



**Off-Base Drinking Water Sample Results,
Combined Level 2 and Level 4 Laboratory Report,
Electronic Data Deliverable, Data Validation Report,
and the Sample Location Figure, SDG 320-31180-1**

*Naval Air Station Willow Grove
Willow Grove, Pennsylvania*

August 2019

N00158_000711
WILLOW_GROVE_NAS
SSIC 5000-33c

**LABORATORY DATA PACKAGE, 320-31180-1, NAWC WARMINSTER NAS
WILLOW GROVE PA**

09/12/2017
TESTAMERICA LABORATORIES INC

Approved for public release: distribution unlimited.

ANALYTICAL REPORT

Job Number: 320-31180-1

SDG Number: WE04

Job Description: Warminster: PFAS, NAS JRB Willow Grove

For:

Tetra Tech, Inc.

234 Mall Boulevard

Suite 260

King of Prussia, PA 19406

Attention: Andy Frebowitz



Approved for release.
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Project Manager I
9/12/2017 1:14 PM

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Definitions/Glossary

Client: Tetra Tech, Inc.
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

TestAmerica Job ID: 320-31180-1
SDG: WE04

Qualifiers

LCMS

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

Glossary

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

Job Narrative
320-31180-1

Receipt

The samples were received on 8/30/2017 9:50 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.2° C.

LCMS

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

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

Organic Prep

Method(s) 537: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-182400.

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

Detection Summary

Client: Tetra Tech, Inc.
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

TestAmerica Job ID: 320-31180-1
SDG: WE04

Client Sample ID: WGNA-082917-RW-4837 Lab Sample ID: 320-31180-1

No Detections.

Client Sample ID: WGNA-082917-FRB-4837 Lab Sample ID: 320-31180-2

No Detections.

Client Sample Results

Client: Tetra Tech, Inc.
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

TestAmerica Job ID: 320-31180-1
SDG: WE04

Client Sample ID: WGNA-082917-RW-4837

Date Collected: 08/29/17 13:50

Date Received: 08/30/17 09:50

Lab Sample ID: 320-31180-1

Matrix: Water

Method: 537 - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	15	U	38	6.5	ng/L	—	09/01/17 08:39	09/08/17 22:45	1
Perfluorooctanoic acid (PFOA)	7.6	U	19	2.7	ng/L	—	09/01/17 08:39	09/08/17 22:45	1
Perfluorononanoic acid (PFNA)	19	U	23	7.6	ng/L	—	09/01/17 08:39	09/08/17 22:45	1
Perfluorohexanesulfonic acid (PFHxS)	11	U	28	5.2	ng/L	—	09/01/17 08:39	09/08/17 22:45	1
Perfluoroheptanoic acid (PFHpA)	3.8	U	9.5	1.8	ng/L	—	09/01/17 08:39	09/08/17 22:45	1
Perfluorobutanesulfonic acid (PFBS)	34	U	85	15	ng/L	—	09/01/17 08:39	09/08/17 22:45	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	93		70 - 130				09/01/17 08:39	09/08/17 22:45	1
13C2 PFDA	102		70 - 130				09/01/17 08:39	09/08/17 22:45	1

Client Sample ID: WGNA-082917-FRB-4837

Date Collected: 08/29/17 11:45

Date Received: 08/30/17 09:50

Lab Sample ID: 320-31180-2

Matrix: Water

Method: 537 - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	16	U	39	6.7	ng/L	—	09/01/17 08:39	09/08/17 22:50	1
Perfluorooctanoic acid (PFOA)	7.9	U	20	2.8	ng/L	—	09/01/17 08:39	09/08/17 22:50	1
Perfluorononanoic acid (PFNA)	20	U	24	7.9	ng/L	—	09/01/17 08:39	09/08/17 22:50	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.4	ng/L	—	09/01/17 08:39	09/08/17 22:50	1
Perfluoroheptanoic acid (PFHpA)	3.9	U	9.9	1.9	ng/L	—	09/01/17 08:39	09/08/17 22:50	1
Perfluorobutanesulfonic acid (PFBS)	36	U	89	16	ng/L	—	09/01/17 08:39	09/08/17 22:50	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	101		70 - 130				09/01/17 08:39	09/08/17 22:50	1
13C2 PFDA	108		70 - 130				09/01/17 08:39	09/08/17 22:50	1

Default Detection Limits

Client: Tetra Tech, Inc.
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

TestAmerica Job ID: 320-31180-1
SDG: WE04

Method: 537 - Perfluorinated Alkyl Acids (LC/MS)

Prep: 537

Analyte	LOQ	DL	Units	Method
Perfluorobutanesulfonic acid (PFBS)	90	16	ng/L	537
Perfluoroheptanoic acid (PFHpA)	10	1.9	ng/L	537
Perfluorohexanesulfonic acid (PFHxS)	30	5.5	ng/L	537
Perfluorononanoic acid (PFNA)	24	8.0	ng/L	537
Perfluorooctanesulfonic acid (PFOS)	40	6.8	ng/L	537
Perfluorooctanoic acid (PFOA)	20	2.8	ng/L	537

Surrogate Summary

Client: Tetra Tech, Inc.
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

TestAmerica Job ID: 320-31180-1
SDG: WE04

Method: 537 - Perfluorinated Alkyl Acids (LC/MS)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)	
Lab Sample ID	Client Sample ID	3C2 PFHx (70-130)	3C2 PFDA (70-130)
320-31180-1	WGNA-082917-RW-4837	93	102
320-31180-2	WGNA-082917-FRB-4837	101	108
LLCS 320-182400/2-A	Lab Control Sample	98	108
LLCSD 320-182400/3-A	Lab Control Sample Dup	100	117
MB 320-182400/1-A	Method Blank	101	111

Surrogate Legend

13C2 PFHxA = 13C2 PFHxA

13C2 PFDA = 13C2 PFDA

QC Sample Results

Client: Tetra Tech, Inc.
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

TestAmerica Job ID: 320-31180-1
SDG: WE04

Method: 537 - Perfluorinated Alkyl Acids (LC/MS)

Lab Sample ID: MB 320-182400/1-A

Matrix: Water

Analysis Batch: 183512

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 182400

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	16	U	40	6.8	ng/L	-	09/01/17 08:39	09/08/17 20:51	1
Perfluorooctanoic acid (PFOA)	8.0	U	20	2.8	ng/L	-	09/01/17 08:39	09/08/17 20:51	1
Perfluorononanoic acid (PFNA)	20	U	24	8.0	ng/L	-	09/01/17 08:39	09/08/17 20:51	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.5	ng/L	-	09/01/17 08:39	09/08/17 20:51	1
Perfluoroheptanoic acid (PFHpA)	4.0	U	10	1.9	ng/L	-	09/01/17 08:39	09/08/17 20:51	1
Perfluorobutanesulfonic acid (PFBS)	36	U	90	16	ng/L	-	09/01/17 08:39	09/08/17 20:51	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	101		70 - 130	09/01/17 08:39	09/08/17 20:51	1
13C2 PFDA	111		70 - 130	09/01/17 08:39	09/08/17 20:51	1

Lab Sample ID: LLCS 320-182400/2-A

Matrix: Water

Analysis Batch: 183512

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 182400

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorooctanesulfonic acid (PFOS)	40.0	37.5	J M	ng/L	-	94	50 - 150
Perfluorooctanoic acid (PFOA)	20.0	19.2	J	ng/L	-	96	50 - 150
Perfluorononanoic acid (PFNA)	20.0	19.1	J	ng/L	-	96	50 - 150
Perfluorohexanesulfonic acid (PFHxS)	30.0	30.1		ng/L	-	100	50 - 150
Perfluoroheptanoic acid (PFHpA)	10.0	10.4		ng/L	-	104	50 - 150
Perfluorobutanesulfonic acid (PFBS)	90.0	96.1		ng/L	-	107	50 - 150

Surrogate	LLCS %Recovery	LLCS Qualifier	Limits
13C2 PFHxA	98		70 - 130
13C2 PFDA	108		70 - 130

Lab Sample ID: LLCSD 320-182400/3-A

Matrix: Water

Analysis Batch: 183512

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 182400

Analyte	Spike Added	LLCSD Result	LLCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorooctanesulfonic acid (PFOS)	40.0	38.9	J M	ng/L	-	97	50 - 150	4	50
Perfluorooctanoic acid (PFOA)	20.0	19.5	J	ng/L	-	97	50 - 150	1	50
Perfluorononanoic acid (PFNA)	20.0	19.8	J	ng/L	-	99	50 - 150	4	50
Perfluorohexanesulfonic acid (PFHxS)	30.0	29.8	J	ng/L	-	99	50 - 150	1	50
Perfluoroheptanoic acid (PFHpA)	10.0	10.5		ng/L	-	105	50 - 150	1	50
Perfluorobutanesulfonic acid (PFBS)	90.0	96.8		ng/L	-	108	50 - 150	0.7	50

Surrogate	LLCSD %Recovery	LLCSD Qualifier	Limits
13C2 PFHxA	100		70 - 130
13C2 PFDA	117		70 - 130

TestAmerica Sacramento

QC Association Summary

Client: Tetra Tech, Inc.
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

TestAmerica Job ID: 320-31180-1
SDG: WE04

LCMS

Prep Batch: 182400

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-31180-1	WGNA-082917-RW-4837	Total/NA	Water	537	
320-31180-2	WGNA-082917-FRB-4837	Total/NA	Water	537	
MB 320-182400/1-A	Method Blank	Total/NA	Water	537	
LLCS 320-182400/2-A	Lab Control Sample	Total/NA	Water	537	
LLCSD 320-182400/3-A	Lab Control Sample Dup	Total/NA	Water	537	

Analysis Batch: 183512

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 320-182400/1-A	Method Blank	Total/NA	Water	537	182400
LLCS 320-182400/2-A	Lab Control Sample	Total/NA	Water	537	182400
LLCSD 320-182400/3-A	Lab Control Sample Dup	Total/NA	Water	537	182400

Analysis Batch: 183774

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-31180-1	WGNA-082917-RW-4837	Total/NA	Water	537	182400
320-31180-2	WGNA-082917-FRB-4837	Total/NA	Water	537	182400

Lab Chronicle

Client: Tetra Tech, Inc.
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

TestAmerica Job ID: 320-31180-1
SDG: WE04

Client Sample ID: WGNA-082917-RW-4837

Date Collected: 08/29/17 13:50

Date Received: 08/30/17 09:50

Lab Sample ID: 320-31180-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			182400	09/01/17 08:39	CCB	TAL SAC
Total/NA	Analysis	537		1	183774	09/08/17 22:45	JRB	TAL SAC

Client Sample ID: WGNA-082917-FRB-4837

Date Collected: 08/29/17 11:45

Date Received: 08/30/17 09:50

Lab Sample ID: 320-31180-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			182400	09/01/17 08:39	CCB	TAL SAC
Total/NA	Analysis	537		1	183774	09/08/17 22:50	JRB	TAL SAC

Laboratory References:

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

Accreditation/Certification Summary

Client: Tetra Tech, Inc.
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

TestAmerica Job ID: 320-31180-1
SDG: WE04

Laboratory: TestAmerica Sacramento

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

Authority	Program	EPA Region	Identification Number	Expiration Date
Oregon	NELAP	10	4040	01-28-18

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

Analysis Method	Prep Method	Matrix	Analyte
537	537	Water	Perfluorobutanesulfonic acid (PFBS)
537	537	Water	Perfluoroheptanoic acid (PFHpA)
537	537	Water	Perfluorohexanesulfonic acid (PFHxS)
537	537	Water	Perfluorononanoic acid (PFNA)
537	537	Water	Perfluorooctanesulfonic acid (PFOS)
537	537	Water	Perfluorooctanoic acid (PFOA)

Method Summary

Client: Tetra Tech, Inc.
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

TestAmerica Job ID: 320-31180-1
SDG: WE04

Method	Method Description	Protocol	Laboratory
537	Perfluorinated Alkyl Acids (LC/MS)	EPA	TAL SAC

Protocol References:
EPA = US Environmental Protection Agency

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

Sample Summary

Client: Tetra Tech, Inc.
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

TestAmerica Job ID: 320-31180-1
SDG: WE04

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-31180-1	WGNA-082917-RW-4837	Water	08/29/17 13:50	08/30/17 09:50
320-31180-2	WGNA-082917-FRB-4837	Water	08/29/17 11:45	08/30/17 09:50

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-31180-1SDG No.: WE04Instrument ID: A8_N Analysis Batch Number: 183459Lab Sample ID: IC 320-183459/7 Client Sample ID: _____Date Analyzed: 09/08/17 13:51 Lab File ID: 2017.09.08_537ICAL_009.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.16	Isomers	barnettj	09/08/17 14:31

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-31180-1SDG No.: WE04Instrument ID: A8_N Analysis Batch Number: 183512Lab Sample ID: CCV 320-183512/1 CCVIS Client Sample ID: _____Date Analyzed: 09/08/17 20:41 Lab File ID: 2017.09.08_537C_001.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.16	Missed Peak	barnettj	09/11/17 11:10

Lab Sample ID: LLCS 320-182400/2-A Client Sample ID: _____Date Analyzed: 09/08/17 20:56 Lab File ID: 2017.09.08_537C_004.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.16	Missed Peak	barnettj	09/11/17 11:11

Lab Sample ID: LLCSD 320-182400/3-A Client Sample ID: _____Date Analyzed: 09/08/17 21:01 Lab File ID: 2017.09.08_537C_005.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.16	Missed Peak	barnettj	09/11/17 11:12

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-31180-1

SDG No.: WE04

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
LC537-ICV_00028	01/05/18	08/02/17	MeOH/H2O, Lot 067374	10 mL	LC537-IS_00045	1000 uL	13C2-PFOA	10 ng/mL
.LC537-IS_00045	01/05/18	07/05/17	Methanol, Lot 090285	30000 uL	LCM2PFOA_00007	60 uL	13C2-PFOA	28.68 ng/mL
..LCM2PFOA_00007	02/12/21	Wellington Laboratories, Lot M2PFOA0216			LCMPFOS_00019	180 uL	13C4 PFOS	0.1 ug/mL
..LCMPFOS_00019	08/03/21	Wellington Laboratories, Lot MPFOS0816			(Purchased Reagent)		13C2-PFOA	0.2868 ug/mL
LC537-ICV_00028	01/05/18	08/02/17	MeOH/H2O, Lot 067374	10 mL	LC537-SU_00046	1000 uL	13C2-PFOA	50 ug/mL
					LC537ICIM_00019	20 uL	13C4 PFOS	47.8 ug/mL
							13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	100.119 ng/mL
							Perfluoroheptanoic acid (PFHpA)	9.99613 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	20.0761 ng/mL
							Perfluorononanoic acid (PFNA)	20.1272 ng/mL
							Perfluorooctanoic acid (PFOA)	20.4843 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	19.698 ng/mL
.LC537-SU_00046	01/05/18	07/05/17	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL
..LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			LCMPFHxA_00013	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFHxA_00013	04/08/21	Wellington Laboratories, Lot MPFHxA0416			(Purchased Reagent)		13C2 PFDA	50 ug/mL
.LC537ICIM_00019	01/25/18	08/01/17	Methanol, Lot 090285	25 mL	LC537-PFBS2_00008	0.6 mL	13C2 PFHxA	50 ug/mL
					LC537-PFHxA2_00011	0.061 mL	Perfluorobutanesulfonic acid (PFBS)	50.0597 ug/mL
					LC537-PFHxS2_00008	0.122 mL	Perfluoroheptanoic acid (PFHpA)	4.99806 ug/mL
					LC537-PFNA2_00009	0.126 mL	Perfluorohexanesulfonic acid (PFHxS)	10.038 ug/mL
					LC537-PFOA2_00010	0.122 mL	Perfluorononanoic acid (PFNA)	10.0636 ug/mL
					LC537-PFOS2_00010	0.124 mL	Perfluorooctanoic acid (PFOA)	10.2421 ug/mL
..LC537-PFBS2_00008	01/25/18	07/25/17	Methanol, Lot 090285	20 mL	LC537-PFOS2_00002	0.0418 g	Perfluorooctanesulfonic acid (PFOS)	9.849 ug/mL
...LC537_PFBS2_00002	09/08/22	Santa Cruz Biotechnology, Lot F0917			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	2085.82 ug/mL
..LC537-PFHxA2_00011	01/25/18	07/25/17	Methanol, Lot 09092	31 mL	LC537-PFHxA2_00002	0.0635 g	Perfluoroheptanoic acid (PFHpA)	0.998 g/g
...LC537_PFHxA2_00002	06/13/22	Afla Aesar, Lot 10200390			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	1 g/g
..LC537-PFHxS2_00008	01/25/18	07/25/17	Methanol, Lot 090285	21 mL	LC537-PFHxS2_00002	0.0475 g	Perfluorohexanesulfonic acid (PFHxS)	2056.98 ug/mL
...LC537_PFHxS2_00002	06/08/22	Santa Cruz Biotechnology, Lot G2516			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
..LC537-PFNA2_00009	01/25/18	07/25/17	Methanol, Lot 090285	21 mL	LC537-PFNA2_00002	0.0421 g	Perfluorononanoic acid (PFNA)	1996.74 ug/mL
...LC537-PFNA2_00002	06/14/22	Aldrich, Lot MKCC0699			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.996 g/g
..LC537-PFOA2_00010	01/25/18	08/01/17	Methanol, Lot 090285	20 mL	LC537-PFOA2_00002	0.0424 g	Perfluorooctanoic acid (PFOA)	2098.8 ug/mL
...LC537-PFOA2_00002	06/09/22	Afla Aesar, Lot 10199078			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.99 g/g

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-31180-1

SDG No.: WE04

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LC537-PFOS2_00010	01/25/18	08/01/17	Methanol, Lot 090285	22 mL	LC537_PFOS2_00002	0.0561 g	Perfluorooctanesulfonic acid (PFOS)	1985.68 ug/mL
...LC537_PFOS2_00002	06/14/22	Sigma, Lot BCBQ0108V			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.7787 g/g
LC537-IS_00047	02/04/18	08/04/17	Methanol, Lot 090285	30000 uL	LCM2PFOA_00007	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00021	180 uL	13C4 PFOS	0.2868 ug/mL
.LCM2PFOA_00007	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
.LCMPFOS_00021	12/12/21	Wellington Laboratories, Lot MPFOS1216			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
LC537-L1_00020	02/04/18	08/14/17	MeOH/H2O, Lot 090285	5 mL	LC537-IS_00048	500 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-MSP_00029	60 uL	Perfluorobutanesulfonic acid (PFBS)	9.0018 ng/mL
							Perfluoroheptanoic acid (PFHpA)	1.00036 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	3.00103 ng/mL
							Perfluorononanoic acid (PFNA)	2.0006 ng/mL
							Perfluorooctanoic acid (PFOA)	2.00191 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	4.00146 ng/mL
					LC537-SU_00049	500 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-IS_00048	02/04/18	08/04/17	Methanol, Lot 090285	30000 uL	LCM2PFOA_00007	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00021	180 uL	13C4 PFOS	0.2868 ug/mL
..LCM2PFOA_00007	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00021	12/12/21	Wellington Laboratories, Lot MPFOS1216			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-MSP_00029	02/10/18	08/10/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00023	166.7 uL	Perfluorobutanesulfonic acid (PFBS)	750.15 ng/mL
							Perfluoroheptanoic acid (PFHpA)	83.3637 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	250.086 ng/mL
							Perfluorononanoic acid (PFNA)	166.716 ng/mL
							Perfluorooctanoic acid (PFOA)	166.826 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	333.455 ng/mL
..LC537SPIM_00023	02/10/18	08/10/17	Methanol, Lot 104453	10000 uL	LC537-PFBS_00008	450 uL	Perfluorobutanesulfonic acid (PFBS)	90 ug/mL
					LC537-PFHpA_00015	100 uL	Perfluoroheptanoic acid (PFHpA)	10.0016 ug/mL
					LC537-PFHxS_00010	150 uL	Perfluorohexanesulfonic acid (PFHxS)	30.0043 ug/mL
					LC537-PFNA_00013	200 uL	Perfluorononanoic acid (PFNA)	20.002 ug/mL
					LC537-PFOA_00013	200 uL	Perfluorooctanoic acid (PFOA)	20.0151 ug/mL
					LC537-PFOS_00008	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0066 ug/mL
...LC537-PFBS_00008	02/10/18	08/10/17	Methanol, Lot 090285	49.6 mL	LC537_PFBS_00002	0.0992 g	Perfluorobutanesulfonic acid (PFBS)	2 mg/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-31180-1

SDG No.: WE04

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
....LC537_PFBs_00002	04/01/18		Sigma, Lot MKBP8842V		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBs)	1 g/g
...LC537-PFHpA_00015	02/10/18	08/10/17	Methanol, Lot 090285	48.7 mL	LC537_PFHpA_00002	0.0492 g	Perfluoroheptanoic acid (PFHpA)	1.00016 mg/mL
....LC537_PFHpA_00002	04/01/18		Aldrich, Lot BCBM2579V		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.99 g/g
...LC537-PFHxS_00010	02/10/18	08/10/17	Methanol, Lot 090285	55.92 mL	LC537_PFHxS_00002	0.123 g	Perfluorohexanesulfonic acid (PFHxS)	2.00029 mg/mL
....LC537_PFHxS_00002	04/01/18		Sigma, Lot BCBL3545V		(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
...LC537-PFNA_00013	02/10/18	08/10/17	Methanol, Lot 090285	62.3 mL	LC537 PFNA_00002	0.0647 g	Perfluorononanoic acid (PFNA)	1000.1 ug/mL
....LC537 PFNA_00002	04/01/18		TCI America, Lot QN44F		(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g
...LC537-PFOA_00013	02/10/18	08/10/17	Methanol, Lot 090285	22.76 mL	LC537 PFOA_00003	0.0228 g	Perfluorooctanoic acid (PFOA)	1.00076 mg/mL
....LC537 PFOA_00003	10/31/23		SIGMA ALDRICH, Lot BCBS1198V		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
...LC537-PFOS_00008	02/10/18	08/10/17	Methanol, Lot 090285	44.43 mL	LC537_PFOS_00003	0.0488 g	Perfluorooctanesulfonic acid (PFOS)	1.00016 mg/mL
....LC537_PFOS_00003	04/17/19		sigma alrich, Lot SZBE107XV		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-SU_00049	02/04/18	08/04/17	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL
..LCMPFDA_00012	09/30/21		Wellington Laboratories, Lot MPFDA0916		(Purchased Reagent)		13C2 PFHxA	0.1 ug/mL
..LCMPFHxA_00013	04/08/21		Wellington Laboratories, Lot MPFHxA0416		(Purchased Reagent)		13C2 PFHxA	50 ug/mL
LC537-L2_00020	02/04/18	08/14/17	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00025	80 uL	Perfluorobutanesulfonic acid (PFBs)	20.0016 ng/mL
							Perfluoroheptanoic acid (PFHpA)	2.22277 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	6.66817 ng/mL
							Perfluorononanoic acid (PFNA)	4.44524 ng/mL
							Perfluorooctanoic acid (PFOA)	4.44816 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	8.89106 ng/mL
					LC537-IS_00048	500 uL	13C2-PFOA	10 ng/mL
					LC537-SU_00049	500 uL	13C4 PFOS	28.68 ng/mL
							13C2 PFDA	10 ng/mL
.LC537-HSP_00025	02/10/18	08/10/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00023	277.8 uL	13C2 PFHxA	10 ng/mL
							Perfluorobutanesulfonic acid (PFBs)	1250.1 ng/mL
							Perfluoroheptanoic acid (PFHpA)	138.923 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	416.76 ng/mL
							Perfluorononanoic acid (PFNA)	277.827 ng/mL
							Perfluorooctanoic acid (PFOA)	278.01 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	555.691 ng/mL
..LC537SPIM_00023	02/10/18	08/10/17	Methanol, Lot 104453	10000 uL	LC537-PFBs_00008	450 uL	Perfluorobutanesulfonic acid (PFBs)	90 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-31180-1

SDG No.: WE04

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LC537-PFHpA_00015	100 uL	Perfluoroheptanoic acid (PFHpA)	10.0016 ug/mL
					LC537-PFHxS_00010	150 uL	Perfluorohexanesulfonic acid (PFHxS)	30.0043 ug/mL
					LC537-PFNA_00013	200 uL	Perfluorononanoic acid (PFNA)	20.002 ug/mL
					LC537-PFOA_00013	200 uL	Perfluorooctanoic acid (PFOA)	20.0151 ug/mL
					LC537-PFOS_00008	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0066 ug/mL
...LC537-PFBS_00008	02/10/18	08/10/17	Methanol, Lot 090285	49.6 mL	LC537_PFBS_00002	0.0992 g	Perfluorobutanesulfonic acid (PFBS)	2 mg/mL
....LC537_PFBS_00002	04/01/18	Sigma, Lot MKBP8842V			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1 g/g
...LC537-PFHpA_00015	02/10/18	08/10/17	Methanol, Lot 090285	48.7 mL	LC537_PFHpA_00002	0.0492 g	Perfluoroheptanoic acid (PFHpA)	1.00016 mg/mL
....LC537_PFHpA_00002	04/01/18	Aldrich, Lot BCBM2579V			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.99 g/g
...LC537-PFHxS_00010	02/10/18	08/10/17	Methanol, Lot 090285	55.92 mL	LC537_PFHxS_00002	0.123 g	Perfluorohexanesulfonic acid (PFHxS)	2.00029 mg/mL
....LC537_PFHxS_00002	04/01/18	Sigma, Lot BCBL3545V			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
...LC537-PFNA_00013	02/10/18	08/10/17	Methanol, Lot 090285	62.3 mL	LC537_PFNA_00002	0.0647 g	Perfluorononanoic acid (PFNA)	1000.1 ug/mL
....LC537 PFNA_00002	04/01/18	TCI America, Lot QN44F			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g
...LC537-PFOA_00013	02/10/18	08/10/17	Methanol, Lot 090285	22.76 mL	LC537_PFOA_00003	0.0228 g	Perfluorooctanoic acid (PFOA)	1.00076 mg/mL
....LC537 PFOA_00003	10/31/23	SIGMA ALDRICH, Lot BCBS1198V			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
...LC537-PFOS_00008	02/10/18	08/10/17	Methanol, Lot 090285	44.43 mL	LC537_PFOS_00003	0.0488 g	Perfluorooctanesulfonic acid (PFOS)	1.00016 mg/mL
....LC537_PFOS_00003	04/17/19	sigma alrich, Lot SZBE107XV			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-IS_00048	02/04/18	08/04/17	Methanol, Lot 090285	30000 uL	LCM2PFOA_00007	60 uL	13C2-PFOA	0.1 ug/mL
..LCM2PFOA_00007	02/12/21	Wellington Laboratories, Lot M2PFOA0216			LCMPFOS_00021	180 uL	13C4 PFOS	0.2868 ug/mL
..LCMPFOS_00021	12/12/21	Wellington Laboratories, Lot MPFOS1216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
.LC537-SU_00049	02/04/18	08/04/17	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C4 PFOS	47.8 ug/mL
..LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			LCMPFHxA_00013	60 uL	13C2 PFDA	0.1 ug/mL
..LCMPFHxA_00013	04/08/21	Wellington Laboratories, Lot MPFHxA0416			(Purchased Reagent)		13C2 PFHxA	0.1 ug/mL
LC537-L3_00023	02/04/18	08/14/17	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00025	180 uL	Perfluorobutanesulfonic acid (PFBS)	45.0036 ng/mL
							Perfluoroheptanoic acid (PFHpA)	5.00122 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	15.0034 ng/mL
							Perfluorononanoic acid (PFNA)	10.0018 ng/mL
							Perfluorooctanoic acid (PFOA)	10.0084 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	20.0049 ng/mL
					LC537-IS_00048	500 uL	13C2-PFOA	10 ng/mL
					LC537-SU_00049	500 uL	13C4 PFOS	28.68 ng/mL
							13C2 PFDA	10 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-31180-1

SDG No.: WE04

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LC537-HSP_00025	02/10/18	08/10/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00023	277.8 uL	13C2 PFHxA	10 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	1250.1 ng/mL
							Perfluoroheptanoic acid (PFHpA)	138.923 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	416.76 ng/mL
							Perfluorononanoic acid (PFNA)	277.827 ng/mL
							Perfluorooctanoic acid (PFOA)	278.01 ng/mL
..LC537SPIM_00023	02/10/18	08/10/17	Methanol, Lot 104453	10000 uL	LC537-PFBS_00008	450 uL	Perfluorobutanesulfonic acid (PFBS)	90 ug/mL
							Perfluoroheptanoic acid (PFHpA)	10.0016 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	30.0043 ug/mL
							Perfluorononanoic acid (PFNA)	20.002 ug/mL
							Perfluorooctanoic acid (PFOA)	20.0151 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	40.0066 ug/mL
...LC537-PFBS_00008	02/10/18	08/10/17	Methanol, Lot 090285	49.6 mL	LC537_PFB_00002	0.0992 g	Perfluorobutanesulfonic acid (PFBS)	2 mg/mL
....LC537_PFB_00002	04/01/18	Sigma, Lot MKBP8842V			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1 g/g
...LC537-PFHpA_00015	02/10/18	08/10/17	Methanol, Lot 090285	48.7 mL	LC537_PFHpA_00002	0.0492 g	Perfluoroheptanoic acid (PFHpA)	1.00016 mg/mL
....LC537_PFHpA_00002	04/01/18	Aldrich, Lot BCBM2579V			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.99 g/g
...LC537-PFHxS_00010	02/10/18	08/10/17	Methanol, Lot 090285	55.92 mL	LC537_PFHxS_00002	0.123 g	Perfluorohexanesulfonic acid (PFHxS)	2.00029 mg/mL
....LC537_PFHxS_00002	04/01/18	Sigma, Lot BCBL3545V			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
...LC537-PFNA_00013	02/10/18	08/10/17	Methanol, Lot 090285	62.3 mL	LC537 PFNA_00002	0.0647 g	Perfluorononanoic acid (PFNA)	1000.1 ug/mL
....LC537 PFNA_00002	04/01/18	TCI America, Lot QN44F			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g
...LC537-PFOA_00013	02/10/18	08/10/17	Methanol, Lot 090285	22.76 mL	LC537 PFOA_00003	0.0228 g	Perfluorooctanoic acid (PFOA)	1.00076 mg/mL
....LC537 PFOA_00003	10/31/23	SIGMA ALDRICH, Lot BCBS1198V			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
...LC537-PFOS_00008	02/10/18	08/10/17	Methanol, Lot 090285	44.43 mL	LC537_PFOS_00003	0.0488 g	Perfluorooctanesulfonic acid (PFOS)	1.00016 mg/mL
....LC537_PFOS_00003	04/17/19	sigma alrich, Lot SZBE107XV			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-IS_00048	02/04/18	08/04/17	Methanol, Lot 090285	30000 uL	LCM2PFOA_00007	60 uL	13C2-PFOA	0.1 ug/mL
..LCM2PFOA_00007	02/12/21	Wellington Laboratories, Lot M2PFOA0216			LCMPFOS_00021	180 uL	13C4 PFOS	0.2868 ug/mL
..LCMPFOS_00021	12/12/21	Wellington Laboratories, Lot MPFOS1216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
.LC537-SU_00049	02/04/18	08/04/17	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C4 PFOS	47.8 ug/mL
..LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			LCMPFHxA_00013	60 uL	13C2 PFDA	0.1 ug/mL
..LCMPFHxA_00013	04/08/21	Wellington Laboratories, Lot MPFHxA0416			(Purchased Reagent)		13C2 PFHxA	0.1 ug/mL
							13C2 PFDA	50 ug/mL
							13C2 PFHxA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-31180-1

SDG No.: WE04

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
LC537-L4_00020	02/04/18	08/14/17	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00025	360 uL	Perfluorobutanesulfonic acid (PFBS)	90.0072 ng/mL
							Perfluoroheptanoic acid (PFHpA)	10.0024 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	30.0067 ng/mL
							Perfluorononanoic acid (PFNA)	20.0036 ng/mL
							Perfluorooctanoic acid (PFOA)	20.0167 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	40.0098 ng/mL
					LC537-IS_00048	500 uL	13C2-PFOA	10 ng/mL
					LC537-SU_00049	500 uL	13C4 PFOS	28.68 ng/mL
							13C2 PFDA	10 ng/mL
LC537-HSP_00025	02/10/18	08/10/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00023	277.8 uL	13C2 PFHxA	10 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	1250.1 ng/mL
							Perfluoroheptanoic acid (PFHpA)	138.923 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	416.76 ng/mL
							Perfluorononanoic acid (PFNA)	277.827 ng/mL
							Perfluorooctanoic acid (PFOA)	278.01 ng/mL
LC537SPIM_00023	02/10/18	08/10/17	Methanol, Lot 104453	10000 uL	LC537-PFBS_00008	450 uL	Perfluorooctanesulfonic acid (PFOS)	555.691 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	90 ug/mL
							Perfluoroheptanoic acid (PFHpA)	10.0016 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	30.0043 ug/mL
							Perfluorononanoic acid (PFNA)	20.002 ug/mL
							Perfluorooctanoic acid (PFOA)	20.0151 ug/mL
LC537-PFBS_00008	02/10/18	08/10/17	Methanol, Lot 090285	49.6 mL	LC537-PFOS_00008	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0066 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	2 mg/mL
							Perfluoroheptanoic acid (PFHpA)	1.00016 mg/mL
							Perfluorohexanesulfonic acid (PFHxS)	2.00029 mg/mL
							Perfluorononanoic acid (PFNA)	1000.1 ug/mL
							Perfluorooctanoic acid (PFOA)	1.00076 mg/mL
LC537-PFOS_00002	04/01/18		Sigma, Lot MKBP8842V				Perfluorooctanoic acid (PFOA)	0.999 g/g
LC537-PFBS_00002	04/01/18		Sigma, Lot MKBP8842V				Perfluorobutanesulfonic acid (PFBS)	1 g/g
LC537-PFHpA_00015	02/10/18	08/10/17	Methanol, Lot 090285	48.7 mL	LC537-PFHpA_00002	0.0492 g	Perfluoroheptanoic acid (PFHpA)	1.00016 mg/mL
LC537-PFHpA_00002	04/01/18		Aldrich, Lot BCBM2579V				Perfluoroheptanoic acid (PFHpA)	0.99 g/g
LC537-PFHxS_00010	02/10/18	08/10/17	Methanol, Lot 090285	55.92 mL	LC537-PFHxS_00002	0.123 g	Perfluorohexanesulfonic acid (PFHxS)	2.00029 mg/mL
LC537-PFHxS_00002	04/01/18		Sigma, Lot BCBL3545V				Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
LC537-PFNA_00013	02/10/18	08/10/17	Methanol, Lot 090285	62.3 mL	LC537-PFNA_00002	0.0647 g	Perfluorononanoic acid (PFNA)	1000.1 ug/mL
LC537-PFNA_00002	04/01/18		TCI America, Lot QN44F				Perfluorononanoic acid (PFNA)	0.963 g/g
LC537-PFOA_00013	02/10/18	08/10/17	Methanol, Lot 090285	22.76 mL	LC537-PFOA_00003	0.0228 g	Perfluorooctanoic acid (PFOA)	1.00076 mg/mL
LC537-PFOA_00003	10/31/23		SIGMA ALDRICH, Lot BCBS1198V				Perfluorooctanoic acid (PFOA)	0.999 g/g

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-31180-1

SDG No.: WE04

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LC537-PFOS_00008	02/10/18	08/10/17	Methanol, Lot 090285	44.43 mL	LC537_PFOS_00003	0.0488 g	Perfluorooctanesulfonic acid (PFOS)	1.00016 mg/mL
....LC537_PFOS_00003	04/17/19	sigma alrich, Lot SZBE107XV			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-IS_00048	02/04/18	08/04/17	Methanol, Lot 090285	30000 uL	LCM2PFOA_00007	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00021	180 uL	13C4 PFOS	0.2868 ug/mL
..LCM2PFOA_00007	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00021	12/12/21	Wellington Laboratories, Lot MPFOS1216			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-SU_00049	02/04/18	08/04/17	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL
					LCMPFHxA_00013	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFHxA_00013	04/08/21	Wellington Laboratories, Lot MPFHxA0416			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
LC537-L5_00024	02/04/18	08/14/17	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00025	540 uL	Perfluorobutanesulfonic acid (PFBS)	135.011 ng/mL
							Perfluoroheptanoic acid (PFHpA)	15.0037 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	45.0101 ng/mL
							Perfluorononanoic acid (PFNA)	30.0053 ng/mL
							Perfluorooctanoic acid (PFOA)	30.0251 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	60.0146 ng/mL
					LC537-IS_00048	500 uL	13C2-PFOA	10 ng/mL
					LC537-SU_00049	500 uL	13C4 PFOS	28.68 ng/mL
							13C2 PFDA	10 ng/mL
.LC537-HSP_00025	02/10/18	08/10/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00023	277.8 uL	13C2 PFHxA	10 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	1250.1 ng/mL
							Perfluoroheptanoic acid (PFHpA)	138.923 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	416.76 ng/mL
							Perfluorononanoic acid (PFNA)	277.827 ng/mL
							Perfluorooctanoic acid (PFOA)	278.01 ng/mL
..LC537SPIM_00023	02/10/18	08/10/17	Methanol, Lot 104453	10000 uL	LC537-PFBS_00008	450 uL	Perfluorooctanesulfonic acid (PFOS)	555.691 ng/mL
					LC537-PFHpA_00015	100 uL	Perfluorobutanesulfonic acid (PFBS)	90 ug/mL
					LC537-PFHxS_00010	150 uL	Perfluoroheptanoic acid (PFHpA)	10.0016 ug/mL
					LC537-PFNA_00013	200 uL	Perfluorohexanesulfonic acid (PFHxS)	30.0043 ug/mL
					LC537-PFOA_00013	200 uL	Perfluorononanoic acid (PFNA)	20.002 ug/mL
					LC537-PFOS_00008	400 uL	Perfluorooctanoic acid (PFOA)	20.0151 ug/mL
...LC537-PFBS_00008	02/10/18	08/10/17	Methanol, Lot 090285	49.6 mL	LC537_PFBS_00002	0.0992 g	Perfluorooctanesulfonic acid (PFOS)	40.0066 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	2 mg/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-31180-1

SDG No.: WE04

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
....LC537_PFBs_00002	04/01/18		Sigma, Lot MKBP8842V		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBs)	1 g/g
...LC537-PFHpA_00015	02/10/18	08/10/17	Methanol, Lot 090285	48.7 mL	LC537_PFHpA_00002	0.0492 g	Perfluoroheptanoic acid (PFHpA)	1.00016 mg/mL
....LC537_PFHpA_00002	04/01/18		Aldrich, Lot BCBM2579V		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.99 g/g
...LC537-PFHxS_00010	02/10/18	08/10/17	Methanol, Lot 090285	55.92 mL	LC537_PFHxS_00002	0.123 g	Perfluorohexanesulfonic acid (PFHxS)	2.00029 mg/mL
....LC537_PFHxS_00002	04/01/18		Sigma, Lot BCBL3545V		(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
...LC537-PFNA_00013	02/10/18	08/10/17	Methanol, Lot 090285	62.3 mL	LC537 PFNA_00002	0.0647 g	Perfluorononanoic acid (PFNA)	1000.1 ug/mL
....LC537 PFNA_00002	04/01/18		TCI America, Lot QN44F		(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g
...LC537-PFOA_00013	02/10/18	08/10/17	Methanol, Lot 090285	22.76 mL	LC537 PFOA_00003	0.0228 g	Perfluorooctanoic acid (PFOA)	1.00076 mg/mL
....LC537 PFOA_00003	10/31/23		SIGMA ALDRICH, Lot BCBS1198V		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
...LC537-PFOS_00008	02/10/18	08/10/17	Methanol, Lot 090285	44.43 mL	LC537_PFOS_00003	0.0488 g	Perfluorooctanesulfonic acid (PFOS)	1.00016 mg/mL
....LC537_PFOS_00003	04/17/19		sigma alrich, Lot SZBE107XV		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-IS_00048	02/04/18	08/04/17	Methanol, Lot 090285	30000 uL	LCM2PFOA_00007	60 uL	13C2-PFOA	0.1 ug/mL
..LCM2PFOA_00007	02/12/21		Wellington Laboratories, Lot M2PFOA0216		(Purchased Reagent)		13C4 PFOS	0.2868 ug/mL
..LCMPFOS_00021	12/12/21		Wellington Laboratories, Lot MPFOS1216		(Purchased Reagent)		13C2-PFOA	50 ug/mL
.LC537-SU_00049	02/04/18	08/04/17	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C4 PFOS	47.8 ug/mL
..LCMPFDA_00012	09/30/21		Wellington Laboratories, Lot MPFDA0916		(Purchased Reagent)		13C2 PFDA	0.1 ug/mL
..LCMPFHxA_00013	04/08/21		Wellington Laboratories, Lot MPFHxA0416		(Purchased Reagent)		13C2 PFHxA	0.1 ug/mL
LC537-L6_00020	02/04/18	08/14/17	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00025	720 uL	Perfluorobutanesulfonic acid (PFBs)	180.014 ng/mL
							Perfluoroheptanoic acid (PFHpA)	20.0049 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	60.0135 ng/mL
							Perfluorononanoic acid (PFNA)	40.0071 ng/mL
							Perfluorooctanoic acid (PFOA)	40.0334 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	80.0195 ng/mL
					LC537-IS_00048	500 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
							13C2 PFDA	10 ng/mL
.LC537-HSP_00025	02/10/18	08/10/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00023	277.8 uL	13C2 PFHxA	10 ng/mL
							Perfluorobutanesulfonic acid (PFBs)	1250.1 ng/mL
							Perfluoroheptanoic acid (PFHpA)	138.923 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	416.76 ng/mL
							Perfluorononanoic acid (PFNA)	277.827 ng/mL
							Perfluorooctanoic acid (PFOA)	278.01 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-31180-1

SDG No.: WE04

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorooctanesulfonic acid (PFOS)	555.691 ng/mL
..LC537SPIM_00023	02/10/18	08/10/17	Methanol, Lot 104453	10000 uL	LC537-PFBS_00008	450 uL	Perfluorobutanesulfonic acid (PFBS)	90 ug/mL
					LC537-PFHpA_00015	100 uL	Perfluoroheptanoic acid (PFHpA)	10.0016 ug/mL
					LC537-PFHxS_00010	150 uL	Perfluorohexanesulfonic acid (PFHxS)	30.0043 ug/mL
					LC537-PFNA_00013	200 uL	Perfluorononanoic acid (PFNA)	20.002 ug/mL
					LC537-PFOA_00013	200 uL	Perfluorooctanoic acid (PFOA)	20.0151 ug/mL
					LC537-PFOS_00008	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0066 ug/mL
...LC537-PFBS_00008	02/10/18	08/10/17	Methanol, Lot 090285	49.6 mL	LC537_PFBS_00002	0.0992 g	Perfluorobutanesulfonic acid (PFBS)	2 mg/mL
....LC537_PFBS_00002	04/01/18	Sigma, Lot MKBP8842V			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1 g/g
...LC537-PFHpA_00015	02/10/18	08/10/17	Methanol, Lot 090285	48.7 mL	LC537_PFHpA_00002	0.0492 g	Perfluoroheptanoic acid (PFHpA)	1.00016 mg/mL
....LC537_PFHpA_00002	04/01/18	Aldrich, Lot BCBM2579V			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.99 g/g
...LC537-PFHxS_00010	02/10/18	08/10/17	Methanol, Lot 090285	55.92 mL	LC537_PFHxS_00002	0.123 g	Perfluorohexanesulfonic acid (PFHxS)	2.00029 mg/mL
....LC537_PFHxS_00002	04/01/18	Sigma, Lot BCBL3545V			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
...LC537-PFNA_00013	02/10/18	08/10/17	Methanol, Lot 090285	62.3 mL	LC537 PFNA_00002	0.0647 g	Perfluorononanoic acid (PFNA)	1000.1 ug/mL
....LC537 PFNA_00002	04/01/18	TCI America, Lot QN44F			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g
...LC537-PFOA_00013	02/10/18	08/10/17	Methanol, Lot 090285	22.76 mL	LC537 PFOA_00003	0.0228 g	Perfluorooctanoic acid (PFOA)	1.00076 mg/mL
....LC537_PFOA_00003	10/31/23	SIGMA ALDRICH, Lot BCBS1198V			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
...LC537-PFOS_00008	02/10/18	08/10/17	Methanol, Lot 090285	44.43 mL	LC537_PFOS_00003	0.0488 g	Perfluorooctanesulfonic acid (PFOS)	1.00016 mg/mL
....LC537_PFOS_00003	04/17/19	sigma alrich, Lot SZBE107XV			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-IS_00048	02/04/18	08/04/17	Methanol, Lot 090285	30000 uL	LCM2PFOA_00007	60 uL	13C2-PFOA	0.1 ug/mL
..LCM2PFOA_00007	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C4 PFOS	0.2868 ug/mL
..LCMPFOS_00021	12/12/21	Wellington Laboratories, Lot MPFOS1216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
.LC537-SU_00049	02/04/18	08/04/17	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C4 PFOS	47.8 ug/mL
..LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	0.1 ug/mL
..LCMPFHxA_00013	04/08/21	Wellington Laboratories, Lot MPFHxA0416			(Purchased Reagent)		13C2 PFHxA	0.1 ug/mL
LC537-LSP_00026	02/10/18	08/10/17	Methanol, Lot 090285	20000 uL	LC537SPIM_00023	50 uL	Perfluorobutane Sulfonate	225 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	225 ng/mL
							Perfluoroheptanoic acid (PFHpA)	25.0041 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	75.0109 ng/mL
							Perfluorononanoic acid (PFNA)	50.0049 ng/mL
							Perfluorooctanoic acid (PFOA)	50.0378 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-31180-1

SDG No.: WE04

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorooctanesulfonic acid (PFOS)	100.016 ng/mL
.LC537SPIM_00023	02/10/18	08/10/17	Methanol, Lot 104453	10000 uL	LC537-PFBS_00008	450 uL	Perfluorobutane Sulfonate	90 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	90 ug/mL
					LC537-PFHpA_00015	100 uL	Perfluoroheptanoic acid (PFHpA)	10.0016 ug/mL
					LC537-PFHxS_00010	150 uL	Perfluorohexanesulfonic acid (PFHxS)	30.0043 ug/mL
					LC537-PFNA_00013	200 uL	Perfluorononanoic acid (PFNA)	20.002 ug/mL
					LC537-PFOA_00013	200 uL	Perfluorooctanoic acid (PFOA)	20.0151 ug/mL
					LC537-PFOS_00008	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0066 ug/mL
..LC537-PFBS_00008	02/10/18	08/10/17	Methanol, Lot 090285	49.6 mL	LC537_PFBS_00002	0.0992 g	Perfluorobutane Sulfonate	2 mg/mL
							Perfluorobutanesulfonic acid (PFBS)	2 mg/mL
...LC537_PFBS_00002	04/01/18	Sigma, Lot MKBP8842V			(Purchased Reagent)		Perfluorobutane Sulfonate	1 g/g
							Perfluorobutanesulfonic acid (PFBS)	1 g/g
..LC537-PFHpA_00015	02/10/18	08/10/17	Methanol, Lot 090285	48.7 mL	LC537_PFHpA_00002	0.0492 g	Perfluoroheptanoic acid (PFHpA)	1.00016 mg/mL
...LC537_PFHpA_00002	04/01/18	Aldrich, Lot BCBM2579V			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.99 g/g
..LC537-PFHxS_00010	02/10/18	08/10/17	Methanol, Lot 090285	55.92 mL	LC537_PFHxS_00002	0.123 g	Perfluorohexanesulfonic acid (PFHxS)	2.00029 mg/mL
...LC537_PFHxS_00002	04/01/18	Sigma, Lot BCBL3545V			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
..LC537-PFNA_00013	02/10/18	08/10/17	Methanol, Lot 090285	62.3 mL	LC537 PFNA_00002	0.0647 g	Perfluorononanoic acid (PFNA)	1000.1 ug/mL
...LC537 PFNA_00002	04/01/18	TCI America, Lot QN44F			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g
..LC537-PFOA_00013	02/10/18	08/10/17	Methanol, Lot 090285	22.76 mL	LC537 PFOA_00003	0.0228 g	Perfluorooctanoic acid (PFOA)	1.00076 mg/mL
...LC537 PFOA_00003	10/31/23	SIGMA ALDRICH, Lot BCBS1198V			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
..LC537-PFOS_00008	02/10/18	08/10/17	Methanol, Lot 090285	44.43 mL	LC537_PFOS_00003	0.0488 g	Perfluorooctanesulfonic acid (PFOS)	1.00016 mg/mL
...LC537_PFOS_00003	04/17/19	sigma alrich, Lot SZBE107XV			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
LC537-SU_00048	02/04/18	08/04/17	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL
					LCMPFHxA_00013	60 uL	13C2 PFHxA	0.1 ug/mL
.LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL
.LCMPFHxA_00013	04/08/21	Wellington Laboratories, Lot MPFHxA0416			(Purchased Reagent)		13C2 PFHxA	50 ug/mL

Reagent

LC537_PFB_00002

4/1/15 SPV

SIGMA-ALDRICH®

sigma-aldrich.com

3050 Spruce Street, Saint Louis, MO 63103, USA

Website: www.sigmaaldrich.com

Email USA: techserv@sial.com

Outside USA: eurtechserv@sial.com

Certificate of Analysis

Product Name:

Nonafluorobutane-1-sulfonic acid - 97%

Product Number:

562629

Batch Number:

MKBP8842V

Brand:

ALDRICH

CAS Number:

375-73-5

MDL Number:

MFCD01320794

Formula:

C₄HF₉O₃S

Formula Weight:

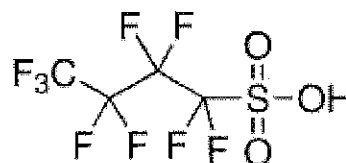
300.10 g/mol

Storage Temperature:

Store at 2 - 8 °C

Quality Release Date:

11 OCT 2013



PFBS

Test	Specification	Result
Appearance (Color)	Colorless	Colorless
Appearance (Form)	Liquid	Liquid
Infrared Spectrum	Conforms to Structure	Conforms
Fluorine NMR Spectrum	Conforms to Structure	Conforms
Purity (Titration by NaOH)	96.5 - 103.5 %	101.6 %

Jamie Gleason

Jamie Gleason, Manager

Quality Control

Milwaukee, Wisconsin US

Sigma-Aldrich warrants, that at the time of the quality release or subsequent retest date this product conformed to the information contained in this publication. The current Specification sheet may be available at Sigma-Aldrich.com. For further inquiries, please contact Technical Service. Purchaser must determine the suitability of the product for its particular use. See reverse side of invoice or packing slip for additional terms and conditions of sale.

Reagent

LC537_PFB2_00002

11.6.8.17 SW



CERTIFICATE OF ANALYSIS

The Power to Question

Catalog Number: sc-236187
 Lot Number: F0917
 Product Name: Nonafluorobutane-1-sulfonic acid
 CAS Number: 375-73-5
 Molecular Formula: $C_4HF_9O_3S$
 Molecular Weight: 300.10

Test	Specification	Result
Appearance	Colorless liquid	Complies
Identification (19F-NMR)	Conforms to structure	Complies
Purity (Sodium Hydroxide Titration)	$\geq 97\%$	101.3%
Infrared Spectrum	Conforms to structure	Complies

Reagent

LC537_PFHpA_00002

Certificate of Analysis

Product Name: PERFLUOROHEPTANOIC ACID
99 %
Product Number: 342041
Batch Number: BCBM2579V
Brand: Aldrich
CAS Number: 375-85-9
Formula: $\text{CF}_3(\text{CF}_2)_5\text{CO}_2\text{H}$
Formula Weight: 364.06
Quality Release Date: 06 DEC 2013
Recommended Retest Date: OCT 2018

PFH₇A

TEST	SPECIFICATION	RESULT
APPEARANCE (COLOR)	COLORLESS OR WHITE	WHITE
APPEARANCE (FORM)	LIQUID OR SOLID	SOLID
TITRATION	98.5 - 101.5 %	99.8 %
TITRATION (METHOD)	-	BACK TITRATION
PURITY (GC AREA %)	≥ 98.5 %	99.5 %
INFRARED SPECTRUM	CONFORMS TO STRUCTURE	CONFORMS



Dr. Claudia Geithner
Manager Quality Control
Buchs, Switzerland

Sigma-Aldrich warrants that at the time of the quality release or subsequent retest date this product conformed to the information contained in this publication. The current specification sheet may be available at Sigma-Aldrich.com. For further inquiries, please contact Technical Service. Purchaser must determine the suitability of the product for its particular use. See reverse side of invoice or packing slip for additional terms and conditions of sale.

Reagent

LC537_PFHpA2_00002

Certificate of analysis

r:6.13.17 SW

PFHe A

Product No.: A12092
Product: Perfluoroheptanoic acid, 98+%
Lot No.: 10200390

Appearance: White fused solid
Water Content (Karl-Fischer): 0.30%
Melting Point: 32.0-34.3°C
Assay (Aqueous acid-base titration): 99.7%
Identification (FTIR): Conforms

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Reagent

LC537_PFHxS_00002

4/1/15 std

SIGMA-ALDRICH®

3050 Spruce Street, Saint Louis, MO 63103 USA
Email USA: techserv@sial.com Outside USA: eurtechserv@sial.com

Certificate of Analysis

Product Name: TRIDECAFLUOROHXANE-1-SULFONIC ACID POTASSIUM SALT
Product Number: 50929
Batch Number: BCBL3545V
Brand: Aldrich
CAS Number: 3871-99-6
Formula: $C_{13}F_{27}KO_2S$
Formula Weight: 438.20
Quality Release Date: 20 JUN 2013

PFAS-K

TEST	SPECIFICATION	RESULT
APPEARANCE (COLOR)	WHITE TO FAINT BEIGE	WHITE
APPEARANCE (FORM)	POWDER OR CRYSTALS	POWDER
TITRATION (ION EXCHANGE)	≥ 98.0 %	99.5 %
INFRARED SPECTRUM	CONFORMS TO STRUCTURE	CONFORMS

Claudia Geitner

Dr. Claudia Geitner
Manager Quality Control
Buchs, Switzerland

$$MW_{corr} = \frac{(k_{form}) - (k) + (H)}{438.20 (k_{form})} = \frac{(438.20 - 39.10 + 1.01)}{438.20 (k_{form})} = 0.91307 \text{ (anion form)}$$

$$Purity = 90.94 \% \text{ w/m.w correction}$$

std 4/1/15

Sigma-Aldrich warrants that at the time of the quality release or subsequent retest date this product conformed to the information contained in this publication. The current specification sheet may be available at Sigma-Aldrich.com. For further inquiries, please contact Technical Service. Purchaser must determine the suitability of the product for its particular use. See reverse side of invoice or packing slip for additional terms and conditions of sale.

Reagent

LC537_PFHxS2_00002

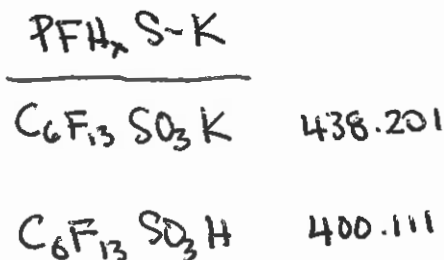


The Future is Now

CERTIFICATE OF ANALYSIS

Catalog Number: sc-237289
 Lot Number: G2516
 Product Name: Tridecafluorohexane-1-sulfonic acid potassium salt
 CAS Number: 3871-99-6
 Molecular Formula: $C_6F_{13}KO_3S$
 Molecular Weight: 438.20

Test	Specification	Result
Appearance	White to faint beige powder or crystals	White powder
Identification (Infrared Spectrum)	Consistent with structure	Complies
Purity (Titration, Ion Exchange)	$\geq 98.0\%$	100.4%



$$MW \text{ correction} = \frac{400.11}{438.201} = 0.91307 \quad \frac{PFH_2S}{\text{CAS \# 355-46-4}}$$

$$\text{Purity \& MW correction} = 90.9\%$$

This document was produced electronically and is valid without a signature.

Reagent

LC537_PFNA_00002

R: 4/1/15 SKV



Certificate of Analysis

Apr 2, 2015 (JST)

TOKYO CHEMICAL INDUSTRY CO.,LTD.
4-10-1 Nihonbashi-Honcho, Chuo-ku, Tokyo 103-0023 Japan

Chemical Name: Heptadecafluorononanoic Acid		
Product Number: H0843	Lot: QN44F	
CAS: 375-95-1		

Tests	Results	Specifications
Purity(GC)	96.3 %	min. 95.0 %
Purity(Neutralization titration)	98.1 %	min. 95.0 %
Melting point	63.3 deg-C	62.0 to 67.0 deg-C

TCI Lot numbers are 4-5 characters in length.
Characters listed after the first 4-5 characters are control numbers for internal purpose only.

Customer service:

TCI AMERICA
Tel: +1-800-423-8616 / +1-503-283-1681
Fax: +1-888-520-1075 / +1-503-283-1987
E-mail: Sales-US@TCIchemicals.com

PFNA

Reagent

LC537_PFNA2_00002

11.6.14.17 SKW

SIGMA-ALDRICH

sigma-aldrich.com

3050 Spruce Street, Saint Louis, MO 63103, USA

Website: www.sigmaaldrich.com

Email USA: techserv@sial.com

Outside USA: eurtechserv@sial.com

Certificate of Analysis

Product Name:

Perfluorononanoic acid - 97%

Product Number:

394459

Batch Number:

MKCC0699

Brand:

ALDRICH

CAS Number:

375-95-1

MDL Number:

MFCD00039605

Formula:

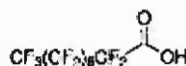
C₉H₁₇O₂

Formula Weight:

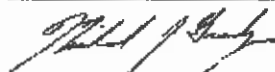
464.08 g/mol

Quality Release Date:

07 DEC 2016



Test	Specification	Result
Appearance (Color)	White to Off-White	White
Appearance (Form)	Powder or Crystals or Crystalline Chunk(s) or Granule or Flakes or Solid	Powder
Infrared Spectrum	Conforms to Structure	Conforms
GC (area %)	≥ 96.5 %	98.2 %



Michael Grady, Manager

Quality Control

Milwaukee, WI US

PFNA

Sigma-Aldrich warrants, that at the time of the quality release or subsequent retest date this product conformed to the information contained in this publication. The current Specification sheet may be available at Sigma-Aldrich.com. For further inquiries, please contact Technical Service. Purchaser must determine the suitability of the product for its particular use. See reverse side of Invoice or packing slip for additional terms and conditions of sale.

Reagent

LC537_PFOA_00003

C: 11/30/16 SKV
PFA

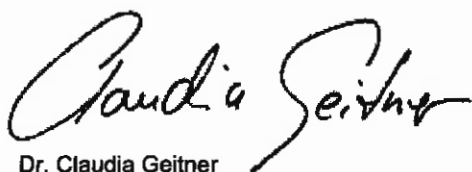
SIGMA-ALDRICH

3050 Spruce Street, Saint Louis, MO 63103 USA
Email USA: techserv@sial.com Outside USA: eurtechserv@sial.com

Certificate of Analysis

Product Name: PENTADECAFLUOROOCTANOIC ACID
analytical standard
Product Number: 33824
Batch Number: BCBS1198V
Brand: Sigma-Aldrich
CAS Number: 335-67-1
Formula: $\text{CF}_3(\text{CF}_2)_6\text{COOH}$
Formula Weight: 414.07
Expiration Date: OCT 2023
Quality Release Date: 12 MAY 2016

TEST	SPECIFICATION	RESULT
PURITY (HPLC AREA %)	$\geq 98.0\%$	100.0%
IDENTIFICATION (LC-MS)	IDENTITY CONFORMS	CONFORMS



Dr. Claudia Geitner
Manager Quality Control
Buchs, Switzerland

Sigma-Aldrich warrants that at the time of the quality release or subsequent retest date this product conformed to the information contained in this publication. The current specification sheet may be available at Sigma-Aldrich.com. For further inquiries, please contact Technical Service. Purchaser must determine the suitability of the product for its particular use. See reverse side of invoice or packing slip for additional terms and conditions of sale.

Reagent

LC537_PFOA2_00002

Certificate of analysis

17: 6/9/17 SW

Product No.: L08862
Product: Perfluorooctanoic acid, 95%
Lot No.: 10199078

PFOA

Appearance: White powder
Water Content (Karl-Fischer): 1.30%
Melting Point: 47.6-54.0°C
Assay (Aqueous acid-base titration): 98.4%
Assay (GC Silyl Deriv): 97.2%

This document has been electronically generated and does not require a signature.

Order our products online www.alfa.com

ThermoFisher
SCIENTIFIC

Reagent

LC537_PFOS_00003

n: 11/30/16 SV
PFOS

SIGMA-ALDRICH

CERTIFICATE OF ANALYSIS

Sigma-Aldrich Laborchemikalien GmbH D-30918 Seelze
Telefon: +49 5137 8238-150

Seelze, 22.04.2014/524107/14/08646

Order-No.:

Customer-No.:

Order-Code:

Quantity:

Production Date: 17.Apr.2014

Expiry Date: 17.Apr.2019

Article/Product: 33829

Batch : SZBE107XV

Heptadecafluorooctanesulfonic acid potassium salt OEKANAL®

Reference Material (RM)

1. General Information

Formula: C₈F₁₇KO₃S

CAS-No.: [2795-39-3]

Usage : PFOS

Molar mass: 538.22 g/Mole

Recomm. storage temp.: roomtemp.

The estimated uncertainty of a single measurement of the assay can be expected to be 0.5 % relative (confidence level = 95%, n= 6) whereby the assay measurements are calculated by 100% minus found impurities.

2. Batch Analysis

Identity

Assay (LC-MS)

Date of Analysis

complying

98 %

22.Apr.2014

3. Advice and Remarks

- The expiry date is based on the current knowledge and holds only for proper storage conditions in the originally closed flasks/ packages.
- Whenever the container is opened for removal of aliquot portions of the substance, the person handling the substance must assure, that the integrity of the substance is maintained and proper records of all its handlings are kept. Special care has to be taken to avoid any contamination or adulteration of the substance.
- We herewith confirm that the delivery is effected according to the technical delivery conditions agreed.
- Particular properties of the products or the suitability for a particular area of application are not assured.
- We guarantee a proper quality within our General Conditions of Sales.

Sigma-Aldrich Laborchemikalien GmbH
Quality Management SA-LC

Reagent

LC537_PFOS2_00002

R: 6.14.17 SKV

SIGMA-ALDRICH

3050 Spruce Street, Saint Louis, MO 63103 USA
Email USA: techserv@sial.com Outside USA: eurtechserv@sial.com

Certificate of Analysis

Product Name: HEPTADECAFLUOROOCTANESULFONIC ACID TETRAETHYLAMMONIUM SALT
98 %
Product Number: 365289
Batch Number: BCBQ0108V
Brand: Aldrich
CAS Number: 56773-42-3
Formula: $\text{CF}_3(\text{CF}_2)_6\text{CF}_2\text{SO}_3\text{N}(\text{C}_2\text{H}_5)_4$
Formula Weight: 629.37
Quality Release Date: 11 JUN 2015

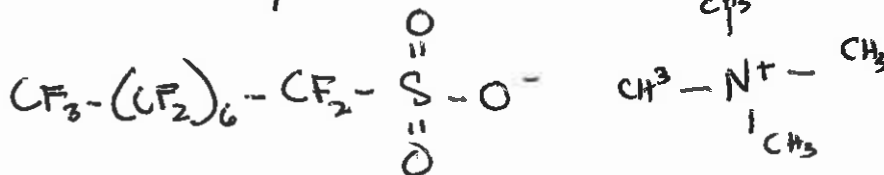
TEST	SPECIFICATION	RESULT
APPEARANCE (COLOR)	WHITE TO OFF WHITE	OFF-WHITE
APPEARANCE (FORM)	POWDER OR POWDER WITH CHUNK(S)	POWDER
CARBON CONTENT	29.77 % - 31.29 %	29.97 %
INFRARED SPECTRUM	CONFORMS TO STRUCTURE	CONFORMS

Claudia Geitner

Dr. Claudia Geitner
Manager Quality Control
Buchs, Switzerland

$$\text{MW correction: } \frac{500.125}{629.37} = 0.7946$$

$$\text{Purity \& MW correction} = 77.37\%$$



$$\begin{array}{r} \text{C}_8\text{F}_{17}\text{SO}_3^+\text{H} \\ \text{C} = 12.011 \quad 96.088 \\ \text{F} = 18.998 \quad 322.966 \\ \text{S} = 32.066 \quad 32.066 \\ \text{O} = 16.000 \quad 47.947 \\ \text{H} = 1.008 \quad 1.008 \\ \text{N} = 14.007 \quad - \\ \hline 500.125 \end{array}$$

$$\begin{array}{r} \text{C}_8\text{H}_{20}\text{N} \\ 96.088 \\ - \\ - \\ 20.60 \\ 14.007 \\ \hline 130.255 \end{array}$$

Reagent

LCM2PFOA_00007



WELLINGTON LABORATORIES

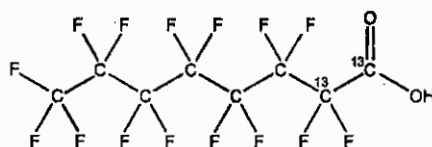
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2PFOA
COMPOUND: Perfluoro-n-[1,2-¹³C₂]octanoic acid

LOT NUMBER: M2PFOA0216

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: ¹³C₂¹²C₆HF₁₅O₂
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 416.05
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%

ISOTOPIC PURITY: ≥99% ¹³C
(1,2-¹³C₂)

LAST TESTED: (mm/dd/yyyy) 02/12/2016

EXPIRY DATE: (mm/dd/yyyy) 02/12/2021

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 02/24/2016
(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

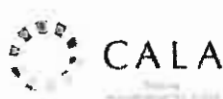
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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

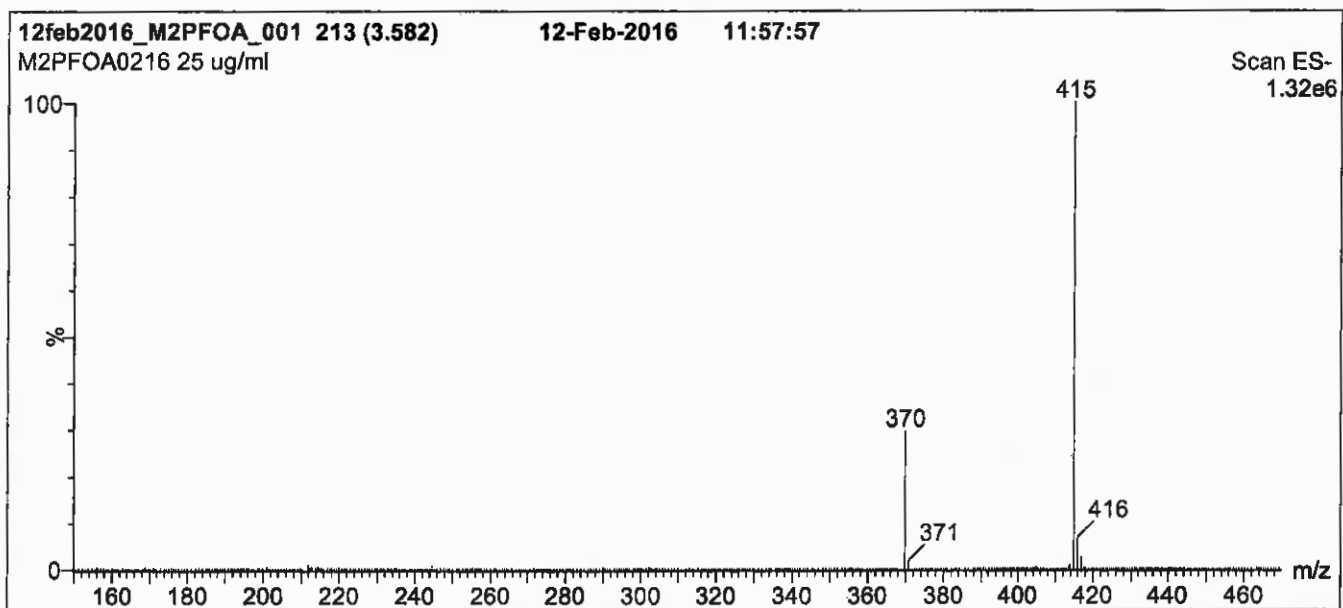
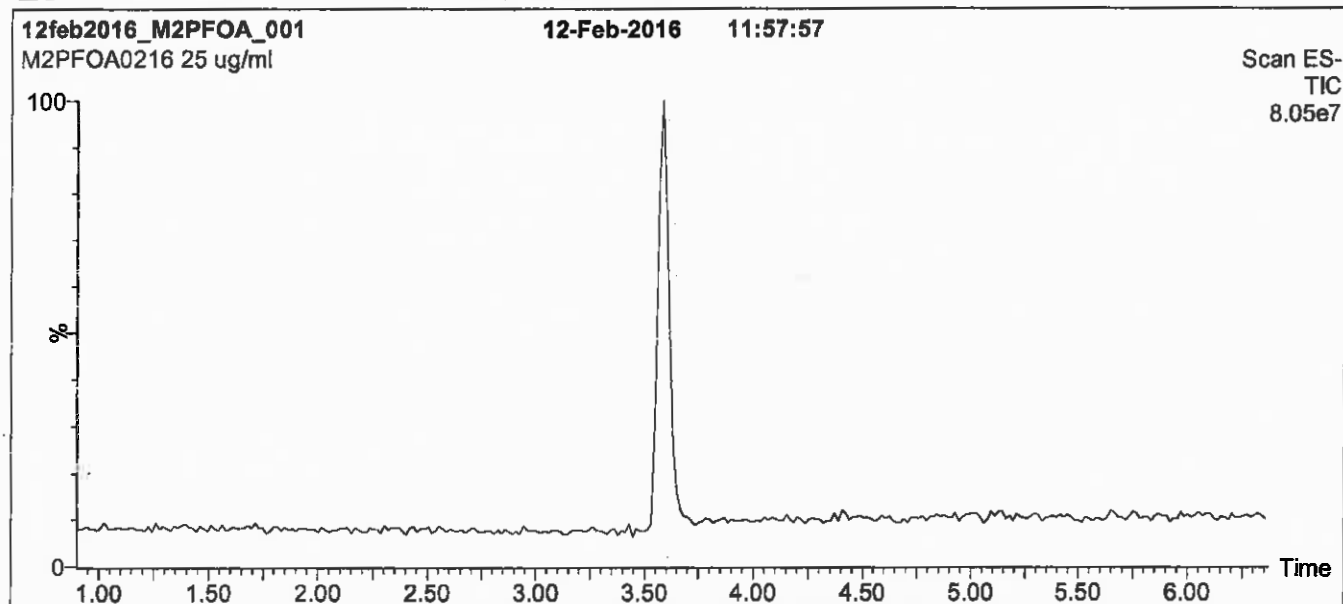
QUALITY MANAGEMENT:

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



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient

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

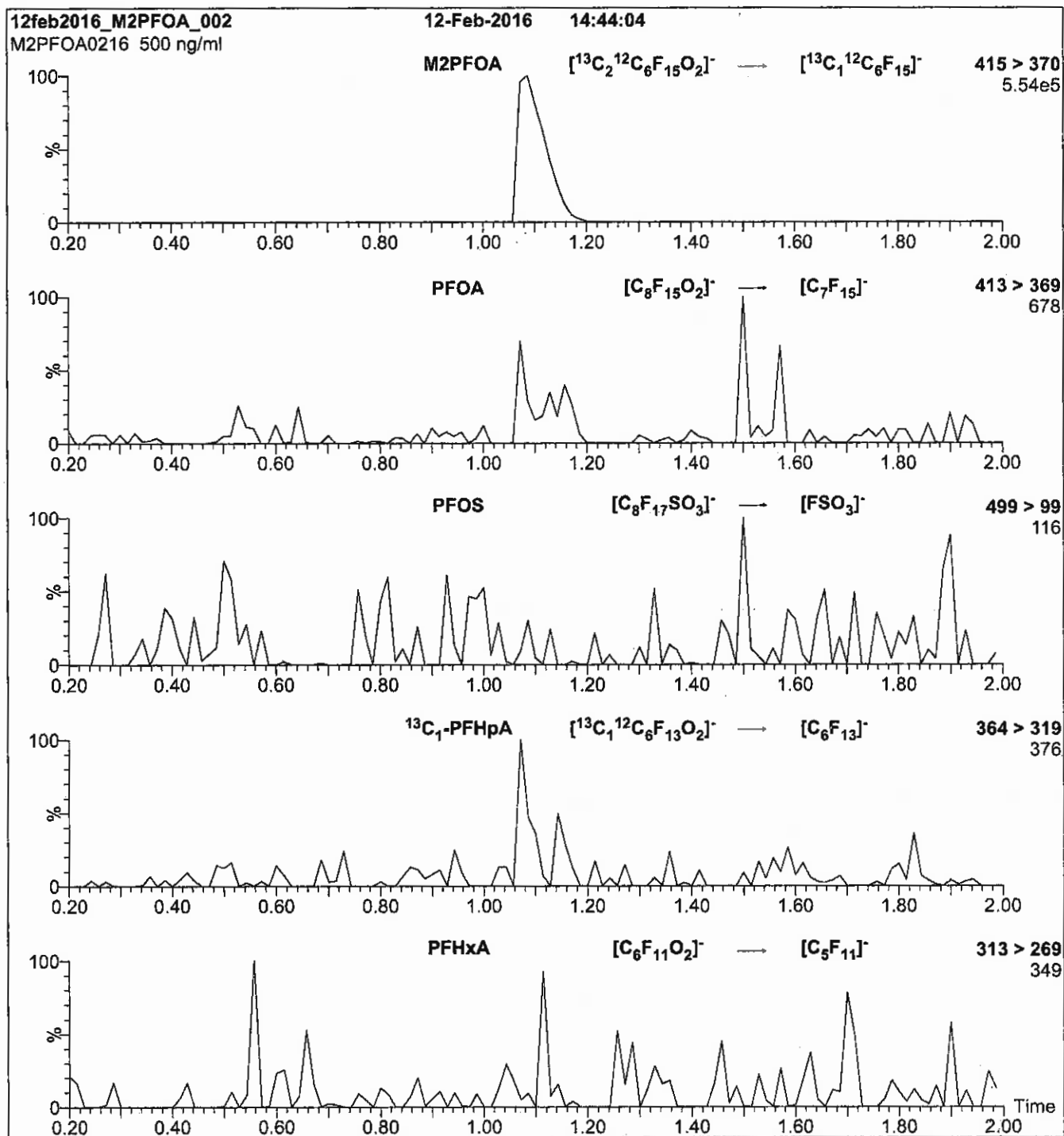
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

Mobile phase: Isocratic 80% MeOH / 20% H_2O

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

MS Parameters

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

Reagent

LCMPFDA_00012

R: SBC 12/21/16



814255

ID: LCMFDA_00012

Exp: 09/30/21 Prod: SBC

¹³C2-Perfluorodecanoic a



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFDA

LOT NUMBER:

MPFDA0916

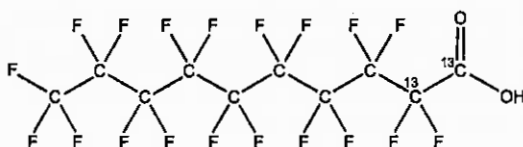
COMPOUND:

Perfluoro-n-[1,2-¹³C₂]decanoic acid

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

¹³C₂¹²C₈HF₁₉O₂

MOLECULAR WEIGHT:

516.07

CONCENTRATION:

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

≥99% ¹³C

LAST TESTED: (mm/dd/yyyy)

09/30/2016

(1,2-¹³C₂)

EXPIRY DATE: (mm/dd/yyyy)

09/30/2021

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains < 0.1% of ¹³C₁-PFNA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chritton

Date: 10/07/2016

(mm/dd/yyyy)

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

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.

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UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

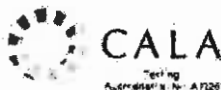
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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

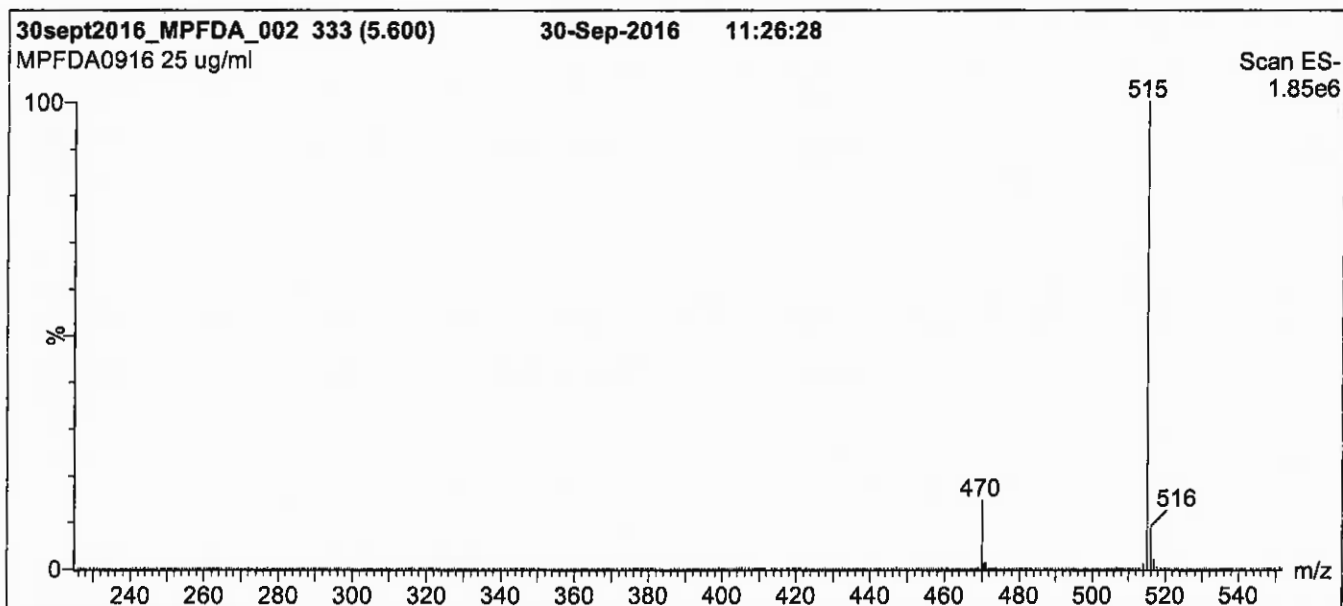
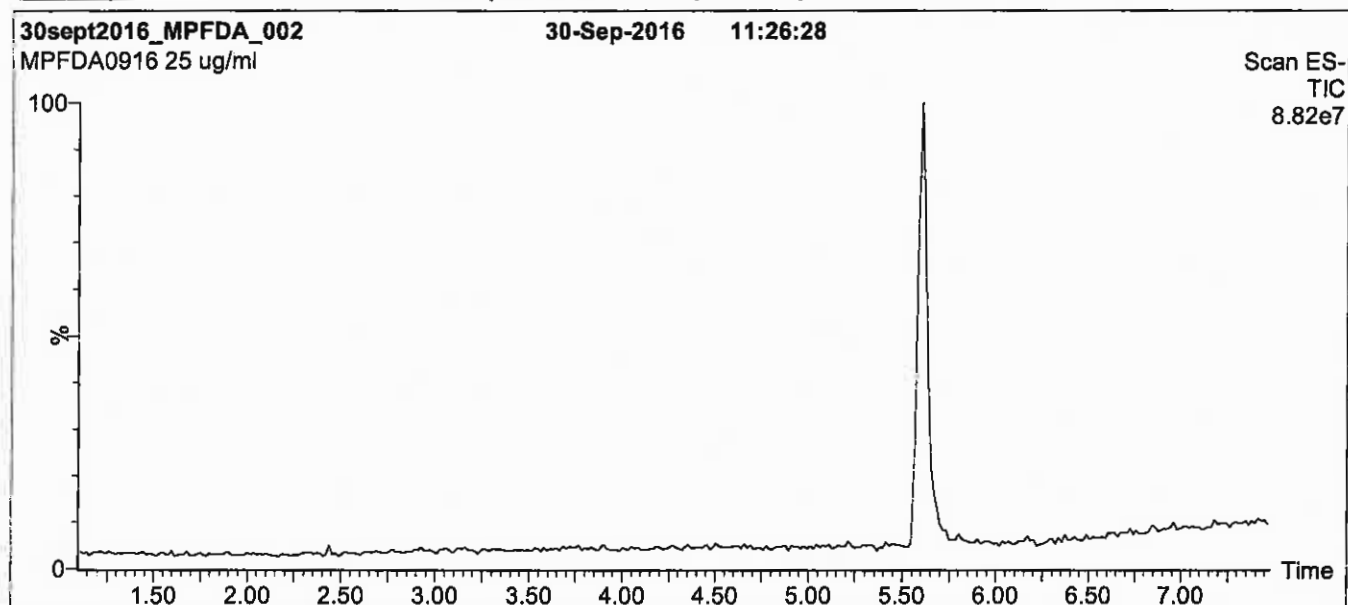
QUALITY MANAGEMENT:

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



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

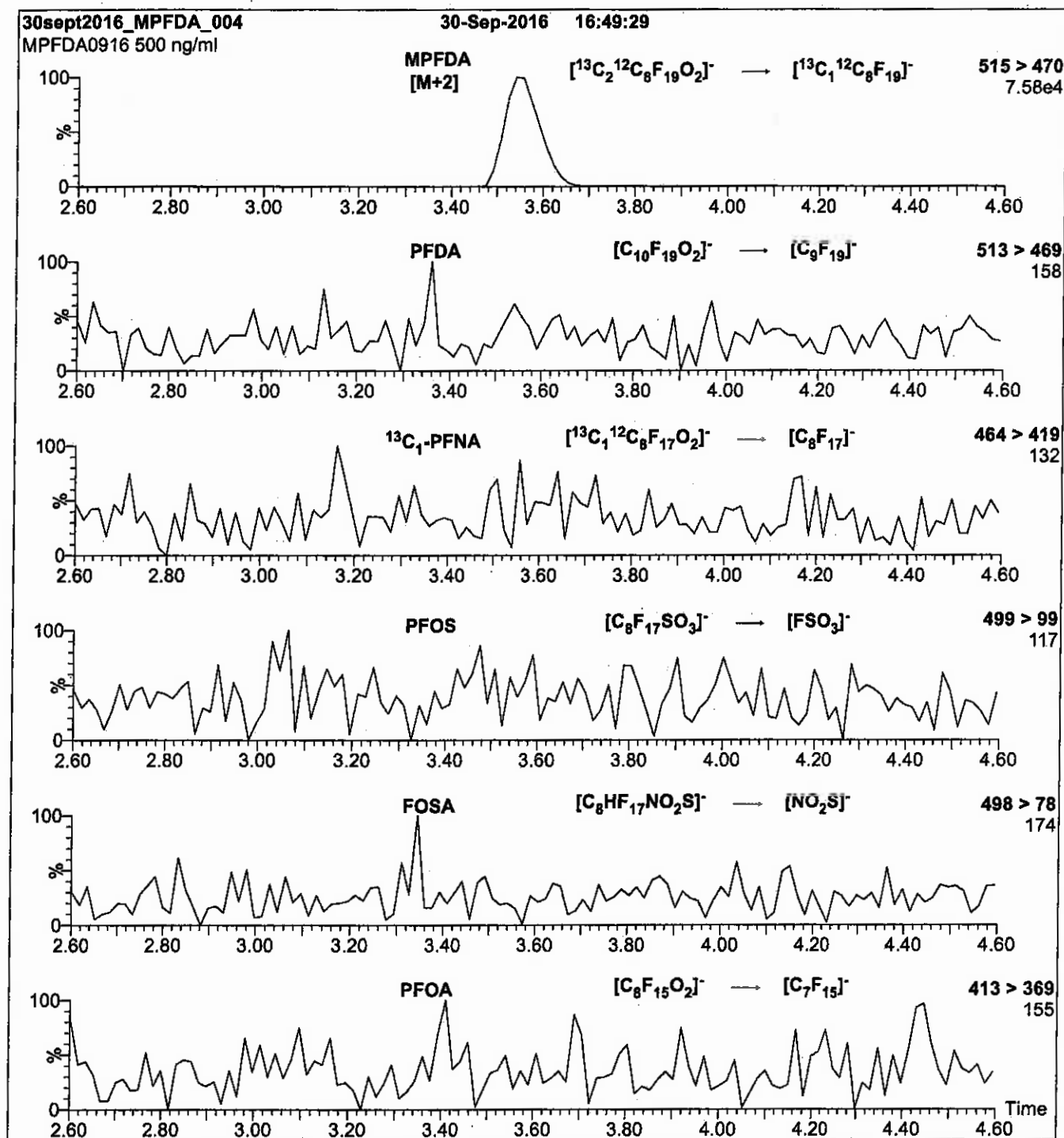
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

Collision Gas (mbar) = $3.31e-3$
Collision Energy (eV) = 13

Reagent

LCMPFHxA_00013

R: SBC 12/21/16



814258

ID: LCMPFHxA_00013

Exp: 04/08/21 Ppdt: SBC

13C2-Perfluorohexanoic ac

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

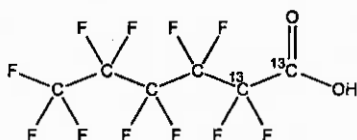
MPFHxA

LOT NUMBER:

MPFHxA0416

COMPOUND:Perfluoro-n-[1,2-¹³C₂]hexanoic acid**STRUCTURE:****CAS #:**

Not available

**MOLECULAR FORMULA:**¹³C₂¹²C₄HF₁₁O₂**CONCENTRATION:**

50 ± 2.5 µg/ml

MOLECULAR WEIGHT:

316.04

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:≥99%¹³C**LAST TESTED:** (mm/dd/yyyy)

04/08/2016

(1,2-¹³C₂)**EXPIRY DATE:** (mm/dd/yyyy)

04/08/2021

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 04/29/2016

(mm/dd/yyyy)

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

INTENDED USE:

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HAZARDS:

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UNCERTAINTY:

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

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

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

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

TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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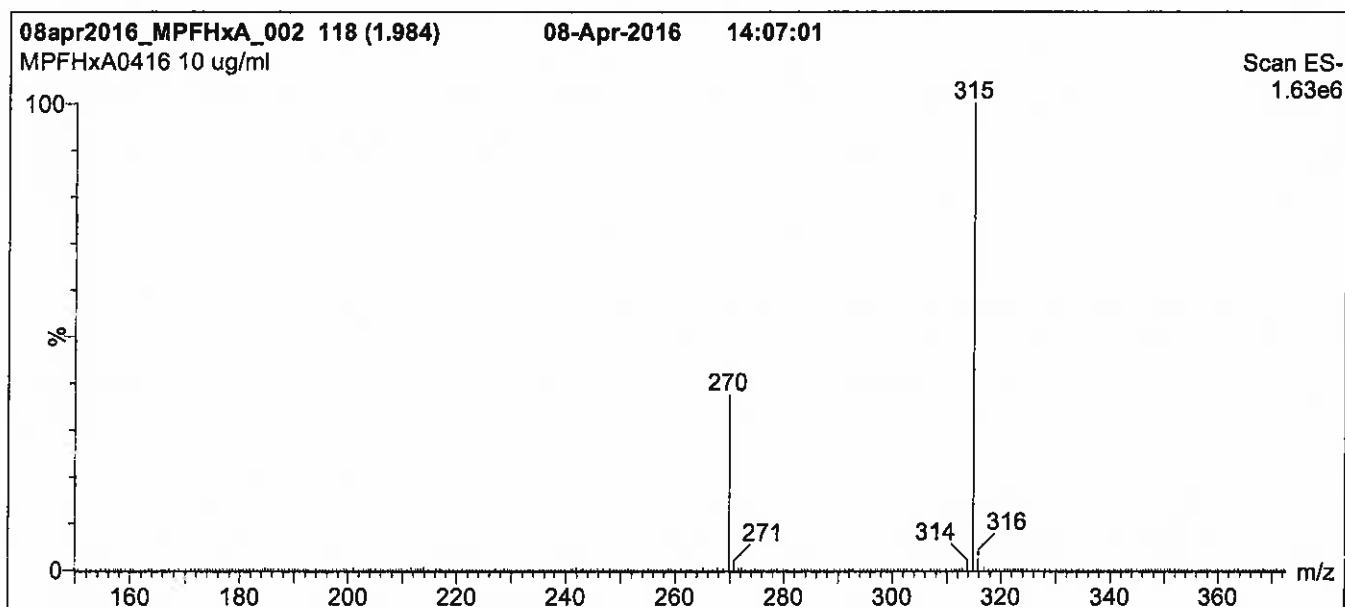
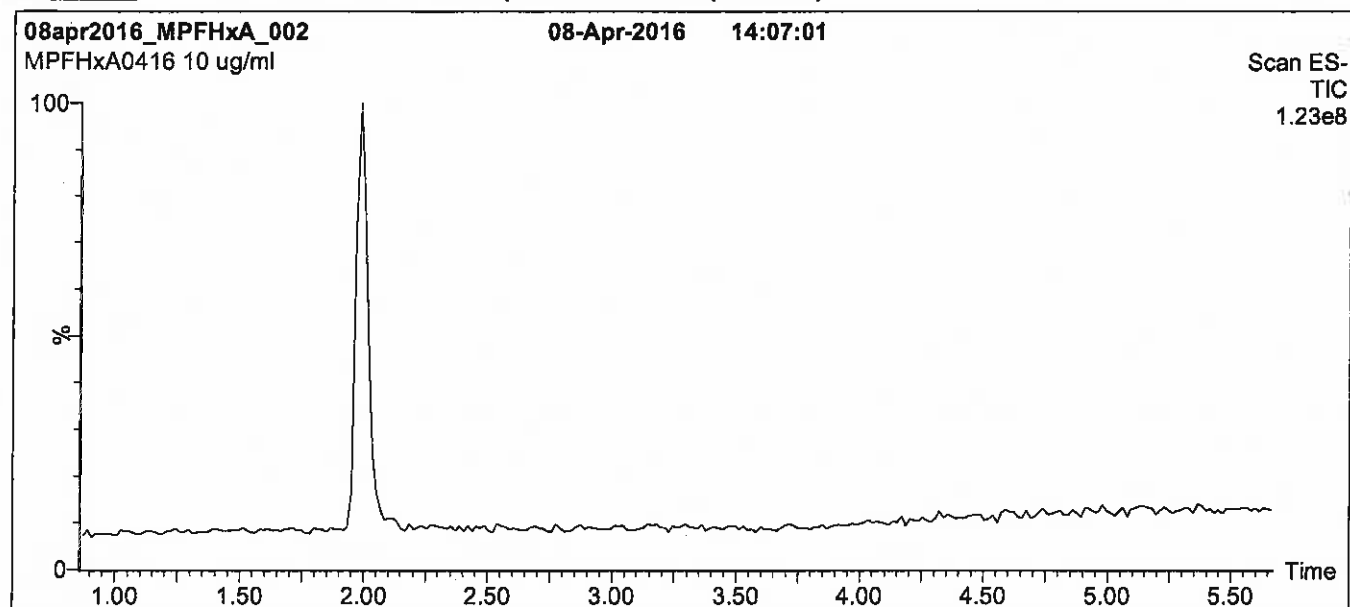
QUALITY MANAGEMENT:

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



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 RP₁₈
1.7 μ m, 2.1 x 100 mm

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

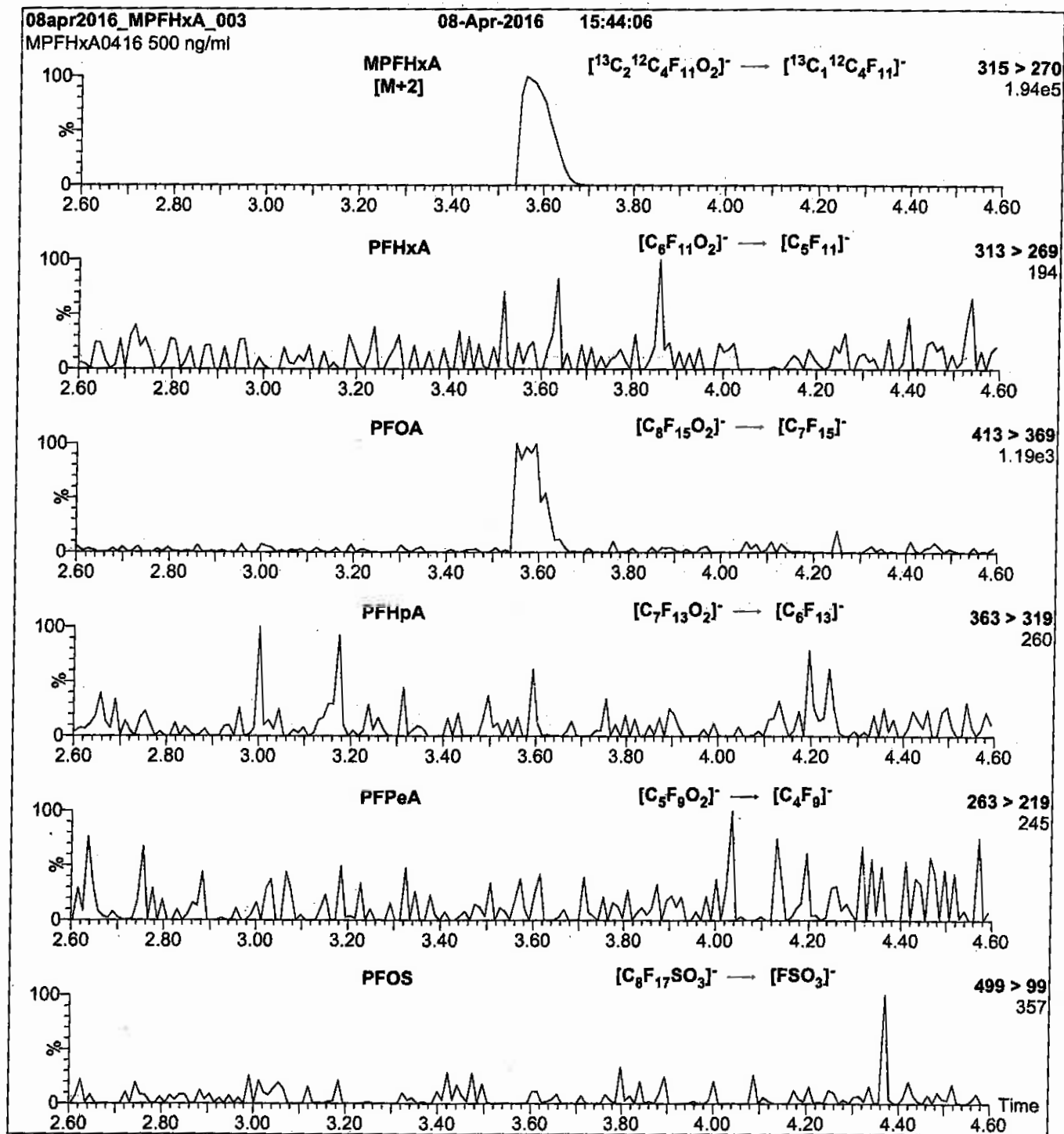
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

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

MS Parameters

Collision Gas (mbar) = $3.39\text{e-}3$
Collision Energy (eV) = 10

Reagent

LCMPFOS_00019

R: SBC 12/21/16



814253

ID: LCMFOS_00019

Exp: 08/03/21 Pipd: SBC

13C4-Perfluorooctanesulfo

WELLINGTON
LABORATORIESCERTIFICATE OF ANALYSIS
DOCUMENTATION**PRODUCT CODE:**

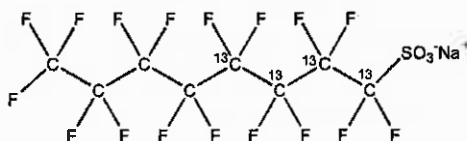
MPFOS

LOT NUMBER:

MPFOS0816

COMPOUND:Sodium perfluoro-1-[1,2,3,4-¹³C₄]octanesulfonate**STRUCTURE:****CAS #:**

Not available

**MOLECULAR FORMULA:**¹³C₄¹²C₄F₁₇SO₃Na**CONCENTRATION:**

50.0 ± 2.5 µg/ml (Na salt)

47.8 ± 2.4 µg/ml (MPFOS anion)

MOLECULAR WEIGHT:

526.08

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:≥99% ¹³C**LAST TESTED:** (mm/dd/yyyy)

08/03/2016

(1,2,3,4-¹³C₄)**EXPIRY DATE:** (mm/dd/yyyy)

08/03/2021

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.8% Sodium perfluoro-1-[1,2,3-¹³C₃]heptanesulfonate.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 08/05/2016

(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

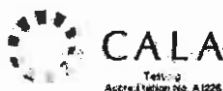
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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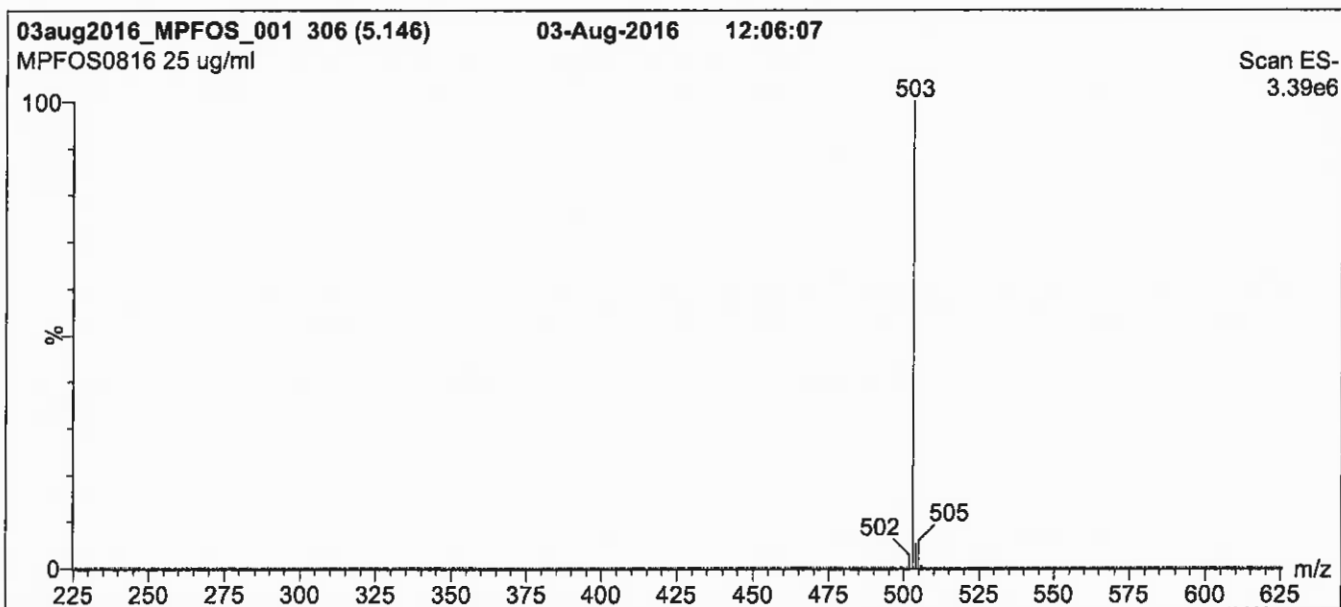
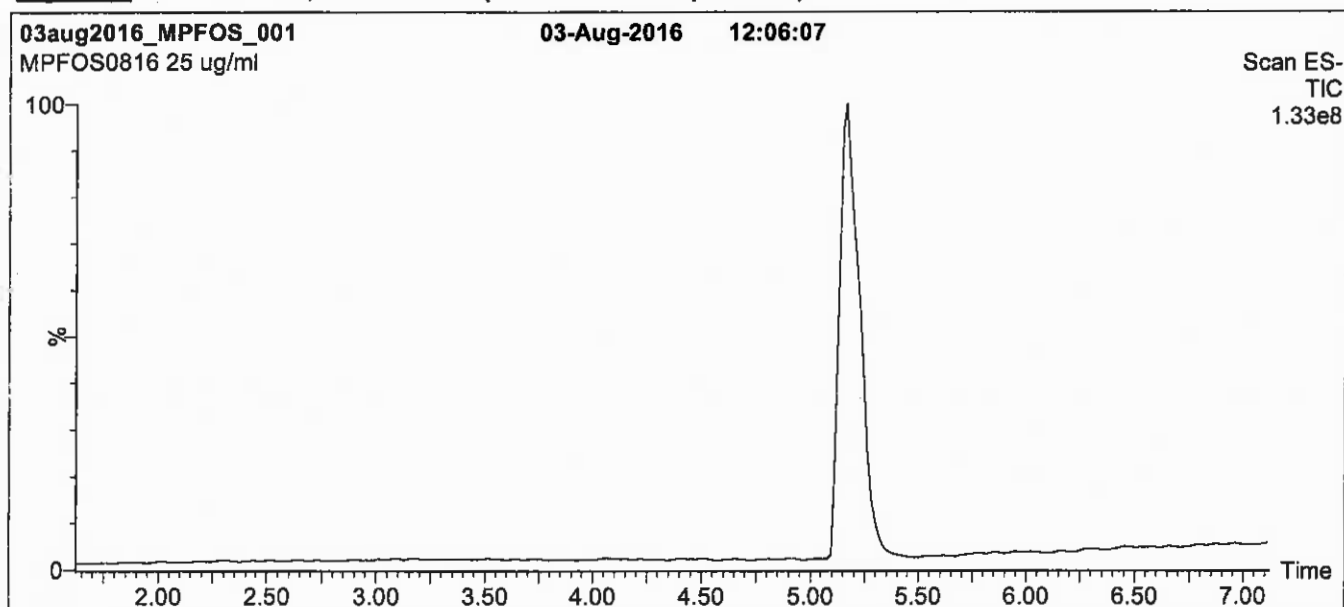
QUALITY MANAGEMENT:

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient

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

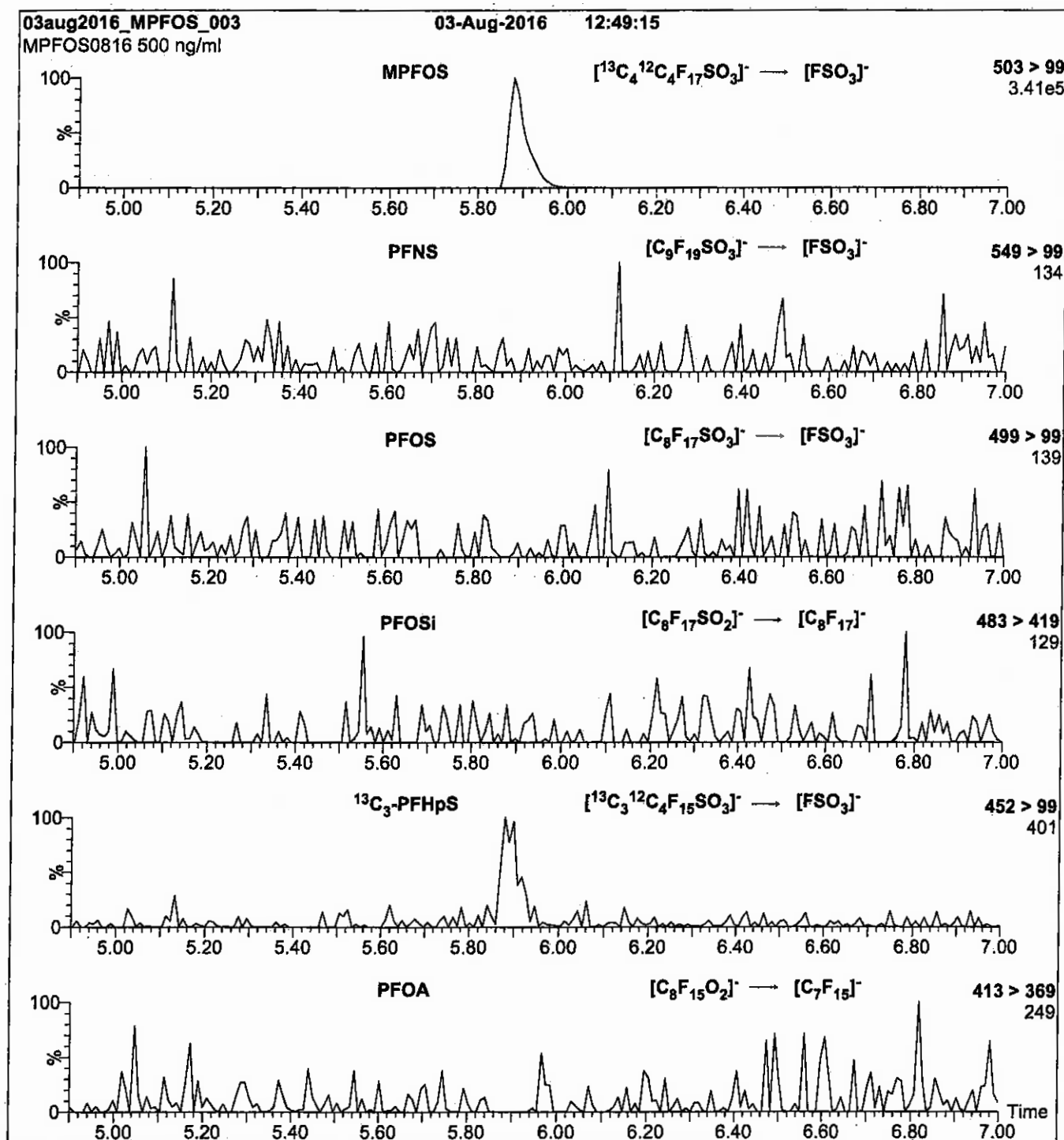
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

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

MS Parameters

Collision Gas (mbar) = 3.46e-3

Collision Energy (eV) = 40

Reagent

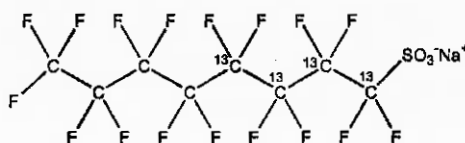
LCMPFOS_00021



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFOS **LOT NUMBER:** MPFOS1216
COMPOUND: Sodium perfluoro-1-[1,2,3,4-¹³C₄]octanesulfonate
STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₄¹²C₄F₁₇SO₃Na **MOLECULAR WEIGHT:** 526.08
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt) **SOLVENT(S):** Methanol
 47.8 ± 2.4 µg/ml (MPFOS anion)
CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99% ¹³C
LAST TESTED: (mm/dd/yyyy) 12/12/2016 (1,2,3,4-¹³C₄)
EXPIRY DATE: (mm/dd/yyyy) 12/12/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.8% Sodium perfluoro-1-[1,2,3-¹³C₃]heptanesulfonate.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 12/14/2016

(mm/dd/yyyy)

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

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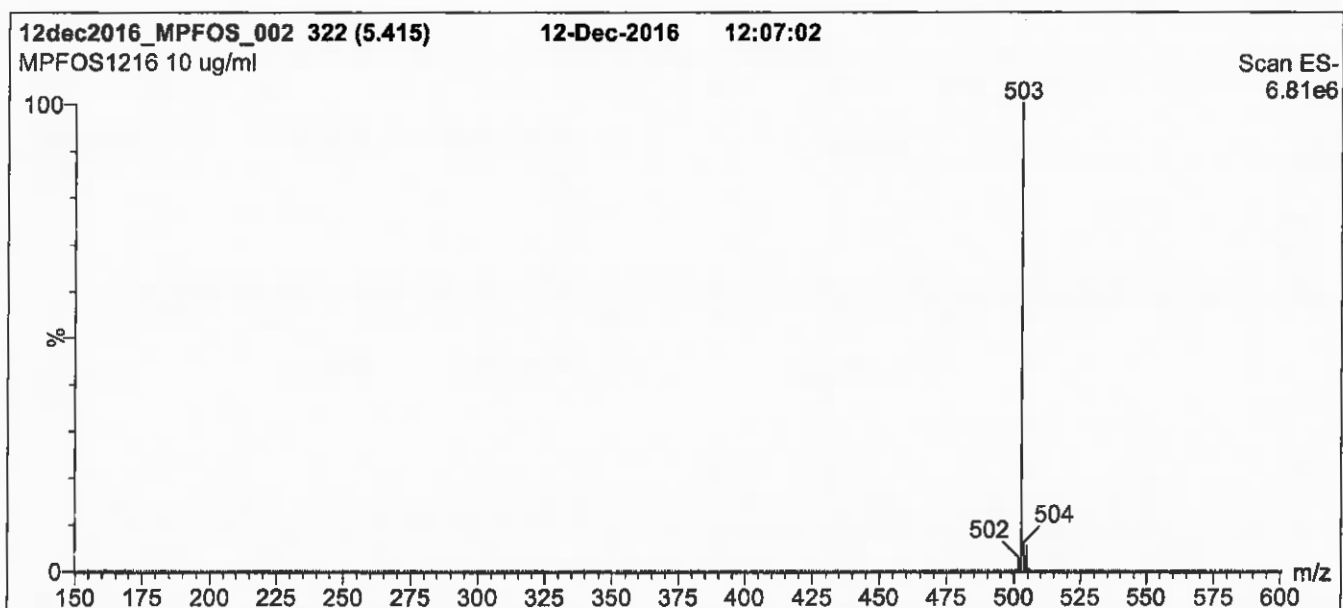
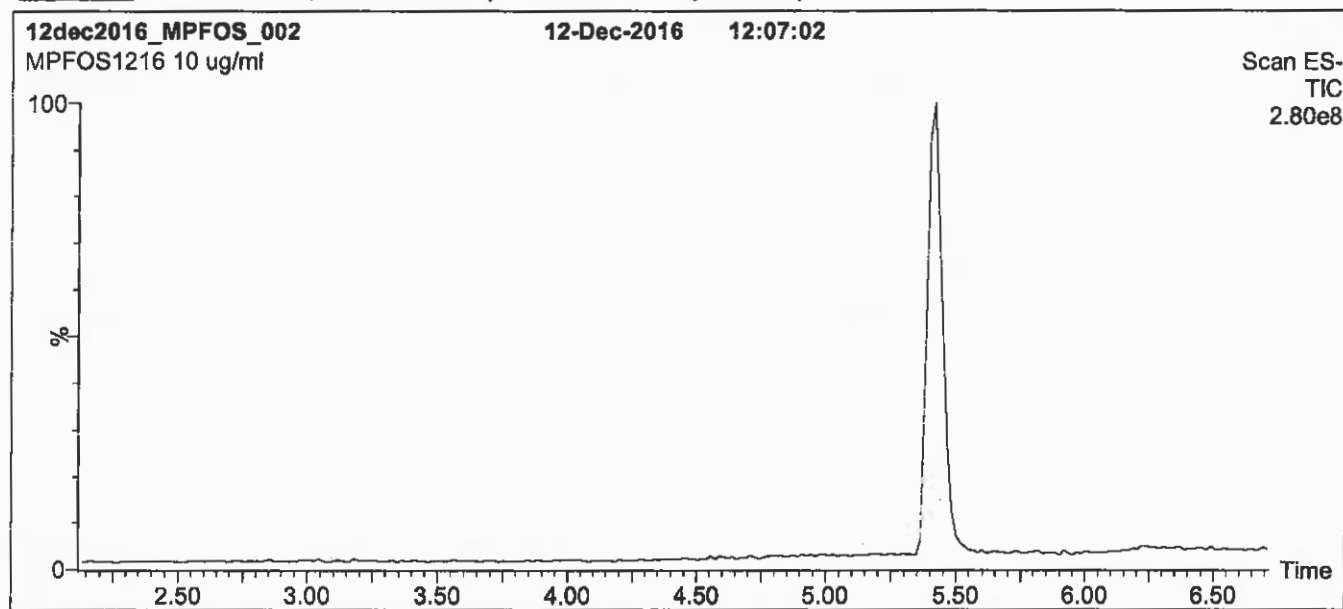
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Figure 1: MPFOS; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient

Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 85% organic over 7.5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

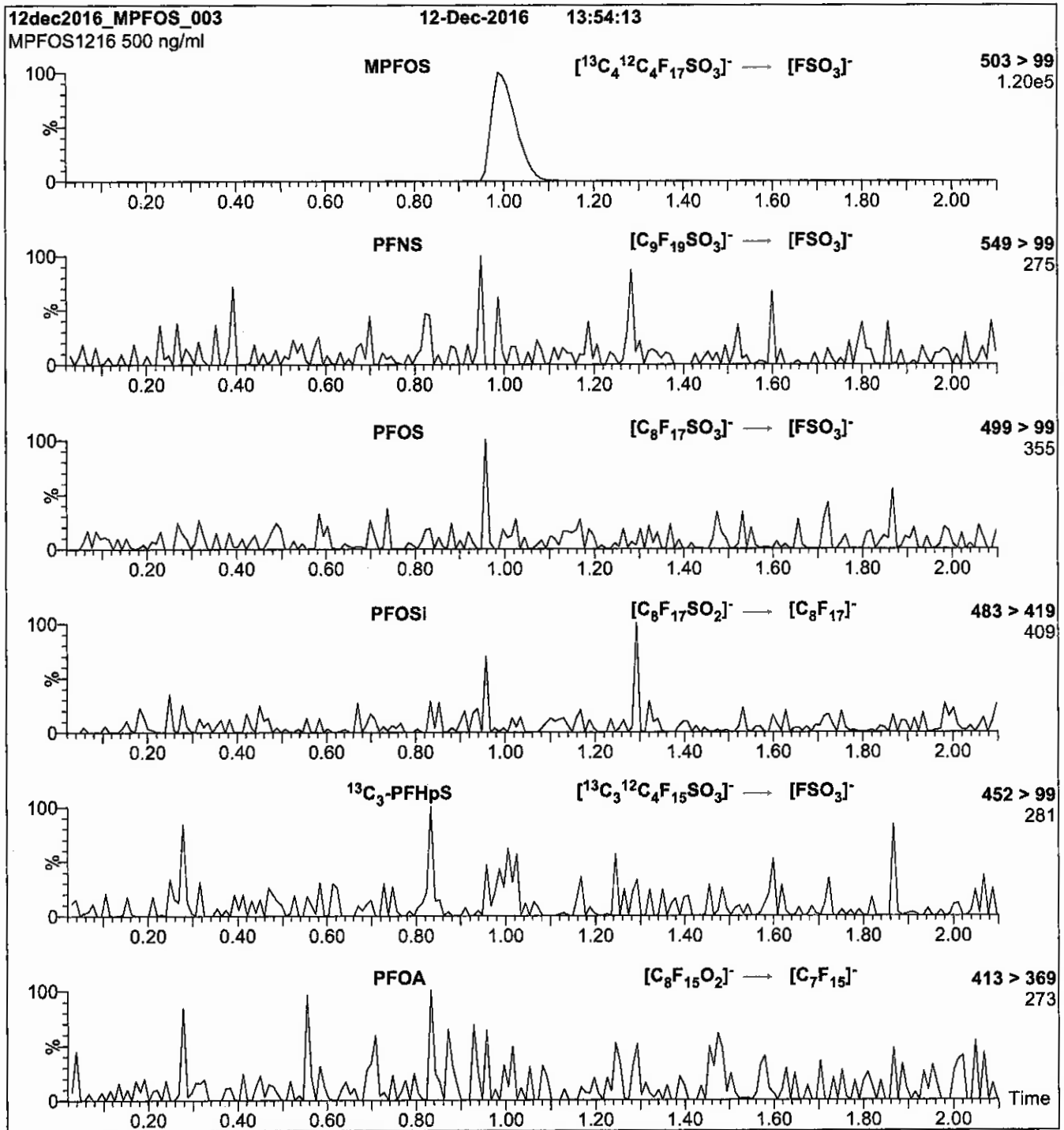
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

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

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 40

Method 537 DOD

Perfluorinated Alkyl Acids (LC/MS)
by Method 537 DOD

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-31180-1

SDG No.: WE04

Matrix: Water Level: Low

GC Column (1): GeminiC18 3 ID: 3 (mm)

Client Sample ID	Lab Sample ID	PFHxA #	PFDA #
WGNA-082917-RW-483 7	320-31180-1	93	102
WGNA-082917-FRB-48 37	320-31180-2	101	108
	MB 320-182400/1-A	101	111
	LLCS 320-182400/2-A	98	108
	LLCSD 320-182400/3-A	100	117

PFHxA = 13C2 PFHxA
PFDA = 13C2 PFDA

QC LIMITS
70-130
70-130

Column to be used to flag recovery values

FORM III
LCMS LOW LEVEL CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-31180-1
 SDG No.: WE04
 Matrix: Water Level: Low Lab File ID: 2017.09.08_537C_004.d
 Lab ID: LLCS 320-182400/2-A Client ID: _____

COMPOUND	SPIKE ADDED (ng/L)	LLCS CONCENTRATION (ng/L)	LLCS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	40.0	37.5 J	94	50-150	M
Perfluorooctanoic acid (PFOA)	20.0	19.2 J	96	50-150	
Perfluorononanoic acid (PFNA)	20.0	19.1 J	96	50-150	
Perfluorohexanesulfonic acid (PFHxS)	30.0	30.1	100	50-150	
Perfluoroheptanoic acid (PFHpA)	10.0	10.4	104	50-150	
Perfluorobutanesulfonic acid (PFBS)	90.0	96.1	107	50-150	

Column to be used to flag recovery and RPD values

FORM III
LCMS LOW LEVEL CONTROL STANDARD DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-31180-1
 SDG No.: WE04
 Matrix: Water Level: Low Lab File ID: 2017.09.08_537C_005.d
 Lab ID: LLCSD 320-182400/3-A Client ID: _____

COMPOUND	SPIKE ADDED (ng/L)	LLCSD CONCENTRATION (ng/L)	LLCSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
Perfluorooctanesulfonic acid (PFOS)	40.0	38.9 J	97	4	50	50-150	M
Perfluorooctanoic acid (PFOA)	20.0	19.5 J	97	1	50	50-150	
Perfluorononanoic acid (PFNA)	20.0	19.8 J	99	4	50	50-150	
Perfluorohexanesulfonic acid (PFHxS)	30.0	29.8 J	99	1	50	50-150	
Perfluoroheptanoic acid (PFHpA)	10.0	10.5	105	1	50	50-150	
Perfluorobutanesulfonic acid (PFBS)	90.0	96.8	108	0.7	50	50-150	

Column to be used to flag recovery and RPD values

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-31180-1
SDG No.: WE04
Lab File ID: 2017.09.08_537C_003.d Lab Sample ID: MB 320-182400/1-A
Matrix: Water Date Extracted: 09/01/2017 08:39
Instrument ID: A8_N Date Analyzed: 09/08/2017 20:51
Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LLCS 320-182400/2-A	2017.09.08_ 537C 004.d	09/08/2017 20:56
	LLCSD 320-182400/3-A	2017.09.08_ 537C 005.d	09/08/2017 21:01
WGNA-082917-RW-4837	320-31180-1	2017.09.08_ 537C 027.d	09/08/2017 22:45
WGNA-082917-FRB-4837	320-31180-2	2017.09.08_ 537C 028.d	09/08/2017 22:50

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-31180-1
 SDG No.: WE04
 Instrument ID: A8_N Calibration Start Date: 09/08/2017 13:27
 GC Column: GeminiC18 3x100 ID: 3(mm) Calibration End Date: 09/08/2017 13:51
 Calibration ID: 34044

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MEAN AREA AND MEAN RT		1910246	1.93	5581381	2.16		
UPPER LIMIT		2865369	2.43	8372072	2.66		
LOWER LIMIT		955123	1.43	2790691	1.66		
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCVL 320-183459/9		1974239	1.93	5860601	2.16		
ICV 320-183459/11		2166899	1.94	6602152	2.17		
CCV 320-183512/1 CCVIS		1659667	1.92	5340700	2.16		
MB 320-182400/1-A		1780906	1.92	5489924	2.16		
LLCS 320-182400/2-A		1858873	1.91	5511672	2.16		
LLCSD 320-182400/3-A		1740089	1.91	5356328	2.16		
CCV 320-183512/13 CCVIS		1674403	1.91	5232378	2.15		
CCV 320-183774/25 CCVIS		1762955	1.91	5568740	2.15		
320-31180-1	WGNA-082917-RW-4837	1872331	1.91	5398198	2.15		
320-31180-2	WGNA-082917-FRB-4837	1843752	1.91	5518835	2.15		
CCV 320-183774/29 CCVIS		1731366	1.90	5297806	2.14		

13PFOA = 13C2-PFOA

PFOS = 13C4 PFOS

Area Limit = 50%-150% of internal standard area

RT Limit = $\pm$ 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-31180-1
 SDG No.: WE04
 Sample No.: CCV 320-183512/1 Date Analyzed: 09/08/2017 20:41
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2017.09.08_537C_001 Heated Purge: (Y/N) N
 Calibration ID: 34044

	13PFOA		PFOS			
	AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD	1659667	1.92	5340700	2.16		
UPPER LIMIT	2323534	2.42	7476980	2.66		
LOWER LIMIT	1161767	1.42	3738490	1.66		
LAB SAMPLE ID	CLIENT SAMPLE ID					
MB 320-182400/1-A		1780906	1.92	5489924	2.16	
LLCS 320-182400/2-A		1858873	1.91	5511672	2.16	
LLCSD 320-182400/3-A		1740089	1.91	5356328	2.16	

13PFOA = 13C2-PFOA
 PFOS = 13C4 PFOS

Area Limit = 70%-140% of internal standard area
 RT Limit = $\pm$ 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-31180-1
 SDG No.: WE04
 Sample No.: CCV 320-183512/13 Date Analyzed: 09/08/2017 21:39
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2017.09.08_537C_013 Heated Purge: (Y/N) N
 Calibration ID: 34044

	13PFOA		PFOS			
	AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD	1674403	1.91	5232378	2.15		
UPPER LIMIT	2344164	2.41	7325329	2.65		
LOWER LIMIT	1172082	1.41	3662665	1.65		
LAB SAMPLE ID	CLIENT SAMPLE ID					
MB 320-182400/1-A		1780906	1.92	5489924	2.16	
LLCS 320-182400/2-A		1858873	1.91	5511672	2.16	
LLCSD 320-182400/3-A		1740089	1.91	5356328	2.16	

13PFOA = 13C2-PFOA
 PFOS = 13C4 PFOS

Area Limit = 70%-140% of internal standard area
 RT Limit = $\pm$ 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-31180-1
 SDG No.: WE04
 Sample No.: CCV 320-183774/25 Date Analyzed: 09/08/2017 22:36
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2017.09.08_537C_025 Heated Purge: (Y/N) N
 Calibration ID: 34044

	13PFOA		PFOS			
	AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD	1762955	1.91	5568740	2.15		
UPPER LIMIT	2468137	2.41	7796236	2.65		
LOWER LIMIT	1234069	1.41	3898118	1.65		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-31180-1	WGNA-082917-RW-4837		1872331	1.91	5398198	2.15
320-31180-2	WGNA-082917-FRB-4837		1843752	1.91	5518835	2.15

13PFOA = 13C2-PFOA
 PFOS = 13C4 PFOS

Area Limit = 70%-140% of internal standard area
 RT Limit = $\pm$ 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-31180-1
 SDG No.: WE04
 Sample No.: CCV 320-183774/29 Date Analyzed: 09/08/2017 22:55
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2017.09.08_537C_029 Heated Purge: (Y/N) N
 Calibration ID: 34044

	13PFOA		PFOS			
	AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD	1731366	1.90	5297806	2.14		
UPPER LIMIT	2423912	2.40	7416928	2.64		
LOWER LIMIT	1211956	1.40	3708464	1.64		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-31180-1	WGNA-082917-RW-4837		1872331	1.91	5398198	2.15
320-31180-2	WGNA-082917-FRB-4837		1843752	1.91	5518835	2.15

13PFOA = 13C2-PFOA
 PFOS = 13C4 PFOS

Area Limit = 70%-140% of internal standard area
 RT Limit = $\pm$ 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-31180-1</u>
SDG No.: <u>WE04</u>	
Client Sample ID: <u>WGNA-082917-RW-4837</u>	Lab Sample ID: <u>320-31180-1</u>
Matrix: <u>Water</u>	Lab File ID: <u>2017.09.08_537C_027.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>08/29/2017 13:50</u>
Extraction Method: <u>537</u>	Date Extracted: <u>09/01/2017 08:39</u>
Sample wt/vol: <u>263.3(mL)</u>	Date Analyzed: <u>09/08/2017 22:45</u>
Con. Extract Vol.: <u>1.00(mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2(uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3(mm)</u>
% Moisture: <u></u>	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>183774</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	U	38	15	6.5
335-67-1	Perfluorooctanoic acid (PFOA)	7.6	U	19	7.6	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.6
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	28	11	5.2
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.8	U	9.5	3.8	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	34	U	85	34	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	93		70-130
STL00996	13C2 PFDA	102		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47701.b\2017.09.08_537C_027.d
 Lims ID: 320-31180-A-1-A
 Client ID: WGNA-082917-RW-4837
 Sample Type: Client
 Inject. Date: 08-Sep-2017 22:45:34 ALS Bottle#: 21 Worklist Smp#: 27
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-31180-a-1-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47701.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 11-Sep-2017 15:23:55 Calib Date: 08-Sep-2017 13:51:29
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170908-47689.b\2017.09.08_537ICAL_009.d

Column 1 : Det: EXP1

Process Host: XAWRK011

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.571	1.577	-0.007	1.000	2102896	9.31		13176	
* 6 13C2-PFOA									
415.00 > 370.00	1.912	1.932	-0.020		1872331	10.0		10127	
* 7 13C4 PFOS									
503.00 > 80.00	2.147	2.164	-0.017		5398198	28.7		5677	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.306	2.320	-0.014	1.000	1284215	10.2		9526	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47701.b\2017.09.08_537C_027.d

Injection Date: 08-Sep-2017 22:45:34

Instrument ID: A8_N

Lims ID: 320-31180-A-1-A

Lab Sample ID: 320-31180-1

Client ID: WGNA-082917-RW-4837

Operator ID: SACINSTLCMS01

ALS Bottle#: 21

Worklist Smp#: 27

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

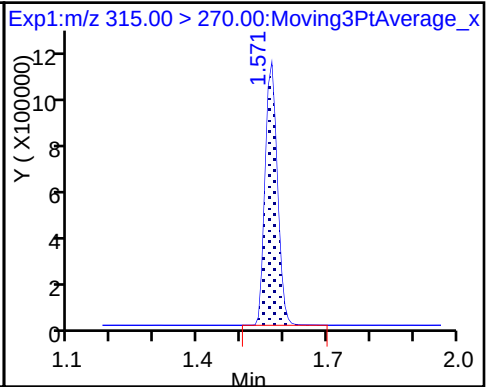
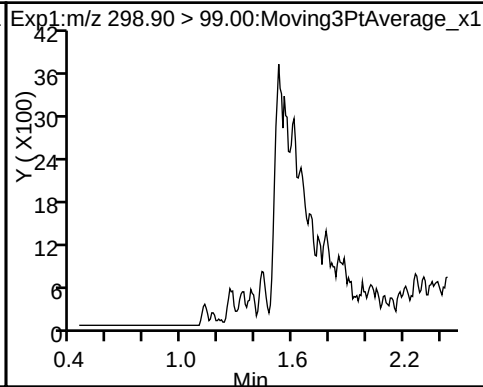
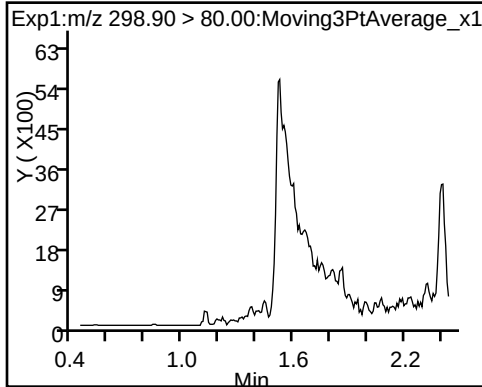
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

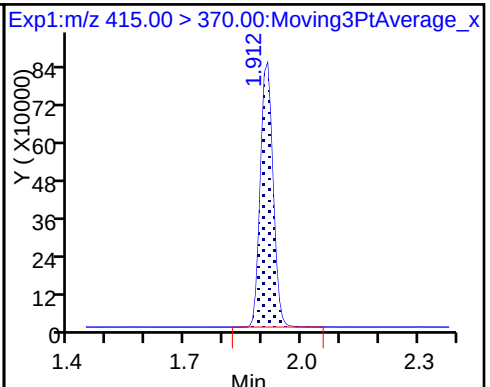
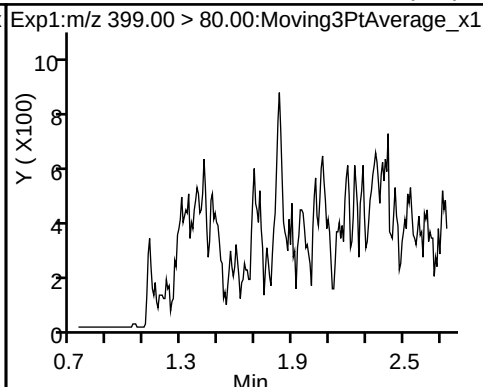
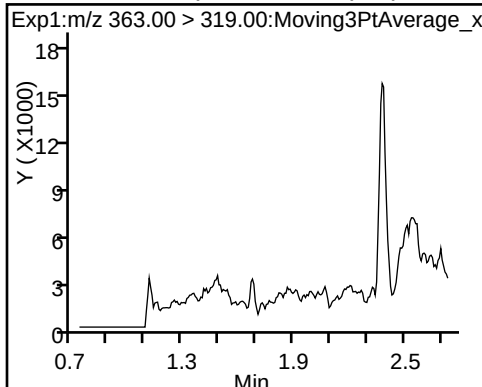
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid (ND)

3 Perfluorohexanesulfonic acid (ND)

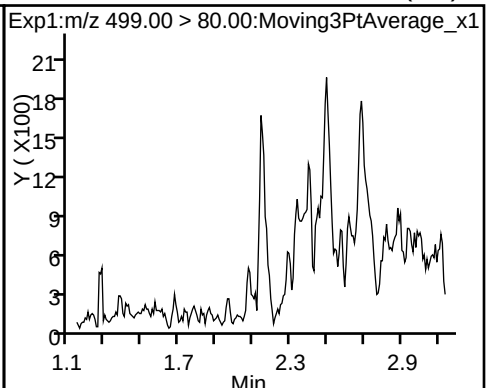
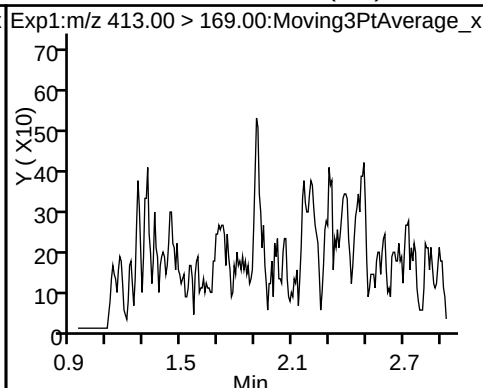
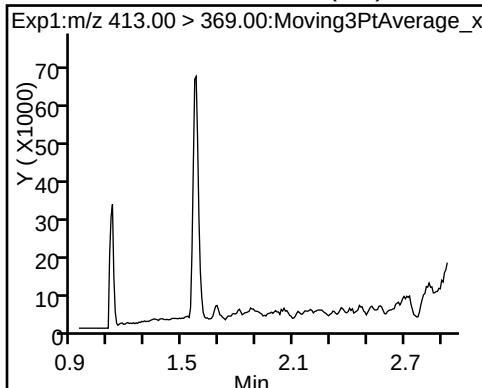
* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

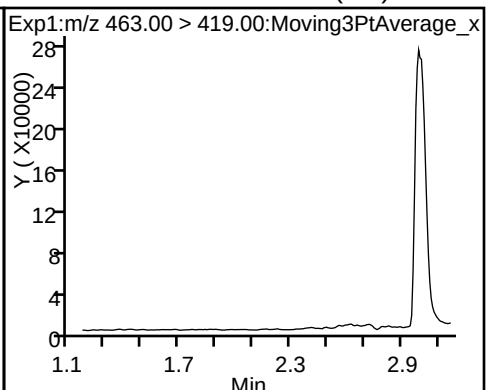
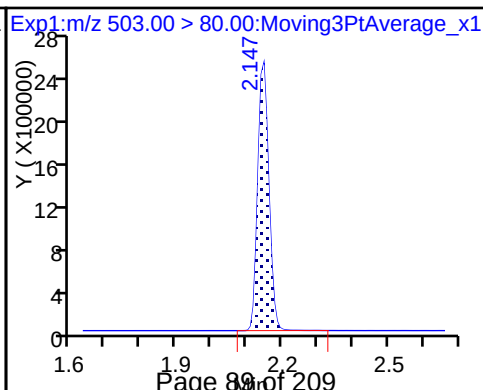
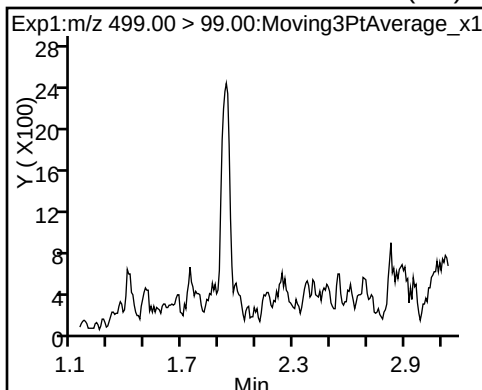
5 Perfluorooctanoic acid (ND)

8 Perfluorooctane sulfonic acid (ND)

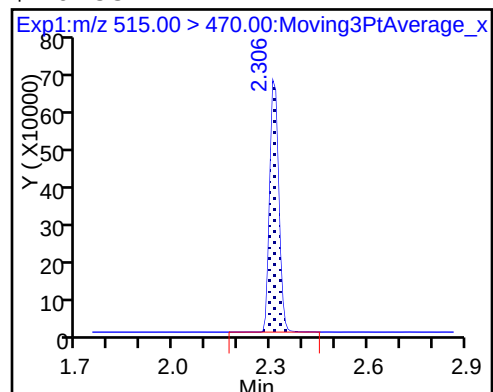


8 Perfluorooctane sulfonic acid (ND) * 7 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47701.b\2017.09.08_537C_027.d
Lims ID: 320-31180-A-1-A
Client ID: WGNA-082917-RW-4837
Sample Type: Client
Inject. Date: 08-Sep-2017 22:45:34 ALS Bottle#: 21 Worklist Smp#: 27
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-31180-a-1-a
Misc. Info.: Plate: 1 Rack: 3
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Method: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47701.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 11-Sep-2017 15:23:55 Calib Date: 08-Sep-2017 13:51:29
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170908-47689.b\2017.09.08_537ICAL_009.d

Column 1 : Det: EXP1

Process Host: XAWRK011

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.31	93.09
\$ 10 13C2 PFDA	10.0	10.2	102.13

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-31180-1</u>
SDG No.: <u>WE04</u>	
Client Sample ID: <u>WGNA-082917-FRB-4837</u>	Lab Sample ID: <u>320-31180-2</u>
Matrix: <u>Water</u>	Lab File ID: <u>2017.09.08_537C_028.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>08/29/2017 11:45</u>
Extraction Method: <u>537</u>	Date Extracted: <u>09/01/2017 08:39</u>
Sample wt/vol: <u>253.4 (mL)</u>	Date Analyzed: <u>09/08/2017 22:50</u>
Con. Extract Vol.: <u>1.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: <u></u>	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>183774</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	39	16	6.7
335-67-1	Perfluorooctanoic acid (PFOA)	7.9	U	20	7.9	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	7.9
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	30	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.9	U	9.9	3.9	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	89	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	101		70-130
STL00996	13C2 PFDA	108		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47701.b\2017.09.08_537C_028.d
 Lims ID: 320-31180-A-2-A
 Client ID: WGNA-082917-FRB-4837
 Sample Type: Client
 Inject. Date: 08-Sep-2017 22:50:19 ALS Bottle#: 22 Worklist Smp#: 28
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-31180-a-2-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47701.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 11-Sep-2017 15:23:55 Calib Date: 08-Sep-2017 13:51:29
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170908-47689.b\2017.09.08_537ICAL_009.d

Column 1 : Det: EXP1

Process Host: XAWRK011

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.571	1.577	-0.007	1.000	2238220	10.1		13785	
* 6 13C2-PFOA									
415.00 > 370.00	1.912	1.932	-0.020		1843752	10.0		10340	
* 7 13C4 PFOS									
503.00 > 80.00	2.147	2.164	-0.017		5518835	28.7		6133	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.314	2.320	-0.006	1.000	1331177	10.8		9988	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47701.b\2017.09.08_537C_028.d

Injection Date: 08-Sep-2017 22:50:19

Instrument ID: A8_N

Lims ID: 320-31180-A-2-A

Lab Sample ID: 320-31180-2

Client ID: WGNA-082917-FRB-4837

Operator ID: SACINSTLCMS01

ALS Bottle#: 22

Worklist Smp#: 28

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

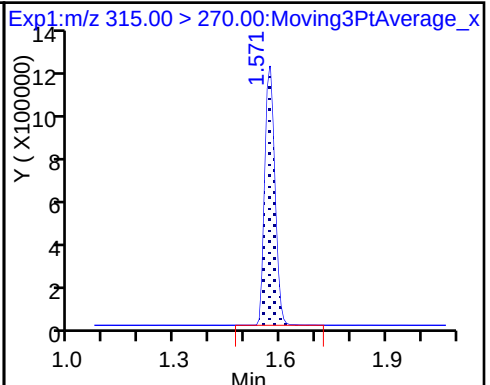
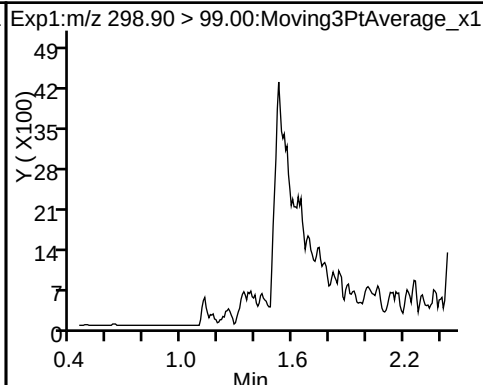
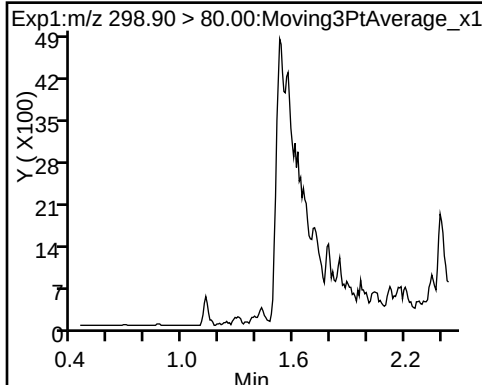
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

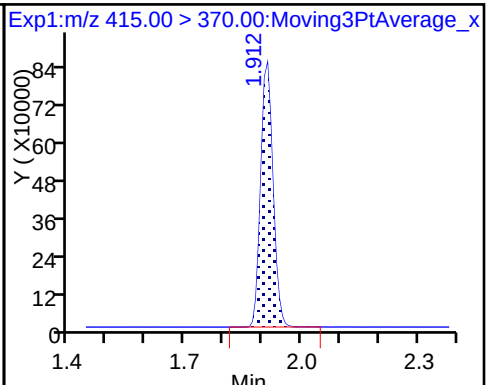
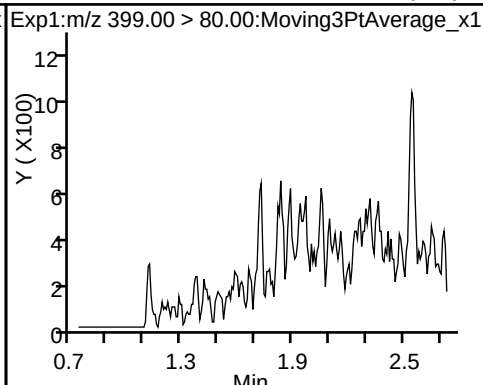
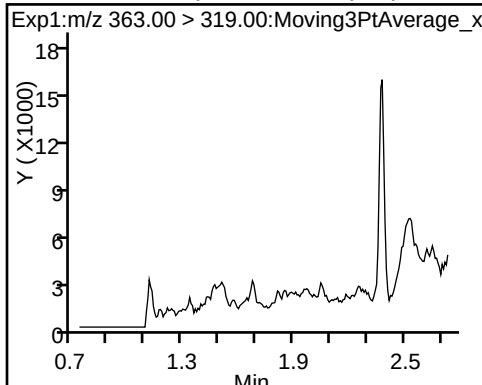
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid (ND)

3 Perfluorohexanesulfonic acid (ND)

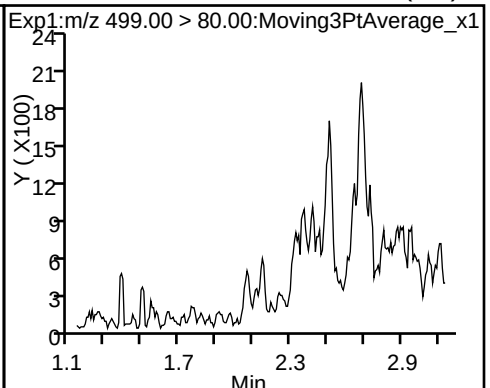
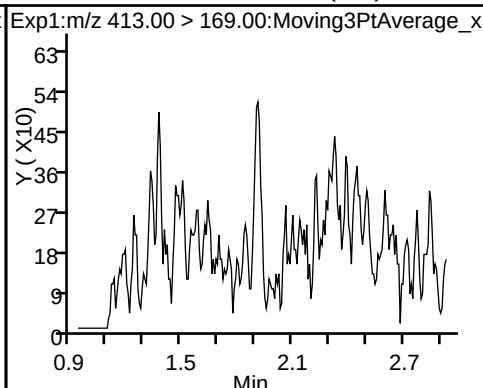
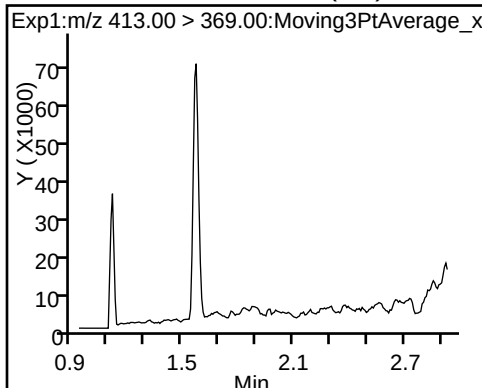
* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

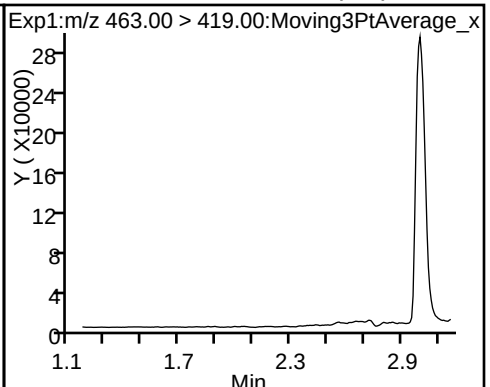
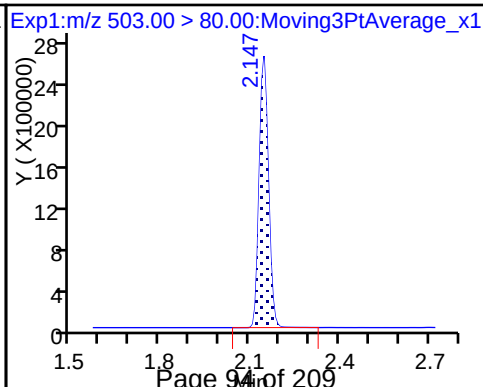
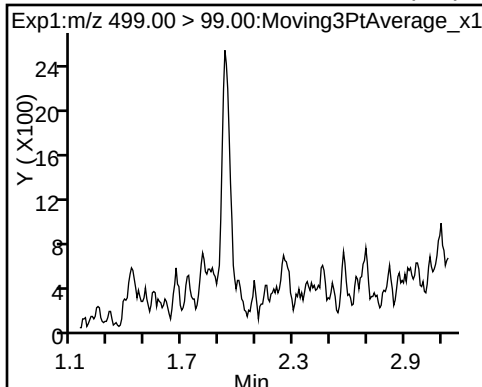
5 Perfluorooctanoic acid (ND)

8 Perfluorooctane sulfonic acid (ND)

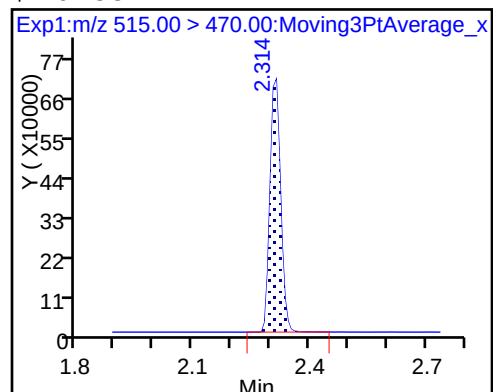


8 Perfluorooctane sulfonic acid (ND) * 7 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47701.b\2017.09.08_537C_028.d
Lims ID: 320-31180-A-2-A
Client ID: WGNA-082917-FRB-4837
Sample Type: Client
Inject. Date: 08-Sep-2017 22:50:19 ALS Bottle#: 22 Worklist Smp#: 28
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-31180-a-2-a
Misc. Info.: Plate: 1 Rack: 3
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Method: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47701.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 11-Sep-2017 15:23:55 Calib Date: 08-Sep-2017 13:51:29
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170908-47689.b\2017.09.08_537ICAL_009.d

Column 1 : Det: EXP1

Process Host: XAWRK011

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	10.1	100.61
\$ 10 13C2 PFDA	10.0	10.8	107.51

FORM VI
LCMS BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-31180-1 Analy Batch No.: 183459

SDG No.: WE04

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 09/08/2017 13:27 Calibration End Date: 09/08/2017 13:51 Calibration ID: 34044

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-183459/2	2017.09.08_537ICAL_004.d
Level 2	IC 320-183459/3	2017.09.08_537ICAL_005.d
Level 3	IC 320-183459/4	2017.09.08_537ICAL_006.d
Level 4	IC 320-183459/5	2017.09.08_537ICAL_007.d
Level 5	IC 320-183459/6	2017.09.08_537ICAL_008.d
Level 6	IC 320-183459/7	2017.09.08_537ICAL_009.d

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
Perfluorobutanesulfonic acid (PFBS)	1.0710 0.6966	1.0575	1.0111	0.8594	0.7869	QuaF		1.0622	-0.002040						0.9990		0.9600
Perfluoroheptanoic acid (PFHpA)	0.9220 0.9255	0.9473	0.9541	0.9231	0.9315	Ave		0.9339				1.5		30.0			
Perfluorohexanesulfonic acid (PFHxS)	1.6148 1.4811	1.6536	1.6599	1.5874	1.5838	Ave		1.5968				4.1		30.0			
Perfluorooctanoic acid (PFOA)	0.9158 0.9617	0.9269	0.9412	0.8992	0.9123	Ave		0.9262				2.4		30.0			
Perfluorooctanesulfonic acid (PFOS)	0.8859 0.9363	0.9387	0.9168	0.9427	0.9444	Ave		0.9275				2.4		30.0			
Perfluorononanoic acid (PFNA)	0.6548 0.6554	0.6685	0.6501	0.6318	0.6303	Ave		0.6485				2.3		30.0			
13C2 PFHxA	1.1920 1.2378	1.2004	1.1834	1.2079	1.2178	Ave		1.2066				1.6		30.0			
13C2 PFDA	0.6511 0.7007	0.6681	0.6589	0.6707	0.6801	Ave		0.6716				2.6		30.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-31180-1 Analy Batch No.: 183459

SDG No.: WE04

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 09/08/2017 13:27 Calibration End Date: 09/08/2017 13:51 Calibration ID: 34044

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-183459/2	2017.09.08_537ICAL_004.d
Level 2	IC 320-183459/3	2017.09.08_537ICAL_005.d
Level 3	IC 320-183459/4	2017.09.08_537ICAL_006.d
Level 4	IC 320-183459/5	2017.09.08_537ICAL_007.d
Level 5	IC 320-183459/6	2017.09.08_537ICAL_008.d
Level 6	IC 320-183459/7	2017.09.08_537ICAL_009.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5
Perfluorobutanesulfonic acid (PFBS)	PFOS	QuaF	1896171 23775992	4213055	9072488	15158012	19852718	9.00 180	20.0	45.0	90.0	135
Perfluoroheptanoic acid (PFHpA)	13PF OA	Ave	176698 3422434	406467	925418	1800569	2623771	1.00 20.0	2.22	5.00	10.0	15.0
Perfluorohexanesulfonic acid (PFHxS)	PFOS	Ave	953075 16853658	2196189	4965386	9333896	13320862	3.00 60.0	6.67	15.0	30.0	45.0
Perfluorooctanoic acid (PFOA)	13PF OA	Ave	351237 7116752	795859	1826954	3509739	5142636	2.00 40.0	4.45	10.0	20.0	30.0
Perfluorooctanesulfonic acid (PFOS)	PFOS	Ave	697187 14205705	1662376	3656842	7391088	10590577	4.00 80.0	8.89	20.0	40.0	60.0
Perfluorononanoic acid (PFNA)	13PF OA	Ave	250972 4847063	573628	1261094	2464425	3550611	2.00 40.0	4.45	10.0	20.0	30.0
13C2 PFHxA	13PF OA	Ave	2283494 2288248	2317173	2295161	2355406	2286265	10.0 10.0	10.0	10.0	10.0	10.0
13C2 PFDA	13PF OA	Ave	1247394 1295246	1289579	1277856	1307825	1276749	10.0 10.0	10.0	10.0	10.0	10.0

Curve Type Legend:

Ave = Average ISTD
QuaF = Quadratic ISTD forced zero

FORM VI
LCMS BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
READBACK PERCENT ERROR

Lab Name: TestAmerica Sacramento Job No.: 320-31180-1 Analy Batch No.: 183459

SDG No.: WE04

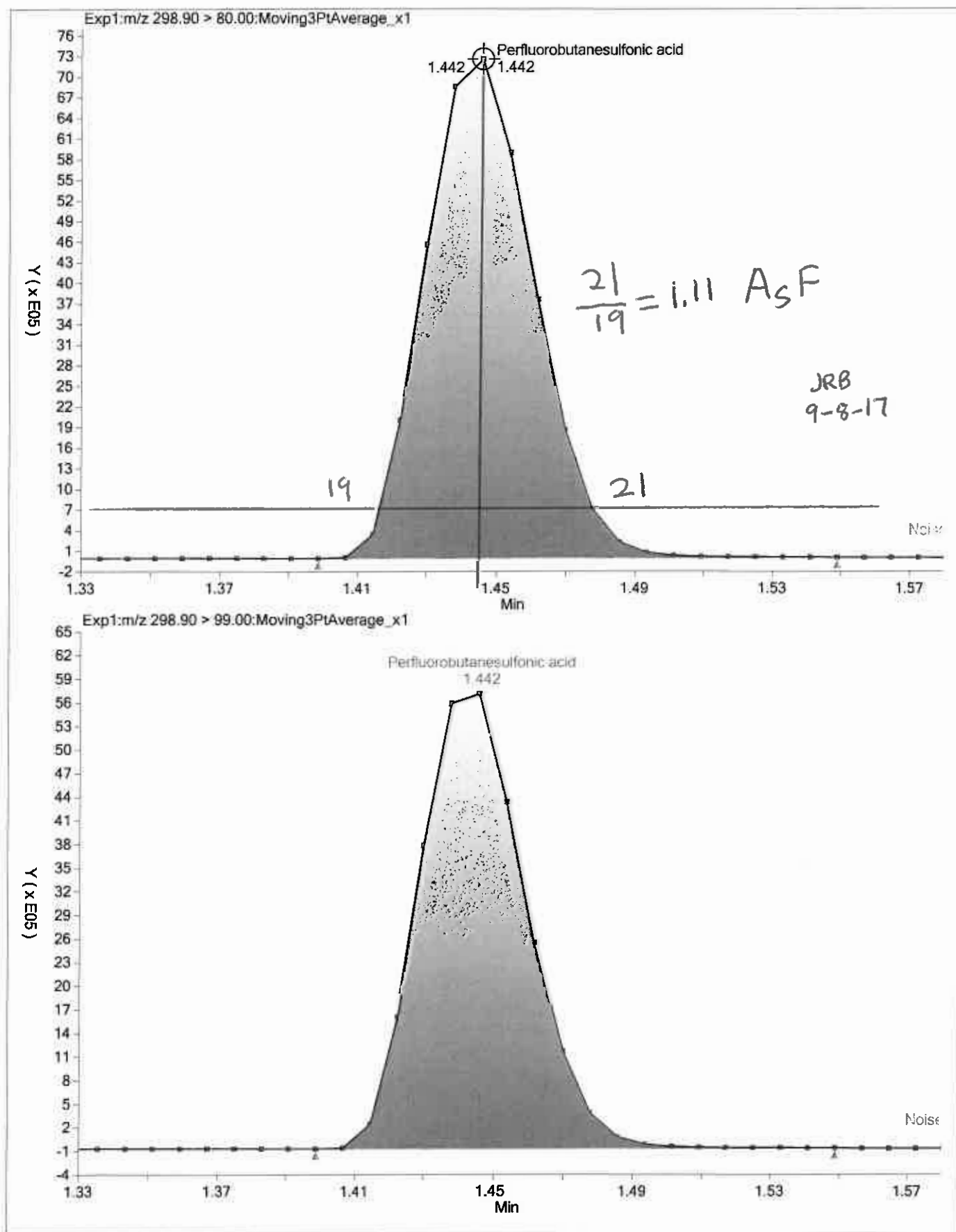
Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

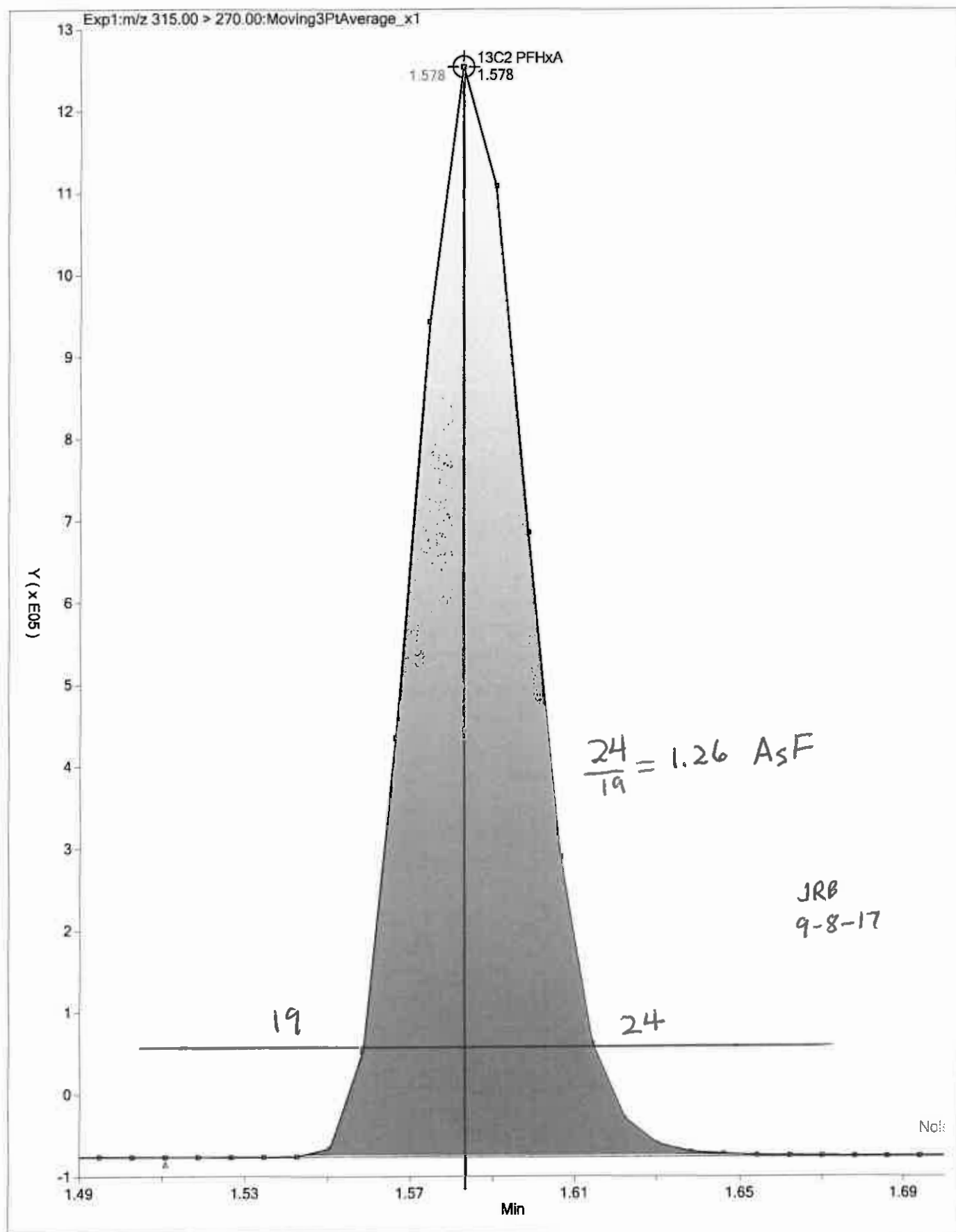
Calibration Start Date: 09/08/2017 13:27 Calibration End Date: 09/08/2017 13:51 Calibration ID: 34044

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-183459/2	2017.09.08_537ICAL_004.d
Level 2	IC 320-183459/3	2017.09.08_537ICAL_005.d
Level 3	IC 320-183459/4	2017.09.08_537ICAL_006.d
Level 4	IC 320-183459/5	2017.09.08_537ICAL_007.d
Level 5	IC 320-183459/6	2017.09.08_537ICAL_008.d
Level 6	IC 320-183459/7	2017.09.08_537ICAL_009.d

ANALYTE	PERCENT ERROR						PERCENT ERROR LIMIT					
	LVL 1 #	LVL 2 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6
Perfluorobutanesulfonic acid (PFBS)	2.7	3.7	4.7	-2.7	0.0	0.5	50	30	30	30	30	30
Perfluoroheptanoic acid (PFHpA)	-1.3	1.4	2.2	-1.2	-0.3	-0.9	50	30	30	30	30	30
Perfluorohexanesulfonic acid (PFHxS)	1.1	3.6	4.0	-0.6	-0.8	-7.2	50	30	30	30	30	30
Perfluorooctanoic acid (PFOA)	-1.1	0.1	1.6	-2.9	-1.5	3.8	50	30	30	30	30	30
Perfluorooctanesulfonic acid (PFOS)	-4.5	1.2	-1.1	1.6	1.8	0.9	50	30	30	30	30	30
Perfluorononanoic acid (PFNA)	1.0	3.1	0.3	-2.6	-2.8	1.1	50	30	30	30	30	30
13C2 PFHxA	-1.2	-0.5	-1.9	0.1	0.9	2.6	30	30	30	30	30	30
13C2 PFDA	-3.0	-0.5	-1.9	-0.1	1.3	4.3	30	30	30	30	30	30





TestAmerica Laboratories
Istd/Surrogate Recovery Report

Worklist Name: 08SEP2017_537_ICAL

Worklist Num: 47689

Instrument: A8_N

Method: 537_A8_N

Batch Directory: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47689.b

Limit Group: LC 537 ICAI

Analysis Type: SemiVOA

Inj Volume: 2.00

Inj Vol Units: ul

Lims Batch: 183459

CCV IS Mode: Select Ical Level, Cal Level: 3

Non-Cal IS Mode: Last Ccal Sample

\$ 2 13C2 PFHxA

\$ 10 13C2 PFDA

Lab ID	Inj Date	\$ 2	\$ 10	* 6 13C2-PFOA	* 7 13C4 PFOS
IS Std				1332513 1.93	4417453 2.16
# 1 RB	08-Sep-2017 13:23:04			1773490 133.1	5621219 127.3
IS Std					
# 2 IC L1	08-Sep-2017 13:27:48	1.58 98.79	2.32 96.95	1.93 1915757> 100.0*	2.16 5640583> 100.0*
# 3 IC L2	08-Sep-2017 13:32:32	1.58 99.49	2.32 99.48	1.94 1930305> 100.8*	2.17 5712377> 101.3*
# 4 IC L3	08-Sep-2017 13:37:17	1.58 98.08	2.32 98.11	1.94 1939425> 101.2*	2.17 5718230> 101.4*
# 5 IC L4	08-Sep-2017 13:42:01	1.58 100.10	2.32 99.87	1.94 1950011> 101.8*	2.16 5620007> 99.6*
# 6 IC L5	08-Sep-2017 13:46:44	1.58 100.90	2.32 101.30	1.94 1877393> 98.0*	2.16 5359060> 95.0*
# 7 IC L6	08-Sep-2017 13:51:29	1.57 102.60	2.31 104.30	1.93 1848587> 96.5*	2.16 5438027> 96.4*
IS Std				1939425 1.94	5718230 2.17
# 8 RB	08-Sep-2017 13:56:14			1756977 90.6	5487052 96.0
IS Std				1950011 1.94	5620007 2.16
# 9 CCVL	08-Sep-2017 14:00:59	1.58 100.60	2.32 101.90	1.93 1974239 101.2	2.16 5860601 104.3
IS Std				1974239 1.93	5860501 2.16
#10 RB	08-Sep-2017 14:05:44			1867455 94.6	5506559 94.0
IS Std				1950011 1.94	5620007 2.16
#11 ICV	08-Sep-2017 14:10:28	1.59 98.18	2.32 98.42	1.94 2166899 111.1	2.17 6602152 117.5
IS Std				1776145 1.93	5415288 2.16
#12 RB	08-Sep-2017 14:15:11			1776145 100.0	5415288 100.0

13C2 - PFOA

$$RPD = \frac{1848587 - 1950011}{1848587 + 1950011} = -5.3$$

13C4 - PFOS

$$RPD = \frac{5438027 - 5718230}{5438027 + 5718230} = -5.0$$

9/12/2017
New

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47689.b\2017.09.08_537ICAL_004.d
 Lims ID: IC L1
 Client ID:
 Sample Type: IC Calib Level: 1
 Inject. Date: 08-Sep-2017 13:27:48 ALS Bottle#: 1 Worklist Smp#: 2
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L1_537
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub1
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47689.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 08-Sep-2017 14:36:34 Calib Date: 08-Sep-2017 13:51:29
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last Ical File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47689.b\2017.09.08_537ICAL_009.d

Column 1 : Det: EXP1

Process Host: XAWRK020

First Level Reviewer: barnettj

Date: 08-Sep-2017 14:29:56

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.442	1.440	0.002	1.000	1896171	9.24		1698	
298.90 > 99.00	1.434	1.440	-0.006	0.995	1335223		1.42(0.00-0.00)	879	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.578	1.577	0.001	1.000	2283494	9.88		10570	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.737	1.736	0.001	1.000	176698	0.9876		32.4	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.737	1.739	-0.002	1.000	953075	3.03		1423	
* 6 13C2-PFOA									
415.00 > 370.00	1.927	1.932	-0.005		1915757	10.0		9533	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.935	1.933	0.002	1.000	351237	1.98		23.2	
413.00 > 169.00	1.935	1.933	0.002	1.000	187461		1.87(0.00-0.00)	278	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.162	2.162	0.0	1.000	697187	3.82		448	
499.00 > 99.00	2.162	2.162	0.0	1.000	149805		4.65(0.00-0.00)	237	
* 7 13C4 PFOS									
503.00 > 80.00	2.162	2.164	-0.002		5640583	28.7		5931	
9 Perfluorononanoic acid									
463.00 > 419.00	2.170	2.171	-0.001	1.000	250972	2.02		33.0	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.322	2.320	0.002	1.000	1247394	9.70		9670	

Reagents:

LC537-L1_00020

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47689.b\2017.09.08_537ICAL_004.d

Injection Date: 08-Sep-2017 13:27:48

Instrument ID: A8_N

Lims ID: IC L1

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 1

Worklist Smp#: 2

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

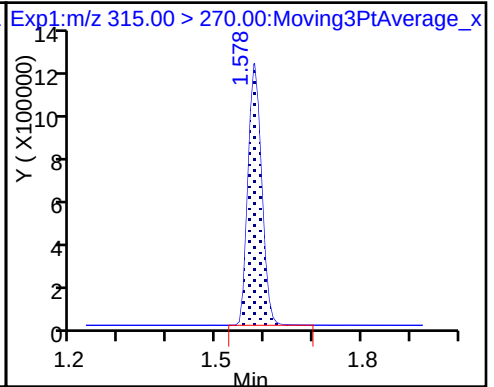
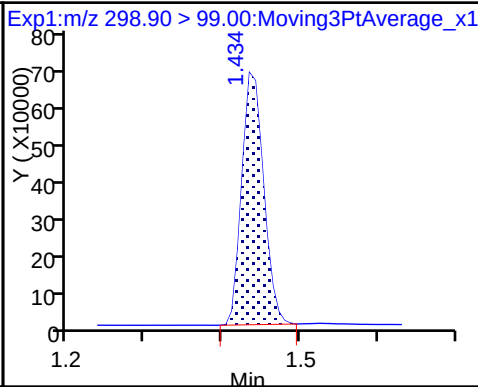
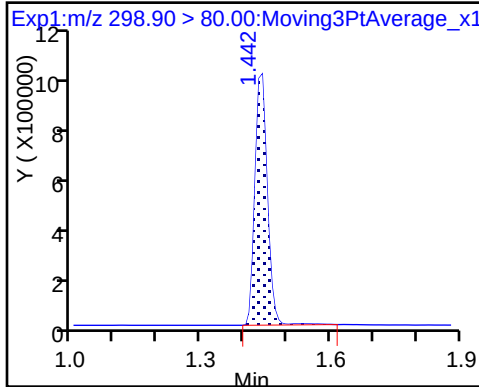
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

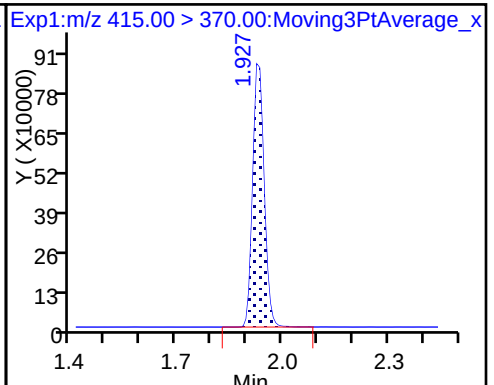
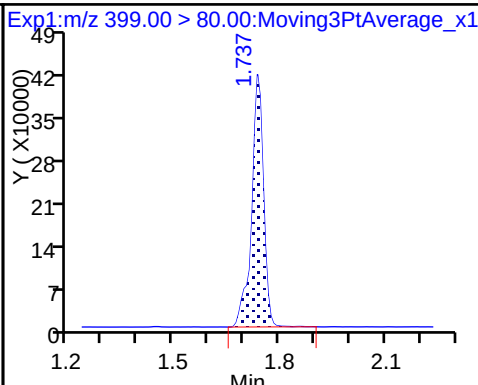
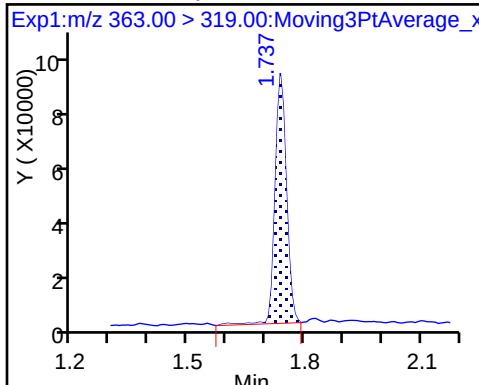
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

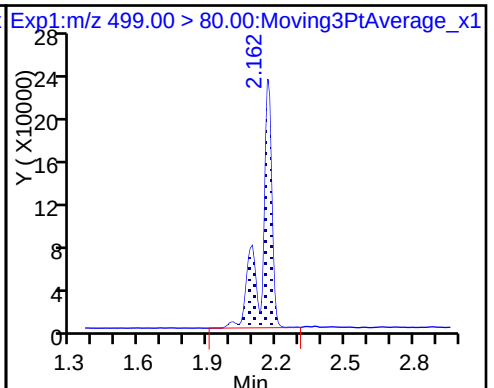
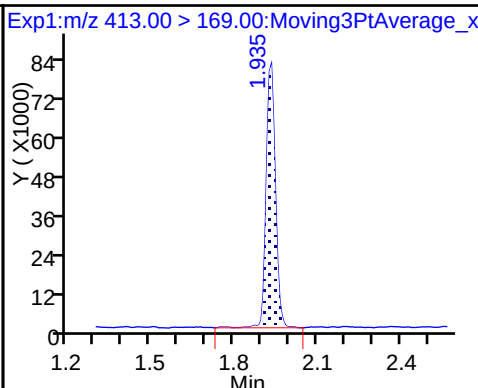
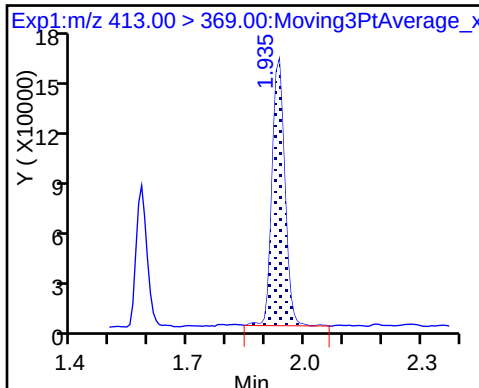
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

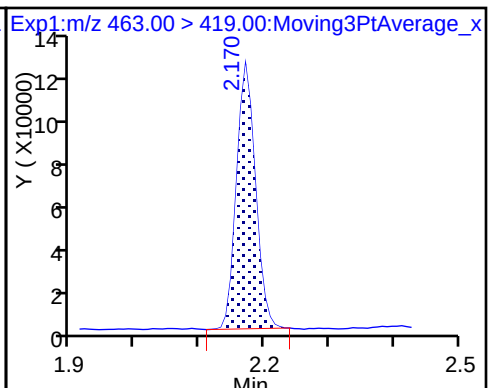
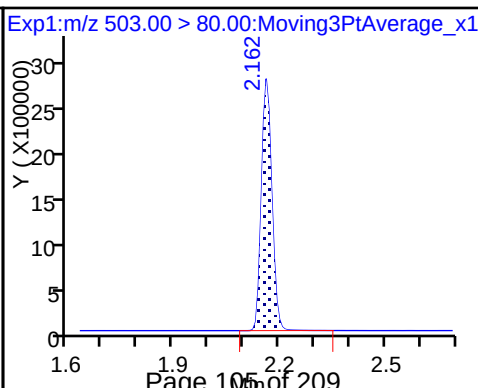
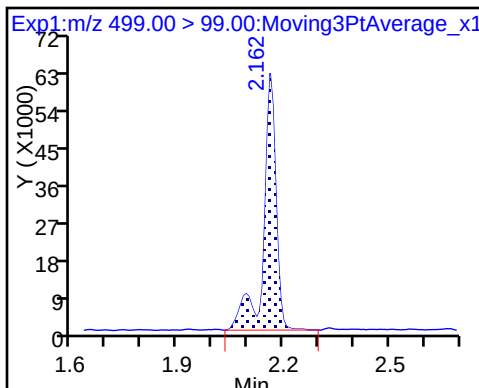
8 Perfluorooctane sulfonic acid



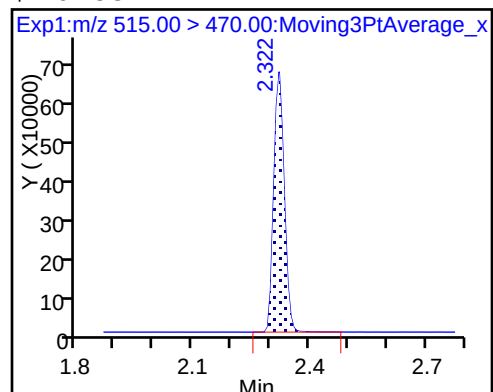
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47689.b\2017.09.08_537ICAL_005.d
 Lims ID: IC L2
 Client ID:
 Sample Type: IC Calib Level: 2
 Inject. Date: 08-Sep-2017 13:32:32 ALS Bottle#: 2 Worklist Smp#: 3
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L2_537
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub1
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47689.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 08-Sep-2017 14:36:35 Calib Date: 08-Sep-2017 13:51:29
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last Ical File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47689.b\2017.09.08_537ICAL_009.d

Column 1 : Det: EXP1

Process Host: XAWRK020

First Level Reviewer: barnettj

Date: 08-Sep-2017 14:30:15

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.442	1.440	0.002	1.000	4213055	20.7		2450	
298.90 > 99.00	1.442	1.440	0.002	1.000	3092801		1.36(0.00-0.00)	2075	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.578	1.577	0.001	1.000	2317173	9.95		10516	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.737	1.736	0.001	1.000	406467	2.25		75.3	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.745	1.739	0.006	1.000	2196189	6.91		3071	
* 6 13C2-PFOA									
415.00 > 370.00	1.935	1.932	0.003		1930305	10.0		10693	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.935	1.933	0.002	1.000	795859	4.45		55.2	
413.00 > 169.00	1.935	1.933	0.002	1.000	446132		1.78(0.00-0.00)	649	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.170	2.162	0.008	1.000	1662376	9.00		1102	
499.00 > 99.00	2.170	2.162	0.008	1.000	339290		4.90(0.00-0.00)	458	
* 7 13C4 PFOS									
503.00 > 80.00	2.170	2.164	0.006		5712377	28.7		5105	
9 Perfluorononanoic acid									
463.00 > 419.00	2.170	2.171	-0.001	1.000	573628	4.58		70.7	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.322	2.320	0.002	1.000	1289579	9.95		9016	

Reagents:

LC537-L2_00020

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47689.b\2017.09.08_537ICAL_005.d

Injection Date: 08-Sep-2017 13:32:32

Instrument ID: A8_N

Lims ID: IC L2

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 2

Worklist Smp#: 3

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

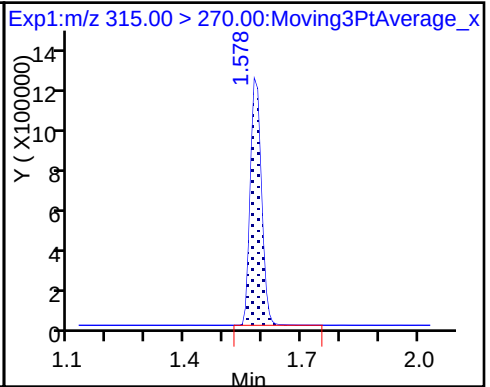
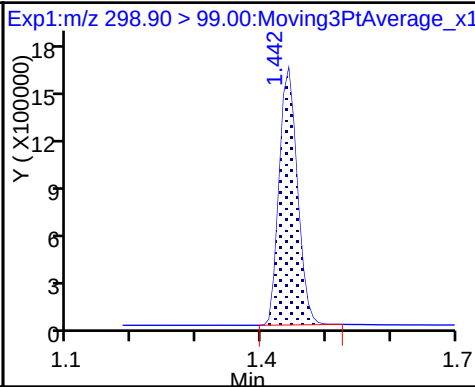
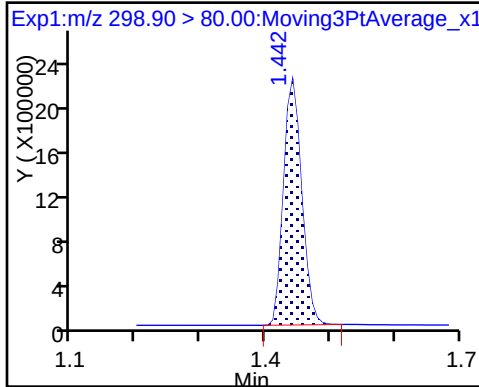
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

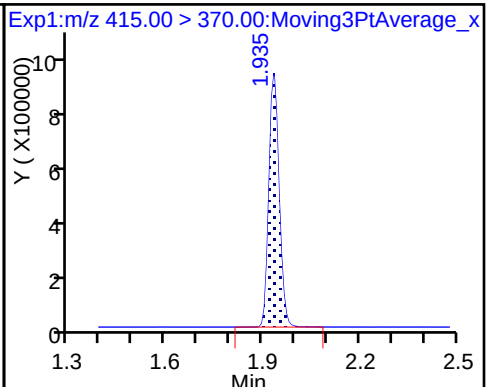
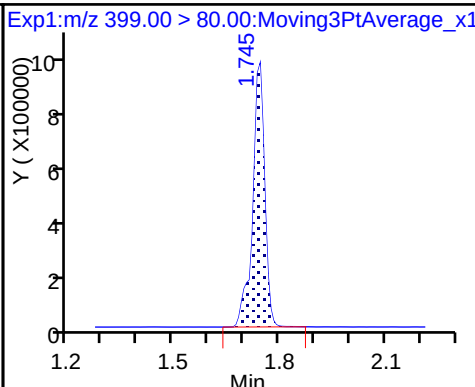
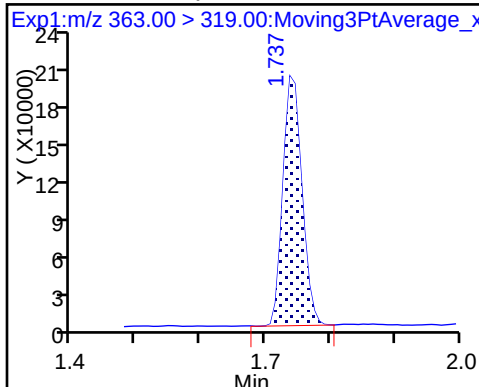
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

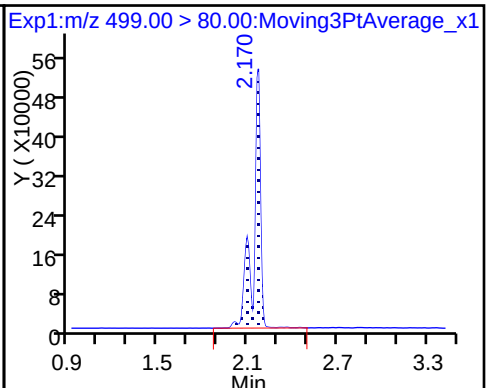
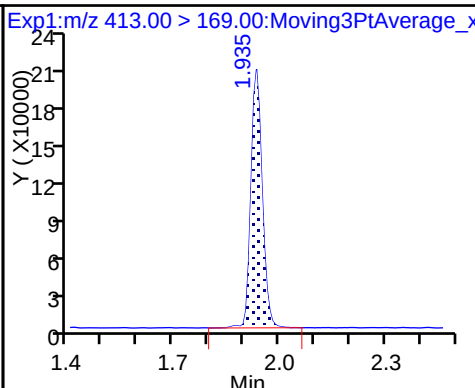
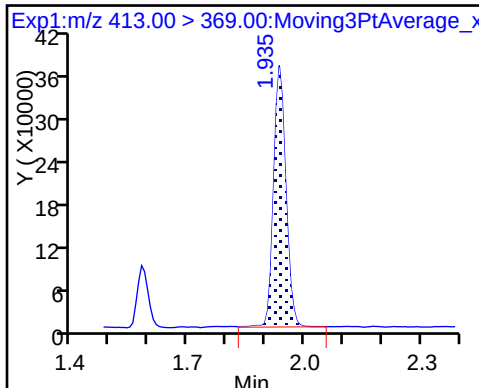
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

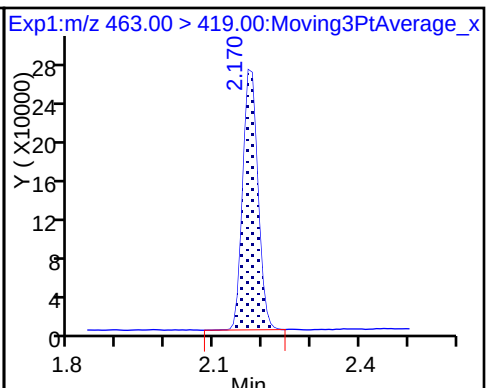
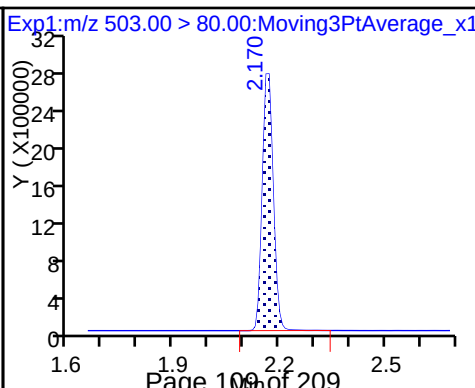
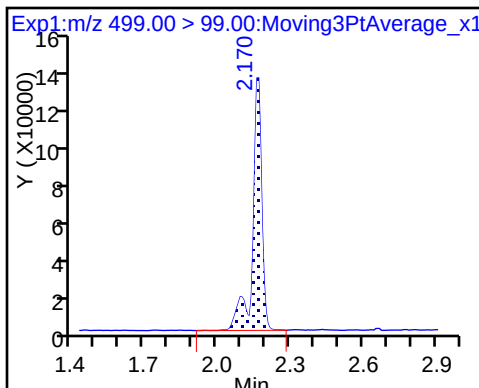
8 Perfluorooctane sulfonic acid



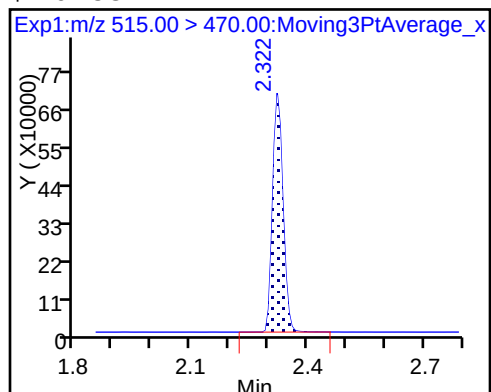
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47689.b\2017.09.08_537ICAL_006.d
 Lims ID: IC L3
 Client ID:
 Sample Type: IC Calib Level: 3
 Inject. Date: 08-Sep-2017 13:37:17 ALS Bottle#: 3 Worklist Smp#: 4
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L3_537
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub1
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47689.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 08-Sep-2017 14:36:36 Calib Date: 08-Sep-2017 13:51:29
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last Ical File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47689.b\2017.09.08_537ICAL_009.d

Column 1 : Det: EXP1

Process Host: XAWRK020

First Level Reviewer: barnettj

Date: 08-Sep-2017 14:30:36

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.442	1.440	0.002	1.000	9072488	47.1		5125	
298.90 > 99.00	1.442	1.440	0.002	1.000	6528395		1.39(0.00-0.00)	3987	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.578	1.577	0.001	1.000	2295161	9.81		9388	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.737	1.736	0.001	1.000	925418	5.11		168	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.745	1.739	0.006	1.000	4965386	15.6		5555	
* 6 13C2-PFOA									
415.00 > 370.00	1.935	1.932	0.003		1939425	10.0		9225	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.935	1.933	0.002	1.000	1826954	10.2		130	
413.00 > 169.00	1.935	1.933	0.002	1.000	988483		1.85(0.00-0.00)	1402	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.170	2.162	0.008	1.000	3656842	19.8		2499	
499.00 > 99.00	2.170	2.162	0.008	1.000	766039		4.77(0.00-0.00)	1116	
* 7 13C4 PFOS									
503.00 > 80.00	2.170	2.164	0.006		5718230	28.7		6352	
9 Perfluorononanoic acid									
463.00 > 419.00	2.177	2.171	0.006	1.000	1261094	10.0		168	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.322	2.320	0.002	1.000	1277856	9.81		8257	

Reagents:

LC537-L3_00023

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47689.b\2017.09.08_537ICAL_006.d

Injection Date: 08-Sep-2017 13:37:17

Instrument ID: A8_N

Lims ID: IC L3

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 3

Worklist Smp#: 4

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

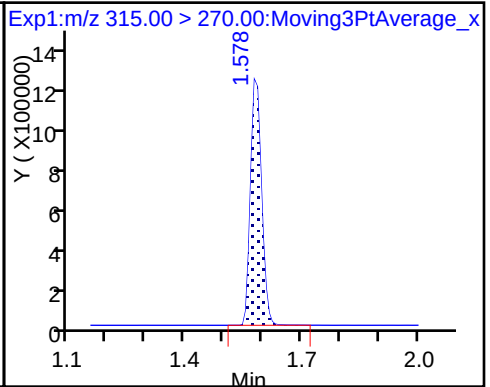
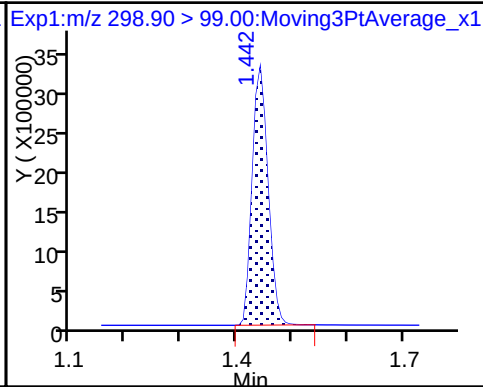
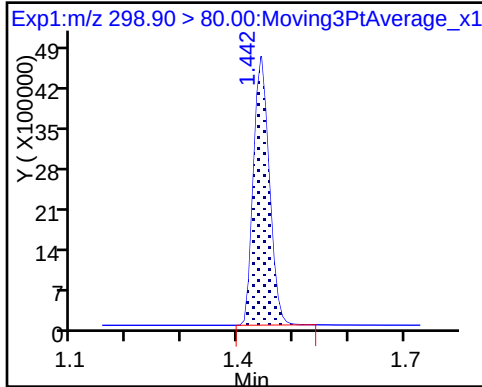
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

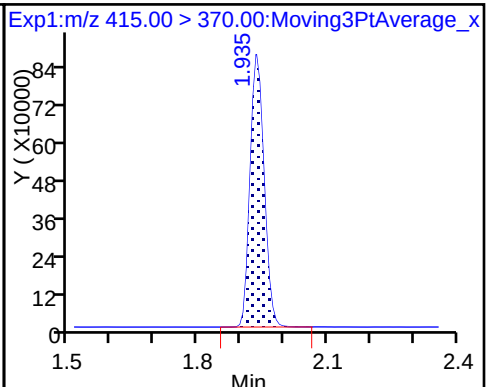
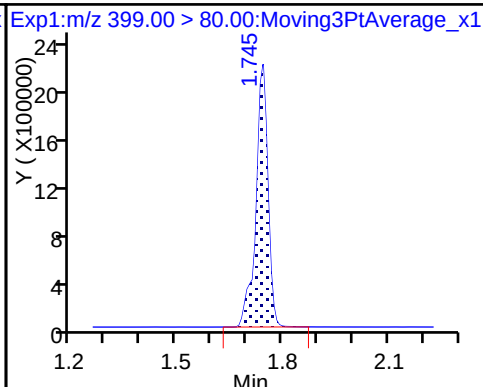
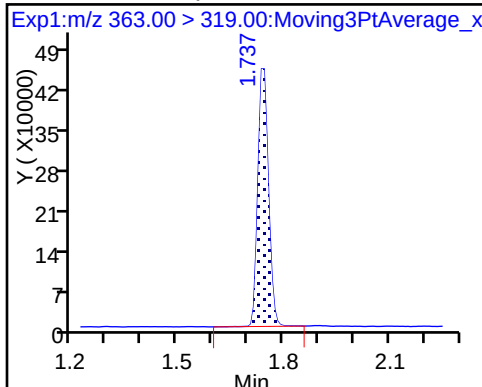
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

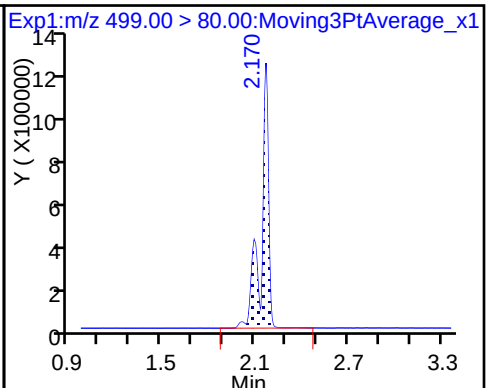
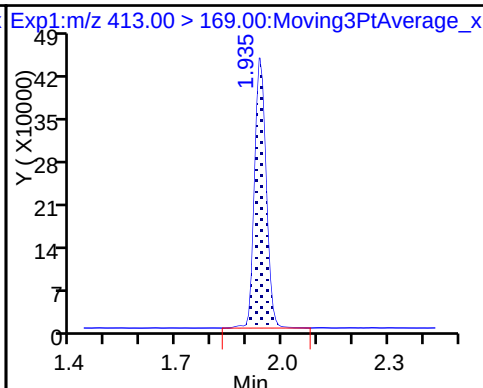
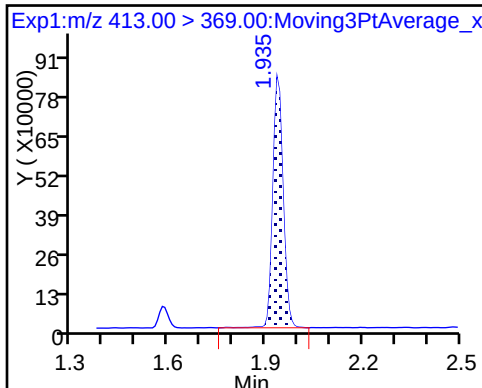
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

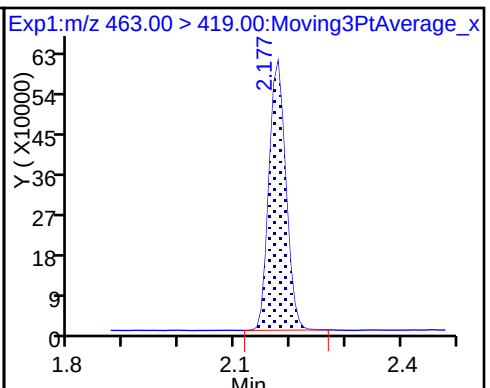
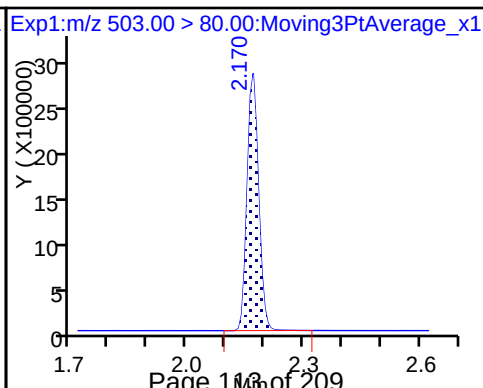
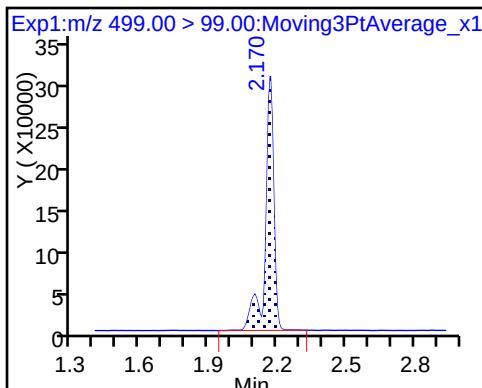
8 Perfluorooctane sulfonic acid



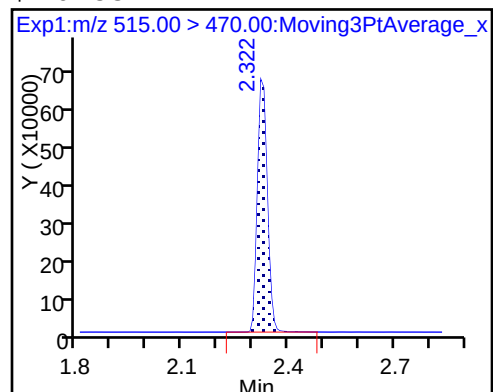
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47689.b\2017.09.08_537ICAL_007.d
 Lims ID: IC L4
 Client ID:
 Sample Type: ICISAV Calib Level: 4
 Inject. Date: 08-Sep-2017 13:42:01 ALS Bottle#: 4 Worklist Smp#: 5
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L4_537
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub1
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47689.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 08-Sep-2017 14:36:37 Calib Date: 08-Sep-2017 13:51:29
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last Ical File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47689.b\2017.09.08_537ICAL_009.d

Column 1 : Det: EXP1

Process Host: XAWRK020

First Level Reviewer: barnettj

Date: 08-Sep-2017 14:30:52

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.442	1.440	0.002	1.000	15158012	87.5		6269	
298.90 > 99.00	1.442	1.440	0.002	1.000	11655421		1.30(0.00-0.00)	5621	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.578	1.577	0.001	1.000	2355406	10.0		11115	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.737	1.736	0.001	1.000	1800569	9.89		354	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.737	1.739	-0.002	1.000	9333896	29.8		8135	
* 6 13C2-PFOA									
415.00 > 370.00	1.935	1.932	0.003		1950011	10.0		10259	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.935	1.933	0.002	1.000	3509739	19.4		239	
413.00 > 169.00	1.935	1.933	0.002	1.000	1963901		1.79(0.00-0.00)	3039	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.162	2.162	0.0	1.000	7391088	40.7		3757	
499.00 > 99.00	2.162	2.162	0.0	1.000	1510241		4.89(0.00-0.00)	1788	
* 7 13C4 PFOS									
503.00 > 80.00	2.162	2.164	-0.002		5620007	28.7		6079	
9 Perfluorononanoic acid									
463.00 > 419.00	2.170	2.171	-0.001	1.000	2464425	19.5		304	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.322	2.320	0.002	1.000	1307825	9.99		9047	

Reagents:

LC537-L4_00020

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47689.b\2017.09.08_537ICAL_007.d

Injection Date: 08-Sep-2017 13:42:01

Instrument ID: A8_N

Lims ID: IC L4

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 4

Worklist Smp#: 5

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

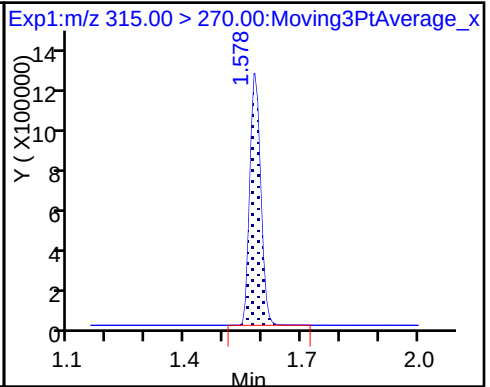
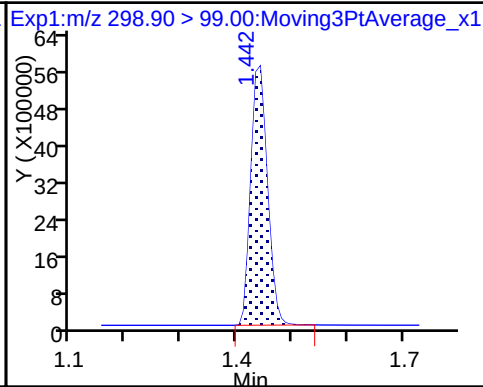
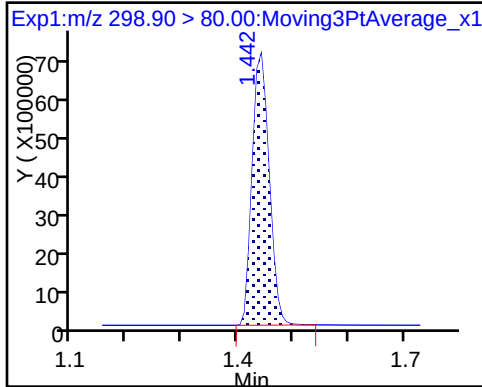
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

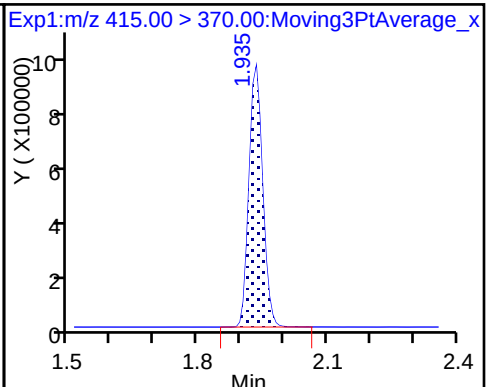
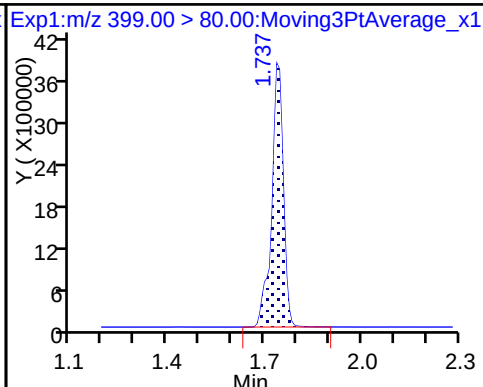
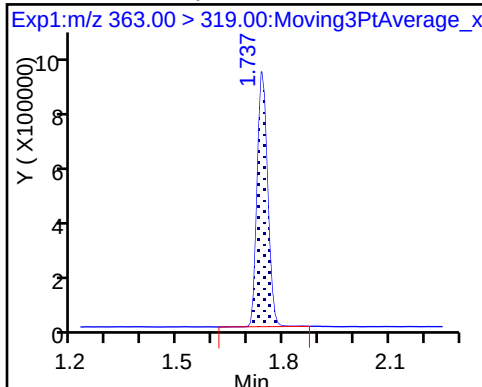
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

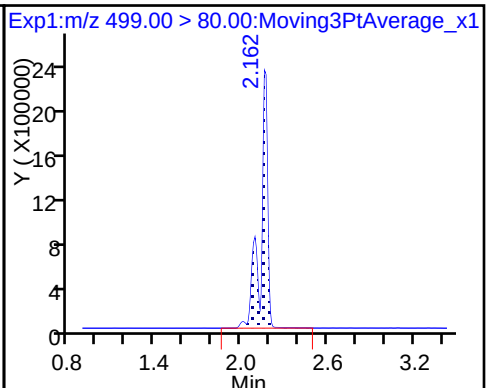
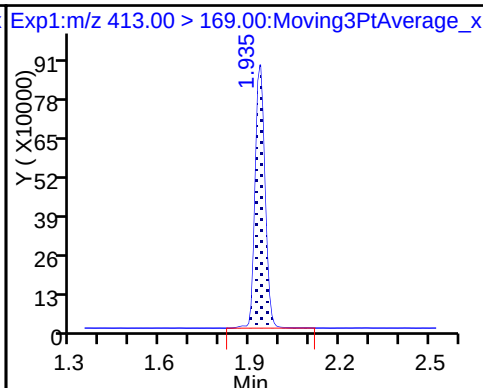
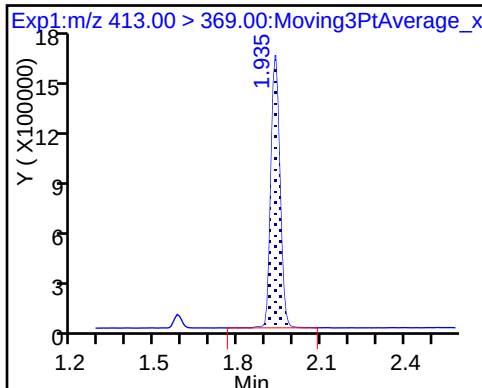
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

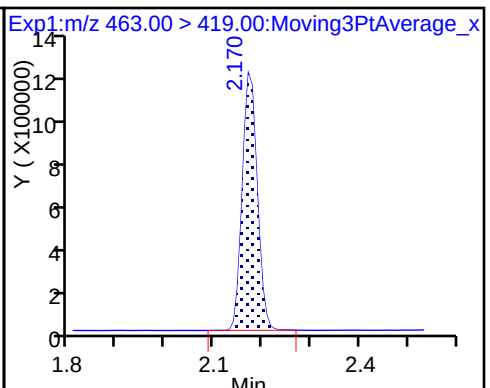
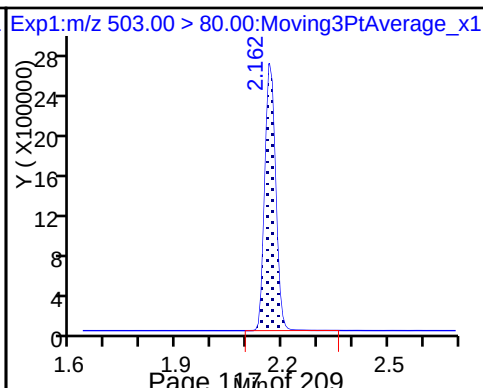
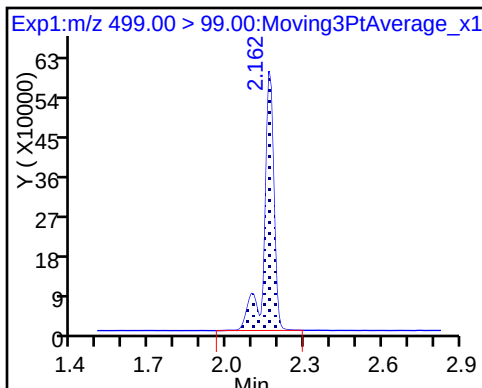
8 Perfluorooctane sulfonic acid



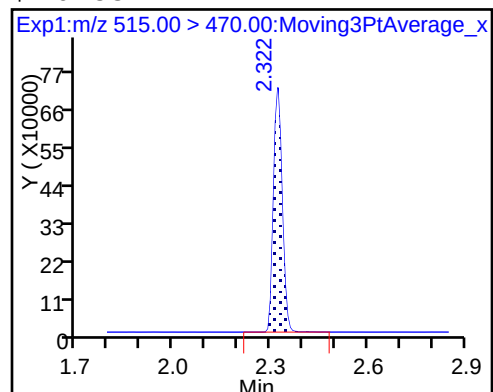
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47689.b\2017.09.08_537ICAL_008.d
 Lims ID: IC L5
 Client ID:
 Sample Type: IC Calib Level: 5
 Inject. Date: 08-Sep-2017 13:46:44 ALS Bottle#: 5 Worklist Smp#: 6
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L5_537
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub1
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47689.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 08-Sep-2017 14:36:38 Calib Date: 08-Sep-2017 13:51:29
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last Ical File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47689.b\2017.09.08_537ICAL_009.d

Column 1 : Det: EXP1

Process Host: XAWRK020

First Level Reviewer: barnettj

Date: 08-Sep-2017 14:31:12

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.442	1.440	0.002	1.000	19852718	135.1		6850	
298.90 > 99.00	1.442	1.440	0.002	1.000	15195611		1.31(0.00-0.00)	6310	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.578	1.577	0.001	1.000	2286265	10.1		10462	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.737	1.736	0.001	1.000	2623771	15.0		505	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.737	1.739	-0.002	1.000	13320862	44.6		8385	
* 6 13C2-PFOA									
415.00 > 370.00	1.935	1.932	0.003		1877393	10.0		9959	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.935	1.933	0.002	1.000	5142636	29.6		349	
413.00 > 169.00	1.935	1.933	0.002	1.000	2903019		1.77(0.00-0.00)	4203	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.170	2.162	0.008	1.000	10590577	61.1		5066	
499.00 > 99.00	2.162	2.162	0.0	0.996	2209991		4.79(0.00-0.00)	2997	
* 7 13C4 PFOS									
503.00 > 80.00	2.162	2.164	-0.002		5359060	28.7		5743	
9 Perfluorononanoic acid									
463.00 > 419.00	2.170	2.171	-0.001	1.000	3550611	29.2		429	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.322	2.320	0.002	1.000	1276749	10.1		8684	

Reagents:

LC537-L5_00024

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47689.b\2017.09.08_537ICAL_008.d

Injection Date: 08-Sep-2017 13:46:44

Instrument ID: A8_N

Lims ID: IC L5

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#:

5

Worklist Smp#:

6

Injection Vol: 2.0 ul

Dil. Factor:

1.0000

Method: 537_A8_N

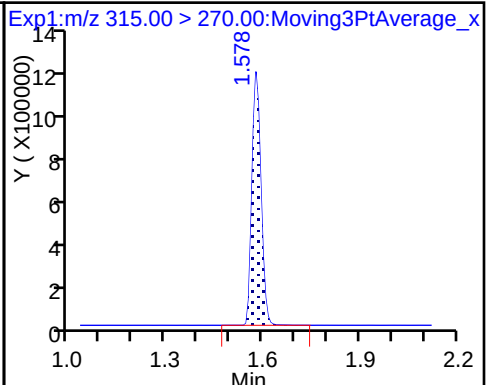
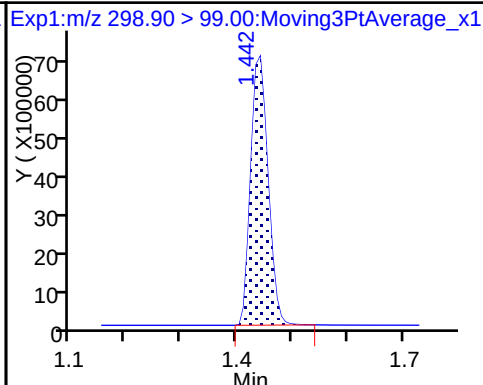
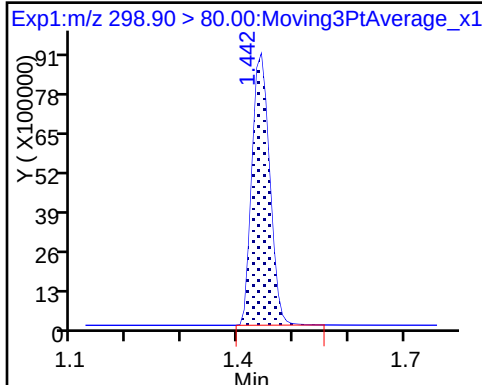
Limit Group:

LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

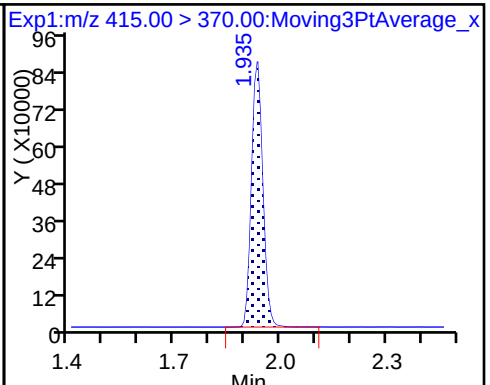
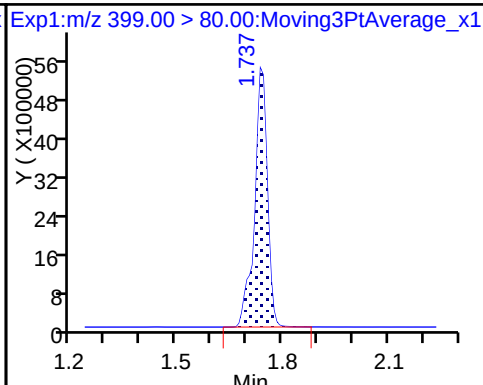
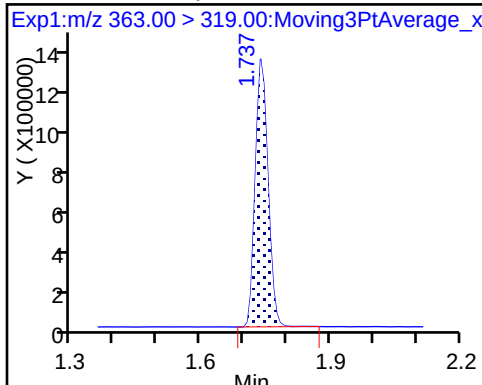
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

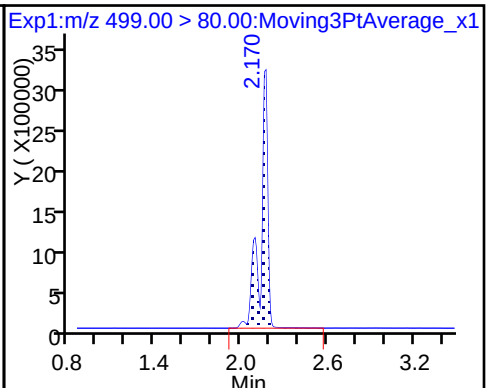
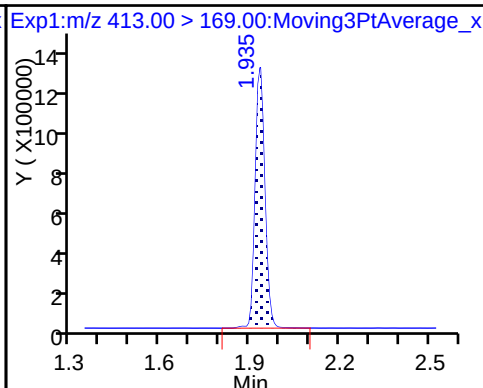
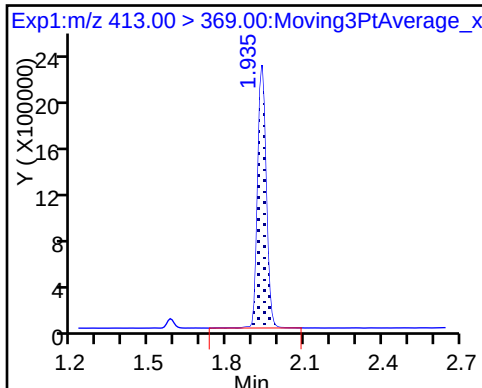
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

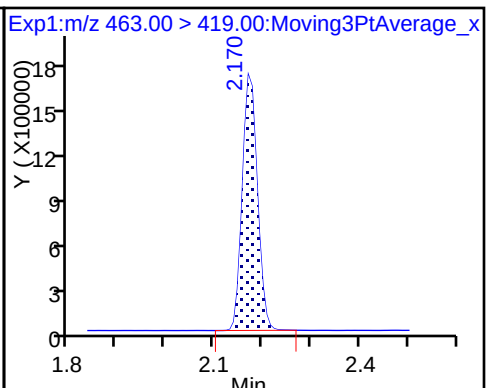
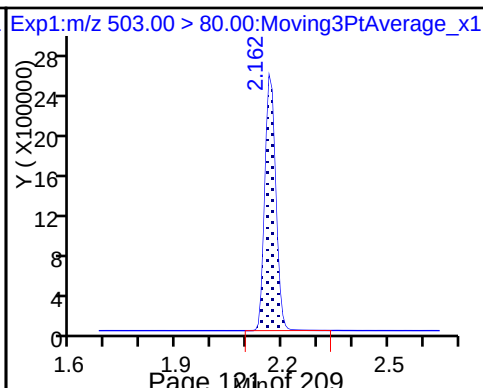
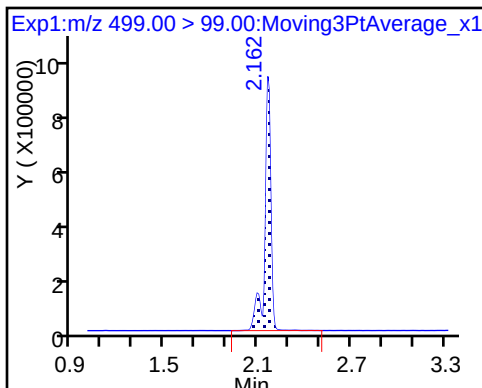
8 Perfluorooctane sulfonic acid



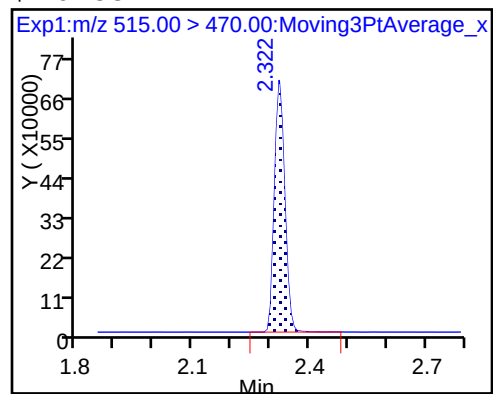
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47689.b\2017.09.08_537ICAL_009.d
 Lims ID: IC L6
 Client ID:
 Sample Type: IC Calib Level: 6
 Inject. Date: 08-Sep-2017 13:51:29 ALS Bottle#: 6 Worklist Smp#: 7
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L6_537
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub1
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47689.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 08-Sep-2017 14:36:39 Calib Date: 08-Sep-2017 13:51:29
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last Ical File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47689.b\2017.09.08_537ICAL_009.d

Column 1 : Det: EXP1

Process Host: XAWRK020

First Level Reviewer: barnettj

Date: 08-Sep-2017 14:31:55

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.434	1.440	-0.006	1.000	23775992	180.9		7144	
298.90 > 99.00	1.434	1.440	-0.006	1.000	18153774		1.31(0.00-0.00)	6192	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.571	1.577	-0.007	1.000	2288248	10.3		10238	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.730	1.736	-0.006	1.000	3422434	19.8		633	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.730	1.739	-0.009	1.000	16853658	55.7		8445	
* 6 13C2-PFOA									
415.00 > 370.00	1.927	1.932	-0.005		1848587	10.0		9323	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.927	1.933	-0.006	1.000	7116752	41.6		463	
413.00 > 169.00	1.927	1.933	-0.006	1.000	3999566		1.78(0.00-0.00)	5263	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.162	2.162	0.0	1.000	14205705	80.8		6204	M
499.00 > 99.00	2.155	2.162	-0.007	0.996	3042793		4.67(0.00-0.00)	2941	M
* 7 13C4 PFOS									
503.00 > 80.00	2.155	2.164	-0.009		5438027	28.7		5942	
9 Perfluorononanoic acid									
463.00 > 419.00	2.170	2.171	-0.001	1.000	4847063	40.4		564	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.314	2.320	-0.006	1.000	1295246	10.4		7835	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L6_00020

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47689.b\2017.09.08_537ICAL_009.d

Injection Date: 08-Sep-2017 13:51:29

Instrument ID: A8_N

Lims ID: IC L6

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 6

Worklist Smp#: 7

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

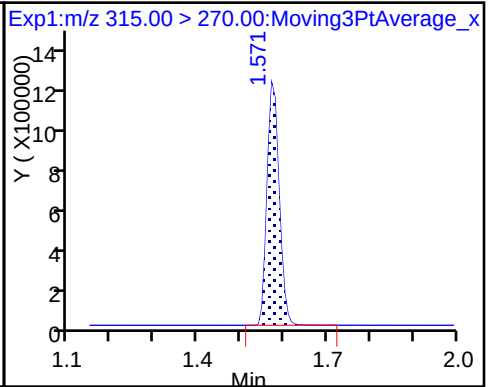
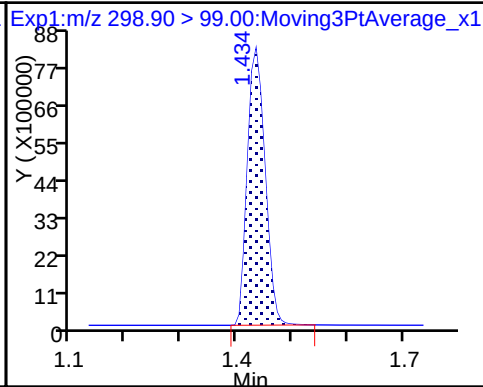
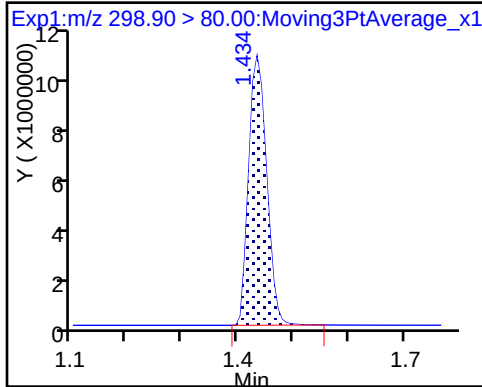
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

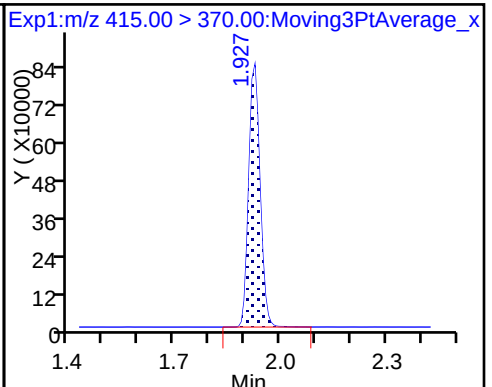
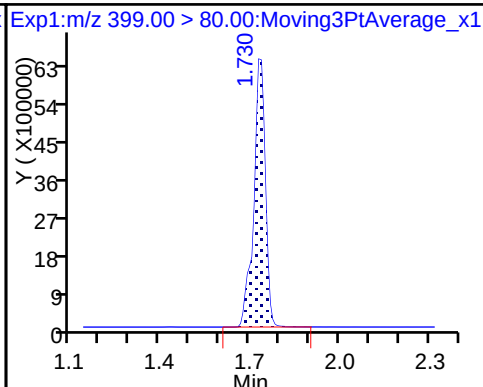
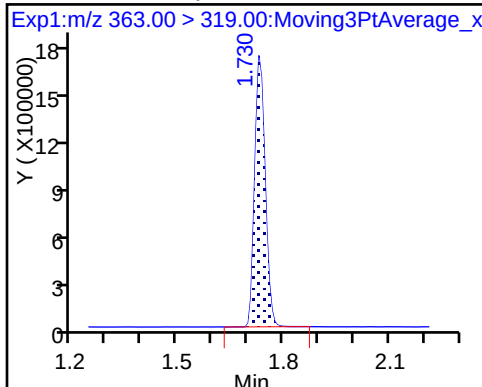
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

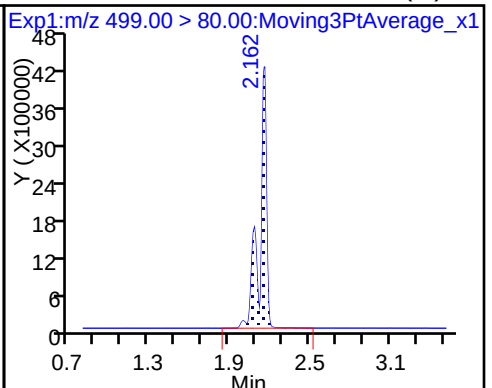
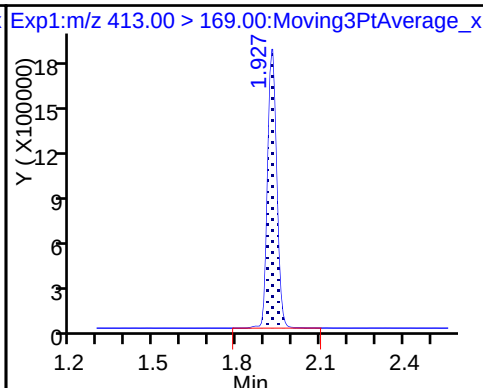
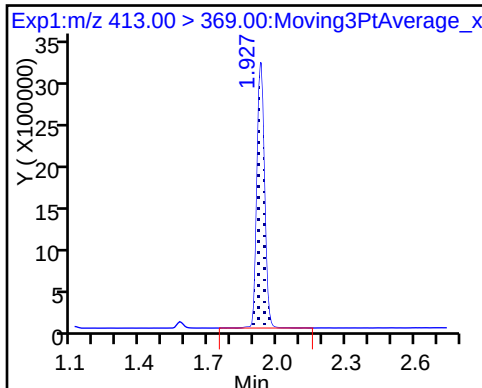
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

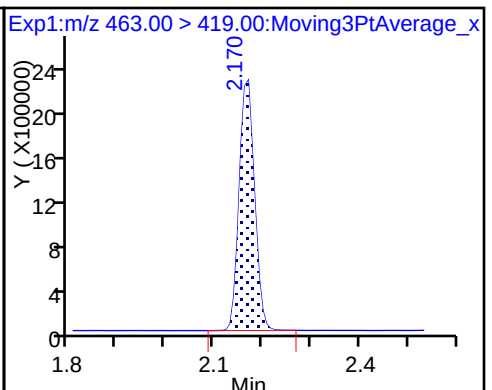
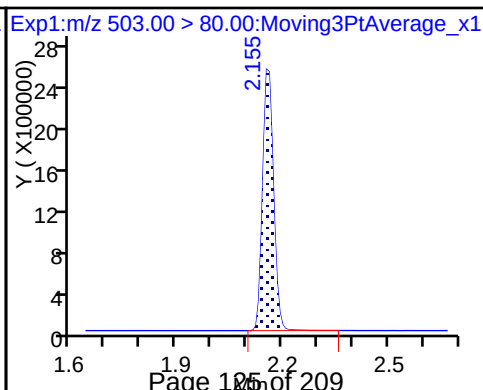
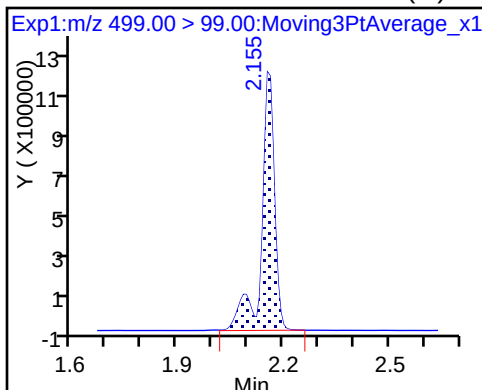
8 Perfluorooctane sulfonic acid (M)



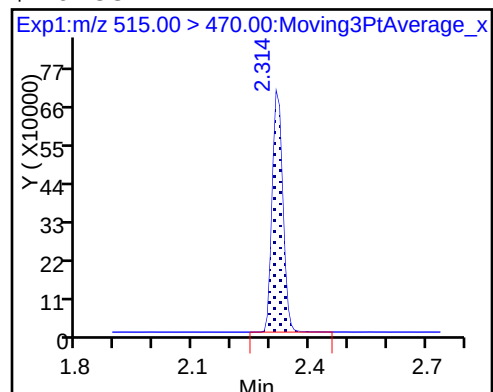
8 Perfluorooctane sulfonic acid (M)

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

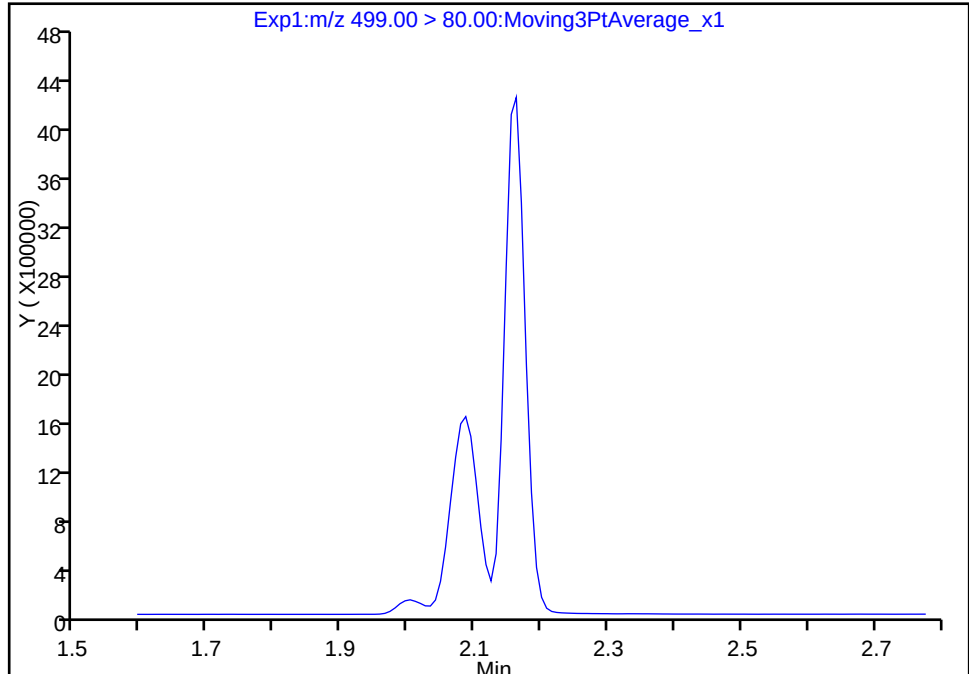
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Injection Date: 08-Sep-2017 13:51:29 Instrument ID: A8_N
Lims ID: IC L6
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 6 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

8 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

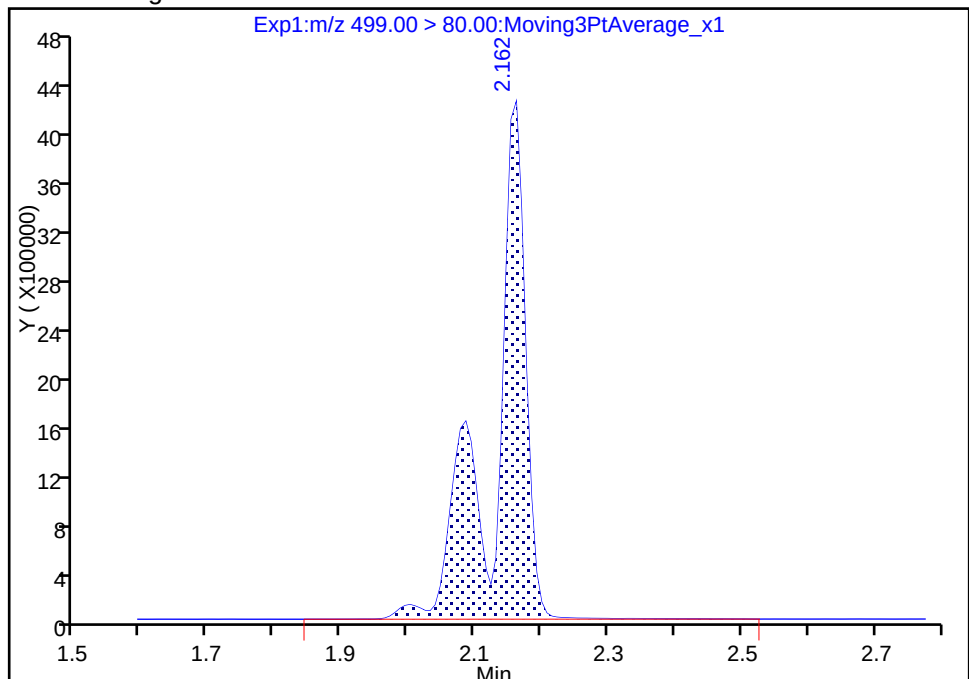
Not Detected
Expected RT: 2.16

Processing Integration Results



Manual Integration Results

RT: 2.16
Area: 14205705
Amount: 80.778955
Amount Units: ng/ml



Reviewer: barnettj, 08-Sep-2017 14:31:17

Audit Action: Assigned Compound ID

Audit Reason: Isomers

TestAmerica Sacramento

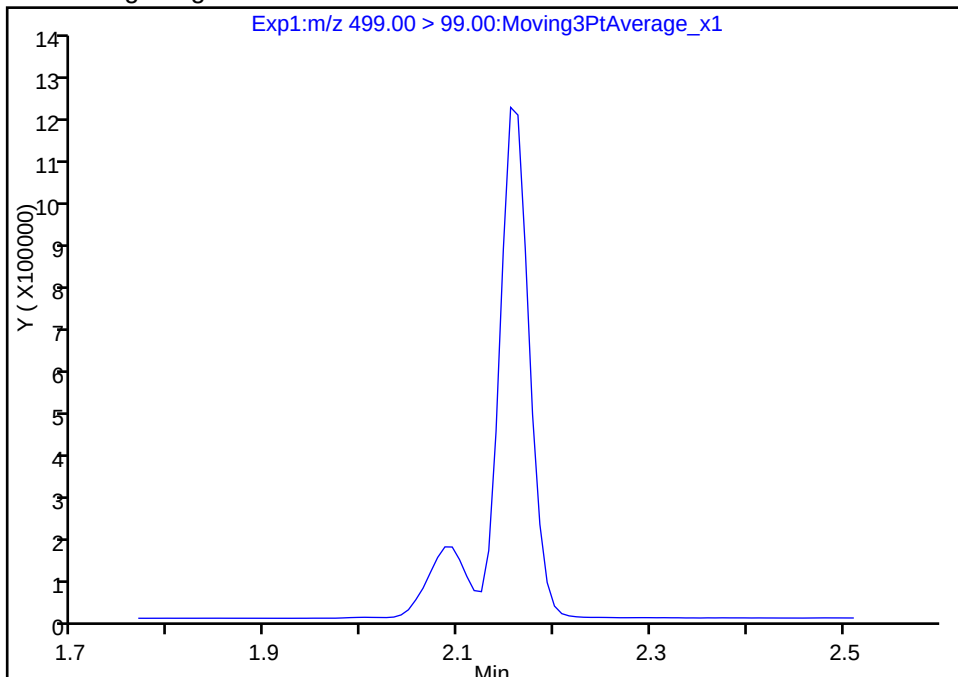
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47689.b\2017.09.08_537ICAL_009.d
Injection Date: 08-Sep-2017 13:51:29 Instrument ID: A8_N
Lims ID: IC L6
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 6 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

8 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

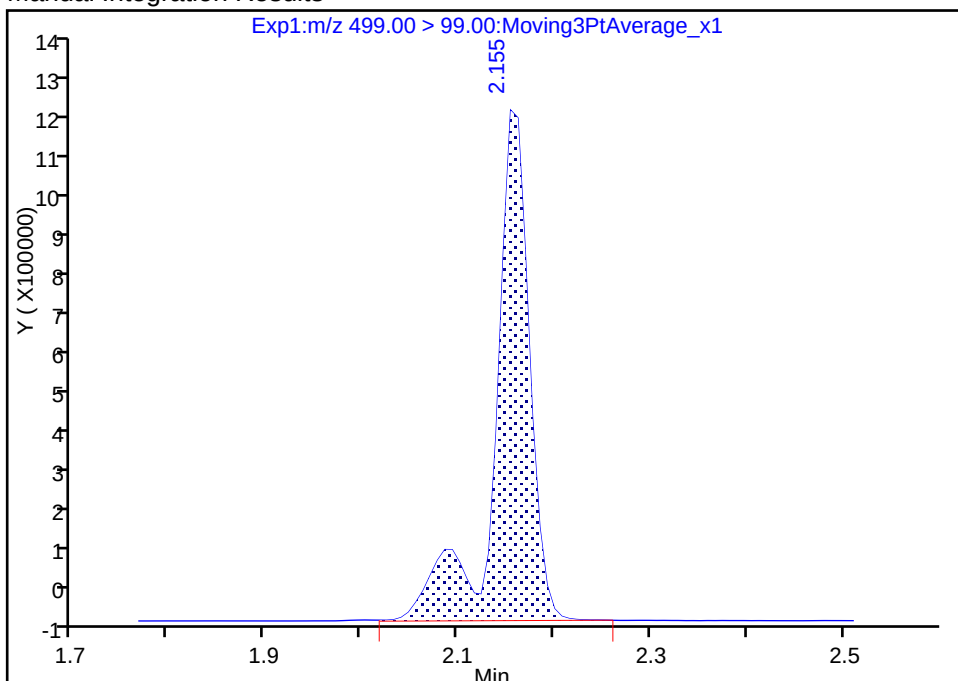
Not Detected
Expected RT: 2.16

Processing Integration Results



Manual Integration Results

RT: 2.15
Area: 3042793
Amount: 80.778955
Amount Units: ng/ml



Reviewer: barnettj, 08-Sep-2017 14:31:30

Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento

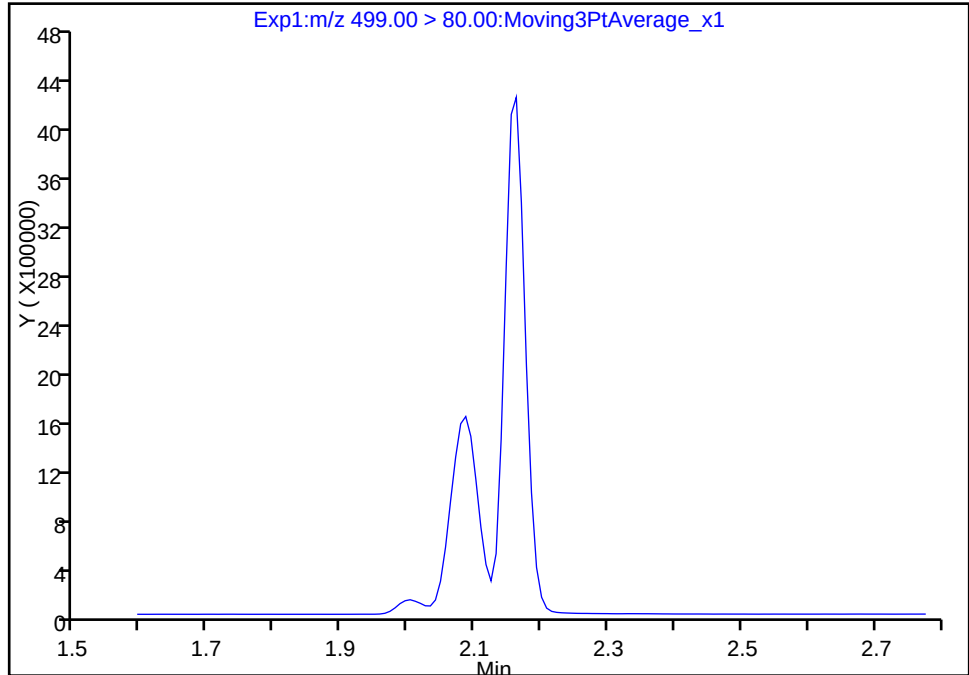
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Injection Date: 08-Sep-2017 13:51:29 Instrument ID: A8_N
Lims ID: IC L6
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 6 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

8 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

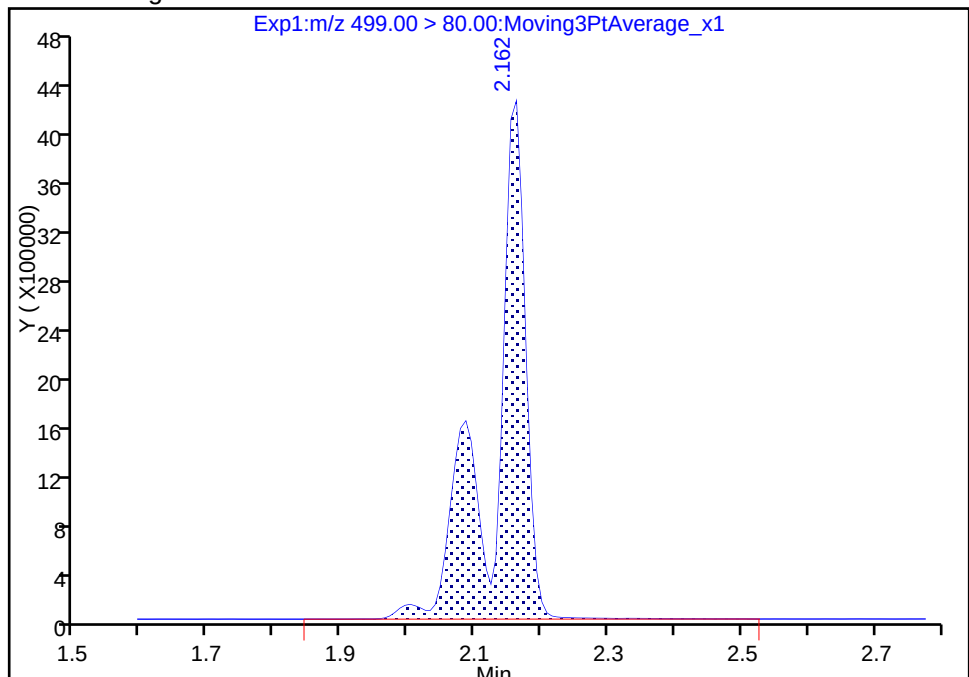
Not Detected
Expected RT: 2.16

Processing Integration Results



Manual Integration Results

RT: 2.16
Area: 14205705
Amount: 80.778955
Amount Units: ng/ml



Reviewer: barnettj, 08-Sep-2017 14:31:30

Audit Action: Manually Integrated

Audit Reason: Isomers

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-31180-1
 SDG No.: WE04
 Lab Sample ID: CCVL 320-183459/9 Calibration Date: 09/08/2017 14:00
 Instrument ID: A8_N Calib Start Date: 09/08/2017 13:27
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 09/08/2017 13:51
 Lab File ID: 2017.09.08_537ICAL_011.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		1.035		20.3	20.0	1.4	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9339	0.9801		2.33	2.22	4.9	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.597	1.670		6.97	6.67	4.6	50.0
Perfluorooctanoic acid (PFOA)	Ave	0.9262	0.9160		4.40	4.45	-1.1	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9275	0.9149		8.77	8.89	-1.4	50.0
Perfluorononanoic acid (PFNA)	Ave	0.6485	0.6787		4.65	4.45	4.7	50.0
13C2 PFHxA	Ave	1.207	1.214		10.1	10.0	0.6	30.0
13C2 PFDA	Ave	0.6716	0.6847		10.2	10.0	1.9	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47689.b\2017.09.08_537ICAL_011.d
 Lims ID: CCVL
 Client ID:
 Sample Type: CCVL
 Inject. Date: 08-Sep-2017 14:00:59 ALS Bottle#: 2 Worklist Smp#: 9
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L2
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub1
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47689.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 08-Sep-2017 14:36:41 Calib Date: 08-Sep-2017 13:51:29
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last Ical File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47689.b\2017.09.08_537ICAL_009.d

Column 1 : Det: EXP1

Process Host: XAWRK020

First Level Reviewer: barnettj Date: 08-Sep-2017 14:34:45

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.434	1.440	-0.006	1.000	4231471	20.3		2782	
298.90 > 99.00	1.434	1.440	-0.006	1.000	3093905		1.37(0.00-0.00)	2232	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.578	1.577	0.001	1.000	2397228	10.1		10955	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.737	1.736	0.001	1.000	430105	2.33		83.2	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.737	1.739	-0.002	1.000	2275562	6.97		3197	
* 6 13C2-PFOA									
415.00 > 370.00	1.927	1.932	-0.005		1974239	10.0		10041	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.927	1.933	-0.006	1.000	804442	4.40		57.6	
413.00 > 169.00	1.927	1.933	-0.006	1.000	454125		1.77(0.00-0.00)	774	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.162	2.162	0.0	1.000	1662205	8.77		1128	
499.00 > 99.00	2.162	2.162	0.0	1.000	347509		4.78(0.00-0.00)	502	
* 7 13C4 PFOS									
503.00 > 80.00	2.162	2.164	-0.002		5860601	28.7		6007	
9 Perfluorononanoic acid									
463.00 > 419.00	2.170	2.171	-0.001	1.000	595614	4.65		78.1	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.322	2.320	0.002	1.000	1351701	10.2		8571	

Reagents:

LC537-L2_00020

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47689.b\2017.09.08_537ICAL_011.d

Injection Date: 08-Sep-2017 14:00:59

Instrument ID: A8_N

Lims ID: CCVL

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 2

Worklist Smp#: 9

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

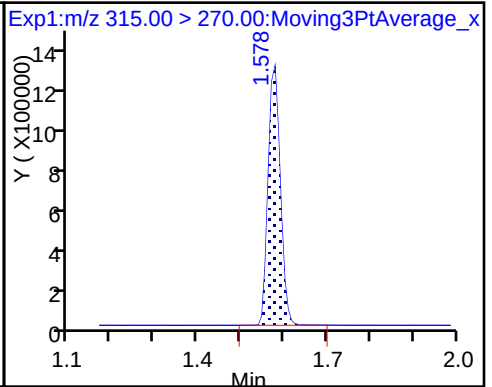
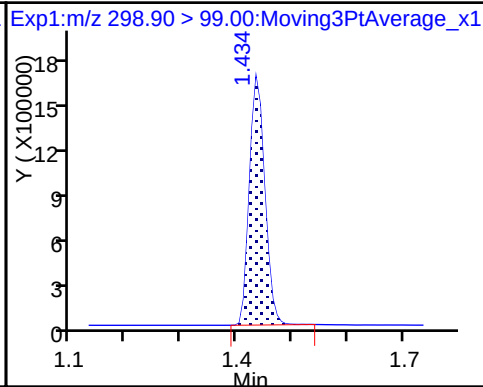
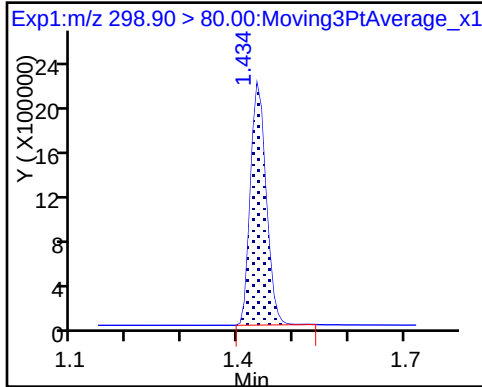
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

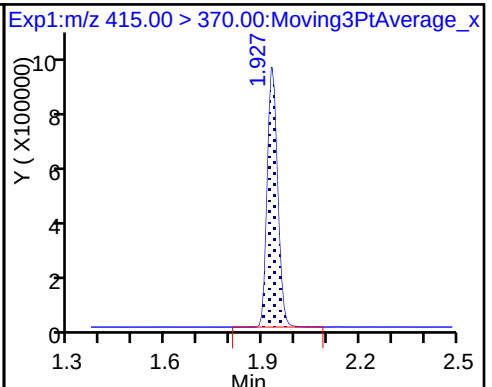
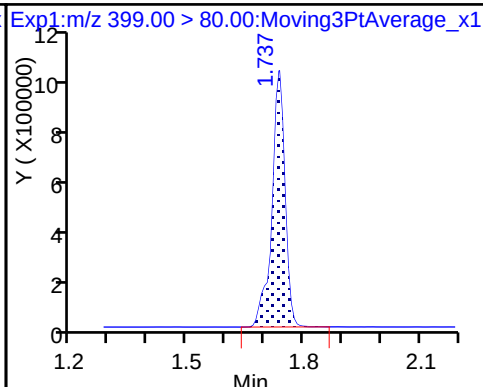
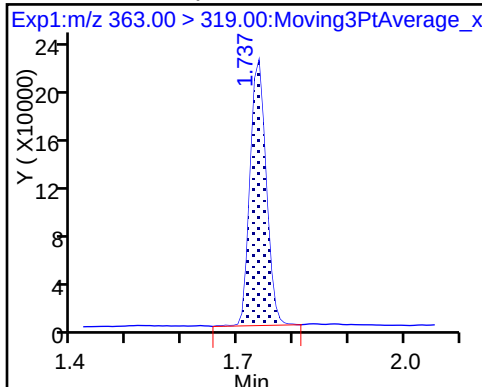
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

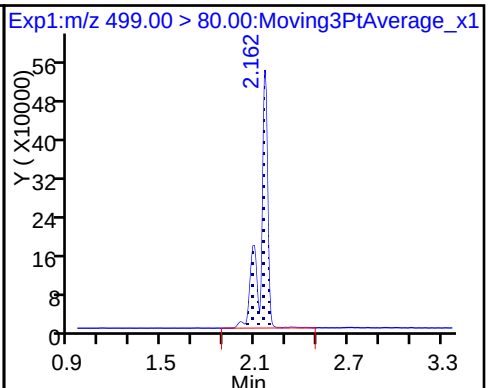
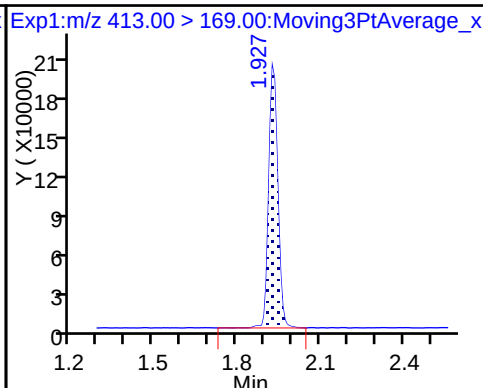
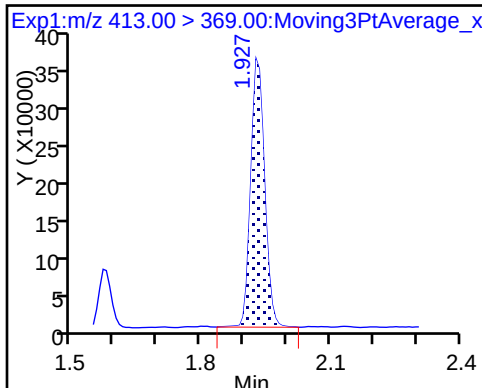
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

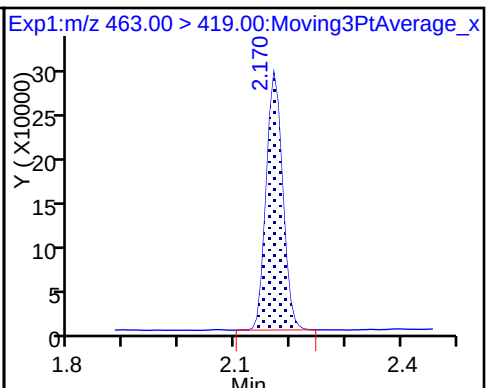
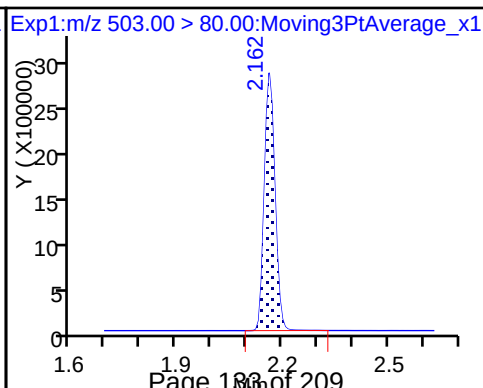
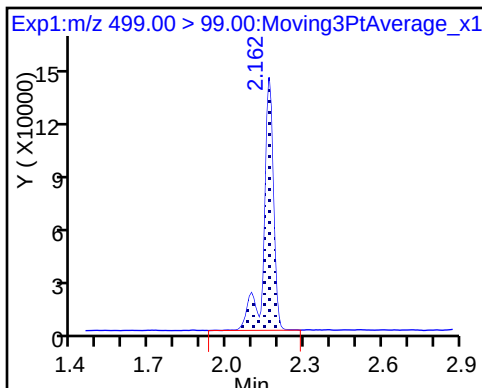
8 Perfluorooctane sulfonic acid



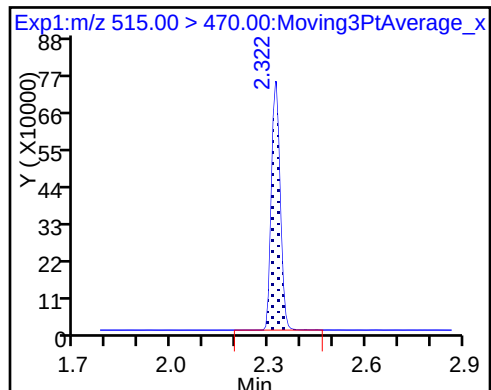
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-31180-1
 SDG No.: WE04
 Lab Sample ID: ICV 320-183459/11 Calibration Date: 09/08/2017 14:10
 Instrument ID: A8_N Calib Start Date: 09/08/2017 13:27
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 09/08/2017 13:51
 Lab File ID: 2017.09.08_537ICAL_013.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		0.8407		97.5	100	-2.6	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9339	0.9585		10.3	10.0	2.6	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.597	1.807		22.7	20.1	13.2	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9262	0.9495		21.0	20.5	2.5	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9275	1.113		23.6	19.7	20.1	30.0
Perfluorononanoic acid (PFNA)	Ave	0.6485	0.7430		23.1	20.1	14.6	30.0
13C2 PFHxA	Ave	1.207	1.185		9.82	10.0	-1.8	30.0
13C2 PFDA	Ave	0.6716	0.6610		9.84	10.0	-1.6	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47689.b\2017.09.08_537ICAL_013.d
 Lims ID: ICV
 Client ID:
 Sample Type: ICV
 Inject. Date: 08-Sep-2017 14:10:28 ALS Bottle#: 7 Worklist Smp#: 11
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: ICV
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist:
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47689.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 08-Sep-2017 14:36:42 Calib Date: 08-Sep-2017 13:51:29
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last Ical File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47689.b\2017.09.08_537ICAL_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK020

First Level Reviewer: barnettj

Date: 08-Sep-2017 14:34:24

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.442	1.440	0.002	1.000	19376335	97.5		6914	
298.90 > 99.00	1.442	1.440	0.002	1.000	14935061		1.30(0.00-0.00)	6602	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.586	1.577	0.009	1.000	2566770	9.82		12238	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.737	1.736	0.001	1.000	2076062	10.3		392	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.745	1.739	0.006	1.000	8349942	22.7		7727	
* 6 13C2-PFOA									
415.00 > 370.00	1.935	1.932	0.003		2166899	10.0		10916	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.935	1.933	0.002	1.000	4214438	21.0		288	
413.00 > 169.00	1.935	1.933	0.002	1.000	2422425		1.74(0.00-0.00)	3521	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.170	2.162	0.008	1.000	5049121	23.6		2981	
499.00 > 99.00	2.170	2.162	0.008	1.000	947042		5.33(0.00-0.00)	1196	
* 7 13C4 PFOS									
503.00 > 80.00	2.170	2.164	0.006		6602152	28.7		6669	
9 Perfluorononanoic acid									
463.00 > 419.00	2.177	2.171	0.006	1.000	3240273	23.1		458	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.322	2.320	0.002	1.000	1432268	9.84		8543	

Reagents:

LC537-ICV_00028

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47689.b\2017.09.08_537ICAL_013.d

Injection Date: 08-Sep-2017 14:10:28

Instrument ID: A8_N

Lims ID: ICV

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 7

Worklist Smp#: 11

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

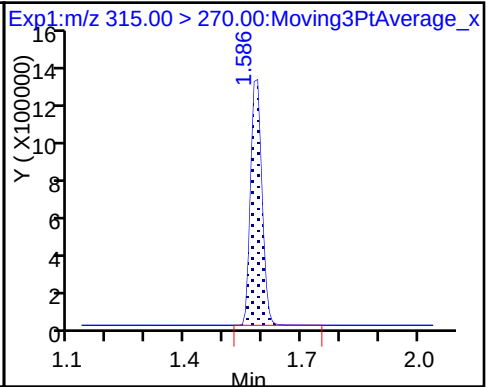
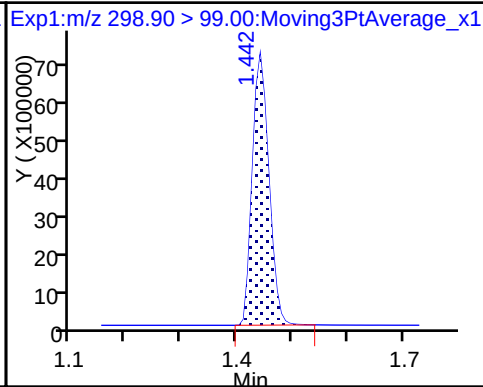
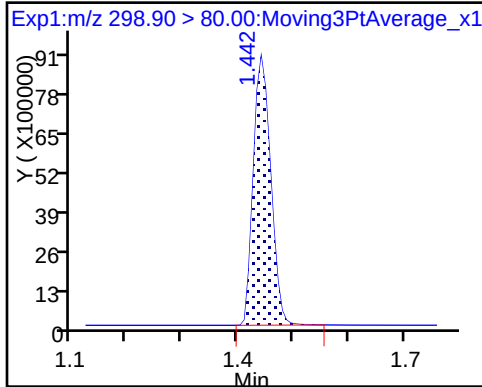
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

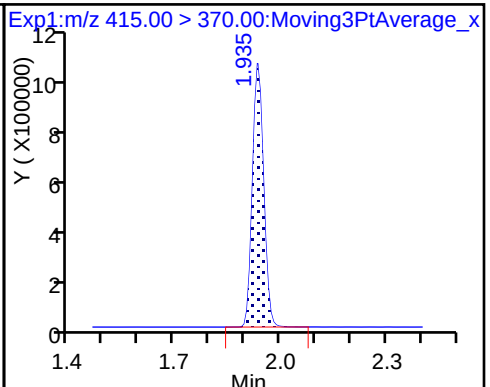
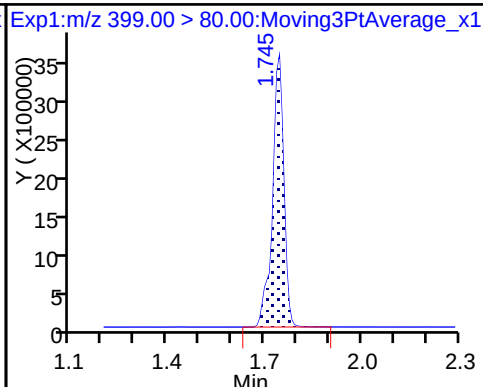
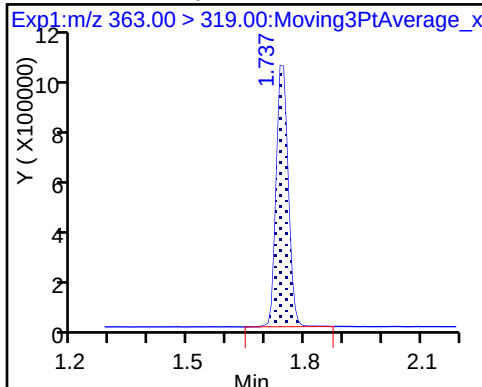
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

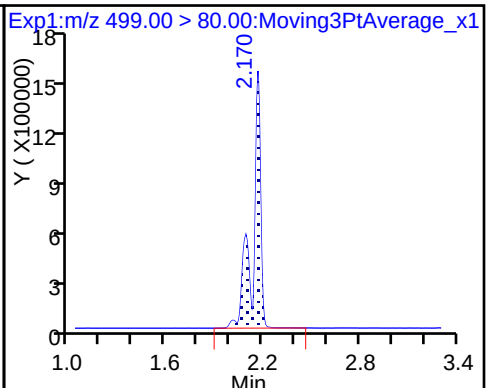
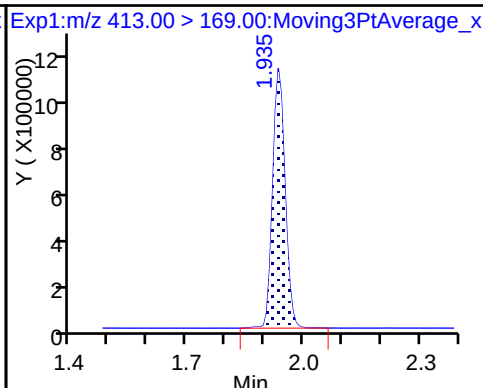
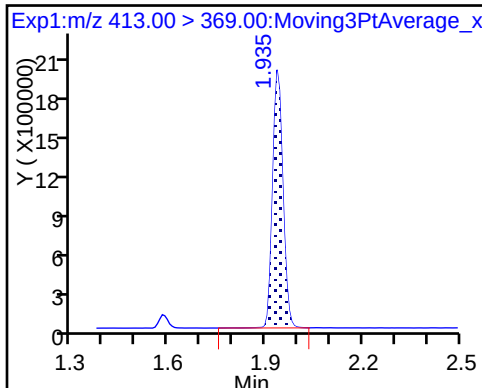
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

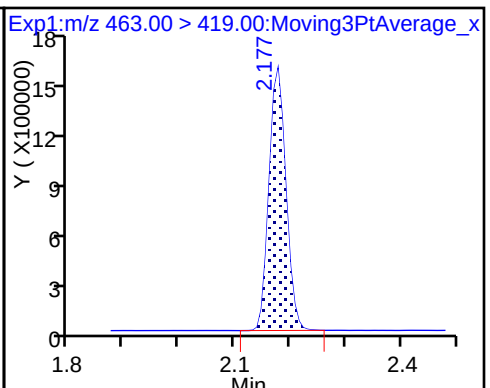
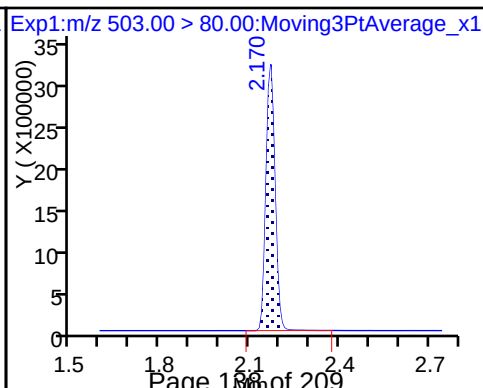
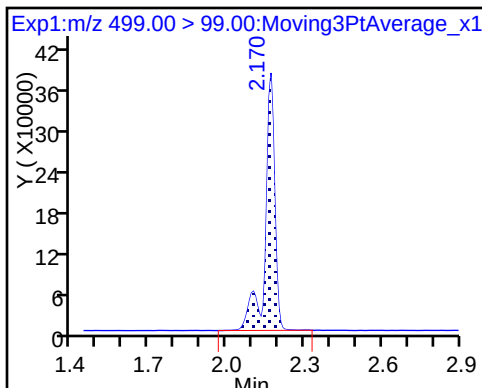
8 Perfluorooctane sulfonic acid



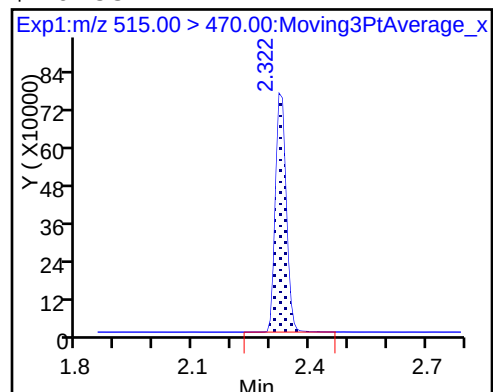
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-31180-1
 SDG No.: WE04
 Lab Sample ID: CCVL 320-183505/3 Calibration Date: 09/08/2017 15:38
 Instrument ID: A8_N Calib Start Date: 09/08/2017 13:27
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 09/08/2017 13:51
 Lab File ID: 2017.09.08_537B_004.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		1.046		20.5	20.0	2.5	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9339	0.9827		2.34	2.22	5.2	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.597	1.654		6.91	6.67	3.6	50.0
Perfluorooctanoic acid (PFOA)	Ave	0.9262	0.9027		4.34	4.45	-2.5	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9275	0.9099		8.72	8.89	-1.9	50.0
Perfluorononanoic acid (PFNA)	Ave	0.6485	0.6629		4.54	4.45	2.2	50.0
13C2 PFHxA	Ave	1.207	1.208		10.0	10.0	0.2	30.0
13C2 PFDA	Ave	0.6716	0.6635		9.88	10.0	-1.2	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47697.b\2017.09.08_537B_004.d
 Lims ID: CCVL
 Client ID:
 Sample Type: CCVL
 Inject. Date: 08-Sep-2017 15:38:19 ALS Bottle#: 2 Worklist Smp#: 3
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L2
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub1
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47697.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 11-Sep-2017 13:40:46 Calib Date: 08-Sep-2017 13:51:29
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47689.b\2017.09.08_537ICAL_009.d

Column 1 : Det: EXP1

Process Host: XAWRK011

First Level Reviewer: barnettj

Date: 11-Sep-2017 10:13:37

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.442	1.440	0.002	1.000	4384320	20.5		2929	
298.90 > 99.00	1.442	1.440	0.002	1.000	3146825		1.39(0.00-0.00)	2377	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.578	1.577	0.001	1.000	2456768	10.0		12781	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.737	1.736	0.001	1.000	444074	2.34		90.7	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.737	1.739	-0.002	1.000	2312363	6.91		3441	
* 6 13C2-PFOA									
415.00 > 370.00	1.927	1.932	-0.005		2032951	10.0		10848	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.927	1.933	-0.006	1.000	816255	4.34		58.7	
413.00 > 169.00	1.927	1.933	-0.006	1.000	466657		1.75(0.00-0.00)	829	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.162	2.162	0.0	1.000	1695895	8.72		1040	
499.00 > 99.00	2.162	2.162	0.0	1.000	364303		4.66(0.00-0.00)	530	
* 7 13C4 PFOS									
503.00 > 80.00	2.162	2.164	-0.002		6012410	28.7		6165	
9 Perfluorononanoic acid									
463.00 > 419.00	2.170	2.171	-0.001	1.000	599093	4.54		81.4	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.322	2.320	0.002	1.000	1348768	9.88		9886	

Reagents:

LC537-L2_00020

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47697.b\2017.09.08_537B_004.d

Injection Date: 08-Sep-2017 15:38:19

Instrument ID: A8_N

Lims ID: CCVL

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 2

Worklist Smp#: 3

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

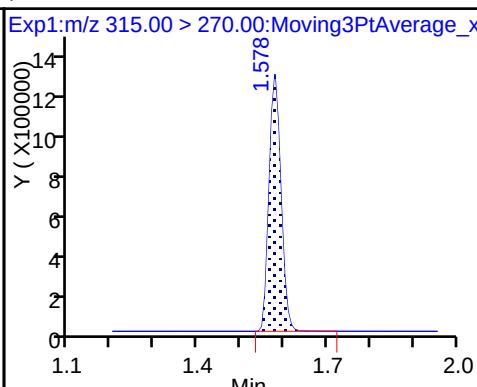
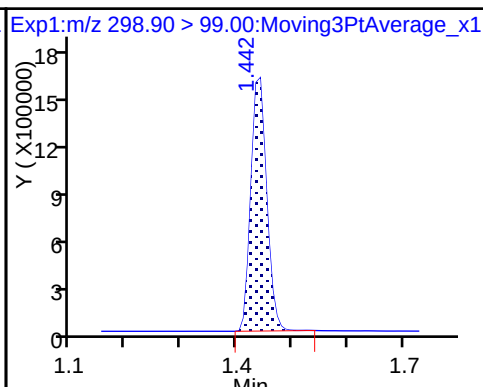
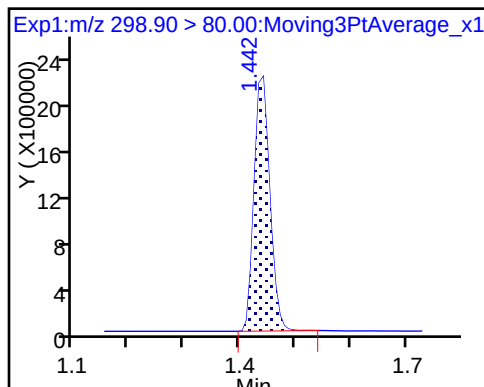
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

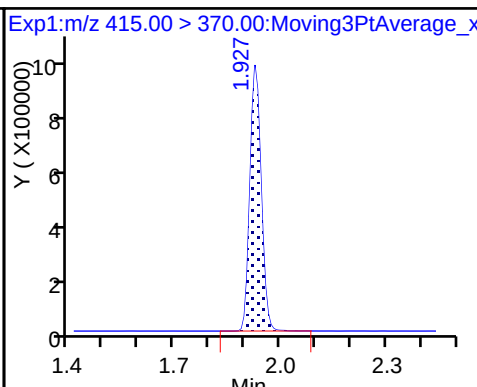
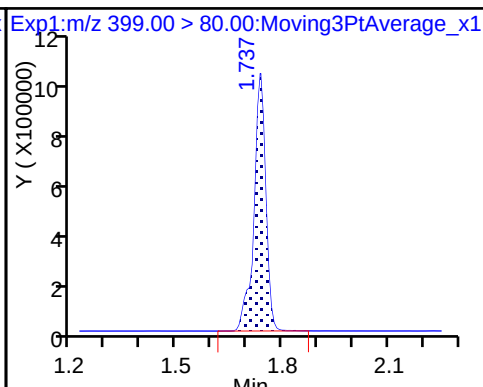
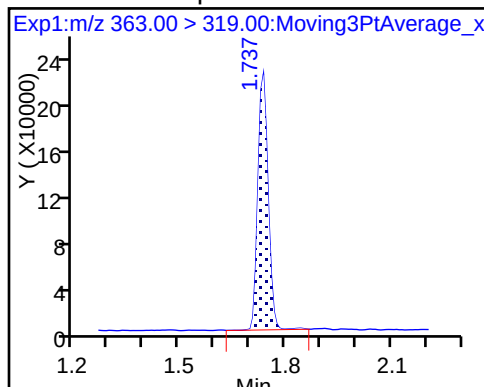
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

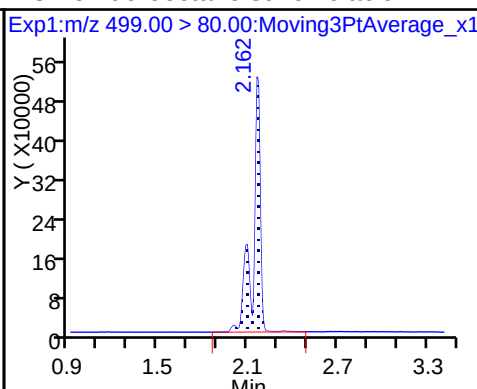
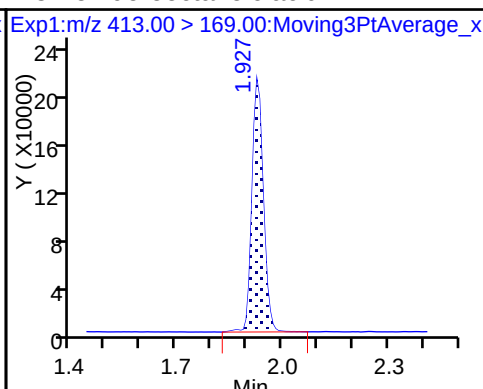
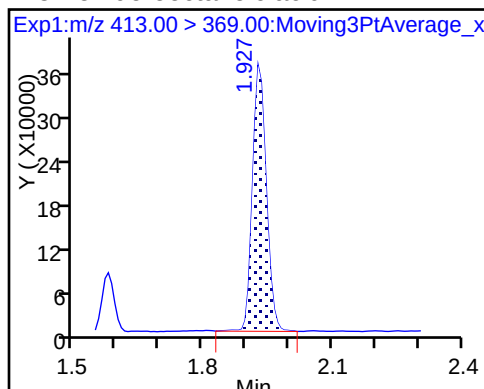
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

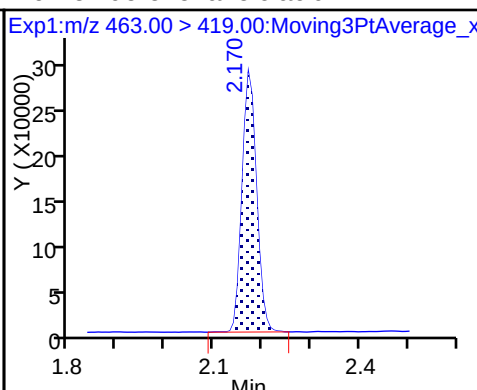
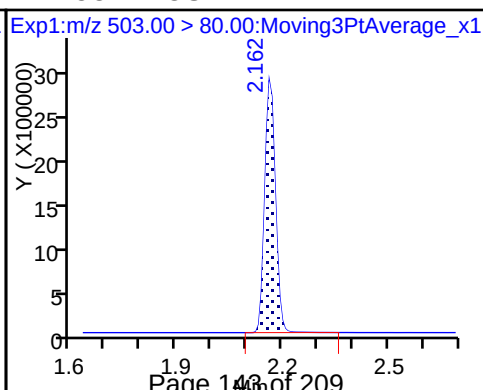
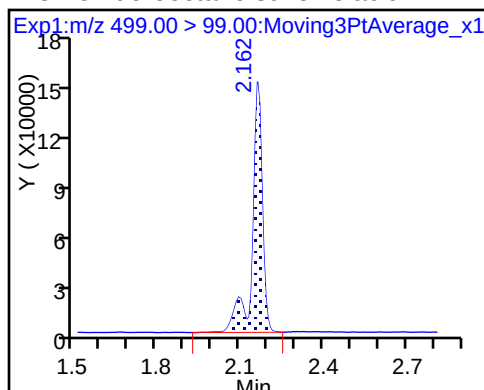
8 Perfluorooctane sulfonic acid



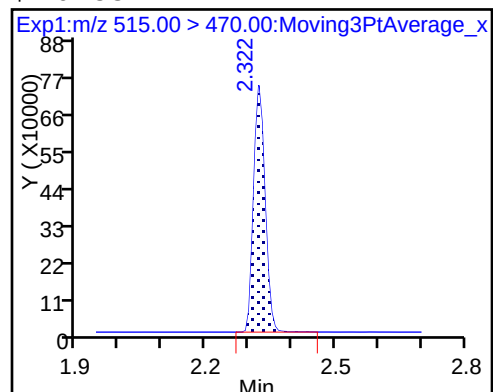
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-31180-1
 SDG No.: WE04
 Lab Sample ID: CCV 320-183512/1 Calibration Date: 09/08/2017 20:41
 Instrument ID: A8_N Calib Start Date: 09/08/2017 13:27
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 09/08/2017 13:51
 Lab File ID: 2017.09.08_537C_001.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		1.034		48.3	45.0	7.3	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9339	1.033		5.53	5.00	10.6	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.597	1.670		15.7	15.0	4.6	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9262	0.9403		10.2	10.0	1.5	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9275	0.9220		19.9	20.0	-0.6	30.0
Perfluorononanoic acid (PFNA)	Ave	0.6485	0.6642		10.2	10.0	2.4	30.0
13C2 PFHxA	Ave	1.207	1.286		10.7	10.0	6.5	30.0
13C2 PFDA	Ave	0.6716	0.6874		10.2	10.0	2.4	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47701.b\2017.09.08_537C_001.d
 Lims ID: CCV L3
 Client ID:
 Sample Type: CCVIS
 Inject. Date: 08-Sep-2017 20:41:59 ALS Bottle#: 3 Worklist Smp#: 1
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L3
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub1
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47701.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 11-Sep-2017 15:23:38 Calib Date: 08-Sep-2017 13:51:29
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47689.b\2017.09.08_537ICAL_009.d

Column 1 : Det: EXP1

Process Host: XAWRK011

First Level Reviewer: barnettj Date: 11-Sep-2017 11:11:04

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.442	1.440	0.002	1.000	8662455	48.3		4979	
298.90 > 99.00	1.442	1.440	0.002	1.000	6353317		1.36(0.00-0.00)	4087	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.578	1.577	0.001	1.000	2133533	10.7		14059	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.730	1.736	-0.006	1.000	857257	5.53		176	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.730	1.739	-0.009	1.000	4664734	15.7		5738	
* 6 13C2-PFOA									
415.00 > 370.00	1.920	1.932	-0.012		1659667	10.0		9783	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.920	1.933	-0.013	1.000	1561865	10.2		68.7	
413.00 > 169.00	1.920	1.933	-0.013	1.000	832214		1.88(0.00-0.00)	1928	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.155	2.140	0.015	1.000	3434770	19.9		2654	M
499.00 > 99.00	2.155	2.140	0.015	1.000	690744		4.97(0.00-0.00)	787	M
* 7 13C4 PFOS									
503.00 > 80.00	2.155	2.164	-0.009		5340700	28.7		6043	
9 Perfluorononanoic acid									
463.00 > 419.00	2.162	2.171	-0.009	1.000	1102588	10.2		138	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.314	2.320	-0.006	1.000	1140918	10.2		8588	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L3_00023

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47701.b\2017.09.08_537C_001.d

Injection Date: 08-Sep-2017 20:41:59

Instrument ID: A8_N

Lims ID: CCV L3

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 3

Worklist Smp#: 1

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

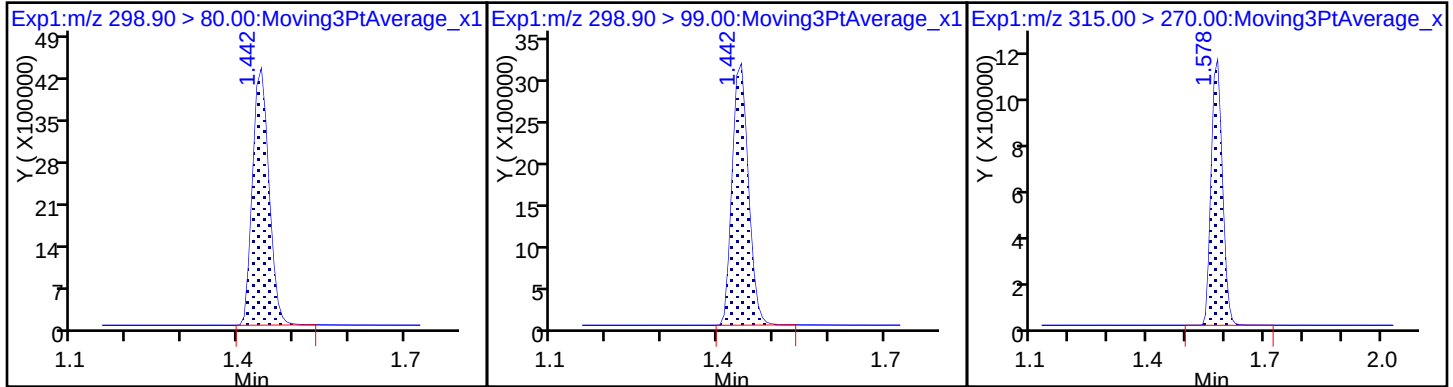
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

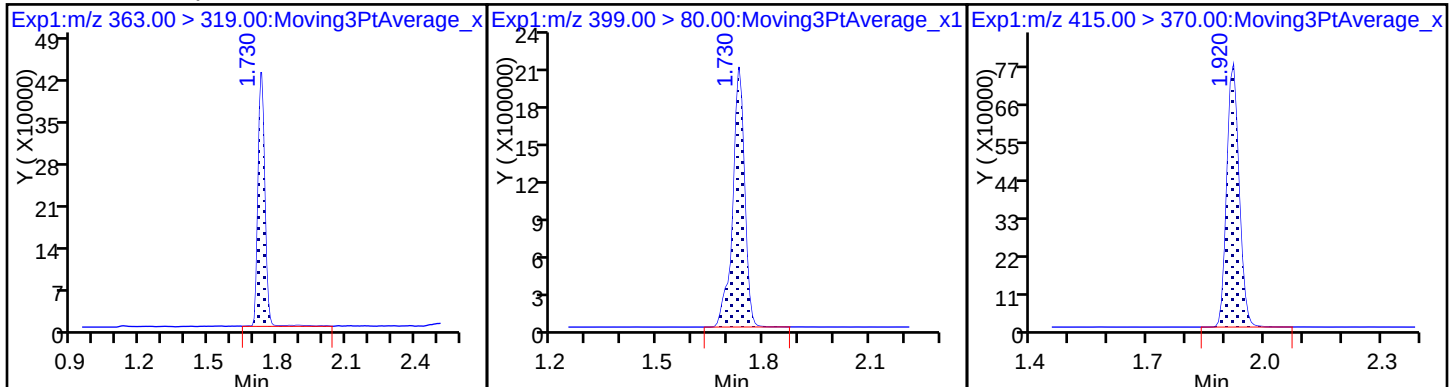
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

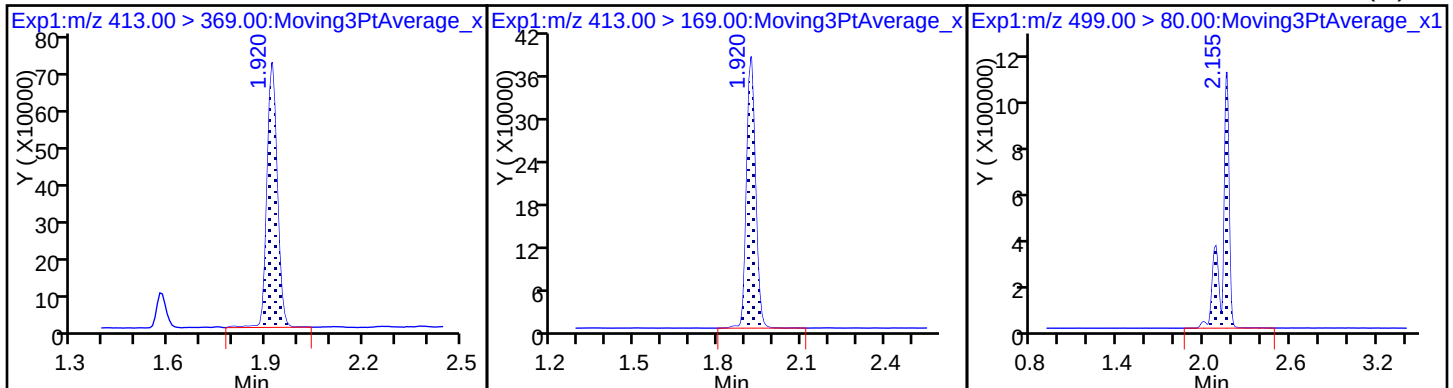
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

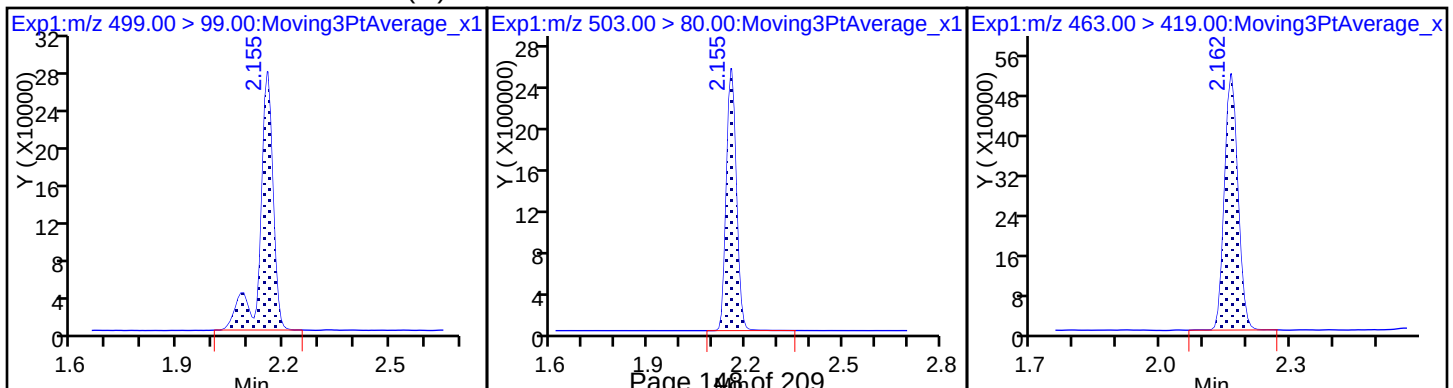
8 Perfluorooctane sulfonic acid (M)



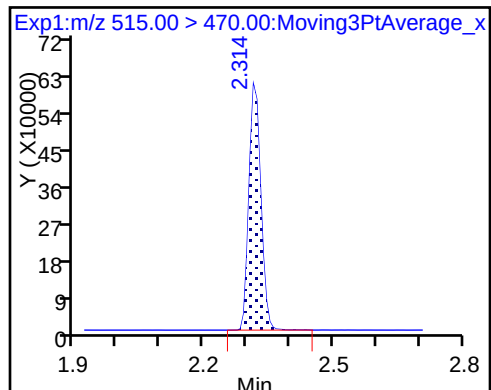
8 Perfluorooctane sulfonic acid (M)

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

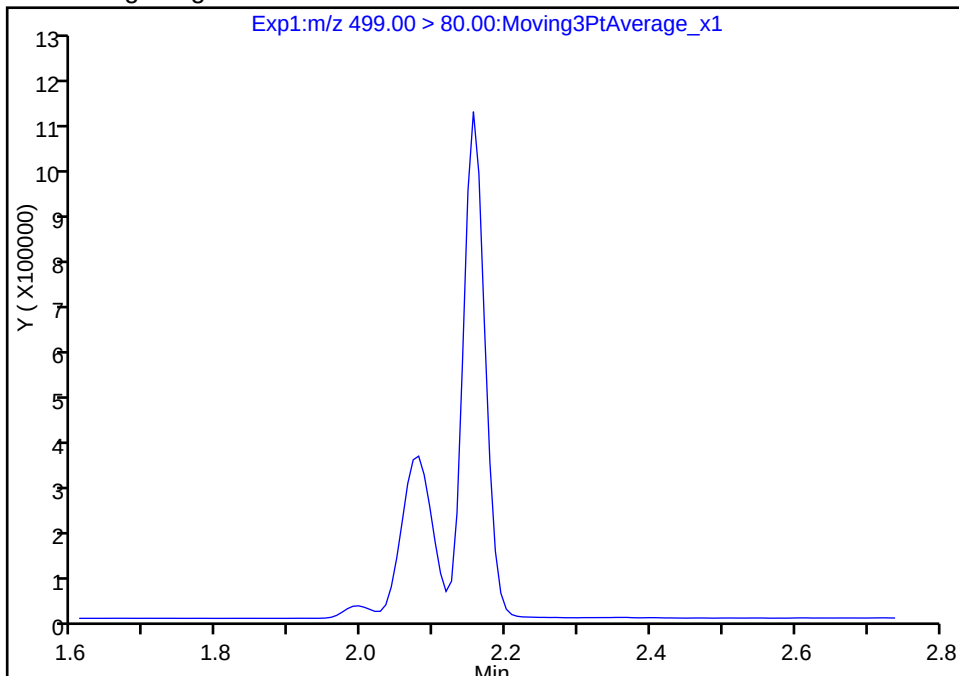
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47701.b\2017.09.08_537C_001.d
Injection Date: 08-Sep-2017 20:41:59 Instrument ID: A8_N
Lims ID: CCV L3
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

8 Perfluorooctane sulfonic acid, CAS: 1763-23-1

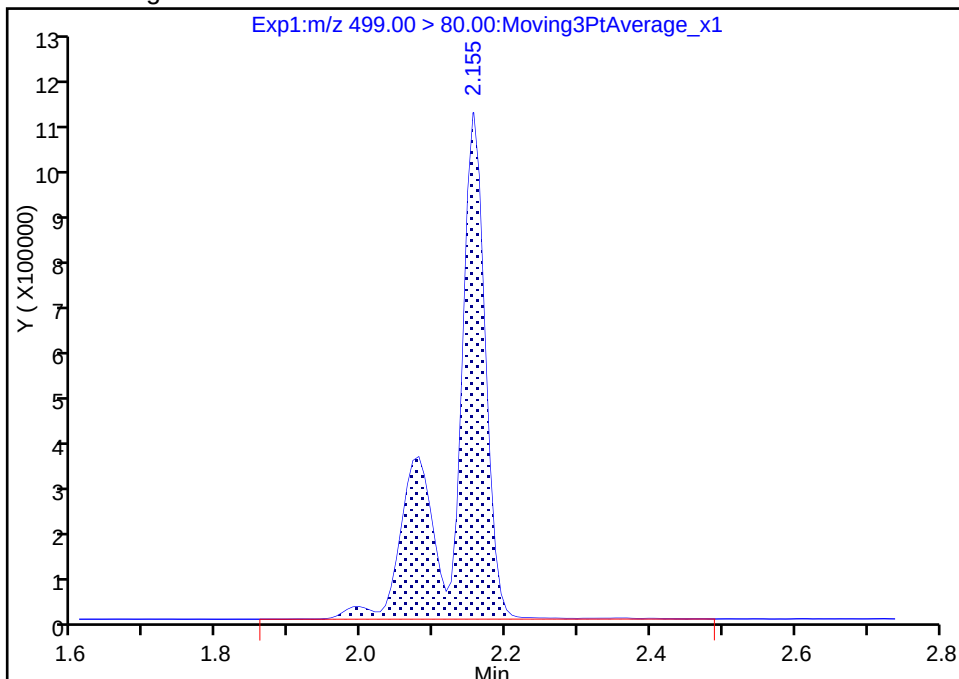
Signal: 1

Not Detected
Expected RT: 2.14

Processing Integration Results



Manual Integration Results



RT: 2.15
Area: 3434770
Amount: 19.887321
Amount Units: ng/ml

Reviewer: barnettj, 11-Sep-2017 11:10:43

Audit Action: Assigned Compound ID

Audit Reason: Missed Peak

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47701.b\2017.09.08_537C_001.d

Injection Date: 08-Sep-2017 20:41:59

Instrument ID: A8_N

Lims ID: CCV L3

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 3

Worklist Smp#: 1

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

Method: 537_A8_N

Limit Group: LC 537 ICAL

Column:

Detector EXP1

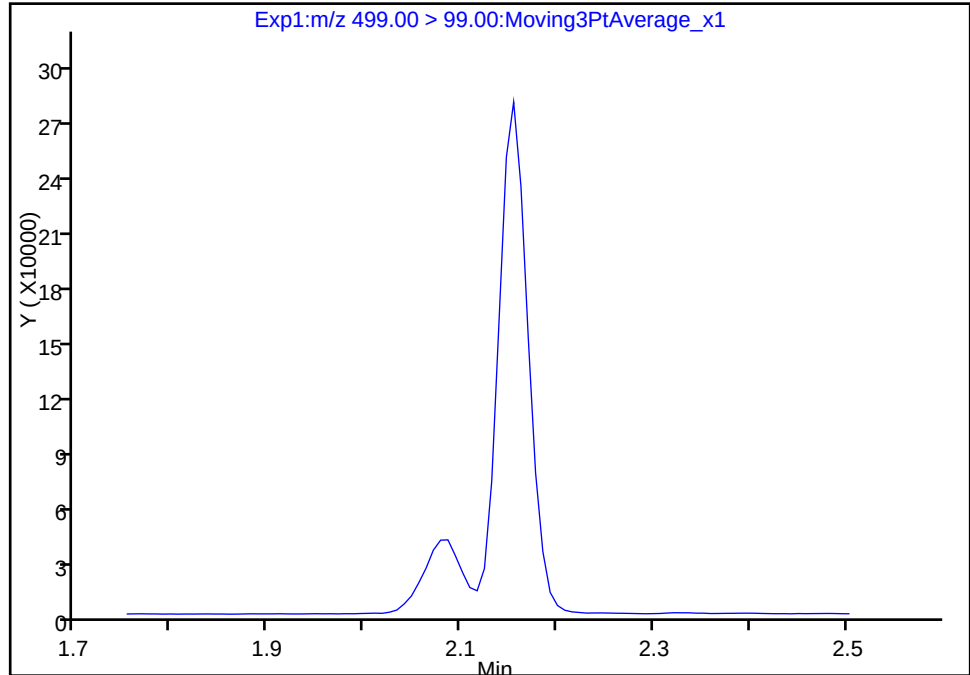
8 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

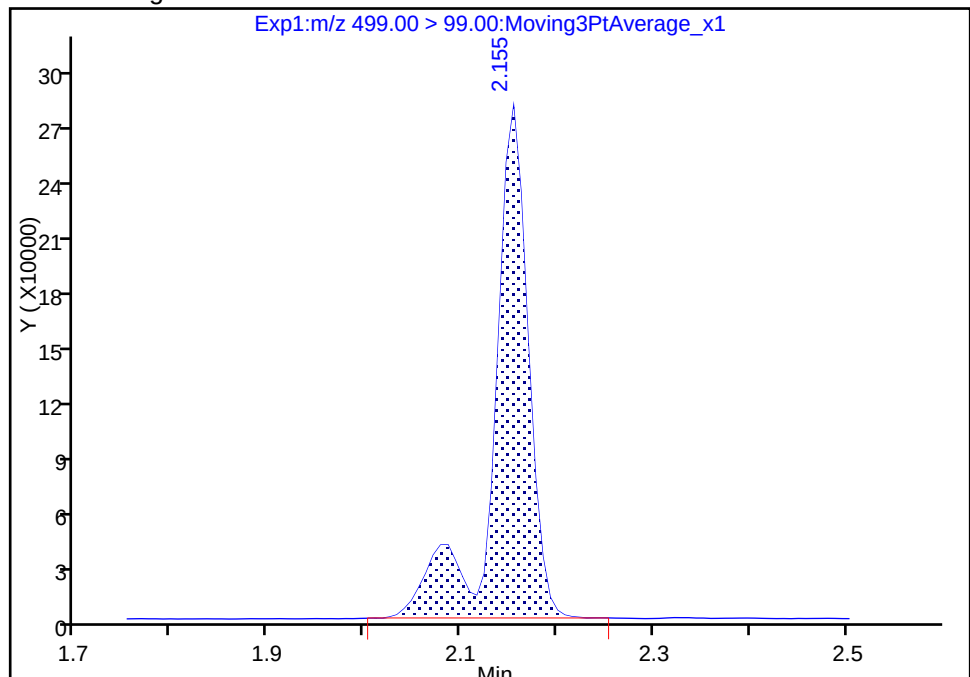
Not Detected

Expected RT: 2.14

Processing Integration Results



Manual Integration Results



RT: 2.15

Area: 690744

Amount: 19.887321

Amount Units: ng/ml

Reviewer: barnettj, 11-Sep-2017 11:10:56

Audit Action: Manually Integrated

Audit Reason: Missed Peak

TestAmerica Sacramento

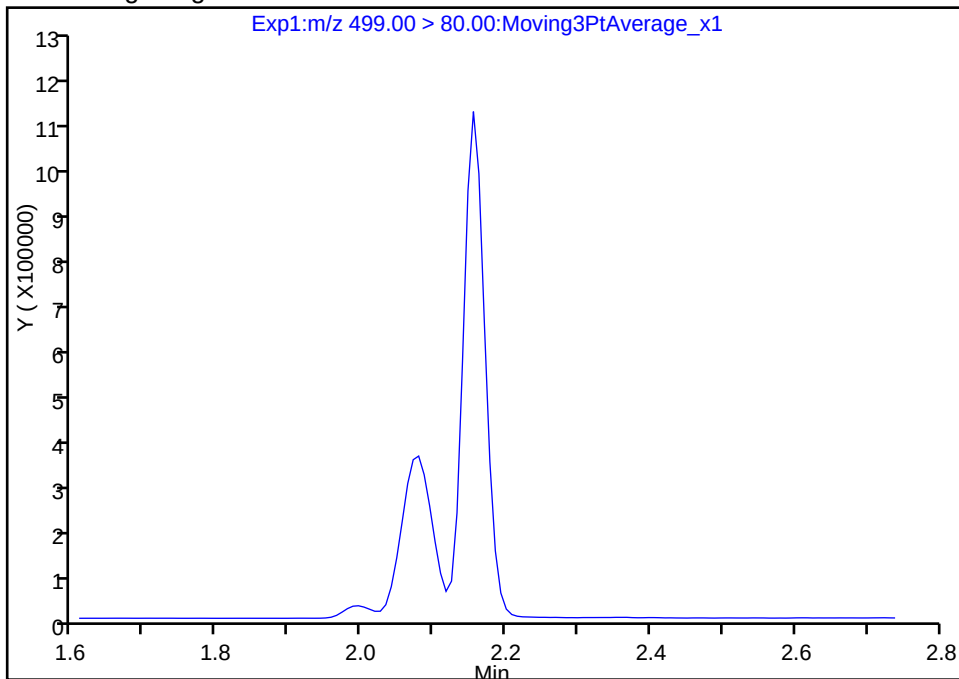
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47701.b\2017.09.08_537C_001.d
Injection Date: 08-Sep-2017 20:41:59 Instrument ID: A8_N
Lims ID: CCV L3
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

8 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

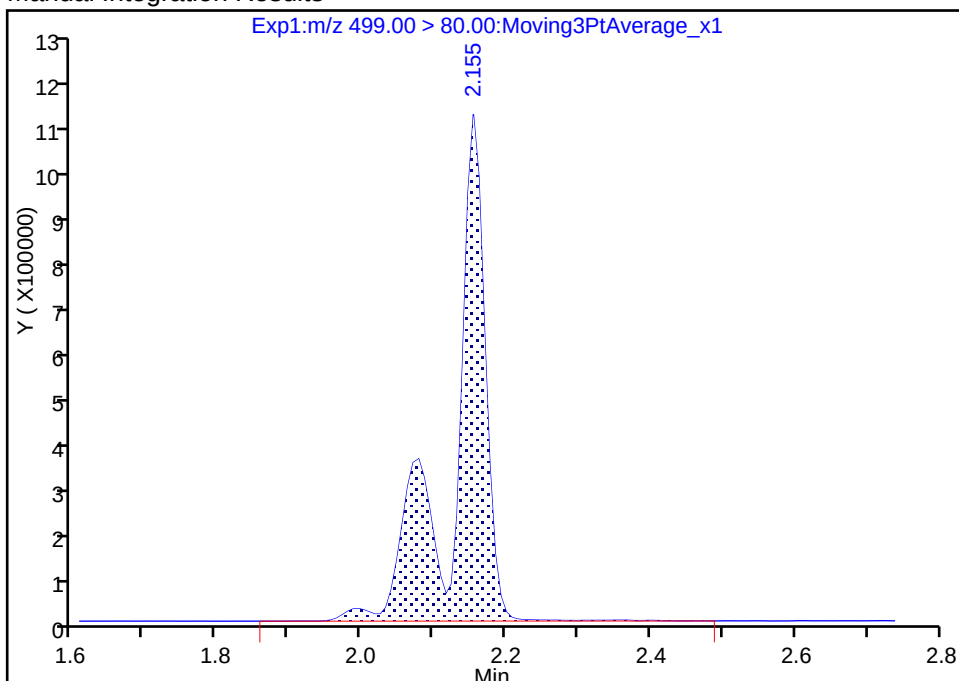
Not Detected
Expected RT: 2.14

Processing Integration Results



Manual Integration Results

RT: 2.15
Area: 3434770
Amount: 19.887321
Amount Units: ng/ml



Reviewer: barnettj, 11-Sep-2017 11:10:56

Audit Action: Manually Integrated

Audit Reason: Missed Peak

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-31180-1
 SDG No.: WE04
 Lab Sample ID: CCV 320-183512/13 Calibration Date: 09/08/2017 21:39
 Instrument ID: A8_N Calib Start Date: 09/08/2017 13:27
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 09/08/2017 13:51
 Lab File ID: 2017.09.08_537C_013.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		0.7924		137	135	1.1	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9339	0.9876		15.9	15.0	5.7	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.597	1.552		43.7	45.0	-2.8	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9262	0.9339		30.3	30.0	0.8	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9275	0.9312		60.3	60.0	0.4	30.0
Perfluorononanoic acid (PFNA)	Ave	0.6485	0.6526		30.2	30.0	0.6	30.0
13C2 PFHxA	Ave	1.207	1.277		10.6	10.0	5.8	30.0
13C2 PFDA	Ave	0.6716	0.6814		10.1	10.0	1.5	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47701.b\2017.09.08_537C_013.d
 Lims ID: CCV L5
 Client ID:
 Sample Type: CCVIS
 Inject. Date: 08-Sep-2017 21:39:02 ALS Bottle#: 5 Worklist Smp#: 13
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L5
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub1
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47701.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 11-Sep-2017 15:23:47 Calib Date: 08-Sep-2017 13:51:29
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47689.b\2017.09.08_537ICAL_009.d

Column 1 : Det: EXP1

Process Host: XAWRK011

First Level Reviewer: barnettj

Date: 11-Sep-2017 11:15:38

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.434	1.440	-0.006	1.000	19518313	136.5		6761	
298.90 > 99.00	1.434	1.440	-0.006	1.000	15131185		1.29(0.00-0.00)	6726	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.571	1.577	-0.007	1.000	2138171	10.6		12482	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.722	1.736	-0.014	1.000	2480940	15.9		500	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.722	1.739	-0.017	1.000	12740992	43.7		8667	
* 6 13C2-PFOA									
415.00 > 370.00	1.912	1.932	-0.020		1674403	10.0		9309	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.912	1.933	-0.021	1.000	4695000	30.3		197	
413.00 > 169.00	1.912	1.933	-0.021	1.000	2620840		1.79(0.00-0.00)	5318	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.147	2.140	0.007	1.000	10196134	60.3		6632	
499.00 > 99.00	2.147	2.140	0.007	1.000	2129641		4.79(0.00-0.00)	2205	
* 7 13C4 PFOS									
503.00 > 80.00	2.147	2.164	-0.017		5232378	28.7		5746	
9 Perfluorononanoic acid									
463.00 > 419.00	2.155	2.171	-0.016	1.000	3278671	30.2		327	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.314	2.320	-0.006	1.000	1140919	10.1		8723	

Reagents:

LC537-L5_00024

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47701.b\2017.09.08_537C_013.d

Injection Date: 08-Sep-2017 21:39:02

Instrument ID: A8_N

Lims ID: CCV L5

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 5

Worklist Smp#: 13

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

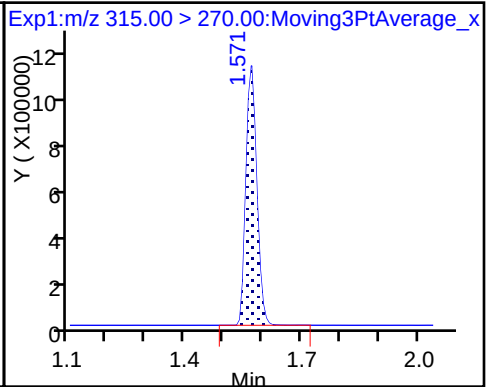
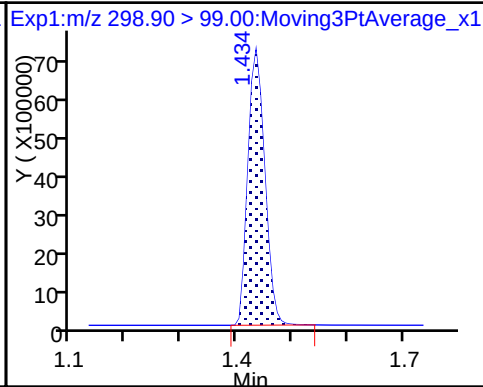
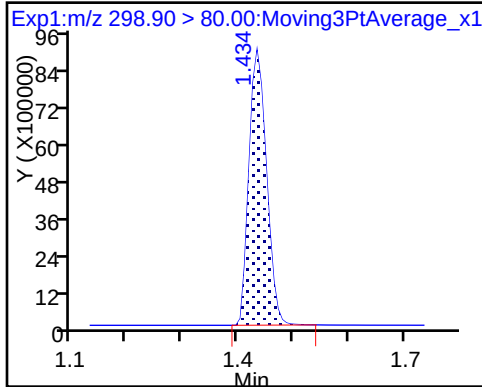
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

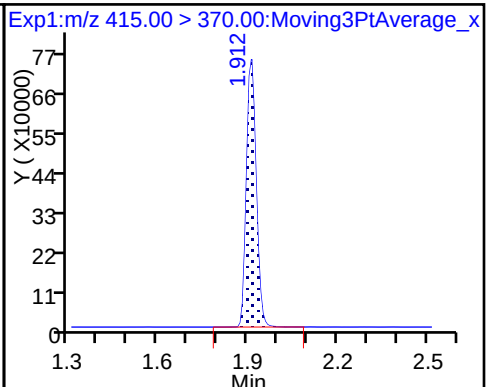
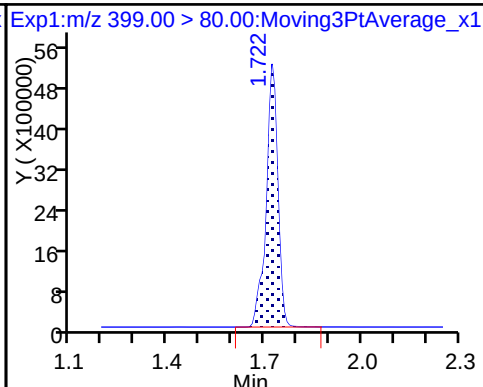
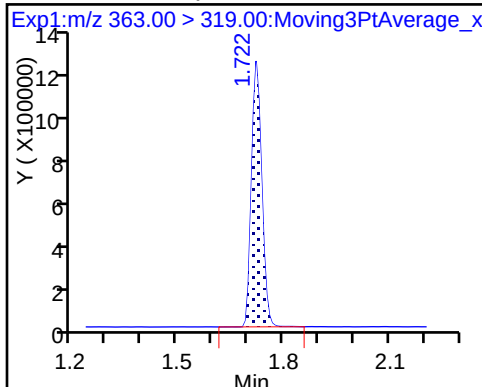
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

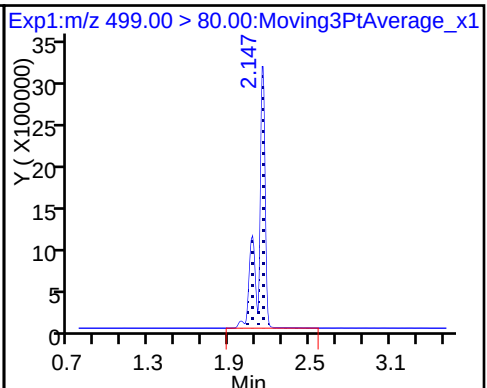
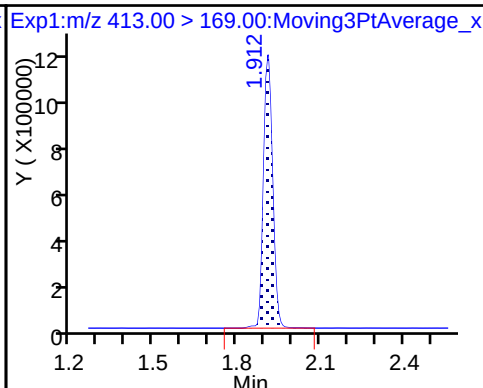
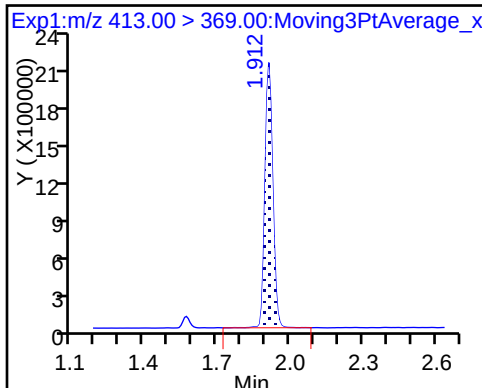
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

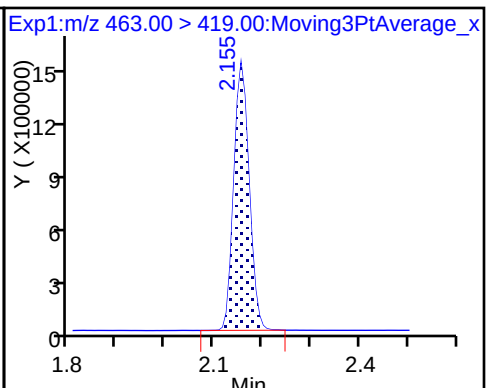
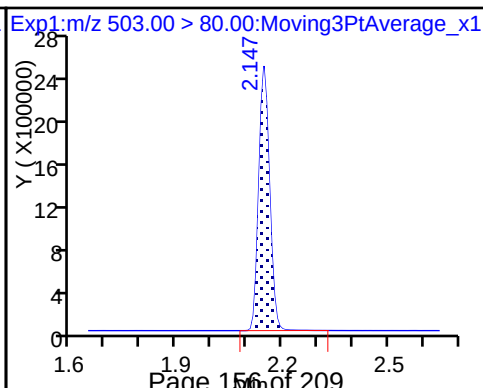
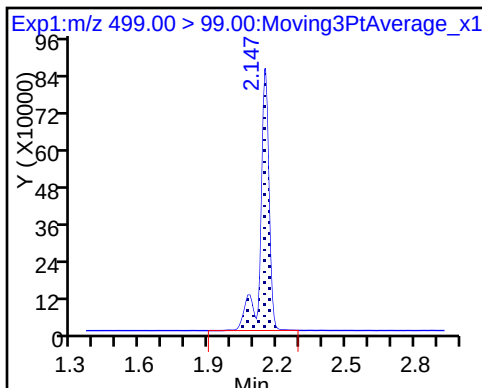
8 Perfluorooctane sulfonic acid



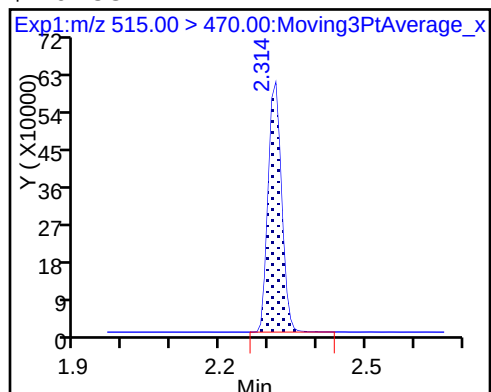
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-31180-1
 SDG No.: WE04
 Lab Sample ID: CCV 320-183774/25 Calibration Date: 09/08/2017 22:36
 Instrument ID: A8_N Calib Start Date: 09/08/2017 13:27
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 09/08/2017 13:51
 Lab File ID: 2017.09.08_537C_025.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		1.032		48.2	45.0	7.1	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9339	1.007		5.39	5.00	7.8	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.597	1.694		15.9	15.0	6.1	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9262	0.9253		10.0	10.0	-0.1	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9275	0.9070		19.6	20.0	-2.2	30.0
Perfluorononanoic acid (PFNA)	Ave	0.6485	0.6860		10.6	10.0	5.8	30.0
13C2 PFHxA	Ave	1.207	1.286		10.7	10.0	6.6	30.0
13C2 PFDA	Ave	0.6716	0.6809		10.1	10.0	1.4	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47701.b\2017.09.08_537C_025.d
 Lims ID: CCV L3
 Client ID:
 Sample Type: CCVIS
 Inject. Date: 08-Sep-2017 22:36:06 ALS Bottle#: 3 Worklist Smp#: 25
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L3
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub1
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47701.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 11-Sep-2017 15:23:55 Calib Date: 08-Sep-2017 13:51:29
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47689.b\2017.09.08_537ICAL_009.d

Column 1 : Det: EXP1

Process Host: XAWRK011

First Level Reviewer: barnettj

Date: 11-Sep-2017 11:18:35

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.434	1.440	-0.006	1.000	9019513	48.2		4953	
298.90 > 99.00	1.434	1.440	-0.006	1.000	6464892		1.40(0.00-0.00)	3955	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.571	1.577	-0.007	1.000	2267952	10.7		12367	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.722	1.736	-0.014	1.000	887704	5.39		181	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.730	1.739	-0.009	1.000	4935276	15.9		5814	
* 6 13C2-PFOA									
415.00 > 370.00	1.912	1.932	-0.020		1762955	10.0		9208	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.912	1.933	-0.021	1.000	1632627	10.0		65.4	
413.00 > 169.00	1.912	1.933	-0.021	1.000	875385		1.87(0.00-0.00)	2109	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.147	2.140	0.007	1.000	3522927	19.6		2661	
499.00 > 99.00	2.147	2.140	0.007	1.000	730898		4.82(0.00-0.00)	847	
* 7 13C4 PFOS									
503.00 > 80.00	2.147	2.164	-0.017		5568740	28.7		6133	
9 Perfluorononanoic acid									
463.00 > 419.00	2.155	2.171	-0.016	1.000	1209579	10.6		126	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.306	2.320	-0.014	1.000	1200337	10.1		10416	

Reagents:

LC537-L3_00023

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47701.b\2017.09.08_537C_025.d

Injection Date: 08-Sep-2017 22:36:06

Instrument ID: A8_N

Lims ID: CCV L3

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 3

Worklist Smp#: 25

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

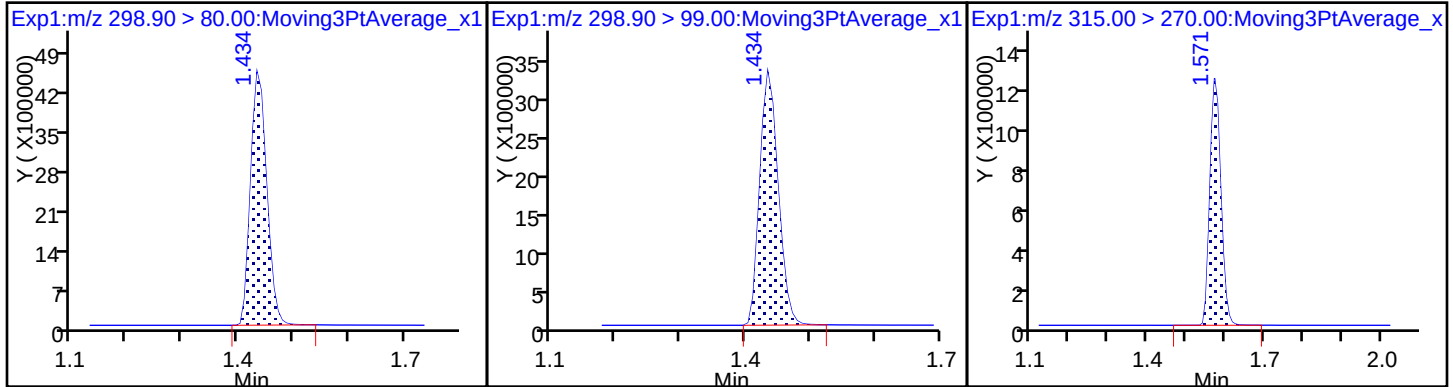
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

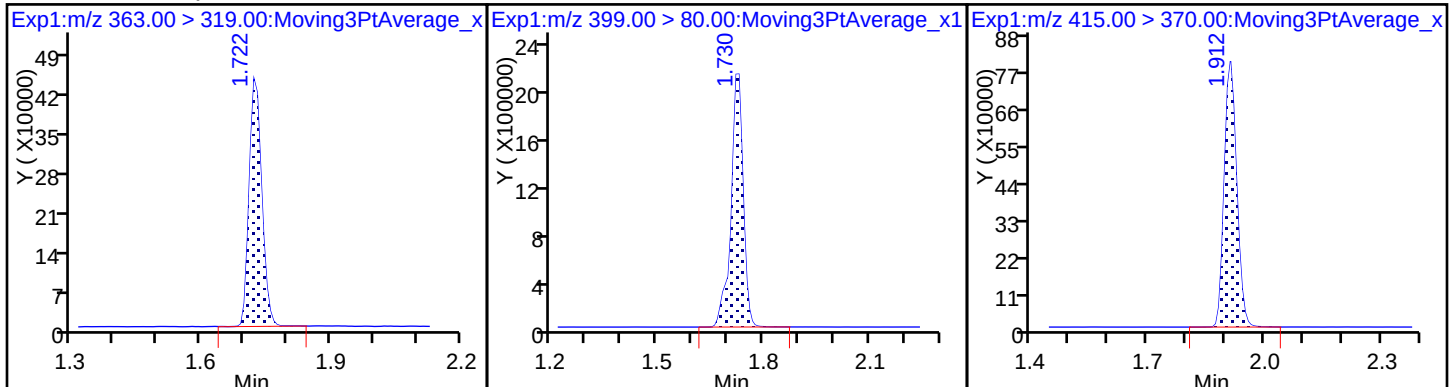
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

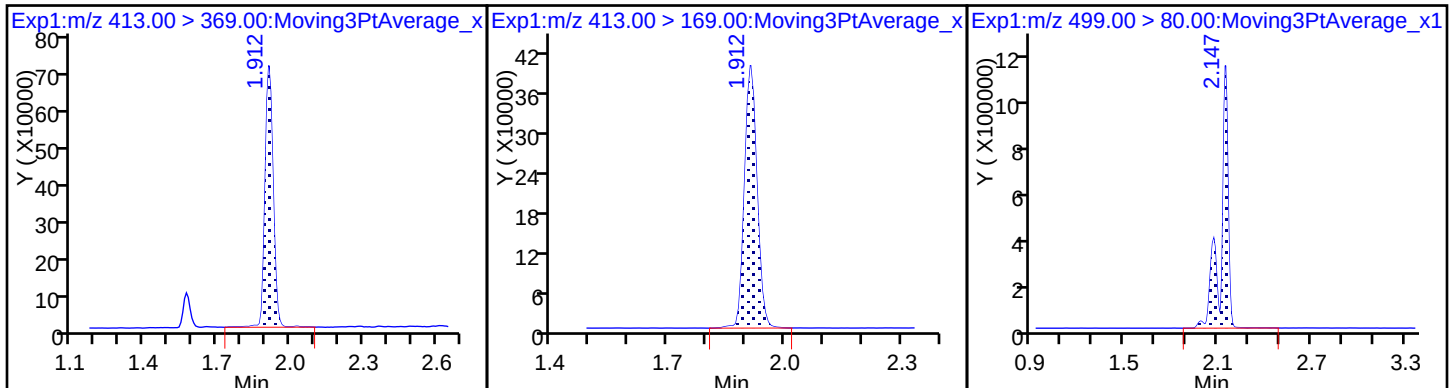
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

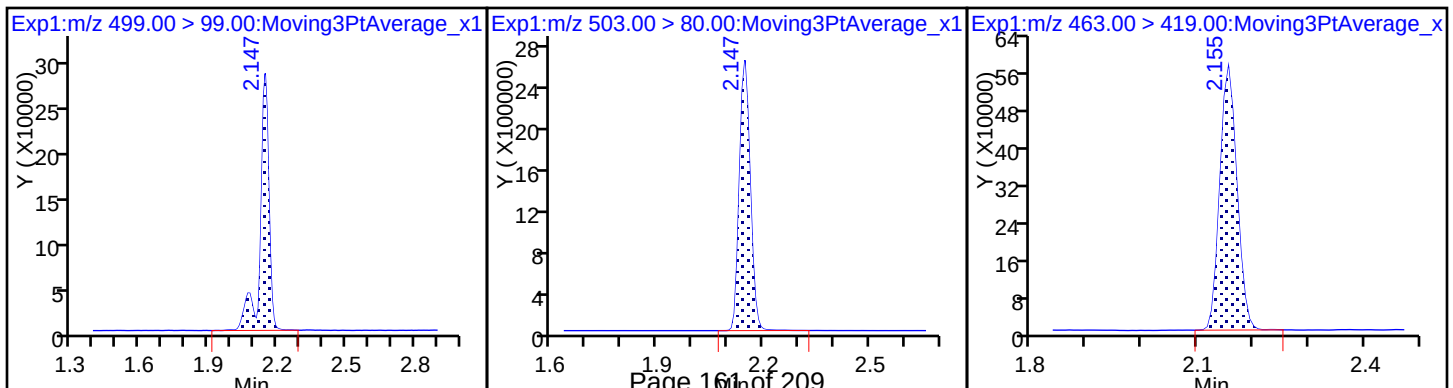
8 Perfluorooctane sulfonic acid



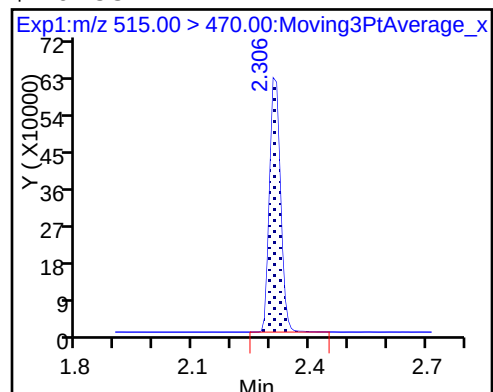
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-31180-1
 SDG No.: WE04
 Lab Sample ID: CCV 320-183774/29 Calibration Date: 09/08/2017 22:55
 Instrument ID: A8_N Calib Start Date: 09/08/2017 13:27
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 09/08/2017 13:51
 Lab File ID: 2017.09.08_537C_029.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		0.7978		138	135	2.2	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9339	0.9816		15.8	15.0	5.1	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.597	1.542		43.5	45.0	-3.4	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9262	0.9192		29.8	30.0	-0.8	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9275	0.9403		60.8	60.0	1.4	30.0
Perfluorononanoic acid (PFNA)	Ave	0.6485	0.6620		30.6	30.0	2.1	30.0
13C2 PFHxA	Ave	1.207	1.300		10.8	10.0	7.7	30.0
13C2 PFDA	Ave	0.6716	0.7048		10.5	10.0	5.0	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47701.b\2017.09.08_537C_029.d
 Lims ID: CCV L5
 Client ID:
 Sample Type: CCVIS
 Inject. Date: 08-Sep-2017 22:55:03 ALS Bottle#: 5 Worklist Smp#: 29
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L5
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub1
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47701.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 11-Sep-2017 15:23:58 Calib Date: 08-Sep-2017 13:51:29
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last Ical File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47689.b\2017.09.08_537ICAL_009.d

Column 1 : Det: EXP1

Process Host: XAWRK011

First Level Reviewer: barnettj

Date: 11-Sep-2017 11:19:36

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.426	1.440	-0.014	1.000	19896732	138.0		6487	
298.90 > 99.00	1.426	1.440	-0.014	1.000	15325147		1.30(0.00-0.00)	6632	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.563	1.577	-0.014	1.000	2250648	10.8		12960	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.722	1.736	-0.014	1.000	2549779	15.8		495	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.722	1.739	-0.017	1.000	12822538	43.5		8837	
* 6 13C2-PFOA									
415.00 > 370.00	1.904	1.932	-0.028		1731366	10.0		10097	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.904	1.933	-0.029	1.000	4778552	29.8		188	
413.00 > 169.00	1.904	1.933	-0.029	1.000	2606538		1.83(0.00-0.00)	5381	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.140	2.140	0.0	1.000	10424070	60.8		6118	
499.00 > 99.00	2.140	2.140	0.0	1.000	2185993		4.77(0.00-0.00)	2123	
* 7 13C4 PFOS									
503.00 > 80.00	2.140	2.164	-0.024		5297806	28.7		6115	
9 Perfluorononanoic acid									
463.00 > 419.00	2.147	2.171	-0.024	1.000	3438984	30.6		344	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.306	2.320	-0.014	1.000	1220332	10.5		9659	

Reagents:

LC537-L5_00024

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47701.b\2017.09.08_537C_029.d

Injection Date: 08-Sep-2017 22:55:03

Instrument ID: A8_N

Lims ID: CCV L5

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 5

Worklist Smp#: 29

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

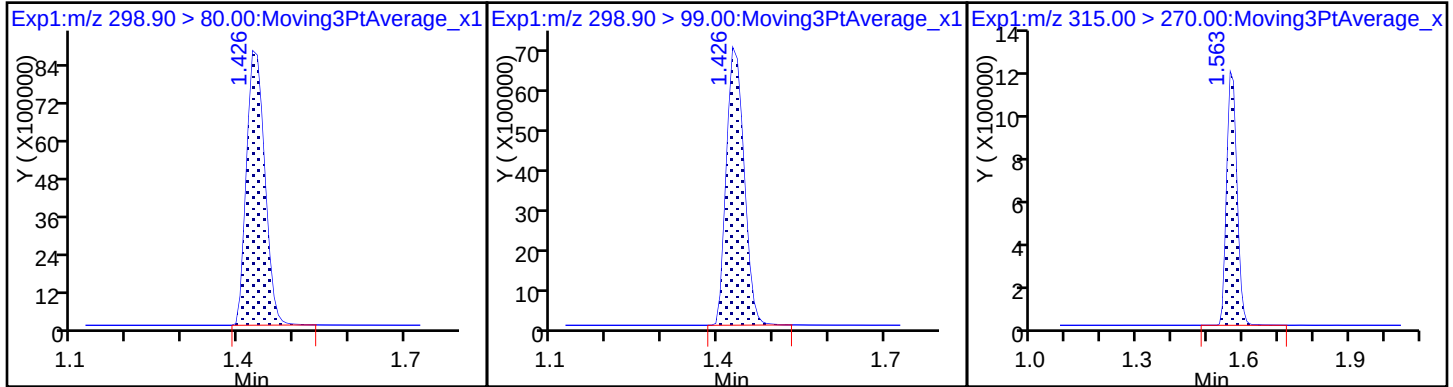
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

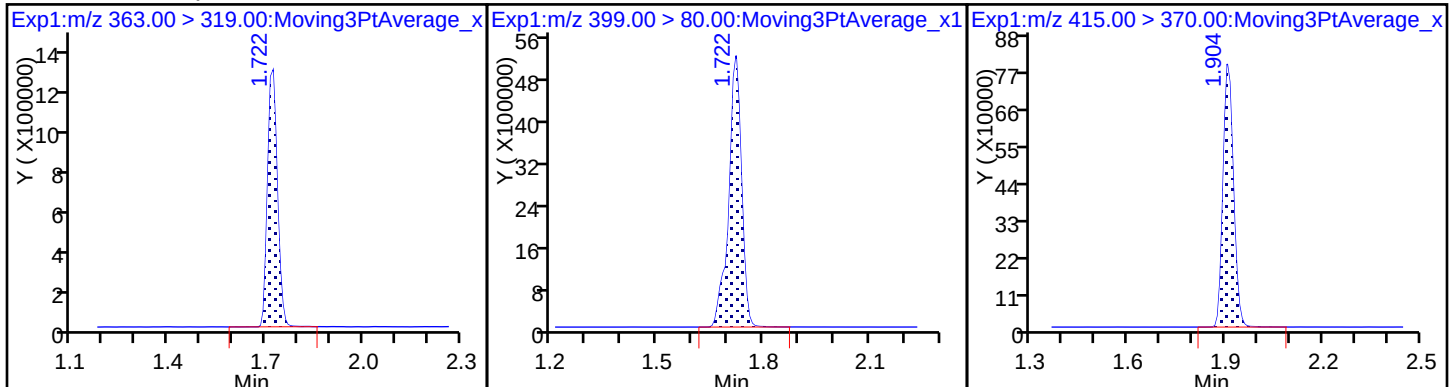
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

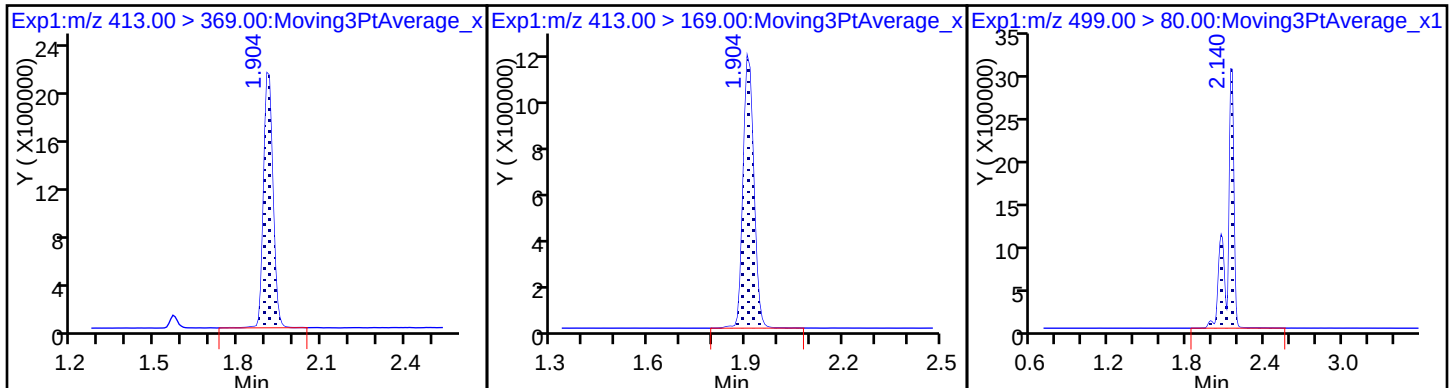
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

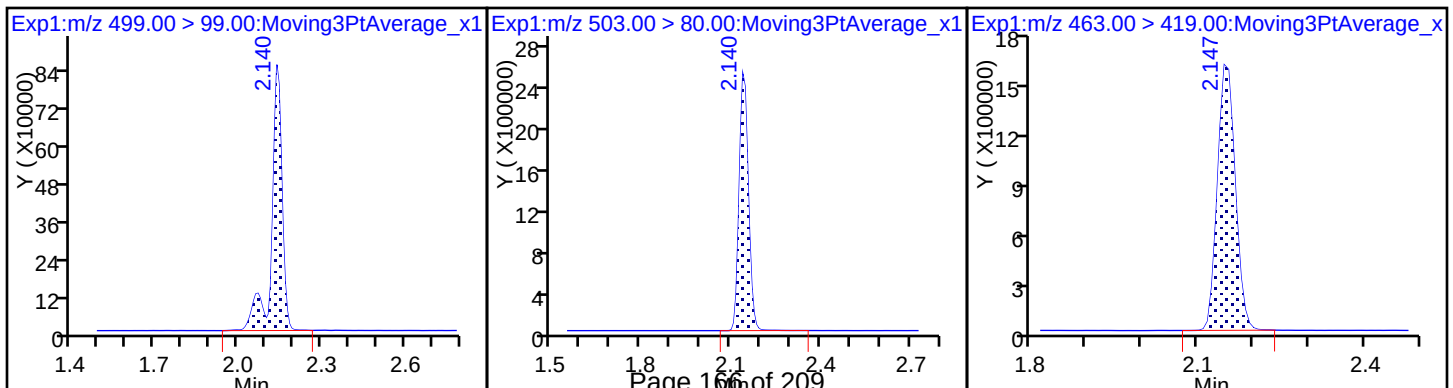
8 Perfluorooctane sulfonic acid



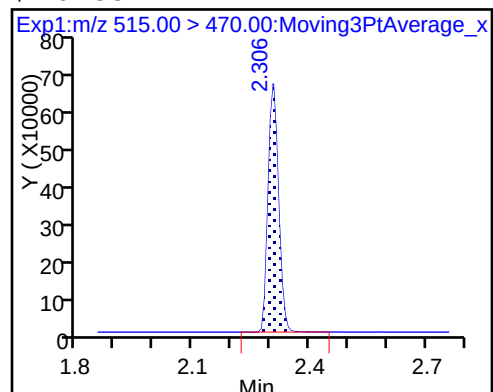
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-31180-1</u>
SDG No.: <u>WE04</u>	
Client Sample ID: _____	Lab Sample ID: <u>MB 320-182400/1-A</u>
Matrix: <u>Water</u>	Lab File ID: <u>2017.09.08_537C_003.d</u>
Analysis Method: <u>537</u>	Date Collected: _____
Extraction Method: <u>537</u>	Date Extracted: <u>09/01/2017 08:39</u>
Sample wt/vol: <u>250 (mL)</u>	Date Analyzed: <u>09/08/2017 20:51</u>
Con. Extract Vol.: <u>1.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>183512</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	8.0	U	20	8.0	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	8.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.0	U	10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	90	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	101		70-130
STL00996	13C2 PFDA	111		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47701.b\2017.09.08_537C_003.d
 Lims ID: MB 320-182400/1-A
 Client ID:
 Sample Type: MB
 Inject. Date: 08-Sep-2017 20:51:30 ALS Bottle#: 1 Worklist Smp#: 3
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: mb 320-182400/1-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47701.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 11-Sep-2017 15:23:38 Calib Date: 08-Sep-2017 13:51:29
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170908-47689.b\2017.09.08_537ICAL_009.d

Column 1 : Det: EXP1

Process Host: XAWRK011

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.578	1.577	0.001	1.000	2168128	10.1		12612	
* 6 13C2-PFOA									
415.00 > 370.00	1.920	1.932	-0.012		1780906	10.0		9557	
* 7 13C4 PFOS									
503.00 > 80.00	2.155	2.164	-0.009		5489924	28.7		4963	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.314	2.320	-0.006	1.000	1332225	11.1		10649	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47701.b\2017.09.08_537C_003.d

Injection Date: 08-Sep-2017 20:51:30

Instrument ID: A8_N

Lims ID: MB 320-182400/1-A

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 1

Worklist Smp#: 3

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

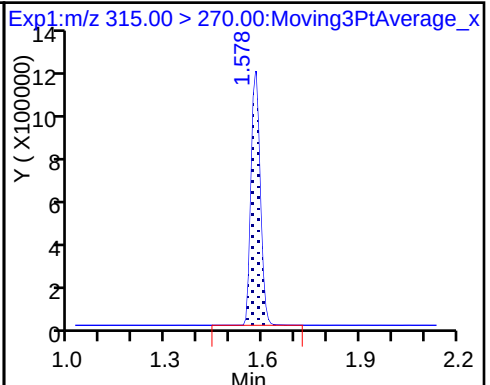
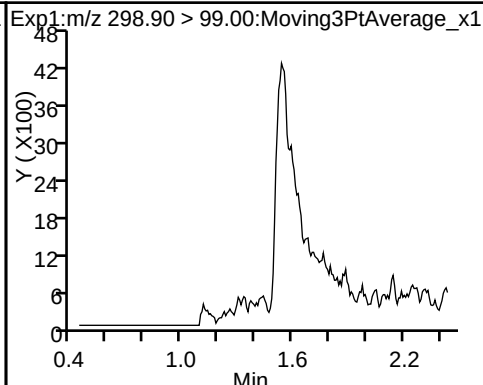
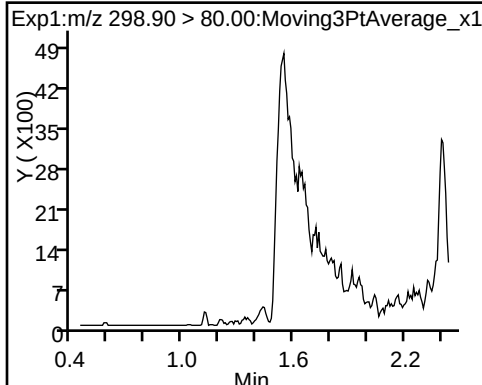
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

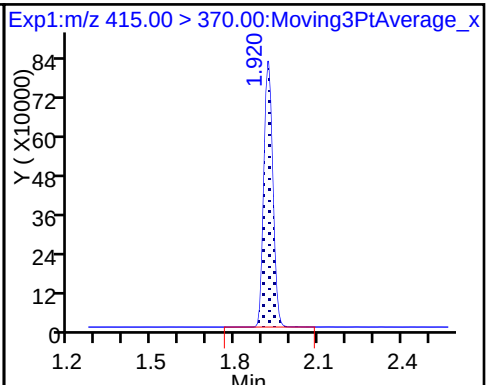
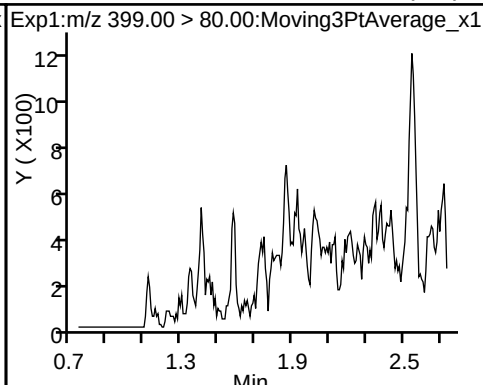
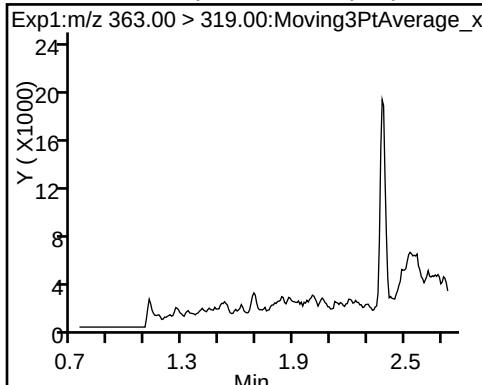
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid (ND)

3 Perfluorohexanesulfonic acid (ND)

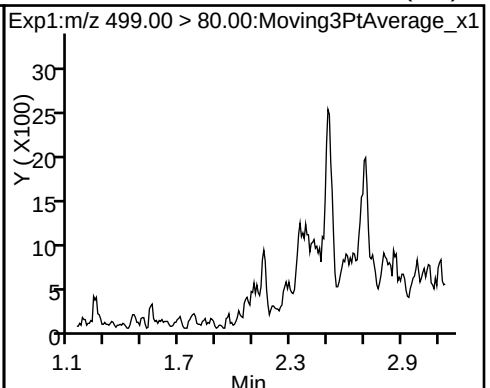
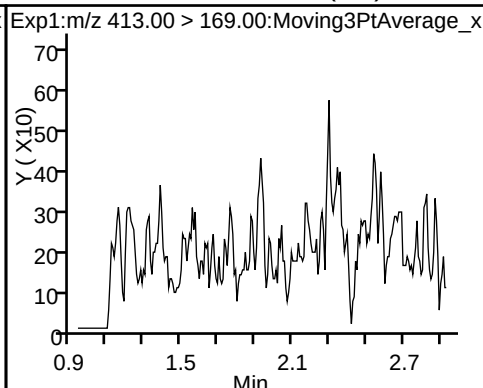
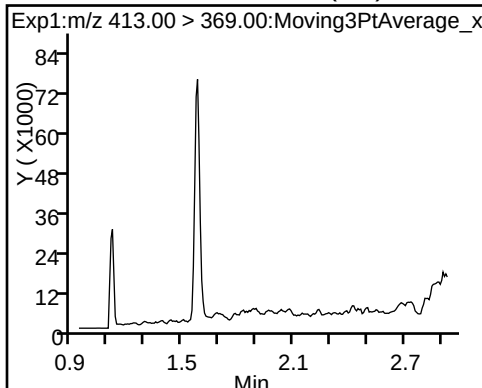
* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

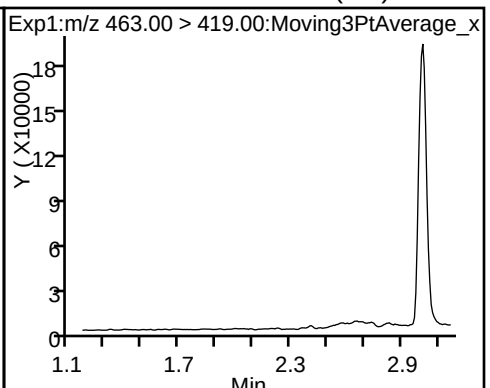
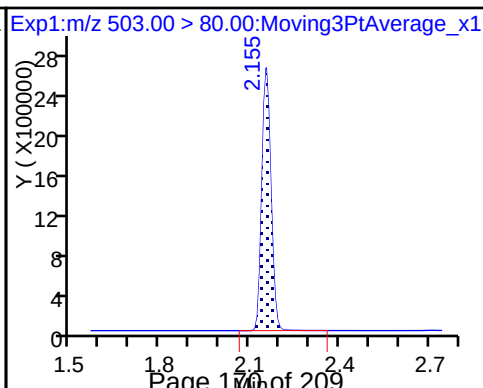
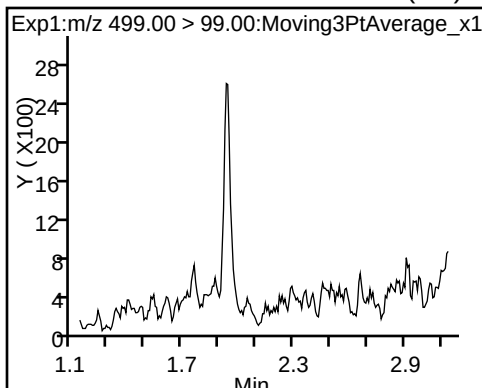
5 Perfluorooctanoic acid (ND)

8 Perfluorooctane sulfonic acid (ND)

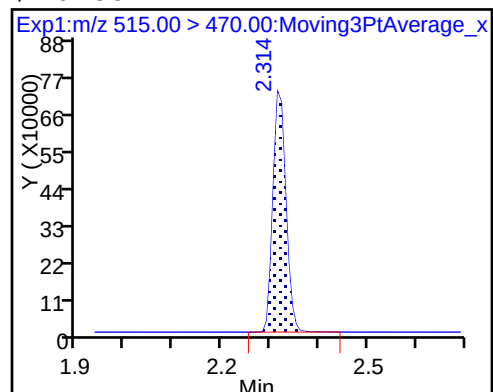


8 Perfluorooctane sulfonic acid (ND) * 7 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47701.b\2017.09.08_537C_003.d
Lims ID: MB 320-182400/1-A
Client ID:
Sample Type: MB
Inject. Date: 08-Sep-2017 20:51:30 ALS Bottle#: 1 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: mb 320-182400/1-a
Misc. Info.: Plate: 1 Rack: 3
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Method: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47701.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 11-Sep-2017 15:23:38 Calib Date: 08-Sep-2017 13:51:29
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170908-47689.b\2017.09.08_537ICAL_009.d
Column 1 : Det: EXP1
Process Host: XAWRK011

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	10.1	100.90
\$ 10 13C2 PFDA	10.0	11.1	111.39

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-31180-1</u>
SDG No.: <u>WE04</u>	
Client Sample ID: _____	Lab Sample ID: <u>LLCS 320-182400/2-A</u>
Matrix: <u>Water</u>	Lab File ID: <u>2017.09.08_537C_004.d</u>
Analysis Method: <u>537</u>	Date Collected: _____
Extraction Method: <u>537</u>	Date Extracted: <u>09/01/2017 08:39</u>
Sample wt/vol: <u>250 (mL)</u>	Date Analyzed: <u>09/08/2017 20:56</u>
Con. Extract Vol.: <u>1.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>183512</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	37.5	J M	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	19.2	J	20	8.0	2.8
375-95-1	Perfluorononanoic acid (PFNA)	19.1	J	24	20	8.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	30.1		30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	10.4		10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	96.1		90	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	98		70-130
STL00996	13C2 PFDA	108		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47701.b\2017.09.08_537C_004.d
 Lims ID: LLCS 320-182400/2-A
 Client ID:
 Sample Type: LLCS
 Inject. Date: 08-Sep-2017 20:56:16 ALS Bottle#: 2 Worklist Smp#: 4
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: llcs 320-182400/2-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47701.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 11-Sep-2017 15:23:38 Calib Date: 08-Sep-2017 13:51:29
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170908-47689.b\2017.09.08_537ICAL_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK011

First Level Reviewer: barnettj

Date: 11-Sep-2017 11:11:50

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.442	1.440	0.002	1.000	4678605	24.0		2627	
298.90 > 99.00	1.442	1.440	0.002	1.000	3108373		1.51(0.00-0.00)	1845	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.571	1.577	-0.007	1.000	2187209	9.75		12871	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.730	1.736	-0.006	1.000	451508	2.60		89.7	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.730	1.739	-0.009	1.000	2311067	7.53		3141	
* 6 13C2-PFOA									
415.00 > 370.00	1.912	1.932	-0.020		1858873	10.0		8434	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.920	1.933	-0.013	1.000	827772	4.81		39.4	
413.00 > 169.00	1.920	1.933	-0.013	1.000	437586		1.89(0.00-0.00)	979	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.155	2.140	0.015	1.000	1671748	9.38		1155	M
499.00 > 99.00	2.155	2.140	0.015	1.000	352760		4.74(0.00-0.00)	320	M
* 7 13C4 PFOS									
503.00 > 80.00	2.155	2.164	-0.009		5511672	28.7		4540	
9 Perfluorononanoic acid									
463.00 > 419.00	2.162	2.171	-0.009	1.000	576073	4.78		33.3	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.314	2.320	-0.006	1.000	1345407	10.8		9792	

QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47701.b\2017.09.08_537C_004.d

Injection Date: 08-Sep-2017 20:56:16

Instrument ID: A8_N

Lims ID: LLCS 320-182400/2-A

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 2

Worklist Smp#: 4

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

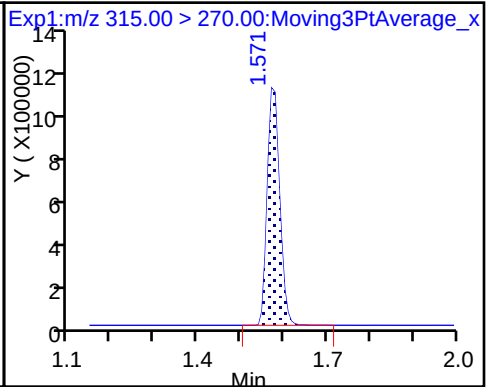
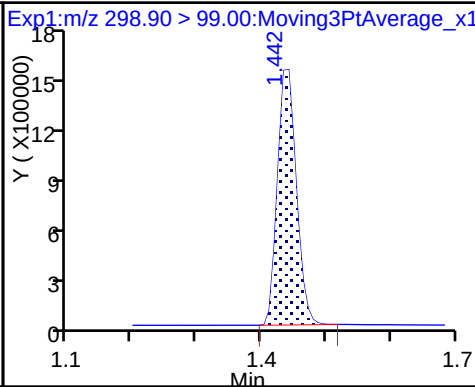
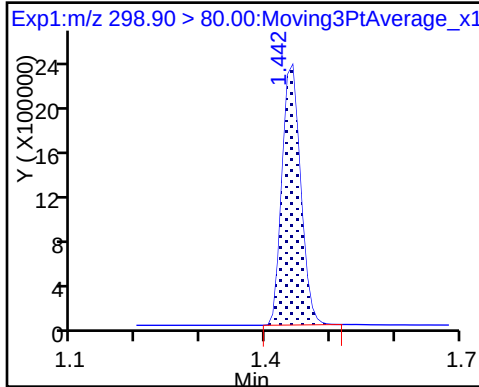
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

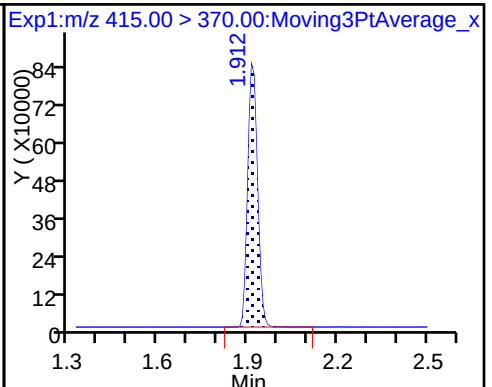
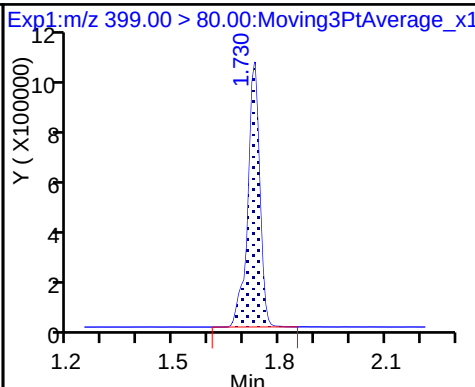
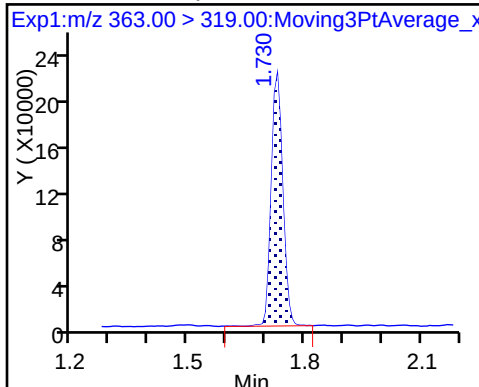
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

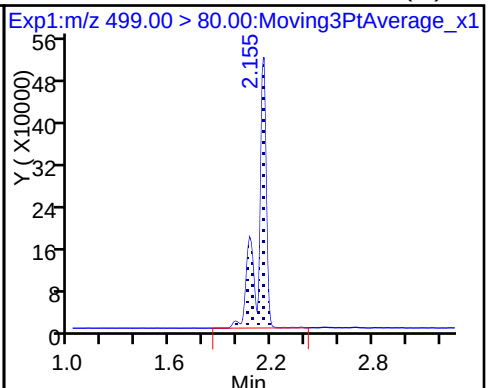
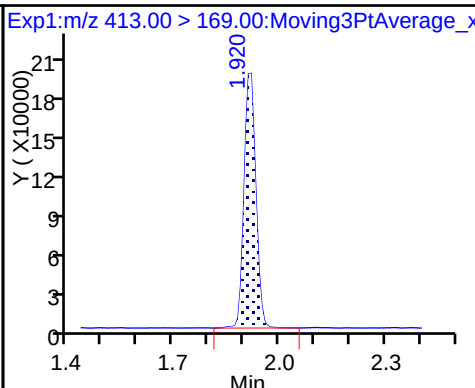
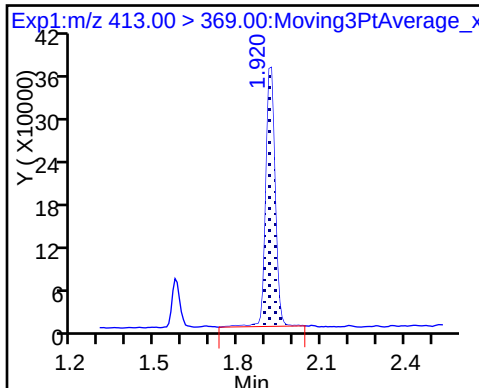
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

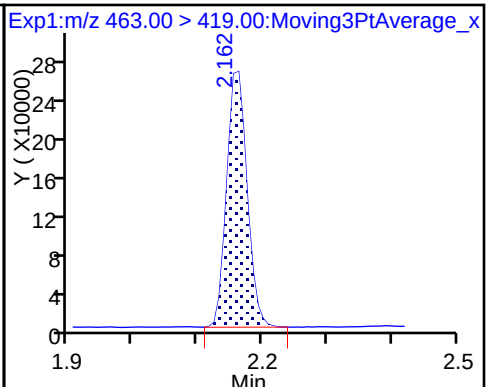
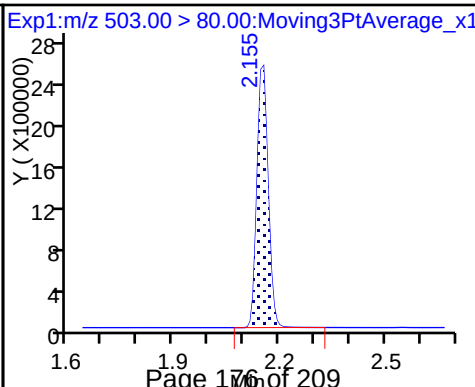
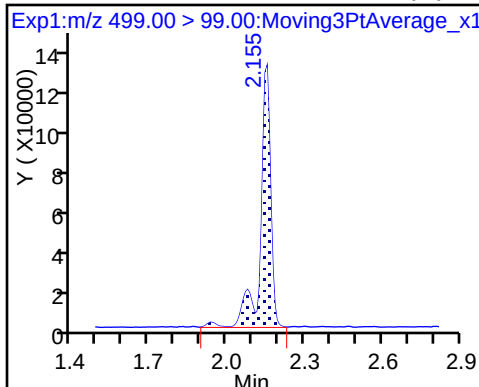
8 Perfluorooctane sulfonic acid (M)



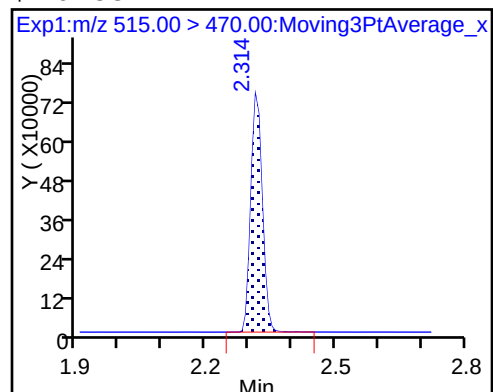
8 Perfluorooctane sulfonic acid (M)

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47701.b\2017.09.08_537C_004.d
Lims ID: LLCS 320-182400/2-A
Client ID:
Sample Type: LLCS
Inject. Date: 08-Sep-2017 20:56:16 ALS Bottle#: 2 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: llcs 320-182400/2-a
Misc. Info.: Plate: 1 Rack: 3
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Method: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47701.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 11-Sep-2017 15:23:38 Calib Date: 08-Sep-2017 13:51:29
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170908-47689.b\2017.09.08_537ICAL_009.d
Column 1 : Det: EXP1
Process Host: XAWRK011

First Level Reviewer: barnettj

Date: 11-Sep-2017 11:11:50

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.75	97.52
\$ 10 13C2 PFDA	10.0	10.8	107.77

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47701.b\2017.09.08_537C_004.d

Injection Date: 08-Sep-2017 20:56:16

Instrument ID: A8_N

Lims ID: LLCS 320-182400/2-A

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#:

2

Worklist Smp#: 4

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

Method: 537_A8_N

Limit Group: LC 537 ICAL

Column:

Detector EXP1

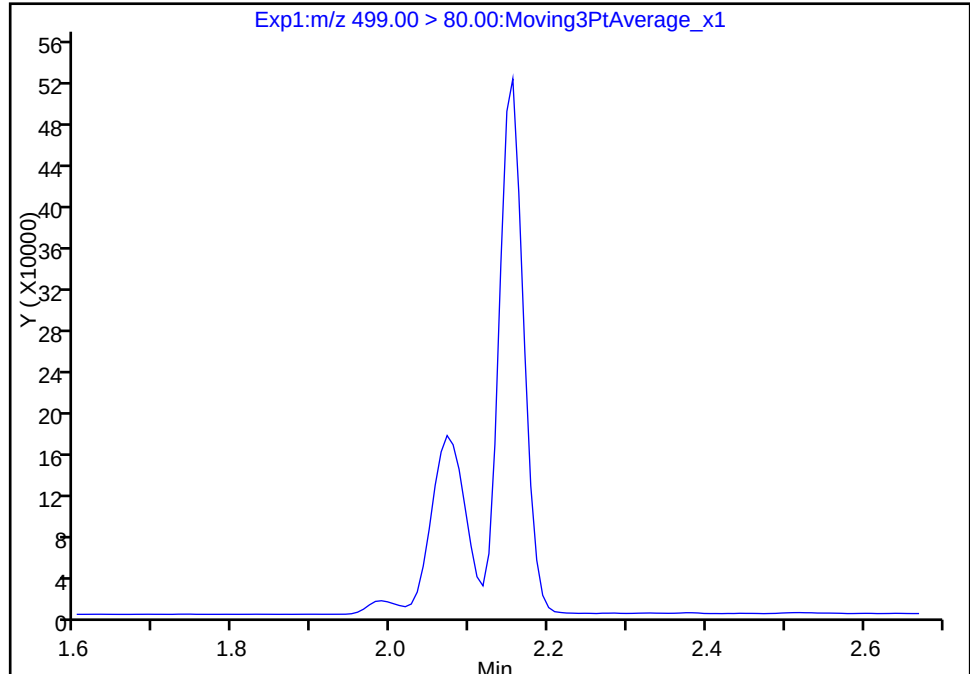
8 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

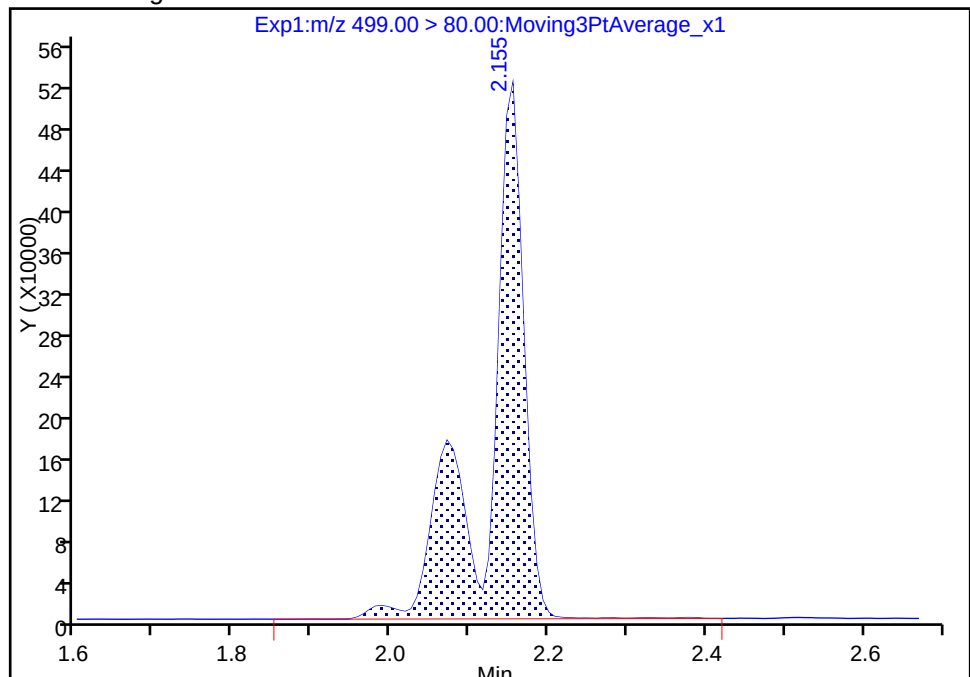
Not Detected

Expected RT: 2.14

Processing Integration Results



Manual Integration Results



RT: 2.15

Area: 1671748

Amount: 9.379167

Amount Units: ng/ml

Reviewer: barnettj, 11-Sep-2017 11:11:13

Audit Action: Assigned Compound ID

Audit Reason: Missed Peak

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47701.b\2017.09.08_537C_004.d

Injection Date: 08-Sep-2017 20:56:16

Instrument ID: A8_N

Lims ID: LLCS 320-182400/2-A

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#:

2

Worklist Smp#: 4

Injection Vol: 2.0 ul

Dil. Factor:

1.0000

Method: 537_A8_N

Limit Group:

LC 537 ICAL

Column:

Detector

EXP1

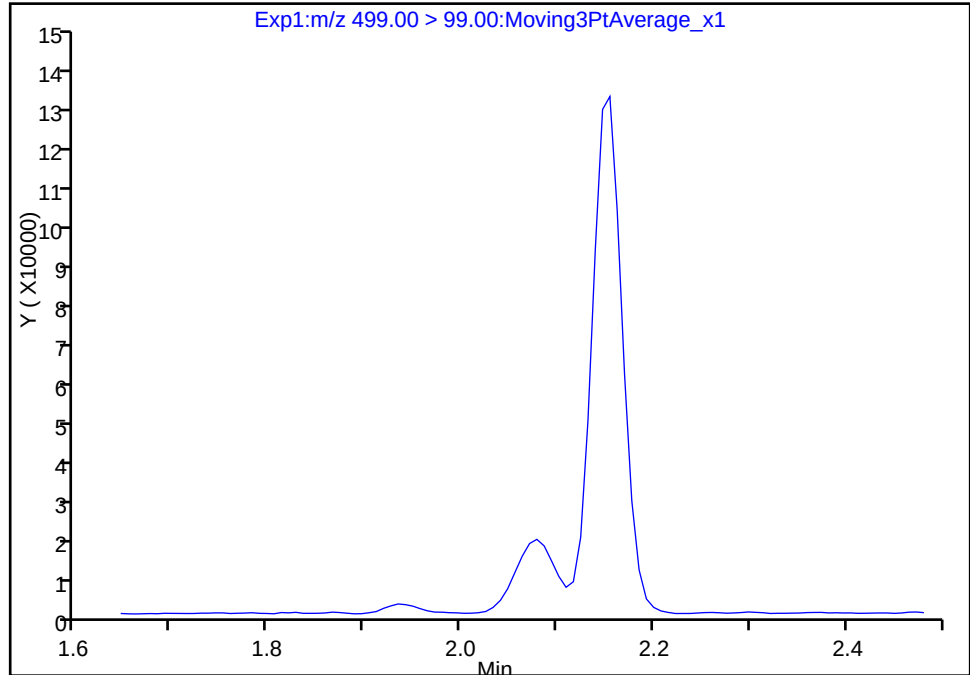
8 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

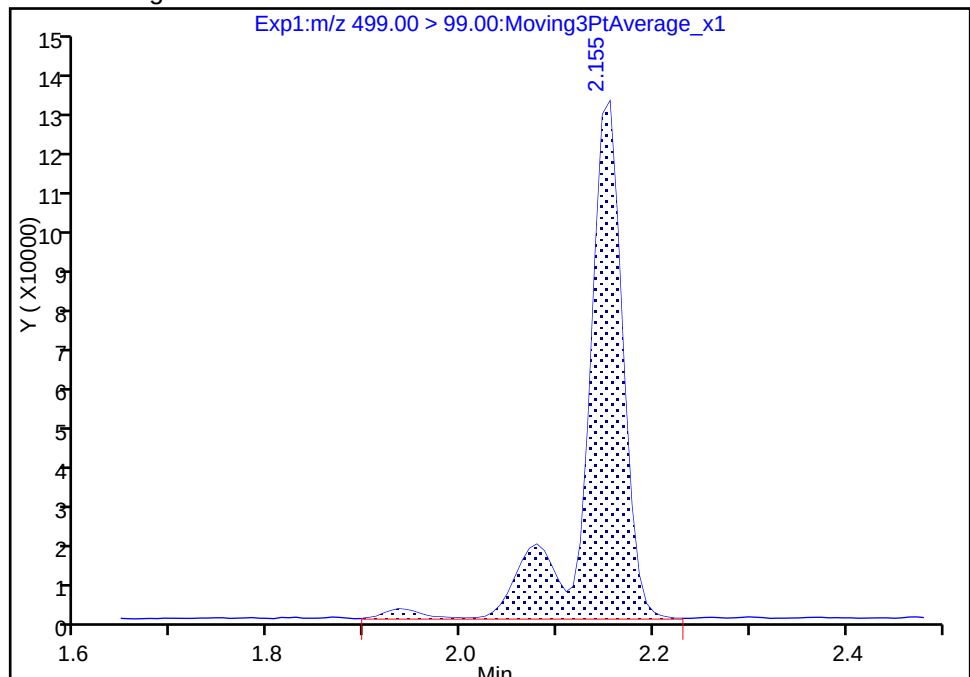
Not Detected

Expected RT: 2.14

Processing Integration Results



Manual Integration Results



RT: 2.15

Area: 352760

Amount: 9.379167

Amount Units: ng/ml

Reviewer: barnettj, 11-Sep-2017 11:11:31

Audit Action: Manually Integrated

Audit Reason: Missed Peak

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47701.b\2017.09.08_537C_004.d

Injection Date: 08-Sep-2017 20:56:16

Instrument ID: A8_N

Lims ID: LLCS 320-182400/2-A

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 2

Worklist Smp#: 4

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

Method: 537_A8_N

Limit Group: LC 537 ICAL

Column:

Detector EXP1

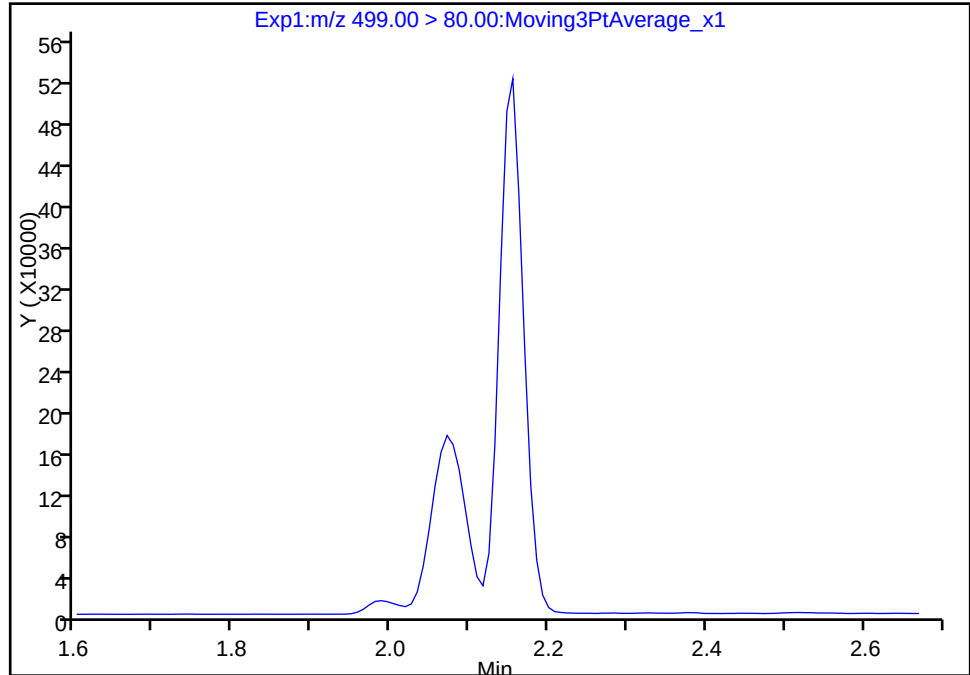
8 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

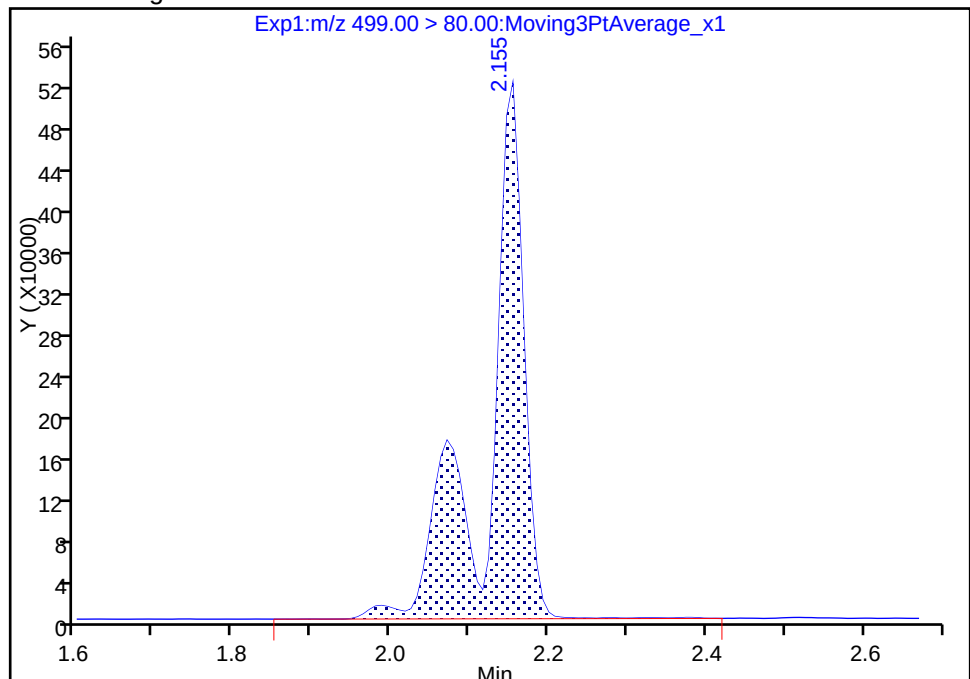
Not Detected

Expected RT: 2.14

Processing Integration Results



Manual Integration Results



RT: 2.15

Area: 1671748

Amount: 9.379167

Amount Units: ng/ml

Reviewer: barnettj, 11-Sep-2017 11:11:31

Audit Action: Manually Integrated

Audit Reason: Missed Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-31180-1</u>
SDG No.: <u>WE04</u>	
Client Sample ID: _____	Lab Sample ID: <u>LLCSD 320-182400/3-A</u>
Matrix: <u>Water</u>	Lab File ID: <u>2017.09.08_537C_005.d</u>
Analysis Method: <u>537</u>	Date Collected: _____
Extraction Method: <u>537</u>	Date Extracted: <u>09/01/2017 08:39</u>
Sample wt/vol: <u>250 (mL)</u>	Date Analyzed: <u>09/08/2017 21:01</u>
Con. Extract Vol.: <u>1.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>183512</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	38.9	J M	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	19.5	J	20	8.0	2.8
375-95-1	Perfluorononanoic acid (PFNA)	19.8	J	24	20	8.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	29.8	J	30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	10.5		10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	96.8		90	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	100		70-130
STL00996	13C2 PFDA	117		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47701.b\2017.09.08_537C_005.d
 Lims ID: LLCSD 320-182400/3-A
 Client ID:
 Sample Type: LLCSD
 Inject. Date: 08-Sep-2017 21:01:01 ALS Bottle#: 3 Worklist Smp#: 5
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: llcsd 320-182400/3-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47701.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 11-Sep-2017 15:23:38 Calib Date: 08-Sep-2017 13:51:29
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170908-47689.b\2017.09.08_537ICAL_009.d
 Column 1 : Det: EXP1
 Process Host: XAWRK011

First Level Reviewer: barnettj

Date: 11-Sep-2017 11:12:14

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.434	1.440	-0.006	1.000	4576812	24.2		2527	
298.90 > 99.00	1.434	1.440	-0.006	1.000	3157111		1.45(0.00-0.00)	2223	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.571	1.577	-0.007	1.000	2106692	10.0		12743	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.722	1.736	-0.014	1.000	427488	2.63		81.8	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.730	1.739	-0.009	1.000	2224295	7.46		2890	
* 6 13C2-PFOA									
415.00 > 370.00	1.912	1.932	-0.020		1740089	10.0		12108	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.912	1.933	-0.021	1.000	783728	4.86		37.0	
413.00 > 169.00	1.912	1.933	-0.021	1.000	426426		1.84(0.00-0.00)	893	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.155	2.140	0.015	1.000	1685275	9.73		1832	M
499.00 > 99.00	2.155	2.140	0.015	1.000	350338		4.81(0.00-0.00)	378	M
* 7 13C4 PFOS									
503.00 > 80.00	2.155	2.164	-0.009		5356328	28.7		4866	
9 Perfluorononanoic acid									
463.00 > 419.00	2.162	2.171	-0.009	1.000	559469	4.96		39.1	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.322	2.320	0.002	1.000	1371018	11.7		10817	

QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47701.b\2017.09.08_537C_005.d

Injection Date: 08-Sep-2017 21:01:01

Instrument ID: A8_N

Lims ID: LLCSD 320-182400/3-A

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 3

Worklist Smp#: 5

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

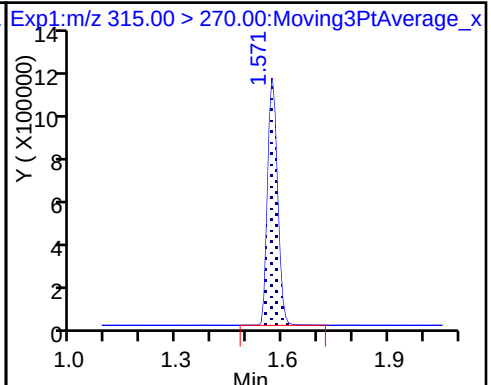
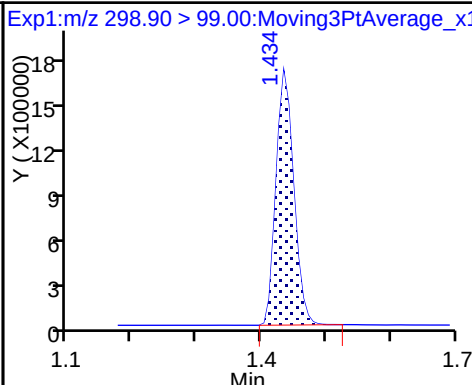
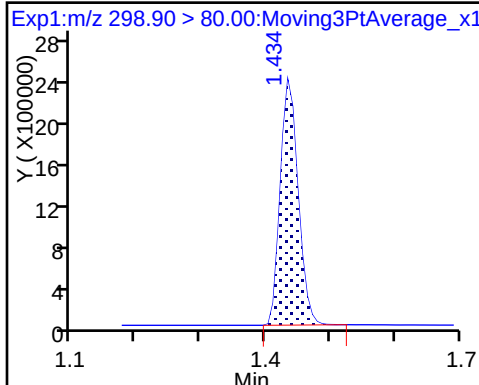
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

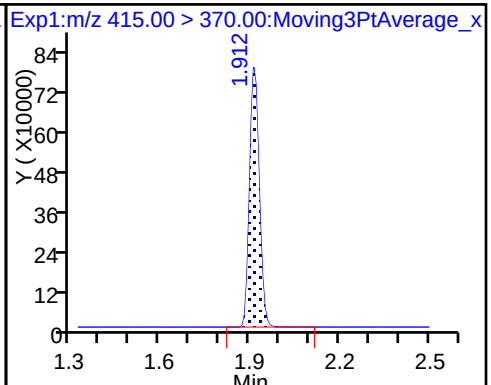
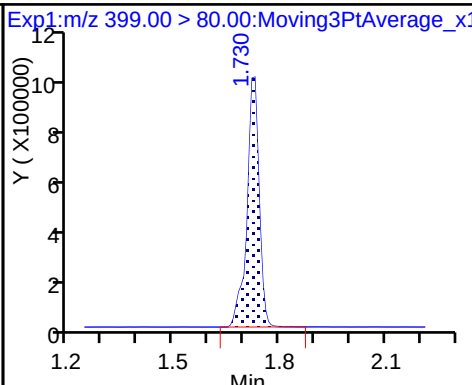
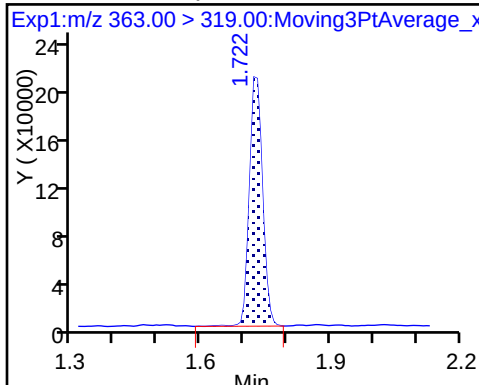
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

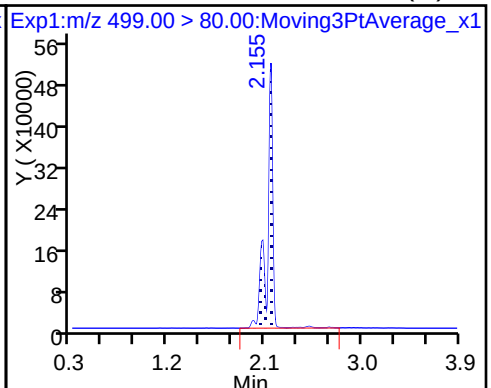
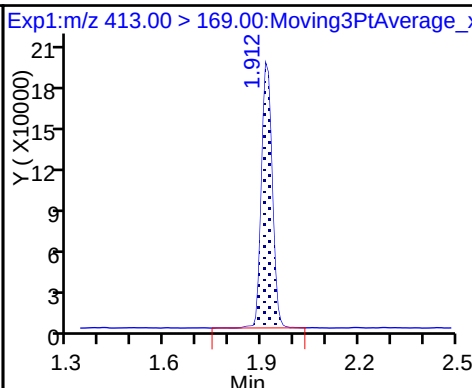
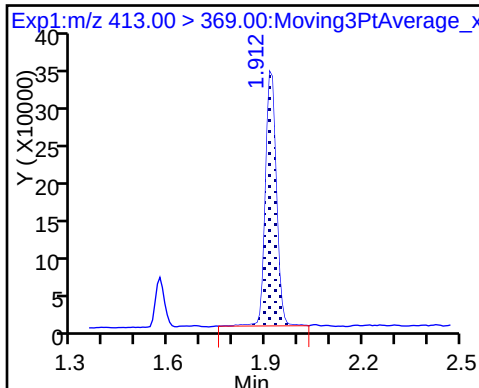
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

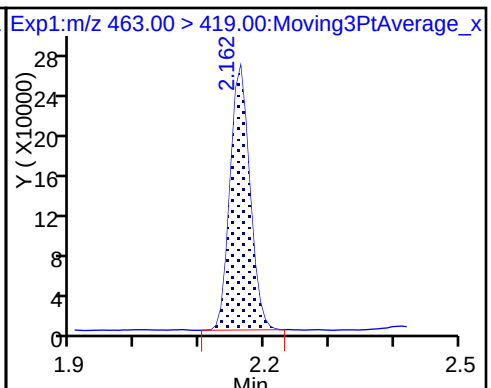
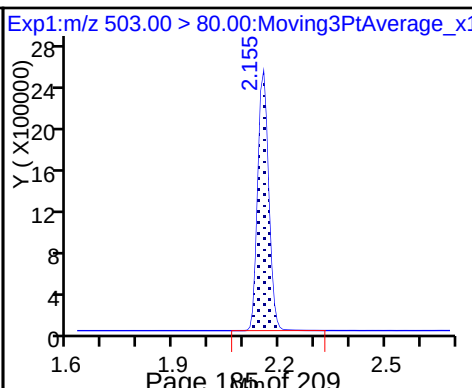
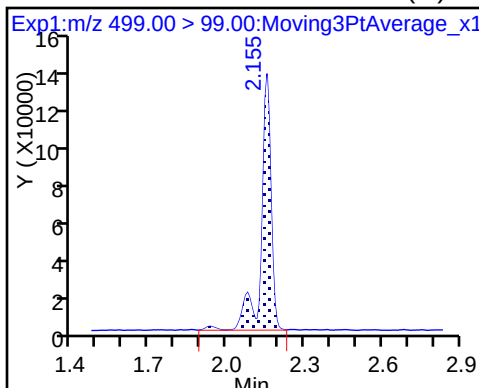
8 Perfluorooctane sulfonic acid (M)



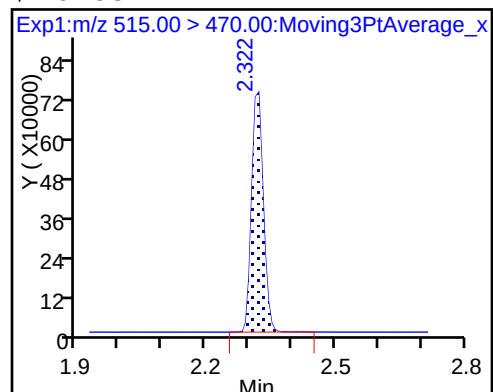
8 Perfluorooctane sulfonic acid (M)

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47701.b\2017.09.08_537C_005.d
Lims ID: LLCSD 320-182400/3-A
Client ID:
Sample Type: LLCSD
Inject. Date: 08-Sep-2017 21:01:01 ALS Bottle#: 3 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: llcsd 320-182400/3-a
Misc. Info.: Plate: 1 Rack: 3
Operator ID: SACINSTLCMS01 Instrument ID: A8_N
Method: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47701.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 11-Sep-2017 15:23:38 Calib Date: 08-Sep-2017 13:51:29
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170908-47689.b\2017.09.08_537ICAL_009.d
Column 1 : Det: EXP1
Process Host: XAWRK011

First Level Reviewer: barnettj

Date: 11-Sep-2017 11:12:14

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	10.0	100.34
\$ 10 13C2 PFDA	10.0	11.7	117.32

TestAmerica Sacramento

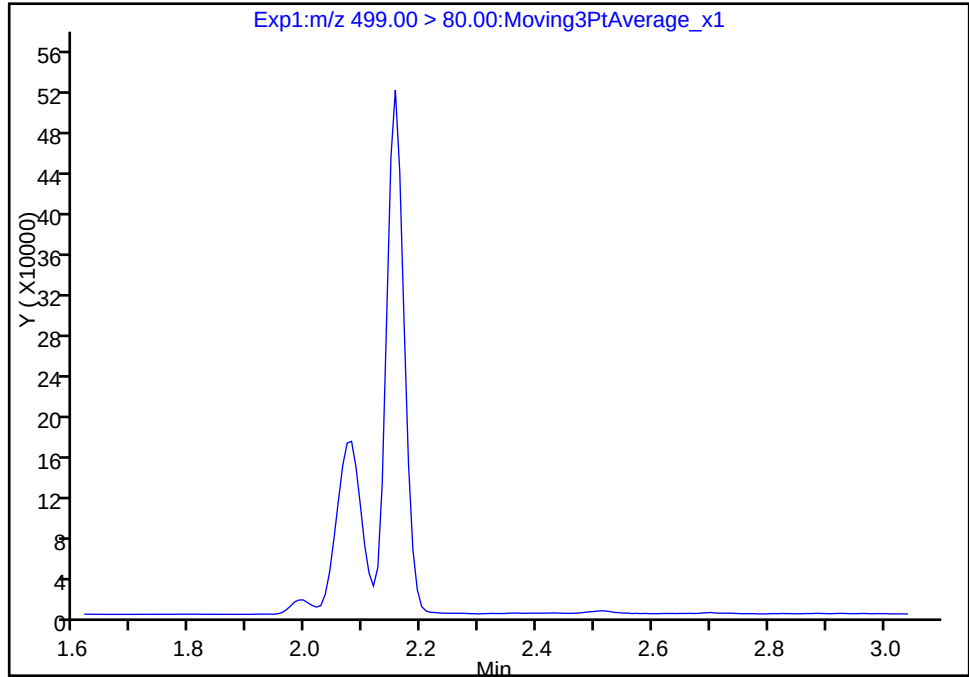
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47701.b\2017.09.08_537C_005.d
Injection Date: 08-Sep-2017 21:01:01 Instrument ID: A8_N
Lims ID: LLCSD 320-182400/3-A
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

8 Perfluorooctane sulfonic acid, CAS: 1763-23-1

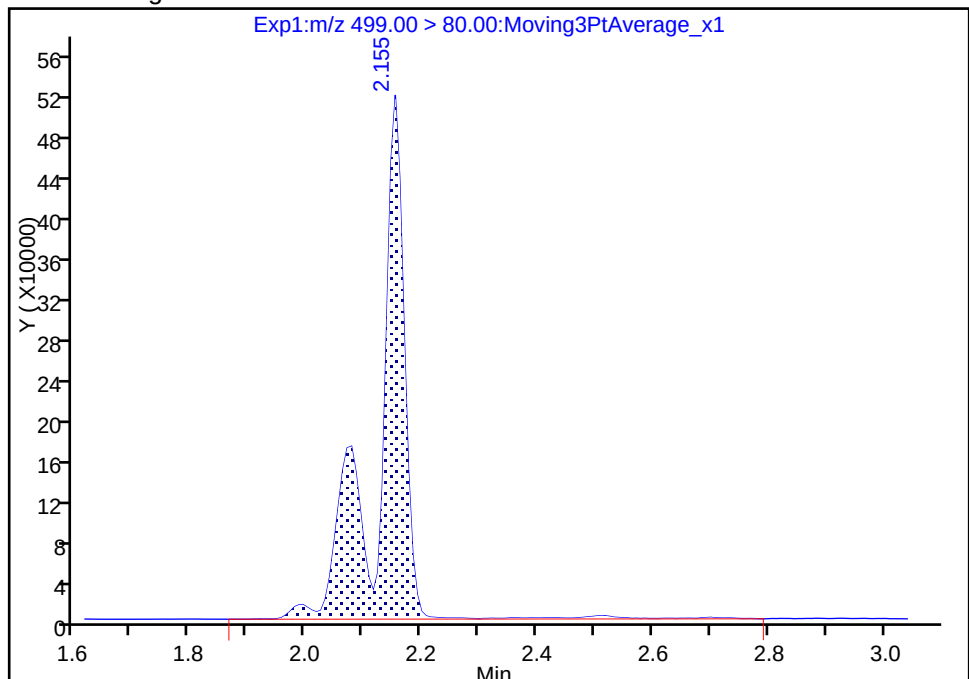
Signal: 1

Not Detected
Expected RT: 2.14

Processing Integration Results



Manual Integration Results



RT: 2.15
Area: 1685275
Amount: 9.729274
Amount Units: ng/ml

Reviewer: barnettj, 11-Sep-2017 11:11:55

Audit Action: Assigned Compound ID

Audit Reason: Missed Peak

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47701.b\2017.09.08_537C_005.d

Injection Date: 08-Sep-2017 21:01:01

Instrument ID: A8_N

Lims ID: LLCSD 320-182400/3-A

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 3

Worklist Smp#: 5

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

Method: 537_A8_N

Limit Group: LC 537 ICAL

Column:

Detector EXP1

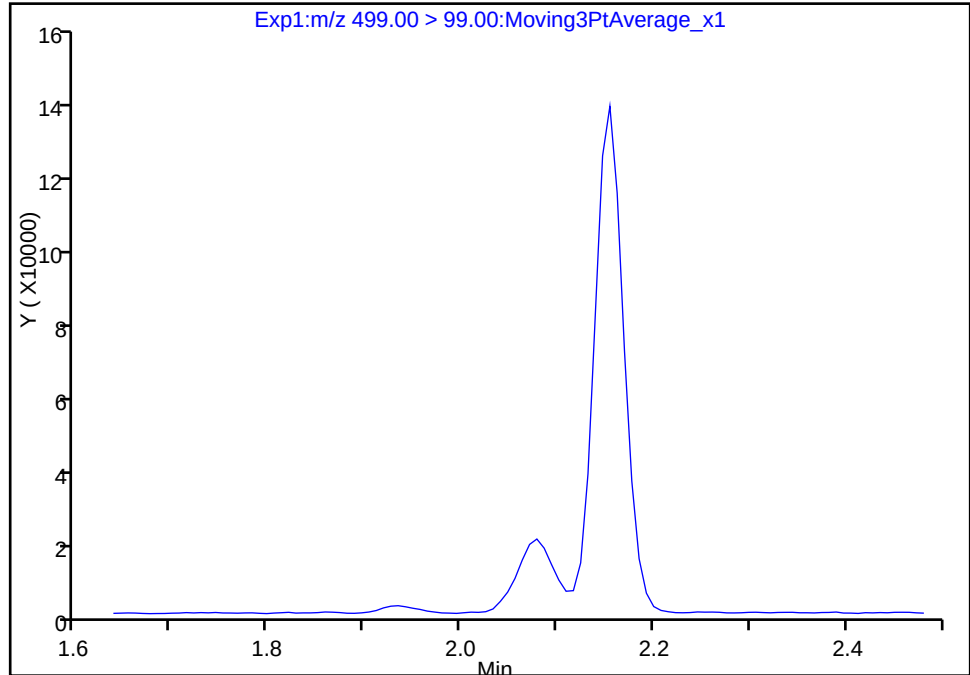
8 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

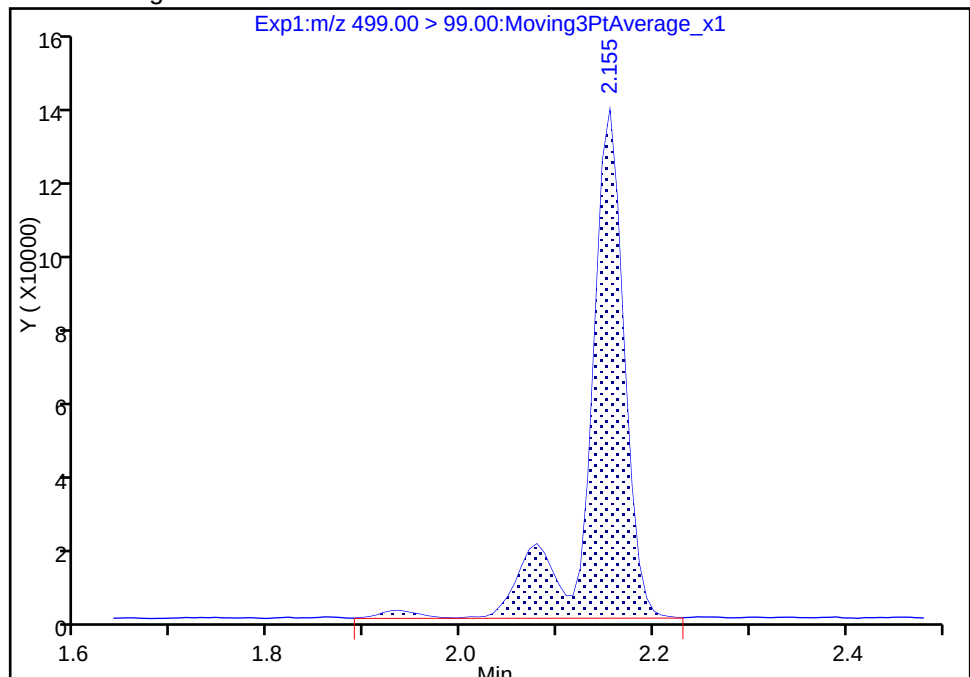
Not Detected

Expected RT: 2.14

Processing Integration Results



Manual Integration Results



RT: 2.15

Area: 350338

Amount: 9.729274

Amount Units: ng/ml

Reviewer: barnettj, 11-Sep-2017 11:12:08

Audit Action: Manually Integrated

Audit Reason: Missed Peak

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47701.b\2017.09.08_537C_005.d

Injection Date: 08-Sep-2017 21:01:01

Instrument ID: A8_N

Lims ID: LLCSD 320-182400/3-A

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 3

Worklist Smp#: 5

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

Method: 537_A8_N

Limit Group: LC 537 ICAL

Column:

Detector EXP1

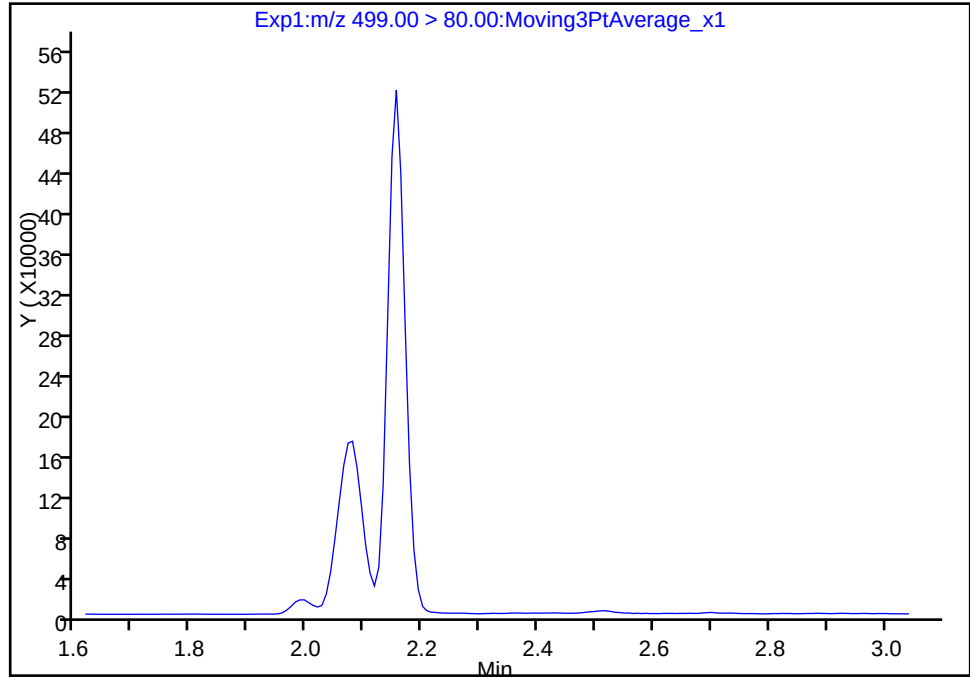
8 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

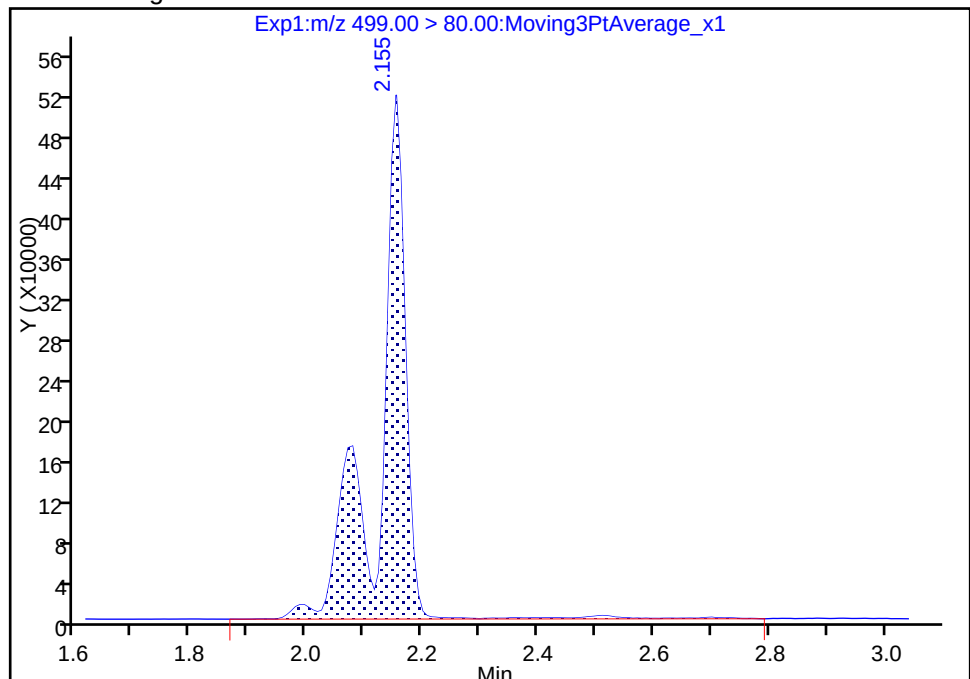
Not Detected

Expected RT: 2.14

Processing Integration Results



Manual Integration Results



RT: 2.15

Area: 1685275

Amount: 9.729274

Amount Units: ng/ml

Reviewer: barnettj, 11-Sep-2017 11:12:08

Audit Action: Manually Integrated

Audit Reason: Missed Peak

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica SacramentoJob No.: 320-31180-1SDG No.: WE04Instrument ID: A8_NStart Date: 09/08/2017 13:27Analysis Batch Number: 183459End Date: 09/08/2017 14:10

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-183459/2		09/08/2017 13:27	1	2017.09.08_537I CAL 004.d	GeminiC18 3x100 3(mm)
IC 320-183459/3		09/08/2017 13:32	1	2017.09.08_537I CAL 005.d	GeminiC18 3x100 3(mm)
IC 320-183459/4		09/08/2017 13:37	1	2017.09.08_537I CAL 006.d	GeminiC18 3x100 3(mm)
IC 320-183459/5 ICISAV		09/08/2017 13:42	1	2017.09.08_537I CAL 007.d	GeminiC18 3x100 3(mm)
IC 320-183459/6		09/08/2017 13:46	1	2017.09.08_537I CAL 008.d	GeminiC18 3x100 3(mm)
IC 320-183459/7		09/08/2017 13:51	1	2017.09.08_537I CAL 009.d	GeminiC18 3x100 3(mm)
ZZZZZ		09/08/2017 13:56	1		GeminiC18 3x100 3(mm)
CCVL 320-183459/9		09/08/2017 14:00	1	2017.09.08_537I CAL 011.d	GeminiC18 3x100 3(mm)
ZZZZZ		09/08/2017 14:05	1		GeminiC18 3x100 3(mm)
ICV 320-183459/11		09/08/2017 14:10	1	2017.09.08_537I CAL 013.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-31180-1SDG No.: WE04Instrument ID: A8_N Start Date: 09/08/2017 15:38Analysis Batch Number: 183505 End Date: 09/08/2017 15:38

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCVL 320-183505/3		09/08/2017 15:38	1	2017.09.08_537B 004.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica SacramentoJob No.: 320-31180-1SDG No.: WE04Instrument ID: A8_NStart Date: 09/08/2017 20:41Analysis Batch Number: 183512End Date: 09/08/2017 21:39

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-183512/1 CCVIS		09/08/2017 20:41	1	2017.09.08_537C 001.d	GeminiC18 3x100 3(mm)
ZZZZZ		09/08/2017 20:46	1		GeminiC18 3x100 3(mm)
MB 320-182400/1-A		09/08/2017 20:51	1	2017.09.08_537C 003.d	GeminiC18 3x100 3(mm)
LLCS 320-182400/2-A		09/08/2017 20:56	1	2017.09.08_537C 004.d	GeminiC18 3x100 3(mm)
LLCSD 320-182400/3-A		09/08/2017 21:01	1	2017.09.08_537C 005.d	GeminiC18 3x100 3(mm)
ZZZZZ		09/08/2017 21:05	1		GeminiC18 3x100 3(mm)
ZZZZZ		09/08/2017 21:10	1		GeminiC18 3x100 3(mm)
ZZZZZ		09/08/2017 21:15	1		GeminiC18 3x100 3(mm)
ZZZZZ		09/08/2017 21:20	1		GeminiC18 3x100 3(mm)
ZZZZZ		09/08/2017 21:24	1		GeminiC18 3x100 3(mm)
ZZZZZ		09/08/2017 21:29	1		GeminiC18 3x100 3(mm)
ZZZZZ		09/08/2017 21:34	1		GeminiC18 3x100 3(mm)
CCV 320-183512/13 CCVIS		09/08/2017 21:39	1	2017.09.08_537C 013.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-31180-1
SDG No.: WE04
Instrument ID: A8_N Start Date: 09/08/2017 22:36
Analysis Batch Number: 183774 End Date: 09/08/2017 22:55

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-183774/25 CCVIS		09/08/2017 22:36	1	2017.09.08_537C 025.d	GeminiC18 3x100 3(mm)
ZZZZZ		09/08/2017 22:40	1		GeminiC18 3x100 3(mm)
320-31180-1		09/08/2017 22:45	1	2017.09.08_537C 027.d	GeminiC18 3x100 3(mm)
320-31180-2		09/08/2017 22:50	1	2017.09.08_537C 028.d	GeminiC18 3x100 3(mm)
CCV 320-183774/29 CCVIS		09/08/2017 22:55	1	2017.09.08_537C 029.d	GeminiC18 3x100 3(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-31180-1SDG No.: WE04Batch Number: 182400 Batch Start Date: 09/01/17 08:39 Batch Analyst: Branscum, CassieBatch Method: 537 Batch End Date: 09/05/17 11:38

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	ReceivedpH	LC537-IS 00047
MB 320-182400/1		537, 537				250 mL	1.00 mL	7 SU	100 uL
LLCS 320-182400/2		537, 537				250 mL	1.00 mL	7 SU	100 uL
LLCSD 320-182400/3		537, 537				250 mL	1.00 mL	7 SU	100 uL
320-31180-A-1	WGNA-082917-RW-4 837	537, 537	T	291.18 g	27.86 g	263.3 mL	1.00 mL	7 SU	100 uL
320-31180-A-2	WGNA-082917-FRB- 4837	537, 537	T	280.56 g	27.16 g	253.4 mL	1.00 mL	7 SU	100 uL

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-LSP 00026	LC537-SU 00048	AnalysisComment			
MB 320-182400/1		537, 537			100 uL	ch nd			
LLCS 320-182400/2		537, 537		100 uL	100 uL	ch nd			
LLCSD 320-182400/3		537, 537		100 uL	100 uL	ch nd			
320-31180-A-1	WGNA-082917-RW-4 837	537, 537	T		100 uL	ch nd			
320-31180-A-2	WGNA-082917-FRB- 4837	537, 537	T		100 uL	ch nd			

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.: 320-31180-1SDG No.: WE04Batch Number: 182400 Batch Start Date: 09/01/17 08:39 Batch Analyst: Branscum, CassieBatch Method: 537 Batch End Date: 09/05/17 11:38

Batch Notes	
Batch Comment	IS:1002957
Manifold ID	7,3
Methanol ID	1010866
Pipette ID	M16387D
Analyst ID - IS Reagent Drop	CCB
Analyst ID - IS Reagent Drop Witness	HJA
Analyst ID - SU Reagent Drop	CCB
Analyst ID - SU Reagent Drop Witness	JNS
Analyst ID - TA Reagent Drop	CCB
Analyst ID - TA Reagent Drop Witness	JNS
SPE Cartridge ID	6357081-03
Trizma ID	SLBR4303V
Reagent Water ID	8/28/17

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.

A8

Job No: 31214, 31180 Instrument ID & Date: 9-8-17 ICAL Batch: 183459
 Extraction Batch: 182400 Worklist #: 47701 TALS Batch: 183512, 183773, 183774

Review Items	-- Level 1 --			Level 2
	Yes	No	N/A	
Initial Calibration				
1. Is ICAL verified and locked in Chrom & TALS?	✓			✓
2. Is ICV properly linked in TALS?	✓			✓
Continuing Calibration				
1. Low-range CCV injected at start of analytical run? CCV injected after every 10 samples and at the end of the analytical run and alternated between Low-range, Mid-range and High-range?	✓			✓
2. If sequence was not after an ICAL was a low and mid range CCV injected at the start of the analytical run?	✓			✓
3. Native compounds and surrogates in control? Low-range within $\pm 50\%$ of true value Mid and High-range within $\pm 30\%$ of true value	✓			✓
4. Internal Standard areas in control? Areas $\geq 50\%$ of average area of the ICAL and 70-140% of the most recent CCV.	✓			✓
Client Samples & QC Sample Results				
1. Were preparation and analysis done within holding times?	✓			✓
2. Are Chromatograms reviewed and spectra verified?	✓			✓
3. Are positive results within calibration range?	✓			✓
4. Dilutions due to target cpds? _____ Dilutions due to non-targets? _____			✓	
5. All target compounds in MB < 1/3 RL ? (Requires NCM if "no.")	✓			✓
6. Are target constituents in LCS/LCSD within method control limits?	✓			✓
7. Internal Standard areas in control for all samples and QC reported? $\pm 50\%$ from the average area of the ICAL and 70-140% of the most recent CCV	✓			✓
8. Do results (e.g., dilutions/trip blanks) make sense?	✓			✓
9. Are MS/MSD recoveries and RPDs within method control limits?			✓	
10. Are all QC samples properly linked in TALS?	✓			✓
11. All manual integrations appropriate and completely documented?	✓			✓
12. Are nonconformances documented as NCMs?			✓	
13. Are all Chrom graphics uploaded?	✓			✓

1st Level Reviewer / Date: JRB 9-11-17

2nd Level Reviewer / Date: Murray 9/12/2017

NCM # and Comments: _____

A8

Instrument ID & Date: 9-8-17 Worklist#: 47689

ICAL Batch: 183459, 183460 Calibration ID number: 34044, 34045

Review Items	Level 1			Level 2
	Yes	No	N/A	
Initial Calibration				
1. Mass calibration, as needed, verified by full scan of PFC stock standard. All PFC ions used for quantitation are within 0.3 m/z of true mass?	✓			✓
2. Responses increase with increasing concentration?	✓			✓
3. Fit used (circle): <u>Average</u> Linear (1/x ²) Linear <u>Quadratic</u> (6 points minimum)				
4. Meets fit criteria? Intercept ≤ 1/2 RL RSD ≤ 30% for Average R ² ≥ 0.990 for Linear R ² ≥ 0.990 for Quadratic NOTE: "Force through Zero" must be used and weighted if needed	✓			✓
5. If quadratic fit used the curve does not "bend over".	✓			✓
6. Feed calibration points into the calculated curve. Are points ≤ MRL within ±50% of true value? Are points > MRL within ±30% of true value?	✓			✓
7. Any carryover from the high calibration point must be ≤ 1/3 RL	✓			✓
8. Asymmetry check meets criteria for the first two eluting peaks? (0.8 - 1.5).	✓			✓
9. Is the asymmetry check scanned and linked in TALS to the calibration point?	✓			✓
10. Is ICV (2 nd source) ± 30% of true value?	✓			✓
11. Is ICV (2 nd source) internal standards ±50% of average area of the ICAL?	✓			✓
12. ICAL locked in Chrom and uploaded to TALS?	✓			
13. ICAL locked in TALS and scanned?				✓

1st Level Reviewer / Date: JRB 9-11-17

2nd Level Reviewer / Date: MW 9/14/2017

NCM # and Comments:

TestAmerica Laboratories
Worklist QC Batch Report

Worklist Name: 08SEP2017_537I

Worklist Number: 47701

Instrument Name: A8_N

Chrom Method: 537_A8_N

Data Directory: \\ChromNa\Sacramento\ChromData\A8_N\20170908-47701.b

QC Batching: Enabled

Limit Group Batching: Enabled

QC Batch: 1	LC 537 ICAL Raw Batch: 183512
# 1 CCV L3	# 1 CCV L3
# 2 RB	# 2 RB
# 3 MB 320-182400/1-A	# 3 MB 320-182400/1-A
# 4 LLCS 320-182400/2-A	# 4 LLCS 320-182400/2-A
# 5 LLCSD 320-182400/3-A	# 5 LLCSD 320-182400/3-A
# 6 320-31214-A-1-A	# 6 320-31214-A-1-A
# 7 320-31214-A-2-A	# 7 320-31214-A-2-A
# 8 320-31214-A-3-A	# 8 320-31214-A-3-A
# 9 320-31214-A-4-A	# 9 320-31214-A-4-A
#10 320-31214-A-5-A	#10 320-31214-A-5-A
#11 320-31214-A-6-A	#11 320-31214-A-6-A
#12 320-31214-A-7-A	#12 320-31214-A-7-A
#13 CCV L5	#13 CCV L5

QC Batch: 2	LC 537 ICAL Raw Batch: 183773
#13 CCV L5	#13 CCV L5
#14 RB	#14 RB
#15 320-31214-A-8-A	#15 320-31214-A-8-A
#16 320-31214-A-9-A	#16 320-31214-A-9-A
#17 320-31214-A-10-A	#17 320-31214-A-10-A
#18 320-31214-A-11-A	#18 320-31214-A-11-A
#19 320-31214-A-12-A	#19 320-31214-A-12-A
#20 320-31214-A-13-A	#20 320-31214-A-13-A
#21 320-31214-A-14-A	#21 320-31214-A-14-A
#22 320-31214-A-15-A	#22 320-31214-A-15-A
#23 320-31214-A-16-A	#23 320-31214-A-16-A
#24 320-31214-A-17-A	#24 320-31214-A-17-A
#25 CCV L3	#25 CCV L3

QC Batch: 3	LC 537 ICAL Raw Batch: 183774
#25 CCV L3	#25 CCV L3
#26 RB	#26 RB
#27 320-31180-A-1-A	#27 320-31180-A-1-A
#28 320-31180-A-2-A	#28 320-31180-A-2-A
#29 CCV L5	#29 CCV L5
#30 RB	#30 RB

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-182400

Analyst: Branscum, Cassie

Batch Open: 9/1/2017 8:39:00AM

Method Code: 320-537_Prep-320

Batch End: 9/5/2017 11:38:00AM

Extraction of Perfluorinated Alkyl Acids

Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmnt FinAmnt	Rcvd	PHs Adj1	Adj2	Due Date	Analytical TAT	Div Rank	Comments	Output Sample Lab ID
1 MB~320-182400/1 N/A	N/A		250 mL	7			N/A	N/A	N/A	ch nd	
			1.00 mL								
2 LLCS~320-182400/2 N/A	N/A		250 mL	7			N/A	N/A	N/A	ch nd	
			1.00 mL								
3 LLCSD~320-182400/3 N/A	N/A		250 mL	7			N/A	N/A	N/A	ch nd	
			1.00 mL								
4 320-31214-A-1 (537_DOD5)	N/A (320-31214-1)	286.16 g	259 mL	7			9/7/17	16_Days	4	ch nd	
		27.21 g	1.00 mL								
5 320-31214-A-2 (537_DOD5)	N/A (320-31214-1)	271.58 g	243.9 mL	7			9/7/17	16_Days	4	ch nd	
		27.64 g	1.00 mL								
6 320-31214-A-3 (537_DOD5)	N/A (320-31214-1)	287.16 g	259.3 mL	7			9/7/17	16_Days	4	ch nd	
		27.90 g	1.00 mL								
7 320-31214-A-4 (537_DOD5)	N/A (320-31214-1)	285.51 g	258.6 mL	7			9/7/17	16_Days	4	ch nd	
		26.93 g	1.00 mL								
8 320-31214-A-5 (537_DOD5)	N/A (320-31214-1)	278.28 g	250.5 mL	7			9/7/17	16_Days	4	ch nd	
		27.81 g	1.00 mL								
9 320-31214-A-6 (537_DOD5)	N/A (320-31214-1)	275.07 g	247.6 mL	7			9/7/17	16_Days	4	ch nd	
		27.49 g	1.00 mL								
10 320-31214-A-7 (537_DOD5)	N/A (320-31214-1)	277.15 g	249 mL	7			9/7/17	16_Days	4	ch nd	
		28.14 g	1.00 mL								

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-182400

Analyst: Branscum, Cassie

Batch Open: 9/1/2017 8:39:00AM

Method Code: 320-537_Prep-320

Batch End: 9/5/2017 11:38:00AM

11	320-31214-A-8 (537_DOD5)	N/A (320-31214-1)	275.39 g 27.33 g	248.1 mL 1.00 mL	7		9/7/17	16_Days	4	ch nd	
12	320-31214-A-9 (537_DOD5)	N/A (320-31214-1)	278.45 g 27.70 g	250.8 mL 1.00 mL	7		9/7/17	16_Days	4	ch nd	
13	320-31214-A-10 (537_DOD5)	N/A (320-31214-1)	275.87 g 27.29 g	248.6 mL 1.00 mL	7		9/7/17	16_Days	4	ch nd	
14	320-31214-A-11 (537_DOD5)	N/A (320-31214-1)	287.11 g 27.76 g	259.4 mL 1.00 mL	7		9/7/17	16_Days	4	ch nd	
15	320-31214-A-12 (537_DOD5)	N/A (320-31214-1)	285.03 g 27.06 g	258 mL 1.00 mL	7		9/7/17	16_Days	4	ch nd	
16	320-31214-A-13 (537_DOD5)	N/A (320-31214-1)	283.97 g 27.63 g	256.3 mL 1.00 mL	7		9/7/17	16_Days	4	ch nd	
17	320-31214-A-14 (537_DOD5)	N/A (320-31214-1)	281.26 g 27.32 g	253.9 mL 1.00 mL	7		9/7/17	16_Days	4	ch nd	
18	320-31214-A-15 (537_DOD5)	N/A (320-31214-1)	285.14 g 27.47 g	257.7 mL 1.00 mL	7		9/7/17	16_Days	4	ch nd	
19	320-31214-A-16 (537_DOD5)	N/A (320-31214-1)	285.90 g 27.50 g	258.4 mL 1.00 mL	7		9/7/17	16_Days	4	ch nd	
20	320-31214-A-17 (537_DOD5)	N/A (320-31214-1)	285.05 g 27.74 g	257.3 mL 1.00 mL	7		9/7/17	16_Days	4	ch nd	
21	320-31180-A-1 (537_DOD5)	WE04 (320-31180-1)	291.18 g 27.86 g	263.3 mL 1.00 mL	7		9/6/17	16_Days	4	ch nd	
22	320-31180-A-2 (537_DOD5)	WE04 (320-31180-1)	280.56 g 27.16 g	253.4 mL 1.00 mL	7		9/6/17	16_Days	4	ch nd	

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-182400

Analyst: Branscum, Cassie

Batch Open: 9/1/2017 8:39:00AM

Method Code: 320-537_Prep-320

Batch End: 9/5/2017 11:38:00AM

Batch Notes

Manifold ID 7,3

Trizma ID SLBR4303V

SPE Cartridge ID 6357081-03

Methanol ID 1010866

Reagent Water ID 8/28/17

Pipette ID M16387D

Analyst ID - TA Reagent Drop CCB

Analyst ID - TA Reagent Drop JNS

Witness

Analyst ID - SU Reagent Drop CCB

Analyst ID - SU Reagent Drop JNS

Witness

Analyst ID - IS Reagent Drop CCB

Analyst ID - IS Reagent Drop HJA

Witness

Batch Comment IS:1002957

Comments

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-182400

Analyst: Branscum, Cassie

Batch Open: 9/1/2017 8:39:00AM

Method Code: 320-537_Prep-320

Batch End:

Batch Notes

Manifold ID

7, 3

Trizma ID

SLBR4303V

SPE Cartridge ID

6357081-03

Methanol ID

1210866

Reagent Water ID

8/28/17

Pipette ID

M1438TD

Analyst ID - TA Reagent Drop

CCB

Analyst ID - TA Reagent Drop

JNS

Witness

Analyst ID - SU Reagent Drop

CCB

Analyst ID - SU Reagent Drop

JNS

Witness

Analyst ID - IS Reagent Drop

CCB

Analyst ID - IS Reagent Drop

HGA

Witness

Batch Comment

IS: 1002957; HSA / 9-5-17

Comments

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-182400

Analyst: Branscum, Cassie

Batch Open: 9/1/2017 8:39:00AM

Method Code: 320-537_Prep-320

Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-182400/1	LC537-SU_00048	100 uL	1.00 mL	CDB 9-1-17	JNS 9/1/17
LLCS 320-182400/2	LC537-LSP_00026	100 uL	1.00 mL		
LLCS 320-182400/2	LC537-SU_00048	100 uL	1.00 mL		
LLCSD 320-182400/3	LC537-LSP_00026	100 uL	1.00 mL		
LLCSD 320-182400/3	LC537-SU_00048	100 uL	1.00 mL		
320-31214-A-1	LC537-SU_00048	100 uL	1.00 mL		
320-31214-A-2	LC537-SU_00048	100 uL	1.00 mL		
320-31214-A-3	LC537-SU_00048	100 uL	1.00 mL		
320-31214-A-4	LC537-SU_00048	100 uL	1.00 mL		
320-31214-A-5	LC537-SU_00048	100 uL	1.00 mL		
320-31214-A-6	LC537-SU_00048	100 uL	1.00 mL		
320-31214-A-7	LC537-SU_00048	100 uL	1.00 mL		
320-31214-A-8	LC537-SU_00048	100 uL	1.00 mL		
320-31214-A-9	LC537-SU_00048	100 uL	1.00 mL		
320-31214-A-10	LC537-SU_00048	100 uL	1.00 mL		
320-31214-A-11	LC537-SU_00048	100 uL	1.00 mL		
320-31214-A-12	LC537-SU_00048	100 uL	1.00 mL		
320-31214-A-13	LC537-SU_00048	100 uL	1.00 mL		

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-182400

Analyst: Branscum, Cassie

Batch Open: 9/1/2017 8:39:00AM

Method Code: 320-537_Prep-320

Batch End:

320-31214-A-14	LC537-SU_00048	100 uL	1.00 mL	COS 9-1-17	Jus 9/1/17
320-31214-A-15	LC537-SU_00048	100 uL	1.00 mL	↓	
320-31214-A-16	LC537-SU_00048	100 uL	1.00 mL		
320-31214-A-17	LC537-SU_00048	100 uL	1.00 mL		
320-31180-A-1	LC537-SU_00048	100 uL	1.00 mL		
320-31180-A-2	LC537-SU_00048	100 uL	1.00 mL		

Other Reagents:

Reagent

Amount/Units

Lot#:

Preparation Batch Number(s): 320-182400 Test: 537, P-4
Earliest Holding Time: 9-13-17

Sample List Tab	1 st Level Reviewer	2 nd Level Reviewer
Samples identified to the correct method	/	/
All necessary NCMs filed (including holding time)	/	/
Method/sample/login/QAS checked and correct	/	/
Worksheet Tab	1 st Level Reviewer	2 nd Level Reviewer
All samples properly preserved	/	/
Weights in anticipated range and not targeted	/	/
All additional test requirements performed, documented, and uploaded to TALS correctly (e.g. final amount, initial amount, turbidity, and CI Check)	/	/
The pH is transcribed correctly in TALS	/	/
All additional information transcribed into TALS is correct and raw data is attached	/	/
Comments are transcribed correctly in TALS	/	/
Reagents Tab	1 st Level Reviewer	2 nd Level Reviewer
All necessary reagents not expired and entered into TALS	/	/
All spike amounts correct and added to necessary samples and QC	/	/
Batch Information	1 st Level Reviewer	2 nd Level Reviewer
Date and time accurate and entered into TALS correctly	/	/
All necessary 'batch information' complete and entered into TALS correctly	/	/

1st Level Reviewer: CS Date: 9-5-17
2nd Level Reviewer: HSA Date: 9-5-17
Comments: _____

Shipping and Receiving Documents

880 Riverside Parkway
West Sacramento, CA 95605-1500
phone 916.373.5600 fax 303.467.7248

☐ NPDES ☐ RCRA ☐ Other:

TestAmerica Laboratories, Inc.

[illegible]

Login Sample Receipt Checklist

Client: Tetra Tech, Inc.

Job Number: 320-31180-1

SDG Number: WE04

Login Number: 31180

List Source: TestAmerica Sacramento

List Number: 1

Creator: Turpen, Troy

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	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?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

"WGNA-082917-RW-4837","537","RES","320-31180-1","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","15","ng/L","U","6.5","DL","","TRG","","","38","LOQ","YES","-99","","263.3","1.00","15",""
"WGNA-082917-RW-4837","537","RES","320-31180-1","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","7.6","ng/L","U","2.7","DL","","TRG","","","19","LOQ","YES","-99","","263.3","1.00","7.6",""
"WGNA-082917-RW-4837","537","RES","320-31180-1","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","11","ng/L","U","5.2","DL","","TRG","","","28","LOQ","YES","-99","","263.3","1.00","11",""
"WGNA-082917-RW-4837","537","RES","320-31180-1","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","34","ng/L","U","15","DL","","TRG","","","85","LOQ","YES","-99","","263.3","1.00","34",""
"WGNA-082917-RW-4837","537","RES","320-31180-1","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","3.8","ng/L","U","1.8","DL","","TRG","","","9.5","LOQ","YES","-99","","263.3","1.00","3.8",""
"WGNA-082917-RW-4837","537","RES","320-31180-1","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","19","ng/L","U","7.6","DL","","TRG","","","23","LOQ","YES","-99","","263.3","1.00","19",""
"WGNA-082917-RW-4837","537","RES","320-31180-1","TALSAC","STL00993","13C2
PFHxA","35","ng/L","","-99","DL","","SURRE","93","","-99","LOQ","YES","38.0","","263.3","1.00","0",""
"WGNA-082917-RW-4837","537","RES","320-31180-1","TALSAC","STL00996","13C2
PFDA","39","ng/L","","-99","DL","","SURRE","102","","-99","LOQ","YES","38.0","","263.3","1.00","0",""
"WGNA-082917-FRB-4837","537","RES","320-31180-2","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","16","ng/L","U","6.7","DL","","TRG","","","39","LOQ","YES","-99","","253.4","1.00","16",""
"WGNA-082917-FRB-4837","537","RES","320-31180-2","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","7.9","ng/L","U","2.8","DL","","TRG","","","20","LOQ","YES","-99","","253.4","1.00","7.9",""
"WGNA-082917-FRB-4837","537","RES","320-31180-2","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","12","ng/L","U","5.4","DL","","TRG","","","30","LOQ","YES","-99","","253.4","1.00","12",""
"WGNA-082917-FRB-4837","537","RES","320-31180-2","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","36","ng/L","U","16","DL","","TRG","","","89","LOQ","YES","-99","","253.4","1.00","36",""
"WGNA-082917-FRB-4837","537","RES","320-31180-2","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","3.9","ng/L","U","1.9","DL","","TRG","","","9.9","LOQ","YES","-99","","253.4","1.00","3.9",""
"WGNA-082917-FRB-4837","537","RES","320-31180-2","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","20","ng/L","U","7.9","DL","","TRG","","","24","LOQ","YES","-99","","253.4","1.00","20",""
"WGNA-082917-FRB-4837","537","RES","320-31180-2","TALSAC","STL00993","13C2
PFHxA","40","ng/L","","-99","DL","","SURRE","101","","-99","LOQ","YES","39.5","","253.4","1.00","0",""
"WGNA-082917-FRB-4837","537","RES","320-31180-2","TALSAC","STL00996","13C2
PFDA","42","ng/L","","-99","DL","","SURRE","108","","-99","LOQ","YES","39.5","","253.4","1.00","0",""
"LLCS 320-182400/2-A","537","RES","LLCS 320-182400/2-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","37.5","ng/L","J M","6.8","DL","","SPK","94","","40","LOQ","YES","40.0","","250","1.00","16",""
"LLCS 320-182400/2-A","537","RES","LLCS 320-182400/2-A","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","19.2","ng/L","J","2.8","DL","","SPK","96","","20","LOQ","YES","20.0","","250","1.00","8.0",""
"LLCS 320-182400/2-A","537","RES","LLCS 320-182400/2-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","30.1","ng/L","","5.5","DL","","SPK","100","","30","LOQ","YES","30.0","","250","1.00","12",""
"LLCS 320-182400/2-A","537","RES","LLCS 320-182400/2-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","96.1","ng/L","","16","DL","","SPK","107","","90","LOQ","YES","90.0","","250","1.00","36",""
"LLCS 320-182400/2-A","537","RES","LLCS 320-182400/2-A","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","10.4","ng/L","","1.9","DL","","SPK","104","","10","LOQ","YES","10.0","","250","1.00","4.0",""
"LLCS 320-182400/2-A","537","RES","LLCS 320-182400/2-A","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","19.1","ng/L","J","8.0","DL","","SPK","96","","24","LOQ","YES","20.0","","250","1.00","20",""
"LLCS 320-182400/2-A","537","RES","LLCS 320-182400/2-A","TALSAC","STL00993","13C2
PFHxA","39.0","ng/L","","-99","DL","","SURRE","98","","-99","LOQ","YES","40.0","","250","1.00","0",""
"LLCS 320-182400/2-A","537","RES","LLCS 320-182400/2-A","TALSAC","STL00996","13C2
PFDA","43.1","ng/L","","-99","DL","","SURRE","108","","-99","LOQ","YES","40.0","","250","1.00","0",""
"LLCSD 320-182400/3-A","537","RES","LLCSD 320-182400/3-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","38.9","ng/L","J M","6.8","DL","","SPK","97","4","40","LOQ","YES","40.0","LLCS 320-182400/2-A","250","1.00","16",""
"LLCSD 320-182400/3-A","537","RES","LLCSD 320-182400/3-A","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","19.5","ng/L","J","2.8","DL","","SPK","97","1","20","LOQ","YES","20.0","LLCS 320-182400/2-

A","250","1.00","8.0",,""
"LLCSD 320-182400/3-A","537","RES","LLCSD 320-182400/3-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","29.8","ng/L","J","5.5","DL",,"","SPK","99","1","30","LOQ","YES","30.0","LLCS 320-182400/2-A","250","1.00","12",,""
"LLCSD 320-182400/3-A","537","RES","LLCSD 320-182400/3-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","96.8","ng/L",,"","16","DL",,"","SPK","108","0.7","90","LOQ","YES","90.0","LLCS 320-182400/2-A","250","1.00","36",,""
"LLCSD 320-182400/3-A","537","RES","LLCSD 320-182400/3-A","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","10.5","ng/L",,"","1.9","DL",,"","SPK","105","1","10","LOQ","YES","10.0","LLCS 320-182400/2-A","250","1.00","4.0",,""
"LLCSD 320-182400/3-A","537","RES","LLCSD 320-182400/3-A","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","19.8","ng/L","J","8.0","DL",,"","SPK","99","4","24","LOQ","YES","20.0","LLCS 320-182400/2-A","250","1.00","20",,""
"LLCSD 320-182400/3-A","537","RES","LLCSD 320-182400/3-A","TALSAC","STL00993","13C2 PFHxA","40.1","ng/L",,"","-99","DL",,"","SURR","100","3","-99","LOQ","YES","40.0","LLCS 320-182400/2-A","250","1.00","0",,""
"LLCSD 320-182400/3-A","537","RES","LLCSD 320-182400/3-A","TALSAC","STL00996","13C2 PFDA","46.9","ng/L",,"","-99","DL",,"","SURR","117","8","-99","LOQ","YES","40.0","LLCS 320-182400/2-A","250","1.00","0",,""
"MB 320-182400/1-A","537","RES","MB 320-182400/1-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","16","ng/L","U","6.8","DL",,"","TRG",,"","","40","LOQ","YES","-99",,"","250","1.00","16",,""
"MB 320-182400/1-A","537","RES","MB 320-182400/1-A","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","8.0","ng/L","U","2.8","DL",,"","TRG",,"","","20","LOQ","YES","-99",,"","250","1.00","8.0",,""
"MB 320-182400/1-A","537","RES","MB 320-182400/1-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","12","ng/L","U","5.5","DL",,"","TRG",,"","","30","LOQ","YES","-99",,"","250","1.00","12",,""
"MB 320-182400/1-A","537","RES","MB 320-182400/1-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","36","ng/L","U","16","DL",,"","TRG",,"","","90","LOQ","YES","-99",,"","250","1.00","36",,""
"MB 320-182400/1-A","537","RES","MB 320-182400/1-A","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","4.0","ng/L","U","1.9","DL",,"","TRG",,"","","10","LOQ","YES","-99",,"","250","1.00","4.0",,""
"MB 320-182400/1-A","537","RES","MB 320-182400/1-A","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","20","ng/L","U","8.0","DL",,"","TRG",,"","","24","LOQ","YES","-99",,"","250","1.00","20",,""
"MB 320-182400/1-A","537","RES","MB 320-182400/1-A","TALSAC","STL00993","13C2 PFHxA","40.4","ng/L",,"","-99","DL",,"","SURR","101",,"","-99","LOQ","YES","40.0",,"","250","1.00","0",,""
"MB 320-182400/1-A","537","RES","MB 320-182400/1-A","TALSAC","STL00996","13C2 PFDA","44.6","ng/L",,"","-99","DL",,"","SURR","111",,"","-99","LOQ","YES","40.0",,"","250","1.00","0",,""
"Unknown","Unknown","WGNA-082917-RW-4837","08/29/2017 13:50","AQ","320-31180-1","NM",,"","2.20","537","METHOD","RES","09/01/2017 08:39","09/08/2017 22:45","TALSAC","COA","WET","NA","1","NA","NA",,"","100","320-182400","320-182400","NA","320-183774","320-31180-1","08/30/2017 09:50","09/12/2017 13:14",,""
"Unknown","Unknown","WGNA-082917-FRB-4837","08/29/2017 11:45","AQ","320-31180-2","FB",,"","2.20","537","METHOD","RES","09/01/2017 08:39","09/08/2017 22:50","TALSAC","COA","WET","NA","1","NA","NA",,"","100","320-182400","320-182400","NA","320-183774","320-31180-1","08/30/2017 09:50","09/12/2017 13:14",,""
"Unknown","Unknown","LLCS 320-182400/2-A",,"","AQ","LLCS 320-182400/2-A","LCS",,"","-99","537","METHOD","RES","09/01/2017 08:39","09/08/2017 20:56","TALSAC","COA","WET","NA","1","NA","NA",,"","100","320-182400","320-182400","NA","320-183512","320-31180-1","09/01/2017 08:39","09/12/2017 13:14",,""
"Unknown","Unknown","LLCSD 320-182400/3-A",,"","AQ","LLCSD 320-182400/3-A","LCSD",,"","-99","537","METHOD","RES","09/01/2017 08:39","09/08/2017 21:01","TALSAC","COA","WET","NA","1","NA","NA",,"","100","320-182400","320-182400","NA","320-183512","320-31180-1","09/01/2017 08:39","09/12/2017 13:14",,""
"Unknown","Unknown","MB 320-182400/1-A",,"","AQ","MB 320-182400/1-A","MB",,"","-99","537","METHOD","RES","09/01/2017 08:39","09/08/2017 20:51","TALSAC","COA","WET","NA","1","NA","NA",,"","100","320-182400","320-182400","NA","320-

183512","320-31180-1","09/01/2017 08:39","09/12/2017 13:14",""



TO: A. FREBOWITZ **DATE:** SEPTEMBER 18, 2017

FROM: TERRI L. SOLOMON **COPIES:** DV FILE

SUBJECT: ORGANIC DATA VALIDATION –POLYFLUOROALKYL SUBSTANCES (PFAS)
NAS JRB WILLOW GROVE
SAMPLE DELIVERY GROUP (SDG) 320-31180-1

SAMPLES: 1/Field Reagent Blank (FRB)
WGNA-082917-FRB-4837

1/Drinking Water
WGNA-082917-RW-4837

Overview

The sample set for NAS JRB Willow Grove, SDG 320-31180-1, consisted of one (1) drinking water sample and one (1) FRB sample. All samples were analyzed for select perfluorinated alkyl acids including pentadecafluorooctanoic acid (PFOA), perfluorobutane sulfonic acid (PFBS), perfluoroheptanoic acid (PFHpA), perfluorohexanesulfonic acid (PFHxS), perfluorononanoic acid (PFNA) and perfluorooctane sulfonic acid (PFOS). No field duplicate pairs were included in this SDG.

The samples were collected by Tetra Tech on August 29, 2017 and analyzed by TestAmerica-Sacramento. All sample analyses were conducted in accordance with EPA Method 537 version 1.1 analytical and reporting protocols.

The data contained in this SDG was validated with regard to the following parameters: data completeness, holding times, initial/continuing calibrations, laboratory method/FRBs, surrogate spike recoveries, laboratory control sample / laboratory control sample duplicate results, internal standard areas and recoveries, chromatographic resolution, analyte identification, analyte quantitation, and detection limits. Areas of concern are listed below.

Major

None.

Minor

None.

Notes

It was noted in the case narrative that there was insufficient sample volume to analyze a matrix spike / matrix spike duplicate sample. No action was taken as a result of this issue.

It was noted that FRB sample WGNA-082917-FRB-4837 was analyzed although the associated sample results were nondetects. No validation actions were required.

Non-detected results were reported to the Limit of Detection (LOD).

The buffering agent Trizma was added to all drinking water samples.

TO: A. FREBOWITZ
SDG: 320-31180-1

PAGE 2

Executive Summary

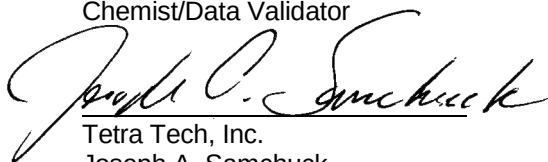
Laboratory Performance: None.

Other Factors Affecting Data Quality: None.

The data for these analyses were reviewed with reference to the Environmental Protection Agency document EPA/600/R-08/092, Method 537, "Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)", (September 2009) and the US EPA National Functional Guidelines for Organic Data Review (January 2017) as applicable. The text of this report has been formulated to address only those areas affecting data quality.



Tetra Tech, Inc.
Terri L. Solomon
Chemist/Data Validator



Tetra Tech, Inc.
Joseph A. Samchuck
Data Validation Manager

Attachments:

Appendix A – Qualified Analytical Results
Appendix B – Results as Reported by the Laboratory
Appendix C – Support Documentation

Data Qualifier Definitions

The following definitions provide brief explanations of the validation qualifiers assigned to results in the data review process.

U	The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted method detection limit for sample and method.
J	The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the reporting limit).
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
UJ	The analyte was analyzed for, but was not detected. The reported detection limit is approximate and may be inaccurate or imprecise.
R	The sample result (detected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
UR	The sample result (nondetected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.

Appendix A

Qualified Analytical Results

Qualifier Codes:

- A = Lab Blank Contamination
- B = Field Blank Contamination
- C = Calibration Noncompliance (i.e., % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
- C01 = GC/MS Tuning Noncompliance
- D = MS/MSD Recovery Noncompliance
- E = LCS/LCSD Recovery Noncompliance
- F = Lab Duplicate Imprecision
- G = Field Duplicate Imprecision
- H = Holding Time Exceedance
- I = ICP Serial Dilution Noncompliance
- J = ICP PDS Recovery Noncompliance; MSA's $r < 0.995$
- K = ICP Interference - includes ICS % R Noncompliance
- L = Instrument Calibration Range Exceedance
- M = Sample Preservation Noncompliance
- N = Internal Standard Noncompliance
- N01 = Internal Standard Recovery Noncompliance Dioxins
- N02 = Recovery Standard Noncompliance Dioxins
- N03 = Clean-up Standard Noncompliance Dioxins
- O = Poor Instrument Performance (i.e., base-time drifting)
- P = Uncertainty near detection limit ($< 2 \times \text{IDL}$ for inorganics and $< \text{CRQL}$ for organics)
- Q = Other problems (can encompass a number of issues; i.e. chromatography, interferences, etc.)
- R = Surrogates Recovery Noncompliance
- S = Pesticide/PCB Resolution
- T = % Breakdown Noncompliance for DDT and Endrin
- U = RPD between columns/detectors $> 40\%$ for positive results determined via GC/HPLC
- V = Non-linear calibrations; correlation coefficient $r < 0.995$
- W = EMPC result
- X = Signal to noise response drop
- Y = Percent solids $< 30\%$
- Z = Uncertainty at 2 standard deviations is greater than sample activity
- Z1 = Tentatively Identified Compound considered presumptively present
- Z2 = Tentatively Identified Compound column bleed
- Z3 = Tentatively Identified Compound aldol condensate
- Z4 = Sample activity is less than the at uncertainty at 3 standard deviations and greater than the MDC
- Z5 = Sample activity is less than the at uncertainty at 3 standard deviations and less than the MDC

PROJ_NO: 08005-WE04 SDG: 320-31180-1 FRACTION: PFAS MEDIA: WATER	NSAMPLE	WGNA-082917-FRB-4837			WGNA-082917-RW-4837		
	LAB_ID	320-31180-2			320-31180-1		
	SAMP_DATE	8/29/2017			8/29/2017		
	QC_TYPE	FB			NM		
	UNITS	NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0		
	DUP_OF						
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD
PENTADECAFLUOROOCTANOIC ACID		7.9 U			7.6 U		
PERFLUOROBUTANESULFONIC ACID		36 U			34 U		
PERFLUOROHEPTANOIC ACID		3.9 U			3.8 U		
PERFLUOROHXANESULFONIC ACID		12 U			11 U		
PERFLUORONONANOIC ACID		20 U			19 U		
PERFLUOROOCTANE SULFONIC ACID		16 U			15 U		

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-31180-1</u>
SDG No.: <u>WE04</u>	
Client Sample ID: <u>WGNA-082917-RW-4837</u>	Lab Sample ID: <u>320-31180-1</u>
Matrix: <u>Water</u>	Lab File ID: <u>2017.09.08_537C_027.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>08/29/2017 13:50</u>
Extraction Method: <u>537</u>	Date Extracted: <u>09/01/2017 08:39</u>
Sample wt/vol: <u>263.3(mL)</u>	Date Analyzed: <u>09/08/2017 22:45</u>
Con. Extract Vol.: <u>1.00(mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2(uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3(mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>183774</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	U	38	15	6.5
335-67-1	Perfluorooctanoic acid (PFOA)	7.6	U	19	7.6	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.6
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	28	11	5.2
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.8	U	9.5	3.8	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	34	U	85	34	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	93		70-130
STL00996	13C2 PFDA	102		70-130

Steven L. Salomon
09/18/2017

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-31180-1</u>
SDG No.: <u>WE04</u>	
Client Sample ID: <u>WGNA-082917-FRB-4837</u>	Lab Sample ID: <u>320-31180-2</u>
Matrix: <u>Water</u>	Lab File ID: <u>2017.09.08_537C_028.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>08/29/2017 11:45</u>
Extraction Method: <u>537</u>	Date Extracted: <u>09/01/2017 08:39</u>
Sample wt/vol: <u>253.4 (mL)</u>	Date Analyzed: <u>09/08/2017 22:50</u>
Con. Extract Vol.: <u>1.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>183774</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	39	16	6.7
335-67-1	Perfluorooctanoic acid (PFOA)	7.9	U	20	7.9	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	7.9
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	30	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.9	U	9.9	3.9	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	89	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	101		70-130
STL00996	13C2 PFDA	108		70-130

Ami L. Selman
09/18/2017

Appendix B

Results as Reported by the Laboratory

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-31180-1</u>
SDG No.: <u>WE04</u>	
Client Sample ID: <u>WGNA-082917-RW-4837</u>	Lab Sample ID: <u>320-31180-1</u>
Matrix: <u>Water</u>	Lab File ID: <u>2017.09.08_537C_027.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>08/29/2017 13:50</u>
Extraction Method: <u>537</u>	Date Extracted: <u>09/01/2017 08:39</u>
Sample wt/vol: <u>263.3(mL)</u>	Date Analyzed: <u>09/08/2017 22:45</u>
Con. Extract Vol.: <u>1.00(mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2(uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3(mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>183774</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	U	38	15	6.5
335-67-1	Perfluorooctanoic acid (PFOA)	7.6	U	19	7.6	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.6
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	28	11	5.2
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.8	U	9.5	3.8	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	34	U	85	34	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	93		70-130
STL00996	13C2 PFDA	102		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-31180-1</u>
SDG No.: <u>WE04</u>	
Client Sample ID: <u>WGNA-082917-FRB-4837</u>	Lab Sample ID: <u>320-31180-2</u>
Matrix: <u>Water</u>	Lab File ID: <u>2017.09.08_537C_028.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>08/29/2017 11:45</u>
Extraction Method: <u>537</u>	Date Extracted: <u>09/01/2017 08:39</u>
Sample wt/vol: <u>253.4 (mL)</u>	Date Analyzed: <u>09/08/2017 22:50</u>
Con. Extract Vol.: <u>1.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: <u></u>	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>183774</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	39	16	6.7
335-67-1	Perfluorooctanoic acid (PFOA)	7.9	U	20	7.9	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	7.9
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	30	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.9	U	9.9	3.9	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	89	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	101		70-130
STL00996	13C2 PFDA	108		70-130

Appendix C

Support Documentation

880 Riverside Parkway
West Sacramento, CA 95605-1500
phone 916.373.5600 fax 303.467.7248

☐ NPDES ☐ RCRA ☐ Other:

TestAmerica Laboratories, Inc.

[illegible]

Job Narrative
320-31180-1

Receipt

The samples were received on 8/30/2017 9:50 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.2° C.

LCMS

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

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

Organic Prep

Method(s) 537: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-182400.

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

Method Summary

Client: Tetra Tech, Inc.
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

TestAmerica Job ID: 320-31180-1
SDG: WE04

Method	Method Description	Protocol	Laboratory
537	Perfluorinated Alkyl Acids (LC/MS)	EPA	TAL SAC

Protocol References:
EPA = US Environmental Protection Agency

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

Sample Summary

Client: Tetra Tech, Inc.
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

TestAmerica Job ID: 320-31180-1
SDG: WE04

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-31180-1	WGNA-082917-RW-4837	Water	08/29/17 13:50	08/30/17 09:50
320-31180-2	WGNA-082917-FRB-4837	Water	08/29/17 11:45	08/30/17 09:50

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento

Job No.: 320-31180-1

SDG No.: WE04

Matrix: Water

Level: Low

GC Column (1): GeminiC18 3 ID: 3 (mm)

Client Sample ID	Lab Sample ID	PFHxA #	PFDA #
WGNA-082917-RW-483 7	320-31180-1	93	102
WGNA-082917-FRB-48 37	320-31180-2	101	108
	MB 320-182400/1-A	101	111
	LLCS 320-182400/2-A	98	108
	LLCSD 320-182400/3-A	100	117

PFHxA = 13C2 PFHxA
PFDA = 13C2 PFDA

QC LIMITS
70-130
70-130

Column to be used to flag recovery values

FORM III
LCMS LOW LEVEL CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-31180-1
 SDG No.: WE04
 Matrix: Water Level: Low Lab File ID: 2017.09.08_537C_004.d
 Lab ID: LLCS 320-182400/2-A Client ID: _____

COMPOUND	SPIKE ADDED (ng/L)	LLCS CONCENTRATION (ng/L)	LLCS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	40.0	37.5 J	94	50-150	M
Perfluorooctanoic acid (PFOA)	20.0	19.2 J	96	50-150	
Perfluorononanoic acid (PFNA)	20.0	19.1 J	96	50-150	
Perfluorohexanesulfonic acid (PFHxS)	30.0	30.1	100	50-150	
Perfluoroheptanoic acid (PFHpA)	10.0	10.4	104	50-150	
Perfluorobutanesulfonic acid (PFBS)	90.0	96.1	107	50-150	

Column to be used to flag recovery and RPD values

FORM III
LCMS LOW LEVEL CONTROL STANDARD DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-31180-1
 SDG No.: WE04
 Matrix: Water Level: Low Lab File ID: 2017.09.08_537C_005.d
 Lab ID: LLCSD 320-182400/3-A Client ID: _____

COMPOUND	SPIKE ADDED (ng/L)	LLCSD CONCENTRATION (ng/L)	LLCSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
Perfluorooctanesulfonic acid (PFOS)	40.0	38.9 J	97	4	50	50-150	M
Perfluorooctanoic acid (PFOA)	20.0	19.5 J	97	1	50	50-150	
Perfluorononanoic acid (PFNA)	20.0	19.8 J	99	4	50	50-150	
Perfluorohexanesulfonic acid (PFHxS)	30.0	29.8 J	99	1	50	50-150	
Perfluoroheptanoic acid (PFHpA)	10.0	10.5	105	1	50	50-150	
Perfluorobutanesulfonic acid (PFBS)	90.0	96.8	108	0.7	50	50-150	

Column to be used to flag recovery and RPD values

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-31180-1
SDG No.: WE04
Lab File ID: 2017.09.08_537C_003.d Lab Sample ID: MB 320-182400/1-A
Matrix: Water Date Extracted: 09/01/2017 08:39
Instrument ID: A8_N Date Analyzed: 09/08/2017 20:51
Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LLCS 320-182400/2-A	2017.09.08_ 537C 004.d	09/08/2017 20:56
	LLCSD 320-182400/3-A	2017.09.08_ 537C 005.d	09/08/2017 21:01
WGNA-082917-RW-4837	320-31180-1	2017.09.08_ 537C 027.d	09/08/2017 22:45
WGNA-082917-FRB-4837	320-31180-2	2017.09.08_ 537C 028.d	09/08/2017 22:50

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-31180-1</u>
SDG No.: <u>WE04</u>	
Client Sample ID: _____	Lab Sample ID: <u>MB 320-182400/1-A</u>
Matrix: <u>Water</u>	Lab File ID: <u>2017.09.08_537C_003.d</u>
Analysis Method: <u>537</u>	Date Collected: _____
Extraction Method: <u>537</u>	Date Extracted: <u>09/01/2017 08:39</u>
Sample wt/vol: <u>250 (mL)</u>	Date Analyzed: <u>09/08/2017 20:51</u>
Con. Extract Vol.: <u>1.00 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>2 (uL)</u>	GC Column: <u>GeminiC18 3x100 ID: 3 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>183512</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	8.0	U	20	8.0	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	8.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.0	U	10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	90	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	101		70-130
STL00996	13C2 PFDA	111		70-130

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-31180-1
 SDG No.: WE04
 Instrument ID: A8_N Calibration Start Date: 09/08/2017 13:27
 GC Column: GeminiC18 3x100 ID: 3(mm) Calibration End Date: 09/08/2017 13:51
 Calibration ID: 34044

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MEAN AREA AND MEAN RT		1910246	1.93	5581381	2.16		
UPPER LIMIT		2865369	2.43	8372072	2.66		
LOWER LIMIT		955123	1.43	2790691	1.66		
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCVL 320-183459/9		1974239	1.93	5860601	2.16		
ICV 320-183459/11		2166899	1.94	6602152	2.17		
CCV 320-183512/1 CCVIS		1659667	1.92	5340700	2.16		
MB 320-182400/1-A		1780906	1.92	5489924	2.16		
LLCS 320-182400/2-A		1858873	1.91	5511672	2.16		
LLCSD 320-182400/3-A		1740089	1.91	5356328	2.16		
CCV 320-183512/13 CCVIS		1674403	1.91	5232378	2.15		
CCV 320-183774/25 CCVIS		1762955	1.91	5568740	2.15		
320-31180-1	WGNA-082917-RW-4837	1872331	1.91	5398198	2.15		
320-31180-2	WGNA-082917-FRB-4837	1843752	1.91	5518835	2.15		
CCV 320-183774/29 CCVIS		1731366	1.90	5297806	2.14		

13PFOA = 13C2-PFOA

PFOS = 13C4 PFOS

Area Limit = 50%-150% of internal standard area

RT Limit = $\pm$ 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-31180-1
 SDG No.: WE04
 Sample No.: CCV 320-183512/1 Date Analyzed: 09/08/2017 20:41
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2017.09.08_537C_001 Heated Purge: (Y/N) N
 Calibration ID: 34044

	13PFOA		PFOS			
	AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD	1659667	1.92	5340700	2.16		
UPPER LIMIT	2323534	2.42	7476980	2.66		
LOWER LIMIT	1161767	1.42	3738490	1.66		
LAB SAMPLE ID	CLIENT SAMPLE ID					
MB 320-182400/1-A		1780906	1.92	5489924	2.16	
LLCS 320-182400/2-A		1858873	1.91	5511672	2.16	
LLCSD 320-182400/3-A		1740089	1.91	5356328	2.16	

13PFOA = 13C2-PFOA
 PFOS = 13C4 PFOS

Area Limit = 70%-140% of internal standard area
 RT Limit = $\pm$ 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-31180-1
 SDG No.: WE04
 Sample No.: CCV 320-183512/13 Date Analyzed: 09/08/2017 21:39
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2017.09.08_537C_013 Heated Purge: (Y/N) N
 Calibration ID: 34044

	13PFOA		PFOS			
	AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD	1674403	1.91	5232378	2.15		
UPPER LIMIT	2344164	2.41	7325329	2.65		
LOWER LIMIT	1172082	1.41	3662665	1.65		
LAB SAMPLE ID	CLIENT SAMPLE ID					
MB 320-182400/1-A		1780906	1.92	5489924	2.16	
LLCS 320-182400/2-A		1858873	1.91	5511672	2.16	
LLCSD 320-182400/3-A		1740089	1.91	5356328	2.16	

13PFOA = 13C2-PFOA
 PFOS = 13C4 PFOS

Area Limit = 70%-140% of internal standard area
 RT Limit = $\pm$ 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-31180-1
 SDG No.: WE04
 Sample No.: CCV 320-183774/25 Date Analyzed: 09/08/2017 22:36
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2017.09.08_537C_025 Heated Purge: (Y/N) N
 Calibration ID: 34044

	13PFOA		PFOS			
	AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD	1762955	1.91	5568740	2.15		
UPPER LIMIT	2468137	2.41	7796236	2.65		
LOWER LIMIT	1234069	1.41	3898118	1.65		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-31180-1	WGNA-082917-RW-4837		1872331	1.91	5398198	2.15
320-31180-2	WGNA-082917-FRB-4837		1843752	1.91	5518835	2.15

13PFOA = 13C2-PFOA
 PFOS = 13C4 PFOS

Area Limit = 70%-140% of internal standard area
 RT Limit = $\pm$ 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-31180-1
 SDG No.: WE04
 Sample No.: CCV 320-183774/29 Date Analyzed: 09/08/2017 22:55
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2017.09.08_537C_029 Heated Purge: (Y/N) N
 Calibration ID: 34044

	13PFOA		PFOS			
	AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD	1731366	1.90	5297806	2.14		
UPPER LIMIT	2423912	2.40	7416928	2.64		
LOWER LIMIT	1211956	1.40	3708464	1.64		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-31180-1	WGNA-082917-RW-4837		1872331	1.91	5398198	2.15
320-31180-2	WGNA-082917-FRB-4837		1843752	1.91	5518835	2.15

13PFOA = 13C2-PFOA
 PFOS = 13C4 PFOS

Area Limit = 70%-140% of internal standard area
 RT Limit = $\pm$ 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VI
LCMS BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-31180-1 Analy Batch No.: 183459

SDG No.: WE04

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 09/08/2017 13:27 Calibration End Date: 09/08/2017 13:51 Calibration ID: 34044

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-183459/2	2017.09.08_537ICAL_004.d
Level 2	IC 320-183459/3	2017.09.08_537ICAL_005.d
Level 3	IC 320-183459/4	2017.09.08_537ICAL_006.d
Level 4	IC 320-183459/5	2017.09.08_537ICAL_007.d
Level 5	IC 320-183459/6	2017.09.08_537ICAL_008.d
Level 6	IC 320-183459/7	2017.09.08_537ICAL_009.d

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
Perfluorobutanesulfonic acid (PFBS)	1.0710 0.6966	1.0575	1.0111	0.8594	0.7869	QuaF		1.0622	-0.002040						0.9990		0.9600
Perfluoroheptanoic acid (PFHpA)	0.9220 0.9255	0.9473	0.9541	0.9231	0.9315	Ave		0.9339				1.5		30.0			
Perfluorohexanesulfonic acid (PFHxS)	1.6148 1.4811	1.6536	1.6599	1.5874	1.5838	Ave		1.5968				4.1		30.0			
Perfluorooctanoic acid (PFOA)	0.9158 0.9617	0.9269	0.9412	0.8992	0.9123	Ave		0.9262				2.4		30.0			
Perfluorooctanesulfonic acid (PFOS)	0.8859 0.9363	0.9387	0.9168	0.9427	0.9444	Ave		0.9275				2.4		30.0			
Perfluorononanoic acid (PFNA)	0.6548 0.6554	0.6685	0.6501	0.6318	0.6303	Ave		0.6485				2.3		30.0			
13C2 PFHxA	1.1920 1.2378	1.2004	1.1834	1.2079	1.2178	Ave		1.2066				1.6		30.0			
13C2 PFDA	0.6511 0.7007	0.6681	0.6589	0.6707	0.6801	Ave		0.6716				2.6		30.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-31180-1 Analy Batch No.: 183459

SDG No.: WE04

Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 09/08/2017 13:27 Calibration End Date: 09/08/2017 13:51 Calibration ID: 34044

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-183459/2	2017.09.08_537ICAL_004.d
Level 2	IC 320-183459/3	2017.09.08_537ICAL_005.d
Level 3	IC 320-183459/4	2017.09.08_537ICAL_006.d
Level 4	IC 320-183459/5	2017.09.08_537ICAL_007.d
Level 5	IC 320-183459/6	2017.09.08_537ICAL_008.d
Level 6	IC 320-183459/7	2017.09.08_537ICAL_009.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5
Perfluorobutanesulfonic acid (PFBS)	PFOS	QuaF	1896171 23775992	4213055	9072488	15158012	19852718	9.00 180	20.0	45.0	90.0	135
Perfluoroheptanoic acid (PFHpA)	13PF OA	Ave	176698 3422434	406467	925418	1800569	2623771	1.00 20.0	2.22	5.00	10.0	15.0
Perfluorohexanesulfonic acid (PFHxS)	PFOS	Ave	953075 16853658	2196189	4965386	9333896	13320862	3.00 60.0	6.67	15.0	30.0	45.0
Perfluorooctanoic acid (PFOA)	13PF OA	Ave	351237 7116752	795859	1826954	3509739	5142636	2.00 40.0	4.45	10.0	20.0	30.0
Perfluorooctanesulfonic acid (PFOS)	PFOS	Ave	697187 14205705	1662376	3656842	7391088	10590577	4.00 80.0	8.89	20.0	40.0	60.0
Perfluorononanoic acid (PFNA)	13PF OA	Ave	250972 4847063	573628	1261094	2464425	3550611	2.00 40.0	4.45	10.0	20.0	30.0
13C2 PFHxA	13PF OA	Ave	2283494 2288248	2317173	2295161	2355406	2286265	10.0 10.0	10.0	10.0	10.0	10.0
13C2 PFDA	13PF OA	Ave	1247394 1295246	1289579	1277856	1307825	1276749	10.0 10.0	10.0	10.0	10.0	10.0

Curve Type Legend:

Ave = Average ISTD
QuaF = Quadratic ISTD forced zero

FORM VI
LCMS BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
READBACK PERCENT ERROR

Lab Name: TestAmerica Sacramento Job No.: 320-31180-1 Analy Batch No.: 183459

SDG No.: WE04

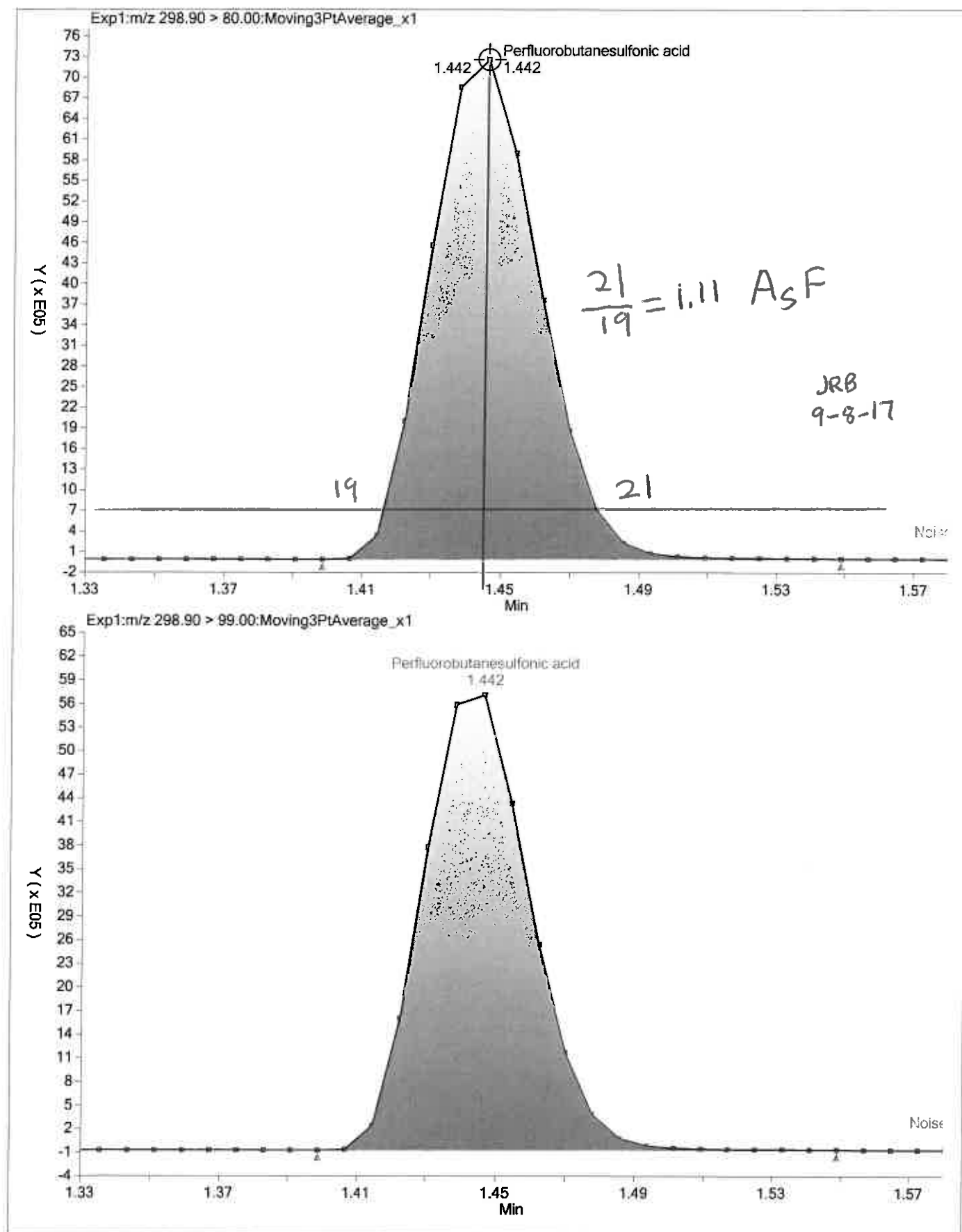
Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

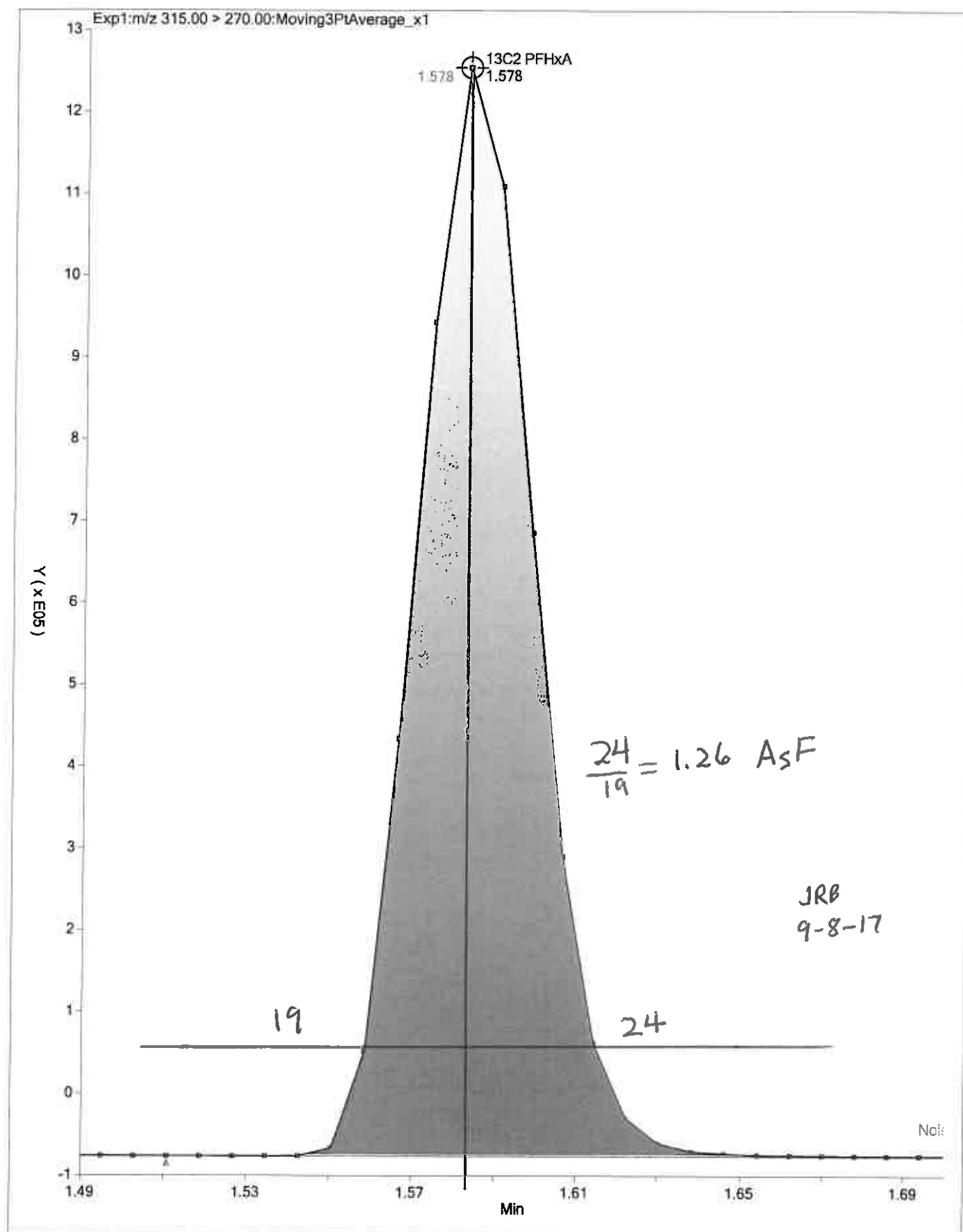
Calibration Start Date: 09/08/2017 13:27 Calibration End Date: 09/08/2017 13:51 Calibration ID: 34044

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-183459/2	2017.09.08_537ICAL_004.d
Level 2	IC 320-183459/3	2017.09.08_537ICAL_005.d
Level 3	IC 320-183459/4	2017.09.08_537ICAL_006.d
Level 4	IC 320-183459/5	2017.09.08_537ICAL_007.d
Level 5	IC 320-183459/6	2017.09.08_537ICAL_008.d
Level 6	IC 320-183459/7	2017.09.08_537ICAL_009.d

ANALYTE	PERCENT ERROR						PERCENT ERROR LIMIT					
	LVL 1 #	LVL 2 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6
Perfluorobutanesulfonic acid (PFBS)	2.7	3.7	4.7	-2.7	0.0	0.5	50	30	30	30	30	30
Perfluoroheptanoic acid (PFHpA)	-1.3	1.4	2.2	-1.2	-0.3	-0.9	50	30	30	30	30	30
Perfluorohexanesulfonic acid (PFHxS)	1.1	3.6	4.0	-0.6	-0.8	-7.2	50	30	30	30	30	30
Perfluorooctanoic acid (PFOA)	-1.1	0.1	1.6	-2.9	-1.5	3.8	50	30	30	30	30	30
Perfluorooctanesulfonic acid (PFOS)	-4.5	1.2	-1.1	1.6	1.8	0.9	50	30	30	30	30	30
Perfluorononanoic acid (PFNA)	1.0	3.1	0.3	-2.6	-2.8	1.1	50	30	30	30	30	30
13C2 PFHxA	-1.2	-0.5	-1.9	0.1	0.9	2.6	30	30	30	30	30	30
13C2 PFDA	-3.0	-0.5	-1.9	-0.1	1.3	4.3	30	30	30	30	30	30





FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-31180-1
 SDG No.: WE04
 Lab Sample ID: CCVL 320-183459/9 Calibration Date: 09/08/2017 14:00
 Instrument ID: A8_N Calib Start Date: 09/08/2017 13:27
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 09/08/2017 13:51
 Lab File ID: 2017.09.08_537ICAL_011.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		1.035		20.3	20.0	1.4	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9339	0.9801		2.33	2.22	4.9	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.597	1.670		6.97	6.67	4.6	50.0
Perfluorooctanoic acid (PFOA)	Ave	0.9262	0.9160		4.40	4.45	-1.1	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9275	0.9149		8.77	8.89	-1.4	50.0
Perfluorononanoic acid (PFNA)	Ave	0.6485	0.6787		4.65	4.45	4.7	50.0
13C2 PFHxA	Ave	1.207	1.214		10.1	10.0	0.6	30.0
13C2 PFDA	Ave	0.6716	0.6847		10.2	10.0	1.9	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-31180-1
 SDG No.: WE04
 Lab Sample ID: ICV 320-183459/11 Calibration Date: 09/08/2017 14:10
 Instrument ID: A8_N Calib Start Date: 09/08/2017 13:27
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 09/08/2017 13:51
 Lab File ID: 2017.09.08_537ICAL_013.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		0.8407		97.5	100	-2.6	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9339	0.9585		10.3	10.0	2.6	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.597	1.807		22.7	20.1	13.2	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9262	0.9495		21.0	20.5	2.5	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9275	1.113		23.6	19.7	20.1	30.0
Perfluorononanoic acid (PFNA)	Ave	0.6485	0.7430		23.1	20.1	14.6	30.0
13C2 PFHxA	Ave	1.207	1.185		9.82	10.0	-1.8	30.0
13C2 PFDA	Ave	0.6716	0.6610		9.84	10.0	-1.6	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-31180-1
 SDG No.: WE04
 Lab Sample ID: CCVL 320-183505/3 Calibration Date: 09/08/2017 15:38
 Instrument ID: A8_N Calib Start Date: 09/08/2017 13:27
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 09/08/2017 13:51
 Lab File ID: 2017.09.08_537B_004.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		1.046		20.5	20.0	2.5	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9339	0.9827		2.34	2.22	5.2	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.597	1.654		6.91	6.67	3.6	50.0
Perfluorooctanoic acid (PFOA)	Ave	0.9262	0.9027		4.34	4.45	-2.5	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9275	0.9099		8.72	8.89	-1.9	50.0
Perfluorononanoic acid (PFNA)	Ave	0.6485	0.6629		4.54	4.45	2.2	50.0
13C2 PFHxA	Ave	1.207	1.208		10.0	10.0	0.2	30.0
13C2 PFDA	Ave	0.6716	0.6635		9.88	10.0	-1.2	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-31180-1
 SDG No.: WE04
 Lab Sample ID: CCV 320-183512/1 Calibration Date: 09/08/2017 20:41
 Instrument ID: A8_N Calib Start Date: 09/08/2017 13:27
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 09/08/2017 13:51
 Lab File ID: 2017.09.08_537C_001.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		1.034		48.3	45.0	7.3	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9339	1.033		5.53	5.00	10.6	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.597	1.670		15.7	15.0	4.6	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9262	0.9403		10.2	10.0	1.5	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9275	0.9220		19.9	20.0	-0.6	30.0
Perfluorononanoic acid (PFNA)	Ave	0.6485	0.6642		10.2	10.0	2.4	30.0
13C2 PFHxA	Ave	1.207	1.286		10.7	10.0	6.5	30.0
13C2 PFDA	Ave	0.6716	0.6874		10.2	10.0	2.4	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-31180-1
 SDG No.: WE04
 Lab Sample ID: CCV 320-183512/13 Calibration Date: 09/08/2017 21:39
 Instrument ID: A8_N Calib Start Date: 09/08/2017 13:27
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 09/08/2017 13:51
 Lab File ID: 2017.09.08_537C_013.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		0.7924		137	135	1.1	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9339	0.9876		15.9	15.0	5.7	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.597	1.552		43.7	45.0	-2.8	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9262	0.9339		30.3	30.0	0.8	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9275	0.9312		60.3	60.0	0.4	30.0
Perfluorononanoic acid (PFNA)	Ave	0.6485	0.6526		30.2	30.0	0.6	30.0
13C2 PFHxA	Ave	1.207	1.277		10.6	10.0	5.8	30.0
13C2 PFDA	Ave	0.6716	0.6814		10.1	10.0	1.5	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-31180-1
 SDG No.: WE04
 Lab Sample ID: CCV 320-183774/25 Calibration Date: 09/08/2017 22:36
 Instrument ID: A8_N Calib Start Date: 09/08/2017 13:27
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 09/08/2017 13:51
 Lab File ID: 2017.09.08_537C_025.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		1.032		48.2	45.0	7.1	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9339	1.007		5.39	5.00	7.8	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.597	1.694		15.9	15.0	6.1	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9262	0.9253		10.0	10.0	-0.1	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9275	0.9070		19.6	20.0	-2.2	30.0
Perfluorononanoic acid (PFNA)	Ave	0.6485	0.6860		10.6	10.0	5.8	30.0
13C2 PFHxA	Ave	1.207	1.286		10.7	10.0	6.6	30.0
13C2 PFDA	Ave	0.6716	0.6809		10.1	10.0	1.4	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-31180-1
 SDG No.: WE04
 Lab Sample ID: CCV 320-183774/29 Calibration Date: 09/08/2017 22:55
 Instrument ID: A8_N Calib Start Date: 09/08/2017 13:27
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 09/08/2017 13:51
 Lab File ID: 2017.09.08_537C_029.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		0.7978		138	135	2.2	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9339	0.9816		15.8	15.0	5.1	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.597	1.542		43.5	45.0	-3.4	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9262	0.9192		29.8	30.0	-0.8	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9275	0.9403		60.8	60.0	1.4	30.0
Perfluorononanoic acid (PFNA)	Ave	0.6485	0.6620		30.6	30.0	2.1	30.0
13C2 PFHxA	Ave	1.207	1.300		10.8	10.0	7.7	30.0
13C2 PFDA	Ave	0.6716	0.7048		10.5	10.0	5.0	30.0

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica SacramentoJob No.: 320-31180-1SDG No.: WE04Instrument ID: A8_NStart Date: 09/08/2017 13:27Analysis Batch Number: 183459End Date: 09/08/2017 14:10

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-183459/2		09/08/2017 13:27	1	2017.09.08_537I CAL 004.d	GeminiC18 3x100 3(mm)
IC 320-183459/3		09/08/2017 13:32	1	2017.09.08_537I CAL 005.d	GeminiC18 3x100 3(mm)
IC 320-183459/4		09/08/2017 13:37	1	2017.09.08_537I CAL 006.d	GeminiC18 3x100 3(mm)
IC 320-183459/5 ICISAV		09/08/2017 13:42	1	2017.09.08_537I CAL 007.d	GeminiC18 3x100 3(mm)
IC 320-183459/6		09/08/2017 13:46	1	2017.09.08_537I CAL 008.d	GeminiC18 3x100 3(mm)
IC 320-183459/7		09/08/2017 13:51	1	2017.09.08_537I CAL 009.d	GeminiC18 3x100 3(mm)
ZZZZZ		09/08/2017 13:56	1		GeminiC18 3x100 3(mm)
CCVL 320-183459/9		09/08/2017 14:00	1	2017.09.08_537I CAL 011.d	GeminiC18 3x100 3(mm)
ZZZZZ		09/08/2017 14:05	1		GeminiC18 3x100 3(mm)
ICV 320-183459/11		09/08/2017 14:10	1	2017.09.08_537I CAL 013.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-31180-1
SDG No.: WE04
Instrument ID: A8_N Start Date: 09/08/2017 15:38
Analysis Batch Number: 183505 End Date: 09/08/2017 15:38

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCVL 320-183505/3		09/08/2017 15:38	1	2017.09.08_537B 004.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica SacramentoJob No.: 320-31180-1SDG No.: WE04Instrument ID: A8_NStart Date: 09/08/2017 20:41Analysis Batch Number: 183512End Date: 09/08/2017 21:39

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-183512/1 CCVIS		09/08/2017 20:41	1	2017.09.08_537C 001.d	GeminiC18 3x100 3(mm)
ZZZZZ		09/08/2017 20:46	1		GeminiC18 3x100 3(mm)
MB 320-182400/1-A		09/08/2017 20:51	1	2017.09.08_537C 003.d	GeminiC18 3x100 3(mm)
LLCS 320-182400/2-A		09/08/2017 20:56	1	2017.09.08_537C 004.d	GeminiC18 3x100 3(mm)
LLCSD 320-182400/3-A		09/08/2017 21:01	1	2017.09.08_537C 005.d	GeminiC18 3x100 3(mm)
ZZZZZ		09/08/2017 21:05	1		GeminiC18 3x100 3(mm)
ZZZZZ		09/08/2017 21:10	1		GeminiC18 3x100 3(mm)
ZZZZZ		09/08/2017 21:15	1		GeminiC18 3x100 3(mm)
ZZZZZ		09/08/2017 21:20	1		GeminiC18 3x100 3(mm)
ZZZZZ		09/08/2017 21:24	1		GeminiC18 3x100 3(mm)
ZZZZZ		09/08/2017 21:29	1		GeminiC18 3x100 3(mm)
ZZZZZ		09/08/2017 21:34	1		GeminiC18 3x100 3(mm)
CCV 320-183512/13 CCVIS		09/08/2017 21:39	1	2017.09.08_537C 013.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-31180-1
SDG No.: WE04
Instrument ID: A8_N Start Date: 09/08/2017 22:36
Analysis Batch Number: 183774 End Date: 09/08/2017 22:55

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-183774/25 CCVIS		09/08/2017 22:36	1	2017.09.08_537C 025.d	GeminiC18 3x100 3(mm)
ZZZZZ		09/08/2017 22:40	1		GeminiC18 3x100 3(mm)
320-31180-1		09/08/2017 22:45	1	2017.09.08_537C 027.d	GeminiC18 3x100 3(mm)
320-31180-2		09/08/2017 22:50	1	2017.09.08_537C 028.d	GeminiC18 3x100 3(mm)
CCV 320-183774/29 CCVIS		09/08/2017 22:55	1	2017.09.08_537C 029.d	GeminiC18 3x100 3(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-31180-1

SDG No.: WE04

Batch Number: 182400 Batch Start Date: 09/01/17 08:39 Batch Analyst: Branscum, Cassie

Batch Method: 537 Batch End Date: 09/05/17 11:38

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	ReceivedpH	LC537-IS 00047
MB 320-182400/1		537, 537				250 mL	1.00 mL	7 SU	100 uL
LLCS 320-182400/2		537, 537				250 mL	1.00 mL	7 SU	100 uL
LLCSD 320-182400/3		537, 537				250 mL	1.00 mL	7 SU	100 uL
320-31180-A-1	WGNA-082917-RW-4 837	537, 537	T	291.18 g	27.86 g	263.3 mL	1.00 mL	7 SU	100 uL
320-31180-A-2	WGNA-082917-FRB- 4837	537, 537	T	280.56 g	27.16 g	253.4 mL	1.00 mL	7 SU	100 uL

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-LSP 00026	LC537-SU 00048	AnalysisComment			
MB 320-182400/1		537, 537			100 uL	ch nd			
LLCS 320-182400/2		537, 537		100 uL	100 uL	ch nd			
LLCSD 320-182400/3		537, 537		100 uL	100 uL	ch nd			
320-31180-A-1	WGNA-082917-RW-4 837	537, 537	T		100 uL	ch nd			
320-31180-A-2	WGNA-082917-FRB- 4837	537, 537	T		100 uL	ch nd			

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.: 320-31180-1SDG No.: WE04Batch Number: 182400 Batch Start Date: 09/01/17 08:39 Batch Analyst: Branscum, CassieBatch Method: 537 Batch End Date: 09/05/17 11:38

Batch Notes	
Batch Comment	IS:1002957
Manifold ID	7,3
Methanol ID	1010866
Pipette ID	M16387D
Analyst ID - IS Reagent Drop	CCB
Analyst ID - IS Reagent Drop Witness	HJA
Analyst ID - SU Reagent Drop	CCB
Analyst ID - SU Reagent Drop Witness	JNS
Analyst ID - TA Reagent Drop	CCB
Analyst ID - TA Reagent Drop Witness	JNS
SPE Cartridge ID	6357081-03
Trizma ID	SLBR4303V
Reagent Water ID	8/28/17

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.

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-182400

Analyst: Branscum, Cassie

Batch Open: 9/1/2017 8:39:00AM

Method Code: 320-537_Prep-320

Batch End: 9/5/2017 11:38:00AM

Extraction of Perfluorinated Alkyl Acids

Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmnt FinAmnt	Rcvd	PHs Adj1	Adj2	Due Date	Analytical TAT	Div Rank	Comments	Output Sample Lab ID
1 MB~320-182400/1 N/A	N/A		250 mL	7			N/A	N/A	N/A	ch nd	
			1.00 mL								
2 LLCS~320-182400/2 N/A	N/A		250 mL	7			N/A	N/A	N/A	ch nd	
			1.00 mL								
3 LLCSD~320-182400/3 N/A	N/A		250 mL	7			N/A	N/A	N/A	ch nd	
			1.00 mL								
4 320-31214-A-1 (537_DOD5)	N/A (320-31214-1)	286.16 g	259 mL	7			9/7/17	16_Days	4	ch nd	
		27.21 g	1.00 mL								
5 320-31214-A-2 (537_DOD5)	N/A (320-31214-1)	271.58 g	243.9 mL	7			9/7/17	16_Days	4	ch nd	
		27.64 g	1.00 mL								
6 320-31214-A-3 (537_DOD5)	N/A (320-31214-1)	287.16 g	259.3 mL	7			9/7/17	16_Days	4	ch nd	
		27.90 g	1.00 mL								
7 320-31214-A-4 (537_DOD5)	N/A (320-31214-1)	285.51 g	258.6 mL	7			9/7/17	16_Days	4	ch nd	
		26.93 g	1.00 mL								
8 320-31214-A-5 (537_DOD5)	N/A (320-31214-1)	278.28 g	250.5 mL	7			9/7/17	16_Days	4	ch nd	
		27.81 g	1.00 mL								
9 320-31214-A-6 (537_DOD5)	N/A (320-31214-1)	275.07 g	247.6 mL	7			9/7/17	16_Days	4	ch nd	
		27.49 g	1.00 mL								
10 320-31214-A-7 (537_DOD5)	N/A (320-31214-1)	277.15 g	249 mL	7			9/7/17	16_Days	4	ch nd	
		28.14 g	1.00 mL								

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-182400

Analyst: Branscum, Cassie

Batch Open: 9/1/2017 8:39:00AM

Method Code: 320-537_Prep-320

Batch End: 9/5/2017 11:38:00AM

11	320-31214-A-8 (537_DOD5)	N/A (320-31214-1)	275.39 g	248.1 mL	7		9/7/17	16_Days	4	ch nd	
			27.33 g	1.00 mL							
12	320-31214-A-9 (537_DOD5)	N/A (320-31214-1)	278.45 g	250.8 mL	7		9/7/17	16_Days	4	ch nd	
			27.70 g	1.00 mL							
13	320-31214-A-10 (537_DOD5)	N/A (320-31214-1)	275.87 g	248.6 mL	7		9/7/17	16_Days	4	ch nd	
			27.29 g	1.00 mL							
14	320-31214-A-11 (537_DOD5)	N/A (320-31214-1)	287.11 g	259.4 mL	7		9/7/17	16_Days	4	ch nd	
			27.76 g	1.00 mL							
15	320-31214-A-12 (537_DOD5)	N/A (320-31214-1)	285.03 g	258 mL	7		9/7/17	16_Days	4	ch nd	
			27.06 g	1.00 mL							
16	320-31214-A-13 (537_DOD5)	N/A (320-31214-1)	283.97 g	256.3 mL	7		9/7/17	16_Days	4	ch nd	
			27.63 g	1.00 mL							
17	320-31214-A-14 (537_DOD5)	N/A (320-31214-1)	281.26 g	253.9 mL	7		9/7/17	16_Days	4	ch nd	
			27.32 g	1.00 mL							
18	320-31214-A-15 (537_DOD5)	N/A (320-31214-1)	285.14 g	257.7 mL	7		9/7/17	16_Days	4	ch nd	
			27.47 g	1.00 mL							
19	320-31214-A-16 (537_DOD5)	N/A (320-31214-1)	285.90 g	258.4 mL	7		9/7/17	16_Days	4	ch nd	
			27.50 g	1.00 mL							
20	320-31214-A-17 (537_DOD5)	N/A (320-31214-1)	285.05 g	257.3 mL	7		9/7/17	16_Days	4	ch nd	
			27.74 g	1.00 mL							
21	320-31180-A-1 (537_DOD5)	WE04 (320-31180-1)	291.18 g	263.3 mL	7		9/6/17	16_Days	4	ch nd	
			27.86 g	1.00 mL							
22	320-31180-A-2 (537_DOD5)	WE04 (320-31180-1)	280.56 g	253.4 mL	7		9/6/17	16_Days	4	ch nd	
			27.16 g	1.00 mL							

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-182400

Analyst: Branscum, Cassie

Batch Open: 9/1/2017 8:39:00AM

Method Code: 320-537_Prep-320

Batch End: 9/5/2017 11:38:00AM

Batch Notes

Manifold ID 7,3

Trizma ID SLBR4303V

SPE Cartridge ID 6357081-03

Methanol ID 1010866

Reagent Water ID 8/28/17

Pipette ID M16387D

Analyst ID - TA Reagent Drop CCB

Analyst ID - TA Reagent Drop JNS

Witness

Analyst ID - SU Reagent Drop CCB

Analyst ID - SU Reagent Drop JNS

Witness

Analyst ID - IS Reagent Drop CCB

Analyst ID - IS Reagent Drop HJA

Witness

Batch Comment IS:1002957

Comments

PFAS Calibration Calculations:

Initial Calibration 9/8/2017
Instrument A8_N

Perfluorohexanesulfonic acid

Analyte Concentration	Analyte Response	Internal Standard Response	Internal Standard Amount	RRF	Reported RRF
3	953075	5640583	28.7	1.61646	1.6148
6.67	2196189	5712377	28.7	1.65428	1.6536
15	4965386	5718230	28.7	1.66143	1.6599
30	9333896	5620007	28.7	1.58886	1.5874
45	13320862	5359060	28.7	1.58531	1.5838
60	16853658	5438027	28.7	1.48246	1.4811
Average				1.59813	1.5968
Standard Deviation				0.0650	
RSD				0.0407	
%RSD				4.06724	4.1

Continuing Calibration 09/08/2017 @ 20:41
A8_N

Perfluorohexanesulfonic acid

Analyte Concentration	Analyte Response	Internal Standard Response	Internal Standard Amount	RRF	%D	Reported RRF	Reported %D
15	4664734	5340700	28.7	1.6712	4.6571284	1.67	4.6

Willow Grove
SDG 320-31180-1

Sample Identification LCS

Compound Perfluorohexanesulfonic acid

Compound Area 2311067

Internal Standard Amount (ng) 28.7

Dilution Factor 1

Internal Standard Area 5511672

Average RRF 1.5968

Sample Volume(ml) 250

Volume Extract (ml) 1

Injection Volume (μl) 1

μl to ml 1000.00

Concentration 30.15 ng/L

Spike Added 30

Percent Recovery 100.48

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