016 15:08 Calibration End Date: 02/19/2016 17:15 Calibration ID: 19191

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)	17268 20409	18332 18204	24759	23146	22421	AveID		1.3041				15.6		35.0			
Perfluoropentanoic acid (PFPeA)	+++++ 26519	41667 24011	33706	33699	31098	AveID		1.0434				4.7		35.0			
Perfluorobutanesulfonic acid (PFBS)	+++++ 14042	11589 +++++	13996	16675	15750	AveID		0.9930				17.5		50.0			
Perfluorohexanoic acid (PFHxA)	+++++ 28593	29048 23704	35504	30900	31979	AveID		1.0832				10.4		35.0			
Perfluoroheptanoic acid (PFHpA)	+++++ 26755	35173 22997	33430	38937	32292	AveID		1.0429				6.5		35.0			
Perfluorohexanesulfonic acid (PFHxS)	+++++ 8511.3	10001 +++++	10164	10841	9886.6	AveID		0.6753				4.5		35.0			
Perfluorooctanoic acid (PFOA)	41176 26427	32208 +++++	37796	35759	31611	AveID		1.0038				10.3		35.0			
Perfluoroheptanesulfonic Acid (PFHpS)	+++++ 8507.0	9112.4 +++++	11112	11362	10932	L2ID	-0.177	0.6259							1.0000		0.9900
Perfluorooctanesulfonic acid (PFOS)	+++++ 13560	19579 +++++	18099	18656	16687	AveID		0.9724				2.6		35.0			
Perfluorononanoic acid (PFNA)	+++++ 19794	23017 16627	24079	25918	22126	AveID		0.8075				10.2		35.0			
Perfluorodecanoic acid (PFDA)	+++++ 20747	42554 +++++	32768	28572	26974	L2ID	0.3477	0.9748							0.9990		0.9900
Perfluorooctane Sulfonamide (FOSA)	+++++ 33984	42097 29306	40773	41641	39679	AveID		0.9268				2.4		35.0			
Perfluorodecane Sulfonic acid	+++++ 7589.1	6534.2 +++++	10246	10522	10316	L1ID	-0.161	0.5576							0.9980		0.9900
Perfluoroundecanoic acid (PFUnA)	76472 22856	51520 +++++	42693	34710	30224	L1ID	0.5568	0.8236							0.9980		0.9900
Perfluorododecanoic acid (PFDoA)	28216 25891	23692 22968	32661	33950	30803	AveID		0.7311				14.6		35.0			
Perfluorotridecanoic Acid (PFTriA)	34658 29612	40040 23925	48646	43762	38156	AveID		0.9409				15.3		50.0			
Perfluorotetradecanoic acid (PFTeA)	49430 19999	42000 17283	27015	24942	23186	L2ID	0.2791	0.5968							0.9970		0.9900
Perfluoro-n-hexadecanoic acid (PFHxDA)	+++++ 37534	171017 32169	64991	49814	43976	L2ID	2.7370	1.0725							1.0000		0.9900
Perfluoro-n-octandecanoic acid (PFODA)	49252 37638	39408 34132	49070	48056	44933	AveID		1.1108				9.8		50.0			

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1 Analy Batch No.: 100906

SDG No.: CTO WE7G PFC Sampling

Instrument ID: A6 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 02/19/2016 15:08 Calibration End Date: 02/19/2016 17:15 Calibration ID: 19191

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-100906/2	19FEB2016A6A_004.d
Level 2	STD 320-100906/3	19FEB2016A6A_005.d
Level 3	STD 320-100906/4	19FEB2016A6A_006.d
Level 4	STD 320-100906/5	19FEB2016A6A_007.d
Level 5	STD 320-100906/6	19FEB2016A6A_008.d
Level 6	STD 320-100906/7	19FEB2016A6A_009.d
Level 7	STD 320-100906/8	19FEB2016A6A_010.d

ANALYTE	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
13C4 PFBA	Ave	860754 714491	907904 631840	882584	823965	778630	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C5-PFPeA	Ave	1656599 1294135	1879822 1171928	1560021	1598957	1604599	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C2 PFHxA	Ave	1557529 1287540	1635595 1040351	1469185	1512461	1412469	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C4-PFHpA	Ave	1685988 1313950	1858023 1099321	1638704	1694741	1498068	50.0 50.0	50.0 50.0	50.0	50.0	50.0
18O2 PFHxS	Ave	777834 570842	753810 +++++	723683	739449	681798	47.3 47.3	47.3 +++++	47.3	47.3	47.3
13C4 PFOA	Ave	1842532 1311023	1971561 +++++	1750451	1793859	1573533	50.0 50.0	50.0 +++++	50.0	50.0	50.0
13C4 PFOS	Ave	955905 668257	991283 +++++	898344	879178	821717	47.8 47.8	47.8 +++++	47.8	47.8	47.8
13C5 PFNA	Ave	1631991 1143055	1761627 1010032	1474756	1459436	1386004	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C2 PFDA	Ave	1521664 1048548	1607037 +++++	1565532	1524195	1321943	50.0 50.0	50.0 +++++	50.0	50.0	50.0
13C8 FOSA	Ave	2269224 1899691	2206225 1599127	2223851	2199385	2127859	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C2 PFUnA	Ave	2008621 1410933	2118412 +++++	1980471	1975170	1719562	50.0 50.0	50.0 +++++	50.0	50.0	50.0
13C2 PFDoA	Ave	2199484 1709160	2242621 1451296	2017427	2115244	1956174	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C2-PFTeDA	Ave	1897170 1592616	1961399 1521958	1864931	1885833	1841361	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C2-PFHxDA	Ave	2299786 1957713	2343949 1815999	2201810	2282833	2184111	50.0 50.0	50.0 50.0	50.0	50.0	50.0

Curve Type Legend:
Ave = Average

RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1 Analy Batch No.: 100906

SDG No.: CTO WE7G PFC Sampling

Instrument ID: A6 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 02/19/2016 15:08 Calibration End Date: 02/19/2016 17:15 Calibration ID: 19191

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-100906/2	19FEB2016A6A_004.d
Level 2	STD 320-100906/3	19FEB2016A6A_005.d
Level 3	STD 320-100906/4	19FEB2016A6A_006.d
Level 4	STD 320-100906/5	19FEB2016A6A_007.d
Level 5	STD 320-100906/6	19FEB2016A6A_008.d
Level 6	STD 320-100906/7	19FEB2016A6A_009.d
Level 7	STD 320-100906/8	19FEB2016A6A_010.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	8634 4081745	18332 7281727	123793	462922	1121027	0.500 200	1.00 400	5.00	20.0	50.0
Perfluoropentanoic acid (PFPeA)		AveID	+++++ 5303760	41667 9604476	168531	673970	1554916	+++++ 200	1.00 400	5.00	20.0	50.0
Perfluorobutanesulfonic acid (PFBS)		AveID	+++++ 2482631	10245 +++++	61862	294821	696169	+++++ 177	0.884 +++++	4.42	17.7	44.2
Perfluorohexanoic acid (PFHxA)		AveID	+++++ 5718698	29048 9481665	177522	618008	1598966	+++++ 200	1.00 400	5.00	20.0	50.0
Perfluoroheptanoic acid (PFHpA)		AveID	+++++ 5350969	35173 9198751	167149	778743	1614588	+++++ 200	1.00 400	5.00	20.0	50.0
Perfluorohexanesulfonic acid (PFHxS)		AveID	+++++ 1610335	9461 +++++	48077	205104	467634	+++++ 189	0.946 +++++	4.73	18.9	47.3
Perfluorooctanoic acid (PFOA)		AveID	20588 5285370	32208 +++++	188978	715180	1580565	0.500 200	1.00 +++++	5.00	20.0	50.0
Perfluoroheptanesulfonic Acid (PFHpS)		L2ID	+++++ 1619742	8675 +++++	52893	216336	520355	+++++ 190	0.952 +++++	4.76	19.0	47.6
Perfluorooctanesulfonic acid (PFOS)		AveID	+++++ 2592636	18718 +++++	86511	356703	797626	+++++ 191	0.956 +++++	4.78	19.1	47.8
Perfluorononanoic acid (PFNA)		AveID	+++++ 3958780	23017 6650814	120395	518362	1106311	+++++ 200	1.00 400	5.00	20.0	50.0
Perfluorodecanoic acid (PFDA)		L2ID	+++++ 4149384	42554 +++++	163841	571448	1348689	+++++ 200	1.00 +++++	5.00	20.0	50.0
Perfluorooctane Sulfonamide (FOSA)		AveID	+++++ 6796748	42097 11722467	203867	832823	1983962	+++++ 200	1.00 400	5.00	20.0	50.0
Perfluorodecane Sulfonic acid		L1ID	+++++ 1463184	6299 +++++	49387	202871	497252	+++++ 193	0.964 +++++	4.82	19.3	48.2
Perfluoroundecanoic acid (PFUnA)		L1ID	38236 4571131	51520 +++++	213464	694202	1511190	0.500 200	1.00 +++++	5.00	20.0	50.0
Perfluorododecanoic acid (PFDoA)		AveID	14108 5178123	23692 9187053	163307	679009	1540137	0.500 200	1.00 400	5.00	20.0	50.0

RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1 Analy Batch No.: 100906

SDG No.: CTO WE7G PFC Sampling

Instrument ID: A6 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 02/19/2016 15:08 Calibration End Date: 02/19/2016 17:15 Calibration ID: 19191

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
Perfluorotridecanoic Acid (PFTriA)		AveID	17329 5922305	40040 9569869	243228	875238	1907812	0.500 200	1.00 400	5.00	20.0	50.0
Perfluorotetradecanoic acid (PFTeA)		L2ID	24715 3999720	42000 6913347	135077	498848	1159290	0.500 200	1.00 400	5.00	20.0	50.0
Perfluoro-n-hexadecanoic acid (PFHxDA)		L2ID	+++++ 7506851	171017 12867499	324953	996289	2198803	+++++ 200	1.00 400	5.00	20.0	50.0
Perfluoro-n-octandecanoic acid (PFODA)		AveID	24626 7527521	39408 13652743	245350	961125	2246657	0.500 200	1.00 400	5.00	20.0	50.0

Curve Type Legend:

AveID = Average isotope dilution
L1ID = Linear 1/conc IsoDil
L2ID = Linear 1/conc^2 IsoDil

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_004.d
Lims ID: Std L1
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 19-Feb-2016 15:08:21 ALS Bottle#: 9 Worklist Smp#: 2
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: STD L1
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
Operator ID: JRB Instrument ID: A6
Sublist: chrom-PFAC_A6*sub5

Method: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\PFAC_A6.m
Limit Group: LC PFC_DOD ICAL
Last Update: 22-Feb-2016 09:58:40 Calib Date: 19-Feb-2016 17:15:39
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_010.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK010

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.0 > 172.0	5.718	5.712	0.006		860754	53.8		108	3626	
2 Perfluorobutyric acid										
212.9 > 169.0	5.724	5.715	0.009	1.000	8634	0.3846		76.9	31.2	
D 3 13C5-PFPeA										
267.9 > 223.0	6.832	6.827	0.005		1656599	53.9		108	5445	
4 Perfluoropentanoic acid										
262.9 > 219.0	6.823	6.828	-0.005	1.000	24416	0.7063		141	4.9	
5 Perfluorobutane Sulfonate										
298.9 > 80.0	6.943	6.939	0.004	1.000	6549	NC			8.3	
298.9 > 99.0	6.947	6.939	0.008	1.001	2180		3.00(0.00-0.00)		6.8	
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	6.943	6.939	0.004	1.000	6549	0.4011		90.7		
7 Perfluorohexanoic acid										
313.0 > 269.0	8.082	8.078	0.004	1.000	17559	0.5204		104	63.7	
D 6 13C2 PFHxA										
315.0 > 270.0	8.087	8.080	0.007		1557529	55.0		110	5408	
D 8 13C4-PFHpA										
367.0 > 322.0	9.328	9.322	0.006		1685988	54.7		109	6243	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.328	9.322	0.006	1.000	21816	0.6204		124	116	
D 11 18O2 PFHxS										
403.0 > 84.0	9.363	9.358	0.005		777834	52.0		110	2685	
10 Perfluorohexane Sulfonate										
399.0 > 80.0	9.381	9.364	0.017	1.000	6504	NC			21.0	
41 Perfluorohexanesulfonic acid										
399.0 > 80.0	9.381	9.364	0.017	1.000	6504	0.5857		124		
D 12 13C4 PFOA										
417.0 > 372.0	10.453	10.450	0.003		1842532	54.0		108	6072	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorooctanoic acid										
413.0 > 369.0	10.453	10.450	0.003	1.000	20588	0.5566		111	21.4	
413.0 > 169.0	10.474	10.450	0.024	1.002	8191		2.51(0.00-0.00)	111	24.5	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.461	10.457	0.004	1.000	6248	NC			31.0	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.461	10.457	0.004	1.000	6248	0.7817		164		
D 16 13C4 PFOS										
503.0 > 80.0	11.421	11.414	0.007		955905	52.6		110	3294	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.421	11.417	0.004	1.000	10554	0.5427		114	37.9	
499.0 > 99.0	11.414	11.417	-0.003	0.999	3471		3.04(0.00-0.00)	114	16.8	
D 17 13C5 PFNA										
468.0 > 423.0	11.444	11.434	0.010		1631991	57.9		116	6715	
18 Perfluorononanoic acid										
463.0 > 419.0	11.458	11.439	0.019	1.000	11375	0.4316		86.3	38.1	
D 19 13C2 PFDA										
515.0 > 470.0	12.286	12.275	0.011		1521664	53.1		106	4154	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.286	12.276	0.010	1.000	28318	0.5978		120	92.0	
D 23 13C8 FOSA										
506.0 > 78.0	12.814	12.810	0.004		2269224	54.7		109	1690	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.825	12.812	0.013	1.000	16577	0.3941		78.8	56.9	
25 Perfluorodecane Sulfonate										
599.0 > 80.0	12.950	12.949	0.001	1.000	2979	NC			5.8	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	12.950	12.949	0.001	1.000	2979	0.5554		115		
D 26 13C2 PFUnA										
565.0 > 520.0	13.010	13.000	0.010		2008621	53.7		107	5478	
27 Perfluoroundecanoic acid										
563.0 > 519.0	13.010	13.000	0.010	1.000	38236	0.4797		95.9	98.7	
D 28 13C2 PFDoA										
615.0 > 570.0	13.616	13.609	0.007		2199484	56.2		112	4878	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.625	13.611	0.014	1.000	14108	0.4387		87.7	18.9	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.147	14.130	0.017	1.000	17329	0.4187		83.7	16.0	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.585	14.571	0.014	1.000	24715	0.4738		94.8	13.2	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.579	14.571	0.008		1897170	52.8		106	6130	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.216	15.207	0.009		2299786	53.4		107	7006	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.216	15.208	0.008	1.000	178126	1.22		245	191	
36 Perfluorooctandecanoic acid										
913.0 > 869.0	15.557	15.543	0.014	1.000	24626	0.5040		101	32.9	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L1_00018 Amount Added: 1.00 Units: mL

Report Date: 22-Feb-2016 09:58:41 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_004.d

Injection Date: 19-Feb-2016 15:08:21 Instrument ID: A6

Lims ID: Std L1

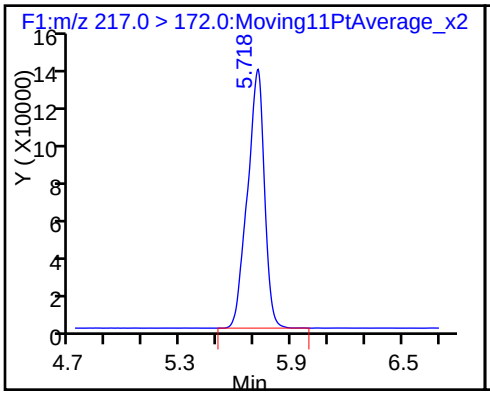
Client ID:

Operator ID: JRB ALS Bottle#: 9 Worklist Smp#: 2

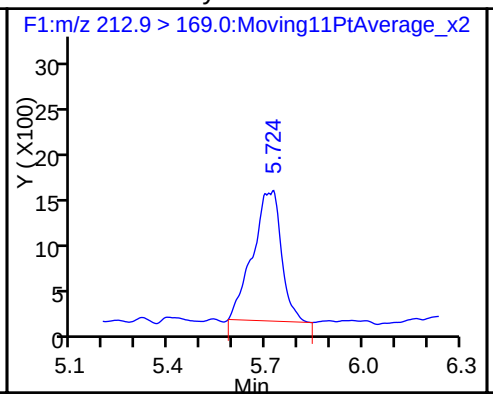
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

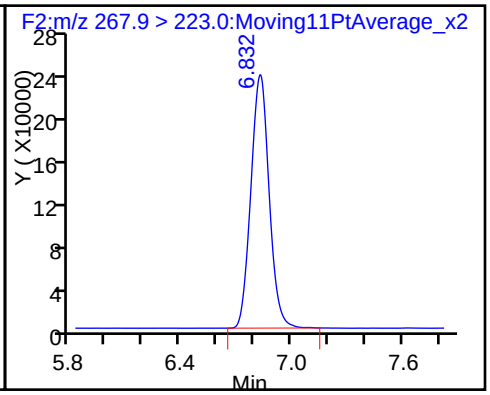
D 1 13C4 PFBA



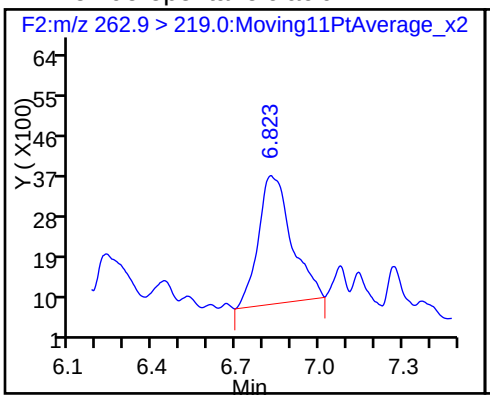
2 Perfluorobutyric acid



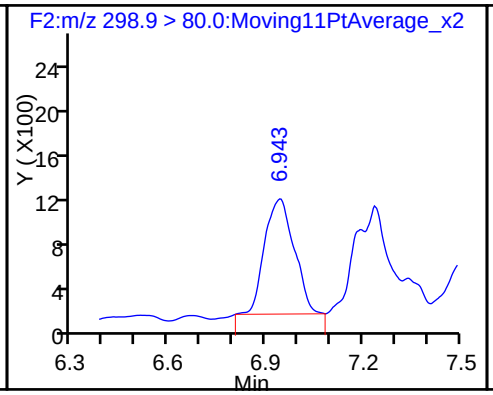
D 3 13C5-PFPeA



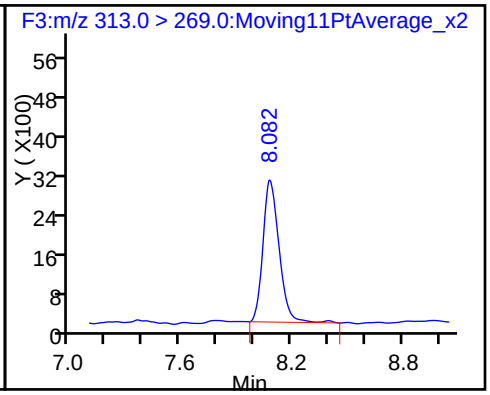
4 Perfluoropentanoic acid



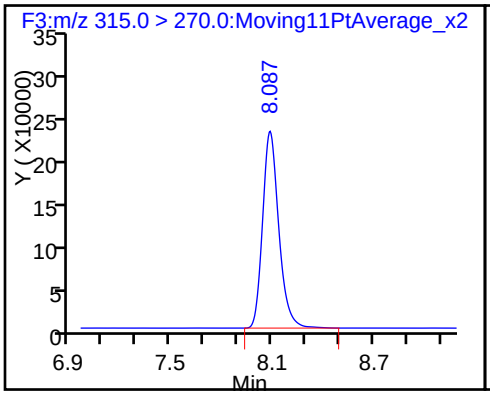
40 Perfluorobutanesulfonic acid



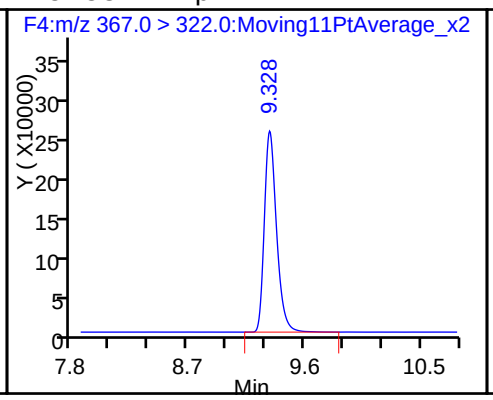
7 Perfluorohexanoic acid



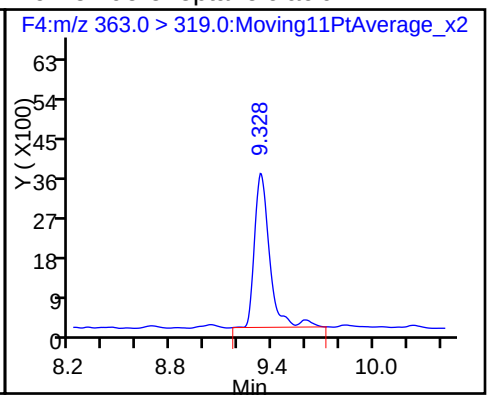
D 6 13C2 PFHxA



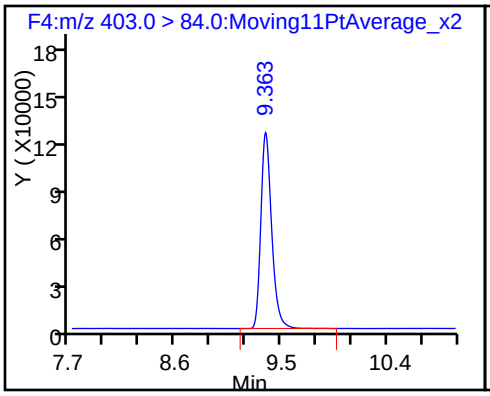
D 8 13C4-PFHpA



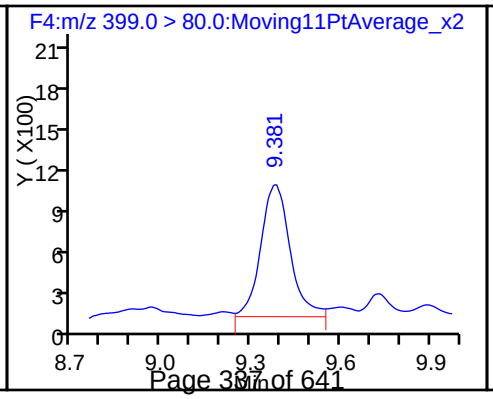
9 Perfluoroheptanoic acid



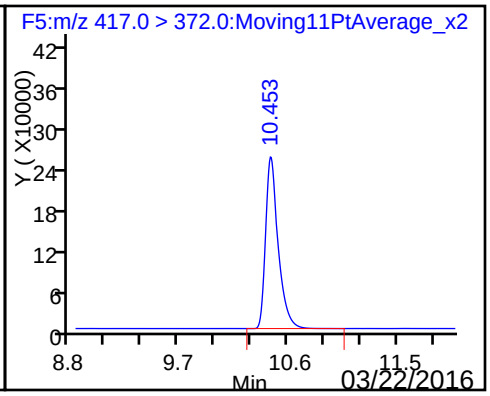
D 11 18O2 PFHxS



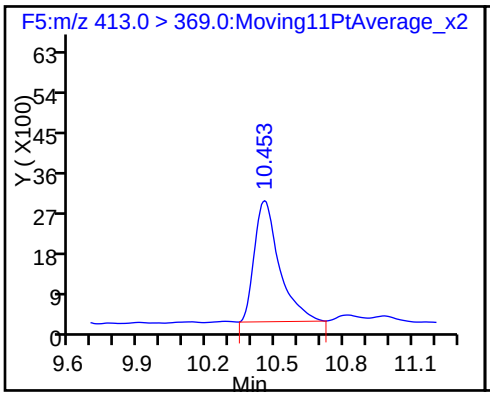
41 Perfluorohexanesulfonic acid



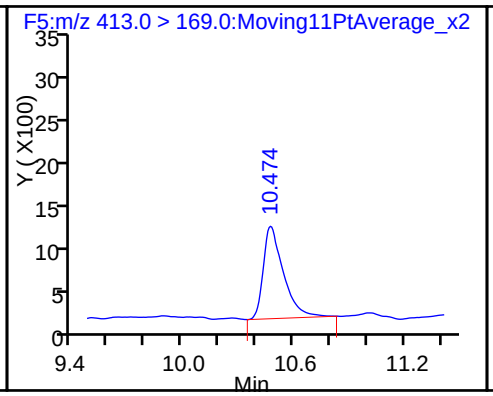
D 12 13C4 PFOA



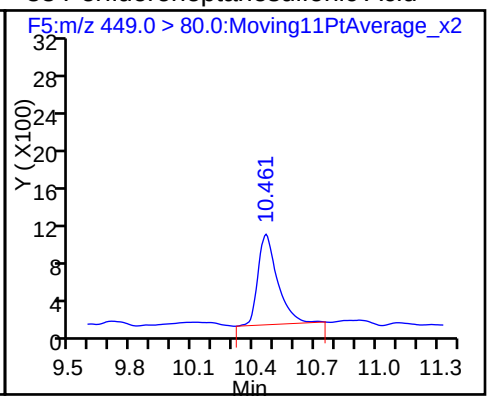
13 Perfluorooctanoic acid



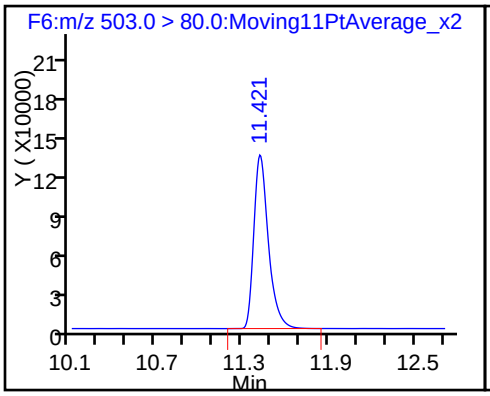
13 Perfluorooctanoic acid



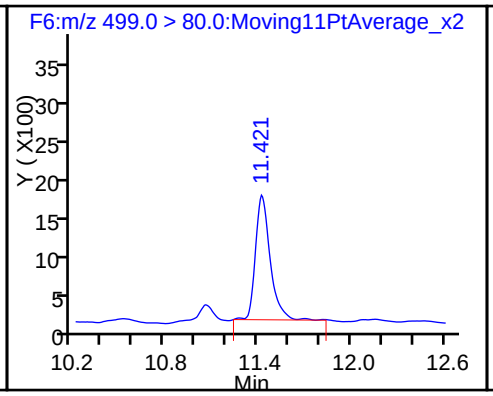
38 Perfluoroheptanesulfonic Acid



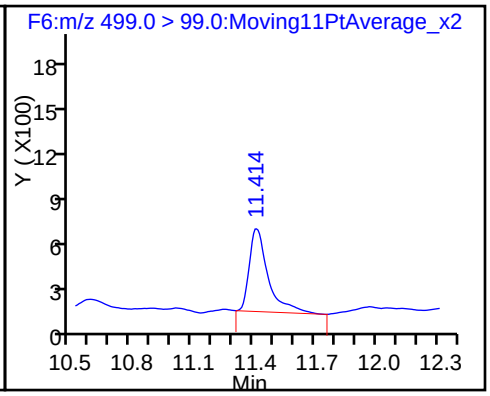
D 16 13C4 PFOS



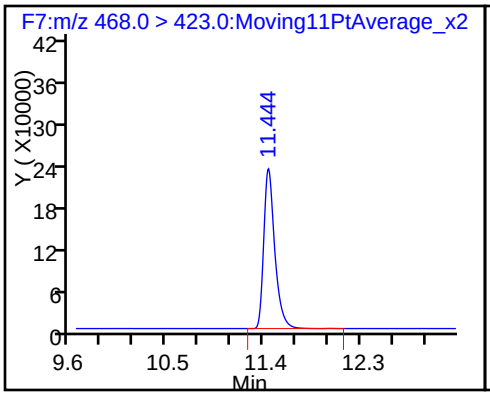
15 Perfluorooctane sulfonic acid



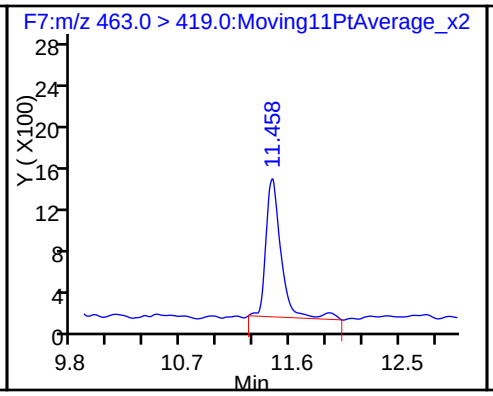
15 Perfluorooctane sulfonic acid



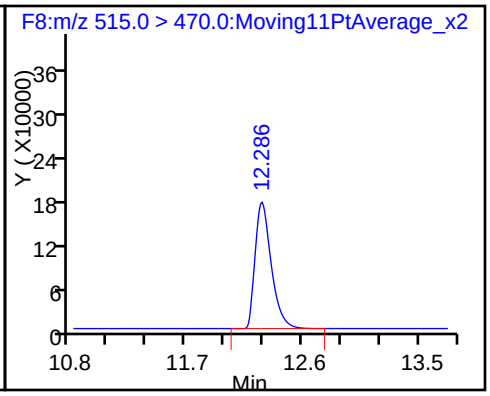
D 17 13C5 PFNA



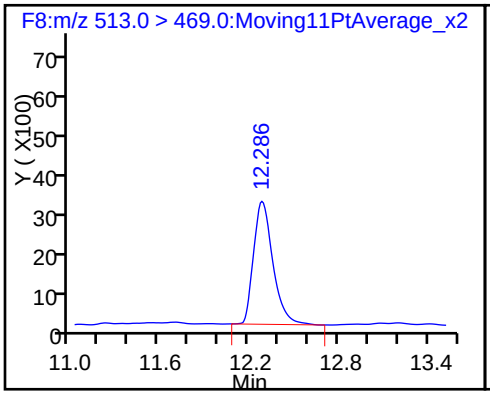
18 Perfluorononanoic acid



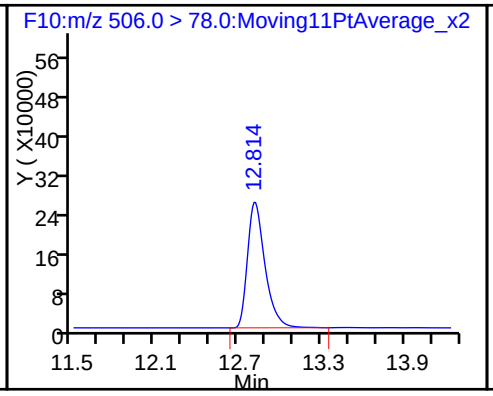
D 19 13C2 PFDA



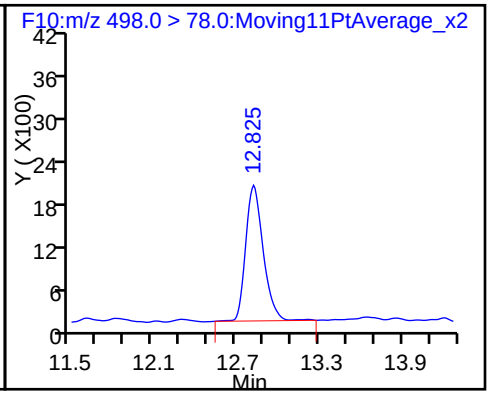
20 Perfluorodecanoic acid



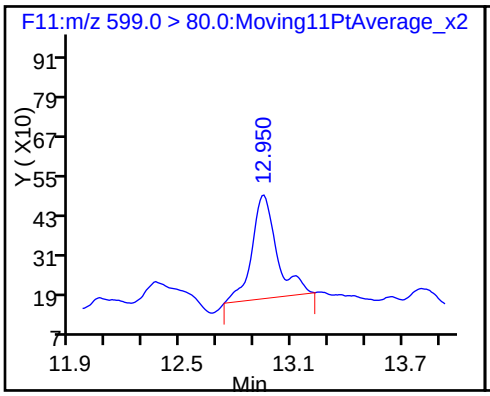
D 23 13C8 FOSA



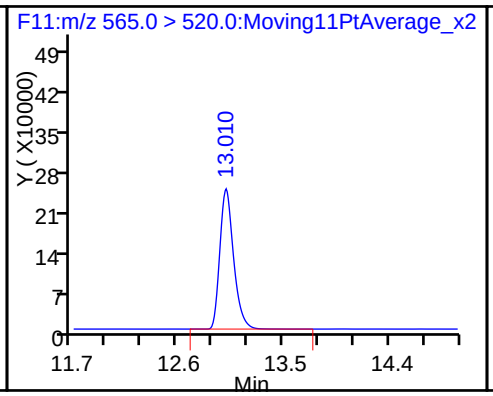
24 Perfluorooctane Sulfonamide



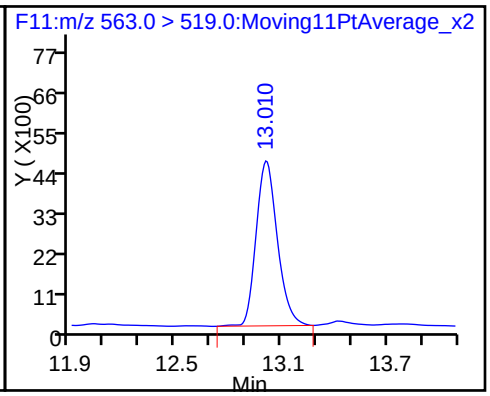
39 Perfluorodecane Sulfonic acid



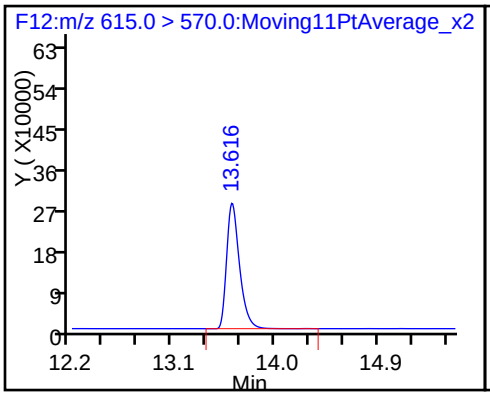
D 26 13C2 PFUnA



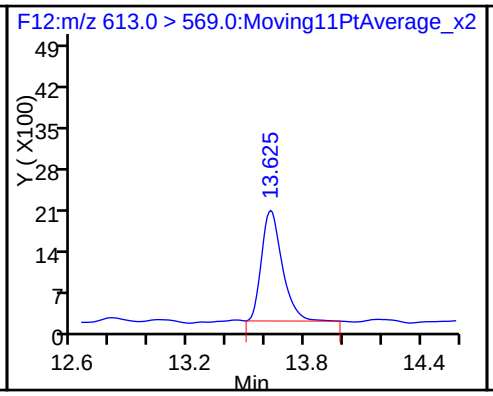
27 Perfluoroundecanoic acid



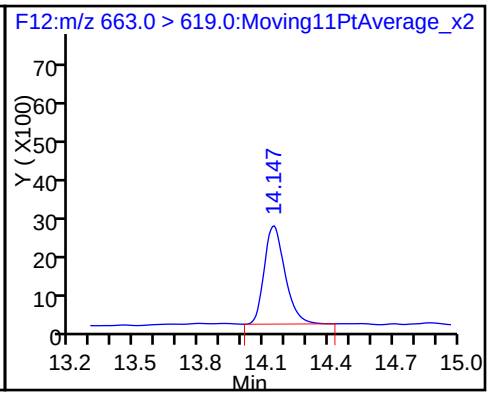
D 28 13C2 PFDoA



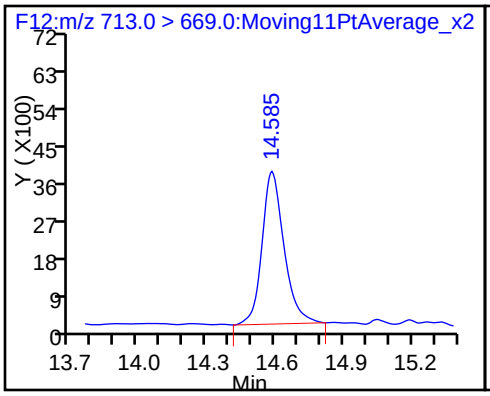
29 Perfluorododecanoic acid



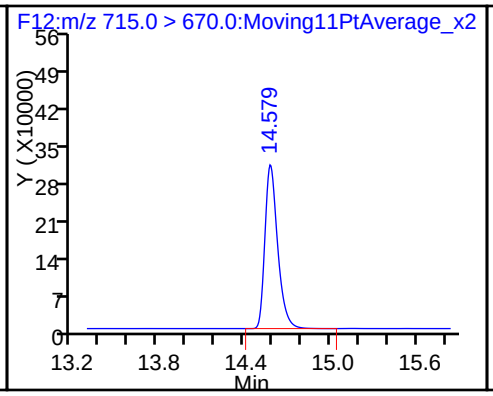
30 Perfluorotridecanoic acid



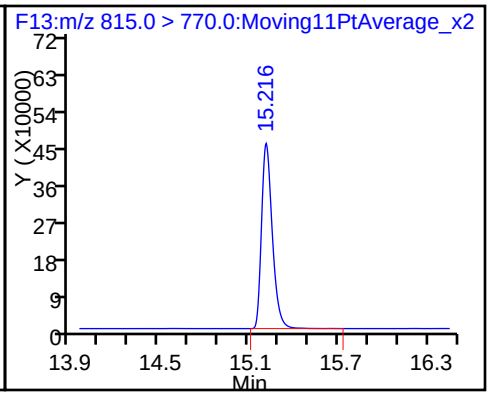
32 Perfluorotetradecanoic acid



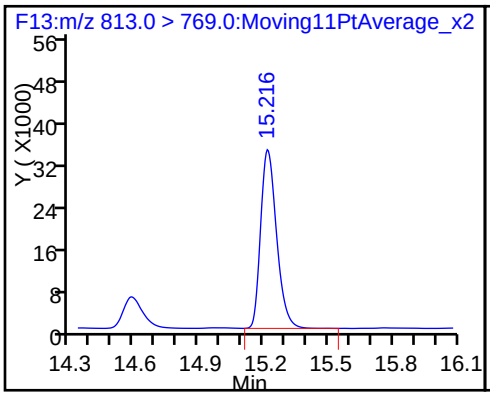
D 33 13C2-PFTeDA



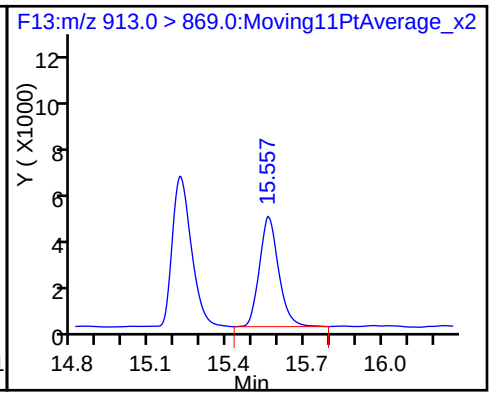
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_005.d
Lims ID: Std L2
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 19-Feb-2016 15:29:34 ALS Bottle#: 10 Worklist Smp#: 3
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: STD L2
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
Operator ID: JRB Instrument ID: A6
Sublist: chrom-PFAC_A6*sub5

Method: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\PFAC_A6.m
Limit Group: LC PFC_DOD ICAL
Last Update: 22-Feb-2016 09:58:43 Calib Date: 19-Feb-2016 17:15:39
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_010.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK010

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.0 > 172.0	5.718	5.712	0.006		907904	56.7		113	2336	
2 Perfluorobutyric acid										
212.9 > 169.0	5.706	5.715	-0.009	1.000	18332	0.7742		77.4	48.8	
D 3 13C5-PFPeA										
267.9 > 223.0	6.837	6.827	0.010		1879822	61.1		122	4021	
4 Perfluoropentanoic acid										
262.9 > 219.0	6.837	6.828	0.009	1.000	41667	1.06		106	9.8	
5 Perfluorobutane Sulfonate										
298.9 > 80.0	6.943	6.939	0.004	1.000	10245	NC			11.2	
298.9 > 99.0	6.966	6.939	0.027	1.003	7619		1.34(0.00-0.00)		16.4	
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	6.943	6.939	0.004	1.000	10245	0.6474		73.2		
7 Perfluorohexanoic acid										
313.0 > 269.0	8.087	8.078	0.009	1.000	29048	0.8198		82.0	93.9	
D 6 13C2 PFHxA										
315.0 > 270.0	8.093	8.080	0.013		1635595	57.7		115	3642	
D 8 13C4-PFHpA										
367.0 > 322.0	9.334	9.322	0.012		1858023	60.3		121	6735	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.334	9.322	0.012	1.000	35173	0.9076		90.8	125	
D 11 18O2 PFHxS										
403.0 > 84.0	9.369	9.358	0.011		753810	50.4		106	2618	
10 Perfluorohexane Sulfonate										
399.0 > 80.0	9.387	9.364	0.023	1.000	9461	NC			32.6	
41 Perfluorohexanesulfonic acid										
399.0 > 80.0	9.387	9.364	0.023	1.000	9461	0.8791		92.9		
D 12 13C4 PFOA										
417.0 > 372.0	10.468	10.450	0.018		1971561	57.7		115	5104	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorooctanoic acid										
413.0 > 369.0	10.461	10.450	0.011	1.000	32208	0.8137		81.4	40.4	
413.0 > 169.0	10.468	10.450	0.018	1.001	15290		2.11(0.00-0.00)	81.4	38.9	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.475	10.457	0.018	1.000	8675	NC			20.9	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.475	10.457	0.018	1.000	8675	0.9509		99.9		
D 16 13C4 PFOS										
503.0 > 80.0	11.428	11.414	0.014		991283	54.5		114	3292	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.436	11.417	0.019	1.000	18718	0.9282		97.1	72.2	
499.0 > 99.0	11.428	11.417	0.011	0.999	4150		4.51(0.00-0.00)	97.1	19.5	
D 17 13C5 PFNA										
468.0 > 423.0	11.451	11.434	0.017		1761627	62.5		125	4150	
18 Perfluorononanoic acid										
463.0 > 419.0	11.451	11.439	0.012	1.000	23017	0.8091		80.9	58.4	
D 19 13C2 PFDA										
515.0 > 470.0	12.286	12.275	0.011		1607037	56.1		112	6838	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.296	12.276	0.020	1.000	42554	1.00		100	97.7	
D 23 13C8 FOSA										
506.0 > 78.0	12.824	12.810	0.014		2206225	53.2		106	1506	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.824	12.812	0.012	1.000	42097	1.03		103	188	
25 Perfluorodecane Sulfonate										
599.0 > 80.0	12.970	12.949	0.021	1.000	6299	NC			16.0	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	12.970	12.949	0.021	1.000	6299	0.8330		86.4		
D 26 13C2 PFUnA										
565.0 > 520.0	13.010	13.000	0.010		2118412	56.7		113	6237	
27 Perfluoroundecanoic acid										
563.0 > 519.0	13.010	13.000	0.010	1.000	51520	0.8005		80.0	179	
D 28 13C2 PFDoA										
615.0 > 570.0	13.624	13.609	0.015		2242621	57.3		115	5907	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.624	13.611	0.013	1.000	23692	0.7225		72.3	32.2	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.139	14.130	0.009	1.000	40040	0.9488		94.9	60.9	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.585	14.571	0.014	1.000	42000	1.10		110	25.5	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.585	14.571	0.014		1961399	54.6		109	5975	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.218	15.207	0.011		2343949	54.4		109	6703	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.218	15.208	0.010	1.000	171017	1.00		100	211	
36 Perfluorooctandecanoic acid										
913.0 > 869.0	15.549	15.543	0.006	1.000	39408	0.7910		79.1	62.1	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L2_00019 Amount Added: 1.00 Units: mL

Report Date: 22-Feb-2016 09:58:44 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_005.d

Injection Date: 19-Feb-2016 15:29:34 Instrument ID: A6

Lims ID: Std L2

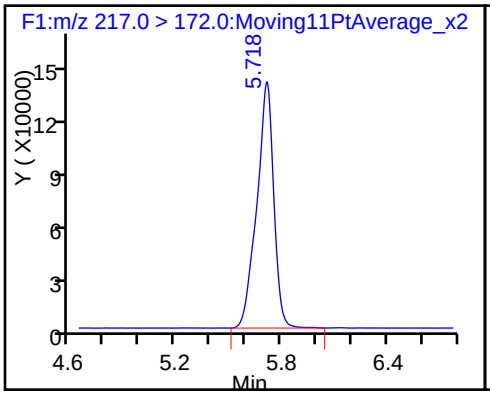
Client ID:

Operator ID: JRB ALS Bottle#: 10 Worklist Smp#: 3

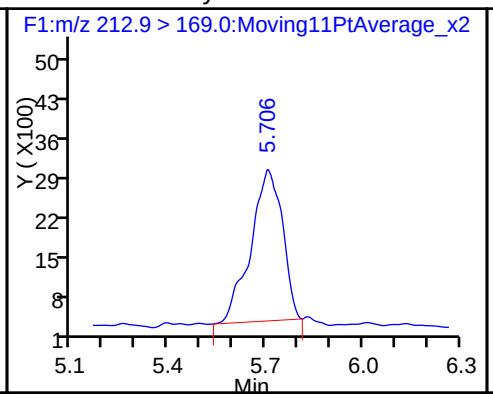
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

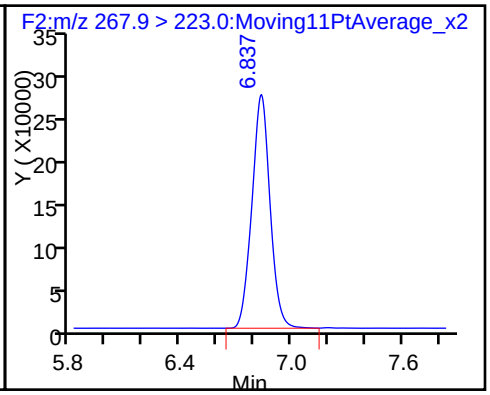
D 1 13C4 PFBA



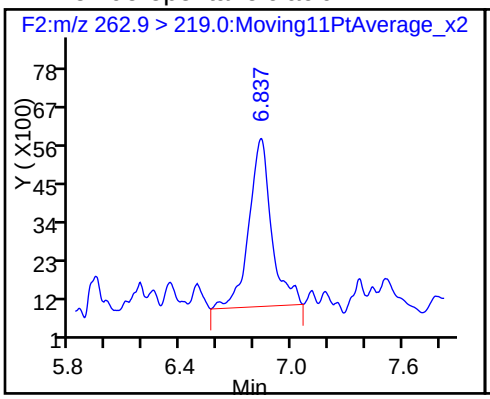
2 Perfluorobutyric acid



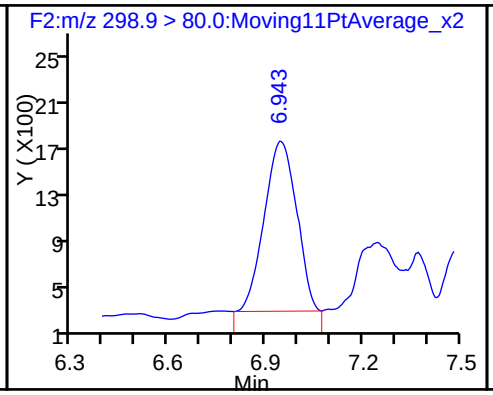
D 3 13C5-PFPeA



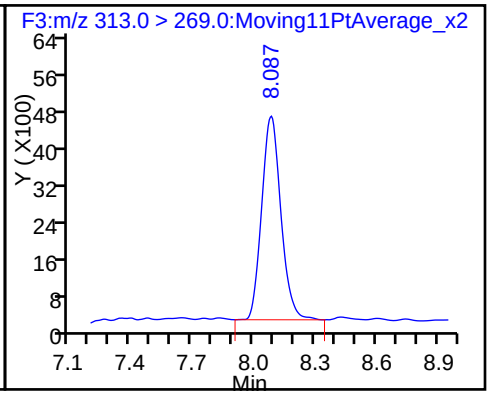
4 Perfluoropentanoic acid



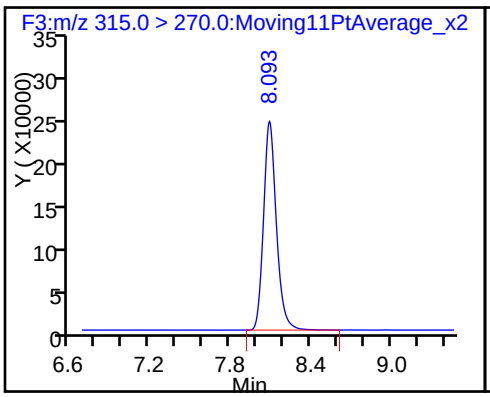
40 Perfluorobutanesulfonic acid



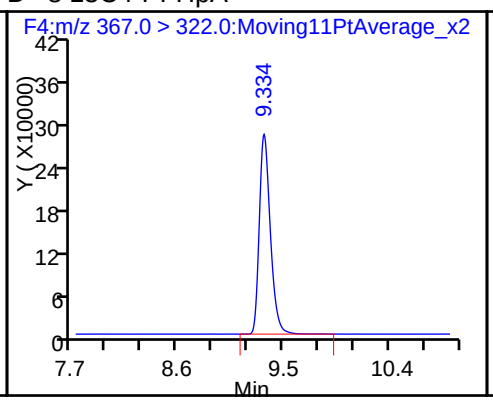
7 Perfluorohexanoic acid



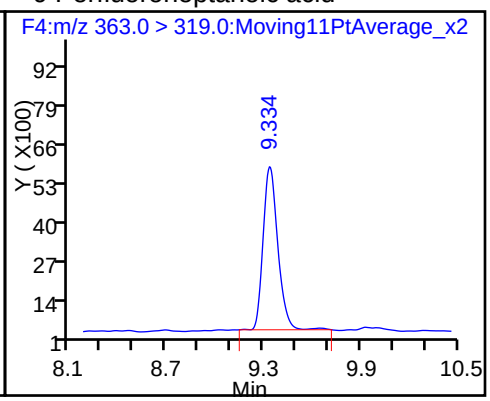
D 6 13C2 PFHxA



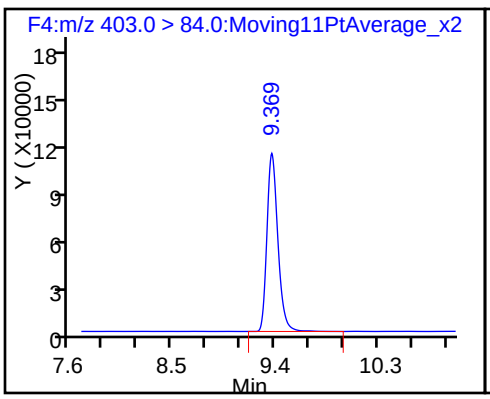
D 8 13C4-PFHpA



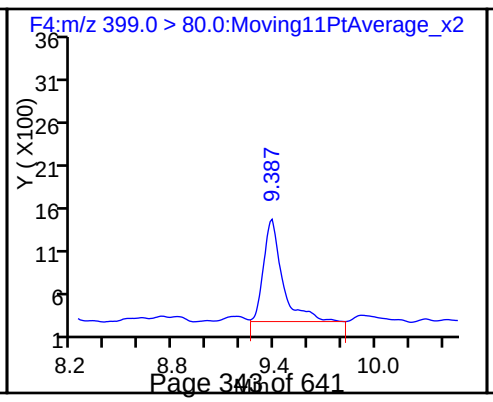
9 Perfluoroheptanoic acid



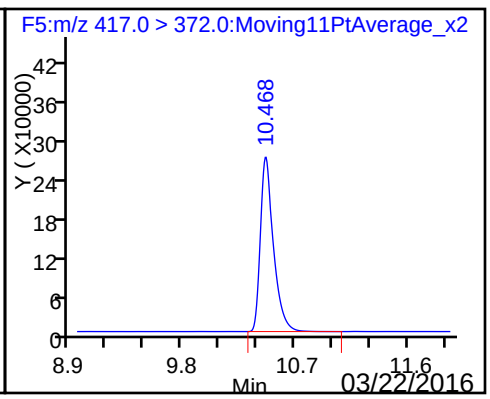
D 11 18O2 PFHxS



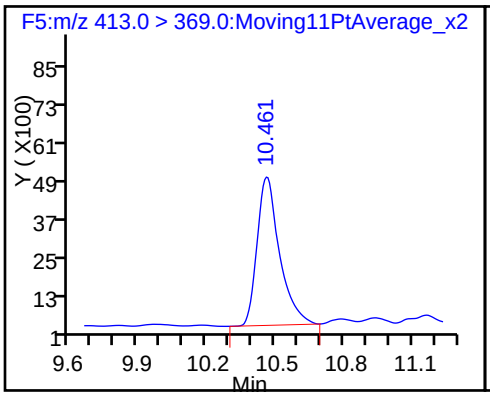
41 Perfluorohexanesulfonic acid



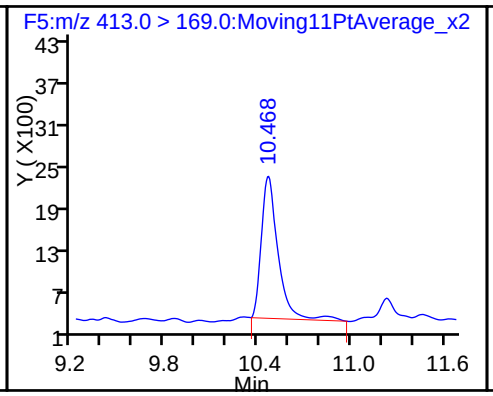
D 12 13C4 PFOA



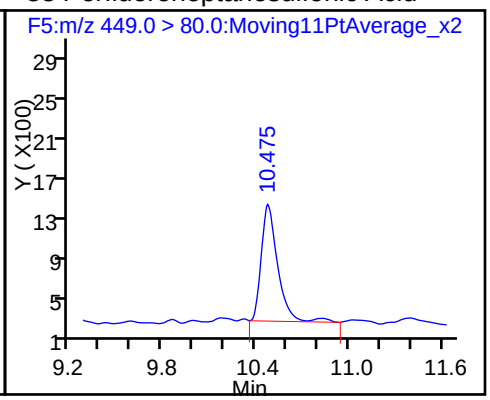
13 Perfluorooctanoic acid



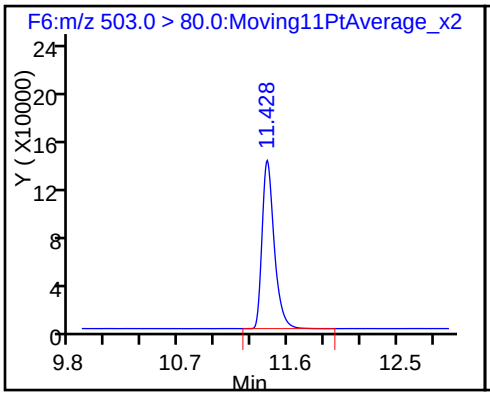
13 Perfluorooctanoic acid



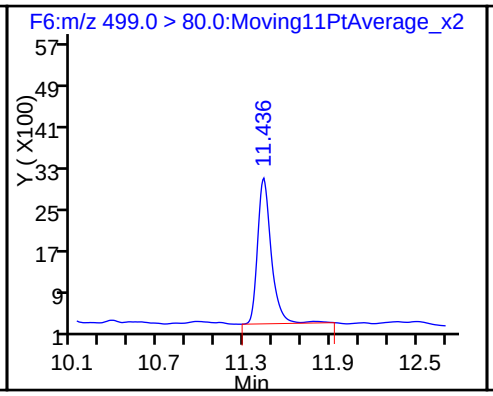
38 Perfluoroheptanesulfonic Acid



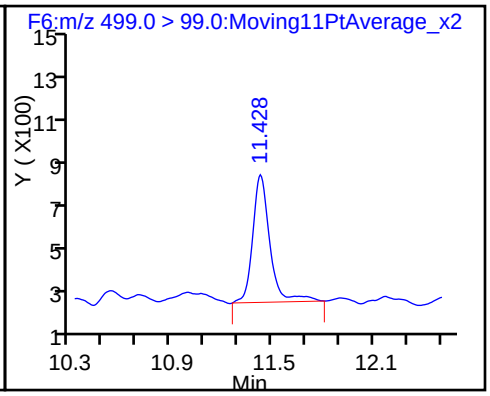
D 16 13C4 PFOS



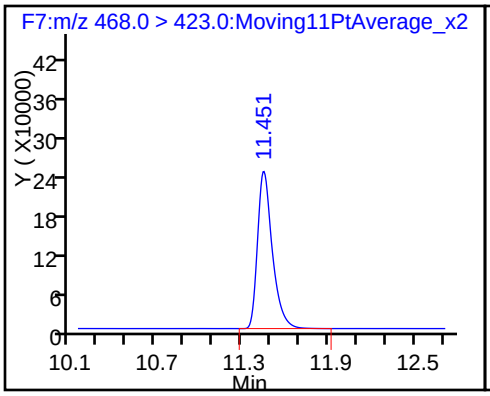
15 Perfluorooctane sulfonic acid



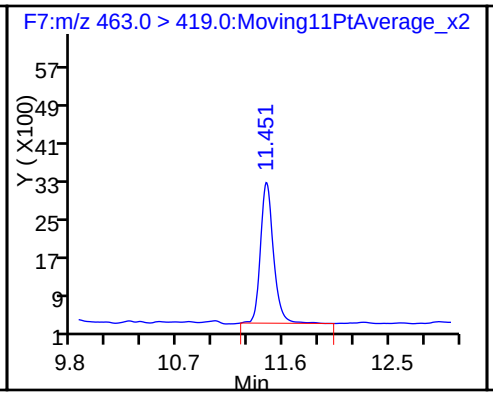
15 Perfluorooctane sulfonic acid



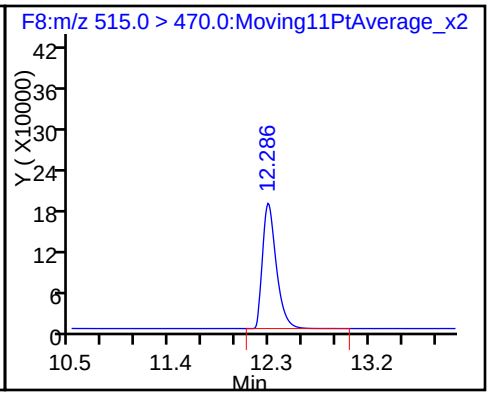
D 17 13C5 PFNA



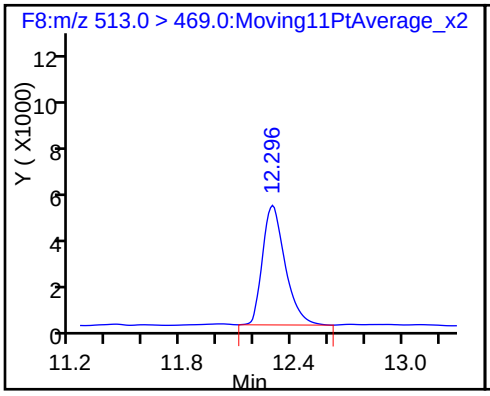
18 Perfluorononanoic acid



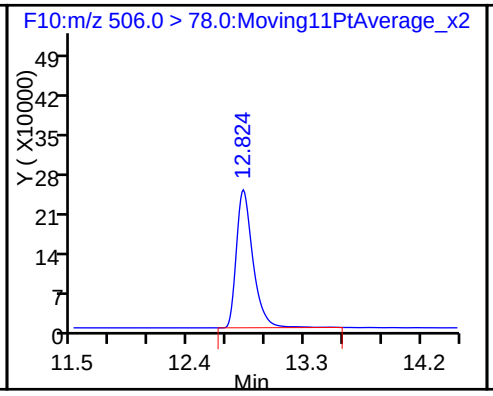
D 19 13C2 PFDA



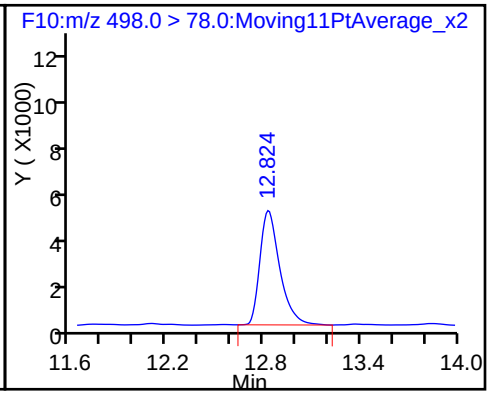
20 Perfluorodecanoic acid



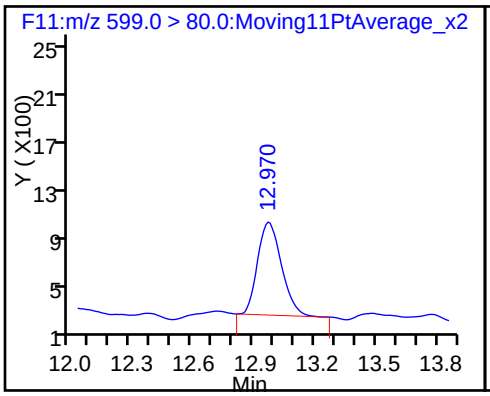
D 23 13C8 FOSA



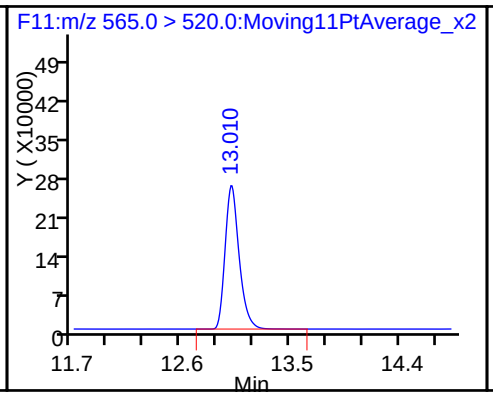
24 Perfluorooctane Sulfonamide



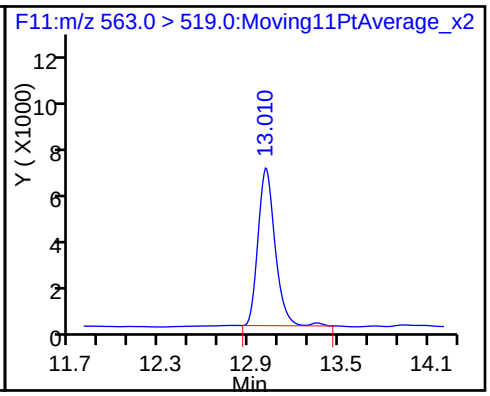
39 Perfluorodecane Sulfonic acid



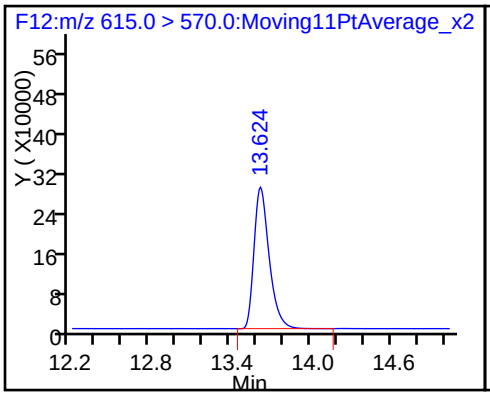
D 26 13C2 PFUnA



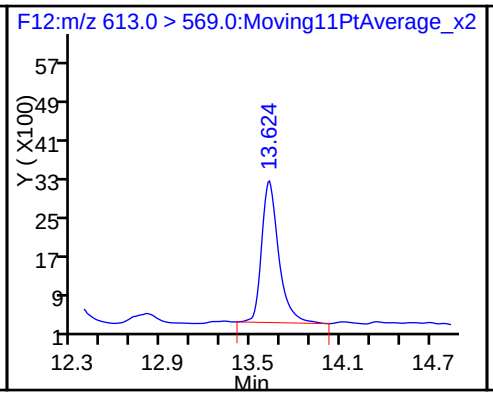
27 Perfluoroundecanoic acid



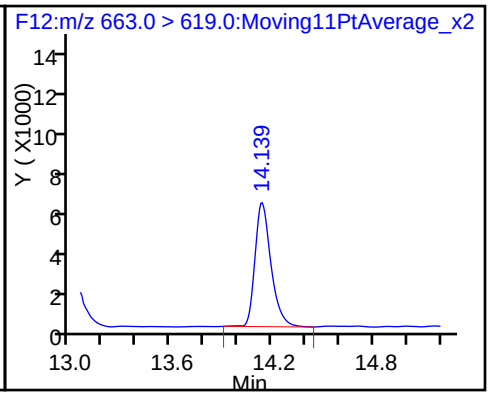
D 28 13C2 PFDoA



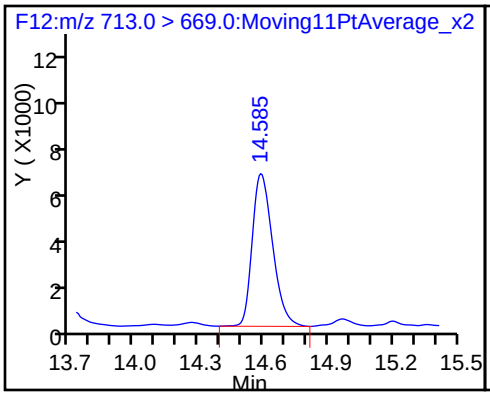
29 Perfluorododecanoic acid



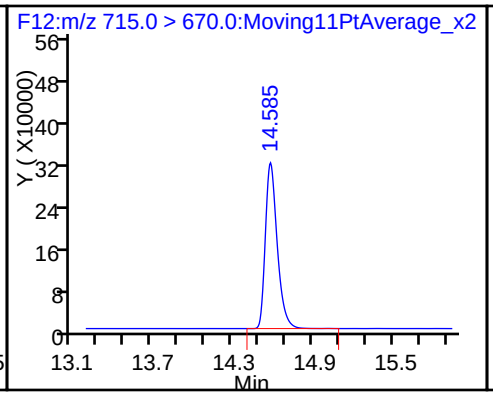
30 Perfluorotridecanoic acid



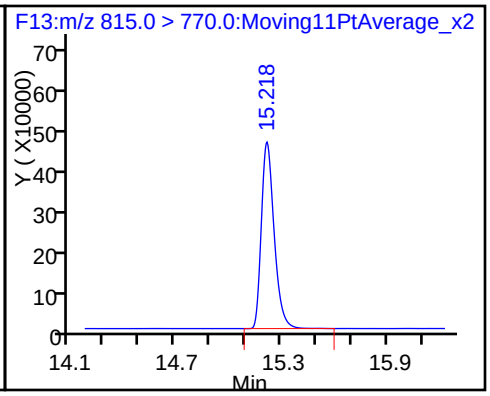
32 Perfluorotetradecanoic acid



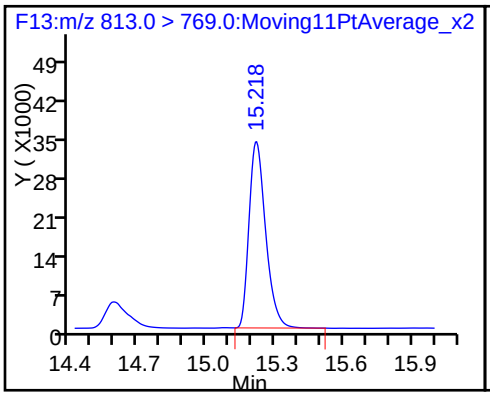
D 33 13C2-PFTeDA



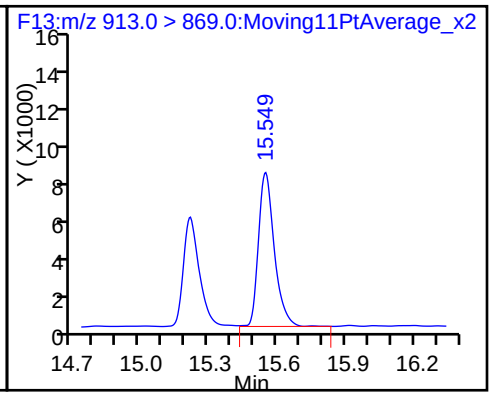
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_006.d
Lims ID: Std L3
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 19-Feb-2016 15:50:47 ALS Bottle#: 11 Worklist Smp#: 4
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: STD L3
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
Operator ID: JRB Instrument ID: A6
Sublist: chrom-PFAC_A6*sub5

Method: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\PFAC_A6.m
Limit Group: LC PFC_DOD ICAL
Last Update: 22-Feb-2016 09:58:45 Calib Date: 19-Feb-2016 17:15:39
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_010.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK010

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.0 > 172.0	5.712	5.712	0.0		882584	55.2		110	3246	
2 Perfluorobutyric acid										
212.9 > 169.0	5.718	5.715	0.003	1.000	123793	5.38		108	317	
D 3 13C5-PFPeA										
267.9 > 223.0	6.828	6.827	0.001		1560021	50.7		101	4030	
4 Perfluoropentanoic acid										
262.9 > 219.0	6.842	6.828	0.014	1.000	168531	5.18		104	40.4	
5 Perfluorobutane Sulfonate										
298.9 > 80.0	6.939	6.939	0.0	1.000	61862	NC			60.9	
298.9 > 99.0	6.948	6.939	0.009	1.001	38678		1.60(0.00-0.00)		67.4	
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	6.939	6.939	0.0	1.000	61862	4.07		92.1		
7 Perfluorohexanoic acid										
313.0 > 269.0	8.084	8.078	0.006	1.000	177522	5.58		112	677	
D 6 13C2 PFHxA										
315.0 > 270.0	8.084	8.080	0.004		1469185	51.9		104	5297	
D 8 13C4-PFHpA										
367.0 > 322.0	9.328	9.322	0.006		1638704	53.2		106	5483	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.328	9.322	0.006	1.000	167149	4.89		97.8	599	
D 11 18O2 PFHxS										
403.0 > 84.0	9.363	9.358	0.005		723683	48.4		102	2722	
10 Perfluorohexane Sulfonate										
399.0 > 80.0	9.363	9.364	-0.001	1.000	48077	NC			141	
41 Perfluorohexanesulfonic acid										
399.0 > 80.0	9.363	9.364	-0.001	1.000	48077	4.65		98.4		
D 12 13C4 PFOA										
417.0 > 372.0	10.453	10.450	0.003		1750451	51.3		103	8337	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorooctanoic acid										
413.0 > 369.0	10.453	10.450	0.003	1.000	188978	5.38		108	203	
413.0 > 169.0	10.461	10.450	0.011	1.001	67070		2.82(0.00-0.00)	108	145	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.461	10.457	0.004	1.000	52893	NC			204	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.461	10.457	0.004	1.000	52893	4.78		100		
D 16 13C4 PFOS										
503.0 > 80.0	11.420	11.414	0.006		898344	49.4		103	3427	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.420	11.417	0.003	1.000	86511	4.73		99.0	229	
499.0 > 99.0	11.420	11.417	0.003	1.000	39257		2.20(0.00-0.00)	99.0	114	
D 17 13C5 PFNA										
468.0 > 423.0	11.443	11.434	0.009		1474756	52.3		105	5146	
18 Perfluorononanoic acid										
463.0 > 419.0	11.443	11.439	0.004	1.000	120395	5.06		101	398	
D 19 13C2 PFDA										
515.0 > 470.0	12.286	12.275	0.011		1565532	54.7		109	4281	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.286	12.276	0.010	1.000	163841	5.01		100	357	
D 23 13C8 FOSA										
506.0 > 78.0	12.814	12.810	0.004		2223851	53.6		107	1602	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.814	12.812	0.002	1.000	203867	4.95		98.9	406	
25 Perfluorodecane Sulfonate										
599.0 > 80.0	12.960	12.949	0.011	1.000	49387	NC			162	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	12.960	12.949	0.011	1.000	49387	5.00		104		
D 26 13C2 PFUnA										
565.0 > 520.0	13.010	13.000	0.010		1980471	53.0		106	5969	
27 Perfluoroundecanoic acid										
563.0 > 519.0	13.010	13.000	0.010	1.000	213464	5.87		117	515	
D 28 13C2 PFDoA										
615.0 > 570.0	13.615	13.609	0.006		2017427	51.6		103	3234	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.615	13.611	0.004	1.000	163307	5.54		111	163	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.139	14.130	0.009	1.000	243228	6.41		128	291	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.578	14.571	0.007	1.000	135077	5.14		103	90.0	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.578	14.571	0.007		1864931	51.9		104	5864	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.213	15.207	0.006		2201810	51.1		102	5730	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.213	15.208	0.005	1.000	324953	4.96		99.1	522	
36 Perfluorooctandecanoic acid										
913.0 > 869.0	15.544	15.543	0.001	1.000	245350	5.47		109	345	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L3_00016 Amount Added: 1.00 Units: mL

Report Date: 22-Feb-2016 09:58:46 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_006.d

Injection Date: 19-Feb-2016 15:50:47 Instrument ID: A6

Lims ID: Std L3

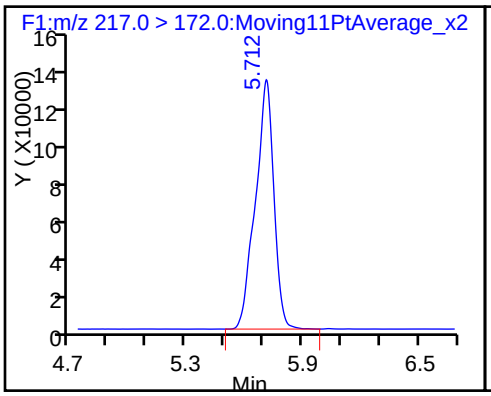
Client ID:

Operator ID: JRB ALS Bottle#: 11 Worklist Smp#: 4

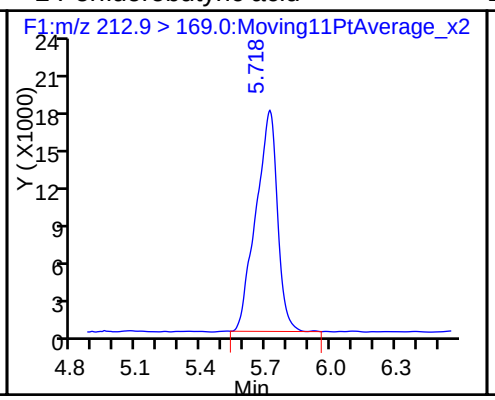
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

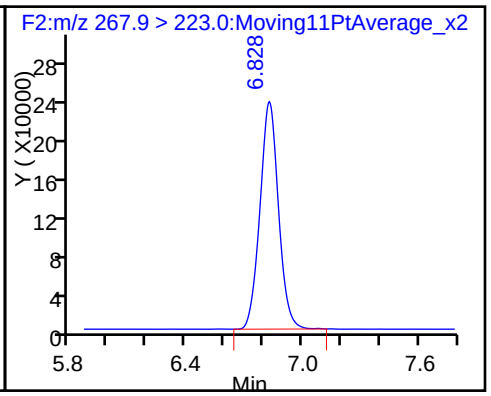
D 1 13C4 PFBA



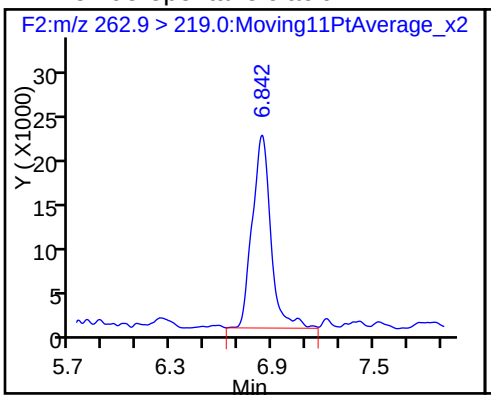
2 Perfluorobutyric acid



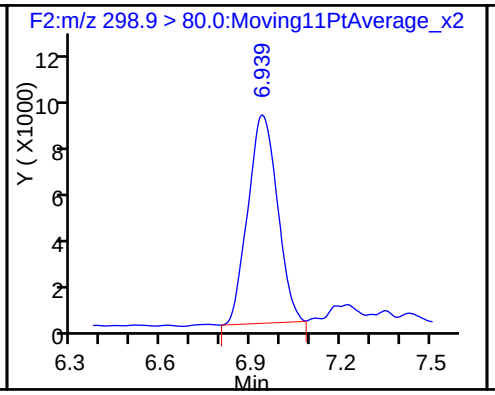
D 3 13C5-PFPeA



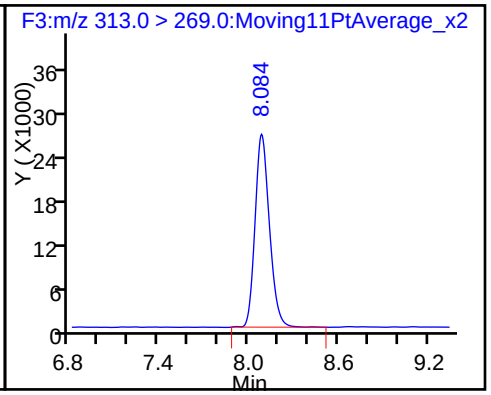
4 Perfluoropentanoic acid



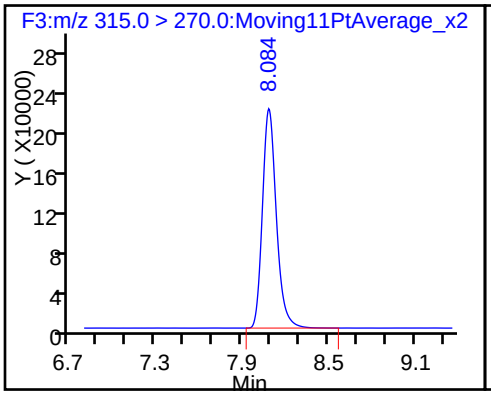
40 Perfluorobutanesulfonic acid



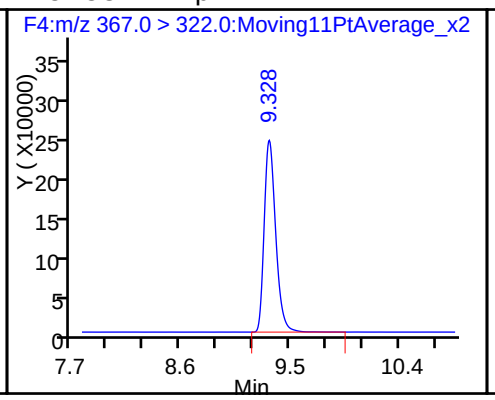
7 Perfluorohexanoic acid



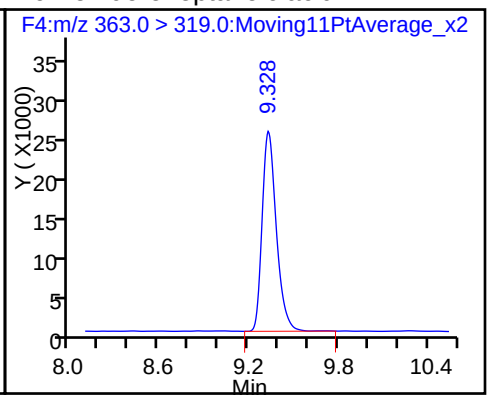
D 6 13C2 PFHxA



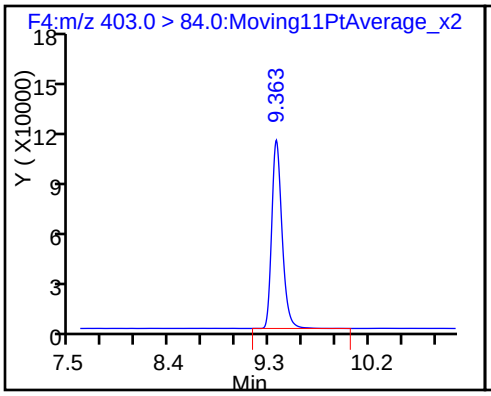
D 8 13C4-PFHpA



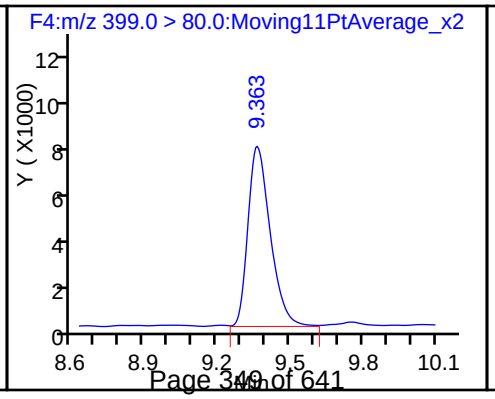
9 Perfluoroheptanoic acid



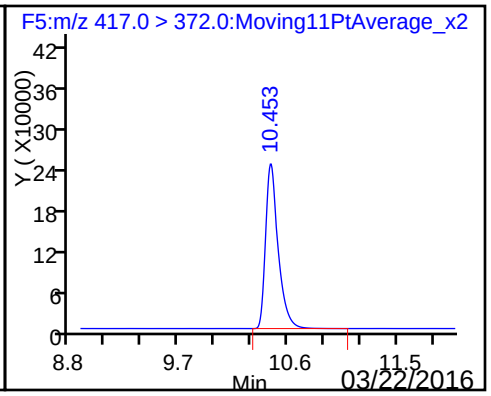
D 11 18O2 PFHxS



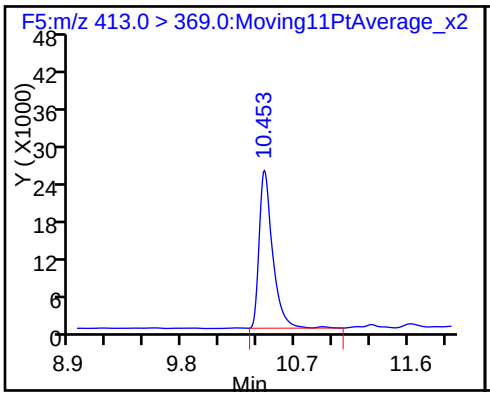
41 Perfluorohexanesulfonic acid



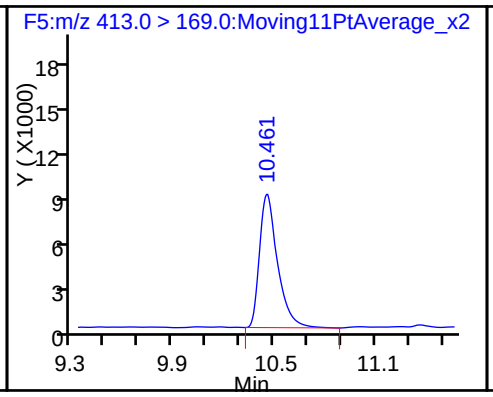
D 12 13C4 PFOA



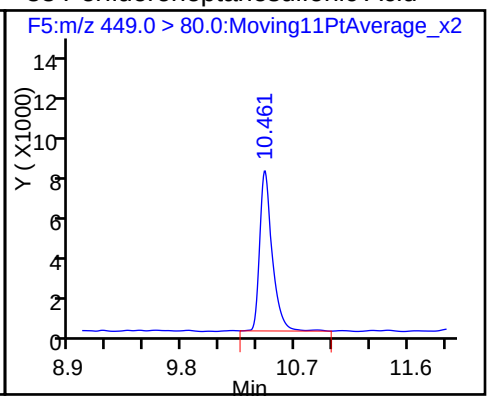
13 Perfluorooctanoic acid



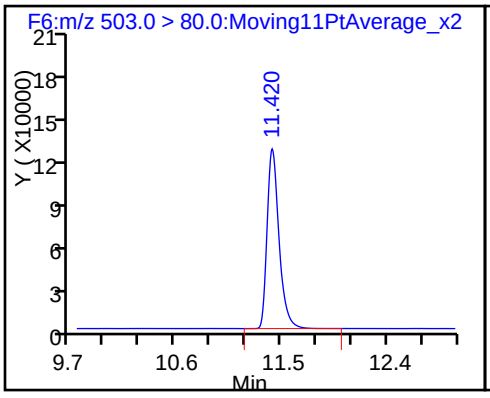
13 Perfluorooctanoic acid



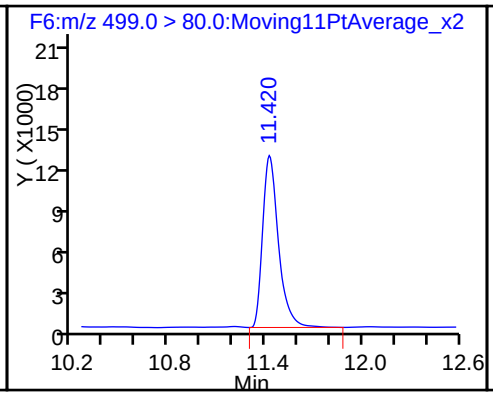
38 Perfluoroheptanesulfonic Acid



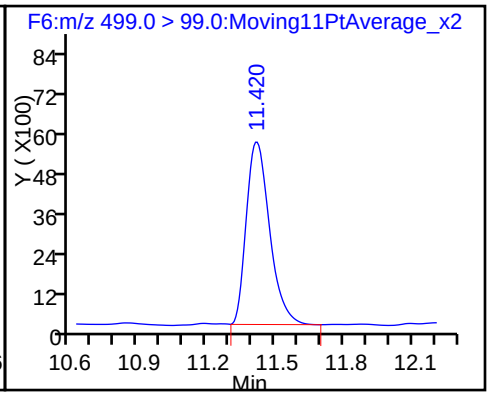
D 16 13C4 PFOS



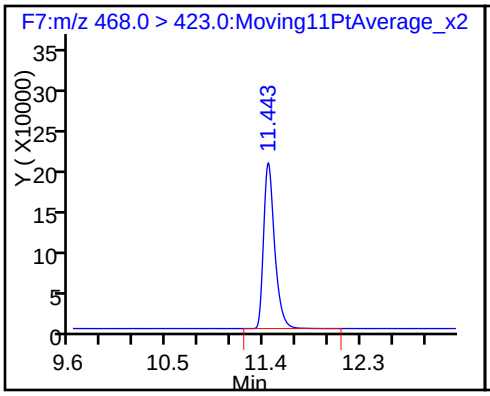
15 Perfluorooctane sulfonic acid



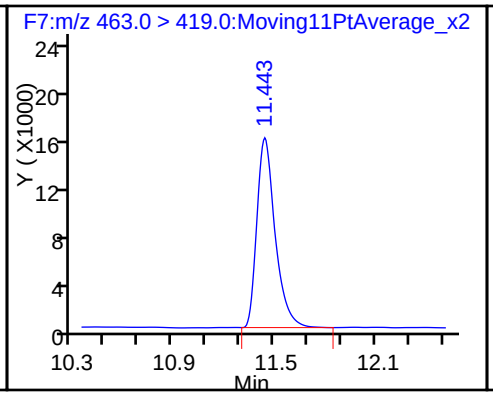
15 Perfluorooctane sulfonic acid



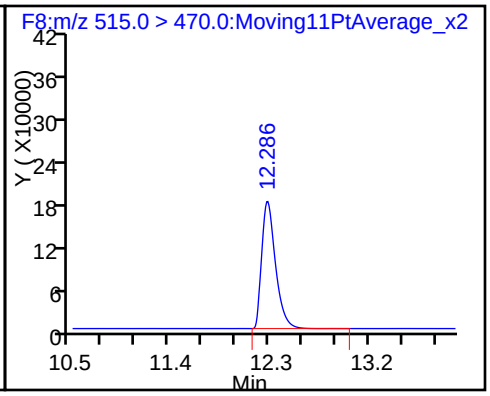
D 17 13C5 PFNA



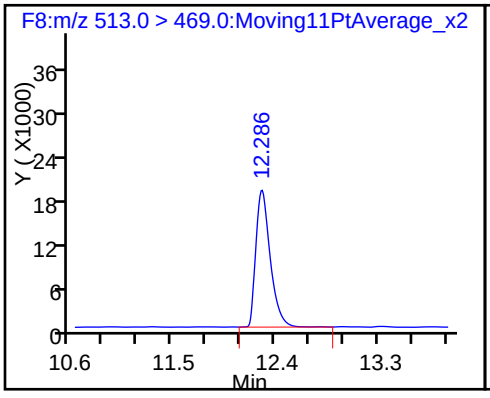
18 Perfluorononanoic acid



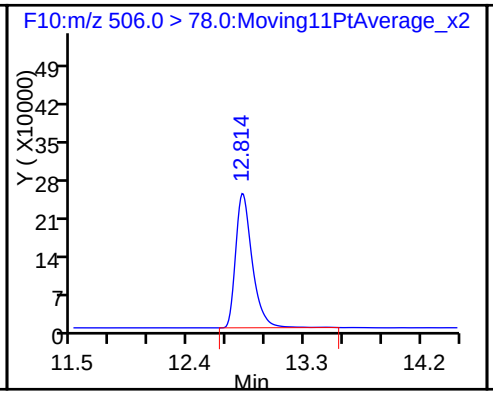
D 19 13C2 PFDA



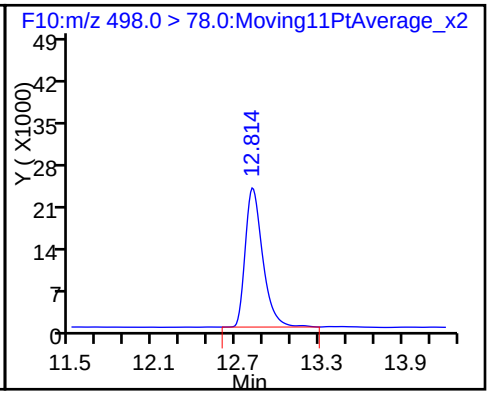
20 Perfluorodecanoic acid



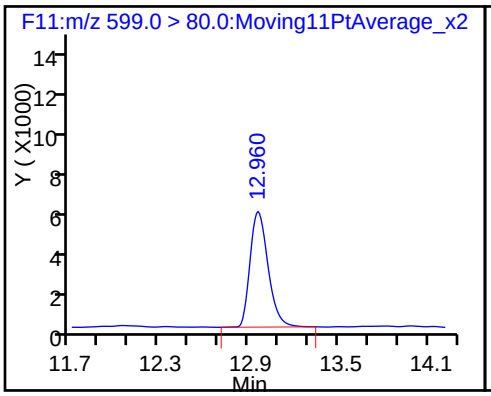
D 23 13C8 FOSA



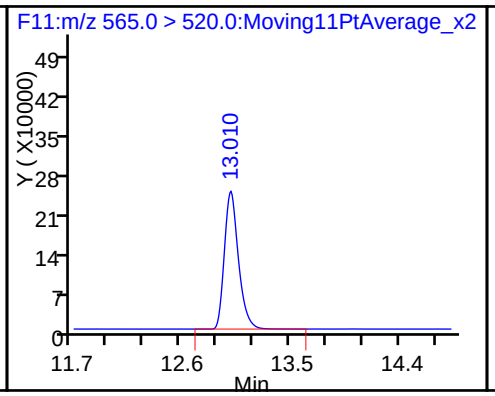
24 Perfluorooctane Sulfonamide



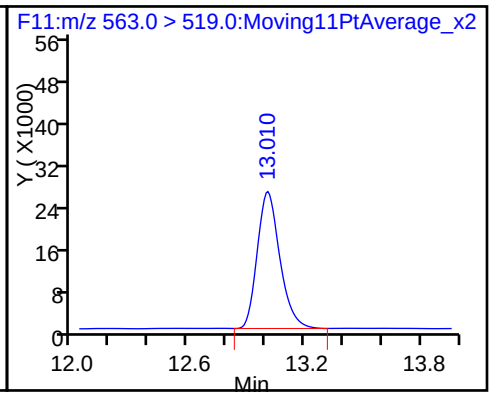
39 Perfluorodecane Sulfonic acid



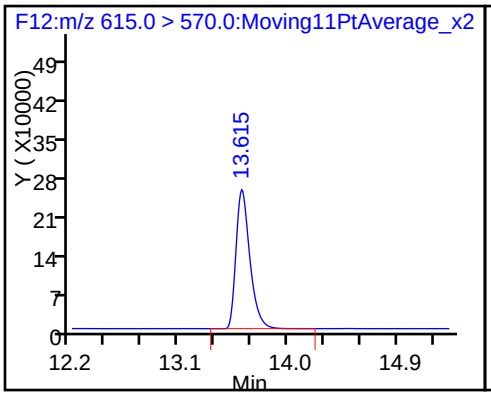
D 26 13C2 PFUnA



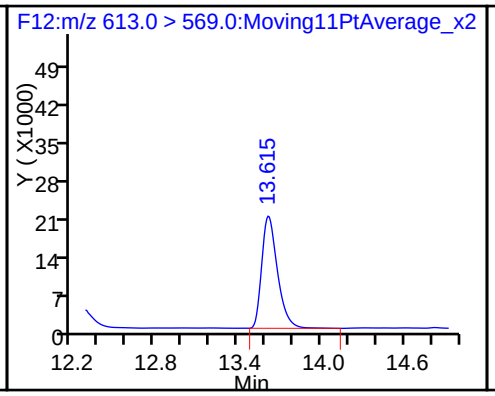
27 Perfluoroundecanoic acid



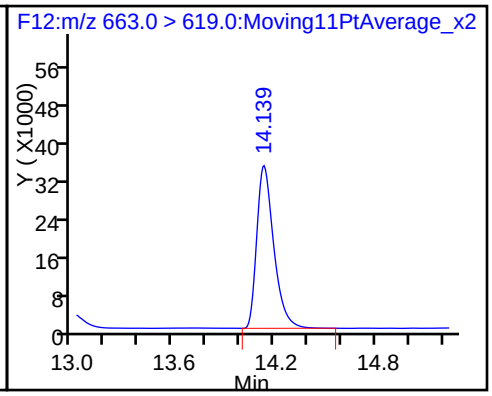
D 28 13C2 PFDoA



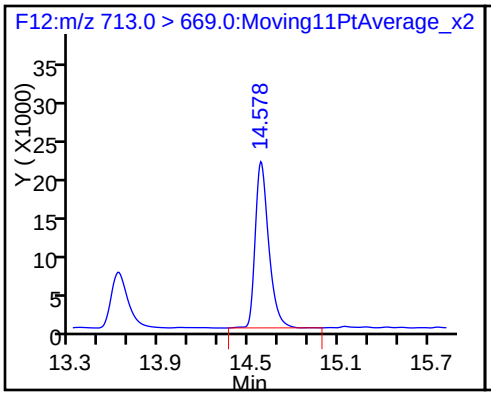
29 Perfluorododecanoic acid



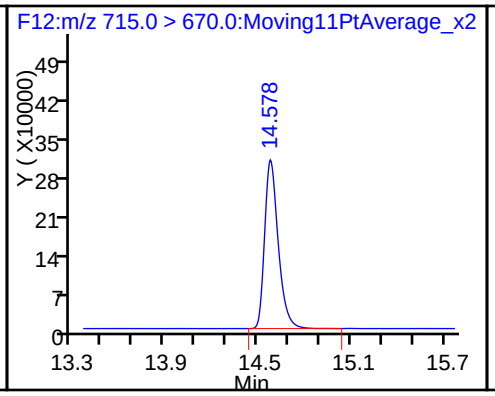
30 Perfluorotridecanoic acid



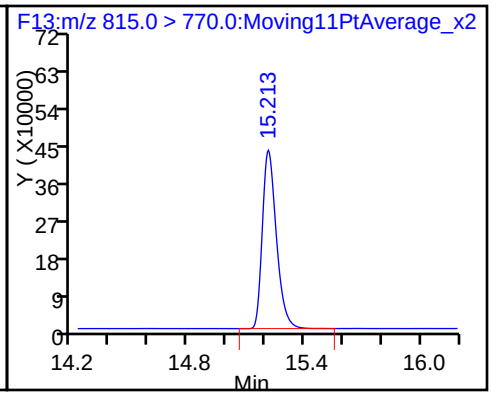
32 Perfluorotetradecanoic acid



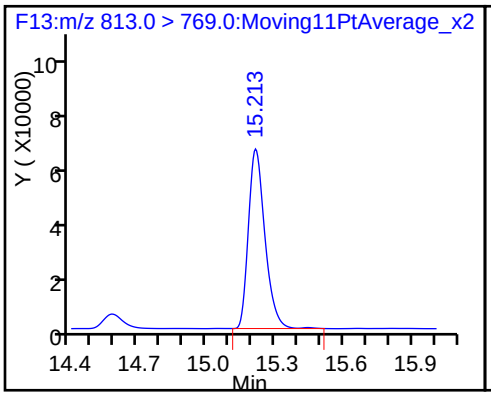
D 33 13C2-PFTeDA



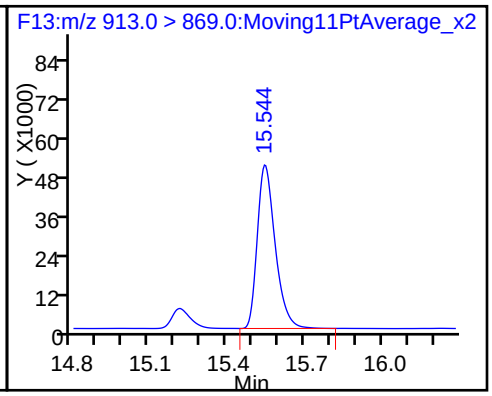
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_007.d
Lims ID: Std L4
Client ID:
Sample Type: IC Calib Level: 4
Inject. Date: 19-Feb-2016 16:11:58 ALS Bottle#: 12 Worklist Smp#: 5
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: STD L4
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
Operator ID: JRB Instrument ID: A6
Sublist: chrom-PFAC_A6*sub5

Method: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\PFAC_A6.m
Limit Group: LC PFC_DOD ICAL
Last Update: 22-Feb-2016 09:58:48 Calib Date: 19-Feb-2016 17:15:39
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_010.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK010

First Level Reviewer: westendorfc Date: 21-Feb-2016 15:43:25

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.0 > 172.0	5.709	5.712	-0.003		823965	51.5		103	1860	
2 Perfluorobutyric acid										
212.9 > 169.0	5.715	5.715	0.0	1.000	462922	21.5		108	1792	
D 3 13C5-PFPeA										
267.9 > 223.0	6.828	6.827	0.001		1598957	52.0		104	5454	
4 Perfluoropentanoic acid										
262.9 > 219.0	6.828	6.828	0.0	1.000	673970	20.2		101	192	
5 Perfluorobutane Sulfonate										
298.9 > 80.0	6.942	6.939	0.003	1.000	294821	NC			430	
298.9 > 99.0	6.942	6.939	0.003	1.000	171078		1.72(0.00-0.00)		274	
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	6.942	6.939	0.003	1.000	294821	19.0		107		
7 Perfluorohexanoic acid										
313.0 > 269.0	8.082	8.078	0.004	1.000	618008	18.9		94.3	2035	
D 6 13C2 PFHxA										
315.0 > 270.0	8.082	8.080	0.002		1512461	53.4		107	5873	
D 8 13C4-PFHpA										
367.0 > 322.0	9.323	9.322	0.001		1694741	55.0		110	5704	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.323	9.322	0.001	1.000	778743	22.0		110	2475	
D 11 18O2 PFHxS										
403.0 > 84.0	9.358	9.358	0.0		739449	49.4		104	2322	
10 Perfluorohexane Sulfonate										
399.0 > 80.0	9.358	9.364	-0.006	1.000	205104	NC			759	
41 Perfluorohexanesulfonic acid										
399.0 > 80.0	9.358	9.364	-0.006	1.000	205104	19.4		103		

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFOA										
417.0 > 372.0	10.454	10.450	0.004		1793859	52.5		105	5536	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.454	10.450	0.004	1.000	715180	19.9		99.3	762	
413.0 > 169.0	10.454	10.450	0.004	1.000	250759		2.85(0.00-0.00)	99.3	716	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.461	10.457	0.004	1.000	216336	NC			809	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.461	10.457	0.004	1.000	216336	19.1		100		
D 16 13C4 PFOS										
503.0 > 80.0	11.414	11.414	0.0		879178	48.4		101	3624	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.421	11.417	0.004	1.000	356703	19.9		104	413	
499.0 > 99.0	11.414	11.417	-0.003	0.999	193440		1.84(0.00-0.00)	104	731	
D 17 13C5 PFNA										
468.0 > 423.0	11.437	11.434	0.003		1459436	51.8		104	5635	
18 Perfluorononanoic acid										
463.0 > 419.0	11.437	11.439	-0.002	1.000	518362	22.0		110	1486	
D 19 13C2 PFDA										
515.0 > 470.0	12.276	12.275	0.001		1524195	53.2		106	4870	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.276	12.276	0.0	1.000	571448	18.9		94.4	1987	
D 23 13C8 FOSA										
506.0 > 78.0	12.814	12.810	0.004		2199385	53.0		106	2293	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.814	12.812	0.002	1.000	832823	20.4		102	833	
25 Perfluorodecane Sulfonate										
599.0 > 80.0	12.950	12.949	0.001	1.000	202871	NC			616	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	12.950	12.949	0.001	1.000	202871	20.1		104		
D 26 13C2 PFUnA										
565.0 > 520.0	13.002	13.000	0.002		1975170	52.8		106	5266	
27 Perfluoroundecanoic acid										
563.0 > 519.0	13.002	13.000	0.002	1.000	694202	20.7		103	1673	
D 28 13C2 PFDoA										
615.0 > 570.0	13.615	13.609	0.006		2115244	54.1		108	6995	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.615	13.611	0.004	1.000	679009	22.0		110	827	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.132	14.130	0.002	1.000	875238	22.0		110	983	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.572	14.571	0.001	1.000	498848	19.3		96.5	333	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.579	14.571	0.008		1885833	52.5		105	5639	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.213	15.207	0.006		2282833	53.0		106	5499	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.213	15.208	0.005	1.000	996289	19.4		97.0	1274	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
36 Perfluorooctandecanoic acid										
913.0 > 869.0	15.544	15.543	0.001	1.000	961125	20.5		102	1418	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L4_00017 Amount Added: 1.00 Units: mL

Report Date: 22-Feb-2016 09:58:49 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_007.d

Injection Date: 19-Feb-2016 16:11:58 Instrument ID: A6

Lims ID: Std L4

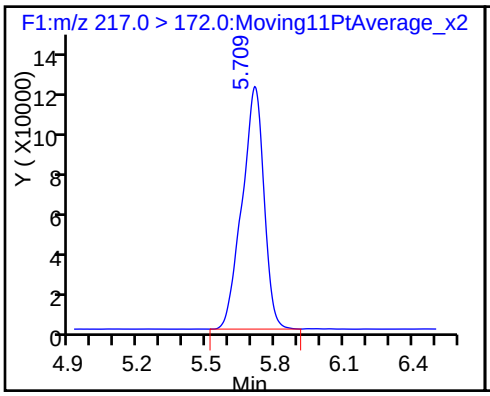
Client ID:

Operator ID: JRB ALS Bottle#: 12 Worklist Smp#: 5

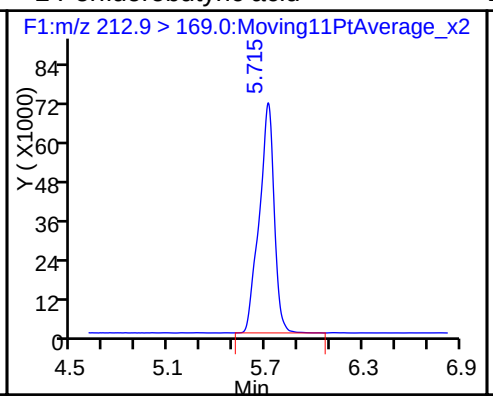
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

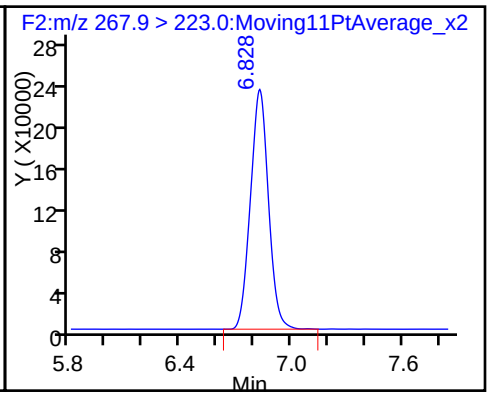
D 1 13C4 PFBA



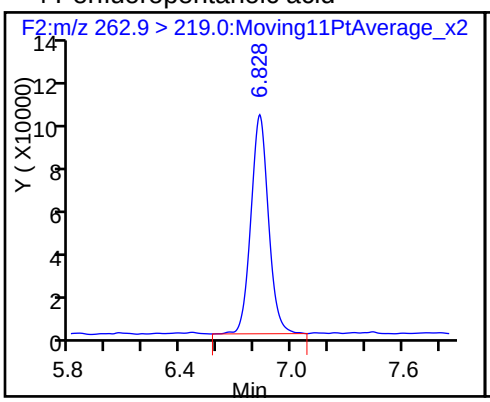
2 Perfluorobutyric acid



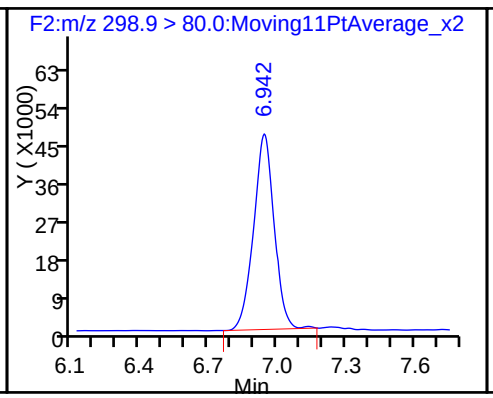
D 3 13C5-PFPeA



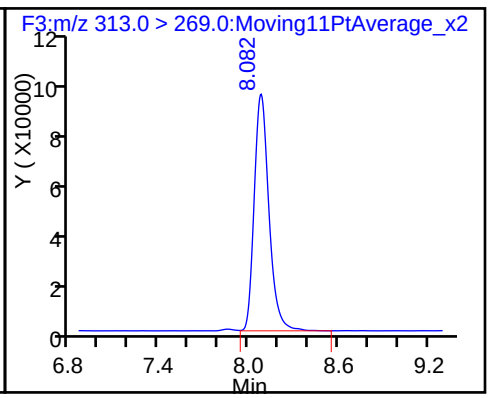
4 Perfluoropentanoic acid



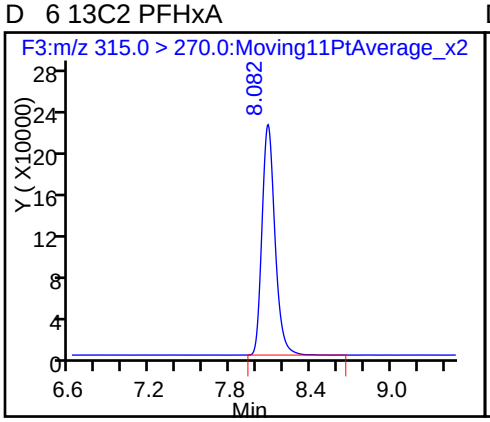
40 Perfluorobutanesulfonic acid



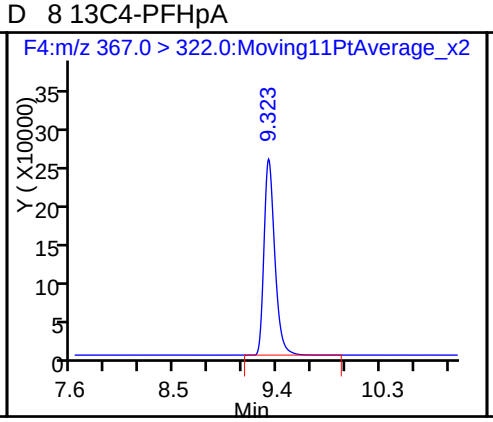
7 Perfluorohexanoic acid



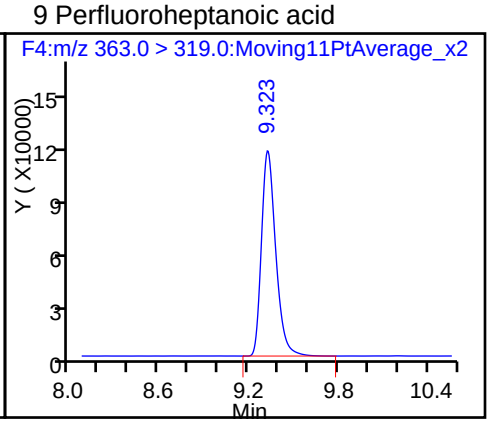
D 6 13C2 PFHxA



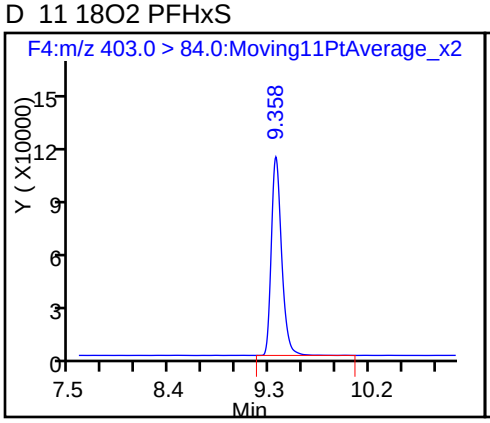
D 8 13C4-PFHpA



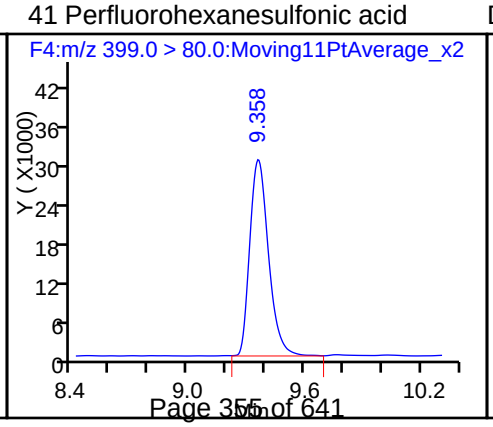
9 Perfluoroheptanoic acid



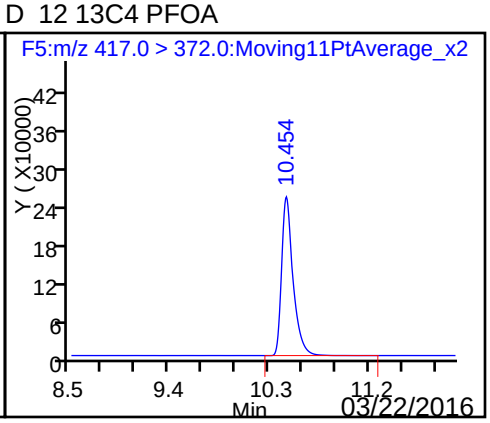
D 11 18O2 PFHxS



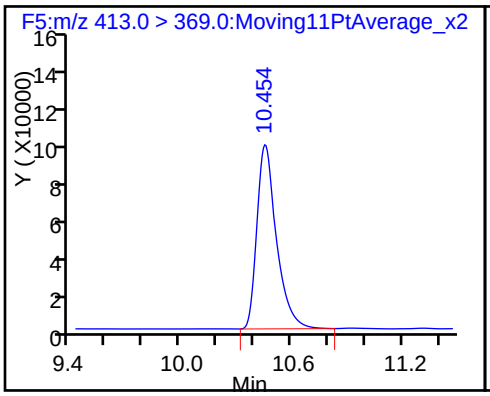
41 Perfluorohexanesulfonic acid



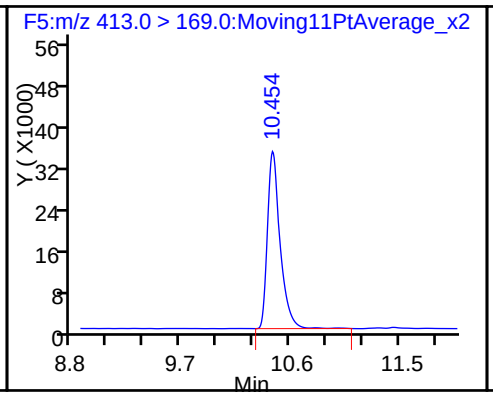
D 12 13C4 PFOA



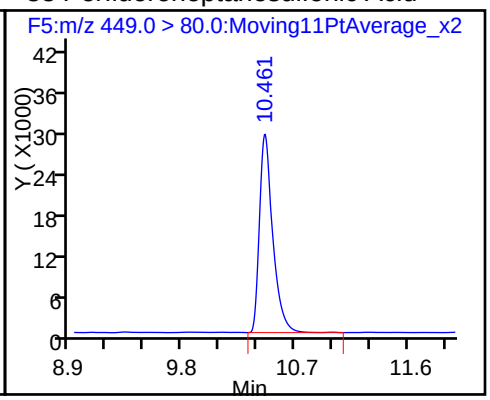
13 Perfluorooctanoic acid



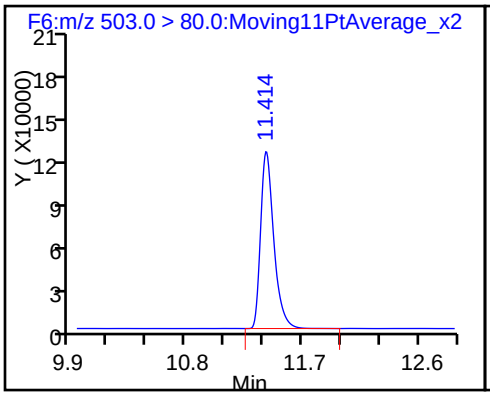
13 Perfluorooctanoic acid



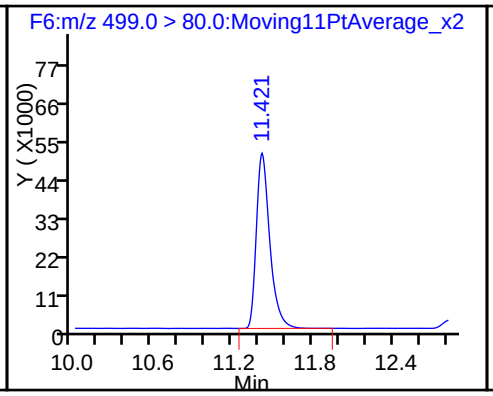
38 Perfluoroheptanesulfonic Acid



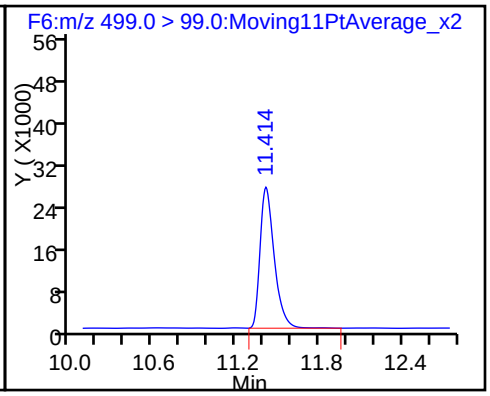
D 16 13C4 PFOS



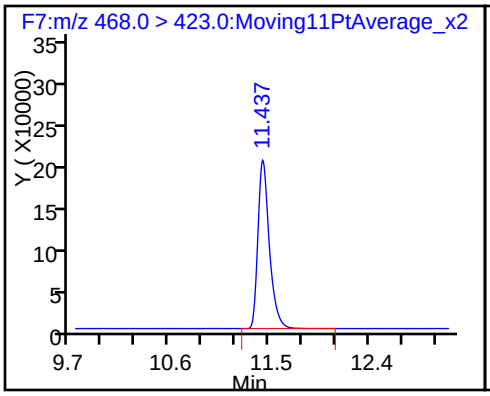
15 Perfluorooctane sulfonic acid



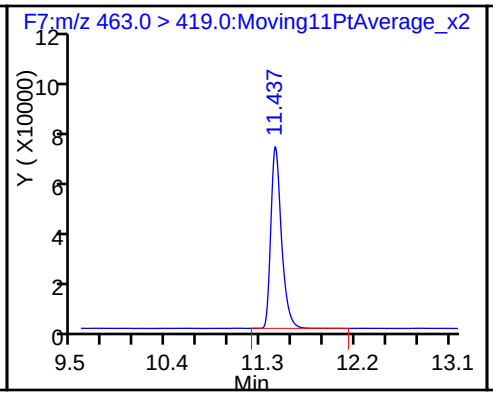
15 Perfluorooctane sulfonic acid



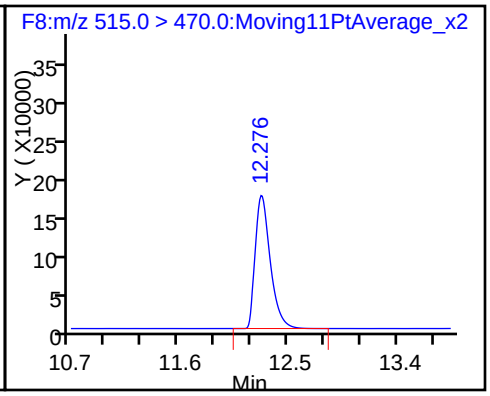
D 17 13C5 PFNA



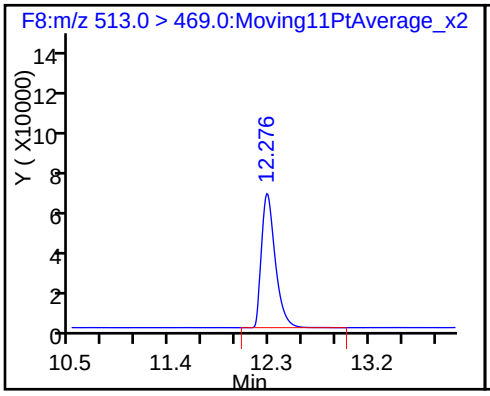
18 Perfluorononanoic acid



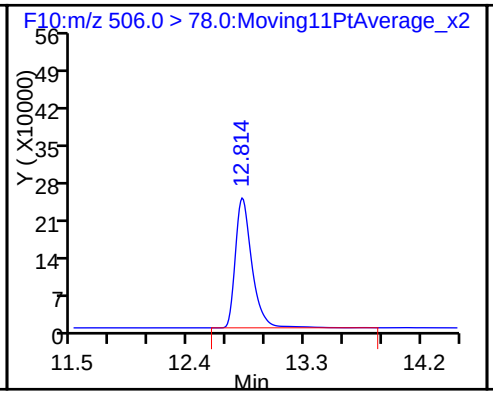
D 19 13C2 PFDA



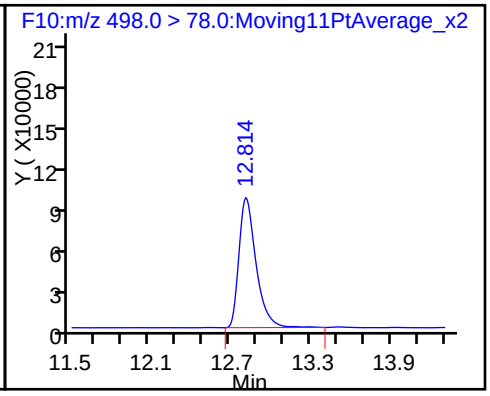
20 Perfluorodecanoic acid



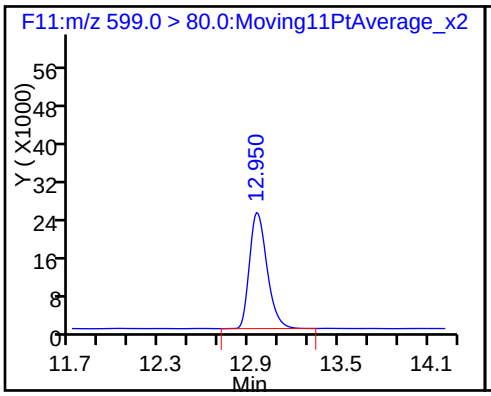
D 23 13C8 FOSA



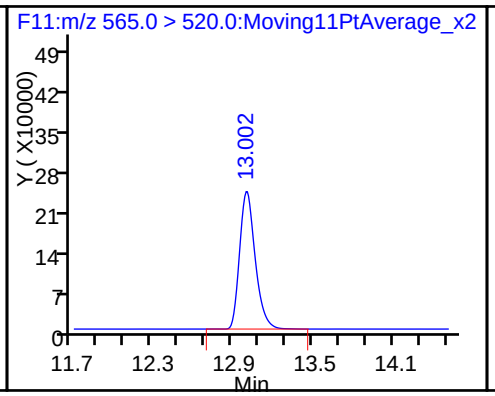
24 Perfluorooctane Sulfonamide



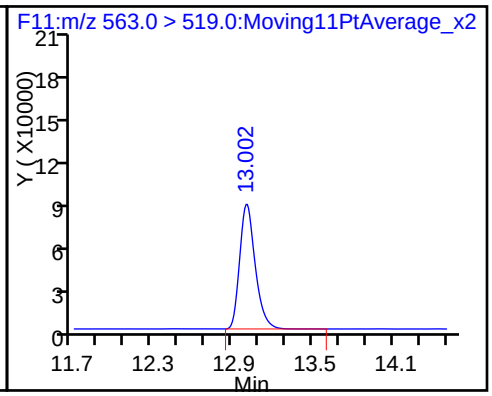
39 Perfluorodecane Sulfonic acid



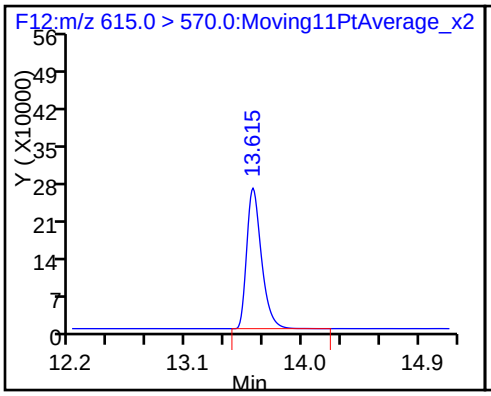
D 26 13C2 PFUnA



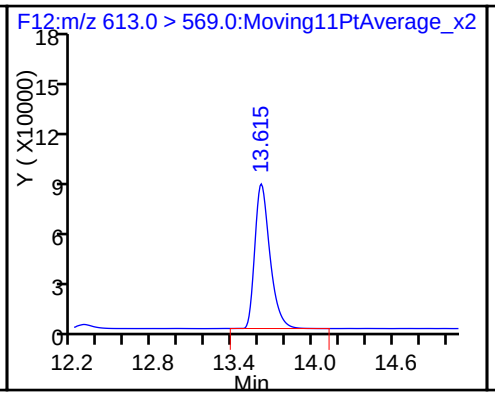
27 Perfluoroundecanoic acid



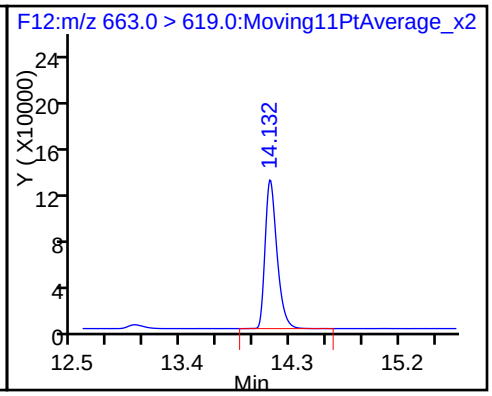
D 28 13C2 PFDoA



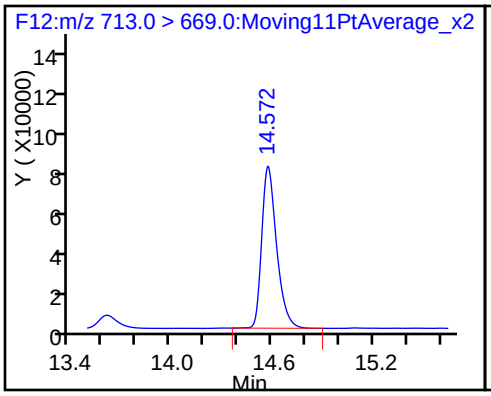
29 Perfluorododecanoic acid



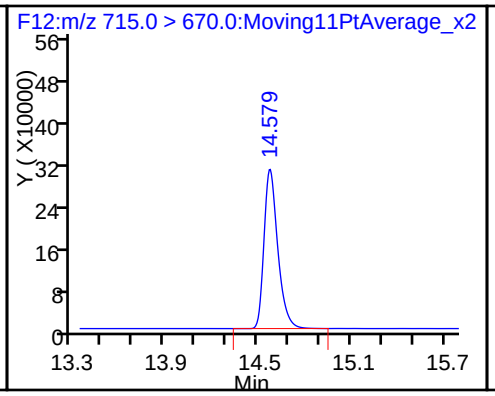
30 Perfluorotridecanoic acid



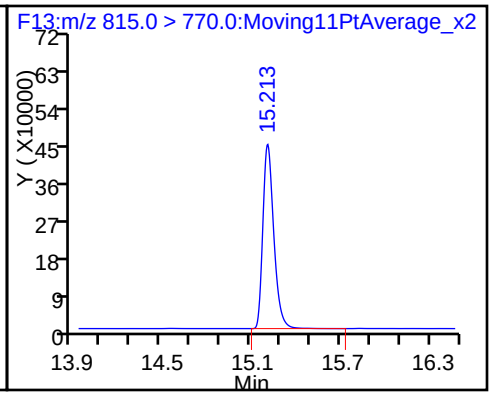
32 Perfluorotetradecanoic acid



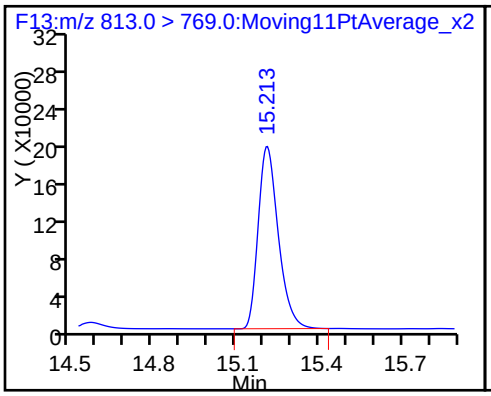
D 33 13C2-PFTeDA



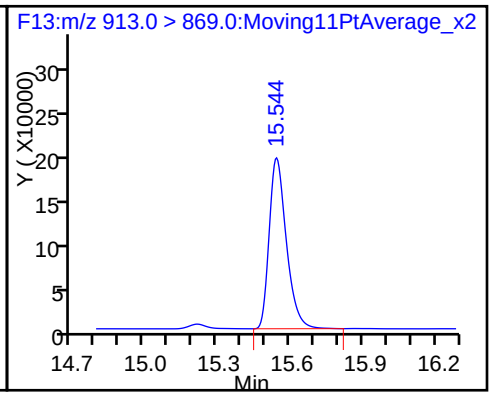
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_008.d
Lims ID: Std L5
Client ID:
Sample Type: IC Calib Level: 5
Inject. Date: 19-Feb-2016 16:33:12 ALS Bottle#: 13 Worklist Smp#: 6
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: STD L5
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
Operator ID: JRB Instrument ID: A6
Sublist: chrom-PFAC_A6*sub5

Method: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\PFAC_A6.m
Limit Group: LC PFC_DOD ICAL
Last Update: 22-Feb-2016 09:58:51 Calib Date: 19-Feb-2016 17:15:39
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_010.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK010

First Level Reviewer: barnettj Date: 19-Feb-2016 17:45:09

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.0 > 172.0	5.709	5.712	-0.003		778630	48.7		97.3	2140	
2 Perfluorobutyric acid										
212.9 > 169.0	5.715	5.715	0.0	1.000	1121027	55.2		110	3299	
D 3 13C5-PFPeA										
267.9 > 223.0	6.823	6.827	-0.004		1604599	52.2		104	5949	
4 Perfluoropentanoic acid										
262.9 > 219.0	6.828	6.828	0.0	1.000	1554916	46.4		92.9	382	
5 Perfluorobutane Sulfonate										
298.9 > 80.0	6.938	6.939	-0.001	1.000	696169	NC			934	
298.9 > 99.0	6.943	6.939	0.004	1.001	378428		1.84(0.00-0.00)		526	
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	6.938	6.939	-0.001	1.000	696169	48.6		110		
7 Perfluorohexanoic acid										
313.0 > 269.0	8.077	8.078	-0.001	1.000	1598966	52.3		105	2420	
D 6 13C2 PFHxA										
315.0 > 270.0	8.082	8.080	0.002		1412469	49.9		99.7	3689	
D 8 13C4-PFHpA										
367.0 > 322.0	9.323	9.322	0.001		1498068	48.6		97.2	4589	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.323	9.322	0.001	1.000	1614588	51.7		103	4595	
D 11 18O2 PFHxS										
403.0 > 84.0	9.358	9.358	0.0		681798	45.6		96.3	3254	
10 Perfluorohexane Sulfonate										
399.0 > 80.0	9.364	9.364	0.0	1.000	467634	NC			1449	
41 Perfluorohexanesulfonic acid										
399.0 > 80.0	9.364	9.364	0.0	1.000	467634	48.0		102		

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFOA										
417.0 > 372.0	10.454	10.450	0.004		1573533	46.1		92.2	4818	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.454	10.450	0.004	1.000	1580565	50.0		100	1517	
413.0 > 169.0	10.454	10.450	0.004	1.000	544646		2.90(0.00-0.00)	100	1443	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.461	10.457	0.004	1.000	520355	NC			2081	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.461	10.457	0.004	1.000	520355	48.6		102		
D 16 13C4 PFOS										
503.0 > 80.0	11.422	11.414	0.008		821717	45.2		94.5	2661	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.422	11.417	0.005	1.000	797626	47.7		99.8	421	
499.0 > 99.0	11.422	11.417	0.005	1.000	433010		1.84(0.00-0.00)	99.8	1470	
D 17 13C5 PFNA										
468.0 > 423.0	11.437	11.434	0.003		1386004	49.2		98.3	7596	
18 Perfluorononanoic acid										
463.0 > 419.0	11.437	11.439	-0.002	1.000	1106311	49.4		98.9	3403	
D 19 13C2 PFDA										
515.0 > 470.0	12.280	12.275	0.005		1321943	46.2		92.3	3965	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.280	12.276	0.004	1.000	1348689	52.0		104	2340	
D 23 13C8 FOSA										
506.0 > 78.0	12.818	12.810	0.008		2127859	51.3		103	1526	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.818	12.812	0.006	1.000	1983962	50.3		101	2804	
25 Perfluorodecane Sulfonate										
599.0 > 80.0	12.954	12.949	0.005	1.000	497252	NC			1216	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	12.954	12.949	0.005	1.000	497252	52.2		108		
D 26 13C2 PFUnA										
565.0 > 520.0	13.005	13.000	0.005		1719562	46.0		92.0	3390	
27 Perfluoroundecanoic acid										
563.0 > 519.0	13.005	13.000	0.005	1.000	1511190	52.7		105	4312	
D 28 13C2 PFDoA										
615.0 > 570.0	13.620	13.609	0.011		1956174	50.0		100	4217	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.620	13.611	0.009	1.000	1540137	53.8		108	1765	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.136	14.130	0.006	1.000	1907812	51.8		104	1846	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.576	14.571	0.005	1.000	1159290	49.2		98.4	877	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.576	14.571	0.005		1841361	51.3		103	6184	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.210	15.207	0.003		2184111	50.7		101	5115	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.210	15.208	0.002	1.000	2198803	49.9		99.7	2557	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
36 Perfluorooctandecanoic acid										
913.0 > 869.0	15.546	15.543	0.003	1.000	2246657	51.7		103	2473	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L5_00016 Amount Added: 1.00 Units: mL

Report Date: 22-Feb-2016 09:58:52 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_008.d

Injection Date: 19-Feb-2016 16:33:12 Instrument ID: A6

Lims ID: Std L5

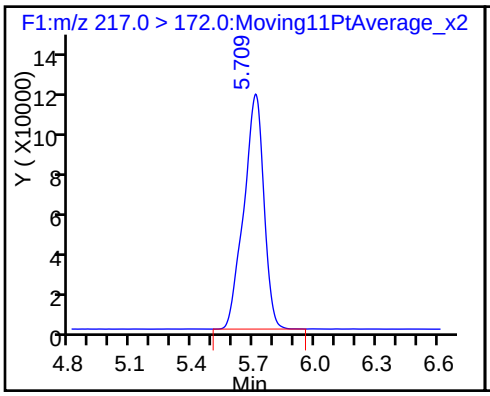
Client ID:

Operator ID: JRB ALS Bottle#: 13 Worklist Smp#: 6

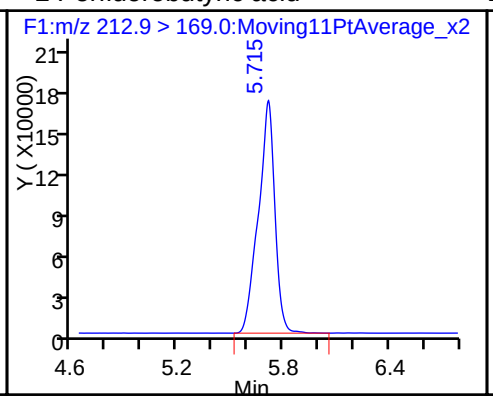
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

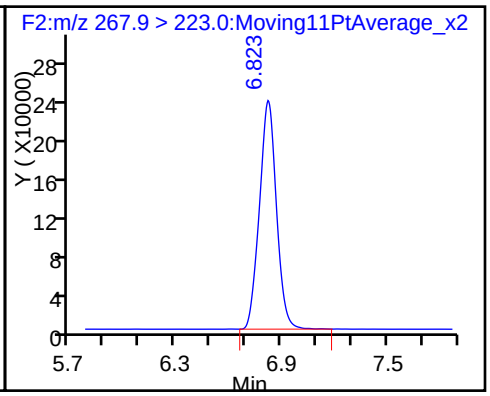
D 1 13C4 PFBA



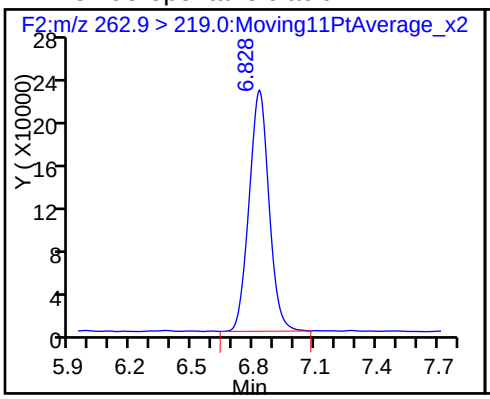
2 Perfluorobutyric acid



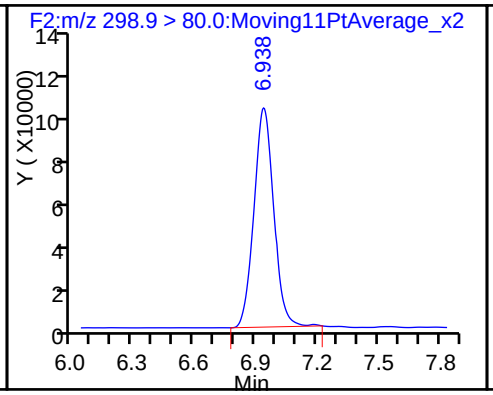
D 3 13C5-PFPeA



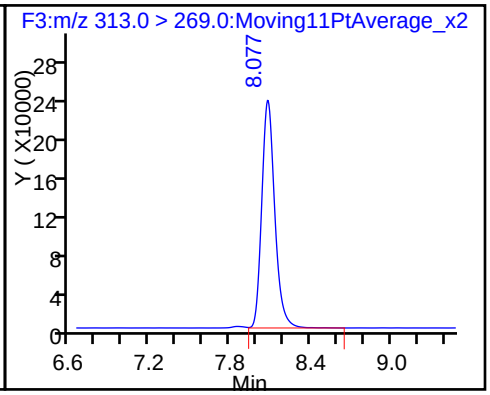
4 Perfluoropentanoic acid



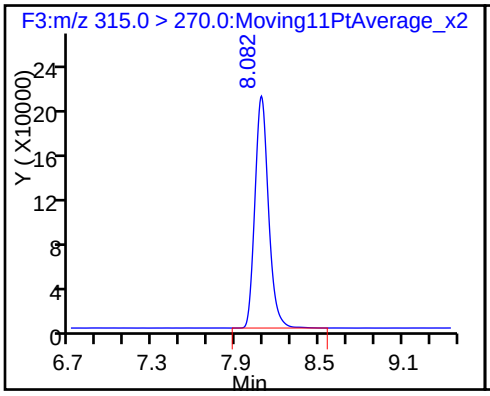
40 Perfluorobutanesulfonic acid



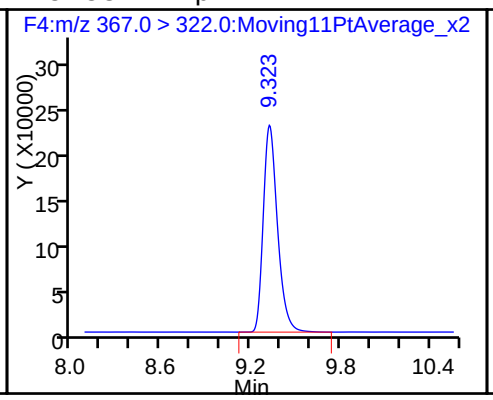
7 Perfluorohexanoic acid



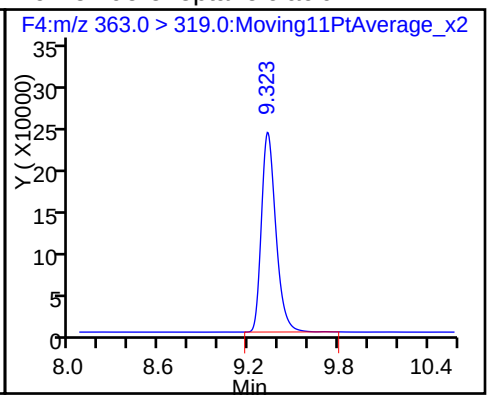
D 6 13C2 PFHxA



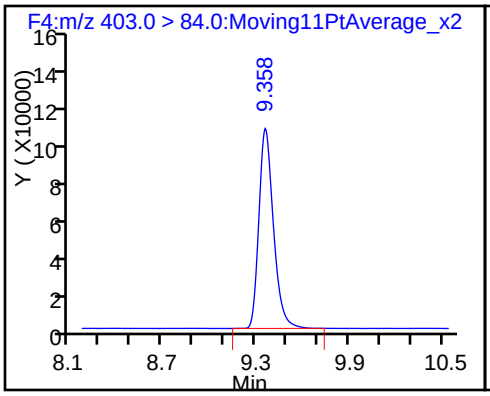
D 8 13C4-PFHpA



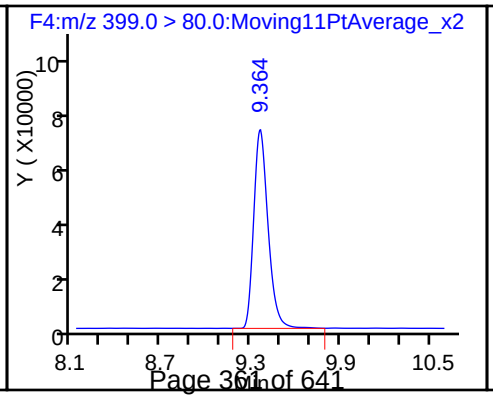
9 Perfluoroheptanoic acid



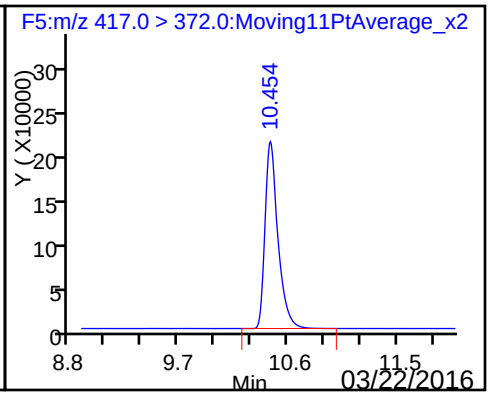
D 11 18O2 PFHxS



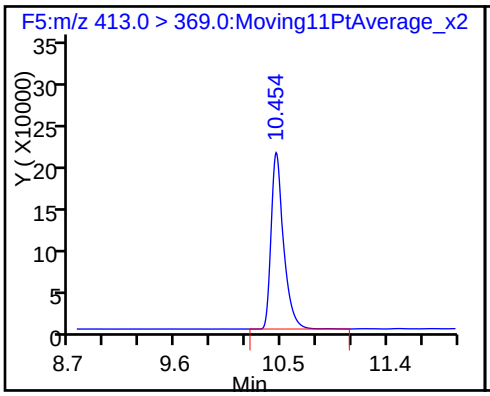
41 Perfluorohexanesulfonic acid



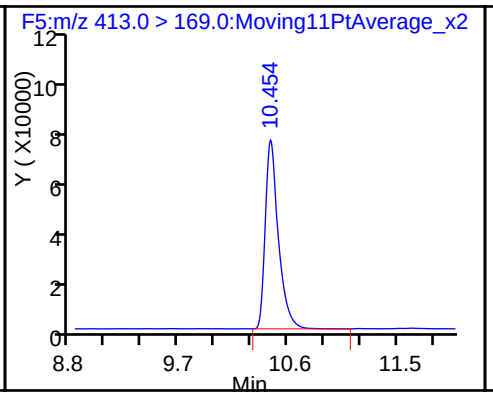
D 12 13C4 PFOA



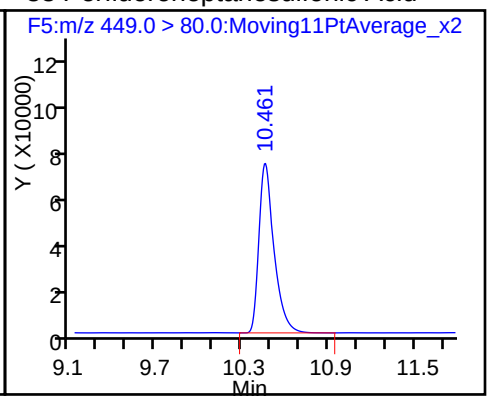
13 Perfluorooctanoic acid



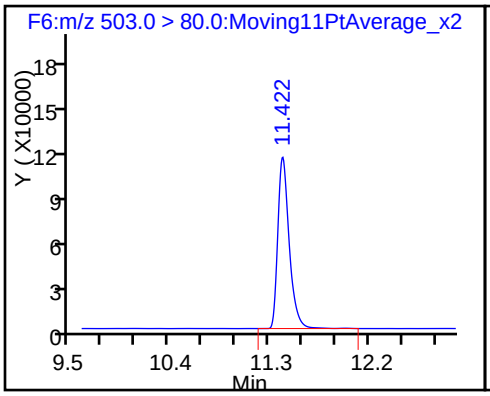
13 Perfluorooctanoic acid



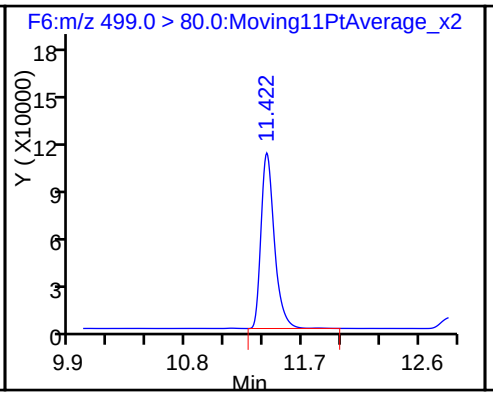
38 Perfluoroheptanesulfonic Acid



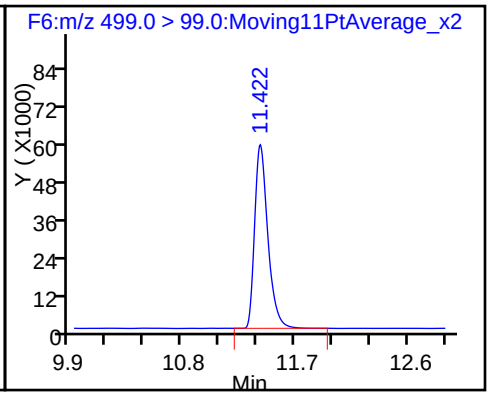
D 16 13C4 PFOS



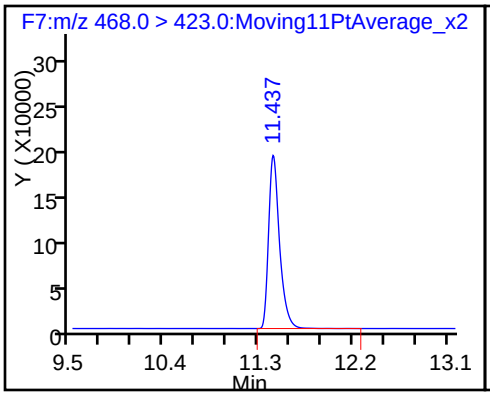
15 Perfluorooctane sulfonic acid



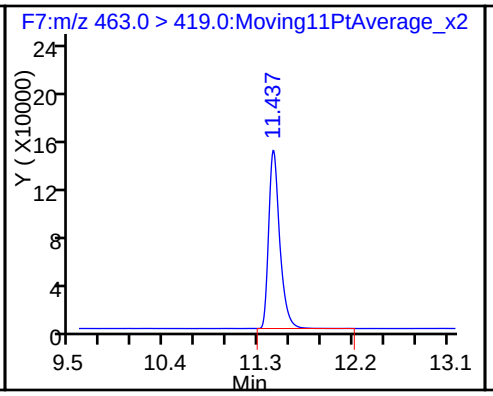
15 Perfluorooctane sulfonic acid



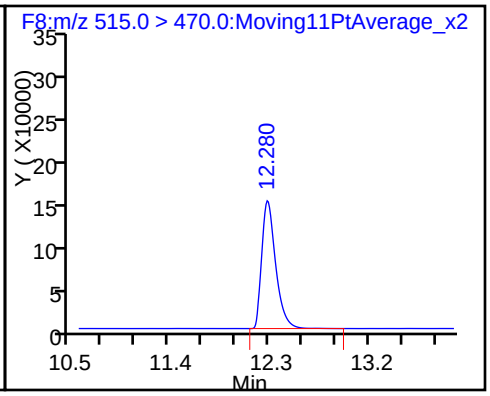
D 17 13C5 PFNA



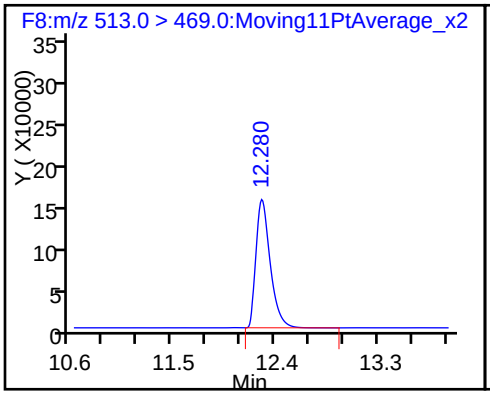
18 Perfluorononanoic acid



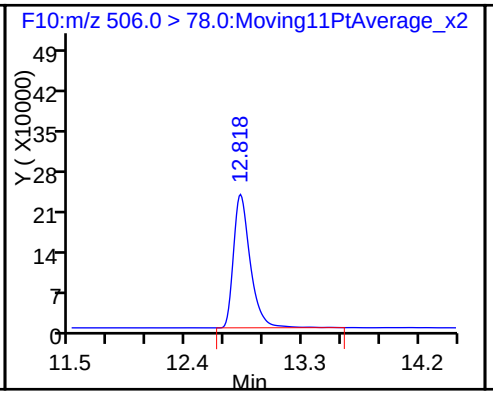
D 19 13C2 PFDA



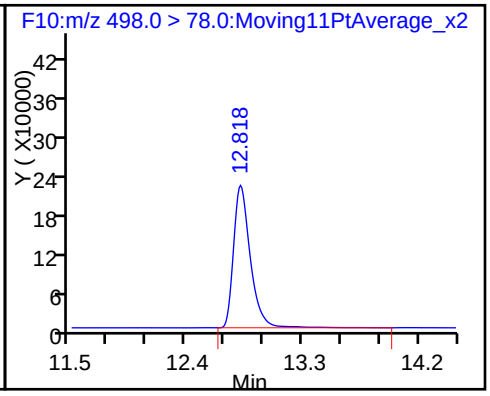
20 Perfluorodecanoic acid



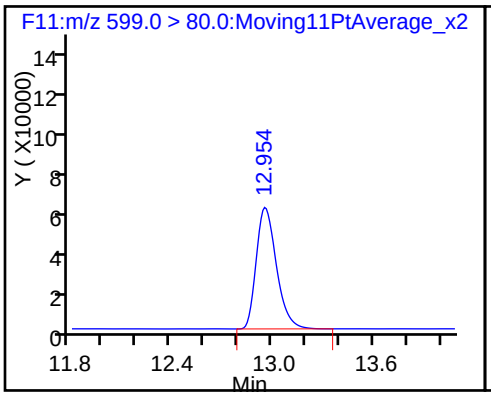
D 23 13C8 FOSA



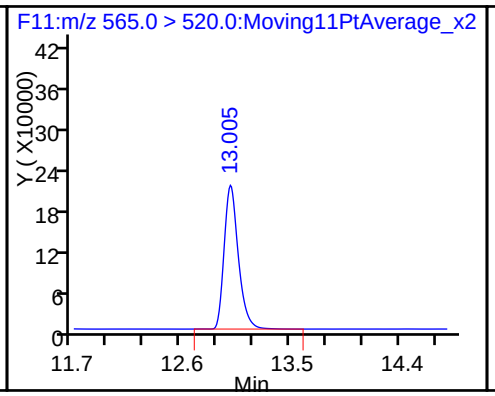
24 Perfluorooctane Sulfonamide



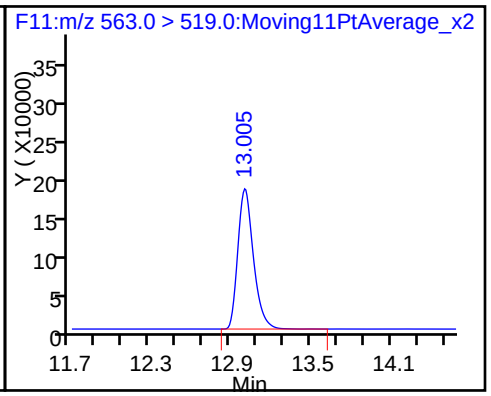
39 Perfluorodecane Sulfonic acid



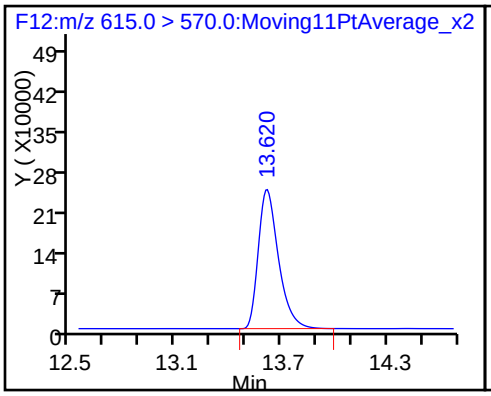
D 26 13C2 PFUnA



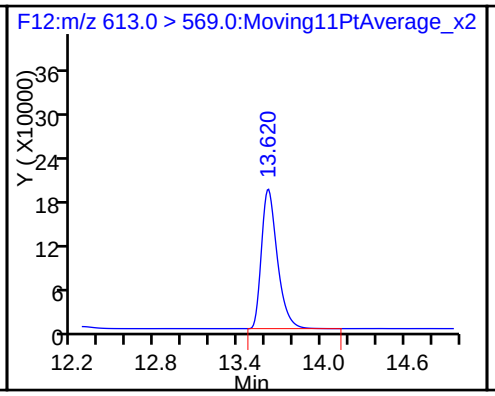
27 Perfluoroundecanoic acid



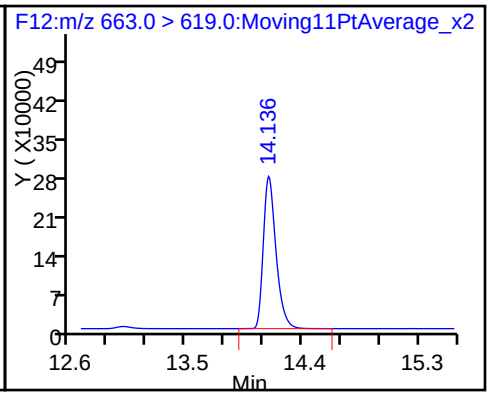
D 28 13C2 PFDoA



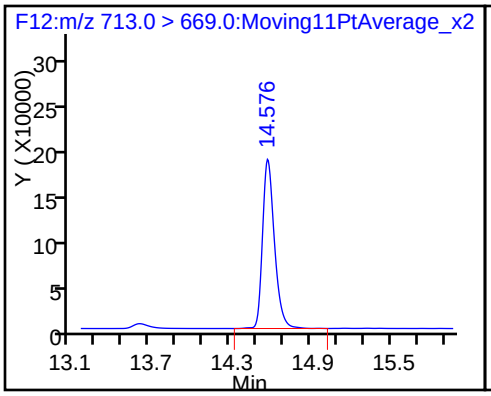
29 Perfluorododecanoic acid



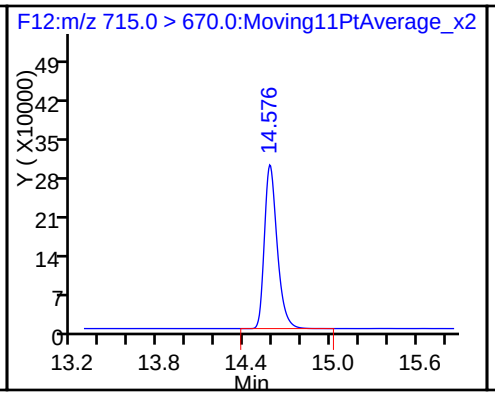
30 Perfluorotridecanoic acid



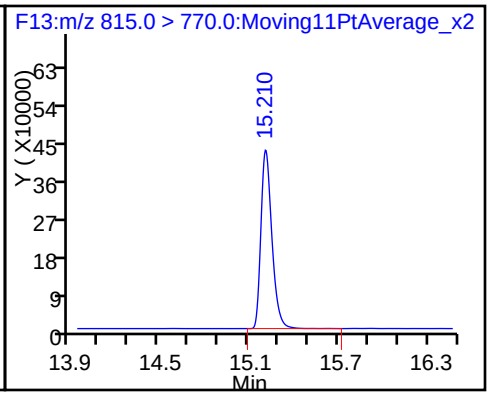
32 Perfluorotetradecanoic acid



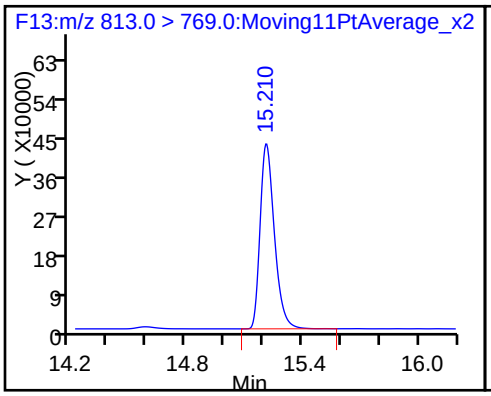
D 33 13C2-PFTeDA



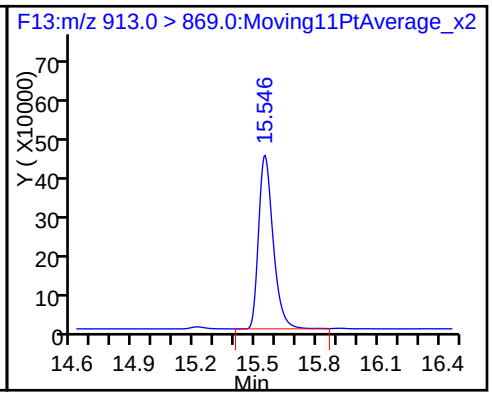
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_009.d
Lims ID: Std L6
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 19-Feb-2016 16:54:25 ALS Bottle#: 14 Worklist Smp#: 7
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: STD L6
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
Operator ID: JRB Instrument ID: A6
Sublist: chrom-PFAC_A6*sub5

Method: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\PFAC_A6.m
Limit Group: LC PFC_DOD ICAL
Last Update: 22-Feb-2016 09:58:53 Calib Date: 19-Feb-2016 17:15:39
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_010.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK010

First Level Reviewer: barnettj Date: 19-Feb-2016 17:45:44

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.0 > 172.0	5.709	5.712	-0.003		714491	44.7		89.3	2310	
2 Perfluorobutyric acid										
212.9 > 169.0	5.712	5.715	-0.003	1.000	4081745	219.0		110	10186	
D 3 13C5-PFPeA										
267.9 > 223.0	6.819	6.827	-0.008		1294135	42.1		84.1	3701	
4 Perfluoropentanoic acid										
262.9 > 219.0	6.819	6.828	-0.009	1.000	5303760	196.4		98.2	1105	
5 Perfluorobutane Sulfonate										
298.9 > 80.0	6.934	6.939	-0.005	1.000	2482631	NC			3270	
298.9 > 99.0	6.934	6.939	-0.005	1.000	1388611		1.79(0.00-0.00)		1814	
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	6.934	6.939	-0.005	1.000	2482631	207.2		117		
7 Perfluorohexanoic acid										
313.0 > 269.0	8.067	8.078	-0.011	1.000	5718698	205.0		103	2780	
D 6 13C2 PFHxA										
315.0 > 270.0	8.067	8.080	-0.013		1287540	45.4		90.9	4384	
D 8 13C4-PFHpA										
367.0 > 322.0	9.310	9.322	-0.012		1313950	42.6		85.3	4738	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.310	9.322	-0.012	1.000	5350969	195.3		97.6	8505	
D 11 18O2 PFHxS										
403.0 > 84.0	9.346	9.358	-0.012		570842	38.1		80.6	2260	
10 Perfluorohexane Sulfonate										
399.0 > 80.0	9.346	9.364	-0.018	1.000	1610335	NC			3760	
41 Perfluorohexanesulfonic acid										
399.0 > 80.0	9.346	9.364	-0.018	1.000	1610335	197.6		104		

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFOA										
417.0 > 372.0	10.432	10.450	-0.018		1311023	38.4		76.8	4940	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.439	10.450	-0.011	1.000	5285370	200.8		100	4885	
413.0 > 169.0	10.439	10.450	-0.011	1.000	1833992		2.88(0.00-0.00)	100	3465	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.439	10.457	-0.018	1.000	1619742	NC			4928	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.439	10.457	-0.018	1.000	1619742	185.4		97.4		
D 16 13C4 PFOS										
503.0 > 80.0	11.399	11.414	-0.015		668257	36.8		76.9	2419	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.399	11.417	-0.018	1.000	2592636	190.7		99.7	325	
499.0 > 99.0	11.399	11.417	-0.018	1.000	1437770		1.80(0.00-0.00)	99.7	3069	
D 17 13C5 PFNA										
468.0 > 423.0	11.414	11.434	-0.020		1143055	40.5		81.1	4555	
18 Perfluorononanoic acid										
463.0 > 419.0	11.421	11.439	-0.018	1.000	3958780	214.5		107	10634	
D 19 13C2 PFDA										
515.0 > 470.0	12.254	12.275	-0.021		1048548	36.6		73.2	3638	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.254	12.276	-0.022	1.000	4149384	202.6		101	8461	
D 23 13C8 FOSA										
506.0 > 78.0	12.793	12.810	-0.017		1899691	45.8		91.5	1488	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.793	12.812	-0.019	1.000	6796748	193.0		96.5	1161	
25 Perfluorodecane Sulfonate										
599.0 > 80.0	12.929	12.949	-0.020	1.000	1463184	NC			4274	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	12.929	12.949	-0.020	1.000	1463184	188.0		97.5		
D 26 13C2 PFUnA										
565.0 > 520.0	12.981	13.000	-0.019		1410933	37.7		75.5	4400	
27 Perfluoroundecanoic acid										
563.0 > 519.0	12.981	13.000	-0.019	1.000	4571131	196.0		98.0	6731	
D 28 13C2 PFDoA										
615.0 > 570.0	13.588	13.609	-0.021		1709160	43.7		87.4	3686	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.588	13.611	-0.023	1.000	5178123	207.2		104	5811	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.109	14.130	-0.021	1.000	5922305	184.1		92.1	4913	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.552	14.571	-0.019	1.000	3999720	195.6		97.8	2278	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.552	14.571	-0.019		1592616	44.4		88.7	6647	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.188	15.207	-0.019		1957713	45.4		90.8	4814	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.193	15.208	-0.015	1.000	7506851	202.2		101	4498	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
36 Perfluorooctandecanoic acid										
913.0 > 869.0	15.529	15.543	-0.014	1.000	7527521	198.2		99.1	4555	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L6_00015 Amount Added: 1.00 Units: mL

Report Date: 22-Feb-2016 09:58:54 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_009.d

Injection Date: 19-Feb-2016 16:54:25 Instrument ID: A6

Lims ID: Std L6

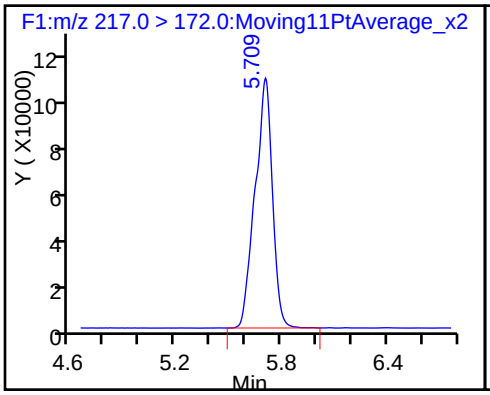
Client ID:

Operator ID: JRB ALS Bottle#: 14 Worklist Smp#: 7

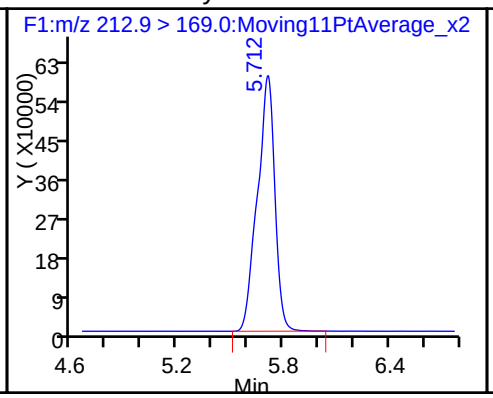
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

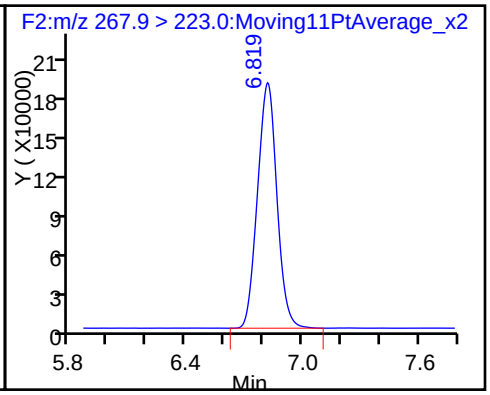
D 1 13C4 PFBA



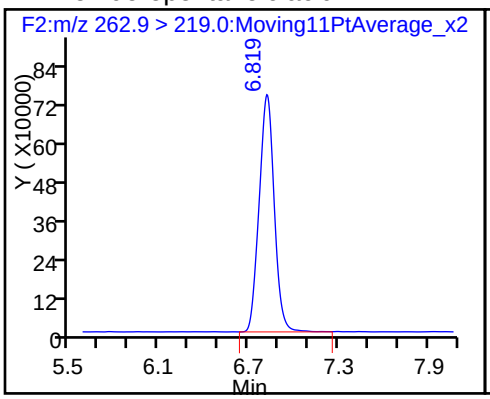
2 Perfluorobutyric acid



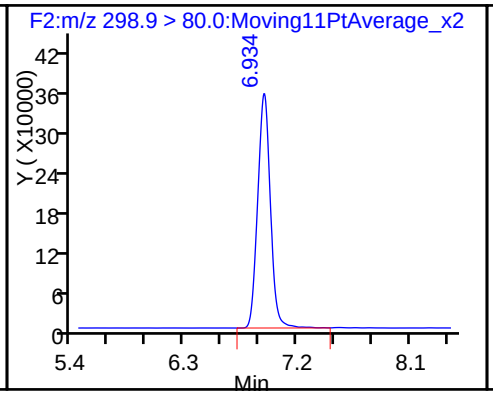
D 3 13C5-PFPeA



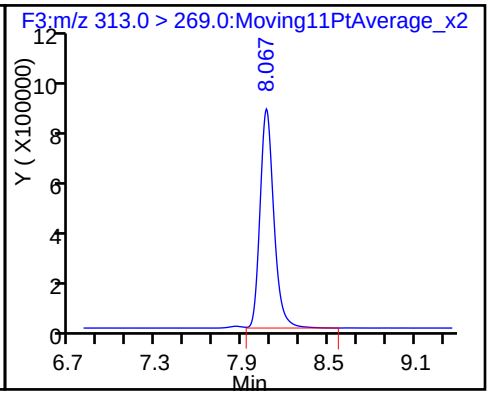
4 Perfluoropentanoic acid



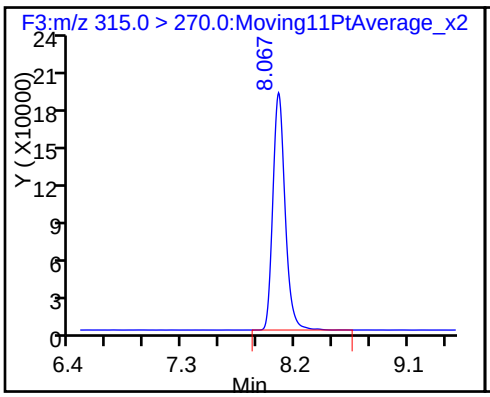
40 Perfluorobutanesulfonic acid



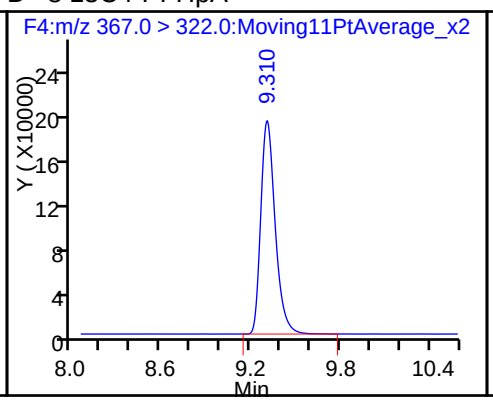
7 Perfluorohexanoic acid



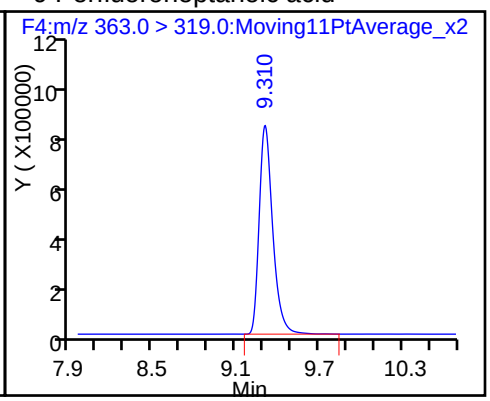
D 6 13C2 PFHxA



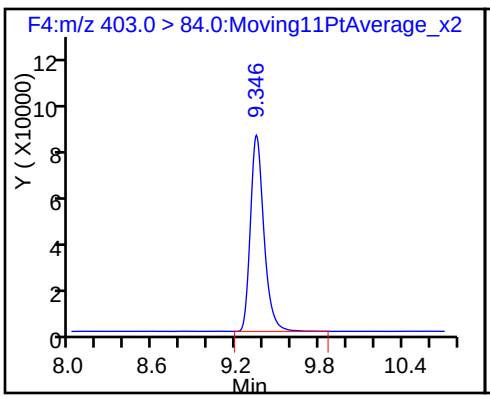
D 8 13C4-PFHpA



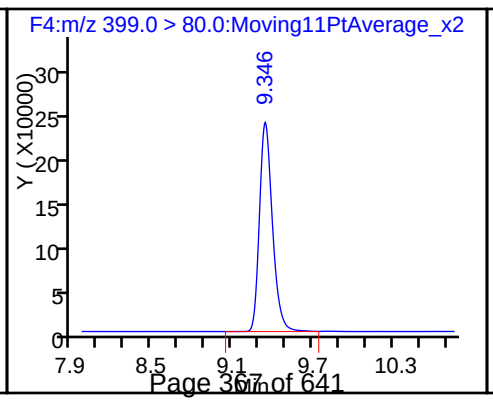
9 Perfluoroheptanoic acid



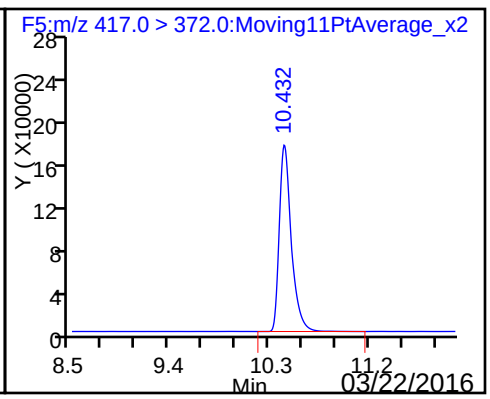
D 11 18O2 PFHxS



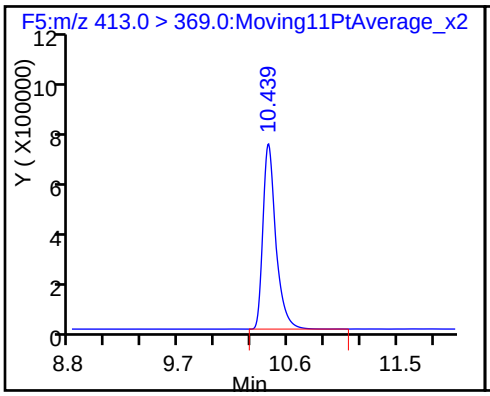
41 Perfluorohexanesulfonic acid



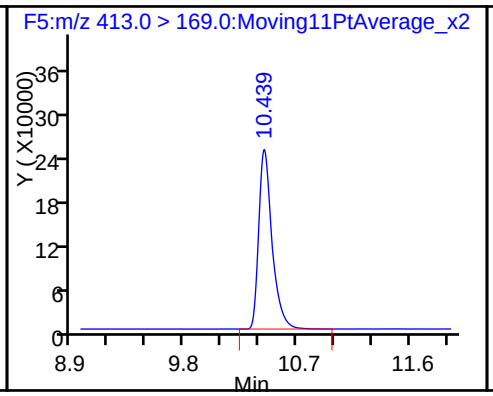
D 12 13C4 PFOA



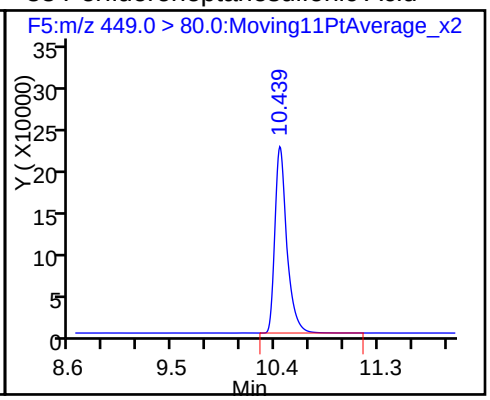
13 Perfluorooctanoic acid



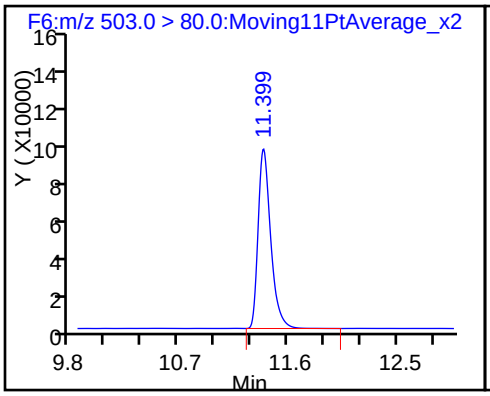
13 Perfluorooctanoic acid



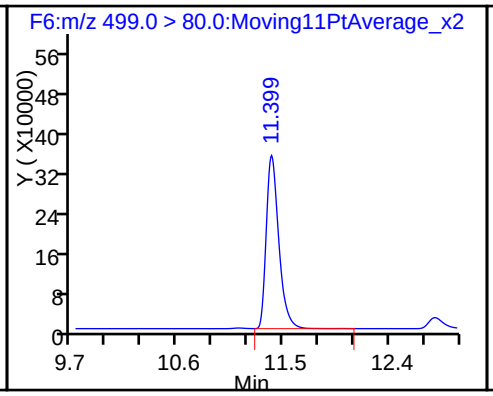
38 Perfluoroheptanesulfonic Acid



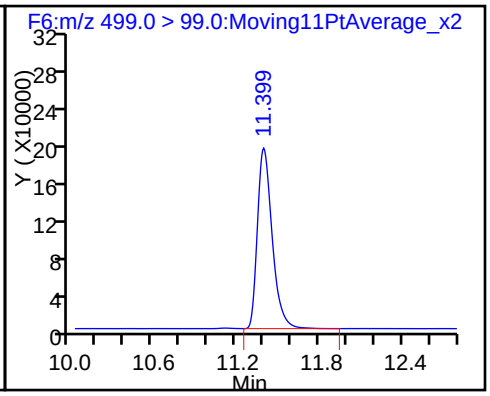
D 16 13C4 PFOS



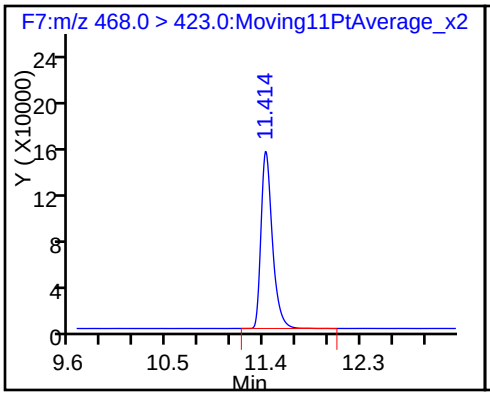
15 Perfluorooctane sulfonic acid



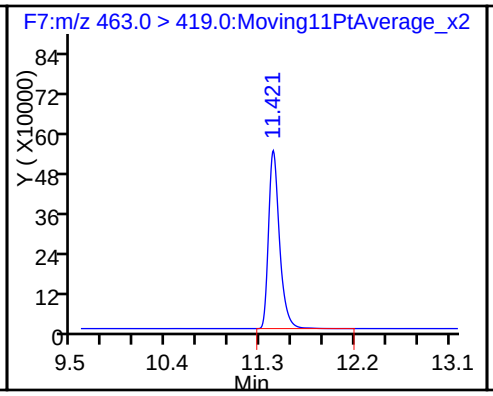
15 Perfluorooctane sulfonic acid



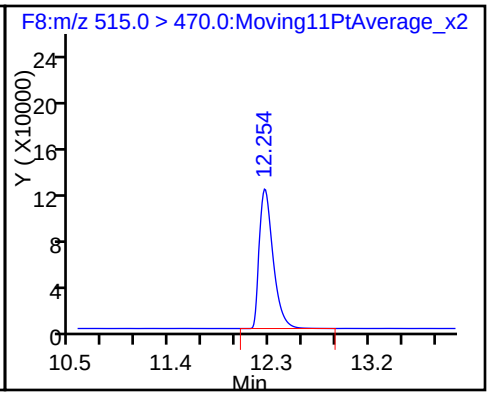
D 17 13C5 PFNA



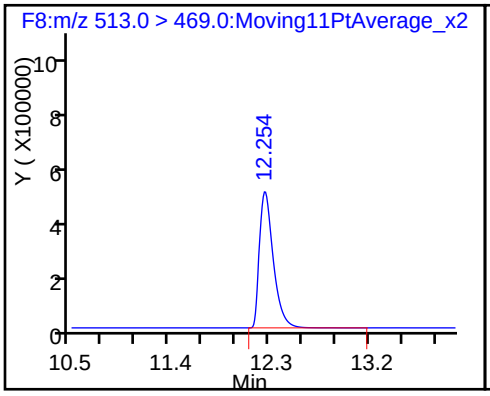
18 Perfluorononanoic acid



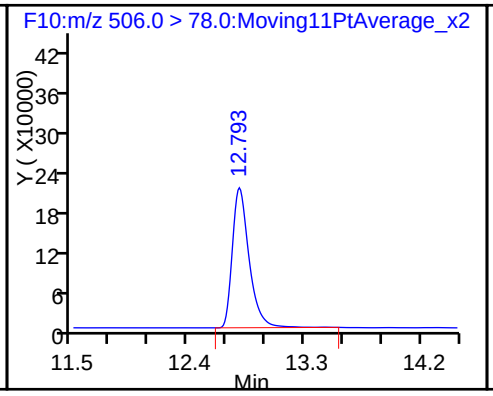
D 19 13C2 PFDA



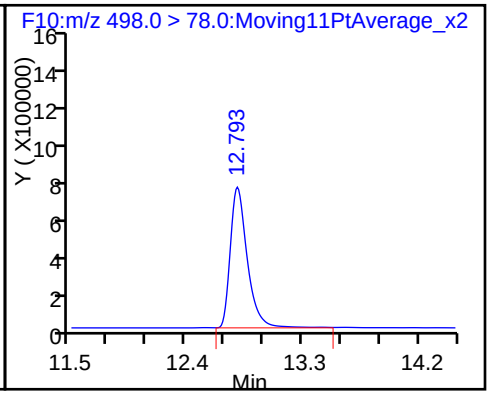
20 Perfluorodecanoic acid



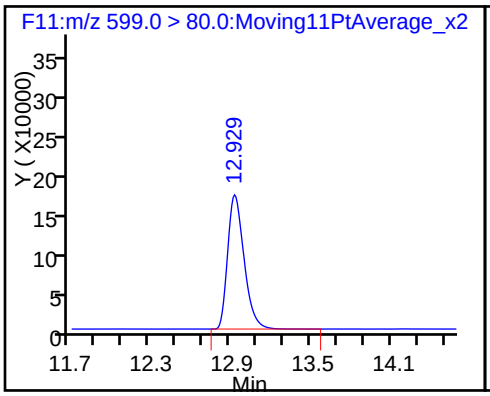
D 23 13C8 FOSA



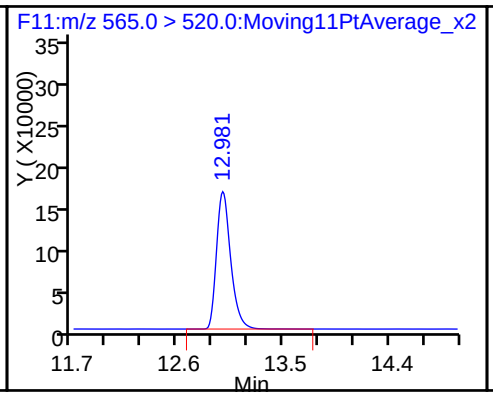
24 Perfluorooctane Sulfonamide



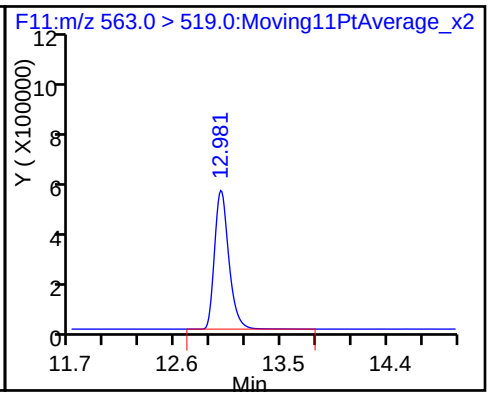
39 Perfluorodecane Sulfonic acid



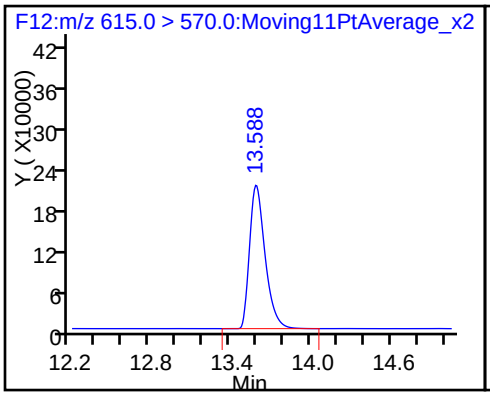
D 26 13C2 PFUnA



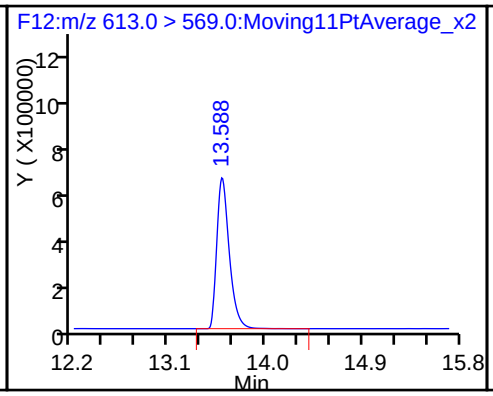
27 Perfluoroundecanoic acid



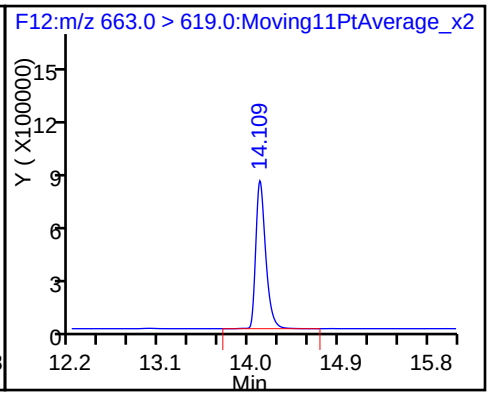
D 28 13C2 PFDoA



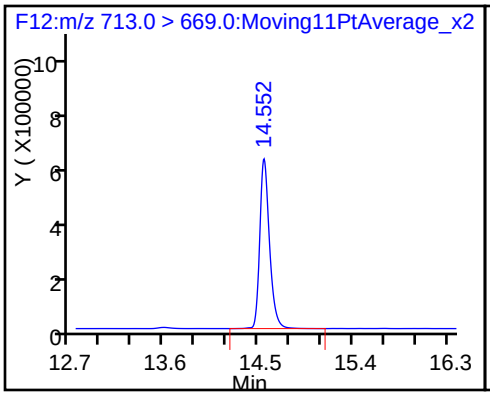
29 Perfluorododecanoic acid



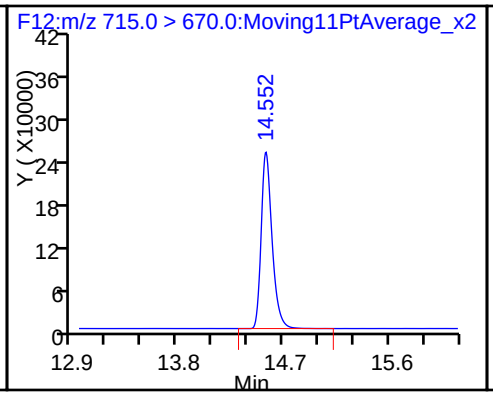
30 Perfluorotridecanoic acid



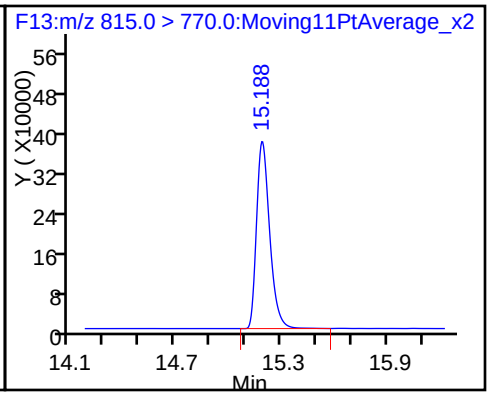
32 Perfluorotetradecanoic acid



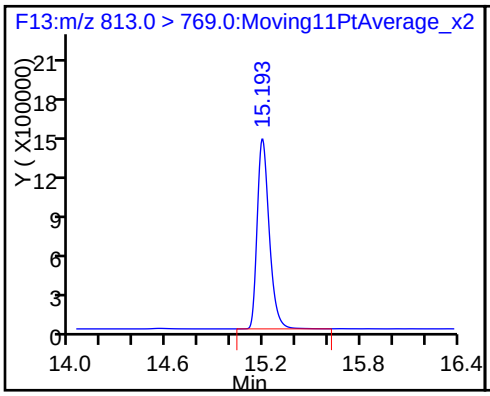
D 33 13C2-PFTeDA



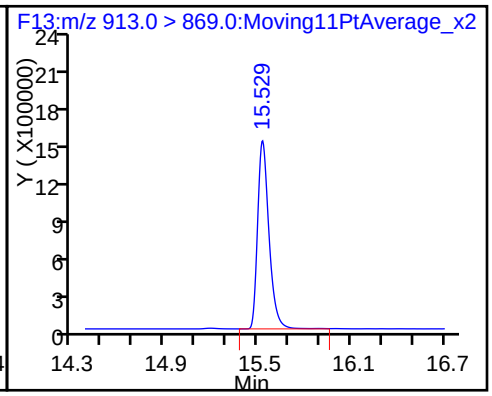
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_010.d
Lims ID: Std L7
Client ID:
Sample Type: IC Calib Level: 7
Inject. Date: 19-Feb-2016 17:15:39 ALS Bottle#: 15 Worklist Smp#: 8
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: STD L7
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
Operator ID: JRB Instrument ID: A6
Sublist: chrom-PFAC_A6*sub5

Method: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\PFAC_A6.m
Limit Group: LC PFC_DOD ICAL
Last Update: 22-Feb-2016 09:58:55 Calib Date: 19-Feb-2016 17:15:39
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_010.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK010

First Level Reviewer: barnettj Date: 19-Feb-2016 17:46:38

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.0 > 172.0	5.709	5.712	-0.003		631840	39.5		79.0	1919	
2 Perfluorobutyric acid										
212.9 > 169.0	5.712	5.715	-0.003	1.000	7281727	441.9		110	11351	
D 3 13C5-PFPeA										
267.9 > 223.0	6.818	6.827	-0.009		1171928	38.1		76.2	3691	
4 Perfluoropentanoic acid										
262.9 > 219.0	6.818	6.828	-0.010	1.000	9604476	392.7		98.2	1997	
5 Perfluorobutane Sulfonate										
298.9 > 80.0	6.933	6.939	-0.006	1.000	4163359	NC			2718	
298.9 > 99.0	6.933	6.939	-0.006	1.000	2275031		1.83(0.00-0.00)		3395	
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	6.933	6.939	-0.006	1.000	4163359	435.6		123		
7 Perfluorohexanoic acid										
313.0 > 269.0	8.065	8.078	-0.013	1.000	9481665	420.7		105	2241	
D 6 13C2 PFHxA										
315.0 > 270.0	8.065	8.080	-0.015		1040351	36.7		73.4	2818	
D 8 13C4-PFHpA										
367.0 > 322.0	9.305	9.322	-0.017		1099321	35.7		71.3	3231	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.305	9.322	-0.017	1.000	9198751	401.2		100	11672	
D 11 18O2 PFHxS										
403.0 > 84.0	9.346	9.358	-0.012		455229	30.4		64.3	1441	
10 Perfluorohexane Sulfonate										
399.0 > 80.0	9.346	9.364	-0.018	1.000	2660458	NC			6698	
41 Perfluorohexanesulfonic acid										
399.0 > 80.0	9.346	9.364	-0.018	1.000	2660458	409.4		108		

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFOA										
417.0 > 372.0	10.433	10.450	-0.017		1023740	30.0		60.0	3518	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.433	10.450	-0.017	1.000	8666978	421.7		105	4474	
413.0 > 169.0	10.433	10.450	-0.017	1.000	2909884		2.98(0.00-0.00)	105	3285	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.440	10.457	-0.017	1.000	2666346	NC			7584	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.440	10.457	-0.017	1.000	2666346	381.1		100		
D 16 13C4 PFOS										
503.0 > 80.0	11.392	11.414	-0.022		534710	29.4		61.5	2475	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.399	11.417	-0.018	1.000	4278056	393.3		103	332	
499.0 > 99.0	11.399	11.417	-0.018	1.000	2357374		1.81(0.00-0.00)	103	3975	
D 17 13C5 PFNA										
468.0 > 423.0	11.415	11.434	-0.019		1010032	35.8		71.7	2370	
18 Perfluorononanoic acid										
463.0 > 419.0	11.422	11.439	-0.017	1.000	6650814	407.7		102	13388	
D 19 13C2 PFDA										
515.0 > 470.0	12.255	12.275	-0.020		925036	32.3		64.6	1991	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.255	12.276	-0.021	1.000	6815253	377.5		94.4	4656	
D 23 13C8 FOSA										
506.0 > 78.0	12.793	12.810	-0.017		1599127	38.5		77.1	1713	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.793	12.812	-0.019	1.000	11722467	395.5		98.9	1678	
25 Perfluorodecane Sulfonate										
599.0 > 80.0	12.929	12.949	-0.020	1.000	2170020	NC			3636	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	12.929	12.949	-0.020	1.000	2170020	348.2		90.3		
D 26 13C2 PFUnA										
565.0 > 520.0	12.981	13.000	-0.019		1172072	31.4		62.7	3708	
27 Perfluoroundecanoic acid										
563.0 > 519.0	12.981	13.000	-0.019	1.000	7799843	403.3		101	7175	
D 28 13C2 PFDoA										
615.0 > 570.0	13.588	13.609	-0.021		1451296	37.1		74.2	3521	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.588	13.611	-0.023	1.000	9187053	432.9		108	6144	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.109	14.130	-0.021	1.000	9569869	350.4		87.6	4611	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.552	14.571	-0.019	1.000	6913347	398.6		99.7	3248	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.552	14.571	-0.019		1521958	42.4		84.8	4569	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.193	15.207	-0.014		1815999	42.1		84.3	3968	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.193	15.208	-0.015	1.000	12867499	410.8		103	4108	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
36 Perfluorooctandecanoic acid										
913.0 > 869.0	15.529	15.543	-0.014	1.000	13652743	423.4		106	3366	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L7_00015 Amount Added: 1.00 Units: mL

Report Date: 22-Feb-2016 09:58:56 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_010.d

Injection Date: 19-Feb-2016 17:15:39 Instrument ID: A6

Lims ID: Std L7

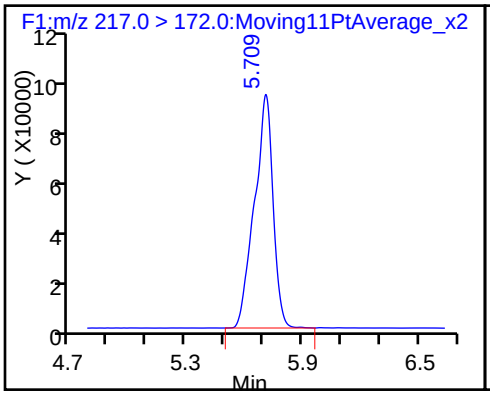
Client ID:

Operator ID: JRB ALS Bottle#: 15 Worklist Smp#: 8

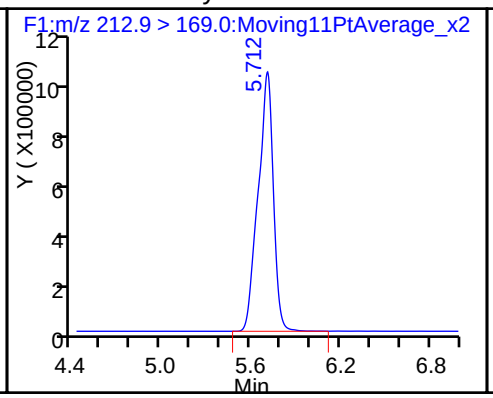
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

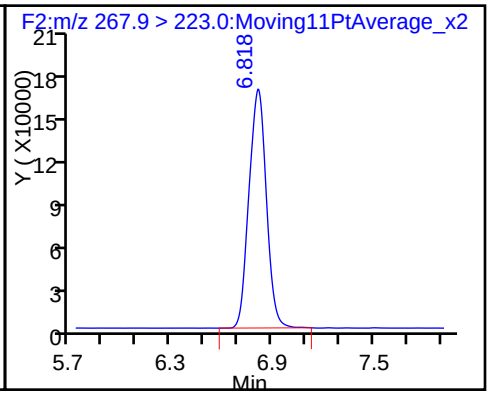
D 1 13C4 PFBA



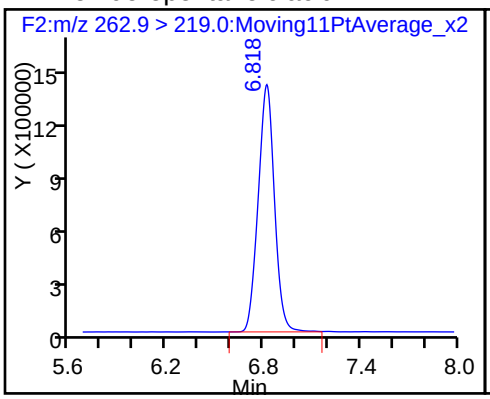
2 Perfluorobutyric acid



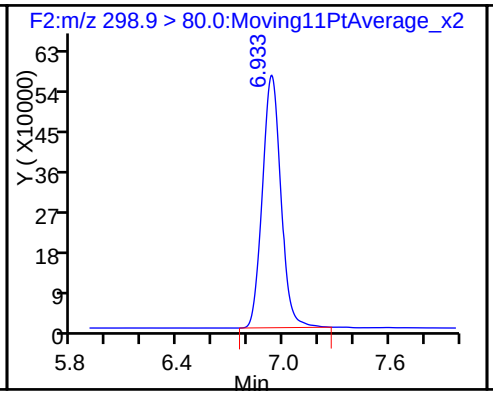
D 3 13C5-PFPeA



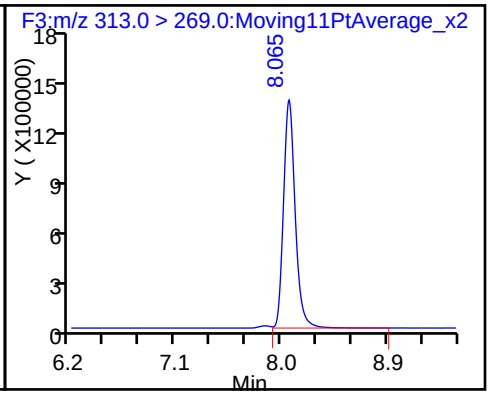
4 Perfluoropentanoic acid



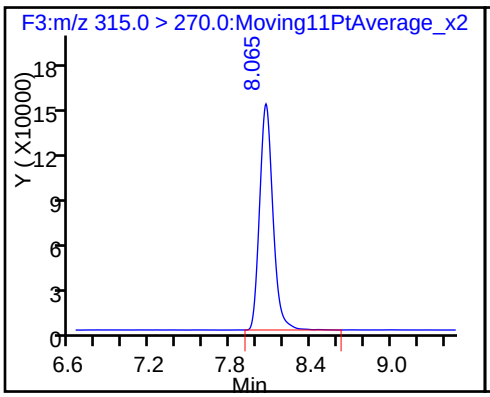
40 Perfluorobutanesulfonic acid



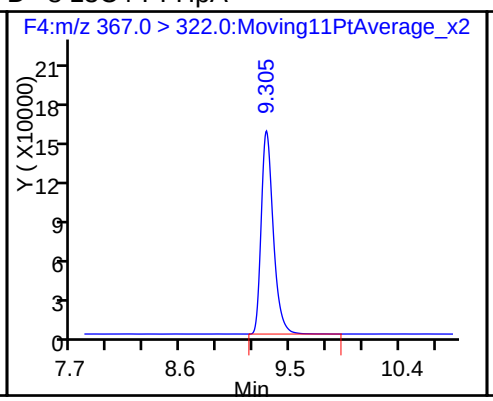
7 Perfluorohexanoic acid



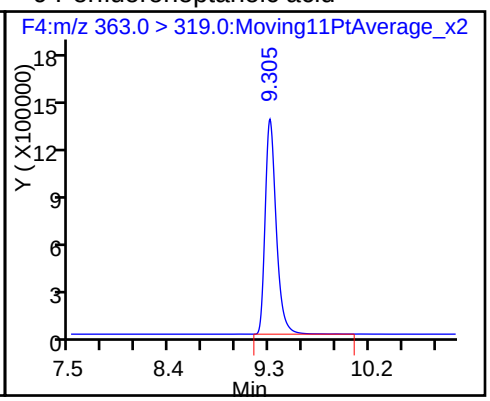
D 6 13C2 PFHxA



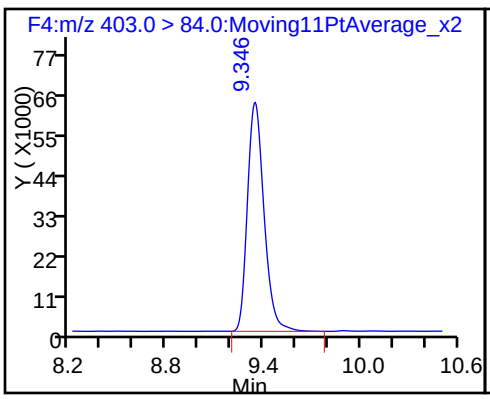
D 8 13C4-PFHpA



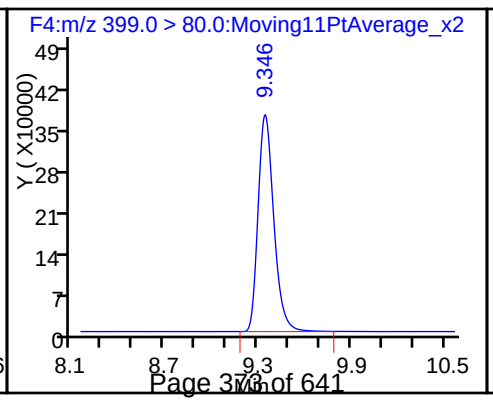
9 Perfluoroheptanoic acid



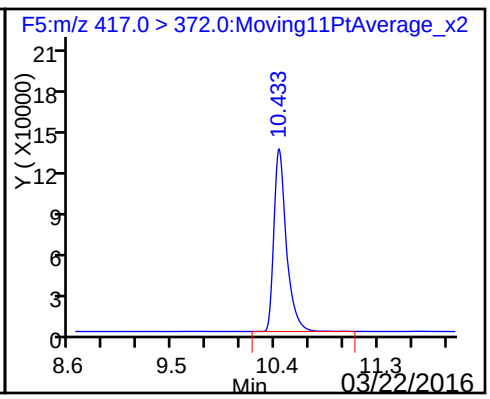
D 11 18O2 PFHxS



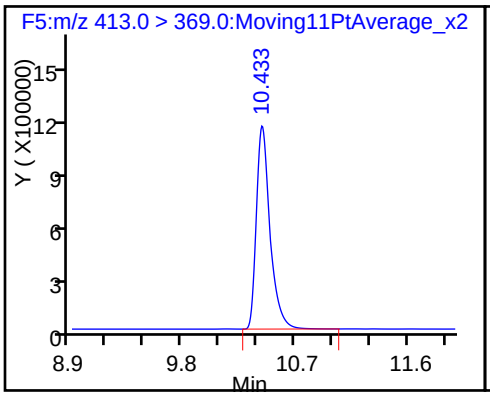
41 Perfluorohexanesulfonic acid



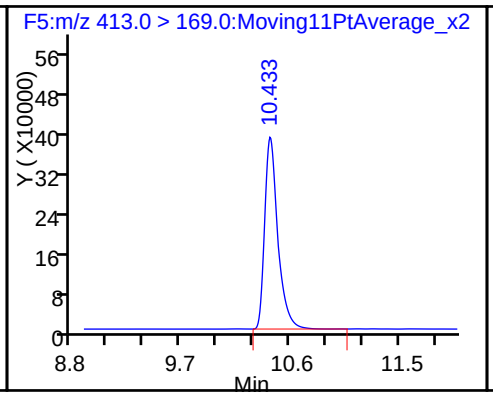
D 12 13C4 PFOA



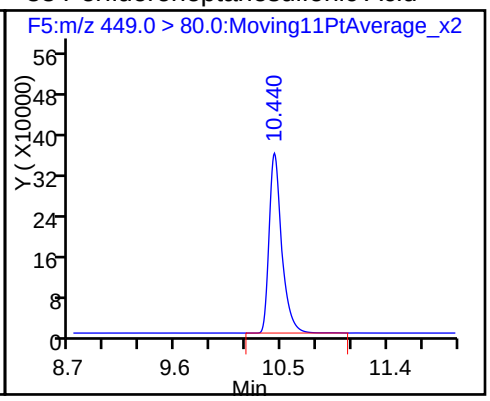
13 Perfluorooctanoic acid



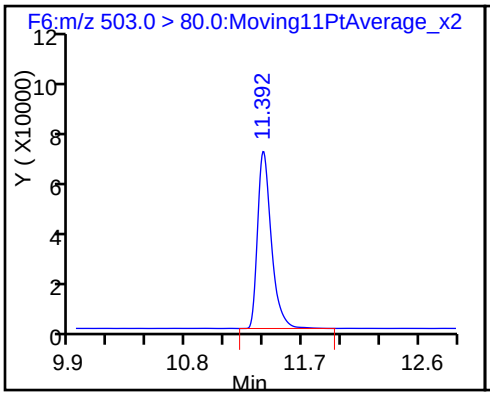
13 Perfluorooctanoic acid



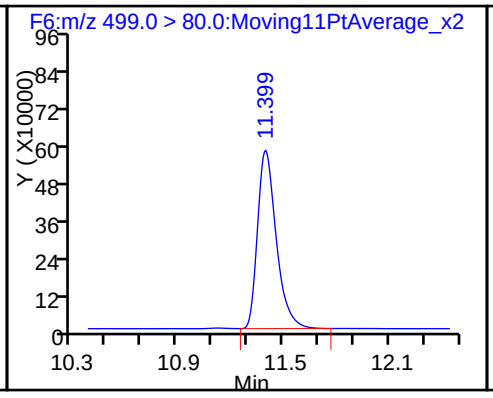
38 Perfluoroheptanesulfonic Acid



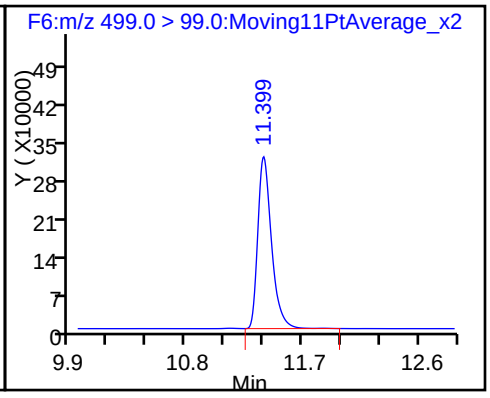
D 16 13C4 PFOS



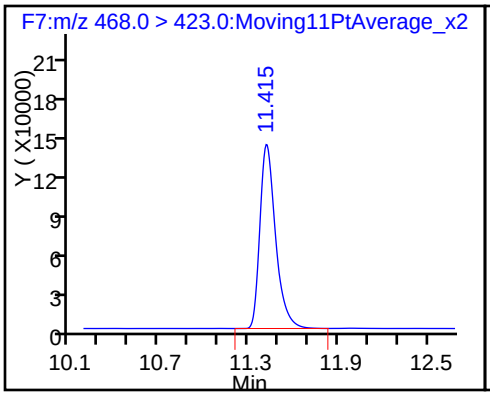
15 Perfluorooctane sulfonic acid



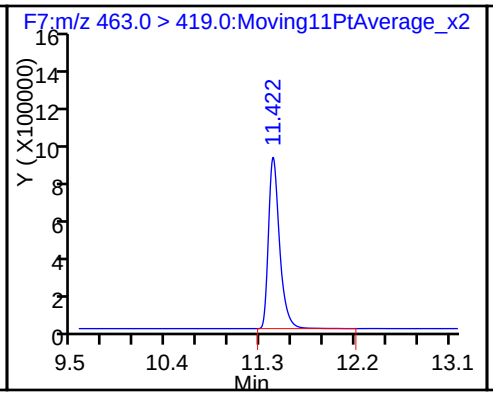
15 Perfluorooctane sulfonic acid



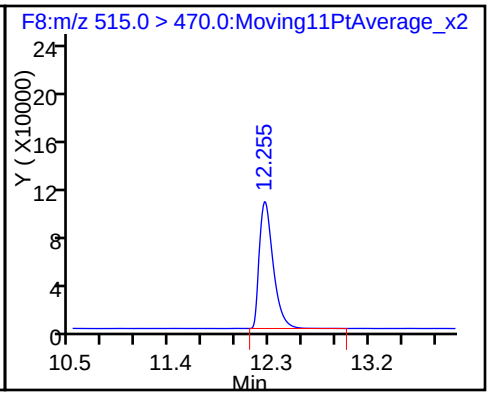
D 17 13C5 PFNA



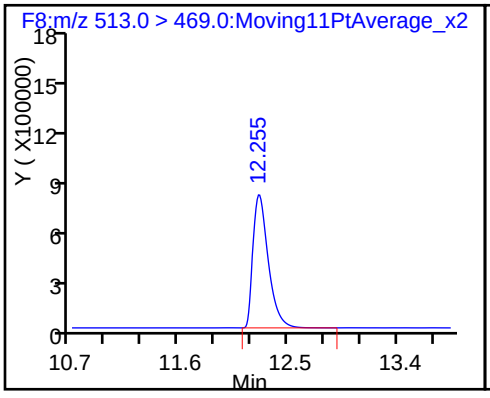
18 Perfluorononanoic acid



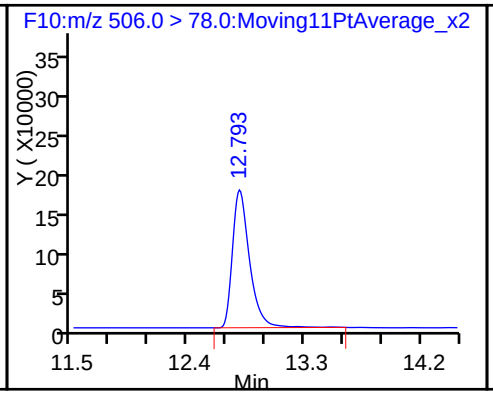
D 19 13C2 PFDA



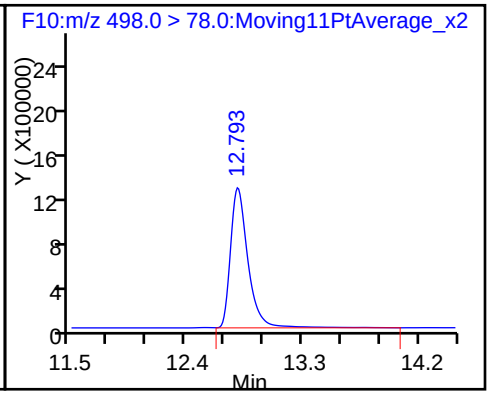
20 Perfluorodecanoic acid



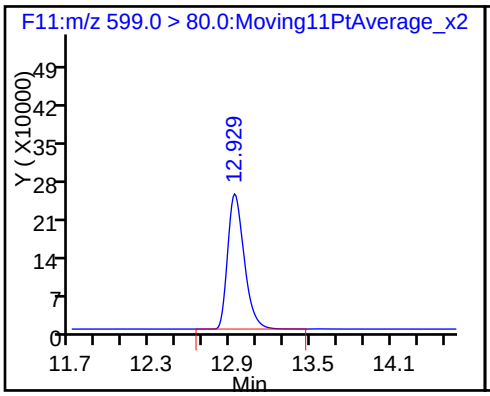
D 23 13C8 FOSA



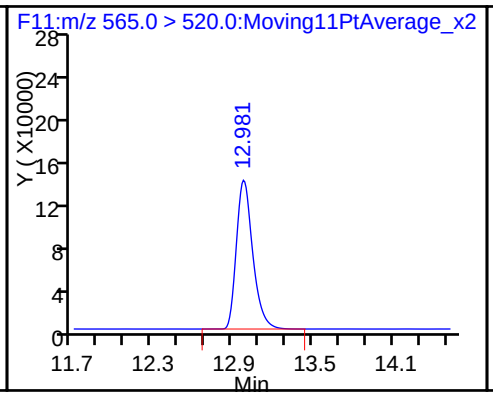
24 Perfluorooctane Sulfonamide



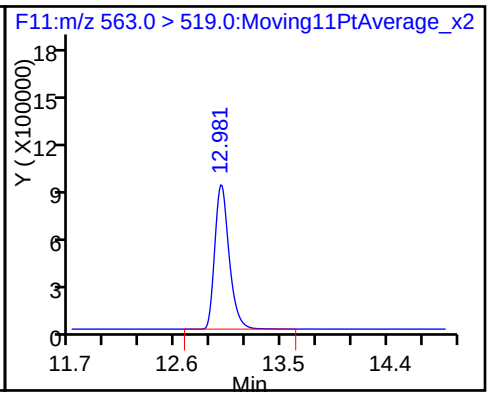
39 Perfluorodecane Sulfonic acid



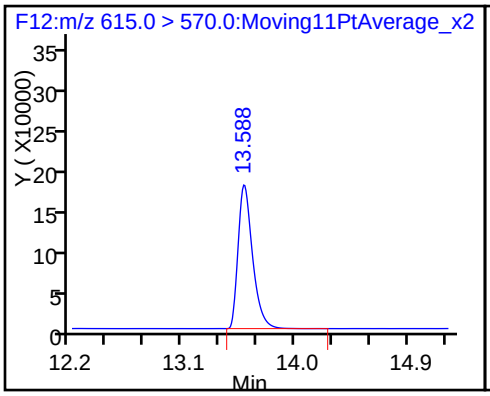
D 26 13C2 PFUnA



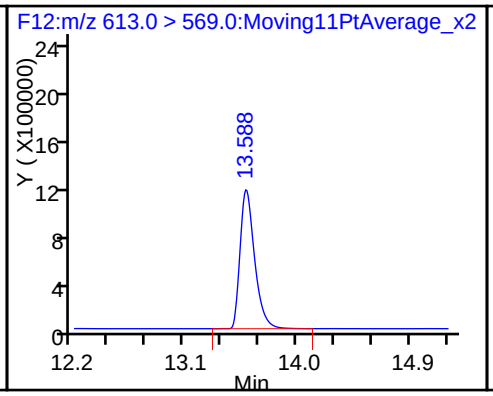
27 Perfluoroundecanoic acid



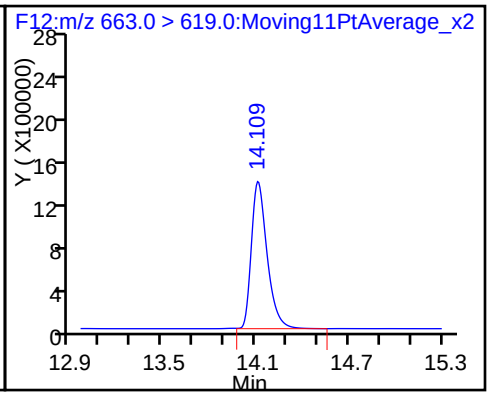
D 28 13C2 PFDoA



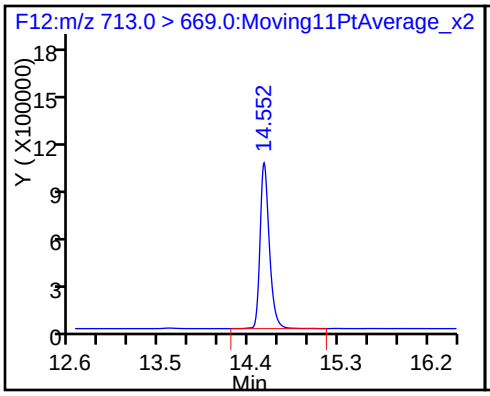
29 Perfluorododecanoic acid



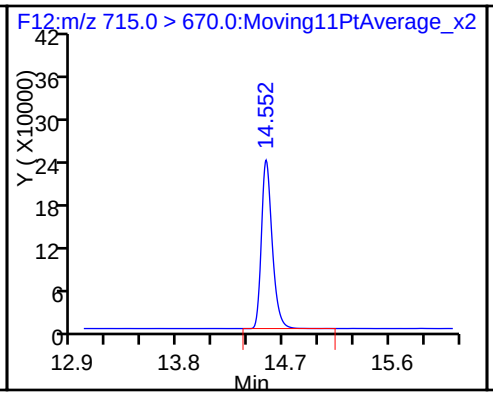
30 Perfluorotridecanoic acid



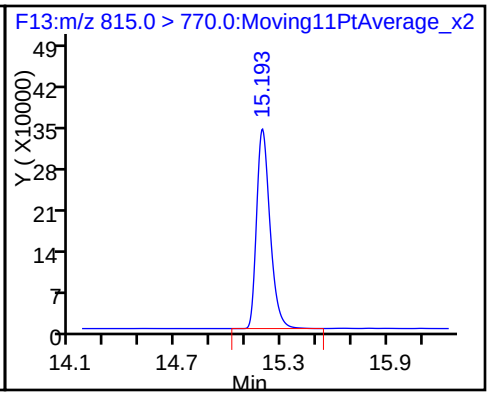
32 Perfluorotetradecanoic acid



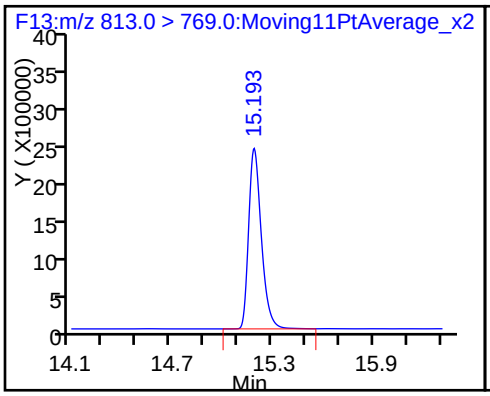
D 33 13C2-PFTeDA



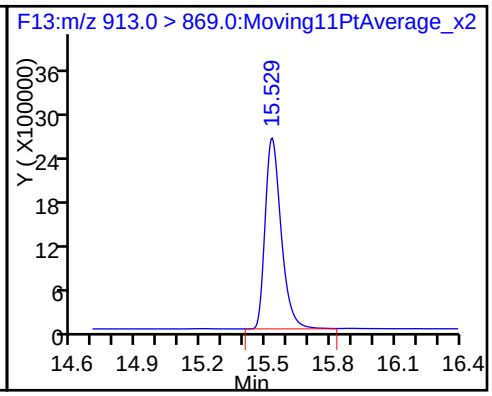
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Lab Sample ID: ICV 320-100305/10 Calibration Date: 02/12/2016 13:24

Instrument ID: A4 Calib Start Date: 02/12/2016 10:35

GC Column: Acquity ID: 2.10(mm) Calib End Date: 02/12/2016 12:42

Lab File ID: 12FEB2016A4A_011.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.4901	0.5679		57.9	50.0	15.9	25.0
Perfluoropentanoic acid (PFPeA)	AveID	0.4708	0.5472		58.1	50.0	16.2	25.0
Perfluorobutanesulfonic acid (PFBS)	L1ID		0.8082		42.8	44.3	-3.4	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.4308	0.4788		55.6	50.0	11.2	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.5120	0.4775		46.6	50.0	-6.8	25.0
Perfluorohexanesulfonic acid (PFHxS)	L2ID		1.199		50.6	47.3	7.1	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	2.544	2.580		48.3	47.6	1.4	25.0
Perfluorooctanoic acid (PFOA)	AveID	0.4910	0.4815		49.0	50.0	-1.9	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	4.265	5.017		56.2	47.8	17.6	25.0
Perfluorononanoic acid (PFNA)	L1ID		1.133		54.0	50.0	8.0	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9142	0.9011		49.3	50.0	-1.4	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9450	1.016		53.7	50.0	7.5	25.0
Perfluorodecane Sulfonic acid	AveID	1.927	2.087		52.3	48.3	8.3	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.037	1.039		50.1	50.0	0.1	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.8053	0.8703		54.0	50.0	8.1	25.0
Perfluorotridecanoic Acid (PFTriA)	L2ID		0.8591		51.5	50.0	3.0	25.0
Perfluorotetradecanoic acid (PFTeA)	L2ID		0.3819		50.2	50.0	0.5	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		1.056		48.8	50.0	-2.3	25.0
Perfluoro-n-octandecanoic acid (PFODA)	L1ID		1.026		51.2	50.0	2.3	25.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160212-28353.b\12FEB2016A4A_011.d
Lims ID: ICV
Client ID:
Sample Type: ICV
Inject. Date: 12-Feb-2016 13:24:55 ALS Bottle#: 9 Worklist Smp#: 10
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: ICV
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4
Sublist: chrom-PFAC_A4*sub6

Method: \\ChromNA\Sacramento\ChromData\A4\20160212-28353.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 15-Feb-2016 10:03:56 Calib Date: 12-Feb-2016 12:42:35
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160212-28353.b\12FEB2016A4A_009.d

Column 1 : Det: F1:MRM
Process Host: XAWRK007

First Level Reviewer: barnettj Date: 12-Feb-2016 17:40:03

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
216.7 > 171.5	5.729	5.712	0.017		1908642	47.0		94.1	6779	
2 Perfluorobutyric acid										
212.7 > 168.6	5.732	5.712	0.020	1.000	1083841	57.9			3338	
4 Perfluoropentanoic acid										
262.9 > 218.7	7.026	6.986	0.040	1.000	842323	58.1			647	
D 3 13C5-PFPeA										
267.6 > 222.7	7.020	6.986	0.034		1539466	48.1		96.2	2904	
5 Perfluorobutane Sulfonate										
298.8 > 79.6	7.155	7.115	0.040	1.000	800699	NC			536	
298.8 > 98.6	7.155	7.115	0.040	1.000	553707		1.45(0.00-0.00)		494	
51 Perfluorobutanesulfonic acid										
298.8 > 79.6	7.155	7.115	0.040	1.000	800699	42.8				
D 6 13C2 PFHxA										
314.6 > 269.7	8.383	8.367	0.016		1874527	47.9		95.7	4493	
7 Perfluorohexanoic acid										
312.9 > 268.7	8.389	8.369	0.020	1.000	897607	55.6			1409	
22 PFPeS (Perflouro-1-pentanesulfonat										
348.7 > 79.5	8.470	8.676	-0.206	0.876	982357	NC			2741	
D 8 13C4-PFHpA										
366.6 > 321.6	9.643	9.639	0.004		1861616	47.8		95.6	4264	
9 Perfluoroheptanoic acid										
362.8 > 318.7	9.643	9.640	0.003	1.000	888852	46.6			1623	
58 Perfluorohexanesulfonic acid										
398.3 > 79.2	9.671	9.675	-0.004	1.000	1267917	50.6				
10 Perfluorohexane Sulfonate										
398.3 > 79.2	9.671	9.675	-0.004	1.000	1267917	NC			3702	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 11 18O2 PFHxS										
402.5 > 83.6	9.671	9.675	-0.004		1059018	46.7		98.7	2658	
39 Perfluoroheptanesulfonic Acid										
448.3 > 79.2	10.724	10.740	-0.016	1.000	1248257	48.3				
14 Perfluoroheptane Sulfonate										
448.3 > 79.2	10.724	10.740	-0.016	1.000	1248257	NC			3638	
D 12 13C4 PFOA										
416.5 > 371.6	10.724	10.743	-0.019		1999016	47.0		93.9	3452	
13 Perfluorooctanoic acid										
412.8 > 368.8	10.724	10.743	-0.019	1.000	962485	49.0			1436	
412.8 > 168.7	10.733	10.743	-0.010	1.001	366426		2.63(0.00-0.00)		845	
D 16 13C4 PFOS										
502.4 > 79.7	11.618	11.651	-0.033		485944	48.0		100	2096	
15 Perfluorooctane sulfonic acid										
498.3 > 79.2	11.626	11.656	-0.030	1.000	2435496	56.2			2710	
498.3 > 98.2	11.626	11.656	-0.030	1.000	1419627		1.72(0.00-0.00)		2054	
D 17 13C5 PFNA										
467.5 > 422.6	11.644	11.678	-0.034		1986876	47.8		95.5	3977	
18 Perfluorononanoic acid										
462.5 > 418.6	11.653	11.680	-0.027	1.000	2250334	54.0			2036	
D 19 13C2 PFDA										
514.4 > 469.5	12.434	12.473	-0.039		2782767	47.4		94.7	3747	
20 Perfluorodecanoic acid										
512.5 > 468.5	12.434	12.476	-0.042	1.000	2507408	49.3			3108	
21 PFNS (Perflouro-1-nonanesulfonate)										
548.6 > 79.6	12.393	12.580	-0.187	1.000	762915	NC			2195	
24 Perfluorooctane Sulfonamide										
497.5 > 77.6	12.952	12.991	-0.039	1.000	4381313	53.7			1820	
D 23 13C8 FOSA										
505.4 > 77.6	12.952	12.991	-0.039		4313351	48.3		96.6	1996	
25 Perfluorodecane Sulfonate										
598.4 > 79.6	13.058	13.098	-0.040	1.000	1023926	NC			3381	
49 Perfluorodecane Sulfonic acid										
598.4 > 79.6	13.058	13.098	-0.040	1.000	1023926	52.3				
D 26 13C2 PFUnA										
564.3 > 519.5	13.111	13.146	-0.035		2868368	49.0		98.1	3326	
27 Perfluoroundecanoic acid										
562.4 > 518.5	13.111	13.146	-0.035	1.000	2979313	50.1			2312	
D 28 13C2 PFDoA										
614.4 > 569.4	13.684	13.713	-0.029		3530689	49.6		99.3	3478	
29 Perfluorododecanoic acid										
612.4 > 568.6	13.684	13.715	-0.031	1.000	3072566	54.0			1465	
30 Perfluorotridecanoic acid										
662.4 > 618.5	14.167	14.193	-0.026	1.000	3033306	51.5			1491	
31 PFDoS (Perflouro-1-dodecanesulfona										
698.6 > 79.7	14.113	14.227	-0.114	1.000	315882	NC			1447	
D 33 13C2-PFTeDA										
714.5 > 669.5	14.576	14.603	-0.027		3288418	51.9		104	3923	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
32 Perfluorotetradecanoic acid										
712.6 > 668.5	14.576	14.604	-0.028	1.000	1348229	50.2			890	
D 35 13C2-PFHxDA										
814.8 > 769.6	15.124	15.138	-0.014		1776974	59.9		120	4070	
34 Perfluorohexadecanoic acid										
812.6 > 768.6	15.124	15.139	-0.015	1.000	3730056	48.8			2582	
36 Perfluorooctandecanoic acid										
912.7 > 868.6	15.426	15.442	-0.016	1.000	3621991	51.2			2372	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFCIC_00014 Amount Added: 1.00 Units: mL

Report Date: 15-Feb-2016 10:03:58 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160212-28353.b\12FEB2016A4A_011.d

Injection Date: 12-Feb-2016 13:24:55 Instrument ID: A4

Lims ID: ICV

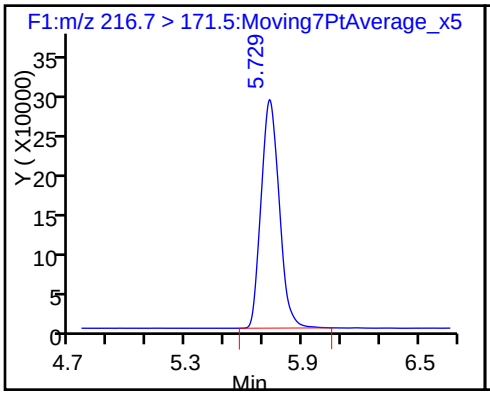
Client ID:

Operator ID: JRB ALS Bottle#: 9 Worklist Smp#: 10

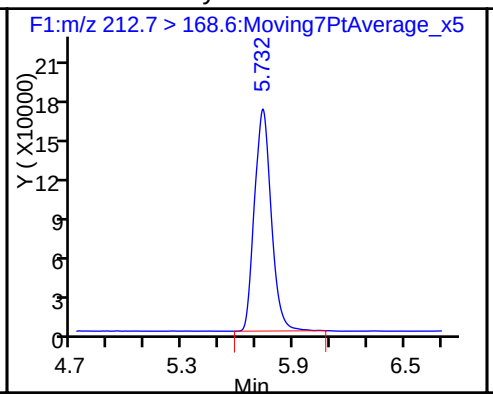
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

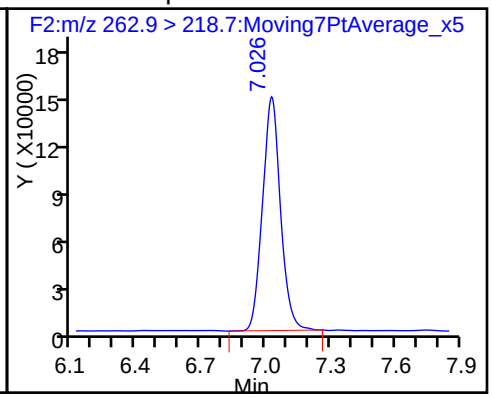
D 1 13C4 PFBA



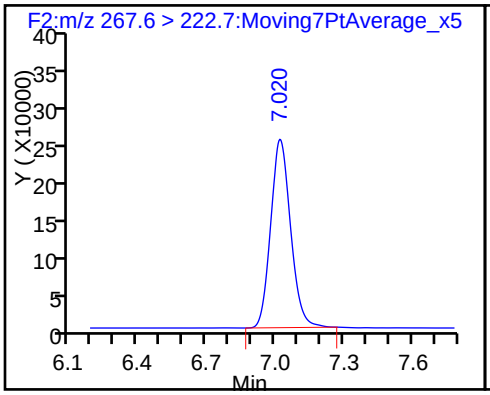
2 Perfluorobutyric acid



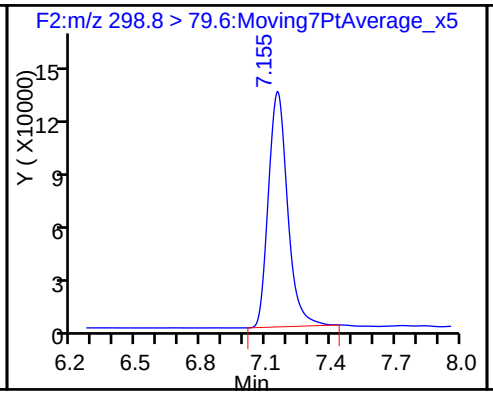
4 Perfluoropentanoic acid



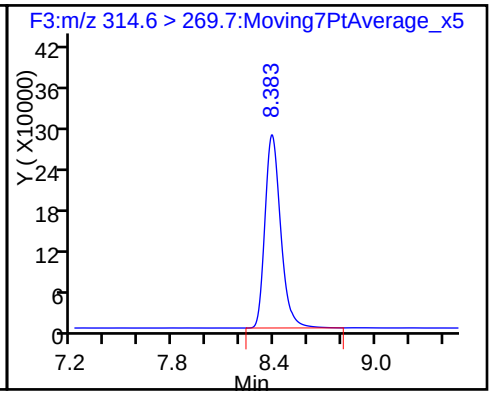
D 3 13C5-PFPeA



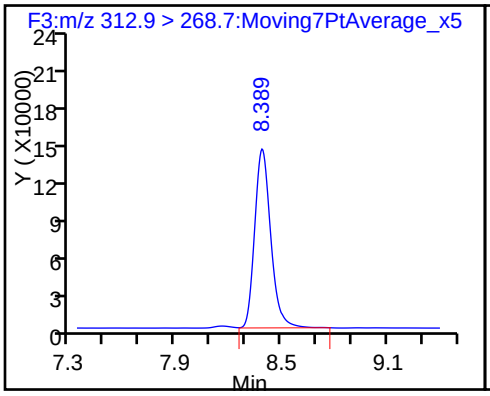
51 Perfluorobutanesulfonic acid



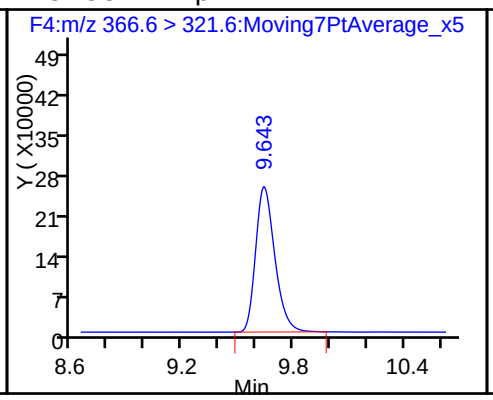
D 6 13C2 PFHxA



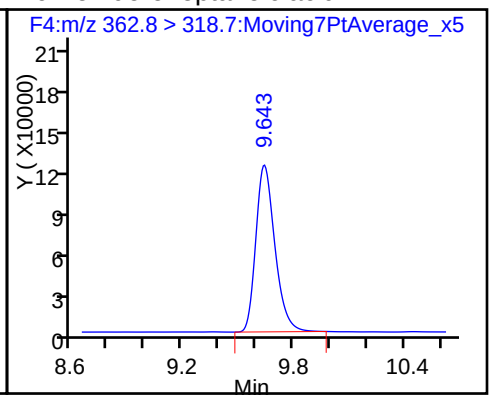
7 Perfluorohexanoic acid



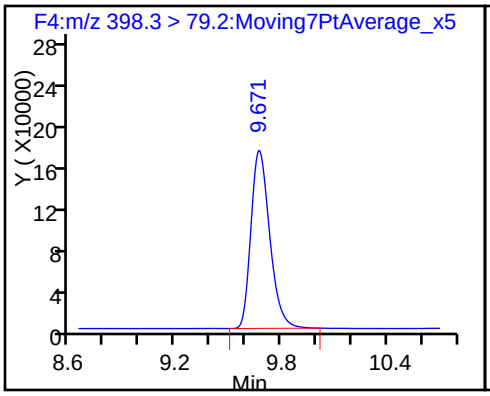
D 8 13C4-PFHpA



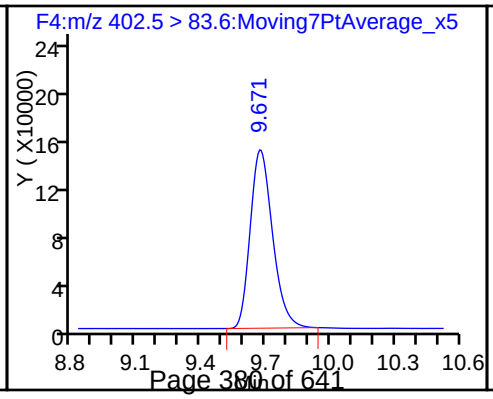
9 Perfluoroheptanoic acid



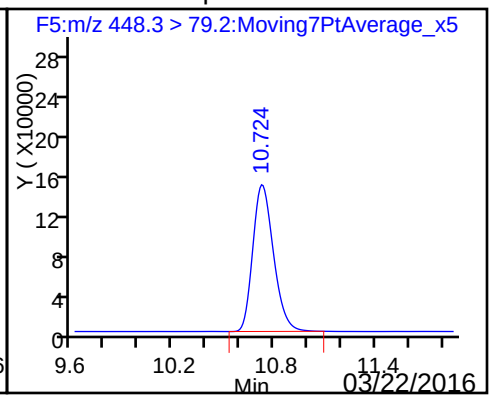
58 Perfluorohexanesulfonic acid



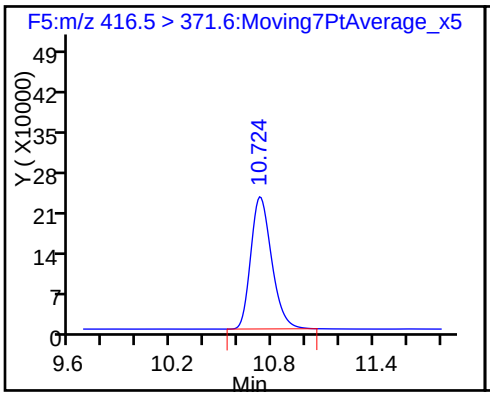
D 11 18O2 PFHxS



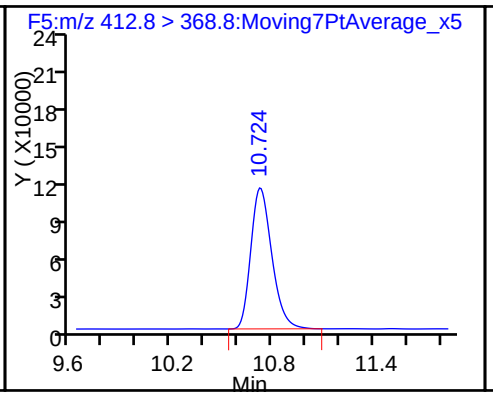
39 Perfluoroheptanesulfonic Acid



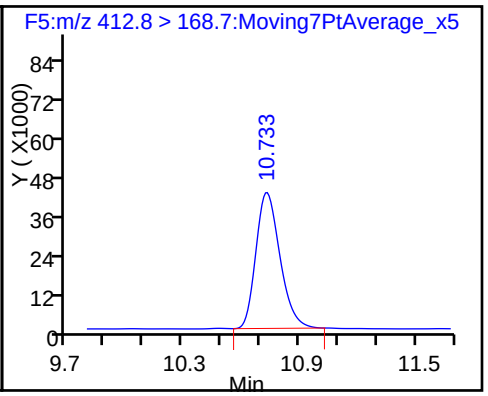
D 12 13C4 PFOA



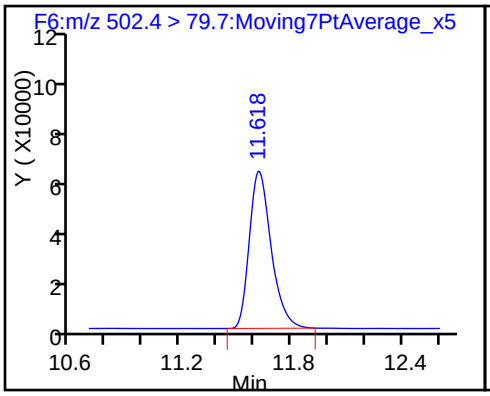
13 Perfluorooctanoic acid



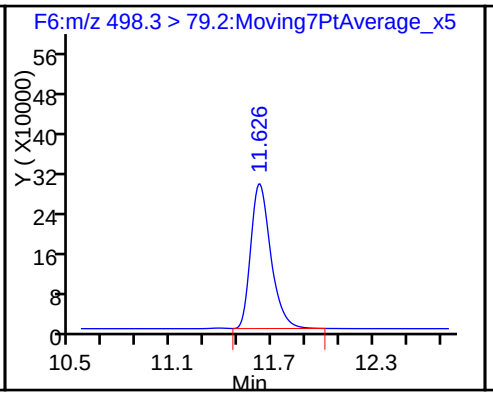
13 Perfluorooctanoic acid



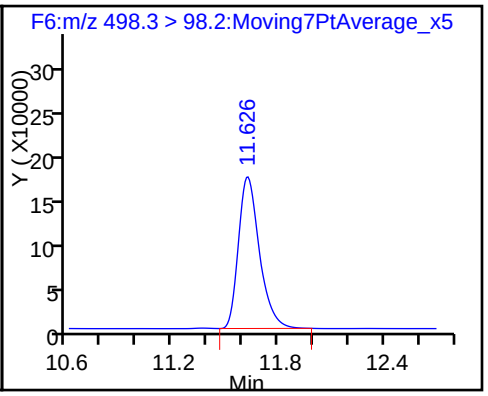
D 16 13C4 PFOS



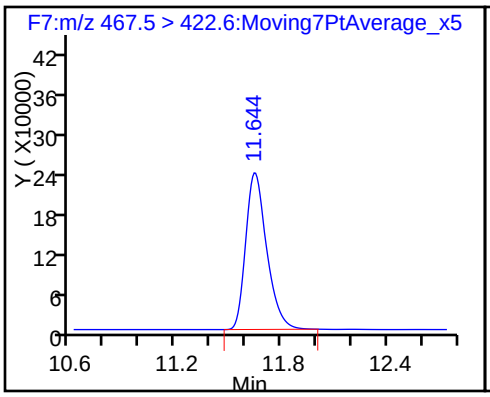
15 Perfluorooctane sulfonic acid



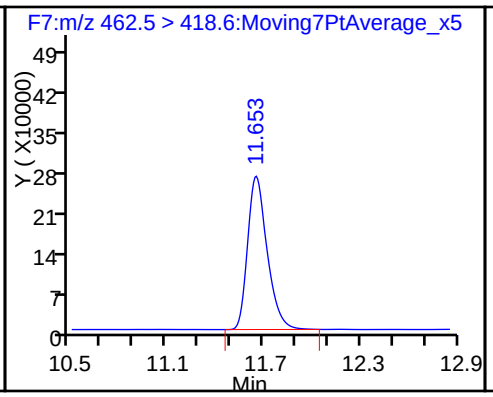
15 Perfluorooctane sulfonic acid



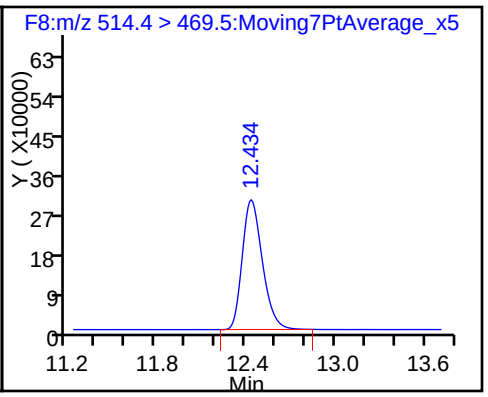
D 17 13C5 PFNA



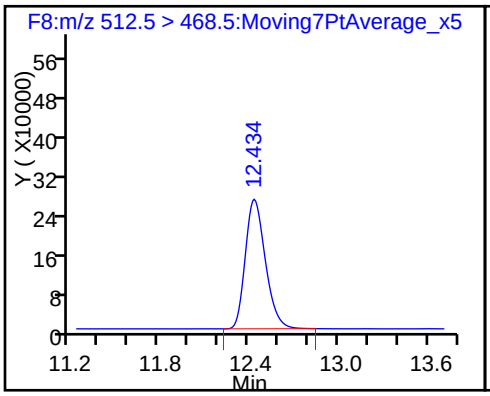
18 Perfluorononanoic acid



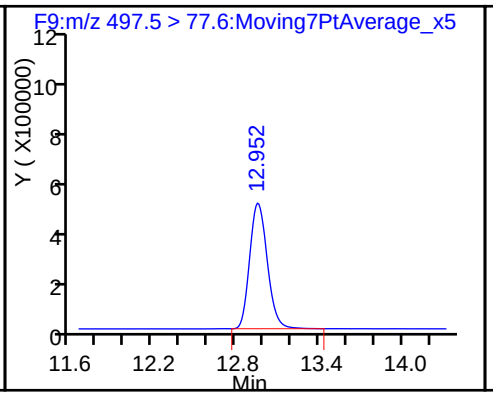
D 19 13C2 PFDA



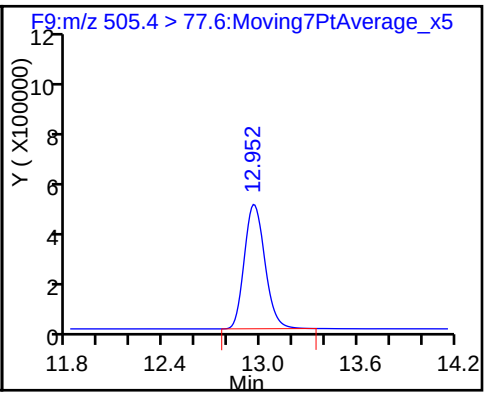
20 Perfluorodecanoic acid



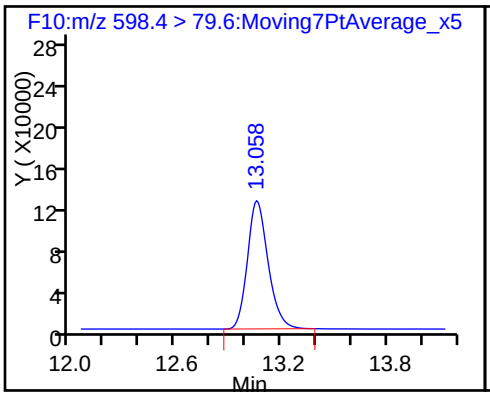
24 Perfluorooctane Sulfonamide



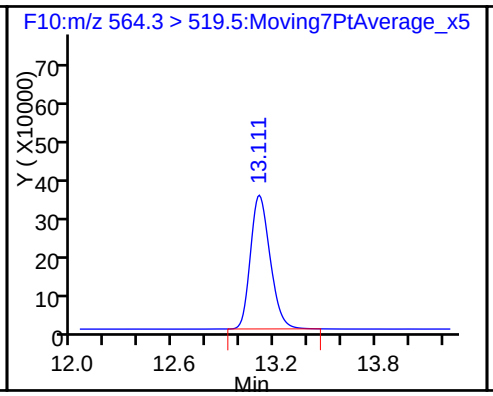
D 23 13C8 FOSA



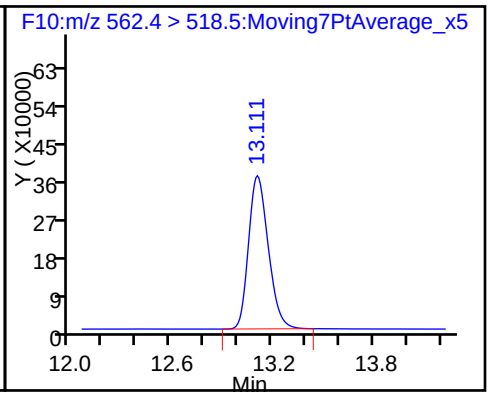
49 Perfluorodecane Sulfonic acid



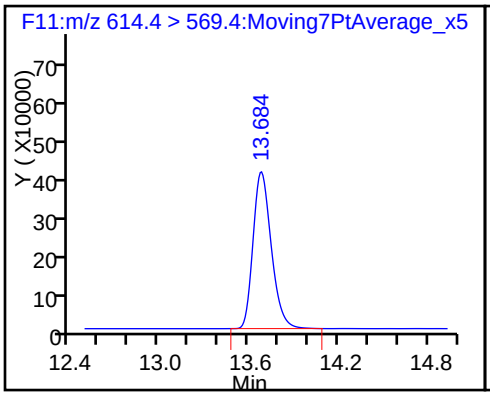
D 26 13C2 PFUnA



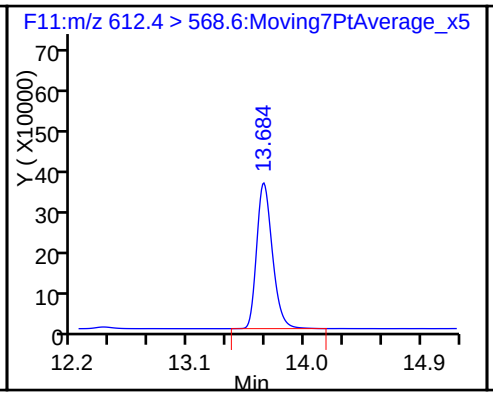
27 Perfluoroundecanoic acid



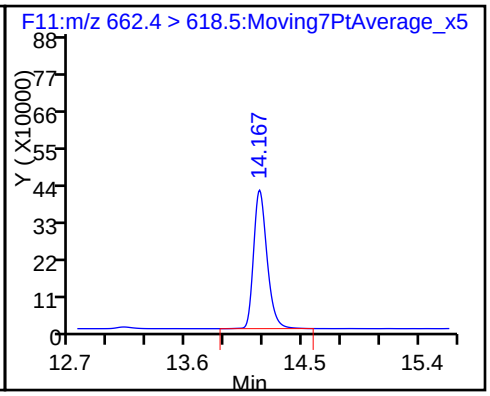
D 28 13C2 PFDoA



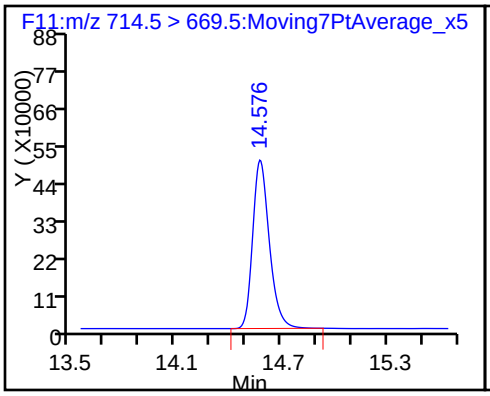
29 Perfluorododecanoic acid



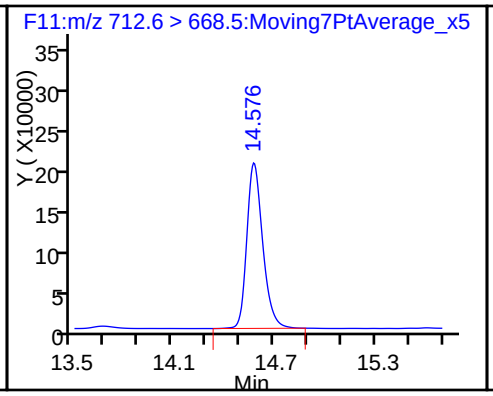
30 Perfluorotridecanoic acid



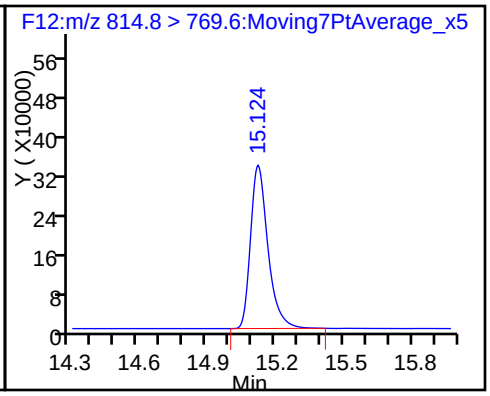
D 33 13C2-PFTeDA



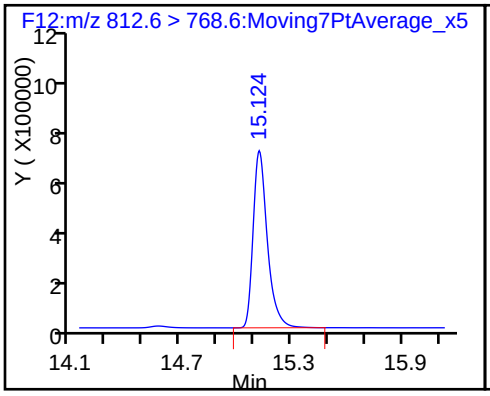
32 Perfluorotetradecanoic acid



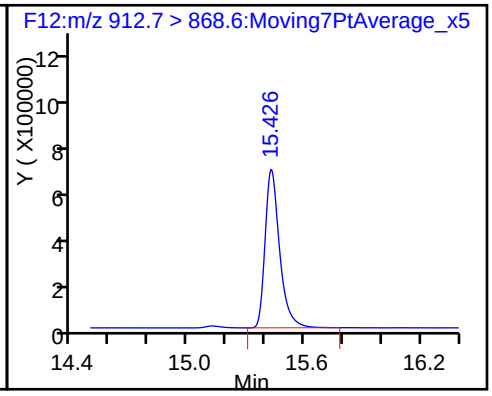
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Lab Sample ID: CCV 320-100305/40 Calibration Date: 02/13/2016 00:01

Instrument ID: A4 Calib Start Date: 02/12/2016 10:35

GC Column: Acquity ID: 2.10(mm) Calib End Date: 02/12/2016 12:42

Lab File ID: 12FEB2016A4A_041.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.4901	0.5313		21.7	20.0	8.4	25.0
Perfluoropentanoic acid (PFPeA)	AveID	0.4708	0.4801		20.4	20.0	2.0	25.0
Perfluorobutanesulfonic acid (PFBS)	L1ID		1.029		14.7	17.7	-17.1	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.4308	0.4473		20.8	20.0	3.8	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.5120	0.5030		19.6	20.0	-1.8	25.0
Perfluorohexanesulfonic acid (PFHxS)	L2ID		1.130		18.9	18.9	-0.0	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	2.544	3.438		25.7	19.0	35.1*	25.0
Perfluorooctanoic acid (PFOA)	AveID	0.4910	0.4308		17.5	20.0	-12.3	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	4.265	5.395		24.2	19.1	26.5*	25.0
Perfluorononanoic acid (PFNA)	L1ID		1.160		22.2	20.0	11.0	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9142	0.8678		19.0	20.0	-5.1	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9450	1.005		21.3	20.0	6.4	25.0
Perfluorodecane Sulfonic acid	AveID	1.927	2.266		22.7	19.3	17.6	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.037	0.9717		18.7	20.0	-6.3	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.8053	0.8602		21.4	20.0	6.8	25.0
Perfluorotridecanoic Acid (PFTriA)	L2ID		0.8802		21.1	20.0	5.5	25.0
Perfluorotetradecanoic acid (PFTeA)	L2ID		0.3595		18.8	20.0	-6.2	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		0.8891		16.3	20.0	-18.3	25.0
Perfluoro-n-octandecanoic acid (PFODA)	L1ID		0.7773		15.9	20.0	-20.6	25.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160212-28353.b\12FEB2016A4A_041.d
Lims ID: CCV L4
Client ID:
Sample Type: CCV
Inject. Date: 13-Feb-2016 00:01:23 ALS Bottle#: 47 Worklist Smp#: 40
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: CCV L4
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4
Sublist: chrom-PFAC_A4*sub12

Method: \\ChromNA\Sacramento\ChromData\A4\20160212-28353.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 15-Feb-2016 10:07:12 Calib Date: 12-Feb-2016 12:42:35
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160212-28353.b\12FEB2016A4A_009.d

Column 1 : Det: F1:MRM
Process Host: XAWRK007

First Level Reviewer: westendorfc Date: 15-Feb-2016 09:21:48

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
216.7 > 171.5	5.570	5.712	-0.142		1932591	47.6		95.2	7956	
2 Perfluorobutyric acid										
212.7 > 168.6	5.570	5.712	-0.142	1.000	410725	21.7		108	925	
4 Perfluoropentanoic acid										
262.9 > 218.7	6.769	6.986	-0.217	1.000	283463	20.4		102	294	
D 3 13C5-PFPeA										
267.6 > 222.7	6.764	6.986	-0.222		1476036	46.1		92.3	3796	
5 Perfluorobutane Sulfonate										
298.8 > 79.6	6.888	7.115	-0.227	1.000	383963	NC			238	
298.8 > 98.6	6.884	7.115	-0.231	0.999	255794		1.50(0.00-0.00)		197	
51 Perfluorobutanesulfonic acid										
298.8 > 79.6	6.888	7.115	-0.227	1.000	383963	14.7		82.9		
D 6 13C2 PFHxA										
314.6 > 269.7	8.066	8.367	-0.301		1836068	46.9		93.8	4895	
7 Perfluorohexanoic acid										
312.9 > 268.7	8.066	8.369	-0.303	1.000	328539	20.8		104	1083	
D 8 13C4-PFHpA										
366.6 > 321.6	9.305	9.639	-0.334		1813051	46.6		93.1	4180	
9 Perfluoroheptanoic acid										
362.8 > 318.7	9.305	9.640	-0.335	1.000	364779	19.6		98.2	898	
58 Perfluorohexanesulfonic acid										
398.3 > 79.2	9.340	9.675	-0.335	1.000	451415	18.9		100.0		
10 Perfluorohexane Sulfonate										
398.3 > 79.2	9.340	9.675	-0.335	1.000	451415	NC			1169	
D 11 18O2 PFHxS										
402.5 > 83.6	9.340	9.675	-0.335		998501	44.0		93.1	2487	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
39 Perfluoroheptanesulfonic Acid										
448.3 > 79.2	10.391	10.740	-0.349	1.000	549835	25.7		135		
14 Perfluoroheptane Sulfonate										
448.3 > 79.2	10.391	10.740	-0.349	1.000	549835	NC			2176	
D 12 13C4 PFOA										
416.5 > 371.6	10.391	10.743	-0.352		2224559	52.2		104	5414	
13 Perfluorooctanoic acid										
412.8 > 368.8	10.391	10.743	-0.352	1.000	383302	17.5		87.7	981	
D 16 13C4 PFOS										
502.4 > 79.7	11.313	11.651	-0.338		401507	39.6		82.9	1651	
15 Perfluorooctane sulfonic acid										
498.3 > 79.2	11.313	11.656	-0.343	1.000	866386	24.2		126	1548	
D 17 13C5 PFNA										
467.5 > 422.6	11.336	11.678	-0.342		1963354	47.2		94.4	6100	
18 Perfluorononanoic acid										
462.5 > 418.6	11.336	11.680	-0.344	1.000	911333	22.2		111	1384	
D 19 13C2 PFDA										
514.4 > 469.5	12.144	12.473	-0.329		2887941	49.2		98.3	4099	
20 Perfluorodecanoic acid										
512.5 > 468.5	12.144	12.476	-0.332	1.000	1002452	19.0		94.9	2524	
24 Perfluorooctane Sulfonamide										
497.5 > 77.6	12.673	12.991	-0.318	1.000	1499415	21.3		106	1343	
D 23 13C8 FOSA										
505.4 > 77.6	12.673	12.991	-0.318		3729431	41.8		83.5	1371	
25 Perfluorodecane Sulfonate										
598.4 > 79.6	12.789	13.098	-0.309	1.000	366949	NC			1105	
49 Perfluorodecane Sulfonic acid										
598.4 > 79.6	12.789	13.098	-0.309	1.000	366949	22.7		118		
D 26 13C2 PFUnA										
564.3 > 519.5	12.830	13.146	-0.316		2770335	47.4		94.7	2682	
27 Perfluoroundecanoic acid										
562.4 > 518.5	12.830	13.146	-0.316	1.000	1076730	18.7		93.7	1203	
D 28 13C2 PFDoA										
614.4 > 569.4	13.424	13.713	-0.289		3103590	43.6		87.3	3360	
29 Perfluorododecanoic acid										
612.4 > 568.6	13.424	13.715	-0.291	1.000	1067827	21.4		107	1578	
30 Perfluorotridecanoic acid										
662.4 > 618.5	13.914	14.193	-0.279	1.000	1092644	21.1		105	778	
D 33 13C2-PFTeDA										
714.5 > 669.5	14.351	14.603	-0.252		2670650	42.1		84.3	3717	
32 Perfluorotetradecanoic acid										
712.6 > 668.5	14.351	14.604	-0.253	1.000	446275	18.8		93.8	262	
D 35 13C2-PFHxDA										
814.8 > 769.6	14.958	15.138	-0.180		1156686	39.0		78.0	2832	
34 Perfluorohexadecanoic acid										
812.6 > 768.6	14.958	15.139	-0.181	1.000	1103795	16.3		81.7	1130	
36 Perfluorooctandecanoic acid										
912.7 > 868.6	15.280	15.442	-0.162	1.000	964932	15.9		79.4	1068	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L4_00017 Amount Added: 1.00 Units: mL

Report Date: 15-Feb-2016 10:07:12 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160212-28353.b\12FEB2016A4A_041.d

Injection Date: 13-Feb-2016 00:01:23 Instrument ID: A4

Lims ID: CCV L4

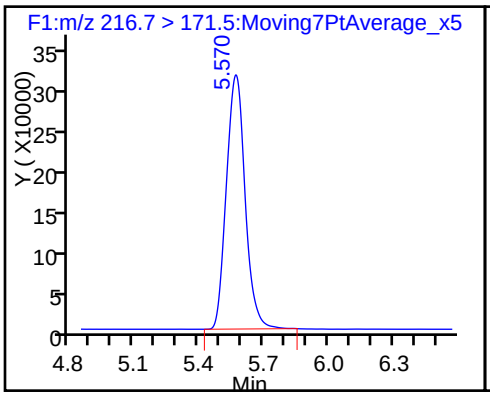
Client ID:

Operator ID: JRB ALS Bottle#: 47 Worklist Smp#: 40

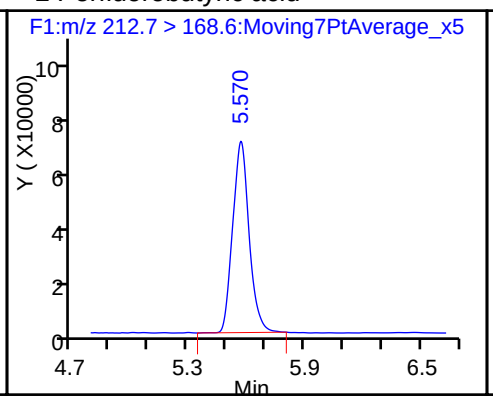
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

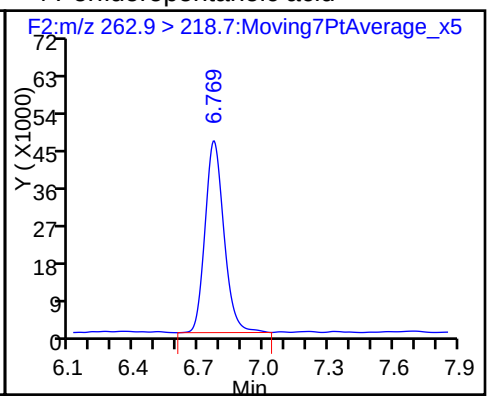
D 1 13C4 PFBA



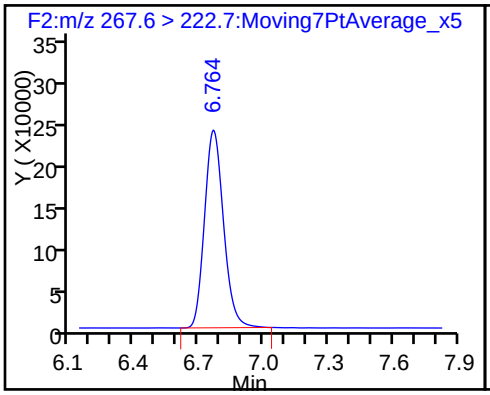
2 Perfluorobutyric acid



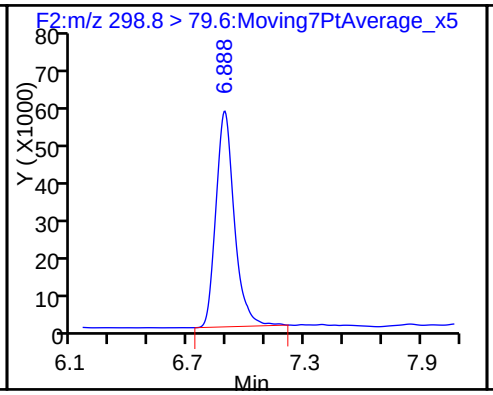
4 Perfluoropentanoic acid



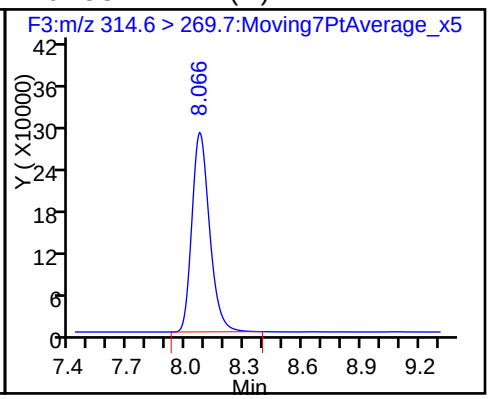
D 3 13C5-PFPeA



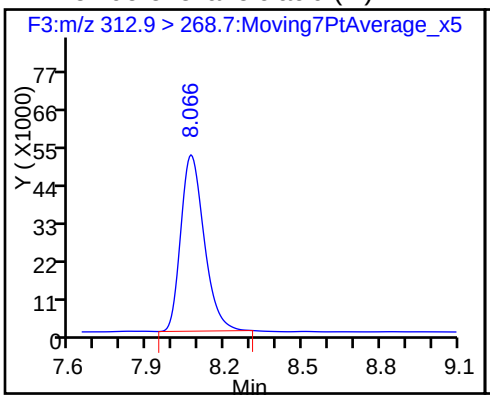
51 Perfluorobutanesulfonic acid



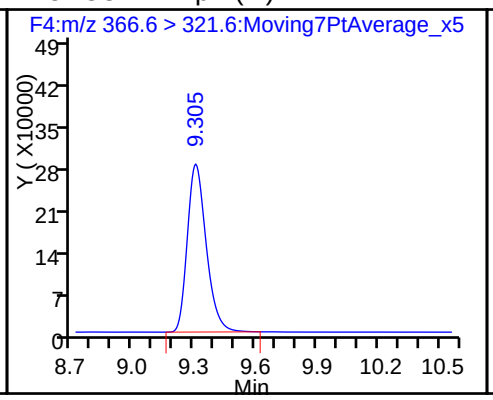
D 6 13C2 PFHxA (M)



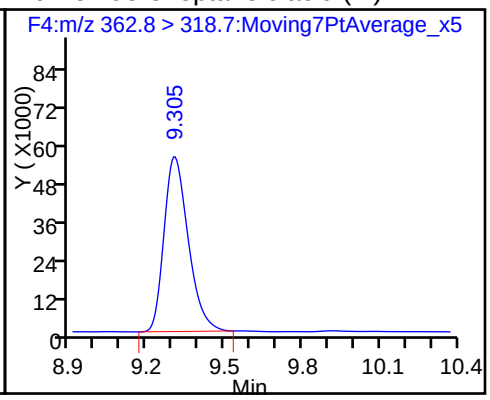
7 Perfluorohexanoic acid (M)



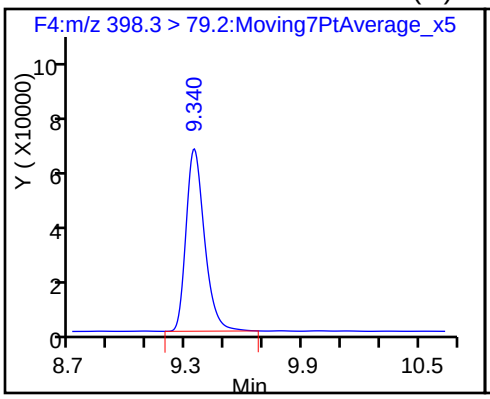
D 8 13C4-PFHpA (M)



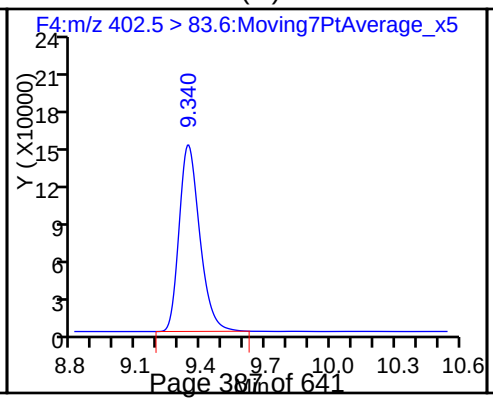
9 Perfluoroheptanoic acid (M)



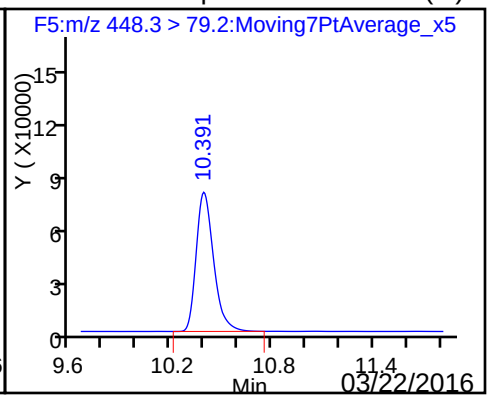
58 Perfluorohexanesulfonic acid (M)



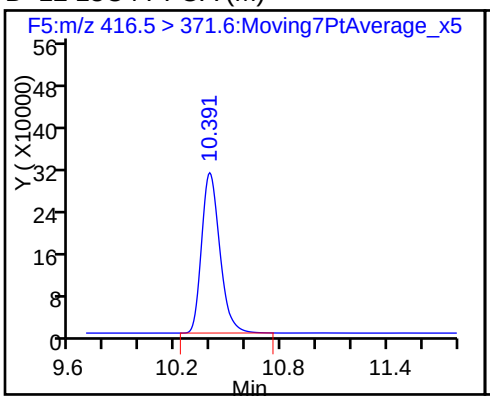
D 11 18O2 PFHxS (M)



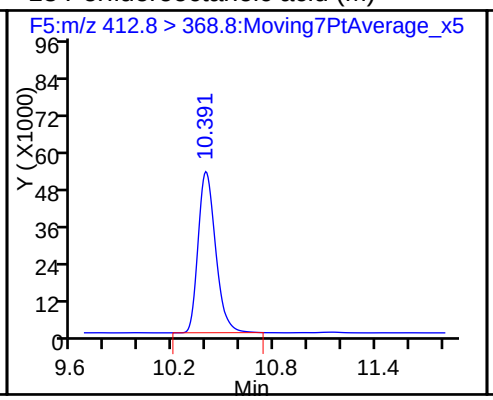
39 Perfluoroheptanesulfonic Acid (M)



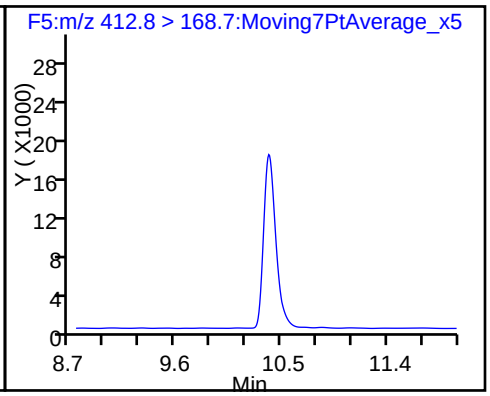
D 12 13C4 PFOA (M)



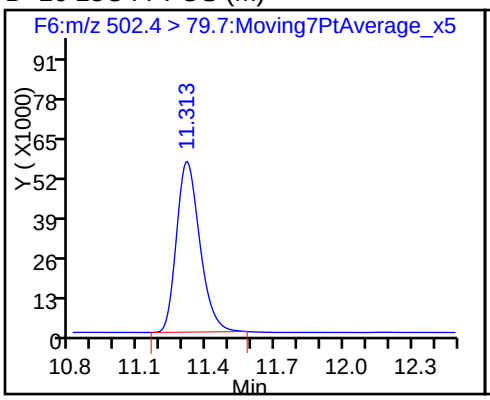
13 Perfluorooctanoic acid (M)



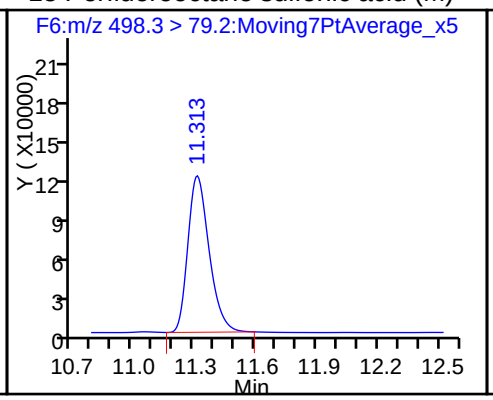
13 Perfluorooctanoic acid



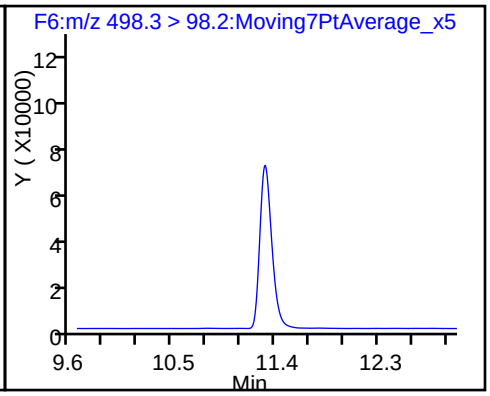
D 16 13C4 PFOS (M)



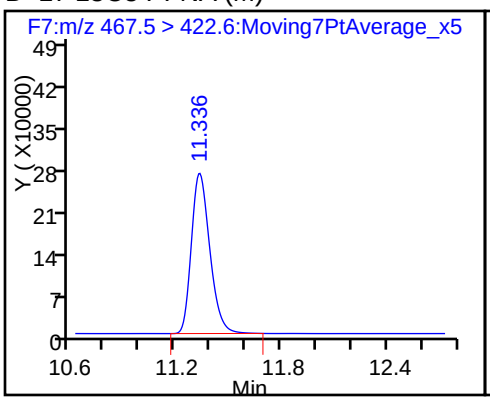
15 Perfluorooctane sulfonic acid (M)



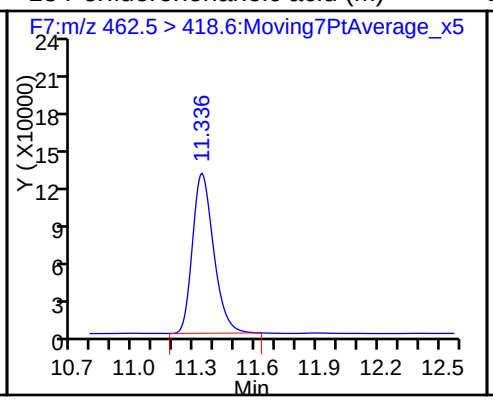
15 Perfluorooctane sulfonic acid



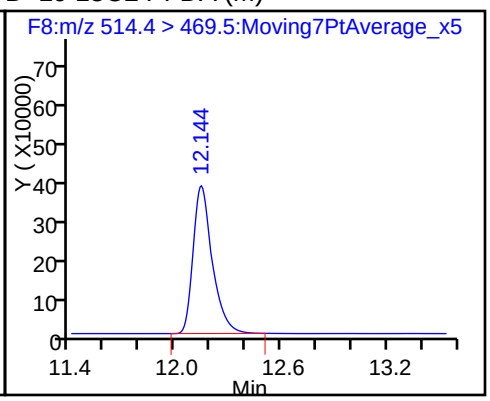
D 17 13C5 PFNA (M)



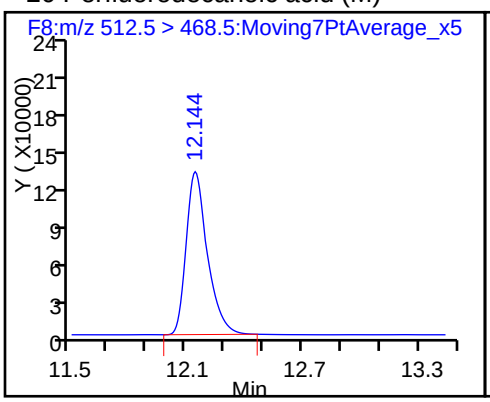
18 Perfluorononanoic acid (M)



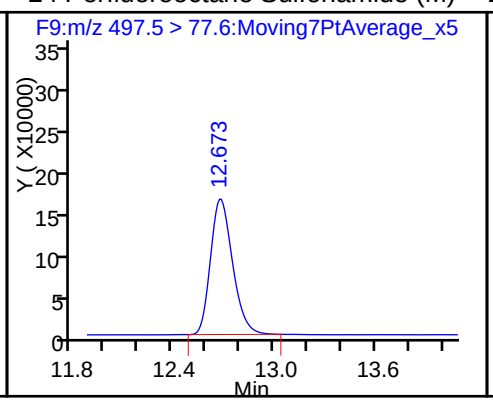
D 19 13C2 PFDA (M)



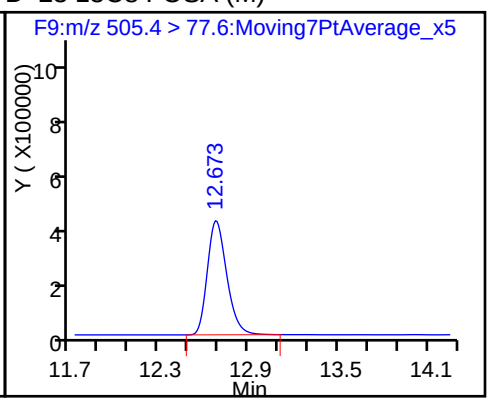
20 Perfluorodecanoic acid (M)



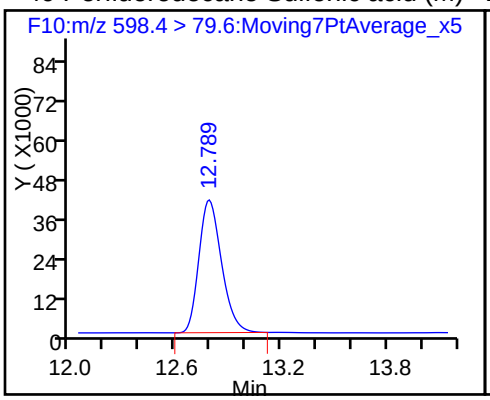
24 Perfluorooctane Sulfonamide (M)



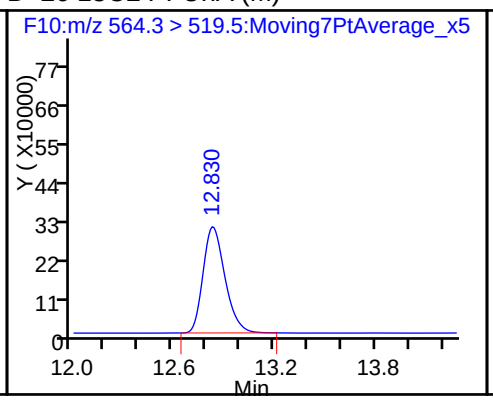
D 23 13C8 FOSA (M)



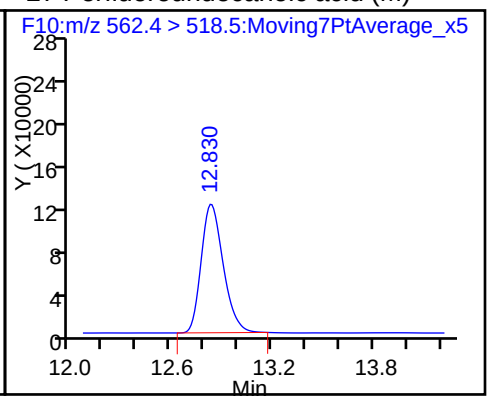
49 Perfluorodecane Sulfonic acid (M)



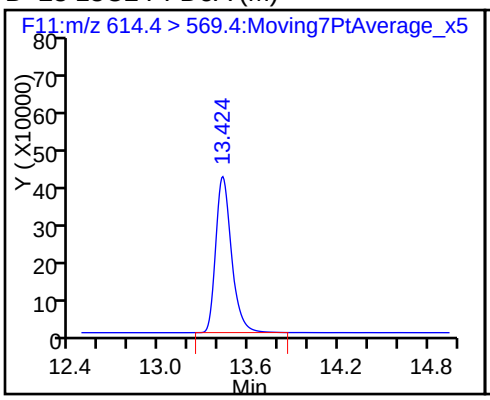
D 26 13C2 PFUnA (M)



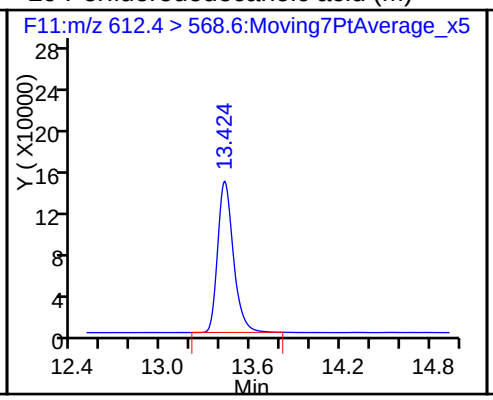
27 Perfluoroundecanoic acid (M)



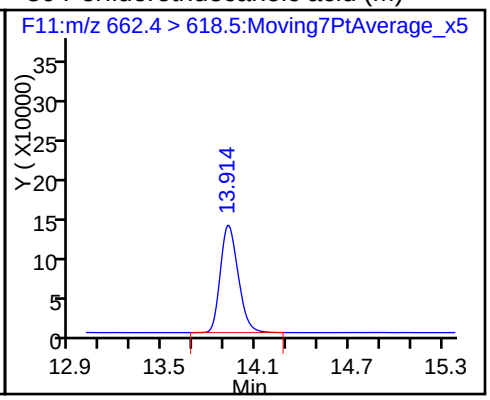
D 28 13C2 PFDoA (M)



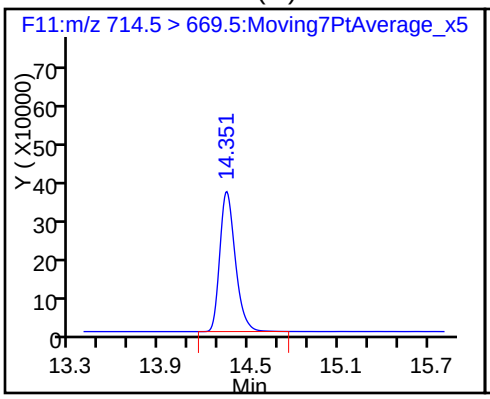
29 Perfluorododecanoic acid (M)



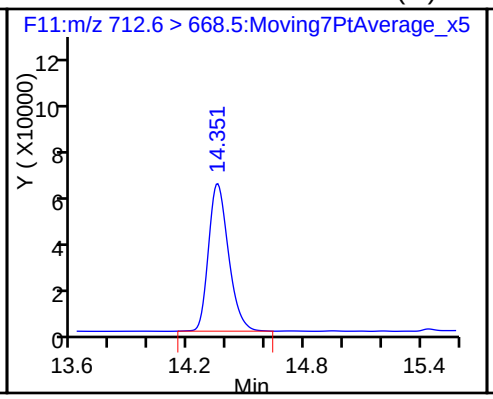
30 Perfluorotridecanoic acid (M)



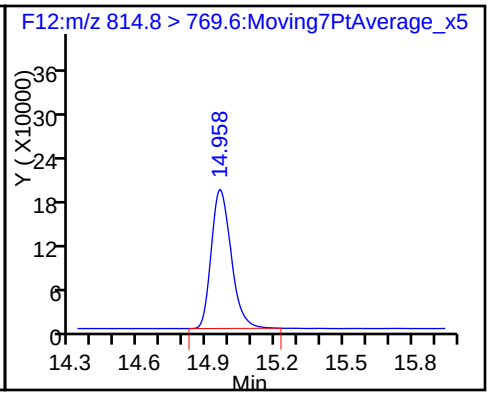
D 33 13C2-PFTeDA (M)



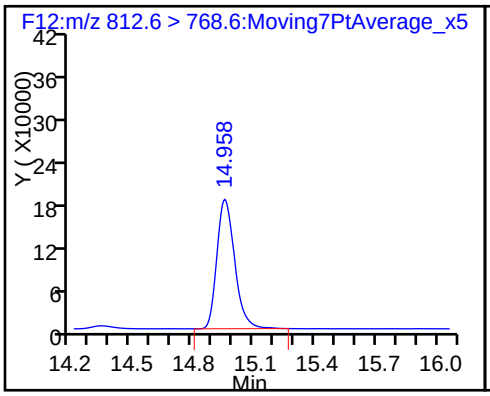
32 Perfluorotetradecanoic acid (M)



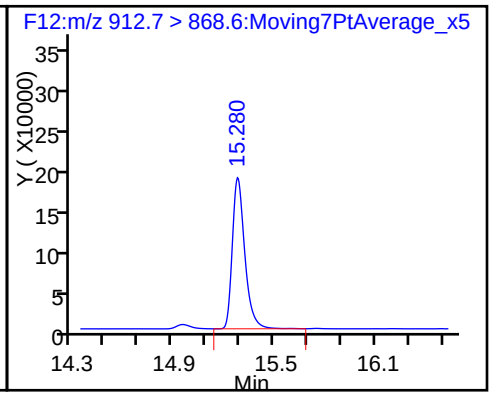
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Lab Sample ID: CCV 320-100305/51 Calibration Date: 02/13/2016 03:54

Instrument ID: A4 Calib Start Date: 02/12/2016 10:35

GC Column: Acquity ID: 2.10(mm) Calib End Date: 02/12/2016 12:42

Lab File ID: 12FEB2016A4A_052.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.4901	0.5244		53.5	50.0	7.0	25.0
Perfluoropentanoic acid (PFPeA)	AveID	0.4708	0.4516		48.0	50.0	-4.1	25.0
Perfluorobutanesulfonic acid (PFBS)	L1ID		0.7015		35.2	44.2	-20.5	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.4308	0.3874		45.0	50.0	-10.1	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.5120	0.4541		44.3	50.0	-11.3	25.0
Perfluorohexanesulfonic acid (PFHxS)	L2ID		1.221		51.6	47.3	9.2	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	2.544	4.219		78.9	47.6	65.8*	25.0
Perfluorooctanoic acid (PFOA)	AveID	0.4910	0.4097		41.7	50.0	-16.5	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	4.265	7.089		79.4	47.8	66.2*	25.0
Perfluorononanoic acid (PFNA)	L1ID		0.9842		47.0	50.0	-6.1	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9142	0.8496		46.5	50.0	-7.1	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9450	0.9919		52.5	50.0	5.0	25.0
Perfluorodecane Sulfonic acid	AveID	1.927	2.658		66.5	48.2	37.9*	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.037	1.005		48.5	50.0	-3.1	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.8053	0.8257		51.3	50.0	2.5	25.0
Perfluorotridecanoic Acid (PFTriA)	L2ID		0.7837		47.0	50.0	-6.1	25.0
Perfluorotetradecanoic acid (PFTeA)	L2ID		0.3438		45.2	50.0	-9.6	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		0.8249		38.1	50.0	-23.8	25.0
Perfluoro-n-octandecanoic acid (PFODA)	L1ID		0.6924		34.7	50.0	-30.6*	25.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160212-28353.b\12FEB2016A4A_052.d
Lims ID: CCV L5
Client ID:
Sample Type: CCV
Inject. Date: 13-Feb-2016 03:54:21 ALS Bottle#: 48 Worklist Smp#: 51
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: CCV L5
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4
Sublist: chrom-PFAC_A4*sub12

Method: \\ChromNA\Sacramento\ChromData\A4\20160212-28353.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 16-Feb-2016 08:37:08 Calib Date: 12-Feb-2016 12:42:35
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160212-28353.b\12FEB2016A4A_009.d

Column 1 : Det: F1:MRM
Process Host: XAWRK014

First Level Reviewer: westendorfc Date: 15-Feb-2016 13:26:20

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
216.7 > 171.5	5.496	5.712	-0.216		1933902	47.7		95.3	6988	
2 Perfluorobutyric acid										
212.7 > 168.6	5.502	5.712	-0.210	1.000	1014168	53.5		107	2752	
4 Perfluoropentanoic acid										
262.9 > 218.7	6.668	6.986	-0.318	1.000	662247	48.0		95.9	686	
D 3 13C5-PFPeA										
267.6 > 222.7	6.663	6.986	-0.323		1466604	45.8		91.7	3696	
5 Perfluorobutane Sulfonate										
298.8 > 79.6	6.783	7.115	-0.332	1.000	547214	NC			354	
51 Perfluorobutanesulfonic acid										
298.8 > 79.6	6.783	7.115	-0.332	1.000	547214	35.2		79.5		
D 6 13C2 PFHxA										
314.6 > 269.7	7.954	8.367	-0.413		1862377	47.6		95.1	5654	
7 Perfluorohexanoic acid										
312.9 > 268.7	7.954	8.369	-0.415	1.000	721529	45.0		89.9	1439	
D 8 13C4-PFHpA										
366.6 > 321.6	9.194	9.639	-0.445		1616208	41.5		83.0	4113	
9 Perfluoroheptanoic acid										
362.8 > 318.7	9.194	9.640	-0.446	1.000	733894	44.3		88.7	1564	
58 Perfluorohexanesulfonic acid										
398.3 > 79.2	9.229	9.675	-0.446	1.000	1019442	51.6		109		
10 Perfluorohexane Sulfonate										
398.3 > 79.2	9.229	9.675	-0.446	1.000	1019442	NC			1937	
D 11 18O2 PFHxS										
402.5 > 83.6	9.229	9.675	-0.446		834789	36.8		77.8	2788	
39 Perfluoroheptanesulfonic Acid										
448.3 > 79.2	10.308	10.740	-0.432	1.000	1225149	78.9		166		

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
14 Perfluoroheptane Sulfonate										
448.3 > 79.2	10.308	10.740	-0.432	1.000	1235149	NC			2954	
D 12 13C4 PFOA										
416.5 > 371.6	10.308	10.743	-0.435		1917508	45.0		90.1	5722	
13 Perfluorooctanoic acid										
412.8 > 368.8	10.308	10.743	-0.435	1.000	785613	41.7		83.5	1679	
D 16 13C4 PFOS										
502.4 > 79.7	11.240	11.651	-0.411		294011	29.0		60.7	1240	
15 Perfluorooctane sulfonic acid										
498.3 > 79.2	11.248	11.656	-0.408	1.000	2084119	79.4		166	2968	
D 17 13C5 PFNA										
467.5 > 422.6	11.270	11.678	-0.408		1876713	45.1		90.2	4313	
18 Perfluorononanoic acid										
462.5 > 418.6	11.270	11.680	-0.410	1.000	1846967	47.0		93.9	2443	
D 19 13C2 PFDA										
514.4 > 469.5	12.091	12.473	-0.382		2662972	45.3		90.7	4929	
20 Perfluorodecanoic acid										
512.5 > 468.5	12.099	12.476	-0.377	1.000	2262503	46.5		92.9	2657	
24 Perfluorooctane Sulfonamide										
497.5 > 77.6	12.633	12.991	-0.358	1.000	3391522	52.5		105	1508	
D 23 13C8 FOSA										
505.4 > 77.6	12.633	12.991	-0.358		3419233	38.3		76.6	1536	
25 Perfluorodecane Sulfonate										
598.4 > 79.6	12.747	13.098	-0.351	1.000	787912	NC			2055	
49 Perfluorodecane Sulfonic acid										
598.4 > 79.6	12.747	13.098	-0.351	1.000	787912	66.5		138		
D 26 13C2 PFUnA										
564.3 > 519.5	12.799	13.146	-0.347		2548279	43.6		87.1	4647	
27 Perfluoroundecanoic acid										
562.4 > 518.5	12.799	13.146	-0.347	1.000	2562150	48.5		96.9	2158	
D 28 13C2 PFDoA										
614.4 > 569.4	13.393	13.713	-0.320		3091706	43.5		86.9	4335	
29 Perfluorododecanoic acid										
612.4 > 568.6	13.393	13.715	-0.322	1.000	2552807	51.3		103	3289	
30 Perfluorotridecanoic acid										
662.4 > 618.5	13.896	14.193	-0.297	1.000	2423005	47.0		93.9	1489	
D 33 13C2-PFTeDA										
714.5 > 669.5	14.327	14.603	-0.276		2525070	39.8		79.7	3437	
32 Perfluorotetradecanoic acid										
712.6 > 668.5	14.327	14.604	-0.277	1.000	1062771	45.2		90.4	513	
D 35 13C2-PFHxDA										
814.8 > 769.6	14.944	15.138	-0.194		1032868	34.8		69.6	2340	
34 Perfluorohexadecanoic acid										
812.6 > 768.6	14.944	15.139	-0.195	1.000	2550287	38.1		76.2	1971	
36 Perfluorooctandecanoic acid										
912.7 > 868.6	15.265	15.442	-0.177	1.000	2140741	34.7		69.4	2051	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L5_00016 Amount Added: 1.00 Units: mL

Report Date: 16-Feb-2016 08:37:09 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160212-28353.b\12FEB2016A4A_052.d

Injection Date: 13-Feb-2016 03:54:21 Instrument ID: A4

Lims ID: CCV L5

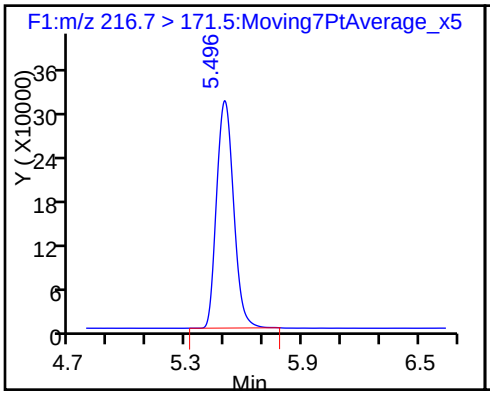
Client ID:

Operator ID: JRB ALS Bottle#: 48 Worklist Smp#: 51

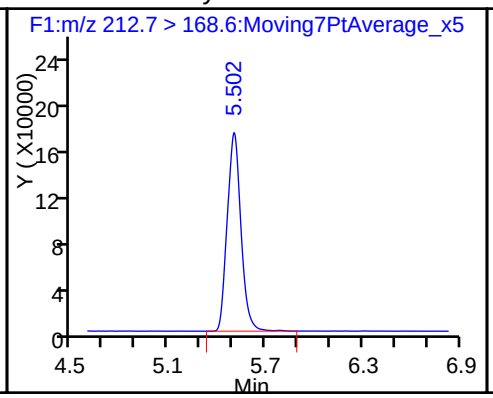
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

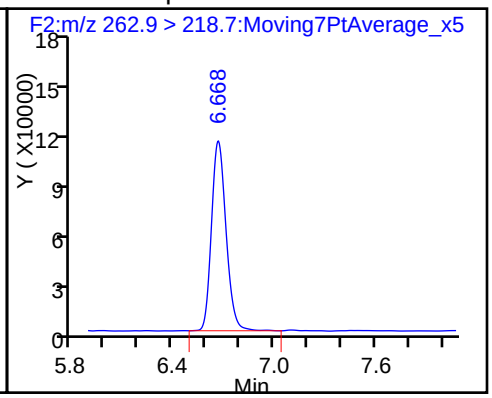
D 1 13C4 PFBA



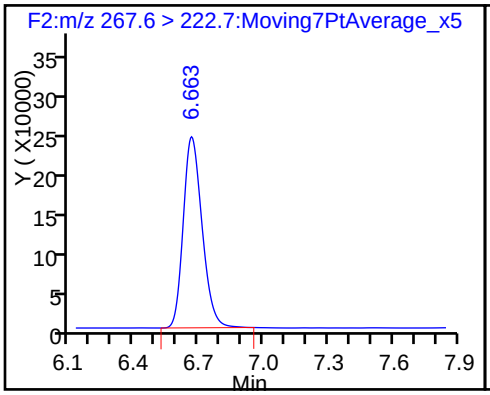
2 Perfluorobutyric acid



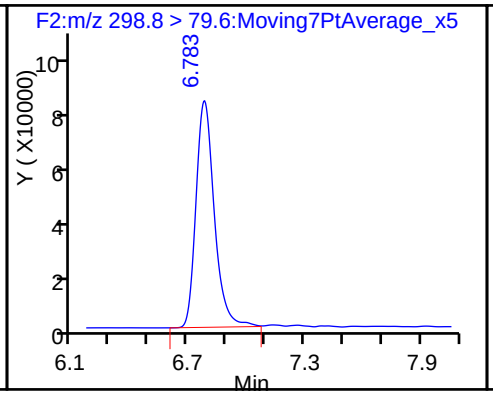
4 Perfluoropentanoic acid



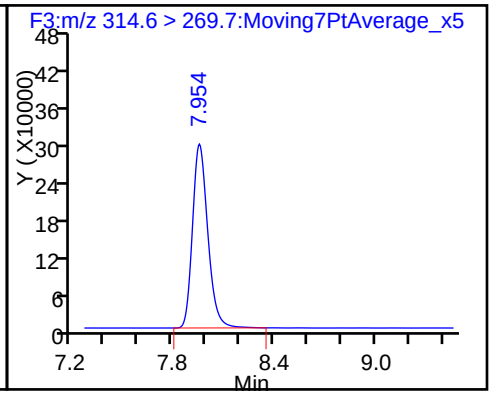
D 3 13C5-PFPeA



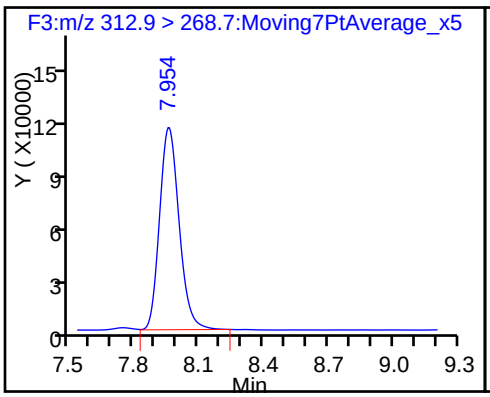
51 Perfluorobutanesulfonic acid



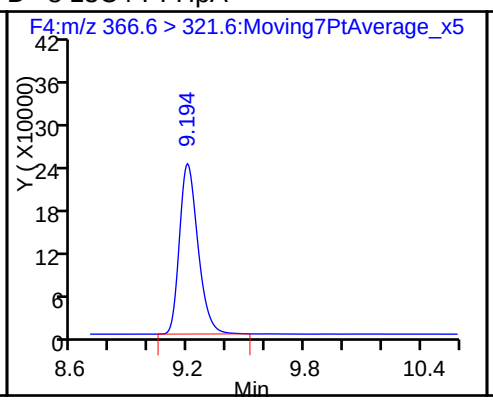
D 6 13C2 PFHxA



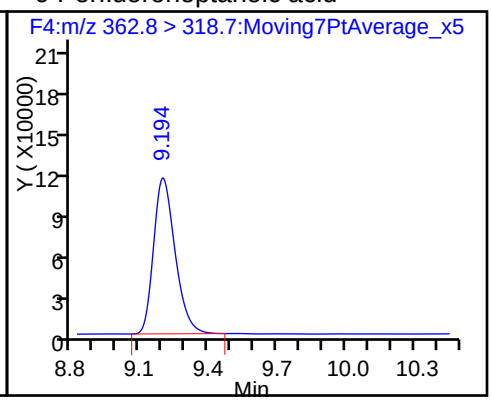
7 Perfluorohexanoic acid



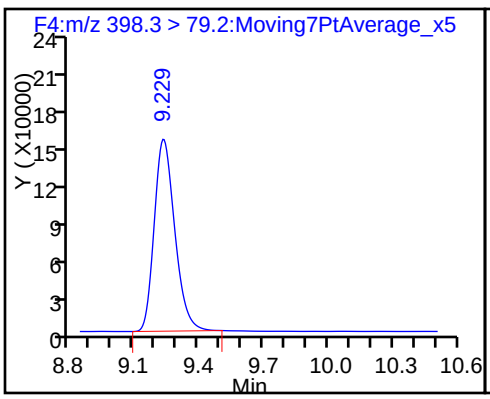
D 8 13C4-PFHpA



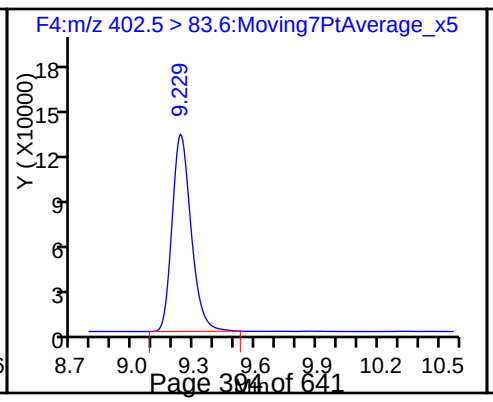
9 Perfluoroheptanoic acid



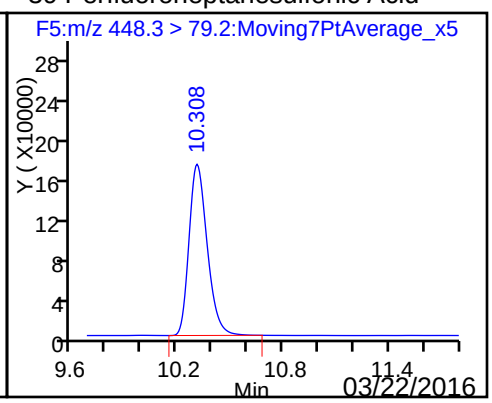
58 Perfluorohexanesulfonic acid



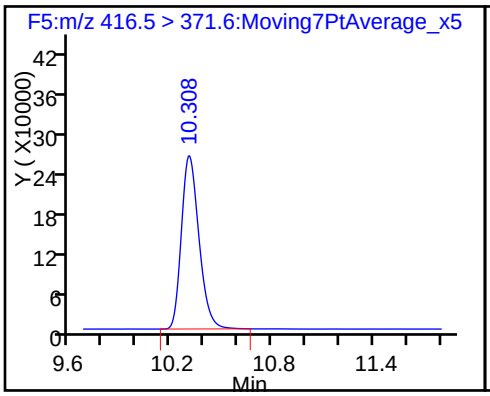
D 11 18O2 PFHxS



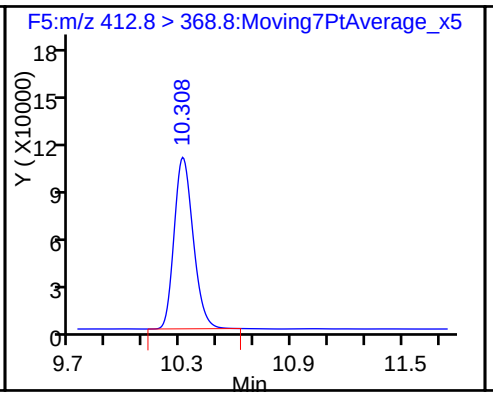
39 Perfluoroheptanesulfonic Acid



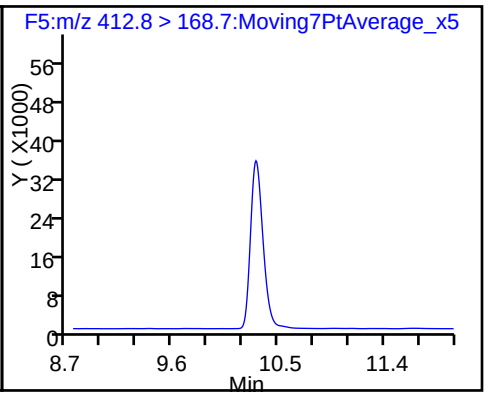
D 12 13C4 PFOA



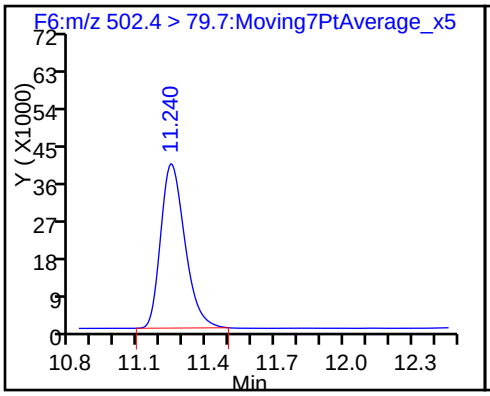
13 Perfluorooctanoic acid



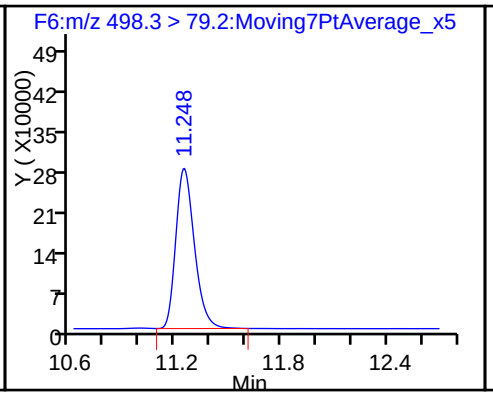
13 Perfluorooctanoic acid



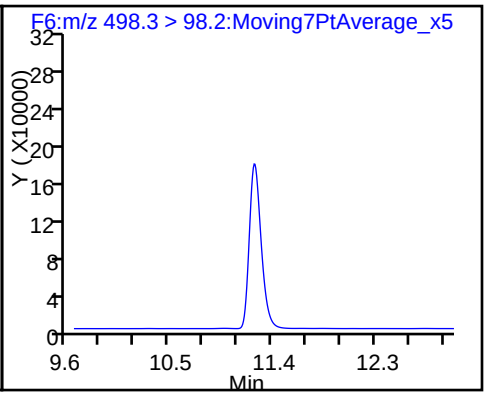
D 16 13C4 PFOS



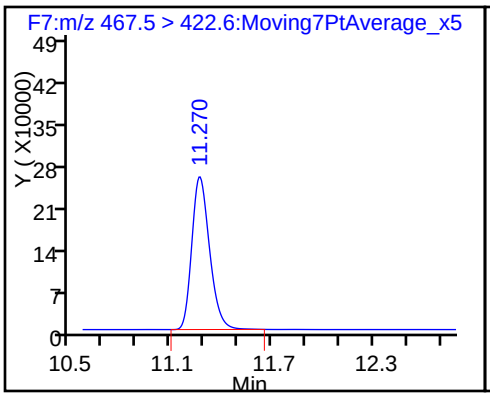
15 Perfluorooctane sulfonic acid



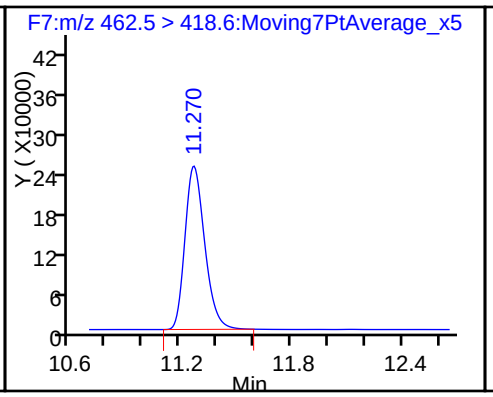
15 Perfluorooctane sulfonic acid



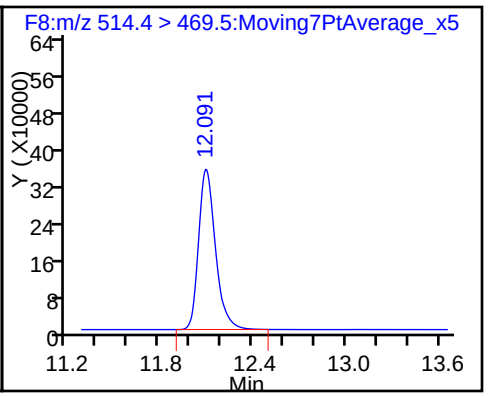
D 17 13C5 PFNA



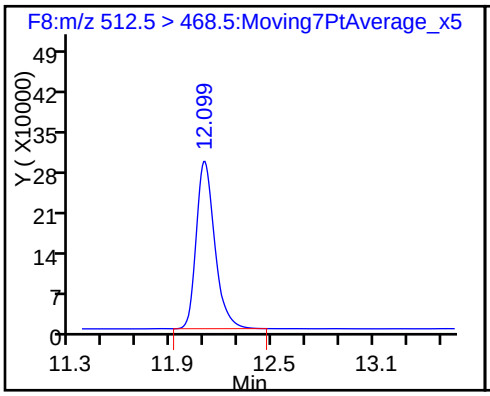
18 Perfluorononanoic acid



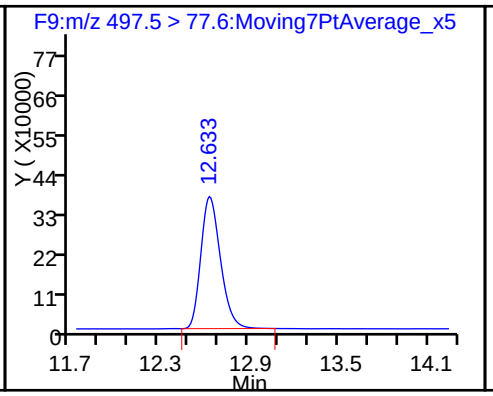
D 19 13C2 PFDA



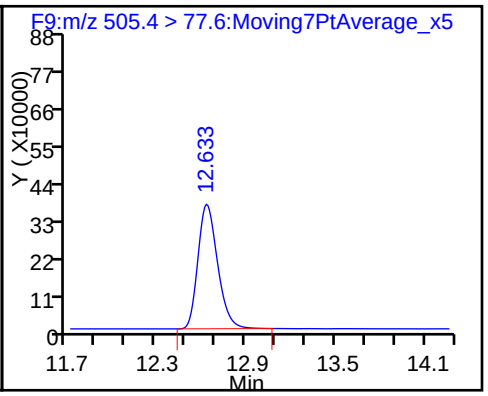
20 Perfluorodecanoic acid



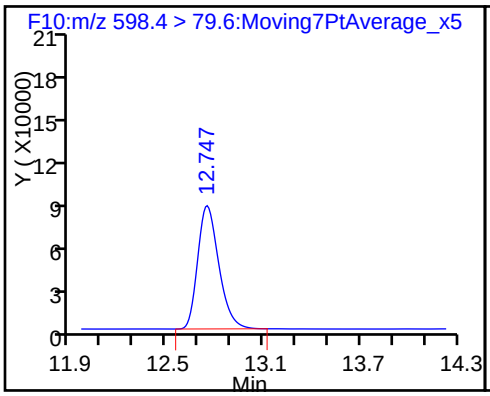
24 Perfluorooctane Sulfonamide



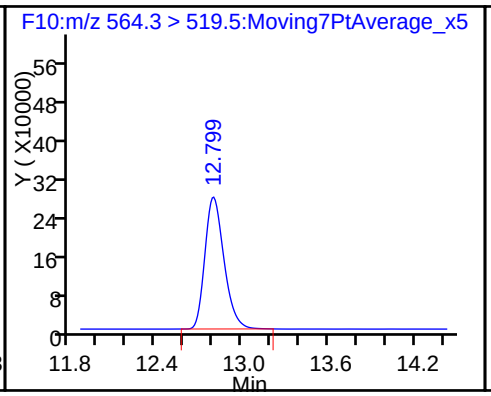
D 23 13C8 FOSA



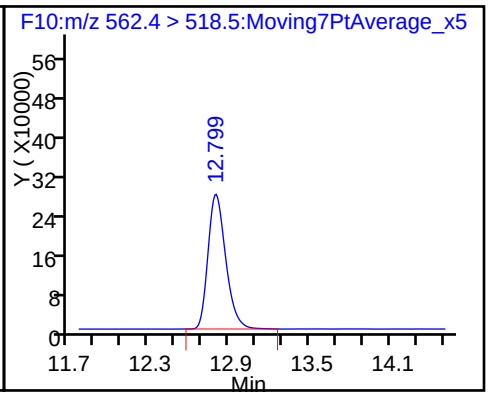
49 Perfluorodecane Sulfonic acid



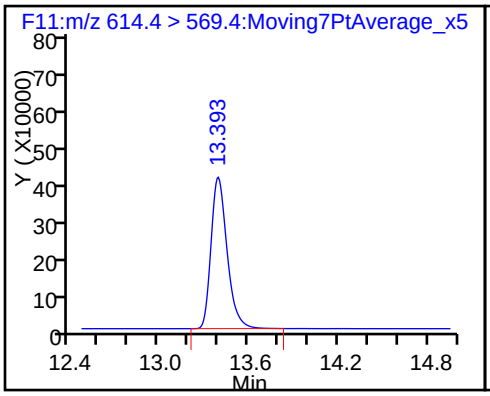
D 26 13C2 PFUnA



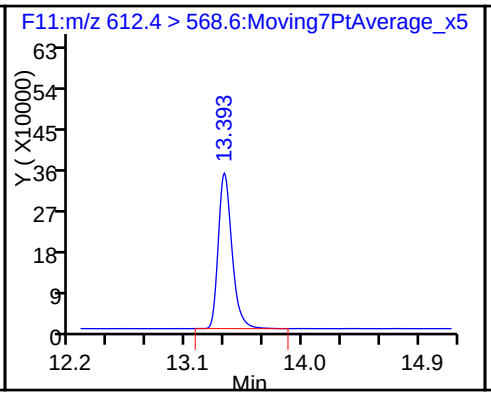
27 Perfluoroundecanoic acid



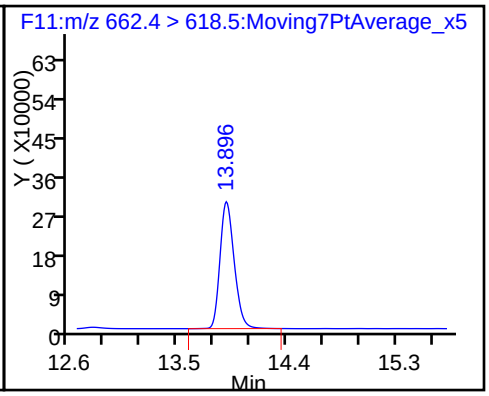
D 28 13C2 PFDoA



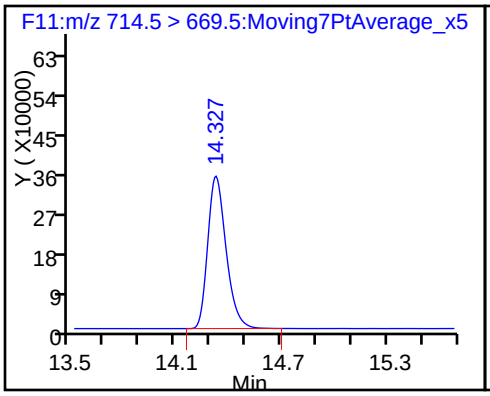
29 Perfluorododecanoic acid



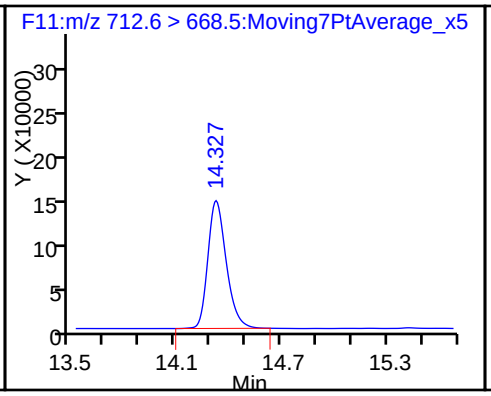
30 Perfluorotridecanoic acid



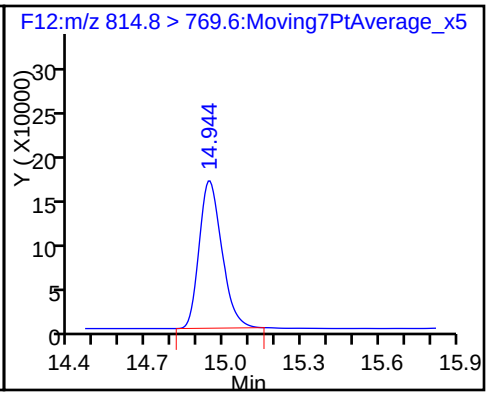
D 33 13C2-PFTeDA



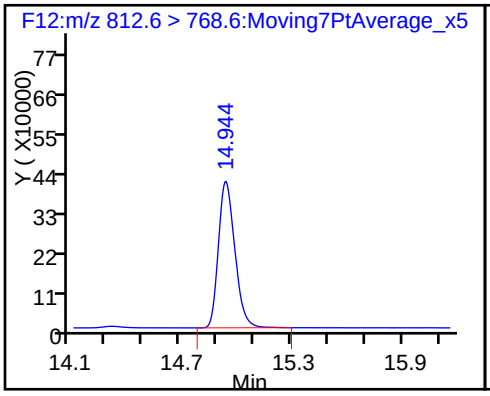
32 Perfluorotetradecanoic acid



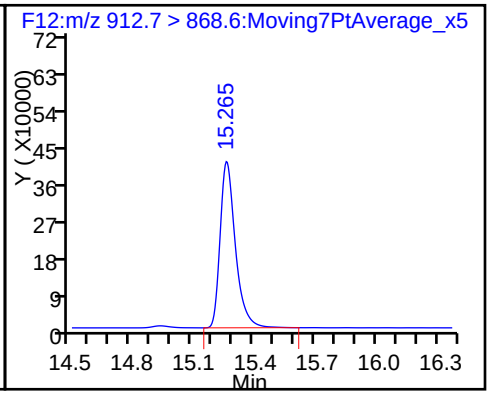
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Lab Sample ID: ICV 320-100906/10 Calibration Date: 02/19/2016 17:58

Instrument ID: A6 Calib Start Date: 02/19/2016 15:08

GC Column: Acquity ID: 2.10(mm) Calib End Date: 02/19/2016 17:15

Lab File ID: 19FEB2016A6A_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	1.304	1.537		58.9	50.0	17.9	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.043	1.090		52.2	50.0	4.5	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	0.9930	1.215		54.1	44.3	22.4	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.083	1.137		52.5	50.0	4.9	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.043	1.171		56.1	50.0	12.3	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	0.6753	0.6993		48.9	47.3	3.6	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	L2ID		0.6445		49.3	47.6	3.6	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.004	1.026		51.1	50.0	2.2	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	0.9724	1.110		54.5	47.8	14.1	25.0
Perfluorononanoic acid (PFNA)	AveID	0.8075	0.8793		54.4	50.0	8.9	25.0
Perfluorodecanoic acid (PFDA)	L2ID		0.997		50.8	50.0	1.6	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9268	0.9404		50.7	50.0	1.5	25.0
Perfluorodecane Sulfonic acid	L1ID		0.6116		53.2	48.3	10.3	25.0
Perfluoroundecanoic acid (PFUnA)	L1ID		0.9581		57.5	50.0	15.0	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.7311	0.8388		57.4	50.0	14.7	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9409	1.009		53.6	50.0	7.2	25.0
Perfluorotetradecanoic acid (PFTeA)	L2ID		0.6279		52.1	50.0	4.3	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		1.181		52.5	50.0	5.1	25.0
Perfluoro-n-octandecanoic acid (PFODA)	AveID	1.111	1.148		51.7	50.0	3.4	25.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_012.d
Lims ID: ICV
Client ID:
Sample Type: ICV
Inject. Date: 19-Feb-2016 17:58:06 ALS Bottle#: 16 Worklist Smp#: 10
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: ICV
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
Operator ID: JRB Instrument ID: A6
Sublist: chrom-PFAC_A4*sub6

Method: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\PFAC_A6.m
Limit Group: LC PFC_DOD ICAL
Last Update: 22-Feb-2016 09:59:00 Calib Date: 19-Feb-2016 17:15:39
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_010.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK010

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.0 > 172.0	5.705	5.712	-0.007		693136	43.3		86.6	2632	
2 Perfluorobutyric acid										
212.9 > 169.0	5.705	5.715	-0.010	1.000	1065572	58.9			3120	
D 3 13C5-PFPeA										
267.9 > 223.0	6.816	6.827	-0.011		1409700	45.8		91.7	4713	
4 Perfluoropentanoic acid										
262.9 > 219.0	6.816	6.828	-0.012	1.000	1536827	52.2			395	
5 Perfluorobutane Sulfonate										
298.9 > 80.0	6.931	6.939	-0.008	1.000	654025	NC			569	
298.9 > 99.0	6.931	6.939	-0.008	1.000	370497		1.77(0.00-0.00)		770	
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	6.931	6.939	-0.008	1.000	654025	54.1				
7 Perfluorohexanoic acid										
313.0 > 269.0	8.066	8.078	-0.012	1.000	1540103	52.5			1860	
D 6 13C2 PFHxA										
315.0 > 270.0	8.066	8.080	-0.014		1354941	47.8		95.7	4025	
22 PFPeS (Perflouro-1-pentanesulfonat										
349.0 > 80.0	8.142	8.158	-0.016	0.872	456683	NC			1959	
D 8 13C4-PFHpA										
367.0 > 322.0	9.305	9.322	-0.017		1318603	42.8		85.6	4607	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.305	9.322	-0.017	1.000	1543763	56.1			4041	
D 11 18O2 PFHxS										
403.0 > 84.0	9.341	9.358	-0.017		575394	38.4		81.3	2432	
10 Perfluorohexane Sulfonate										
399.0 > 80.0	9.341	9.364	-0.023	1.000	401937	NC			1168	
41 Perfluorohexanesulfonic acid										
399.0 > 80.0	9.341	9.364	-0.023	1.000	401937	48.9				

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFOA										
417.0 > 372.0	10.433	10.450	-0.017		1436383	42.1		84.1	5380	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.433	10.450	-0.017	1.000	1474139	51.1			1374	
413.0 > 169.0	10.433	10.450	-0.017	1.000	511709		2.88(0.00-0.00)		1005	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.433	10.457	-0.024	1.000	444139	NC			1618	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.433	10.457	-0.024	1.000	444139	49.3				
D 16 13C4 PFOS										
503.0 > 80.0	11.393	11.414	-0.021		691986	38.1		79.6	3094	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.393	11.417	-0.024	1.000	767227	54.5			354	
499.0 > 99.0	11.393	11.417	-0.024	1.000	394536		1.94(0.00-0.00)		1323	
D 17 13C5 PFNA										
468.0 > 423.0	11.415	11.434	-0.019		1208840	42.9		85.8	3370	
18 Perfluorononanoic acid										
463.0 > 419.0	11.415	11.439	-0.024	1.000	1062919	54.4			3617	
21 PFNS (Perflouro-1-nonanesulfonate)										
549.0 > 80.0	12.224	12.249	-0.025	1.000	380394	NC			1433	
D 19 13C2 PFDA										
515.0 > 470.0	12.256	12.275	-0.019		1189272	41.5		83.1	5143	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.256	12.276	-0.020	1.000	1186169	50.8			4224	
D 23 13C8 FOSA										
506.0 > 78.0	12.794	12.810	-0.016		1917001	46.2		92.4	1321	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.794	12.812	-0.018	1.000	1802677	50.7			1040	
25 Perfluorodecane Sulfonate										
599.0 > 80.0	12.930	12.949	-0.019	1.000	427181	NC			1632	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	12.930	12.949	-0.019	1.000	427181	53.2				
D 26 13C2 PFUnA										
565.0 > 520.0	12.982	13.000	-0.018		1413914	37.8		75.7	4613	
27 Perfluoroundecanoic acid										
563.0 > 519.0	12.982	13.000	-0.018	1.000	1354687	57.5			3853	
D 28 13C2 PFDoA										
615.0 > 570.0	13.589	13.609	-0.020		1717701	43.9		87.8	4484	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.589	13.611	-0.022	1.000	1440856	57.4			2048	
31 PFDoS (Perflouro-1-dodecanesulfona										
699.0 > 80.0	14.056	14.083	-0.027	1.000	481182	NC			1600	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.110	14.130	-0.020	1.000	1733242	53.6			2403	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.553	14.571	-0.018	1.000	1078544	52.1			883	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.546	14.571	-0.025		1649978	46.0		91.9	6367	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 35 13C2-PFHxDA										
815.0 > 770.0	15.191	15.207	-0.016		2024385	47.0		93.9	5896	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.191	15.208	-0.017	1.000	2029338	52.5			2611	
36 Perfluorooctandecanoic acid										
913.0 > 869.0	15.527	15.543	-0.016	1.000	1972635	51.7			2318	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFCIC_00016 Amount Added: 1.00 Units: mL

Report Date: 22-Feb-2016 09:59:01 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_012.d

Injection Date: 19-Feb-2016 17:58:06 Instrument ID: A6

Lims ID: ICV

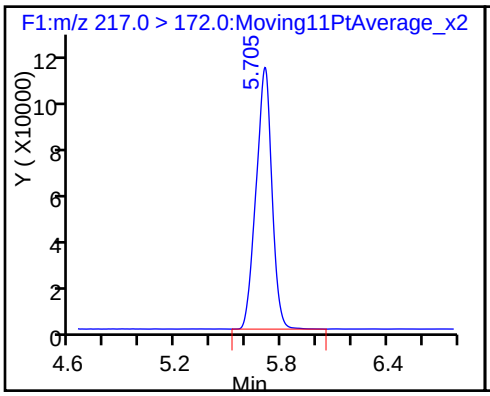
Client ID:

Operator ID: JRB ALS Bottle#: 16 Worklist Smp#: 10

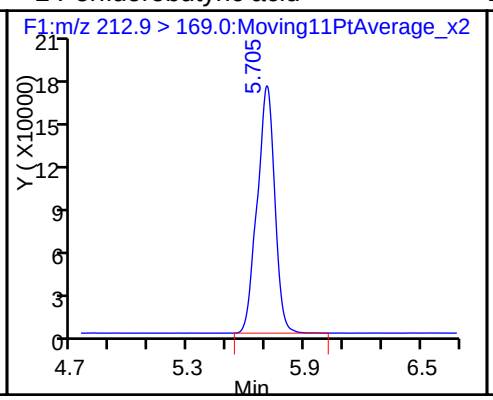
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

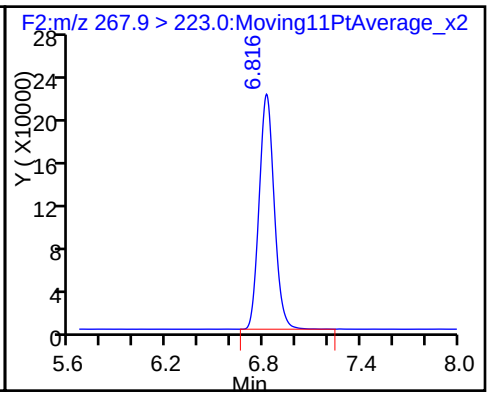
D 1 13C4 PFBA



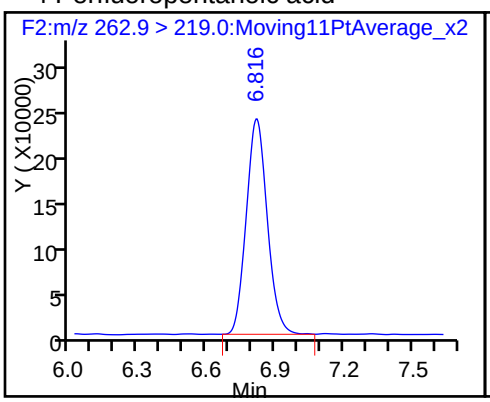
2 Perfluorobutyric acid



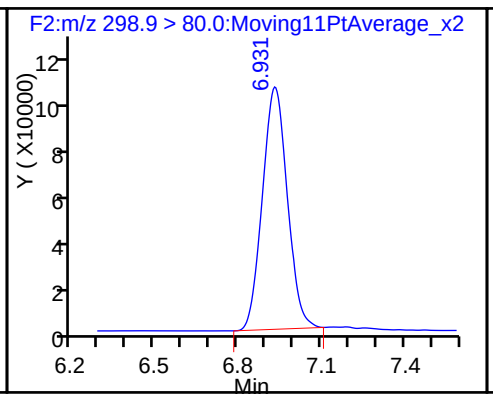
D 3 13C5-PFPeA



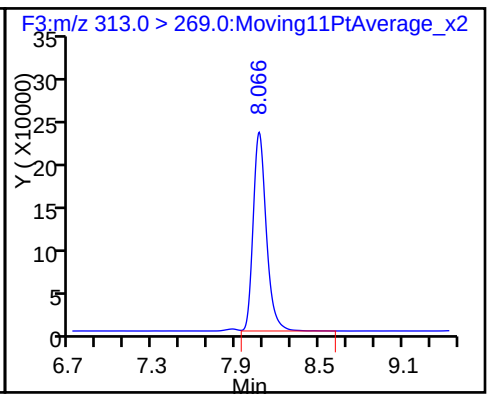
4 Perfluoropentanoic acid



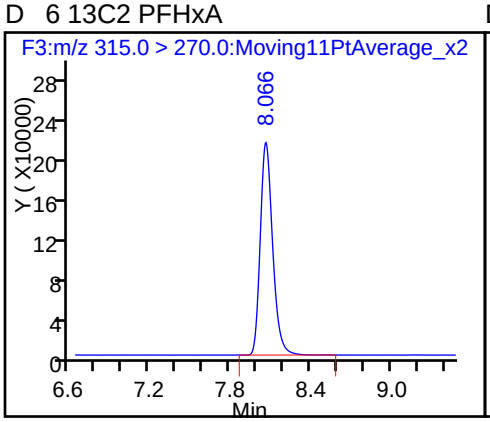
40 Perfluorobutanesulfonic acid



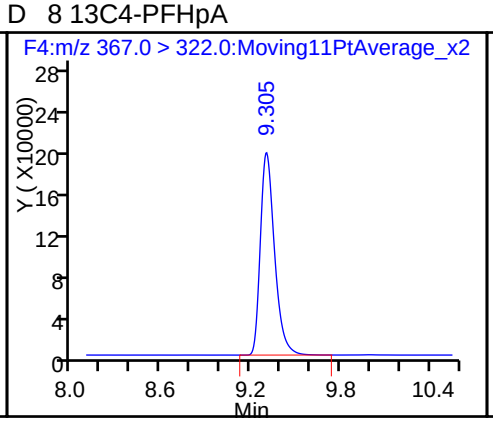
7 Perfluorohexanoic acid



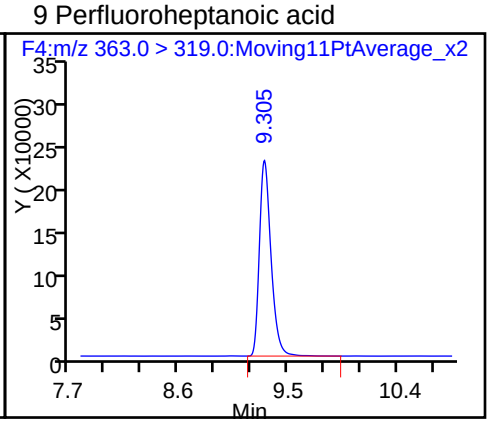
D 6 13C2 PFHxA



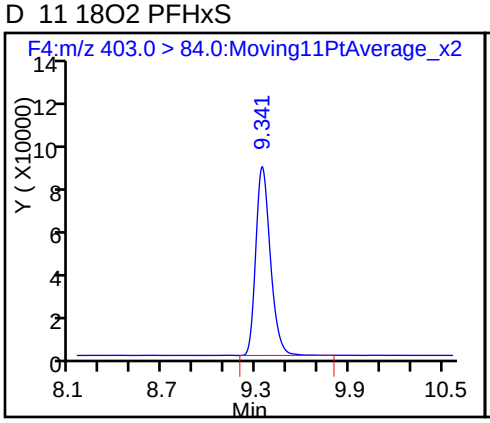
D 8 13C4-PFHpA



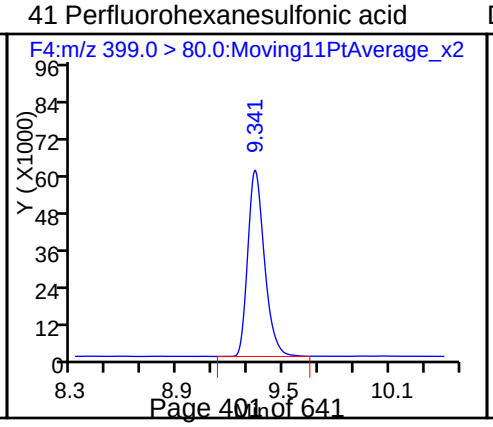
9 Perfluoroheptanoic acid



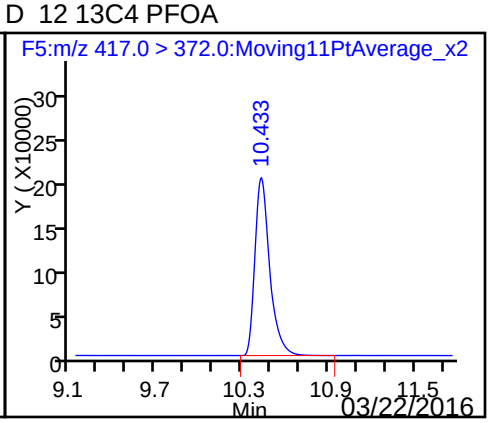
D 11 18O2 PFHxS



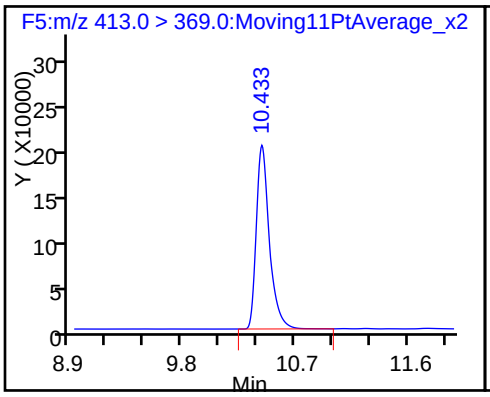
41 Perfluorohexanesulfonic acid



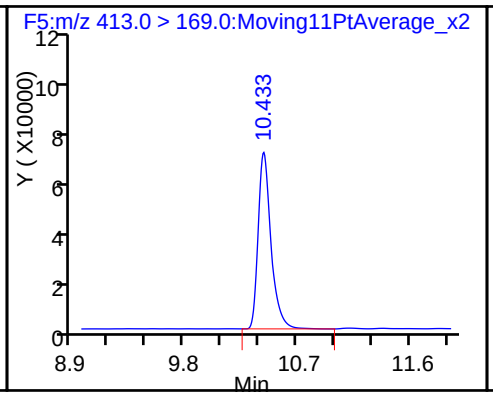
D 12 13C4 PFOA



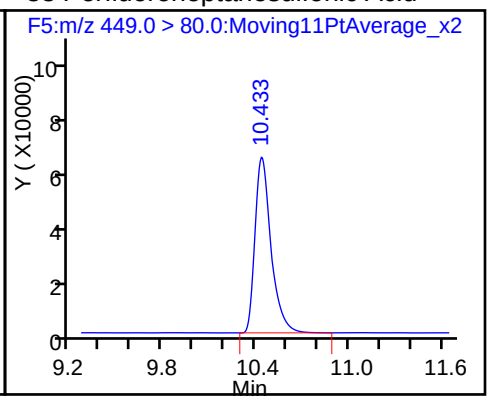
13 Perfluorooctanoic acid



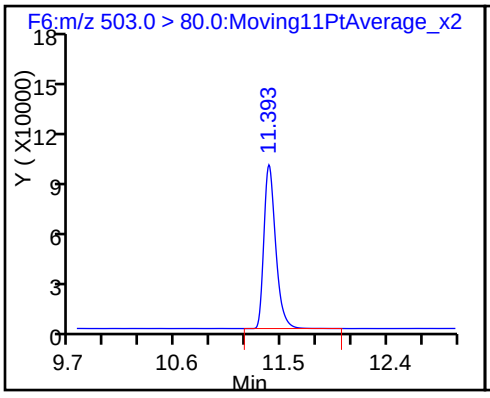
13 Perfluorooctanoic acid



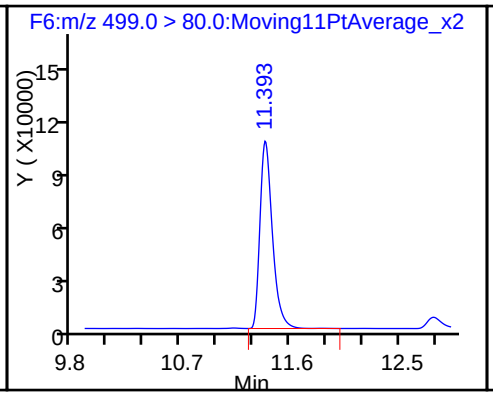
38 Perfluoroheptanesulfonic Acid



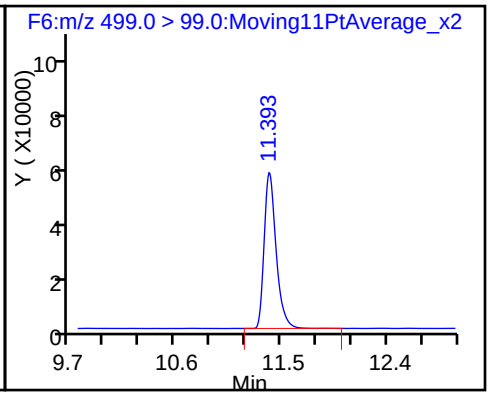
D 16 13C4 PFOS



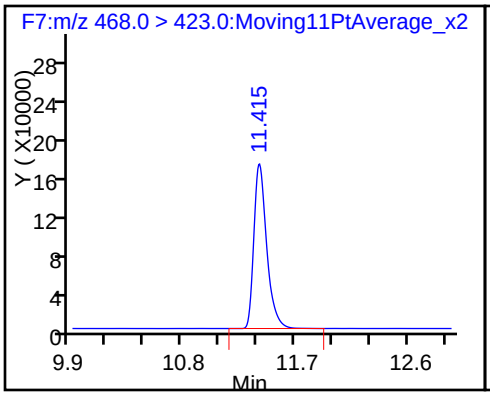
15 Perfluorooctane sulfonic acid



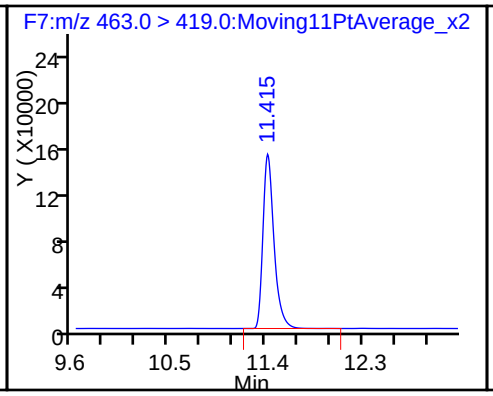
15 Perfluorooctane sulfonic acid



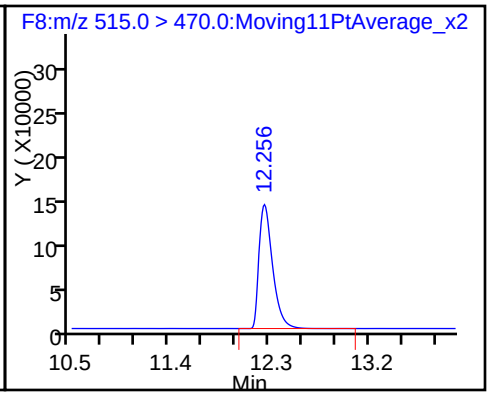
D 17 13C5 PFNA



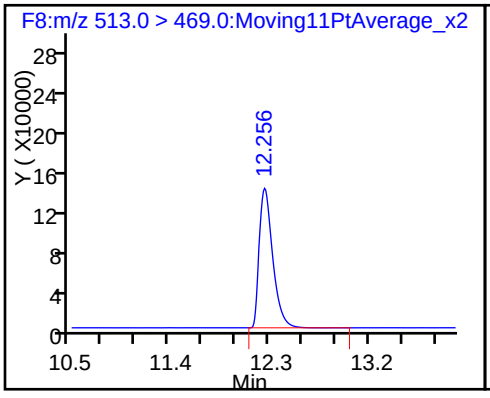
18 Perfluorononanoic acid



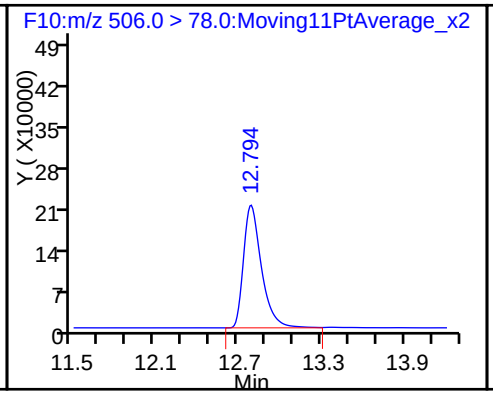
D 19 13C2 PFDA



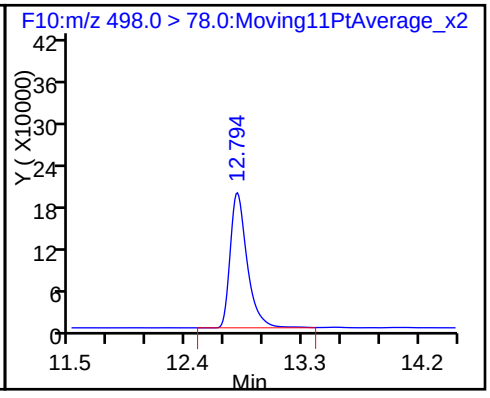
20 Perfluorodecanoic acid



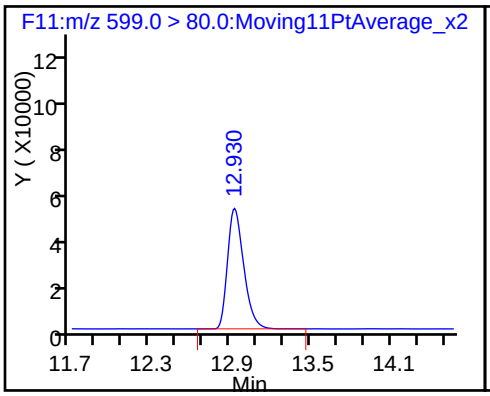
D 23 13C8 FOSA



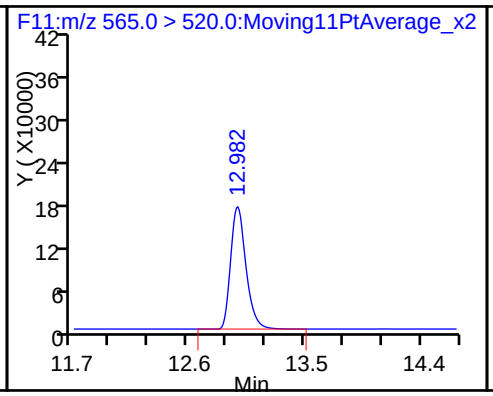
24 Perfluorooctane Sulfonamide



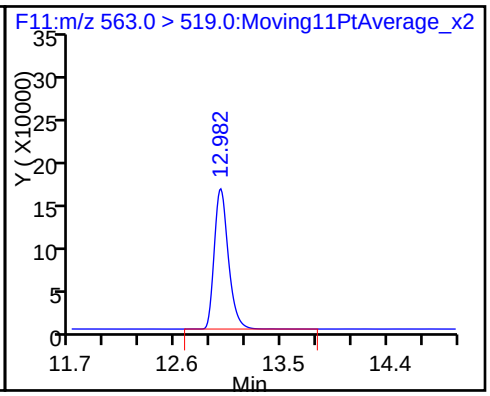
39 Perfluorodecane Sulfonic acid



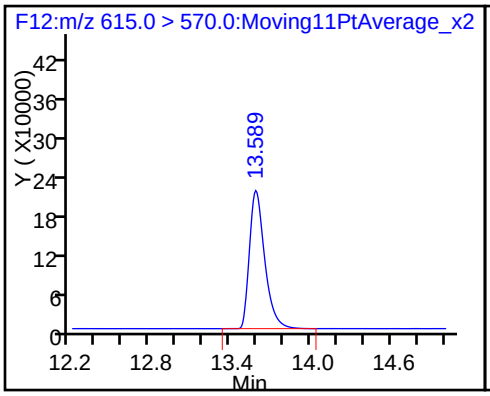
D 26 13C2 PFUnA



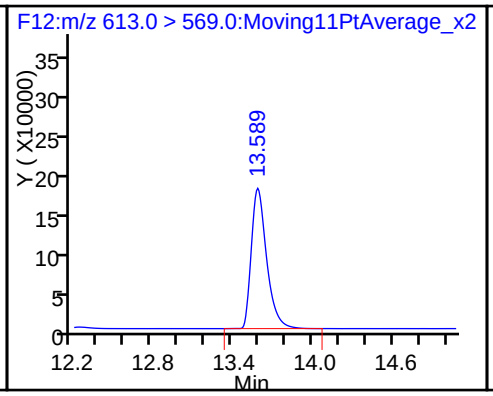
27 Perfluoroundecanoic acid



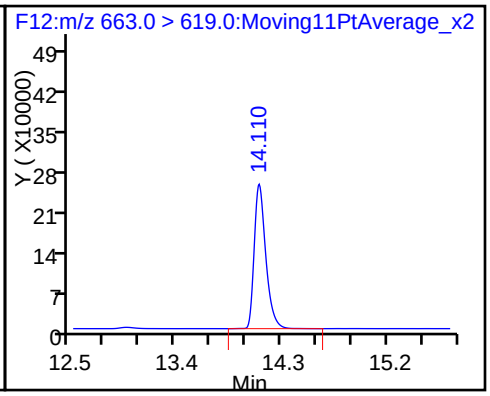
D 28 13C2 PFDoA



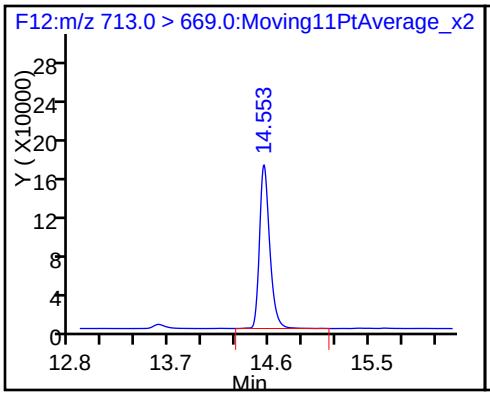
29 Perfluorododecanoic acid



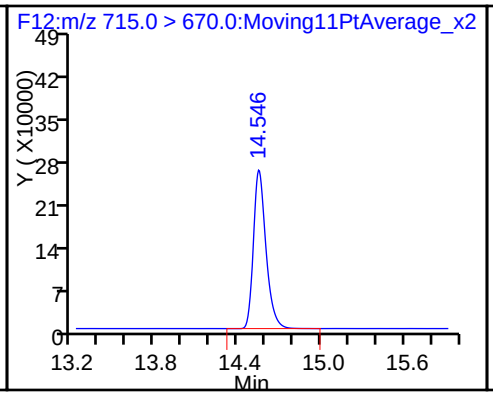
30 Perfluorotridecanoic acid



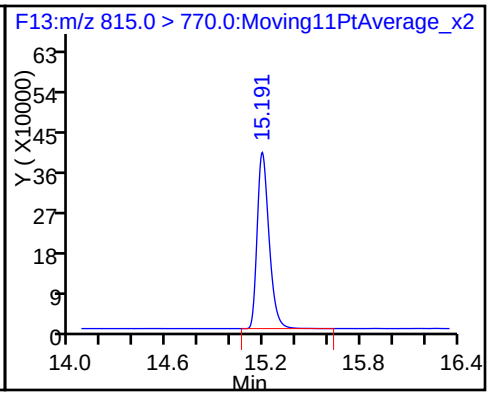
32 Perfluorotetradecanoic acid



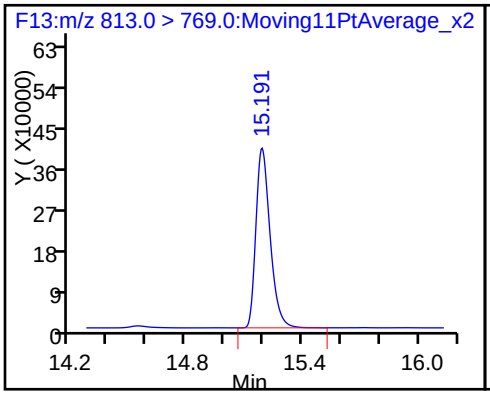
D 33 13C2-PFTeDA



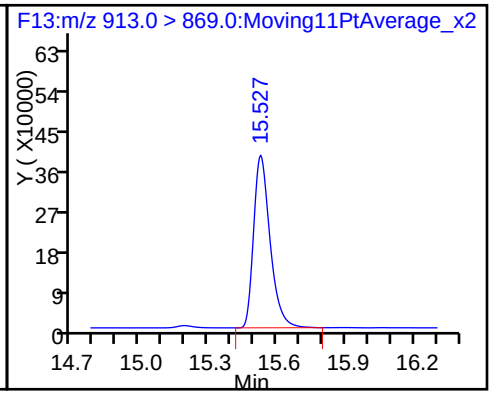
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Lab Sample ID: CCV 320-100906/43 Calibration Date: 02/20/2016 05:40

Instrument ID: A6 Calib Start Date: 02/19/2016 15:08

GC Column: Acquity ID: 2.10(mm) Calib End Date: 02/19/2016 17:15

Lab File ID: 19FEB2016A6A_045.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	1.304	1.434		22.0	20.0	10.0	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.043	1.028		19.7	20.0	-1.5	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	0.9930	1.189		21.2	17.7	19.8	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.083	1.126		20.8	20.0	3.9	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.043	1.190		22.8	20.0	14.1	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	0.6753	0.7464		20.9	18.9	10.5	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.004	1.028		20.5	20.0	2.4	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	L2ID		0.7230		22.3	19.0	17.0	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	0.9724	1.073		21.1	19.1	10.4	25.0
Perfluorononanoic acid (PFNA)	AveID	0.8075	0.7921		19.6	20.0	-1.9	25.0
Perfluorodecanoic acid (PFDA)	L2ID		0.9104		18.3	20.0	-8.4	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9268	0.8822		19.0	20.0	-4.8	25.0
Perfluorodecane Sulfonic acid	L1ID		0.6729		23.6	19.3	22.2	25.0
Perfluoroundecanoic acid (PFUnA)	L1ID		0.8914		21.0	20.0	4.9	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.7311	0.8023		21.9	20.0	9.7	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9409	1.042		22.1	20.0	10.7	25.0
Perfluorotetradecanoic acid (PFTeA)	L2ID		0.6163		20.2	20.0	0.9	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		1.126		18.4	20.0	-7.8	25.0
Perfluoro-n-octandecanoic acid (PFODA)	AveID	1.111	1.031		18.6	20.0	-7.1	25.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_045.d
Lims ID: CCV L4
Client ID:
Sample Type: CCV
Inject. Date: 20-Feb-2016 05:40:35 ALS Bottle#: 12 Worklist Smp#: 43
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: CCV L4
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
Operator ID: JRB Instrument ID: A6
Sublist: chrom-PFAC_A6*sub5

Method: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\PFAC_A6.m
Limit Group: LC PFC_DOD ICAL
Last Update: 22-Feb-2016 09:59:40 Calib Date: 19-Feb-2016 17:15:39
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_010.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK010

First Level Reviewer: westendorfc Date: 22-Feb-2016 08:19:42

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.0 > 172.0	5.700	5.712	-0.012		739750	46.2		92.5	3474	
2 Perfluorobutyric acid										
212.9 > 169.0	5.697	5.715	-0.018	1.000	424275	22.0		110	916	
D 3 13C5-PFPeA										
267.9 > 223.0	6.805	6.827	-0.022		1587614	51.6		103	4733	
4 Perfluoropentanoic acid										
262.9 > 219.0	6.805	6.828	-0.023	1.000	652654	19.7		98.5	158	
5 Perfluorobutane Sulfonate										
298.9 > 80.0	6.920	6.939	-0.019	1.000	269562	NC			336	
298.9 > 99.0	6.920	6.939	-0.019	1.000	144355		1.87(0.00-0.00)		365	
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	6.920	6.939	-0.019	1.000	269562	21.2		120		
7 Perfluorohexanoic acid										
313.0 > 269.0	8.049	8.078	-0.029	1.000	603219	20.8		104	1219	
D 6 13C2 PFHxA										
315.0 > 270.0	8.049	8.080	-0.031		1339541	47.3		94.6	6869	
22 PFPeS (Perflouro-1-pentanesulfonat										
349.0 > 80.0	8.125	8.158	-0.033	0.872	203419	NC			674	
D 8 13C4-PFHpA										
367.0 > 322.0	9.288	9.322	-0.034		1454678	47.2		94.4	6491	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.288	9.322	-0.034	1.000	692643	22.8		114	1501	
D 11 18O2 PFHxS										
403.0 > 84.0	9.323	9.358	-0.035		606393	40.5		85.7	2799	
10 Perfluorohexane Sulfonate										
399.0 > 80.0	9.317	9.364	-0.047	1.000	181033	NC			433	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
41 Perfluorohexanesulfonic acid										
399.0 > 80.0	9.317	9.364	-0.047	1.000	181033	20.9		111		
D 12 13C4 PFOA										
417.0 > 372.0	10.412	10.450	-0.038		1545984	45.3		90.6	5776	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.412	10.450	-0.038	1.000	635798	20.5		102	696	
413.0 > 169.0	10.412	10.450	-0.038	1.000	210818		3.02(0.00-0.00)		628	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.419	10.457	-0.038	1.000	200818	NC			691	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.419	10.457	-0.038	1.000	200818	22.3		117		
D 16 13C4 PFOS										
503.0 > 80.0	11.377	11.414	-0.037		697291	38.3		80.2	2392	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.377	11.417	-0.040	1.000	299312	21.1		110	470	
499.0 > 99.0	11.377	11.417	-0.040	1.000	141830		2.11(0.00-0.00)		479	
D 17 13C5 PFNA										
468.0 > 423.0	11.393	11.434	-0.041		1345222	47.7		95.4	4165	
18 Perfluorononanoic acid										
463.0 > 419.0	11.400	11.439	-0.039	1.000	426205	19.6		98.1	1868	
21 PFNS (Perflouro-1-nonanesulfonate)										
549.0 > 80.0	12.203	12.249	-0.046	1.000	178226	NC			594	
D 19 13C2 PFDA										
515.0 > 470.0	12.234	12.275	-0.041		1304985	45.6		91.2	4599	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.234	12.276	-0.042	1.000	475208	18.3		91.6	1260	
D 23 13C8 FOSA										
506.0 > 78.0	12.783	12.810	-0.027		1591012	38.3		76.7	1051	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.783	12.812	-0.029	1.000	561444	19.0		95.2	1156	
25 Perfluorodecane Sulfonate										
599.0 > 80.0	12.918	12.949	-0.031	1.000	189262	NC			962	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	12.918	12.949	-0.031	1.000	189262	23.6		122		
D 26 13C2 PFUnA										
565.0 > 520.0	12.960	13.000	-0.040		1676629	44.9		89.7	6651	
27 Perfluoroundecanoic acid										
563.0 > 519.0	12.960	13.000	-0.040	1.000	597798	21.0		105	1584	
D 28 13C2 PFDoA										
615.0 > 570.0	13.578	13.609	-0.031		1825247	46.7		93.3	7049	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.578	13.611	-0.033	1.000	585761	21.9		110	852	
31 PFDoS (Perflouro-1-dodecanesulfona										
699.0 > 80.0	14.039	14.083	-0.044	1.000	191566	NC			863	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.093	14.130	-0.037	1.000	760506	22.1		111	1212	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.539	14.571	-0.032	1.000	449980	20.2		101	341	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 33 13C2-PFTeDA										
715.0 > 670.0	14.539	14.571	-0.032		1556683	43.4		86.7	5943	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.177	15.207	-0.030		1775802	41.2		82.4	6748	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.177	15.208	-0.031	1.000	822211	18.4		92.2	1559	
36 Perfluorooctandecanoic acid										
913.0 > 869.0	15.514	15.543	-0.029	1.000	753047	18.6		92.9	1332	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L4_00017 Amount Added: 1.00 Units: mL

Report Date: 22-Feb-2016 09:59:40 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_045.d

Injection Date: 20-Feb-2016 05:40:35 Instrument ID: A6

Lims ID: CCV L4

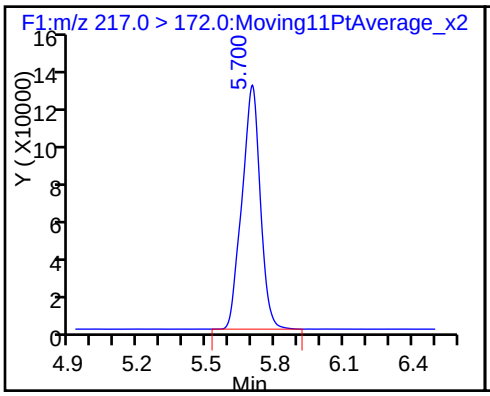
Client ID:

Operator ID: JRB ALS Bottle#: 12 Worklist Smp#: 43

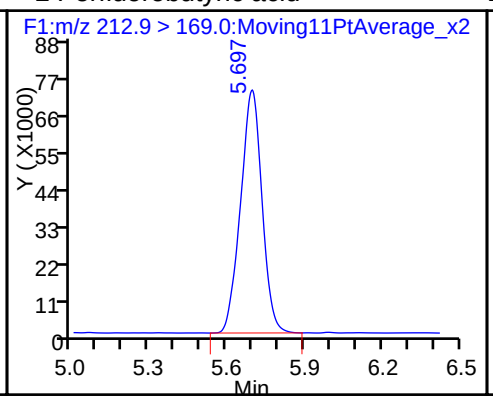
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

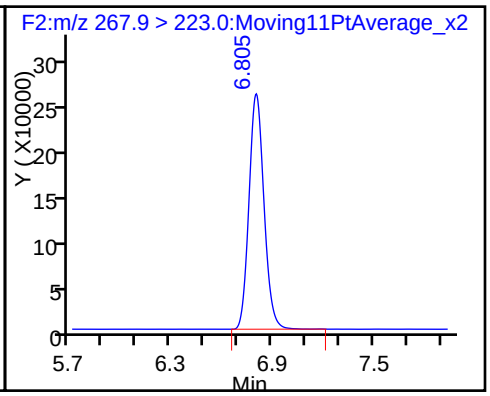
D 1 13C4 PFBA



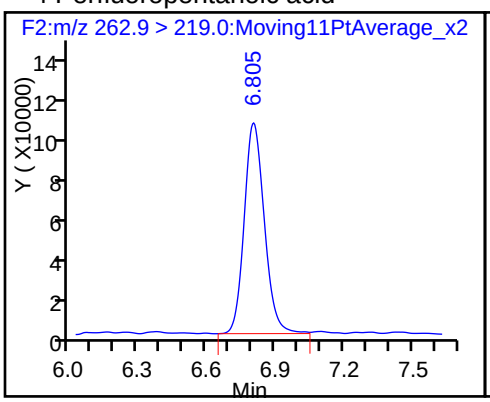
2 Perfluorobutyric acid



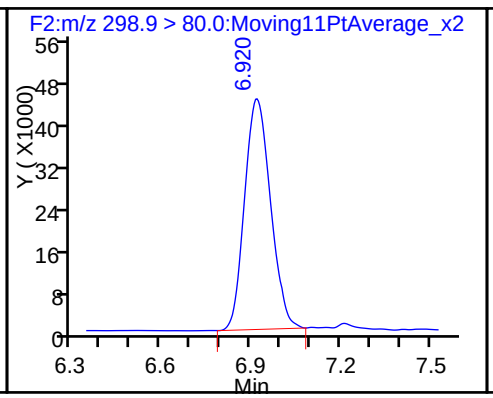
D 3 13C5-PFPeA



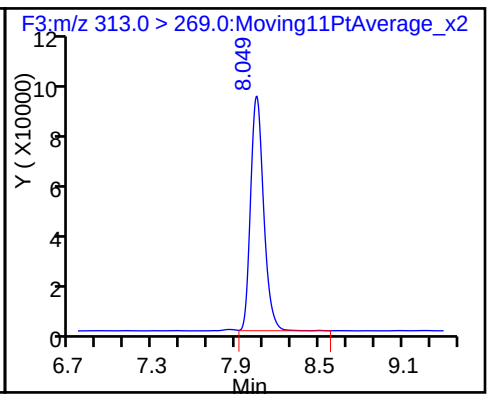
4 Perfluoropentanoic acid



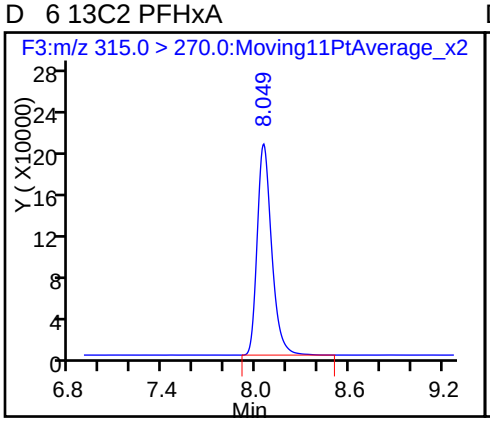
40 Perfluorobutanesulfonic acid



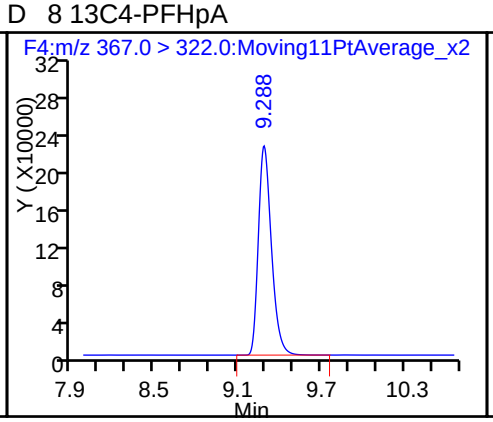
7 Perfluorohexanoic acid



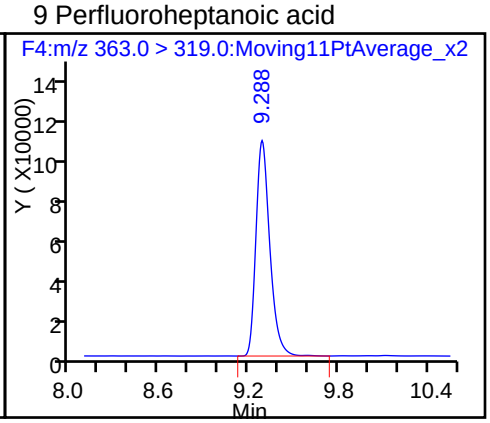
D 6 13C2 PFHxA



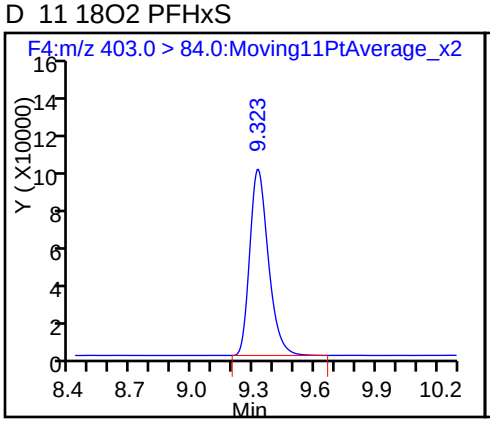
D 8 13C4-PFHpA



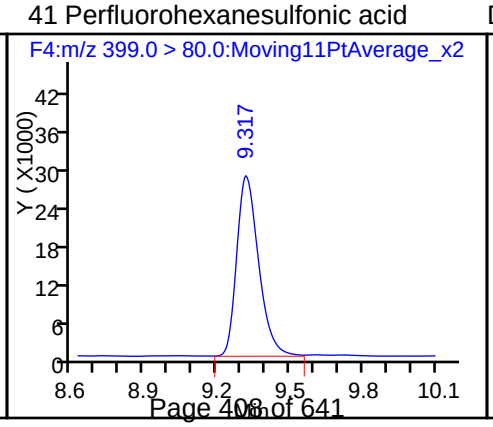
9 Perfluoroheptanoic acid



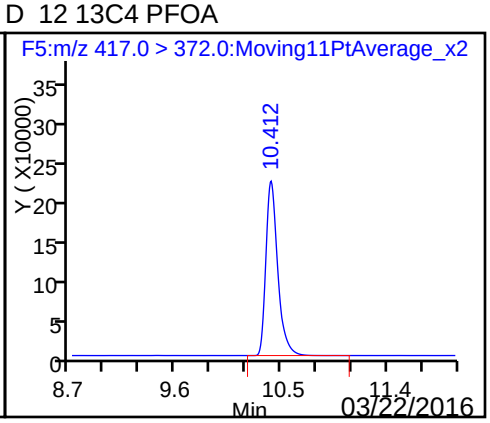
D 11 18O2 PFHxS



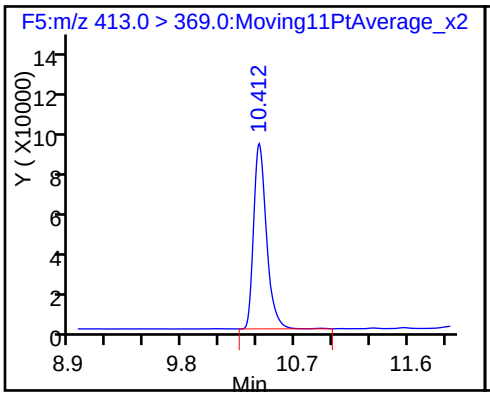
41 Perfluorohexanesulfonic acid



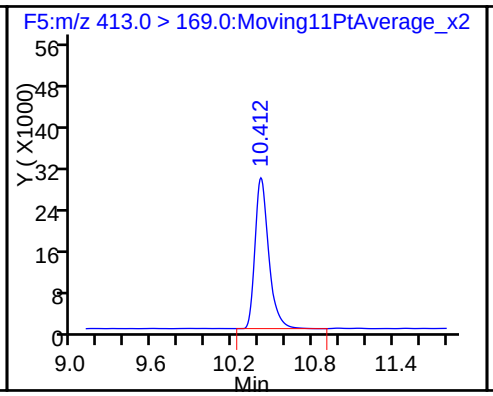
D 12 13C4 PFOA



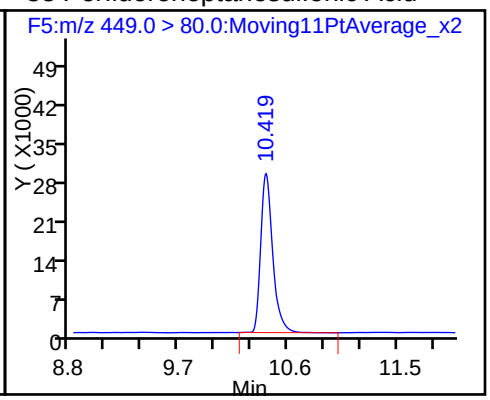
13 Perfluorooctanoic acid



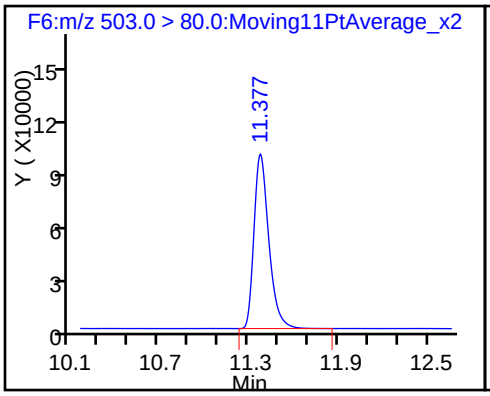
13 Perfluorooctanoic acid



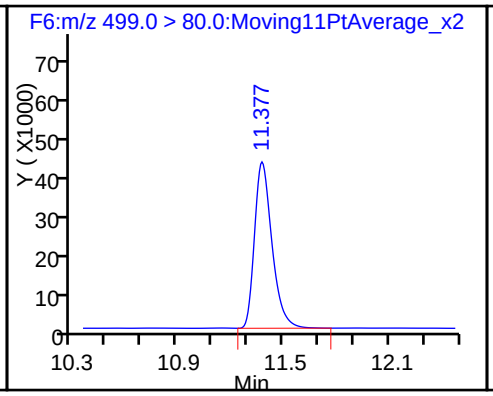
38 Perfluoroheptanesulfonic Acid



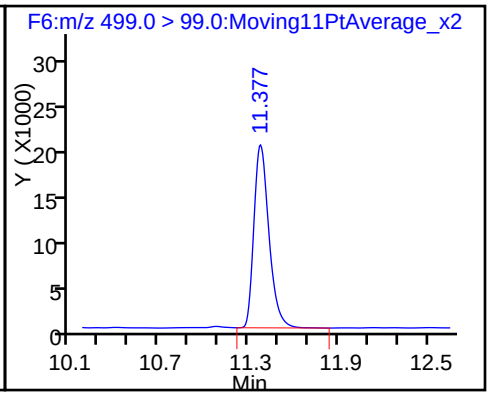
D 16 13C4 PFOS



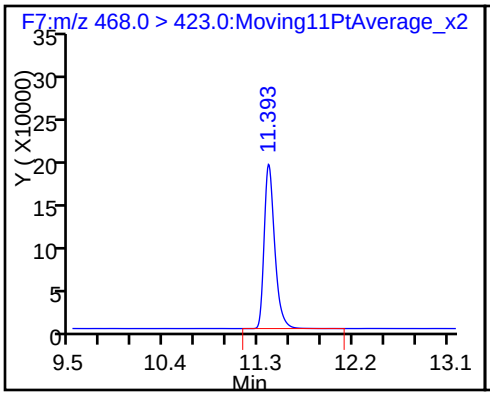
15 Perfluorooctane sulfonic acid



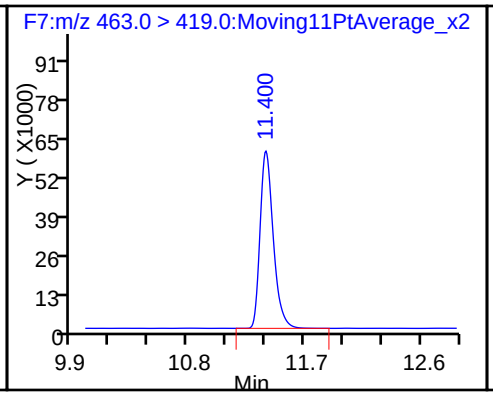
15 Perfluorooctane sulfonic acid



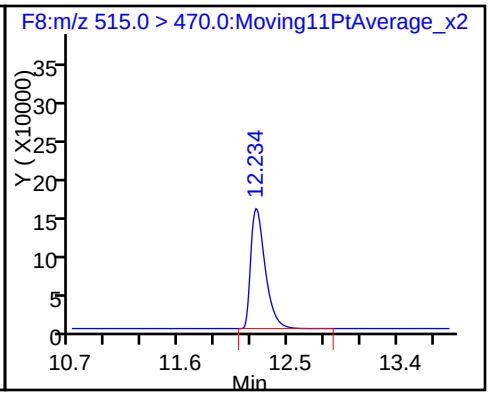
D 17 13C5 PFNA



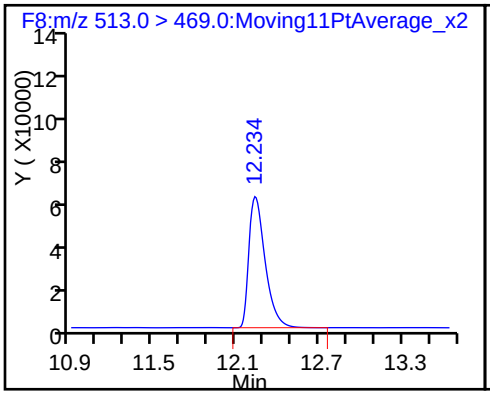
18 Perfluorononanoic acid



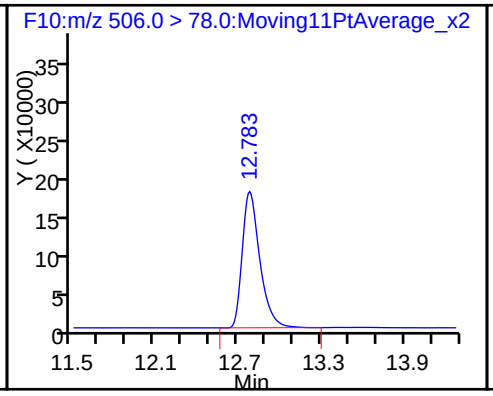
D 19 13C2 PFDA



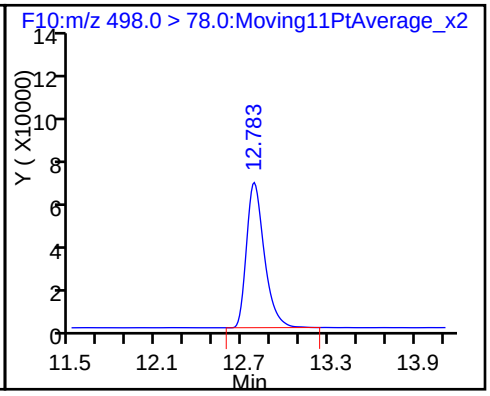
20 Perfluorodecanoic acid



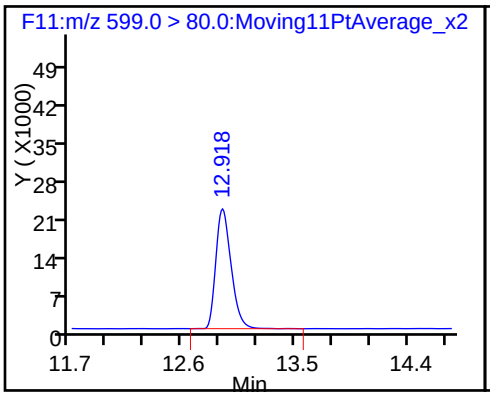
D 23 13C8 FOSA



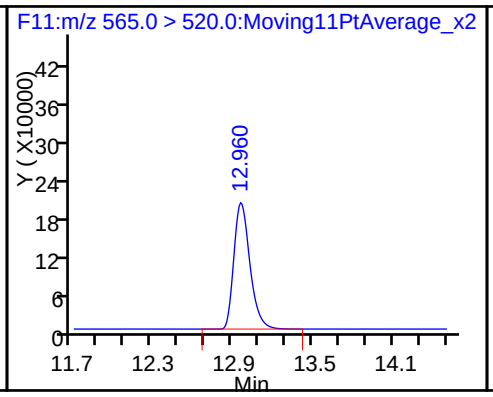
24 Perfluorooctane Sulfonamide



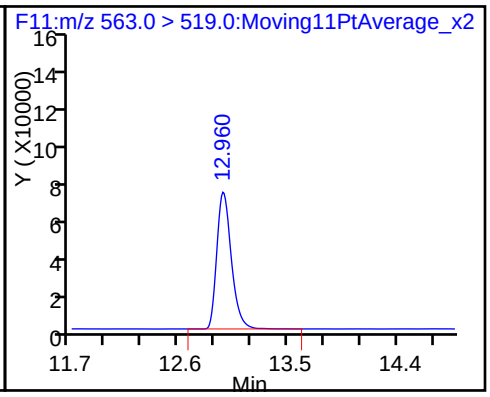
39 Perfluorodecane Sulfonic acid



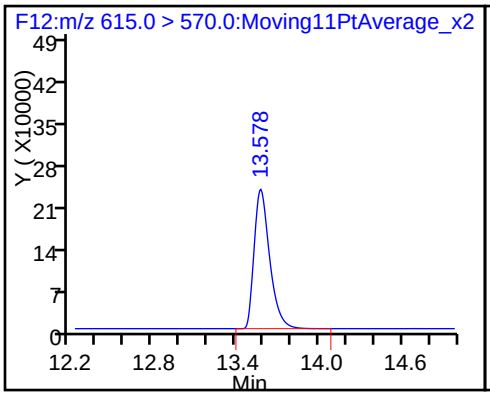
D 26 13C2 PFUnA



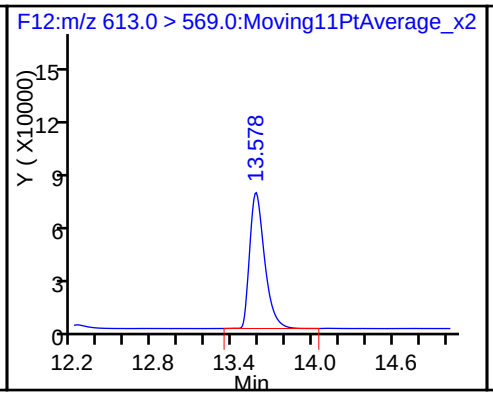
27 Perfluoroundecanoic acid



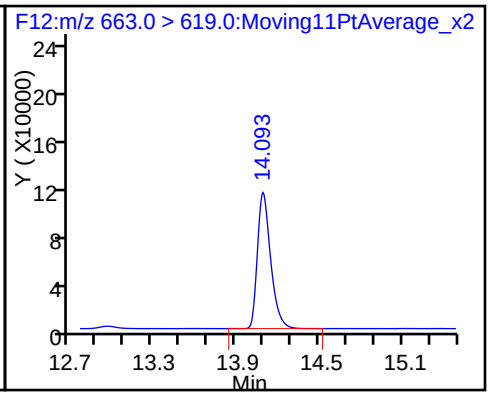
D 28 13C2 PFDoA



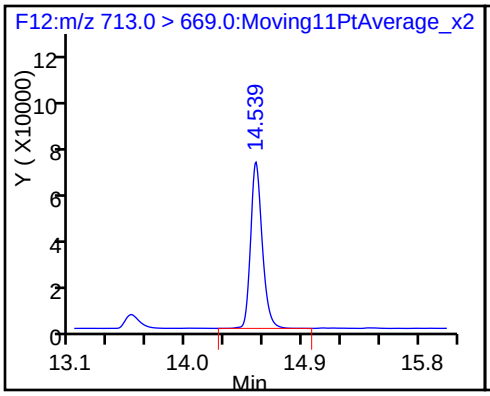
29 Perfluorododecanoic acid



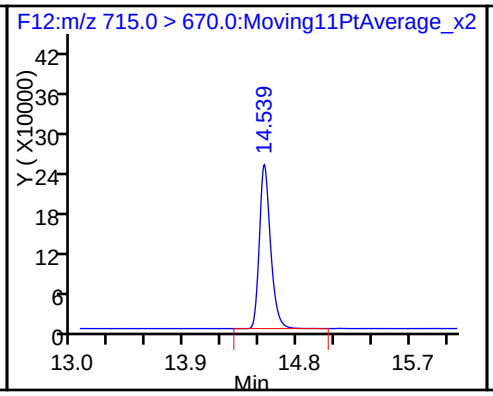
30 Perfluorotridecanoic acid



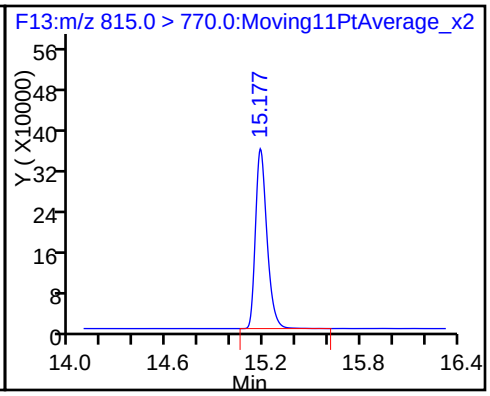
32 Perfluorotetradecanoic acid



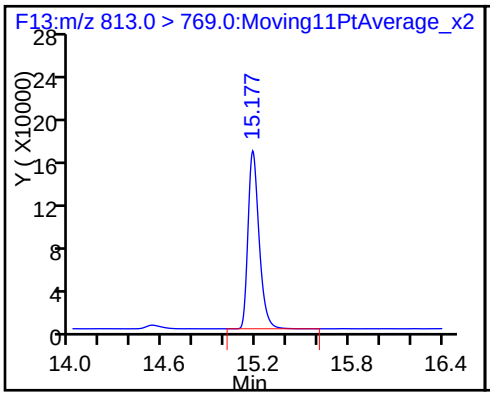
D 33 13C2-PFTeDA



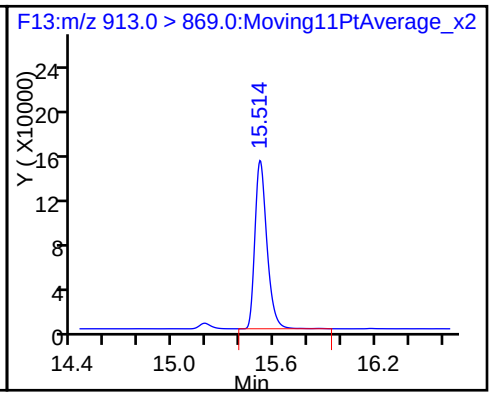
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Lab Sample ID: CCV 320-100906/54 Calibration Date: 02/20/2016 09:34

Instrument ID: A6 Calib Start Date: 02/19/2016 15:08

GC Column: Acquity ID: 2.10(mm) Calib End Date: 02/19/2016 17:15

Lab File ID: 19FEB2016A6A_056.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	1.304	1.412		54.1	50.0	8.3	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.043	0.9755		46.7	50.0	-6.5	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	0.9930	1.104		49.1	44.2	11.1	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.083	1.144		52.8	50.0	5.6	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.043	1.018		48.8	50.0	-2.4	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	0.6753	0.7199		50.4	47.3	6.6	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.004	1.000		49.8	50.0	-0.4	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	L2ID		0.6299		48.2	47.6	1.2	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	0.9724	1.010		49.6	47.8	3.8	25.0
Perfluorononanoic acid (PFNA)	AveID	0.8075	0.8407		52.1	50.0	4.1	25.0
Perfluorodecanoic acid (PFDA)	L2ID		1.010		51.5	50.0	2.9	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9268	0.8877		47.9	50.0	-4.2	25.0
Perfluorodecane Sulfonic acid	L1ID		0.6249		54.3	48.2	12.7	25.0
Perfluoroundecanoic acid (PFUnA)	L1ID		0.8572		51.4	50.0	2.7	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.7311	0.8069		55.2	50.0	10.4	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9409	1.037		55.1	50.0	10.2	25.0
Perfluorotetradecanoic acid (PFTeA)	L2ID		0.6323		52.5	50.0	5.0	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		1.064		47.0	50.0	-5.9	25.0
Perfluoro-n-octandecanoic acid (PFODA)	AveID	1.111	1.025		46.1	50.0	-7.7	25.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_056.d
Lims ID: CCV L5
Client ID:
Sample Type: CCV
Inject. Date: 20-Feb-2016 09:34:04 ALS Bottle#: 13 Worklist Smp#: 54
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: CCV L5
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
Operator ID: JRB Instrument ID: A6
Sublist: chrom-PFAC_A6*sub5

Method: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\PFAC_A6.m
Limit Group: LC PFC_DOD ICAL
Last Update: 22-Feb-2016 10:18:05 Calib Date: 19-Feb-2016 17:15:39
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_010.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK010

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.0 > 172.0	5.696	5.712	-0.016		735784	46.0		92.0	2562	
2 Perfluorobutyric acid										
212.9 > 169.0	5.696	5.715	-0.019	1.000	1038956	54.1		108	3162	
D 3 13C5-PFPeA										
267.9 > 223.0	6.800	6.827	-0.027		1596544	51.9		104	6136	
4 Perfluoropentanoic acid										
262.9 > 219.0	6.805	6.828	-0.023	1.000	1557494	46.7		93.5	340	
5 Perfluorobutane Sulfonate										
298.9 > 80.0	6.920	6.939	-0.019	1.000	634088	NC			805	
298.9 > 99.0	6.915	6.939	-0.024	0.999	340139		1.86(0.00-0.00)		723	
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	6.920	6.939	-0.019	1.000	634088	49.1		111		
7 Perfluorohexanoic acid										
313.0 > 269.0	8.049	8.078	-0.029	1.000	1592823	52.8		106	3176	
D 6 13C2 PFHxA										
315.0 > 270.0	8.049	8.080	-0.031		1392598	49.2		98.3	5464	
22 PFPeS (Perflouro-1-pentanesulfonat										
349.0 > 80.0	8.131	8.158	-0.027	0.872	444944	NC			1556	
D 8 13C4-PFHpA										
367.0 > 322.0	9.288	9.322	-0.034		1592041	51.6		103	6480	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.288	9.322	-0.034	1.000	1619972	48.8		97.6	3886	
D 11 18O2 PFHxS										
403.0 > 84.0	9.323	9.358	-0.035		614918	41.1		86.9	2481	
10 Perfluorohexane Sulfonate										
399.0 > 80.0	9.323	9.364	-0.041	1.000	442664	NC			1286	
41 Perfluorohexanesulfonic acid										
399.0 > 80.0	9.323	9.364	-0.041	1.000	442664	50.4		107		

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFOA										
417.0 > 372.0	10.412	10.450	-0.038		1618742	47.4		94.8	5890	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.412	10.450	-0.038	1.000	1618258	49.8		99.6	2042	
413.0 > 169.0	10.419	10.450	-0.031	1.001	515853		3.14(0.00-0.00)		1384	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.419	10.457	-0.038	1.000	435358	NC			1348	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.419	10.457	-0.038	1.000	435358	48.2		101		
D 16 13C4 PFOS										
503.0 > 80.0	11.385	11.414	-0.029		694093	38.2		79.9	2463	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.385	11.417	-0.032	1.000	700885	49.6		104	445	
499.0 > 99.0	11.385	11.417	-0.032	1.000	365929		1.92(0.00-0.00)		1939	
D 17 13C5 PFNA										
468.0 > 423.0	11.400	11.434	-0.034		1363986	48.4		96.8	6799	
18 Perfluorononanoic acid										
463.0 > 419.0	11.400	11.439	-0.039	1.000	1146645	52.1		104	3094	
21 PFNS (Perflouro-1-nonanesulfonate)										
549.0 > 80.0	12.204	12.249	-0.045	1.000	413024	NC			1920	
D 19 13C2 PFDA										
515.0 > 470.0	12.245	12.275	-0.030		1287906	45.0		90.0	3873	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.245	12.276	-0.031	1.000	1300889	51.5		103	4985	
D 23 13C8 FOSA										
506.0 > 78.0	12.783	12.810	-0.027		1825198	44.0		88.0	3566	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.783	12.812	-0.029	1.000	1620215	47.9		95.8	1429	
25 Perfluorodecane Sulfonate										
599.0 > 80.0	12.919	12.949	-0.030	1.000	437365	NC			1584	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	12.919	12.949	-0.030	1.000	437365	54.3		113		
D 26 13C2 PFUnA										
565.0 > 520.0	12.971	13.000	-0.029		1701977	45.5		91.1	5975	
27 Perfluoroundecanoic acid										
563.0 > 519.0	12.971	13.000	-0.029	1.000	1458974	51.4		103	4237	
D 28 13C2 PFDoA										
615.0 > 570.0	13.578	13.609	-0.031		1913739	48.9		97.8	4707	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.578	13.611	-0.033	1.000	1544099	55.2		110	2102	
31 PFDoS (Perflouro-1-dodecanesulfona										
699.0 > 80.0	14.048	14.083	-0.035	1.000	468581	NC			1591	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.102	14.130	-0.028	1.000	1985226	55.1		110	1838	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.546	14.571	-0.025	1.000	1209996	52.5		105	605	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.546	14.571	-0.025		1833393	51.1		102	6312	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 35 13C2-PFHxDA										
815.0 > 770.0	15.180	15.207	-0.027		2004655	46.5		93.0	6714	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.180	15.208	-0.028	1.000	2035836	47.0		94.1	2224	
36 Perfluorooctandecanoic acid										
913.0 > 869.0	15.517	15.543	-0.026	1.000	1961521	46.1		92.3	1793	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L5_00016 Amount Added: 1.00 Units: mL

Report Date: 22-Feb-2016 10:18:05 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_056.d

Injection Date: 20-Feb-2016 09:34:04 Instrument ID: A6

Lims ID: CCV L5

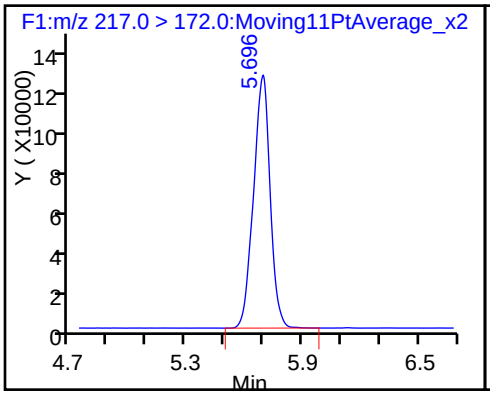
Client ID:

Operator ID: JRB ALS Bottle#: 13 Worklist Smp#: 54

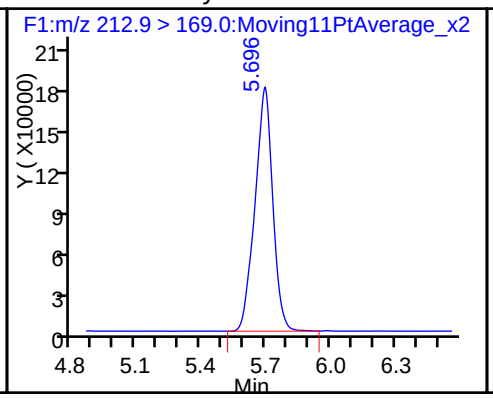
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

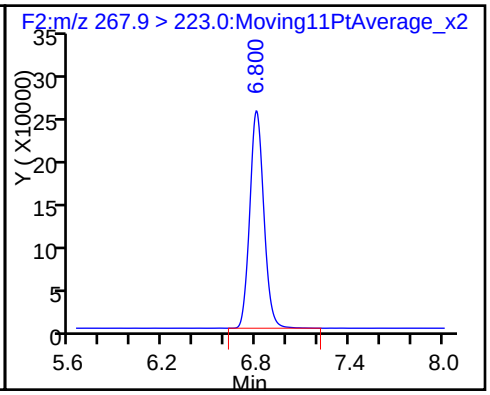
D 1 13C4 PFBA



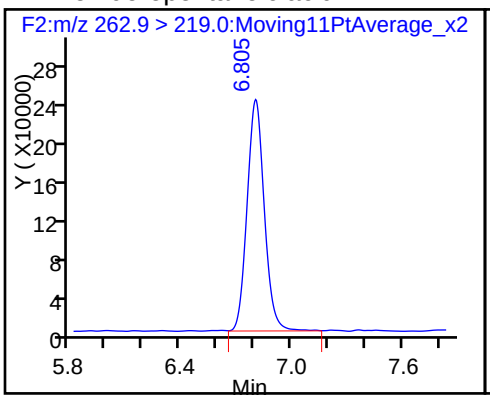
2 Perfluorobutyric acid



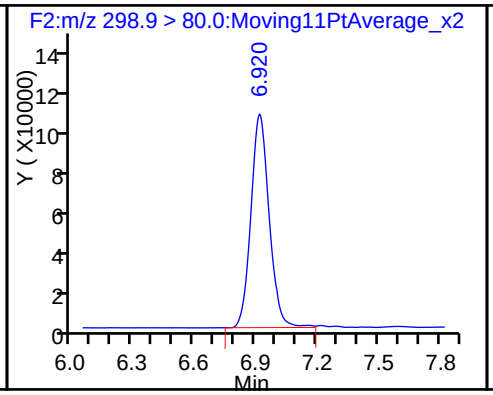
D 3 13C5-PFPeA



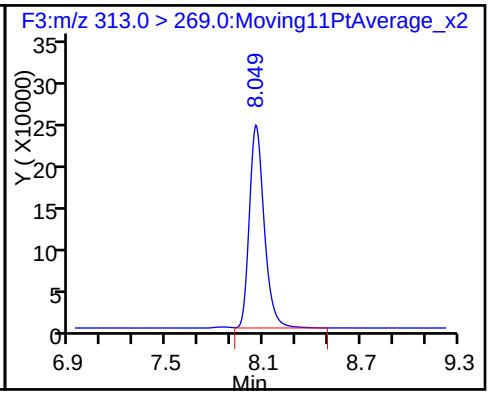
4 Perfluoropentanoic acid



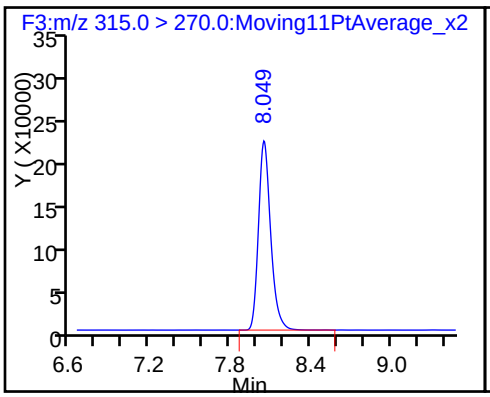
40 Perfluorobutanesulfonic acid



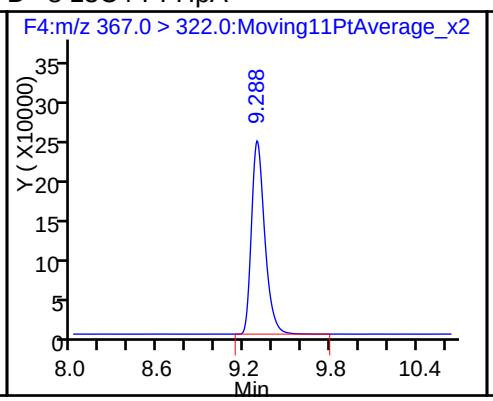
7 Perfluorohexanoic acid



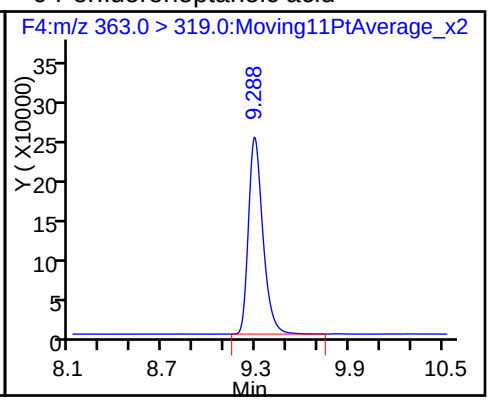
D 6 13C2 PFHxA



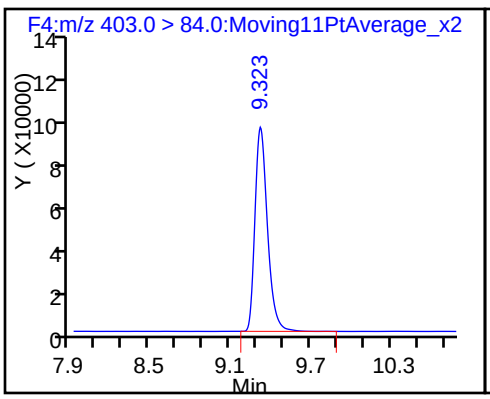
D 8 13C4-PFHpA



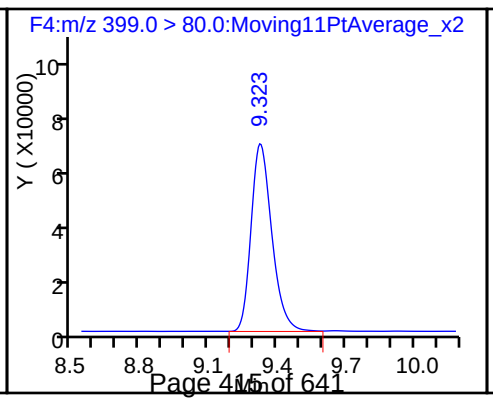
9 Perfluoroheptanoic acid



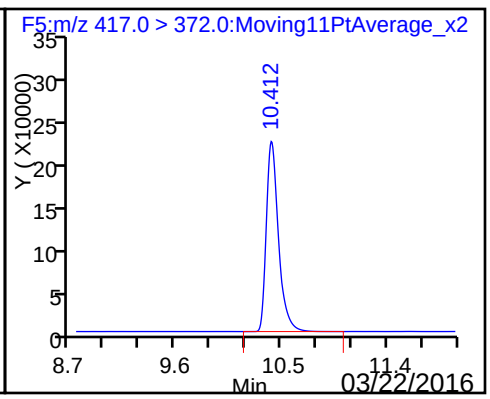
D 11 18O2 PFHxS



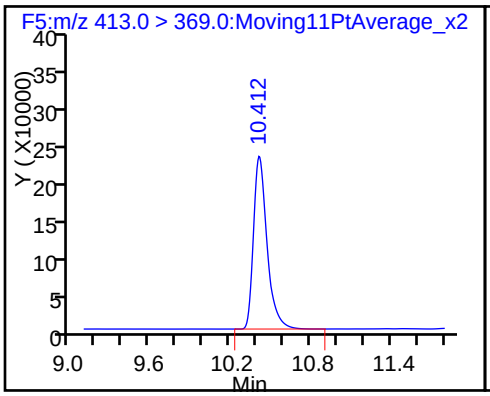
41 Perfluorohexanesulfonic acid



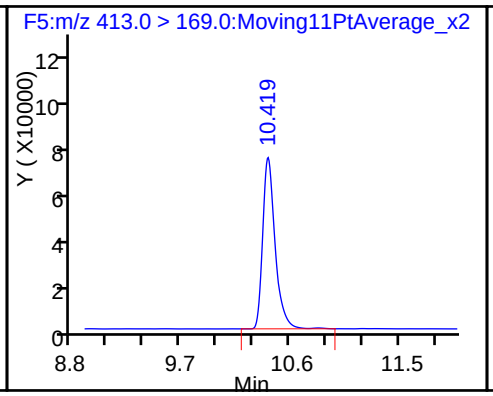
D 12 13C4 PFOA



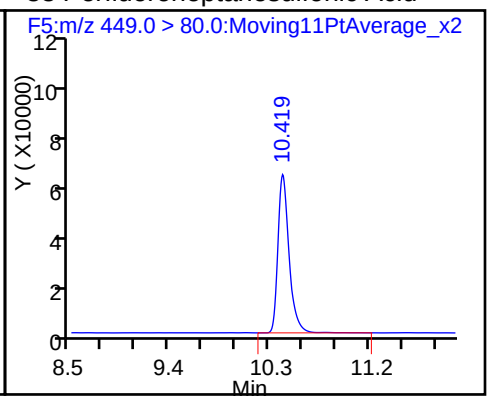
13 Perfluorooctanoic acid



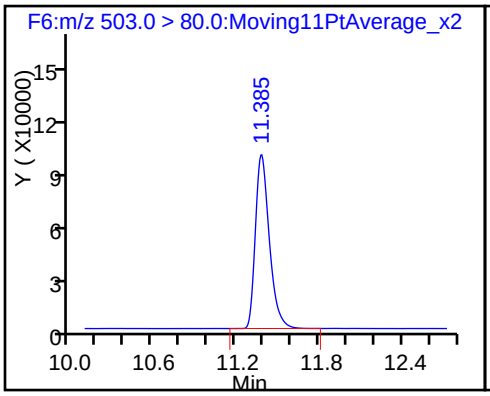
13 Perfluorooctanoic acid



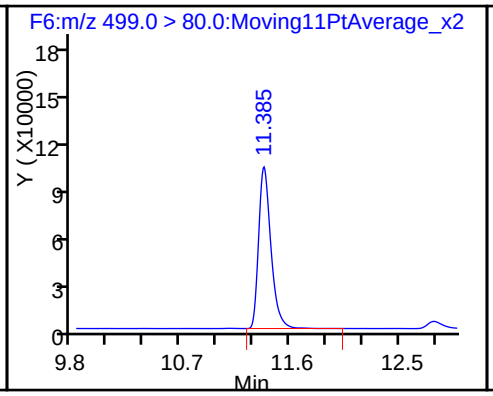
38 Perfluoroheptanesulfonic Acid



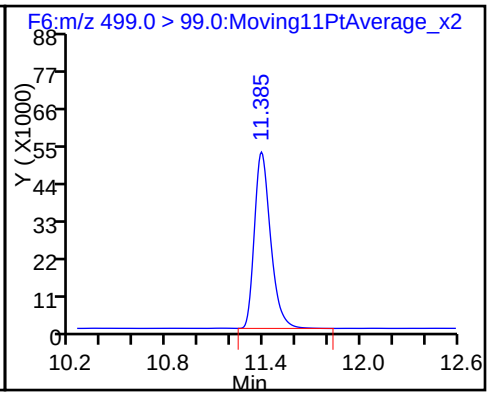
D 16 13C4 PFOS



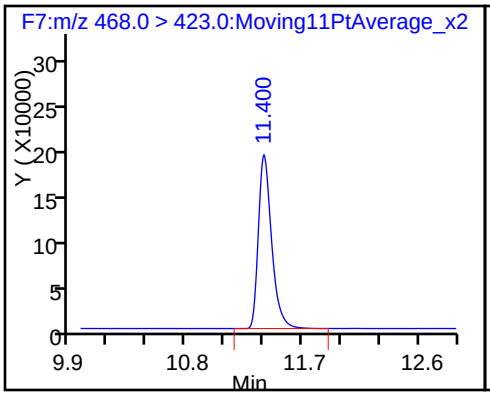
15 Perfluorooctane sulfonic acid



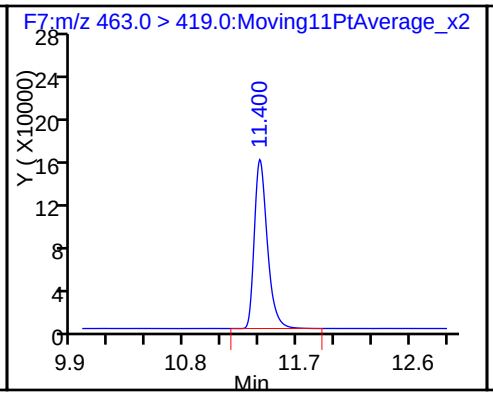
15 Perfluorooctane sulfonic acid



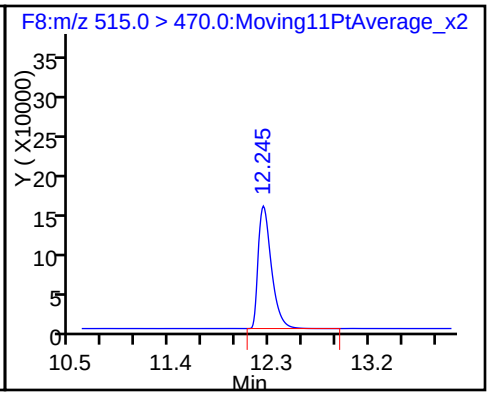
D 17 13C5 PFNA



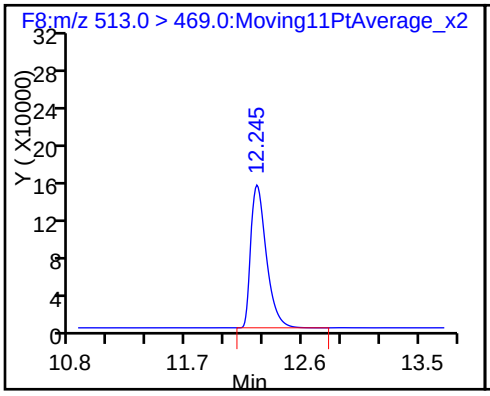
18 Perfluorononanoic acid



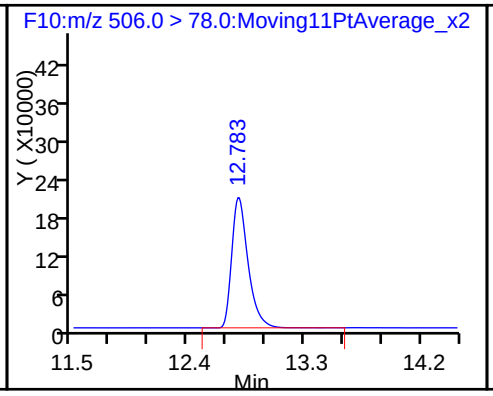
D 19 13C2 PFDA



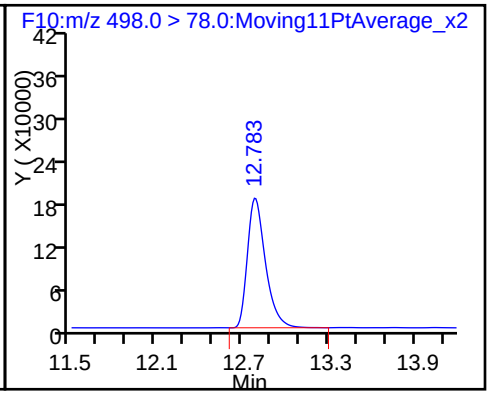
20 Perfluorodecanoic acid



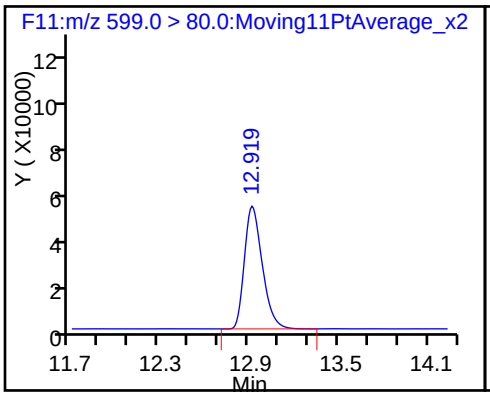
D 23 13C8 FOSA



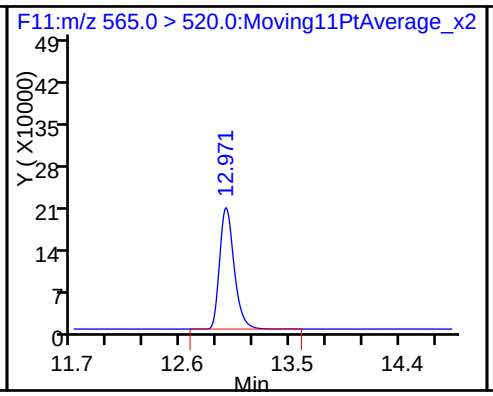
24 Perfluorooctane Sulfonamide



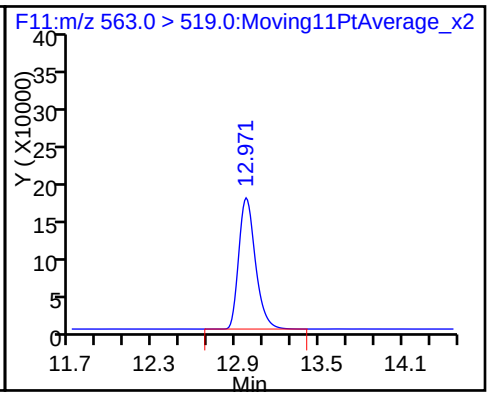
39 Perfluorodecane Sulfonic acid



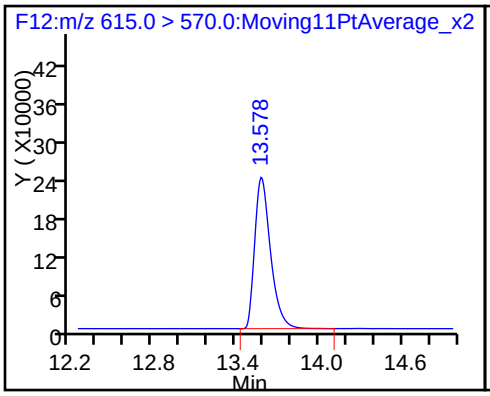
D 26 13C2 PFUnA



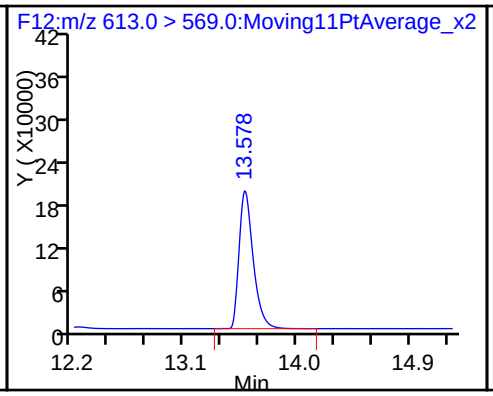
27 Perfluoroundecanoic acid



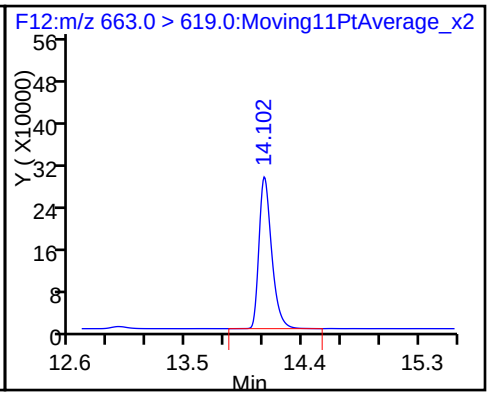
D 28 13C2 PFDoA



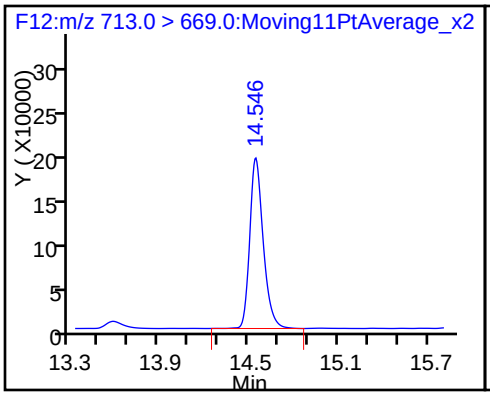
29 Perfluorododecanoic acid



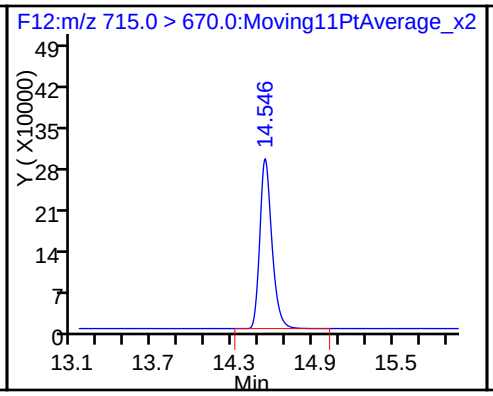
30 Perfluorotridecanoic acid



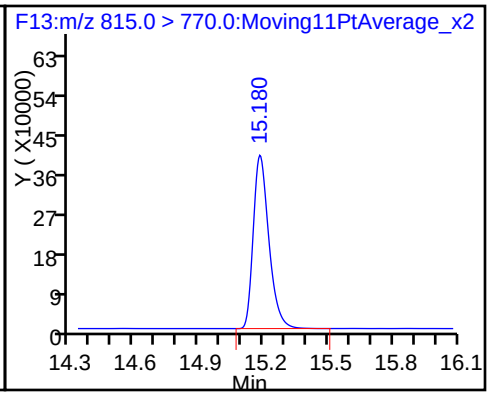
32 Perfluorotetradecanoic acid



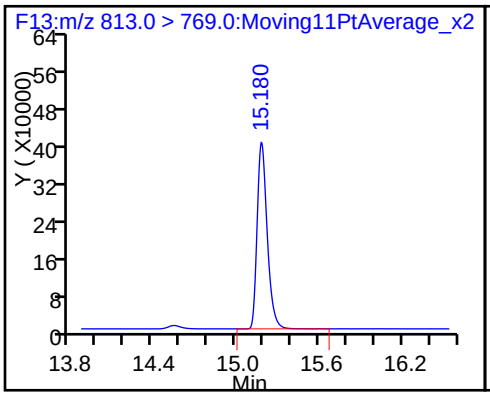
D 33 13C2-PFTeDA



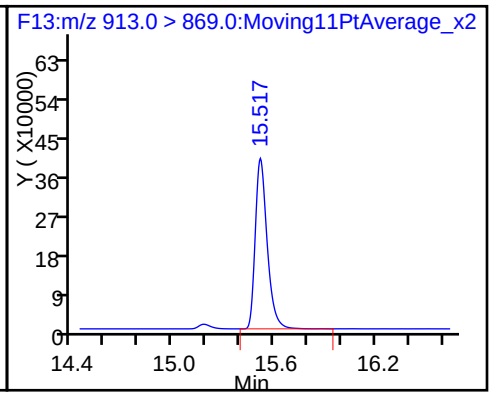
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Lab Sample ID: CCV 320-100906/65 Calibration Date: 02/20/2016 13:27

Instrument ID: A6 Calib Start Date: 02/19/2016 15:08

GC Column: Acquity ID: 2.10(mm) Calib End Date: 02/19/2016 17:15

Lab File ID: 19FEB2016A6A_067.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	1.304	1.413		21.7	20.0	8.4	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.043	1.005		19.3	20.0	-3.7	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	0.9930	0.9556		17.0	17.7	-3.8	25.0
Perfluorohexanoic acid (PFHxA)	AveID	1.083	1.152		21.3	20.0	6.3	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.043	1.149		22.0	20.0	10.2	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	0.6753	0.6952		19.5	18.9	2.9	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	L2ID		0.6011		18.6	19.0	-2.5	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.004	0.9799		19.5	20.0	-2.4	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	0.9724	0.9873		19.4	19.1	1.5	25.0
Perfluorononanoic acid (PFNA)	AveID	0.8075	0.9268		23.0	20.0	14.8	25.0
Perfluorodecanoic acid (PFDA)	L2ID		0.9888		19.9	20.0	-0.4	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9268	0.9281		20.0	20.0	0.1	25.0
Perfluorodecane Sulfonic acid	L1ID		0.5449		19.1	19.3	-0.8	25.0
Perfluoroundecanoic acid (PFUnA)	L1ID		0.9003		21.2	20.0	5.9	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.7311	0.7269		19.9	20.0	-0.6	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9409	0.9810		20.9	20.0	4.3	25.0
Perfluorotetradecanoic acid (PFTeA)	L2ID		0.5337		17.4	20.0	-12.9	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		1.202		19.9	20.0	-0.7	25.0
Perfluoro-n-octandecanoic acid (PFODA)	AveID	1.111	0.9712		17.5	20.0	-12.6	25.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_067.d
Lims ID: CCV L4
Client ID:
Sample Type: CCV
Inject. Date: 20-Feb-2016 13:27:32 ALS Bottle#: 12 Worklist Smp#: 65
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: CCV L4
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
Operator ID: JRB Instrument ID: A6
Sublist: chrom-PFAC_A6*sub5

Method: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\PFAC_A6.m
Limit Group: LC PFC_DOD ICAL
Last Update: 22-Feb-2016 11:18:21 Calib Date: 19-Feb-2016 17:15:39
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_010.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK010

First Level Reviewer: westendorfc Date: 21-Feb-2016 13:19:47

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.0 > 172.0	5.699	5.712	-0.013		844637	52.8		106	3042	
2 Perfluorobutyric acid										
212.9 > 169.0	5.699	5.715	-0.016	1.000	477412	21.7		108	1440	
D 3 13C5-PFPeA										
267.9 > 223.0	6.804	6.827	-0.023		1885401	61.3		123	5167	
4 Perfluoropentanoic acid										
262.9 > 219.0	6.804	6.828	-0.024	1.000	757574	19.3		96.3	163	
5 Perfluorobutane Sulfonate										
298.9 > 80.0	6.929	6.939	-0.010	1.000	277743	NC			326	
298.9 > 99.0	6.920	6.939	-0.019	0.999	153377		1.81(0.00-0.00)		222	
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	6.929	6.939	-0.010	1.000	277743	17.0		96.2		
7 Perfluorohexanoic acid										
313.0 > 269.0	8.055	8.078	-0.023	1.000	730390	21.3		106	1455	
D 6 13C2 PFHxA										
315.0 > 270.0	8.055	8.080	-0.025		1585078	56.0		112	5137	
22 PFPeS (Perflouro-1-pentanesulfonat										
349.0 > 80.0	8.131	8.158	-0.027	0.872	217669	NC			1096	
D 8 13C4-PFHpA										
367.0 > 322.0	9.288	9.322	-0.034		1821976	59.1		118	6569	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.294	9.322	-0.028	1.000	837547	22.0		110	3808	
D 11 18O2 PFHxS										
403.0 > 84.0	9.329	9.358	-0.029		777616	52.0		110	3271	
10 Perfluorohexane Sulfonate										
399.0 > 80.0	9.329	9.364	-0.035	1.000	216237	NC			848	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
41 Perfluorohexanesulfonic acid										
399.0 > 80.0	9.329	9.364	-0.035	1.000	216237	19.5		103		
D 12 13C4 PFOA										
417.0 > 372.0	10.419	10.450	-0.031		1951511	57.2		114	10200	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.419	10.450	-0.031	1.000	764939	19.5		97.6	803	
413.0 > 169.0	10.419	10.450	-0.031	1.000	285474		2.68(0.00-0.00)		705	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.419	10.457	-0.038	1.000	212630	NC			693	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.419	10.457	-0.038	1.000	212630	18.6		97.5		
D 16 13C4 PFOS										
503.0 > 80.0	11.385	11.414	-0.029		888097	48.8		102	3468	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.385	11.417	-0.032	1.000	350731	19.4		102	295	
499.0 > 99.0	11.385	11.417	-0.032	1.000	168205		2.09(0.00-0.00)		725	
D 17 13C5 PFNA										
468.0 > 423.0	11.408	11.434	-0.026		1605407	56.9		114	7343	
18 Perfluorononanoic acid										
463.0 > 419.0	11.408	11.439	-0.031	1.000	595129	23.0		115	1413	
21 PFNS (Perflouro-1-nonanesulfonate)										
549.0 > 80.0	12.214	12.249	-0.035	1.000	216600	NC			797	
D 19 13C2 PFDA										
515.0 > 470.0	12.245	12.275	-0.030		1606537	56.1		112	3436	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.245	12.276	-0.031	1.000	635386	19.9		99.6	1693	
D 23 13C8 FOSA										
506.0 > 78.0	12.794	12.810	-0.016		2216095	53.4		107	2538	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.794	12.812	-0.018	1.000	822680	20.0		100	1616	
25 Perfluorodecane Sulfonate										
599.0 > 80.0	12.919	12.949	-0.030	1.000	195178	NC			580	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	12.919	12.949	-0.030	1.000	195178	19.1		99.2		
D 26 13C2 PFUnA										
565.0 > 520.0	12.971	13.000	-0.029		2056267	55.0		110	5372	
27 Perfluoroundecanoic acid										
563.0 > 519.0	12.971	13.000	-0.029	1.000	740493	21.2		106	2090	
D 28 13C2 PFDoA										
615.0 > 570.0	13.579	13.609	-0.030		2309380	59.0		118	6770	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.579	13.611	-0.032	1.000	671444	19.9		99.4	904	
31 PFDoS (Perflouro-1-dodecanesulfona										
699.0 > 80.0	14.048	14.083	-0.035	1.000	225190	NC			743	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.102	14.130	-0.028	1.000	906215	20.9		104	935	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.546	14.571	-0.025	1.000	492963	17.4		87.1	248	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 33 13C2-PFTeDA										
715.0 > 670.0	14.546	14.571	-0.025		1919727	53.5		107	6759	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.180	15.207	-0.027		2251795	52.2		104	5198	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.180	15.208	-0.028	1.000	1109943	19.9		99.3	1278	
36 Perfluorooctandecanoic acid										
913.0 > 869.0	15.517	15.543	-0.026	1.000	897159	17.5		87.4	997	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L4_00017 Amount Added: 1.00 Units: mL

Report Date: 22-Feb-2016 11:18:21 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_067.d

Injection Date: 20-Feb-2016 13:27:32 Instrument ID: A6

Lims ID: CCV L4

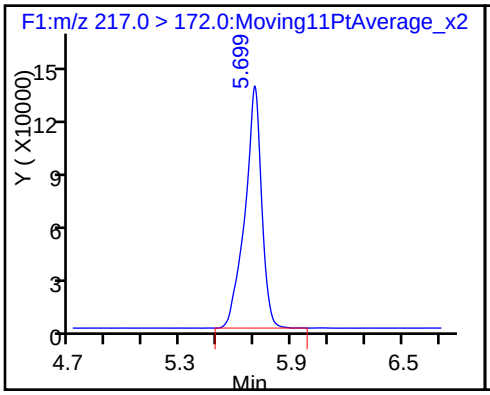
Client ID:

Operator ID: JRB ALS Bottle#: 12 Worklist Smp#: 65

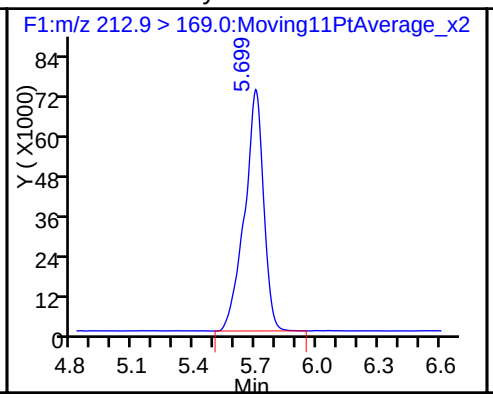
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

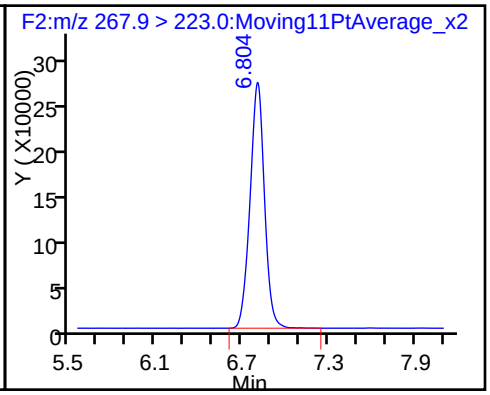
D 1 13C4 PFBA



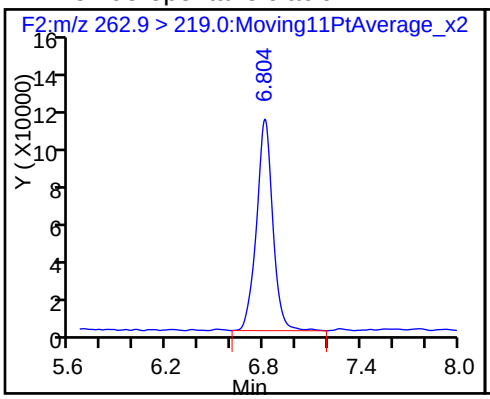
2 Perfluorobutyric acid



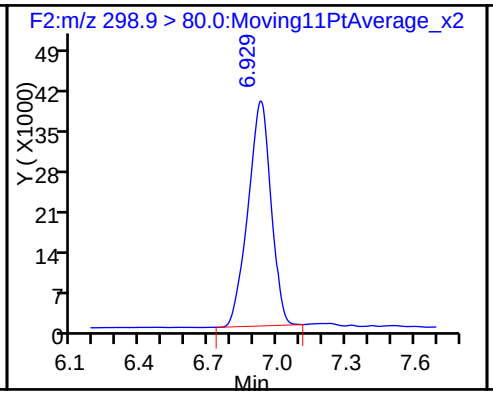
D 3 13C5-PFPeA



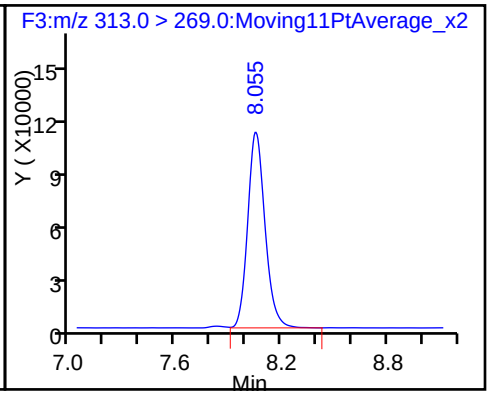
4 Perfluoropentanoic acid



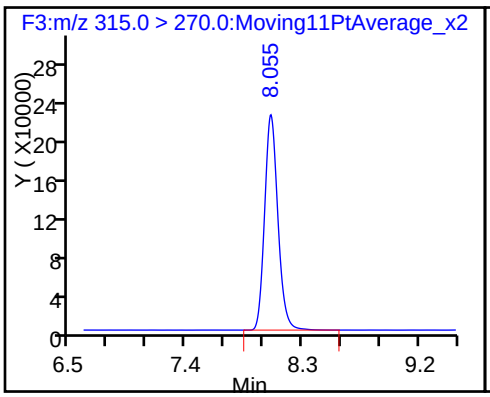
40 Perfluorobutanesulfonic acid



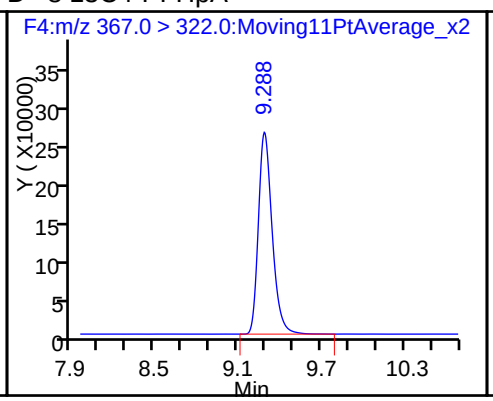
7 Perfluorohexanoic acid



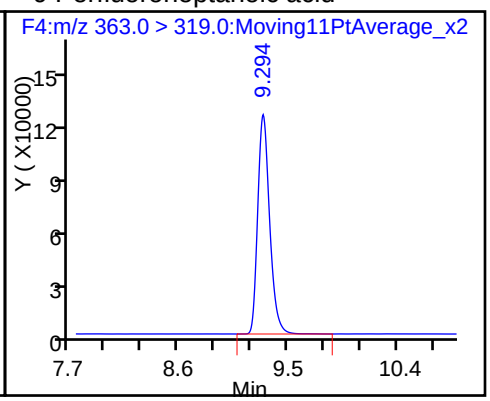
D 6 13C2 PFHxA



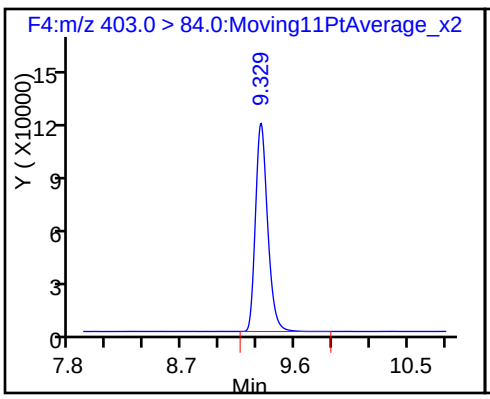
D 8 13C4-PFHpA



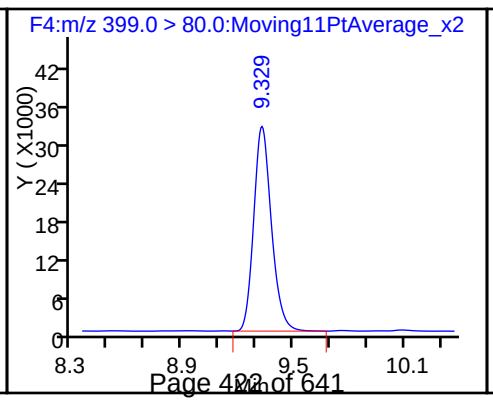
9 Perfluoroheptanoic acid



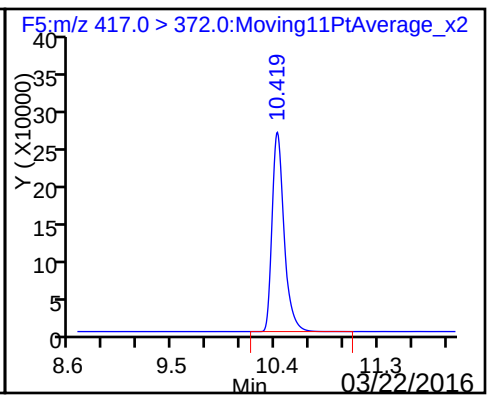
D 11 18O2 PFHxS



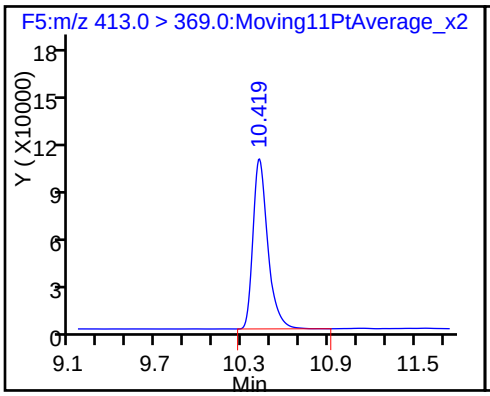
41 Perfluorohexanesulfonic acid



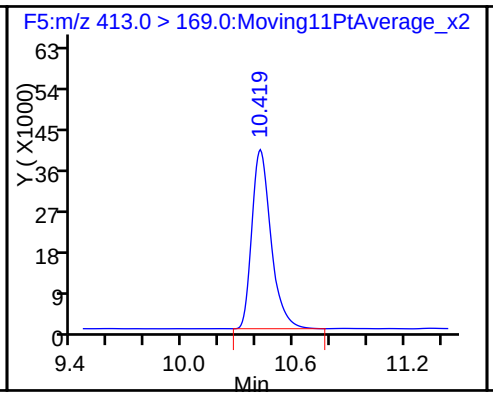
D 12 13C4 PFOA



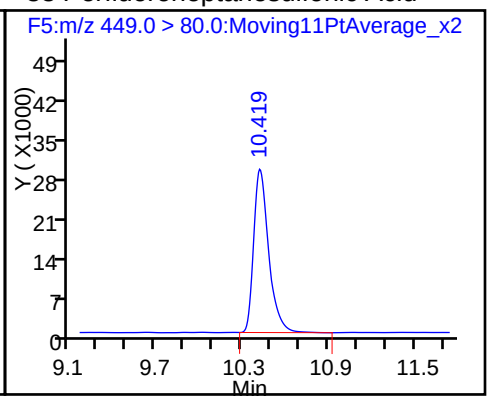
13 Perfluorooctanoic acid



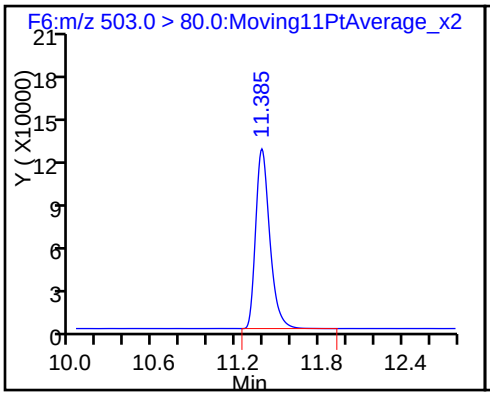
13 Perfluorooctanoic acid



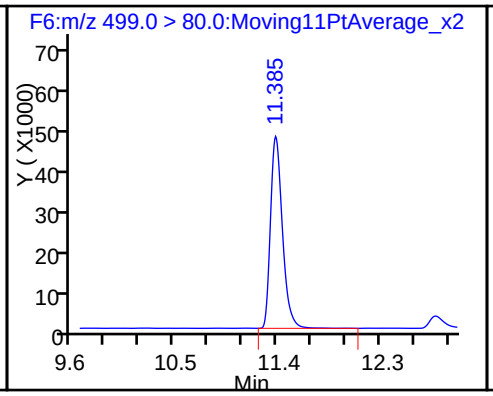
38 Perfluoroheptanesulfonic Acid



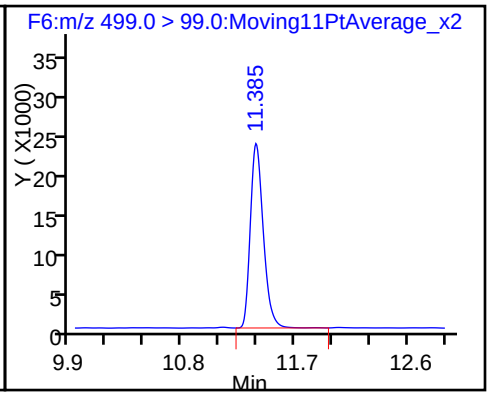
D 16 13C4 PFOS



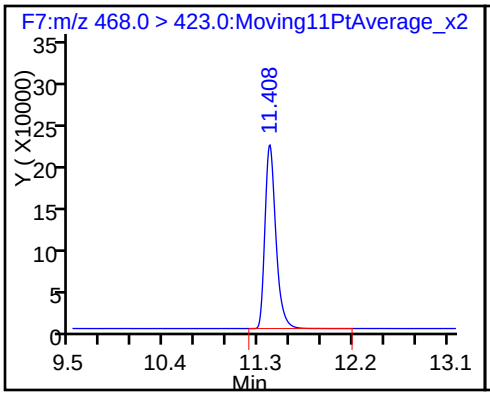
15 Perfluorooctane sulfonic acid



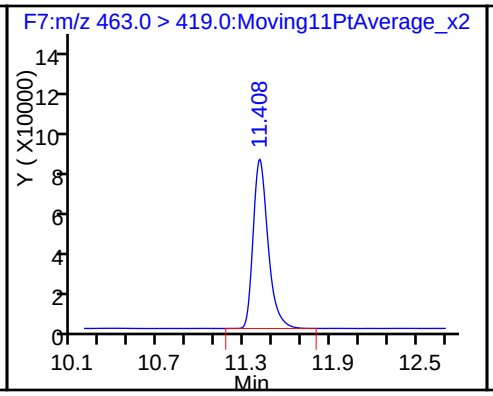
15 Perfluorooctane sulfonic acid



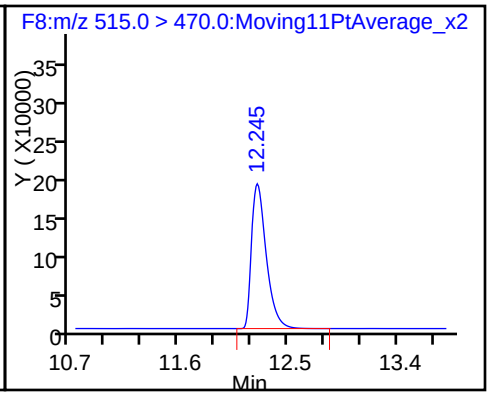
D 17 13C5 PFNA



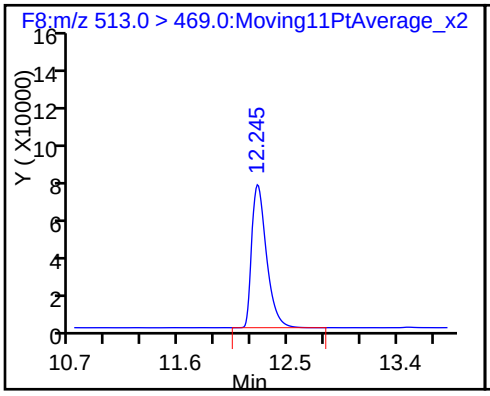
18 Perfluorononanoic acid



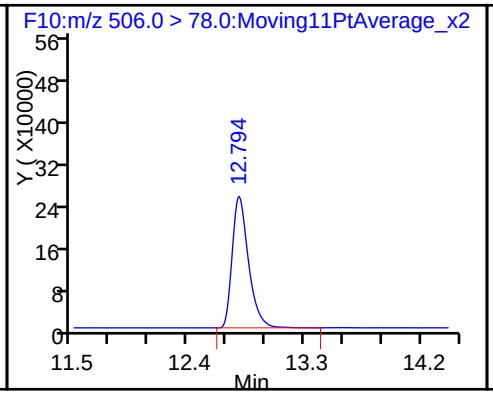
D 19 13C2 PFDA



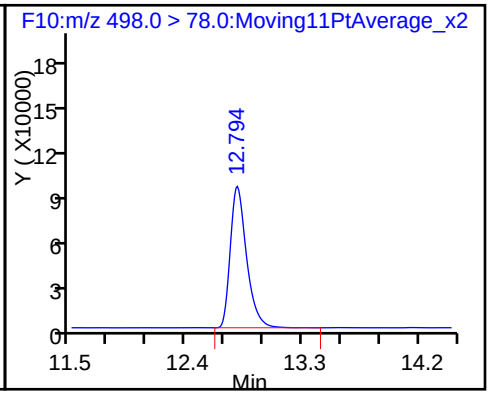
20 Perfluorodecanoic acid



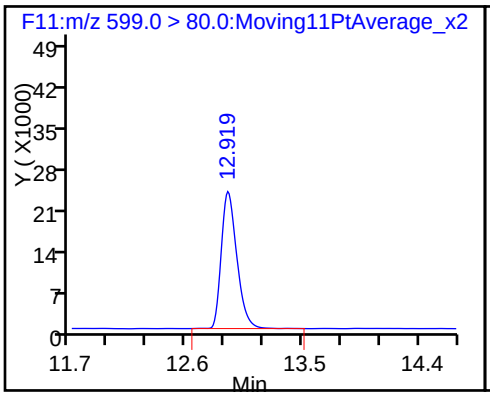
D 23 13C8 FOSA



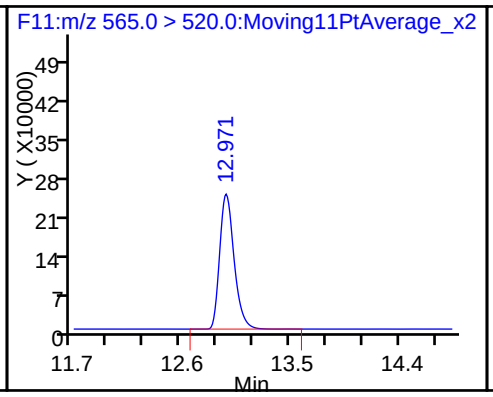
24 Perfluorooctane Sulfonamide



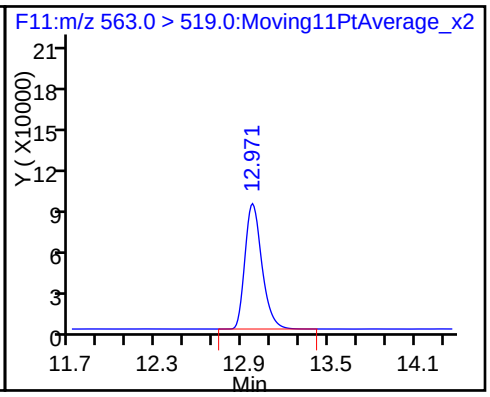
39 Perfluorodecane Sulfonic acid



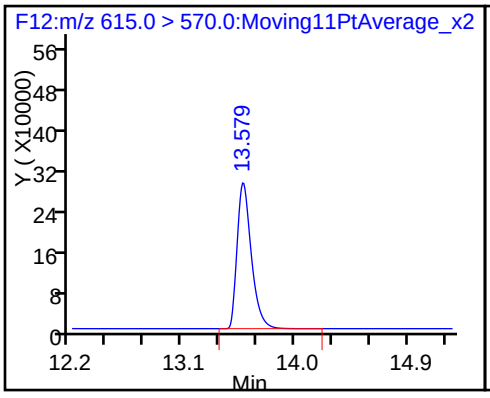
D 26 13C2 PFUnA



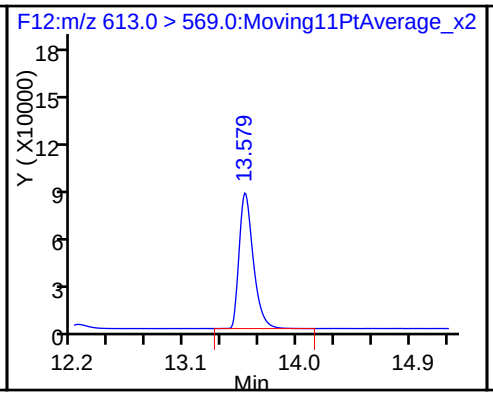
27 Perfluoroundecanoic acid



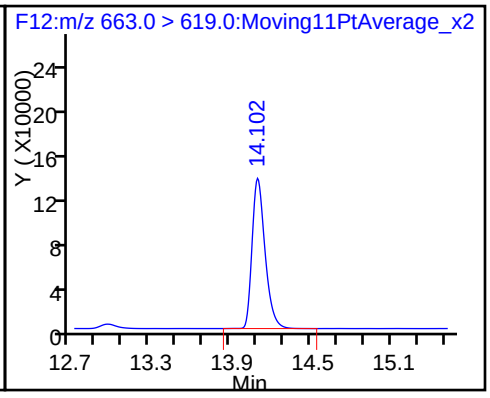
D 28 13C2 PFDoA



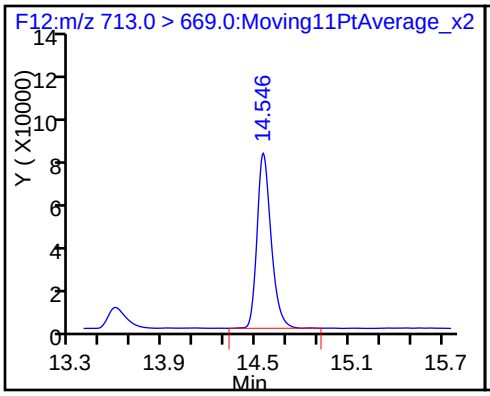
29 Perfluorododecanoic acid



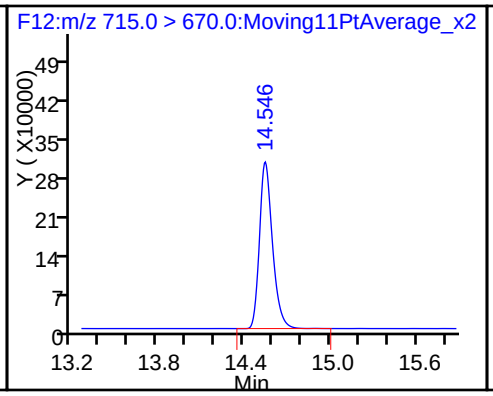
30 Perfluorotridecanoic acid



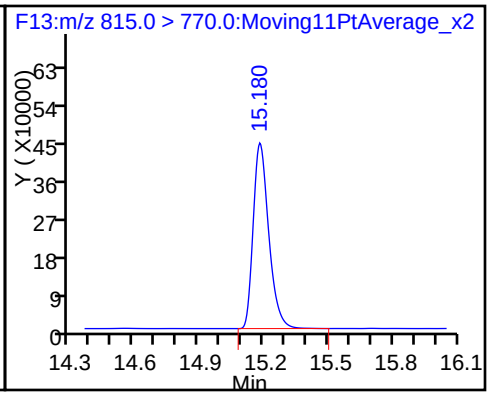
32 Perfluorotetradecanoic acid



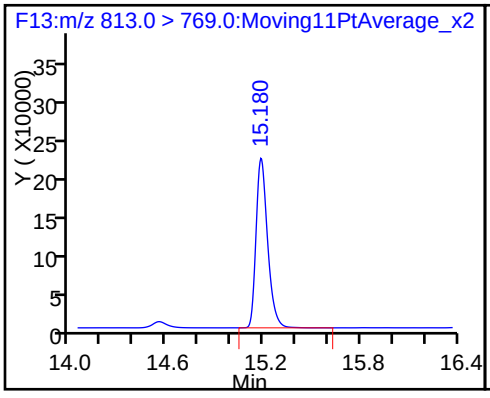
D 33 13C2-PFTeDA



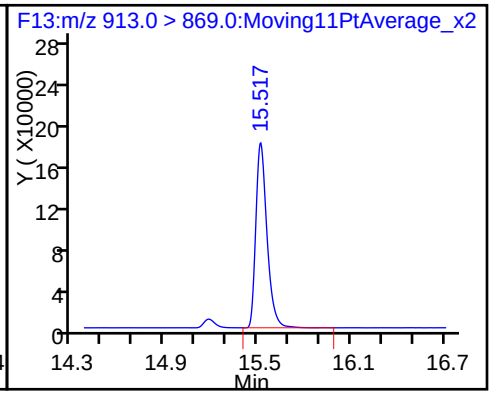
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Client Sample ID: | Lab Sample ID: MB 320-100093/1-A

Matrix: Water | Lab File ID: 12FEB2016A4A_042.d

Analysis Method: WS-LC-0025 | Date Collected:

Extraction Method: 3535 | Date Extracted: 02/09/2016 10:23

Sample wt/vol: 500(mL) | Date Analyzed: 02/13/2016 00:22

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 15(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 100305 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.0020	U	0.0025	0.0020	0.00087

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00994	18O2 PFHxS	95		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160212-28353.b\12FEB2016A4A_042.d
Lims ID: MB 320-100093/1-A
Client ID:
Sample Type: MB
Inject. Date: 13-Feb-2016 00:22:35 ALS Bottle#: 26 Worklist Smp#: 41
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: MB 320-100093/1-A box 18
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4

Method: \\ChromNA\Sacramento\ChromData\A4\20160212-28353.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 15-Feb-2016 15:26:28 Calib Date: 12-Feb-2016 12:42:35
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160212-28353.b\12FEB2016A4A_009.d

Column 1 : Det: F1:MRM
Process Host: XAWRK014

First Level Reviewer: westendorfc Date: 15-Feb-2016 09:32:44

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
216.7 > 171.5	5.502	5.712	-0.210		2107465	51.9		104	9071	
D 3 13C5-PFPeA										
267.6 > 222.7	6.704	6.986	-0.282		1537026	48.0		96.1	4613	
5 Perfluorobutane Sulfonate										
298.8 > 79.6	6.814	7.115	-0.301	1.000	224725	NC			128	
51 Perfluorobutanesulfonic acid										
298.8 > 79.6	6.814	7.115	-0.301	1.000	224725	2.29				
D 6 13C2 PFHxA										
314.6 > 269.7	8.017	8.367	-0.350		2045654	52.2		104	6042	
D 8 13C4-PFHpA										
366.6 > 321.6	9.264	9.639	-0.375		1970849	50.6		101	6246	
9 Perfluoroheptanoic acid										
362.8 > 318.7	9.264	9.640	-0.376	1.000	10783	0.5343			35.7	
58 Perfluorohexanesulfonic acid										
398.3 > 79.2	9.293	9.675	-0.382	1.000	5224	-0.1095				
10 Perfluorohexane Sulfonate										
398.3 > 79.2	9.293	9.675	-0.382	1.000	5224	NC			18.1	
D 11 18O2 PFHxS										
402.5 > 83.6	9.299	9.675	-0.376		1017192	44.9		94.8	2451	
D 12 13C4 PFOA										
416.5 > 371.6	10.370	10.743	-0.373		2259154	53.1		106	6800	
D 16 13C4 PFOS										
502.4 > 79.7	11.313	11.651	-0.338		403051	39.8		83.3	1399	
D 17 13C5 PFNA										
467.5 > 422.6	11.336	11.678	-0.342		1999657	48.1		96.1	5363	
D 19 13C2 PFDA										
514.4 > 469.5	12.159	12.473	-0.314		2903115	49.4		98.8	6083	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 23 13C8 FOSA										
505.4 > 77.6	12.701	12.991	-0.290		817248	9.15		18.3	792	
D 26 13C2 PFUnA										
564.3 > 519.5	12.858	13.146	-0.288		2629742	45.0		89.9	3600	
D 28 13C2 PFDoA										
614.4 > 569.4	13.460	13.713	-0.253		2970716	41.8		83.5	4140	
30 Perfluorotridecanoic acid										
662.4 > 618.5	13.957	14.193	-0.236	1.000	2883	0.0550			2.9	
D 33 13C2-PFTeDA										
714.5 > 669.5	14.379	14.603	-0.224		2359844	37.2		74.5	3807	
32 Perfluorotetradecanoic acid										
712.6 > 668.5	14.386	14.604	-0.218	1.000	9243	0.1772			4.2	
D 35 13C2-PFHxDA										
814.8 > 769.6	14.981	15.138	-0.157		1104662	37.2		74.5	2839	
34 Perfluorohexadecanoic acid										
812.6 > 768.6	14.981	15.139	-0.158	1.000	43581	0.5370			58.9	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Report Date: 16-Feb-2016 08:35:46 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160212-28353.b\12FEB2016A4A_042.d

Injection Date: 13-Feb-2016 00:22:35 Instrument ID: A4

Lims ID: MB 320-100093/1-A

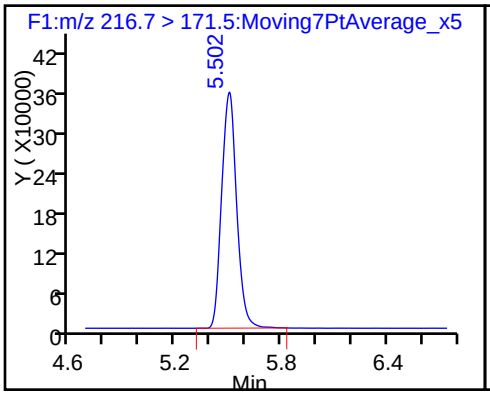
Client ID:

Operator ID: JRB ALS Bottle#: 26 Worklist Smp#: 41

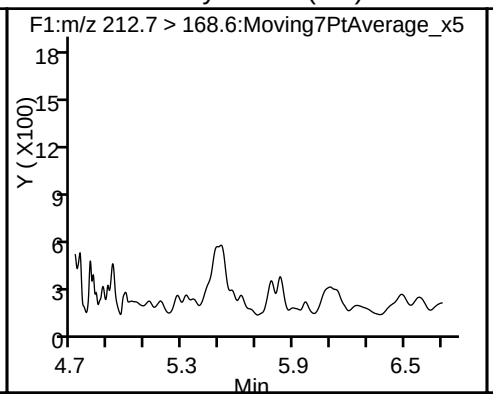
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

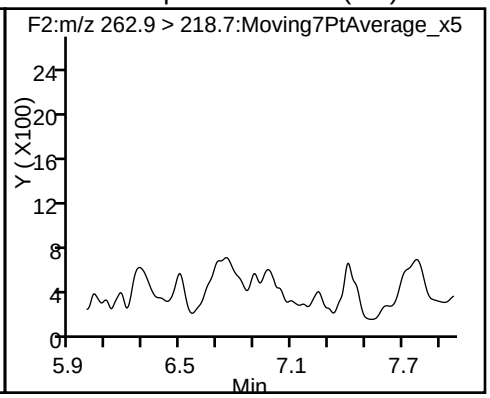
D 1 13C4 PFBA



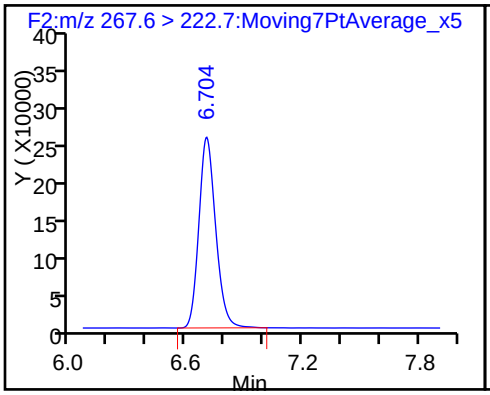
2 Perfluorobutyric acid (ND)



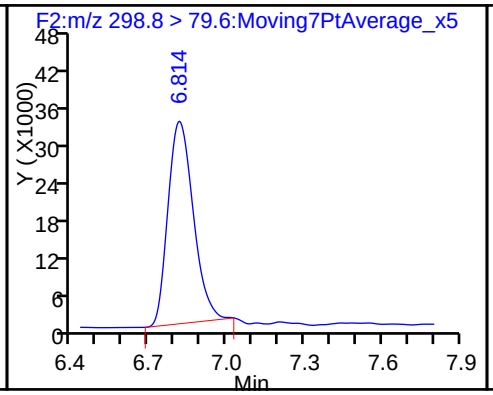
4 Perfluoropentanoic acid (ND)



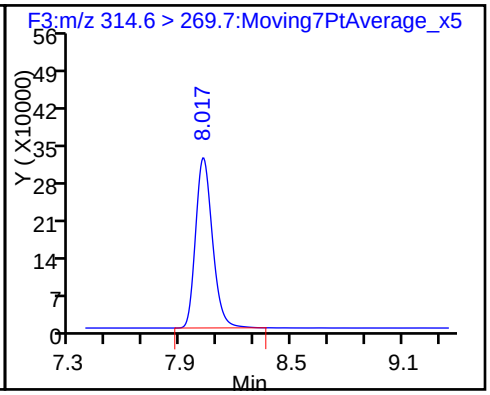
D 3 13C5-PFPeA



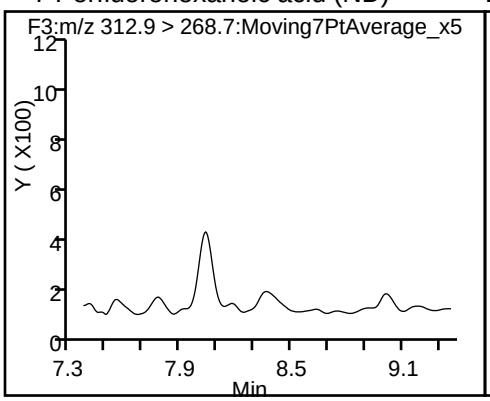
51 Perfluorobutanesulfonic acid



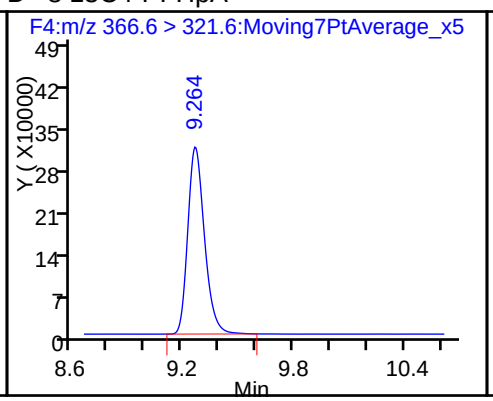
D 6 13C2 PFHxA



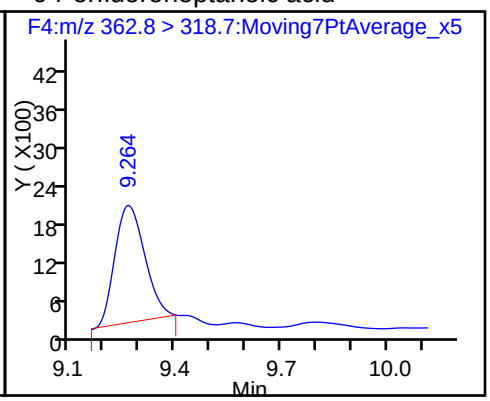
7 Perfluorohexanoic acid (ND)



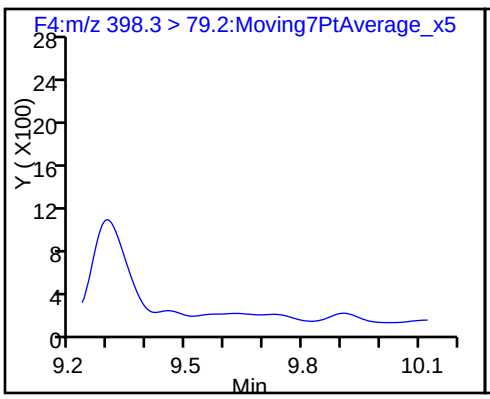
D 8 13C4-PFHpA



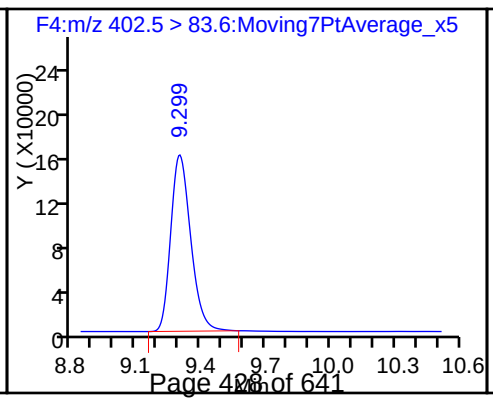
9 Perfluoroheptanoic acid



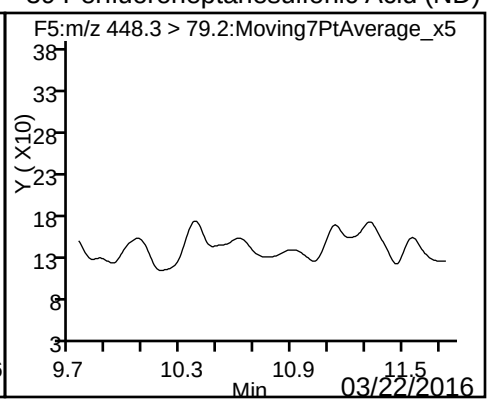
58 Perfluorohexanesulfonic acid



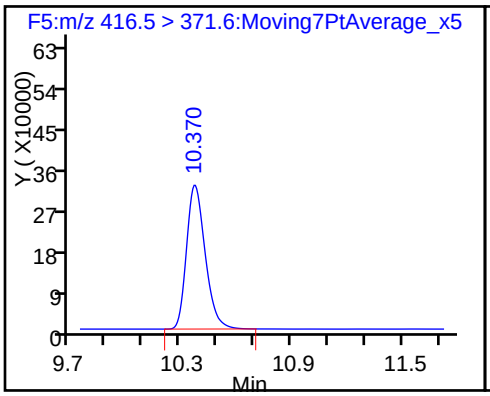
D 11 18O2 PFHxS



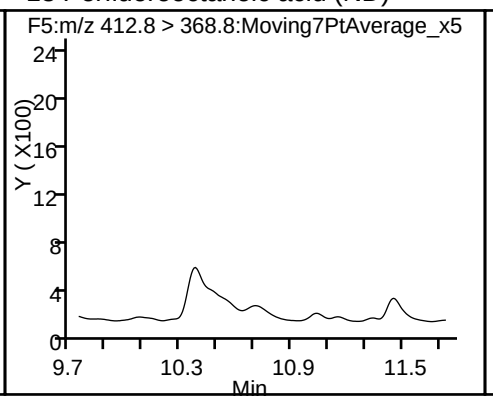
39 Perfluoroheptanesulfonic Acid (ND)



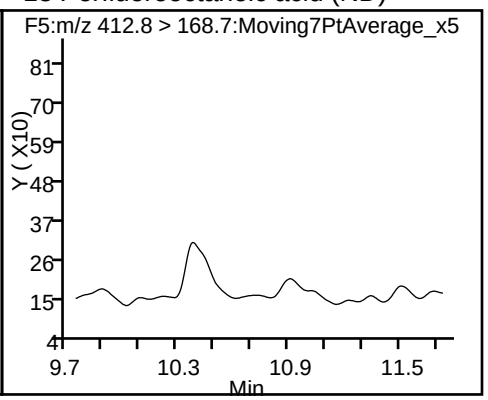
D 12 13C4 PFOA



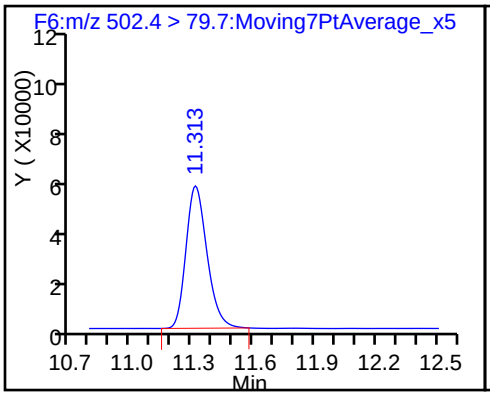
13 Perfluorooctanoic acid (ND)



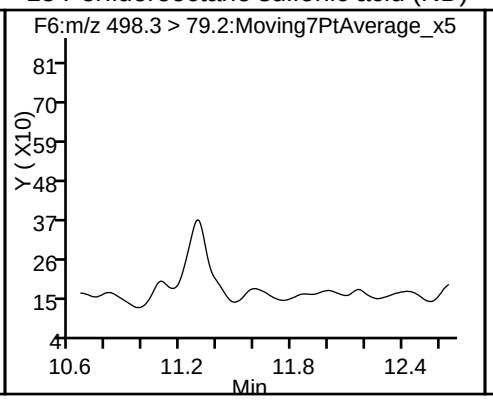
13 Perfluorooctanoic acid (ND)



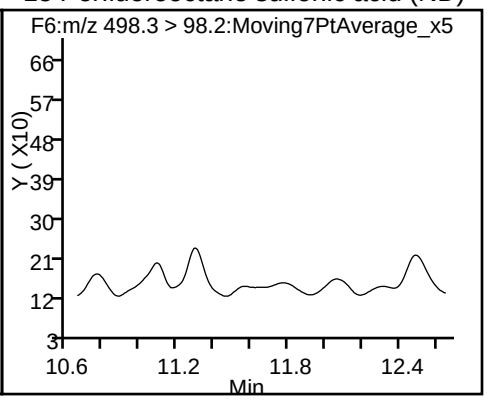
D 16 13C4 PFOS



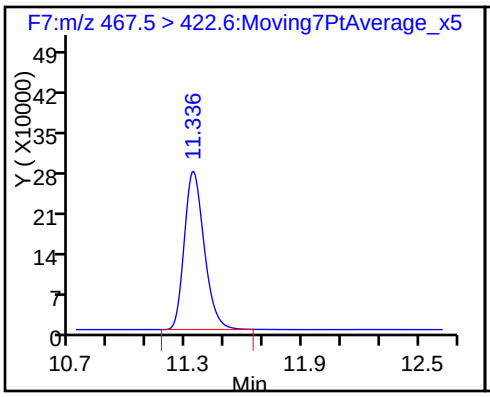
15 Perfluorooctane sulfonic acid (ND)



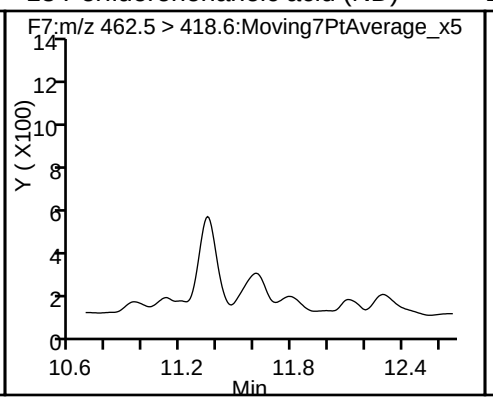
15 Perfluorooctane sulfonic acid (ND)



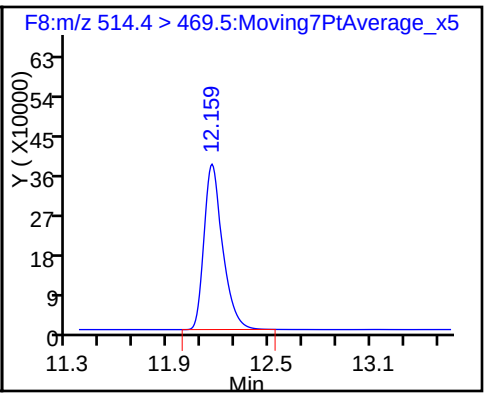
D 17 13C5 PFNA



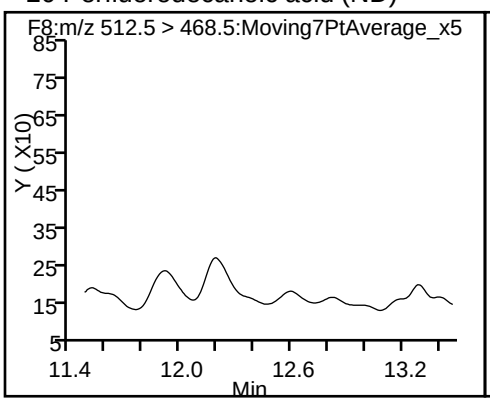
18 Perfluorononanoic acid (ND)



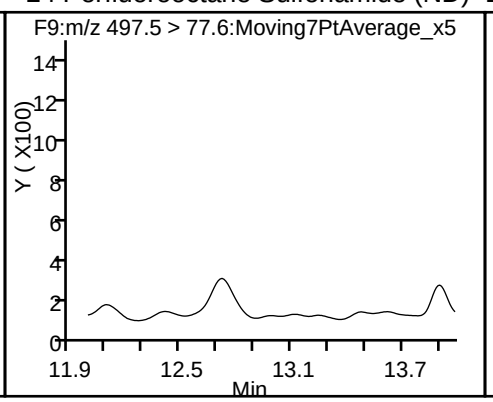
D 19 13C2 PFDA



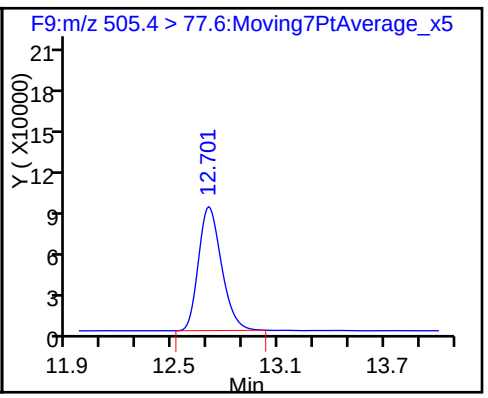
20 Perfluorodecanoic acid (ND)



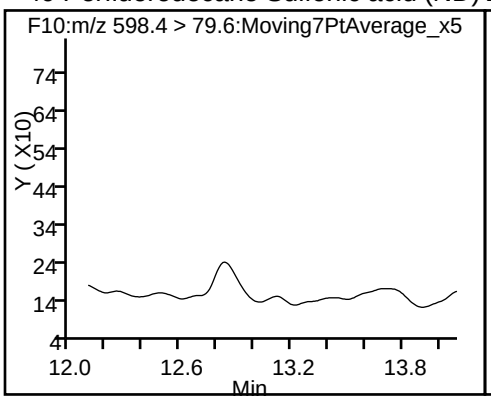
24 Perfluorooctane Sulfonamide (ND)



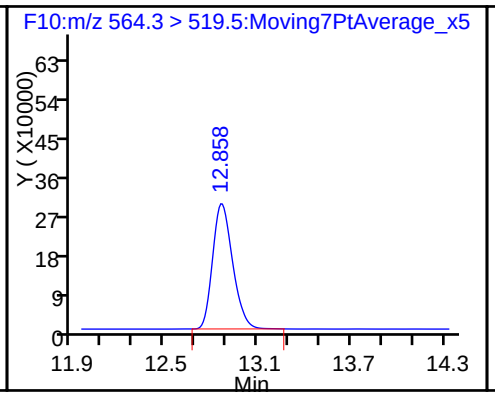
D 23 13C8 FOSA



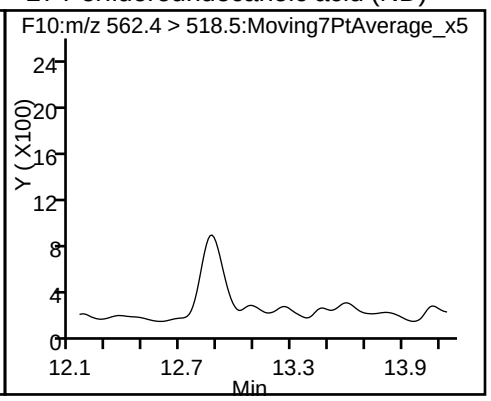
49 Perfluorodecane Sulfonic acid (ND)



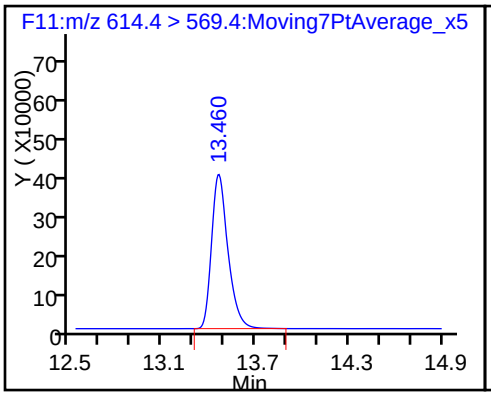
D 26 13C2 PFUnA



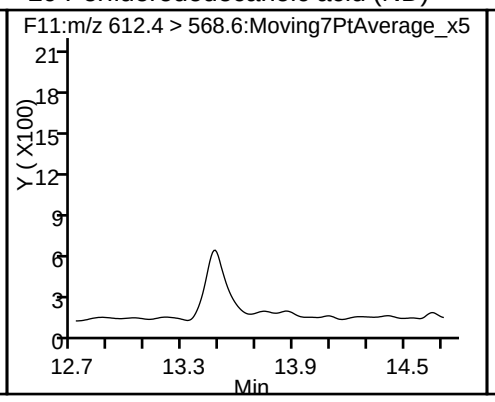
27 Perfluoroundecanoic acid (ND)



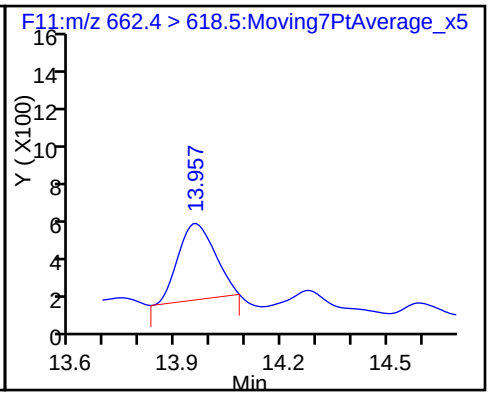
D 28 13C2 PFDoA



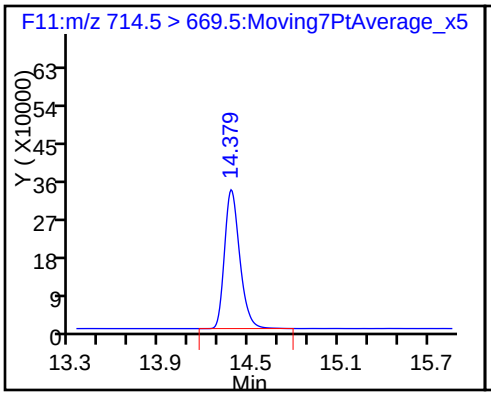
29 Perfluorododecanoic acid (ND)



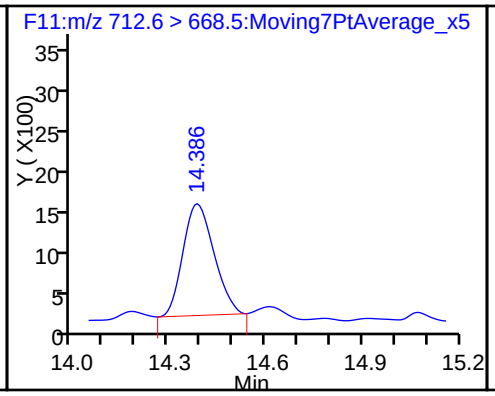
30 Perfluorotridecanoic acid



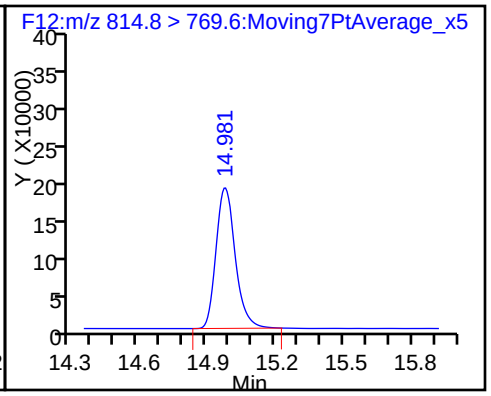
D 33 13C2-PFTeDA



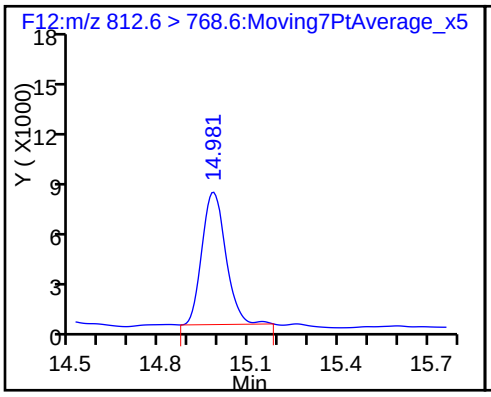
32 Perfluorotetradecanoic acid



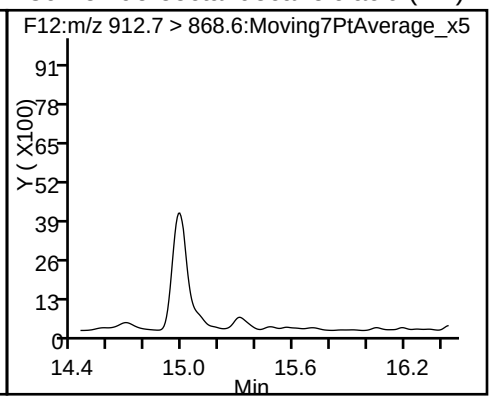
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid (ND)



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Client Sample ID: | Lab Sample ID: MB 320-100093/1-A

Matrix: Water | Lab File ID: 19FEB2016A6A_047.d

Analysis Method: WS-LC-0025 | Date Collected:

Extraction Method: 3535 | Date Extracted: 02/09/2016 10:23

Sample wt/vol: 500(mL) | Date Analyzed: 02/20/2016 06:23

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 15(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 100906 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0020	U	0.0025	0.0020	0.00080
335-67-1	Perfluorooctanoic acid (PFOA)	0.0020	U	0.0025	0.0020	0.00075
375-95-1	Perfluorononanoic acid (PFNA)	0.0020	U	0.0025	0.0020	0.00065
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0020	U	0.0025	0.0020	0.00092
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.00143	J	0.0040	0.0030	0.0013

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01892	13C4-PFHpA	103		25-150
STL00990	13C4 PFOA	101		25-150
STL00995	13C5 PFNA	103		25-150
STL00991	13C4 PFOS	92		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_047.d
Lims ID: MB 320-100093/1-A
Client ID:
Sample Type: MB
Inject. Date: 20-Feb-2016 06:23:01 ALS Bottle#: 1 Worklist Smp#: 45
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: MB 320-100093/1-A
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
Operator ID: JRB Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\PFAC_A6.m
Limit Group: LC PFC_DOD ICAL
Last Update: 22-Feb-2016 13:06:10 Calib Date: 19-Feb-2016 17:15:39
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_010.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK010

First Level Reviewer: barnettj Date: 22-Feb-2016 13:29:40

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.0 > 172.0	5.690	5.712	-0.022		796044	49.8		99.5	3613	
2 Perfluorobutyric acid										
212.9 > 169.0	5.635	5.715	-0.080	1.000	3850	0.1854			3.2	
D 3 13C5-PFPeA										
267.9 > 223.0	6.800	6.827	-0.027		1689147	54.9		110	5481	
4 Perfluoropentanoic acid										
262.9 > 219.0	6.823	6.828	-0.005	1.000	8535	0.2421			1.5	
5 Perfluorobutane Sulfonate										
298.9 > 80.0	6.924	6.939	-0.015	1.000	2554	NC			5.0	
298.9 > 99.0	6.938	6.939	-0.001	1.002	2255		1.13(0.00-0.00)		8.8	
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	6.924	6.939	-0.015	1.000	2554	0.1761				
7 Perfluorohexanoic acid										
313.0 > 269.0	8.047	8.078	-0.031	1.000	55187	1.78			69.6	
D 6 13C2 PFHxA										
315.0 > 270.0	8.047	8.080	-0.033		1431721	50.5		101	4817	
22 PFPeS (Perflouro-1-pentanesulfonat										
349.0 > 80.0	8.129	8.158	-0.029	0.872	1631	NC			9.9	
D 8 13C4-PFHpA										
367.0 > 322.0	9.285	9.322	-0.037		1588868	51.5		103	7407	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.297	9.322	-0.025	1.000	1477	0.0446			5.8	
D 11 18O2 PFHxS										
403.0 > 84.0	9.320	9.358	-0.038		690758	46.2		97.6	2532	
10 Perfluorohexane Sulfonate										
399.0 > 80.0	9.320	9.364	-0.044	1.000	16976	NC			55.3	
41 Perfluorohexanesulfonic acid										
399.0 > 80.0	9.320	9.364	-0.044	1.000	16976	1.72				

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFOA										
417.0 > 372.0	10.407	10.450	-0.043		1722358	50.4		101	6977	
D 16 13C4 PFOS										
503.0 > 80.0	11.379	11.414	-0.035		796221	43.8		91.6	2247	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.365	11.417	-0.052	1.000	11575	0.7146			37.5	
499.0 > 99.0	11.394	11.417	-0.023	1.003	6957		1.66(0.00-0.00)		21.9	
D 17 13C5 PFNA										
468.0 > 423.0	11.395	11.434	-0.039		1454345	51.6		103	3476	
D 19 13C2 PFDA										
515.0 > 470.0	12.238	12.275	-0.037		1396539	48.8		97.6	3223	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.228	12.276	-0.048	1.000	11670	0.0719			34.1	
D 23 13C8 FOSA										
506.0 > 78.0	12.787	12.810	-0.023		425415	10.3		20.5	1512	
D 26 13C2 PFUnA										
565.0 > 520.0	12.964	13.000	-0.036		1751587	46.9		93.7	4655	
27 Perfluoroundecanoic acid										
563.0 > 519.0	12.954	13.000	-0.046	1.000	30855	0.3934			116	
D 28 13C2 PFDoA										
615.0 > 570.0	13.581	13.609	-0.028		1880421	48.1		96.1	5575	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.548	14.571	-0.023	1.000	15510	0.2234			7.8	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.542	14.571	-0.029		1428562	39.8		79.6	5027	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.178	15.207	-0.029		1657995	38.5		76.9	4788	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.178	15.208	-0.030	1.000	134780	0.7895			194	
36 Perfluorooctandecanoic acid										
913.0 > 869.0	15.524	15.543	-0.019	1.000	1666	0.0399			4.1	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Report Date: 22-Feb-2016 13:29:41 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_047.d

Injection Date: 20-Feb-2016 06:23:01 Instrument ID: A6

Lims ID: MB 320-100093/1-A

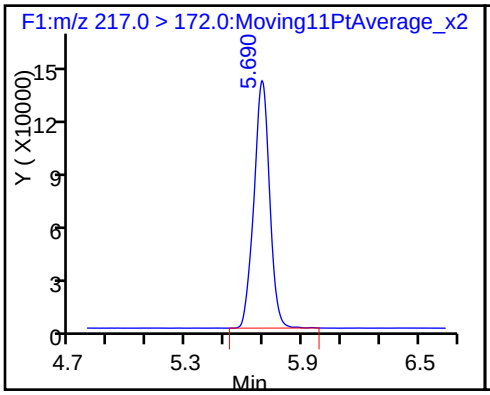
Client ID:

Operator ID: JRB ALS Bottle#: 1 Worklist Smp#: 45

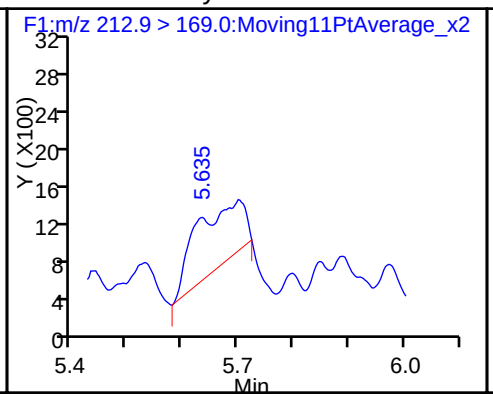
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

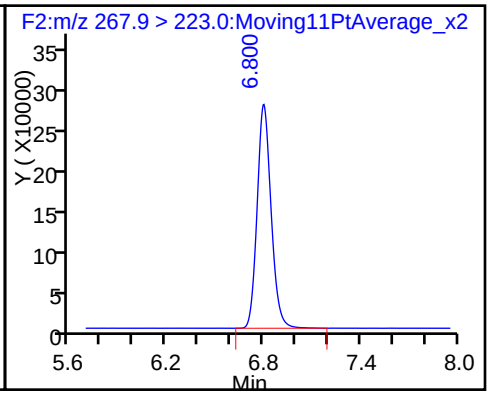
D 1 13C4 PFBA



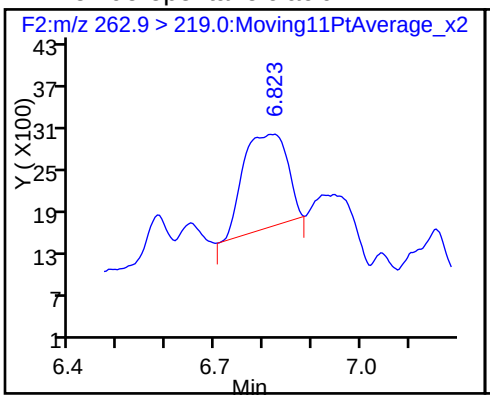
2 Perfluorobutyric acid



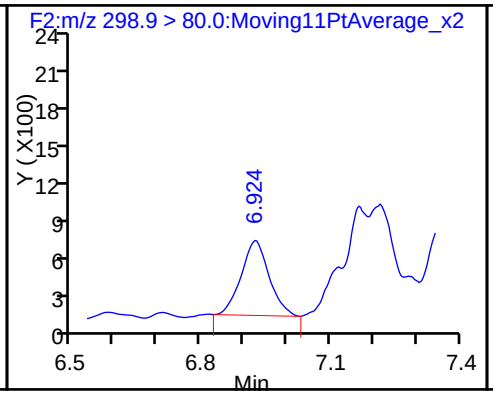
D 3 13C5-PFPeA



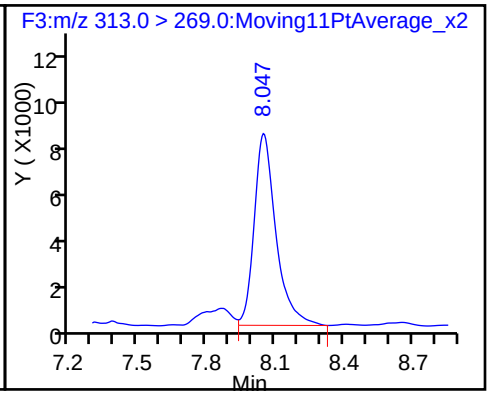
4 Perfluoropentanoic acid



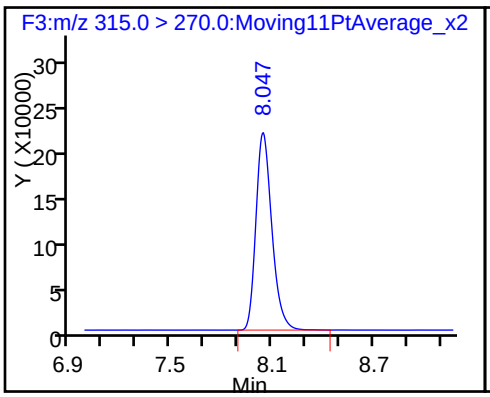
40 Perfluorobutanesulfonic acid



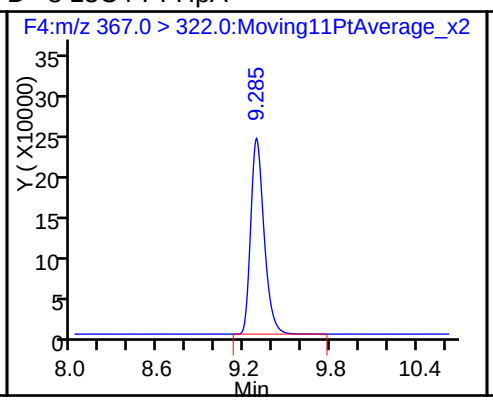
7 Perfluorohexanoic acid



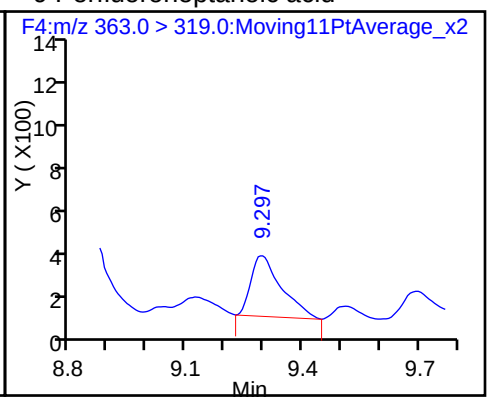
D 6 13C2 PFHxA



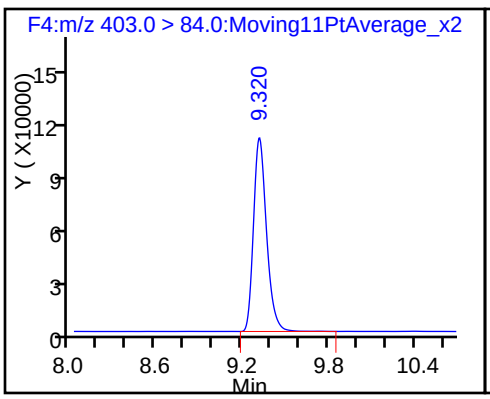
D 8 13C4-PFHpA



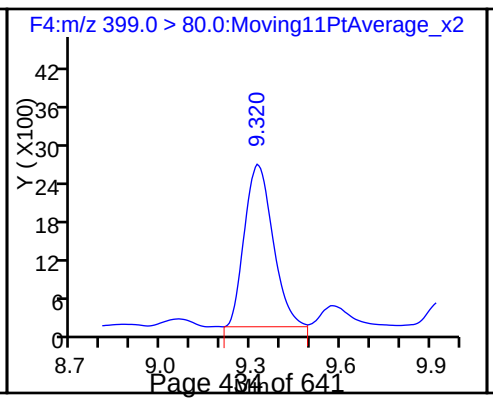
9 Perfluoroheptanoic acid



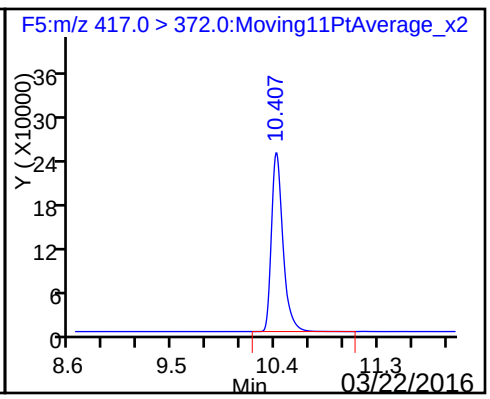
D 11 18O2 PFHxS



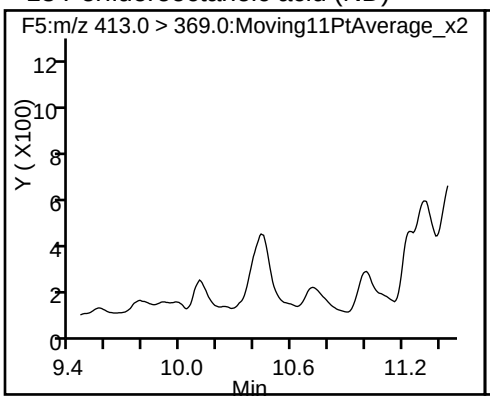
41 Perfluorohexanesulfonic acid



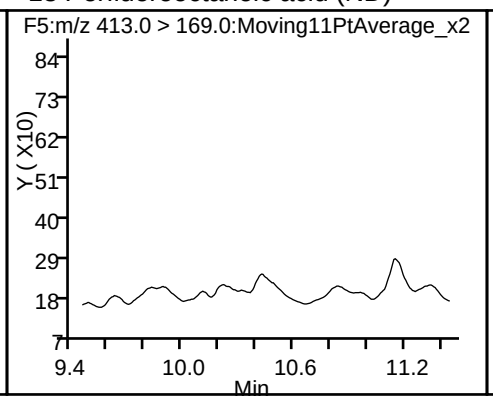
D 12 13C4 PFOA



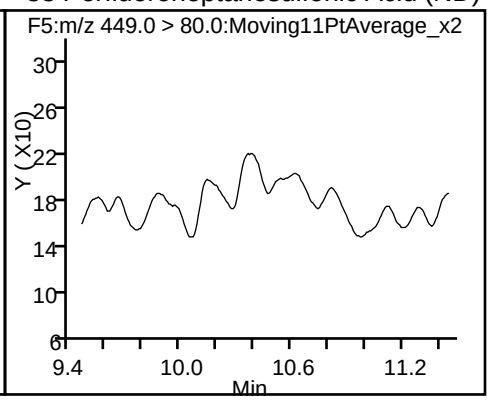
13 Perfluorooctanoic acid (ND)



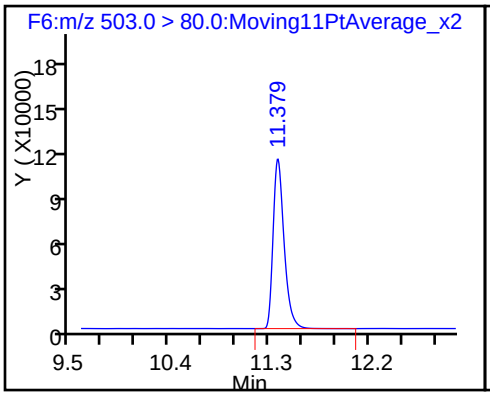
13 Perfluorooctanoic acid (ND)



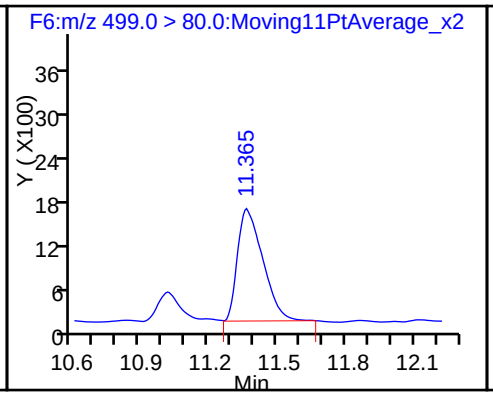
38 Perfluoroheptanesulfonic Acid (ND)



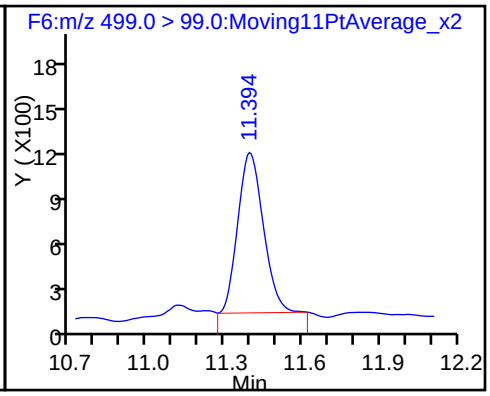
D 16 13C4 PFOS



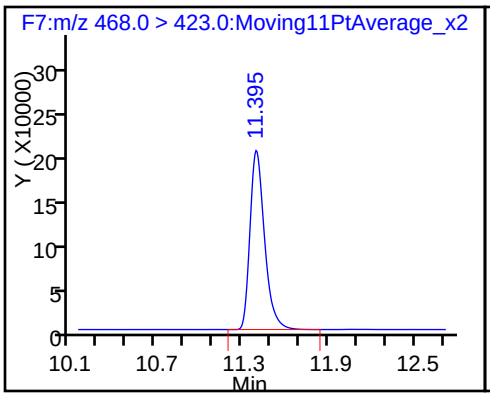
15 Perfluorooctane sulfonic acid



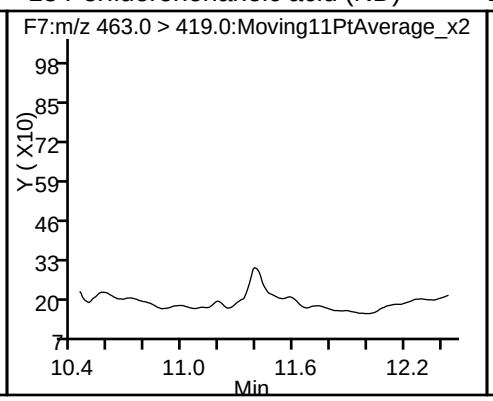
15 Perfluorooctane sulfonic acid



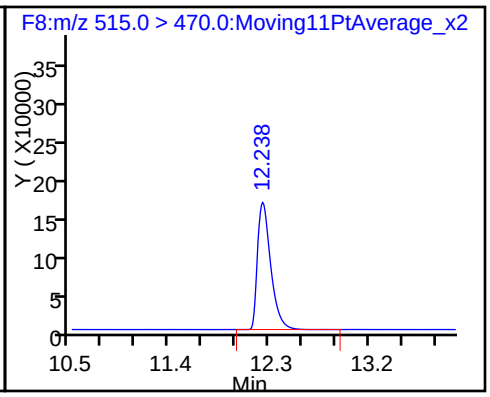
D 17 13C5 PFNA



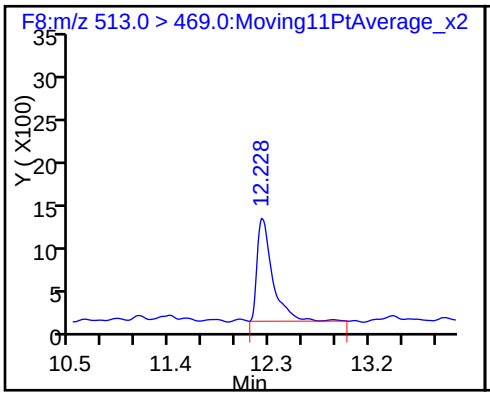
18 Perfluorononanoic acid (ND)



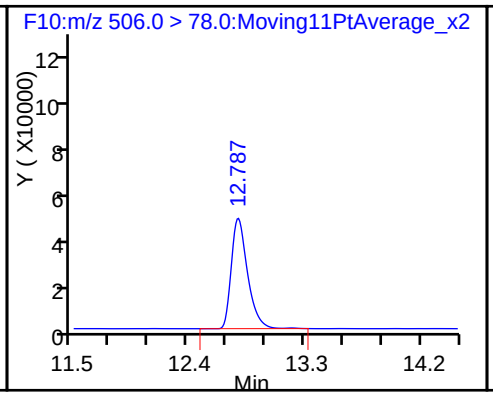
D 19 13C2 PFDA



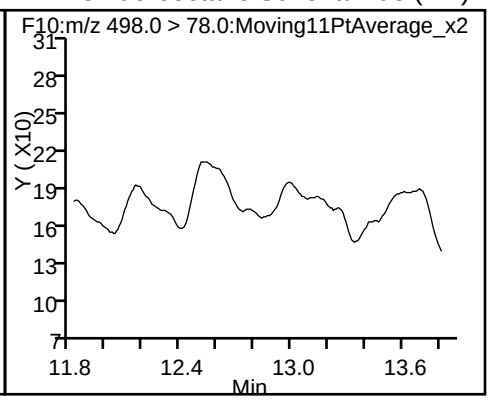
20 Perfluorodecanoic acid



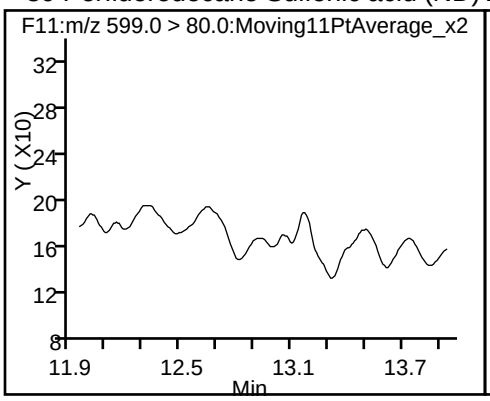
D 23 13C8 FOSA



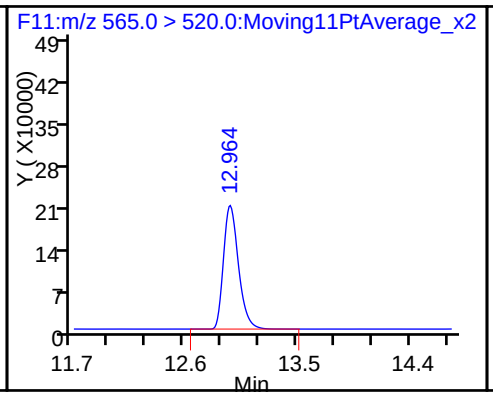
24 Perfluorooctane Sulfonamide (ND)



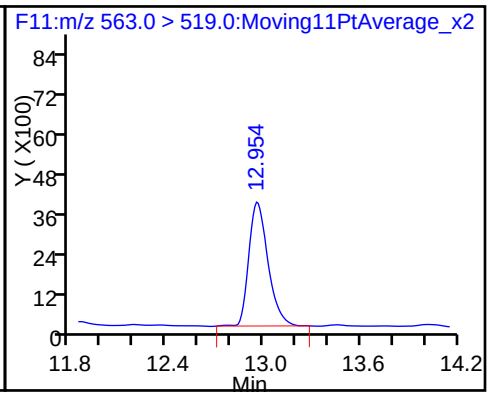
39 Perfluorodecane Sulfonic acid (ND)



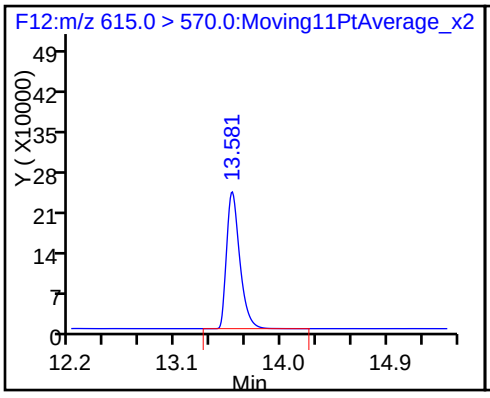
D 26 13C2 PFUnA



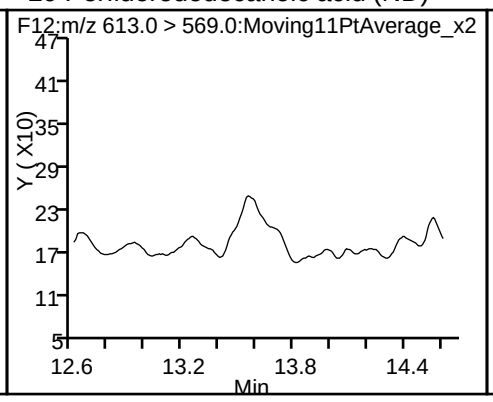
27 Perfluoroundecanoic acid



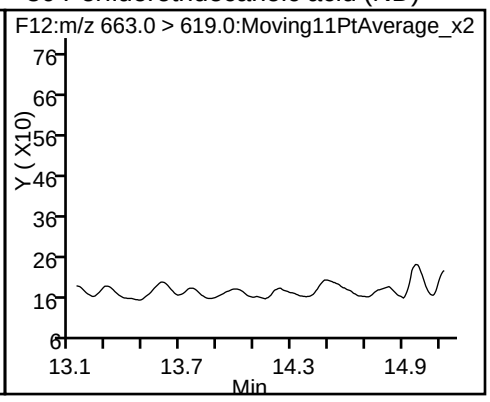
D 28 13C2 PFDoA



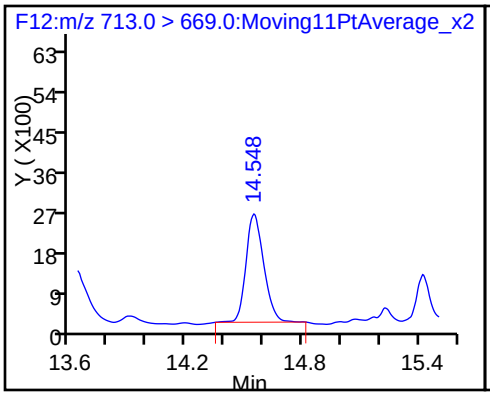
29 Perfluorododecanoic acid (ND)



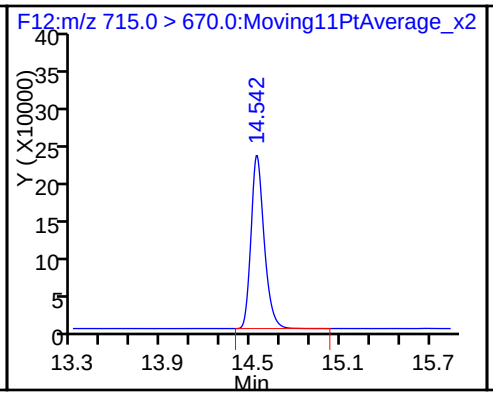
30 Perfluorotridecanoic acid (ND)



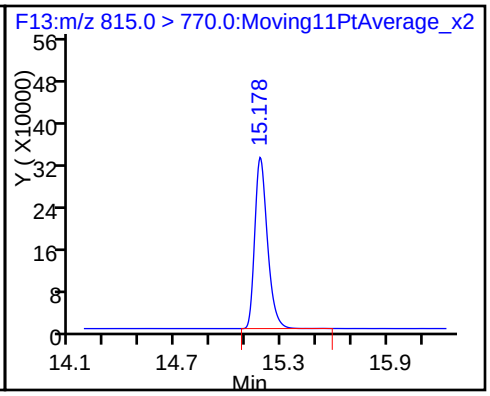
32 Perfluorotetradecanoic acid



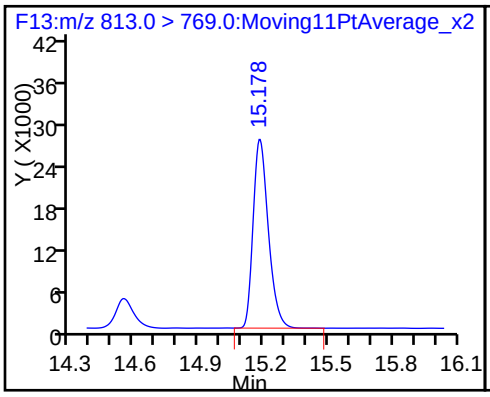
D 33 13C2-PFTeDA



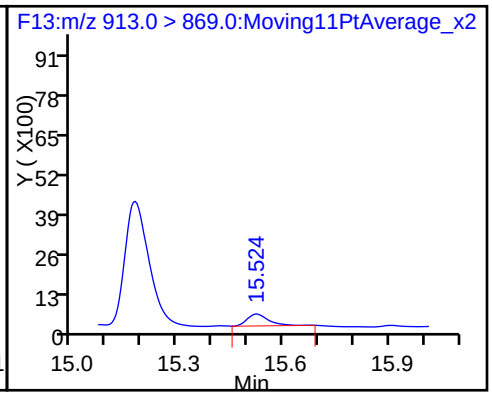
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Client Sample ID: | Lab Sample ID: MB 320-100147/1-A

Matrix: Water | Lab File ID: 19FEB2016A6A_061.d

Analysis Method: WS-LC-0025 | Date Collected:

Extraction Method: 3535 | Date Extracted: 02/10/2016 07:14

Sample wt/vol: 500(mL) | Date Analyzed: 02/20/2016 11:20

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 15(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 100906 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0020	U	0.0025	0.0020	0.00080
335-67-1	Perfluorooctanoic acid (PFOA)	0.0020	U	0.0025	0.0020	0.00075
375-95-1	Perfluorononanoic acid (PFNA)	0.0020	U	0.0025	0.0020	0.00065
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0020	U	0.0025	0.0020	0.00092
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.0020	U	0.0025	0.0020	0.00087
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0030	U	0.0040	0.0030	0.0013

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01892	13C4-PFHpA	118		25-150
STL00990	13C4 PFOA	114		25-150
STL00995	13C5 PFNA	118		25-150
STL00994	18O2 PFHxS	97		25-150
STL00991	13C4 PFOS	98		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_061.d
Lims ID: MB 320-100147/1-A
Client ID:
Sample Type: MB
Inject. Date: 20-Feb-2016 11:20:12 ALS Bottle#: 14 Worklist Smp#: 59
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: MB 320-100147/1-A
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
Operator ID: JRB Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\PFAC_A6.m
Limit Group: LC PFC_DOD ICAL
Last Update: 22-Feb-2016 13:06:10 Calib Date: 19-Feb-2016 17:15:39
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_010.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK010

First Level Reviewer: barnettj Date: 22-Feb-2016 13:18:17

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.0 > 172.0	5.697	5.712	-0.015		822677	51.4		103	3372	
D 3 13C5-PFPeA										
267.9 > 223.0	6.813	6.827	-0.014		1784267	58.0		116	6089	
4 Perfluoropentanoic acid										
262.9 > 219.0	6.846	6.828	0.018	1.000	1205	0.0324			0.6	
5 Perfluorobutane Sulfonate										
298.9 > 80.0	7.164	6.939	0.225	1.000	3607	NC			8.7	
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	7.164	6.939	0.225	1.000	3607	0.2490				
7 Perfluorohexanoic acid										
313.0 > 269.0	8.049	8.078	-0.029	1.000	7122	0.2144			28.7	
D 6 13C2 PFHxA										
315.0 > 270.0	8.066	8.080	-0.014		1533227	54.1		108	4338	
D 8 13C4-PFHpA										
367.0 > 322.0	9.299	9.322	-0.023		1824111	59.2		118	8633	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.288	9.322	-0.034	1.000	2422	0.0637			7.9	
D 11 18O2 PFHxS										
403.0 > 84.0	9.335	9.358	-0.023		690169	46.1		97.5	2530	
10 Perfluorohexane Sulfonate										
399.0 > 80.0	9.276	9.364	-0.088	1.000	300	NC			1.3	
41 Perfluorohexanesulfonic acid										
399.0 > 80.0	9.276	9.364	-0.088	1.000	300	0.0304				
D 12 13C4 PFOA										
417.0 > 372.0	10.426	10.450	-0.024		1947965	57.1		114	6865	
D 16 13C4 PFOS										
503.0 > 80.0	11.392	11.414	-0.022		852270	46.9		98.1	3706	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 17 13C5 PFNA										
468.0 > 423.0	11.415	11.434	-0.019		1658130	58.8		118	6278	
D 19 13C2 PFDA										
515.0 > 470.0	12.255	12.275	-0.020		1710616	59.7		119	4388	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.255	12.276	-0.021	1.000	12471	0.0172			44.1	
D 23 13C8 FOSA										
506.0 > 78.0	12.804	12.810	-0.006		554432	13.4		26.7	1148	
D 26 13C2 PFUnA										
565.0 > 520.0	12.980	13.000	-0.020		2089226	55.9		112	4731	
27 Perfluoroundecanoic acid										
563.0 > 519.0	12.980	13.000	-0.020	1.000	25268	0.0582			60.4	
D 28 13C2 PFDoA										
615.0 > 570.0	13.587	13.609	-0.022		2322857	59.4		119	5786	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.552	14.571	-0.019	1.000	16305	0.1205			6.6	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.552	14.571	-0.019		1865148	52.0		104	6265	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.182	15.207	-0.025		2228972	51.7		103	6252	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.182	15.208	-0.026	1.000	177273	1.01			251	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Report Date: 22-Feb-2016 13:18:19 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_061.d

Injection Date: 20-Feb-2016 11:20:12 Instrument ID: A6

Lims ID: MB 320-100147/1-A

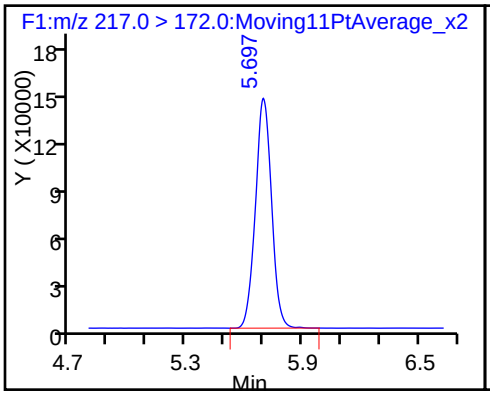
Client ID:

Operator ID: JRB ALS Bottle#: 14 Worklist Smp#: 59

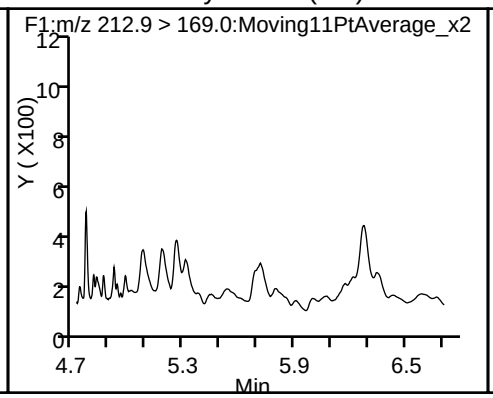
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

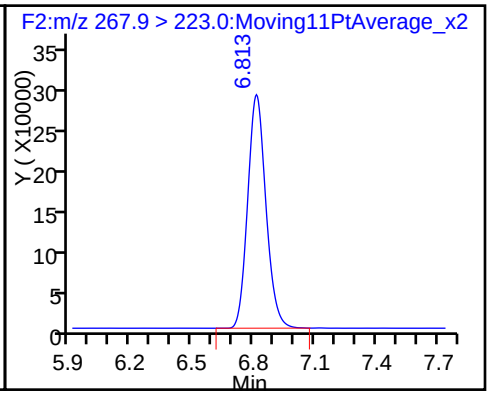
D 1 13C4 PFBA



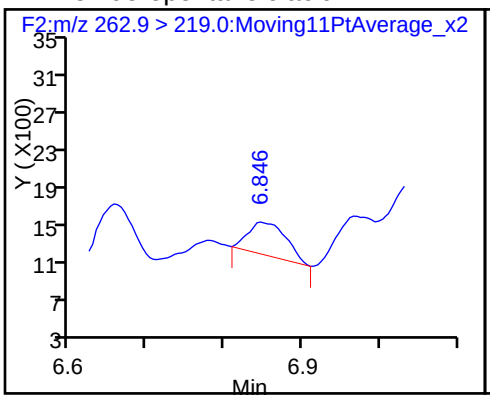
2 Perfluorobutyric acid (ND)



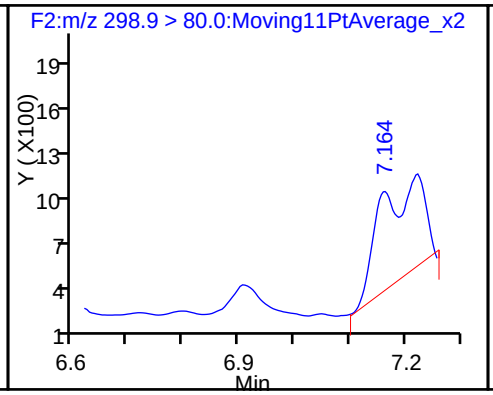
D 3 13C5-PFPeA



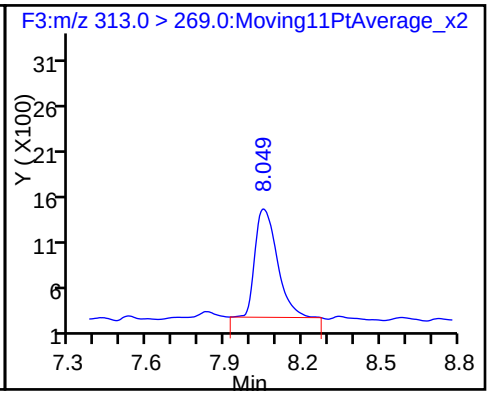
4 Perfluoropentanoic acid



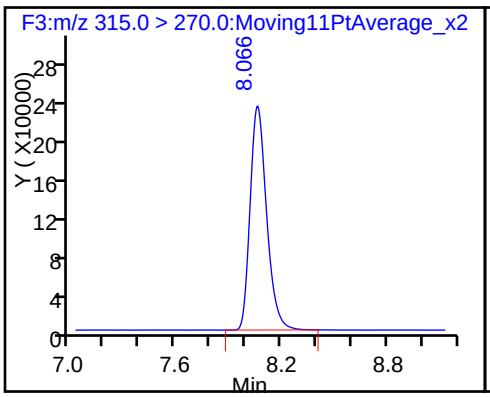
40 Perfluorobutanesulfonic acid



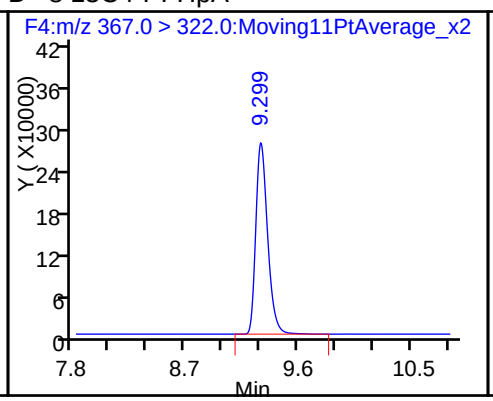
7 Perfluorohexanoic acid



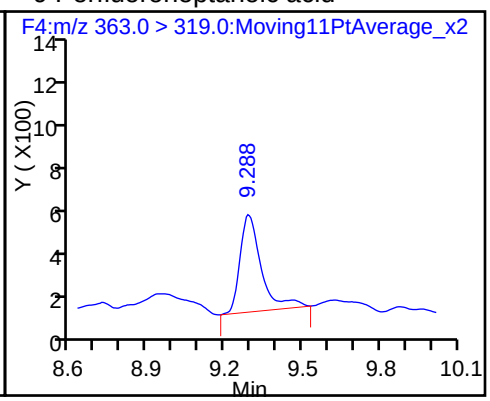
D 6 13C2 PFHxA



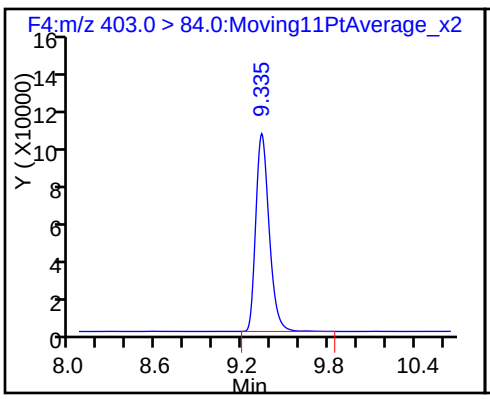
D 8 13C4-PFHpA



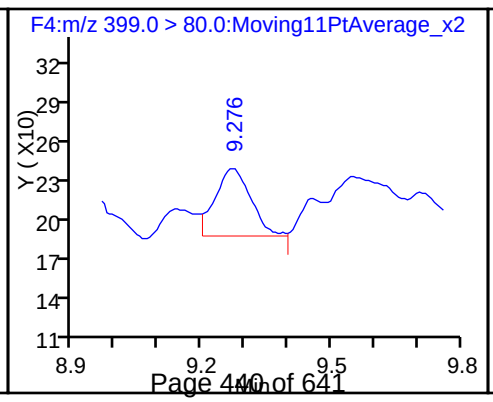
9 Perfluoroheptanoic acid



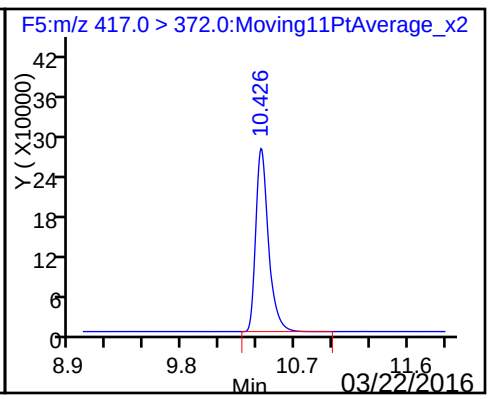
D 11 18O2 PFHxS



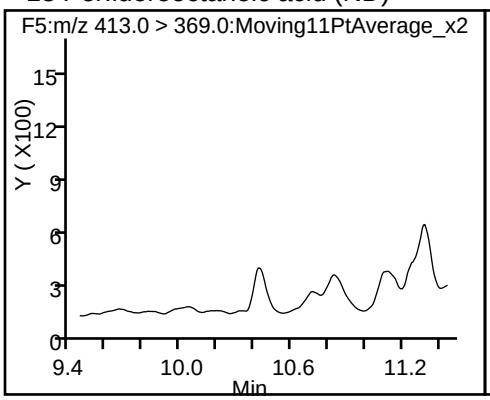
41 Perfluorohexanesulfonic acid



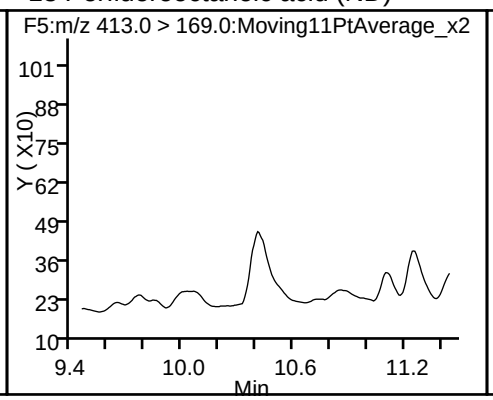
D 12 13C4 PFOA



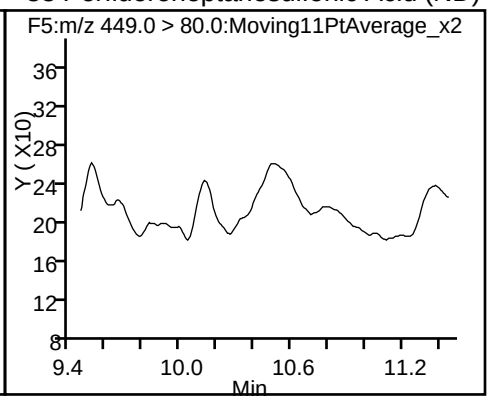
13 Perfluorooctanoic acid (ND)



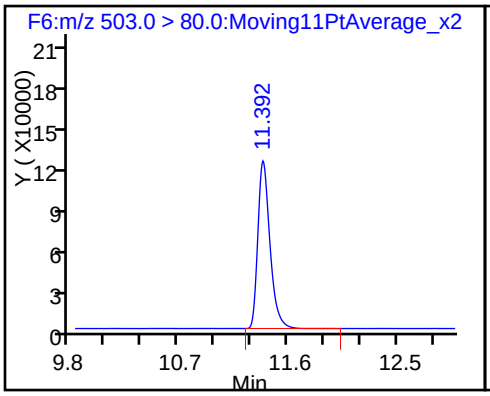
13 Perfluorooctanoic acid (ND)



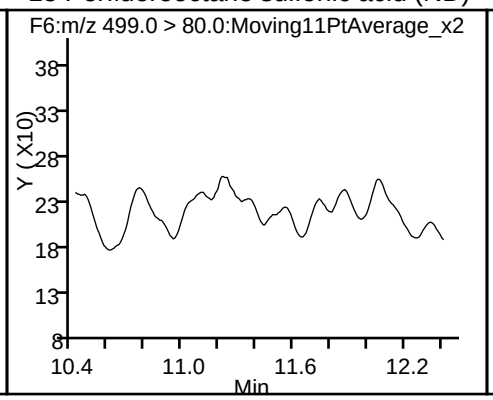
38 Perfluoroheptanesulfonic Acid (ND)



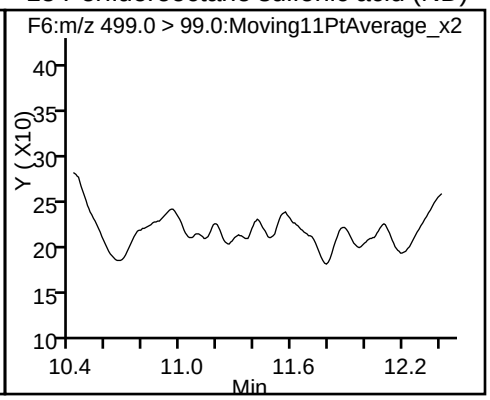
D 16 13C4 PFOS



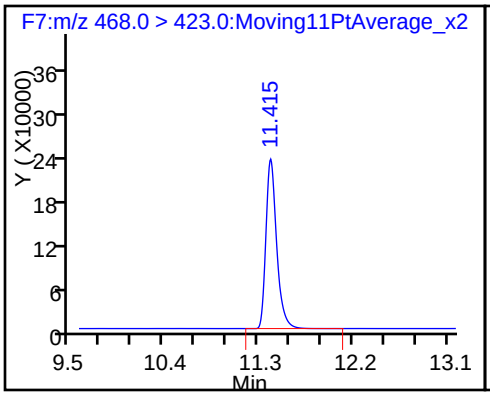
15 Perfluorooctane sulfonic acid (ND)



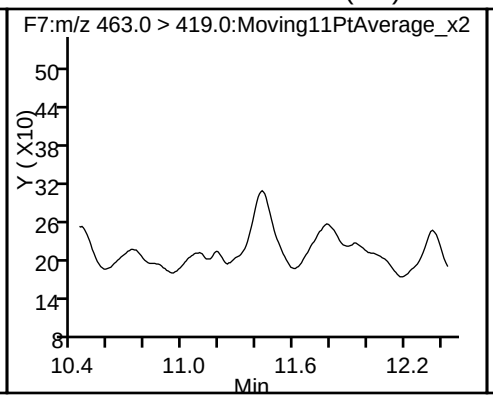
15 Perfluorooctane sulfonic acid (ND)



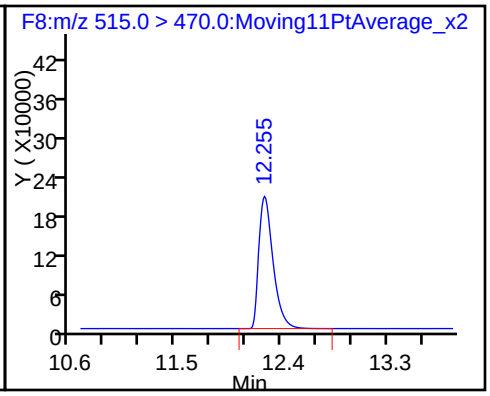
D 17 13C5 PFNA



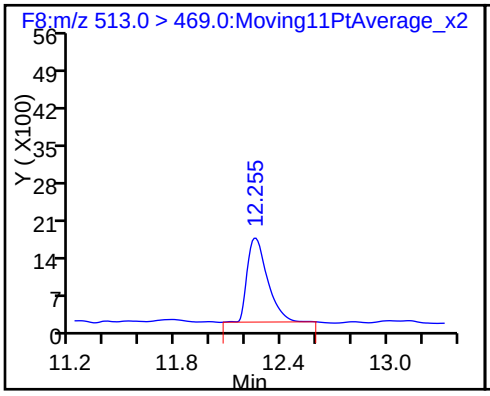
18 Perfluorononanoic acid (ND)



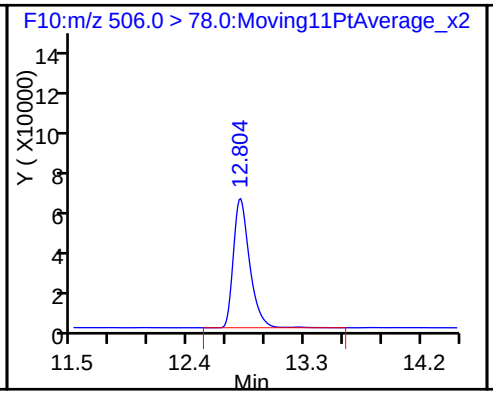
D 19 13C2 PFDA



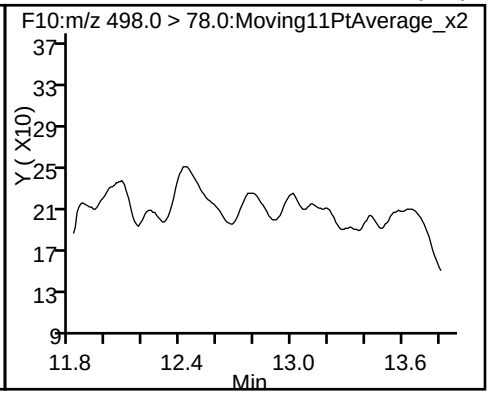
20 Perfluorodecanoic acid



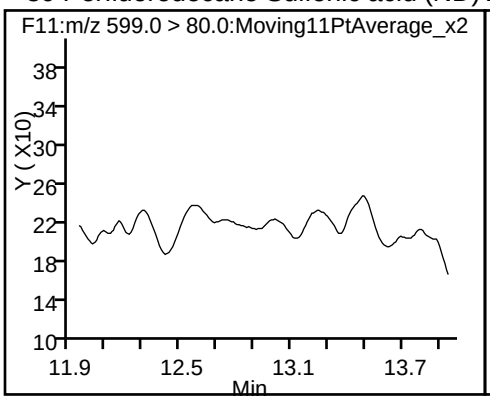
D 23 13C8 FOSA



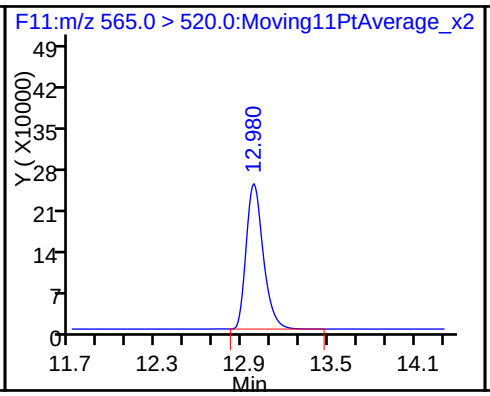
24 Perfluorooctane Sulfonamide (ND)



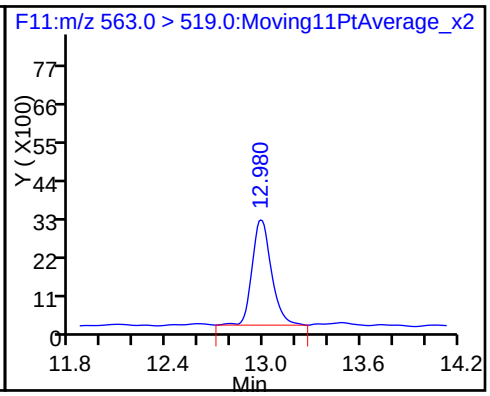
39 Perfluorodecane Sulfonic acid (ND)



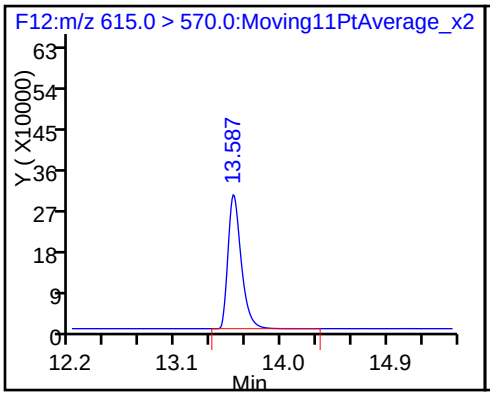
D 26 13C2 PFUnA



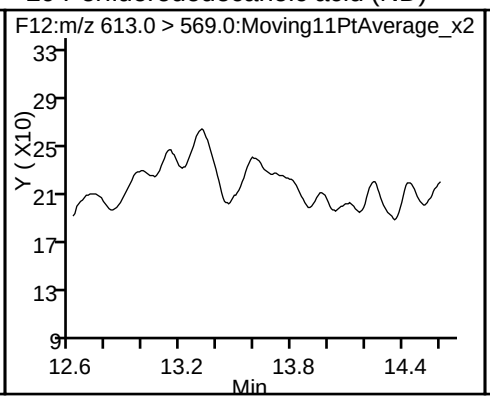
27 Perfluoroundecanoic acid



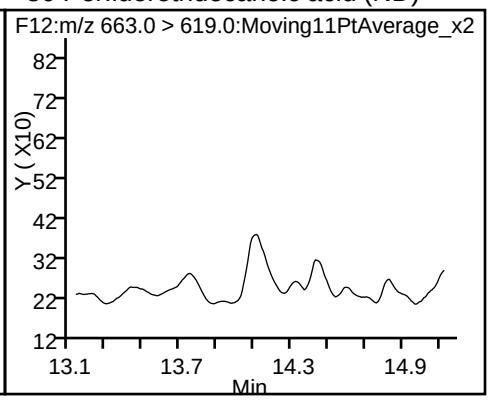
D 28 13C2 PFDoA



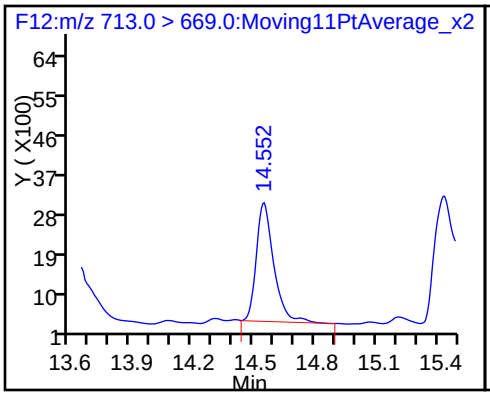
29 Perfluorododecanoic acid (ND)



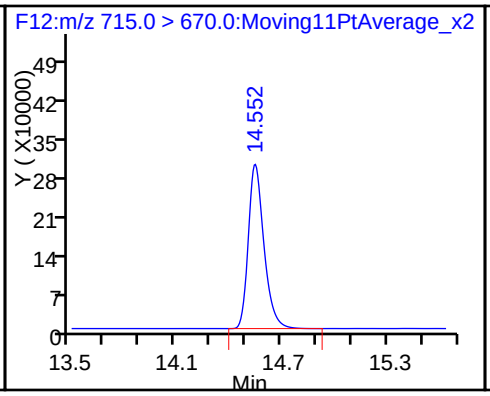
30 Perfluorotridecanoic acid (ND)



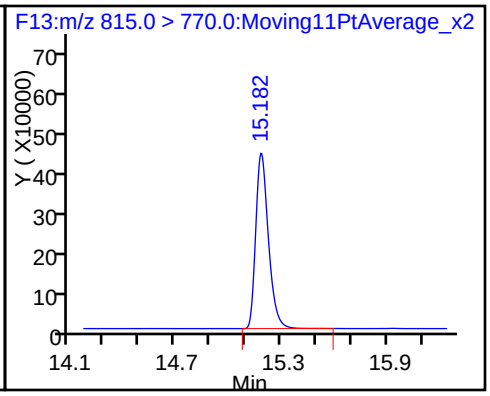
32 Perfluorotetradecanoic acid



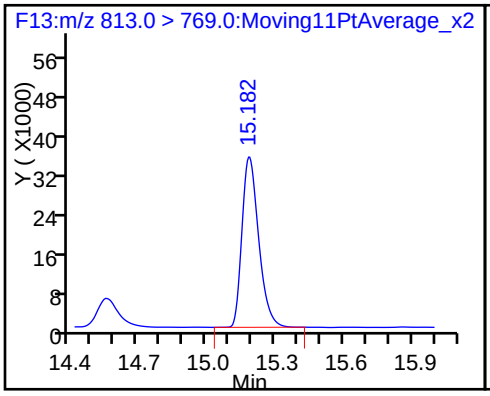
D 33 13C2-PFTeDA



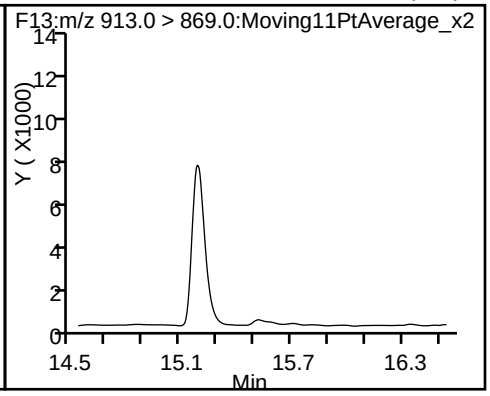
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid (ND)



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Client Sample ID: | Lab Sample ID: LCS 320-100093/2-A

Matrix: Water | Lab File ID: 19FEB2016A6A_048.d

Analysis Method: WS-LC-0025 | Date Collected:

Extraction Method: 3535 | Date Extracted: 02/09/2016 10:23

Sample wt/vol: 500(mL) | Date Analyzed: 02/20/2016 06:44

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 15(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 100906 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0513		0.0025	0.0020	0.00080
335-67-1	Perfluorooctanoic acid (PFOA)	0.0485		0.0025	0.0020	0.00075
375-95-1	Perfluorononanoic acid (PFNA)	0.0537		0.0025	0.0020	0.00065
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0459		0.0025	0.0020	0.00092
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.0480		0.0025	0.0020	0.00087
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0515		0.0040	0.0030	0.0013

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01892	13C4-PFHpA	95		25-150
STL00990	13C4 PFOA	95		25-150
STL00995	13C5 PFNA	98		25-150
STL00994	18O2 PFHxS	90		25-150
STL00991	13C4 PFOS	82		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_048.d
Lims ID: LCS 320-100093/2-A
Client ID:
Sample Type: LCS
Inject. Date: 20-Feb-2016 06:44:15 ALS Bottle#: 2 Worklist Smp#: 46
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: LCS 320-100093/2-A
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
Operator ID: JRB Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\PFAC_A6.m
Limit Group: LC PFC_DOD ICAL
Last Update: 22-Feb-2016 13:06:10 Calib Date: 19-Feb-2016 17:15:39
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_010.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK010

First Level Reviewer: westendorfc Date: 21-Feb-2016 15:38:20

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.0 > 172.0	5.697	5.712	-0.015		758399	47.4		94.8	3128	
2 Perfluorobutyric acid										
212.9 > 169.0	5.697	5.715	-0.018	1.000	480442	24.3		121	892	
D 3 13C5-PFPeA										
267.9 > 223.0	6.805	6.827	-0.022		1590400	51.7		103	5164	
4 Perfluoropentanoic acid										
262.9 > 219.0	6.809	6.828	-0.019	1.000	770505	23.2		116	224	
5 Perfluorobutane Sulfonate										
298.9 > 80.0	6.924	6.939	-0.015	1.000	306961	NC			348	
298.9 > 99.0	6.924	6.939	-0.015	1.000	166428		1.84(0.00-0.00)		290	
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	6.924	6.939	-0.015	1.000	306961	22.9		130		
7 Perfluorohexanoic acid										
313.0 > 269.0	8.055	8.078	-0.023	1.000	727454	25.3		127	1385	
D 6 13C2 PFHxA										
315.0 > 270.0	8.055	8.080	-0.025		1326503	46.8		93.7	4748	
22 PFPeS (Perflouro-1-pentanesulfonat										
349.0 > 80.0	8.131	8.158	-0.027	0.872	239493	NC			932	
D 8 13C4-PFHpA										
367.0 > 322.0	9.288	9.322	-0.034		1471383	47.7		95.5	4291	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.294	9.322	-0.028	1.000	787432	25.7		128	3152	
D 11 18O2 PFHxS										
403.0 > 84.0	9.323	9.358	-0.035		637656	42.6		90.1	3184	
10 Perfluorohexane Sulfonate										
399.0 > 80.0	9.323	9.364	-0.041	1.000	218573	NC			829	
41 Perfluorohexanesulfonic acid										
399.0 > 80.0	9.323	9.364	-0.041	1.000	218573	24.0		127		

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFOA										
417.0 > 372.0	10.419	10.450	-0.031		1613824	47.3		94.5	6332	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.419	10.450	-0.031	1.000	785558	24.2		121	1043	
413.0 > 169.0	10.419	10.450	-0.031	1.000	236834		3.32(0.00-0.00)		760	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.419	10.457	-0.038	1.000	252668	NC			1450	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.419	10.457	-0.038	1.000	252668	27.4		144		
D 16 13C4 PFOS										
503.0 > 80.0	11.385	11.414	-0.029		711939	39.2		81.9	3408	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.385	11.417	-0.032	1.000	373063	25.8		135	880	
499.0 > 99.0	11.385	11.417	-0.032	1.000	211135		1.77(0.00-0.00)		669	
D 17 13C5 PFNA										
468.0 > 423.0	11.401	11.434	-0.033		1374538	48.8		97.5	6797	
18 Perfluorononanoic acid										
463.0 > 419.0	11.408	11.439	-0.031	1.000	596415	26.9		134	1966	
21 PFNS (Perflouro-1-nonanesulfonate)										
549.0 > 80.0	12.203	12.249	-0.046	1.000	212396	NC			888	
D 19 13C2 PFDA										
515.0 > 470.0	12.245	12.275	-0.030		1265366	44.2		88.4	5404	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.245	12.276	-0.031	1.000	649916	26.0		130	2595	
D 23 13C8 FOSA										
506.0 > 78.0	12.793	12.810	-0.017		165922	4.00		8.0	445	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.793	12.812	-0.019	1.000	58737	19.1		95.5	196	
25 Perfluorodecane Sulfonate										
599.0 > 80.0	12.919	12.949	-0.030	1.000	211472	NC			820	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	12.919	12.949	-0.030	1.000	211472	25.8		134		
D 26 13C2 PFUnA										
565.0 > 520.0	12.970	13.000	-0.030		1646373	44.0		88.1	4319	
27 Perfluoroundecanoic acid										
563.0 > 519.0	12.970	13.000	-0.030	1.000	708085	25.4		127	2414	
D 28 13C2 PFDoA										
615.0 > 570.0	13.578	13.609	-0.031		1801826	46.1		92.1	5300	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.578	13.611	-0.033	1.000	663674	25.2		126	894	
31 PFDoS (Perflouro-1-dodecanesulfona										
699.0 > 80.0	14.048	14.083	-0.035	1.000	215474	NC			709	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.101	14.130	-0.029	1.000	859635	25.4		127	1189	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.546	14.571	-0.025	1.000	471466	21.5		107	292	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.539	14.571	-0.032		1400557	39.0		78.0	3533	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 35 13C2-PFHxDA										
815.0 > 770.0	15.183	15.207	-0.024		1666171	38.7		77.3	4296	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.183	15.208	-0.025	1.000	958744	22.3		111	1477	
36 Perfluorooctandecanoic acid										
913.0 > 869.0	15.514	15.543	-0.029	1.000	873096	21.8		109	1349	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Report Date: 22-Feb-2016 13:08:00 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_048.d

Injection Date: 20-Feb-2016 06:44:15 Instrument ID: A6

Lims ID: LCS 320-100093/2-A

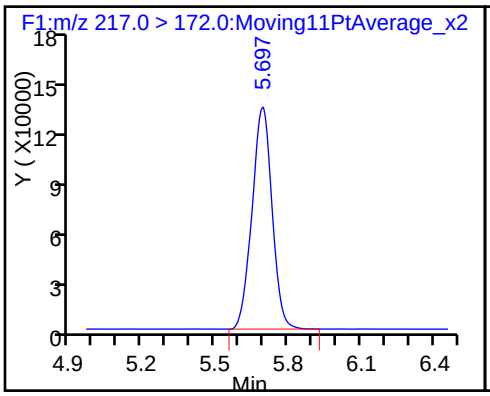
Client ID:

Operator ID: JRB ALS Bottle#: 2 Worklist Smp#: 46

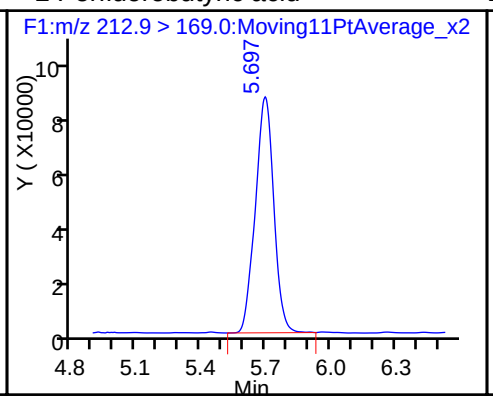
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

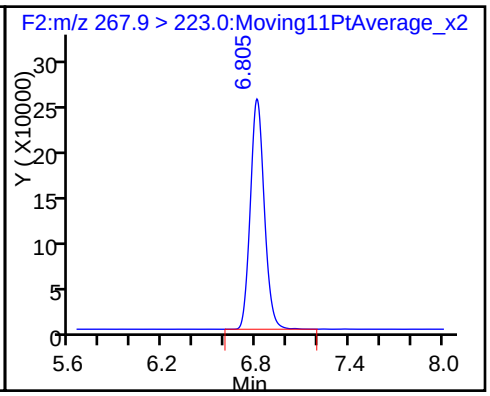
D 1 13C4 PFBA



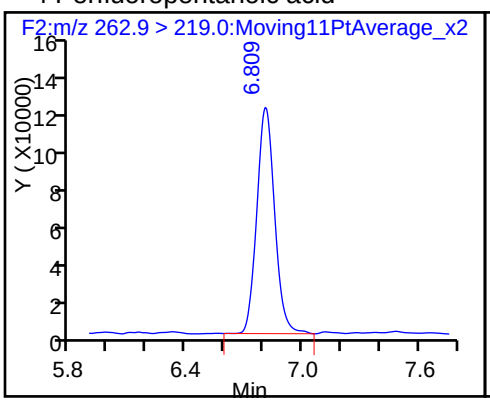
2 Perfluorobutyric acid



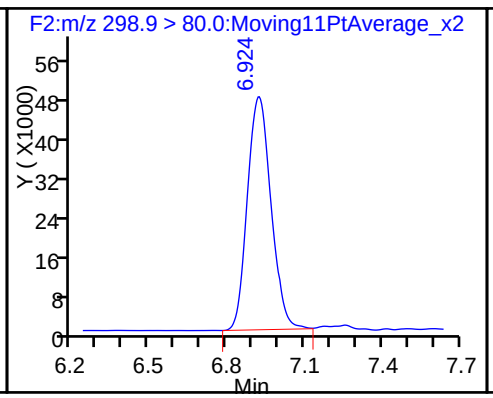
D 3 13C5-PFPeA



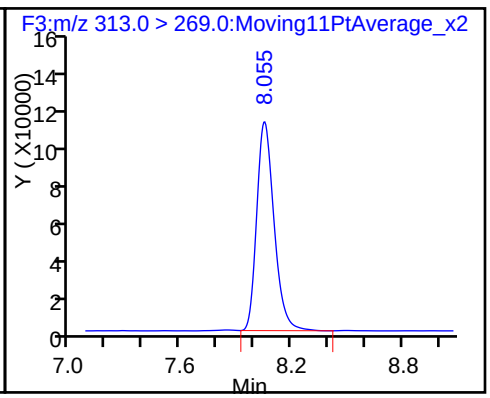
4 Perfluoropentanoic acid



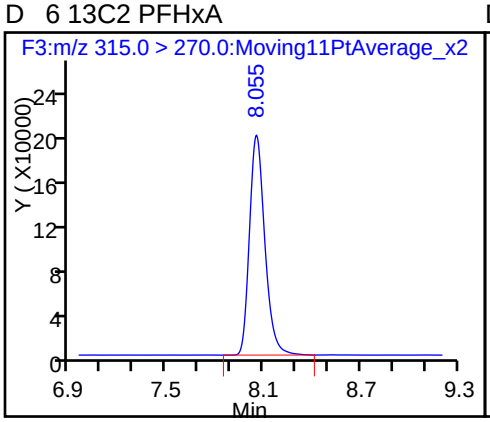
40 Perfluorobutanesulfonic acid



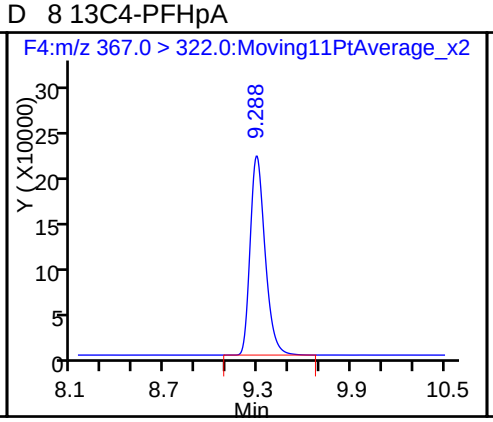
7 Perfluorohexanoic acid



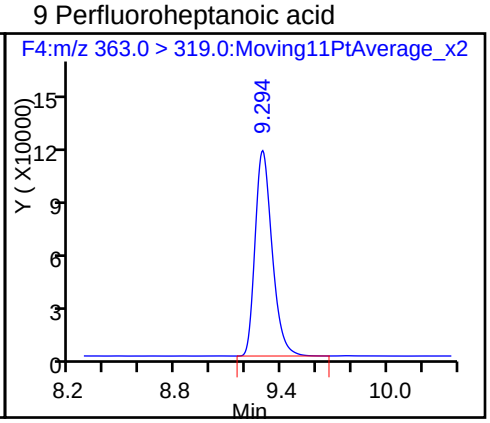
D 6 13C2 PFHxA



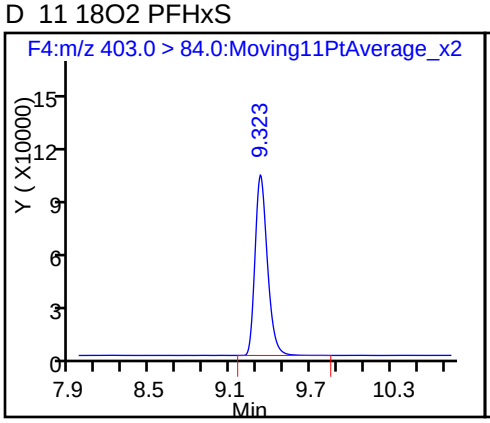
D 8 13C4-PFHpA



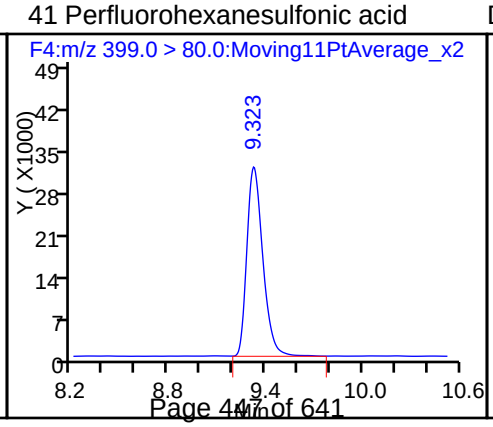
9 Perfluoroheptanoic acid



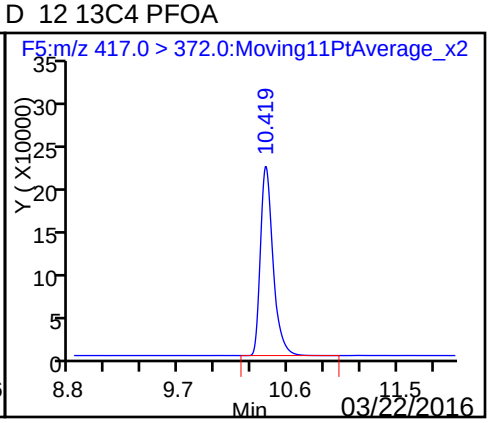
D 11 18O2 PFHxS



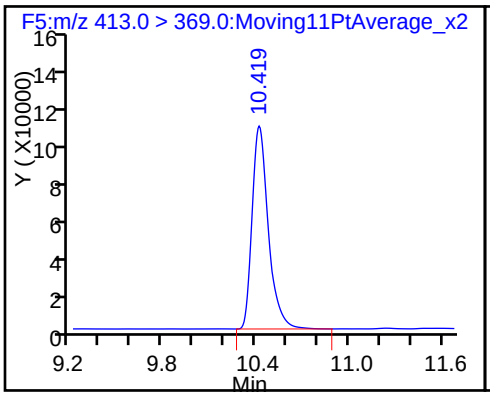
41 Perfluorohexanesulfonic acid



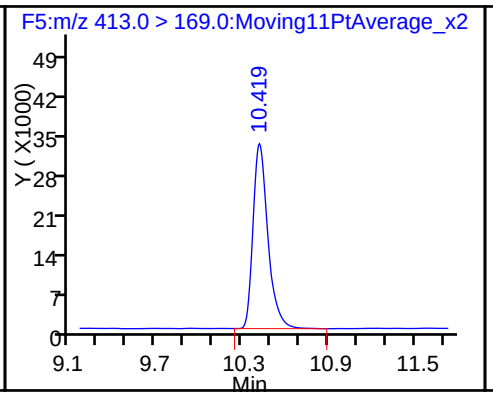
D 12 13C4 PFOA



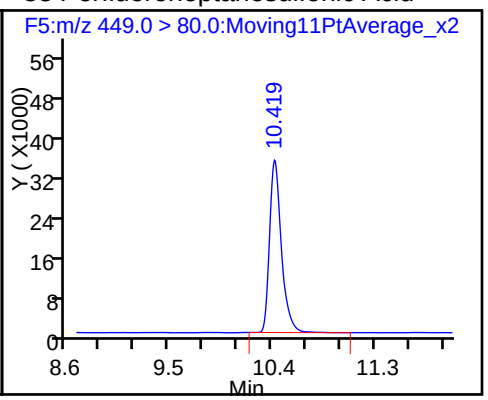
13 Perfluorooctanoic acid



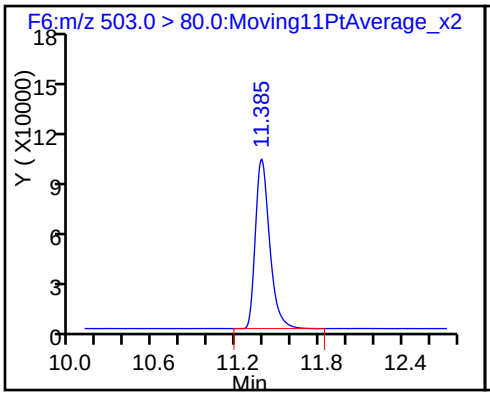
13 Perfluorooctanoic acid



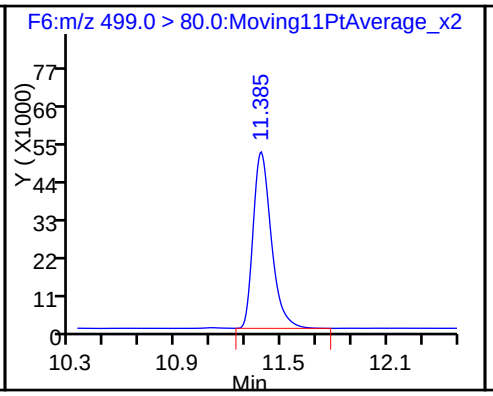
38 Perfluoroheptanesulfonic Acid



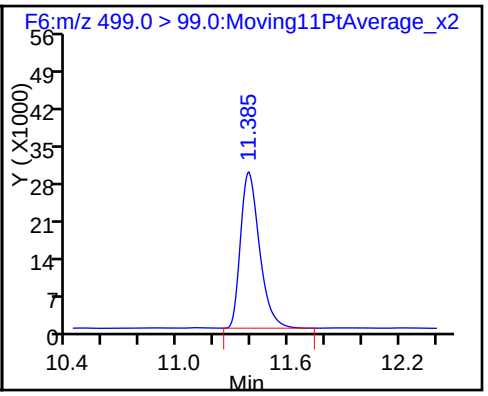
D 16 13C4 PFOS



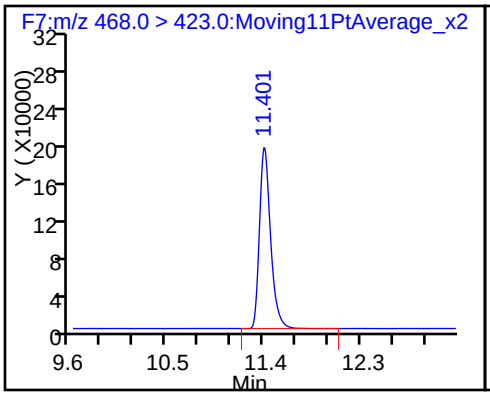
15 Perfluorooctane sulfonic acid



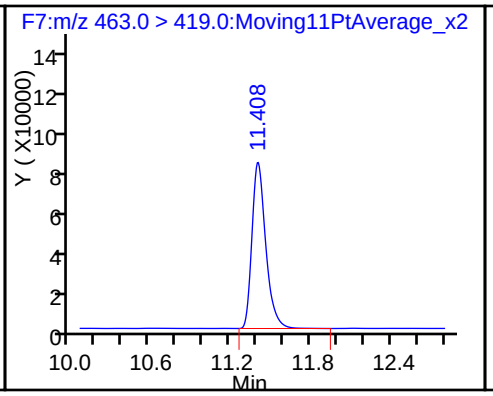
15 Perfluorooctane sulfonic acid



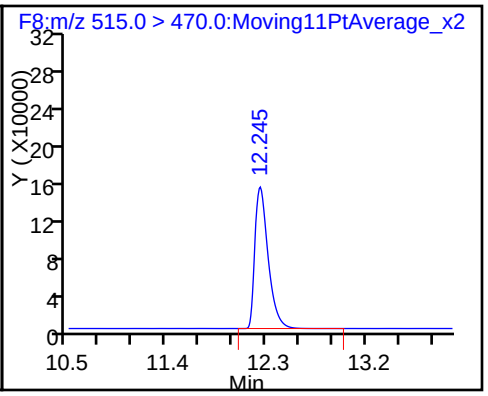
D 17 13C5 PFNA



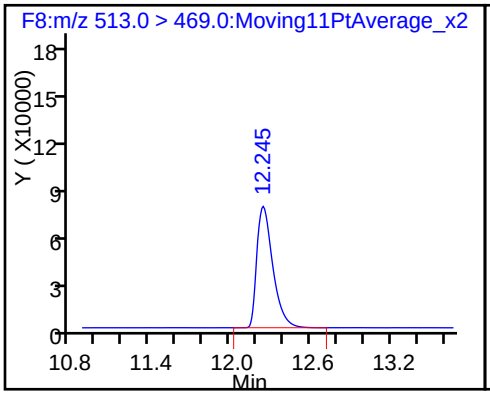
18 Perfluorononanoic acid



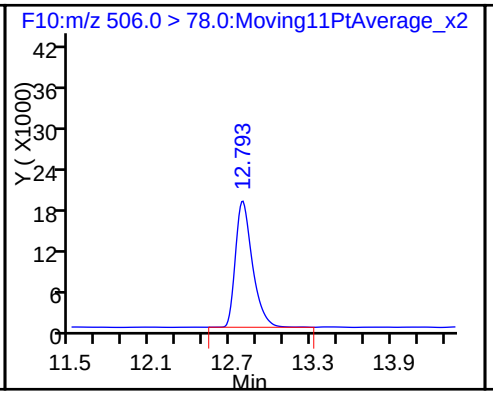
D 19 13C2 PFDA



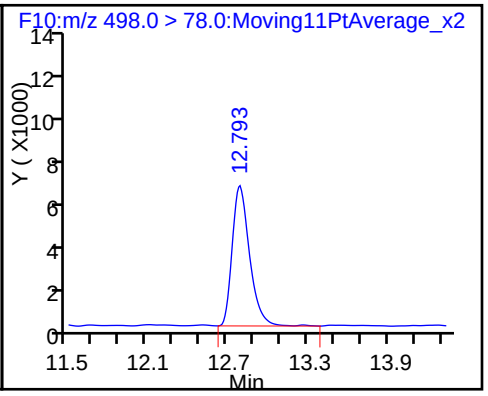
20 Perfluorodecanoic acid



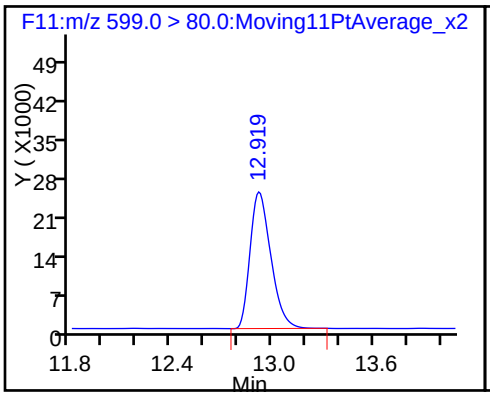
D 23 13C8 FOSA



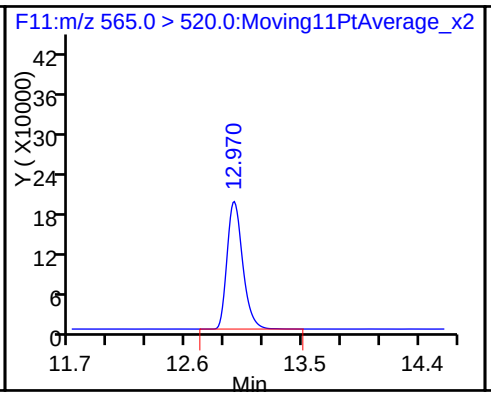
24 Perfluorooctane Sulfonamide



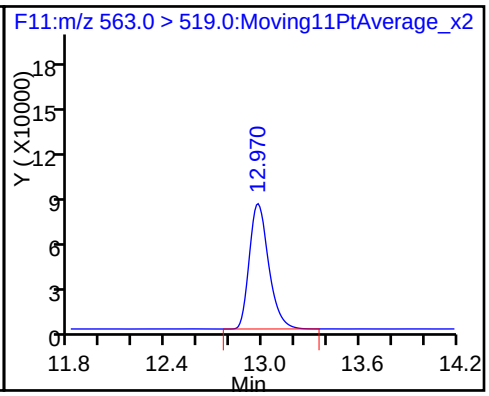
39 Perfluorodecane Sulfonic acid



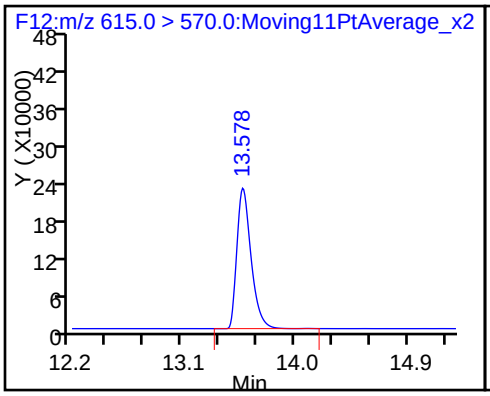
D 26 13C2 PFUnA



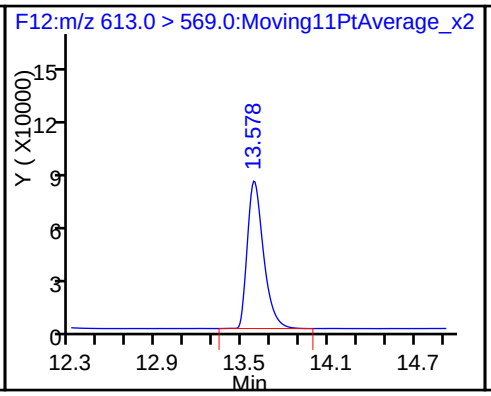
27 Perfluoroundecanoic acid



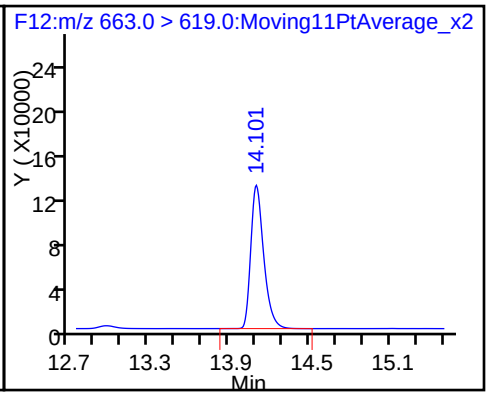
D 28 13C2 PFDoA



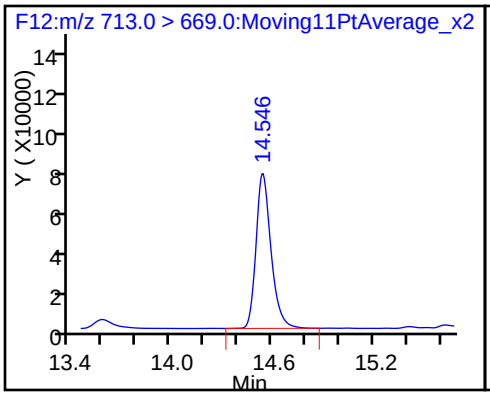
29 Perfluorododecanoic acid



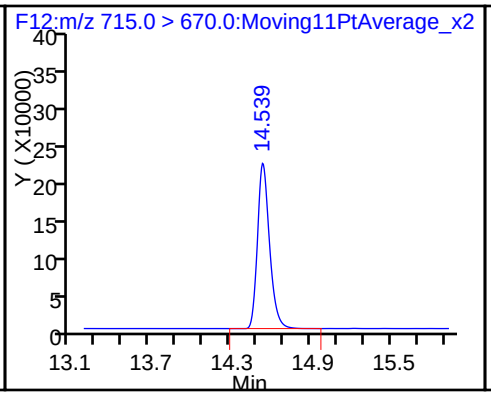
30 Perfluorotridecanoic acid



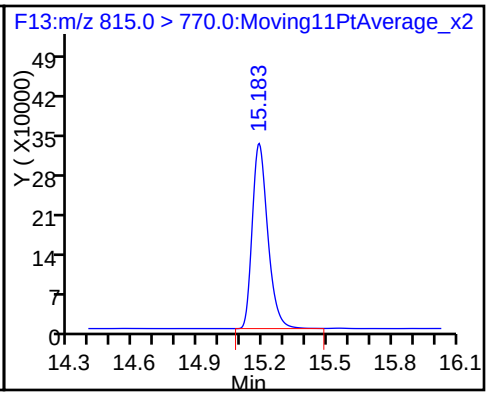
32 Perfluorotetradecanoic acid



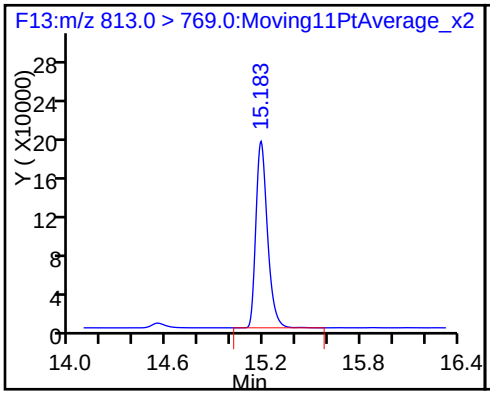
D 33 13C2-PFTeDA



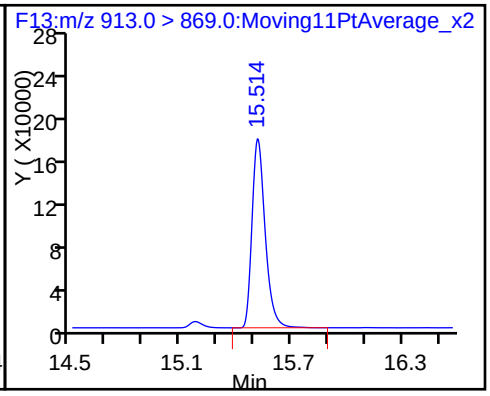
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Client Sample ID: | Lab Sample ID: LCS 320-100147/2-A

Matrix: Water | Lab File ID: 19FEB2016A6A_062.d

Analysis Method: WS-LC-0025 | Date Collected:

Extraction Method: 3535 | Date Extracted: 02/10/2016 07:14

Sample wt/vol: 500(mL) | Date Analyzed: 02/20/2016 11:41

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 15(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 100906 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0498		0.0025	0.0020	0.00080
335-67-1	Perfluorooctanoic acid (PFOA)	0.0476		0.0025	0.0020	0.00075
375-95-1	Perfluorononanoic acid (PFNA)	0.0528		0.0025	0.0020	0.00065
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0412		0.0025	0.0020	0.00092
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.0503		0.0025	0.0020	0.00087
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0529		0.0040	0.0030	0.0013

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01892	13C4-PFHpA	124		25-150
STL00990	13C4 PFOA	119		25-150
STL00995	13C5 PFNA	117		25-150
STL00994	18O2 PFHxS	108		25-150
STL00991	13C4 PFOS	99		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_062.d
Lims ID: LCS 320-100147/2-A
Client ID:
Sample Type: LCS
Inject. Date: 20-Feb-2016 11:41:26 ALS Bottle#: 15 Worklist Smp#: 60
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: LCS 320-100147/2-A
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
Operator ID: JRB Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\PFAC_A6.m
Limit Group: LC PFC_DOD ICAL
Last Update: 22-Feb-2016 13:06:10 Calib Date: 19-Feb-2016 17:15:39
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_010.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK010

First Level Reviewer: barnettj Date: 22-Feb-2016 13:18:47

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.0 > 172.0	5.703	5.712	-0.009		865377	54.1		108	2525	
2 Perfluorobutyric acid										
212.9 > 169.0	5.703	5.715	-0.012	1.000	588390	26.1		130	1526	
D 3 13C5-PFPeA										
267.9 > 223.0	6.814	6.827	-0.013		1909548	62.1		124	5750	
4 Perfluoropentanoic acid										
262.9 > 219.0	6.818	6.828	-0.010	1.000	950555	23.9		119	223	
5 Perfluorobutane Sulfonate										
298.9 > 80.0	6.933	6.939	-0.006	1.000	329085	NC			329	
298.9 > 99.0	6.929	6.939	-0.010	0.999	199360		1.65(0.00-0.00)		387	
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	6.933	6.939	-0.006	1.000	329085	20.6		116		
7 Perfluorohexanoic acid										
313.0 > 269.0	8.066	8.078	-0.012	1.000	916014	25.8		129	1757	
D 6 13C2 PFHxA										
315.0 > 270.0	8.060	8.080	-0.020		1641733	58.0		116	6475	
22 PFPeS (Perflouro-1-pentanesulfonat										
349.0 > 80.0	8.142	8.158	-0.016	0.872	291567	NC			989	
D 8 13C4-PFHpA										
367.0 > 322.0	9.299	9.322	-0.023		1907376	61.9		124	5722	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.305	9.322	-0.017	1.000	989698	24.9		124	2636	
D 11 18O2 PFHxS										
403.0 > 84.0	9.334	9.358	-0.024		761104	50.9		108	2298	
10 Perfluorohexane Sulfonate										
399.0 > 80.0	9.340	9.364	-0.024	1.000	273522	NC			819	
41 Perfluorohexanesulfonic acid										
399.0 > 80.0	9.340	9.364	-0.024	1.000	273522	25.2		133		

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFOA										
417.0 > 372.0	10.433	10.450	-0.017		2039439	59.7		119	6590	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.426	10.450	-0.024	1.000	974127	23.8		119	1129	
413.0 > 169.0	10.433	10.450	-0.017	1.001	312616		3.12(0.00-0.00)		711	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.433	10.457	-0.024	1.000	273837	NC			688	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.433	10.457	-0.024	1.000	273837	24.5		129		
D 16 13C4 PFOS										
503.0 > 80.0	11.392	11.414	-0.022		862175	47.4		99.2	2828	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.399	11.417	-0.018	1.000	463522	26.4		138	465	
499.0 > 99.0	11.392	11.417	-0.025	0.999	228306		2.03(0.00-0.00)		854	
D 17 13C5 PFNA										
468.0 > 423.0	11.415	11.434	-0.019		1649054	58.5		117	5820	
18 Perfluorononanoic acid										
463.0 > 419.0	11.415	11.439	-0.024	1.000	702858	26.4		132	1655	
21 PFNS (Perflouro-1-nonanesulfonate)										
549.0 > 80.0	12.224	12.249	-0.025	1.000	212899	NC			941	
D 19 13C2 PFDA										
515.0 > 470.0	12.255	12.275	-0.020		1652251	57.7		115	2788	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.255	12.276	-0.021	1.000	769368	23.5		118	2247	
D 23 13C8 FOSA										
506.0 > 78.0	12.804	12.810	-0.006		1559046	37.6		75.1	2280	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.804	12.812	-0.008	1.000	710550	24.6		123	1893	
25 Perfluorodecane Sulfonate										
599.0 > 80.0	12.929	12.949	-0.020	1.000	247870	NC			747	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	12.929	12.949	-0.020	1.000	247870	24.9		129		
D 26 13C2 PFUnA										
565.0 > 520.0	12.981	13.000	-0.019		2104757	56.3		113	6044	
27 Perfluoroundecanoic acid										
563.0 > 519.0	12.981	13.000	-0.019	1.000	876111	24.6		123	2372	
D 28 13C2 PFDoA										
615.0 > 570.0	13.596	13.609	-0.013		2271652	58.1		116	6437	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.596	13.611	-0.015	1.000	909345	27.4		137	1005	
31 PFDoS (Perflouro-1-dodecanesulfona										
699.0 > 80.0	14.055	14.083	-0.028	1.000	290830	NC			998	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.108	14.130	-0.022	1.000	1123125	26.3		131	1020	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.552	14.571	-0.019	1.000	647031	23.4		117	223	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.552	14.571	-0.019		1962230	54.7		109	4945	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 35 13C2-PFHxDA										
815.0 > 770.0	15.188	15.207	-0.019		2508425	58.2		116	5146	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.188	15.208	-0.020	1.000	1372099	25.6		128	1589	
36 Perfluorooctandecanoic acid										
913.0 > 869.0	15.519	15.543	-0.024	1.000	1366360	27.1		135	1358	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Report Date: 22-Feb-2016 13:18:49 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_062.d

Injection Date: 20-Feb-2016 11:41:26 Instrument ID: A6

Lims ID: LCS 320-100147/2-A

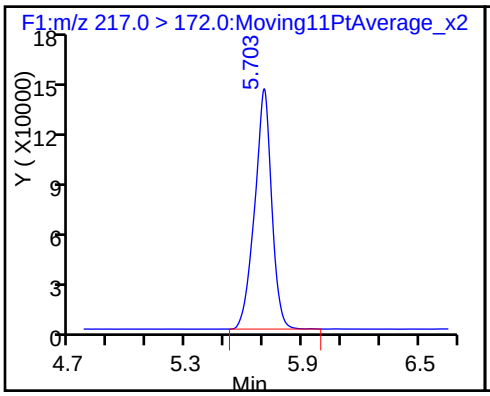
Client ID:

Operator ID: JRB ALS Bottle#: 15 Worklist Smp#: 60

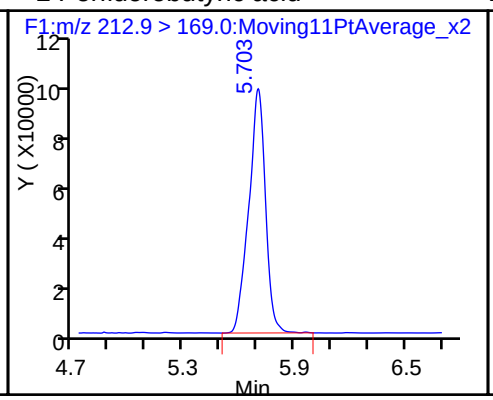
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

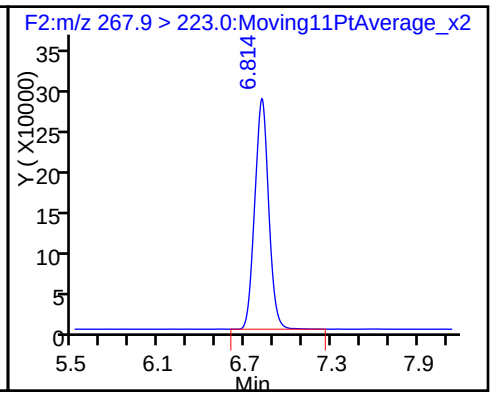
D 1 13C4 PFBA



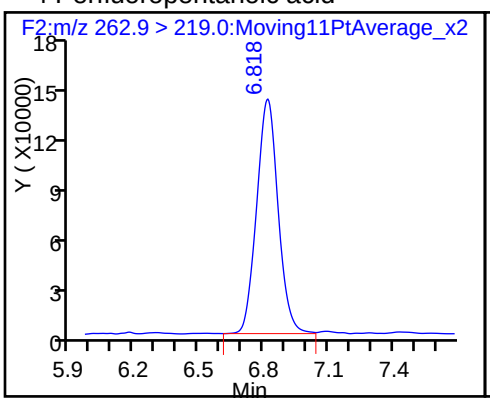
2 Perfluorobutyric acid



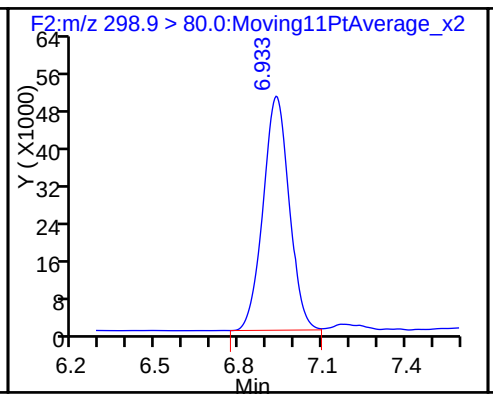
D 3 13C5-PFPeA



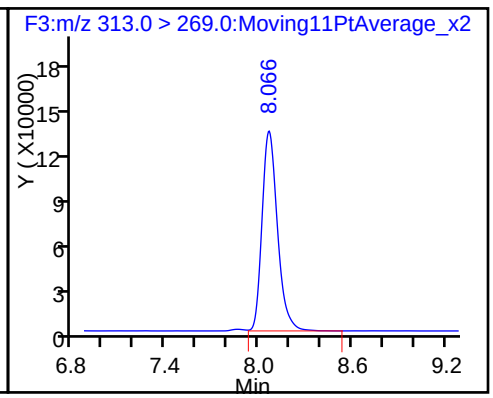
4 Perfluoropentanoic acid



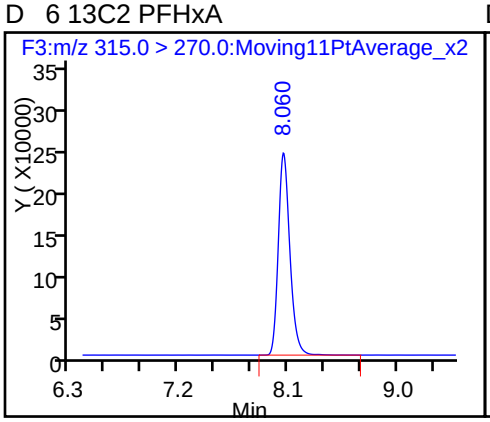
40 Perfluorobutanesulfonic acid



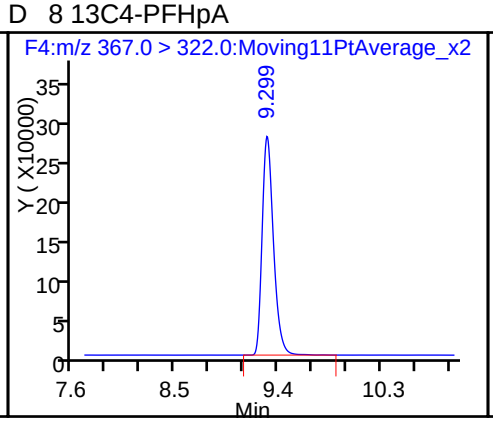
7 Perfluorohexanoic acid



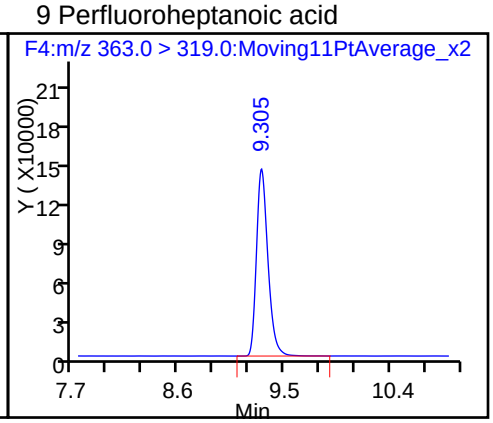
D 6 13C2 PFHxA



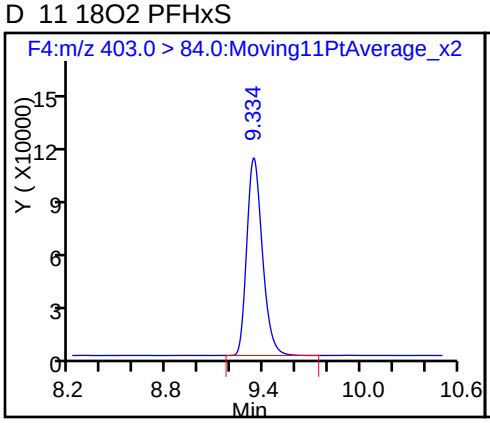
D 8 13C4-PFHpA



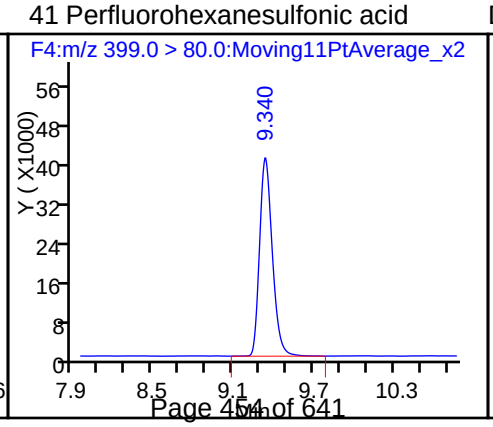
9 Perfluoroheptanoic acid



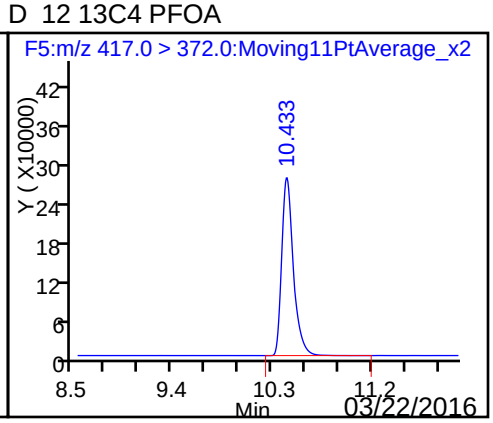
D 11 18O2 PFHxS



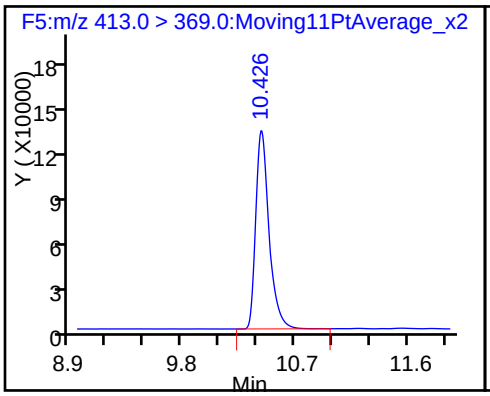
41 Perfluorohexanesulfonic acid



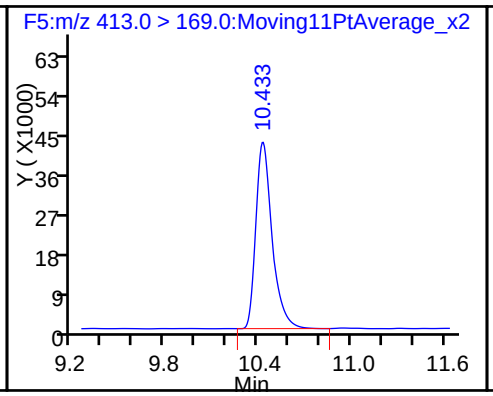
D 12 13C4 PFOA



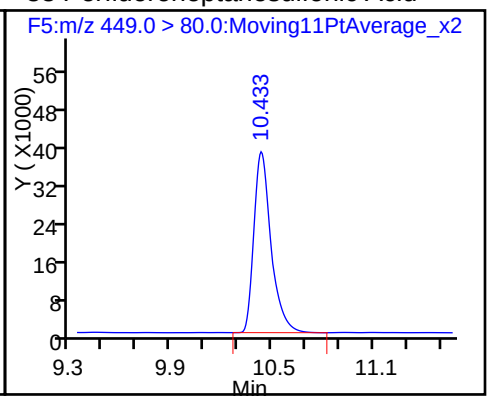
13 Perfluorooctanoic acid



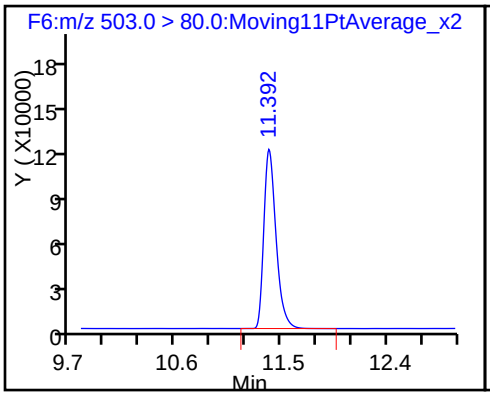
13 Perfluorooctanoic acid



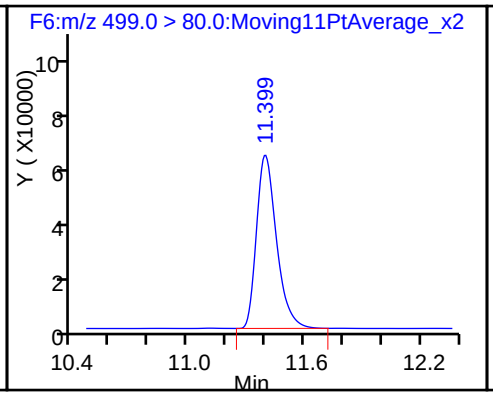
38 Perfluoroheptanesulfonic Acid



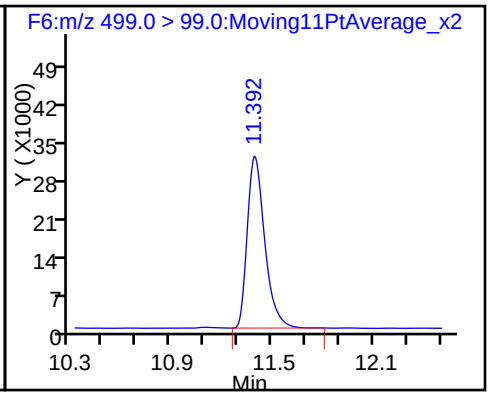
D 16 13C4 PFOS



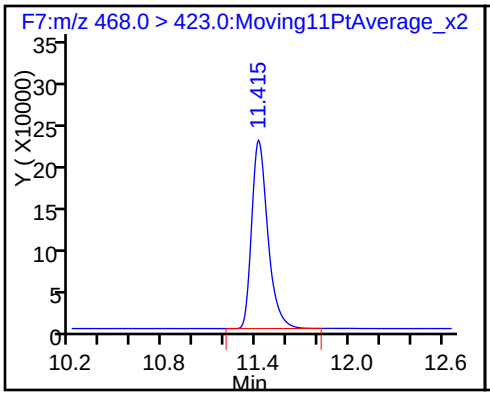
15 Perfluorooctane sulfonic acid



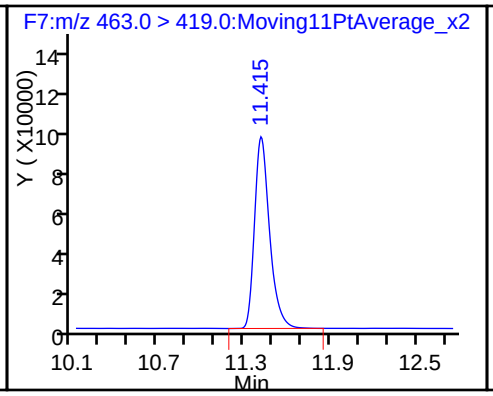
15 Perfluorooctane sulfonic acid



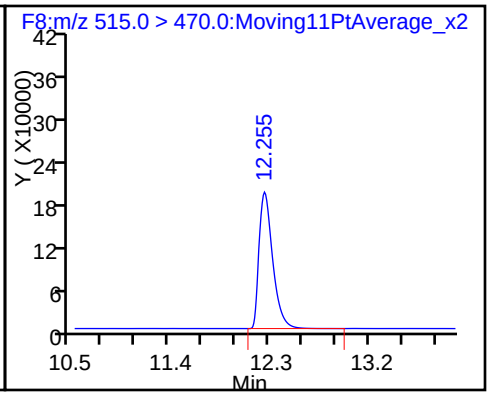
D 17 13C5 PFNA



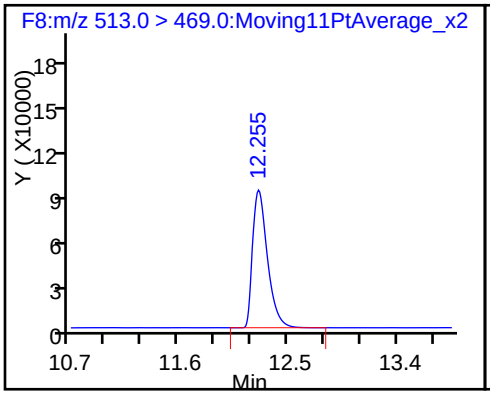
18 Perfluorononanoic acid



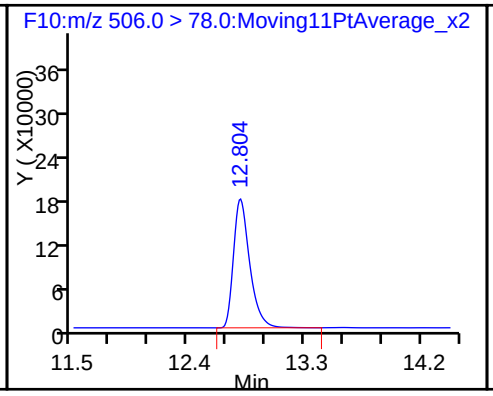
D 19 13C2 PFDA



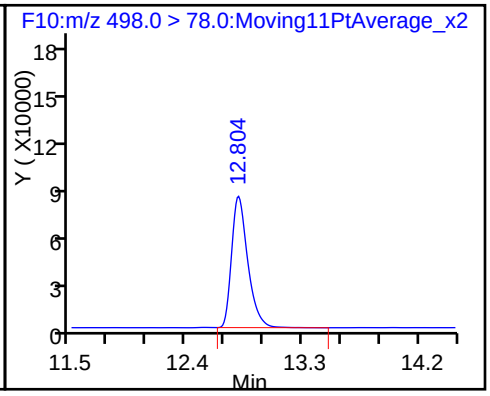
20 Perfluorodecanoic acid



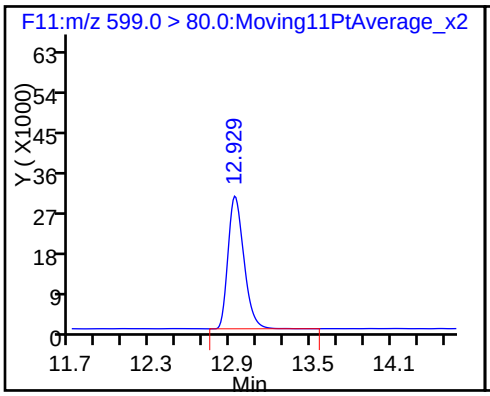
D 23 13C8 FOSA



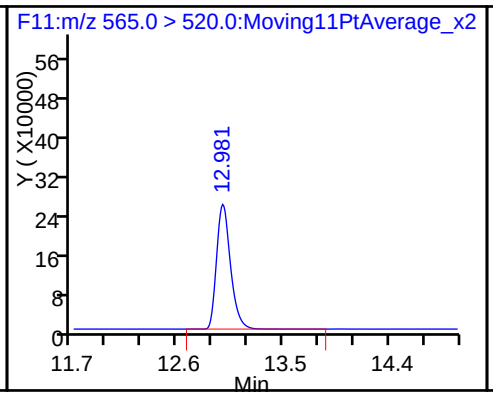
24 Perfluorooctane Sulfonamide



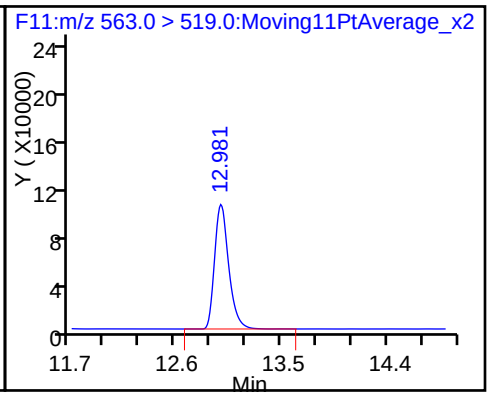
39 Perfluorodecane Sulfonic acid



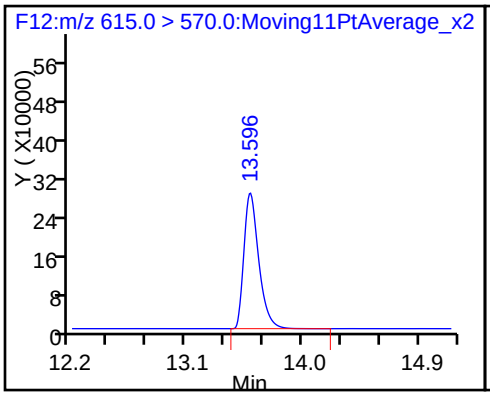
D 26 13C2 PFUnA



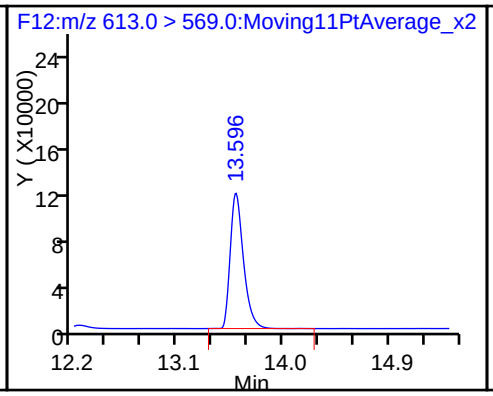
27 Perfluoroundecanoic acid



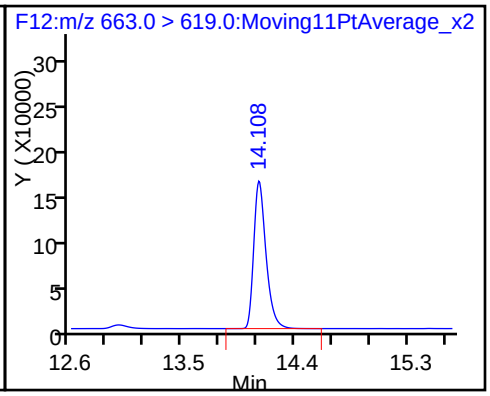
D 28 13C2 PFDoA



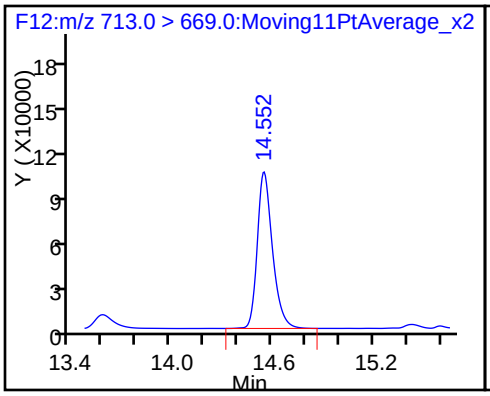
29 Perfluorododecanoic acid



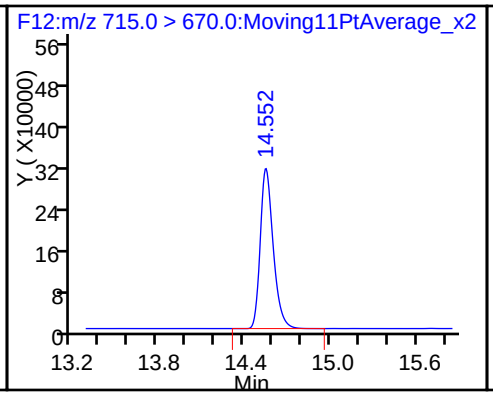
30 Perfluorotridecanoic acid



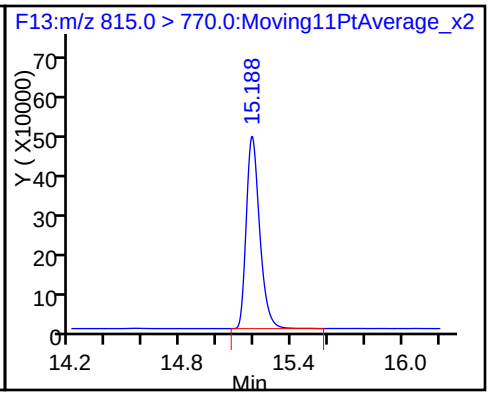
32 Perfluorotetradecanoic acid



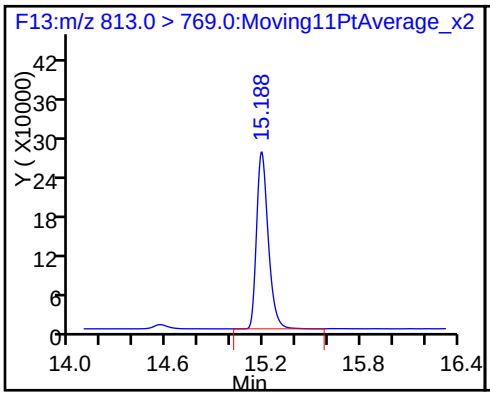
D 33 13C2-PFTeDA



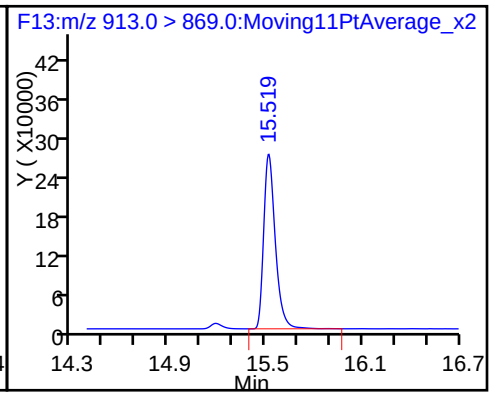
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Client Sample ID: | Lab Sample ID: LCSD 320-100093/3-A

Matrix: Water | Lab File ID: 19FEB2016A6A_049.d

Analysis Method: WS-LC-0025 | Date Collected:

Extraction Method: 3535 | Date Extracted: 02/09/2016 10:23

Sample wt/vol: 500(mL) | Date Analyzed: 02/20/2016 07:05

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 15(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 100906 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0506		0.0025	0.0020	0.00080
335-67-1	Perfluorooctanoic acid (PFOA)	0.0493		0.0025	0.0020	0.00075
375-95-1	Perfluorononanoic acid (PFNA)	0.0517		0.0025	0.0020	0.00065
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0472		0.0025	0.0020	0.00092
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.0486		0.0025	0.0020	0.00087
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0452		0.0040	0.0030	0.0013

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01892	13C4-PFHpA	95		25-150
STL00990	13C4 PFOA	88		25-150
STL00995	13C5 PFNA	91		25-150
STL00994	18O2 PFHxS	86		25-150
STL00991	13C4 PFOS	80		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_049.d
Lims ID: LCSD 320-100093/3-A
Client ID:
Sample Type: LCSD
Inject. Date: 20-Feb-2016 07:05:28 ALS Bottle#: 3 Worklist Smp#: 47
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: LCSD 320-100093/3-A
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
Operator ID: JRB Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\PFAC_A6.m
Limit Group: LC PFC_DOD ICAL
Last Update: 22-Feb-2016 10:48:20 Calib Date: 19-Feb-2016 17:15:39
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_010.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK010

First Level Reviewer: barnettj Date: 20-Feb-2016 13:11:09

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.0 > 172.0	5.699	5.712	-0.013		734641	45.9		91.8	2704	
2 Perfluorobutyric acid										
212.9 > 169.0	5.696	5.715	-0.019	1.000	485146	25.3		127	1247	
D 3 13C5-PFPeA										
267.9 > 223.0	6.803	6.827	-0.024		1540503	50.1		100	5533	
4 Perfluoropentanoic acid										
262.9 > 219.0	6.803	6.828	-0.025	1.000	722067	22.5		112	178	
5 Perfluorobutane Sulfonate										
298.9 > 80.0	6.918	6.939	-0.021	1.000	300270	NC			379	
298.9 > 99.0	6.923	6.939	-0.016	1.001	149697		2.01(0.00-0.00)		240	
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	6.918	6.939	-0.021	1.000	300270	23.6		133		
7 Perfluorohexanoic acid										
313.0 > 269.0	8.050	8.078	-0.028	1.000	733184	25.9		130	1978	
D 6 13C2 PFHxA										
315.0 > 270.0	8.050	8.080	-0.030		1305099	46.1		92.1	6340	
22 PFPeS (Perflouro-1-pentanesulfonat										
349.0 > 80.0	8.126	8.158	-0.032	0.872	224529	NC			920	
D 8 13C4-PFHpA										
367.0 > 322.0	9.288	9.322	-0.034		1471294	47.7		95.5	5622	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.288	9.322	-0.034	1.000	776183	25.3		126	2978	
D 11 18O2 PFHxS										
403.0 > 84.0	9.318	9.358	-0.040		606231	40.5		85.6	2633	
10 Perfluorohexane Sulfonate										
399.0 > 80.0	9.323	9.364	-0.041	1.000	210408	NC			687	
41 Perfluorohexanesulfonic acid										
399.0 > 80.0	9.323	9.364	-0.041	1.000	210408	24.3		128		

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFOA										
417.0 > 372.0	10.413	10.450	-0.037		1501627	44.0		88.0	5693	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.413	10.450	-0.037	1.000	743776	24.7		123	1424	
413.0 > 169.0	10.420	10.450	-0.030	1.001	224572		3.31(0.00-0.00)		836	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.420	10.457	-0.037	1.000	220037	NC			800	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.420	10.457	-0.037	1.000	220037	24.6		129		
D 16 13C4 PFOS										
503.0 > 80.0	11.378	11.414	-0.036		691703	38.0		79.6	3976	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.385	11.417	-0.032	1.000	318089	22.6		118	1062	
499.0 > 99.0	11.385	11.417	-0.032	1.000	192858		1.65(0.00-0.00)		754	
D 17 13C5 PFNA										
468.0 > 423.0	11.401	11.434	-0.033		1281775	45.5		90.9	3447	
18 Perfluorononanoic acid										
463.0 > 419.0	11.401	11.439	-0.038	1.000	534851	25.8		129	1565	
21 PFNS (Perflouro-1-nonanesulfonate)										
549.0 > 80.0	12.207	12.249	-0.042	1.000	199232	NC			591	
D 19 13C2 PFDA										
515.0 > 470.0	12.238	12.275	-0.037		1277810	44.6		89.3	4187	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.238	12.276	-0.038	1.000	617874	24.4		122	2237	
D 23 13C8 FOSA										
506.0 > 78.0	12.787	12.810	-0.023		187222	4.51		9.0	565	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.787	12.812	-0.025	1.000	75363	21.7		109	298	
25 Perfluorodecane Sulfonate										
599.0 > 80.0	12.923	12.949	-0.026	1.000	208463	NC			652	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	12.923	12.949	-0.026	1.000	208463	26.1		136		
D 26 13C2 PFUnA										
565.0 > 520.0	12.964	13.000	-0.036		1543585	41.3		82.6	4747	
27 Perfluoroundecanoic acid										
563.0 > 519.0	12.964	13.000	-0.036	1.000	678501	26.0		130	2991	
D 28 13C2 PFDoA										
615.0 > 570.0	13.583	13.609	-0.026		1775672	45.4		90.8	5236	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.583	13.611	-0.028	1.000	659146	25.4		127	1290	
31 PFDoS (Perflouro-1-dodecanesulfona										
699.0 > 80.0	14.044	14.083	-0.039	1.000	206389	NC			628	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.098	14.130	-0.032	1.000	827090	24.8		124	1247	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.537	14.571	-0.034	1.000	478423	22.1		111	277	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.543	14.571	-0.028		1463155	40.8		81.5	4057	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 35 13C2-PFHxDA										
815.0 > 770.0	15.179	15.207	-0.028		1834802	42.6		85.1	6199	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.179	15.208	-0.029	1.000	946964	22.3		112	1317	
36 Perfluorooctandecanoic acid										
913.0 > 869.0	15.516	15.543	-0.027	1.000	838124	21.2		106	1517	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Report Date: 22-Feb-2016 11:14:31 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_049.d

Injection Date: 20-Feb-2016 07:05:28 Instrument ID: A6

Lims ID: LCSD 320-100093/3-A

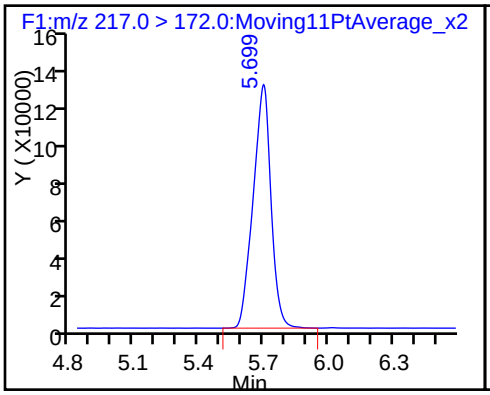
Client ID:

Operator ID: JRB ALS Bottle#: 3 Worklist Smp#: 47

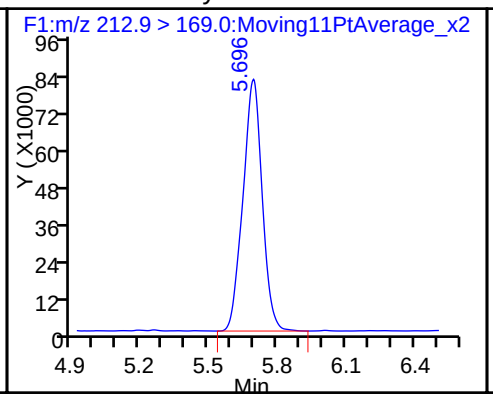
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

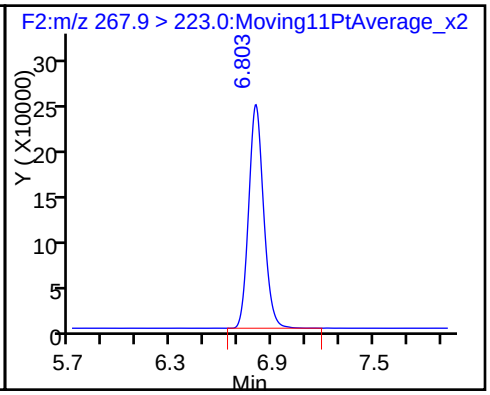
D 1 13C4 PFBA



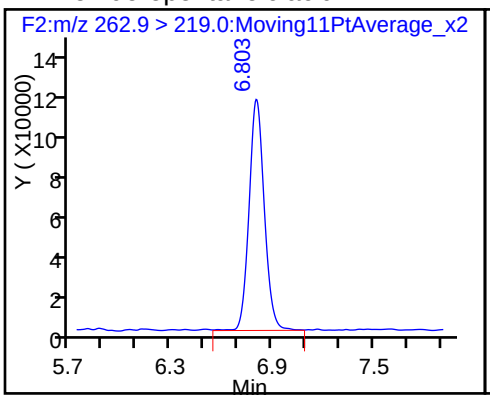
2 Perfluorobutyric acid



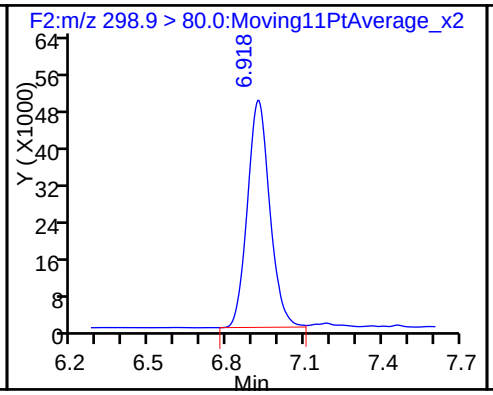
D 3 13C5-PFPeA



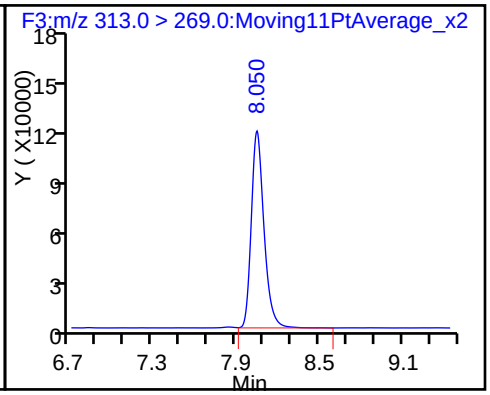
4 Perfluoropentanoic acid



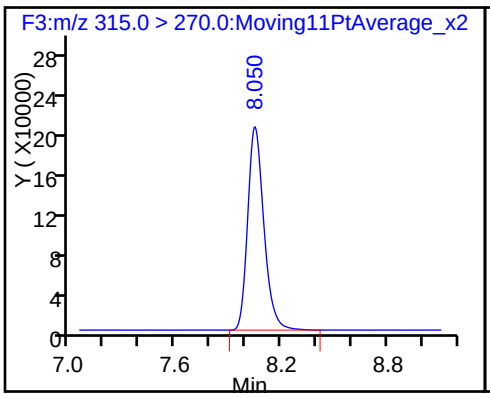
40 Perfluorobutanesulfonic acid



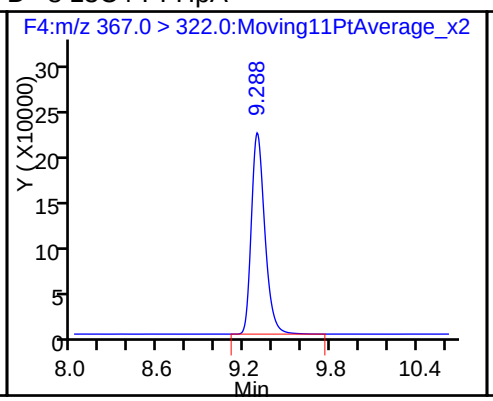
7 Perfluorohexanoic acid



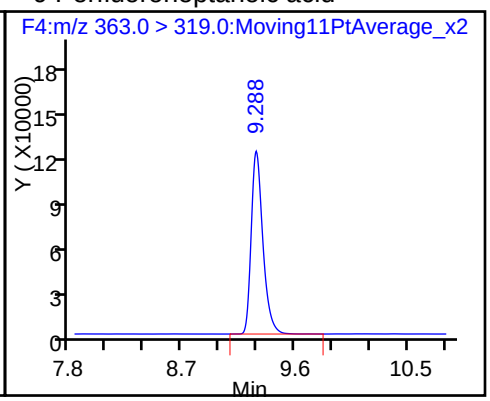
D 6 13C2 PFHxA



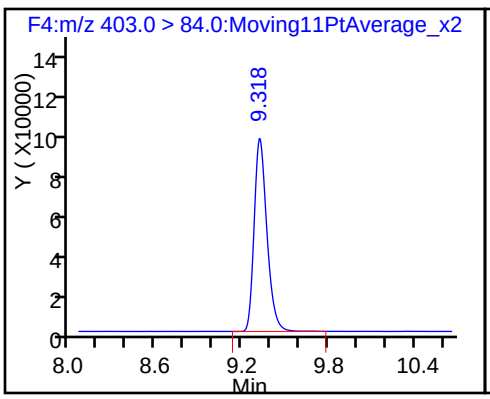
D 8 13C4-PFHpA



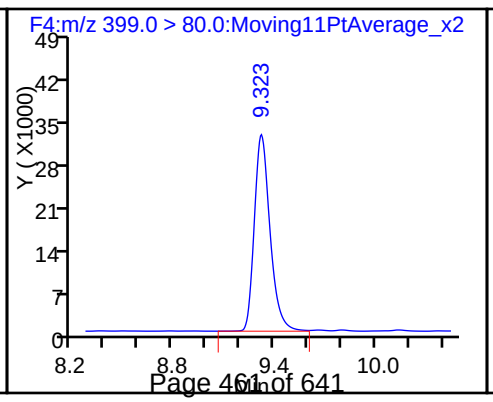
9 Perfluoroheptanoic acid



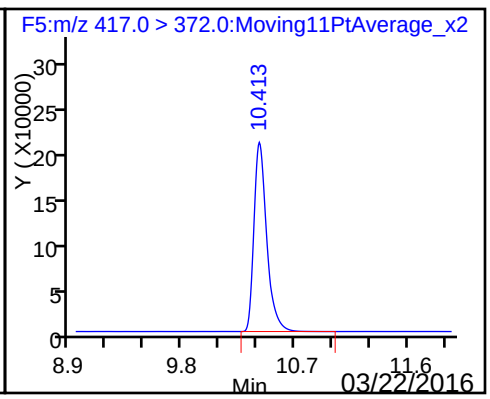
D 11 18O2 PFHxS



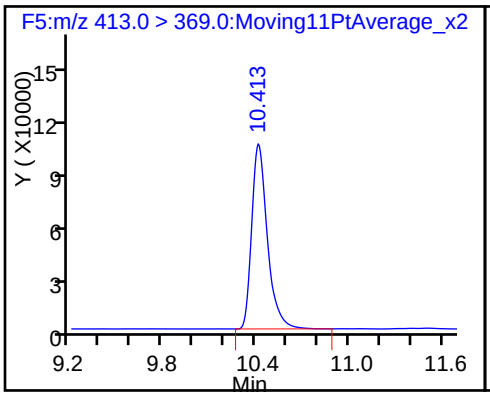
41 Perfluorohexanesulfonic acid



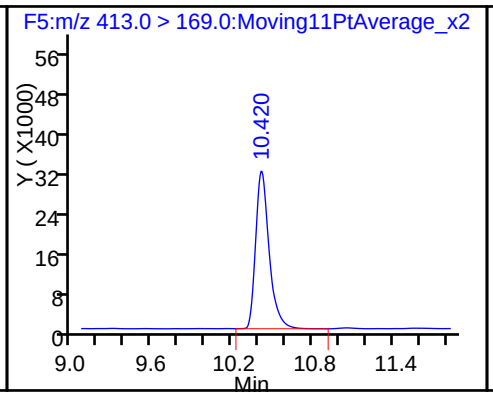
D 12 13C4 PFOA



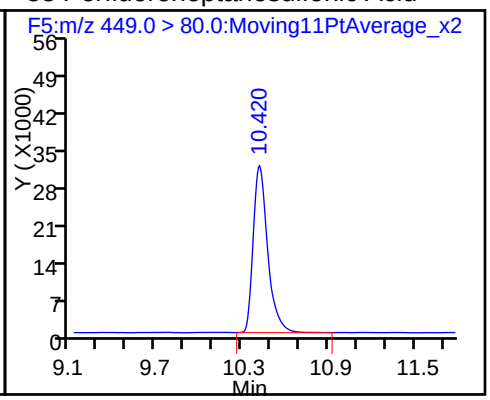
13 Perfluorooctanoic acid



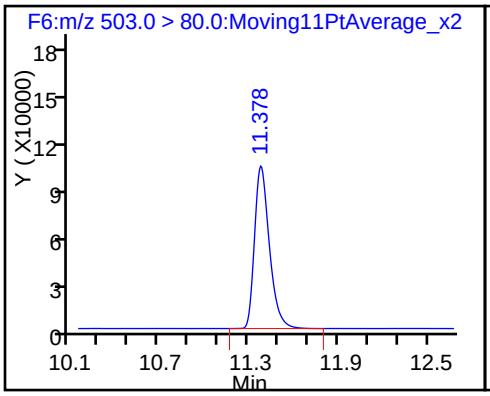
13 Perfluorooctanoic acid



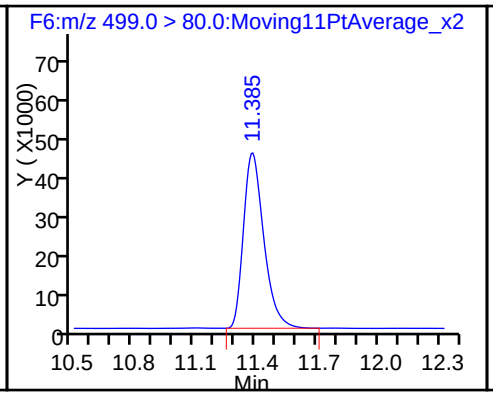
38 Perfluoroheptanesulfonic Acid



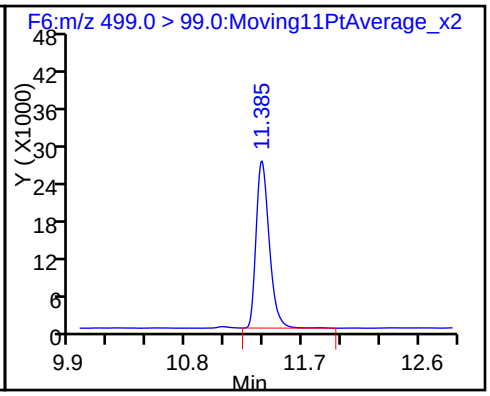
D 16 13C4 PFOS



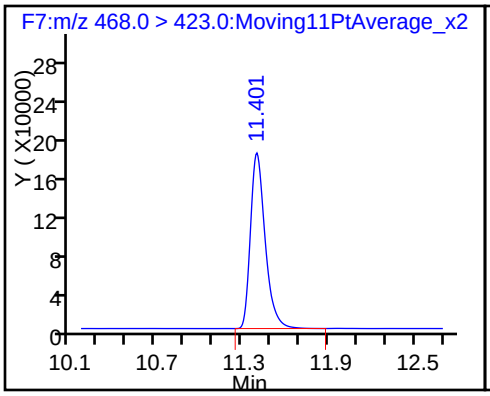
15 Perfluorooctane sulfonic acid



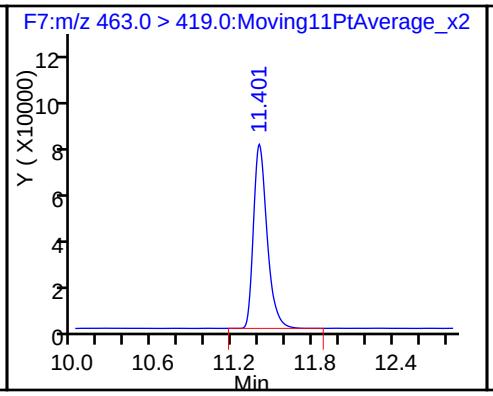
15 Perfluorooctane sulfonic acid



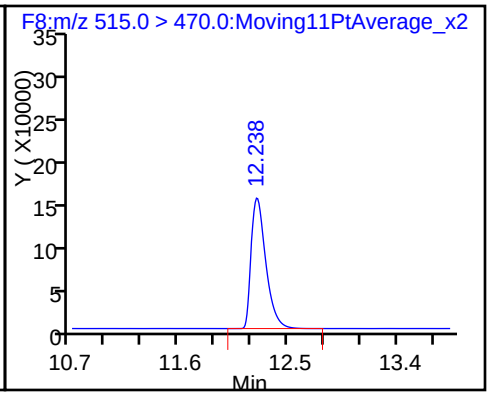
D 17 13C5 PFNA



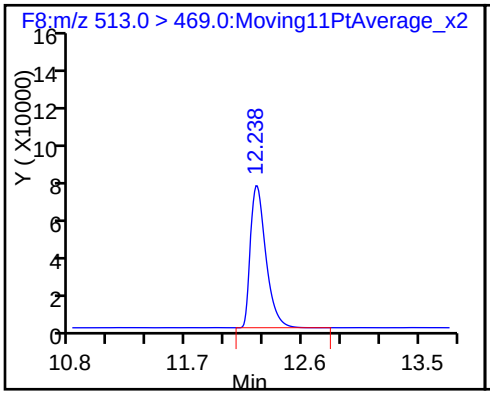
18 Perfluorononanoic acid



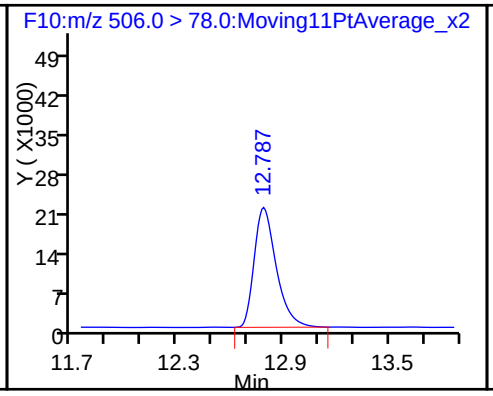
D 19 13C2 PFDA



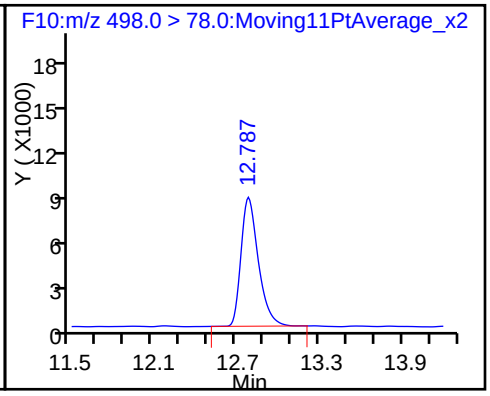
20 Perfluorodecanoic acid



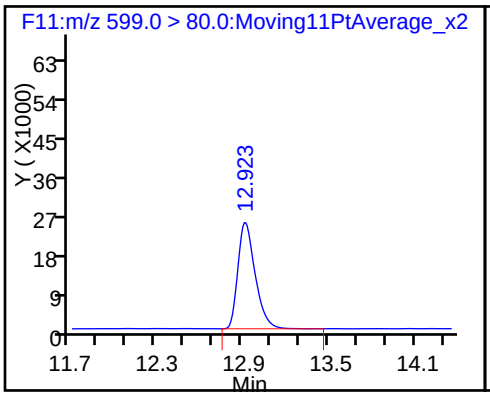
D 23 13C8 FOSA



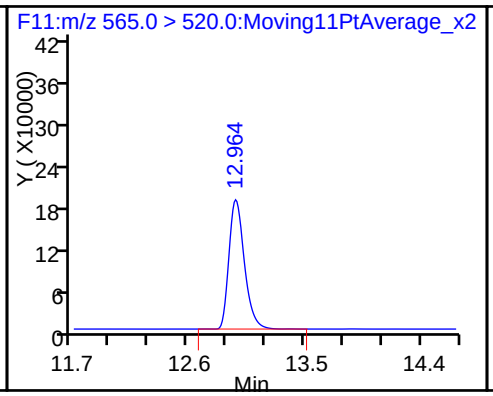
24 Perfluorooctane Sulfonamide



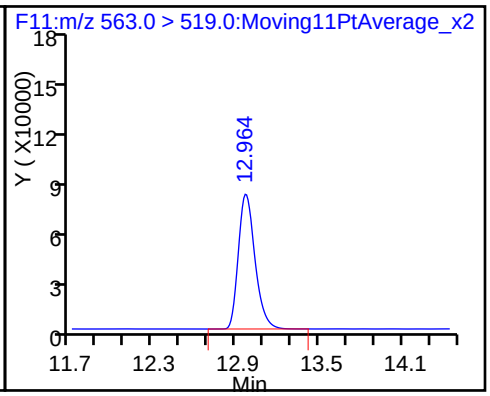
39 Perfluorodecane Sulfonic acid



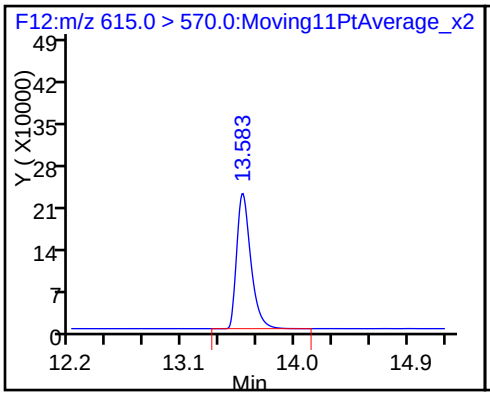
D 26 13C2 PFUnA



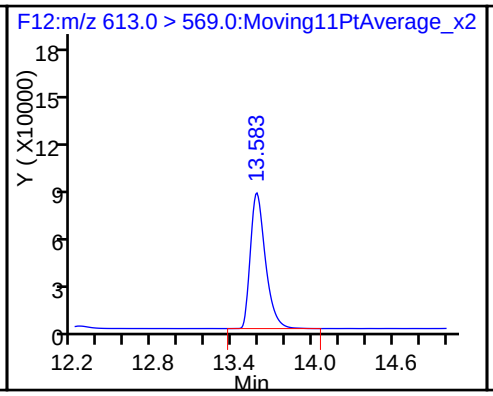
27 Perfluoroundecanoic acid



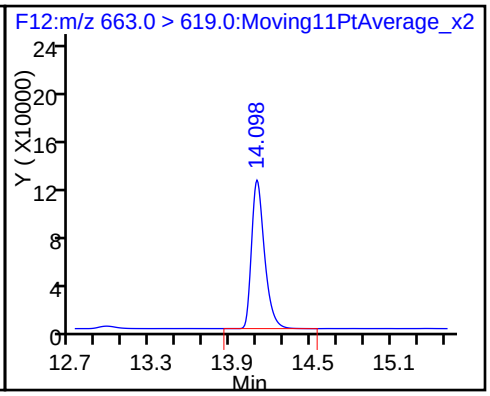
D 28 13C2 PFDoA



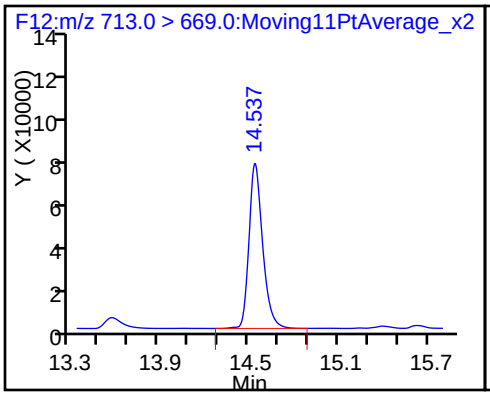
29 Perfluorododecanoic acid



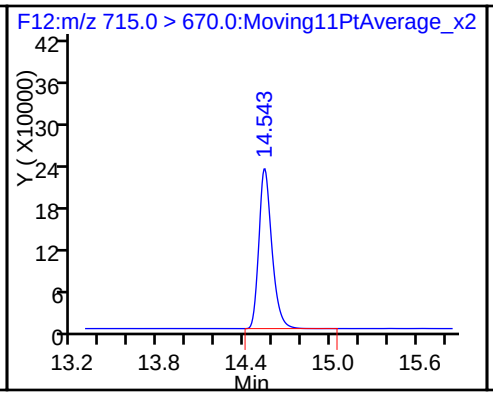
30 Perfluorotridecanoic acid



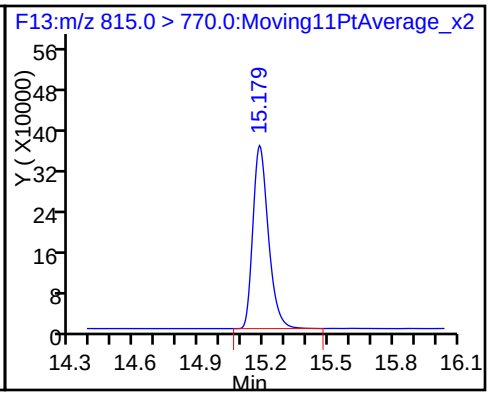
32 Perfluorotetradecanoic acid



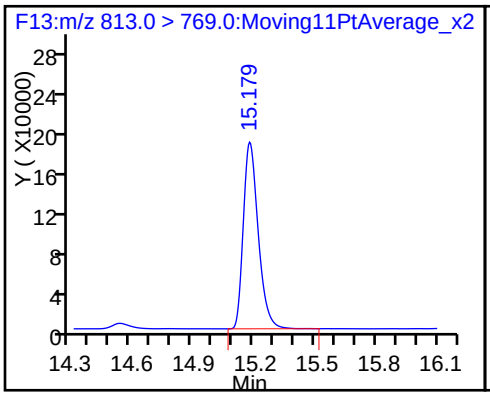
D 33 13C2-PFTeDA



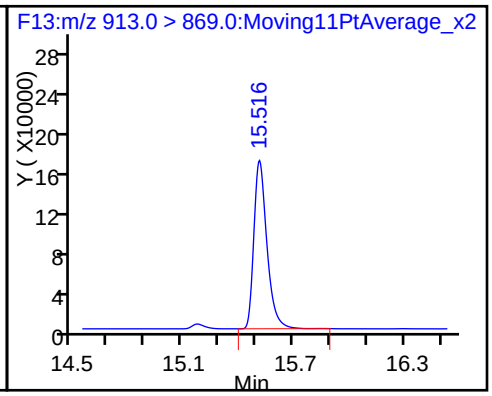
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Client Sample ID: | Lab Sample ID: LCSD 320-100147/3-A

Matrix: Water | Lab File ID: 19FEB2016A6A_063.d

Analysis Method: WS-LC-0025 | Date Collected:

Extraction Method: 3535 | Date Extracted: 02/10/2016 07:14

Sample wt/vol: 500(mL) | Date Analyzed: 02/20/2016 12:02

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 15(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 100906 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0461		0.0025	0.0020	0.00080
335-67-1	Perfluorooctanoic acid (PFOA)	0.0488		0.0025	0.0020	0.00075
375-95-1	Perfluorononanoic acid (PFNA)	0.0534		0.0025	0.0020	0.00065
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0461		0.0025	0.0020	0.00092
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.0473		0.0025	0.0020	0.00087
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0502		0.0040	0.0030	0.0013

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01892	13C4-PFHpA	123		25-150
STL00990	13C4 PFOA	115		25-150
STL00995	13C5 PFNA	116		25-150
STL00994	18O2 PFHxS	107		25-150
STL00991	13C4 PFOS	100		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_063.d
Lims ID: LCSD 320-100147/3-A
Client ID:
Sample Type: LCSD
Inject. Date: 20-Feb-2016 12:02:40 ALS Bottle#: 16 Worklist Smp#: 61
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: LCSD 320-100147/3-A
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
Operator ID: JRB Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\PFAC_A6.m
Limit Group: LC PFC_DOD ICAL
Last Update: 22-Feb-2016 13:06:10 Calib Date: 19-Feb-2016 17:15:39
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_010.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK010

First Level Reviewer: barnettj Date: 22-Feb-2016 13:19:25

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.0 > 172.0	5.703	5.712	-0.009		865315	54.1		108	3010	
2 Perfluorobutyric acid										
212.9 > 169.0	5.703	5.715	-0.012	1.000	584537	25.9		130	1881	
D 3 13C5-PFPeA										
267.9 > 223.0	6.814	6.827	-0.013		1896686	61.7		123	5073	
4 Perfluoropentanoic acid										
262.9 > 219.0	6.814	6.828	-0.014	1.000	914284	23.1		115	180	
5 Perfluorobutane Sulfonate										
298.9 > 80.0	6.933	6.939	-0.006	1.000	366254	NC			487	
298.9 > 99.0	6.933	6.939	-0.006	1.000	179580		2.04(0.00-0.00)		418	
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	6.933	6.939	-0.006	1.000	366254	23.0		130		
7 Perfluorohexanoic acid										
313.0 > 269.0	8.066	8.078	-0.012	1.000	915746	25.4		127	1635	
D 6 13C2 PFHxA										
315.0 > 270.0	8.060	8.080	-0.020		1661145	58.6		117	6670	
22 PFPeS (Perflouro-1-pentanesulfonat										
349.0 > 80.0	8.142	8.158	-0.016	0.872	272614	NC			1437	
D 8 13C4-PFHpA										
367.0 > 322.0	9.299	9.322	-0.023		1899497	61.6		123	5479	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.299	9.322	-0.023	1.000	913727	23.1		115	3225	
D 11 18O2 PFHxS										
403.0 > 84.0	9.334	9.358	-0.024		757395	50.6		107	3894	
10 Perfluorohexane Sulfonate										
399.0 > 80.0	9.334	9.364	-0.030	1.000	255878	NC			598	
41 Perfluorohexanesulfonic acid										
399.0 > 80.0	9.334	9.364	-0.030	1.000	255878	23.7		125		

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFOA										
417.0 > 372.0	10.426	10.450	-0.024		1965668	57.6		115	8320	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.426	10.450	-0.024	1.000	962302	24.4		122	1158	
413.0 > 169.0	10.426	10.450	-0.024	1.000	319130		3.02(0.00-0.00)		832	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.433	10.457	-0.024	1.000	279542	NC			913	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.433	10.457	-0.024	1.000	279542	24.9		131		
D 16 13C4 PFOS										
503.0 > 80.0	11.392	11.414	-0.022		866581	47.7		99.7	4049	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.392	11.417	-0.025	1.000	442810	25.1		131	418	
499.0 > 99.0	11.392	11.417	-0.025	1.000	235467		1.88(0.00-0.00)		777	
D 17 13C5 PFNA										
468.0 > 423.0	11.415	11.434	-0.019		1641246	58.2		116	7472	
18 Perfluorononanoic acid										
463.0 > 419.0	11.415	11.439	-0.024	1.000	707121	26.7		133	2987	
21 PFNS (Perflouro-1-nonanesulfonate)										
549.0 > 80.0	12.224	12.249	-0.025	1.000	240757	NC			732	
D 19 13C2 PFDA										
515.0 > 470.0	12.255	12.275	-0.020		1581281	55.2		110	3303	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.255	12.276	-0.021	1.000	750409	24.0		120	2428	
D 23 13C8 FOSA										
506.0 > 78.0	12.804	12.810	-0.006		1783320	43.0		85.9	2421	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.804	12.812	-0.008	1.000	810653	24.5		123	1681	
25 Perfluorodecane Sulfonate										
599.0 > 80.0	12.929	12.949	-0.020	1.000	239484	NC			872	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	12.929	12.949	-0.020	1.000	239484	24.0		124		
D 26 13C2 PFUnA										
565.0 > 520.0	12.981	13.000	-0.019		2055157	55.0		110	6847	
27 Perfluoroundecanoic acid										
563.0 > 519.0	12.981	13.000	-0.019	1.000	878074	25.3		126	1871	
D 28 13C2 PFDoA										
615.0 > 570.0	13.588	13.609	-0.021		2289189	58.5		117	6302	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.588	13.611	-0.023	1.000	872443	26.1		130	953	
31 PFDoS (Perflouro-1-dodecanesulfona										
699.0 > 80.0	14.055	14.083	-0.028	1.000	264376	NC			887	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.109	14.130	-0.021	1.000	1087698	25.2		126	1007	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.552	14.571	-0.019	1.000	639855	22.9		115	227	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.552	14.571	-0.019		1928200	53.7		107	5038	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 35 13C2-PFHxDA										
815.0 > 770.0	15.188	15.207	-0.019		2519728	58.5		117	5345	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.188	15.208	-0.020	1.000	1367316	25.3		126	1802	
36 Perfluorooctandecanoic acid										
913.0 > 869.0	15.519	15.543	-0.024	1.000	1259800	24.8		124	1158	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Report Date: 22-Feb-2016 13:19:27 Chrom Revision: 2.2 02-Dec-2015 11:51:48

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160219-28492.b\19FEB2016A6A_063.d

Injection Date: 20-Feb-2016 12:02:40 Instrument ID: A6

Lims ID: LCSD 320-100147/3-A

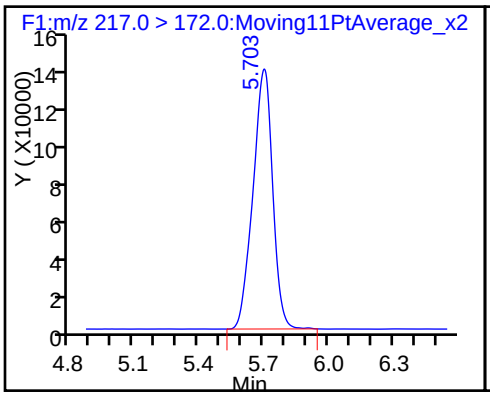
Client ID:

Operator ID: JRB ALS Bottle#: 16 Worklist Smp#: 61

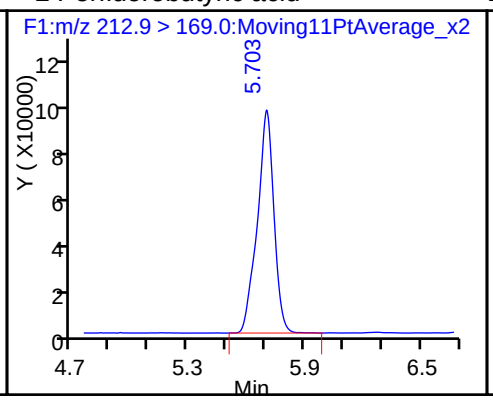
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

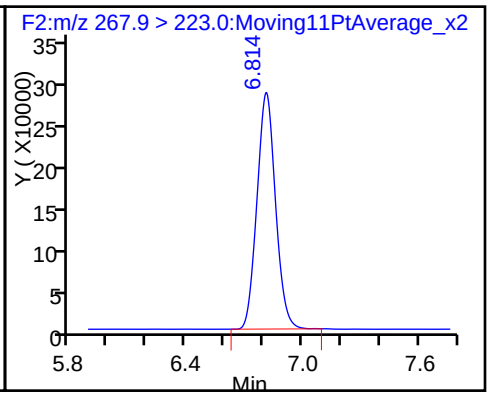
D 1 13C4 PFBA



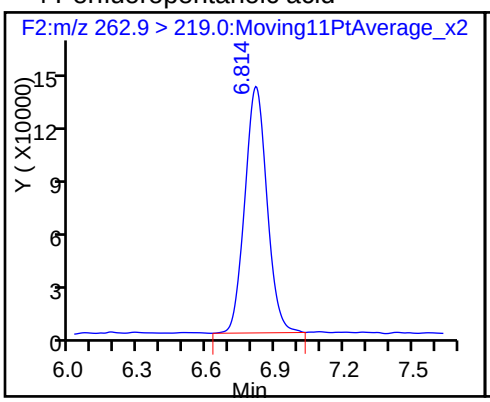
2 Perfluorobutyric acid



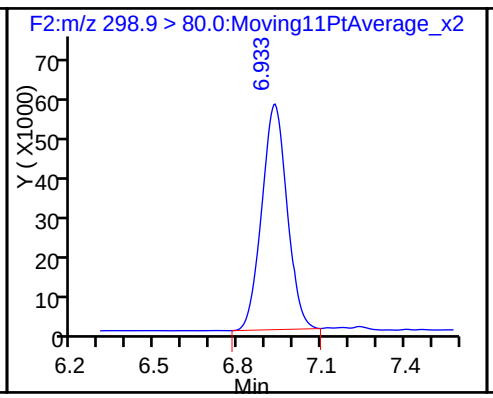
D 3 13C5-PFPeA



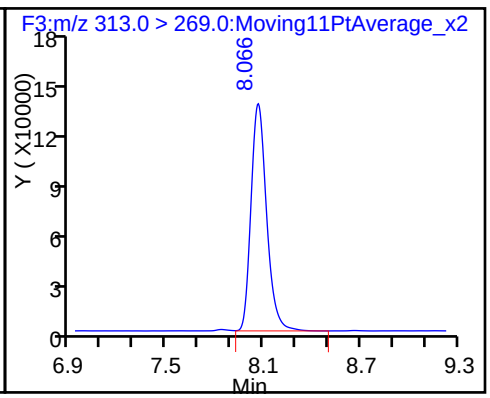
4 Perfluoropentanoic acid



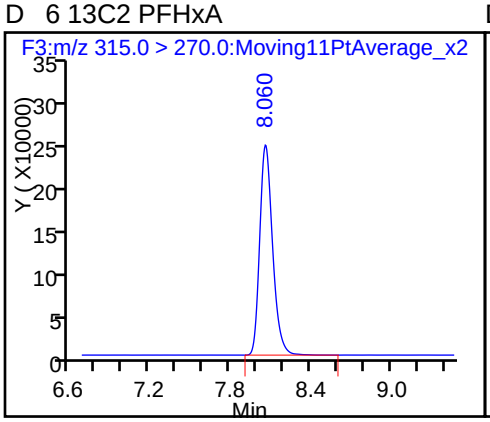
40 Perfluorobutanesulfonic acid



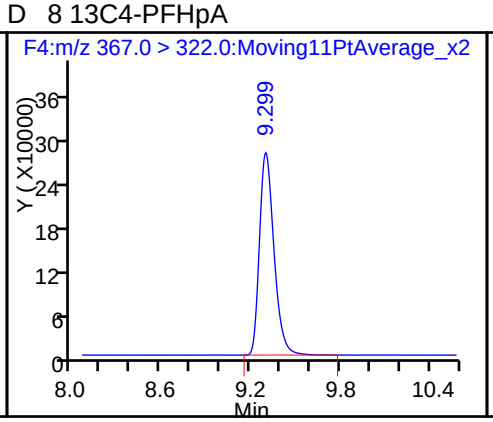
7 Perfluorohexanoic acid



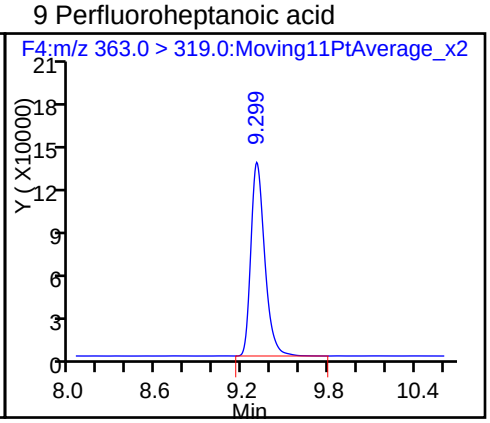
D 6 13C2 PFHxA



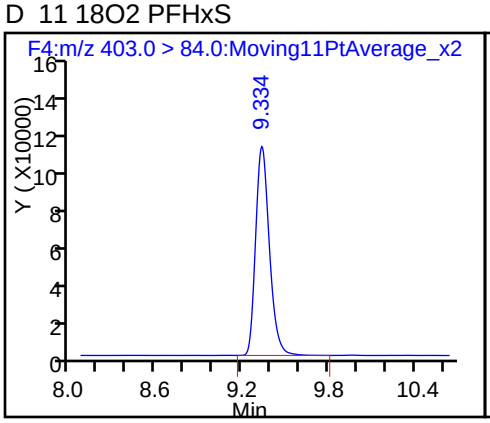
D 8 13C4-PFHpA



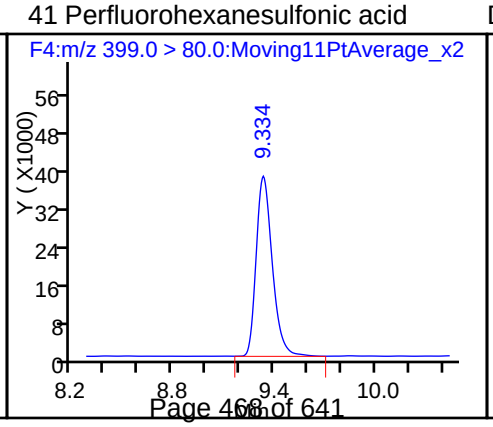
9 Perfluoroheptanoic acid



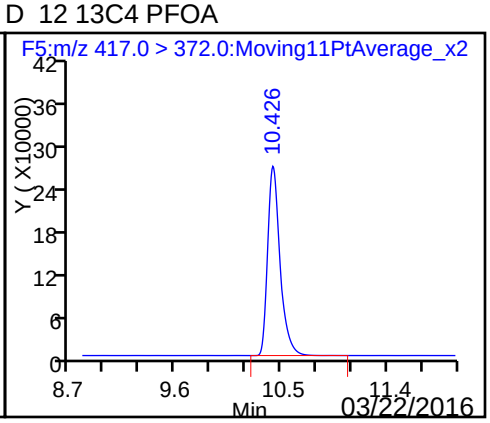
D 11 18O2 PFHxS



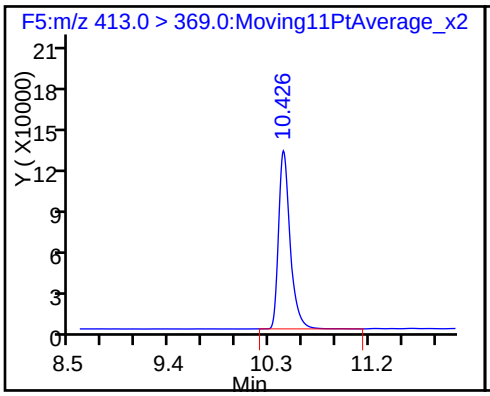
41 Perfluorohexanesulfonic acid



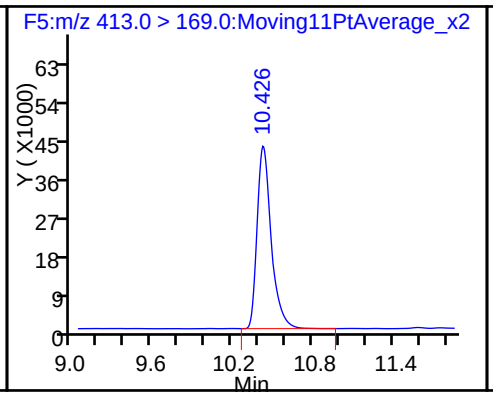
D 12 13C4 PFOA



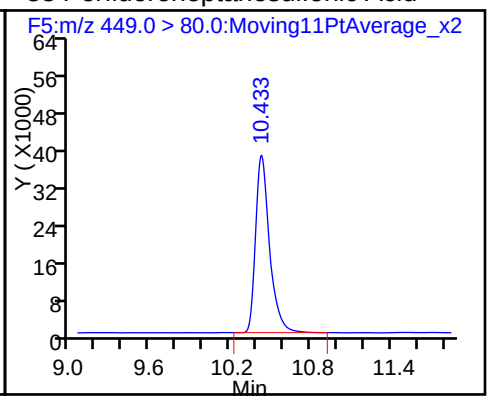
13 Perfluorooctanoic acid



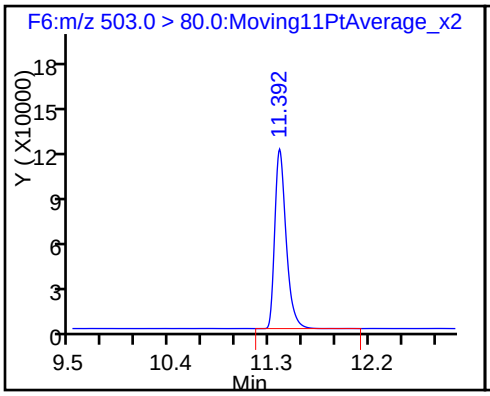
13 Perfluorooctanoic acid



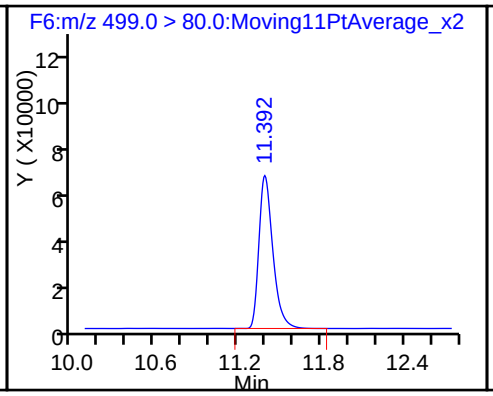
38 Perfluoroheptanesulfonic Acid



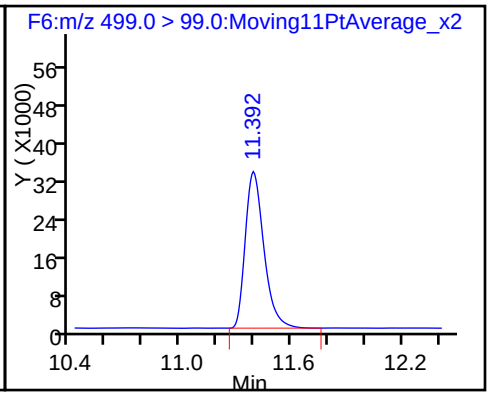
D 16 13C4 PFOS



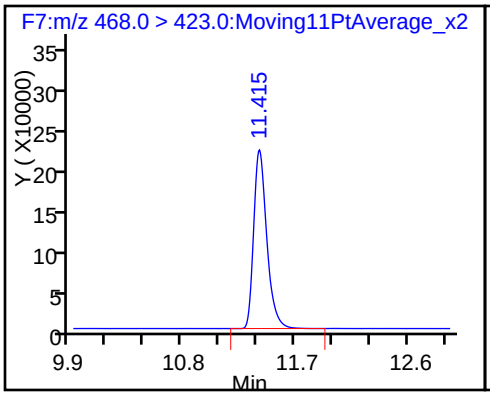
15 Perfluorooctane sulfonic acid



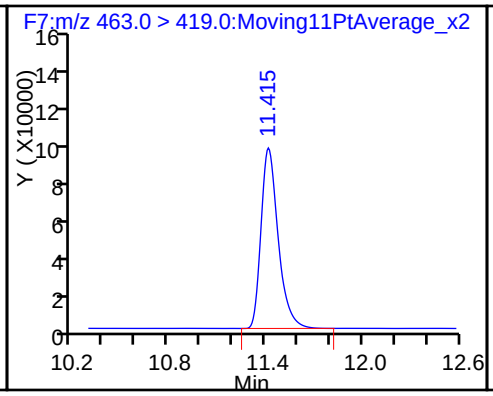
15 Perfluorooctane sulfonic acid



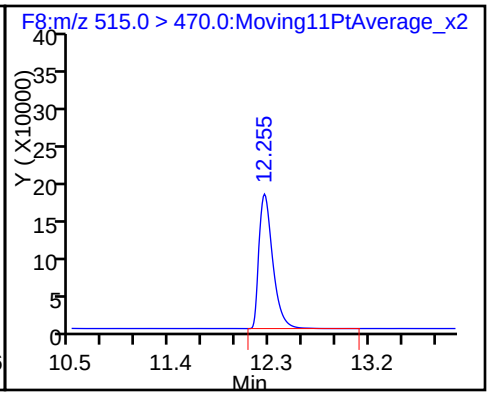
D 17 13C5 PFNA



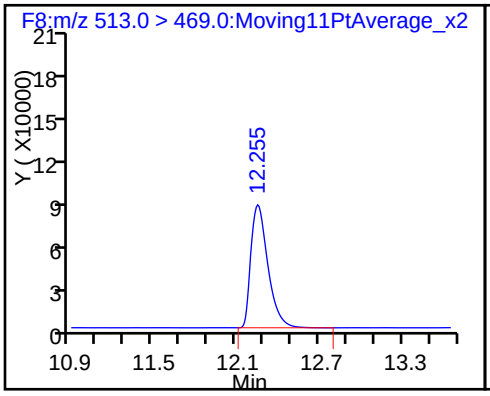
18 Perfluorononanoic acid



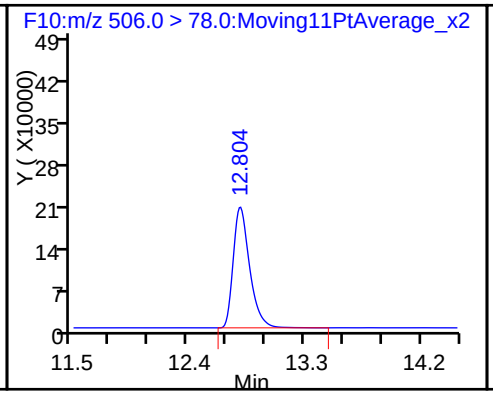
D 19 13C2 PFDA



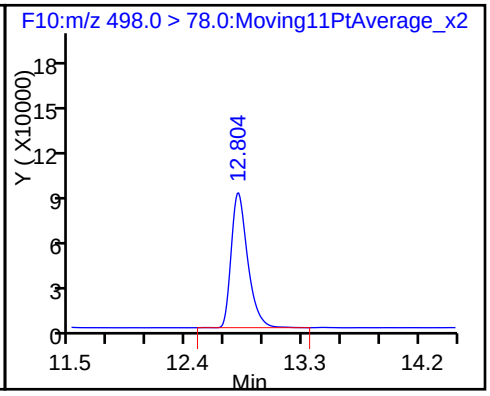
20 Perfluorodecanoic acid



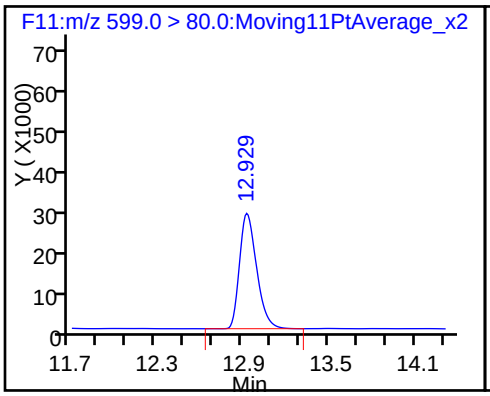
D 23 13C8 FOSA



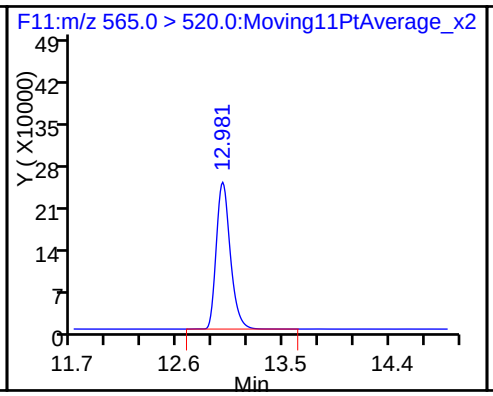
24 Perfluorooctane Sulfonamide



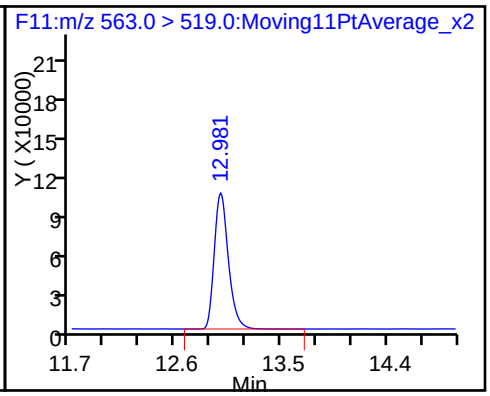
39 Perfluorodecane Sulfonic acid



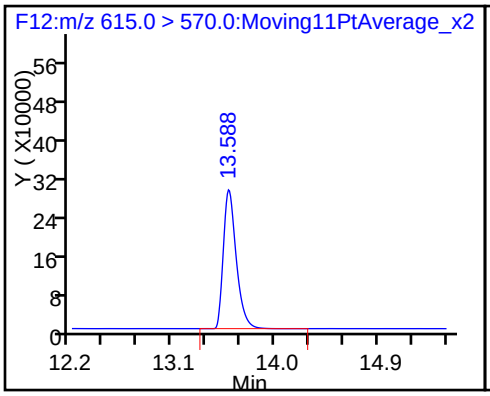
D 26 13C2 PFUnA



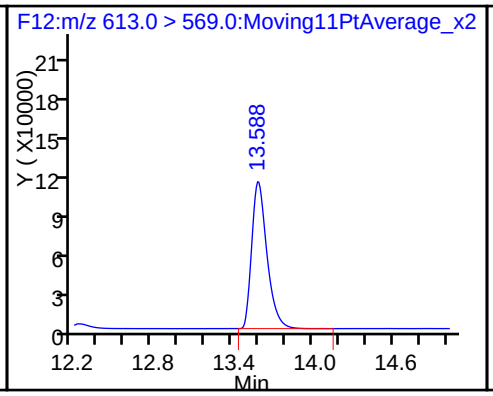
27 Perfluoroundecanoic acid



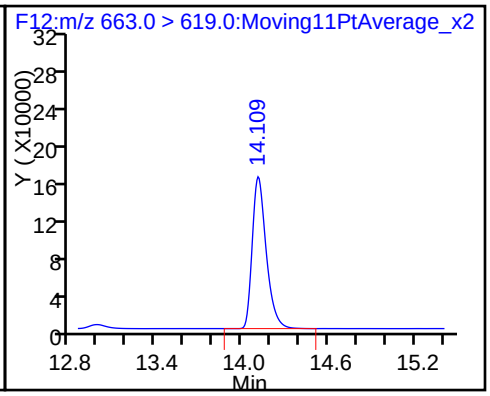
D 28 13C2 PFDoA



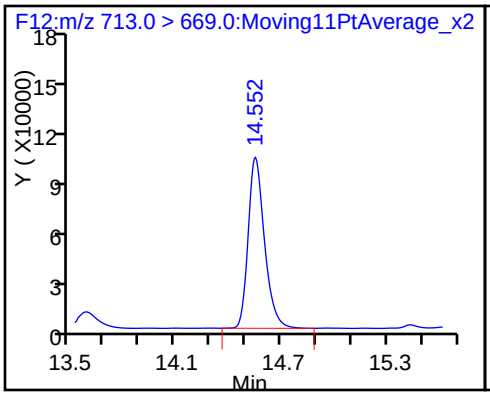
29 Perfluorododecanoic acid



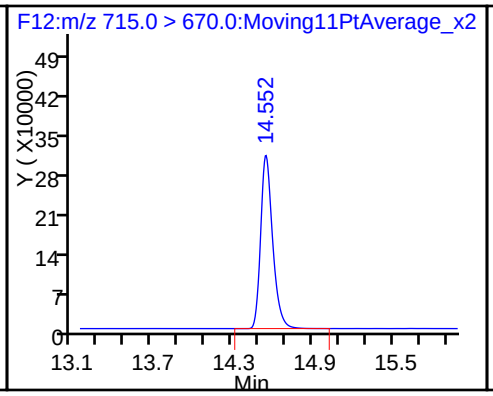
30 Perfluorotridecanoic acid



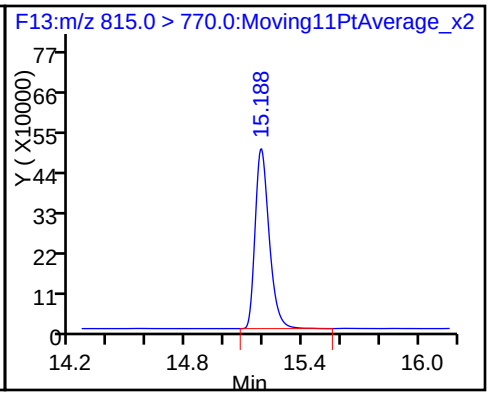
32 Perfluorotetradecanoic acid



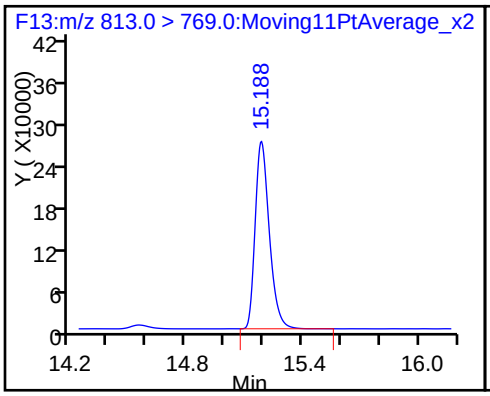
D 33 13C2-PFTeDA



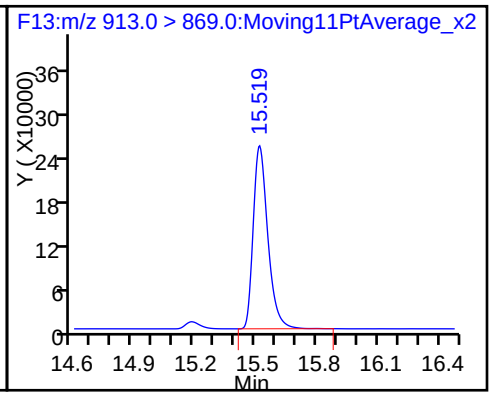
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Instrument ID: A4 Start Date: 02/12/2016 10:35

Analysis Batch Number: 100305 End Date: 02/13/2016 15:33

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
STD 320-100305/2 IC		02/12/2016 10:35	1	12FEB2016A4A_003.d	Acquity 2.1(mm)
STD 320-100305/3 IC		02/12/2016 10:56	1	12FEB2016A4A_004.d	Acquity 2.1(mm)
STD 320-100305/4 IC		02/12/2016 11:17	1	12FEB2016A4A_005.d	Acquity 2.1(mm)
STD 320-100305/5 IC		02/12/2016 11:39	1	12FEB2016A4A_006.d	Acquity 2.1(mm)
STD 320-100305/6 IC		02/12/2016 12:00	1	12FEB2016A4A_007.d	Acquity 2.1(mm)
STD 320-100305/7 IC		02/12/2016 12:21	1	12FEB2016A4A_008.d	Acquity 2.1(mm)
STD 320-100305/8 IC		02/12/2016 12:42	1	12FEB2016A4A_009.d	Acquity 2.1(mm)
ZZZZZ		02/12/2016 13:03	1		Acquity 2.1(mm)
ICV 320-100305/10		02/12/2016 13:24	1	12FEB2016A4A_011.d	Acquity 2.1(mm)
CCV 320-100305/92		02/12/2016 16:57	1		Acquity 2.1(mm)
CCV 320-100305/40		02/13/2016 00:01	1	12FEB2016A4A_041.d	Acquity 2.1(mm)
MB 320-100093/1-A		02/13/2016 00:22	1	12FEB2016A4A_042.d	Acquity 2.1(mm)
ZZZZZ		02/13/2016 00:43	1		Acquity 2.1(mm)
ZZZZZ		02/13/2016 01:04	1		Acquity 2.1(mm)
ZZZZZ		02/13/2016 01:26	1		Acquity 2.1(mm)
ZZZZZ		02/13/2016 01:47	1		Acquity 2.1(mm)
ZZZZZ		02/13/2016 02:08	1		Acquity 2.1(mm)
ZZZZZ		02/13/2016 02:29	1		Acquity 2.1(mm)
ZZZZZ		02/13/2016 02:50	1		Acquity 2.1(mm)
ZZZZZ		02/13/2016 03:11	1		Acquity 2.1(mm)
ZZZZZ		02/13/2016 03:33	1		Acquity 2.1(mm)
CCV 320-100305/51		02/13/2016 03:54	1	12FEB2016A4A_052.d	Acquity 2.1(mm)
ZZZZZ		02/13/2016 04:15	1		Acquity 2.1(mm)
ZZZZZ		02/13/2016 04:36	1		Acquity 2.1(mm)
ZZZZZ		02/13/2016 04:57	1		Acquity 2.1(mm)
ZZZZZ		02/13/2016 05:19	1		Acquity 2.1(mm)
ZZZZZ		02/13/2016 05:40	1		Acquity 2.1(mm)
ZZZZZ		02/13/2016 06:01	1		Acquity 2.1(mm)
ZZZZZ		02/13/2016 06:22	1		Acquity 2.1(mm)
ZZZZZ		02/13/2016 06:43	1		Acquity 2.1(mm)
ZZZZZ		02/13/2016 07:04	1		Acquity 2.1(mm)
ZZZZZ		02/13/2016 07:26	1		Acquity 2.1(mm)
CCV 320-100305/62		02/13/2016 07:47	1		Acquity 2.1(mm)
ZZZZZ		02/13/2016 08:08	1		Acquity 2.1(mm)
ZZZZZ		02/13/2016 08:29	1		Acquity 2.1(mm)
ZZZZZ		02/13/2016 08:50	1		Acquity 2.1(mm)
ZZZZZ		02/13/2016 09:12	1		Acquity 2.1(mm)
ZZZZZ		02/13/2016 09:33	1		Acquity 2.1(mm)
ZZZZZ		02/13/2016 09:54	1		Acquity 2.1(mm)
ZZZZZ		02/13/2016 10:15	1		Acquity 2.1(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Instrument ID: A4 Start Date: 02/12/2016 10:35

Analysis Batch Number: 100305 End Date: 02/13/2016 15:33

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
ZZZZZ		02/13/2016 10:36	1		Acquity 2.1(mm)
ZZZZZ		02/13/2016 10:57	1		Acquity 2.1(mm)
ZZZZZ		02/13/2016 11:19	1		Acquity 2.1(mm)
CCV 320-100305/73		02/13/2016 11:40	1		Acquity 2.1(mm)
ZZZZZ		02/13/2016 12:01	1		Acquity 2.1(mm)
ZZZZZ		02/13/2016 12:22	1		Acquity 2.1(mm)
ZZZZZ		02/13/2016 12:43	1		Acquity 2.1(mm)
ZZZZZ		02/13/2016 13:04	1		Acquity 2.1(mm)
ZZZZZ		02/13/2016 13:26	1		Acquity 2.1(mm)
ZZZZZ		02/13/2016 13:47	1		Acquity 2.1(mm)
ZZZZZ		02/13/2016 14:08	1		Acquity 2.1(mm)
ZZZZZ		02/13/2016 14:29	1		Acquity 2.1(mm)
ZZZZZ		02/13/2016 14:50	1		Acquity 2.1(mm)
ZZZZZ		02/13/2016 15:12	1		Acquity 2.1(mm)
CCV 320-100305/84		02/13/2016 15:33	1		Acquity 2.1(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Instrument ID: A6 Start Date: 02/19/2016 15:08

Analysis Batch Number: 100906 End Date: 02/20/2016 16:59

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
STD 320-100906/2 IC		02/19/2016 15:08	1	19FEB2016A6A_004.d	Acquity 2.1(mm)
STD 320-100906/3 IC		02/19/2016 15:29	1	19FEB2016A6A_005.d	Acquity 2.1(mm)
STD 320-100906/4 IC		02/19/2016 15:50	1	19FEB2016A6A_006.d	Acquity 2.1(mm)
STD 320-100906/5 IC		02/19/2016 16:11	1	19FEB2016A6A_007.d	Acquity 2.1(mm)
STD 320-100906/6 IC		02/19/2016 16:33	1	19FEB2016A6A_008.d	Acquity 2.1(mm)
STD 320-100906/7 IC		02/19/2016 16:54	1	19FEB2016A6A_009.d	Acquity 2.1(mm)
STD 320-100906/8 IC		02/19/2016 17:15	1	19FEB2016A6A_010.d	Acquity 2.1(mm)
ZZZZZ		02/19/2016 17:36	1		Acquity 2.1(mm)
ICV 320-100906/10		02/19/2016 17:58	1	19FEB2016A6A_012.d	Acquity 2.1(mm)
CCV 320-100906/43		02/20/2016 05:40	1	19FEB2016A6A_045.d	Acquity 2.1(mm)
MB 320-100093/1-A		02/20/2016 06:23	1	19FEB2016A6A_047.d	Acquity 2.1(mm)
LCS 320-100093/2-A		02/20/2016 06:44	1	19FEB2016A6A_048.d	Acquity 2.1(mm)
LCSD 320-100093/3-A		02/20/2016 07:05	1	19FEB2016A6A_049.d	Acquity 2.1(mm)
ZZZZZ		02/20/2016 07:26	1		Acquity 2.1(mm)
ZZZZZ		02/20/2016 07:47	1		Acquity 2.1(mm)
ZZZZZ		02/20/2016 08:09	1		Acquity 2.1(mm)
ZZZZZ		02/20/2016 08:30	1		Acquity 2.1(mm)
ZZZZZ		02/20/2016 08:51	1		Acquity 2.1(mm)
ZZZZZ		02/20/2016 09:12	1		Acquity 2.1(mm)
CCV 320-100906/54		02/20/2016 09:34	1	19FEB2016A6A_056.d	Acquity 2.1(mm)
ZZZZZ		02/20/2016 09:55	1		Acquity 2.1(mm)
320-17154-1		02/20/2016 10:16	1	19FEB2016A6A_058.d	Acquity 2.1(mm)
320-17154-3		02/20/2016 10:37	1	19FEB2016A6A_059.d	Acquity 2.1(mm)
320-17154-6		02/20/2016 10:58	1	19FEB2016A6A_060.d	Acquity 2.1(mm)
MB 320-100147/1-A		02/20/2016 11:20	1	19FEB2016A6A_061.d	Acquity 2.1(mm)
LCS 320-100147/2-A		02/20/2016 11:41	1	19FEB2016A6A_062.d	Acquity 2.1(mm)
LCSD 320-100147/3-A		02/20/2016 12:02	1	19FEB2016A6A_063.d	Acquity 2.1(mm)
320-17154-8		02/20/2016 12:23	1	19FEB2016A6A_064.d	Acquity 2.1(mm)
320-17154-10		02/20/2016 12:45	1	19FEB2016A6A_065.d	Acquity 2.1(mm)
CCV 320-100906/65		02/20/2016 13:27	1	19FEB2016A6A_067.d	Acquity 2.1(mm)
CCV 320-100906/75		02/20/2016 16:59	1		Acquity 2.1(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Batch Number: 100093 Batch Start Date: 02/09/16 10:23 Batch Analyst: Arauz, Horacio J

Batch Method: 3535 Batch End Date: 02/09/16 20:35

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	LCMPFCSU 00025	LCPFCSP 00039
MB 320-100093/1		3535, WS-LC-0025				500 mL	1.00 mL	50 uL	
LCS 320-100093/2		3535, WS-LC-0025				500 mL	1.00 mL	50 uL	20 uL
LCSD 320-100093/3		3535, WS-LC-0025				500 mL	1.00 mL	50 uL	20 uL
320-17154-A-1	OF-FB09-0216	3535, WS-LC-0025	T	549.36 g	44.49 g	504.9 mL	1.00 mL	50 uL	
320-17154-A-3	OF-FB37-0216	3535, WS-LC-0025	T	593.62 g	42.89 g	550.7 mL	1.00 mL	50 uL	
320-17154-A-6	OF-FB11-0216	3535, WS-LC-0025	T	596.20 g	44.78 g	551.4 mL	1.00 mL	50 uL	

Batch Notes	
Balance ID	QA-070
Batch Comment	0.1N Sodium Hydrox./H2O 565548; MeOH 572662; J.T.B Hexane 0000101243
H2O ID	02-09-16
Pipette ID	EC15219
Analyst ID - Reagent Drop	HJA
Analyst ID - SU Reagent Drop	HJA
Analyst ID - SU Reagent Drop Witness	SNE
Solvent Lot #	578365
Solvent Name	0.3% Ammonium hydroxide/MeOH
SOP Number	WS-LC-0025
SPE Cartridge Type	Wax 500mg
Solid Phase Extraction Disk ID	002635307A

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-17154-1

SDG No.: CTO WE7G PFC Sampling

Batch Number: 100147 Batch Start Date: 02/10/16 07:14 Batch Analyst: Arauz, Horacio J

Batch Method: 3535 Batch End Date: 02/10/16 20:25

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	LCMPFCSU 00025	LCPFCSP 00039
MB 320-100147/1		3535, WS-LC-0025				500 mL	1.00 mL	50 uL	
LCS 320-100147/2		3535, WS-LC-0025				500 mL	1.00 mL	50 uL	20 uL
LCSD 320-100147/3		3535, WS-LC-0025				500 mL	1.00 mL	50 uL	20 uL
320-17154-A-8	OF-FB28-0216	3535, WS-LC-0025	T	566.05 g	44.50 g	521.6 mL	1.00 mL	50 uL	
320-17154-A-10	OF-FB67-0216	3535, WS-LC-0025	T	578.68 g	42.81 g	535.9 mL	1.00 mL	50 uL	

Batch Notes	
Balance ID	QA-070
Batch Comment	0.1N Sodium Hydrox./H2O 565548; MeOH 572662; J.T.B Hexane 0000101243
H2O ID	02-09-16
Pipette ID	EC15219
Analyst ID - Reagent Drop	HJA
Analyst ID - SU Reagent Drop	HJA
Analyst ID - SU Reagent Drop Witness	CRF
Solvent Lot #	578365
Solvent Name	0.3% Ammonium hydroxide/MeOH
SOP Number	WS-LC-0025
SPE Cartridge Type	Wax 500mg
Solid Phase Extraction Disk ID	002635307A

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): 320-17150, 320-17154 Work List ID(s): 28353, 28492

Extraction Batch: 100093, 100147 Analysis Batch(es): 100305, 100906

Delivery Rank 4 Due Date: 2/8/16

A. Calibration/Instrument Run QC	1st Level	2nd Level	N/A
1. ICAL locked in Chrom and TALS? ICAL Batch#	✓	✓	
2. ICAL, CCV Frequency & Criteria met.	✓	✓	
• $RF_{average}$ criteria appropriate for the method.	✓	✓	
• Linear Regression criteria appropriate if required ($r \geq 0.995$).	✓	✓	
• Quadratic fit criteria appropriate if required ($r^2 \geq 0.990$).			✓
• For Linear Regression and Quadratic fit – Does the y-intercept support ½ the reporting limit as described in CA-Q-S-005?	✓	✓	
• All curve points show calculated concentrations.	✓	✓	
3. Peaks correctly ID'd by data system.	✓	✓	
5. Tune check frequency & criteria met and Tune check report attached.			✓
B. QA/QC			
1. Are all QC samples properly linked in TALS?	✓	✓	
2. Method blank, LCS/LCSD and MS/SD frequencies met.	✓	✓	
3. LCS/LCSD and MB data are within control limits. If not, NCM is present.	✓	✓	
4. Are MS/MSD recoveries and RPD within control limits?			✓
5. Holding Times were met for prep and analytical.	✓	✓	
6. IS/Surrogate recoveries meet criteria or properly noted.	✓	✓	
C. Sample Analysis			
1. Was correct analysis performed and were project instructions followed?	✓	✓	
2. If required, are compounds within RT windows?			✓
3. If required, are positive hits confirmed and >40% RPD flagged?			✓
4. Manual Integrations reviewed and appropriate.			✓
5. All analytes correctly reported. (Primary, secondary, acceptable status)	✓	✓	
6. Correct reporting limits used. (based on client request, prep factors, and dilutions)	✓	✓	
D. Documentation			
1. Are all non-conformances documented/attached? NCM#			✓
2. Do results make sense (e.g. dilutions, etc.)?	✓	✓	
3. Have all flags been reviewed for appropriateness?	✓	✓	
4. For level 3 and 4 reports, have forms and raw data been reviewed?		✓	
5. Was QC Checker run for this job?	✓	✓	

**Upon completion of this checklist, the reviewer must scan and attach the checklist to the TALS job.*

1st Level (Analyst): JRB Date: 2/22/16

2nd Level Reviewer: MWolf Date: 2/22/2016

18

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-100093
Method Code: 320-3535_IVWT-320

Analyst: Arauz, Horacio J

Batch Open: 2/9/2016 10:23:08AM
Batch End: 2/09/16 20:35

(1)

Solid-Phase Extraction (SPE)

	Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmnt FinAmnt	PHs Rcvd	PHs Adj1	PHs Adj2	Due Date	Analytical TAT	Dlv Rank	Comments	Output Sample Lab ID
1	MB~320-100093/1 N/A	N/A		500 mL				N/A	N/A	N/A		MB 320-100093/1-A
				1.00 mL								
2	LCS~320-100093/2 N/A	N/A		500 mL				N/A	N/A	N/A		LCS 320-100093/2-A
				1.00 mL								
3	LCSD~320-100093/3 N/A	N/A		500 mL				N/A	N/A	N/A		LCSD 320-100093/3-A
				1.00 mL								
	320-17150-A-1 (PFC_IDA_DOD5)	N/A (320-17150-1)	603.30 g	558.5 mL				2/8/16	5_Days	4	cancel	320-17150-A-1-A
			44.76 g	1.00 mL								
	320-17150-A-2 (PFC_IDA_DOD5)	N/A (320-17150-1)	575.48 g	532.6 mL				2/8/16	5_Days	4		320-17150-A-2-A
			42.91 g	1.00 mL								
6	320-17150-A-3 (PFC_IDA_DOD5)	N/A (320-17150-1)	597.46 g	552.6 mL				2/8/16	5_Days	4	cancel	320-17150-A-3-A
			44.83 g	1.00 mL								
7	320-17150-A-4 (PFC_IDA_DOD5)	N/A (320-17150-1)	564.91 g	522 mL				2/8/16	5_Days	4		320-17150-A-4-A
			42.89 g	1.00 mL								
8	320-17150-A-5 (PFC_IDA_DOD5)	N/A (320-17150-1)	578.05 g	534.2 mL				2/8/16	5_Days	4	cancel	320-17150-A-5-A
			43.87 g	1.00 mL								
9	320-17150-A-6 (PFC_IDA_DOD5)	N/A (320-17150-1)	577.94 g	534.9 mL				2/8/16	5_Days	4		320-17150-A-6-A
			43.02 g	1.00 mL								
10	320-17150-A-7 (PFC_IDA_DOD5)	N/A (320-17150-1)	582.39 g	537.5 mL				2/8/16	5_Days	4	cancel	320-17150-A-7-A
			44.94 g	1.00 mL								

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-100093 Analyst: Arauz, Horacio J Batch Open: 2/9/2016 10:23:08AM

Method Code: 320-3535_IVWT-320 Batch End:

11	320-17150-A-8 (PFC_IDA_DOD5)	N/A (320-17150-1)	583.91 g 42.98 g	540.9 mL 1.00 mL				2/8/16	5_Days	4		
12	320-17150-A-9 (PFC_IDA_DOD5)	N/A (320-17150-1)	588.67 g 44.02 g	544.7 mL 1.00 mL				2/8/16	5_Days	4		
13	320-17150-A-10 (PFC_IDA_DOD5)	N/A (320-17150-1)	583.36 g 44.57 g	538.8 mL 1.00 mL				2/8/16	5_Days	4	cancel	
14	320-17150-A-11 (PFC_IDA_DOD5)	N/A (320-17150-1)	597.25 g 42.99 g	554.3 mL 1.00 mL				2/8/16	5_Days	4		
15	320-17150-A-12 (PFC_IDA_DOD5)	N/A (320-17150-1)	596.09 g 44.90 g	551.2 mL 1.00 mL				2/8/16	5_Days	4	cancel	
16	320-17150-A-13 (PFC_IDA_DOD5)	N/A (320-17150-1)	589.34 g 44.06 g	545.3 mL 1.00 mL				2/8/16	5_Days	4		
17	320-17150-A-14 (PFC_IDA_DOD5)	N/A (320-17150-1)	593.57 g 44.47 g	549.1 mL 1.00 mL				2/8/16	5_Days	4	cancel	
18	320-17154-A-1 (PFC_IDA_DOD5)	N/A (320-17154-1)	549.36 g 44.49 g	504.9 mL 1.00 mL				2/8/16	5_Days	4		
19	320-17154-A-2 (PFC_IDA_DOD5)	N/A (320-17154-1)	577.08 g 45.84 g	531.2 mL 1.00 mL				2/8/16	5_Days	4	cancel	
20	320-17154-A-3 (PFC_IDA_DOD5)	N/A (320-17154-1)	593.62 g 42.89 g	550.7 mL 1.00 mL				2/8/16	5_Days	4		
21	320-17154-A-4 (PFC_IDA_DOD5)	N/A (320-17154-1)	581.63 g 43.14 g	538.5 mL 1.00 mL				2/8/16	5_Days	4	cancel	
22	320-17154-A-5 (PFC_IDA_DOD5)	N/A (320-17154-1)	586.86 g 45.91 g	541 mL 1.00 mL				2/8/16	5_Days	4	cancel	

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments),

Batch Number: 320-100093 Analyst: Arauz, Horacio J Batch Open: 2/9/2016 10:23:08AM

Method Code: 320-3535_IVWT-320 Batch End:

23	320-17154-A-6 (PFC_IDA_DOD5)	N/A (320-17154-1)	596.20 g 44.78 g	551.4 mL 1.00 mL				2/8/16	5_Days	4	

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-100093 Analyst: Arauz, Horacio J Batch Open: 2/9/2016 10:23:08AM

Method Code: 320-3535_IVWT-320 Batch End:

Batch Notes

First Start time	NA
First End time	NA
Balance ID	QA-070
SPE Cartridge Type	Wax 500mg
Solid Phase Extraction Disk Lot Number	002635307A
H2O Lot used	02-09-16
Pipette ID	EC15219
Solvent Name	0.3% Ammonium hydroxide/MeOH
Solvent Lot #	578365
Analyst who added reagent	HJA
SU Reagent Drop	HJA
SU Reagent Drop Witness	SNE
Acid Name	NA
Acid Lot	NA
Reagent ID	NA
Reagent Lot Number	NA
NaCl Lot #	NA
SOP Number	WS-LC-0025
Batch Comment	0.1N Sodium Hydrox./H2O 565548; MeOH 572662; J.T.B Hexane 0000101243

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-100093

Analyst: Arauz, Horacio J

Batch Open: 2/9/2016 10:23:08AM

Method Code: 320-3535_IVWT-320

Batch End:

Comments

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-100093
Analyst: Arauz, Horacio J
Batch Open: 2/9/2016 10:23:08AM
Method Code: 320-3535_IVWT-320
Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-100093/1	LCMPFCSU_00025	50 uL	1.00 mL	HJA 2-9-16	SNE 2/9/16
LCS 320-100093/2	LCMPFCSU_00025	50 uL	1.00 mL		
LCS 320-100093/2	LCPFCSP_00039	20 uL	1.00 mL		
LCSD 320-100093/3	LCMPFCSU_00025	50 uL	1.00 mL		
LCSD 320-100093/3	LCPFCSP_00039	20 uL	1.00 mL		
320-17150-A-1	LCMPFCSU_00025	50 uL	1.00 mL		
320-17150-A-2	LCMPFCSU_00025	50 uL	1.00 mL		
320-17150-A-3	LCMPFCSU_00025	50 uL	1.00 mL		
320-17150-A-4	LCMPFCSU_00025	50 uL	1.00 mL		
320-17150-A-5	LCMPFCSU_00025	50 uL	1.00 mL		
320-17150-A-6	LCMPFCSU_00025	50 uL	1.00 mL		
320-17150-A-7	LCMPFCSU_00025	50 uL	1.00 mL		
320-17150-A-8	LCMPFCSU_00025	50 uL	1.00 mL		
320-17150-A-9	LCMPFCSU_00025	50 uL	1.00 mL		
320-17150-A-10	LCMPFCSU_00025	50 uL	1.00 mL		
320-17150-A-11	LCMPFCSU_00025	50 uL	1.00 mL		
320-17150-A-12	LCMPFCSU_00025	50 uL	1.00 mL		
320-17150-A-13	LCMPFCSU_00025	50 uL	1.00 mL		

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-100093 Analyst: Arauz, Horacio J Batch Open: 2/9/2016 10:23:08AM

Method Code: 320-3535_IVWT-320 Batch End:

320-17150-A-14	LCMPFCSU_00025	50 uL	1.00 mL	HJA 2-9-16	SNE 2/9/16
320-17154-A-1	LCMPFCSU_00025	50 uL	1.00 mL		
320-17154-A-2	LCMPFCSU_00025	50 uL	1.00 mL		
320-17154-A-3	LCMPFCSU_00025	50 uL	1.00 mL		
320-17154-A-4	LCMPFCSU_00025	50 uL	1.00 mL		
320-17154-A-5	LCMPFCSU_00025	50 uL	1.00 mL		
320-17154-A-6	LCMPFCSU_00025	50 uL	1.00 mL		

Other Reagents:

Reagent	Amount/Units	Lot#:

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sacramento
Preparation Data Review Checklist

Preparation Batch Number(s): 320-100093 Test: PFC-L

Earliest Holding Time: 2-10-16

Sample List Tab	1st Level Reviewer	2nd Level Reviewer
Samples identified to the correct method	✓	✓
All necessary NCMs filed (including holding time)	✓	✓
Method/sample/login/QAS checked and correct	✓	✓
Worksheet Tab	**1st Level Reviewer**	**2nd Level Reviewer**
All samples properly preserved	NA	NA
Weights in anticipated range and not targeted	✓	✓
All additional test requirements performed, documented, and uploaded to TALS correctly (e.g. final amount, initial amount, turbidity, and Cl Check)	✓	✓
The pH is transcribed correctly in TALS	NA	NA
All additional information transcribed into TALS is correct and raw data is attached	✓	✓
Comments are transcribed correctly in TALS	✓	✓
Reagents Tab	**1st Level Reviewer**	**2nd Level Reviewer**
All necessary reagents not expired and entered into TALS	✓	✓
All spike amounts correct and added to necessary samples and QC	✓	✓
Batch Information	**1st Level Reviewer**	**2nd Level Reviewer**
Date and time accurate and entered into TALS correctly	✓	✓
All necessary 'batch information' complete and entered into TALS correctly	✓	✓

1st Level Reviewer: _____ Date: 2/09/16

2nd Level Reviewer: SNE Date: 2/10/16

Comments: _____

Box #18

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-100147

Method Code: 320-3535_IVWT-320

Analyst: Arauz, Horacio J

Batch Open: 2/10/2016 7:14:29AM

Batch End: 2/10/16 20:25

(2)

Solid-Phase Extraction (SPE)

	Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmnt FinAmnt	PHs Rcvd	PHs Adj1	PHs Adj2	Due Date	Analytical TAT	Dlv Rank	Comments	Output Sample Lab ID
1	MB~320-100147/1 N/A	N/A		500 mL				N/A	N/A	N/A		MB 320-100147/1-A
				1.00 mL								
2	LCS~320-100147/2 N/A	N/A		500 mL				N/A	N/A	N/A		LCS 320-100147/2-A
				1.00 mL								
3	LCSD~320-100147/3 N/A	N/A		500 mL				N/A	N/A	N/A		LCSD 320-100147/3-A
				1.00 mL								
4	320-17154-A-7 (PFC_IDA_DOD5)	N/A (320-17154-1)	606.10 g	561.2 mL				2/8/16	5_Days	4	Cancel	320-17154-A-7-A
			44.87 g	1.00 mL								
5	320-17154-A-8 (PFC_IDA_DOD5)	N/A (320-17154-1)	566.05 g	521.6 mL				2/8/16	5_Days	4		320-17154-A-8-A
			44.50 g	1.00 mL								
6	320-17154-A-9 (PFC_IDA_DOD5)	N/A (320-17154-1)	572.25 g	526.9 mL				2/8/16	5_Days	4	Cancel	320-17154-A-9-A
			45.31 g	1.00 mL								
7	320-17154-A-10 (PFC_IDA_DOD5)	N/A (320-17154-1)	578.68 g	535.9 mL				2/8/16	5_Days	4		320-17154-A-10-A
			42.81 g	1.00 mL								
8	320-17183-A-1 (PFC_IDA_DOD5)	N/A (320-17183-1)	572.46 g	527.2 mL				2/9/16	5_Days	4		320-17183-A-1-A
			45.30 g	1.00 mL								
9	320-17183-A-2 (PFC_IDA_DOD5)	N/A (320-17183-1)	573.90 g	529.2 mL				2/9/16	5_Days	4		320-17183-A-2-A
			44.66 g	1.00 mL								
10	320-17183-A-3 (PFC_IDA_DOD5)	N/A (320-17183-1)	599.77 g	553.8 mL				2/9/16	5_Days	4		320-17183-A-3-A
			45.94 g	1.00 mL								

Page 485 of 641

03/22/2016

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-100147 Analyst: Arauz, Horacio J Batch Open: 2/10/2016 7:14:29AM

Method Code: 320-3535_IVWT-320 Batch End:

11	320-17183-A-4 (PFC_IDA_DOD5)	N/A (320-17183-1)	591.89 g 44.22 g	547.7 mL 1.00 mL				2/9/16	5_Days	4	
12	320-17183-A-5 (PFC_IDA_DOD5)	N/A (320-17183-1)	595.34 g 45.96 g	549.4 mL 1.00 mL				2/9/16	5_Days	4	
13	320-17183-A-6 (PFC_IDA_DOD5)	N/A (320-17183-1)	582.18 g 44.82 g	537.4 mL 1.00 mL				2/9/16	5_Days	4	
14	320-17183-A-7 (PFC_IDA_DOD5)	N/A (320-17183-1)	604.2 g 43.25 g	561 mL 1.00 mL				2/9/16	5_Days	4	
15	320-17183-A-8 (PFC_IDA_DOD5)	N/A (320-17183-1)	593.22 g 44.26 g	549 mL 1.00 mL				2/9/16	5_Days	4	
16	320-17183-A-9 (PFC_IDA_DOD5)	N/A (320-17183-1)	598.43 g 44.88 g	553.6 mL 1.00 mL				2/9/16	5_Days	4	
17	320-17183-A-10 (PFC_IDA_DOD5)	N/A (320-17183-1)	574.41 g 44.85 g	529.6 mL 1.00 mL				2/9/16	5_Days	4	
18	320-17184-A-1 (PFC_IDA_DOD5)	N/A (320-17184-1)	573.03 g 44.43 g	528.6 mL 1.00 mL				2/10/16	8_Day_Rush	4	
19	320-17184-A-2 (PFC_IDA_DOD5)	N/A (320-17184-1)	582.88 g 44.14 g	538.7 mL 1.00 mL				2/10/16	8_Day_Rush	4	
20	320-17184-A-3 (PFC_IDA_DOD5)	N/A (320-17184-1)	574.41 g 44.44 g	530 mL 1.00 mL				2/10/16	8_Day_Rush	4	
21	320-17184-A-4 (PFC_IDA_DOD5)	N/A (320-17184-1)	591.29 g 44.50 g	546.8 mL 1.00 mL				2/10/16	8_Day_Rush	4	
22	320-17184-A-5 (PFC_IDA_DOD5)	N/A (320-17184-1)	582.37 g 45.04 g	537.3 mL 1.00 mL				2/10/16	8_Day_Rush	4	

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-100147 Analyst: Arauz, Horacio J Batch Open: 2/10/2016 7:14:29AM

Method Code: 320-3535_IVWT-320 Batch End:

23	320-17184-A-6 (PFC_IDA_DOD5)	N/A (320-17184-1)	574.59 g 44.63 g	530 mL 1.00 mL				2/10/16	8_Day_Rush	4	

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-100147 Analyst: Arauz, Horacio J Batch Open: 2/10/2016 7:14:29AM

Method Code: 320-3535_IVWT-320 Batch End:

Batch Notes

First Start time	NA
First End time	NA
Balance ID	QA-070
SPE Cartridge Type	Wax 500mg
Solid Phase Extraction Disk Lot Number	002635307A
H2O Lot used	02-09-16
Pipette ID	EC15219
Solvent Name	0.3% Ammonium hydroxide/MeOH
Solvent Lot #	578365
Analyst who added reagent	HJA
SU Reagent Drop	HJA
SU Reagent Drop Witness	CRF
Acid Name	NA
Acid Lot	NA
Reagent ID	NA
Reagent Lot Number	NA
NaCl Lot #	NA
SOP Number	WS-LC-0025
Batch Comment	0.1N Sodium Hydrox./H2O 565548; MeOH 572662; J.T.B Hexane 0000101243

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-100147
Analyst: Arauz, Horacio J
Batch Open: 2/10/2016 7:14:29AM

Method Code: 320-3535_IVWT-320
Batch End:

Comments

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-100147
Analyst: Arauz, Horacio J
Batch Open: 2/10/2016 7:14:29AM
Method Code: 320-3535_IVWT-320
Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-100147/1	LCMPFCSU_00025	50 uL	1.00 mL	HJA 2-10-16	CFR 2/10/16
LCS 320-100147/2	LCMPFCSU_00025	50 uL	1.00 mL		
LCS 320-100147/2	LCPFCSP_00039	20 uL	1.00 mL		
LCSD 320-100147/3	LCMPFCSU_00025	50 uL	1.00 mL		
LCSD 320-100147/3	LCPFCSP_00039	20 uL	1.00 mL		
320-17154-A-7	LCMPFCSU_00025	50 uCi	1.00 mL		
320-17154-A-8	LCMPFCSU_00025	50 uL	1.00 mL		
320-17154-A-9	LCMPFCSU_00025	50 uL	1.00 mL		
320-17154-A-10	LCMPFCSU_00025	50 uL	1.00 mL		
320-17183-A-1	LCMPFCSU_00025	50 uL	1.00 mL		
320-17183-A-2	LCMPFCSU_00025	50 uL	1.00 mL		
320-17183-A-3	LCMPFCSU_00025	50 uL	1.00 mL		
320-17183-A-4	LCMPFCSU_00025	50 uL	1.00 mL		
320-17183-A-5	LCMPFCSU_00025	50 uL	1.00 mL		
320-17183-A-6	LCMPFCSU_00025	50 uL	1.00 mL		
320-17183-A-7	LCMPFCSU_00025	50 uL	1.00 mL		
320-17183-A-8	LCMPFCSU_00025	50 uL	1.00 mL		
320-17183-A-9	LCMPFCSU_00025	50 uL	1.00 mL		

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-100147 Analyst: Arauz, Horacio J Batch Open: 2/10/2016 7:14:29AM

Method Code: 320-3535_IVWT-320 Batch End:

320-17183-A-10	LCMPFCSU_00025	50 uL	1.00 mL	HSA 2-10-16	CFR 2/10/16
320-17184-A-1	LCMPFCSU_00025	50 uL	1.00 mL		
320-17184-A-2	LCMPFCSU_00025	50 uL	1.00 mL		
320-17184-A-3	LCMPFCSU_00025	50 uL	1.00 mL		
320-17184-A-4	LCMPFCSU_00025	50 uL	1.00 mL		
320-17184-A-5	LCMPFCSU_00025	50 uL	1.00 mL		
320-17184-A-6	LCMPFCSU_00025	50 uL	1.00 mL		

Other Reagents:

Reagent	Amount/Units	Lot#:

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sacramento
Preparation Data Review Checklist

Preparation Batch Number(s): 320-100197 Test: PFC-L

Earliest Holding Time: 2-10-16 / 2-11-16

Sample List Tab	1st Level Reviewer	2nd Level Reviewer
Samples identified to the correct method	✓	✓
All necessary NCMs filed (including holding time)	✓	✓
Method/sample/login/QAS checked and correct	✓	✓
Worksheet Tab	**1st Level Reviewer**	**2nd Level Reviewer**
All samples properly preserved	NA	NA
Weights in anticipated range and not targeted	✓	✓
All additional test requirements performed, documented, and uploaded to TALS correctly (e.g. final amount, initial amount, turbidity, and Cl Check)	✓	✓
The pH is transcribed correctly in TALS	NA	NA
All additional information transcribed into TALS is correct and raw data is attached	✓	✓
Comments are transcribed correctly in TALS	✓	✓
Reagents Tab	**1st Level Reviewer**	**2nd Level Reviewer**
All necessary reagents not expired and entered into TALS	✓	✓
All spike amounts correct and added to necessary samples and QC	✓	✓
Batch Information	**1st Level Reviewer**	**2nd Level Reviewer**
Date and time accurate and entered into TALS correctly	✓	✓
All necessary 'batch information' complete and entered into TALS correctly	✓	✓

1st Level Reviewer: [signature] Date: 2/10/16

2nd Level Reviewer: SAE Date: 2/10/16

Comments:

BOX 20

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

West Sacramento
ESC-Extraction Master Sheet

Holding Time Due: _____ Project Due: _____

BATCH #: _____ Initiated By: HSA Date: 2-18-16

Test: QC-537 Spike Extn Comp'd By: HSA Date: 2-18-16

QC Code	Lot ID	Sample #	Sample Size / Initial Mass	Final Volume / Final Mass	Chlorine checked
			ml	ml	
	LC537-SU_00012		500	ml	
	LC537-MSP_00008		500	1.00	

SOP No.:

EXTRACTION COMMENTS:

Multi-Incremental Sampling/Date: _____

Dried/Date_____ Ground//Date_____

Sonicated - Start: End: Date:

Cleanup by/Date_____ Dilution by/Date_____

Final Vialling /Date_____

Millipore Water Dispensed / Date_____

SPE Cartridge: Waters Lot #_____

QCCodes	

QCCodes	Standard Information				
	Volume	STD ID	Expire	STD Name	Std Conc.
HSA 50	50 ml	LC537-SU_00012	2/25/16	537 Surrogat	0.2 µg/ml
	50 ml	LC537-MSP_00008	4-1-16	537-Spike	200-1500 ng
	10 ml	LC537-IS_00010	3-16-16	IS	1-2.5 µg/ml

Spiked By / Date: _____ Witnessed By / Date: _____

QC Codes: B = MB, C = LCS, L = LCSD, S = MS, D = SD, FB = Filter Blank

Subcontract Data

Prepared for: Test America

Project: 320-17154

Analytical Data Package
(Level IV)

Analysis: Low level PFOS and PFOA in water (Method 537)

Maxxam Job #: B630797

Maxxam Analytics International
6740 Campobello Rd.
Mississauga, Ontario, Canada
L5N 2L8
1-800-668-0639
www.maxxamanalytics.com

Table of Contents

Maxxam Analytics International
6740 Campobello Rd.
Mississauga, Ontario, Canada
L5N 2L8
1-800-668-0639
www.maxxamanalytics.com

Table of Contents

I hereby certify that to the best of my knowledge all analytical data presented in this report:

- Has been checked for completeness.
- Is accurate, legible and error free.
- Has been conducted in accordance with approved SOP's and that all deviations are clearly listed in the Case Narrative.
- This report has been generated in .pdf format.

Review Performed By:

M Di Grazia

Project Manager

Maxxam
A Bureau Veritas Group Company

Melissa DiGrazia
2016.03.08 08:10:57 -05'00'

Maxxam Analytics International
6740 Campobello Rd.
Mississauga, Ontario, Canada
L5N 2L8
1-800-668-0639
www.maxxamanalytics.com

Glossary of Terms

- ***Detection Limit (DL)*** this can also be called ***Method Detection Limit (MDL***): The lowest concentration or amount of the target analyte that can be identified, measured, and reported with confidence that the analyte concentration is not a false positive value. (Clarification): The smallest analyte concentration that can be demonstrated to be different from zero or a blank concentration at the 99% level of confidence. At the DL, the false positive rate (Type I error) is 1%.

- ***Limit of Detection (LOD*)**: An estimate of the minimum amount of a substance that an analytical process can reliably detect. An LOD is analyte- and matrix-specific and may be laboratory-dependent. (Clarification): The smallest amount or concentration of a substance that must be present in a sample in order to be detected at a high level of confidence (99%). At the LOD, the false negative rate (Type II error) is 1%.

- ***Limits of Quantitation (LOQ)*** this can also be called ***Reporting Detection Limit (RDL)***: The minimum levels, concentrations, or quantities of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. (Clarification): The lowest concentration that produces a quantitative result within specified limits of precision and bias. For DoD projects, the LOQ shall be set at or above the concentration of the lowest initial calibration standard.

- ***Acceptance Criteria*** are values used by the laboratory to determine that a process is in control.

- ***Accuracy*** is the degree of agreement of a measured value with the true or expected value.

- ***Calibration Standards*** are a set of solutions containing the analytes of interest at a specified concentration.

- ***Calibration Verification Standard*** consists of a calibration standard solution of intermediate concentration (mid-point initial calibration level) used to access whether the initial calibration is still valid

- ***Certified Reference Material*** is a stable homogenous material that is certified by repetitive analysis from a supplier who is certified to generate said materials.

- ***Internal Standard*** a deuterated or ^{13}C-labelled analyte that is added to a sample extract prior to instrumental analysis to compensate for injection variability.

- ***Isomer*** is a member of a group of compounds that differ from each other only in the locations of a specific number of common substituent atoms or groups of atoms on the parent compound.

- ***Method Blank*** is a laboratory control sample using reagents that are known to be free of contamination.

- ***Precision*** is the degree of agreement between the data generated from repetitive measurements under specific conditions.

- ***Quality Assurance*** is a system of activities whose purpose is to provide the producer or user of a product with the assurance that the product meets a defined standard of quality.

- ***Quality Control*** is the overall system of activities whose purpose is to control the quality of a product so that it meets the needs of the end user.

- ***RSD*** is the relative standard deviation.

- ***Blank Spike*** is a laboratory control sample that has been fortified with native analytes of interest.

- ***Window Defining Mixture*** is a solution containing only the earliest and latest eluting congeners within each homologous group of target analytes on a specified GC column.

- ***RPD*** or Relative Percent Difference. A measure used to compare duplicate sample analysis.

- ***EMPC/NDR –*** Peak detected does not meet ratio criteria and has resulted in a higher detection limit.

1.0 Project Narrative

Maxxam Analytics International
6740 Campobello Rd.
Mississauga, Ontario, Canada
L5N 2L8
1-800-668-0639
www.maxxamanalytics.com

Maxxam Job: B630797

Sample Analysis

All samples were analyzed on QC batch 4386408 (2016/02/19). Recoveries of the Matrix Spike (MS) and/or Matrix Spike Duplicate (MSD) were above the upper control limit for Perfluorobutanesulfonate (PFBS), Perfluorohexanesulfonate (PFHxS) and Perfluoroheptanoic acid (PFHpA). Laboratory spiked water (LCS) resulted in satisfactory recovery of the compounds of interest. When considered together, these QC data suggest that matrix interferences may be biasing the data high. For results that were U-flagged, this potential bias has no impact.

Internal Standard Responses

Isotopically labeled $^{13}C_4$-Perfluoroheptanoic acid (MPFHpA) is used as an internal standard to quantify native Perfluoroheptanoic acid (PFHpA). The instrument response observed for this labeled compound was below the defined lower control limit (LCL) for the following sample:

BVX827 *OF-RW37-0216*

The instrument response for the injection standard ($^{13}C_6$-Perfluorohexanoic acid, $^{13}C_6$-PFHxA) fell within the required tolerance limits. This indicates that the response observed for this isotopically labeled internal standard was not a result of poor or inconsistent sample introduction into the liquid chromatograph/tandem mass spectrometer (LC/MS/MS).

Data Qualifiers

In the Results of Analyses, U-flags are applied to results that are less than the DL (MDL). J-flags are applied to results that are less than the RDL (LOQ) but greater than the DL (MDL). Due to limitations in LIMS, the results cannot be U-flagged to the LOD. The LODs for each analyte are presented in the table below.

Parameter	MDL (ng/L)	LOD (ng/L)	LOQ (ng/L)
Perfluorobutane sulfonate (PFBS)	0.27	1.0	2.0
Perfluorohexane sulfonate (PFHxS)	0.40	1.0	2.0
Perfluoroheptanoic acid (PFHpA)	0.39	1.0	2.0
Perfluorooctanoic acid (PFOA)	0.39	1.0	2.0
Perfluorooctane sulfonate (PFOS)	0.30	1.0	2.0
Perfluorononanoic acid (PFNA)	0.33	1.0	2.0

Sin Chii Chia, B.Sc.
schia@maxxam.ca
Office 905 817 5700

PROJECT NARRATIVE

Maxxam Analytics
Client Project #: 320-17154

Client: TestAmerica
Client Project: 320-17154

I. SAMPLE RECEIPT/ANALYSIS

a) Sample Listing

Maxxam ID	Client Sample ID	Date Sampled	Date Received	Date Prepped	Date Run	Initial Calibration
Low level PFOS and PFOA in water						
BVX826	OF-RW09-0216	2016/02/03	2016/02/13	2016/02/18	2016/02/19	2016/02/19
BVX827	OF-RW37-0216	2016/02/03	2016/02/13	2016/02/18	2016/02/19	2016/02/19
BVX828	OF-RW11-0216	2016/02/03	2016/02/13	2016/02/18	2016/02/19	2016/02/19
BVX829	OF-RW28-0216	2016/02/03	2016/02/13	2016/02/18	2016/02/19	2016/02/19
BVX830	OF-RW67-0216	2016/02/03	2016/02/13	2016/02/18	2016/02/19	2016/02/19

Run Date is defined as the date of injection of the last calibration standard (12 hours or less) prior to the samples analyzed within that run sequence. Therefore the time of calibration injection that defines the run date is always within 12 hours of the time of sample injection.

b) Shipping Problems: none encountered

c) Documentation Problems: none encountered

II. SAMPLE PREP:

No problems encountered

III. SAMPLE ANALYSIS:

See also comments within the appropriate Certificate of Analysis

a) Hold Times: all within recommended hold times

b) Instrument Calibration: all within control limits

c) Quality Control: All applicable QC meets control criteria, except where otherwise noted.

d) All analytes requiring manual intergration(s) are noted on the sample chromatograms

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for other than the conditions detailed above.

In addition, I certify, that to the best of my knowledge and belief, the data as reported are true and accurate. Release of the data contained in this data package has been authorized by the cognizant laboratory official or his/her designee, as verified by this signature.

M Di Grazia

2016/03/08
Date

2. Sample Management Records

Maxxam Analytics International
6740 Campobello Rd
Mississauga, Ontario, Canada
L5N 2L8
1-800-668-0639
www.maxxamanalytics.com

2.1 Sample Custody

Maxxam Analytics International
6740 Campobello Rd
Mississauga, Ontario, Canada
L5N 2L8
1-800-668-0639
www.maxxamanalytics.com

Chain of Custody Record

[redacted]

Due 2/22

Temperature on Receipt _____

Drinking Water? Yes☒ No☐

320-17154 Chain of Custody

CTO WE7G

G

Project Manager	Date	Chain of Custody Number
[redacted]	02/03/16	283602
Telephone Number (Area Code)/Fax Number	Lab Number	Page 1 of 1
[redacted]		
Site Contact	Lab Contact	
[redacted]		
Carrier/Waybill Number		
FedEx		

Analysis (Attach list if more space is needed)

Special Instructions/ Conditions of Receipt

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Select PECS
[redacted]	02/03/16	1646		X			X						1
OF-RW09-0216		1645											2
[redacted]		1720											1
OF-RW37-0216		1728											2
OF-RW11-0216		1604											2
[redacted]		1610											1
OF-RW28-0216		1741											2
[redacted]		1748											1
OF-RW67-0216		1819											2
[redacted]		1821											1

13-Feb-16 13:40
Hongmei Zhao (Grace)
B630797
RGN ENV-951

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

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

Turn Around Time Required
☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☐ Other _____

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished By: Kathryn Smith	02/03/16	19:30	1. Received By:	2/4/16	945
2. Relinquished By:	Date	Time	2. Received By:	2016/02/13	13:40
3. Relinquished By:	Date	Time	3. Received By:	Date	Time

Comments

0.3°C REFER TO ACTR

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

3. Analytical Results

Maxxam Analytics International
6740 Campobello Rd
Mississauga, Ontario, Canada
L5N 2L8
1-800-668-0639
www.maxxamanalytics.com

3.1 Summary Report

Maxxam Analytics International
6740 Campobello Rd
Mississauga, Ontario, Canada
L5N 2L8
1-800-668-0639
www.maxxamanalytics.com

Your Project #: 320-17154
Your C.O.C. #: 283602

Attention:PFC Reporting Group

TestAmerica
Sacramento
880 Riverside Parkway
West Sacramento, CA
USA 95605

Report Date: 2016/03/08
Report #: R3920386
Version: 3 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B630797
Received: 2016/02/13, 13:40

Sample Matrix: Water
Samples Received: 5

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Low level PFOS and PFOA in water	5	2016/02/18	2016/02/19	CAM SOP-00894	EPA 537 m

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Melissa DiGrazia, Project Manager - ATUT
Email: MDiGrazia@maxxam.ca
Phone# (905) 817-5700
==========
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B630797
Report Date: 2016/03/08

TestAmerica
Client Project #: 320-17154

RESULTS OF ANALYSES OF WATER

Maxxam ID		BVX826	BVX827	BVX828	BVX829	BVX830			
Sampling Date		2016/02/03 16:45	2016/02/03 17:28	2016/02/03 16:04	2016/02/03 17:41	2016/02/03 18:19			
COC Number		283602	283602	283602	283602	283602			
	UNITS	OF-RW09-0216	OF-RW37-0216	OF-RW11-0216	OF-RW28-0216	OF-RW67-0216	RDL	MDL	QC Batch
Miscellaneous Parameters									
Perfluorobutane Sulfonate (PFBS)	ng/L	0.27 U	0.79 J	0.27 U	0.27 U	0.97 J	2.0	0.27	4386408
Perfluoroheptanoic Acid (PFHpA)	ng/L	0.39 U	0.46 J	0.39 U	0.39 U	0.39 U	2.0	0.39	4386408
Perfluorohexane Sulfonate (PFHxS)	ng/L	0.71 J	3.3	0.75 J	0.75 J	0.40 U	2.0	0.40	4386408
Perfluoro-n-Octanoic Acid (PFOA)	ng/L	0.41 J	7.2	0.39 U	0.39 U	0.39 U	2.0	0.39	4386408
Perfluorononanoic Acid (PFNA)	ng/L	0.33 U	0.33 U	0.33 U	0.37 J	0.33 U	2.0	0.33	4386408
Perfluorooctane Sulfonate (PFOS)	ng/L	0.32 J	0.81 J	0.87 J	0.30 U	0.30 U	2.0	0.30	4386408
Surrogate Recovery (%)									
13C4-Perfluoroheptanoic acid	%	54	52	55	54	48 (1)	N/A	N/A	4386408
13C4-Perfluorooctanesulfonate	%	59	64	54	59	51	N/A	N/A	4386408
13C4-Perfluorooctanoic acid	%	58	57	59	54	51	N/A	N/A	4386408
13C5-Perfluorononanoic acid	%	62	65	61	57	55	N/A	N/A	4386408
18O2-Perfluorohexanesulfonate	%	69	64	60	50	56	N/A	N/A	4386408

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

N/A = Not Applicable

(1) Surrogate recovery was below the defined lower control limit (LCL). Laboratory spiked water resulted in satisfactory recovery of the surrogate. When considered together, these QC data suggest that matrix interferences may be biasing the data low. Because quantitation is performed using isotope dilution techniques, any losses of the native compound that may occur during any of the sample preparation, extraction, cleanup or determinative steps will be mirrored by a similar loss of the labeled standard, and as such can be accounted for and corrected. Therefore, the quantification of these target compounds is not affected by the low surrogate recovery.

Maxxam Job #: B630797
Report Date: 2016/03/08

TestAmerica
Client Project #: 320-17154

TEST SUMMARY

Maxxam ID: BVX826 **Collected:** 2016/02/03
Sample ID: OF-RW09-0216 **Shipped:**
Matrix: Water **Received:** 2016/02/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Low level PFOS and PFOA in water	LCMS	4386408	2016/02/18	2016/02/19	Colm McNamara

Maxxam ID: BVX827 **Collected:** 2016/02/03
Sample ID: OF-RW37-0216 **Shipped:**
Matrix: Water **Received:** 2016/02/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Low level PFOS and PFOA in water	LCMS	4386408	2016/02/18	2016/02/19	Colm McNamara

Maxxam ID: BVX828 **Collected:** 2016/02/03
Sample ID: OF-RW11-0216 **Shipped:**
Matrix: Water **Received:** 2016/02/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Low level PFOS and PFOA in water	LCMS	4386408	2016/02/18	2016/02/19	Colm McNamara

Maxxam ID: BVX829 **Collected:** 2016/02/03
Sample ID: OF-RW28-0216 **Shipped:**
Matrix: Water **Received:** 2016/02/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Low level PFOS and PFOA in water	LCMS	4386408	2016/02/18	2016/02/19	Colm McNamara

Maxxam ID: BVX830 **Collected:** 2016/02/03
Sample ID: OF-RW67-0216 **Shipped:**
Matrix: Water **Received:** 2016/02/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Low level PFOS and PFOA in water	LCMS	4386408	2016/02/18	2016/02/19	Colm McNamara

GENERAL COMMENTS

Report revised to remove qualifier legend

Perfluorinated Compounds (PFCs):

Perfluoroheptanoic acid (PFHpA) MDL = 0.39, LOD = 1.0, LOQ = 2.0
Perfluorooctanoic acid (PFOA) MDL = 0.39, LOD = 1.0, LOQ = 2.0
Perfluorononanoic acid (PFNA) MDL = 0.33, LOD = 1.0, LOQ = 2.0
Perfluorobutane sulfonate (PFBS) MDL = 0.27, LOD = 1.0, LOQ = 2.0
Perfluorohexane sulfonate (PFHxS) MDL = 0.40, LOD = 1.0, LOQ = 2.0
Perfluorooctane sulfonate (PFOS) MDL = 0.30, LOD = 1.0, LOQ = 2.0
All Units are in ng/L

Results relate only to the items tested.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4386408	CM5	Matrix Spike	13C4-Perfluoroheptanoic acid	2016/02/19		50	%	50 - 130
			13C4-Perfluorooctanesulfonate	2016/02/19		59	%	50 - 130
			13C4-Perfluorooctanoic acid	2016/02/19		58	%	50 - 130
			13C5-Perfluorononanoic acid	2016/02/19		61	%	50 - 130
			18O2-Perfluorohexanesulfonate	2016/02/19		53	%	50 - 130
			Perfluorobutane Sulfonate (PFBS)	2016/02/19		157 (1)	%	70 - 130
			Perfluoroheptanoic Acid (PFHpA)	2016/02/19		133 (1)	%	70 - 130
			Perfluorohexane Sulfonate (PFHxS)	2016/02/19		148 (1)	%	70 - 130
			Perfluorononanoic Acid (PFNA)	2016/02/19		120	%	70 - 130
			Perfluoro-n-Octanoic Acid (PFOA)	2016/02/19		125	%	70 - 130
			Perfluorooctane Sulfonate (PFOS)	2016/02/19		116	%	70 - 130
4386408	CM5	RPD	Perfluorobutane Sulfonate (PFBS)	2016/02/19	4.2		%	30
			Perfluoroheptanoic Acid (PFHpA)	2016/02/19	6.2		%	30
			Perfluorohexane Sulfonate (PFHxS)	2016/02/19	11		%	30
			Perfluorononanoic Acid (PFNA)	2016/02/19	14		%	30
			Perfluoro-n-Octanoic Acid (PFOA)	2016/02/19	8.5		%	30
			Perfluorooctane Sulfonate (PFOS)	2016/02/19	6.4		%	30
4386408	CM5	Spiked Blank	13C4-Perfluoroheptanoic acid	2016/02/19		67	%	50 - 130
			13C4-Perfluorooctanesulfonate	2016/02/19		77	%	50 - 130
			13C4-Perfluorooctanoic acid	2016/02/19		70	%	50 - 130
			13C5-Perfluorononanoic acid	2016/02/19		73	%	50 - 130
			18O2-Perfluorohexanesulfonate	2016/02/19		83	%	50 - 130
			Perfluorobutane Sulfonate (PFBS)	2016/02/19		107	%	70 - 130
			Perfluoroheptanoic Acid (PFHpA)	2016/02/19		121	%	70 - 130
			Perfluorohexane Sulfonate (PFHxS)	2016/02/19		115	%	70 - 130
			Perfluorononanoic Acid (PFNA)	2016/02/19		118	%	70 - 130
			Perfluoro-n-Octanoic Acid (PFOA)	2016/02/19		124	%	70 - 130
			Perfluorooctane Sulfonate (PFOS)	2016/02/19		112	%	70 - 130
4386408	CM5	Method Blank	13C4-Perfluoroheptanoic acid	2016/02/19		74	%	50 - 130
			13C4-Perfluorooctanesulfonate	2016/02/19		82	%	50 - 130
			13C4-Perfluorooctanoic acid	2016/02/19		74	%	50 - 130
			13C5-Perfluorononanoic acid	2016/02/19		76	%	50 - 130
			18O2-Perfluorohexanesulfonate	2016/02/19		86	%	50 - 130
			Perfluorobutane Sulfonate (PFBS)	2016/02/19	0.27 U, MDL=0.27		ng/L	
			Perfluoroheptanoic Acid (PFHpA)	2016/02/19	0.39 U, MDL=0.39		ng/L	
			Perfluorohexane Sulfonate (PFHxS)	2016/02/19	0.40 U, MDL=0.40		ng/L	
			Perfluorononanoic Acid (PFNA)	2016/02/19	0.33 U, MDL=0.33		ng/L	
			Perfluoro-n-Octanoic Acid (PFOA)	2016/02/19	0.39 U, MDL=0.39		ng/L	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Perfluorooctane Sulfonate (PFOS)	2016/02/19	0.30 U, MDL=0.30		ng/L	

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

Maxxam Job #: B630797
Report Date: 2016/03/08

TestAmerica
Client Project #: 320-17154

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Adam Robinson, Supervisor, LC/MS/MS

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

METHOD 537

DETERMINATION OF SELECTED PERFLUORINATED ALKYL ACIDS IN DRINKING WATER BY SOLID PHASE EXTRACTION AND LIQUID CHROMATOGRAPHY/TANDEM MASS SPECTROMETRY (LC/MS/MS)

Maxxam Analytics International
6740 Campobello Rd
Mississauga, Ontario, Canada
L5N 2L8
1-800-668-0639
www.maxxamanalytics.com

3.2 Sample Chromatograms

Maxxam Analytics International
6740 Campobello Rd
Mississauga, Ontario, Canada
L5N 2L8
1-800-668-0639
www.maxxamanalytics.com

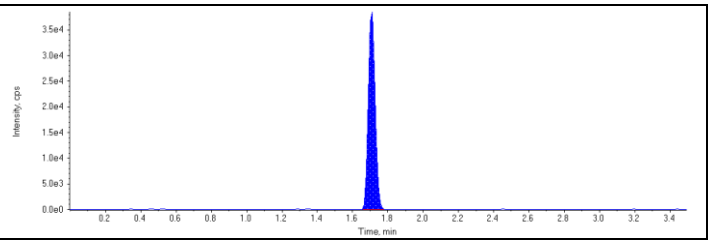
Sample Name	**4386408~BVX826-01**	**Injection Vial**	28
Sample ID	4386408~BVX826-01	**Injection Volume (µL)**	3
Sample Type	Unknown	**Algorithm Used**	Analyst Classic
Acquisition Date	2016/02/19 10:18:03 AM	**Dilution Factor**	1.00
Acquisition Method	PFC_Water_Low.dam	**Sample Annotation**	-
Project	Enviro\PFOS	**Instrument Name**	LCMS03
Data File	PFC_160219\WS#4386408.wiff		
Result Table	PFC_Water_160219_4386408_ULow.rdb		

Internal Standard	Area (cps)	RT (min)	Target Conc. (ng/L)	Calc. Conc. (ng/L)
MPFHxS	104000.	1.71	1.00	-
MPFHpA	272000.	1.74	1.00	-
MPFOA	256000.	1.92	1.00	-
MPFOS	105000.	1.99	1.00	-
MPFNA	186000.	2.05	1.00	-
13C6-PFHxA IS	4080000.	1.48	1.00	-
N/A	N/A	N/A	N/A	-

Target Analyte	Area (cps)	RT (min)	Target Conc. (ng/L)	Calc. Conc. (ng/L)	Accuracy (%)
PFBS 1	0	0.00	N/A	N/A	N/A
PFHxS 1	4150	1.71	N/A	0.713	N/A
PFHpA 1	0	0.00	N/A	N/A	N/A
PFOA 1	9130	1.92	N/A	0.412	N/A
PFOS 1	2530	1.99	N/A	0.320	N/A
PFNA 1	0	0.00	N/A	N/A	N/A
18O2-PFHxS	104000	1.71	N/A	69.2	N/A
13C4-PFHpA	272000	1.74	N/A	53.8	N/A
13C4-PFOA	256000	1.92	N/A	58.1	N/A
13C4-PFOS	105000	1.99	N/A	59.3	N/A
13C5-PFNA	186000	2.05	N/A	61.7	N/A
13C6-PFHxA	4080000	1.48	N/A	102.	N/A

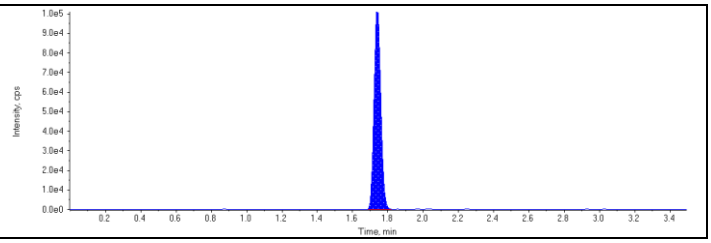
MPFHxS (Internal Standard)

RT (Exp. RT): 1.71(1.68) min
Concentration: 1.00 ng/L
Sample Type: (Unknown)



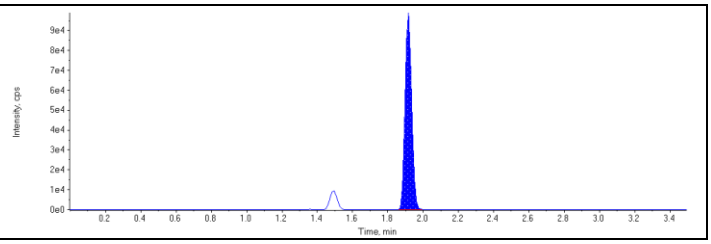
MPFHpA (Internal Standard)

RT (Exp. RT): 1.74(1.75) min
Concentration: 1.00 ng/L
Sample Type: (Unknown)



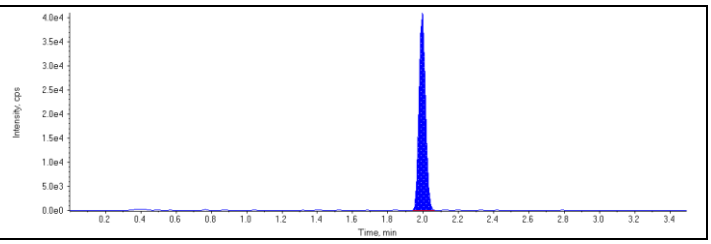
MPFOA (Internal Standard)

RT (Exp. RT): 1.92(1.88) min
Concentration: 1.00 ng/L
Sample Type: (Unknown)



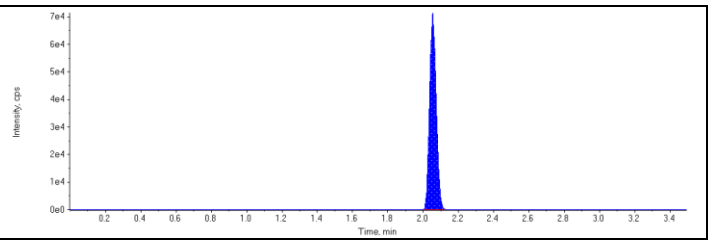
MPFOS (Internal Standard)

RT (Exp. RT): 1.99(1.97) min
Concentration: 1.00 ng/L
Sample Type: (Unknown)



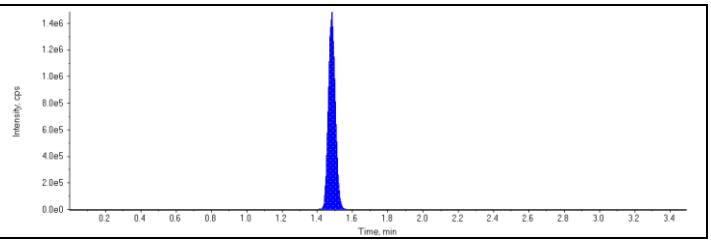
MPFNA (Internal Standard)

RT (Exp. RT): 2.05(2.02) min
Concentration: 1.00 ng/L
Sample Type: (Unknown)



13C6-PFHxA IS (Internal Standard)

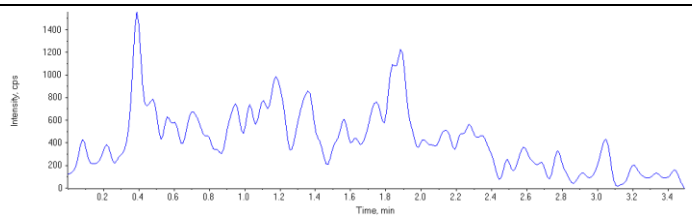
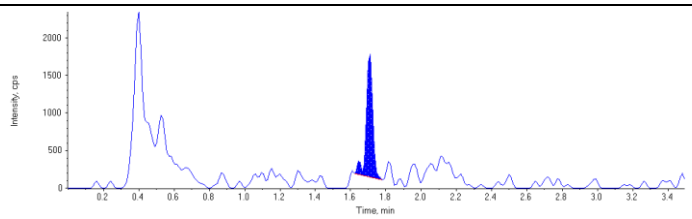
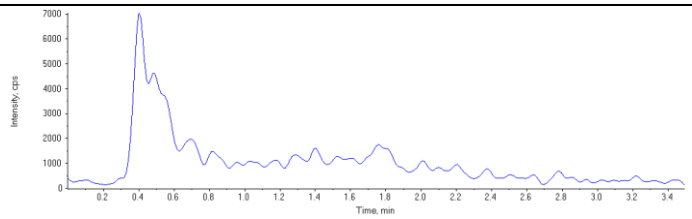
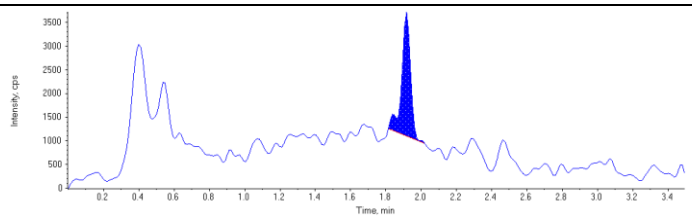
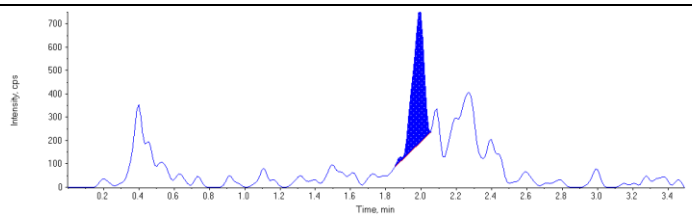
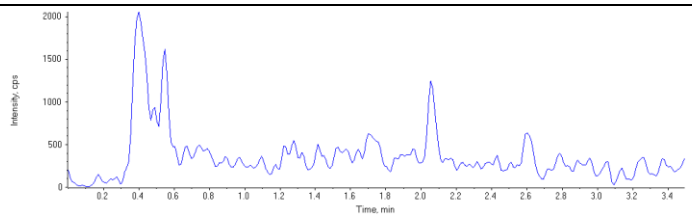
RT (Exp. RT): 1.48(1.42) min
Concentration: 1.00 ng/L
Sample Type: (Unknown)

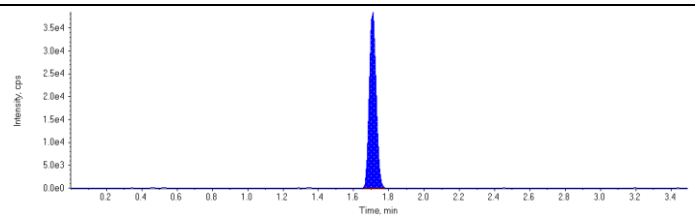
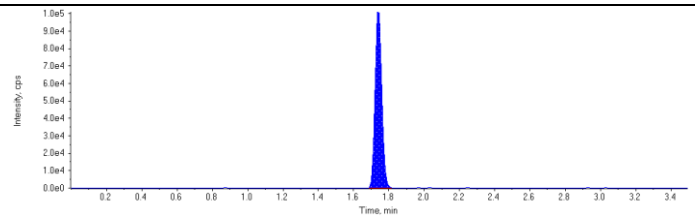
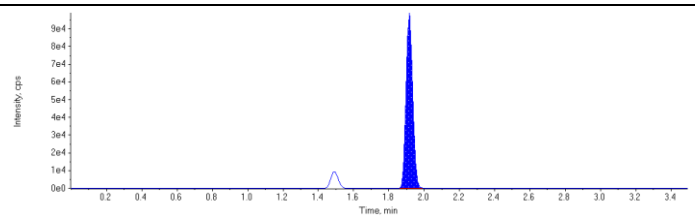
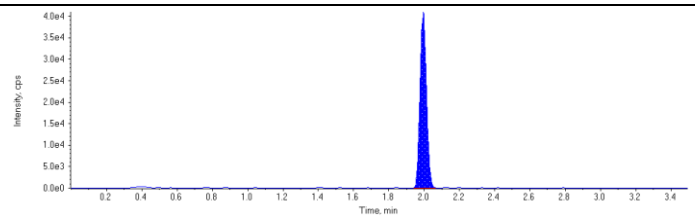
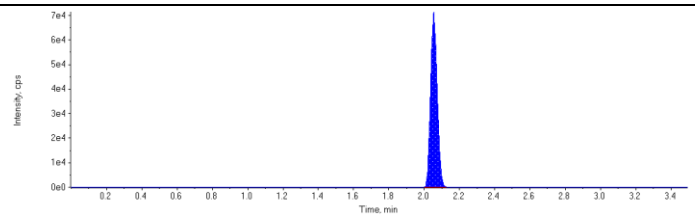
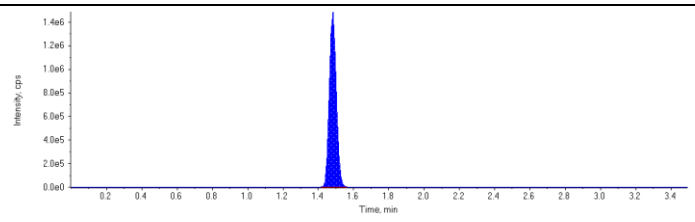


N/A (Internal Standard)

RT (Exp. RT): N/A(N/A) min
Concentration: N/A N/A
Sample Type: (Unknown)

This image is not available

PFBS 1 (298.900/79.900 Da) RT (Exp. RT): 0.00 (1.15) min Calculated Conc: N/A µg/L Area Ratio: 0.00 Sample Type: (Unknown)	
PFHxS 1 (398.900/79.900 Da) RT (Exp. RT): 1.71 (1.68) min Calculated Conc: 0.713 µg/L Area Ratio: 0.0399 Sample Type: (Unknown)	
PFHpA 1 (363.000/319.000 Da) RT (Exp. RT): 0.00 (1.75) min Calculated Conc: N/A µg/L Area Ratio: 0.00 Sample Type: (Unknown)	
PFOA 1 (413.100/369.000 Da) RT (Exp. RT): 1.92 (1.92) min Calculated Conc: 0.412 µg/L Area Ratio: 0.0356 Sample Type: (Unknown)	
PFOS 1 (498.900/79.900 Da) RT (Exp. RT): 1.99 (1.97) min Calculated Conc: 0.320 µg/L Area Ratio: 0.0242 Sample Type: (Unknown)	
PFNA 1 (462.900/419.000 Da) RT (Exp. RT): 0.00 (2.02) min Calculated Conc: N/A µg/L Area Ratio: 0.00 Sample Type: (Unknown)	

18O2-PFHxS (402.900/84.000 Da) RT (Exp. RT): 1.71 (1.68) min Calculated Conc: 69.2 µg/L Area Ratio: 0.0255 Sample Type: (Unknown)	
13C4-PFHpA (366.900/322.000 Da) RT (Exp. RT): 1.74 (1.75) min Calculated Conc: 53.8 µg/L Area Ratio: 0.0665 Sample Type: (Unknown)	
13C4-PFOA (416.900/372.000 Da) RT (Exp. RT): 1.92 (1.88) min Calculated Conc: 58.1 µg/L Area Ratio: 0.0627 Sample Type: (Unknown)	
13C4-PFOS (502.900/79.900 Da) RT (Exp. RT): 1.99 (1.97) min Calculated Conc: 59.3 µg/L Area Ratio: 0.0256 Sample Type: (Unknown)	
13C5-PFNA (467.900/423.000 Da) RT (Exp. RT): 2.05 (2.02) min Calculated Conc: 61.7 µg/L Area Ratio: 0.0454 Sample Type: (Unknown)	
13C6-PFHxA (318.900/274.000 Da) RT (Exp. RT): 1.48 (1.42) min Calculated Conc: 102. µg/L Area Ratio: 0.00 Sample Type: (Unknown)	

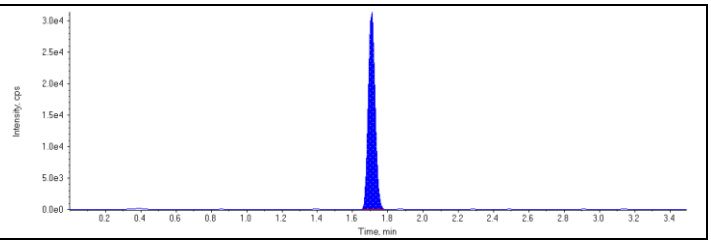
Sample Name	**4386408~BVX827-01**	**Injection Vial**	29
Sample ID	4386408~BVX827-01	**Injection Volume (µL)**	3
Sample Type	Unknown	**Algorithm Used**	Analyst Classic
Acquisition Date	2016/02/19 10:23:09 AM	**Dilution Factor**	1.00
Acquisition Method	PFC_Water_Low.dam	**Sample Annotation**	-
Project	Enviro\PFOS	**Instrument Name**	LCMS03
Data File	PFC_160219\WS#4386408.wiff		
Result Table	PFC_Water_160219_4386408_ULow.rdb		

Internal Standard	Area (cps)	RT (min)	Target Conc. (ng/L)	Calc. Conc. (ng/L)
MPFHxS	84400.	1.71	1.00	-
MPFHpA	229000.	1.74	1.00	-
MPFOA	217000.	1.91	1.00	-
MPFOS	98200.	1.99	1.00	-
MPFNA	170000.	2.05	1.00	-
13C6-PFHxA IS	3560000.	1.48	1.00	-
N/A	N/A	N/A	N/A	-

Target Analyte	Area (cps)	RT (min)	Target Conc. (ng/L)	Calc. Conc. (ng/L)	Accuracy (%)
PFBS 1	5820	1.16	N/A	0.792	N/A
PFHxS 1	74800	1.71	N/A	3.26	N/A
PFHpA 1	11800	1.72	N/A	0.455	N/A
PFOA 1	250000	1.92	N/A	7.15	N/A
PFOS 1	11200	1.95	N/A	0.812	N/A
PFNA 1	0	0.00	N/A	N/A	N/A
18O2-PFHxS	84400	1.71	N/A	64.4	N/A
13C4-PFHpA	229000	1.74	N/A	51.9	N/A
13C4-PFOA	217000	1.91	N/A	56.6	N/A
13C4-PFOS	98200	1.99	N/A	63.9	N/A
13C5-PFNA	170000	2.05	N/A	65.0	N/A
13C6-PFHxA	3560000	1.48	N/A	89.1	N/A

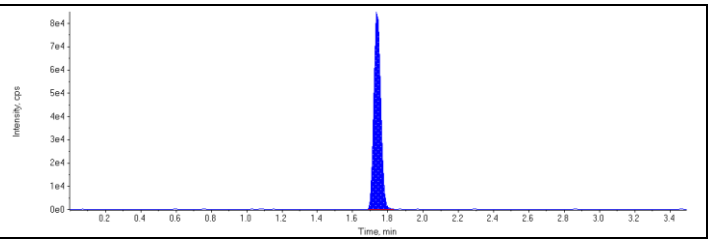
MPFHxS (Internal Standard)

RT (Exp. RT): 1.71(1.68) min
Concentration: 1.00 ng/L
Sample Type: (Unknown)



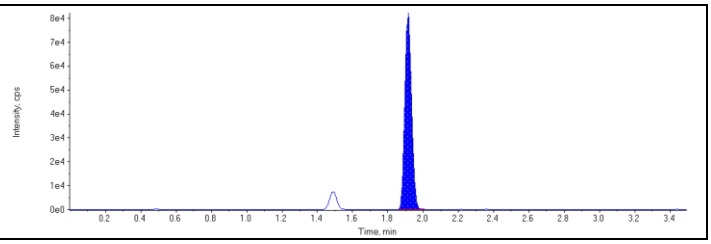
MPFHpA (Internal Standard)

RT (Exp. RT): 1.74(1.75) min
Concentration: 1.00 ng/L
Sample Type: (Unknown)



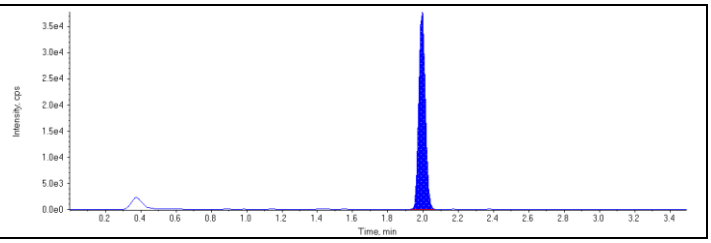
MPFOA (Internal Standard)

RT (Exp. RT): 1.91(1.88) min
Concentration: 1.00 ng/L
Sample Type: (Unknown)



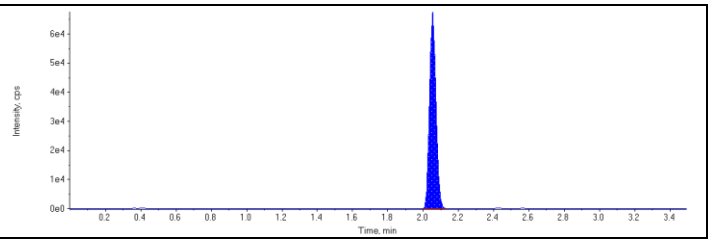
MPFOS (Internal Standard)

RT (Exp. RT): 1.99(1.97) min
Concentration: 1.00 ng/L
Sample Type: (Unknown)



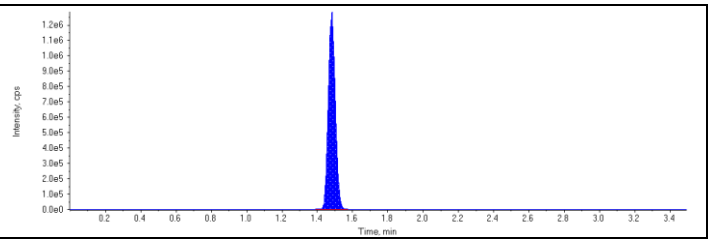
MPFNA (Internal Standard)

RT (Exp. RT): 2.05(2.02) min
Concentration: 1.00 ng/L
Sample Type: (Unknown)



13C6-PFHxA IS (Internal Standard)

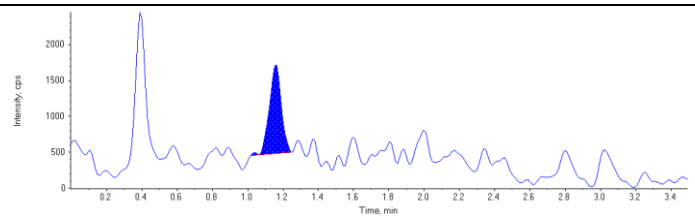
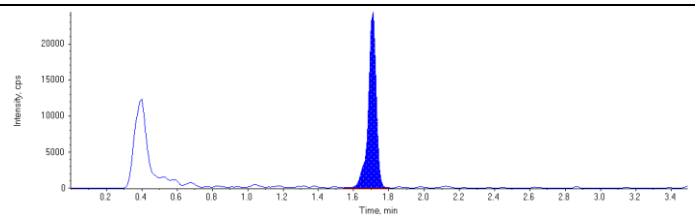
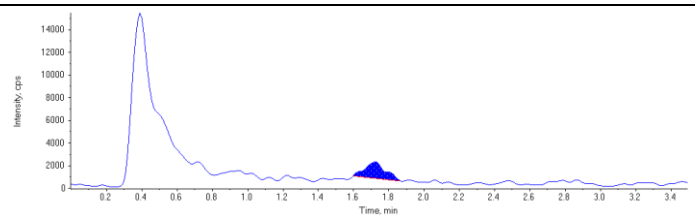
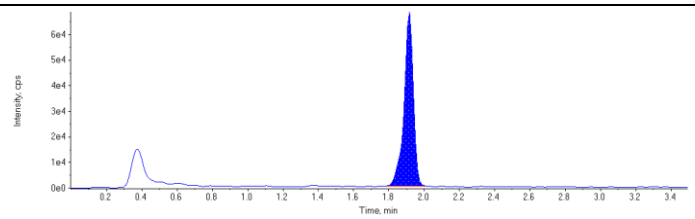
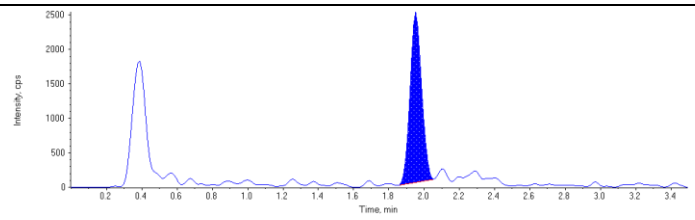
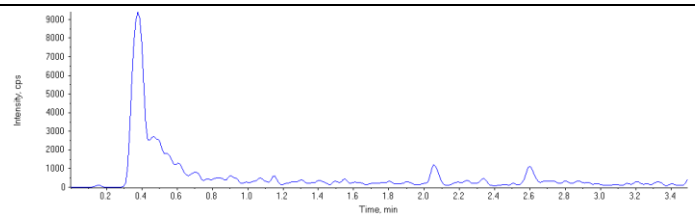
RT (Exp. RT): 1.48(1.42) min
Concentration: 1.00 ng/L
Sample Type: (Unknown)

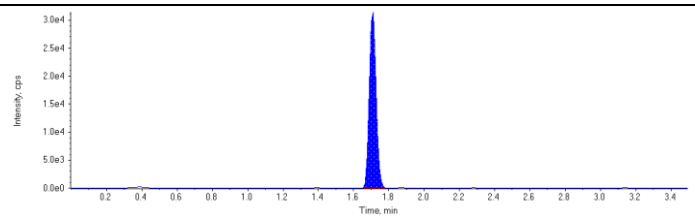
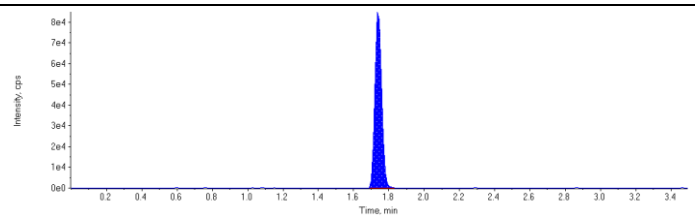
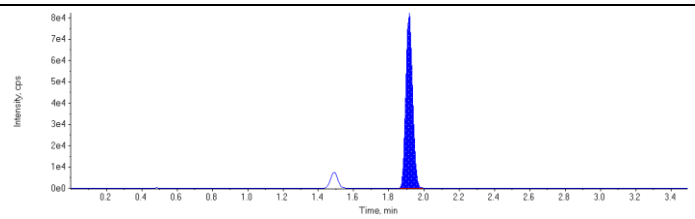
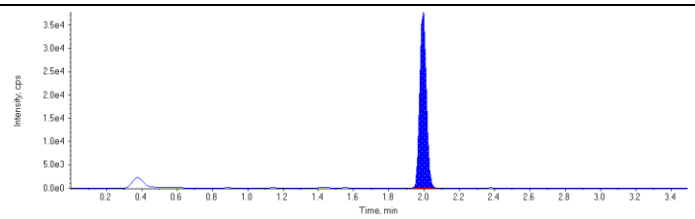
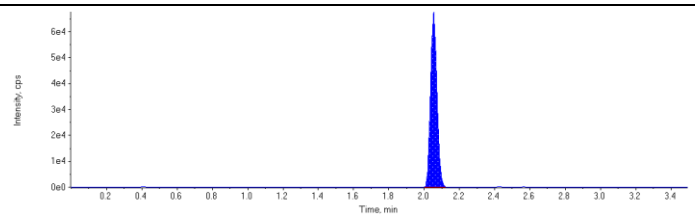
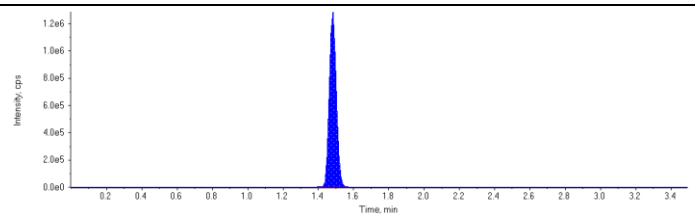


N/A (Internal Standard)

RT (Exp. RT): N/A(N/A) min
Concentration: N/A N/A
Sample Type: (Unknown)

This image is not available

PFBS 1 (298.900/79.900 Da) RT (Exp. RT): 1.16 (1.15) min Calculated Conc: 0.792 µg/L Area Ratio: 0.0689 Sample Type: (Unknown)	
PFHxS 1 (398.900/79.900 Da) RT (Exp. RT): 1.71 (1.68) min Calculated Conc: 3.26 µg/L Area Ratio: 0.886 Sample Type: (Unknown)	
PFHpA 1 (363.000/319.000 Da) RT (Exp. RT): 1.72 (1.75) min Calculated Conc: 0.455 µg/L Area Ratio: 0.0515 Sample Type: (Unknown)	
PFOA 1 (413.100/369.000 Da) RT (Exp. RT): 1.92 (1.92) min Calculated Conc: 7.15 µg/L Area Ratio: 1.15 Sample Type: (Unknown)	
PFOS 1 (498.900/79.900 Da) RT (Exp. RT): 1.95 (1.97) min Calculated Conc: 0.812 µg/L Area Ratio: 0.114 Sample Type: (Unknown)	
PFNA 1 (462.900/419.000 Da) RT (Exp. RT): 0.00 (2.02) min Calculated Conc: N/A µg/L Area Ratio: 0.00 Sample Type: (Unknown)	

18O2-PFHxS (402.900/84.000 Da) RT (Exp. RT): 1.71 (1.68) min Calculated Conc: 64.4 µg/L Area Ratio: 0.0237 Sample Type: (Unknown)	
13C4-PFHpA (366.900/322.000 Da) RT (Exp. RT): 1.74 (1.75) min Calculated Conc: 51.9 µg/L Area Ratio: 0.0643 Sample Type: (Unknown)	
13C4-PFOA (416.900/372.000 Da) RT (Exp. RT): 1.91 (1.88) min Calculated Conc: 56.6 µg/L Area Ratio: 0.0611 Sample Type: (Unknown)	
13C4-PFOS (502.900/79.900 Da) RT (Exp. RT): 1.99 (1.97) min Calculated Conc: 63.9 µg/L Area Ratio: 0.0276 Sample Type: (Unknown)	
13C5-PFNA (467.900/423.000 Da) RT (Exp. RT): 2.05 (2.02) min Calculated Conc: 65.0 µg/L Area Ratio: 0.0479 Sample Type: (Unknown)	
13C6-PFHxA (318.900/274.000 Da) RT (Exp. RT): 1.48 (1.42) min Calculated Conc: 89.1 µg/L Area Ratio: 0.00 Sample Type: (Unknown)	

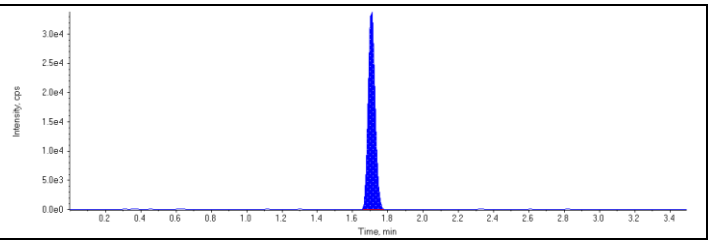
Sample Name	**4386408~BVX828-01**	**Injection Vial**	30
Sample ID	4386408~BVX828-01	**Injection Volume (µL)**	3
Sample Type	Unknown	**Algorithm Used**	Analyst Classic
Acquisition Date	2016/02/19 10:28:14 AM	**Dilution Factor**	1.00
Acquisition Method	PFC_Water_Low.dam	**Sample Annotation**	-
Project	Enviro\PFOS	**Instrument Name**	LCMS03
Data File	PFC_160219\WS#4386408.wiff		
Result Table	PFC_Water_160219_4386408_ULow.rdb		

Internal Standard	Area (cps)	RT (min)	Target Conc. (ng/L)	Calc. Conc. (ng/L)
MPFHxS	92800.	1.71	1.00	-
MPFHpA	289000.	1.74	1.00	-
MPFOA	269000.	1.91	1.00	-
MPFOS	98300.	1.99	1.00	-
MPFNA	188000.	2.05	1.00	-
13C6-PFHxA IS	4220000.	1.48	1.00	-
N/A	N/A	N/A	N/A	-

Target Analyte	Area (cps)	RT (min)	Target Conc. (ng/L)	Calc. Conc. (ng/L)	Accuracy (%)
PFBS 1	0	0.00	N/A	N/A	N/A
PFHxS 1	4910	1.70	N/A	0.752	N/A
PFHpA 1	0	0.00	N/A	N/A	N/A
PFOA 1	0	0.00	N/A	N/A	N/A
PFOS 1	12300	1.99	N/A	0.871	N/A
PFNA 1	0	0.00	N/A	N/A	N/A
18O2-PFHxS	92800	1.71	N/A	59.8	N/A
13C4-PFHpA	289000	1.74	N/A	55.3	N/A
13C4-PFOA	269000	1.91	N/A	59.2	N/A
13C4-PFOS	98300	1.99	N/A	53.9	N/A
13C5-PFNA	188000	2.05	N/A	60.5	N/A
13C6-PFHxA	4220000	1.48	N/A	106.	N/A

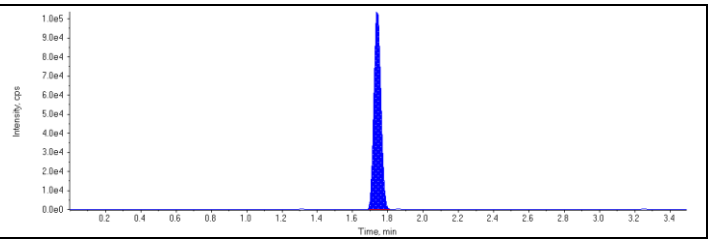
MPFHxS (Internal Standard)

RT (Exp. RT): 1.71(1.68) min
Concentration: 1.00 ng/L
Sample Type: (Unknown)



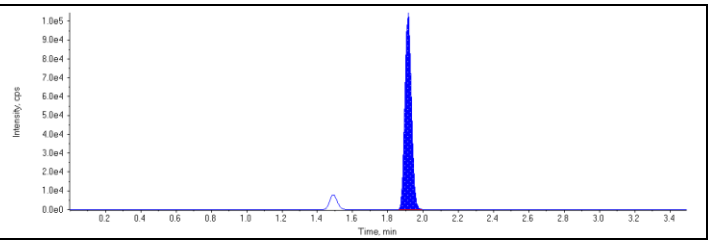
MPFHpA (Internal Standard)

RT (Exp. RT): 1.74(1.75) min
Concentration: 1.00 ng/L
Sample Type: (Unknown)



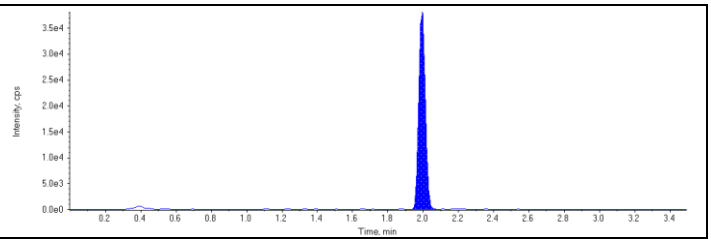
MPFOA (Internal Standard)

RT (Exp. RT): 1.91(1.88) min
Concentration: 1.00 ng/L
Sample Type: (Unknown)



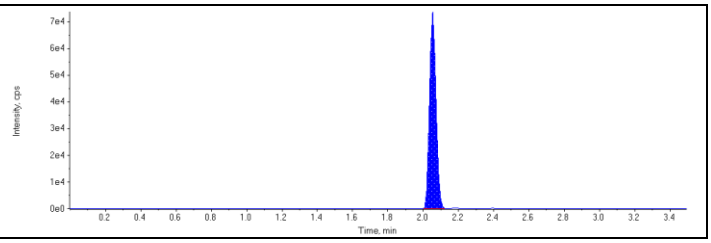
MPFOS (Internal Standard)

RT (Exp. RT): 1.99(1.97) min
Concentration: 1.00 ng/L
Sample Type: (Unknown)



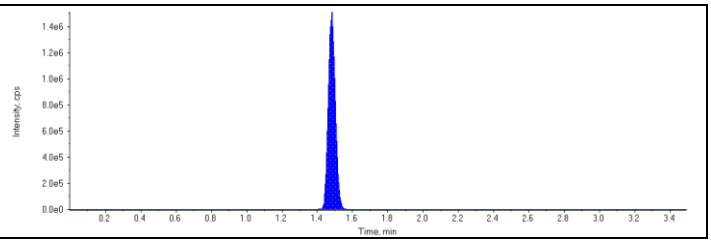
MPFNA (Internal Standard)

RT (Exp. RT): 2.05(2.02) min
Concentration: 1.00 ng/L
Sample Type: (Unknown)



13C6-PFHxA IS (Internal Standard)

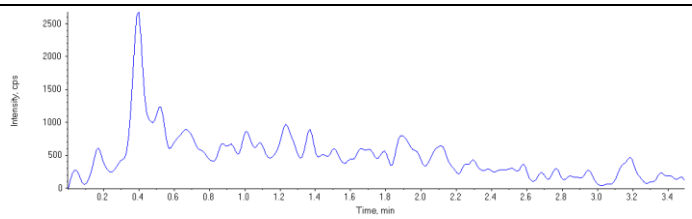
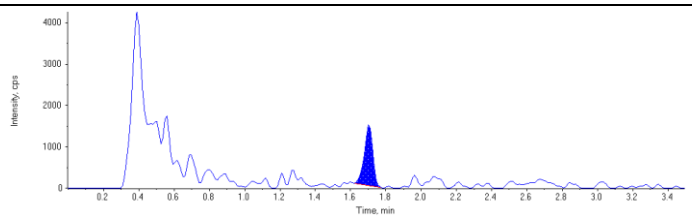
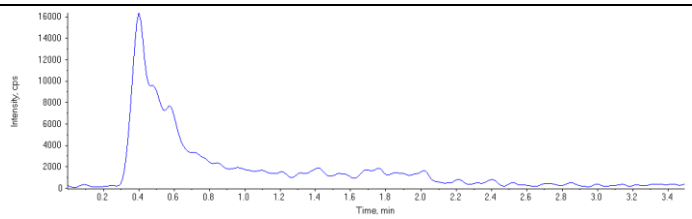
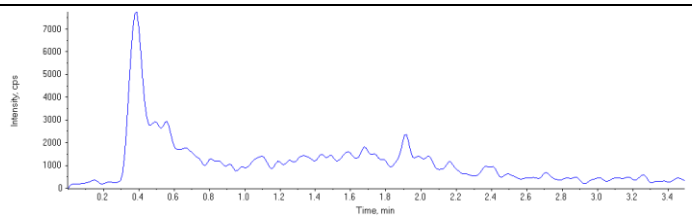
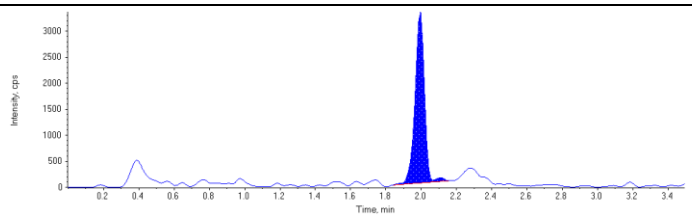
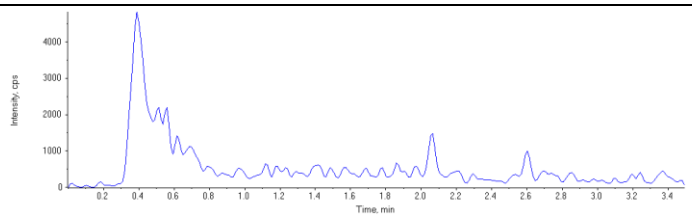
RT (Exp. RT): 1.48(1.42) min
Concentration: 1.00 ng/L
Sample Type: (Unknown)

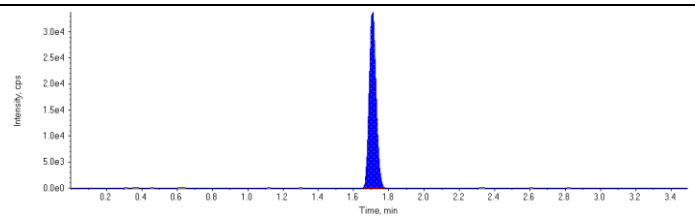
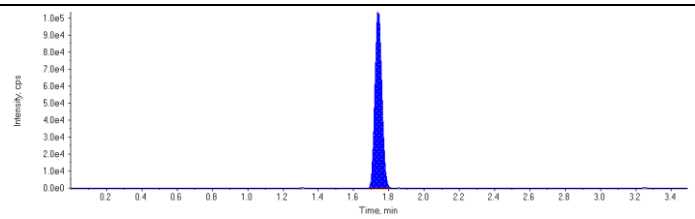
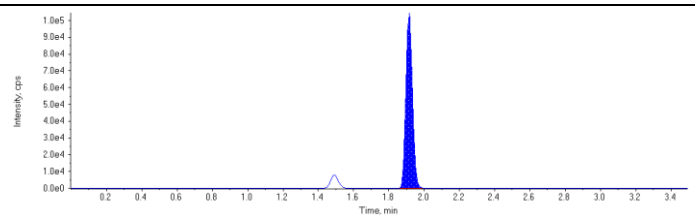
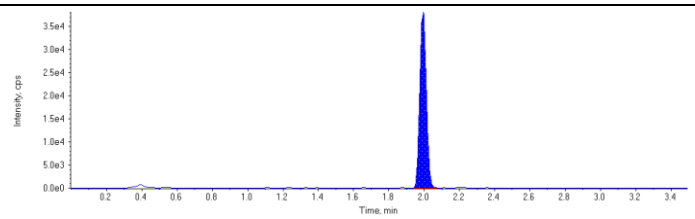
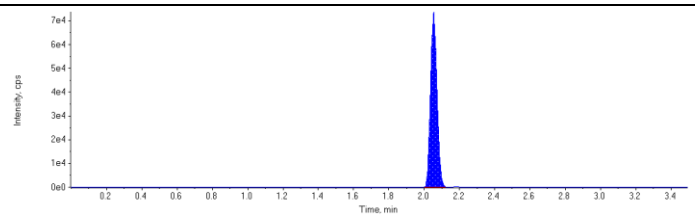
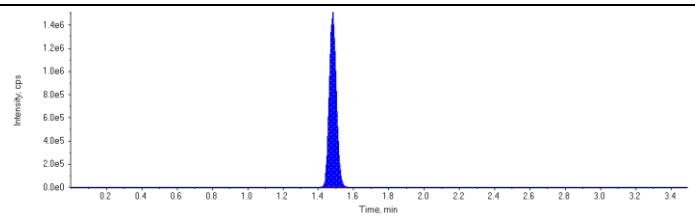


N/A (Internal Standard)

RT (Exp. RT): N/A(N/A) min
Concentration: N/A N/A
Sample Type: (Unknown)

This image is not available

PFBS 1 (298.900/79.900 Da) RT (Exp. RT): 0.00 (1.15) min Calculated Conc: N/A µg/L Area Ratio: 0.00 Sample Type: (Unknown)	
PFHxS 1 (398.900/79.900 Da) RT (Exp. RT): 1.70 (1.68) min Calculated Conc: 0.752 µg/L Area Ratio: 0.0529 Sample Type: (Unknown)	
PFHpA 1 (363.000/319.000 Da) RT (Exp. RT): 0.00 (1.75) min Calculated Conc: N/A µg/L Area Ratio: 0.00 Sample Type: (Unknown)	
PFOA 1 (413.100/369.000 Da) RT (Exp. RT): 0.00 (1.92) min Calculated Conc: N/A µg/L Area Ratio: 0.00 Sample Type: (Unknown)	
PFOS 1 (498.900/79.900 Da) RT (Exp. RT): 1.99 (1.97) min Calculated Conc: 0.871 µg/L Area Ratio: 0.125 Sample Type: (Unknown)	
PFNA 1 (462.900/419.000 Da) RT (Exp. RT): 0.00 (2.02) min Calculated Conc: N/A µg/L Area Ratio: 0.00 Sample Type: (Unknown)	

18O2-PFHxS (402.900/84.000 Da) RT (Exp. RT): 1.71 (1.68) min Calculated Conc: 59.8 µg/L Area Ratio: 0.0220 Sample Type: (Unknown)	
13C4-PFHpA (366.900/322.000 Da) RT (Exp. RT): 1.74 (1.75) min Calculated Conc: 55.3 µg/L Area Ratio: 0.0685 Sample Type: (Unknown)	
13C4-PFOA (416.900/372.000 Da) RT (Exp. RT): 1.91 (1.88) min Calculated Conc: 59.2 µg/L Area Ratio: 0.0639 Sample Type: (Unknown)	
13C4-PFOS (502.900/79.900 Da) RT (Exp. RT): 1.99 (1.97) min Calculated Conc: 53.9 µg/L Area Ratio: 0.0233 Sample Type: (Unknown)	
13C5-PFNA (467.900/423.000 Da) RT (Exp. RT): 2.05 (2.02) min Calculated Conc: 60.5 µg/L Area Ratio: 0.0445 Sample Type: (Unknown)	
13C6-PFHxA (318.900/274.000 Da) RT (Exp. RT): 1.48 (1.42) min Calculated Conc: 106. µg/L Area Ratio: 0.00 Sample Type: (Unknown)	

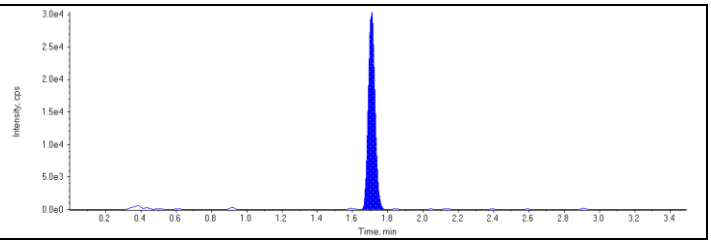
Sample Name	**4386408~BVX829-01**	**Injection Vial**	31
Sample ID	4386408~BVX829-01	**Injection Volume (µL)**	3
Sample Type	Unknown	**Algorithm Used**	Analyst Classic
Acquisition Date	2016/02/19 10:33:19 AM	**Dilution Factor**	1.00
Acquisition Method	PFC_Water_Low.dam	**Sample Annotation**	-
Project	Enviro\PFOS	**Instrument Name**	LCMS03
Data File	PFC_160219\WS#4386408.wiff		
Result Table	PFC_Water_160219_4386408_ULow.rdb		

Internal Standard	Area (cps)	RT (min)	Target Conc. (ng/L)	Calc. Conc. (ng/L)
MPFHxS	79900.	1.71	1.00	-
MPFHpA	286000.	1.74	1.00	-
MPFOA	252000.	1.92	1.00	-
MPFOS	110000.	1.99	1.00	-
MPFNA	180000.	2.05	1.00	-
13C6-PFHxA IS	4310000.	1.48	1.00	-
N/A	N/A	N/A	N/A	-

Target Analyte	Area (cps)	RT (min)	Target Conc. (ng/L)	Calc. Conc. (ng/L)	Accuracy (%)
PFBS 1	0	0.00	N/A	N/A	N/A
PFHxS 1	4270	1.71	N/A	0.753	N/A
PFHpA 1	0	0.00	N/A	N/A	N/A
PFOA 1	0	0.00	N/A	N/A	N/A
PFOS 1	0	0.00	N/A	N/A	N/A
PFNA 1	6260	2.05	N/A	0.366	N/A
18O2-PFHxS	79900	1.71	N/A	50.3	N/A
13C4-PFHpA	286000	1.74	N/A	53.6	N/A
13C4-PFOA	252000	1.92	N/A	54.2	N/A
13C4-PFOS	110000	1.99	N/A	59.2	N/A
13C5-PFNA	180000	2.05	N/A	56.7	N/A
13C6-PFHxA	4310000	1.48	N/A	108.	N/A

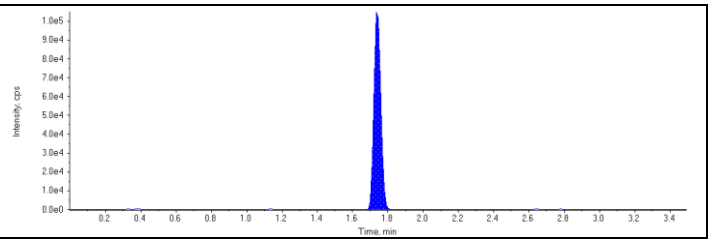
MPFHxS (Internal Standard)

RT (Exp. RT): 1.71(1.68) min
Concentration: 1.00 ng/L
Sample Type: (Unknown)



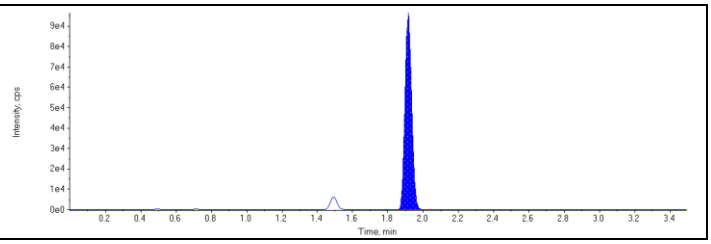
MPFHpA (Internal Standard)

RT (Exp. RT): 1.74(1.75) min
Concentration: 1.00 ng/L
Sample Type: (Unknown)



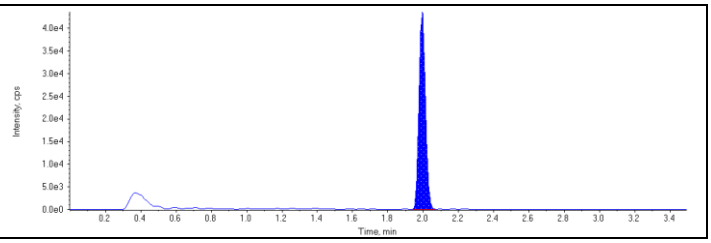
MPFOA (Internal Standard)

RT (Exp. RT): 1.92(1.88) min
Concentration: 1.00 ng/L
Sample Type: (Unknown)



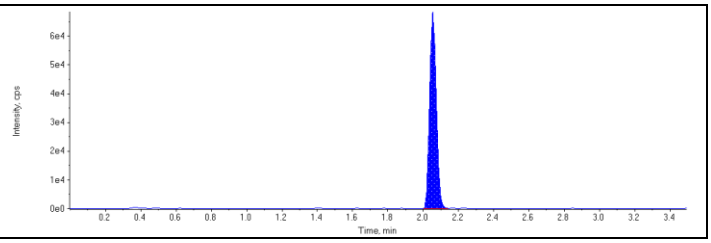
MPFOS (Internal Standard)

RT (Exp. RT): 1.99(1.97) min
Concentration: 1.00 ng/L
Sample Type: (Unknown)



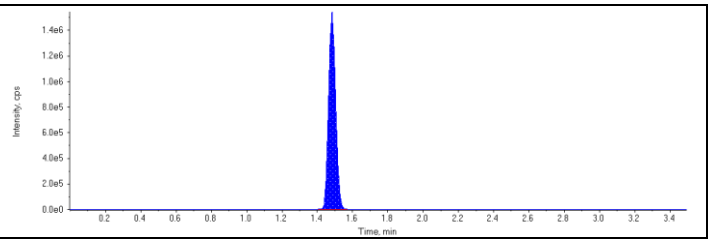
MPFNA (Internal Standard)

RT (Exp. RT): 2.05(2.02) min
Concentration: 1.00 ng/L
Sample Type: (Unknown)



13C6-PFHxA IS (Internal Standard)

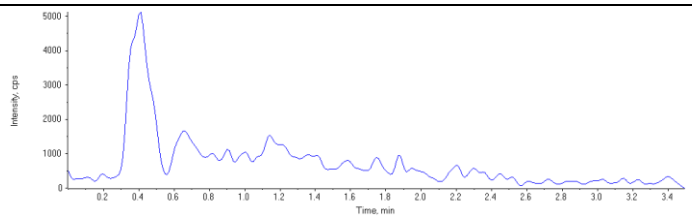
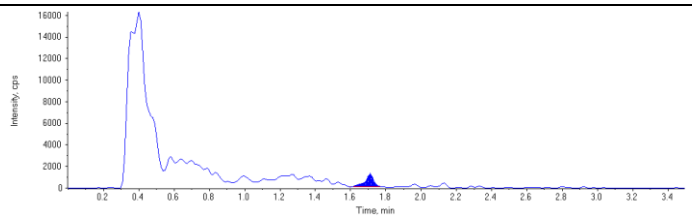
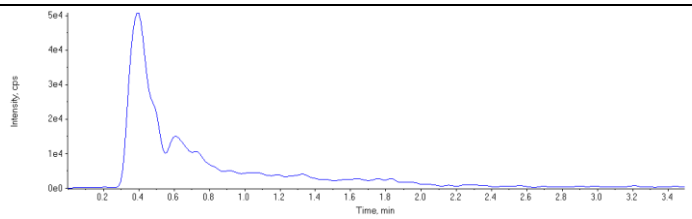
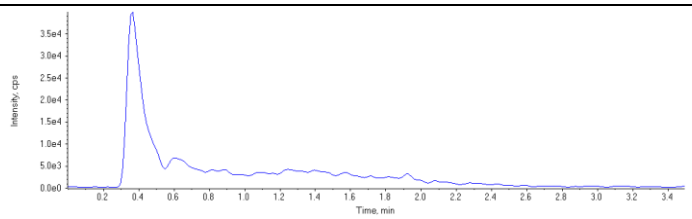
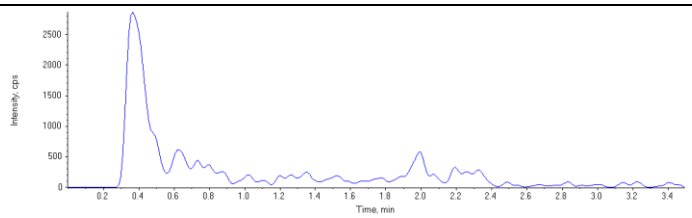
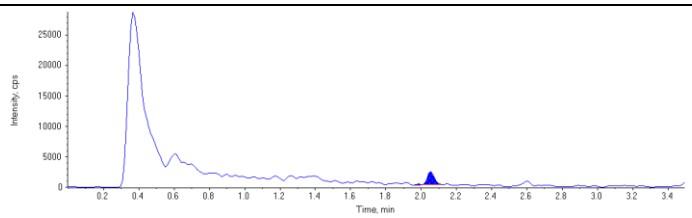
RT (Exp. RT): 1.48(1.42) min
Concentration: 1.00 ng/L
Sample Type: (Unknown)

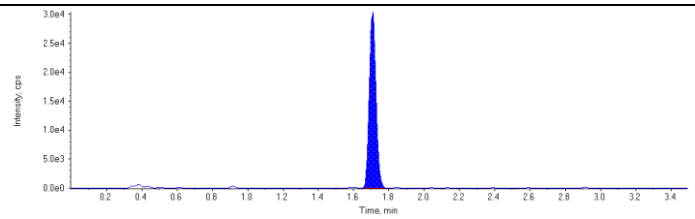
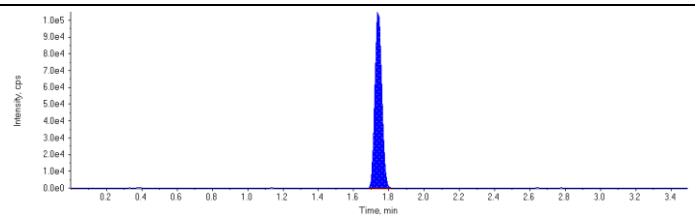
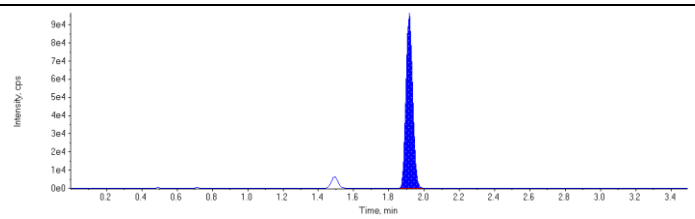
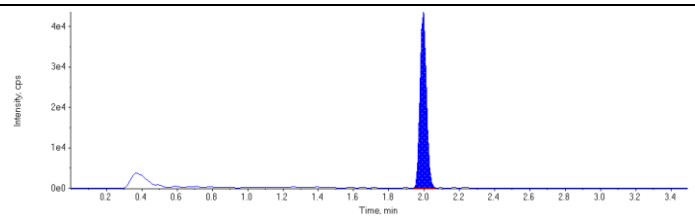
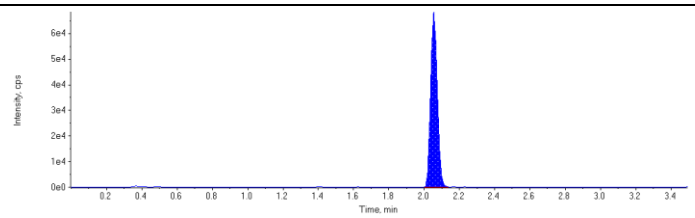
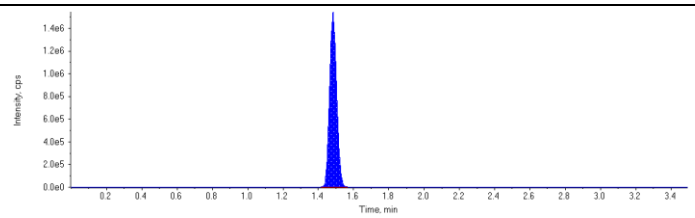


N/A (Internal Standard)

RT (Exp. RT): N/A(N/A) min
Concentration: N/A N/A
Sample Type: (Unknown)

This image is not available

PFBS 1 (298.900/79.900 Da) RT (Exp. RT): 0.00 (1.15) min Calculated Conc: N/A µg/L Area Ratio: 0.00 Sample Type: (Unknown)	
PFHxS 1 (398.900/79.900 Da) RT (Exp. RT): 1.71 (1.68) min Calculated Conc: 0.753 µg/L Area Ratio: 0.0534 Sample Type: (Unknown)	
PFHpA 1 (363.000/319.000 Da) RT (Exp. RT): 0.00 (1.75) min Calculated Conc: N/A µg/L Area Ratio: 0.00 Sample Type: (Unknown)	
PFOA 1 (413.100/369.000 Da) RT (Exp. RT): 0.00 (1.92) min Calculated Conc: N/A µg/L Area Ratio: 0.00 Sample Type: (Unknown)	
PFOS 1 (498.900/79.900 Da) RT (Exp. RT): 0.00 (1.97) min Calculated Conc: N/A µg/L Area Ratio: 0.00 Sample Type: (Unknown)	
PFNA 1 (462.900/419.000 Da) RT (Exp. RT): 2.05 (2.02) min Calculated Conc: 0.366 µg/L Area Ratio: 0.0348 Sample Type: (Unknown)	

18O2-PFHxS (402.900/84.000 Da) RT (Exp. RT): 1.71 (1.68) min Calculated Conc: 50.3 µg/L Area Ratio: 0.0185 Sample Type: (Unknown)	
13C4-PFHpA (366.900/322.000 Da) RT (Exp. RT): 1.74 (1.75) min Calculated Conc: 53.6 µg/L Area Ratio: 0.0663 Sample Type: (Unknown)	
13C4-PFOA (416.900/372.000 Da) RT (Exp. RT): 1.92 (1.88) min Calculated Conc: 54.2 µg/L Area Ratio: 0.0584 Sample Type: (Unknown)	
13C4-PFOS (502.900/79.900 Da) RT (Exp. RT): 1.99 (1.97) min Calculated Conc: 59.2 µg/L Area Ratio: 0.0256 Sample Type: (Unknown)	
13C5-PFNA (467.900/423.000 Da) RT (Exp. RT): 2.05 (2.02) min Calculated Conc: 56.7 µg/L Area Ratio: 0.0417 Sample Type: (Unknown)	
13C6-PFHxA (318.900/274.000 Da) RT (Exp. RT): 1.48 (1.42) min Calculated Conc: 108. µg/L Area Ratio: 0.00 Sample Type: (Unknown)	

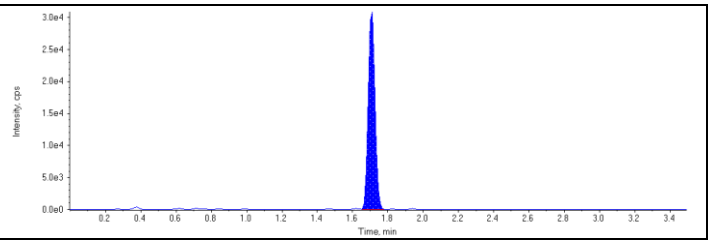
Sample Name	**4386408~BVX830-01**	**Injection Vial**	32
Sample ID	4386408~BVX830-01	**Injection Volume (µL)**	3
Sample Type	Unknown	**Algorithm Used**	Analyst Classic
Acquisition Date	2016/02/19 10:38:25 AM	**Dilution Factor**	1.00
Acquisition Method	PFC_Water_Low.dam	**Sample Annotation**	Re-injected
Project	Enviro\PFOS	**Instrument Name**	LCMS03
Data File	PFC_160219\WS#4386408.wiff		
Result Table	PFC_Water_160219_4386408_ULow.rdb		

Internal Standard	Area (cps)	RT (min)	Target Conc. (ng/L)	Calc. Conc. (ng/L)
MPFHxS	82200.	1.71	1.00	-
MPFHpA	275000.	1.74	1.00	-
MPFOA	249000.	1.91	1.00	-
MPFOS	102000.	1.99	1.00	-
MPFNA	189000.	2.05	1.00	-
13C6-PFHxA IS	4590000.	1.48	1.00	-
N/A	N/A	N/A	N/A	-

Target Analyte	Area (cps)	RT (min)	Target Conc. (ng/L)	Calc. Conc. (ng/L)	Accuracy (%)
PFBS 1	3770	1.15	N/A	0.719	N/A
PFHxS 1	0	0.00	N/A	N/A	N/A
PFHpA 1	9300	1.67	N/A	0.324	N/A
PFOA 1	0	0.00	N/A	N/A	N/A
PFOS 1	0	0.00	N/A	N/A	N/A
PFNA 1	0	0.00	N/A	N/A	N/A
18O2-PFHxS	82200	1.71	N/A	48.6	N/A
13C4-PFHpA	275000	1.74	N/A	48.4	N/A
13C4-PFOA	249000	1.91	N/A	50.3	N/A
13C4-PFOS	102000	1.99	N/A	51.6	N/A
13C5-PFNA	189000	2.05	N/A	55.9	N/A
13C6-PFHxA	4590000	1.48	N/A	115.	N/A

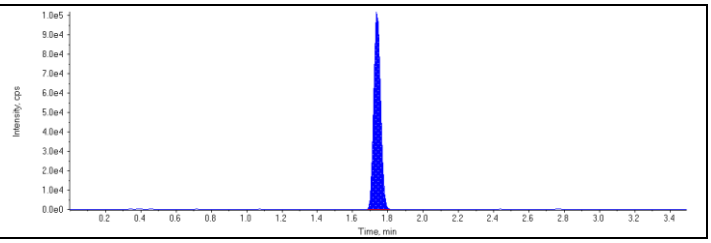
MPFHxS (Internal Standard)

RT (Exp. RT): 1.71(1.68) min
Concentration: 1.00 ng/L
Sample Type: (Unknown)



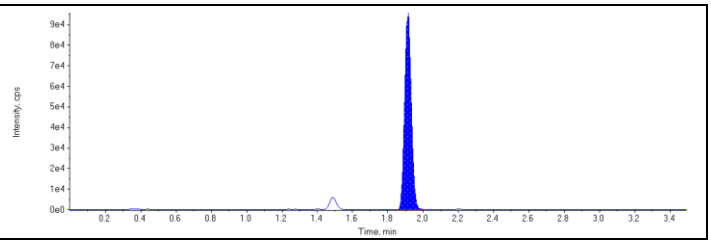
MPFHpA (Internal Standard)

RT (Exp. RT): 1.74(1.75) min
Concentration: 1.00 ng/L
Sample Type: (Unknown)



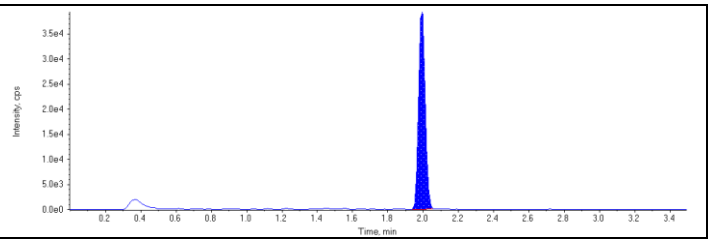
MPFOA (Internal Standard)

RT (Exp. RT): 1.91(1.88) min
Concentration: 1.00 ng/L
Sample Type: (Unknown)



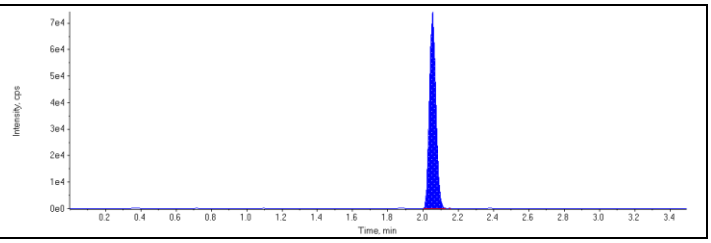
MPFOS (Internal Standard)

RT (Exp. RT): 1.99(1.97) min
Concentration: 1.00 ng/L
Sample Type: (Unknown)



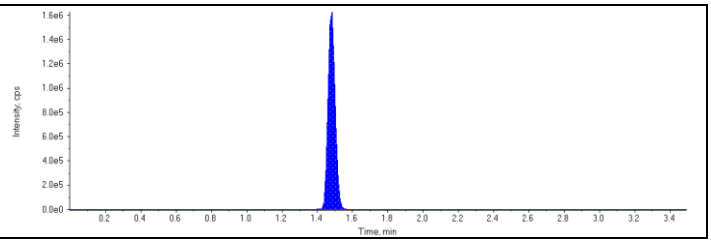
MPFNA (Internal Standard)

RT (Exp. RT): 2.05(2.02) min
Concentration: 1.00 ng/L
Sample Type: (Unknown)



13C6-PFHxA IS (Internal Standard)

RT (Exp. RT): 1.48(1.42) min
Concentration: 1.00 ng/L
Sample Type: (Unknown)



N/A (Internal Standard)

RT (Exp. RT): N/A(N/A) min
Concentration: N/A N/A
Sample Type: (Unknown)

This image is not available

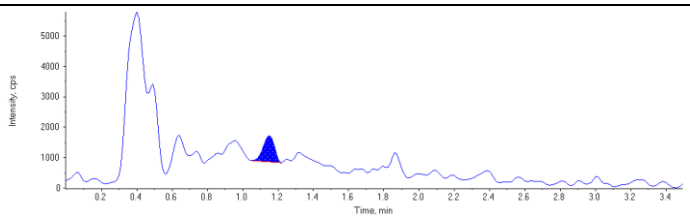
PFBS 1 (298.900/79.900 Da)

RT (Exp. RT): 1.15 (1.15) min

Calculated Conc: 0.719 µg/L

Area Ratio: 0.0459

Sample Type: (Unknown)



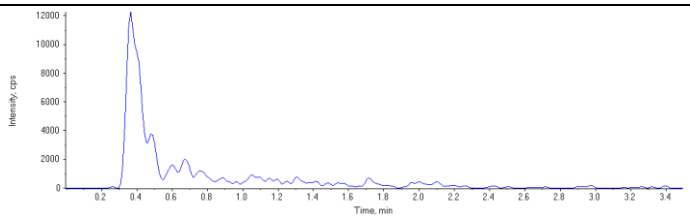
PFHxS 1 (398.900/79.900 Da)

RT (Exp. RT): 0.00 (1.68) min

Calculated Conc: N/A µg/L

Area Ratio: 0.00

Sample Type: (Unknown)



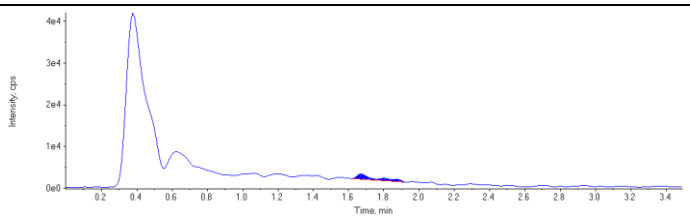
PFHpA 1 (363.000/319.000 Da)

RT (Exp. RT): 1.67 (1.75) min

Calculated Conc: 0.324 µg/L

Area Ratio: 0.0339

Sample Type: (Unknown)



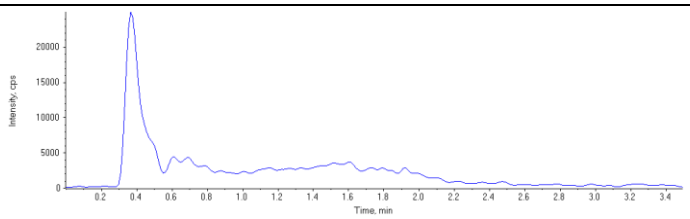
PFOA 1 (413.100/369.000 Da)

RT (Exp. RT): 0.00 (1.92) min

Calculated Conc: N/A µg/L

Area Ratio: 0.00

Sample Type: (Unknown)



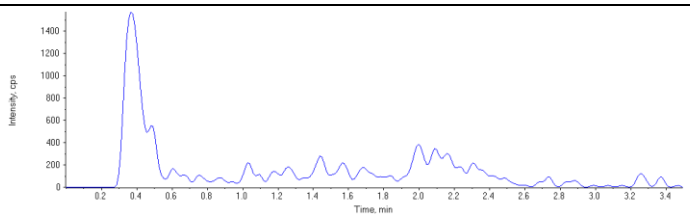
PFOS 1 (498.900/79.900 Da)

RT (Exp. RT): 0.00 (1.97) min

Calculated Conc: N/A µg/L

Area Ratio: 0.00

Sample Type: (Unknown)



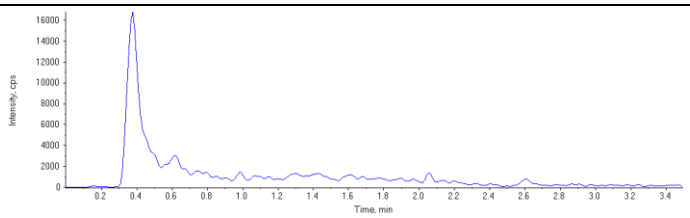
PFNA 1 (462.900/419.000 Da)

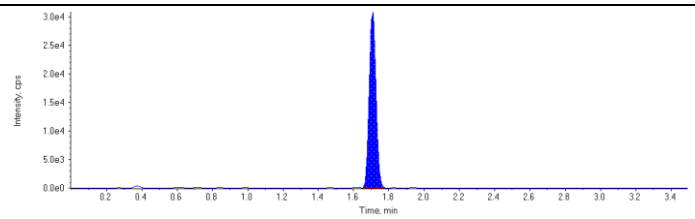
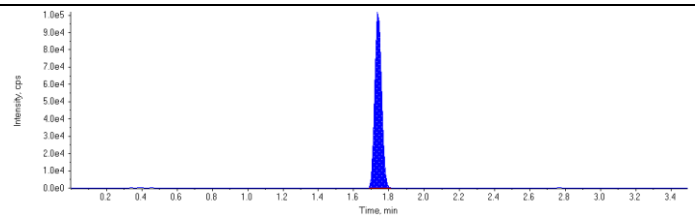
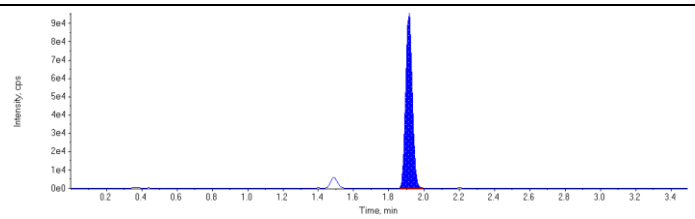
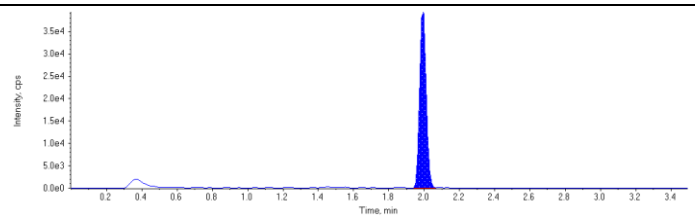
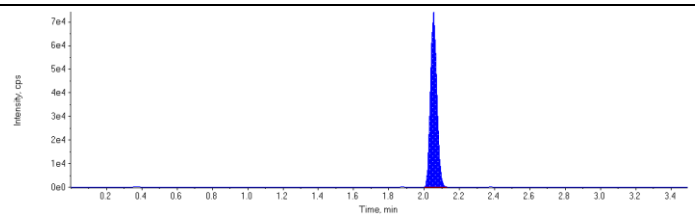
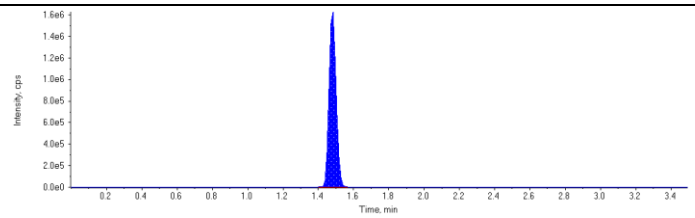
RT (Exp. RT): 0.00 (2.02) min

Calculated Conc: N/A µg/L

Area Ratio: 0.00

Sample Type: (Unknown)



18O2-PFHxS (402.900/84.000 Da) RT (Exp. RT): 1.71 (1.68) min Calculated Conc: 48.6 µg/L Area Ratio: 0.0179 Sample Type: (Unknown)	
13C4-PFHpA (366.900/322.000 Da) RT (Exp. RT): 1.74 (1.75) min Calculated Conc: 48.4 µg/L Area Ratio: 0.0598 Sample Type: (Unknown)	
13C4-PFOA (416.900/372.000 Da) RT (Exp. RT): 1.91 (1.88) min Calculated Conc: 50.3 µg/L Area Ratio: 0.0543 Sample Type: (Unknown)	
13C4-PFOS (502.900/79.900 Da) RT (Exp. RT): 1.99 (1.97) min Calculated Conc: 51.6 µg/L Area Ratio: 0.0223 Sample Type: (Unknown)	
13C5-PFNA (467.900/423.000 Da) RT (Exp. RT): 2.05 (2.02) min Calculated Conc: 55.9 µg/L Area Ratio: 0.0411 Sample Type: (Unknown)	
13C6-PFHxA (318.900/274.000 Da) RT (Exp. RT): 1.48 (1.42) min Calculated Conc: 115. µg/L Area Ratio: 0.00 Sample Type: (Unknown)	

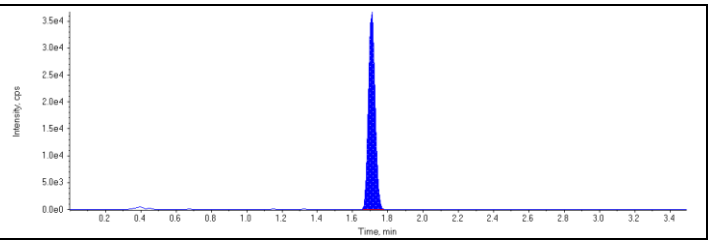
Sample Name	**4386408~BVX830-01**	**Injection Vial**	32
Sample ID	4386408~BVX830-01	**Injection Volume (µL)**	3
Sample Type	Unknown	**Algorithm Used**	Analyst Classic
Acquisition Date	2016/02/19 10:58:48 AM	**Dilution Factor**	1.00
Acquisition Method	PFC_Water_Low.dam	**Sample Annotation**	Reported
Project	Enviro\PFOS	**Instrument Name**	LCMS03
Data File	PFC_160219\WS#4386408.wiff		
Result Table	PFC_Water_160219_4386408_ULow.rdb		

Internal Standard	Area (cps)	RT (min)	Target Conc. (ng/L)	Calc. Conc. (ng/L)
MPFHxS	96600.	1.71	1.00	-
MPFHpA	277000.	1.74	1.00	-
MPFOA	258000.	1.91	1.00	-
MPFOS	103000.	1.99	1.00	-
MPFNA	188000.	2.05	1.00	-
13C6-PFHxA IS	4700000.	1.48	1.00	-
N/A	N/A	N/A	N/A	-

Target Analyte	Area (cps)	RT (min)	Target Conc. (ng/L)	Calc. Conc. (ng/L)	Accuracy (%)
PFBS 1	11900	1.23	N/A	0.966	N/A
PFHxS 1	0	0.00	N/A	N/A	N/A
PFHpA 1	0	0.00	N/A	N/A	N/A
PFOA 1	0	0.00	N/A	N/A	N/A
PFOS 1	0	0.00	N/A	N/A	N/A
PFNA 1	0	0.00	N/A	N/A	N/A
18O2-PFHxS	96600	1.71	N/A	55.9	N/A
13C4-PFHpA	277000	1.74	N/A	47.6	N/A
13C4-PFOA	258000	1.91	N/A	50.8	N/A
13C4-PFOS	103000	1.99	N/A	50.8	N/A
13C5-PFNA	188000	2.05	N/A	54.5	N/A
13C6-PFHxA	4700000	1.48	N/A	118.	N/A

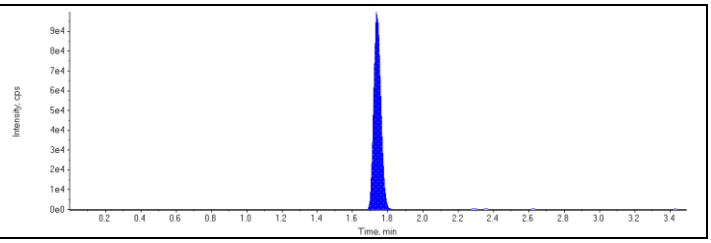
MPFHxS (Internal Standard)

RT (Exp. RT): 1.71(1.68) min
Concentration: 1.00 ng/L
Sample Type: (Unknown)



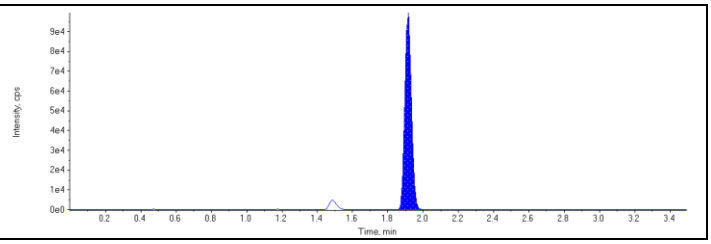
MPFHpA (Internal Standard)

RT (Exp. RT): 1.74(1.75) min
Concentration: 1.00 ng/L
Sample Type: (Unknown)



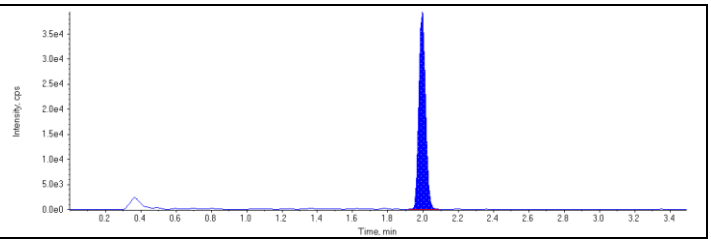
MPFOA (Internal Standard)

RT (Exp. RT): 1.91(1.88) min
Concentration: 1.00 ng/L
Sample Type: (Unknown)



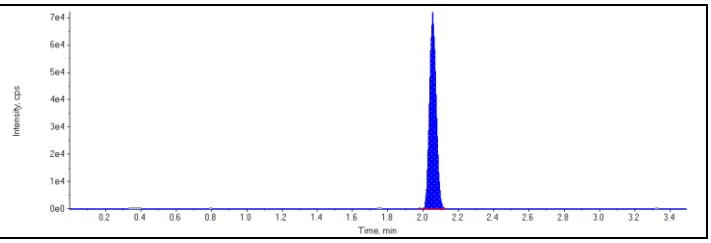
MPFOS (Internal Standard)

RT (Exp. RT): 1.99(1.97) min
Concentration: 1.00 ng/L
Sample Type: (Unknown)



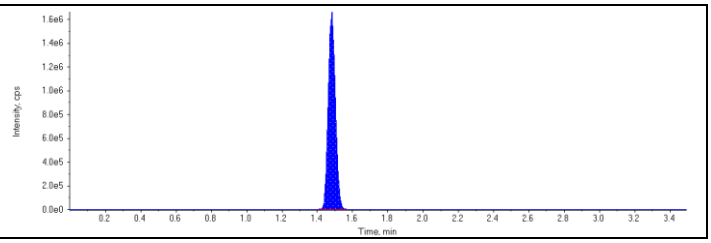
MPFNA (Internal Standard)

RT (Exp. RT): 2.05(2.02) min
Concentration: 1.00 ng/L
Sample Type: (Unknown)



13C6-PFHxA IS (Internal Standard)

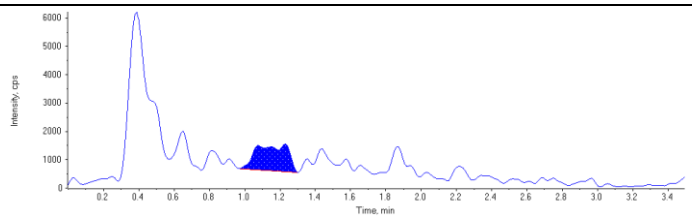
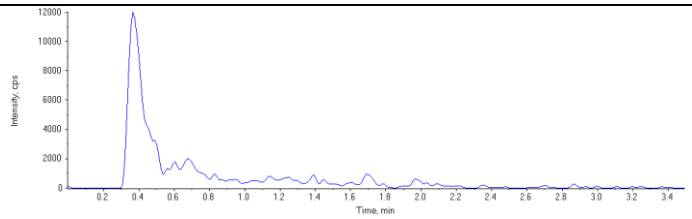
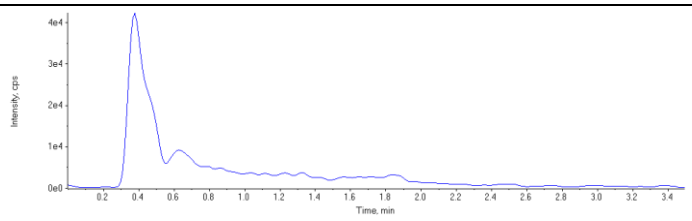
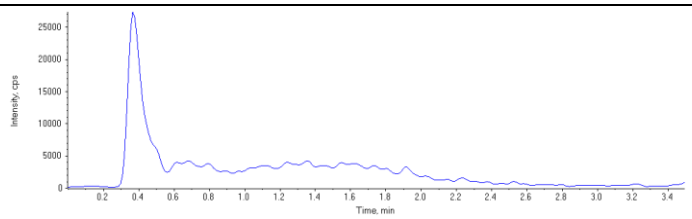
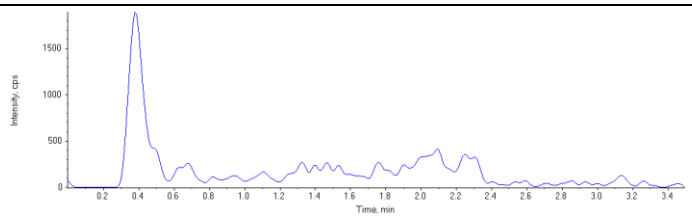
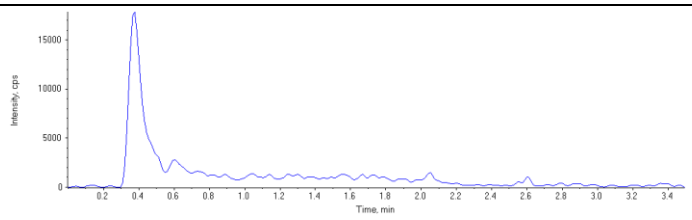
RT (Exp. RT): 1.48(1.42) min
Concentration: 1.00 ng/L
Sample Type: (Unknown)

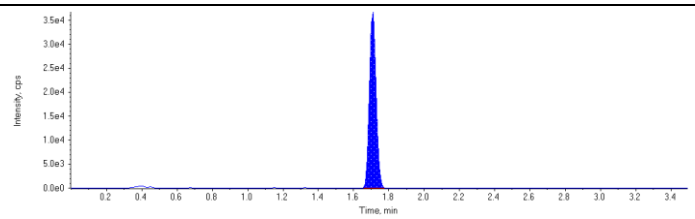
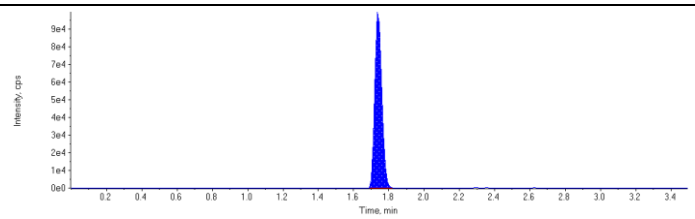
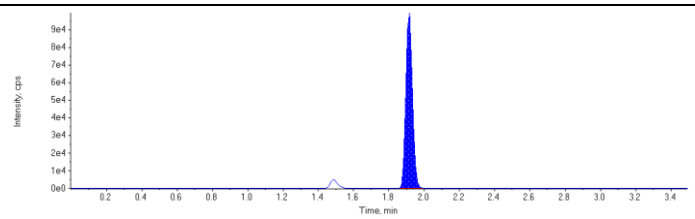
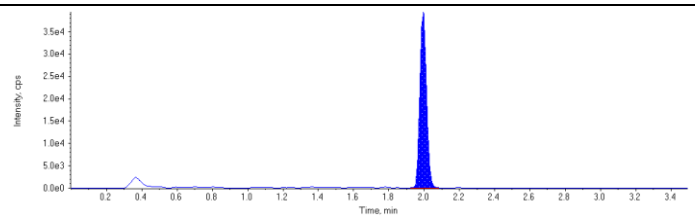
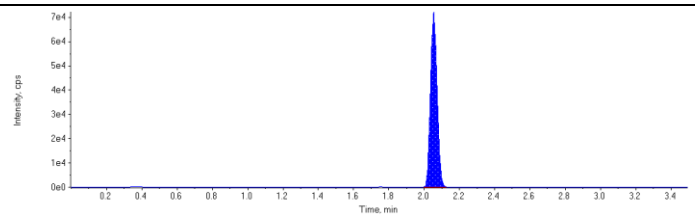
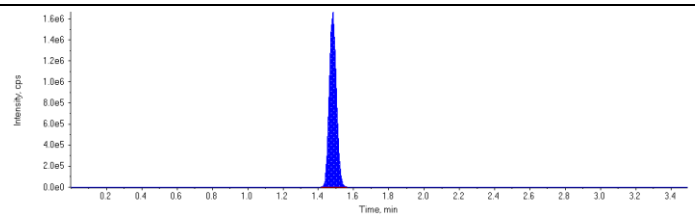


N/A (Internal Standard)

RT (Exp. RT): N/A(N/A) min
Concentration: N/A N/A
Sample Type: (Unknown)

This image is not available

PFBS 1 (298.900/79.900 Da) RT (Exp. RT): 1.23 (1.15) min Calculated Conc: 0.966 µg/L Area Ratio: 0.123 Sample Type: (Unknown)	
PFHxS 1 (398.900/79.900 Da) RT (Exp. RT): 0.00 (1.68) min Calculated Conc: N/A µg/L Area Ratio: 0.00 Sample Type: (Unknown)	
PFHpA 1 (363.000/319.000 Da) RT (Exp. RT): 0.00 (1.75) min Calculated Conc: N/A µg/L Area Ratio: 0.00 Sample Type: (Unknown)	
PFOA 1 (413.100/369.000 Da) RT (Exp. RT): 0.00 (1.92) min Calculated Conc: N/A µg/L Area Ratio: 0.00 Sample Type: (Unknown)	
PFOS 1 (498.900/79.900 Da) RT (Exp. RT): 0.00 (1.97) min Calculated Conc: N/A µg/L Area Ratio: 0.00 Sample Type: (Unknown)	
PFNA 1 (462.900/419.000 Da) RT (Exp. RT): 0.00 (2.02) min Calculated Conc: N/A µg/L Area Ratio: 0.00 Sample Type: (Unknown)	

18O2-PFHxS (402.900/84.000 Da) RT (Exp. RT): 1.71 (1.68) min Calculated Conc: 55.9 µg/L Area Ratio: 0.0206 Sample Type: (Unknown)	
13C4-PFHpA (366.900/322.000 Da) RT (Exp. RT): 1.74 (1.75) min Calculated Conc: 47.6 µg/L Area Ratio: 0.0589 Sample Type: (Unknown)	
13C4-PFOA (416.900/372.000 Da) RT (Exp. RT): 1.91 (1.88) min Calculated Conc: 50.8 µg/L Area Ratio: 0.0548 Sample Type: (Unknown)	
13C4-PFOS (502.900/79.900 Da) RT (Exp. RT): 1.99 (1.97) min Calculated Conc: 50.8 µg/L Area Ratio: 0.0220 Sample Type: (Unknown)	
13C5-PFNA (467.900/423.000 Da) RT (Exp. RT): 2.05 (2.02) min Calculated Conc: 54.5 µg/L Area Ratio: 0.0401 Sample Type: (Unknown)	
13C6-PFHxA (318.900/274.000 Da) RT (Exp. RT): 1.48 (1.42) min Calculated Conc: 118. µg/L Area Ratio: 0.00 Sample Type: (Unknown)	

4. QA/QC Data

Maxxam Analytics International
6740 Campobello Rd
Mississauga, Ontario, Canada
L5N 2L8
1-800-668-0639
www.maxxamanalytics.com

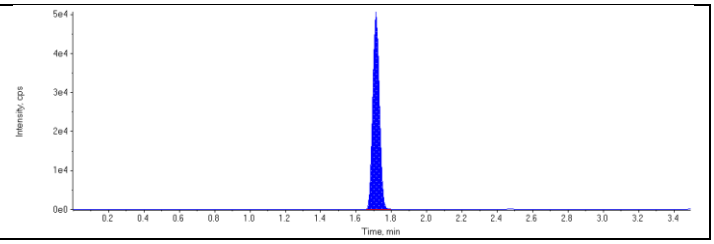
Sample Name	**4386408~BLANK**	**Injection Vial**	2
Sample ID	4386408~BLANK	**Injection Volume (µL)**	3
Sample Type	Quality Control	**Algorithm Used**	Analyst Classic
Acquisition Date	2016/02/19 7:39:53 AM	**Dilution Factor**	1.00
Acquisition Method	PFC_Water_Low.dam	**Sample Annotation**	-
Project	Enviro\PFOS	**Instrument Name**	LCMS03
Data File	PFC_160219\WS#4386408.wiff		
Result Table	PFC_Water_160219_4386408_ULow.rdb		

Internal Standard	Area (cps)	RT (min)	Target Conc. (ng/L)	Calc. Conc. (ng/L)
MPFHxS	130000.	1.71	1.00	-
MPFHpA	375000.	1.74	1.00	-
MPFOA	327000.	1.92	1.00	-
MPFOS	146000.	2.00	1.00	-
MPFNA	228000.	2.06	1.00	-
13C6-PFHxA IS	4100000.	1.49	1.00	-
N/A	N/A	N/A	N/A	-

Target Analyte	Area (cps)	RT (min)	Target Conc. (ng/L)	Calc. Conc. (ng/L)	Accuracy (%)
PFBS 1	0	0.00	0.00	N/A	0.0
PFHxS 1	0	0.00	0.00	N/A	0.0
PFHpA 1	0	0.00	0.00	N/A	0.0
PFOA 1	0	0.00	0.00	N/A	0.0
PFOS 1	0	0.00	0.00	N/A	0.0
PFNA 1	0	0.00	0.00	N/A	0.0
18O2-PFHxS	130000	1.71	100.	86.2	86.2
13C4-PFHpA	375000	1.74	100.	73.9	73.9
13C4-PFOA	327000	1.92	100.	73.9	73.9
13C4-PFOS	146000	2.00	100.	82.4	82.4
13C5-PFNA	228000	2.06	100.	75.7	75.7
13C6-PFHxA	4100000	1.49	100.	103.	103.0

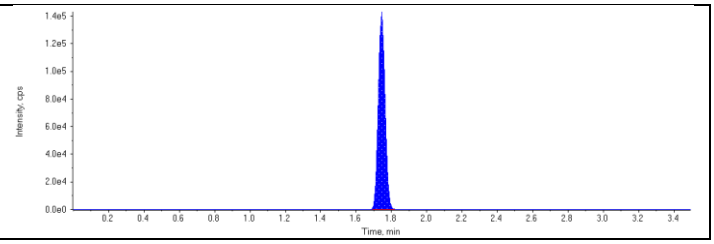
MPFHxS (Internal Standard)

RT (Exp. RT): 1.71(1.68) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



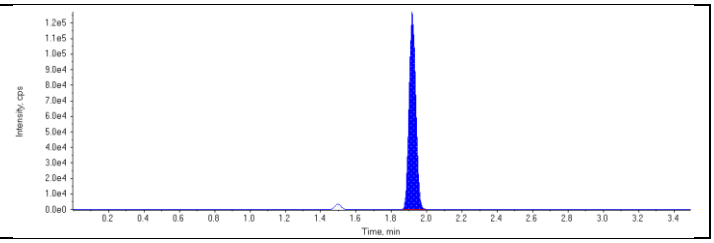
MPFHpA (Internal Standard)

RT (Exp. RT): 1.74(1.75) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



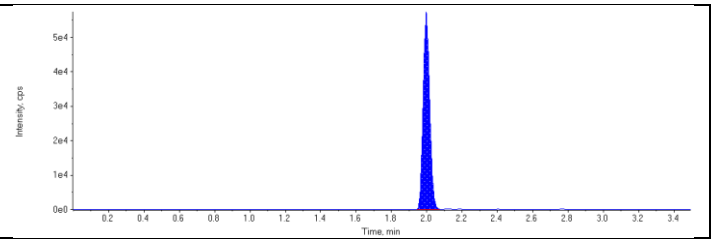
MPFOA (Internal Standard)

RT (Exp. RT): 1.92(1.88) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



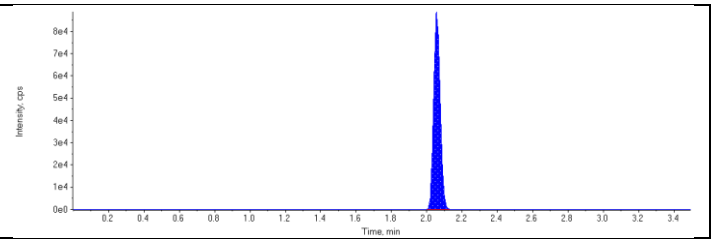
MPFOS (Internal Standard)

RT (Exp. RT): 2.00(1.97) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



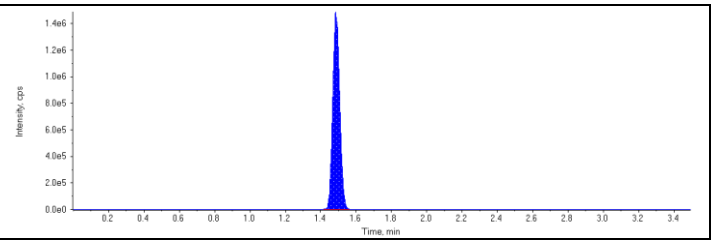
MPFNA (Internal Standard)

RT (Exp. RT): 2.06(2.02) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



13C6-PFHxA IS (Internal Standard)

RT (Exp. RT): 1.49(1.42) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



N/A (Internal Standard)

RT (Exp. RT): N/A(N/A) min
Concentration: N/A N/A
Sample Type: (Quality Control)

This image is not available

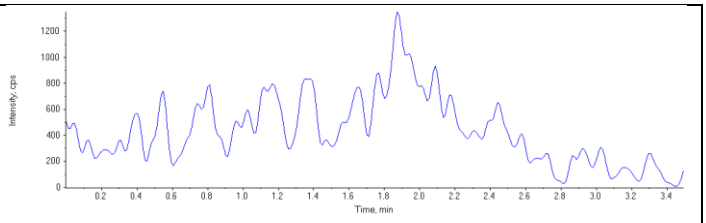
PFBS 1 (298.900/79.900 Da)

RT (Exp. RT): 0.00 (1.15) min

Calculated Conc: N/A µg/L

Area Ratio: 0.00

Sample Type: (Quality Control)



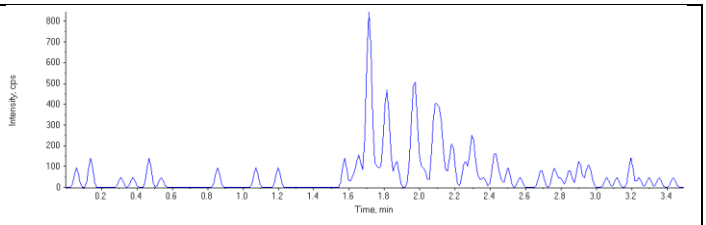
PFHxS 1 (398.900/79.900 Da)

RT (Exp. RT): 0.00 (1.68) min

Calculated Conc: N/A µg/L

Area Ratio: 0.00

Sample Type: (Quality Control)



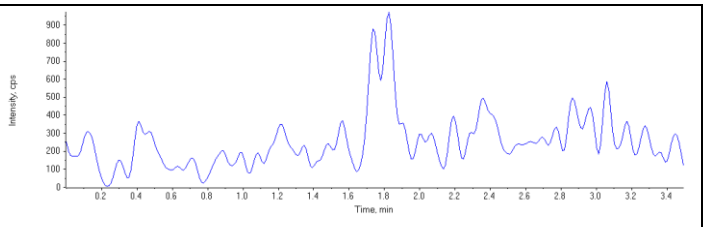
PFHpA 1 (363.000/319.000 Da)

RT (Exp. RT): 0.00 (1.75) min

Calculated Conc: N/A µg/L

Area Ratio: 0.00

Sample Type: (Quality Control)



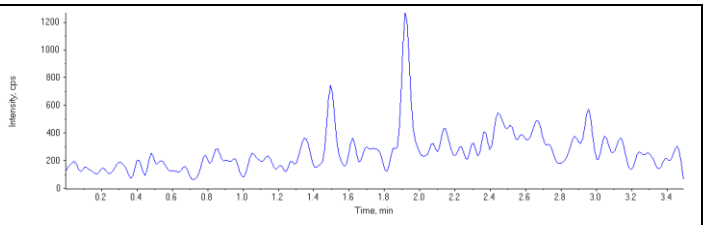
PFOA 1 (413.100/369.000 Da)

RT (Exp. RT): 0.00 (1.92) min

Calculated Conc: N/A µg/L

Area Ratio: 0.00

Sample Type: (Quality Control)



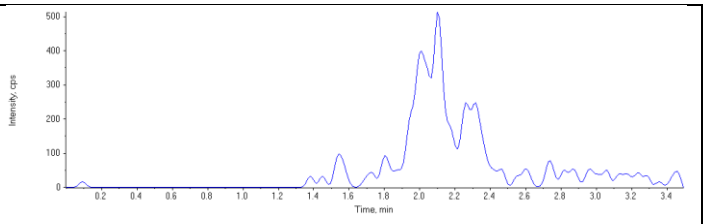
PFOS 1 (498.900/79.900 Da)

RT (Exp. RT): 0.00 (1.97) min

Calculated Conc: N/A µg/L

Area Ratio: 0.00

Sample Type: (Quality Control)



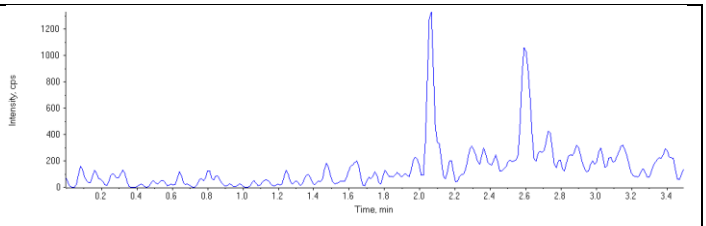
PFNA 1 (462.900/419.000 Da)

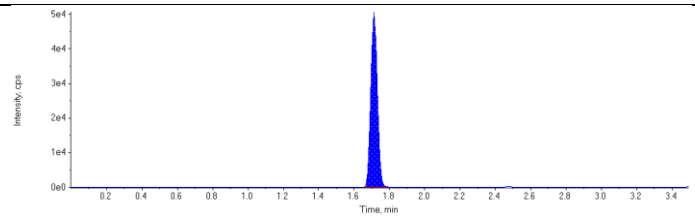
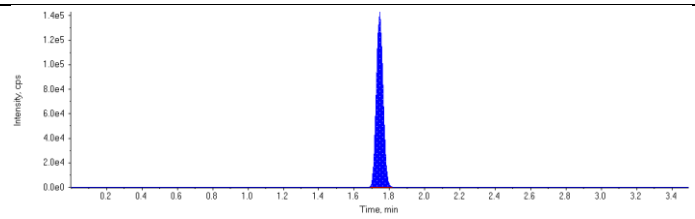
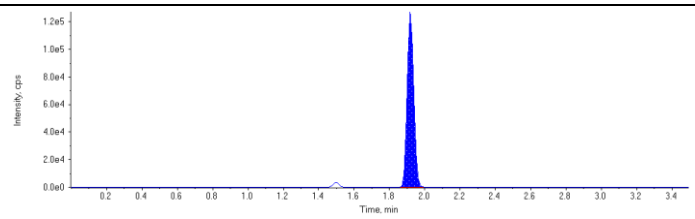
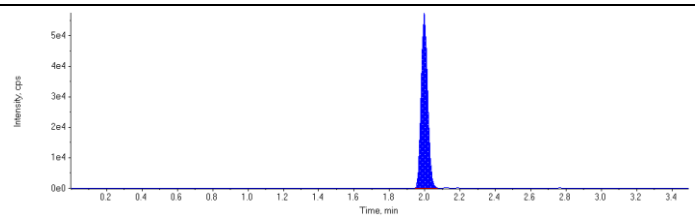
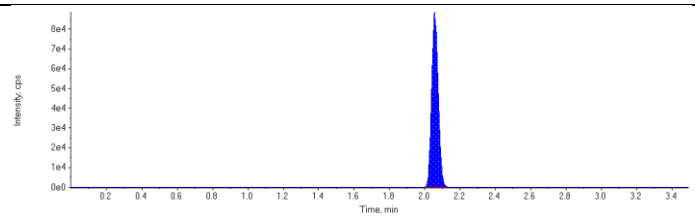
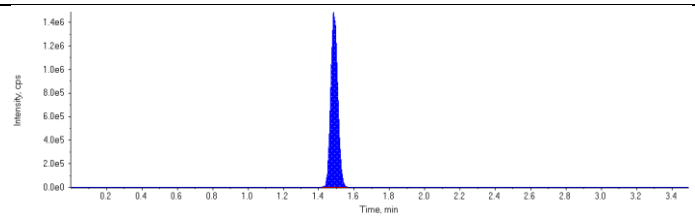
RT (Exp. RT): 0.00 (2.02) min

Calculated Conc: N/A µg/L

Area Ratio: 0.00

Sample Type: (Quality Control)



18O2-PFHxS (402.900/84.000 Da) RT (Exp. RT): 1.71 (1.68) min Calculated Conc: 86.2 µg/L Area Ratio: 0.0317 Sample Type: (Quality Control)	
13C4-PFHpA (366.900/322.000 Da) RT (Exp. RT): 1.74 (1.75) min Calculated Conc: 73.9 µg/L Area Ratio: 0.0914 Sample Type: (Quality Control)	
13C4-PFOA (416.900/372.000 Da) RT (Exp. RT): 1.92 (1.88) min Calculated Conc: 73.9 µg/L Area Ratio: 0.0798 Sample Type: (Quality Control)	
13C4-PFOS (502.900/79.900 Da) RT (Exp. RT): 2.00 (1.97) min Calculated Conc: 82.4 µg/L Area Ratio: 0.0356 Sample Type: (Quality Control)	
13C5-PFNA (467.900/423.000 Da) RT (Exp. RT): 2.06 (2.02) min Calculated Conc: 75.7 µg/L Area Ratio: 0.0557 Sample Type: (Quality Control)	
13C6-PFHxA (318.900/274.000 Da) RT (Exp. RT): 1.49 (1.42) min Calculated Conc: 103. µg/L Area Ratio: 0.00 Sample Type: (Quality Control)	

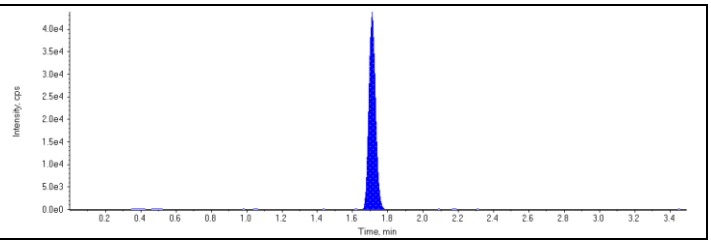
Sample Name	**4386408~MTRX SPK**	**Injection Vial**	10
Sample ID	4386408~MTRX SPK	**Injection Volume (µL)**	3
Sample Type	Quality Control	**Algorithm Used**	Analyst Classic
Acquisition Date	2016/02/19 8:25:52 AM	**Dilution Factor**	1.00
Acquisition Method	PFC_Water_Low.dam	**Sample Annotation**	Re-injected
Project	Enviro\PFOS	**Instrument Name**	LCMS03
Data File	PFC_160219\WS#4386408.wiff		
Result Table	PFC_Water_160219_4386408_ULow.rdb		

Internal Standard	Area (cps)	RT (min)	Target Conc. (ng/L)	Calc. Conc. (ng/L)
MPFHxS	112000.	1.71	1.00	-
MPFHpA	335000.	1.74	1.00	-
MPFOA	321000.	1.92	1.00	-
MPFOS	127000.	2.00	1.00	-
MPFNA	227000.	2.06	1.00	-
13C6-PFHxA IS	5760000.	1.49	1.00	-
N/A	N/A	N/A	N/A	-

Target Analyte	Area (cps)	RT (min)	Target Conc. (ng/L)	Calc. Conc. (ng/L)	Accuracy (%)
PFBS 1	2820000	1.17	50.0	81.2	162.0
PFHxS 1	2500000	1.71	50.0	68.1	136.0
PFHpA 1	3080000	1.74	50.0	68.3	137.0
PFOA 1	3200000	1.92	50.0	60.5	121.0
PFOS 1	1470000	1.99	50.0	64.1	128.0
PFNA 1	2340000	2.06	50.0	62.0	124.0
18O2-PFHxS	112000	1.71	100.	52.6	52.6
13C4-PFHpA	335000	1.74	100.	47.1	47.1
13C4-PFOA	321000	1.92	100.	51.7	51.7
13C4-PFOS	127000	2.00	100.	51.0	51.0
13C5-PFNA	227000	2.06	100.	53.5	53.5
13C6-PFHxA	5760000	1.49	100.	144.	144.0

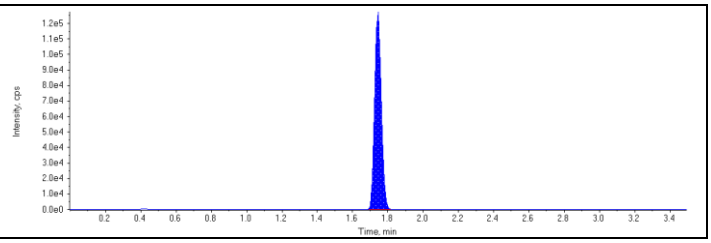
MPFHxS (Internal Standard)

RT (Exp. RT): 1.71(1.68) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



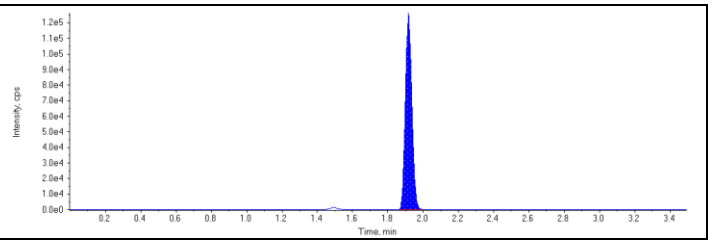
MPFHpA (Internal Standard)

RT (Exp. RT): 1.74(1.75) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



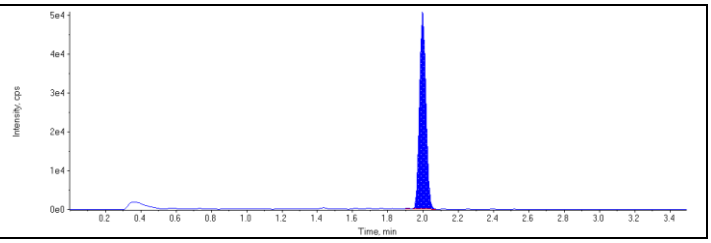
MPFOA (Internal Standard)

RT (Exp. RT): 1.92(1.88) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



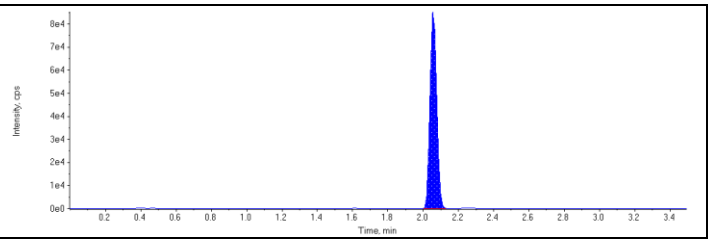
MPFOS (Internal Standard)

RT (Exp. RT): 2.00(1.97) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



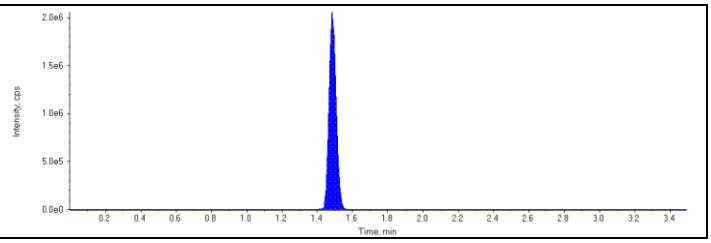
MPFNA (Internal Standard)

RT (Exp. RT): 2.06(2.02) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



13C6-PFHxA IS (Internal Standard)

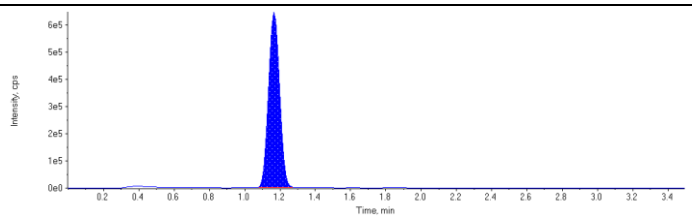
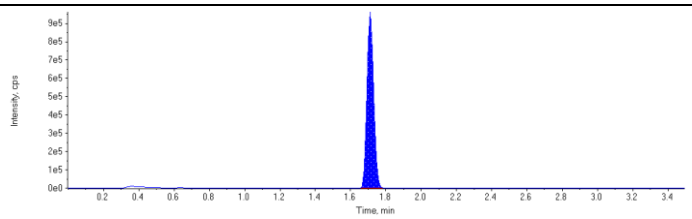
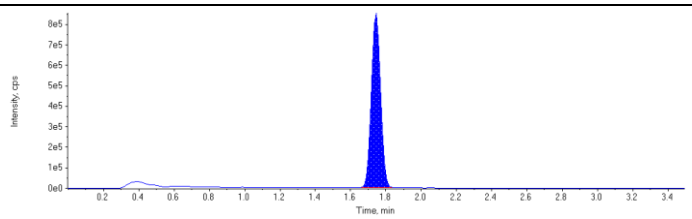
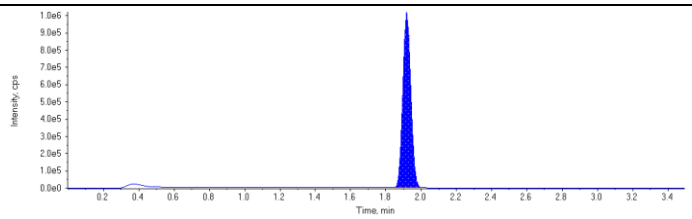
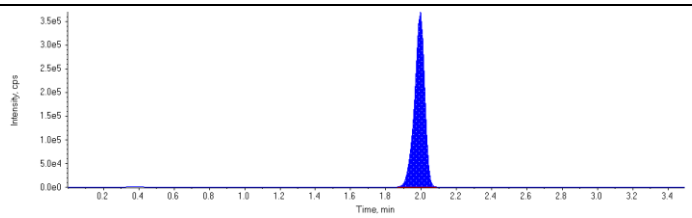
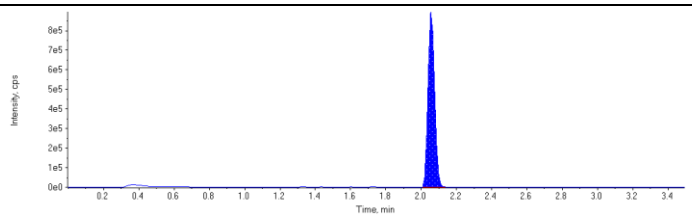
RT (Exp. RT): 1.49(1.42) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)

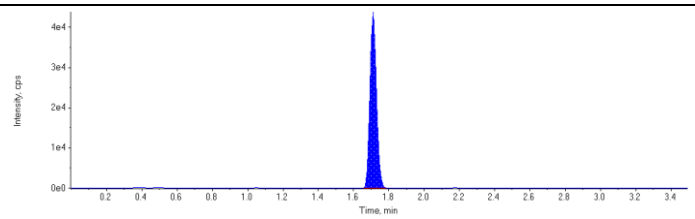
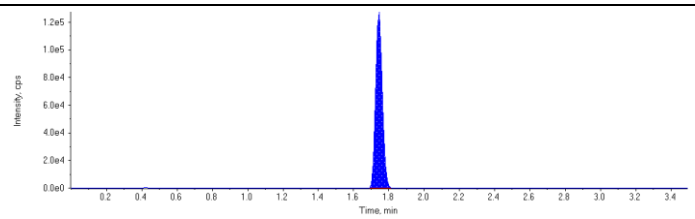
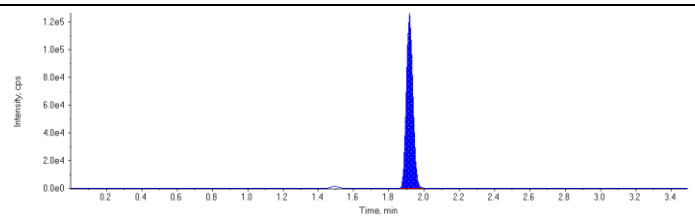
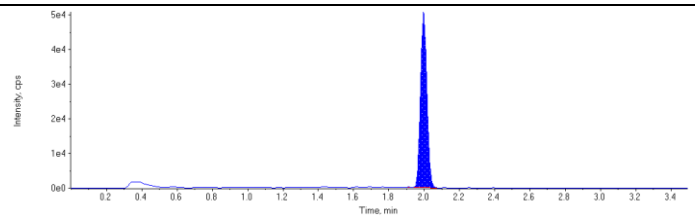
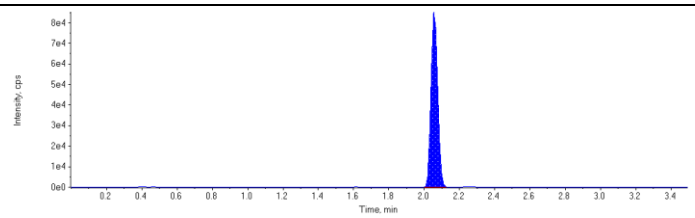
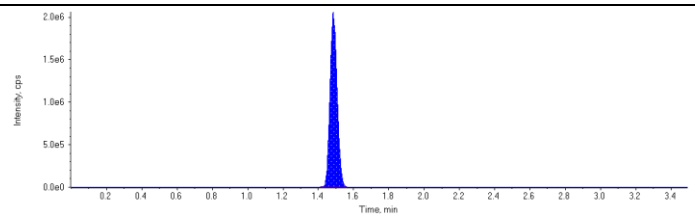


N/A (Internal Standard)

RT (Exp. RT): N/A(N/A) min
Concentration: N/A N/A
Sample Type: (Quality Control)

This image is not available

PFBS 1 (298.900/79.900 Da) RT (Exp. RT): 1.17 (1.15) min Calculated Conc: 81.2 µg/L Area Ratio: 25.3 Sample Type: (Quality Control)	
PFHxS 1 (398.900/79.900 Da) RT (Exp. RT): 1.71 (1.68) min Calculated Conc: 68.1 µg/L Area Ratio: 22.4 Sample Type: (Quality Control)	
PFHpA 1 (363.000/319.000 Da) RT (Exp. RT): 1.74 (1.75) min Calculated Conc: 68.3 µg/L Area Ratio: 9.19 Sample Type: (Quality Control)	
PFOA 1 (413.100/369.000 Da) RT (Exp. RT): 1.92 (1.92) min Calculated Conc: 60.5 µg/L Area Ratio: 9.96 Sample Type: (Quality Control)	
PFOS 1 (498.900/79.900 Da) RT (Exp. RT): 1.99 (1.97) min Calculated Conc: 64.1 µg/L Area Ratio: 11.6 Sample Type: (Quality Control)	
PFNA 1 (462.900/419.000 Da) RT (Exp. RT): 2.06 (2.02) min Calculated Conc: 62.0 µg/L Area Ratio: 10.3 Sample Type: (Quality Control)	

18O2-PFHxS (402.900/84.000 Da) RT (Exp. RT): 1.71 (1.68) min Calculated Conc: 52.6 µg/L Area Ratio: 0.0194 Sample Type: (Quality Control)	
13C4-PFHpA (366.900/322.000 Da) RT (Exp. RT): 1.74 (1.75) min Calculated Conc: 47.1 µg/L Area Ratio: 0.0582 Sample Type: (Quality Control)	
13C4-PFOA (416.900/372.000 Da) RT (Exp. RT): 1.92 (1.88) min Calculated Conc: 51.7 µg/L Area Ratio: 0.0557 Sample Type: (Quality Control)	
13C4-PFOS (502.900/79.900 Da) RT (Exp. RT): 2.00 (1.97) min Calculated Conc: 51.0 µg/L Area Ratio: 0.0220 Sample Type: (Quality Control)	
13C5-PFNA (467.900/423.000 Da) RT (Exp. RT): 2.06 (2.02) min Calculated Conc: 53.5 µg/L Area Ratio: 0.0394 Sample Type: (Quality Control)	
13C6-PFHxA (318.900/274.000 Da) RT (Exp. RT): 1.49 (1.42) min Calculated Conc: 144. µg/L Area Ratio: 0.00 Sample Type: (Quality Control)	

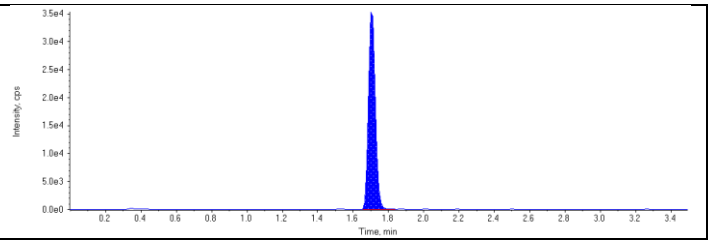
Sample Name	**4386408~MTRX SPK**	**Injection Vial**	10
Sample ID	4386408~MTRX SPK	**Injection Volume (µL)**	3
Sample Type	Quality Control	**Algorithm Used**	Analyst Classic
Acquisition Date	2016/02/19 10:48:37 AM	**Dilution Factor**	1.00
Acquisition Method	PFC_Water_Low.dam	**Sample Annotation**	Reported
Project	Enviro\PFOS	**Instrument Name**	LCMS03
Data File	PFC_160219\WS#4386408.wiff		
Result Table	PFC_Water_160219_4386408_ULow.rdb		

Internal Standard	Area (cps)	RT (min)	Target Conc. (ng/L)	Calc. Conc. (ng/L)
MPFHxS	95600.	1.71	1.00	-
MPFHpA	303000.	1.74	1.00	-
MPFOA	307000.	1.91	1.00	-
MPFOS	126000.	1.99	1.00	-
MPFNA	222000.	2.05	1.00	-
13C6-PFHxA IS	4930000.	1.48	1.00	-
N/A	N/A	N/A	N/A	-

Target Analyte	Area (cps)	RT (min)	Target Conc. (ng/L)	Calc. Conc. (ng/L)	Accuracy (%)
PFBS 1	2350000	1.16	50.0	79.2	158.0
PFHxS 1	2330000	1.71	50.0	73.8	148.0
PFHpA 1	2720000	1.74	50.0	66.7	133.0
PFOA 1	3150000	1.92	50.0	62.3	125.0
PFOS 1	1320000	1.99	50.0	58.0	116.0
PFNA 1	2220000	2.05	50.0	60.1	120.0
18O2-PFHxS	95600	1.71	100.	52.6	52.6
13C4-PFHpA	303000	1.74	100.	49.7	49.7
13C4-PFOA	307000	1.91	100.	57.7	57.7
13C4-PFOS	126000	1.99	100.	58.9	58.9
13C5-PFNA	222000	2.05	100.	61.2	61.2
13C6-PFHxA	4930000	1.48	100.	124.	124.0

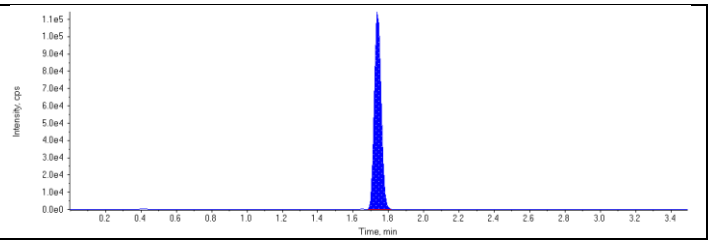
MPFHxS (Internal Standard)

RT (Exp. RT): 1.71(1.68) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



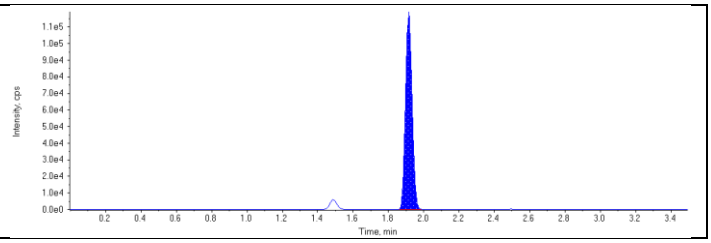
MPFHpA (Internal Standard)

RT (Exp. RT): 1.74(1.75) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



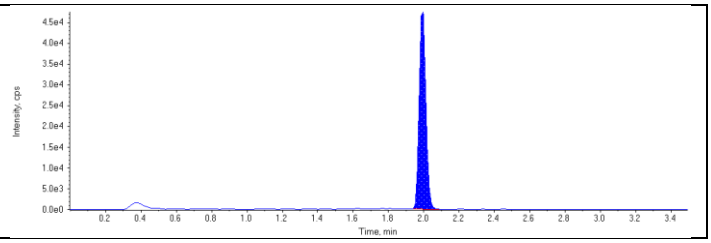
MPFOA (Internal Standard)

RT (Exp. RT): 1.91(1.88) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



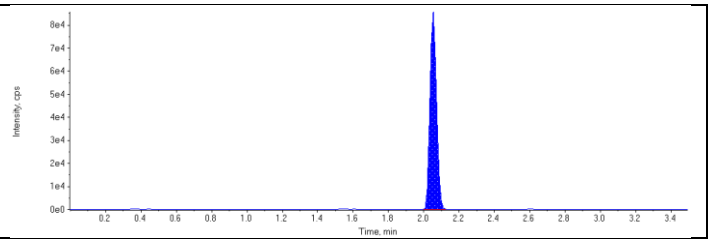
MPFOS (Internal Standard)

RT (Exp. RT): 1.99(1.97) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



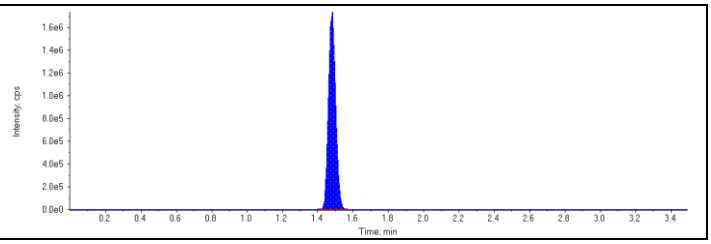
MPFNA (Internal Standard)

RT (Exp. RT): 2.05(2.02) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



13C6-PFHxA IS (Internal Standard)

RT (Exp. RT): 1.48(1.42) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



N/A (Internal Standard)

RT (Exp. RT): N/A(N/A) min
Concentration: N/A N/A
Sample Type: (Quality Control)

This image is not available

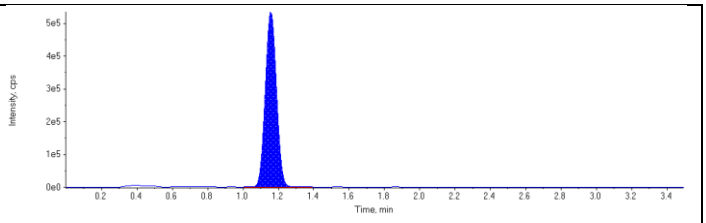
PFBS 1 (298.900/79.900 Da)

RT (Exp. RT): 1.16 (1.15) min

Calculated Conc: 79.2 µg/L

Area Ratio: 24.6

Sample Type: (Quality Control)



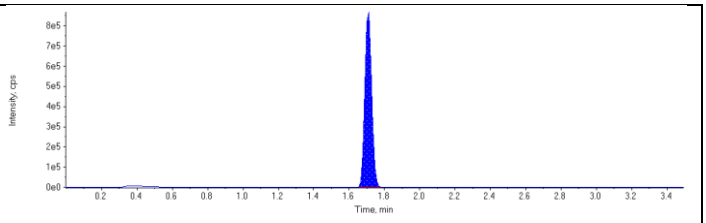
PFHxS 1 (398.900/79.900 Da)

RT (Exp. RT): 1.71 (1.68) min

Calculated Conc: 73.8 µg/L

Area Ratio: 24.3

Sample Type: (Quality Control)



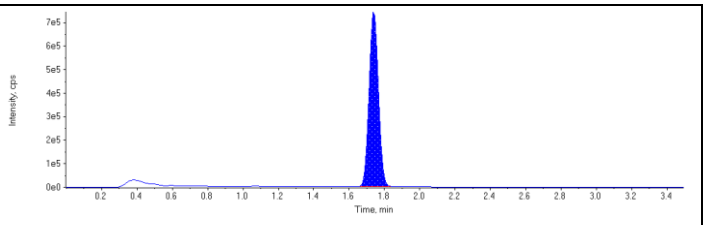
PFHpA 1 (363.000/319.000 Da)

RT (Exp. RT): 1.74 (1.75) min

Calculated Conc: 66.7 µg/L

Area Ratio: 8.98

Sample Type: (Quality Control)



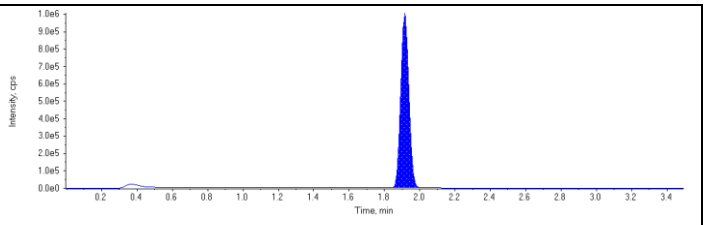
PFOA 1 (413.100/369.000 Da)

RT (Exp. RT): 1.92 (1.92) min

Calculated Conc: 62.3 µg/L

Area Ratio: 10.3

Sample Type: (Quality Control)



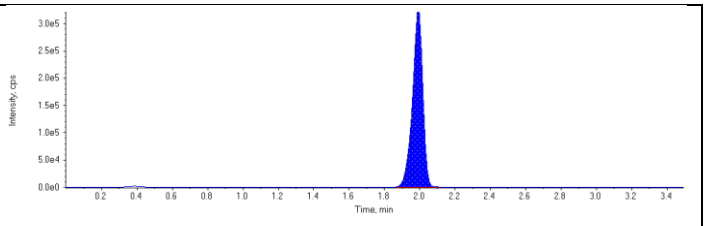
PFOS 1 (498.900/79.900 Da)

RT (Exp. RT): 1.99 (1.97) min

Calculated Conc: 58.0 µg/L

Area Ratio: 10.5

Sample Type: (Quality Control)



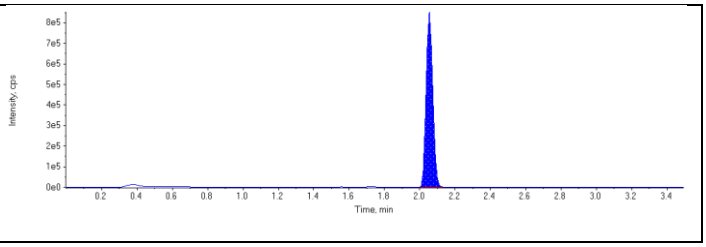
PFNA 1 (462.900/419.000 Da)

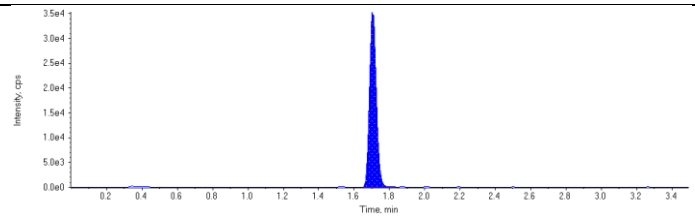
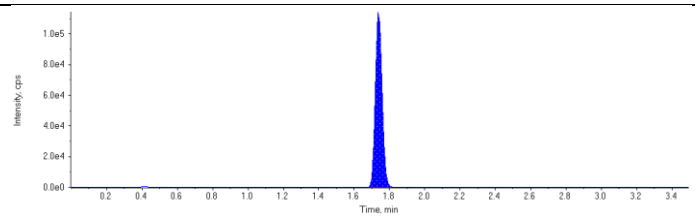
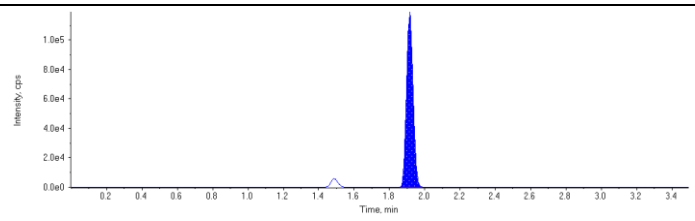
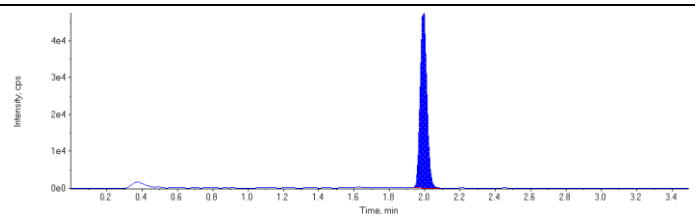
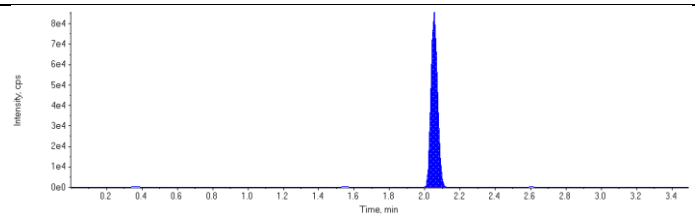
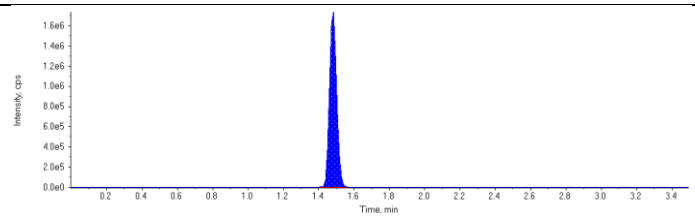
RT (Exp. RT): 2.05 (2.02) min

Calculated Conc: 60.1 µg/L

Area Ratio: 9.98

Sample Type: (Quality Control)



18O2-PFHxS (402.900/84.000 Da) RT (Exp. RT): 1.71 (1.68) min Calculated Conc: 52.6 µg/L Area Ratio: 0.0194 Sample Type: (Quality Control)	
13C4-PFHpA (366.900/322.000 Da) RT (Exp. RT): 1.74 (1.75) min Calculated Conc: 49.7 µg/L Area Ratio: 0.0615 Sample Type: (Quality Control)	
13C4-PFOA (416.900/372.000 Da) RT (Exp. RT): 1.91 (1.88) min Calculated Conc: 57.7 µg/L Area Ratio: 0.0623 Sample Type: (Quality Control)	
13C4-PFOS (502.900/79.900 Da) RT (Exp. RT): 1.99 (1.97) min Calculated Conc: 58.9 µg/L Area Ratio: 0.0255 Sample Type: (Quality Control)	
13C5-PFNA (467.900/423.000 Da) RT (Exp. RT): 2.05 (2.02) min Calculated Conc: 61.2 µg/L Area Ratio: 0.0450 Sample Type: (Quality Control)	
13C6-PFHxA (318.900/274.000 Da) RT (Exp. RT): 1.48 (1.42) min Calculated Conc: 124. µg/L Area Ratio: 0.00 Sample Type: (Quality Control)	

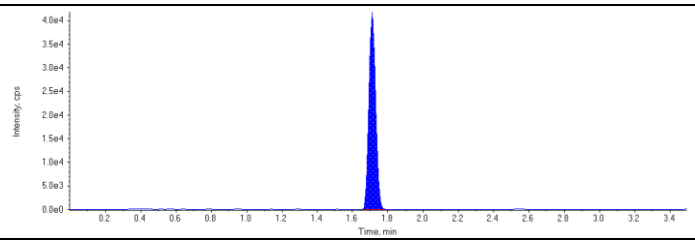
Sample Name	**4386408~MTRX SPK:D1**	**Injection Vial**	11
Sample ID	4386408~MTRX SPK:D1	**Injection Volume (µL)**	3
Sample Type	Quality Control	**Algorithm Used**	Analyst Classic
Acquisition Date	2016/02/19 8:30:58 AM	**Dilution Factor**	1.00
Acquisition Method	PFC_Water_Low.dam	**Sample Annotation**	-
Project	Enviro\PFOS	**Instrument Name**	LCMS03
Data File	PFC_160219\WS#4386408.wiff		
Result Table	PFC_Water_160219_4386408_ULow.rdb		

Internal Standard	Area (cps)	RT (min)	Target Conc. (ng/L)	Calc. Conc. (ng/L)
MPFHxS	110000.	1.71	1.00	-
MPFHpA	331000.	1.74	1.00	-
MPFOA	363000.	1.92	1.00	-
MPFOS	141000.	2.00	1.00	-
MPFNA	263000.	2.06	1.00	-
13C6-PFHxA IS	5140000.	1.49	1.00	-
N/A	N/A	N/A	N/A	-

Target Analyte	Area (cps)	RT (min)	Target Conc. (ng/L)	Calc. Conc. (ng/L)	Accuracy (%)
PFBS 1	2590000	1.17	50.0	76.0	152.0
PFHxS 1	2400000	1.71	50.0	66.4	133.0
PFHpA 1	2790000	1.75	50.0	62.7	125.0
PFOA 1	3420000	1.92	50.0	57.2	114.0
PFOS 1	1400000	1.99	50.0	54.4	109.0
PFNA 1	2270000	2.06	50.0	52.0	104.0
18O2-PFHxS	110000	1.71	100.	58.1	58.1
13C4-PFHpA	331000	1.74	100.	52.1	52.1
13C4-PFOA	363000	1.92	100.	65.5	65.5
13C4-PFOS	141000	2.00	100.	63.7	63.7
13C5-PFNA	263000	2.06	100.	69.5	69.5
13C6-PFHxA	5140000	1.49	100.	129.	129.0

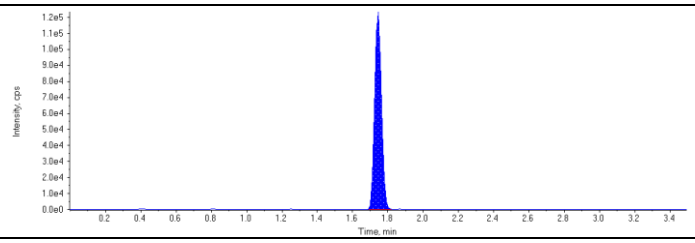
MPFHxS (Internal Standard)

RT (Exp. RT): 1.71(1.68) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



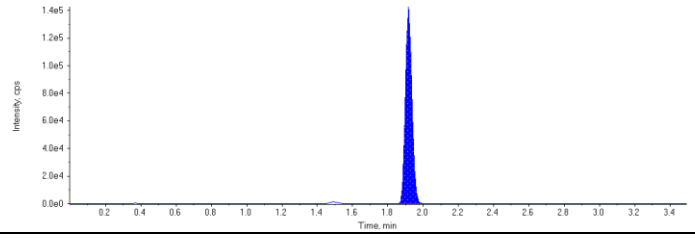
MPFHpA (Internal Standard)

RT (Exp. RT): 1.74(1.75) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



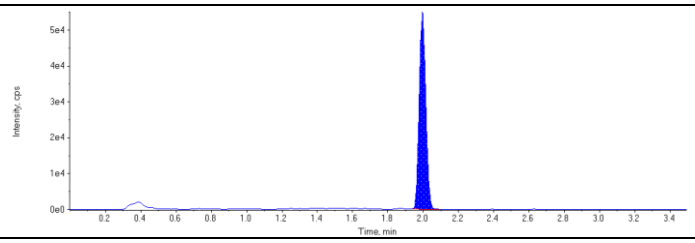
MPFOA (Internal Standard)

RT (Exp. RT): 1.92(1.88) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



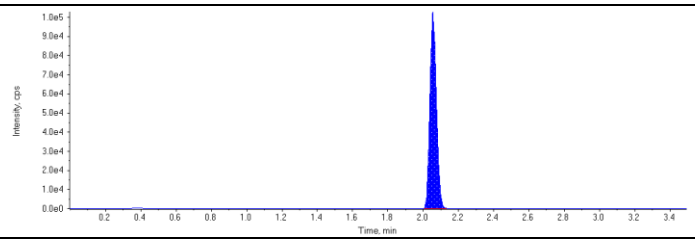
MPFOS (Internal Standard)

RT (Exp. RT): 2.00(1.97) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



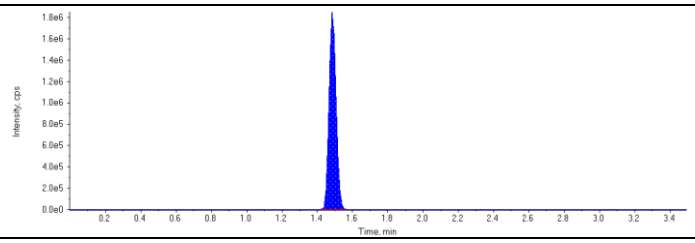
MPFNA (Internal Standard)

RT (Exp. RT): 2.06(2.02) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



13C6-PFHxA IS (Internal Standard)

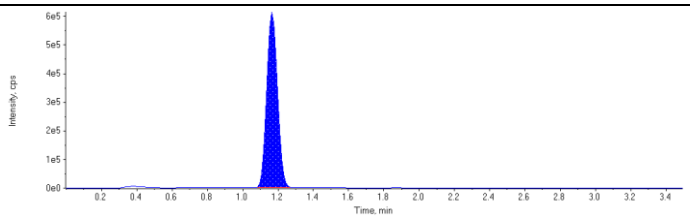
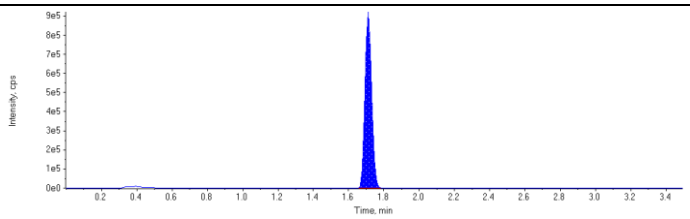
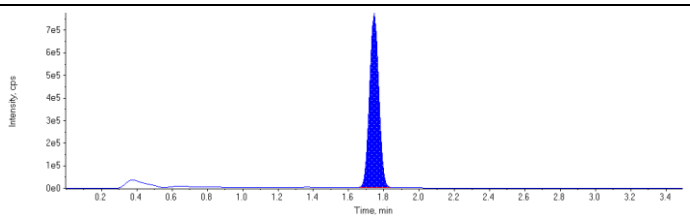
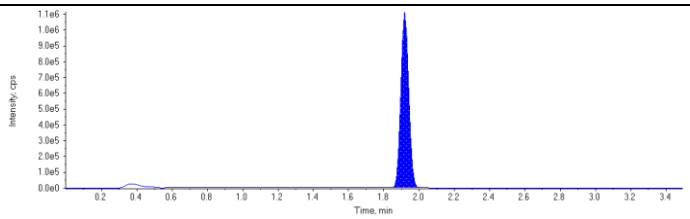
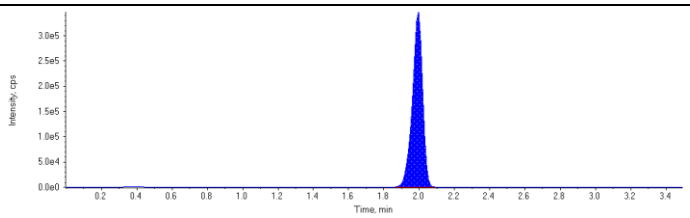
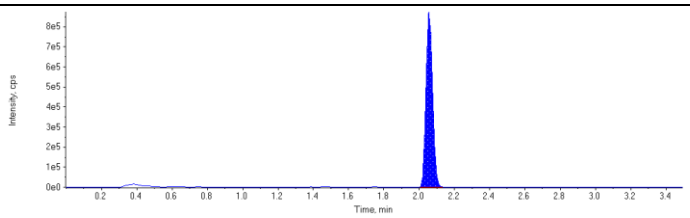
RT (Exp. RT): 1.49(1.42) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)

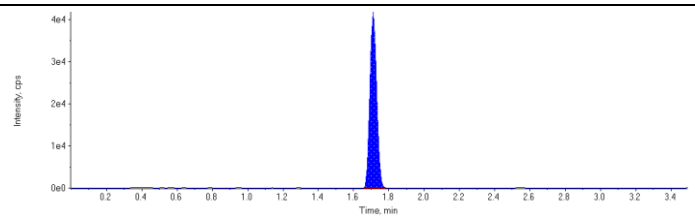
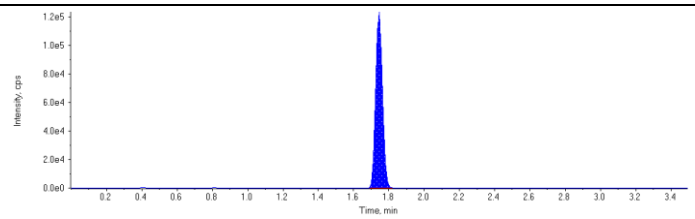
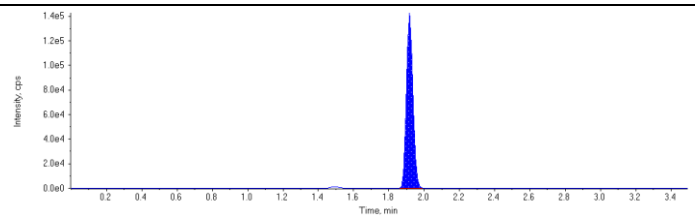
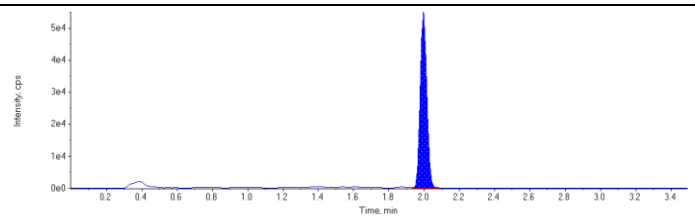
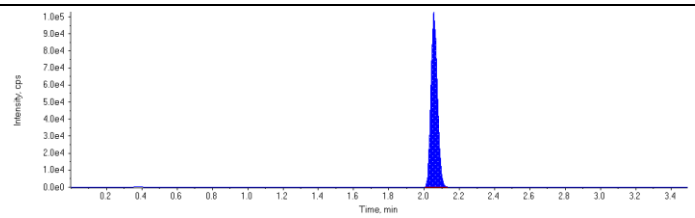
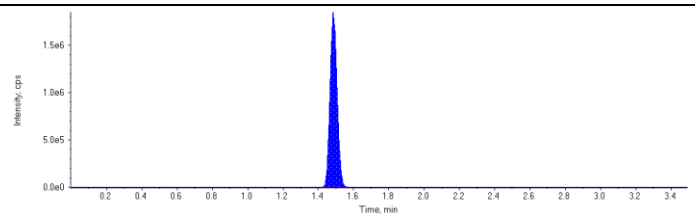


N/A (Internal Standard)

RT (Exp. RT): N/A(N/A) min
Concentration: N/A N/A
Sample Type: (Quality Control)

This image is not available

PFBS 1 (298.900/79.900 Da) RT (Exp. RT): 1.17 (1.15) min Calculated Conc: 76.0 µg/L Area Ratio: 23.6 Sample Type: (Quality Control)	
PFHxS 1 (398.900/79.900 Da) RT (Exp. RT): 1.71 (1.68) min Calculated Conc: 66.4 µg/L Area Ratio: 21.9 Sample Type: (Quality Control)	
PFHpA 1 (363.000/319.000 Da) RT (Exp. RT): 1.75 (1.75) min Calculated Conc: 62.7 µg/L Area Ratio: 8.44 Sample Type: (Quality Control)	
PFOA 1 (413.100/369.000 Da) RT (Exp. RT): 1.92 (1.92) min Calculated Conc: 57.2 µg/L Area Ratio: 9.41 Sample Type: (Quality Control)	
PFOS 1 (498.900/79.900 Da) RT (Exp. RT): 1.99 (1.97) min Calculated Conc: 54.4 µg/L Area Ratio: 9.87 Sample Type: (Quality Control)	
PFNA 1 (462.900/419.000 Da) RT (Exp. RT): 2.06 (2.02) min Calculated Conc: 52.0 µg/L Area Ratio: 8.63 Sample Type: (Quality Control)	

18O2-PFHxS (402.900/84.000 Da) RT (Exp. RT): 1.71 (1.68) min Calculated Conc: 58.1 µg/L Area Ratio: 0.0214 Sample Type: (Quality Control)	
13C4-PFHpA (366.900/322.000 Da) RT (Exp. RT): 1.74 (1.75) min Calculated Conc: 52.1 µg/L Area Ratio: 0.0644 Sample Type: (Quality Control)	
13C4-PFOA (416.900/372.000 Da) RT (Exp. RT): 1.92 (1.88) min Calculated Conc: 65.5 µg/L Area Ratio: 0.0707 Sample Type: (Quality Control)	
13C4-PFOS (502.900/79.900 Da) RT (Exp. RT): 2.00 (1.97) min Calculated Conc: 63.7 µg/L Area Ratio: 0.0275 Sample Type: (Quality Control)	
13C5-PFNA (467.900/423.000 Da) RT (Exp. RT): 2.06 (2.02) min Calculated Conc: 69.5 µg/L Area Ratio: 0.0511 Sample Type: (Quality Control)	
13C6-PFHxA (318.900/274.000 Da) RT (Exp. RT): 1.49 (1.42) min Calculated Conc: 129. µg/L Area Ratio: 0.00 Sample Type: (Quality Control)	

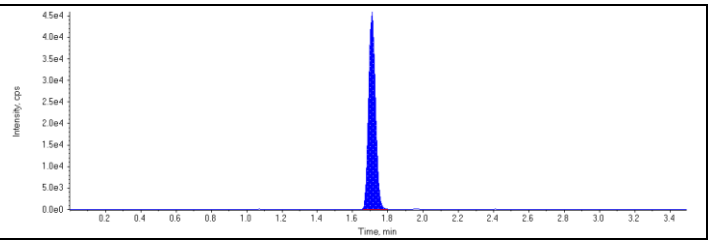
Sample Name	**4386408~SPIKE**	**Injection Vial**	12
Sample ID	4386408~SPIKE	**Injection Volume (µL)**	3
Sample Type	Quality Control	**Algorithm Used**	Analyst Classic
Acquisition Date	2016/02/19 8:36:03 AM	**Dilution Factor**	1.00
Acquisition Method	PFC_Water_Low.dam	**Sample Annotation**	-
Project	Enviro\PFOS	**Instrument Name**	LCMS03
Data File	PFC_160219\WS#4386408.wiff		
Result Table	PFC_Water_160219_4386408_ULow.rdb		

Internal Standard	Area (cps)	RT (min)	Target Conc. (ng/L)	Calc. Conc. (ng/L)
MPFHxS	123000.	1.71	1.00	-
MPFHpA	336000.	1.74	1.00	-
MPFOA	305000.	1.92	1.00	-
MPFOS	135000.	2.00	1.00	-
MPFNA	218000.	2.06	1.00	-
13C6-PFHxA IS	4050000.	1.49	1.00	-
N/A	N/A	N/A	N/A	-

Target Analyte	Area (cps)	RT (min)	Target Conc. (ng/L)	Calc. Conc. (ng/L)	Accuracy (%)
PFBS 1	2040000	1.16	50.0	53.6	107.0
PFHxS 1	2320000	1.71	50.0	57.3	115.0
PFHpA 1	2750000	1.74	50.0	60.7	121.0
PFOA 1	3120000	1.92	50.0	62.2	124.0
PFOS 1	1380000	1.99	50.0	56.2	112.0
PFNA 1	2130000	2.06	50.0	58.9	118.0
18O2-PFHxS	123000	1.71	100.	82.6	82.6
13C4-PFHpA	336000	1.74	100.	67.2	67.2
13C4-PFOA	305000	1.92	100.	69.9	69.9
13C4-PFOS	135000	2.00	100.	77.4	77.4
13C5-PFNA	218000	2.06	100.	73.2	73.2
13C6-PFHxA	4050000	1.49	100.	101.	101.0

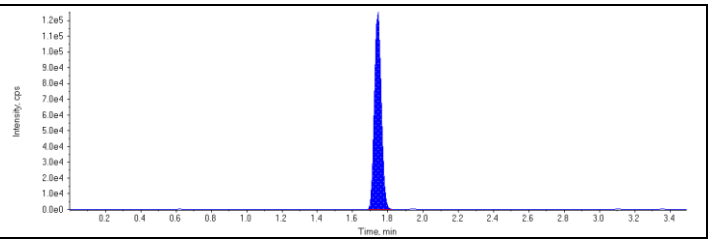
MPFHxS (Internal Standard)

RT (Exp. RT): 1.71(1.68) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



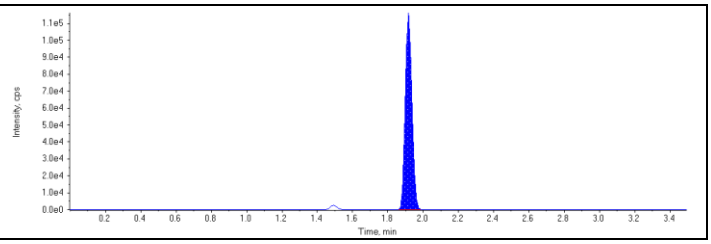
MPFHpA (Internal Standard)

RT (Exp. RT): 1.74(1.75) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



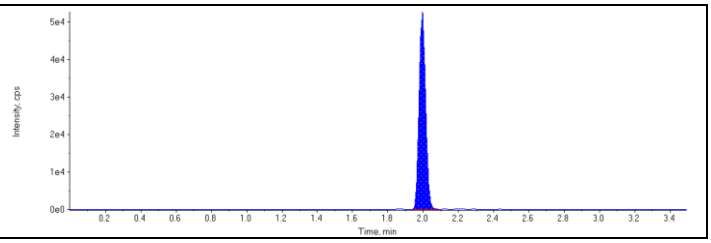
MPFOA (Internal Standard)

RT (Exp. RT): 1.92(1.88) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



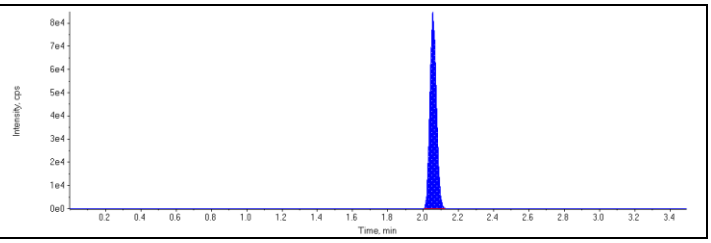
MPFOS (Internal Standard)

RT (Exp. RT): 2.00(1.97) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



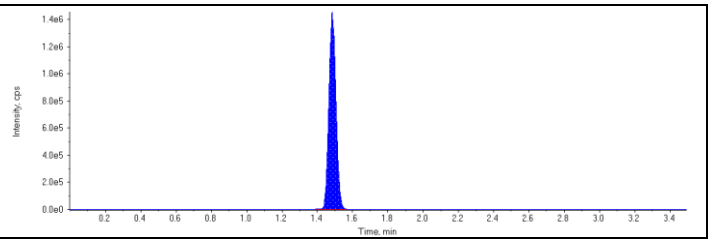
MPFNA (Internal Standard)

RT (Exp. RT): 2.06(2.02) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



13C6-PFHxA IS (Internal Standard)

RT (Exp. RT): 1.49(1.42) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



N/A (Internal Standard)

RT (Exp. RT): N/A(N/A) min
Concentration: N/A N/A
Sample Type: (Quality Control)

This image is not available

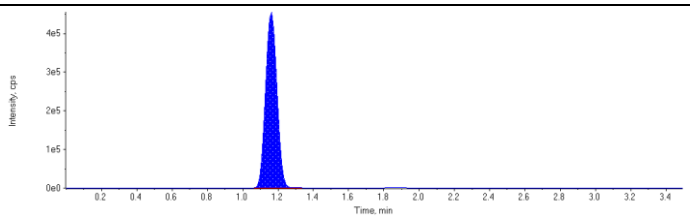
PFBS 1 (298.900/79.900 Da)

RT (Exp. RT): 1.16 (1.15) min

Calculated Conc: 53.6 µg/L

Area Ratio: 16.6

Sample Type: (Quality Control)



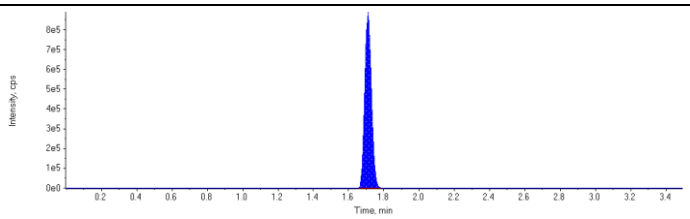
PFHxS 1 (398.900/79.900 Da)

RT (Exp. RT): 1.71 (1.68) min

Calculated Conc: 57.3 µg/L

Area Ratio: 18.9

Sample Type: (Quality Control)



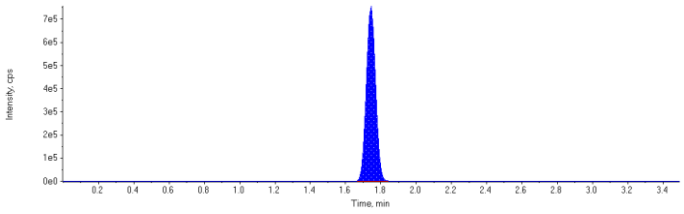
PFHpA 1 (363.000/319.000 Da)

RT (Exp. RT): 1.74 (1.75) min

Calculated Conc: 60.7 µg/L

Area Ratio: 8.17

Sample Type: (Quality Control)



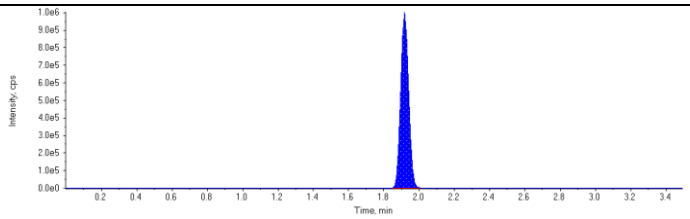
PFOA 1 (413.100/369.000 Da)

RT (Exp. RT): 1.92 (1.92) min

Calculated Conc: 62.2 µg/L

Area Ratio: 10.2

Sample Type: (Quality Control)



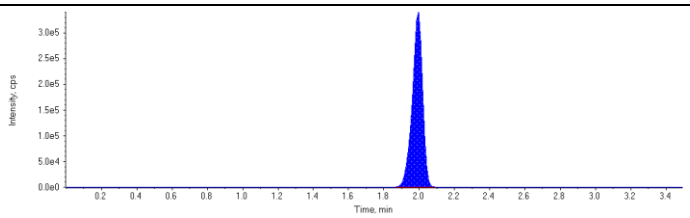
PFOS 1 (498.900/79.900 Da)

RT (Exp. RT): 1.99 (1.97) min

Calculated Conc: 56.2 µg/L

Area Ratio: 10.2

Sample Type: (Quality Control)



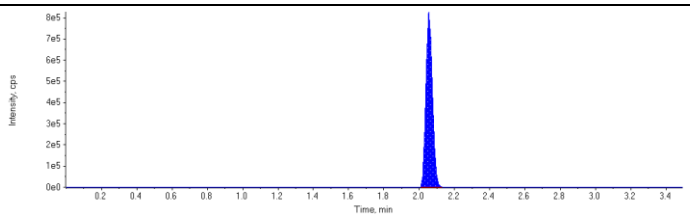
PFNA 1 (462.900/419.000 Da)

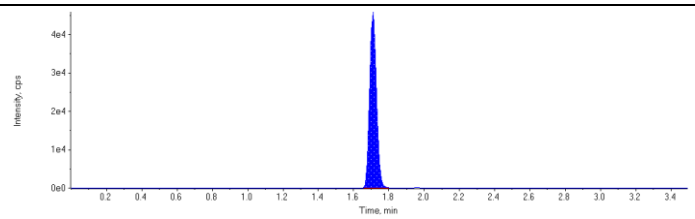
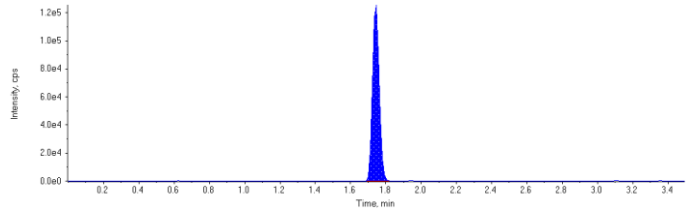
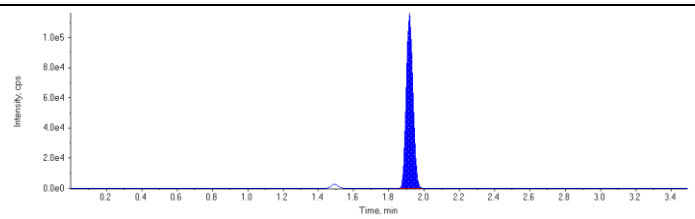
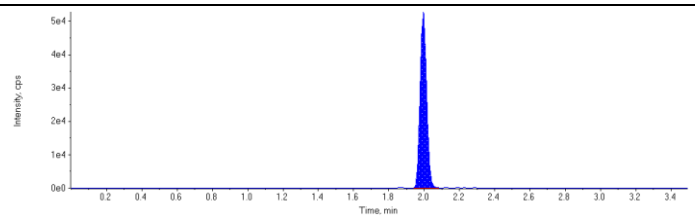
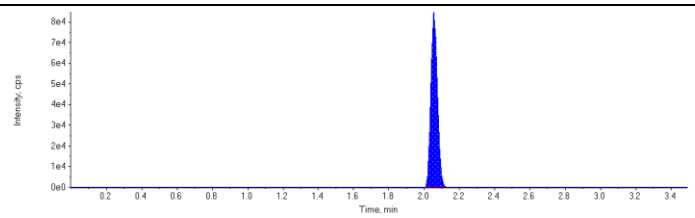
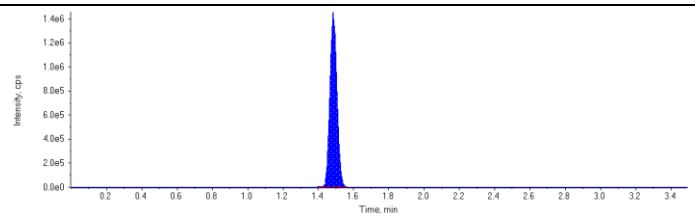
RT (Exp. RT): 2.06 (2.02) min

Calculated Conc: 58.9 µg/L

Area Ratio: 9.79

Sample Type: (Quality Control)



18O2-PFHxS (402.900/84.000 Da) RT (Exp. RT): 1.71 (1.68) min Calculated Conc: 82.6 µg/L Area Ratio: 0.0304 Sample Type: (Quality Control)	
13C4-PFHpA (366.900/322.000 Da) RT (Exp. RT): 1.74 (1.75) min Calculated Conc: 67.2 µg/L Area Ratio: 0.0831 Sample Type: (Quality Control)	
13C4-PFOA (416.900/372.000 Da) RT (Exp. RT): 1.92 (1.88) min Calculated Conc: 69.9 µg/L Area Ratio: 0.0755 Sample Type: (Quality Control)	
13C4-PFOS (502.900/79.900 Da) RT (Exp. RT): 2.00 (1.97) min Calculated Conc: 77.4 µg/L Area Ratio: 0.0335 Sample Type: (Quality Control)	
13C5-PFNA (467.900/423.000 Da) RT (Exp. RT): 2.06 (2.02) min Calculated Conc: 73.2 µg/L Area Ratio: 0.0539 Sample Type: (Quality Control)	
13C6-PFHxA (318.900/274.000 Da) RT (Exp. RT): 1.49 (1.42) min Calculated Conc: 101. µg/L Area Ratio: 0.00 Sample Type: (Quality Control)	

DoD Projects - Internal Data Validation Checklist

Run date: 20160219

Worksheet # (s): 4386408

Analysis: PFOSLOW-W

	Primary review by the analyst - 1st 100 % analysis review	1st 100% review yes	no	n/a	*2nd 100% review
1	Sample analyses meet hold time criteria		✓		✓
2	Analysis set-up meets method criteria	✓			✓
3	Tuning and correct calibration used - criteria meets method criteria	✓			✓
4	SQC/Control Charts updated, analysis in statistical/method control			✓	✓
5	Internal area counts checked (if applicable)	✓			✓
6	LCS, SRM are within acceptance criteria	✓			✓
7	Surrogate Recovery(s) is within acceptance criteria	✓			✓
8	Method Blank meets acceptance criteria	✓			✓
9	Matrix Spike recovery(s) meets acceptance criteria		✓		✓
10	Duplicate precision meets acceptance criteria	✓			✓
11	QC is documented on the run logs	✓			✓
12	Runs checked for carryover	✓			✓
13	Prep log / worksheet(s) are present, signed / dated by a prep / instrument analysts	✓			✓
14	Initial weights, splits, impringer volumes (where applicable) are documented	✓			✓
15	Standards and reagents traceable to Certificates of Analysis	✓			✓
16	Samples above calibration range diluted and reanalyzed	✓			✓
17	Dilution factors (where justified) have been checked for correctness and entered	✓			✓
18	Analytical observations/anomalies documented in LIMS	✓			✓
19	Random calculation checked and in correct units	✓			✓
20	If corrective actions were applied they are documented, initialed & dated			✓	✓
21	Manual integration – before & after data with a reason included, initialed & dated			✓	✓
22	Transferred data is validated in LIMS for correctness	✓			✓
23	Data package assembled (where required)	✓			✓

Reviewed by: CM Date: 20160222

Comments:

	Secondary Supervisor/Qualified Data Review Staff - 2nd 100% verification review	yes	no	n/a
1	Repeats documented and referenced	✓		
2	Method and sample deviations noted, anomalies described (if applicable)	✓		
3	Data and QC validated in LIMS	✓		
4	Random calculation checked	✓		
5	Benchsheet (s) signed and dated	✓		
6	Data Package (if required) checked for completeness	✓		

Reviewed by: AM Date: 2016/02/22

Comments: Samples BVX770, BVX771 and BVX819 were re-naked due to high analyte concentration. The samples will be re-analyzed with an appropriate dilution. AM 2016/02/23

*Note: 2nd 100% verification review documented by secondary qualified data review
Primary and Secondary Internal Data Review Check must be performed by a different person

Worksheet Data Validation Checklist - Extractable Organics

Worksheet # 4386408 | Testcode: PFOS LOW-W

	Sample Preparation	yes	no	n/a
1	Samples extracted within hold time		✓	
2	Client sample ID verified against Lab ID (waters & oils)	✓		
3	Parameter list and Client comments reviewed, (Spiking solutions matched to parameter list)	✓		
4	Height of sediment or if sample was decanted, recorded on worksheet	✓		
5	Method required QC processed with samples, maximum batch size = 20 client samples.	✓		
6	Sample, duplicate, matrix spike appear similar, initial sample as well as final extract	✓		
7	Sample weight or initial volume and extract final volume, aliquot factor clearly recorded.	✓		
8	If performed any additional dilution clearly recorded			✓
9	Matrix spike / Duplicate performed on IOL samples if present			✓
10	Spiking solutions valid (haven't expired), ID and volume used clearly identified on worksheet	✓		
11	Spiking process witnessed and signed off	✓		
12	Extraction type recorded (N3A2B = neutral, 3 x acidic, 2 x basic)	✓ GSZ		✓
13	Sample prep deviations documented within CompliantPro as a Policy Deviation			✓
14	Job Remarks reviewed on 2nd page of worksheet.	✓		
15	Worksheet and reagent tracking record completed and authorized.	✓		

Reviewed by: GSZ | Date: 2016/02/18

Comments:

	Worksheet Approval	yes	no	n/a
1	Verified the position of the vials in autosampler against sequence list; signed off sequence list	✓		
2	Calibration and CCV standards valid (haven't expired)	✓		
3	Initial calibration curve and DFTPP tune (if applicable) acceptable	✓		
4	Continuing and Final CCV and DFTPP tune (if applicable) acceptable	✓		
5	System performance check acceptable (if applicable)	✓		
6	Internal standard responses acceptable	✓		
7	Method blank meets acceptance criteria	✓		
8	Lab Control Samples recoveries meets acceptance criteria	✓		
9	Duplicate RPD meets acceptance criteria	✓		
10	Matrix spike recoveries meets acceptance criteria	✓		
11	Surrogate recoveries meets acceptance criteria	✓		
12	Appropriate control charts updated			✓
13	Samples above calibration range diluted and reanalyzed	✓		
14	Dilutions clearly documented on tracking record, inst file and verified during data upload	✓		
15	Samples following high level samples checked for carryover.	✓		
16	Mass spectra ion ratios acceptable for positive results, hardcopy in file.			✓
17	Analytical observations / anomalies documented	✓		
18	DQW comments entered in LIMS, hardcopy in file			✓
19	Sample Prep section (above) reviewed and verified.	✓		
20	WS Approval performed in LIMS	✓		

Reviewed by: CM | Date: 2016/02/22

Comments:

	Worksheet Validation	yes	no	n/a
1	Calibration, QC and sample results reviewed and determined acceptable	✓		
2	Manual integrations verified			✓
3	Random calculation checked	✓		
4	Data and QC validated in LIMS	✓		
5	Comments reviewed for appropriateness	✓		
6	Reworks / relogs documented in file	✓		
7	Worksheet signed and dated,	✓		
8	Worksheet approved and validated within LIMS	✓		

Reviewed by: AM | Date: 2016/02/22

Comments: Sample BVX819 was sent for re-work due to high analyte concentration. The sample will be re-analyzed with an appropriate dilution.

AM 2016/02/23

WS# : 4386408

Page #: 1/2

RUSH

Report Name : Worksheet - (Liquids and Solids)

Assignment Date : Thursday, February 18, 2016

Assigned to : Geoffrey Sanchez

Test Code : PFOSLOW-W

Instrument Id:

Test Description : Low level PFOS and PFOA in water by LC-MS/MS

Job Number	Sample Number	D	Sample ID	F	% Moisture (Sediment only)	Wt or Vol (mL)	Final Vol (mL)	DF or AF	# Cont	Expiry Date	Test DeadLine	Criteria	Extract Date
	MTRX SPK	0	PFOSL BVX776-01		-0-	125	0.3	1X					2016/02/18
	MTRX SPK	1	PFOSL BVX776-01		-0-	125	0.3	1X					2016/02/18
	SPIKE		PFOSL		-0-	125	0.3	1X					2016/02/18
	BLANK				-0-	125	0.3	1X					2016/02/18
B630791*	*BVX769-01R		OF-FB08-0216		-0-	125	0.3	1X	1	2016/02/18	2016/02/23 17:00		2016/02/18
B630791*	*BVX770-01R		OF-RW08-0216		-0-	125	0.3	1X	1	2016/02/18	2016/02/23 17:00		2016/02/18
B630791*	*BVX771-01R		OF-RW08P-0216		-0-	125	0.3	1X	1	2016/02/18	2016/02/23 17:00		2016/02/18
B630791*	*BVX772-01R		OF-FB41-0216		-0-	125	0.3	1X	1	2016/02/18	2016/02/23 17:00		2016/02/18
B630791*	*BVX773-01R		OF-RW41-0216		-0-	125	0.3	1X	1	2016/02/18	2016/02/23 17:00		2016/02/18
B630791*	*BVX774-01R		OF-RW41P-0216		-0-	125	0.3	1X	1	2016/02/18	2016/02/23 17:00		2016/02/18
B630791*	*BVX775-01R		OF-FB56-0216		-0-	125	0.3	1X	1	2016/02/18	2016/02/23 17:00		2016/02/18
B630791*	*BVX776-01R		OF-RW56-0216		-0-	125	0.3	1X	3	2016/02/18	2016/02/23 17:00		2016/02/18
B630791*	*BVX779-01R		OF-FB51-0216		-0-	125	0.3	1X	1	2016/02/18	2016/02/23 17:00		2016/02/18
B630791*	*BVX780-01R		OF-RW51-0216		-0-	125	0.3	1X	1	2016/02/18	2016/02/23 17:00		2016/02/18
B630791*	*BVX781-01R		OF-RW51P-0216		-0-	125	0.3	1X	1	2016/02/18	2016/02/23 17:00		2016/02/18
B630797*	*BVX826-01R		OF-RW09-0216		<0.1	125	0.3	1X	1	2016/02/17	2016/02/23 17:00		2016/02/18
B630797*	*BVX827-01R		OF-RW37-0216		-0-	125	0.3	1X	1	2016/02/17	2016/02/23 17:00		2016/02/18
B630797*	*BVX828-01R		OF-RW11-0216		<0.1	125	0.3	1X	1	2016/02/17	2016/02/23 17:00		2016/02/18
B630797*	*BVX829-01R		OF-RW28-0216		-0-	125	0.3	1X	1	2016/02/17	2016/02/23 17:00		2016/02/18
B630797*	*BVX830-01R		OF-RW67-0216		-0-	125	0.3	1X	1	2016/02/17	2016/02/23 17:00		2016/02/18
B630796	BVX814				<0.1	12.5	0.3	1X					
B630796	BVX817				<0.1	12.5	0.3	1X					
B630796	BVX818				<0.2	6.25	0.3	1X					
B630796	BVX819				<0.1	12.5	0.3	1X					
						GSZ, 2016/02/18							

Remarks: Job B630797 - extracted past the holding time (resulted from discrepancy between dates in TAT & summary; see attached email).
Job B630796 - rework; upfront dilution needed; lower volume used.

Samples extracted by: Geoffrey Sanchez, GSZ 2016/02/18

Instrumentation performed by: CM Date: 2016/02/19

Calculations performed by: CM Date: 2016/02/22

Validated by: AM Date: 2016/02/23

-682, 2016/02/18

Job No.	Rep / Client Name / Remarks	Contact	Client Tier	National
GB630791	MDG TestAmerica NREG PFOSLOW-W MS/MSD required on BVX776 Level IV required Project #: 320-17185	PFC Reporting Group	Tier 1 (Air.)	Test America
GB630797	MDG TestAmerica NREG PFOSLOW-W Level IV required Project #: 320-17154	PFC Reporting Group	Tier 1 (Air.)	Test America

Surrogates/Spikes		PFC Spk C	PFC Spk A	PFC Spk A (2nd Source)	IS	Method Spike	Spikes	Samples
Calib	MeOH	~~6725-6104~~ 5K-6220	I-4675	I-4676	SI-6010			
STD	ml	ml	ml	ml	ml			
1 - 2825	+	25			+ 150			
2 - 2800	+	50			+ 150			
3 - 2700	+	150			+ 150			
4 - 2813	+		37.5		+ 150			
5 - 2775	+		75		+ 150			
6 - 2725	+		125		+ 150			
ICV - 2788	+			62.5	+ 150			

Sample	Preparation Remarks

Sample	Instrumentation Remarks

Worksheet Number: **4386408**

Low level PFOS and PFOA in water - Water

ng/L

Parameter Name	Units	MTRX SPK	DL	MTRX SPK Dup1	DL	SPIKE	DL
Perfluorobutanoic acid	ng/L	N/A*******		N/A*******		N/A*******	
Perfluorobutane Sulfonate (PFBS)	ng/L	II 156.786	2	II 150.386	2	107.20000	2
Perfluorodecane Sulfonate	ng/L	N/A*******		N/A*******		N/A*******	
Perfluoroheptanoic Acid (PFHpA)	ng/L	II 133.020	2	125.02000	2	121.40000	2
Perfluoroheptane sulfonate	ng/L	N/A*******		N/A*******		N/A*******	
Perfluorohexanoic Acid (PFHxA)	ng/L	N/A*******		N/A*******		N/A*******	
Perfluorohexane Sulfonate (PFHxS)	ng/L	II 147.600	2	II 132.800	2	114.60000	2
Perfluorononanoic Acid (PFNA)	ng/L	120.20000	2	104.00000	2	117.80000	2
Perfluoropentanoic Acid (PFPeA)	ng/L	N/A*******		N/A*******		N/A*******	
Perfluorotetradecanoic Acid	ng/L	N/A*******		N/A*******		N/A*******	
Perfluorotridecanoic Acid	ng/L	N/A*******		N/A*******		N/A*******	
Perfluoroundecanoic Acid (PFUnA)	ng/L	N/A*******		N/A*******		N/A*******	
Perfluorodecanoic Acid (PFDA)	ng/L	N/A*******		N/A*******		N/A*******	
Perfluorododecanoic Acid (PFDoA)	ng/L	N/A*******		N/A*******		N/A*******	
Perfluoro-n-Octanoic Acid (PFOA)	ng/L	124.60000	2	114.40000	2	124.40000	2
Perfluorooctane Sulfonate (PFOS)	ng/L	116.00000	2	108.80000	2	112.40000	2
13C2-perfluorotetradecanoic acid	ng/L	N/A*******		N/A*******		N/A*******	
13C4-Perfluorobutanoic acid	ng/L	N/A*******		N/A*******		N/A*******	
13C5-Perfluorononanoic acid	ng/L	61.2		69.5		73.2	
13C2-Perfluorodecanoic acid	ng/L	N/A*******		N/A*******		N/A*******	
13C2-Perfluorododecanoic acid	ng/L	N/A*******		N/A*******		N/A*******	
13C2-Perfluorohexanoic acid	ng/L	N/A*******		N/A*******		N/A*******	
13C2-Perfluoroundecanoic acid	ng/L	N/A*******		N/A*******		N/A*******	
13C4-Perfluoroheptanoic acid	ng/L	49.7		52.1		67.2	
13C4-Perfluorooctanoic acid	ng/L	57.7		65.5		69.9	
13C4-Perfluorooctanesulfonate	ng/L	58.9		63.7		77.4	
13C5-Perfluoropentanoic acid	ng/L	N/A*******		N/A*******		N/A*******	
18O2-Perfluorohexanesulfonate	ng/L	52.6		58.1		82.6	

Parameter Name	BLANK	DL	B630791 BVX769	DL	B630791 BVX770	DL	B630791 BVX771
Perfluorobutanoic acid	N/A*******		N/A*******	2	N/A*******	2	N/A*******
Perfluorobutane Sulfonate (PFBS)	0	2	0	2	5.03000	2	5.24000
Perfluorodecane Sulfonate	N/A*******		N/A*******	2	N/A*******	2	N/A*******
Perfluoroheptanoic Acid (PFHpA)	0	2	0	2	2.88000	2	2.95000
Perfluoroheptane sulfonate	N/A*******			2		2	
Perfluorohexanoic Acid (PFHxA)	N/A*******		N/A*******	2	N/A*******	2	N/A*******
Perfluorohexane Sulfonate (PFHxS)	0	2	0	2	53.30000	2	59.70000
Perfluorononanoic Acid (PFNA)	0	2	0	2	0.42900	2	0.39200
Perfluoropentanoic Acid (PFPeA)	N/A*******		N/A*******	2	N/A*******	2	N/A*******
Perfluorotetradecanoic Acid	N/A*******		N/A*******	2	N/A*******	2	N/A*******
Perfluorotridecanoic Acid	N/A*******		N/A*******	2	N/A*******	2	N/A*******
Perfluoroundecanoic Acid (PFUnA)	N/A*******		N/A*******	2	N/A*******	2	N/A*******
Perfluorodecanoic Acid (PFDA)	N/A*******		N/A*******	2	N/A*******	2	N/A*******
Perfluorododecanoic Acid (PFDoA)	N/A*******		N/A*******	2	N/A*******	2	N/A*******
Perfluoro-n-Octanoic Acid (PFOA)	0	2	0	2	13.20000	2	13.90000
Perfluorooctane Sulfonate (PFOS)	0	2	0	2	223.00000	2	225.00000
13C2-perfluorotetradecanoic acid	N/A*******		N/A*******		N/A*******		N/A*******
13C4-Perfluorobutanoic acid	N/A*******		N/A*******		N/A*******		N/A*******
13C5-Perfluorononanoic acid	75.7		86.2		83.1		80.3
13C2-Perfluorodecanoic acid	N/A*******		N/A*******		N/A*******		N/A*******
13C2-Perfluorododecanoic acid	N/A*******		N/A*******		N/A*******		N/A*******
13C2-Perfluorohexanoic acid	N/A*******		N/A*******		N/A*******		N/A*******
13C2-Perfluoroundecanoic acid	N/A*******		N/A*******		N/A*******		N/A*******
13C4-Perfluoroheptanoic acid	73.9		71.9		62.5		60.5
13C4-Perfluorooctanoic acid	73.9		79.1		69.6		67.8
13C4-Perfluorooctanesulfonate	82.4		89.8		87.8		82.8
13C5-Perfluoropentanoic acid	N/A*******		N/A*******		N/A*******		N/A*******
18O2-Perfluorohexanesulfonate	86.2		79.4		87.0		78.1

Low level PFOS and PFOA in water - Water
ng/L

Parameter Name	DL	B630791 BVX772	DL	B630791 BVX773	DL	B630791 BVX774	DL
Perfluorobutanoic acid	2	N/A*******	2	N/A*******	2	N/A*******	2
Perfluorobutane Sulfonate (PFBS)	2	0	2	0	2	0.67400	2
Perfluorodecane Sulfonate	2	N/A*******	2	N/A*******	2	N/A*******	2
Perfluoroheptanoic Acid (PFHpA)	2	0	2	0	2	0	2
Perfluoroheptane sulfonate	2		2		2		2
Perfluorohexanoic Acid (PFHxA)	2	N/A*******	2	N/A*******	2	N/A*******	2
Perfluorohexane Sulfonate (PFHxS)	2	0	2	0.68700	2	0.68700	2
Perfluorononanoic Acid (PFNA)	2	0	2	0	2	0	2
Perfluoropentanoic Acid (PFPeA)	2	N/A*******	2	N/A*******	2	N/A*******	2
Perfluorotetradecanoic Acid	2	N/A*******	2	N/A*******	2	N/A*******	2
Perfluorotridecanoic Acid	2	N/A*******	2	N/A*******	2	N/A*******	2
Perfluoroundecanoic Acid (PFUnA)	2	N/A*******	2	N/A*******	2	N/A*******	2
Perfluorodecanoic Acid (PFDA)	2	N/A*******	2	N/A*******	2	N/A*******	2
Perfluorododecanoic Acid (PFDoA)	2	N/A*******	2	N/A*******	2	N/A*******	2
Perfluoro-n-Octanoic Acid (PFOA)	2	0	2	0.29800	2	0	2
Perfluorooctane Sulfonate (PFOS)	2	0	2	0	2	0	2
13C2-perfluorotetradecanoic acid		N/A*******		N/A*******		N/A*******	
13C4-Perfluorobutanoic acid		N/A*******		N/A*******		N/A*******	
13C5-Perfluorononanoic acid		77.7		66.0		63.5	
13C2-Perfluorodecanoic acid		N/A*******		N/A*******		N/A*******	
13C2-Perfluorododecanoic acid		N/A*******		N/A*******		N/A*******	
13C2-Perfluorohexanoic acid		N/A*******		N/A*******		N/A*******	
13C2-Perfluoroundecanoic acid		N/A*******		N/A*******		N/A*******	
13C4-Perfluoroheptanoic acid		64.8		59.4		54.9	
13C4-Perfluorooctanoic acid		67.5		64.8		60.0	
13C4-Perfluorooctanesulfonate		77.6		67.7		61.0	
13C5-Perfluoropentanoic acid		N/A*******		N/A*******		N/A*******	
18O2-Perfluorohexanesulfonate		72.2		62.2		62.2	

Parameter Name	B630791 BVX775	DL	B630791 BVX776	DL	B630791 BVX779	DL	B630791 BVX780
Perfluorobutanoic acid	N/A*******	2	N/A*******	2	N/A*******	2	N/A*******
Perfluorobutane Sulfonate (PFBS)	0	2	0.80700	2	0.63000	2	0
Perfluorodecane Sulfonate	N/A*******	2	N/A*******	2	N/A*******	2	N/A*******
Perfluoroheptanoic Acid (PFHpA)	0	2	0.19000	2	0	2	6.61000
Perfluoroheptane sulfonate		2		2		2	
Perfluorohexanoic Acid (PFHxA)	N/A*******	2	N/A*******	2	N/A*******	2	N/A*******
Perfluorohexane Sulfonate (PFHxS)	0	2	0	2	0	2	0
Perfluorononanoic Acid (PFNA)	0	2	0	2	0	2	0
Perfluoropentanoic Acid (PFPeA)	N/A*******	2	N/A*******	2	N/A*******	2	N/A*******
Perfluorotetradecanoic Acid	N/A*******	2	N/A*******	2	N/A*******	2	N/A*******
Perfluorotridecanoic Acid	N/A*******	2	N/A*******	2	N/A*******	2	N/A*******
Perfluoroundecanoic Acid (PFUnA)	N/A*******	2	N/A*******	2	N/A*******	2	N/A*******
Perfluorodecanoic Acid (PFDA)	N/A*******	2	N/A*******	2	N/A*******	2	N/A*******
Perfluorododecanoic Acid (PFDoA)	N/A*******	2	N/A*******	2	N/A*******	2	N/A*******
Perfluoro-n-Octanoic Acid (PFOA)	0	2	0	2	0	2	0.30000
Perfluorooctane Sulfonate (PFOS)	0	2	0	2	0	2	0
13C2-perfluorotetradecanoic acid	N/A*******		N/A*******		N/A*******		N/A*******
13C4-Perfluorobutanoic acid	N/A*******		N/A*******		N/A*******		N/A*******
13C5-Perfluorononanoic acid	62.9		74.4		88.7		62.6
13C2-Perfluorodecanoic acid	N/A*******		N/A*******		N/A*******		N/A*******
13C2-Perfluorododecanoic acid	N/A*******		N/A*******		N/A*******		N/A*******
13C2-Perfluorohexanoic acid	N/A*******		N/A*******		N/A*******		N/A*******
13C2-Perfluoroundecanoic acid	N/A*******		N/A*******		N/A*******		N/A*******
13C4-Perfluoroheptanoic acid	53.0		59.7		75.7		50.5
13C4-Perfluorooctanoic acid	61.3		66.0		81.1		56.6
13C4-Perfluorooctanesulfonate	58.7		66.2		87.1		63.7
13C5-Perfluoropentanoic acid	N/A*******		N/A*******		N/A*******		N/A*******
18O2-Perfluorohexanesulfonate	61.5		69.7		77.4		65.2

Worksheet Number: **4386408**

Low level PFOS and PFOA in water - Water

ng/L

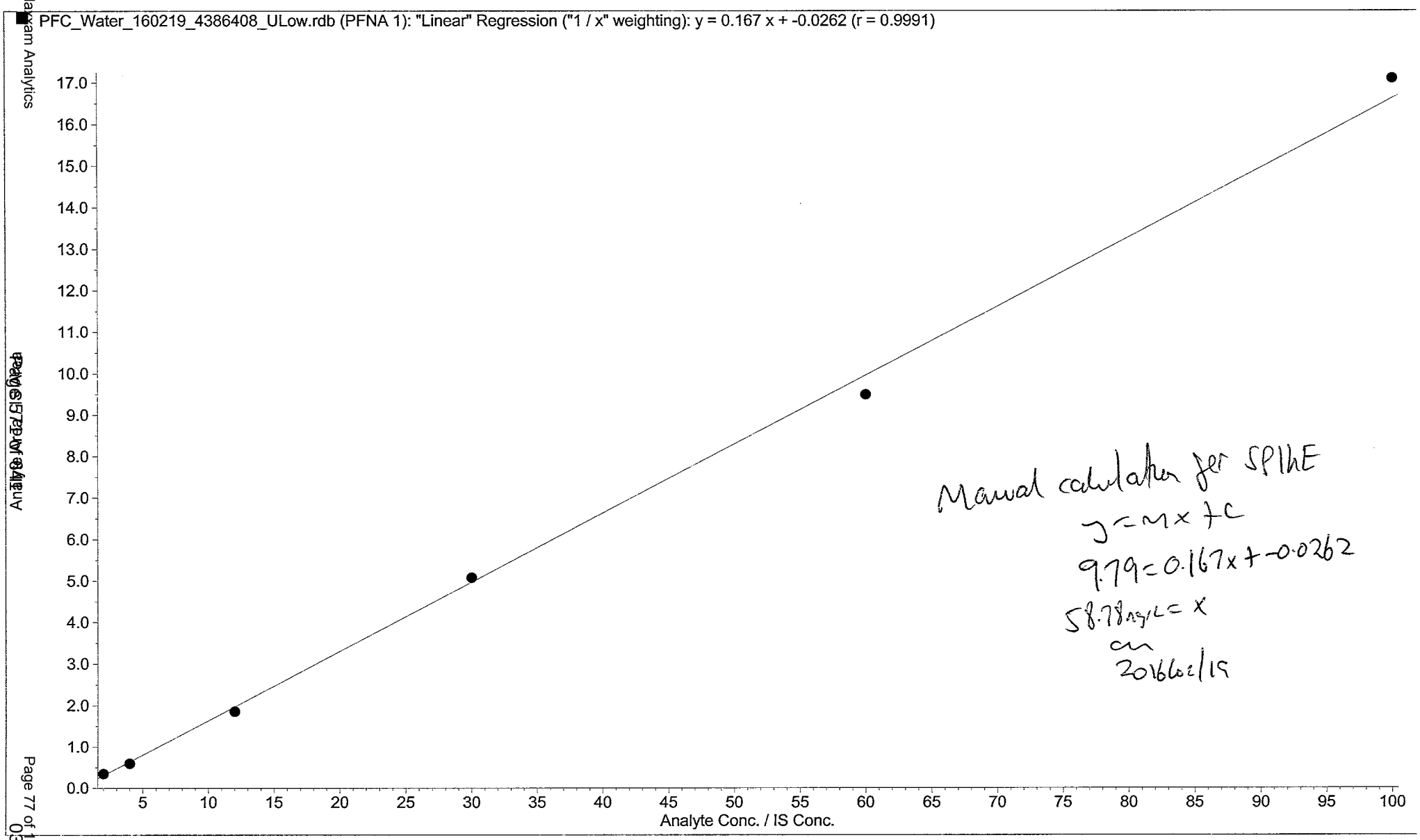
Parameter Name	DL	B630791 BVX781	DL	B630796 BVX814 ReWork	DL	B630796 BVX817 ReWork	DL
Perfluorobutanoic acid	2	N/A*******	2	N/A*******	20	N/A*******	20
Perfluorobutane Sulfonate (PFBS)	2	0	2	9.58000	20	8.19000	20
Perfluorodecane Sulfonate	2	N/A*******	2	N/A*******	20	N/A*******	20
Perfluoroheptanoic Acid (PFHpA)	2	4.19000	2	17.70000	20	16.90000	20
Perfluoroheptane sulfonate	2		2	N/A*******	20	N/A*******	20
Perfluorohexanoic Acid (PFHxA)	2	N/A*******	2	N/A*******	20	N/A*******	20
Perfluorohexane Sulfonate (PFHxS)	2	0	2	7.66000	20	7.48000	20
Perfluorononanoic Acid (PFNA)	2	0	2	3.74000	20	3.88000	20
Perfluoropentanoic Acid (PFPeA)	2	N/A*******	2	N/A*******	20	N/A*******	20
Perfluorotetradecanoic Acid	2	N/A*******	2	N/A*******	20	N/A*******	20
Perfluorotridecanoic Acid	2	N/A*******	2	N/A*******	20	N/A*******	20
Perfluoroundecanoic Acid (PFUnA)	2	N/A*******	2	N/A*******	20	N/A*******	20
Perfluorodecanoic Acid (PFDA)	2	N/A*******	2	N/A*******	20	N/A*******	20
Perfluorododecanoic Acid (PFDoA)	2	N/A*******	2	N/A*******	20	N/A*******	20
Perfluoro-n-Octanoic Acid (PFOA)	2	0	2	493.00000	20	501.00000	20
Perfluorooctane Sulfonate (PFOS)	2	0	2	6.13000	20	5.90000	20
13C2-perfluorotetradecanoic acid		N/A*******		N/A*******		N/A*******	
13C4-Perfluorobutanoic acid		N/A*******		N/A*******		N/A*******	
13C5-Perfluorononanoic acid		61.6		68.7		75.3	
13C2-Perfluorodecanoic acid		N/A*******		N/A*******		N/A*******	
13C2-Perfluorododecanoic acid		N/A*******		N/A*******		N/A*******	
13C2-Perfluorohexanoic acid		N/A*******		N/A*******		N/A*******	
13C2-Perfluoroundecanoic acid		N/A*******		N/A*******		N/A*******	
13C4-Perfluoroheptanoic acid		53.4		58.9		69.6	
13C4-Perfluorooctanoic acid		57.3		64.0		72.1	
13C4-Perfluorooctanesulfonate		59.1		69.1		77.5	
13C5-Perfluoropentanoic acid		N/A*******		N/A*******		N/A*******	
18O2-Perfluorohexanesulfonate		61.7		66.0		84.1	

Parameter Name	B630796 BVX818 ReWork	DL	B630796 BVX819 ReWork	DL	B630797 BVX826	DL	B630797 BVX827
Perfluorobutanoic acid	N/A*******	40	N/A*******	20	N/A*******	2	N/A*******
Perfluorobutane Sulfonate (PFBS)	N/A*******	40	8.62000	20	0	2	0.79200
Perfluorodecane Sulfonate	N/A*******	40	N/A*******	20	N/A*******	2	N/A*******
Perfluoroheptanoic Acid (PFHpA)	N/A*******	40	33.30000	20	0	2	0.45500
Perfluoroheptane sulfonate	N/A*******	40	N/A*******	20	N/A*******	2	N/A*******
Perfluorohexanoic Acid (PFHxA)	N/A*******	40	N/A*******	20	N/A*******	2	N/A*******
Perfluorohexane Sulfonate (PFHxS)	N/A*******	40	7.77000	20	0.71300	2	3.26000
Perfluorononanoic Acid (PFNA)	N/A*******	40	5.80000	20	0	2	0
Perfluoropentanoic Acid (PFPeA)	N/A*******	40	N/A*******	20	N/A*******	2	N/A*******
Perfluorotetradecanoic Acid	N/A*******	40	N/A*******	20	N/A*******	2	N/A*******
Perfluorotridecanoic Acid	N/A*******	40	N/A*******	20	N/A*******	2	N/A*******
Perfluoroundecanoic Acid (PFUnA)	N/A*******	40	N/A*******	20	N/A*******	2	N/A*******
Perfluorodecanoic Acid (PFDA)	N/A*******	40	N/A*******	20	N/A*******	2	N/A*******
Perfluorododecanoic Acid (PFDoA)	N/A*******	40	N/A*******	20	N/A*******	2	N/A*******
Perfluoro-n-Octanoic Acid (PFOA)	1870	40	1100.00000	20	0.41200	2	7.15000
Perfluorooctane Sulfonate (PFOS)	N/A*******	40	8.57000	20	0.32000	2	0.81200
13C2-perfluorotetradecanoic acid	N/A*******		N/A*******		N/A*******		N/A*******
13C4-Perfluorobutanoic acid	N/A*******		N/A*******		N/A*******		N/A*******
13C5-Perfluorononanoic acid	N/A*******		62.7		61.7		65.0
13C2-Perfluorodecanoic acid	N/A*******		N/A*******		N/A*******		N/A*******
13C2-Perfluorododecanoic acid	N/A*******		N/A*******		N/A*******		N/A*******
13C2-Perfluorohexanoic acid	N/A*******		N/A*******		N/A*******		N/A*******
13C2-Perfluoroundecanoic acid	N/A*******		N/A*******		N/A*******		N/A*******
13C4-Perfluoroheptanoic acid	N/A*******		!! 43.1		53.8		51.9
13C4-Perfluorooctanoic acid	77.6		53.3		58.1		56.6
13C4-Perfluorooctanesulfonate	N/A*******		79.5		59.3		63.9
13C5-Perfluoropentanoic acid	N/A*******		N/A*******		N/A*******		N/A*******
18O2-Perfluorohexanesulfonate	N/A*******		74.5		69.2		64.4

Low level PFOS and PFOA in water - Water
ng/L

Parameter Name	DL	B630797 BVX828	DL	B630797 BVX829	DL	B630797 BVX830	DL
Perfluorobutanoic acid	2	N/A*******	2	N/A*******	2	N/A*******	2
Perfluorobutane Sulfonate (PFBS)	2	0	2	0	2	0.96600	2
Perfluorodecane Sulfonate	2	N/A*******	2	N/A*******	2	N/A*******	2
Perfluoroheptanoic Acid (PFHpA)	2	0	2	0	2	0	2
Perfluoroheptane sulfonate	2	N/A*******	2	N/A*******	2	N/A*******	2
Perfluorohexanoic Acid (PFHxA)	2	N/A*******	2	N/A*******	2	N/A*******	2
Perfluorohexane Sulfonate (PFHxS)	2	0.75200	2	0.75300	2	0	2
Perfluorononanoic Acid (PFNA)	2	0	2	0.36600	2	0	2
Perfluoropentanoic Acid (PFPeA)	2	N/A*******	2	N/A*******	2	N/A*******	2
Perfluorotetradecanoic Acid	2	N/A*******	2	N/A*******	2	N/A*******	2
Perfluorotridecanoic Acid	2	N/A*******	2	N/A*******	2	N/A*******	2
Perfluoroundecanoic Acid (PFUnA)	2	N/A*******	2	N/A*******	2	N/A*******	2
Perfluorodecanoic Acid (PFDA)	2	N/A*******	2	N/A*******	2	N/A*******	2
Perfluorododecanoic Acid (PFDoA)	2	N/A*******	2	N/A*******	2	N/A*******	2
Perfluoro-n-Octanoic Acid (PFOA)	2	0	2	0	2	0	2
Perfluorooctane Sulfonate (PFOS)	2	0.87100	2	0	2	0	2
13C2-perfluorotetradecanoic acid		N/A*******		N/A*******		N/A*******	
13C4-Perfluorobutanoic acid		N/A*******		N/A*******		N/A*******	
13C5-Perfluorononanoic acid		60.5		56.7		54.5	
13C2-Perfluorodecanoic acid		N/A*******		N/A*******		N/A*******	
13C2-Perfluorododecanoic acid		N/A*******		N/A*******		N/A*******	
13C2-Perfluorohexanoic acid		N/A*******		N/A*******		N/A*******	
13C2-Perfluoroundecanoic acid		N/A*******		N/A*******		N/A*******	
13C4-Perfluoroheptanoic acid		55.3		53.6		II 47.6	
13C4-Perfluorooctanoic acid		59.2		54.2		50.8	
13C4-Perfluorooctanesulfonate		53.9		59.2		50.8	
13C5-Perfluoropentanoic acid		N/A*******		N/A*******		N/A*******	
18O2-Perfluorohexanesulfonate		59.8		50.3		55.9	

Parameter Name	RDL	MDL	IDL
Perfluorobutanoic acid	2	0.41	0
Perfluorobutane Sulfonate (PFBS)	2	0.27	0
Perfluorodecane Sulfonate	2	0.38	0
Perfluoroheptanoic Acid (PFHpA)	2	0.39	0
Perfluoroheptane sulfonate	2	0.4	0
Perfluorohexanoic Acid (PFHxA)	2	0.42	0
Perfluorohexane Sulfonate (PFHxS)	2	0.4	0
Perfluorononanoic Acid (PFNA)	2	0.33	0
Perfluoropentanoic Acid (PFPeA)	2	0.46	0
Perfluorotetradecanoic Acid	2	0.61	0
Perfluorotridecanoic Acid	2	0.6	0
Perfluoroundecanoic Acid (PFUnA)	2	0.5	0
Perfluorodecanoic Acid (PFDA)	2	0.24	0
Perfluorododecanoic Acid (PFDoA)	2	0.63	0
Perfluoro-n-Octanoic Acid (PFOA)	2	0.39	0
Perfluorooctane Sulfonate (PFOS)	2	0.3	0
13C2-perfluorotetradecanoic acid			
13C4-Perfluorobutanoic acid			
13C5-Perfluorononanoic acid			
13C2-Perfluorodecanoic acid			
13C2-Perfluorododecanoic acid			
13C2-Perfluorohexanoic acid			
13C2-Perfluoroundecanoic acid			
13C4-Perfluoroheptanoic acid			
13C4-Perfluorooctanoic acid			
13C4-Perfluorooctanesulfonate			
13C5-Perfluoropentanoic acid			
18O2-Perfluorohexanesulfonate			



Manual calculation for SPIKE

$y = mx + c$

$9.79 = 0.167x + -0.0262$

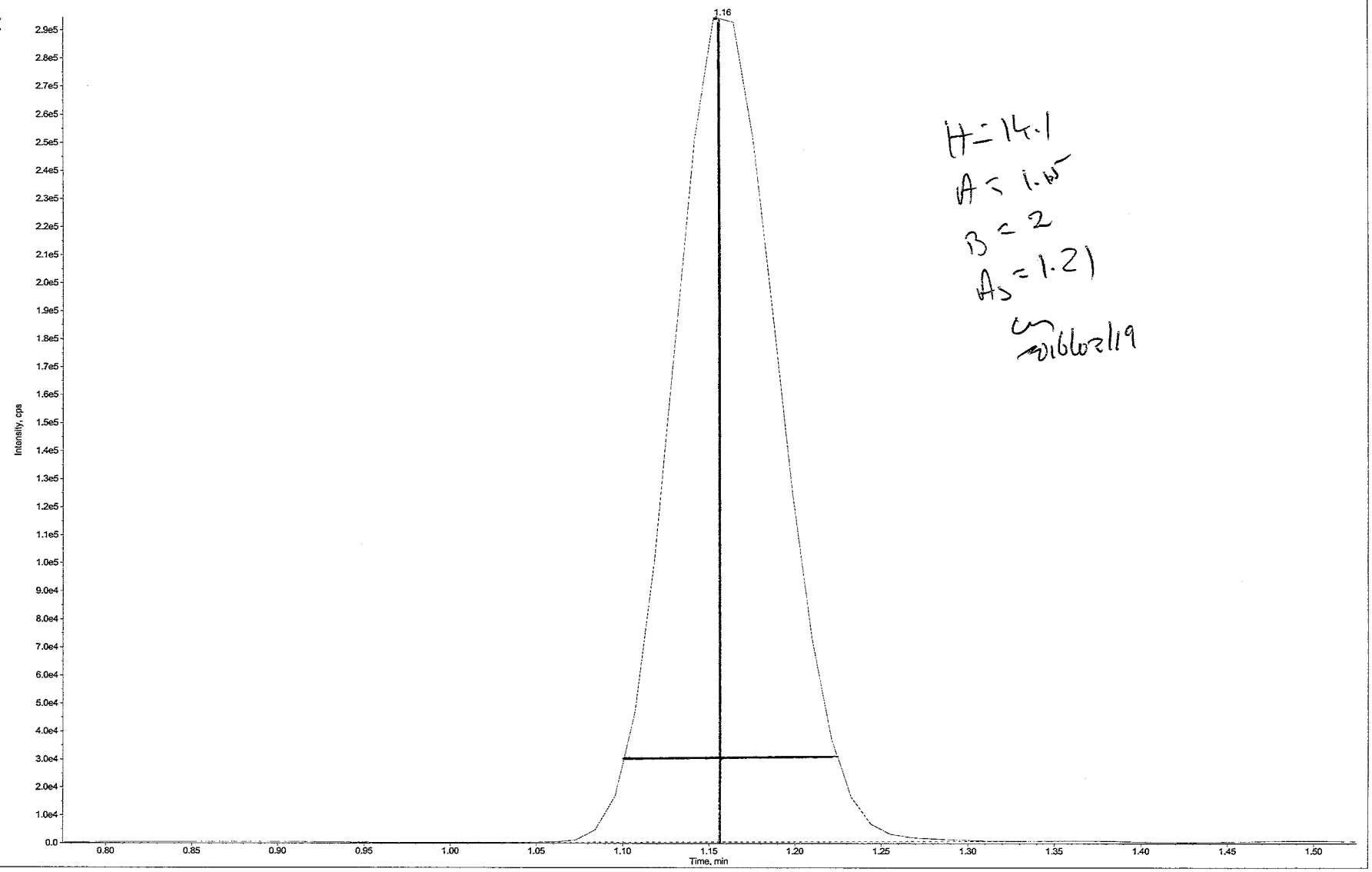
$58.78\ ng/L = x$

on

2016/02/19

Sample Name: "STD 4" Sample ID: "" File: "WS#4386408.wiff"
Peak Name: "PFBS 1" Mass(es): "298.900/79.900 Da"
Comment: "" Annotation: ""

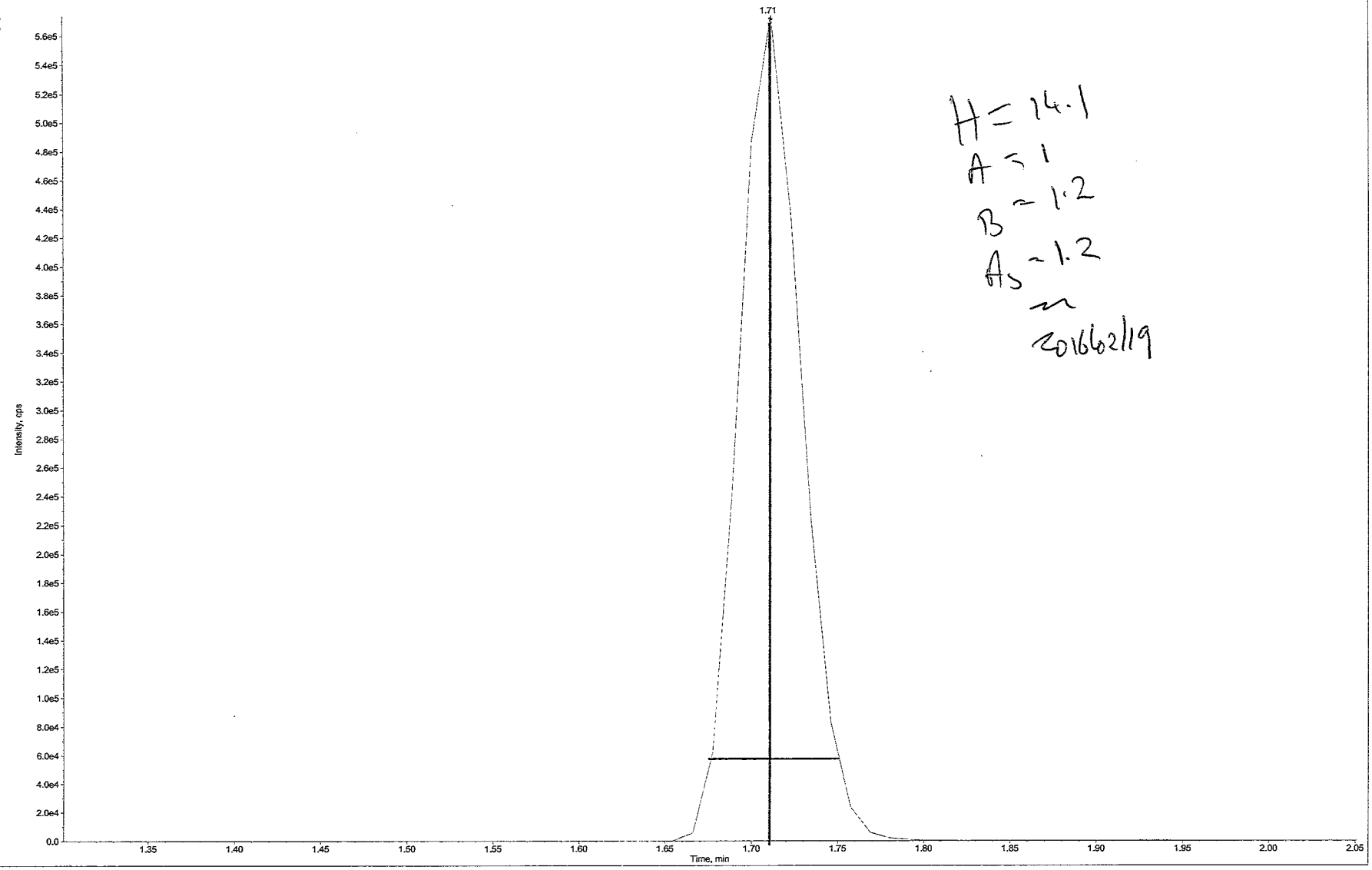
Sample Index:	5
Sample Type:	Standard
Concentration:	30.0 ng/L
Calculated Conc:	29.3 ng/L
Acq. Date:	2016/02/19
Acq. Time:	8:00:24 AM
Modified:	No
Proc. Algorithm:	Analyst Classic
Bunching Factor:	1
Noise Threshold:	20.00 cps
Area Threshold:	2000.00 cps
,Num. Smooths:	5
Sep. Width:	0.00
Sep. Height:	0.00
Exp. Peak Ratio:	5.00
Exp. Adj. Ratio:	4.00
Exp. Val. Ratio:	3.00
RT Window:	10.0 sec
Expected RT:	1.15 min
Use Relative RT:	No
Int. Type:	Base To Base
Retention Time:	1.16 min
Area:	1290000. counts
Height:	2.99e+005 cps
Start Time:	1.04 min
End Time:	1.34 min



H = 14.1
A = 1.05
B = 2
A_s = 1.21
ok 2/19/16

Sample Name: "STD 4" Sample ID: "" File: "WS#4386408.wiff"
Peak Name: "PFHxS 1" Mass(es): "398.900/79.900 Da"
Comment: "" Annotation: ""

Sample Index:	5
Sample Type:	Standard
Concentration:	30.0 ng/L
Calculated Conc:	31.3 ng/L
Acq. Date:	2016/02/19
Acq. Time:	8:00:24 AM
Modified:	No
Proc. Algorithm:	Analyst Classic
Bunching Factor:	1
Noise Threshold:	20.00 cps
Area Threshold:	2000.00 cps
,Num. Smooths:	2
Sep. Width:	0.00
Sep. Height:	0.00
Exp. Peak Ratio:	5.00
Exp. Adj. Ratio:	4.00
Exp. Val. Ratio:	3.00
RT Window:	30.0 sec
Expected RT:	1.68 min
Use Relstive RT:	No
Int. Type:	Base To Base
Retention Time:	1.71 min
Area:	1470000. counts
Height:	5.76e+005 cps
Start Time:	1.64 min
End Time:	1.85 min



H = 14.1
A = 1
B = 1.2
A_S = 1.2
m
20160219

Report Name: Worksheet - Parameter Lists

Report Date: 2016/02/18

Test Code: **PFOSLOW-W**

Worksheet Number: **4386408**

Sample Number	Parameter
BVX769-01	Perfluorobutane Sulfonate (PFBS)
BVX770-01	Perfluoroheptanoic Acid (PFHpA)
BVX771-01	Perfluorohexane Sulfonate (PFHxS)
BVX772-01	Perfluorononanoic Acid (PFNA)
BVX773-01	Perfluoro-n-Octanoic Acid (PFOA)
BVX774-01	Perfluorooctane Sulfonate (PFOS)
BVX775-01	
BVX776-01	
BVX779-01	
BVX780-01	
BVX781-01	
BVX826-01	
BVX827-01	
BVX828-01	
BVX829-01	
BVX830-01	

1.	4386408:MTRX SPK	MTRX SPK
2.	4386408:MTRX SPK:D1	MTRX SPK :D1
3.	4386408:SPIKE	SPIKE
4.	4386408:BLANK	BLANK
5.	4386408:BVX769-01	OF-FB08-0216
6.	4386408:BVX770-01	OF-RW08-0216
7.	4386408:BVX771-01	OF-RW08P-0216
8.	4386408:BVX772-01	OF-FB41-0216
9.	4386408:BVX773-01	OF-RW41-0216
10.	4386408:BVX774-01	OF-RW41P-0216
11.	4386408:BVX775-01	OF-FB56-0216
12.	4386408:BVX776-01	OF-RW56-0216
13.	4386408:BVX779-01	OF-FB51-0216
14.	4386408:BVX780-01	OF-RW51-0216
15.	4386408:BVX781-01	OF-RW51P-0216
16.	4386408:BVX826-01	OF-RW09-0216
17.	4386408:BVX827-01	OF-RW37-0216
18.	4386408:BVX828-01	OF-RW11-0216
19.	4386408:BVX829-01	OF-RW28-0216
20.	4386408:BVX830-01	OF-RW67-0216

Worksheet Reagent Tracking Record Worksheet # 4386408

Volume (µL)

Surrogate/Spike solutions	√	Solution ID #	Conc.	Blk-Spk		MS		Samples	
				Solid	Liquid	Solid	Liquid	Solid	Liquid
DGT Spike			100 ug/mL	60	30	60	30	NA	NA
Diquat Dibromide			50 ug/mL	NA	350	NA	350	NA	NA
Explosives Spiking solution A			20 ug/mL	250	100	250	100	NA	NA
Explosives Spiking solution B			20/80 ug/mL	250	100	250	100	NA	NA
Formaldehyde Spike			100 ug/mL	25	25	25	25	NA	NA
Glyphosate Spike			25 ug/mL	500	20	500	20	NA	NA
Nonylphenol Ethoxylate Spike			100 ug/mL	100	100	100	100	NA	NA
Nonylphenol Spike			10 ug/mL	100	100	100	100	NA	NA
Paraquat Cl Tetrahydrate			20 ug/mL	NA	125	NA	125	NA	NA
Perchlorate Standard Spike			10 ng/mL	NA	100	NA	100	NA	NA
Perchlorate Standard Spike			500 ng/mL	40	NA	40	NA	NA	NA
Perchlorate O-18 Internal Standard			0.10 ng/uL	20	20	20	20	20	20
Morpholine Intermediate Std.			5 ug/mL	NA	50	NA	20	NA	NA
Morpholine-D8 Internal Standard			10 ug/mL	NA	100	NA	100	NA	100
Comp. PFC Spiking Solution A			1ug/mL	62.5	NA	62.5	NA	NA	NA
Comp. PFC Spiking Solution B			250 ng/mL	NA	40 .75	NA	40 75	NA	NA
Comp. PFC Spiking Solution C	✓	SK-6229	100 ng/mL	125	62-5 NA	125	62-5 NA	NA	NA
Internal Standard Solution A	✓	SF-6010	50 ng/mL	50	15 100	50	15 100	50	15 100
Internal Standard Solution B			250ng/mL	50	NA	50	NA	50	NA
ICV/CCV PFC	✓	I-4676	1 ng/mL		62-5				

Solvent/Reagent	Supplier	√	Lot No.	Date Opened	Solvent/Reagent	√	Lot No.	Date Opened/ Prepared
DCM	Fisher				50% NaOH			
Hexane	Fisher				20mM TBAS			
Acetone	Fisher				o-Phosphoric Acid			
Ottawa Sand	Fisher				Borax			
Methanol	Fisher acetech	✓	SHB66076V	2016/02/18	Calcium Chloride			
2-Propanol (IPA)	Fisher				EDTA			
Acetonitrile	Fisher				Phosphate Buffer			
MTBE	Fisher				Sodium Thiosulphate			
Sodium Sulfate	Fisher				DNPH			
60:40 H2O:MeOH Recon Solution		✓	87-190	2016/02/12	5M Acetate Buffer			
DCM:Ethyl Ether (75:25)					FMOC			
Hexane:IPA (98:2)					0.25M Na_2CO_3			
2% Formic Acid		✓	87-131	2016/01/13	0.5M TBAS			
0.2% Formic Acid		✓	B7-114	2015/12/31	1% NH_4OH 0.2%	✓	87-198	2016/02/18
0.05M KOH					Leachate Fluid			
0.05M HCl					Reagent Water	✓	158399	2016/02/17

*Spiked by: GSZ

Spike Date: 2016/02/18

Spike Syringe ID# Pipettor: M23487B

Int. Std Syringe ID# Pipettor: M23487B

*Spiking Witnessed by: SSV

Final pH

Equipment	ID#	√	Equipment	ID#	√	Equipment	Lot #
Pipettor	M15944C	✓	SPE Cartridge			10 mL Serological Pipet	
	P297460	✓	Filter			QC Balance ID	
	K1960917						
Dispenser			Centrifuge			Thermometer ID &Temp	SN 140614017 45°C
Syringe			Sonicator				

Bottle Tracking

Bottle# 14991

Cap# 14443

Systems plus Lot# 16-01-06

Comments: 125mL Ref Bottle (HDPE)

Inj IS - SI-6017 - 2016/01/19

HPLC Evaporator

* - SPIKING OF SAMPLES BY Maxxam Analytics MUST BE WITNESSED AT ALL TIMES.

Project: D:\Analyst Data\Projects\Enviro\PFOS Batch:PFC_160219 Tab:Sample Set:SET1 AcqMethod:PFC_Water_Low.dam
Sample

	Sample Name	Rack Code	Rack Position	Plate Code	Plate Position	Vial Position	Data File	Inj.Volume (µl)
1	Rinse	2 Well Plates	1	*54VialPlate*	1	1	PFC_160219\WS#4386408	3.000
2	4386408~BLANK	2 Well Plates	1	*54VialPlate*	1	2	PFC_160219\WS#4386408	3.000
3	STD 1	2 Well Plates	1	*54VialPlate*	1	3	PFC_160219\WS#4386408	3.000
4	STD 2	2 Well Plates	1	*54VialPlate*	1	4	PFC_160219\WS#4386408	3.000
5	STD 3	2 Well Plates	1	*54VialPlate*	1	5	PFC_160219\WS#4386408	3.000
6	STD 4	2 Well Plates	1	*54VialPlate*	1	6	PFC_160219\WS#4386408	3.000
7	STD 5	2 Well Plates	1	*54VialPlate*	1	7	PFC_160219\WS#4386408	3.000
8	STD 6	2 Well Plates	1	*54VialPlate*	1	8	PFC_160219\WS#4386408	3.000
9	ICV	2 Well Plates	1	*54VialPlate*	1	9	PFC_160219\WS#4386408	3.000
10	CCV	2 Well Plates	1	*54VialPlate*	1	6	PFC_160219\WS#4386408	3.000
11	4386408~MTRX SPK	2 Well Plates	1	*54VialPlate*	1	10	PFC_160219\WS#4386408	3.000
12	4386408~MTRX SPK:D1	2 Well Plates	1	*54VialPlate*	1	11	PFC_160219\WS#4386408	3.000
13	4386408~SPIKE	2 Well Plates	1	*54VialPlate*	1	12	PFC_160219\WS#4386408	3.000
14	4386408~BVX814-01 (10x)	2 Well Plates	1	*54VialPlate*	1	13	PFC_160219\WS#4386408	3.000
15	4386408~BVX817-01 (10x)	2 Well Plates	1	*54VialPlate*	1	14	PFC_160219\WS#4386408	3.000
16	4386408~BVX818-01 (20x)	2 Well Plates	1	*54VialPlate*	1	15	PFC_160219\WS#4386408	3.000
17	4386408~BVX819-01 (10x)	2 Well Plates	1	*54VialPlate*	1	16	PFC_160219\WS#4386408	3.000
18	4386408~BVX769-01	2 Well Plates	1	*54VialPlate*	1	17	PFC_160219\WS#4386408	3.000
19	4386408~BVX770-01	2 Well Plates	1	*54VialPlate*	1	18	PFC_160219\WS#4386408	3.000
20	4386408~BVX771-01	2 Well Plates	1	*54VialPlate*	1	19	PFC_160219\WS#4386408	3.000
21	4386408~BVX772-01	2 Well Plates	1	*54VialPlate*	1	20	PFC_160219\WS#4386408	3.000
22	4386408~BVX773-01	2 Well Plates	1	*54VialPlate*	1	21	PFC_160219\WS#4386408	3.000
23	4386408~BVX774-01	2 Well Plates	1	*54VialPlate*	1	22	PFC_160219\WS#4386408	3.000
24	CCV	2 Well Plates	1	*54VialPlate*	1	6	PFC_160219\WS#4386408	3.000
25	4386408~BVX775-01	2 Well Plates	1	*54VialPlate*	1	23	PFC_160219\WS#4386408	3.000
26	4386408~BVX776-01	2 Well Plates	1	*54VialPlate*	1	24	PFC_160219\WS#4386408	3.000
27	4386408~BVX779-01	2 Well Plates	1	*54VialPlate*	1	25	PFC_160219\WS#4386408	3.000
28	4386408~BVX780-01	2 Well Plates	1	*54VialPlate*	1	26	PFC_160219\WS#4386408	3.000
29	4386408~BVX781-01	2 Well Plates	1	*54VialPlate*	1	27	PFC_160219\WS#4386408	3.000
30	4386408~BVX826-01	2 Well Plates	1	*54VialPlate*	1	28	PFC_160219\WS#4386408	3.000
31	4386408~BVX827-01	2 Well Plates	1	*54VialPlate*	1	29	PFC_160219\WS#4386408	3.000
32	4386408~BVX828-01	2 Well Plates	1	*54VialPlate*	1	30	PFC_160219\WS#4386408	3.000
33	4386408~BVX829-01	2 Well Plates	1	*54VialPlate*	1	31	PFC_160219\WS#4386408	3.000
34	4386408~BVX830-01	2 Well Plates	1	*54VialPlate*	1	32	PFC_160219\WS#4386408	3.000
35	CCV	2 Well Plates	1	*54VialPlate*	1	6	PFC_160219\WS#4386408	3.000
36	4385924~BLANK	2 Well Plates	1	*54VialPlate*	1	33	PFC_160219\WS#4385924	3.000
37	4385924~MTRX SPK	2 Well Plates	1	*54VialPlate*	1	34	PFC_160219\WS#4385924	3.000
38	4385924~MTRX SPK:D1	2 Well Plates	1	*54VialPlate*	1	35	PFC_160219\WS#4385924	3.000
39	4385924~SPIKE	2 Well Plates	1	*54VialPlate*	1	36	PFC_160219\WS#4385924	3.000
40	4385924~BVX947-01 (10x)	2 Well Plates	1	*54VialPlate*	1	37	PFC_160219\WS#4385924	3.000
41	4385924~BVX792-01	2 Well Plates	1	*54VialPlate*	1	38	PFC_160219\WS#4385924	3.000
42	4385924~BVX793-01	2 Well Plates	1	*54VialPlate*	1	39	PFC_160219\WS#4385924	3.000
43	4385924~BVX794-01	2 Well Plates	1	*54VialPlate*	1	40	PFC_160219\WS#4385924	3.000
44	4385924~BVX795-01	2 Well Plates	1	*54VialPlate*	1	41	PFC_160219\WS#4385924	3.000
45	4385924~BVX796-01	2 Well Plates	1	*54VialPlate*	1	42	PFC_160219\WS#4385924	3.000
46	4385924~BVX797-01	2 Well Plates	1	*54VialPlate*	1	43	PFC_160219\WS#4385924	3.000
47	4385924~BVX798-01	2 Well Plates	1	*54VialPlate*	1	44	PFC_160219\WS#4385924	3.000
48	4385924~BVX799-01	2 Well Plates	1	*54VialPlate*	1	45	PFC_160219\WS#4385924	3.000
49	4385924~BVX800-01	2 Well Plates	1	*54VialPlate*	1	46	PFC_160219\WS#4385924	3.000
50	CCV	2 Well Plates	1	*54VialPlate*	1	6	PFC_160219\WS#4385924	3.000
51	4385924~BVX801-01	2 Well Plates	1	*54VialPlate*	1	47	PFC_160219\WS#4385924	3.000
52	4385924~BVX802-01	2 Well Plates	1	*54VialPlate*	1	48	PFC_160219\WS#4385924	3.000
53	4385924~BVX803-01	2 Well Plates	1	*54VialPlate*	1	49	PFC_160219\WS#4385924	3.000
54	4385924~BVX804-01	2 Well Plates	1	*54VialPlate*	1	50	PFC_160219\WS#4385924	3.000
55	4385924~BVX805-01	2 Well Plates	1	*54VialPlate*	1	51	PFC_160219\WS#4385924	3.000
56	CCV	2 Well Plates	1	*54VialPlate*	1	6	PFC_160219\WS#4385924	3.000
57	4385888~BLANK	2 Well Plates	1	*54VialPlate*	2	1	PFC_160219\WS#4385888	3.000
58	4385888~MTRX SPK	2 Well Plates	1	*54VialPlate*	2	2	PFC_160219\WS#4385888	3.000
59	4385888~MTRX SPK:D1	2 Well Plates	1	*54VialPlate*	2	3	PFC_160219\WS#4385888	3.000
60	4385888~SPIKE	2 Well Plates	1	*54VialPlate*	2	4	PFC_160219\WS#4385888	3.000
61	4385888~BVX782-01	2 Well Plates	1	*54VialPlate*	2	5	PFC_160219\WS#4385888	3.000
62	4385888~BVX783-01	2 Well Plates	1	*54VialPlate*	2	6	PFC_160219\WS#4385888	3.000
63	4385888~BVX784-01	2 Well Plates	1	*54VialPlate*	2	7	PFC_160219\WS#4385888	3.000
64	4385888~BVX785-01	2 Well Plates	1	*54VialPlate*	2	8	PFC_160219\WS#4385888	3.000
65	4385888~BVX786-01	2 Well Plates	1	*54VialPlate*	2	9	PFC_160219\WS#4385888	3.000
66	4385888~BVX787-01	2 Well Plates	1	*54VialPlate*	2	10	PFC_160219\WS#4385888	3.000
67	4385888~BVX788-01	2 Well Plates	1	*54VialPlate*	2	11	PFC_160219\WS#4385888	3.000
68	4385888~BVX789-01	2 Well Plates	1	*54VialPlate*	2	12	PFC_160219\WS#4385888	3.000
69	4385888~BVX790-01	2 Well Plates	1	*54VialPlate*	2	13	PFC_160219\WS#4385888	3.000
70	4385888~BVX791-01	2 Well Plates	1	*54VialPlate*	2	14	PFC_160219\WS#4385888	3.000
71	CCV	2 Well Plates	1	*54VialPlate*	1	6	PFC_160219\WS#4385888	3.000

Column #123
MPA = Soln # 506, FJSRE17
MPB = MeOH, Fisher Lot #152613
CM 20160219

	Sample ID	Acquisition Date	Acquisition Method	File Name	Rack Type	Rack Position	Vial Position	Plate Type	Plate Position
1	4386408~BLANK	2016/02/19 7:39:53 AM	PFC_Water_Low.dam	PFC_160219\WS#4386408.wiff	2 Well Plates	1	2	*54VialPlate*	1
2	STD 1	2016/02/19 7:45:04 AM	PFC_Water_Low.dam	PFC_160219\WS#4386408.wiff	2 Well Plates	1	3	*54VialPlate*	1
3	STD 2	2016/02/19 7:50:14 AM	PFC_Water_Low.dam	PFC_160219\WS#4386408.wiff	2 Well Plates	1	4	*54VialPlate*	1
4	STD 3	2016/02/19 7:55:19 AM	PFC_Water_Low.dam	PFC_160219\WS#4386408.wiff	2 Well Plates	1	5	*54VialPlate*	1
5	STD 4	2016/02/19 8:00:24 AM	PFC_Water_Low.dam	PFC_160219\WS#4386408.wiff	2 Well Plates	1	6	*54VialPlate*	1
6	STD 5	2016/02/19 8:05:30 AM	PFC_Water_Low.dam	PFC_160219\WS#4386408.wiff	2 Well Plates	1	7	*54VialPlate*	1
7	STD 6	2016/02/19 8:10:36 AM	PFC_Water_Low.dam	PFC_160219\WS#4386408.wiff	2 Well Plates	1	8	*54VialPlate*	1
8	ICV	2016/02/19 8:15:41 AM	PFC_Water_Low.dam	PFC_160219\WS#4386408.wiff	2 Well Plates	1	9	*54VialPlate*	1
9	CCV	2016/02/19 8:20:47 AM	PFC_Water_Low.dam	PFC_160219\WS#4386408.wiff	2 Well Plates	1	6	*54VialPlate*	1
10	4386408~MTRX SPK	2016/02/19 8:25:52 AM	PFC_Water_Low.dam	PFC_160219\WS#4386408.wiff	2 Well Plates	1	10	*54VialPlate*	1
11	4386408~MTRX SPK:D1	2016/02/19 8:30:58 AM	PFC_Water_Low.dam	PFC_160219\WS#4386408.wiff	2 Well Plates	1	11	*54VialPlate*	1
12	4386408~SPIKE	2016/02/19 8:36:03 AM	PFC_Water_Low.dam	PFC_160219\WS#4386408.wiff	2 Well Plates	1	12	*54VialPlate*	1
13	4386408~BVX814-01 (10x)	2016/02/19 8:51:19 AM	PFC_Water_Low.dam	PFC_160219\WS#4386408.wiff	2 Well Plates	1	13	*54VialPlate*	1
14	4386408~BVX817-01 (10x)	2016/02/19 8:56:24 AM	PFC_Water_Low.dam	PFC_160219\WS#4386408.wiff	2 Well Plates	1	14	*54VialPlate*	1
15	4386408~BVX818-01 (20x)	2016/02/19 9:01:31 AM	PFC_Water_Low.dam	PFC_160219\WS#4386408.wiff	2 Well Plates	1	15	*54VialPlate*	1
16	4386408~BVX819-01 (10x)	2016/02/19 9:06:37 AM	PFC_Water_Low.dam	PFC_160219\WS#4386408.wiff	2 Well Plates	1	16	*54VialPlate*	1
17	4386408~BVX769-01	2016/02/19 9:11:43 AM	PFC_Water_Low.dam	PFC_160219\WS#4386408.wiff	2 Well Plates	1	17	*54VialPlate*	1
18	4386408~BVX770-01	2016/02/19 9:16:48 AM	PFC_Water_Low.dam	PFC_160219\WS#4386408.wiff	2 Well Plates	1	18	*54VialPlate*	1
19	4386408~BVX771-01	2016/02/19 9:21:58 AM	PFC_Water_Low.dam	PFC_160219\WS#4386408.wiff	2 Well Plates	1	19	*54VialPlate*	1
20	4386408~BVX772-01	2016/02/19 9:27:04 AM	PFC_Water_Low.dam	PFC_160219\WS#4386408.wiff	2 Well Plates	1	20	*54VialPlate*	1
21	4386408~BVX773-01	2016/02/19 9:32:10 AM	PFC_Water_Low.dam	PFC_160219\WS#4386408.wiff	2 Well Plates	1	21	*54VialPlate*	1
22	4386408~BVX774-01	2016/02/19 9:37:16 AM	PFC_Water_Low.dam	PFC_160219\WS#4386408.wiff	2 Well Plates	1	22	*54VialPlate*	1
23	CCV	2016/02/19 9:42:22 AM	PFC_Water_Low.dam	PFC_160219\WS#4386408.wiff	2 Well Plates	1	6	*54VialPlate*	1
24	4386408~BVX775-01	2016/02/19 9:52:33 AM	PFC_Water_Low.dam	PFC_160219\WS#4386408.wiff	2 Well Plates	1	23	*54VialPlate*	1
25	4386408~BVX776-01	2016/02/19 9:57:39 AM	PFC_Water_Low.dam	PFC_160219\WS#4386408.wiff	2 Well Plates	1	24	*54VialPlate*	1
26	4386408~BVX779-01	2016/02/19 10:02:45 AM	PFC_Water_Low.dam	PFC_160219\WS#4386408.wiff	2 Well Plates	1	25	*54VialPlate*	1
27	4386408~BVX780-01	2016/02/19 10:07:51 AM	PFC_Water_Low.dam	PFC_160219\WS#4386408.wiff	2 Well Plates	1	26	*54VialPlate*	1
28	4386408~BVX781-01	2016/02/19 10:12:57 AM	PFC_Water_Low.dam	PFC_160219\WS#4386408.wiff	2 Well Plates	1	27	*54VialPlate*	1
29	4386408~BVX826-01	2016/02/19 10:18:03 AM	PFC_Water_Low.dam	PFC_160219\WS#4386408.wiff	2 Well Plates	1	28	*54VialPlate*	1
30	4386408~BVX827-01	2016/02/19 10:23:09 AM	PFC_Water_Low.dam	PFC_160219\WS#4386408.wiff	2 Well Plates	1	29	*54VialPlate*	1
31	4386408~BVX828-01	2016/02/19 10:28:14 AM	PFC_Water_Low.dam	PFC_160219\WS#4386408.wiff	2 Well Plates	1	30	*54VialPlate*	1
32	4386408~BVX829-01	2016/02/19 10:33:19 AM	PFC_Water_Low.dam	PFC_160219\WS#4386408.wiff	2 Well Plates	1	31	*54VialPlate*	1
33	4386408~BVX830-01	2016/02/19 10:38:25 AM	PFC_Water_Low.dam	PFC_160219\WS#4386408.wiff	2 Well Plates	1	32	*54VialPlate*	1
34	CCV	2016/02/19 10:43:32 AM	PFC_Water_Low.dam	PFC_160219\WS#4386408.wiff	2 Well Plates	1	6	*54VialPlate*	1
35	4386408~MTRX SPK	2016/02/19 10:48:37 AM	PFC_Water_Low.dam	PFC_160219\WS#4386408.wiff	2 Well Plates	1	10	*54VialPlate*	1
36	4386408~BVX830-01	2016/02/19 10:58:48 AM	PFC_Water_Low.dam	PFC_160219\WS#4386408.wiff	2 Well Plates	1	32	*54VialPlate*	1
37	CCV	2016/02/19 11:03:54 AM	PFC_Water_Low.dam	PFC_160219\WS#4386408.wiff	2 Well Plates	1	6	*54VialPlate*	1

5. Initial Calibration

Maxxam Analytics International
6740 Campobello Rd
Mississauga, Ontario, Canada
L5N 2L8
1-800-668-0639
www.maxxamanalytics.com

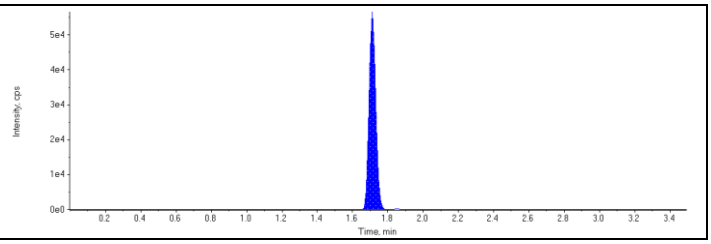
Sample Name	**STD 1**	**Injection Vial**	3
Sample ID	STD 1	**Injection Volume (µL)**	3
Sample Type	Standard	**Algorithm Used**	Analyst Classic
Acquisition Date	2016/02/19 7:45:04 AM	**Dilution Factor**	1.00
Acquisition Method	PFC_Water_Low.dam	**Sample Annotation**	-
Project	Enviro\PFOS	**Instrument Name**	LCMS03
Data File	PFC_160219\WS#4386408.wiff		
Result Table	PFC_Water_160219_4386408_ULow.rdb		

Internal Standard	Area (cps)	RT (min)	Target Conc. (ng/L)	Calc. Conc. (ng/L)
MPFHxS	146000.	1.71	1.00	-
MPFHpA	517000.	1.74	1.00	-
MPFOA	413000.	1.92	1.00	-
MPFOS	179000.	2.00	1.00	-
MPFNA	291000.	2.06	1.00	-
13C6-PFHxA IS	4050000.	1.49	1.00	-
N/A	N/A	N/A	N/A	-

Target Analyte	Area (cps)	RT (min)	Target Conc. (ng/L)	Calc. Conc. (ng/L)	Accuracy (%)
PFBS 1	83700	1.17	2.00	2.40	120.0
PFHxS 1	85100	1.71	2.00	2.35	117.0
PFHpA 1	142000	1.74	2.00	2.11	106.0
PFOA 1	136000	1.92	2.00	2.20	110.0
PFOS 1	69300	1.99	2.00	2.31	116.0
PFNA 1	101000	2.06	2.00	2.24	112.0
18O2-PFHxS	146000	1.71	100.	97.9	97.9
13C4-PFHpA	517000	1.74	100.	103.	103.0
13C4-PFOA	413000	1.92	100.	94.5	94.5
13C4-PFOS	179000	2.00	100.	102.	102.0
13C5-PFNA	291000	2.06	100.	97.6	97.6
13C6-PFHxA	4050000	1.49	100.	101.	101.0

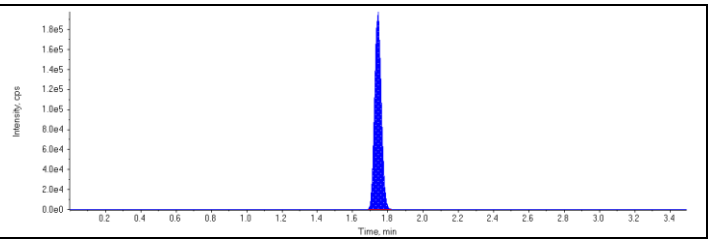
MPFHxS (Internal Standard)

RT (Exp. RT): 1.71(1.68) min
Concentration: 1.00 ng/L
Sample Type: (Standard)



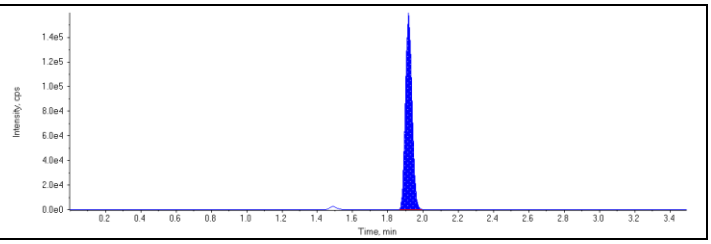
MPFHpA (Internal Standard)

RT (Exp. RT): 1.74(1.75) min
Concentration: 1.00 ng/L
Sample Type: (Standard)



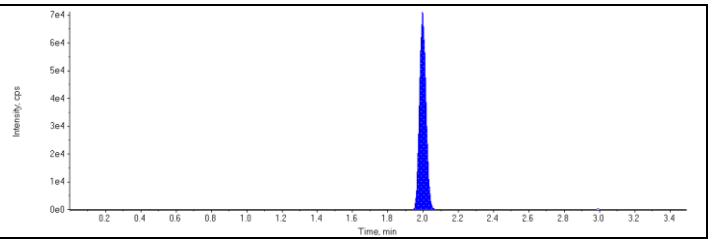
MPFOA (Internal Standard)

RT (Exp. RT): 1.92(1.88) min
Concentration: 1.00 ng/L
Sample Type: (Standard)



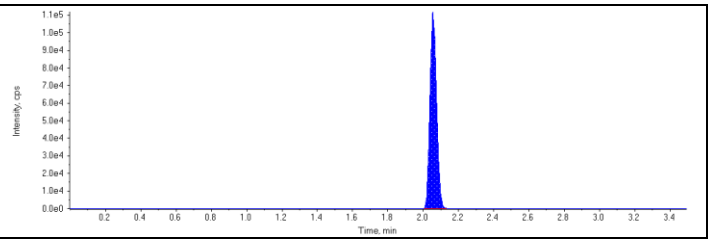
MPFOS (Internal Standard)

RT (Exp. RT): 2.00(1.97) min
Concentration: 1.00 ng/L
Sample Type: (Standard)



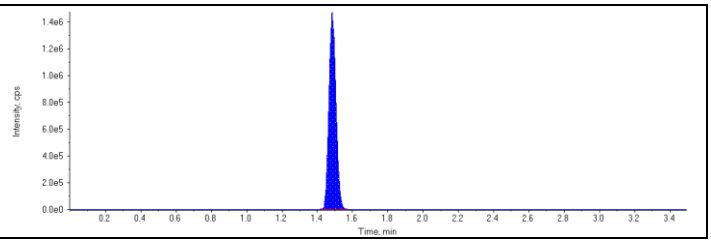
MPFNA (Internal Standard)

RT (Exp. RT): 2.06(2.02) min
Concentration: 1.00 ng/L
Sample Type: (Standard)



13C6-PFHxA IS (Internal Standard)

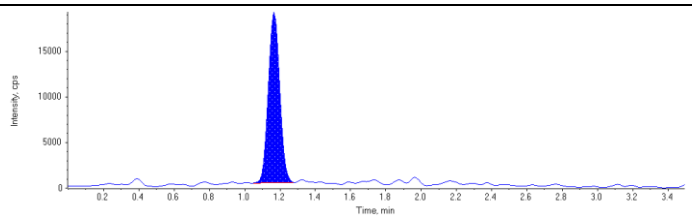
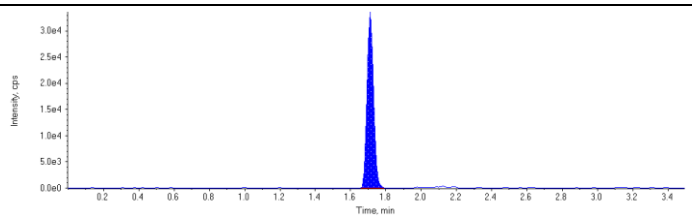
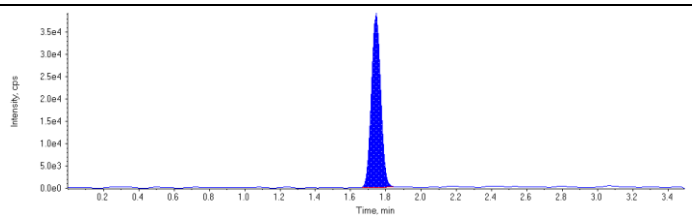
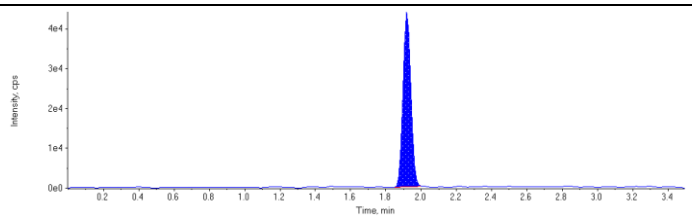
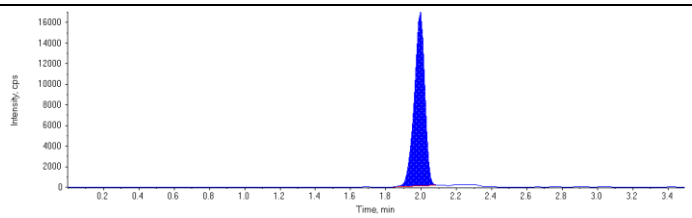
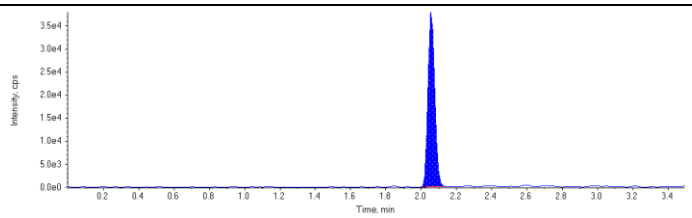
RT (Exp. RT): 1.49(1.42) min
Concentration: 1.00 ng/L
Sample Type: (Standard)

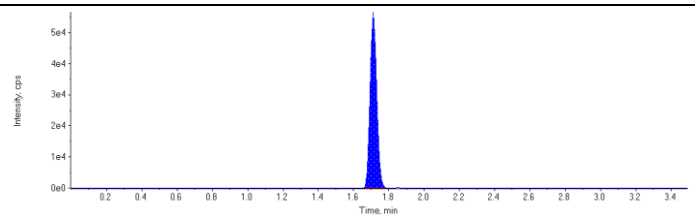
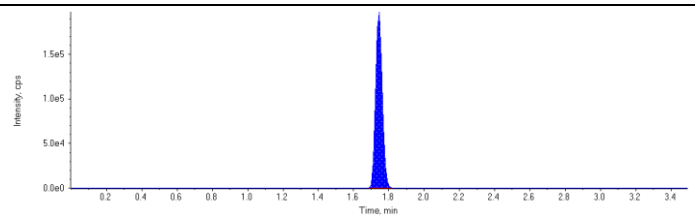
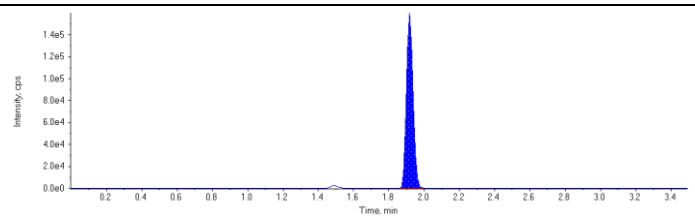
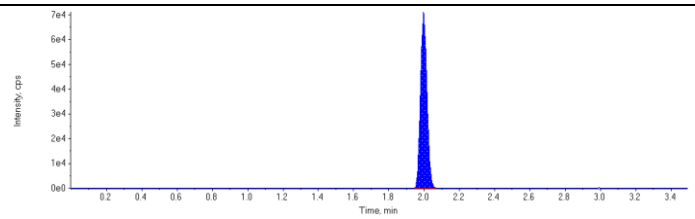
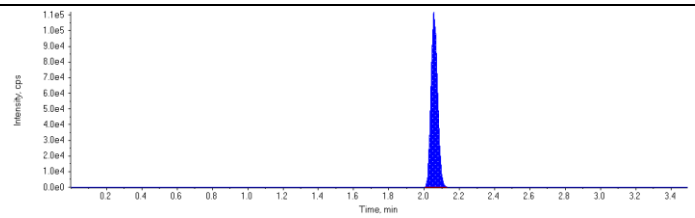
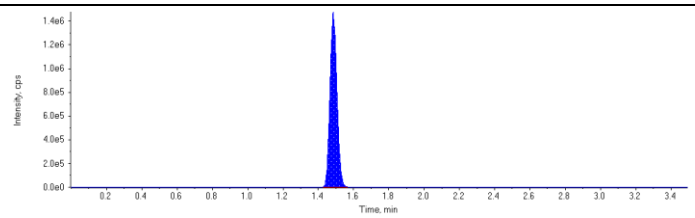


N/A (Internal Standard)

RT (Exp. RT): N/A(N/A) min
Concentration: N/A N/A
Sample Type: (Standard)

This image is not available

PFBS 1 (298.900/79.900 Da) RT (Exp. RT): 1.17 (1.15) min Calculated Conc: 2.40 µg/L Area Ratio: 0.573 Sample Type: (Standard)	
PFHxS 1 (398.900/79.900 Da) RT (Exp. RT): 1.71 (1.68) min Calculated Conc: 2.35 µg/L Area Ratio: 0.583 Sample Type: (Standard)	
PFHpA 1 (363.000/319.000 Da) RT (Exp. RT): 1.74 (1.75) min Calculated Conc: 2.11 µg/L Area Ratio: 0.275 Sample Type: (Standard)	
PFOA 1 (413.100/369.000 Da) RT (Exp. RT): 1.92 (1.92) min Calculated Conc: 2.20 µg/L Area Ratio: 0.331 Sample Type: (Standard)	
PFOS 1 (498.900/79.900 Da) RT (Exp. RT): 1.99 (1.97) min Calculated Conc: 2.31 µg/L Area Ratio: 0.387 Sample Type: (Standard)	
PFNA 1 (462.900/419.000 Da) RT (Exp. RT): 2.06 (2.02) min Calculated Conc: 2.24 µg/L Area Ratio: 0.346 Sample Type: (Standard)	

18O2-PFHxS (402.900/84.000 Da) RT (Exp. RT): 1.71 (1.68) min Calculated Conc: 97.9 µg/L Area Ratio: 0.0361 Sample Type: (Standard)	
13C4-PFHpA (366.900/322.000 Da) RT (Exp. RT): 1.74 (1.75) min Calculated Conc: 103. µg/L Area Ratio: 0.128 Sample Type: (Standard)	
13C4-PFOA (416.900/372.000 Da) RT (Exp. RT): 1.92 (1.88) min Calculated Conc: 94.5 µg/L Area Ratio: 0.102 Sample Type: (Standard)	
13C4-PFOS (502.900/79.900 Da) RT (Exp. RT): 2.00 (1.97) min Calculated Conc: 102. µg/L Area Ratio: 0.0443 Sample Type: (Standard)	
13C5-PFNA (467.900/423.000 Da) RT (Exp. RT): 2.06 (2.02) min Calculated Conc: 97.6 µg/L Area Ratio: 0.0719 Sample Type: (Standard)	
13C6-PFHxA (318.900/274.000 Da) RT (Exp. RT): 1.49 (1.42) min Calculated Conc: 101. µg/L Area Ratio: 0.00 Sample Type: (Standard)	

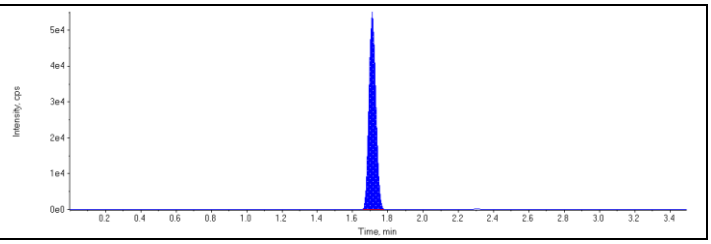
Sample Name	**STD 2**	**Injection Vial**	4
Sample ID	STD 2	**Injection Volume (µL)**	3
Sample Type	Standard	**Algorithm Used**	Analyst Classic
Acquisition Date	2016/02/19 7:50:14 AM	**Dilution Factor**	1.00
Acquisition Method	PFC_Water_Low.dam	**Sample Annotation**	-
Project	Enviro\PFOS	**Instrument Name**	LCMS03
Data File	PFC_160219\WS#4386408.wiff		
Result Table	PFC_Water_160219_4386408_ULow.rdb		

Internal Standard	Area (cps)	RT (min)	Target Conc. (ng/L)	Calc. Conc. (ng/L)
MPFHxS	147000.	1.71	1.00	-
MPFHpA	503000.	1.74	1.00	-
MPFOA	442000.	1.92	1.00	-
MPFOS	177000.	2.00	1.00	-
MPFNA	296000.	2.06	1.00	-
13C6-PFHxA IS	3880000.	1.49	1.00	-
N/A	N/A	N/A	N/A	-

Target Analyte	Area (cps)	RT (min)	Target Conc. (ng/L)	Calc. Conc. (ng/L)	Accuracy (%)
PFBS 1	151000	1.16	4.00	3.86	96.4
PFHxS 1	151000	1.71	4.00	3.68	92.1
PFHpA 1	247000	1.74	4.00	3.72	92.9
PFOA 1	258000	1.92	4.00	3.73	93.3
PFOS 1	111000	1.99	4.00	3.63	90.7
PFNA 1	177000	2.06	4.00	3.74	93.6
18O2-PFHxS	147000	1.71	100.	103.	103.0
13C4-PFHpA	503000	1.74	100.	105.	105.0
13C4-PFOA	442000	1.92	100.	105.	105.0
13C4-PFOS	177000	2.00	100.	105.	105.0
13C5-PFNA	296000	2.06	100.	104.	104.0
13C6-PFHxA	3880000	1.49	100.	97.3	97.3

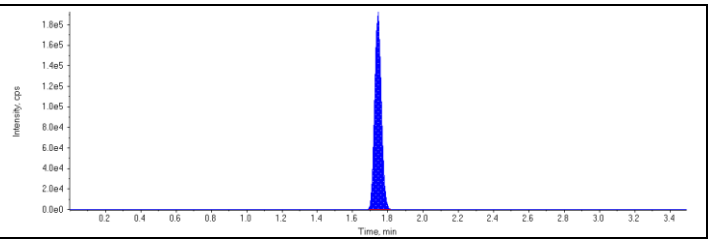
MPFHxS (Internal Standard)

RT (Exp. RT): 1.71(1.68) min
Concentration: 1.00 ng/L
Sample Type: (Standard)



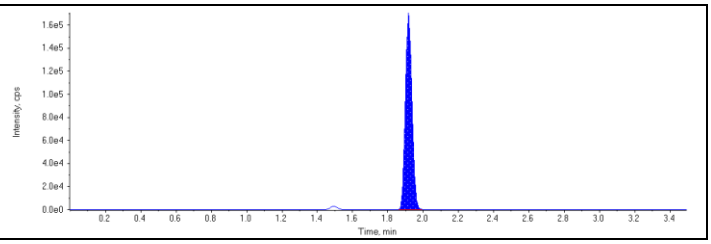
MPFHpA (Internal Standard)

RT (Exp. RT): 1.74(1.75) min
Concentration: 1.00 ng/L
Sample Type: (Standard)



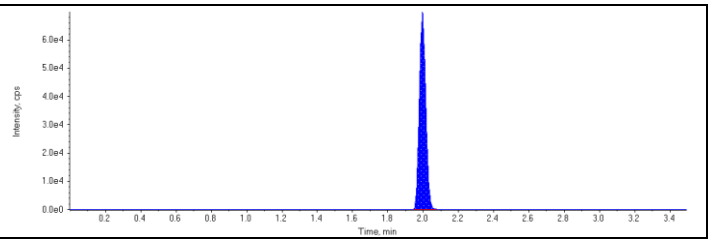
MPFOA (Internal Standard)

RT (Exp. RT): 1.92(1.88) min
Concentration: 1.00 ng/L
Sample Type: (Standard)



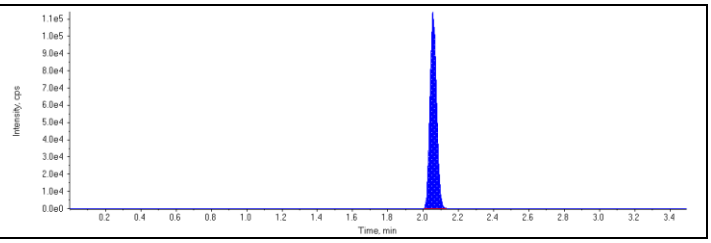
MPFOS (Internal Standard)

RT (Exp. RT): 2.00(1.97) min
Concentration: 1.00 ng/L
Sample Type: (Standard)



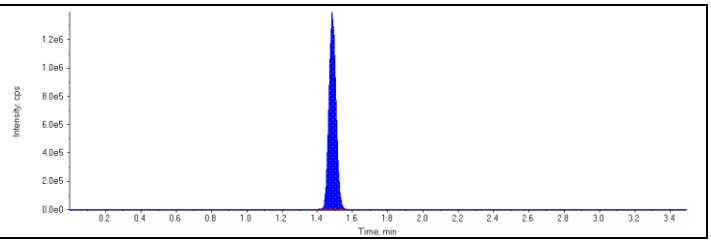
MPFNA (Internal Standard)

RT (Exp. RT): 2.06(2.02) min
Concentration: 1.00 ng/L
Sample Type: (Standard)



13C6-PFHxA IS (Internal Standard)

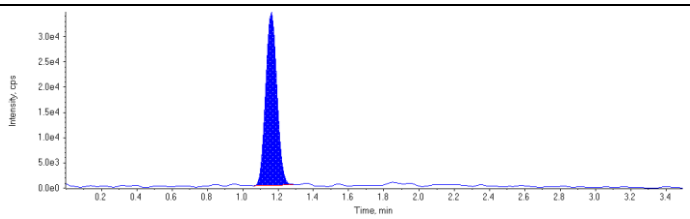
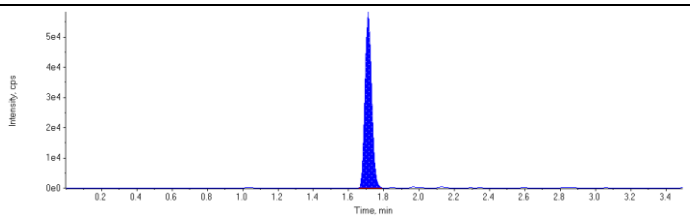
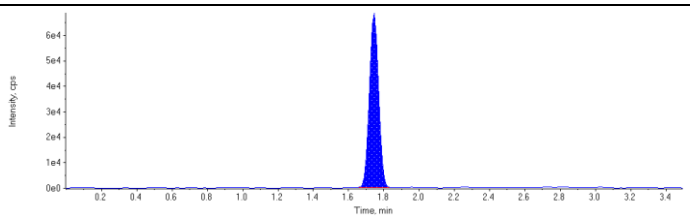
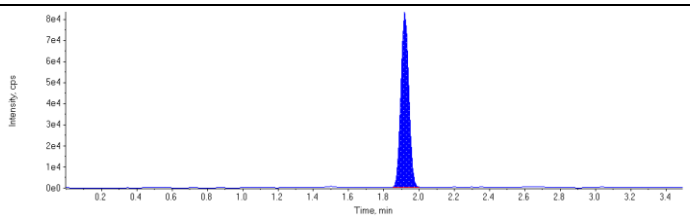
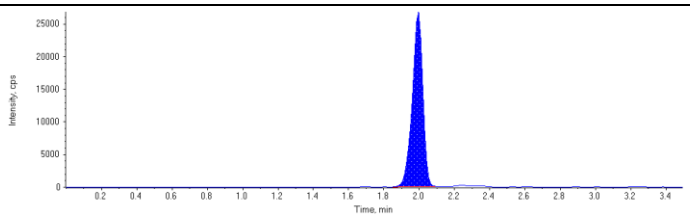
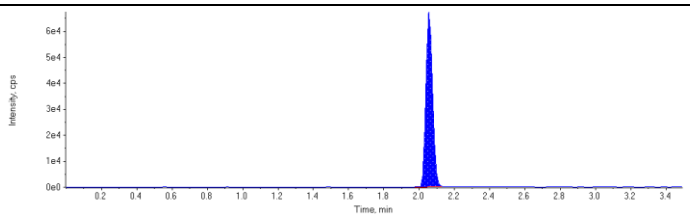
RT (Exp. RT): 1.49(1.42) min
Concentration: 1.00 ng/L
Sample Type: (Standard)

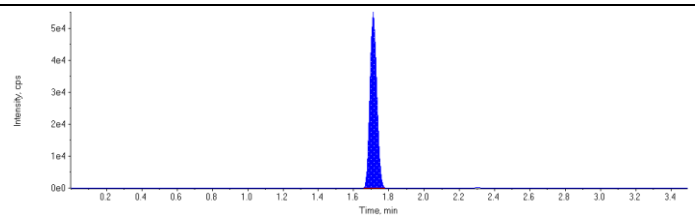
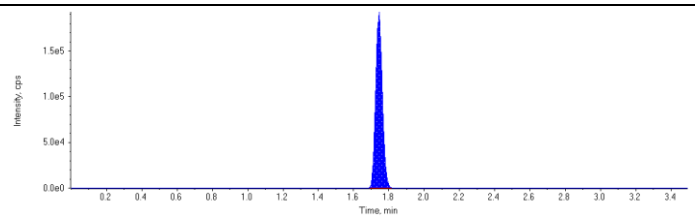
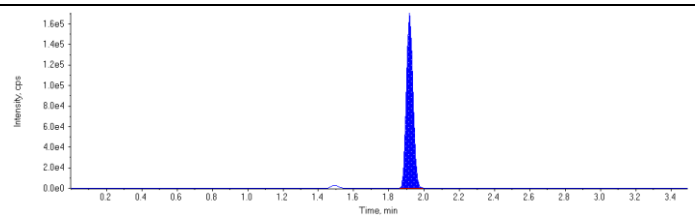
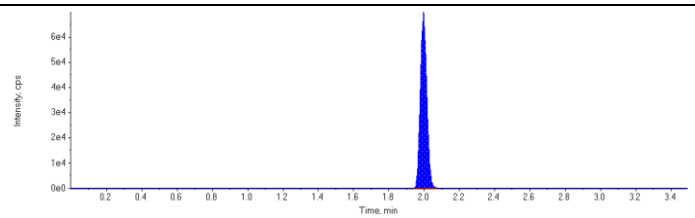
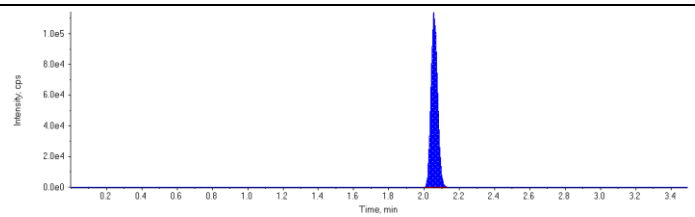
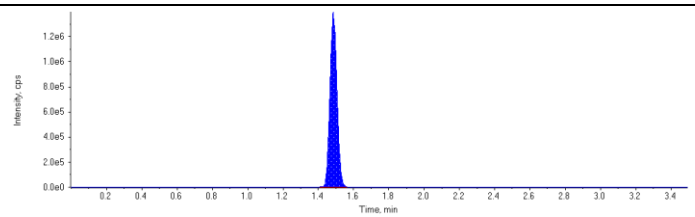


N/A (Internal Standard)

RT (Exp. RT): N/A(N/A) min
Concentration: N/A N/A
Sample Type: (Standard)

This image is not available

PFBS 1 (298.900/79.900 Da) RT (Exp. RT): 1.16 (1.15) min Calculated Conc: 3.86 µg/L Area Ratio: 1.03 Sample Type: (Standard)	
PFHxS 1 (398.900/79.900 Da) RT (Exp. RT): 1.71 (1.68) min Calculated Conc: 3.68 µg/L Area Ratio: 1.03 Sample Type: (Standard)	
PFHpA 1 (363.000/319.000 Da) RT (Exp. RT): 1.74 (1.75) min Calculated Conc: 3.72 µg/L Area Ratio: 0.491 Sample Type: (Standard)	
PFOA 1 (413.100/369.000 Da) RT (Exp. RT): 1.92 (1.92) min Calculated Conc: 3.73 µg/L Area Ratio: 0.584 Sample Type: (Standard)	
PFOS 1 (498.900/79.900 Da) RT (Exp. RT): 1.99 (1.97) min Calculated Conc: 3.63 µg/L Area Ratio: 0.627 Sample Type: (Standard)	
PFNA 1 (462.900/419.000 Da) RT (Exp. RT): 2.06 (2.02) min Calculated Conc: 3.74 µg/L Area Ratio: 0.597 Sample Type: (Standard)	

18O2-PFHxS (402.900/84.000 Da) RT (Exp. RT): 1.71 (1.68) min Calculated Conc: 103. µg/L Area Ratio: 0.0378 Sample Type: (Standard)	
13C4-PFHpA (366.900/322.000 Da) RT (Exp. RT): 1.74 (1.75) min Calculated Conc: 105. µg/L Area Ratio: 0.129 Sample Type: (Standard)	
13C4-PFOA (416.900/372.000 Da) RT (Exp. RT): 1.92 (1.88) min Calculated Conc: 105. µg/L Area Ratio: 0.114 Sample Type: (Standard)	
13C4-PFOS (502.900/79.900 Da) RT (Exp. RT): 2.00 (1.97) min Calculated Conc: 105. µg/L Area Ratio: 0.0456 Sample Type: (Standard)	
13C5-PFNA (467.900/423.000 Da) RT (Exp. RT): 2.06 (2.02) min Calculated Conc: 104. µg/L Area Ratio: 0.0763 Sample Type: (Standard)	
13C6-PFHxA (318.900/274.000 Da) RT (Exp. RT): 1.49 (1.42) min Calculated Conc: 97.3 µg/L Area Ratio: 0.00 Sample Type: (Standard)	

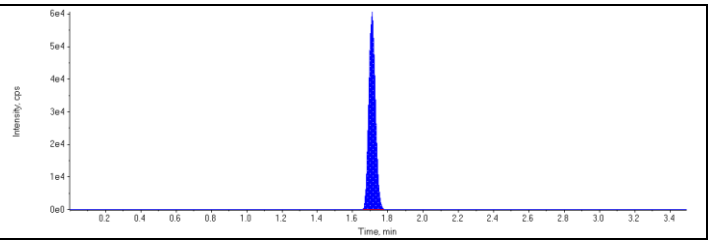
Sample Name	**STD 3**	**Injection Vial**	5
Sample ID	STD 3	**Injection Volume (µL)**	3
Sample Type	Standard	**Algorithm Used**	Analyst Classic
Acquisition Date	2016/02/19 7:55:19 AM	**Dilution Factor**	1.00
Acquisition Method	PFC_Water_Low.dam	**Sample Annotation**	-
Project	Enviro\PFOS	**Instrument Name**	LCMS03
Data File	PFC_160219\WS#4386408.wiff		
Result Table	PFC_Water_160219_4386408_ULow.rdb		

Internal Standard	Area (cps)	RT (min)	Target Conc. (ng/L)	Calc. Conc. (ng/L)
MPFHxS	156000.	1.71	1.00	-
MPFHpA	498000.	1.74	1.00	-
MPFOA	435000.	1.92	1.00	-
MPFOS	167000.	2.00	1.00	-
MPFNA	307000.	2.06	1.00	-
13C6-PFHxA IS	3890000.	1.48	1.00	-
N/A	N/A	N/A	N/A	-

Target Analyte	Area (cps)	RT (min)	Target Conc. (ng/L)	Calc. Conc. (ng/L)	Accuracy (%)
PFBS 1	482000	1.16	12.0	10.4	87.0
PFHxS 1	518000	1.71	12.0	10.6	88.1
PFHpA 1	764000	1.74	12.0	11.5	95.5
PFOA 1	835000	1.92	12.0	11.8	98.4
PFOS 1	356000	1.99	12.0	11.9	99.2
PFNA 1	570000	2.06	12.0	11.3	94.2
18O2-PFHxS	156000	1.71	100.	109.	109.0
13C4-PFHpA	498000	1.74	100.	104.	104.0
13C4-PFOA	435000	1.92	100.	104.	104.0
13C4-PFOS	167000	2.00	100.	99.4	99.4
13C5-PFNA	307000	2.06	100.	107.	107.0
13C6-PFHxA	3890000	1.48	100.	97.4	97.4

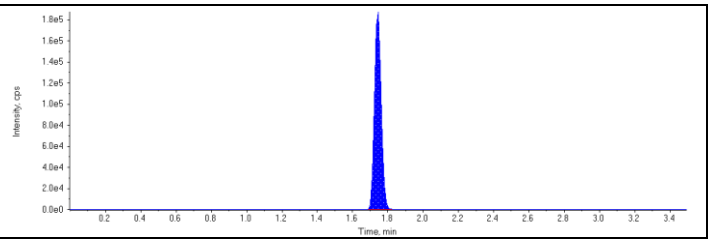
MPFHxS (Internal Standard)

RT (Exp. RT): 1.71(1.68) min
Concentration: 1.00 ng/L
Sample Type: (Standard)



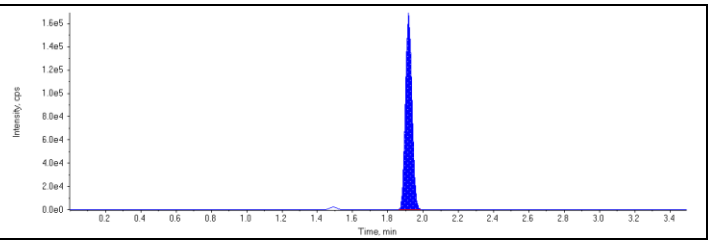
MPFHpA (Internal Standard)

RT (Exp. RT): 1.74(1.75) min
Concentration: 1.00 ng/L
Sample Type: (Standard)



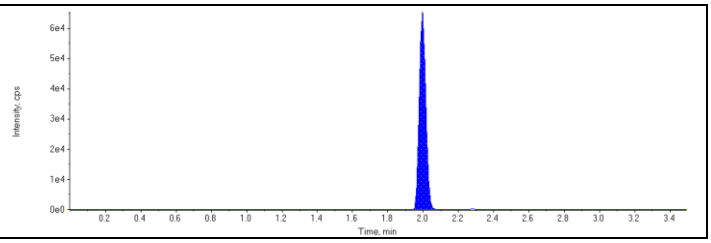
MPFOA (Internal Standard)

RT (Exp. RT): 1.92(1.88) min
Concentration: 1.00 ng/L
Sample Type: (Standard)



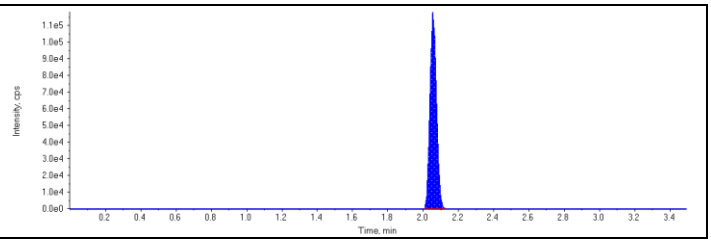
MPFOS (Internal Standard)

RT (Exp. RT): 2.00(1.97) min
Concentration: 1.00 ng/L
Sample Type: (Standard)



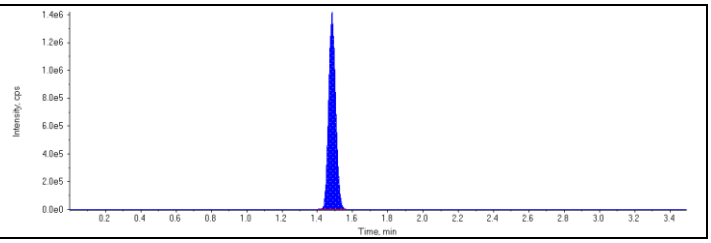
MPFNA (Internal Standard)

RT (Exp. RT): 2.06(2.02) min
Concentration: 1.00 ng/L
Sample Type: (Standard)



13C6-PFHxA IS (Internal Standard)

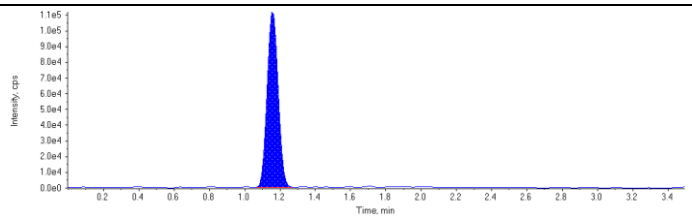
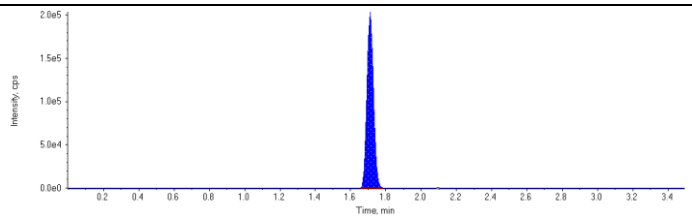
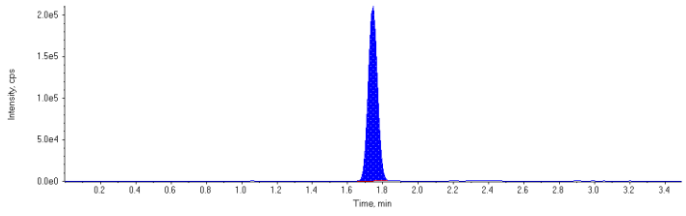
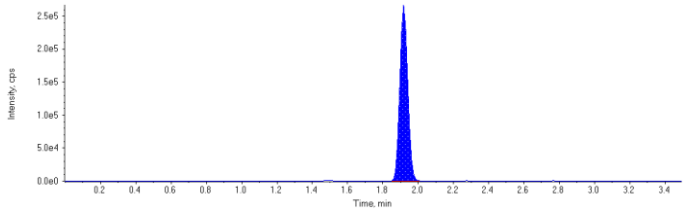
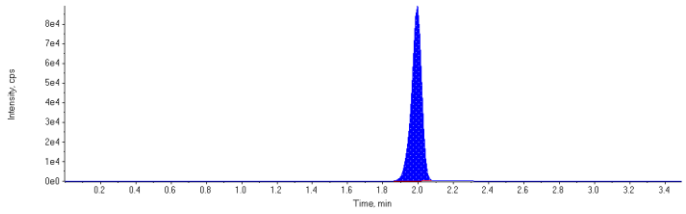
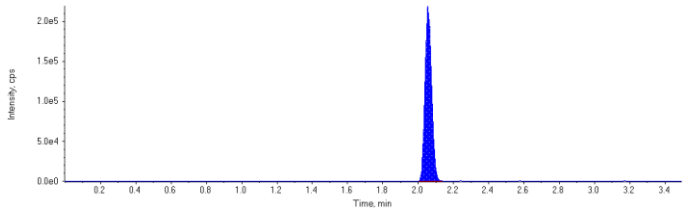
RT (Exp. RT): 1.48(1.42) min
Concentration: 1.00 ng/L
Sample Type: (Standard)

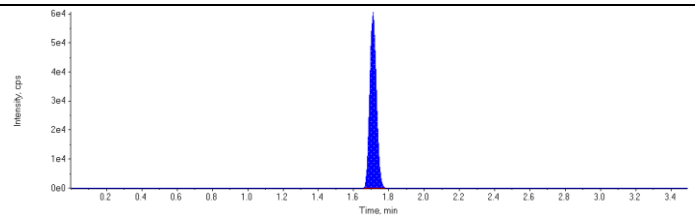
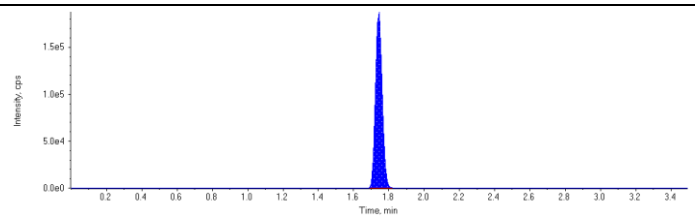
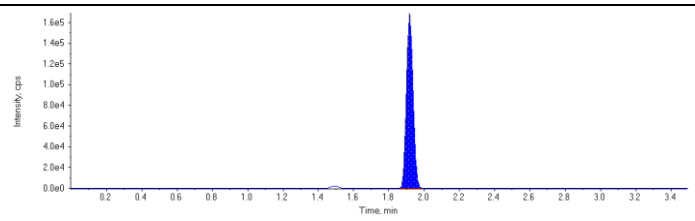
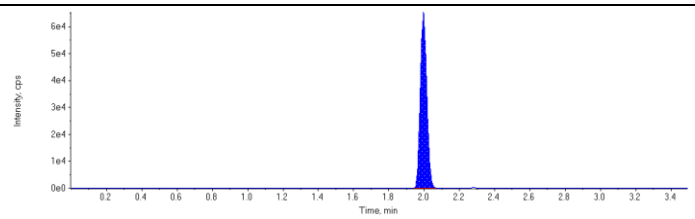
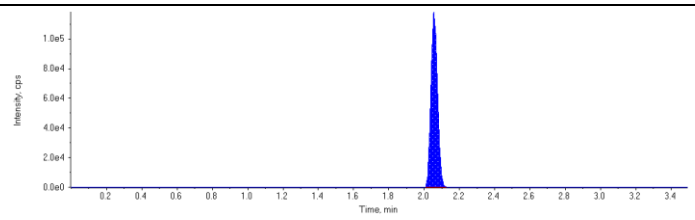
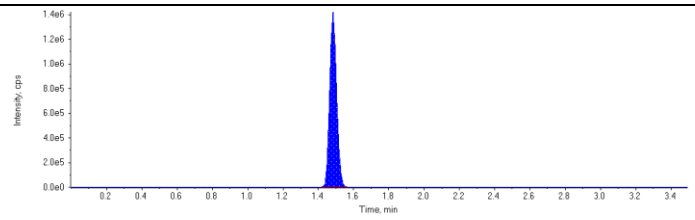


N/A (Internal Standard)

RT (Exp. RT): N/A(N/A) min
Concentration: N/A N/A
Sample Type: (Standard)

This image is not available

PFBS 1 (298.900/79.900 Da) RT (Exp. RT): 1.16 (1.15) min Calculated Conc: 10.4 µg/L Area Ratio: 3.09 Sample Type: (Standard)	
PFHxS 1 (398.900/79.900 Da) RT (Exp. RT): 1.71 (1.68) min Calculated Conc: 10.6 µg/L Area Ratio: 3.32 Sample Type: (Standard)	
PFHpA 1 (363.000/319.000 Da) RT (Exp. RT): 1.74 (1.75) min Calculated Conc: 11.5 µg/L Area Ratio: 1.53 Sample Type: (Standard)	
PFOA 1 (413.100/369.000 Da) RT (Exp. RT): 1.92 (1.92) min Calculated Conc: 11.8 µg/L Area Ratio: 1.92 Sample Type: (Standard)	
PFOS 1 (498.900/79.900 Da) RT (Exp. RT): 1.99 (1.97) min Calculated Conc: 11.9 µg/L Area Ratio: 2.13 Sample Type: (Standard)	
PFNA 1 (462.900/419.000 Da) RT (Exp. RT): 2.06 (2.02) min Calculated Conc: 11.3 µg/L Area Ratio: 1.86 Sample Type: (Standard)	

18O2-PFHxS (402.900/84.000 Da) RT (Exp. RT): 1.71 (1.68) min Calculated Conc: 109. µg/L Area Ratio: 0.0401 Sample Type: (Standard)	
13C4-PFHpA (366.900/322.000 Da) RT (Exp. RT): 1.74 (1.75) min Calculated Conc: 104. µg/L Area Ratio: 0.128 Sample Type: (Standard)	
13C4-PFOA (416.900/372.000 Da) RT (Exp. RT): 1.92 (1.88) min Calculated Conc: 104. µg/L Area Ratio: 0.112 Sample Type: (Standard)	
13C4-PFOS (502.900/79.900 Da) RT (Exp. RT): 2.00 (1.97) min Calculated Conc: 99.4 µg/L Area Ratio: 0.0429 Sample Type: (Standard)	
13C5-PFNA (467.900/423.000 Da) RT (Exp. RT): 2.06 (2.02) min Calculated Conc: 107. µg/L Area Ratio: 0.0791 Sample Type: (Standard)	
13C6-PFHxA (318.900/274.000 Da) RT (Exp. RT): 1.48 (1.42) min Calculated Conc: 97.4 µg/L Area Ratio: 0.00 Sample Type: (Standard)	

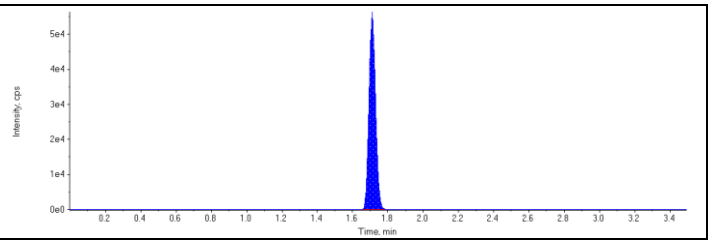
Sample Name	**STD 4**	**Injection Vial**	6
Sample ID	STD 4	**Injection Volume (µL)**	3
Sample Type	Standard	**Algorithm Used**	Analyst Classic
Acquisition Date	2016/02/19 8:00:24 AM	**Dilution Factor**	1.00
Acquisition Method	PFC_Water_Low.dam	**Sample Annotation**	-
Project	Enviro\PFOS	**Instrument Name**	LCMS03
Data File	PFC_160219\WS#4386408.wiff		
Result Table	PFC_Water_160219_4386408_ULow.rdb		

Internal Standard	Area (cps)	RT (min)	Target Conc. (ng/L)	Calc. Conc. (ng/L)
MPFHxS	144000.	1.71	1.00	-
MPFHpA	467000.	1.74	1.00	-
MPFOA	447000.	1.92	1.00	-
MPFOS	172000.	2.00	1.00	-
MPFNA	296000.	2.06	1.00	-
13C6-PFHxA IS	4090000.	1.48	1.00	-
N/A	N/A	N/A	N/A	-

Target Analyte	Area (cps)	RT (min)	Target Conc. (ng/L)	Calc. Conc. (ng/L)	Accuracy (%)
PFBS 1	1290000	1.16	30.0	29.3	97.5
PFHxS 1	1470000	1.71	30.0	31.3	104.0
PFHpA 1	2080000	1.74	30.0	33.2	111.0
PFOA 1	2220000	1.92	30.0	30.3	101.0
PFOS 1	944000	1.99	30.0	30.3	101.0
PFNA 1	1500000	2.06	30.0	30.6	102.0
18O2-PFHxS	144000	1.71	100.	95.4	95.4
13C4-PFHpA	467000	1.74	100.	92.3	92.3
13C4-PFOA	447000	1.92	100.	101.	101.0
13C4-PFOS	172000	2.00	100.	97.3	97.3
13C5-PFNA	296000	2.06	100.	98.3	98.3
13C6-PFHxA	4090000	1.48	100.	102.	102.0

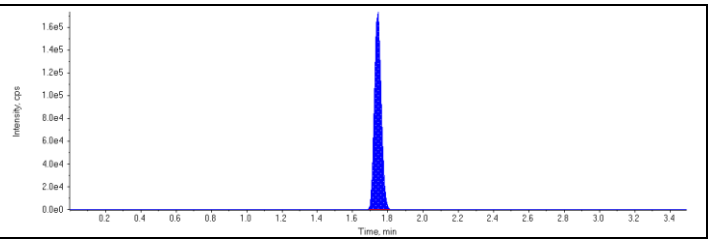
MPFHxS (Internal Standard)

RT (Exp. RT): 1.71(1.68) min
Concentration: 1.00 ng/L
Sample Type: (Standard)



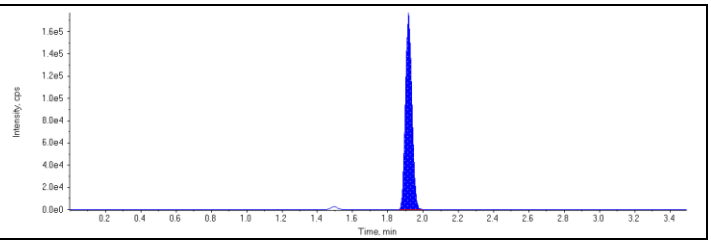
MPFHpA (Internal Standard)

RT (Exp. RT): 1.74(1.75) min
Concentration: 1.00 ng/L
Sample Type: (Standard)



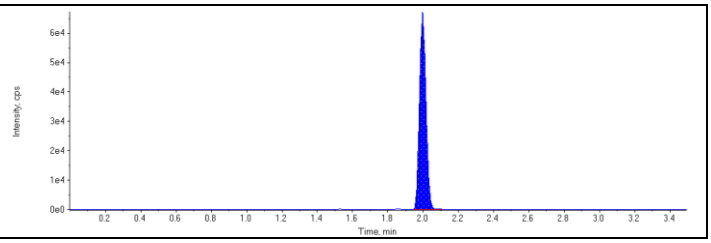
MPFOA (Internal Standard)

RT (Exp. RT): 1.92(1.88) min
Concentration: 1.00 ng/L
Sample Type: (Standard)



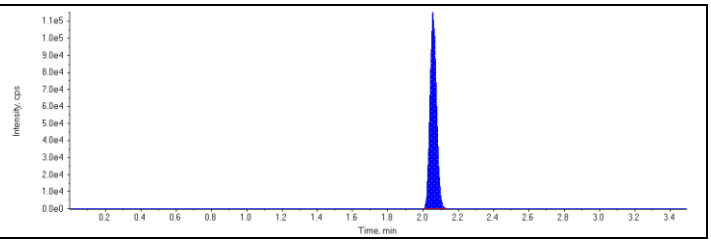
MPFOS (Internal Standard)

RT (Exp. RT): 2.00(1.97) min
Concentration: 1.00 ng/L
Sample Type: (Standard)



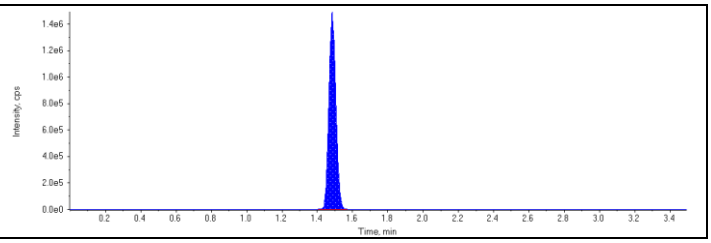
MPFNA (Internal Standard)

RT (Exp. RT): 2.06(2.02) min
Concentration: 1.00 ng/L
Sample Type: (Standard)



13C6-PFHxA IS (Internal Standard)

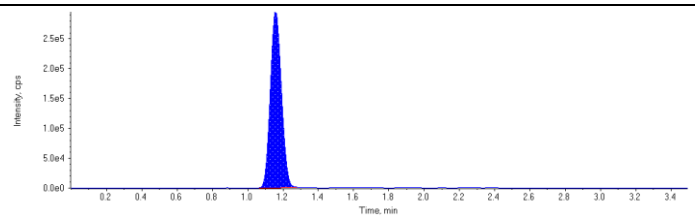
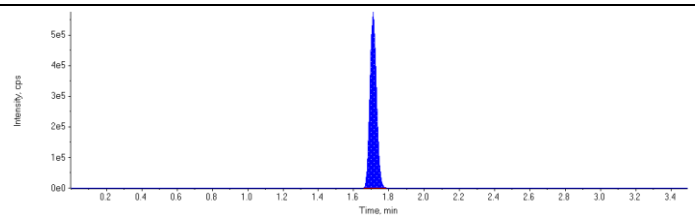
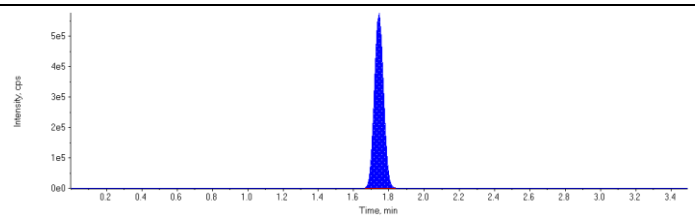
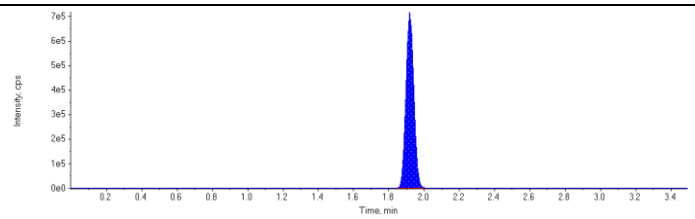
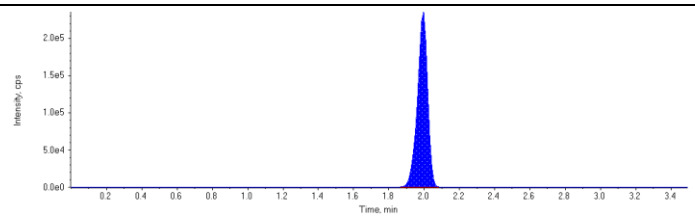
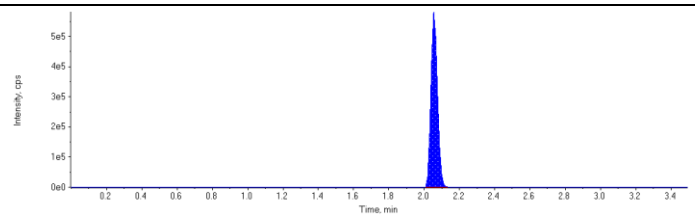
RT (Exp. RT): 1.48(1.42) min
Concentration: 1.00 ng/L
Sample Type: (Standard)

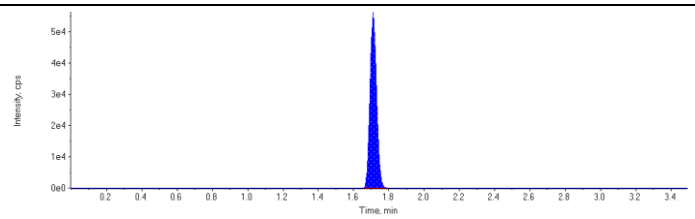
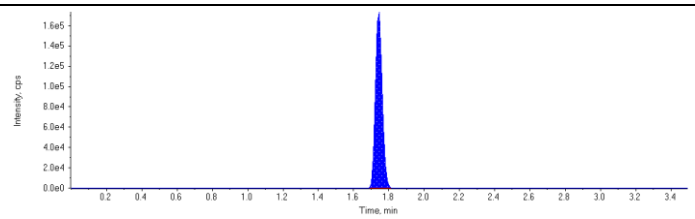
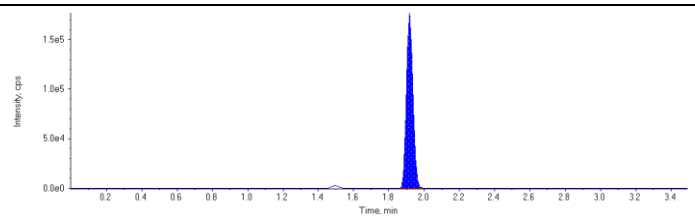
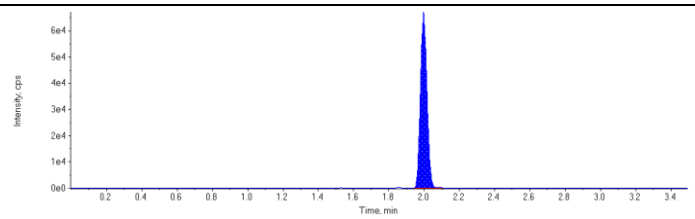
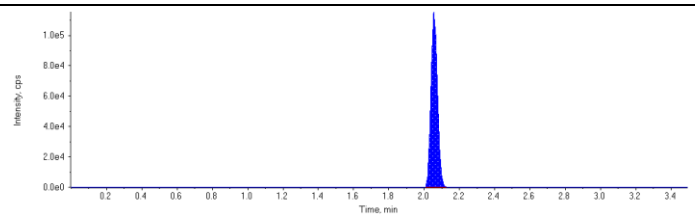
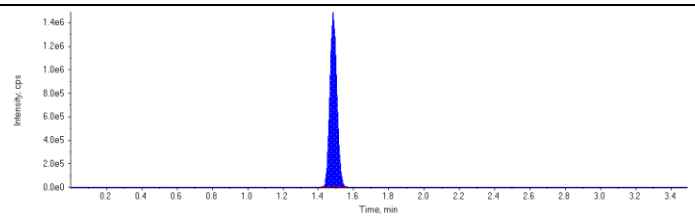


N/A (Internal Standard)

RT (Exp. RT): N/A(N/A) min
Concentration: N/A N/A
Sample Type: (Standard)

This image is not available

PFBS 1 (298.900/79.900 Da) RT (Exp. RT): 1.16 (1.15) min Calculated Conc: 29.3 µg/L Area Ratio: 8.98 Sample Type: (Standard)	
PFHxS 1 (398.900/79.900 Da) RT (Exp. RT): 1.71 (1.68) min Calculated Conc: 31.3 µg/L Area Ratio: 10.2 Sample Type: (Standard)	
PFHpA 1 (363.000/319.000 Da) RT (Exp. RT): 1.74 (1.75) min Calculated Conc: 33.2 µg/L Area Ratio: 4.46 Sample Type: (Standard)	
PFOA 1 (413.100/369.000 Da) RT (Exp. RT): 1.92 (1.92) min Calculated Conc: 30.3 µg/L Area Ratio: 4.97 Sample Type: (Standard)	
PFOS 1 (498.900/79.900 Da) RT (Exp. RT): 1.99 (1.97) min Calculated Conc: 30.3 µg/L Area Ratio: 5.49 Sample Type: (Standard)	
PFNA 1 (462.900/419.000 Da) RT (Exp. RT): 2.06 (2.02) min Calculated Conc: 30.6 µg/L Area Ratio: 5.07 Sample Type: (Standard)	

18O2-PFHxS (402.900/84.000 Da) RT (Exp. RT): 1.71 (1.68) min Calculated Conc: 95.4 µg/L Area Ratio: 0.0351 Sample Type: (Standard)	
13C4-PFHpA (366.900/322.000 Da) RT (Exp. RT): 1.74 (1.75) min Calculated Conc: 92.3 µg/L Area Ratio: 0.114 Sample Type: (Standard)	
13C4-PFOA (416.900/372.000 Da) RT (Exp. RT): 1.92 (1.88) min Calculated Conc: 101. µg/L Area Ratio: 0.109 Sample Type: (Standard)	
13C4-PFOS (502.900/79.900 Da) RT (Exp. RT): 2.00 (1.97) min Calculated Conc: 97.3 µg/L Area Ratio: 0.0420 Sample Type: (Standard)	
13C5-PFNA (467.900/423.000 Da) RT (Exp. RT): 2.06 (2.02) min Calculated Conc: 98.3 µg/L Area Ratio: 0.0723 Sample Type: (Standard)	
13C6-PFHxA (318.900/274.000 Da) RT (Exp. RT): 1.48 (1.42) min Calculated Conc: 102. µg/L Area Ratio: 0.00 Sample Type: (Standard)	

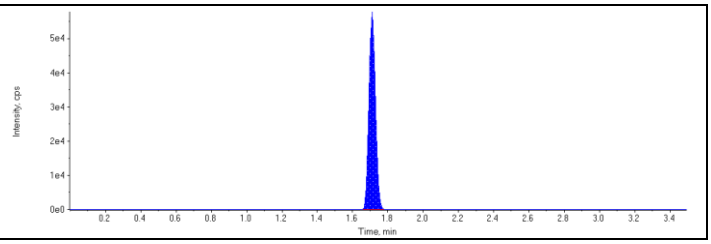
Sample Name	**STD 5**	**Injection Vial**	7
Sample ID	STD 5	**Injection Volume (µL)**	3
Sample Type	Standard	**Algorithm Used**	Analyst Classic
Acquisition Date	2016/02/19 8:05:30 AM	**Dilution Factor**	1.00
Acquisition Method	PFC_Water_Low.dam	**Sample Annotation**	-
Project	Enviro\PFOS	**Instrument Name**	LCMS03
Data File	PFC_160219\WS#4386408.wiff		
Result Table	PFC_Water_160219_4386408_ULow.rdb		

Internal Standard	Area (cps)	RT (min)	Target Conc. (ng/L)	Calc. Conc. (ng/L)
MPFHxS	147000.	1.71	1.00	-
MPFHpA	499000.	1.74	1.00	-
MPFOA	448000.	1.92	1.00	-
MPFOS	186000.	2.00	1.00	-
MPFNA	296000.	2.06	1.00	-
13C6-PFHxA IS	4060000.	1.48	1.00	-
N/A	N/A	N/A	N/A	-

Target Analyte	Area (cps)	RT (min)	Target Conc. (ng/L)	Calc. Conc. (ng/L)	Accuracy (%)
PFBS 1	2520000	1.16	60.0	55.2	92.0
PFHxS 1	2760000	1.71	60.0	57.0	95.1
PFHpA 1	3790000	1.74	60.0	56.5	94.2
PFOA 1	4130000	1.92	60.0	56.1	93.5
PFOS 1	1700000	1.99	60.0	50.5	84.1
PFNA 1	2810000	2.06	60.0	57.2	95.3
18O2-PFHxS	147000	1.71	100.	98.3	98.3
13C4-PFHpA	499000	1.74	100.	99.2	99.2
13C4-PFOA	448000	1.92	100.	102.	102.0
13C4-PFOS	186000	2.00	100.	106.	106.0
13C5-PFNA	296000	2.06	100.	99.1	99.1
13C6-PFHxA	4060000	1.48	100.	102.	102.0

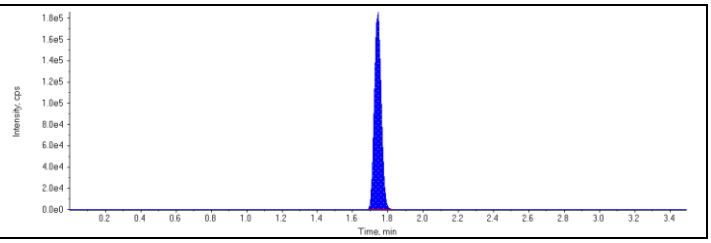
MPFHxS (Internal Standard)

RT (Exp. RT): 1.71(1.68) min
Concentration: 1.00 ng/L
Sample Type: (Standard)



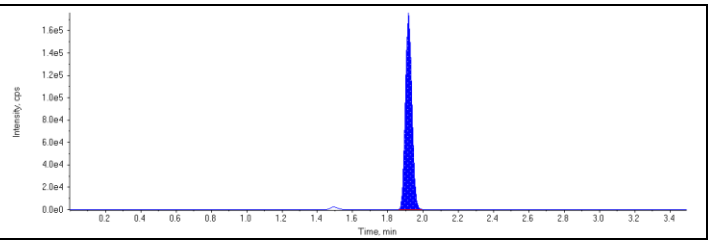
MPFHpA (Internal Standard)

RT (Exp. RT): 1.74(1.75) min
Concentration: 1.00 ng/L
Sample Type: (Standard)



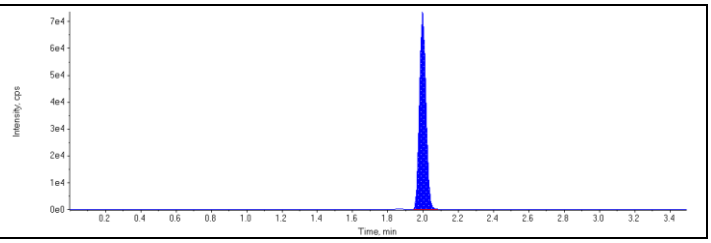
MPFOA (Internal Standard)

RT (Exp. RT): 1.92(1.88) min
Concentration: 1.00 ng/L
Sample Type: (Standard)



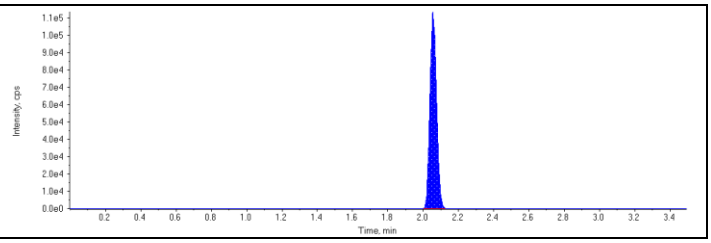
MPFOS (Internal Standard)

RT (Exp. RT): 2.00(1.97) min
Concentration: 1.00 ng/L
Sample Type: (Standard)



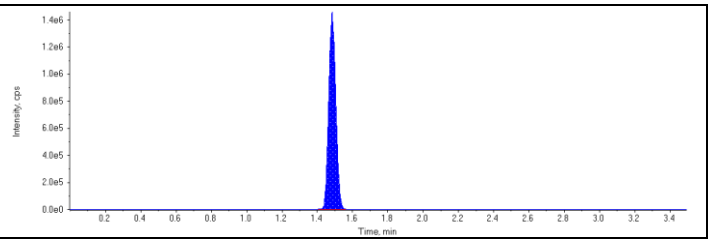
MPFNA (Internal Standard)

RT (Exp. RT): 2.06(2.02) min
Concentration: 1.00 ng/L
Sample Type: (Standard)



13C6-PFHxA IS (Internal Standard)

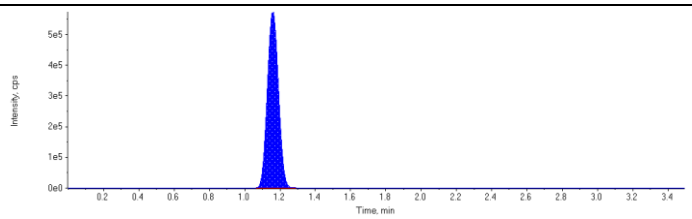
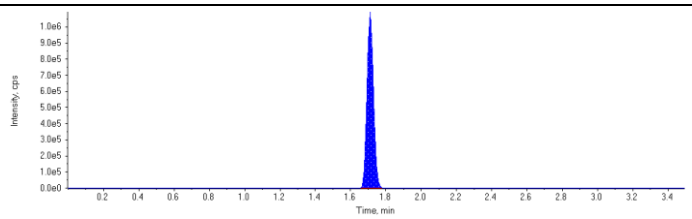
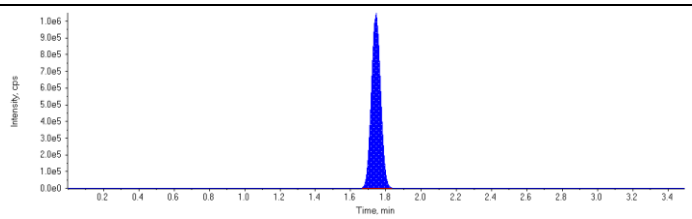
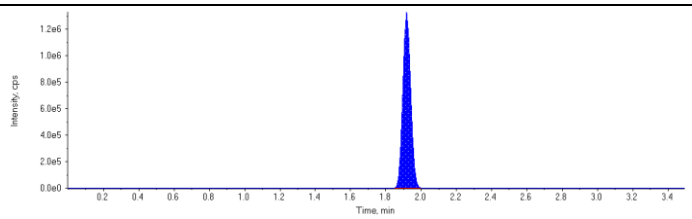
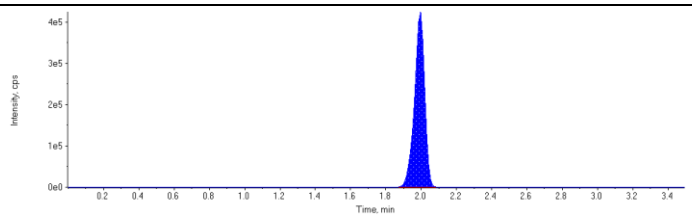
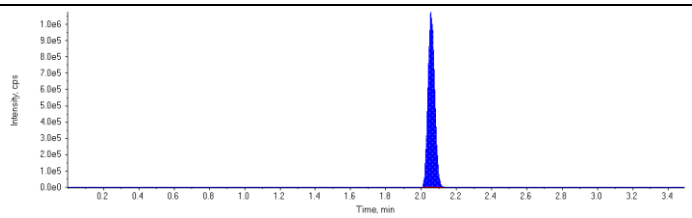
RT (Exp. RT): 1.48(1.42) min
Concentration: 1.00 ng/L
Sample Type: (Standard)

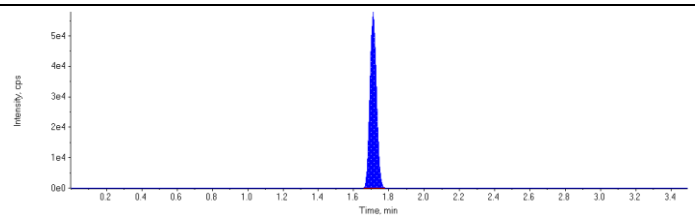
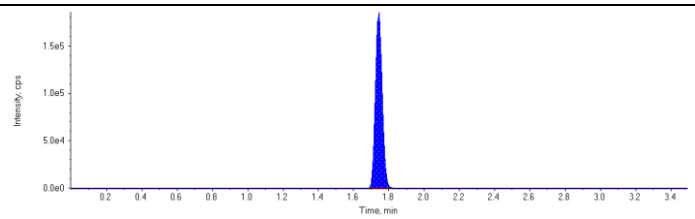
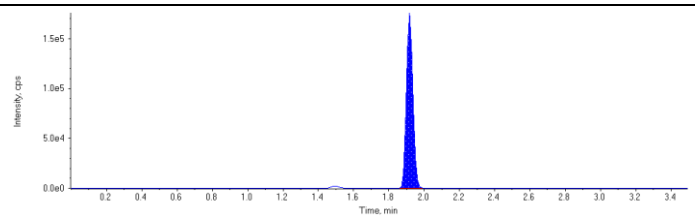
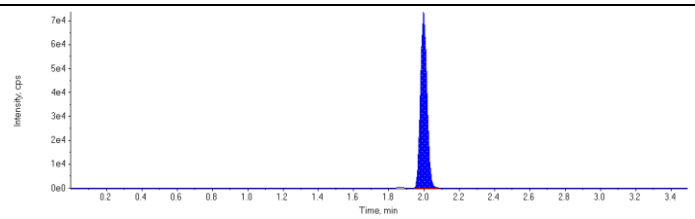
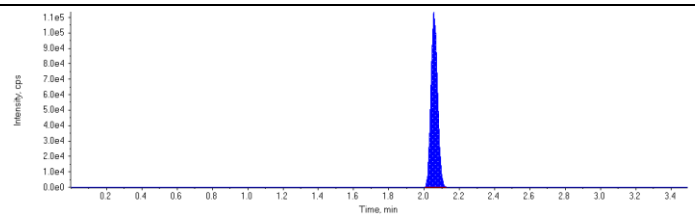
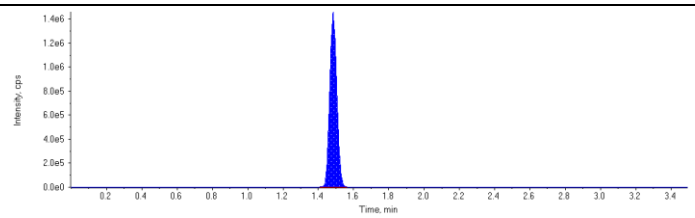


N/A (Internal Standard)

RT (Exp. RT): N/A(N/A) min
Concentration: N/A N/A
Sample Type: (Standard)

This image is not available

PFBS 1 (298.900/79.900 Da) RT (Exp. RT): 1.16 (1.15) min Calculated Conc: 55.2 µg/L Area Ratio: 17.1 Sample Type: (Standard)	
PFHxS 1 (398.900/79.900 Da) RT (Exp. RT): 1.71 (1.68) min Calculated Conc: 57.0 µg/L Area Ratio: 18.8 Sample Type: (Standard)	
PFHpA 1 (363.000/319.000 Da) RT (Exp. RT): 1.74 (1.75) min Calculated Conc: 56.5 µg/L Area Ratio: 7.60 Sample Type: (Standard)	
PFOA 1 (413.100/369.000 Da) RT (Exp. RT): 1.92 (1.92) min Calculated Conc: 56.1 µg/L Area Ratio: 9.23 Sample Type: (Standard)	
PFOS 1 (498.900/79.900 Da) RT (Exp. RT): 1.99 (1.97) min Calculated Conc: 50.5 µg/L Area Ratio: 9.16 Sample Type: (Standard)	
PFNA 1 (462.900/419.000 Da) RT (Exp. RT): 2.06 (2.02) min Calculated Conc: 57.2 µg/L Area Ratio: 9.50 Sample Type: (Standard)	

18O2-PFHxS (402.900/84.000 Da) RT (Exp. RT): 1.71 (1.68) min Calculated Conc: 98.3 µg/L Area Ratio: 0.0362 Sample Type: (Standard)	
13C4-PFHpA (366.900/322.000 Da) RT (Exp. RT): 1.74 (1.75) min Calculated Conc: 99.2 µg/L Area Ratio: 0.123 Sample Type: (Standard)	
13C4-PFOA (416.900/372.000 Da) RT (Exp. RT): 1.92 (1.88) min Calculated Conc: 102. µg/L Area Ratio: 0.110 Sample Type: (Standard)	
13C4-PFOS (502.900/79.900 Da) RT (Exp. RT): 2.00 (1.97) min Calculated Conc: 106. µg/L Area Ratio: 0.0458 Sample Type: (Standard)	
13C5-PFNA (467.900/423.000 Da) RT (Exp. RT): 2.06 (2.02) min Calculated Conc: 99.1 µg/L Area Ratio: 0.0729 Sample Type: (Standard)	
13C6-PFHxA (318.900/274.000 Da) RT (Exp. RT): 1.48 (1.42) min Calculated Conc: 102. µg/L Area Ratio: 0.00 Sample Type: (Standard)	

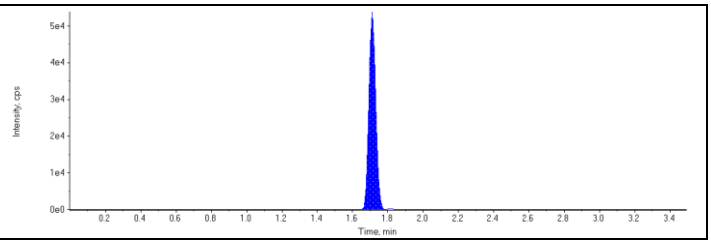
Sample Name	**STD 6**	**Injection Vial**	8
Sample ID	STD 6	**Injection Volume (µL)**	3
Sample Type	Standard	**Algorithm Used**	Analyst Classic
Acquisition Date	2016/02/19 8:10:36 AM	**Dilution Factor**	1.00
Acquisition Method	PFC_Water_Low.dam	**Sample Annotation**	-
Project	Enviro\PFOS	**Instrument Name**	LCMS03
Data File	PFC_160219\WS#4386408.wiff		
Result Table	PFC_Water_160219_4386408_ULow.rdb		

Internal Standard	Area (cps)	RT (min)	Target Conc. (ng/L)	Calc. Conc. (ng/L)
MPFHxS	142000.	1.71	1.00	-
MPFHpA	477000.	1.74	1.00	-
MPFOA	398000.	1.92	1.00	-
MPFOS	154000.	2.00	1.00	-
MPFNA	275000.	2.06	1.00	-
13C6-PFHxA IS	3980000.	1.48	1.00	-
N/A	N/A	N/A	N/A	-

Target Analyte	Area (cps)	RT (min)	Target Conc. (ng/L)	Calc. Conc. (ng/L)	Accuracy (%)
PFBS 1	4720000	1.16	100.	107.	107.0
PFHxS 1	4830000	1.71	100.	103.	103.0
PFHpA 1	6480000	1.74	100.	101.	101.0
PFOA 1	6810000	1.92	100.	104.	104.0
PFOS 1	3060000	2.00	100.	109.	109.0
PFNA 1	4710000	2.06	100.	103.	103.0
18O2-PFHxS	142000	1.71	100.	96.8	96.8
13C4-PFHpA	477000	1.74	100.	96.9	96.9
13C4-PFOA	398000	1.92	100.	92.7	92.7
13C4-PFOS	154000	2.00	100.	89.4	89.4
13C5-PFNA	275000	2.06	100.	94.0	94.0
13C6-PFHxA	3980000	1.48	100.	99.7	99.7

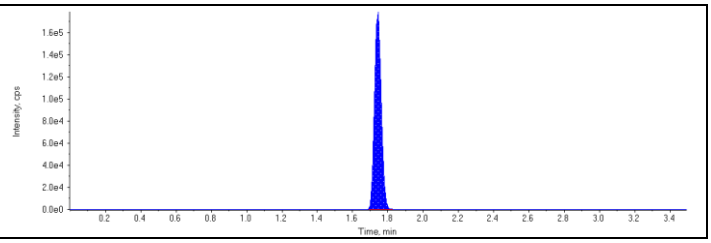
MPFHxS (Internal Standard)

RT (Exp. RT): 1.71(1.68) min
Concentration: 1.00 ng/L
Sample Type: (Standard)



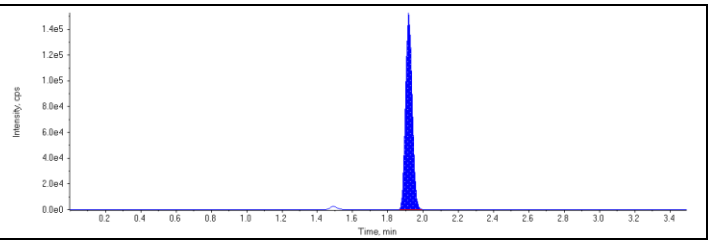
MPFHpA (Internal Standard)

RT (Exp. RT): 1.74(1.75) min
Concentration: 1.00 ng/L
Sample Type: (Standard)



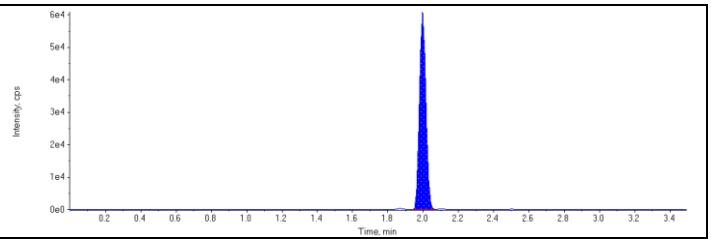
MPFOA (Internal Standard)

RT (Exp. RT): 1.92(1.88) min
Concentration: 1.00 ng/L
Sample Type: (Standard)



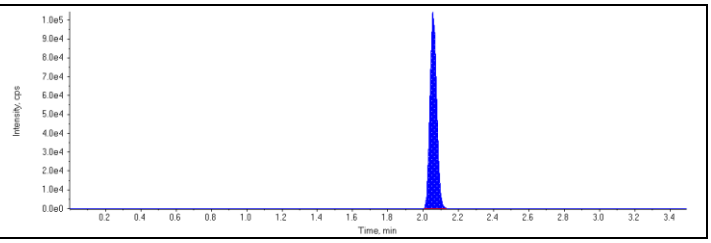
MPFOS (Internal Standard)

RT (Exp. RT): 2.00(1.97) min
Concentration: 1.00 ng/L
Sample Type: (Standard)



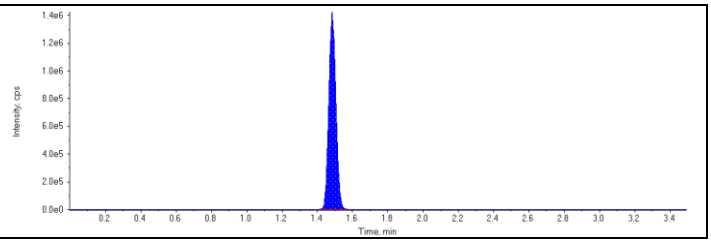
MPFNA (Internal Standard)

RT (Exp. RT): 2.06(2.02) min
Concentration: 1.00 ng/L
Sample Type: (Standard)



13C6-PFHxA IS (Internal Standard)

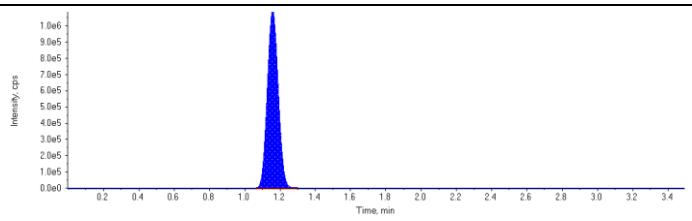
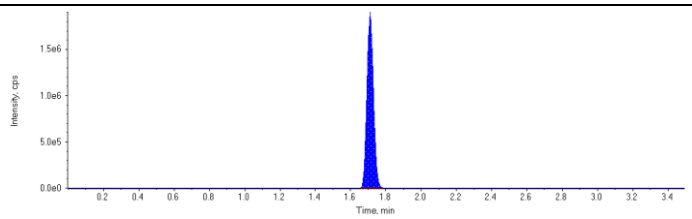
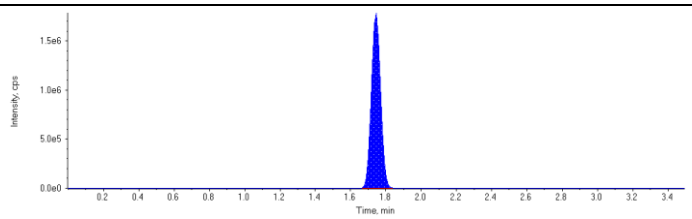
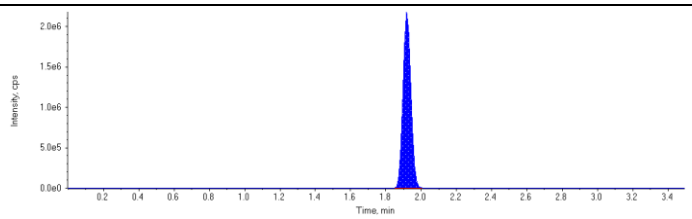
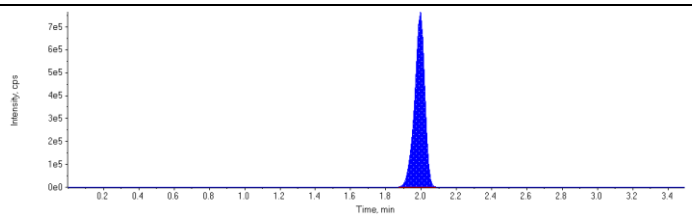
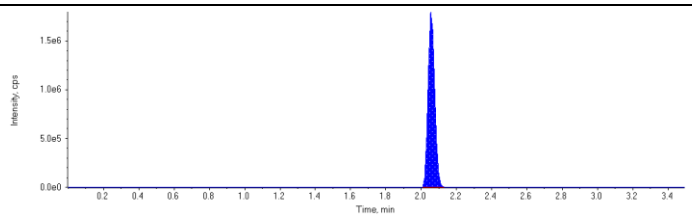
RT (Exp. RT): 1.48(1.42) min
Concentration: 1.00 ng/L
Sample Type: (Standard)

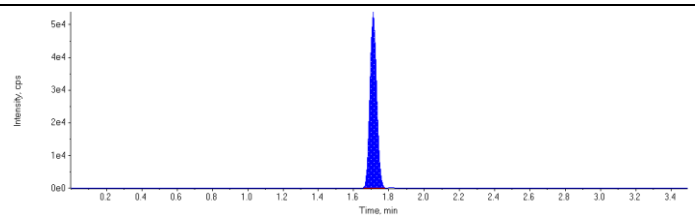
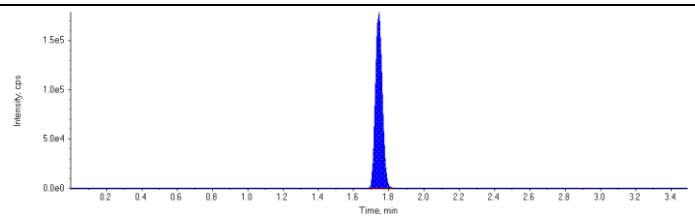
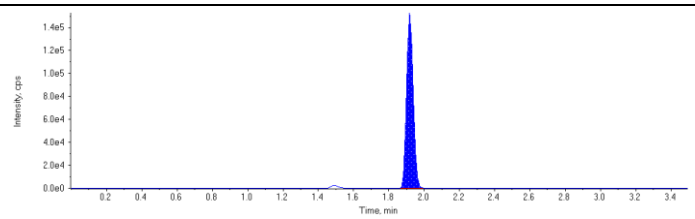
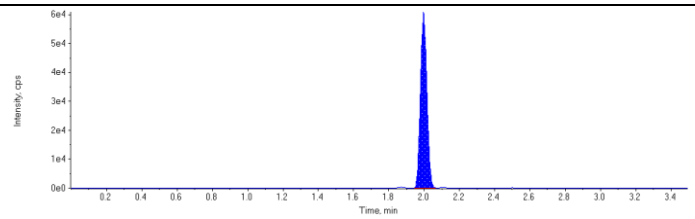
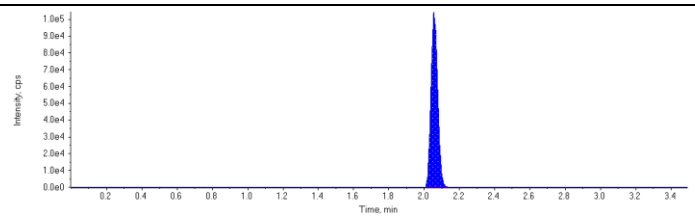
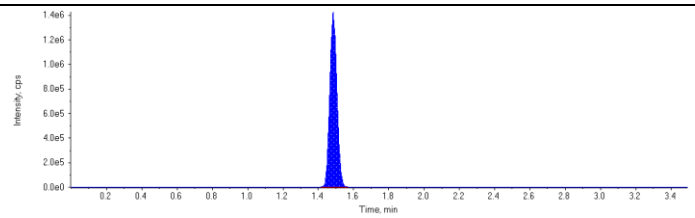


N/A (Internal Standard)

RT (Exp. RT): N/A(N/A) min
Concentration: N/A N/A
Sample Type: (Standard)

This image is not available

PFBS 1 (298.900/79.900 Da) RT (Exp. RT): 1.16 (1.15) min Calculated Conc: 107. µg/L Area Ratio: 33.3 Sample Type: (Standard)	
PFHxS 1 (398.900/79.900 Da) RT (Exp. RT): 1.71 (1.68) min Calculated Conc: 103. µg/L Area Ratio: 34.1 Sample Type: (Standard)	
PFHpA 1 (363.000/319.000 Da) RT (Exp. RT): 1.74 (1.75) min Calculated Conc: 101. µg/L Area Ratio: 13.6 Sample Type: (Standard)	
PFOA 1 (413.100/369.000 Da) RT (Exp. RT): 1.92 (1.92) min Calculated Conc: 104. µg/L Area Ratio: 17.1 Sample Type: (Standard)	
PFOS 1 (498.900/79.900 Da) RT (Exp. RT): 2.00 (1.97) min Calculated Conc: 109. µg/L Area Ratio: 19.9 Sample Type: (Standard)	
PFNA 1 (462.900/419.000 Da) RT (Exp. RT): 2.06 (2.02) min Calculated Conc: 103. µg/L Area Ratio: 17.1 Sample Type: (Standard)	

18O2-PFHxS (402.900/84.000 Da) RT (Exp. RT): 1.71 (1.68) min Calculated Conc: 96.8 µg/L Area Ratio: 0.0356 Sample Type: (Standard)	
13C4-PFHpA (366.900/322.000 Da) RT (Exp. RT): 1.74 (1.75) min Calculated Conc: 96.9 µg/L Area Ratio: 0.120 Sample Type: (Standard)	
13C4-PFOA (416.900/372.000 Da) RT (Exp. RT): 1.92 (1.88) min Calculated Conc: 92.7 µg/L Area Ratio: 0.100 Sample Type: (Standard)	
13C4-PFOS (502.900/79.900 Da) RT (Exp. RT): 2.00 (1.97) min Calculated Conc: 89.4 µg/L Area Ratio: 0.0386 Sample Type: (Standard)	
13C5-PFNA (467.900/423.000 Da) RT (Exp. RT): 2.06 (2.02) min Calculated Conc: 94.0 µg/L Area Ratio: 0.0692 Sample Type: (Standard)	
13C6-PFHxA (318.900/274.000 Da) RT (Exp. RT): 1.48 (1.42) min Calculated Conc: 99.7 µg/L Area Ratio: 0.00 Sample Type: (Standard)	

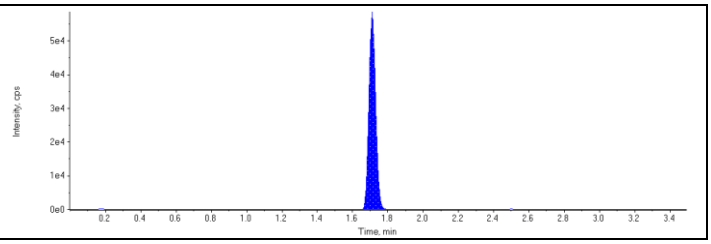
Sample Name	**ICV**	**Injection Vial**	9
Sample ID	ICV	**Injection Volume (µL)**	3
Sample Type	Quality Control	**Algorithm Used**	Analyst Classic
Acquisition Date	2016/02/19 8:15:41 AM	**Dilution Factor**	1.00
Acquisition Method	PFC_Water_Low.dam	**Sample Annotation**	-
Project	Enviro\PFOS	**Instrument Name**	LCMS03
Data File	PFC_160219\WS#4386408.wiff		
Result Table	PFC_Water_160219_4386408_ULow.rdb		

Internal Standard	Area (cps)	RT (min)	Target Conc. (ng/L)	Calc. Conc. (ng/L)
MPFHxS	152000.	1.71	1.00	-
MPFHpA	517000.	1.74	1.00	-
MPFOA	437000.	1.92	1.00	-
MPFOS	163000.	2.00	1.00	-
MPFNA	297000.	2.06	1.00	-
13C6-PFHxA IS	4130000.	1.48	1.00	-
N/A	N/A	N/A	N/A	-

Target Analyte	Area (cps)	RT (min)	Target Conc. (ng/L)	Calc. Conc. (ng/L)	Accuracy (%)
PFBS 1	2240000	1.16	50.0	47.6	95.3
PFHxS 1	2450000	1.71	50.0	49.2	98.4
PFHpA 1	3460000	1.74	50.0	49.7	99.5
PFOA 1	3460000	1.92	50.0	48.2	96.3
PFOS 1	1530000	2.00	50.0	51.5	103.0
PFNA 1	2340000	2.06	50.0	47.6	95.1
18O2-PFHxS	152000	1.71	100.	99.7	99.7
13C4-PFHpA	517000	1.74	100.	101.	101.0
13C4-PFOA	437000	1.92	100.	98.0	98.0
13C4-PFOS	163000	2.00	100.	91.5	91.5
13C5-PFNA	297000	2.06	100.	97.6	97.6
13C6-PFHxA	4130000	1.48	100.	104.	104.0

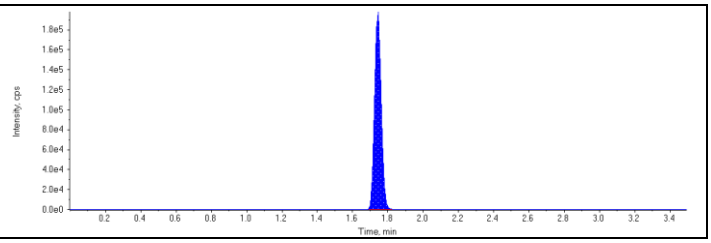
MPFHxS (Internal Standard)

RT (Exp. RT): 1.71(1.68) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



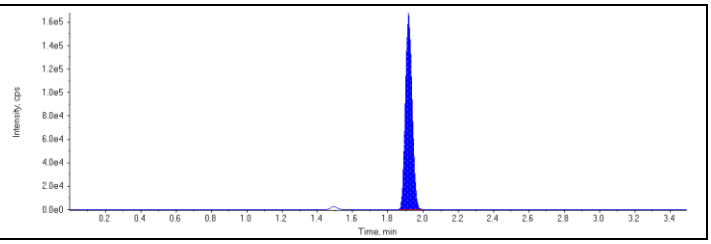
MPFHpA (Internal Standard)

RT (Exp. RT): 1.74(1.75) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



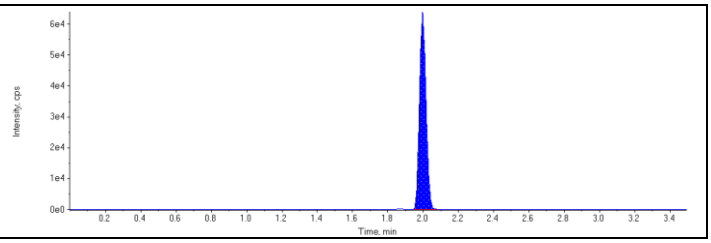
MPFOA (Internal Standard)

RT (Exp. RT): 1.92(1.88) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



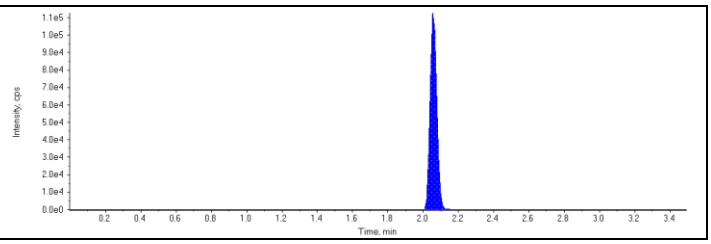
MPFOS (Internal Standard)

RT (Exp. RT): 2.00(1.97) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



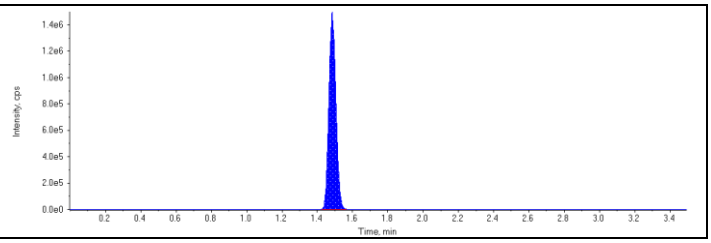
MPFNA (Internal Standard)

RT (Exp. RT): 2.06(2.02) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



13C6-PFHxA IS (Internal Standard)

RT (Exp. RT): 1.48(1.42) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



N/A (Internal Standard)

RT (Exp. RT): N/A(N/A) min
Concentration: N/A N/A
Sample Type: (Quality Control)

This image is not available

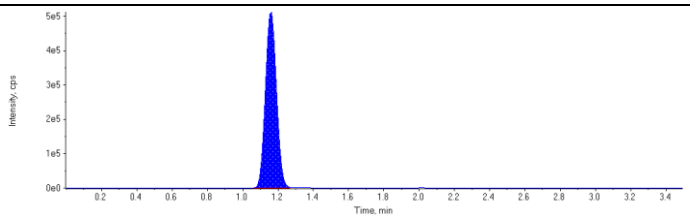
PFBS 1 (298.900/79.900 Da)

RT (Exp. RT): 1.16 (1.15) min

Calculated Conc: 47.6 µg/L

Area Ratio: 14.7

Sample Type: (Quality Control)



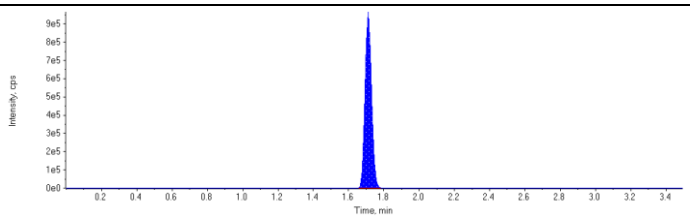
PFHxS 1 (398.900/79.900 Da)

RT (Exp. RT): 1.71 (1.68) min

Calculated Conc: 49.2 µg/L

Area Ratio: 16.2

Sample Type: (Quality Control)



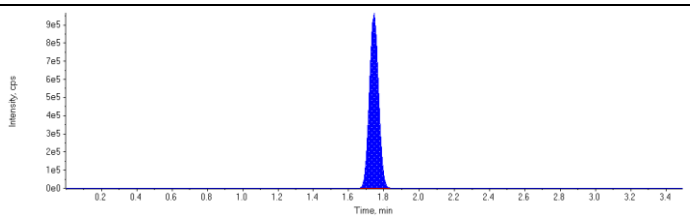
PFHpA 1 (363.000/319.000 Da)

RT (Exp. RT): 1.74 (1.75) min

Calculated Conc: 49.7 µg/L

Area Ratio: 6.69

Sample Type: (Quality Control)



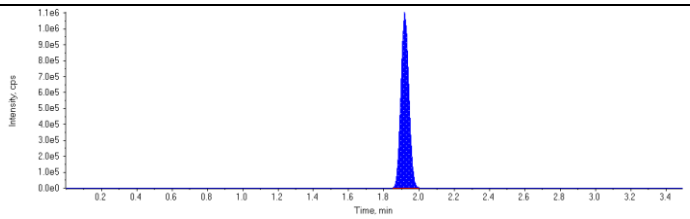
PFOA 1 (413.100/369.000 Da)

RT (Exp. RT): 1.92 (1.92) min

Calculated Conc: 48.2 µg/L

Area Ratio: 7.92

Sample Type: (Quality Control)



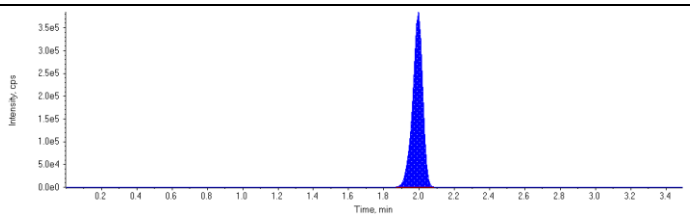
PFOS 1 (498.900/79.900 Da)

RT (Exp. RT): 2.00 (1.97) min

Calculated Conc: 51.5 µg/L

Area Ratio: 9.34

Sample Type: (Quality Control)



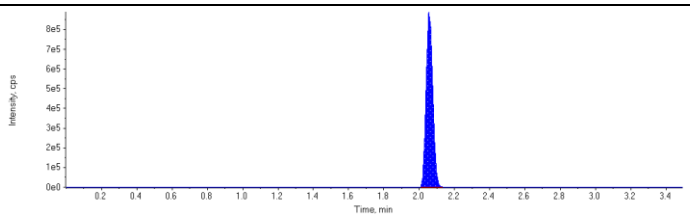
PFNA 1 (462.900/419.000 Da)

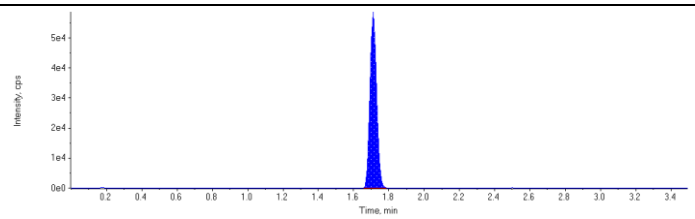
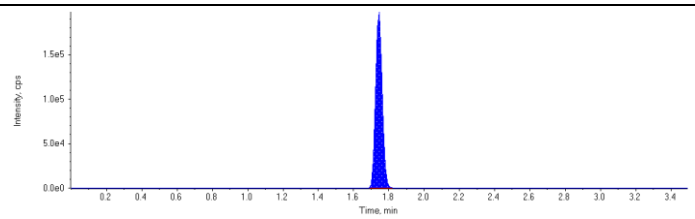
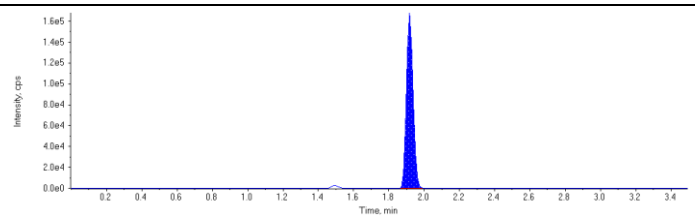
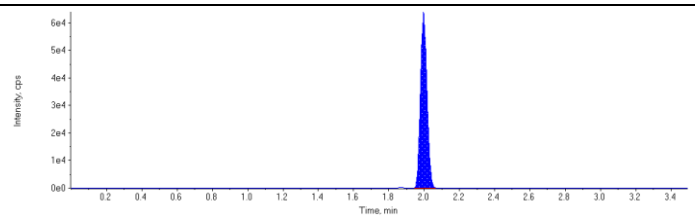
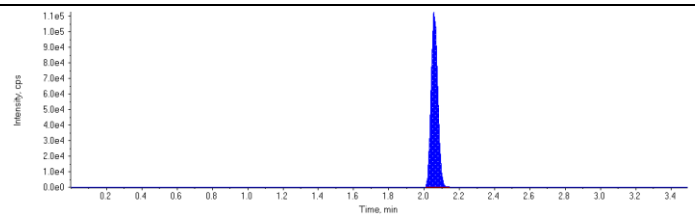
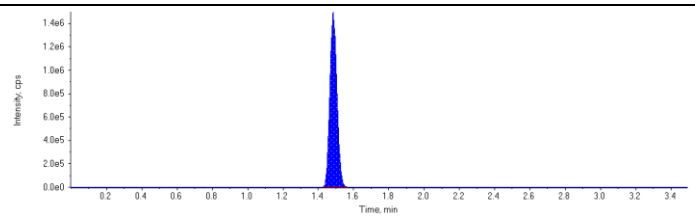
RT (Exp. RT): 2.06 (2.02) min

Calculated Conc: 47.6 µg/L

Area Ratio: 7.89

Sample Type: (Quality Control)



18O2-PFHxS (402.900/84.000 Da) RT (Exp. RT): 1.71 (1.68) min Calculated Conc: 99.7 µg/L Area Ratio: 0.0367 Sample Type: (Quality Control)	
13C4-PFHpA (366.900/322.000 Da) RT (Exp. RT): 1.74 (1.75) min Calculated Conc: 101. µg/L Area Ratio: 0.125 Sample Type: (Quality Control)	
13C4-PFOA (416.900/372.000 Da) RT (Exp. RT): 1.92 (1.88) min Calculated Conc: 98.0 µg/L Area Ratio: 0.106 Sample Type: (Quality Control)	
13C4-PFOS (502.900/79.900 Da) RT (Exp. RT): 2.00 (1.97) min Calculated Conc: 91.5 µg/L Area Ratio: 0.0395 Sample Type: (Quality Control)	
13C5-PFNA (467.900/423.000 Da) RT (Exp. RT): 2.06 (2.02) min Calculated Conc: 97.6 µg/L Area Ratio: 0.0719 Sample Type: (Quality Control)	
13C6-PFHxA (318.900/274.000 Da) RT (Exp. RT): 1.48 (1.42) min Calculated Conc: 104. µg/L Area Ratio: 0.00 Sample Type: (Quality Control)	

Perfluorinated Compound Internal Standard (IS) Evaluation

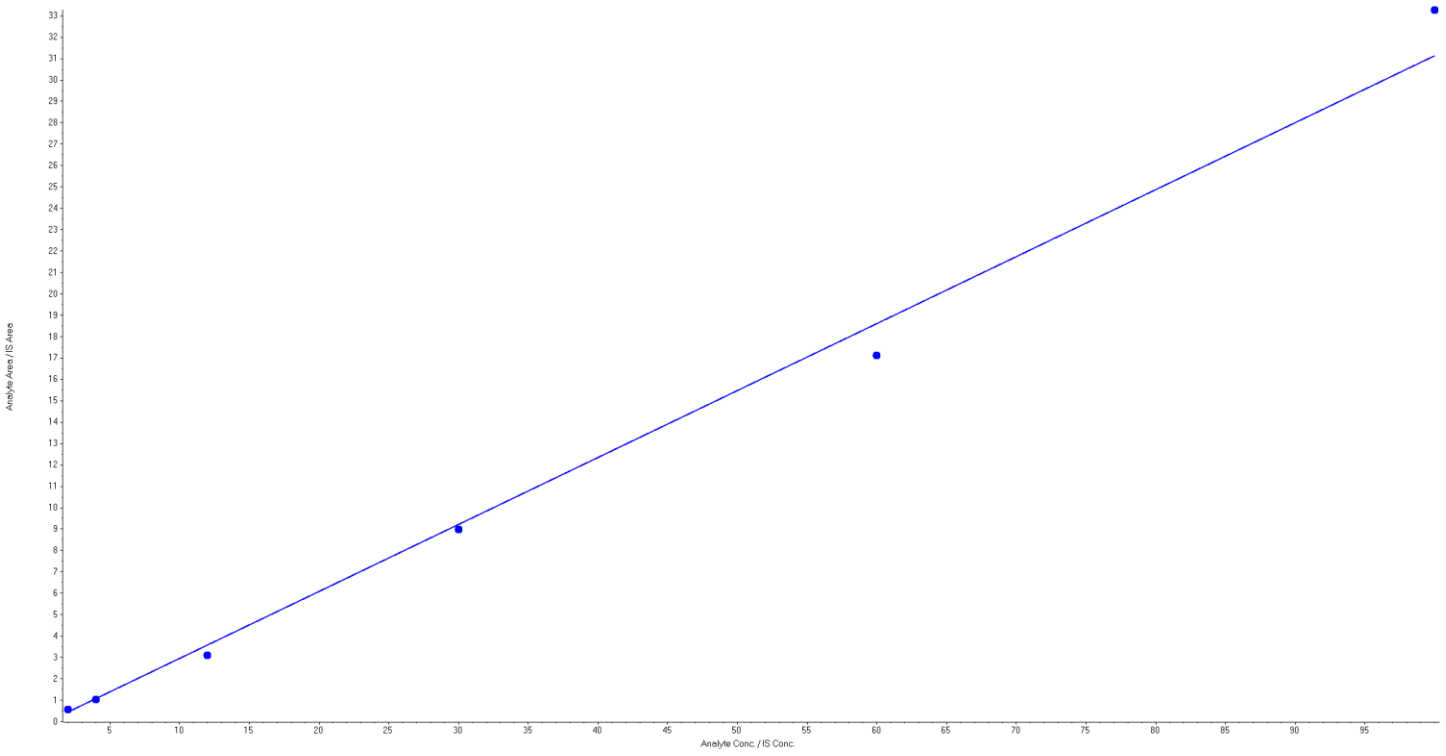
Sample Name	Analyte	PFBS		PFHxS		PFHpA		PFOA		PFOS		PFNA	
	Mass labeled IS	MPFHxS		MPFHxS		MPFHpA		MPFOA		MPFOS		MPFNA	
	Average IS Area in ICAL	147000		147000		493500		430500		172500		293500	
		IS Peak Area	IS %R (ICAL)	IS Peak Area	IS %R (ICAL)	IS Peak Area	IS %R (ICAL)	IS Peak Area	IS %R (ICAL)	IS Peak Area	IS %R (ICAL)	IS Peak Area	IS %R (ICAL)
4386408~BLANK		130000	88	130000	88	375000	76	327000	76	146000	85	228000	78
STD 1		146000	99	146000	99	517000	105	413000	96	179000	104	291000	99
STD 2		147000	100	147000	100	503000	102	442000	103	177000	103	296000	101
STD 3		156000	106	156000	106	498000	101	435000	101	167000	97	307000	105
STD 4		144000	98	144000	98	467000	95	447000	104	172000	100	296000	101
STD 5		147000	100	147000	100	499000	101	448000	104	186000	108	296000	101
STD 6		142000	97	142000	97	477000	97	398000	92	154000	89	275000	94
ICV		152000	103	152000	103	517000	105	437000	102	163000	94	297000	101
CCV		156000	106	156000	106	500000	101	423000	98	177000	103	314000	107
4386408~MTRX SPK		112000	76	112000	76	335000	68	321000	75	127000	74	227000	77
4386408~MTRX SPK:D1		110000	75	110000	75	331000	67	363000	84	141000	82	263000	90
4386408~SPIKE		123000	84	123000	84	336000	68	305000	71	135000	78	218000	74
4386408~BVX814-01 (10x)		113000	77	113000	77	340000	69	322000	75	139000	81	236000	80
4386408~BVX817-01 (10x)		134000	91	134000	91	372000	75	336000	78	145000	84	240000	82
4386408~BVX818-01 (20x)		115000	78	115000	78	355000	72	335000	78	147000	85	235000	80
4386408~BVX819-01 (10x)		109000	74	109000	74	212000	**43**	228000	53	136000	79	183000	62
4386408~BVX769-01		103000	70	103000	70	315000	64	302000	70	137000	79	225000	77
4386408~BVX770-01		116000	79	116000	79	281000	57	273000	63	138000	80	222000	76
4386408~BVX771-01		101000	69	101000	69	263000	53	257000	60	126000	73	208000	71
4386408~BVX772-01		95400	65	95400	65	287000	58	261000	61	120000	70	205000	70
4386408~BVX773-01		97200	66	97200	66	312000	63	297000	69	124000	72	206000	70
4386408~BVX774-01		101000	69	101000	69	301000	61	286000	66	117000	68	207000	71
CCV		118000	80	118000	80	376000	76	350000	81	153000	89	275000	94
4386408~BVX775-01		83400	57	83400	57	241000	**49**	243000	56	93300	54	170000	58
4386408~BVX776-01		116000	79	116000	79	334000	68	322000	75	129000	75	248000	84
4386408~BVX779-01		97700	66	97700	66	321000	65	300000	70	129000	75	224000	76
4386408~BVX780-01		98900	67	98900	67	257000	52	252000	59	113000	66	190000	65
4386408~BVX781-01		89500	61	89500	61	261000	53	244000	57	101000	59	179000	61
4386408~BVX826-01		104000	71	104000	71	272000	55	256000	59	105000	61	186000	63
4386408~BVX827-01		84400	57	84400	57	229000	**46**	217000	50	98200	57	170000	58
4386408~BVX828-01		92800	63	92800	63	289000	59	269000	62	98300	57	188000	64
4386408~BVX829-01		79900	54	79900	54	286000	58	252000	59	110000	64	180000	61
4386408~BVX830-01		82200	56	82200	56	275000	56	249000	58	102000	59	189000	64
CCV		122000	83	122000	83	400000	81	381000	89	150000	87	266000	91
4386408~MTRX SPK		95600	65	95600	65	303000	61	307000	71	126000	73	222000	76
4386408~BVX830-01		96600	66	96600	66	277000	56	258000	60	103000	60	188000	64
CCV		123000	84	123000	84	413000	84	372000	86	165000	96	267000	91

Analyte Name: PFBS 1
Internal Standard: MPFHxS

Data File	PFC_160219\WS#4386408.wiff	**Result Table**	PFC_Water_160219_4386408_ULow.rdb
Acquisition Date	2016/02/19 7:39:53 AM	**Project**	Enviro\PFOS
Acquisition Method	PFC_Water_Low.dam	**Instrument Name**	LCMS03

Regression Equation: y = 0.313 x + -0.179 (r = 0.9966)

Expected Concentration (µg/L)	Number of Values	Calculated Concentration (µg/L)	% Accuracy
2	1	2.40	120.2
4	1	3.86	96.4
12	1	10.44	87.0
30	1	29.26	97.5
60	1	55.22	92.0
100	1	106.82	106.8

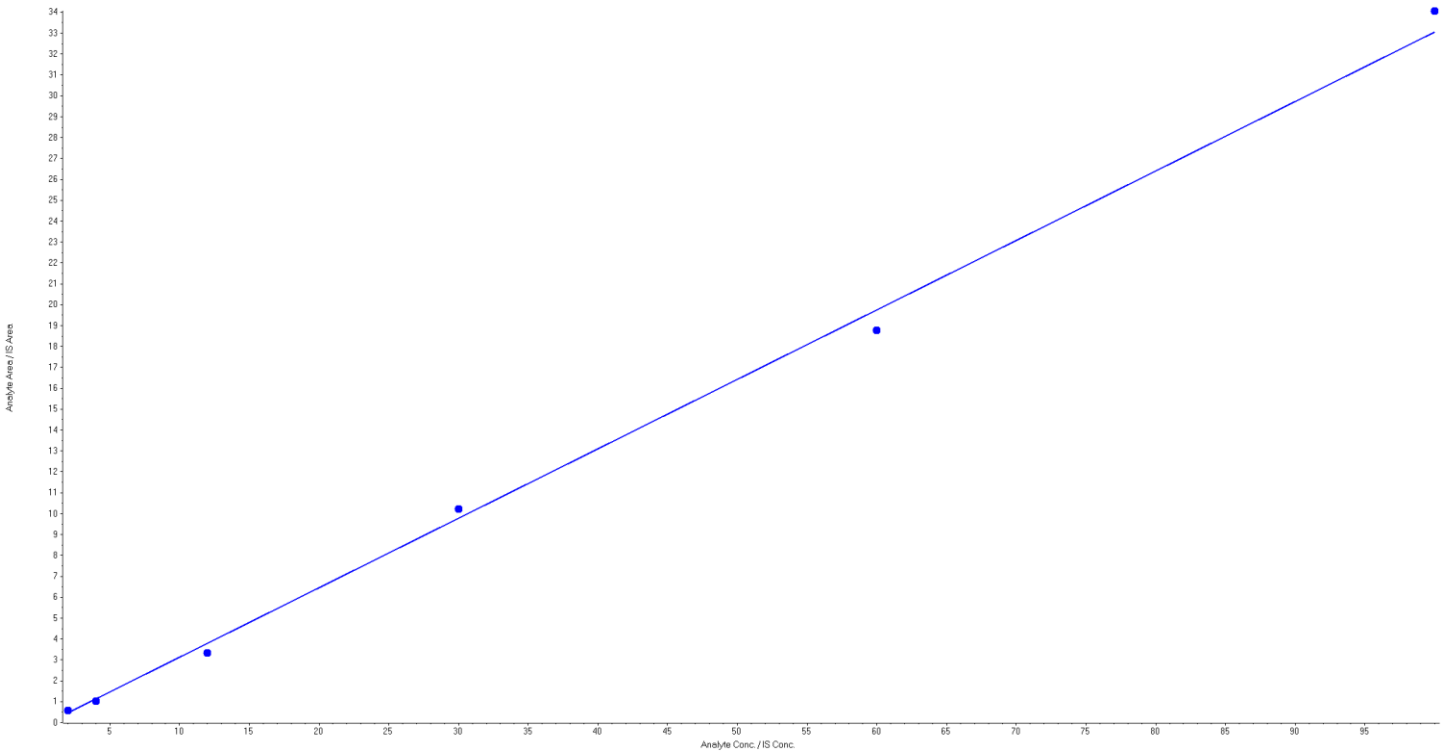


Analyte Name: PFHxS 1
Internal Standard: MPFHxS

Data File	PFC_160219\WS#4386408.wiff	**Result Table**	PFC_Water_160219_4386408_ULow.rdb
Acquisition Date	2016/02/19 7:39:53 AM	**Project**	Enviro\PFOS
Acquisition Method	PFC_Water_Low.dam	**Instrument Name**	LCMS03

Regression Equation: y = 0.333 x + -0.197 (r = 0.9984)

Expected Concentration (µg/L)	Number of Values	Calculated Concentration (µg/L)	% Accuracy
2	1	2.35	117.3
4	1	3.68	92.1
12	1	10.57	88.1
30	1	31.33	104.4
60	1	57.04	95.1
100	1	103.02	103.0

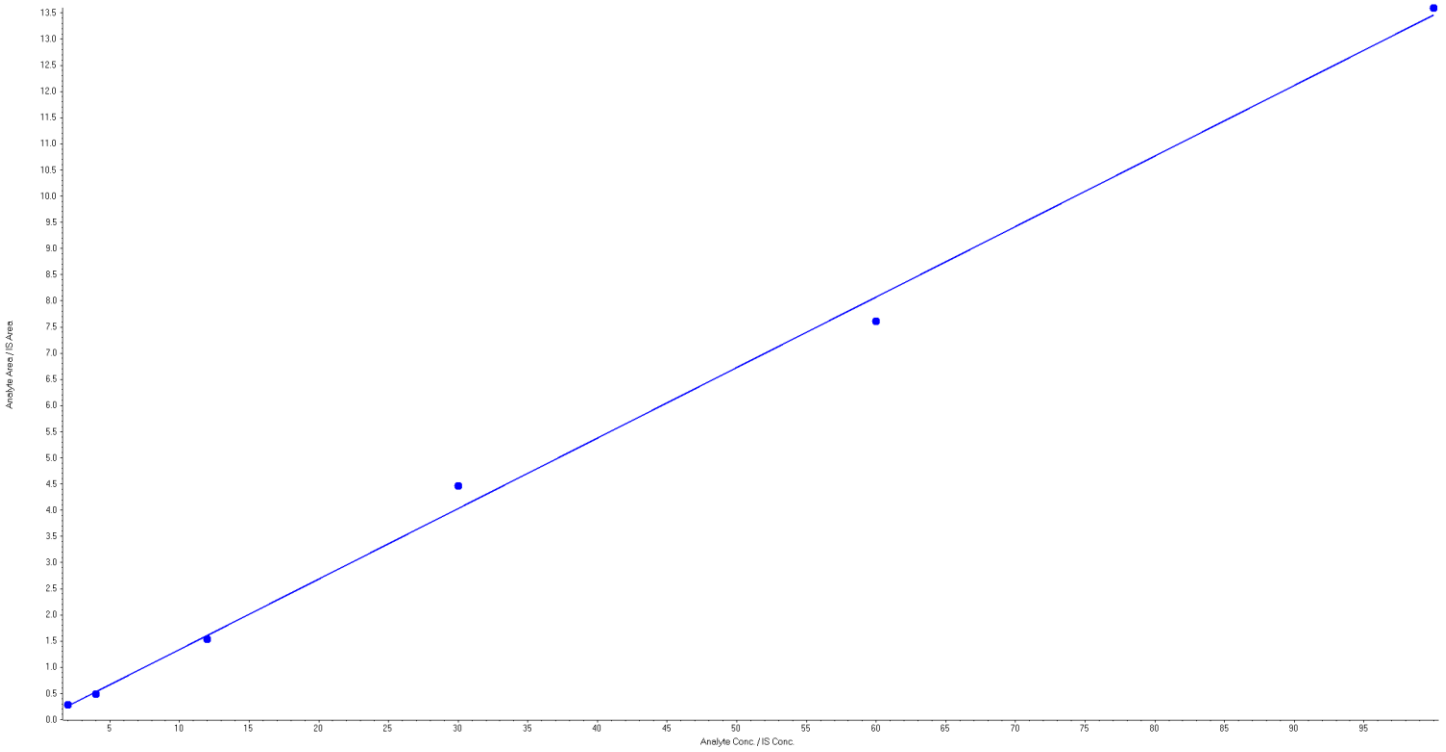


Analyte Name: PFHpA 1
Internal Standard: MPFHpA

Data File	PFC_160219\WS#4386408.wiff	**Result Table**	PFC_Water_160219_4386408_ULow.rdb
Acquisition Date	2016/02/19 7:39:53 AM	**Project**	Enviro\PFOS
Acquisition Method	PFC_Water_Low.dam	**Instrument Name**	LCMS03

Regression Equation: y = 0.135 x + -0.0098 (r = 0.9982)

Expected Concentration (µg/L)	Number of Values	Calculated Concentration (µg/L)	% Accuracy
2	1	2.11	105.7
4	1	3.72	92.9
12	1	11.45	95.5
30	1	33.21	110.7
60	1	56.52	94.2
100	1	100.98	101.0

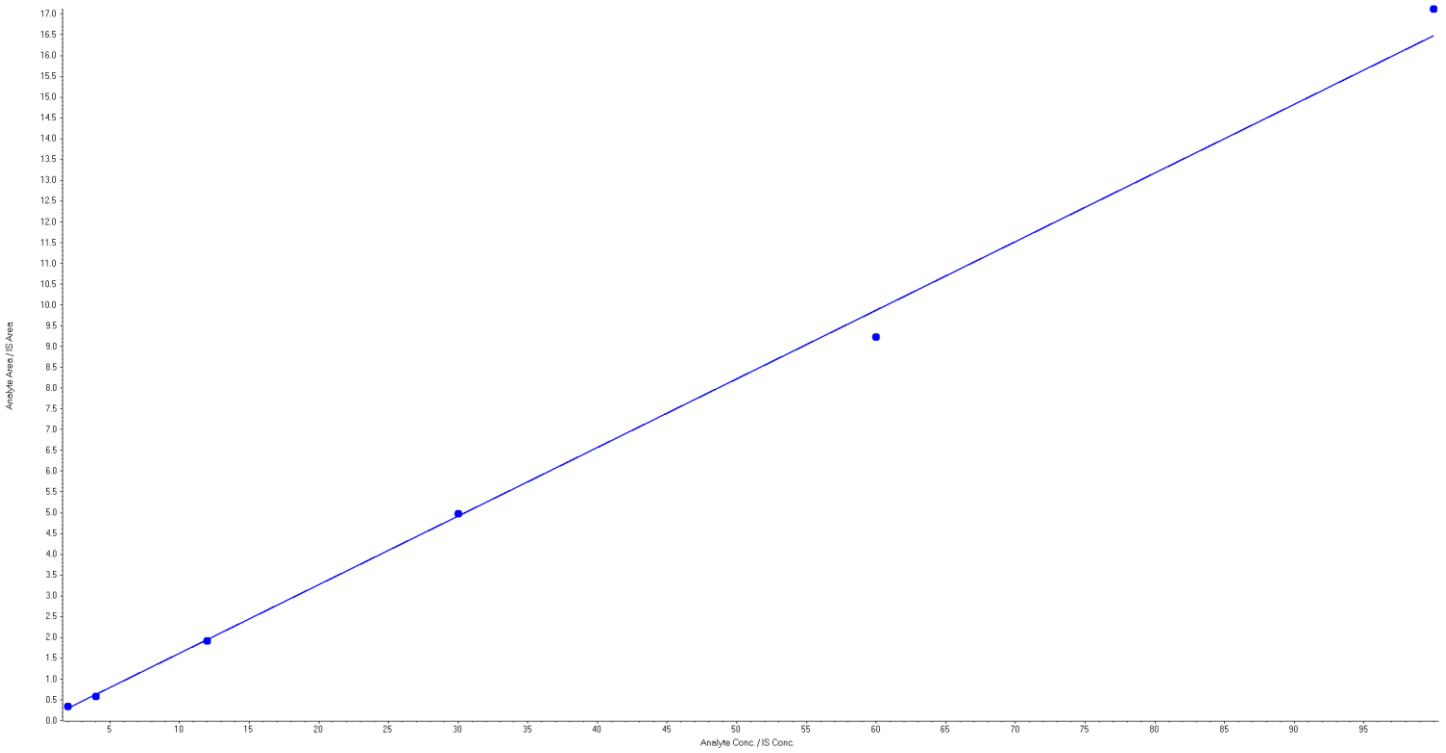


Analyte Name: PFOA 1
Internal Standard: MPFOA

Data File	PFC_160219\WS#4386408.wiff	**Result Table**	PFC_Water_160219_4386408_ULow.rdb
Acquisition Date	2016/02/19 7:39:53 AM	**Project**	Enviro\PFOS
Acquisition Method	PFC_Water_Low.dam	**Instrument Name**	LCMS03

Regression Equation: y = 0.165 x + -0.0324 (r = 0.9987)

Expected Concentration (µg/L)	Number of Values	Calculated Concentration (µg/L)	% Accuracy
2	1	2.20	109.9
4	1	3.73	93.3
12	1	11.81	98.4
30	1	30.30	101.0
60	1	56.08	93.5
100	1	103.88	103.9

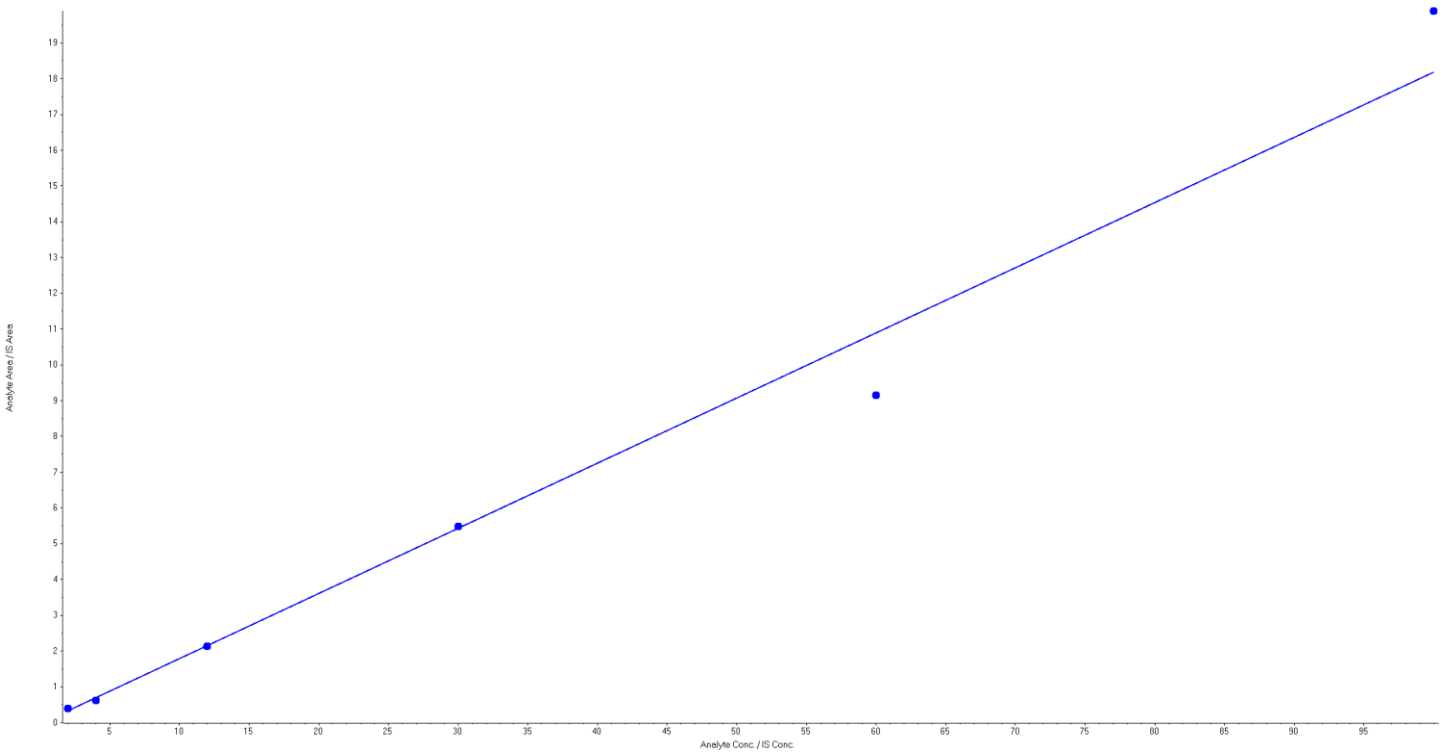


Analyte Name: PFOS 1
Internal Standard: MPFOS

Data File	PFC_160219\WS#4386408.wiff	**Result Table**	PFC_Water_160219_4386408_ULow.rdb
Acquisition Date	2016/02/19 7:39:53 AM	**Project**	Enviro\PFOS
Acquisition Method	PFC_Water_Low.dam	**Instrument Name**	LCMS03

Regression Equation: y = 0.182 x + -0.034 (r = 0.9927)

Expected Concentration (µg/L)	Number of Values	Calculated Concentration (µg/L)	% Accuracy
2	1	2.31	115.6
4	1	3.63	90.7
12	1	11.90	99.2
30	1	30.32	101.1
60	1	50.45	84.1
100	1	109.38	109.4

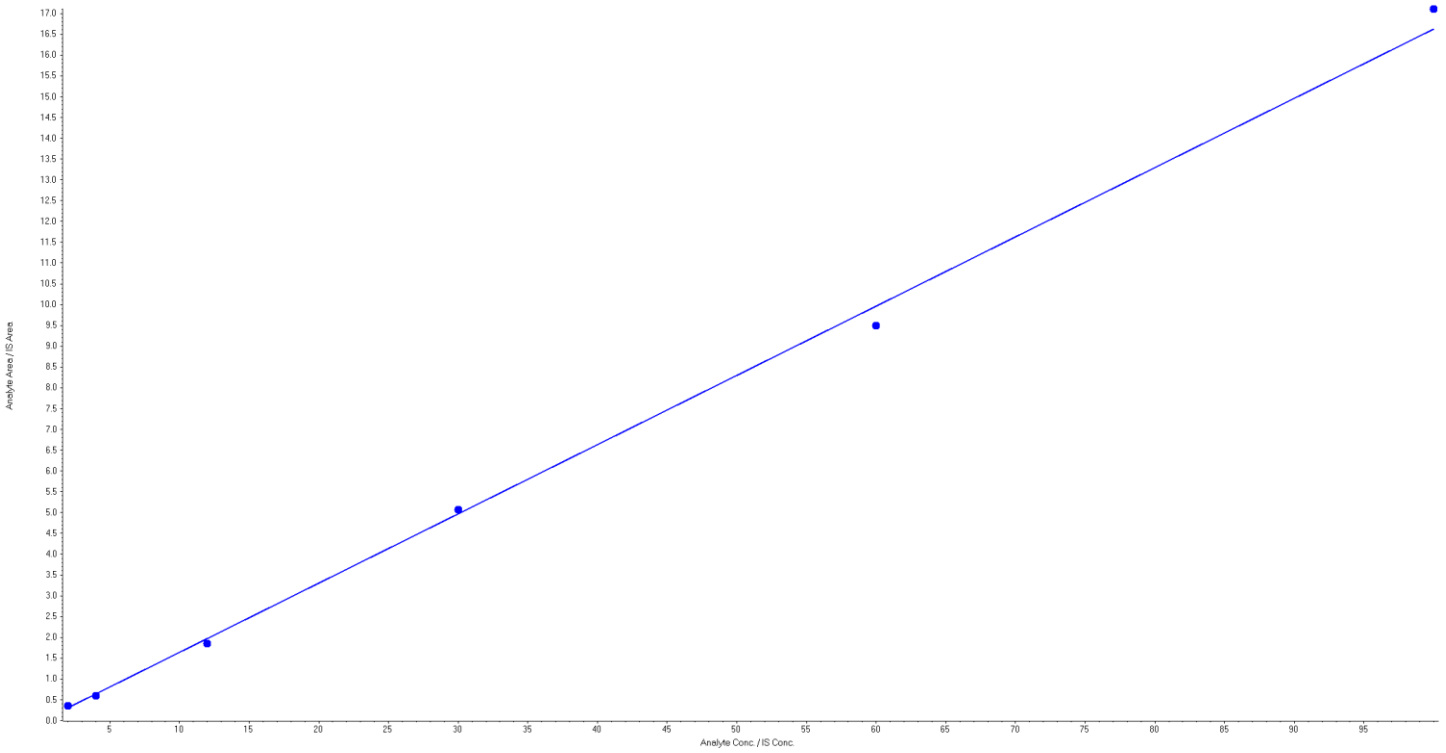


Analyte Name: PFNA 1
Internal Standard: MPFNA

Data File	PFC_160219\WS#4386408.wiff	**Result Table**	PFC_Water_160219_4386408_ULow.rdb
Acquisition Date	2016/02/19 7:39:53 AM	**Project**	Enviro\PFOS
Acquisition Method	PFC_Water_Low.dam	**Instrument Name**	LCMS03

Regression Equation: y = 0.167 x + -0.0262 (r = 0.9991)

Expected Concentration (µg/L)	Number of Values	Calculated Concentration (µg/L)	% Accuracy
2	1	2.24	111.9
4	1	3.74	93.6
12	1	11.30	94.2
30	1	30.63	102.1
60	1	57.19	95.3
100	1	102.89	102.9

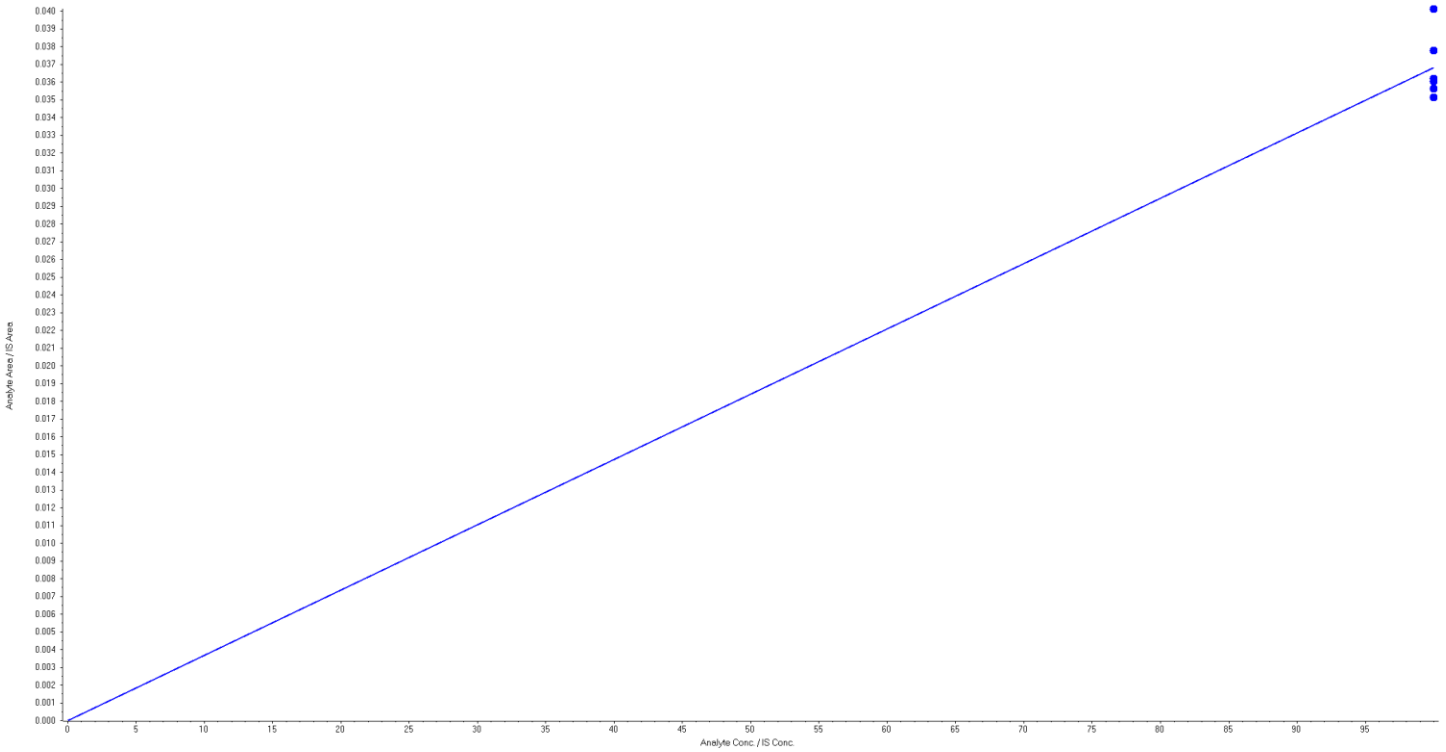


Analyte Name: 18O2-PFHxS
Internal Standard: 13C6-PFHxA IS

Data File	PFC_160219\WS#4386408.wiff	**Result Table**	PFC_Water_160219_4386408_ULow.rdb
Acquisition Date	2016/02/19 7:39:53 AM	**Project**	Enviro\PFOS
Acquisition Method	PFC_Water_Low.dam	**Instrument Name**	LCMS03

Regression Equation: y = 0.000368 x (r = 0.9990)

Expected Concentration (µg/L)	Number of Values	Calculated Concentration (µg/L)	% Accuracy
100	6	100.00	100.0

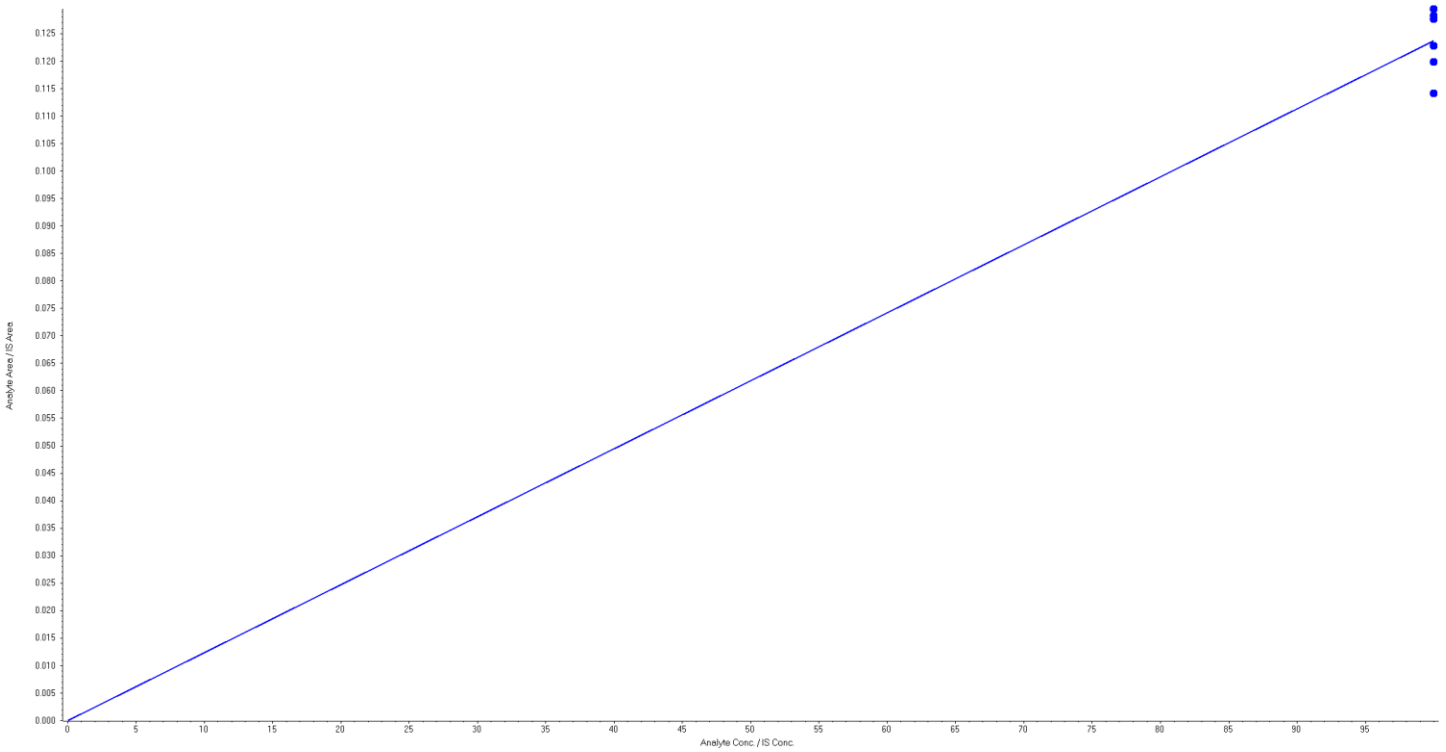


Analyte Name: 13C4-PFHpA
Internal Standard: 13C6-PFHxA IS

Data File	PFC_160219\WS#4386408.wiff	**Result Table**	PFC_Water_160219_4386408_ULow.rdb
Acquisition Date	2016/02/19 7:39:53 AM	**Project**	Enviro\PFOS
Acquisition Method	PFC_Water_Low.dam	**Instrument Name**	LCMS03

Regression Equation: y = 0.00124 x (r = 0.9990)

Expected Concentration (µg/L)	Number of Values	Calculated Concentration (µg/L)	% Accuracy
100	6	100.00	100.0

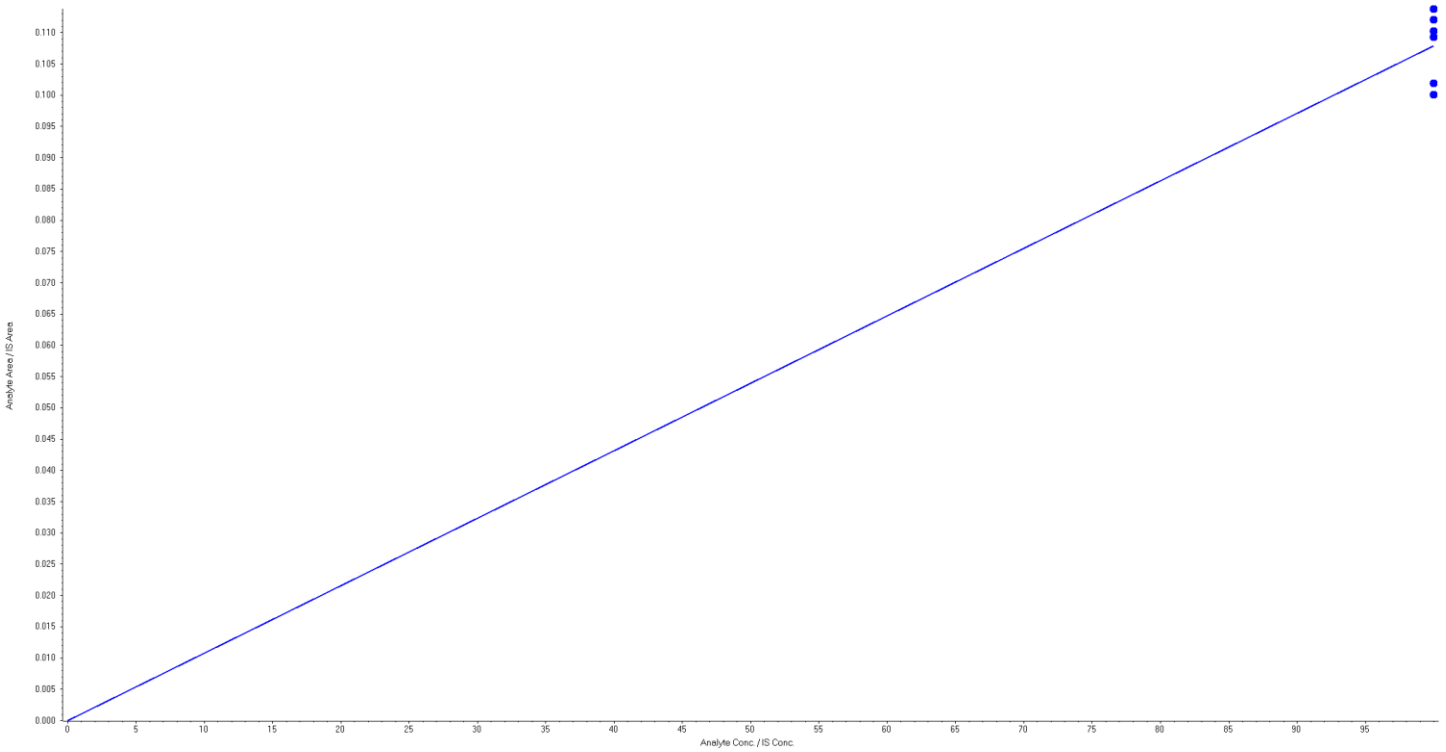


Analyte Name: 13C4-PFOA
Internal Standard: 13C6-PFHxA IS

Data File	PFC_160219\WS#4386408.wiff	**Result Table**	PFC_Water_160219_4386408_ULow.rdb
Acquisition Date	2016/02/19 7:39:53 AM	**Project**	Enviro\PFOS
Acquisition Method	PFC_Water_Low.dam	**Instrument Name**	LCMS03

Regression Equation: y = 0.00108 x (r = 0.9989)

Expected Concentration (µg/L)	Number of Values	Calculated Concentration (µg/L)	% Accuracy
100	6	100.00	100.0

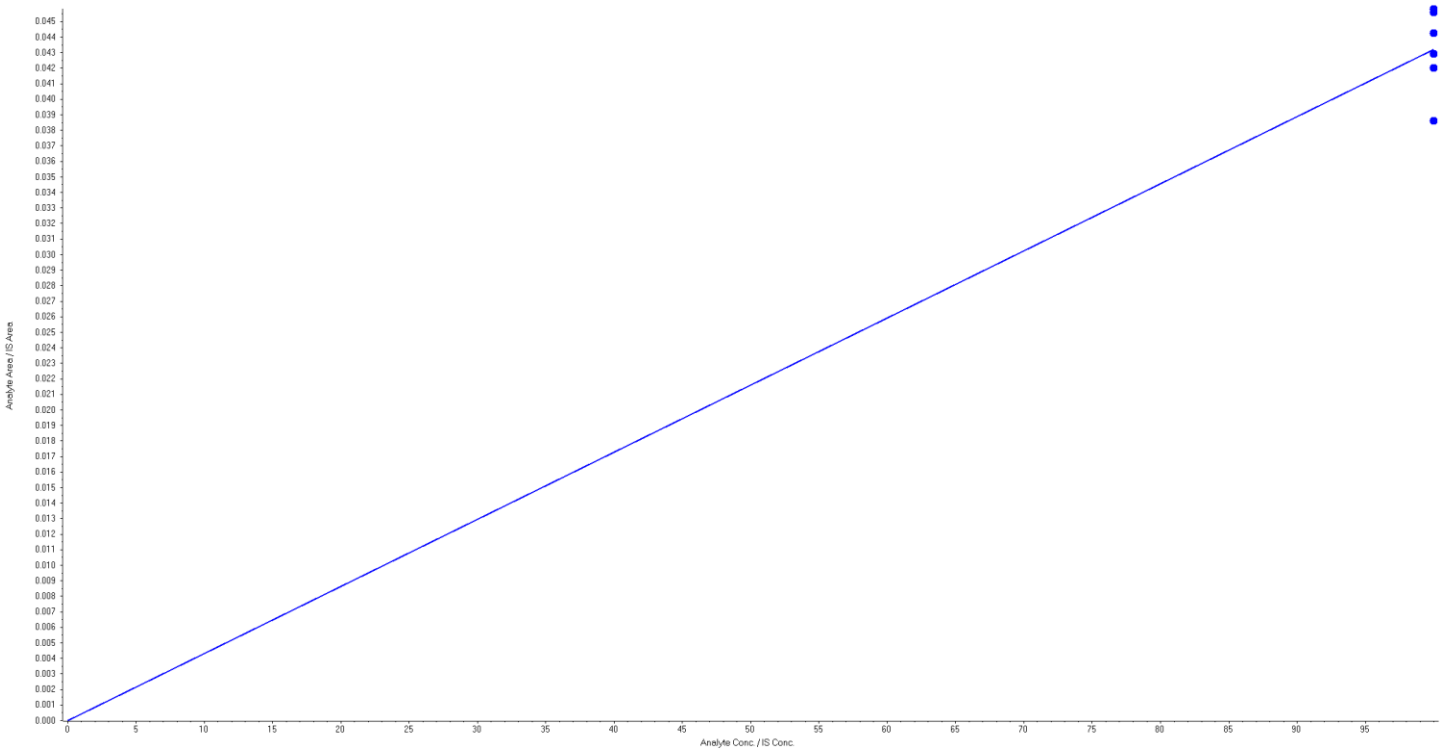


Analyte Name: 13C4-PFOS
Internal Standard: 13C6-PFHxA IS

Data File	PFC_160219\WS#4386408.wiff	**Result Table**	PFC_Water_160219_4386408_ULow.rdb
Acquisition Date	2016/02/19 7:39:53 AM	**Project**	Enviro\PFOS
Acquisition Method	PFC_Water_Low.dam	**Instrument Name**	LCMS03

Regression Equation: y = 0.000432 x (r = 0.9984)

Expected Concentration (µg/L)	Number of Values	Calculated Concentration (µg/L)	% Accuracy
100	6	100.00	100.0

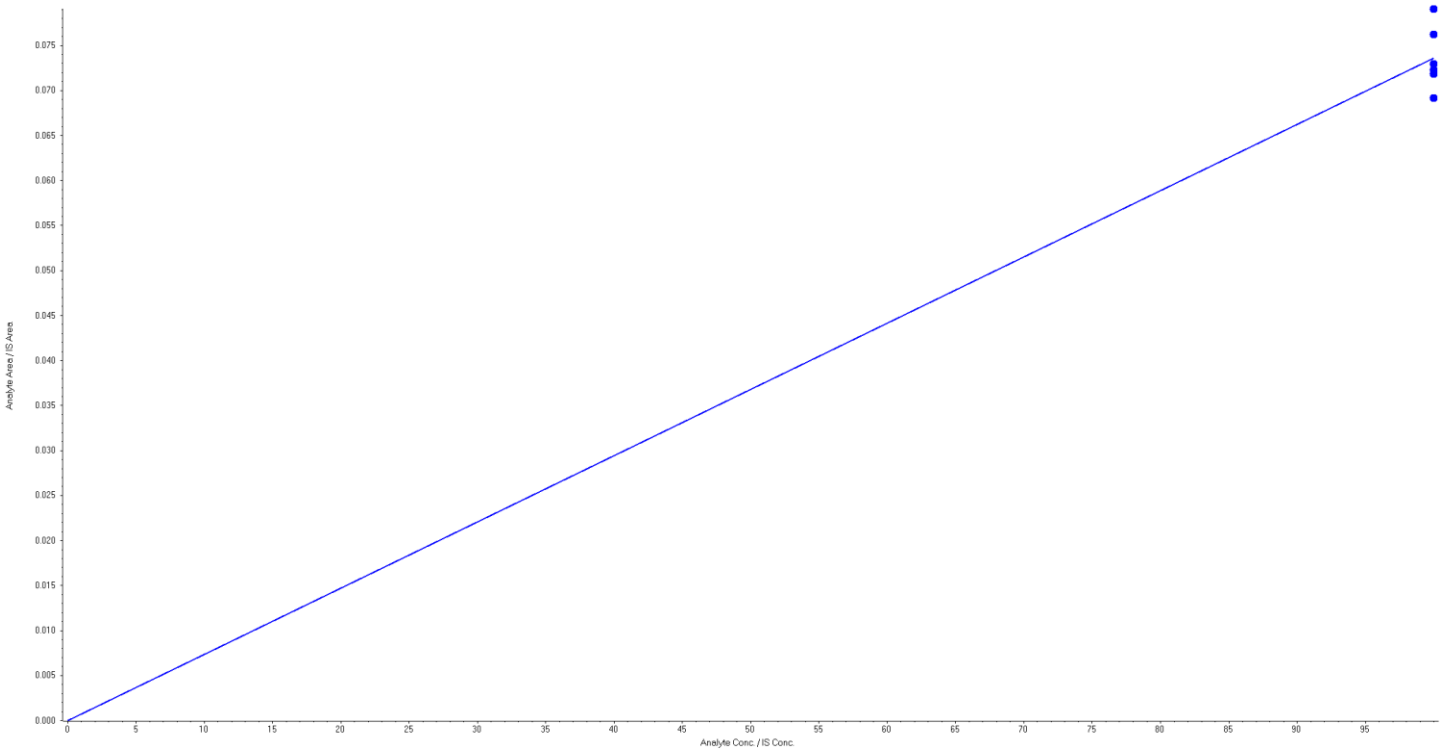


Analyte Name: 13C5-PFNA
Internal Standard: 13C6-PFHxA IS

Data File	PFC_160219\WS#4386408.wiff	**Result Table**	PFC_Water_160219_4386408_ULow.rdb
Acquisition Date	2016/02/19 7:39:53 AM	**Project**	Enviro\PFOS
Acquisition Method	PFC_Water_Low.dam	**Instrument Name**	LCMS03

Regression Equation: y = 0.000736 x (r = 0.9991)

Expected Concentration (µg/L)	Number of Values	Calculated Concentration (µg/L)	% Accuracy
100	6	100.00	100.0



6. Continuing Calibration

Maxxam Analytics International
6740 Campobello Rd
Mississauga, Ontario, Canada
L5N 2L8
1-800-668-0639
www.maxxamanalytics.com

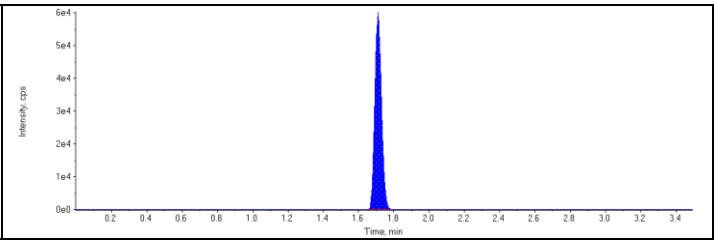
Sample Name	**CCV**	**Injection Vial**	6
Sample ID	CCV	**Injection Volume (µL)**	3
Sample Type	Quality Control	**Algorithm Used**	Analyst Classic
Acquisition Date	2016/02/19 8:20:47 AM	**Dilution Factor**	1.00
Acquisition Method	PFC_Water_Low.dam	**Sample Annotation**	-
Project	Enviro\PFOS	**Instrument Name**	LCMS03
Data File	PFC_160219\WS#4386408.wiff		
Result Table	PFC_Water_160219_4386408_ULow.rdb		

Internal Standard	Area (cps)	RT (min)	Target Conc. (ng/L)	Calc. Conc. (ng/L)
MPFHxS	156000.	1.71	1.00	-
MPFHpA	500000.	1.74	1.00	-
MPFOA	423000.	1.92	1.00	-
MPFOS	177000.	2.00	1.00	-
MPFNA	314000.	2.06	1.00	-
13C6-PFHxA IS	4100000.	1.48	1.00	-
N/A	N/A	N/A	N/A	-

Target Analyte	Area (cps)	RT (min)	Target Conc. (ng/L)	Calc. Conc. (ng/L)	Accuracy (%)
PFBS 1	1410000	1.16	30.0	29.3	97.8
PFHxS 1	1500000	1.71	30.0	29.3	97.8
PFHpA 1	2110000	1.74	30.0	31.4	105.0
PFOA 1	2180000	1.92	30.0	31.3	104.0
PFOS 1	950000	1.99	30.0	29.7	99.2
PFNA 1	1570000	2.06	30.0	30.1	100.0
18O2-PFHxS	156000	1.71	100.	104.	104.0
13C4-PFHpA	500000	1.74	100.	98.6	98.6
13C4-PFOA	423000	1.92	100.	95.7	95.7
13C4-PFOS	177000	2.00	100.	99.6	99.6
13C5-PFNA	314000	2.06	100.	104.	104.0
13C6-PFHxA	4100000	1.48	100.	103.	103.0

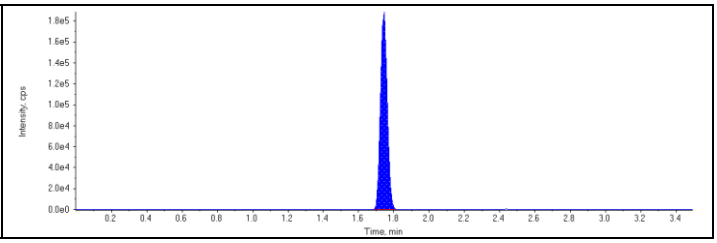
MPFHxS (Internal Standard)

RT (Exp. RT): 1.71(1.68) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



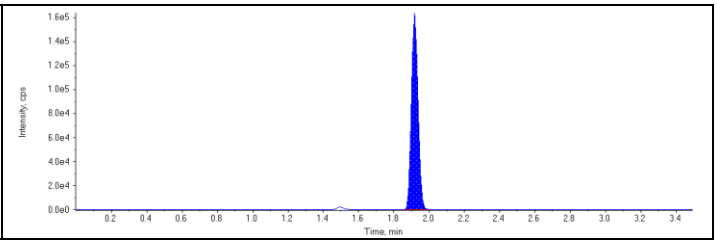
MPFHpA (Internal Standard)

RT (Exp. RT): 1.74(1.75) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



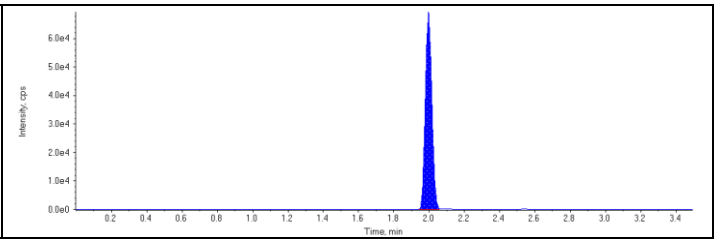
MPFOA (Internal Standard)

RT (Exp. RT): 1.92(1.88) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



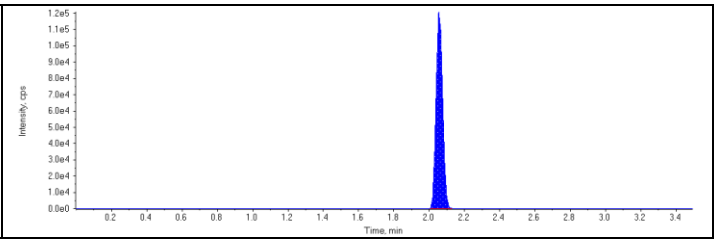
MPFOS (Internal Standard)

RT (Exp. RT): 2.00(1.97) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



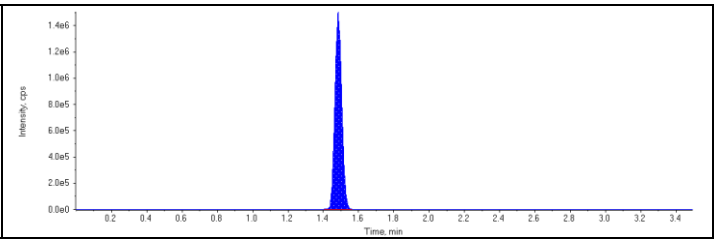
MPFNA (Internal Standard)

RT (Exp. RT): 2.06(2.02) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



13C6-PFHxA IS (Internal Standard)

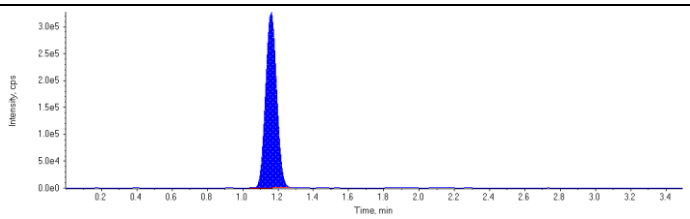
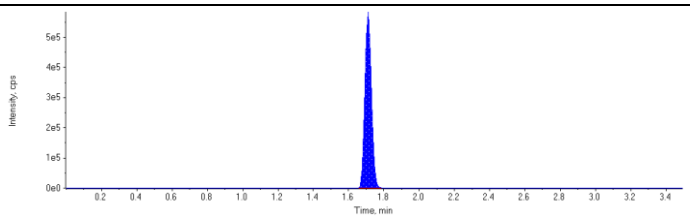
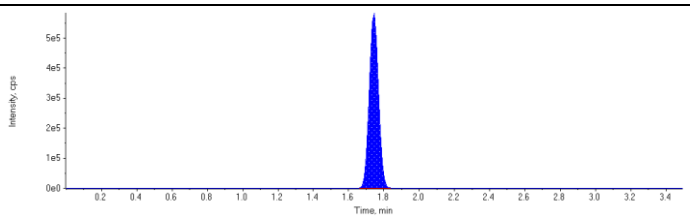
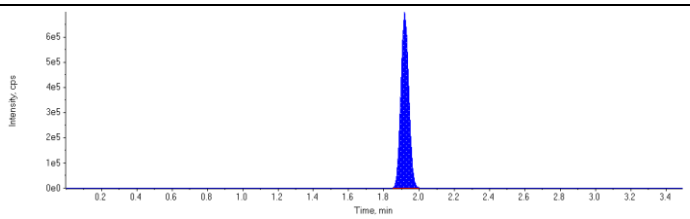
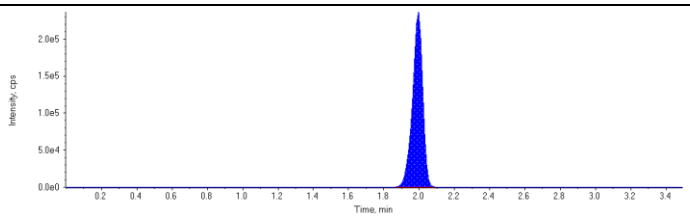
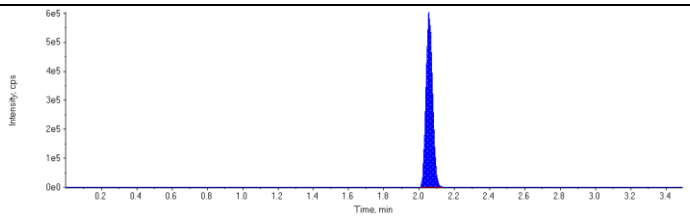
RT (Exp. RT): 1.48(1.42) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)

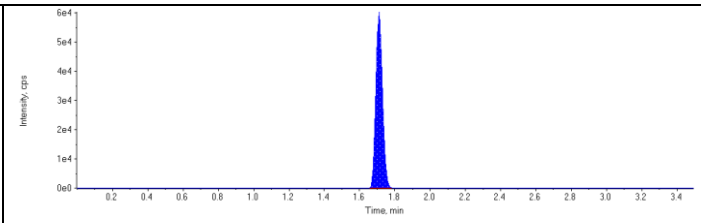
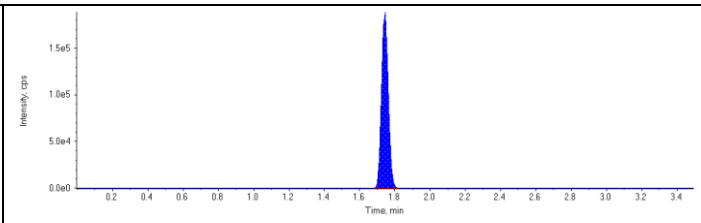
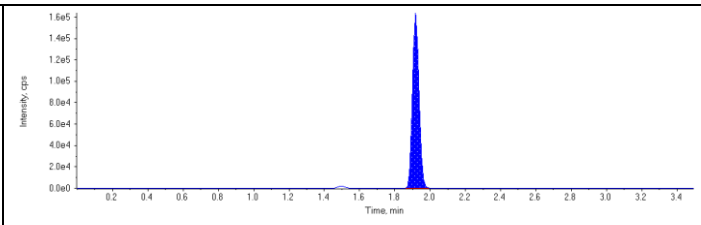
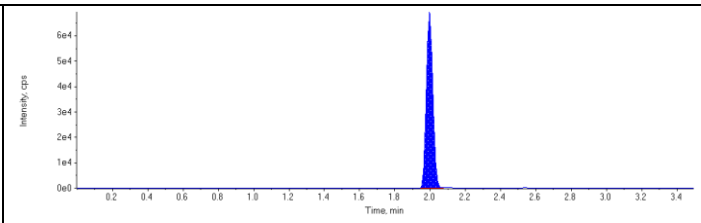
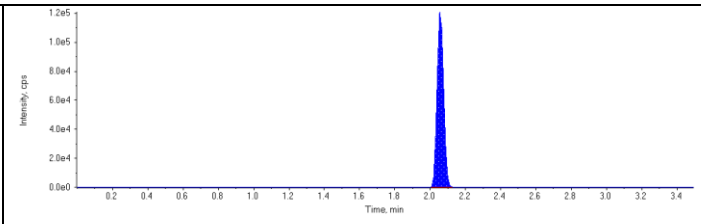
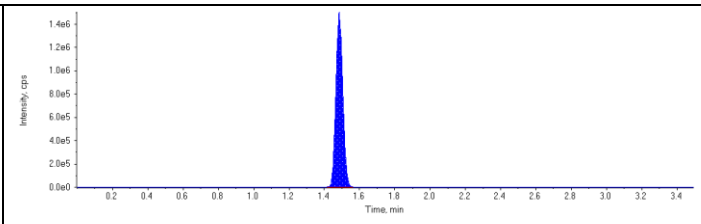


N/A (Internal Standard)

RT (Exp. RT): N/A(N/A) min
Concentration: N/A N/A
Sample Type: (Quality Control)

This image is not available

PFBS 1 (298.900/79.900 Da) RT (Exp. RT): 1.16 (1.15) min Calculated Conc: 29.3 µg/L Area Ratio: 9.01 Sample Type: (Quality Control)	
PFHxS 1 (398.900/79.900 Da) RT (Exp. RT): 1.71 (1.68) min Calculated Conc: 29.3 µg/L Area Ratio: 9.56 Sample Type: (Quality Control)	
PFHpA 1 (363.000/319.000 Da) RT (Exp. RT): 1.74 (1.75) min Calculated Conc: 31.4 µg/L Area Ratio: 4.22 Sample Type: (Quality Control)	
PFOA 1 (413.100/369.000 Da) RT (Exp. RT): 1.92 (1.92) min Calculated Conc: 31.3 µg/L Area Ratio: 5.14 Sample Type: (Quality Control)	
PFOS 1 (498.900/79.900 Da) RT (Exp. RT): 1.99 (1.97) min Calculated Conc: 29.7 µg/L Area Ratio: 5.38 Sample Type: (Quality Control)	
PFNA 1 (462.900/419.000 Da) RT (Exp. RT): 2.06 (2.02) min Calculated Conc: 30.1 µg/L Area Ratio: 4.98 Sample Type: (Quality Control)	

18O2-PFHxS (402.900/84.000 Da) RT (Exp. RT): 1.71 (1.68) min Calculated Conc: 104. µg/L Area Ratio: 0.0382 Sample Type: (Quality Control)	
13C4-PFHpA (366.900/322.000 Da) RT (Exp. RT): 1.74 (1.75) min Calculated Conc: 98.6 µg/L Area Ratio: 0.122 Sample Type: (Quality Control)	
13C4-PFOA (416.900/372.000 Da) RT (Exp. RT): 1.92 (1.88) min Calculated Conc: 95.7 µg/L Area Ratio: 0.103 Sample Type: (Quality Control)	
13C4-PFOS (502.900/79.900 Da) RT (Exp. RT): 2.00 (1.97) min Calculated Conc: 99.6 µg/L Area Ratio: 0.0431 Sample Type: (Quality Control)	
13C5-PFNA (467.900/423.000 Da) RT (Exp. RT): 2.06 (2.02) min Calculated Conc: 104. µg/L Area Ratio: 0.0767 Sample Type: (Quality Control)	
13C6-PFHxA (318.900/274.000 Da) RT (Exp. RT): 1.48 (1.42) min Calculated Conc: 103. µg/L Area Ratio: 0.00 Sample Type: (Quality Control)	

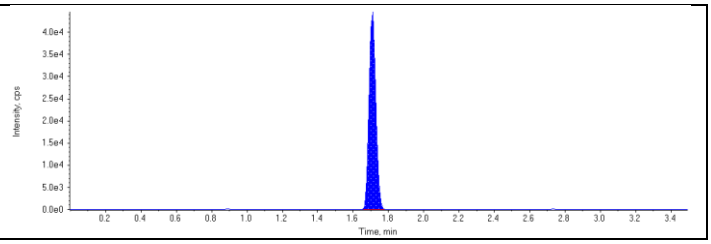
Sample Name	**CCV**	**Injection Vial**	6
Sample ID	CCV	**Injection Volume (µL)**	3
Sample Type	Quality Control	**Algorithm Used**	Analyst Classic
Acquisition Date	2016/02/19 9:42:22 AM	**Dilution Factor**	1.00
Acquisition Method	PFC_Water_Low.dam	**Sample Annotation**	-
Project	Enviro\PFOS	**Instrument Name**	LCMS03
Data File	PFC_160219\WS#4386408.wiff		
Result Table	PFC_Water_160219_4386408_ULow.rdb		

Internal Standard	Area (cps)	RT (min)	Target Conc. (ng/L)	Calc. Conc. (ng/L)
MPFHxS	118000.	1.71	1.00	-
MPFHpA	376000.	1.74	1.00	-
MPFOA	350000.	1.92	1.00	-
MPFOS	153000.	1.99	1.00	-
MPFNA	275000.	2.06	1.00	-
13C6-PFHxA IS	3350000.	1.48	1.00	-
N/A	N/A	N/A	N/A	-

Target Analyte	Area (cps)	RT (min)	Target Conc. (ng/L)	Calc. Conc. (ng/L)	Accuracy (%)
PFBS 1	894000	1.16	30.0	24.9	82.8
PFHxS 1	1060000	1.71	30.0	27.7	92.4
PFHpA 1	1570000	1.74	30.0	31.1	104.0
PFOA 1	1780000	1.92	30.0	31.0	103.0
PFOS 1	804000	1.99	30.0	29.0	96.6
PFNA 1	1370000	2.05	30.0	30.1	100.0
18O2-PFHxS	118000	1.71	100.	95.3	95.3
13C4-PFHpA	376000	1.74	100.	90.7	90.7
13C4-PFOA	350000	1.92	100.	96.7	96.7
13C4-PFOS	153000	1.99	100.	106.	106.0
13C5-PFNA	275000	2.06	100.	111.	111.0
13C6-PFHxA	3350000	1.48	100.	84.0	84.0

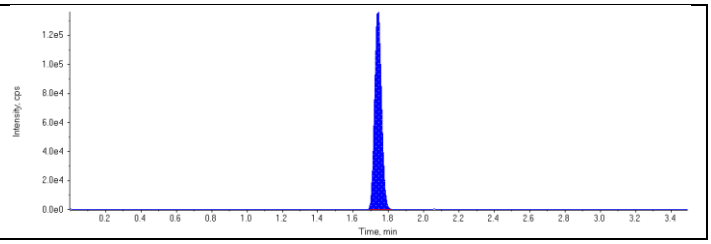
MPFHxS (Internal Standard)

RT (Exp. RT): 1.71(1.68) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



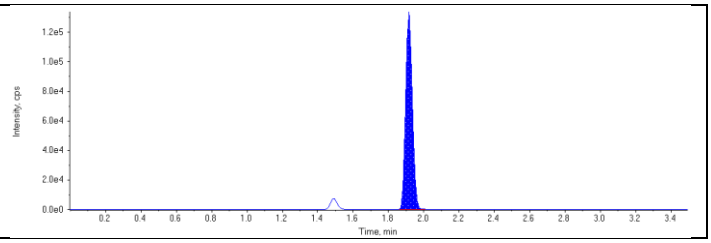
MPFHpA (Internal Standard)

RT (Exp. RT): 1.74(1.75) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



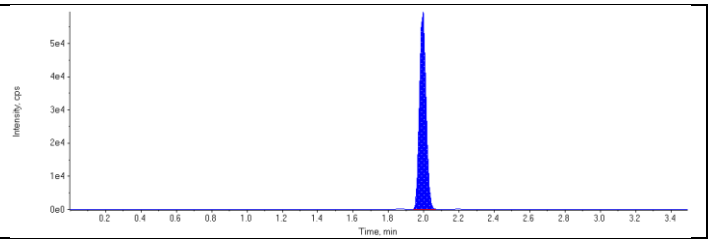
MPFOA (Internal Standard)

RT (Exp. RT): 1.92(1.88) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



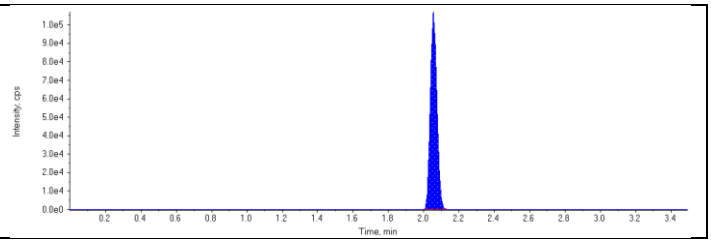
MPFOS (Internal Standard)

RT (Exp. RT): 1.99(1.97) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



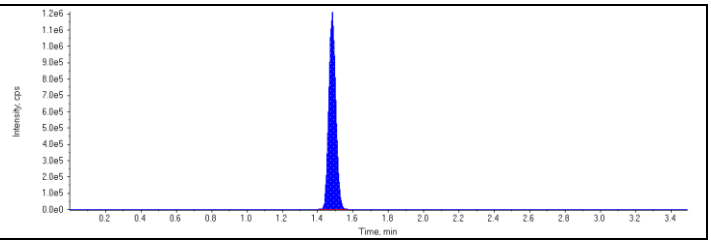
MPFNA (Internal Standard)

RT (Exp. RT): 2.06(2.02) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



13C6-PFHxA IS (Internal Standard)

RT (Exp. RT): 1.48(1.42) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



N/A (Internal Standard)

RT (Exp. RT): N/A(N/A) min
Concentration: N/A N/A
Sample Type: (Quality Control)

This image is not available

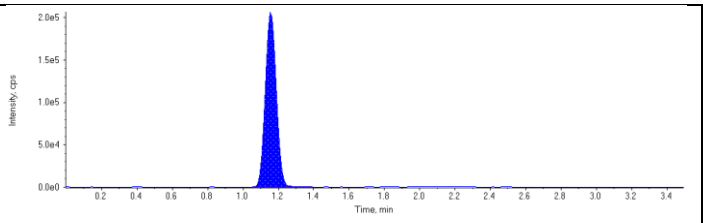
PFBS 1 (298.900/79.900 Da)

RT (Exp. RT): 1.16 (1.15) min

Calculated Conc: 24.9 µg/L

Area Ratio: 7.60

Sample Type: (Quality Control)



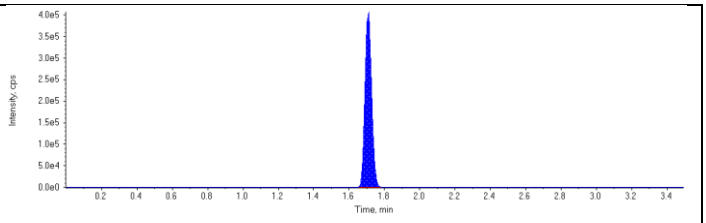
PFHxS 1 (398.900/79.900 Da)

RT (Exp. RT): 1.71 (1.68) min

Calculated Conc: 27.7 µg/L

Area Ratio: 9.02

Sample Type: (Quality Control)



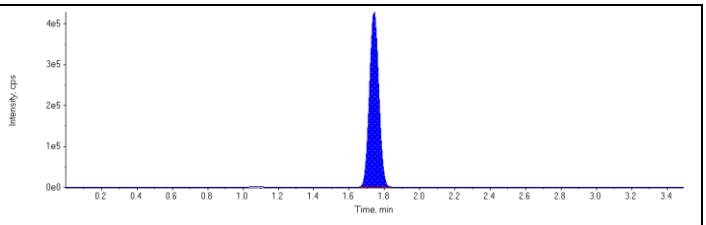
PFHpA 1 (363.000/319.000 Da)

RT (Exp. RT): 1.74 (1.75) min

Calculated Conc: 31.1 µg/L

Area Ratio: 4.18

Sample Type: (Quality Control)



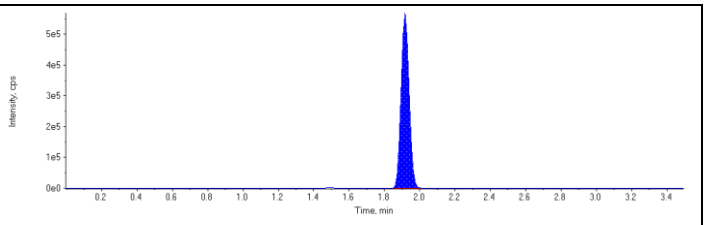
PFOA 1 (413.100/369.000 Da)

RT (Exp. RT): 1.92 (1.92) min

Calculated Conc: 31.0 µg/L

Area Ratio: 5.08

Sample Type: (Quality Control)



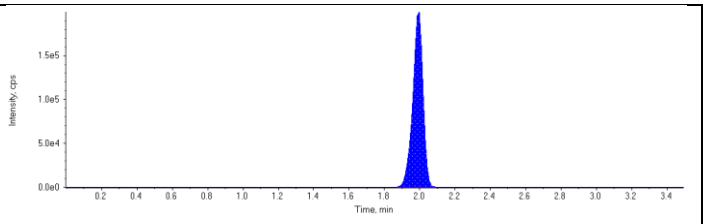
PFOS 1 (498.900/79.900 Da)

RT (Exp. RT): 1.99 (1.97) min

Calculated Conc: 29.0 µg/L

Area Ratio: 5.25

Sample Type: (Quality Control)



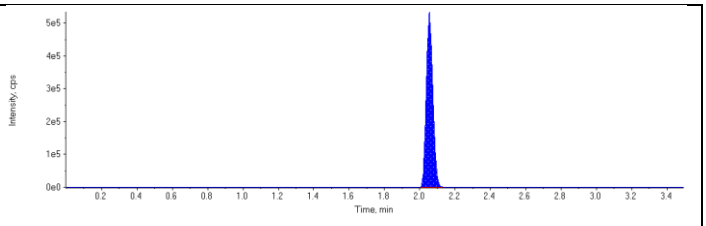
PFNA 1 (462.900/419.000 Da)

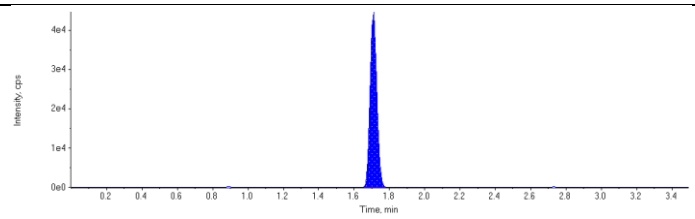
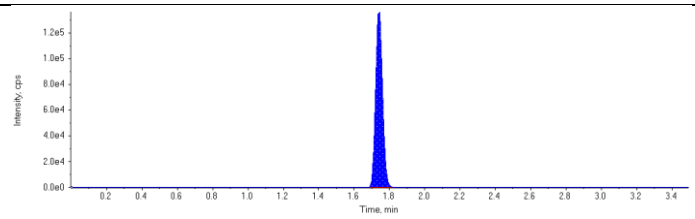
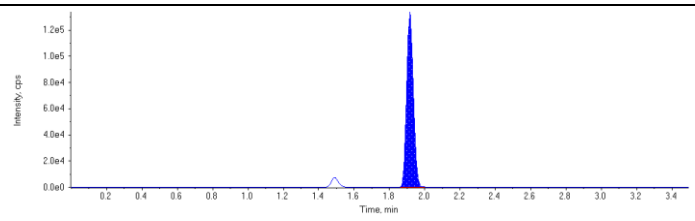
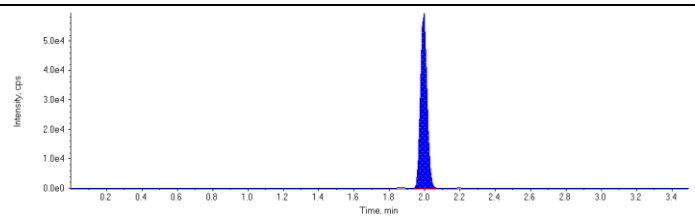
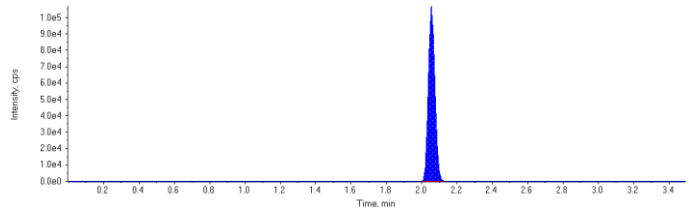
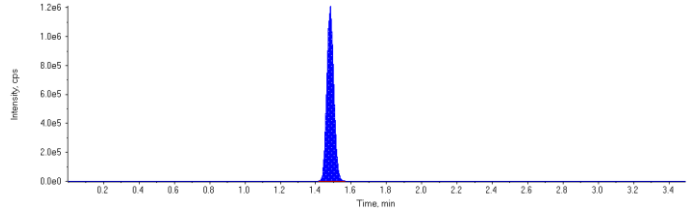
RT (Exp. RT): 2.05 (2.02) min

Calculated Conc: 30.1 µg/L

Area Ratio: 4.98

Sample Type: (Quality Control)



18O2-PFHxS (402.900/84.000 Da) RT (Exp. RT): 1.71 (1.68) min Calculated Conc: 95.3 µg/L Area Ratio: 0.0351 Sample Type: (Quality Control)	
13C4-PFHpA (366.900/322.000 Da) RT (Exp. RT): 1.74 (1.75) min Calculated Conc: 90.7 µg/L Area Ratio: 0.112 Sample Type: (Quality Control)	
13C4-PFOA (416.900/372.000 Da) RT (Exp. RT): 1.92 (1.88) min Calculated Conc: 96.7 µg/L Area Ratio: 0.104 Sample Type: (Quality Control)	
13C4-PFOS (502.900/79.900 Da) RT (Exp. RT): 1.99 (1.97) min Calculated Conc: 106. µg/L Area Ratio: 0.0457 Sample Type: (Quality Control)	
13C5-PFNA (467.900/423.000 Da) RT (Exp. RT): 2.06 (2.02) min Calculated Conc: 111. µg/L Area Ratio: 0.0820 Sample Type: (Quality Control)	
13C6-PFHxA (318.900/274.000 Da) RT (Exp. RT): 1.48 (1.42) min Calculated Conc: 84.0 µg/L Area Ratio: 0.00 Sample Type: (Quality Control)	

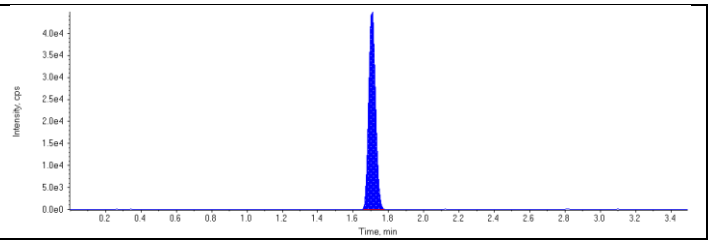
Sample Name	**CCV**	**Injection Vial**	6
Sample ID	CCV	**Injection Volume (µL)**	3
Sample Type	Quality Control	**Algorithm Used**	Analyst Classic
Acquisition Date	2016/02/19 10:43:32 AM	**Dilution Factor**	1.00
Acquisition Method	PFC_Water_Low.dam	**Sample Annotation**	-
Project	Enviro\PFOS	**Instrument Name**	LCMS03
Data File	PFC_160219\WS#4386408.wiff		
Result Table	PFC_Water_160219_4386408_ULow.rdb		

Internal Standard	Area (cps)	RT (min)	Target Conc. (ng/L)	Calc. Conc. (ng/L)
MPFHxS	122000.	1.71	1.00	-
MPFHpA	400000.	1.74	1.00	-
MPFOA	381000.	1.91	1.00	-
MPFOS	150000.	1.99	1.00	-
MPFNA	266000.	2.05	1.00	-
13C6-PFHxA IS	3360000.	1.48	1.00	-
N/A	N/A	N/A	N/A	-

Target Analyte	Area (cps)	RT (min)	Target Conc. (ng/L)	Calc. Conc. (ng/L)	Accuracy (%)
PFBS 1	975000	1.15	30.0	26.0	86.7
PFHxS 1	1160000	1.71	30.0	29.2	97.3
PFHpA 1	1680000	1.74	30.0	31.2	104.0
PFOA 1	1910000	1.92	30.0	30.5	102.0
PFOS 1	851000	1.99	30.0	31.3	104.0
PFNA 1	1330000	2.05	30.0	30.3	101.0
18O2-PFHxS	122000	1.71	100.	99.0	99.0
13C4-PFHpA	400000	1.74	100.	96.4	96.4
13C4-PFOA	381000	1.91	100.	105.	105.0
13C4-PFOS	150000	1.99	100.	103.	103.0
13C5-PFNA	266000	2.05	100.	108.	108.0
13C6-PFHxA	3360000	1.48	100.	84.1	84.1

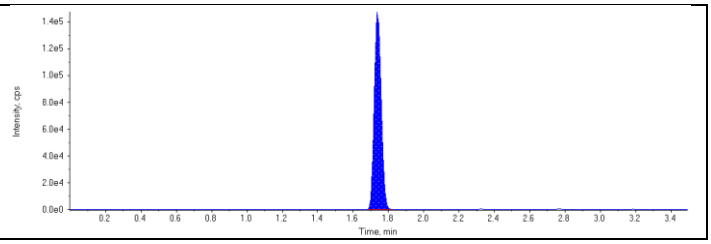
MPFHxS (Internal Standard)

RT (Exp. RT): 1.71(1.68) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



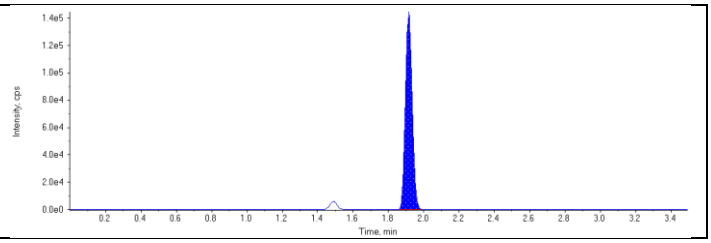
MPFHpA (Internal Standard)

RT (Exp. RT): 1.74(1.75) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



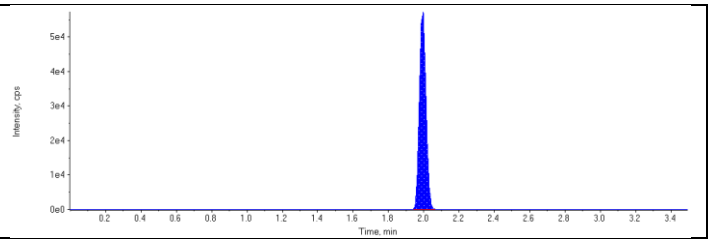
MPFOA (Internal Standard)

RT (Exp. RT): 1.91(1.88) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



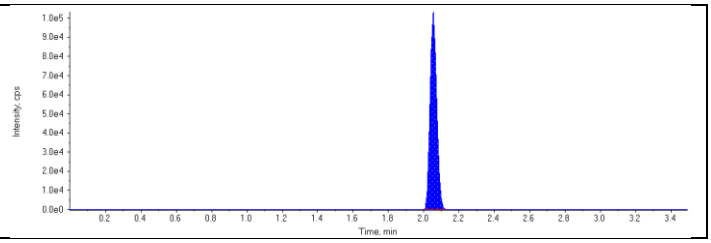
MPFOS (Internal Standard)

RT (Exp. RT): 1.99(1.97) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



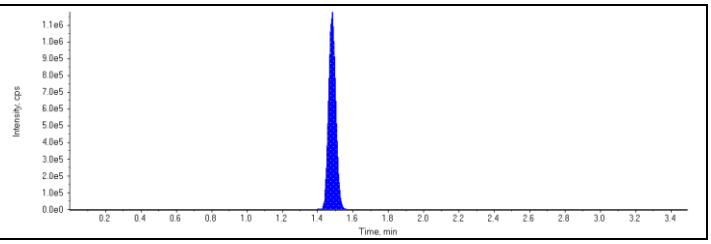
MPFNA (Internal Standard)

RT (Exp. RT): 2.05(2.02) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



13C6-PFHxA IS (Internal Standard)

RT (Exp. RT): 1.48(1.42) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



N/A (Internal Standard)

RT (Exp. RT): N/A(N/A) min
Concentration: N/A N/A
Sample Type: (Quality Control)

This image is not available

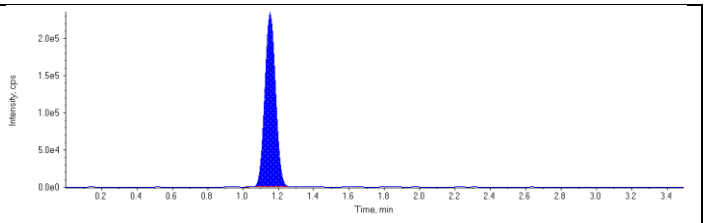
PFBS 1 (298.900/79.900 Da)

RT (Exp. RT): 1.15 (1.15) min

Calculated Conc: 26.0 µg/L

Area Ratio: 7.96

Sample Type: (Quality Control)



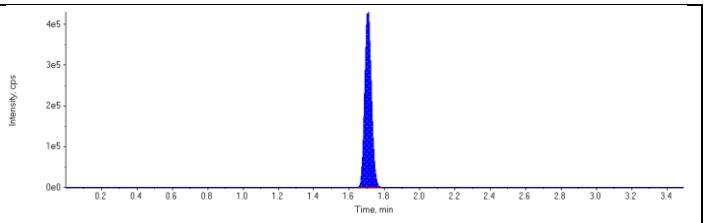
PFHxS 1 (398.900/79.900 Da)

RT (Exp. RT): 1.71 (1.68) min

Calculated Conc: 29.2 µg/L

Area Ratio: 9.51

Sample Type: (Quality Control)



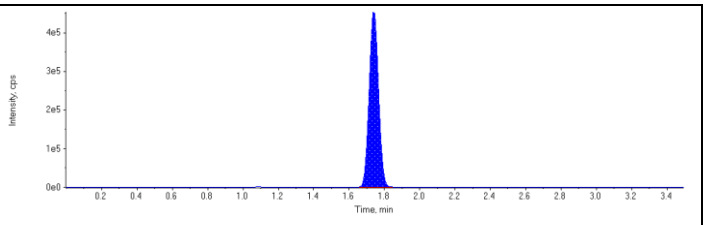
PFHpA 1 (363.000/319.000 Da)

RT (Exp. RT): 1.74 (1.75) min

Calculated Conc: 31.2 µg/L

Area Ratio: 4.20

Sample Type: (Quality Control)



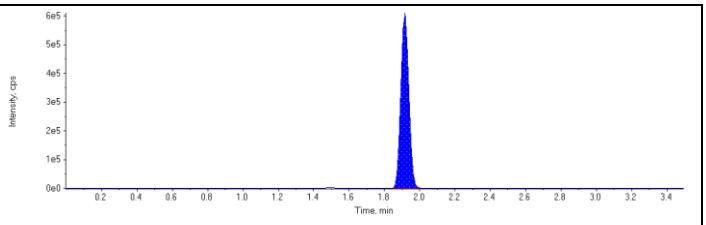
PFOA 1 (413.100/369.000 Da)

RT (Exp. RT): 1.92 (1.92) min

Calculated Conc: 30.5 µg/L

Area Ratio: 5.00

Sample Type: (Quality Control)



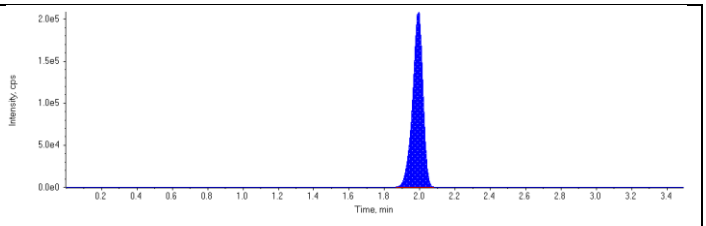
PFOS 1 (498.900/79.900 Da)

RT (Exp. RT): 1.99 (1.97) min

Calculated Conc: 31.3 µg/L

Area Ratio: 5.67

Sample Type: (Quality Control)



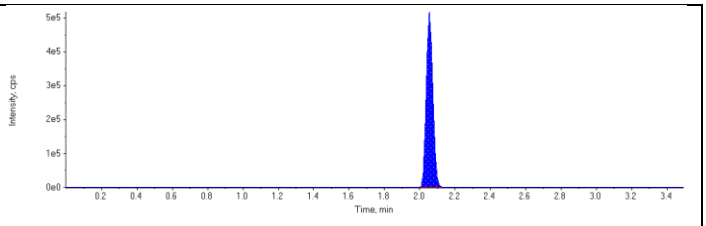
PFNA 1 (462.900/419.000 Da)

RT (Exp. RT): 2.05 (2.02) min

Calculated Conc: 30.3 µg/L

Area Ratio: 5.01

Sample Type: (Quality Control)



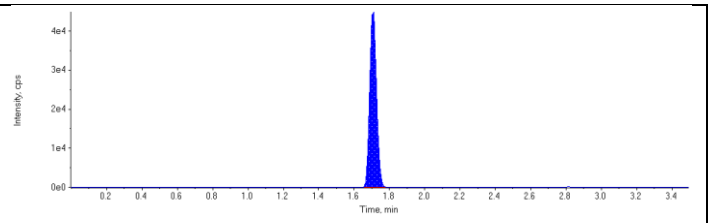
18O2-PFHxS (402.900/84.000 Da)

RT (Exp. RT): 1.71 (1.68) min

Calculated Conc: 99.0 µg/L

Area Ratio: 0.0365

Sample Type: (Quality Control)



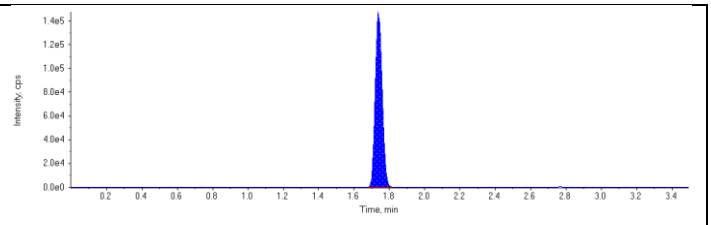
13C4-PFHpA (366.900/322.000 Da)

RT (Exp. RT): 1.74 (1.75) min

Calculated Conc: 96.4 µg/L

Area Ratio: 0.119

Sample Type: (Quality Control)



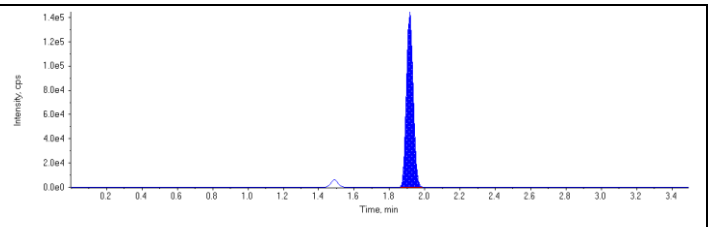
13C4-PFOA (416.900/372.000 Da)

RT (Exp. RT): 1.91 (1.88) min

Calculated Conc: 105. µg/L

Area Ratio: 0.114

Sample Type: (Quality Control)



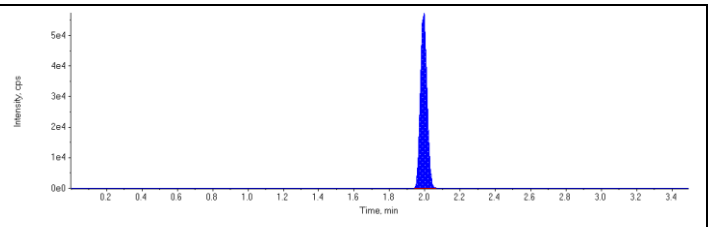
13C4-PFOS (502.900/79.900 Da)

RT (Exp. RT): 1.99 (1.97) min

Calculated Conc: 103. µg/L

Area Ratio: 0.0447

Sample Type: (Quality Control)



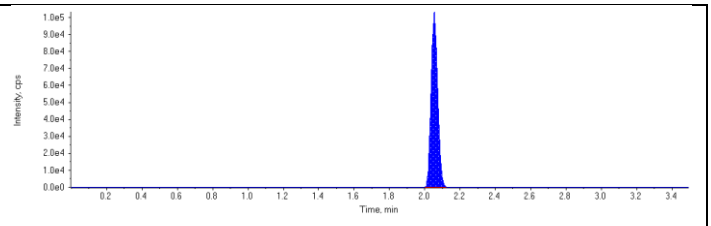
13C5-PFNA (467.900/423.000 Da)

RT (Exp. RT): 2.05 (2.02) min

Calculated Conc: 108. µg/L

Area Ratio: 0.0793

Sample Type: (Quality Control)



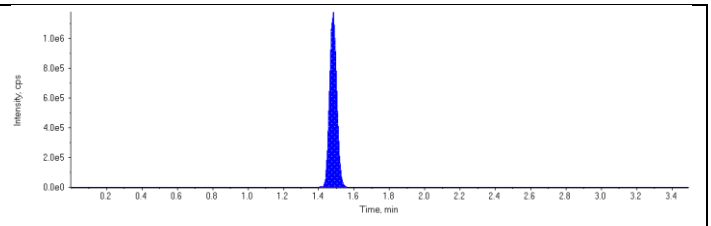
13C6-PFHxA (318.900/274.000 Da)

RT (Exp. RT): 1.48 (1.42) min

Calculated Conc: 84.1 µg/L

Area Ratio: 0.00

Sample Type: (Quality Control)



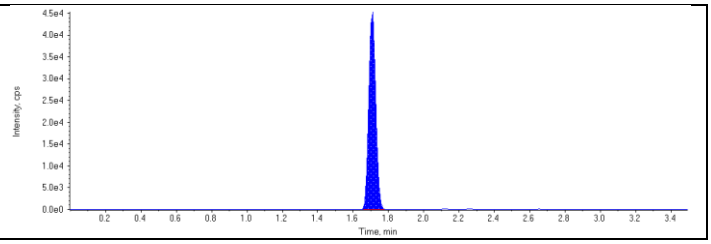
Sample Name	**CCV**	**Injection Vial**	6
Sample ID	CCV	**Injection Volume (µL)**	3
Sample Type	Quality Control	**Algorithm Used**	Analyst Classic
Acquisition Date	2016/02/19 11:03:54 AM	**Dilution Factor**	1.00
Acquisition Method	PFC_Water_Low.dam	**Sample Annotation**	-
Project	Enviro\PFOS	**Instrument Name**	LCMS03
Data File	PFC_160219\WS#4386408.wiff		
Result Table	PFC_Water_160219_4386408_ULow.rdb		

Internal Standard	Area (cps)	RT (min)	Target Conc. (ng/L)	Calc. Conc. (ng/L)
MPFHxS	123000.	1.71	1.00	-
MPFHpA	413000.	1.74	1.00	-
MPFOA	372000.	1.91	1.00	-
MPFOS	165000.	1.99	1.00	-
MPFNA	267000.	2.05	1.00	-
13C6-PFHxA IS	3510000.	1.48	1.00	-
N/A	N/A	N/A	N/A	-

Target Analyte	Area (cps)	RT (min)	Target Conc. (ng/L)	Calc. Conc. (ng/L)	Accuracy (%)
PFBS 1	950000	1.15	30.0	25.3	84.2
PFHxS 1	1180000	1.71	30.0	29.5	98.2
PFHpA 1	1770000	1.74	30.0	31.8	106.0
PFOA 1	1910000	1.92	30.0	31.4	105.0
PFOS 1	881000	1.99	30.0	29.4	98.1
PFNA 1	1370000	2.05	30.0	30.9	103.0
18O2-PFHxS	123000	1.71	100.	95.1	95.1
13C4-PFHpA	413000	1.74	100.	95.1	95.1
13C4-PFOA	372000	1.91	100.	98.3	98.3
13C4-PFOS	165000	1.99	100.	109.	109.0
13C5-PFNA	267000	2.05	100.	103.	103.0
13C6-PFHxA	3510000	1.48	100.	87.9	87.9

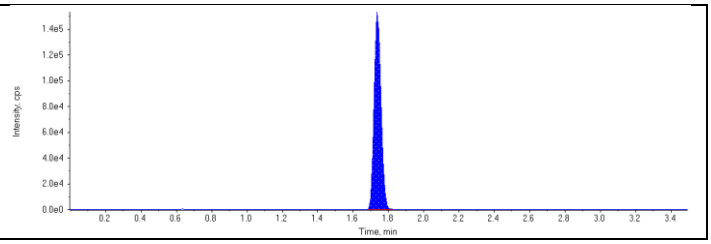
MPFHxS (Internal Standard)

RT (Exp. RT): 1.71(1.68) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



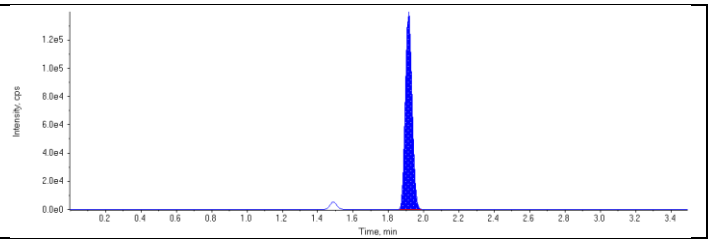
MPFHpA (Internal Standard)

RT (Exp. RT): 1.74(1.75) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



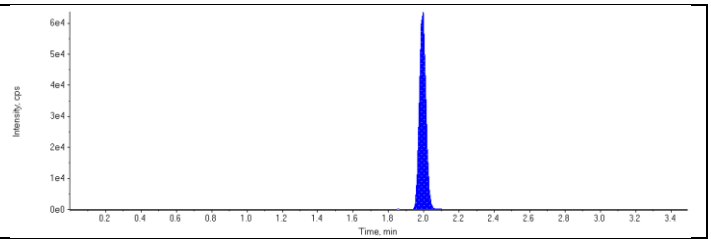
MPFOA (Internal Standard)

RT (Exp. RT): 1.91(1.88) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



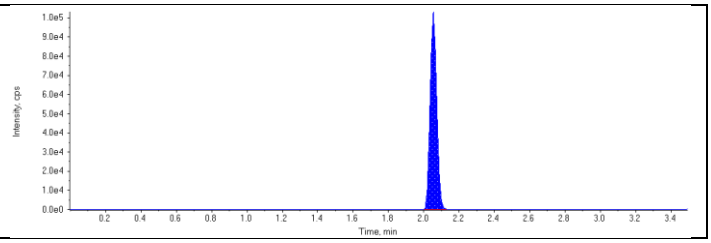
MPFOS (Internal Standard)

RT (Exp. RT): 1.99(1.97) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



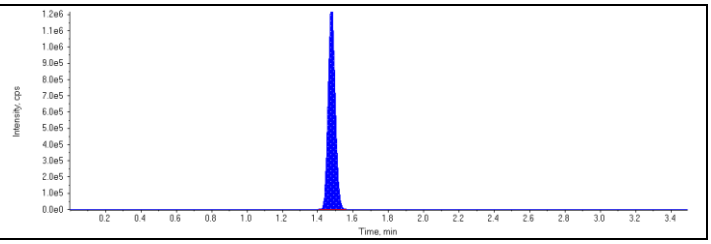
MPFNA (Internal Standard)

RT (Exp. RT): 2.05(2.02) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



13C6-PFHxA IS (Internal Standard)

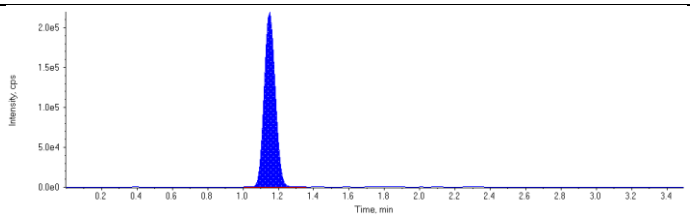
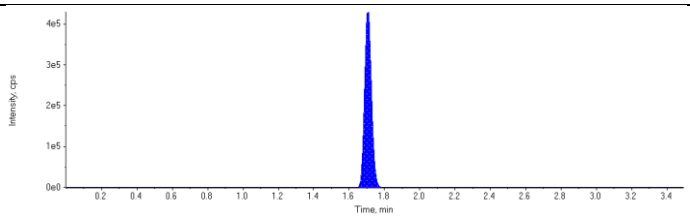
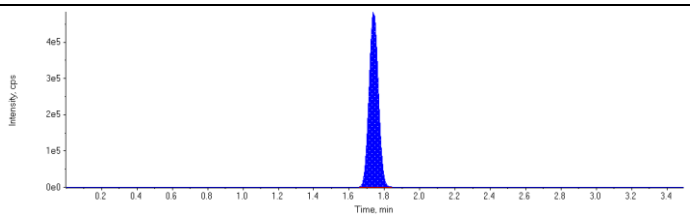
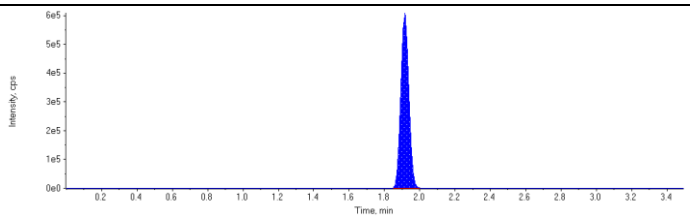
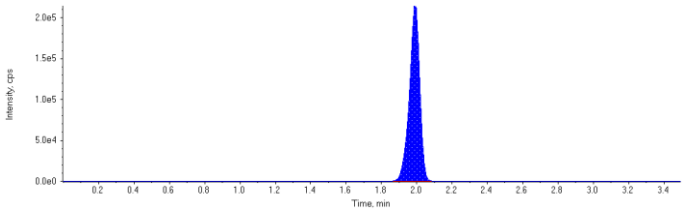
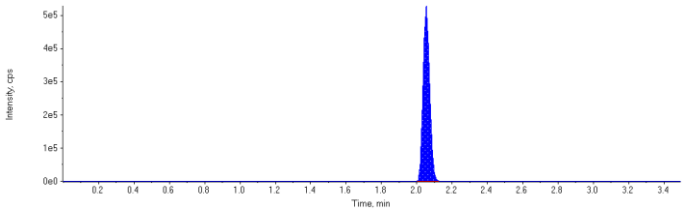
RT (Exp. RT): 1.48(1.42) min
Concentration: 1.00 ng/L
Sample Type: (Quality Control)



N/A (Internal Standard)

RT (Exp. RT): N/A(N/A) min
Concentration: N/A N/A
Sample Type: (Quality Control)

This image is not available

PFBS 1 (298.900/79.900 Da) RT (Exp. RT): 1.15 (1.15) min Calculated Conc: 25.3 µg/L Area Ratio: 7.73 Sample Type: (Quality Control)	
PFHxS 1 (398.900/79.900 Da) RT (Exp. RT): 1.71 (1.68) min Calculated Conc: 29.5 µg/L Area Ratio: 9.60 Sample Type: (Quality Control)	
PFHpA 1 (363.000/319.000 Da) RT (Exp. RT): 1.74 (1.75) min Calculated Conc: 31.8 µg/L Area Ratio: 4.28 Sample Type: (Quality Control)	
PFOA 1 (413.100/369.000 Da) RT (Exp. RT): 1.92 (1.92) min Calculated Conc: 31.4 µg/L Area Ratio: 5.14 Sample Type: (Quality Control)	
PFOS 1 (498.900/79.900 Da) RT (Exp. RT): 1.99 (1.97) min Calculated Conc: 29.4 µg/L Area Ratio: 5.33 Sample Type: (Quality Control)	
PFNA 1 (462.900/419.000 Da) RT (Exp. RT): 2.05 (2.02) min Calculated Conc: 30.9 µg/L Area Ratio: 5.12 Sample Type: (Quality Control)	

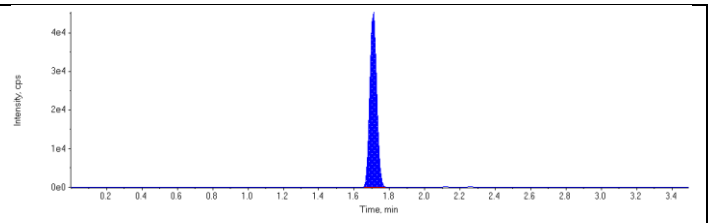
18O2-PFHxS (402.900/84.000 Da)

RT (Exp. RT): 1.71 (1.68) min

Calculated Conc: 95.1 µg/L

Area Ratio: 0.0350

Sample Type: (Quality Control)



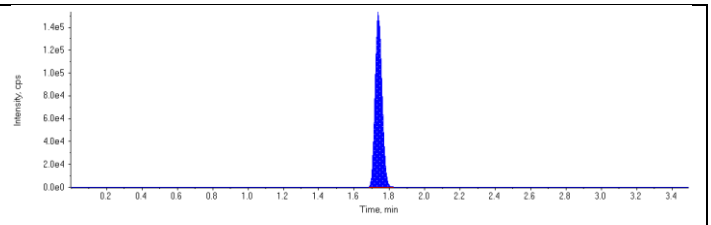
13C4-PFHpA (366.900/322.000 Da)

RT (Exp. RT): 1.74 (1.75) min

Calculated Conc: 95.1 µg/L

Area Ratio: 0.118

Sample Type: (Quality Control)



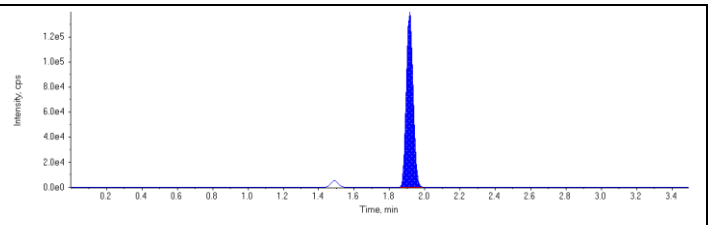
13C4-PFOA (416.900/372.000 Da)

RT (Exp. RT): 1.91 (1.88) min

Calculated Conc: 98.3 µg/L

Area Ratio: 0.106

Sample Type: (Quality Control)



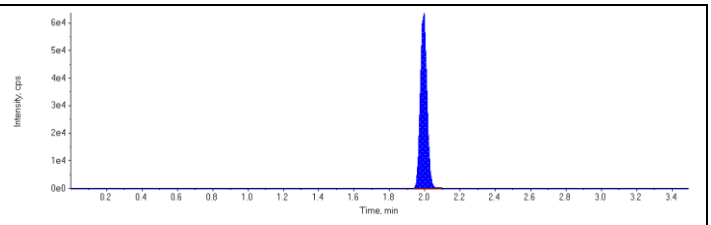
13C4-PFOS (502.900/79.900 Da)

RT (Exp. RT): 1.99 (1.97) min

Calculated Conc: 109. µg/L

Area Ratio: 0.0471

Sample Type: (Quality Control)



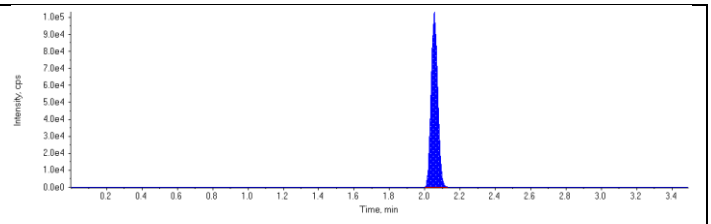
13C5-PFNA (467.900/423.000 Da)

RT (Exp. RT): 2.05 (2.02) min

Calculated Conc: 103. µg/L

Area Ratio: 0.0762

Sample Type: (Quality Control)



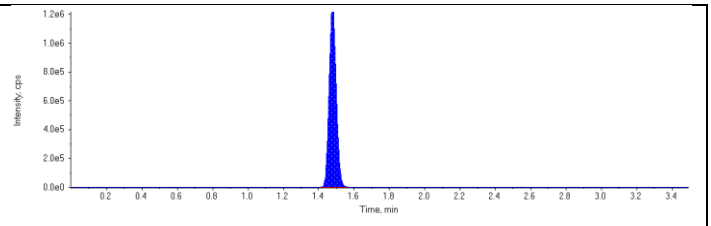
13C6-PFHxA (318.900/274.000 Da)

RT (Exp. RT): 1.48 (1.42) min

Calculated Conc: 87.9 µg/L

Area Ratio: 0.00

Sample Type: (Quality Control)



This is the last page of the report and is intentionally left blank

Maxxam Analytics International
6740 Campobello Rd.
Mississauga, Ontario, Canada
L5N 2L8
1-800-668-0639
www.maxxamanalytics.com

Shipping and Receiving Documents

Chain of Custody Record

Temperature on Receipt _____

Drinking Water? Yes ☒ No ☐

320-17154 Chain of Custody

CTO WE7G

TAL-4124 (1007)

Client	Project Manager	Date	Chain of Custody Number
CH2M Hill	Bill Friedmann	02/03/16	283602
Address	**Telephone Number (Area Code)/Fax Number**	**Lab Number**	**Page 1 of 1**
5701 Cleveland St, Suite 200	757-671-6223		
City / **State** / **Zip Code**	**Site Contact**	**Lab Contact**	
Virginia Beach / VA / 23462			
Project Name and Location (State)	**Carrier/Waybill Number**		
CTO WE7G PFC Sampling	FedEx		
Contract/Purchase Order/Quote No.			
PO# 938652			

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Analysis: Select PFCs	Special Instructions/ Conditions of Receipt
OF-FB09-0216	02/03/16	1640		X			X						1	
OF-RW09-0216		1645											2	
OF-FB37-0216		1720											1	
OF-RW37-0216		1728											2	
OF-RW11-0216		1604											2	
OF-FB11-0216		1610											1	
OF-RW28-0216		1741											2	
OF-FB28-0216		1743											1	
OF-RW67-0216		1819											2	
OF-FB67-0216		1821											1	

Page 63 of 82

Possible Hazard Identification

☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal

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

Turn Around Time Required

☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☐ Other _____

QC Requirements (Specify)

	Date	Time		Date	Time
1 Relinquished By: Kathryn Smith	02/03/16	19:30	1. Received By:	2/4/16	945
2. Relinquished By			2. Received By		
3. Relinquished By			3 Received By		

Comments

0.3°C

03/22/2016

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

Chain of Custody Record

Temperature on Receipt _____

Drinking Water? Yes☒ No☐

320-17154 Chain of Custody

CTO WE7G

Due 2/22

Project Manager	Date	Chain of Custody Number
[redacted]	02/03/16	283602
Telephone Number (Area Code)/Fax Number	Lab Number	Page 1 of 1
[redacted]		
Site Contact	Lab Contact	Analysis (Attach list if more space is needed)
Carrier/Waybill Number: FedEx		Special Instructions/ Conditions of Receipt

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H_2SO_4	HNO_3	HCl	NaOH	ZnAc/ NaOH	Select PEGs
OF-FB07-Ø216	02/03/16	1618		X			X						1
OF-RW09-Ø216		1645											2
OF-FB37-Ø216		1720											1
OF-RW37-Ø216		1728											2
OF-RW11-Ø216		1604											2
OF-FB11-Ø216		1610											1
OF-RW28-Ø216		1741											2
OF-FB28-Ø216		1748											1
OF-RW67-Ø216		1819											2
OF-FB67-Ø216		1821											1

13-Feb-16 13:40
Hongmei Zhao (Grace)
B630797
RGN ENV-951

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

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

Turn Around Time Required
☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☐ Other _____

QC Requirements (Specify)

	Relinquished By	Date	Time	Received By	Date	Time
1.	Kathryn Smith	02/03/16	19:30		2/4/16	945
2.					2016/02/13	13:40
3.						

Comments

0.3°C REFER TO ACTR

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

Login Sample Receipt Checklist

Client: CH2M Hill, Inc.

Job Number: 320-17154-1
SDG Number: CTO WE7G PFC Sampling

Login Number: 17154
List Number: 1
Creator: Nelson, Kym D

List Source: TestAmerica Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	N/A	
Sample Preservation Verified.	True	
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	

Contract_ID	DO_CTO_Number	Phase	Installation_ID	Sample_Name	CH2M_Code	Analysis_Group	Analytical_Method	PRC_Code	Lab_Code	Lab_Name	Leachate_Method	Sample_Basis	Extraction_Method	Result_Type	Lab_QC_Type	Sample_Medium	QC_Level	DateTime_Collected	Date_Received	Leachate_Date	Leachate_Time	Extraction_Date	Extraction_Time	Analysis_Date	Analysis_Time	Lab_Sample_ID	Dilution	Run_Number	Percent_Moisture	Percent_Lipid	Chem_Name	Analyte_ID	Analyte_Value	Original_Analyte_Value	Result_Units	Lab_Qualifier	Validator_Qualifier	GC_Column_Type	Analysis_Result_Type	Result_Narrative	QC_Control_Limit_Code	QC_Accuracy_Upper	QC_Accuracy_Lower	Control_Limit_Date	QC_Narrative	MDL	Detection_Limit	QSM_Version	DL	LOD	LOQ	SDG	Analysis_Batch	Validator_Name	Val_Date
N6247011D8012	WE7G		OCEANA_NAS	OF-RW34-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 10:47	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-10	1	1			Perfluorobutanesulfonic acid (PFBS)	375-73-5	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.00027	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW34-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 10:47	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-10	1	1			Perfluoroheptanoic acid (PFHpA)	375-85-9	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.00039	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW34-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 10:47	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-10	1	1			Perfluorohexanesulfonic acid (PFHxS)	355-46-4	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.0004	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW34-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 10:47	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-10	1	1			Perfluorononanoic acid (PFNA)	375-95-1	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.00033	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW34-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 10:47	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-10	1	1			Perfluorooctane Sulfonate (PFOS)	1763-23-1	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.0003	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW34-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 10:47	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-10	1	1			Perfluorooctanoic acid (PFOA)	335-67-1	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.00039	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW38-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 17:16	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-12	1	1			Perfluorobutanesulfonic acid (PFBS)	375-73-5	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.00027	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW38-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 17:16	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-12	1	1			Perfluoroheptanoic acid (PFHpA)	375-85-9	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.00039	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW38-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 17:16	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-12	1	1			Perfluorohexanesulfonic acid (PFHxS)	355-46-4	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.0004	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW38-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 17:16	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-12	1	1			Perfluorononanoic acid (PFNA)	375-95-1	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.00033	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW38-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 17:16	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-12	1	1			Perfluorooctane Sulfonate (PFOS)	1763-23-1	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.0003	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW38-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 17:16	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-12	1	1			Perfluorooctanoic acid (PFOA)	335-67-1	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.00039	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW50-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 17:42	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-8	1	1			Perfluorobutanesulfonic acid (PFBS)	375-73-5	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.00027	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW50-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 17:42	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-8	1	1			Perfluoroheptanoic acid (PFHpA)	375-85-9	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.00039	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW50-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 17:42	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-8	1	1			Perfluorohexanesulfonic acid (PFHxS)	355-46-4	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.0004	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW50-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 17:42	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-8	1	1			Perfluorononanoic acid (PFNA)	375-95-1	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.00033	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW50-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 17:42	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-8	1	1			Perfluorooctane Sulfonate (PFOS)	1763-23-1	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.0003	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW50-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 17:42	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-8	1	1			Perfluorooctanoic acid (PFOA)	335-67-1	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.00039	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW59-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 14:40	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-6	1	1			Perfluorobutanesulfonic acid (PFBS)	375-73-5	0.019	0.019	UG_L			PR	TRG					00000000				5.0	0.00027	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW59-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 14:40	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-6	1	1			Perfluoroheptanoic acid (PFHpA)	375-85-9	0.007	0.007	UG_L			PR	TRG					00000000				5.0	0.00039	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW59-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 14:40	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-6	10	1			Perfluorohexanesulfonic acid (PFHxS)	355-46-4	0.36	0.36	UG_L	D	D	PR	TRG					00000000				5.0	0.004	0.01	0.02	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW59-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 14:40	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-6	1	1			Perfluorononanoic acid (PFNA)	375-95-1	0.00080	0.00080	UG_L	J	J	PR	TRG					00000000				5.0	0.00033	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW59-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 14:40	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-6	10	1			Perfluorooctane Sulfonate (PFOS)	1763-23-1	0.580	0.580	UG_L	D	D	PR	TRG					00000000				5.0	0.003	0.01	0.02	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW59-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 14:40	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-6	1	1			Perfluorooctanoic acid (PFOA)	335-67-1	0.087	0.087	UG_L			PR	TRG					00000000				5.0	0.00039	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW62-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 09:20	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-2	1	1			Perfluorobutanesulfonic acid (PFBS)	375-73-5	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.00027	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW62-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 09:20	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-2	1	1			Perfluoroheptanoic acid (PFHpA)	375-85-9	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.00039	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW62-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 09:20	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-2	1	1			Perfluorohexanesulfonic acid (PFHxS)	355-46-4	0.00075	0.00075	UG_L	J	J	PR	TRG					00000000				5.0	0.0004	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW62-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 09:20	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-2	1	1			Perfluorononanoic acid (PFNA)	375-95-1	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.00033	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW62-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 09:20	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-2	1	1			Perfluorooctane Sulfonate (PFOS)	1763-23-1	0.0015	0.0015	UG_L	J	J	PR	TRG					00000000				5.0	0.0003	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW62-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 09:20	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-2	1	1			Perfluorooctanoic acid (PFOA)	335-67-1	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.00039	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW63-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 09:50	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-4	1	1			Perfluorobutanesulfonic acid (PFBS)	375-73-5	0.0065	0.0065	UG_L			PR	TRG					00000000				5.0	0.00027	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW63-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 09:50	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-4	1	1			Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0058	0.0058	UG_L			PR	TRG					00000000				5.0	0.00039	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW63-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 09:50	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-4	1	1			Perfluorohexanesulfonic acid (PFHxS)	355-46-4	0.022	0.022	UG_L			PR	TRG					00000000				5.0	0.0004	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW63-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 09:50	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-4	1	1			Perfluorononanoic acid (PFNA)	375-95-1	0.0011	0.0011	UG_L	J	J	PR	TRG					00000000				5.0	0.00033	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW63-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 09:50	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-4	1	1			Perfluorooctane Sulfonate (PFOS)	1763-23-1	0.044	0.044	UG_L			PR	TRG					00000000				5.0	0.0003	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW63-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 09:50	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-4	1	1			Perfluorooctanoic acid (PFOA)	335-67-1	0.03	0.03	UG_L			PR	TRG					00000000				5.0	0.00039	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB62-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 09:15	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-1	1	1			13C4 PFOA	13C4 PFOA	104	104	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW62-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 09:20	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-2	1	1			13C4 PFOA	13C4 PFOA	86	86	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB63-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 09:40	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-3	1	1			13C4 PFOA	13C4 PFOA	107	107	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW63-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 09:50	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-4	1	1			13C4 PFOA	13C4 PFOA	81	81	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB59-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 14:30	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-5	1	1			13C4 PFOA	13C4 PFOA	107	107	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW59-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 14:40	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-6	1	1			13C4 PFOA	13C4 PFOA	96	96	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB50-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 17:35	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-7	1	1			13C4 PFOA	13C4 PFOA	125	125	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW50-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 17:42	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-8	1	1			13C4 PFOA	13C4 PFOA	68	68	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB34-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 10:40	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-9	1	1			13C4 PFOA	13C4 PFOA	113	113	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW34-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 10:47	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-10	1	1			13C4 PFOA	13C4 PFOA	91	91	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB38-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 17:10	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-11	1	1			13C4 PFOA	13C4 PFOA	130	130	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW38-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 17:16	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-12	1	1			13C4 PFOA	13C4 PFOA	79	79	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	4394551-BLK	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	LB1	W	4	02/25/2016 00:00	02/25/2016			20160225	00:00:00	20160229	00:00:00	4394551-BLK	1	1			13C4 PFOA	13C4 PFOA	114	114	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	4394551-LCS	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	BS	W	4	02/25/2016 00:00	02/25/2016			20160225	00:00:00	20160229	00:00:00	4394551-LCS	1	1			13C4 PFOA	13C4 PFOA	140	140	PCT_REC	C	C	PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW63-0216 MS	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	MS	W	4	02/25/2016 00:00	02/25/2016			20160225	00:00:00	20160229	00:00:00	4394551-MS	1	1			13C4 PFOA	13C4 PFOA	75	75	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW63-0216 MSD	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	MSD	W	4	02/25/2016 00:00	02/25/2016			20160225	00:00:00	20160229	00:00:00	4394551-MS Dup	1	1			13C4 PFOA	13C4 PFOA	83	83	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB62-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 09:15	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-1	1	1			13C4 PFOS	13C4 PFOS	110	110	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW62-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 09:20	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-2	1	1			13C4 PFOS	13C4 PFOS	71	71	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB63-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 09:40	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-3	1	1			13C4 PFOS	13C4 PFOS	103	103	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW63-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 09:50	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-4	1	1			13C4 PFOS	13C4 PFOS	72	72	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB59-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 14:30	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-5	1	1			13C4 PFOS	13C4 PFOS	105	105	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW59-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 14:40	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-6	1	1			13C4 PFOS	13C4 PFOS	105	105	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB50-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 17:35	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-7	1	1			13C4 PFOS	13C4 PFOS	102	102	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW50-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 17:42	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-8	1	1			13C4 PFOS	13C4 PFOS	53	53	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB34-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 10:40	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-9	1	1			13C4 PFOS	13C4 PFOS	107	107	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW34-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 10:47	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-10	1	1			13C4 PFOS	13C4 PFOS	81	81	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB38-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 17:10	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-11	1	1			13C4 PFOS	13C4 PFOS	136	136	PCT_REC	C	C	PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW38-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 17:16	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-12	1	1			13C4 PFOS	13C4 PFOS	75	75	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	4394551-BLK	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	LB1	W	4	02/25/2016 00:00	02/25/2016			20160225	00:00:00	20160229	00:00:00	4394551-BLK	1	1			13C4 PFOS	13C4 PFOS	107	107	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	4394551-LCS	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	BS	W	4	02/25/2016 00:00	02/25/2016			20160225	00:00:00	20160229	00:00:00	4394551-LCS	1	1			13C4 PFOS	13C4 PFOS	132	132	PCT_REC	C	C	PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW63-0216 MS	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	MS	W	4	02/25/2016 00:00	02/25/2016			20160225	00:00:00	20160229	00:00:00	4394551-MS	1	1			13C4 PFOS	13C4 PFOS	66	66	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW63-0216 MSD	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	MSD	W	4	02/25/2016 00:00	02/25/2016			20160225	00:00:00	20160229	00:00:00	4394551-MS Dup	1	1			13C4 PFOS	13C4 PFOS	71	71	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB62-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 09:15	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-1	1	1			13C4-PFHPA	13C4-PFHPA	116	116	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW62-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 09:20	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-2	1	1			13C4-PFHPA	13C4-PFHPA	84	84	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB63-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 09:40	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-3	1	1			13C4-PFHPA	13C4-PFHPA	105	105	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW63-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 09:50	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-4	1	1			13C4-PFHPA	13C4-PFHPA	76	76	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB59-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 14:30	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-5	1	1			13C4-PFHPA	13C4-PFHPA	108	108	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW59-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 14:40	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-6	1	1			13C4-PFHPA	13C4-PFHPA	83	83	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB50-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 17:35	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-7	1	1			13C4-PFHPA	13C4-PFHPA	104	104	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW50-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 17:42	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-8	1	1			13C4-PFHPA	13C4-PFHPA	68	68	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB34-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 10:40	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-9	1	1			13C4-PFHPA	13C4-PFHPA	105	105	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW34-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 10:47	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-10	1	1			13C4-PFHPA	13C4-PFHPA	86	86	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB38-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 17:10	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-11	1	1			13C4-PFHPA	13C4-PFHPA	120	120	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW38-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 17:16	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-12	1	1			13C4-PFHPA	13C4-PFHPA	79	79	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	4394551-BLK	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	LB1	W	4	02/25/2016 00:00	02/25/2016			20160225	00:00:00	20160229	00:00:00	4394551-BLK	1	1			13C4-PFHPA	13C4-PFHPA	102	102	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	4394551-LCS	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	BS	W	4	02/25/2016 00:00	02/25/2016			20160225	00:00:00	20160229	00:00:00	4394551-LCS	1	1			13C4-PFHPA	13C4-PFHPA	137	137	PCT_REC	C	C	PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW63-0216 MS	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	MS	W	4	02/25/2016 00:00	02/25/2016			20160225	00:00:00	20160229	00:00:00	4394551-MS	1	1			13C4-PFHPA	13C4-PFHPA	69	69	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW63-0216 MSD	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	MSD	W	4	02/25/2016 00:00	02/25/2016			20160225	00:00:00	20160229	00:00:00	4394551-MS Dup	1	1			13C4-PFHPA	13C4-PFHPA	81	81	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB62-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 09:15	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-1	1	1			13C5 PFNA	13C5 PFNA	104	104	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW62-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 09:20	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-2	1	1			13C5 PFNA	13C5 PFNA	79	79	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB63-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 09:40	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-3	1	1			13C5 PFNA	13C5 PFNA	94	94	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW63-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 09:50	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-4	1	1			13C5 PFNA	13C5 PFNA	75	75	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB59-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 14:30	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-5	1	1			13C5 PFNA	13C5 PFNA	106	106	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW59-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 14:40	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-6	1	1			13C5 PFNA	13C5 PFNA	91	91	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB50-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 17:35	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-7	1	1			13C5 PFNA	13C5 PFNA	119	119	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW50-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 17:42	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-8	1	1			13C5 PFNA	13C5 PFNA	68	68	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB34-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 10:40	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-9	1	1			13C5 PFNA	13C5 PFNA	105	105	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW34-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 10:47	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-10	1	1			13C5 PFNA	13C5 PFNA	81	81	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB38-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 17:10	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-11	1	1			13C5 PFNA	13C5 PFNA	121	121	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW38-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 17:16	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-12	1	1			13C5 PFNA	13C5 PFNA	80	80	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	4394551-BLK	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	LB1	W	4	02/25/2016 00:00	02/25/2016			20160225	00:00:00	20160229	00:00:00	4394551-BLK	1	1			13C5 PFNA	13C5 PFNA	103	103	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	4394551-LCS	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	BS	W	4	02/25/2016 00:00	02/25/2016			20160225	00:00:00	20160229	00:00:00	4394551-LCS	1	1			13C5 PFNA	13C5 PFNA	136	136	PCT_REC	C	C	PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW63-0216 MS	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	MS	W	4	02/25/2016 00:00	02/25/2016			20160225	00:00:00	20160229	00:00:00	4394551-MS	1	1			13C5 PFNA	13C5 PFNA	69	69	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW63-0216 MSD	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	MSD	W	4	02/25/2016 00:00	02/25/2016			20160225	00:00:00	20160229	00:00:00	4394551-MS Dup	1	1			13C5 PFNA	13C5 PFNA	82	82	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB62-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 09:15	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-1	1	1			18O2 PFHXS	18O2 PFHXS	103	103	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW62-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 09:20	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-2	1	1			18O2 PFHXS	18O2 PFHXS	85	85	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB63-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 09:40	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-3	1	1			18O2 PFHXS	18O2 PFHXS	101	101	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW63-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 09:50	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-4	1	1			18O2 PFHXS	18O2 PFHXS	74	74	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB59-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 14:30	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-5	1	1			18O2 PFHXS	18O2 PFHXS	95	95	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW59-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 14:40	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-6	1	1			18O2 PFHXS	18O2 PFHXS	105	105	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB50-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 17:35	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-7	1	1			18O2 PFHXS	18O2 PFHXS	101	101	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW50-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 17:42	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-8	1	1			18O2 PFHXS	18O2 PFHXS	67	67	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB34-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 10:40	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-9	1	1			18O2 PFHXS	18O2 PFHXS	106	106	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW34-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 10:47	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-10	1	1			18O2 PFHXS	18O2 PFHXS	88	88	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB38-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 17:10	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-11	1	1			18O2 PFHXS	18O2 PFHXS	117	117	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW38-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 17:16	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-12	1	1			18O2 PFHXS	18O2 PFHXS	79	79	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	4394551-BLK	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	LB1	W	4	02/25/2016 00:00	02/25/2016			20160225	00:00:00	20160229	00:00:00	4394551-BLK	1	1			18O2 PFHXS	18O2 PFHXS	99	99	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	4394551-LCS	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	BS	W	4	02/25/2016 00:00	02/25/2016			20160225	00:00:00	20160229	00:00:00	4394551-LCS	1	1			18O2 PFHXS	18O2 PFHXS	137	137	PCT_REC	C	C	PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW63-0216 MS	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	MS	W	4	02/25/2016 00:00	02/25/2016			20160225	00:00:00	20160229	00:00:00	4394551-MS	1	1			18O2 PFHXS	18O2 PFHXS	77	77	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW63-0216 MSD	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	MSD	W	4	02/25/2016 00:00	02/25/2016			20160225	00:00:00	20160229	00:00:00	4394551-MS Dup	1	1			18O2 PFHXS	18O2 PFHXS	84	84	PCT_REC			PR	SURR		SLSA	130	50	00000000				5.0				320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB34-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 10:40	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-9	1	1			Perfluorobutanesulfonic acid (PFBS)	375-73-5	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.00027	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB38-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 17:10	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-11	1	1			Perfluorobutanesulfonic acid (PFBS)	375-73-5	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.00027	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	4394551-BLK	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	LB1	W	4	02/25/2016 00:00	02/25/2016			20160225	00:00:00	20160229	00:00:00	4394551-BLK	1	1			Perfluorobutanesulfonic acid (PFBS)	375-73-5	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.00027	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB50-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 17:35	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-7	1	1			Perfluorobutanesulfonic acid (PFBS)	375-73-5	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.00027	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB59-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 14:30	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-5	1	1			Perfluorobutanesulfonic acid (PFBS)	375-73-5	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.00027	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB62-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 09:15	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-1	1	1			Perfluorobutanesulfonic acid (PFBS)	375-73-5	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.00027	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB63-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 09:40	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-3	1	1			Perfluorobutanesulfonic acid (PFBS)	375-73-5	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.00027	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	4394551-LCS	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	BS	W	4	02/25/2016 00:00	02/25/2016			20160225	00:00:00	20160229	00:00:00	4394551-LCS	1	1			Perfluorobutanesulfonic acid (PFBS)	375-73-5	91	91	PCT_REC			PR	TRG		LSA	130	70	00000000				5.0	0.00027	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW63-0216 MS	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	MS	W	4	02/25/2016 00:00	02/25/2016			20160225	00:00:00	20160229	00:00:00	4394551-MS	1	1			Perfluorobutanesulfonic acid (PFBS)	375-73-5	146	146	PCT_REC	C	C	PR	TRG		MSA	130	70	00000000				5.0	0.00027	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW63-0216 MSD	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	MSD	W	4	02/25/2016 00:00	02/25/2016			20160225	00:00:00	20160229	00:00:00	4394551-MS Dup	1	1			Perfluorobutanesulfonic acid (PFBS)	375-73-5	147	147	PCT_REC	C	C	PR	TRG		MSP	130	70	00000000				5.0	0.00027	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB34-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 10:40	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-9	1	1			Perfluoroheptanoic acid (PFHpA)	375-85-9	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.00039	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB38-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 17:10	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-11	1	1			Perfluoroheptanoic acid (PFHpA)	375-85-9	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.00039	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB50-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 17:35	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-7	1	1			Perfluoroheptanoic acid (PFHpA)	375-85-9	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.00039	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB59-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 14:30	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-5	1	1			Perfluoroheptanoic acid (PFHpA)	375-85-9	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.00039	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB62-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 09:15	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-1	1	1			Perfluoroheptanoic acid (PFHpA)	375-85-9	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.00039	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB63-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 09:40	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-3	1	1			Perfluoroheptanoic acid (PFHpA)	375-85-9	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.00039	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	4394551-BLK	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	LB1	W	4	02/25/2016 00:00	02/25/2016			20160225	00:00:00	20160229	00:00:00	4394551-BLK	1	1			Perfluoroheptanoic acid (PFHpA)	375-85-9	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.00039	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	4394551-LCS	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	BS	W	4	02/25/2016 00:00	02/25/2016			20160225	00:00:00	20160229	00:00:00	4394551-LCS	1	1			Perfluoroheptanoic acid (PFHpA)	375-85-9	92	92	PCT_REC			PR	TRG		LSA	130	70	00000000				5.0	0.00039	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW63-0216 MS	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	MS	W	4	02/25/2016 00:00	02/25/2016			20160225	00:00:00	20160229	00:00:00	4394551-MS	1	1			Perfluoroheptanoic acid (PFHpA)	375-85-9	118	118	PCT_REC			PR	TRG		MSA	130	70	00000000				5.0	0.00039	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW63-0216 MSD	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	MSD	W	4	02/25/2016 00:00	02/25/2016			20160225	00:00:00	20160229	00:00:00	4394551-MS Dup	1	1			Perfluoroheptanoic acid (PFHpA)	375-85-9	111	111	PCT_REC			PR	TRG		MSP	130	70	00000000				5.0	0.00039	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB34-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 10:40	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-9	1	1			Perfluorohexanesulfonic acid (PFHxS)	355-46-4	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.0004	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB38-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 17:10	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-11	1	1			Perfluorohexanesulfonic acid (PFHxS)	355-46-4	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.0004	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB50-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 17:35	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-7	1	1			Perfluorohexanesulfonic acid (PFHxS)	355-46-4	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.0004	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB59-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 14:30	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-5	1	1			Perfluorohexanesulfonic acid (PFHxS)	355-46-4	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.0004	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB62-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 09:15	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-1	1	1			Perfluorohexanesulfonic acid (PFHxS)	355-46-4	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.0004	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB63-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 09:40	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-3	1	1			Perfluorohexanesulfonic acid (PFHxS)	355-46-4	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.0004	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	4394551-BLK	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	LB1	W	4	02/25/2016 00:00	02/25/2016			20160225	00:00:00	20160229	00:00:00	4394551-BLK	1	1			Perfluorohexanesulfonic acid (PFHxS)	355-46-4	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.0004	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	4394551-LCS	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	BS	W	4	02/25/2016 00:00	02/25/2016			20160225	00:00:00	20160229	00:00:00	4394551-LCS	1	1			Perfluorohexanesulfonic acid (PFHxS)	355-46-4	96	96	PCT_REC			PR	TRG		LSA	130	70	00000000				5.0	0.0004	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW63-0216 MS	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	MS	W	4	02/25/2016 00:00	02/25/2016			20160225	00:00:00	20160229	00:00:00	4394551-MS	1	1			Perfluorohexanesulfonic acid (PFHxS)	355-46-4	122	122	PCT_REC			PR	TRG		MSA	130	70	00000000				5.0	0.0004	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW63-0216 MSD	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	MSD	W	4	02/25/2016 00:00	02/25/2016			20160225	00:00:00	20160229	00:00:00	4394551-MS Dup	1	1			Perfluorohexanesulfonic acid (PFHxS)	355-46-4	133	133	PCT_REC	C	C	PR	TRG		MSP	130	70	00000000				5.0	0.0004	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB34-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 10:40	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-9	1	1			Perfluorononanoic acid (PFNA)	375-95-1	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.00033	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB38-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 17:10	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-11	1	1			Perfluorononanoic acid (PFNA)	375-95-1	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.00033	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB50-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 17:35	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-7	1	1			Perfluorononanoic acid (PFNA)	375-95-1	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.00033	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB59-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 14:30	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-5	1	1			Perfluorononanoic acid (PFNA)	375-95-1	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.00033	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB62-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 09:15	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-1	1	1			Perfluorononanoic acid (PFNA)	375-95-1	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.00033	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB63-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 09:40	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-3	1	1			Perfluorononanoic acid (PFNA)	375-95-1	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.00033	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	4394551-BLK	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	LB1	W	4	02/25/2016 00:00	02/25/2016			20160225	00:00:00	20160229	00:00:00	4394551-BLK	1	1			Perfluorononanoic acid (PFNA)	375-95-1	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.00033	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	4394551-LCS	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	BS	W	4	02/25/2016 00:00	02/25/2016			20160225	00:00:00	20160229	00:00:00	4394551-LCS	1	1			Perfluorononanoic acid (PFNA)	375-95-1	101	101	PCT_REC			PR	TRG		LSA	130	70	00000000				5.0	0.00033	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW63-0216 MS	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	MS	W	4	02/25/2016 00:00	02/25/2016			20160225	00:00:00	20160229	00:00:00	4394551-MS	1	1			Perfluorononanoic acid (PFNA)	375-95-1	127	127	PCT_REC			PR	TRG		MSA	130	70	00000000				5.0	0.00033	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW63-0216 MSD	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	MSD	W	4	02/25/2016 00:00	02/25/2016			20160225	00:00:00	20160229	00:00:00	4394551-MS Dup	1	1			Perfluorononanoic acid (PFNA)	375-95-1	119	119	PCT_REC			PR	TRG		MSP	130	70	00000000				5.0	0.00033	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB34-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 10:40	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-9	1	1			Perfluorooctane Sulfonate (PFOS)	1763-23-1	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.0003	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB38-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 17:10	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-11	1	1			Perfluorooctane Sulfonate (PFOS)	1763-23-1	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.0003	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB50-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 17:35	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-7	1	1			Perfluorooctane Sulfonate (PFOS)	1763-23-1	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.0003	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB59-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 14:30	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-5	1	1			Perfluorooctane Sulfonate (PFOS)	1763-23-1	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.0003	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	4394551-BLK	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	LB1	W	4	02/25/2016 00:00	02/25/2016			20160225	00:00:00	20160229	00:00:00	4394551-BLK	1	1			Perfluorooctane Sulfonate (PFOS)	1763-23-1	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.0003	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB62-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 09:15	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-1	1	1			Perfluorooctane Sulfonate (PFOS)	1763-23-1	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.0003	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB63-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 09:40	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-3	1	1			Perfluorooctane Sulfonate (PFOS)	1763-23-1	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.0003	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	4394551-LCS	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	BS	W	4	02/25/2016 00:00	02/25/2016			20160225	00:00:00	20160229	00:00:00	4394551-LCS	1	1			Perfluorooctane Sulfonate (PFOS)	1763-23-1	102	102	PCT_REC			PR	TRG		LSA	130	70	00000000				5.0	0.0003	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW63-0216 MS	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	MS	W	4	02/25/2016 00:00	02/25/2016			20160225	00:00:00	20160229	00:00:00	4394551-MS	1	1			Perfluorooctane Sulfonate (PFOS)	1763-23-1	NC	NC	PCT_REC	U	U	PR	TRG		MSA	130	70	00000000				5.0	0.0003	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW63-0216 MSD	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	MSD	W	4	02/25/2016 00:00	02/25/2016			20160225	00:00:00	20160229	00:00:00	4394551-MS Dup	1	1			Perfluorooctane Sulfonate (PFOS)	1763-23-1	NC	NC	PCT_REC	C	C	PR	TRG		MSP	130	70	00000000				5.0	0.0003	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB34-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 10:40	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-9	1	1			Perfluorooctanoic acid (PFOA)	335-67-1	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.00039	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB38-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 17:10	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-11	1	1			Perfluorooctanoic acid (PFOA)	335-67-1	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.00039	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB50-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 17:35	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-7	1	1			Perfluorooctanoic acid (PFOA)	335-67-1	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.00039	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB59-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 14:30	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-5	1	1			Perfluorooctanoic acid (PFOA)	335-67-1	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.00039	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB62-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 09:15	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-1	1	1			Perfluorooctanoic acid (PFOA)	335-67-1	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.00039	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-FB63-0216	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	REG	W	4	02/09/2016 09:40	02/10/2016			20160225	00:00:00	20160229	00:00:00	320-17241-3	1	1			Perfluorooctanoic acid (PFOA)	335-67-1	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.00039	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	4394551-BLK	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	LB1	W	4	02/25/2016 00:00	02/25/2016			20160225	00:00:00	20160229	00:00:00	4394551-BLK	1	1			Perfluorooctanoic acid (PFOA)	335-67-1	0.001	0.001	UG_L	U	U	PR	TRG					00000000				5.0	0.00039	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	4394551-LCS	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	BS	W	4	02/25/2016 00:00	02/25/2016			20160225	00:00:00	20160229	00:00:00	4394551-LCS	1	1			Perfluorooctanoic acid (PFOA)	335-67-1	93	93	PCT_REC			PR	TRG		LSA	130	70	00000000				5.0	0.00039	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW63-0216 MS	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	MS	W	4	02/25/2016 00:00	02/25/2016			20160225	00:00:00	20160229	00:00:00	4394551-MS	1	1			Perfluorooctanoic acid (PFOA)	335-67-1	NC	NC	PCT_REC	U	U	PR	TRG		MSA	130	70	00000000				5.0	0.00039	0.001	0.002	320-17241	100272-4394551		
N6247011D8012	WE7G		OCEANA_NAS	OF-RW63-0216 MSD	NONS	SVOA	537_MOD	ORG	MA	MAXXAM ANALYTICAL	NONE	NA	METHOD	000	MSD	W	4	02/25/2016 00:00	02/25/2016			20160225	00:00:00	20160229	00:00:00	4394551-MS Dup	1	1			Perfluorooctanoic acid (PFOA)	335-67-1	NC	NC	PCT_REC	C	C	PR	TRG		MSP	130	70	00000000				5.0	0.00039	0.001	0.002	320-17241	100272-4394551		

Data Validation Summary

Oceana CTO-WE44, NALF Fentress

TO: Juliana Dean/VBO

Anita Dodson/VBO

FROM: Tiffany McGlynn/GNV

CC: Herb Kelly/GNV

DATE: March 18, 2016

Introduction

The following data validation report discusses the data validation process and findings for TestAmerica Laboratories and Maxxam Laboratories in the Sample Delivery Groups (SDGs) listed in the table below.

Samples were analyzed using the following analytical methods:

- WS-LC-0025 & 537 MOD Perfluorinated Hydrocarbons

The samples included in these SDGs are listed in the table below.

SDG	Sample Name	Matrix
320-17150	OF-RW42B-0216	Water
320-17150	OF-RW39-0216	Water
320-17150	OF-FB40-0216	Water
320-17150	OF-RW40-0216	Water
320-17150	OF-FB43-0216	Water
320-17150	OF-RW43-0216	Water
320-17150	OF-FB42B-0216	Water
320-17150	OF-RW42A-0216	Water
320-17150	OF-FB42A-0216	Water
320-17150	OF-RW35-0216	Water
320-17150	OF-FB35-0216	Water

SDG	Sample Name	Matrix
320-17150	OF-RW58-0216	Water
320-17150	OF-FB58-0216	Water
320-17150	OF-FB39-0216	Water
320-17154	OF-FB09-0216	Water
320-17154	OF-FB67-0216	Water
320-17154	OF-RW09-0216	Water
320-17154	OF-FB37-0216	Water
320-17154	OF-RW37-0216	Water
320-17154	OF-RW11-0216	Water
320-17154	OF-FB11-0216	Water
320-17154	OF-RW28-0216	Water
320-17154	OF-FB28-0216	Water
320-17154	OF-RW67-0216	Water
320-17183	OF-RW66-0216	Water
320-17183	OF-FB27-0216	Water
320-17183	OF-FB66-0216	Water
320-17183	OF-RW49-0216	Water
320-17183	OF-FB49-0216	Water
320-17183	OF-RW36A-0216	Water
320-17183	OF-FB36A-0216	Water
320-17183	OF-RW51A-0216	Water
320-17183	OF-FB51A-0216	Water
320-17183	OF-RW27-0216	Water
320-17184	OF-RW20-0216	Water
320-17184	OF-FB30-0216	Water
320-17184	OF-FB69-0216	Water
320-17184	OF-RW69-0216	Water
320-17184	OF-FB26-0216	Water
320-17184	OF-RW26-0216	Water
320-17184	OF-FB20-0216	Water
320-17184	OF-RW55-0216	Water
320-17184	OF-FB55-0216	Water
320-17184	OF-RW54-0216	Water
320-17184	OF-FB54-0216	Water
320-17184	OF-RW68-0216	Water
320-17184	OF-FB68-0216	Water
320-17184	OF-RW30-0216	Water
320-17185	OF-FB08-0216	Water
320-17185	OF-RW51-0216	Water
320-17185	OF-RW51P-0216	Water

SDG	Sample Name	Matrix
320-17185	OF-RW08-0216	Water
320-17185	OF-RW08P-0216	Water
320-17185	OF-FB41-0216	Water
320-17185	OF-RW41-0216	Water
320-17185	OF-RW41P-0216	Water
320-17185	OF-FB56-0216	Water
320-17185	OF-RW56-0216	Water
320-17185	OF-FB51-0216	Water
320-17190	OF-FB12-0216	Water
320-17190	OF-RW12-0216	Water
320-17190	OF-FB57-0216	Water
320-17190	OF-RW57-0216	Water
320-17190	OF-RW57P-0216	Water
320-17190	OF-FB25-0216	Water
320-17190	OF-RW25-0216	Water
320-17190	OF-FB16-0216	Water
320-17190	OF-RW16-0216	Water
320-17219	OF-FB47-0216	Water
320-17219	OF-RW47-0216	Water
320-17219	OF-FB47A-0216	Water
320-17219	OF-RW47A-0216	Water
320-17219	OF-FB48-0216	Water
320-17219	OF-RW48-0216	Water
320-17236	OF-FB70-0216	Water
320-17236	OF-RW70-0216	Water
320-17236	OF-FB44-0216	Water
320-17236	OF-RW44-0216	Water
320-17236	OF-RW44P-0216	Water
320-17236	OF-FB65-0216	Water
320-17236	OF-RW65-0216	Water
320-17236	OF-FB21-0216	Water
320-17236	OF-RW21-0216	Water
320-17241	OF-FB62-0216	Water
320-17241	OF-RW34-0216	Water
320-17241	OF-FB38-0216	Water
320-17241	OF-RW38-0216	Water
320-17241	OF-RW62-0216	Water
320-17241	OF-FB63-0216	Water
320-17241	OF-RW63-0216	Water
320-17241	OF-FB59-0216	Water

SDG	Sample Name	Matrix
320-17241	OF-RW59-0216	Water
320-17241	OF-FB50-0216	Water
320-17241	OF-RW50-0216	Water
320-17241	OF-FB34-0216	Water
320-17278	OF-FB24-0216	Water
320-17278	OF-RW24-0216	Water
320-17278	OF-FB31-0216	Water
320-17278	OF-RW31-0216	Water
320-17278	OF-FB60-0216	Water
320-17278	OF-RW60-0216	Water
320-17278	OF-RW60P-0216	Water
320-17278	OF-FB46-0216	Water
320-17278	OF-RW46-0216	Water
320-17321	OF-FB02-0216	Water
320-17321	OF-RW02-0216	Water
320-17321	OF-FB15-0216	Water
320-17321	OF-RW15-0216	Water
320-17321	OF-FB18-0216	Water
320-17321	OF-RW18-0216	Water
320-17859	OF-FB07-0316	Water
320-17859	OF-RW07-0316	Water
320-17859	OF-HPFB01-0316	Water
320-17859	OF-HP01-0316	Water

Data Evaluation

Data was evaluated in accordance with the analytical methods and with the criteria found in the following guidance documents: Sampling and Analysis Plan Perfluorinated Compound Investigation, Naval Auxiliary Landing Field Fentress, Chesapeake, Virginia Contract Task Order WE44 (December 2015) and National Functional Guidelines for Organic Data Review (August 2014) with Region 3 Modification (Use of 'B' qualifier) as applicable. The samples were evaluated based on the following criteria:

- Data Completeness
- Technical Holding Times
- Tuning Instrument
- Initial/Continuing Calibrations
- Blanks

- Internal Standards
- Laboratory Control Samples
- Isotope Dilution Analyte
- Field Duplicates
- Identification/Quantitation
- Reporting Limits

Overall Evaluation of Data/Potential Usability Issues

Specific details regarding qualification of the data are addressed in the sections below. If an issue is not addressed there were no actions required based on unmet quality criteria. When more than one qualifier is associated with a compound/analyte, the validator has chosen the qualifier that best indicates possible bias in the results and qualified these data accordingly.

Data Completeness

The SDG was received complete and intact.

Technical Holding Times

According to the chain of custody records, sampling was performed on 2/3/16 through 2/16/16. Samples were received at the laboratory 2/4/16 through 2/17/16. All sample preparation and analyses were performed within holding time requirements with the exception of the samples listed below. Affected data are summarized in **Attachment 1**.

Sample Name	SDG
OF-RW42B-0216	320-17150
OF-RW08-0216	320-17185
OF-RW08P-0216	320-17185
OF-FB62-0216	320-17241
OF-RW34-0216	320-17241
OF-FB38-0216	320-17241
OF-RW38-0216	320-17241
OF-RW62-0216	320-17241
OF-FB63-0216	320-17241
OF-RW63-0216	320-17241
OF-FB59-0216	320-17241

Sample Name	SDG
OF-RW59-0216	320-17241
OF-FB50-0216	320-17241
OF-RW50-0216	320-17241
OF-FB34-0216	320-17241

Blanks

Several compounds were detected in the field blanks and method blanks as listed below. Affected data are summarized in **Attachment 1**.

SDG	Blank ID	Compound	Conc.	Units
320-17183	OF-FB49-0216	Perfluorohexanesulfonic acid (PFHxS)	0.00068	UG_L
320-17183	OF-FB36A-0216	Perfluorooctane Sulfonate (PFOS)	0.00042	UG_L
320-17185	OF-FB51-0216	Perfluorobutanesulfonic acid (PFBS)	0.00063	UG_L
320-17190	OF-FB12-0216	Perfluorohexanesulfonic acid (PFHxS)	0.00079	UG_L
320-17190	OF-FB57-0216	Perfluorohexanesulfonic acid (PFHxS)	0.00083	UG_L
320-17190	OF-FB25-0216	Perfluorobutanesulfonic acid (PFBS)	0.00092	UG_L
320-17190	OF-FB16-0216	Perfluorobutanesulfonic acid (PFBS)	0.0011	UG_L
320-17190	MB 320-100277/1-A	Perfluorobutanesulfonic acid (PFBS)	0.00103	UG_L
320-17190	MB 320-100277/1-A	Perfluorohexanesulfonic acid (PFHxS)	0.00102	UG_L
320-17190	MB 320-100277/1-A	Perfluorooctane Sulfonate (PFOS)	0.00144	UG_L
320-17859	MB 320-104553/1-A	Perfluorooctanoic acid (PFOA)	0.00217	UG_L

Field Duplicate Precision

Perfluoroheptanoic acid (PFHpA) did not meet required precision criteria in native sample OF-RW51-0216 and field duplicate OF-RW51P-0216. Affected data are summarized in **Attachment 1**.

Matrix Spike/Spike Duplicate

For spiked sample OF-RW56-0216 in SDG 320-17185, perfluorobutanesulfonic acid (PFBS) exhibited high recoveries in the MS/MSD. Affected data are summarized in **Attachment 1**.

Surrogates

Surrogates for the samples listed below exhibited low recoveries. Affected data are summarized in **Attachment 1**.

Sample Name	SDG
OF-RW67-0216	320-17154
OF-RW47-0216	320-17219
OF-RW70-0216	320-17236

Sample Name	SDG
OF-RW24-0216	320-17278

Internal Standards

Internal standards exhibited low recoveries for the samples listed below. Affected data are summarized in **Attachment 1**.

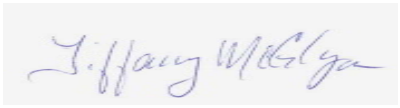
Sample Name	SDG
OF-RW37-0216	320-17154
OF-FB56-0216	320-17185

Conclusion

These data can be used in the project decision-making process as qualified by the data quality evaluation process.

Please do not hesitate to contact us about this validation report.

Sincerely,



Tiffany McGlynn

Qualification Flags

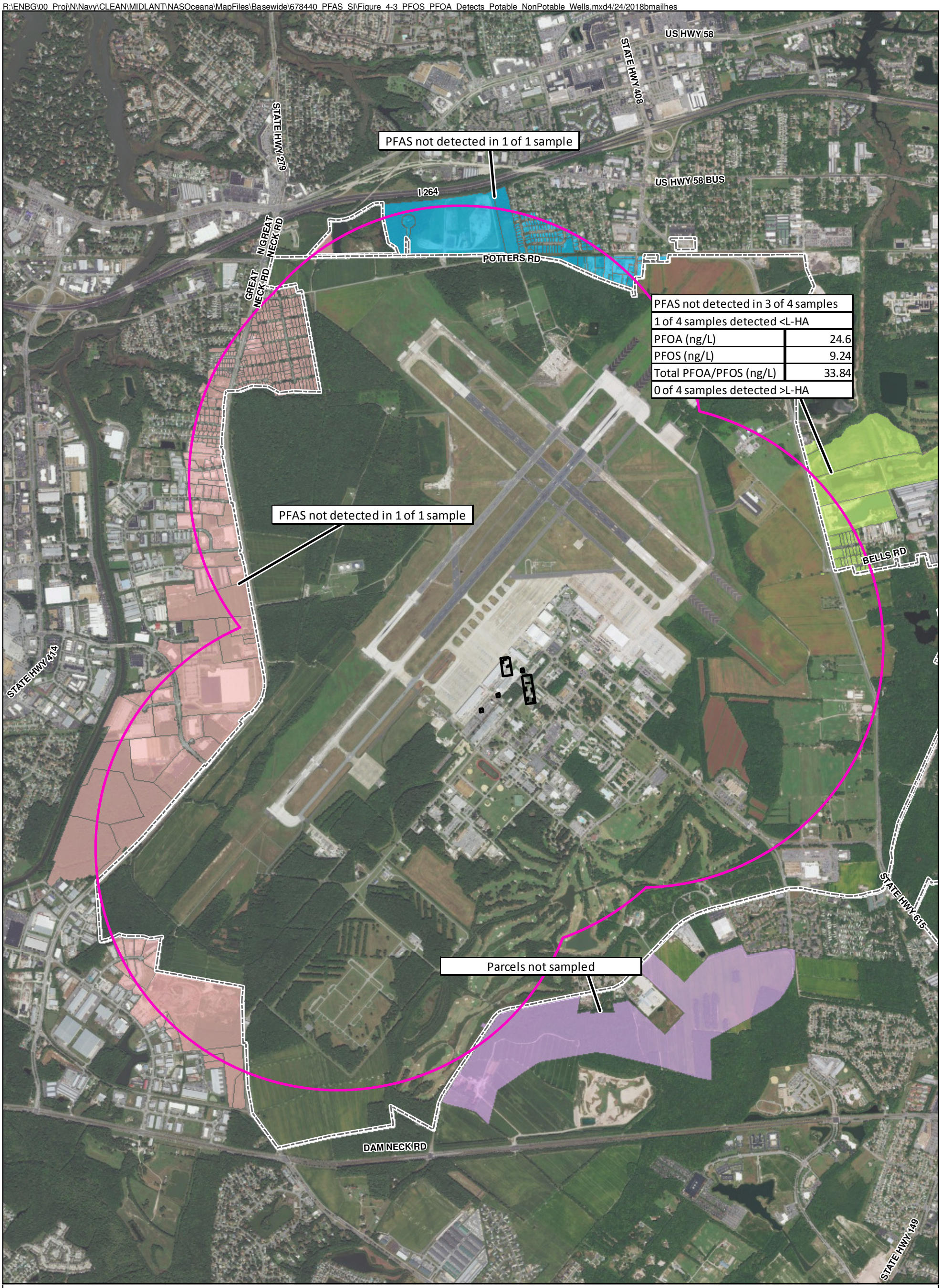
Exclude	More appropriate data exist for this analyte.
R	Data were rejected for use.
UL	Analyte not detected, quantitation limit is potentially biased low.
UJ	Analyte not detected, estimated quantitation limit.
U	Analyte not detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
L	Analyte present, estimated value potentially biased low.
K	Analyte present, estimated value potentially biased high.
N	Analyte identification presumptive; no second column analysis performed or GC/MS tentative identification.
J	Analyte present, estimated value.
NJ	Analysis indicates the presence of an analyte that was "tentatively identified" and the associated value represents its approximate concentration.
None	Placeholder for calculating quality control issues that do not require flagging.
=	Analyte was detected at a concentration greater than the quantitation limit.

Qualifier Code Reference

Value	Description
%SOL	High Moisture content
2C	Second Column – Poor Dual Column Reproducibility
2S	Second Source – Bad reproducibility between tandem detectors
BD	Blank Spike/Blank Spike Duplicate(LCS/LCSD) Precision
BRL	Below Reporting Limit
BSH	Blank Spike/LCS – High Recovery
BSL	Blank Spike/LCS – Low Recovery
CC	Continuing Calibration
CCBL	Continuing Calibration Blank Contamination
CCH	Continuing Calibration Verification – High Recovery
CCL	Continuing Calibration Verification – Low Recovery
DL	Redundant Result – due to Dilution
EBL	Equipment Blank Contamination
EMPC	Estimated Possible Maximum Concentration
ESH	Extraction Standard - High Recovery
ESL	Extraction Standard - Low Recovery
FBL	Field Blank Contamination
FD	Field Duplicate
HT	Holding Time
ICB	Initial Calibration – Bad Linearity or Curve Function
ICH	Initial Calibration – High Relative Response Factors
ICL	Initial Calibration – Low Relative Response Factors
IR15	Ion ratio exceeds +/- 15% difference
ISH	Internal Standard – High Recovery
ISL	Internal Standard – Low Recovery
LD	Lab Duplicate Reproducibility
LR	Concentration Exceeds Linear Range
MBL	Method Blank Contamination
MDP	Matrix Spike/Matrix Spike Duplicate Precision
MI	Matrix interference obscuring the raw data

Value	Description
MSH	Matrix Spike and/or Matrix Spike Duplicate – High Recovery
MSL	Matrix Spike and/or Matrix Spike Duplicate – Low Recovery
OT	Other
PD	Pesticide Degradation
RE	Redundant Result - due to Reanalysis or Re-extraction
SD	Serial Dilution Reproducibility
SSH	Spiked Surrogate – High Recovery
SSL	Spiked Surrogate – Low Recovery
TBL	Trip Blank Contamination
TN	Tune

R:\ENBG\00_Proj\N\Navy\CLEAN\MIDLANT\NASOceana\MapFiles\Basewide\678440_PFAS_SI\Figure_4-3_PFOS_PFOA_Detects_Potable_NonPotable_Wells.mxd4/24/2018bmailhes



Legend

- Non-Core Target Treatment Area (2004)
- Core Target Treatment Area (2004) (Core)
- Sampling Area
- Installation Boundary

Off-Base Parcels

- East
- North
- South
- West

N
W E
S

0 1,000 2,000 4,000 Feet

Imagery Source: ©2017 Esri

Figure 4-3
COCs Detections in Potable Wells Sampled from Parcels Located Off-Base
Basewide Per- and Polyfluoroalkyl Substances Site Inspection Report
NAS Oceana, Virginia Beach, Virginia

ch2m