NAVFAC
Naval Facilities Engineering Command

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 320-32528-1

Naval Air Station Willow Grove
Willow Grove, Pennsylvania

August 2019

N00158_000719
WILLOW_GROVE_NAS
SSIC 5000-33c

LABORATORY DATA PACKAGE, 320-32528, NAWC WARMINSTER NAS WILLOW GROVE PA

11/01/2017

TESTAMERICA LABORATORIES INC

Approved for public release: distribution unlimited.

ANALYTICAL REPORT

Job Number: 320-32528-1

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.
David R Alltucker
Project Manager I
11/1/2017 2:04 PM

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11/01/2017

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Qualifiers

LCMS

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

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	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
320-32528-1

Receipt
The samples were received on 10/19/2017 10:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.9º C.

LCMS
Method(s) 537, 537 DW: 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 320-191223.

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: 320-32528-1

Client Sample ID: WGNA-101817-RW-3933 — Lab Sample ID: 320-32528-1

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	14	J M	39	6.7	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	15	J	20	2.8	ng/L	1		537	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	16	J	30	5.4	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	5.7	J	9.9	1.9	ng/L	1		537	Total/NA

Client Sample ID: WGNA-101817-FRB-3933 — Lab Sample ID: 320-32528-2

No Detections.

Client Sample ID: WGNA-101817-RW-0569 — Lab Sample ID: 320-32528-3

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	26	J M	38	6.5	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	26		19	2.7	ng/L	1		537	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	7.0	J	29	5.3	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	7.5	J	9.6	1.8	ng/L	1		537	Total/NA

Client Sample ID: WGNA-101817-FRB-0569 — Lab Sample ID: 320-32528-4

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample ID: WGNA-101817-RW-3933 — Lab Sample ID: 320-32528-1

Date Collected: 10/18/17 08:10 — **Matrix: Water**
Date Received: 10/19/17 10:15

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**14**	**J M**	39	6.7	ng/L		10/26/17 10:34	10/31/17 17:40	1
Perfluorooctanoic acid (PFOA)	**15**	**J**	20	2.8	ng/L		10/26/17 10:34	10/31/17 17:40	1
Perfluorononanoic acid (PFNA)	20	U M	24	7.9	ng/L		10/26/17 10:34	10/31/17 17:40	1
Perfluorohexanesulfonic acid (PFHxS)	**16**	**J**	30	5.4	ng/L		10/26/17 10:34	10/31/17 17:40	1
Perfluoroheptanoic acid (PFHpA)	**5.7**	**J**	9.9	1.9	ng/L		10/26/17 10:34	10/31/17 17:40	1
Perfluorobutanesulfonic acid (PFBS)	35	U	89	16	ng/L		10/26/17 10:34	10/31/17 17:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*81*		*70 - 130*	*10/26/17 10:34*	*10/31/17 17:40*	*1*
13C2 PFDA	*96*		*70 - 130*	*10/26/17 10:34*	*10/31/17 17:40*	*1*

Client Sample ID: WGNA-101817-FRB-3933 — Lab Sample ID: 320-32528-2

Date Collected: 10/18/17 08:05 — **Matrix: Water**
Date Received: 10/19/17 10:15

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		10/26/17 10:34	10/31/17 17:44	1
Perfluorooctanoic acid (PFOA)	7.7	U	19	2.7	ng/L		10/26/17 10:34	10/31/17 17:44	1
Perfluorononanoic acid (PFNA)	19	U	23	7.7	ng/L		10/26/17 10:34	10/31/17 17:44	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	29	5.3	ng/L		10/26/17 10:34	10/31/17 17:44	1
Perfluoroheptanoic acid (PFHpA)	3.8	U	9.6	1.8	ng/L		10/26/17 10:34	10/31/17 17:44	1
Perfluorobutanesulfonic acid (PFBS)	35	U	87	15	ng/L		10/26/17 10:34	10/31/17 17:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*98*		*70 - 130*	*10/26/17 10:34*	*10/31/17 17:44*	*1*
13C2 PFDA	*102*		*70 - 130*	*10/26/17 10:34*	*10/31/17 17:44*	*1*

Client Sample ID: WGNA-101817-RW-0569 — Lab Sample ID: 320-32528-3

Date Collected: 10/18/17 09:10 — **Matrix: Water**
Date Received: 10/19/17 10:15

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**26**	**J M**	38	6.5	ng/L		10/26/17 10:34	10/31/17 17:49	1
Perfluorooctanoic acid (PFOA)	**26**		19	2.7	ng/L		10/26/17 10:34	10/31/17 17:49	1
Perfluorononanoic acid (PFNA)	19	U M	23	7.7	ng/L		10/26/17 10:34	10/31/17 17:49	1
Perfluorohexanesulfonic acid (PFHxS)	**7.0**	**J**	29	5.3	ng/L		10/26/17 10:34	10/31/17 17:49	1
Perfluoroheptanoic acid (PFHpA)	**7.5**	**J**	9.6	1.8	ng/L		10/26/17 10:34	10/31/17 17:49	1
Perfluorobutanesulfonic acid (PFBS)	35	U	86	15	ng/L		10/26/17 10:34	10/31/17 17:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*80*		*70 - 130*	*10/26/17 10:34*	*10/31/17 17:49*	*1*
13C2 PFDA	*99*		*70 - 130*	*10/26/17 10:34*	*10/31/17 17:49*	*1*

Client Sample ID: WGNA-101817-FRB-0569 **Lab Sample ID: 320-32528-4**
Date Collected: 10/18/17 09:05 **Matrix: Water**
Date Received: 10/19/17 10:15

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	14	U	35	6.0	ng/L		10/26/17 10:34	10/31/17 17:54	1
Perfluorooctanoic acid (PFOA)	7.0	U	18	2.5	ng/L		10/26/17 10:34	10/31/17 17:54	1
Perfluorononanoic acid (PFNA)	18	U	21	7.0	ng/L		10/26/17 10:34	10/31/17 17:54	1
Perfluorohexanesulfonic acid (PFHxS)	11	U	26	4.8	ng/L		10/26/17 10:34	10/31/17 17:54	1
Perfluoroheptanoic acid (PFHpA)	3.5	U	8.8	1.7	ng/L		10/26/17 10:34	10/31/17 17:54	1
Perfluorobutanesulfonic acid (PFBS)	32	U	79	14	ng/L		10/26/17 10:34	10/31/17 17:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*101*		*70 - 130*	*10/26/17 10:34*	*10/31/17 17:54*	*1*
13C2 PFDA	*105*		*70 - 130*	*10/26/17 10:34*	*10/31/17 17:54*	*1*

Default Detection Limits

Client: Tetra Tech, Inc. TestAmerica Job ID: 320-32528-1
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

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: 320-32528-1

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

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)									
		3C2 PFHx	3C2 PFDA								
Lab Sample ID	Client Sample ID	(70-130)	(70-130)								
320-32528-1	WGNA-101817-RW-3933	81	96								
320-32528-2	WGNA-101817-FRB-3933	98	102								
320-32528-3	WGNA-101817-RW-0569	80	99								
320-32528-4	WGNA-101817-FRB-0569	101	105								
LCS 320-191223/2-A	Lab Control Sample	101	104								
LCSD 320-191223/3-A	Lab Control Sample Dup	102	103								
MB 320-191223/1-A	Method Blank	94	95								

Surrogate Legend

13C2 PFHxA = 13C2 PFHxA

13C2 PFDA = 13C2 PFDA

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

Lab Sample ID: MB 320-191223/1-A **Client Sample ID: Method Blank**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 192277 **Prep Batch: 191223**

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	16	U	40	6.8	ng/L		10/26/17 10:34	10/31/17 17:25	1
Perfluorooctanoic acid (PFOA)	8.0	U	20	2.8	ng/L		10/26/17 10:34	10/31/17 17:25	1
Perfluorononanoic acid (PFNA)	20	U	24	8.0	ng/L		10/26/17 10:34	10/31/17 17:25	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.5	ng/L		10/26/17 10:34	10/31/17 17:25	1
Perfluoroheptanoic acid (PFHpA)	4.0	U	10	1.9	ng/L		10/26/17 10:34	10/31/17 17:25	1
Perfluorobutanesulfonic acid (PFBS)	36	U	90	16	ng/L		10/26/17 10:34	10/31/17 17:25	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*94*		*70 - 130*	*10/26/17 10:34*	*10/31/17 17:25*	*1*
13C2 PFDA	*95*		*70 - 130*	*10/26/17 10:34*	*10/31/17 17:25*	*1*

Lab Sample ID: LCS 320-191223/2-A **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 192277 **Prep Batch: 191223**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorooctanesulfonic acid (PFOS)	222	214	M	ng/L		96	70 - 130
Perfluorooctanoic acid (PFOA)	111	111		ng/L		100	70 - 130
Perfluorononanoic acid (PFNA)	111	113		ng/L		102	70 - 130
Perfluorohexanesulfonic acid (PFHxS)	167	160		ng/L		96	70 - 130
Perfluoroheptanoic acid (PFHpA)	55.6	56.4		ng/L		101	70 - 130
Perfluorobutanesulfonic acid (PFBS)	500	466		ng/L		93	70 - 130

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C2 PFHxA	*101*		*70 - 130*
13C2 PFDA	*104*		*70 - 130*

Lab Sample ID: LCSD 320-191223/3-A **Client Sample ID: Lab Control Sample Dup**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 192277 **Prep Batch: 191223**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorooctanesulfonic acid (PFOS)	222	218	M	ng/L		98	70 - 130	2	30
Perfluorooctanoic acid (PFOA)	111	113		ng/L		102	70 - 130	2	30
Perfluorononanoic acid (PFNA)	111	115		ng/L		103	70 - 130	1	30
Perfluorohexanesulfonic acid (PFHxS)	167	166		ng/L		99	70 - 130	4	30
Perfluoroheptanoic acid (PFHpA)	55.6	58.4		ng/L		105	70 - 130	3	30
Perfluorobutanesulfonic acid (PFBS)	500	483		ng/L		97	70 - 130	4	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C2 PFHxA	*102*		*70 - 130*
13C2 PFDA	*103*		*70 - 130*

QC Association Summary

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

TestAmerica Job ID: 320-32528-1

LCMS

Prep Batch: 191223

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-32528-1	WGNA-101817-RW-3933	Total/NA	Water	537	
320-32528-2	WGNA-101817-FRB-3933	Total/NA	Water	537	
320-32528-3	WGNA-101817-RW-0569	Total/NA	Water	537	
320-32528-4	WGNA-101817-FRB-0569	Total/NA	Water	537	
MB 320-191223/1-A	Method Blank	Total/NA	Water	537	
LCS 320-191223/2-A	Lab Control Sample	Total/NA	Water	537	
LCSD 320-191223/3-A	Lab Control Sample Dup	Total/NA	Water	537	

Analysis Batch: 192277

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-32528-1	WGNA-101817-RW-3933	Total/NA	Water	537	191223
320-32528-2	WGNA-101817-FRB-3933	Total/NA	Water	537	191223
320-32528-3	WGNA-101817-RW-0569	Total/NA	Water	537	191223
320-32528-4	WGNA-101817-FRB-0569	Total/NA	Water	537	191223
MB 320-191223/1-A	Method Blank	Total/NA	Water	537	191223
LCS 320-191223/2-A	Lab Control Sample	Total/NA	Water	537	191223
LCSD 320-191223/3-A	Lab Control Sample Dup	Total/NA	Water	537	191223

Lab Chronicle

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

TestAmerica Job ID: 320-32528-1

Client Sample ID: WGNA-101817-RW-3933
Lab Sample ID: 320-32528-1
Date Collected: 10/18/17 08:10
Matrix: Water
Date Received: 10/19/17 10:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			191223	10/26/17 10:34	CCB	TAL SAC
Total/NA	Analysis	537		1	192277	10/31/17 17:40	JRB	TAL SAC

Client Sample ID: WGNA-101817-FRB-3933
Lab Sample ID: 320-32528-2
Date Collected: 10/18/17 08:05
Matrix: Water
Date Received: 10/19/17 10:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			191223	10/26/17 10:34	CCB	TAL SAC
Total/NA	Analysis	537		1	192277	10/31/17 17:44	JRB	TAL SAC

Client Sample ID: WGNA-101817-RW-0569
Lab Sample ID: 320-32528-3
Date Collected: 10/18/17 09:10
Matrix: Water
Date Received: 10/19/17 10:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			191223	10/26/17 10:34	CCB	TAL SAC
Total/NA	Analysis	537		1	192277	10/31/17 17:49	JRB	TAL SAC

Client Sample ID: WGNA-101817-FRB-0569
Lab Sample ID: 320-32528-4
Date Collected: 10/18/17 09:05
Matrix: Water
Date Received: 10/19/17 10:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			191223	10/26/17 10:34	CCB	TAL SAC
Total/NA	Analysis	537		1	192277	10/31/17 17:54	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. TestAmerica Job ID: 320-32528-1
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

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. TestAmerica Job ID: 320-32528-1
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

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.
TestAmerica Job ID: 320-32528-1
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-32528-1	WGNA-101817-RW-3933	Water	10/18/17 08:10	10/19/17 10:15
320-32528-2	WGNA-101817-FRB-3933	Water	10/18/17 08:05	10/19/17 10:15
320-32528-3	WGNA-101817-RW-0569	Water	10/18/17 09:10	10/19/17 10:15
320-32528-4	WGNA-101817-FRB-0569	Water	10/18/17 09:05	10/19/17 10:15

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-32528-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 192162

Lab Sample ID: IC 320-192162/4 Client Sample ID:

Date Analyzed: 10/31/17 11:44 Lab File ID: 2017.10.31_537ICAL_004.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.11	Assign Peak	phomsopha t	10/31/17 12:20

Lab Sample ID: IC 320-192162/5 Client Sample ID:

Date Analyzed: 10/31/17 11:49 Lab File ID: 2017.10.31_537ICAL_005.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.11	Assign Peak	phomsopha t	10/31/17 13:18

Lab Sample ID: IC 320-192162/6 Client Sample ID:

Date Analyzed: 10/31/17 11:54 Lab File ID: 2017.10.31_537ICAL_006.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.11	Assign Peak	phomsopha t	10/31/17 13:18

Lab Sample ID: IC 320-192162/7 ICISAV Client Sample ID:

Date Analyzed: 10/31/17 11:58 Lab File ID: 2017.10.31_537ICAL_007.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.11	Assign Peak	phomsopha t	10/31/17 13:19

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-32528-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 192162

Lab Sample ID: IC 320-192162/8 Client Sample ID:

Date Analyzed: 10/31/17 12:03 Lab File ID: 2017.10.31_537ICAL_008.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.10	Assign Peak	phomsopha t	10/31/17 13:20

Lab Sample ID: CCVL 320-192162/11 Client Sample ID:

Date Analyzed: 10/31/17 12:17 Lab File ID: 2017.10.31_537ICAL_011.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.11	Missed Peak	barnettj	10/31/17 14:37

Lab Sample ID: ICV 320-192162/16 Client Sample ID:

Date Analyzed: 10/31/17 14:58 Lab File ID: 2017.10.31_537AICAL_003.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.11	Isomers	barnettj	10/31/17 15:08

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-32528-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 192277

Lab Sample ID: CCV 320-192277/1 CCVIS Client Sample ID:

Date Analyzed: 10/31/17 17:16 Lab File ID: 2017.10.31_537C_001.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.09	Assign Peak	hannigana	11/01/17 09:42

Lab Sample ID: LCS 320-191223/2-A Client Sample ID:

Date Analyzed: 10/31/17 17:30 Lab File ID: 2017.10.31_537C_004.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.11	Missed Peak	barnettj	11/01/17 10:40

Lab Sample ID: LCSD 320-191223/3-A Client Sample ID:

Date Analyzed: 10/31/17 17:35 Lab File ID: 2017.10.31_537C_005.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.10	Missed Peak	barnettj	11/01/17 10:41

Lab Sample ID: 320-32528-1 Client Sample ID: WGNA-101817-RW-3933

Date Analyzed: 10/31/17 17:40 Lab File ID: 2017.10.31_537C_006.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.10	Missed Peak	barnettj	11/01/17 10:42
Perfluorononanoic acid (PFNA)	2.11	Baseline	barnettj	11/01/17 10:57

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LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-32528-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 192277

Lab Sample ID: 320-32528-3 Client Sample ID: WGNA-101817-RW-0569

Date Analyzed: 10/31/17 17:49 Lab File ID: 2017.10.31_537C_008.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.10	Missed Peak	barnettj	11/01/17 10:57
Perfluorononanoic acid (PFNA)	2.11	Split Peak	barnettj	11/01/17 10:57

Lab Sample ID: CCV 320-192277/10 CCVIS Client Sample ID:

Date Analyzed: 10/31/17 17:59 Lab File ID: 2017.10.31_537C_010.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.10	Missed Peak	barnettj	11/01/17 10:39

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-32528-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
LC537-HSP_00022	02/10/18	08/10/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00023	277.8 uL	Perfluorobutane Sulfonate	1250.1 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	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-ICV_00028	01/05/18	08/02/17	MeOH/H2O, Lot 067374	10 mL	LC537-IS_00045	1000 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
.LC537-IS_00045	01/05/18	07/05/17	Methanol, Lot 090285	30000 uL	LCM2PFOA_00007	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00019	180 uL	13C4 PFOS	0.2868 ug/mL
..LCM2PFOA_00007	02/12/21	Wellington Laboratories, Lot M2PFOA0216			(Purchased Reagent)		13C2-PFOA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-32528-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCMPFOS_00019	08/03/21	Wellington Laboratories, Lot MPFOS0816			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
LC537-ICV_00028	01/05/18	08/02/17	MeOH/H2O, Lot 067374	10 mL	LC537-SU_00046	1000 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
					LC537ICIM_00019	20 uL	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
					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
.LC537ICIM_00019	01/25/18	08/01/17	Methanol, Lot 090285	25 mL	LC537-PFBS2_00008	0.6 mL	Perfluorobutanesulfonic acid (PFBS)	50.0597 ug/mL
					LC537-PFHpA2_00011	0.061 mL	Perfluoroheptanoic acid (PFHpA)	4.99806 ug/mL
					LC537-PFHxS2_00008	0.122 mL	Perfluorohexanesulfonic acid (PFHxS)	10.038 ug/mL
					LC537-PFNA2_00009	0.126 mL	Perfluorononanoic acid (PFNA)	10.0636 ug/mL
					LC537-PFOA2_00010	0.122 mL	Perfluorooctanoic acid (PFOA)	10.2421 ug/mL
					LC537-PFOS2_00010	0.124 mL	Perfluorooctanesulfonic acid (PFOS)	9.849 ug/mL
..LC537-PFBS2_00008	01/25/18	07/25/17	Methanol, Lot 090285	20 mL	LC537_PFBS2_00002	0.0418 g	Perfluorobutanesulfonic acid (PFBS)	2085.82 ug/mL
...LC537_PFBS2_00002	09/08/22	Santa Cruz Biotechnology, Lot F0917			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	0.998 g/g
..LC537-PFHpA2_00011	01/25/18	07/25/17	Methanol, Lot 09092	31 mL	LC537_PFHpA2_00002	0.0635 g	Perfluoroheptanoic acid (PFHpA)	2048.39 ug/mL
...LC537_PFHpA2_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
..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_00051	03/20/18	09/20/17	Methanol, Lot 090285	30000 uL	LCM2PFOA_00006	60 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00021	180 uL	13C4 PFOS	0.2868 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-32528-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LCM2PFOA_00006	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
....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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-32528-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...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
					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-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
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00049	500 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00025	02/10/18	08/10/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00023	277.8 uL	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
					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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-32528-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					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
					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-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
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00049	500 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00025	02/10/18	08/10/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00023	277.8 uL	Perfluorobutanesulfonic acid (PFBS)	1250.1 ng/mL
							Perfluoroheptanoic acid (PFHpA)	138.923 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-32528-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							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
					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
					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-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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-32528-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							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
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00049	500 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00025	02/10/18	08/10/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00023	277.8 uL	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
					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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-32528-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.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
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00049	500 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00025	02/10/18	08/10/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00023	277.8 uL	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
					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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-32528-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
....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
					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-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
					LC537-SU_00049	500 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00025	02/10/18	08/10/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00023	277.8 uL	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.: 320-32528-1

SDG No.:

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
					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-SU_00050	03/20/18	09/20/17	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL
					LCMPFHxA_00015	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_00015	11/22/21	Wellington Laboratories, Lot MPFHxA1116			(Purchased Reagent)		13C2 PFHxA	50 ug/mL

Reagent

LC537_PFBS_00002

R: 4/1/15 SPV

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Website: www.sigmaaldrich.com
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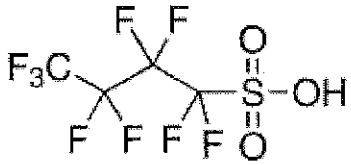
Outside USA: eurtechserv@sial.com

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

Reagent

LC537_PFBS2_00002

1:6817 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)	≥ 97%	101.3%
Infrared Spectrum	Conforms to structure	Complies

Reagent

LC537_PFHpA_00002

R: 4/1/15 SRV

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Certificate of Analysis

PFHpA

Product Name:	PERFLUOROHEPTANOIC ACID 99 %
Product Number:	342041
Batch Number:	BCBM2579V
Brand:	Aldrich
CAS Number:	375-85-9
Formula:	$CF_3(CF_2)_5CO_2H$
Formula Weight:	364.06
Quality Release Date:	06 DEC 2013
Recommended Retest Date:	OCT 2018

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

Claudia Geitner

Dr. Claudia Geitner
Manager Quality Control
Buchs, Switzerland

Reagent

LC537_PFHpA2_00002

Alfa Aesar

Certificate of analysis

r: 6.13.17 SW

PFHp 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

R: 4/1/15 SKV

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Certificate of Analysis

Product Name:	TRIDECAFLUOROHEXANE-1-SULFONIC ACID POTASSIUM SALT >= 98.0 % T
Product Number:	50929
Batch Number:	BCBL3545V
Brand:	Aldrich
CAS Number:	3871-99-6
Formula:	$C_6F_{13}KO_3S$
Formula Weight:	438.20
Quality Release Date:	20 JUN 2013

PFH_xS-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

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

Purity = 90.94 / w/m.w correction

SKV 4/1/15

Reagent

LC537_PFHxS2_00002

n: 6.8.17 SKV

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)	≥ 98.0%	100.4%

$PFH_xS\text{-}K$

$C_6F_{13}SO_3K$ 438.201

$C_6F_{13}SO_3H$ 400.111

MW correction = $\frac{400.11}{438.201}$ = 0.91307 $\frac{PFHxS}{CasH\ 355\text{-}46\text{-}4}$

Purity & MW correction = 90.9%

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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 CAS: 375-95-1	Lot: QN44F	

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

P: 6.14.17 SKV

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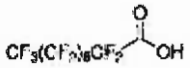
Outside USA: eurtechserv@sial.com

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:	C9HF17O2
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

Reagent

LC537_PFOA_00003

R: 11/30/16 SKV
PFOA

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Certificate of Analysis

Product Name:	PENTADECAFLUOROOCTANOIC ACID analytical standard
Product Number:	33824
Batch Number:	BCBS1198V
Brand:	Sigma-Aldrich
CAS Number:	335-67-1
Formula:	$CF_3(CF_2)_6COOH$
Formula Weight:	414.07
Expiration Date:	OCT 2023
Quality Release Date:	12 MAY 2016

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

Claudia Geitner

Dr. Claudia Geitner
Manager Quality Control
Buchs, Switzerland

Reagent

LC537_PFOA2_00002

Alfa Aesar

Certificate of analysis

R: 6/9/17 SK

PFOA

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

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%

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ThermoFisher SCIENTIFIC

Reagent

LC537_PFOS_00003

r: 11/30/16 SV

PFOS

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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	complying
Assay (LC-MS)	98 %
Date of Analysis	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 aliqout 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

V: 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:	$CF_3(CF_2)_6CF_2SO_3N(C_2H_5)_4$
Formula Weight:	629.37
Quality Release Date:	11 JUN 2015

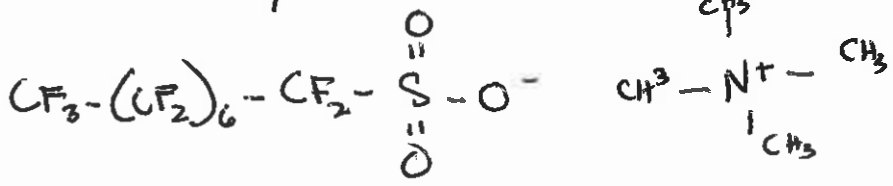
TEST	SPECIFICATION	RESULT
APPEARANCE (COLOR)	WHITE TO OFF WHITE	OFF-WHITE
APPEARANCE (FORM)	POWDER OR POWDER WITH CHUNK(S)	POWDER
CARBON CONTENT	29.77 % - 31.29 %	29.97 %
INFRARED SPECTRUM	CONFORMS TO STRUCTURE	CONFORMS

Claudia Geitner

Dr. Claudia Geitner
Manager Quality Control
Buchs, Switzerland

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

Purity & MW correction = 77.87%



	$C_8F_{17}SO_3^+H$	$C_8H_{20}N$
C = 12.011	96.088	96.088
F = 18.998	322.966	—
S = 32.066	32.066	—
O = 15.999	47.997	—
H = 1.008	1.008	20.160
N = 14.007	—	14.007
	500.125	130.255

Reagent

LCM2PFOA_00006

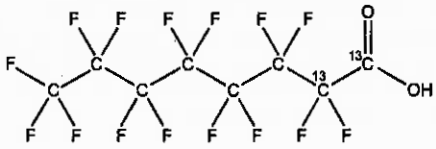
R: SBC 12/21/16

814260
ID: LCM2PFOA_00006
Exp: 02/12/21 Prpd: SBC
13C2-PFOA Stock 50ug/mL

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

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



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_6HF_{15}O_2$	**MOLECULAR WEIGHT:**	416.05
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	02/12/2016		
EXPIRY DATE: (mm/dd/yyyy)	02/12/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

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HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

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

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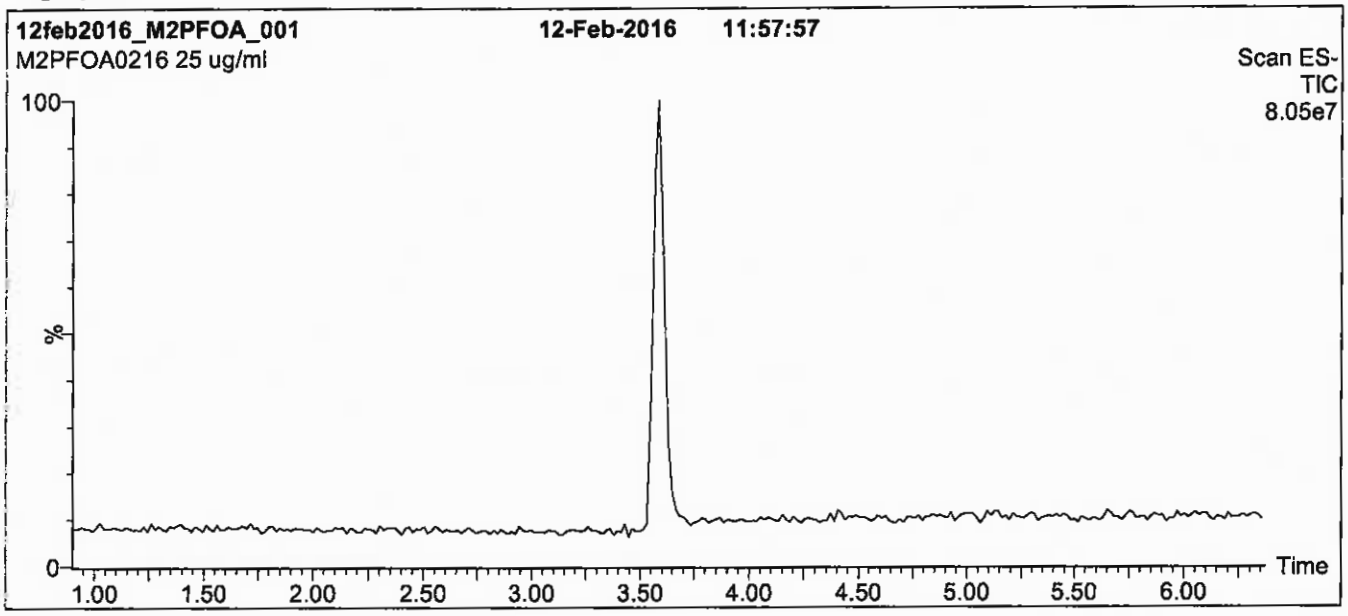
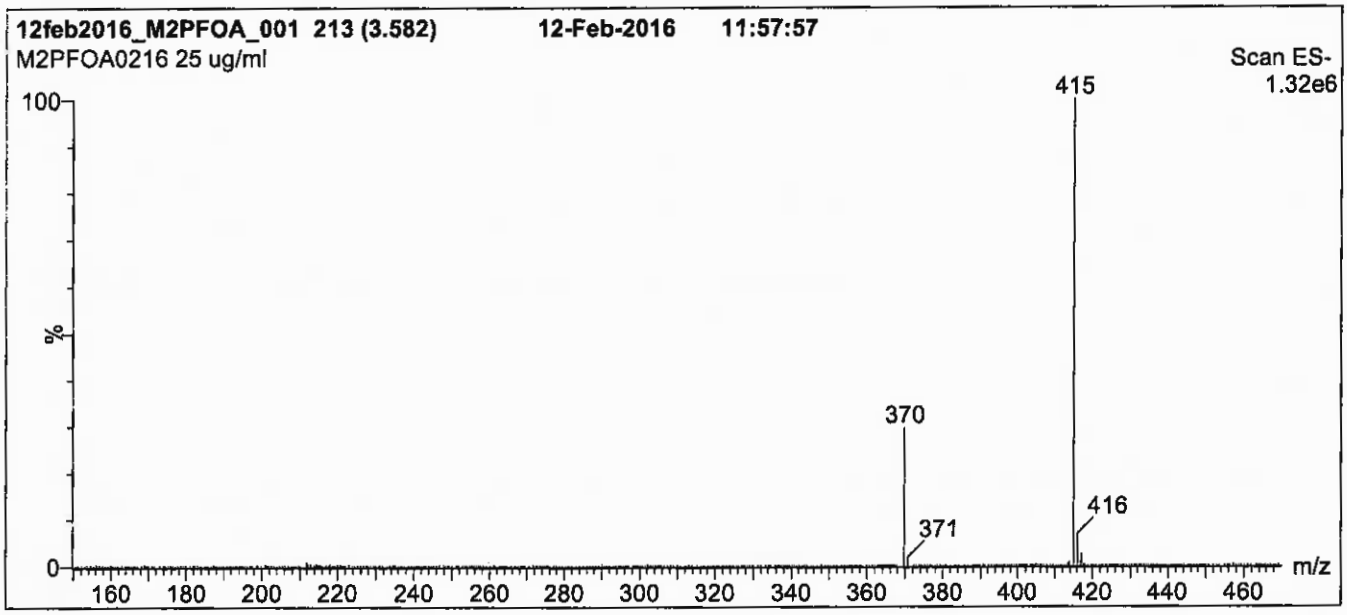
Figure 1: **M2PFOA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

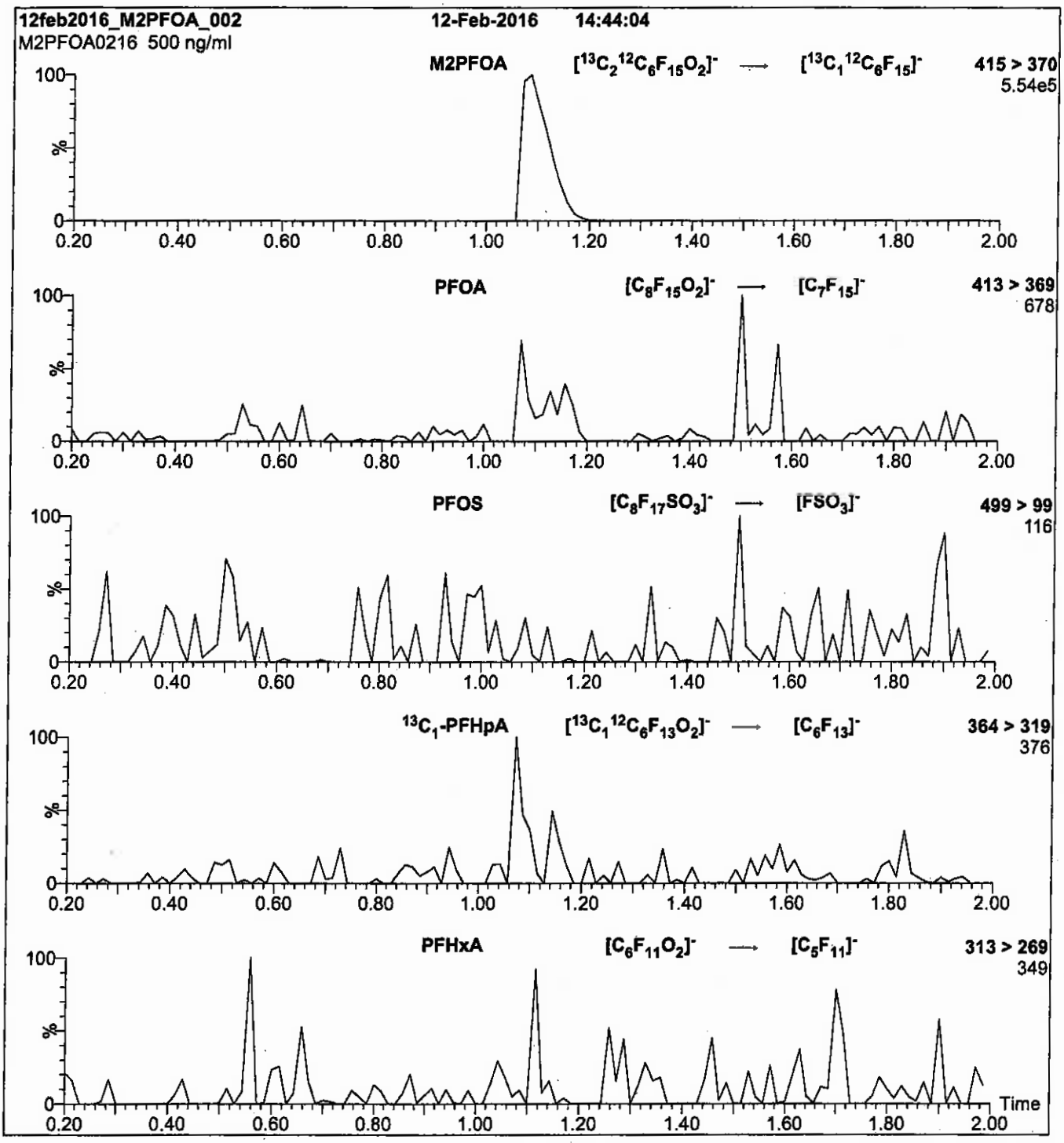
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

Mobile phase: Isocratic 80% MeOH / 20% H_2O

Flow: 300 µl/min

MS Parameters

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

Reagent

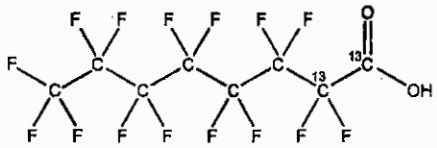
LCM2PFOA_00007

P: 5/6/17 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_6HF_{15}O_2$	**MOLECULAR WEIGHT:**	416.05
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	02/12/2016		
EXPIRY DATE: (mm/dd/yyyy)	02/12/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

HAZARDS:

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HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA

ANAB ACCREDITED

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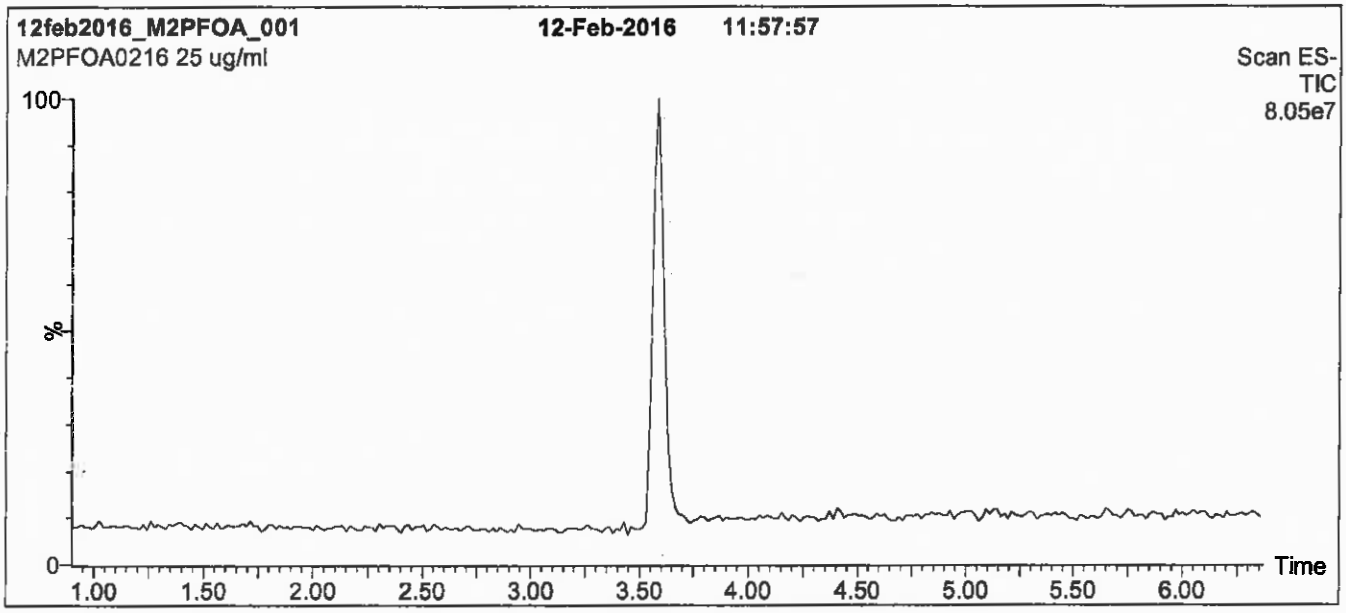
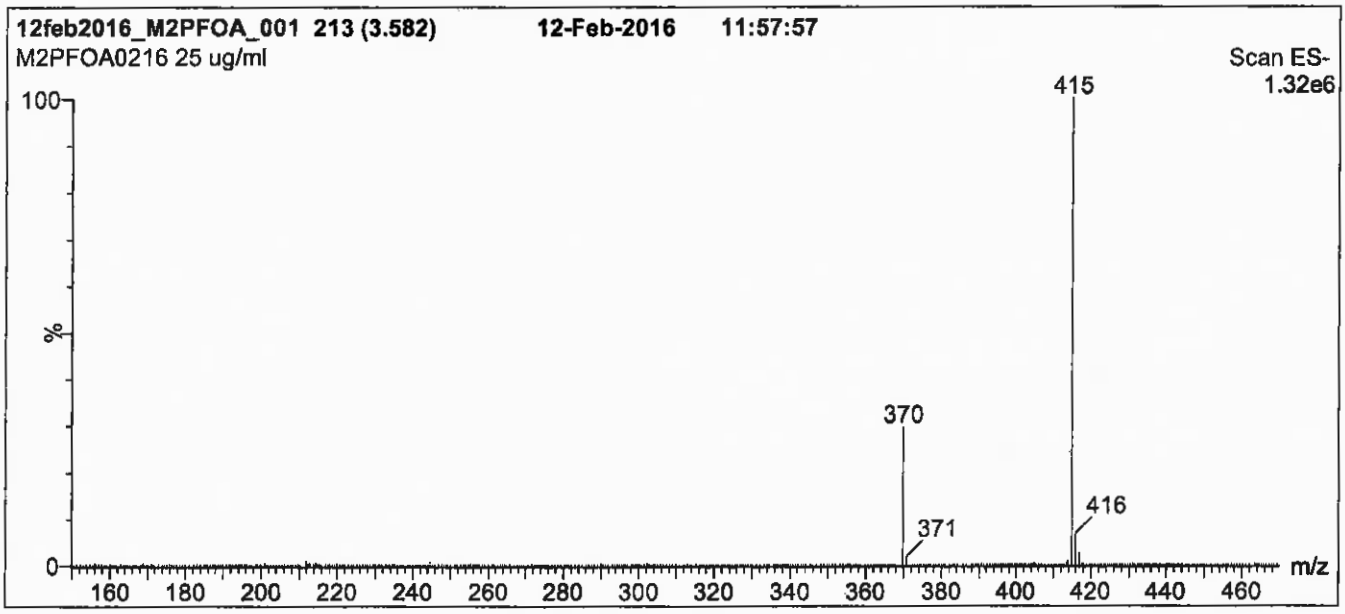
Figure 1: **M2PFOA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

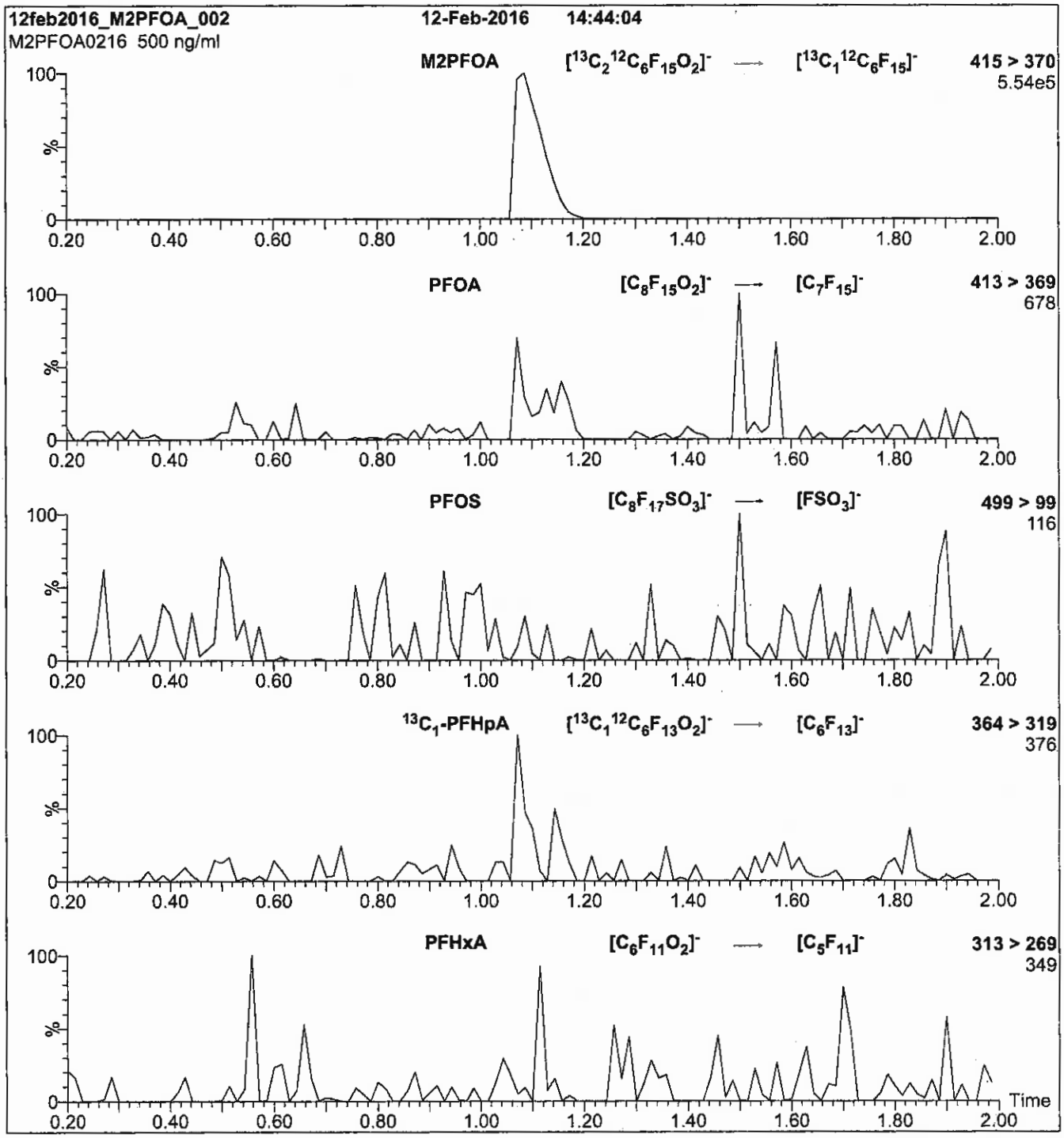
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

Mobile phase: Isocratic 80% MeOH / 20% H_2O

Flow: 300 µl/min

MS Parameters

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

Reagent

LCMPFDA_00012

R: SBC 12/21/16

814255
ID: LCMPFDA_00012
Exp: 09/30/21 Prpd: SBC
13C2-Perfluorodecanoic a

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MPFDA	**LOT NUMBER:**	MPFDA0916
COMPOUND:	Perfluoro-*n*-[1,2-$^{13}C_2$]decanoic acid		
STRUCTURE:		**CAS #:**	Not available

MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_8HF_{19}O_2$	**MOLECULAR WEIGHT:**	516.07
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	09/30/2016		
EXPIRY DATE: (mm/dd/yyyy)	09/30/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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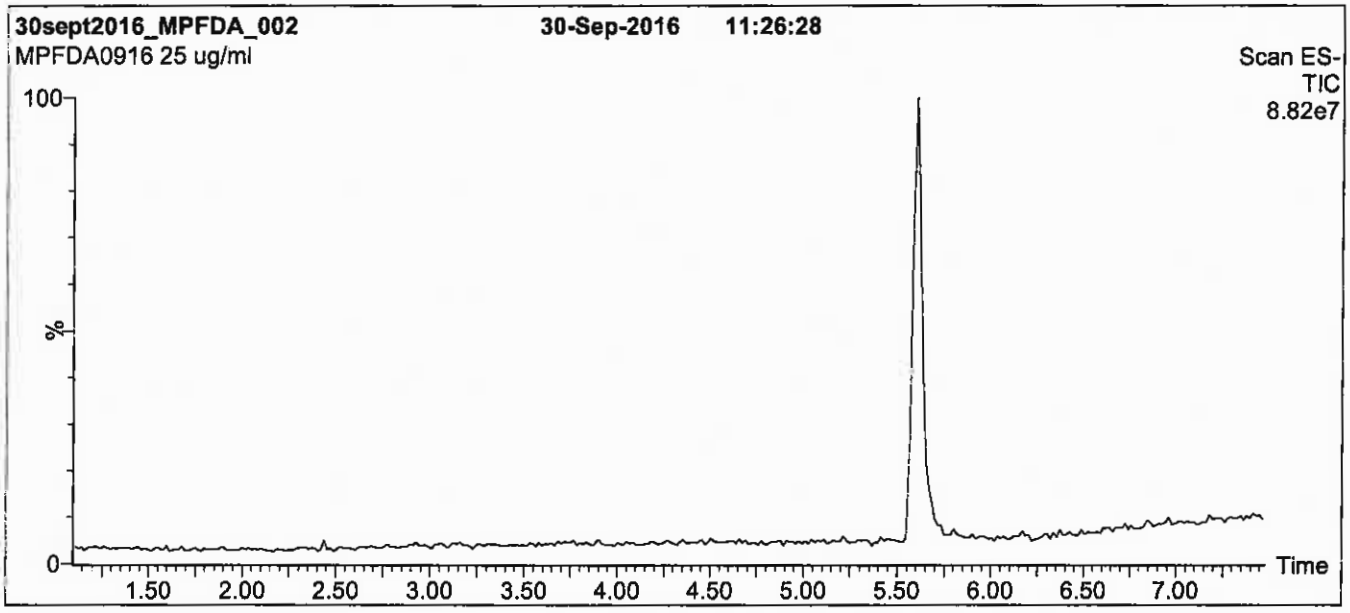
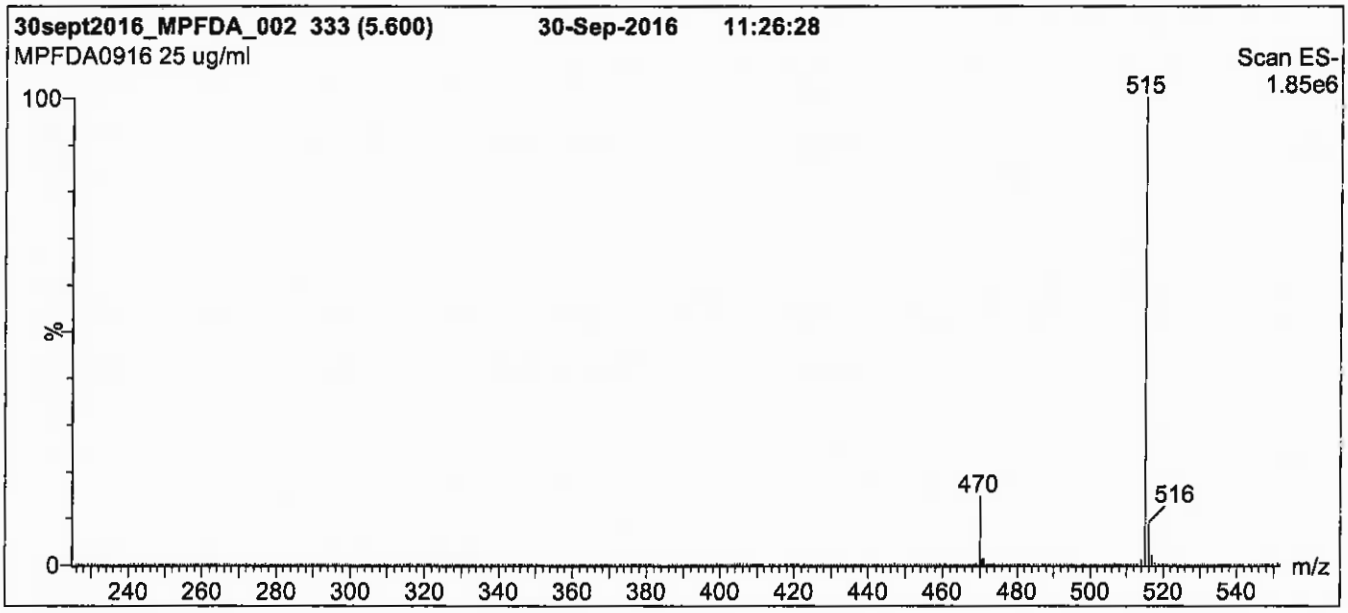
Figure 1: **MPFDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

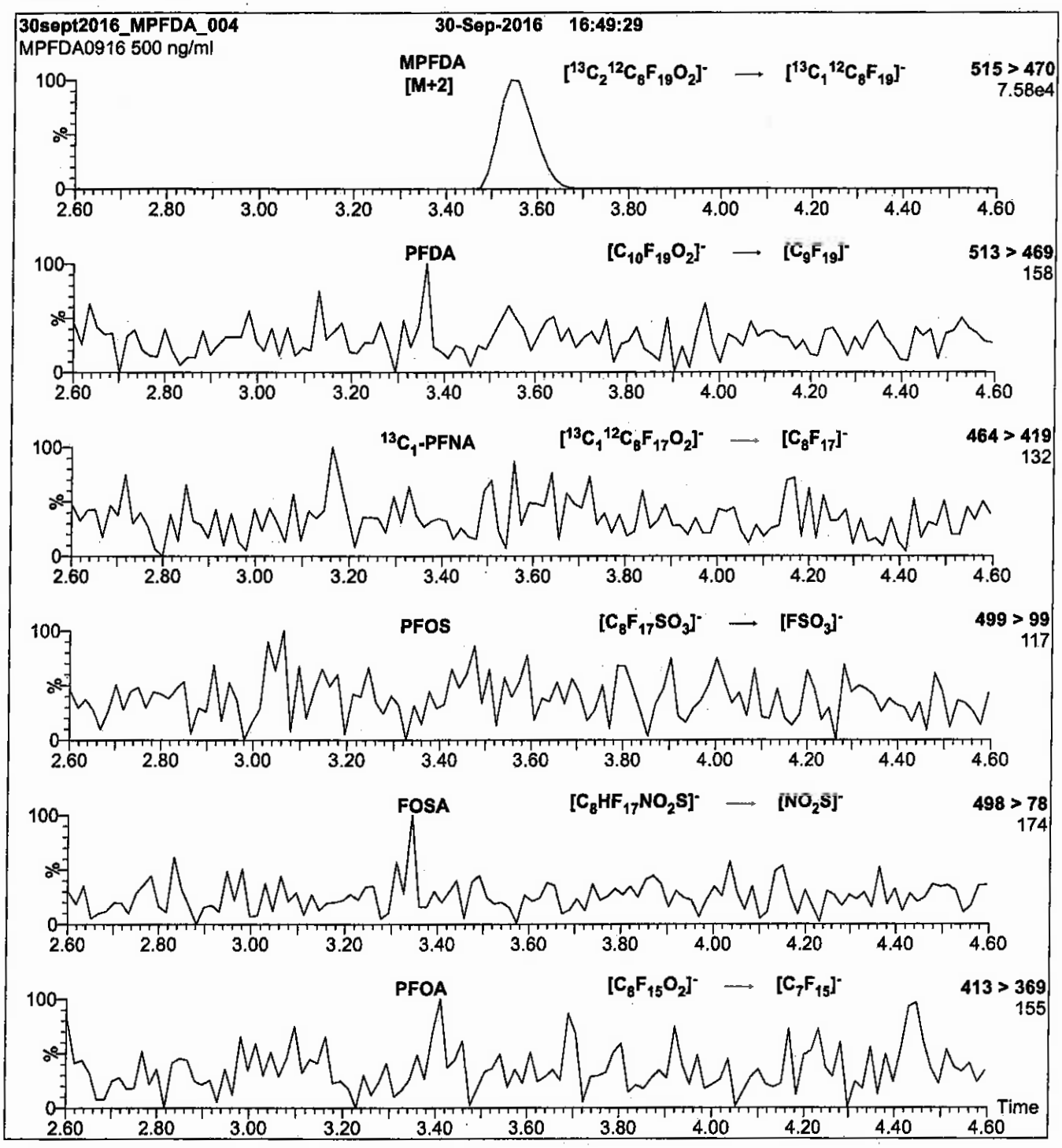
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

MS Parameters

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

Reagent

LCMPFHxA_00013

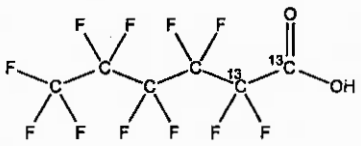
R: SBC 12/21/16

814258
ID: LCMPFHxA_00013
Exp: 04/08/21 Prpd: SBC
13C2-Perfluorohexanoic ac

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

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



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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

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CALA Testing Accreditation No. A1226

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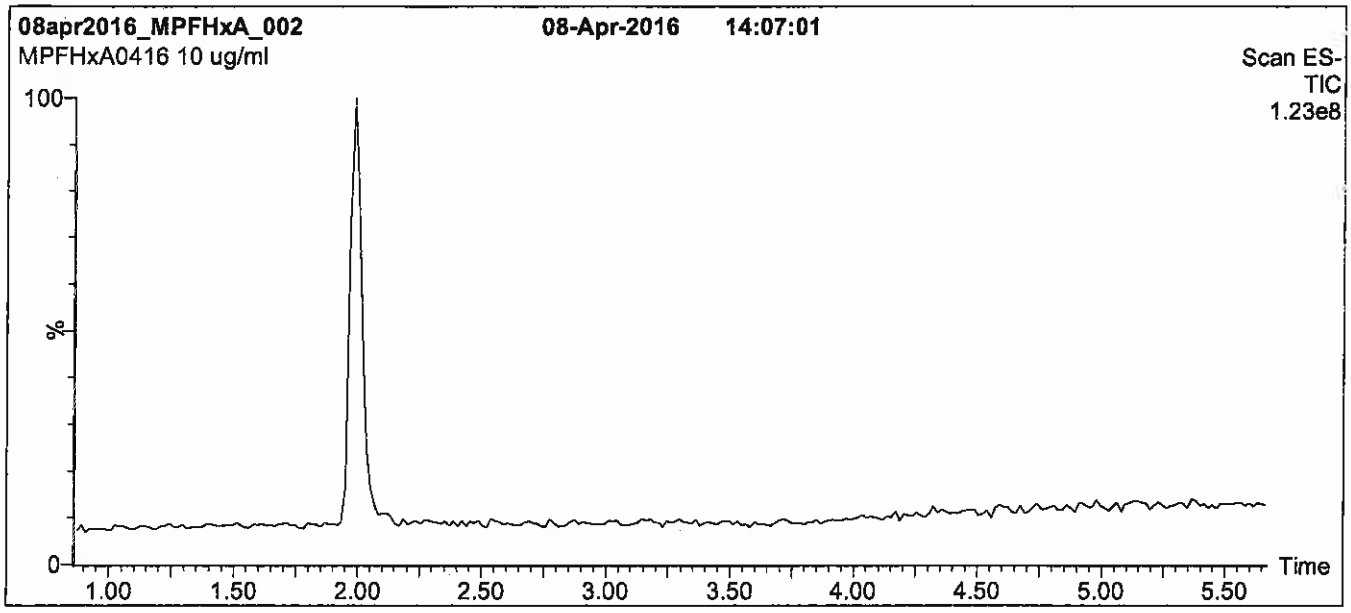
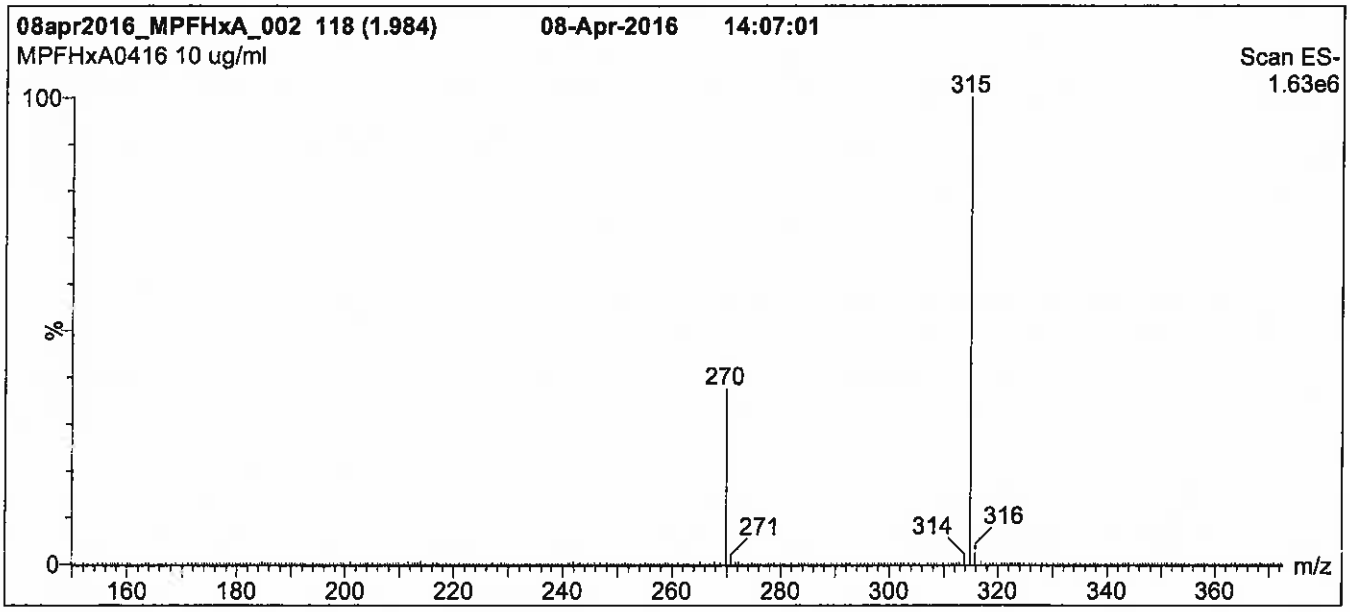




Conditions for Figure 1:

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

Chromatographic Conditions

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

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

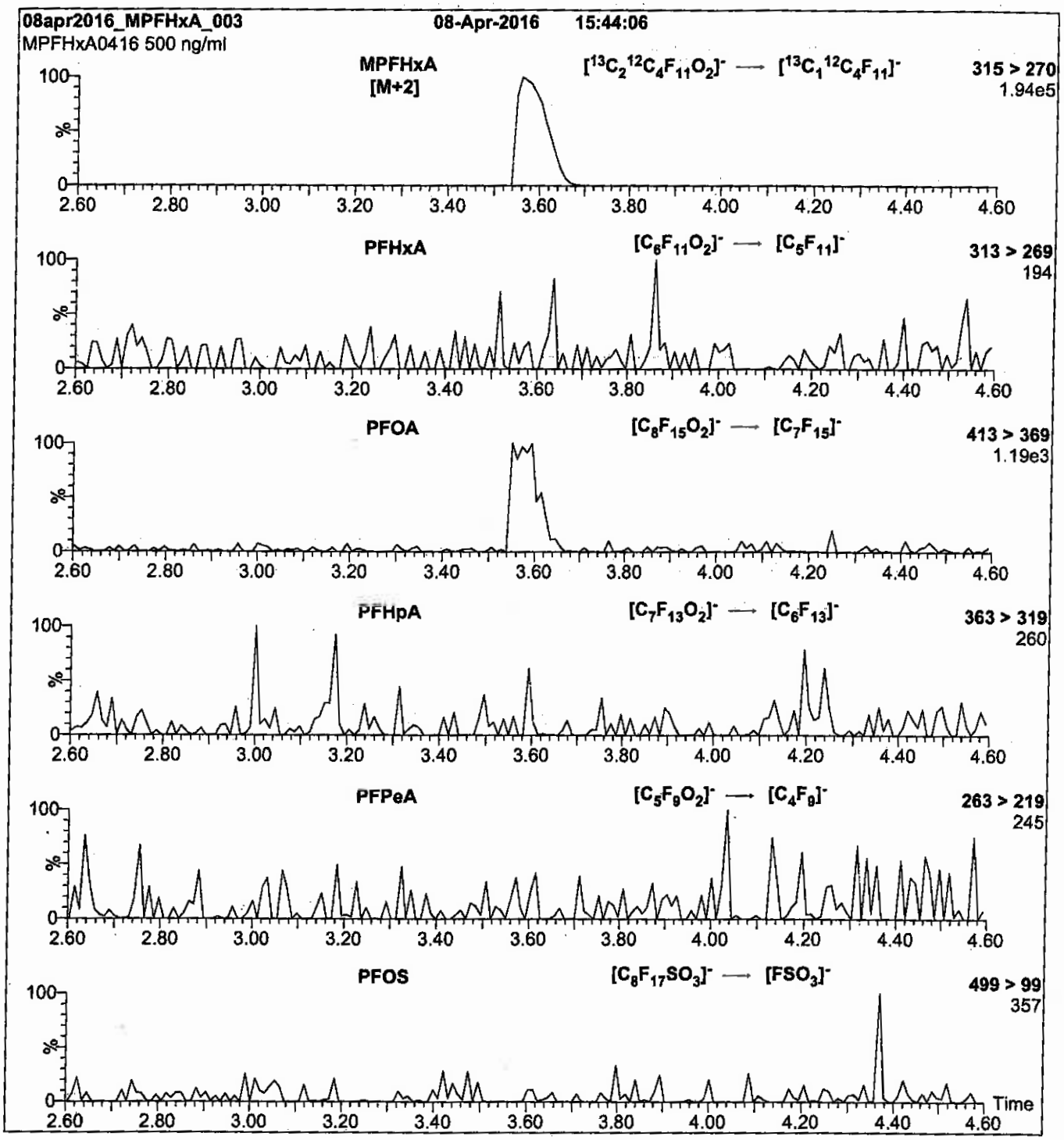
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCMPFHxA_00015

r: 5/8/17 SKJ

WELLINGTON LABORATORIES

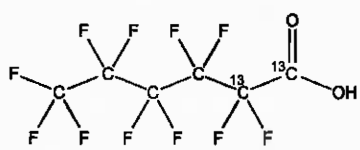
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFHxA

LOT NUMBER: MPFHxA1116

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

STRUCTURE:



CAS #: Not available

MOLECULAR FORMULA: $^{13}C_2{}^{12}C_4HF_{11}O_2$

MOLECULAR WEIGHT: 316.04

CONCENTRATION: 50 ± 2.5 µg/ml

SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%

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

LAST TESTED: (mm/dd/yyyy) 11/22/2016

EXPIRY DATE: (mm/dd/yyyy) 11/22/2021

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CALA

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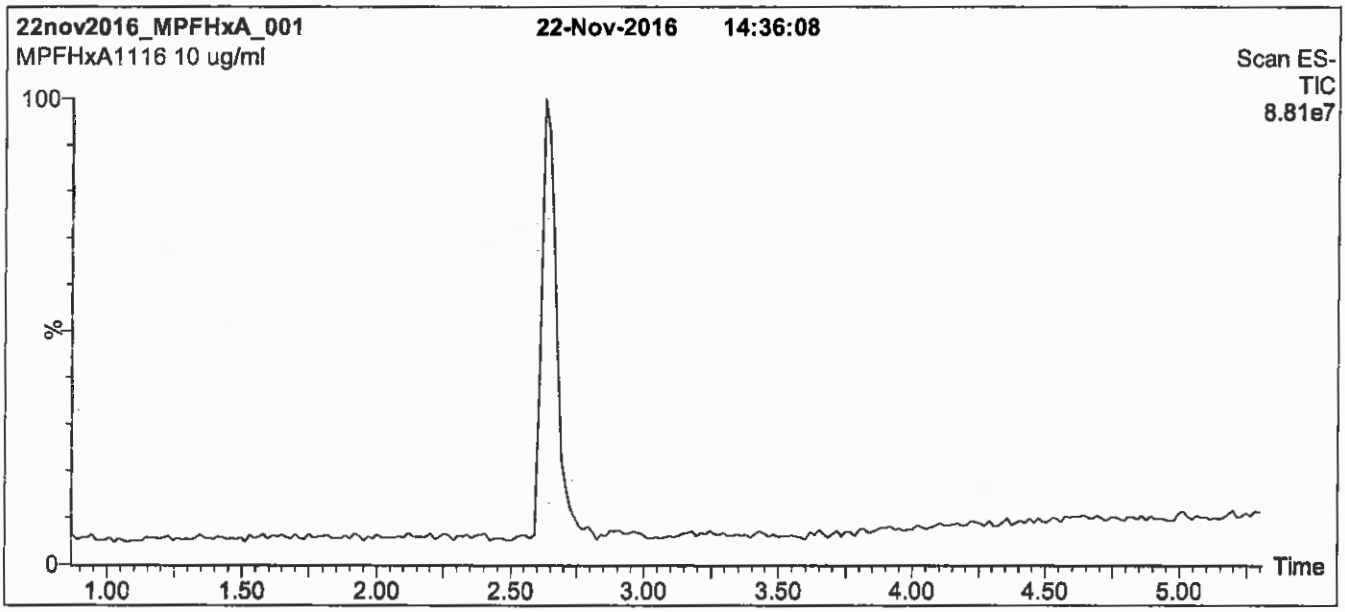
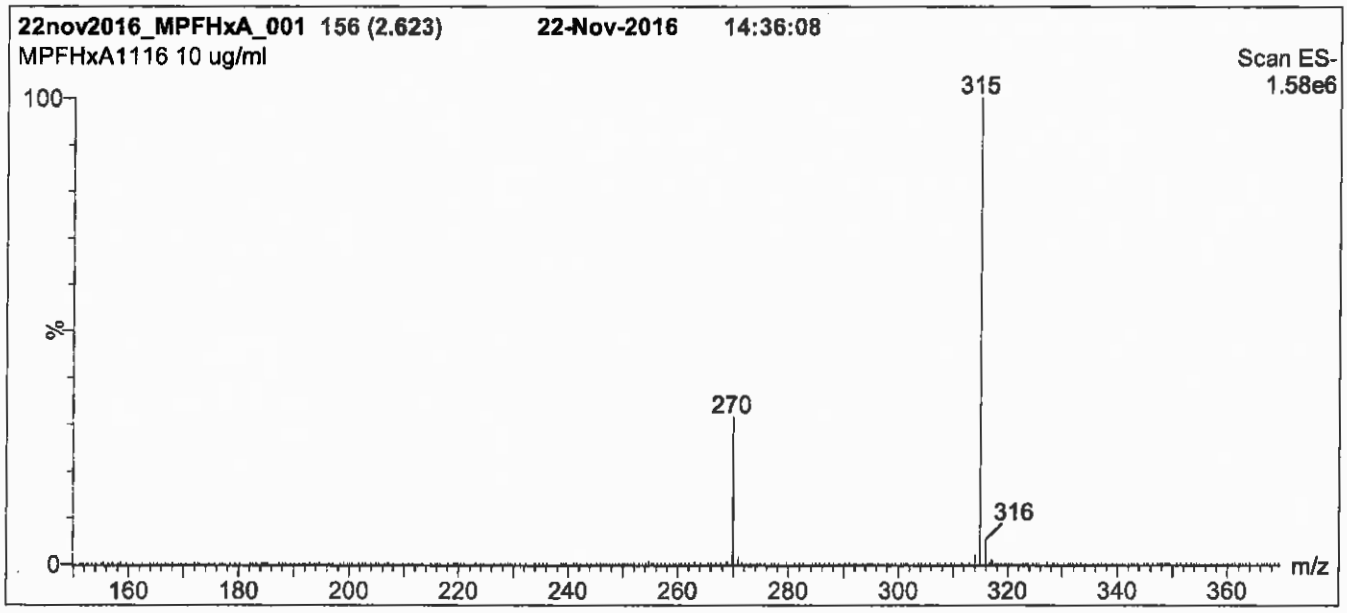
For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions over 0.5 min.
Time: 10 min

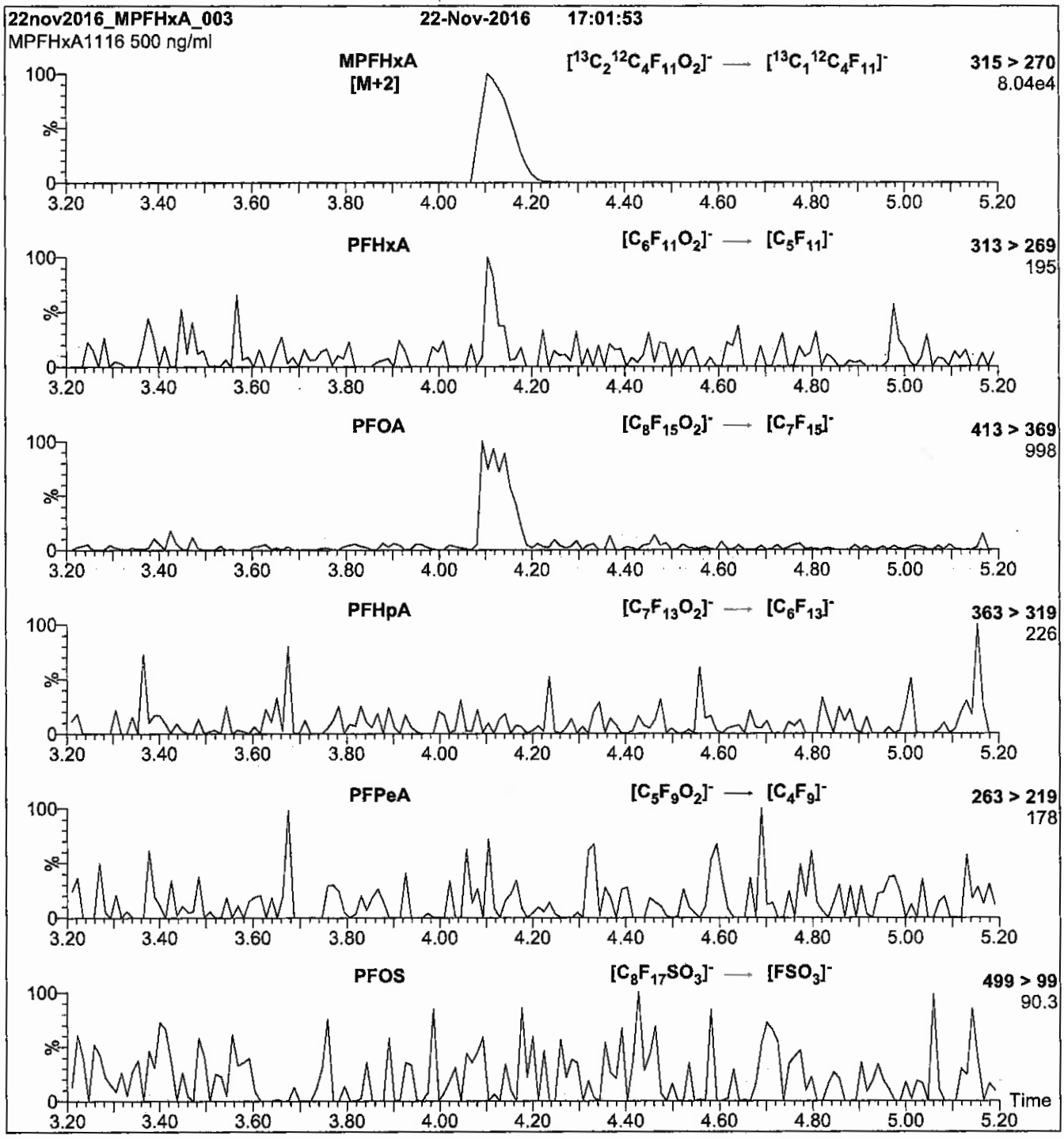
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.46e-3
Collision Energy (eV) = 10

Reagent

LCMPFOS_00019

R: SBC 12/21/16

814253
ID: LCMPFOS_00019
Exp: 08/03/21 Prpd: SBC
13C4-Perfluorooctanesulfo

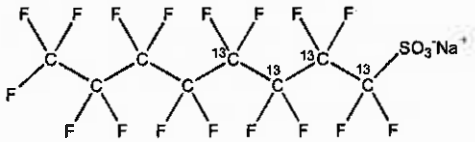
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFOS **LOT NUMBER:** MPFOS0816

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

STRUCTURE: **CAS #:** Not available



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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

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

CALA Testing Accreditation No. A1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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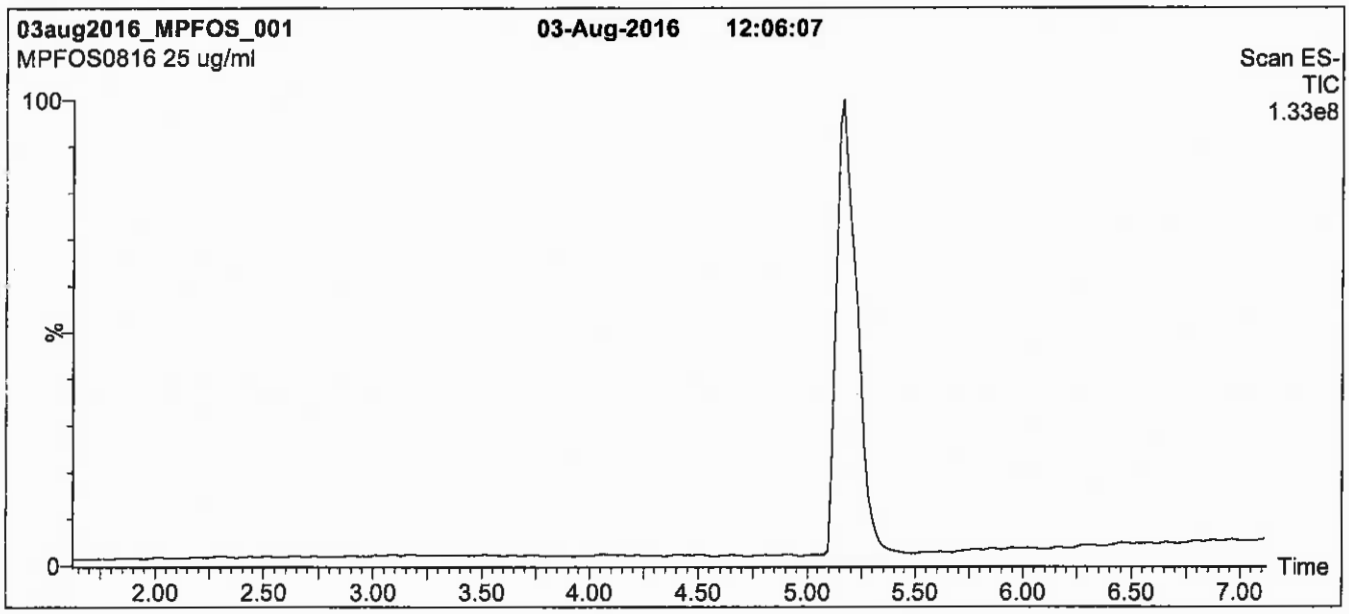
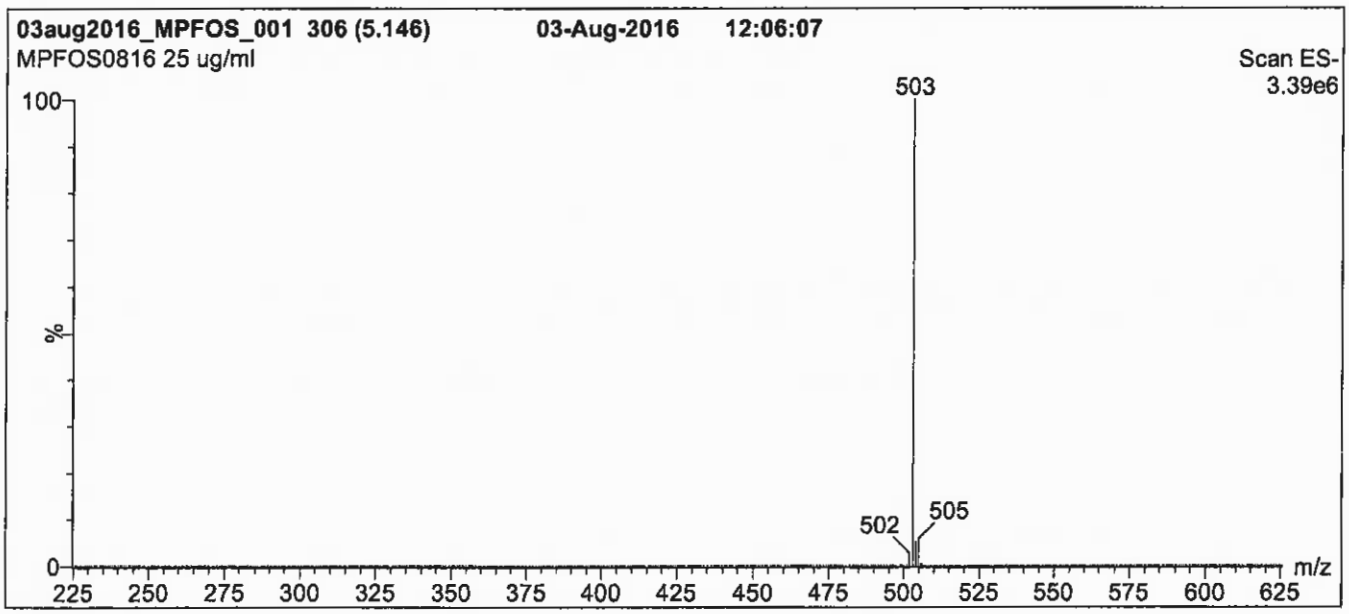
Figure 1: **MPFOS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

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

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

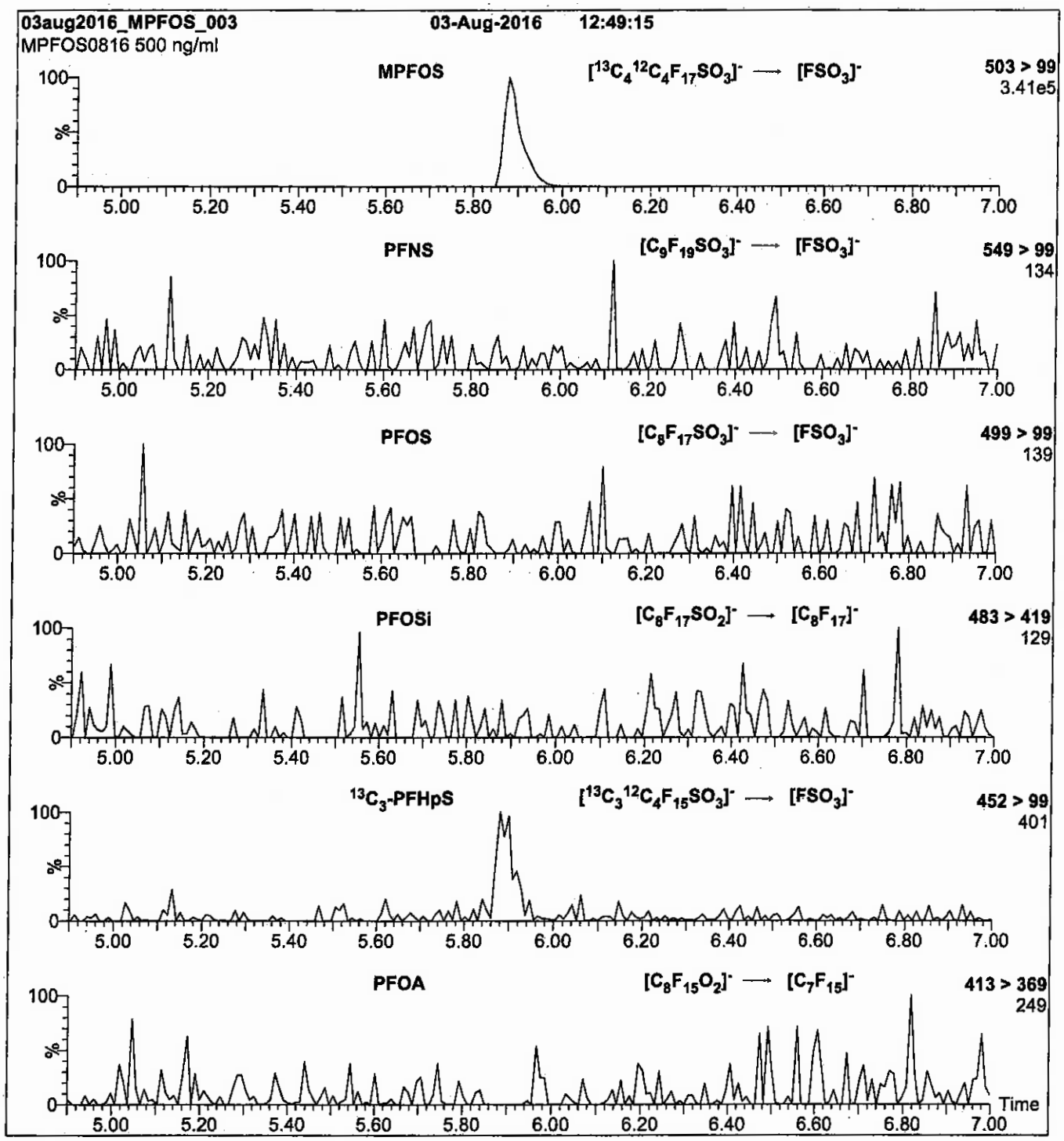
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

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

Reagent

LCMPFOS_00021

r: 5/8/17 SKV

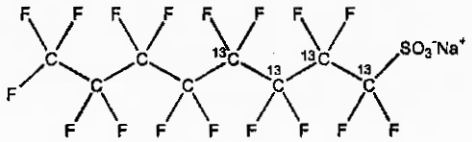
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFOS **LOT NUMBER:** MPFOS1216

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

STRUCTURE: **CAS #:** Not available



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CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2,3,4\text{-}^{13}C_4$)
LAST TESTED: (mm/dd/yyyy)	12/12/2016		
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-$^{13}C_3$]heptanesulfonate.

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Certified By: B.G. Chittim **Date:** 12/14/2016 (mm/dd/yyyy)

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CALA

ANAB ACCREDITED

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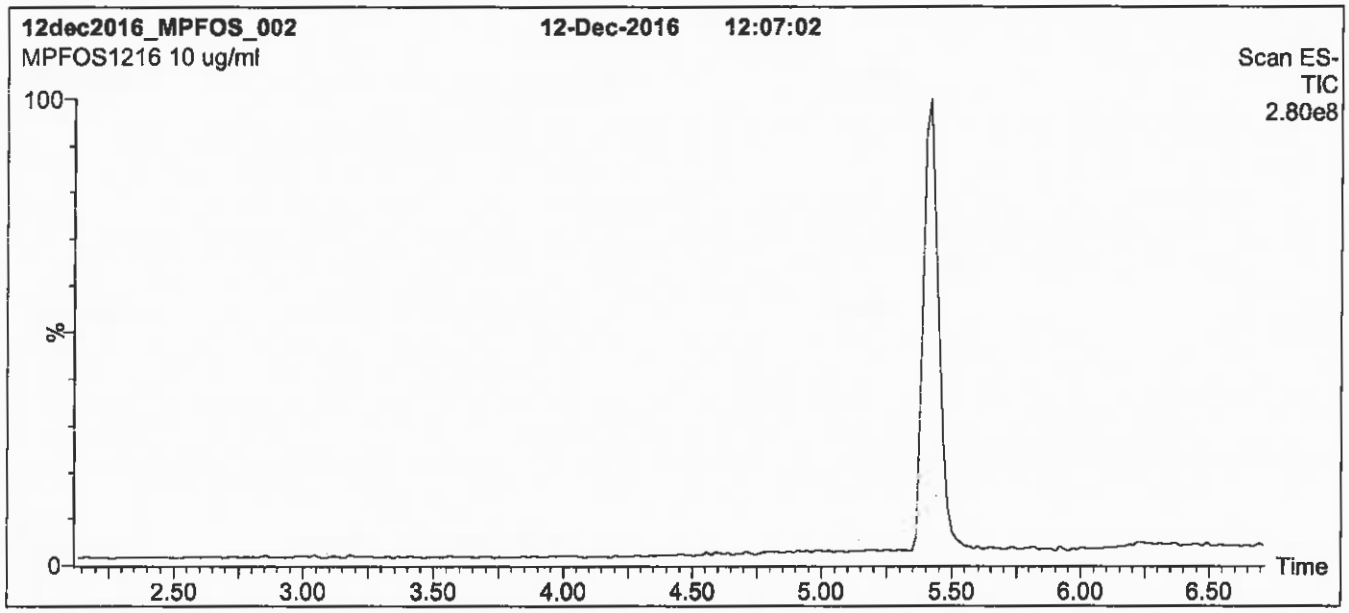

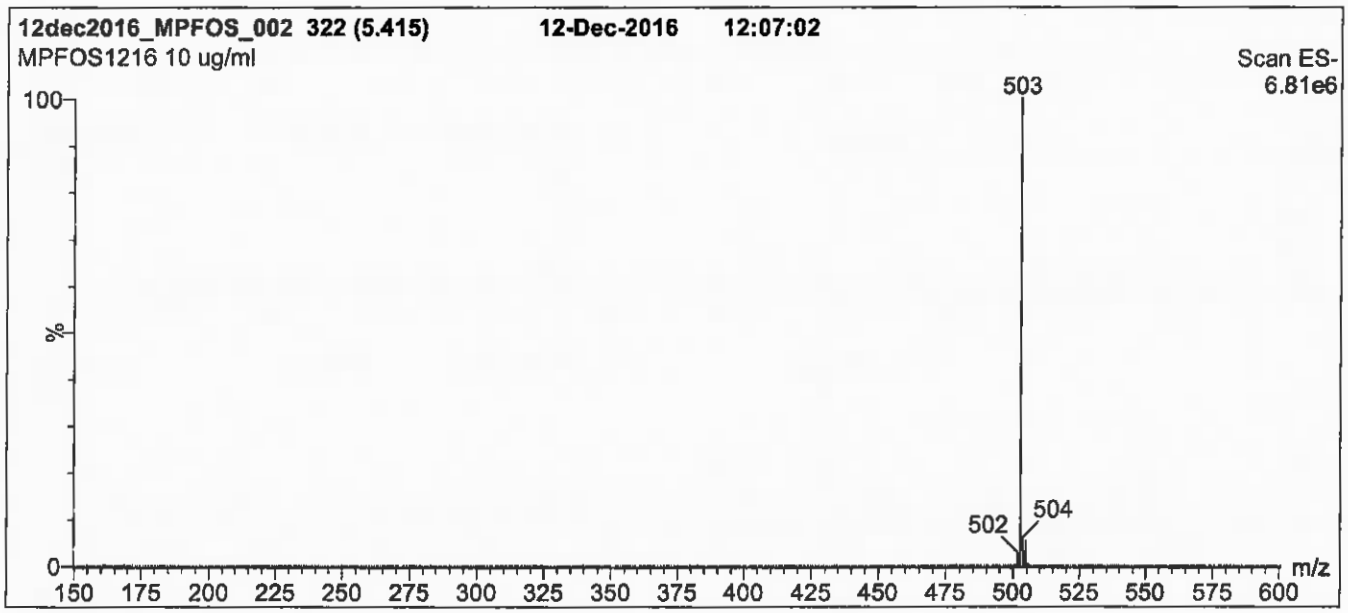

Conditions for Figure 1:

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

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1.7 µm, 2.1 x 100 mm

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

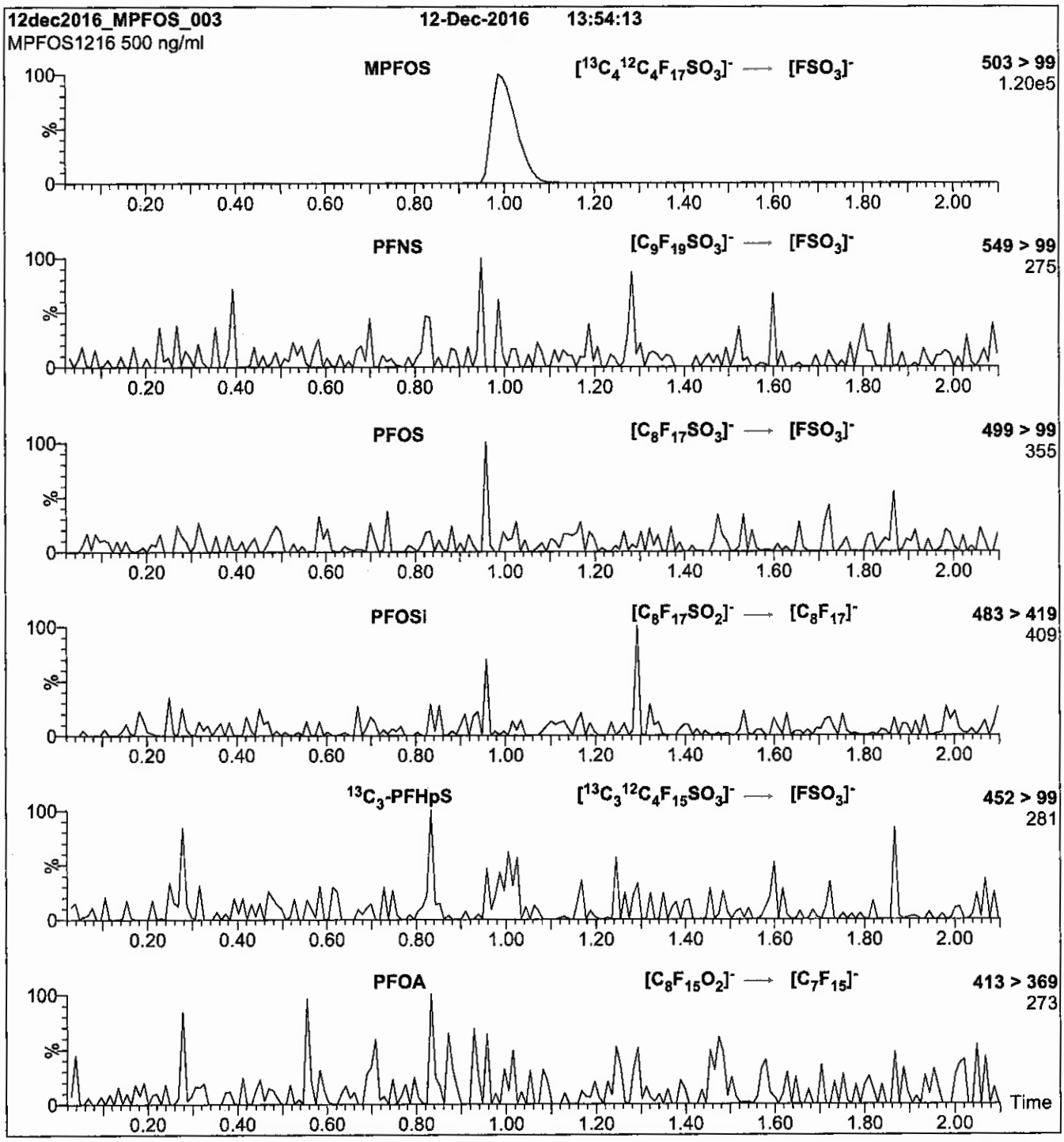
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (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 µl/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.: 320-32528-1

SDG No.:

Matrix: Water Level: Low

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

Client Sample ID	Lab Sample ID	PFHxA #	PFDA #
WGNA-101817-RW-3933	320-32528-1	81	96
WGNA-101817-FRB-3933	320-32528-2	98	102
WGNA-101817-RW-0569	320-32528-3	80	99
WGNA-101817-FRB-0569	320-32528-4	101	105
	MB 320-191223/1-A	94	95
	LCS 320-191223/2-A	101	104
	LCSD 320-191223/3-A	102	103

	QC LIMITS
PFHxA = 13C2 PFHxA	70-130
PFDA = 13C2 PFDA	70-130

Column to be used to flag recovery values

FORM II 537

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-32528-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2017.10.31_537C_004.d

Lab ID: LCS 320-191223/2-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	222	214	96	70-130	M
Perfluorooctanoic acid (PFOA)	111	111	100	70-130	
Perfluorononanoic acid (PFNA)	111	113	102	70-130	
Perfluorohexanesulfonic acid (PFHxS)	167	160	96	70-130	
Perfluoroheptanoic acid (PFHpA)	55.6	56.4	101	70-130	
Perfluorobutanesulfonic acid (PFBS)	500	466	93	70-130	

Column to be used to flag recovery and RPD values

FORM III 537

FORM III
LCMS LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-32528-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2017.10.31_537C_005.d

Lab ID: LCSD 320-191223/3-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LCSD CONCENTRATION (ng/L)	LCSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	222	218	98	2	30	70-130	M
Perfluorooctanoic acid (PFOA)	111	113	102	2	30	70-130	
Perfluorononanoic acid (PFNA)	111	115	103	1	30	70-130	
Perfluorohexanesulfonic acid (PFHxS)	167	166	99	4	30	70-130	
Perfluoroheptanoic acid (PFHpA)	55.6	58.4	105	3	30	70-130	
Perfluorobutanesulfonic acid (PFBS)	500	483	97	4	30	70-130	

Column to be used to flag recovery and RPD values

FORM III 537

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-32528-1

SDG No.:

Lab File ID: 2017.10.31_537C_003.d Lab Sample ID: MB 320-191223/1-A

Matrix: Water Date Extracted: 10/26/2017 10:34

Instrument ID: A8_N Date Analyzed: 10/31/2017 17:25

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-191223/2-A	2017.10.31_537C_004.d	10/31/2017 17:30
	LCSD 320-191223/3-A	2017.10.31_537C_005.d	10/31/2017 17:35
WGNA-101817-RW-3933	320-32528-1	2017.10.31_537C_006.d	10/31/2017 17:40
WGNA-101817-FRB-3933	320-32528-2	2017.10.31_537C_007.d	10/31/2017 17:44
WGNA-101817-RW-0569	320-32528-3	2017.10.31_537C_008.d	10/31/2017 17:49
WGNA-101817-FRB-0569	320-32528-4	2017.10.31_537C_009.d	10/31/2017 17:54

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-32528-1

SDG No.:

Instrument ID: A8_N Calibration Start Date: 10/31/2017 11:44

GC Column: GeminiC18 3x100 ID: 3(mm) Calibration End Date: 10/31/2017 12:08

Calibration ID: 35621

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MEAN AREA AND MEAN RT		2775806	1.86	6114108	2.11		
UPPER LIMIT		4163709	2.36	9171162	2.61		
LOWER LIMIT		1387903	1.36	3057054	1.61		
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCVL 320-192162/11		2865147	1.87	6394781	2.11		
ICV 320-192162/16		2807375	1.87	6562646	2.11		
CCV 320-192277/1 CCVIS		2736266	1.85	5871567	2.09		
MB 320-191223/1-A		2707902	1.85	6287436	2.09		
LCS 320-191223/2-A		2767575	1.86	6347084	2.10		
LCSD 320-191223/3-A		2743298	1.86	6235870	2.10		
320-32528-1	WGNA-101817-RW-3933	2963693	1.86	6520024	2.10		
320-32528-2	WGNA-101817-FRB-3933	2682562	1.85	5988598	2.09		
320-32528-3	WGNA-101817-RW-0569	3036731	1.86	6609095	2.10		
320-32528-4	WGNA-101817-FRB-0569	2593193	1.85	5851132	2.09		
CCV 320-192277/10 CCVIS		2852910	1.86	6200813	2.10		

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

Area Limit = 50%-150% of internal standard area
RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII 537

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-32528-1

SDG No.:

Sample No.: CCV 320-192277/1 Date Analyzed: 10/31/2017 17:16

Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 2017.10.31_537C_001 Heated Purge: (Y/N) N

Calibration ID: 35621

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		2736266	1.85	5871567	2.09		
UPPER LIMIT		3830772	2.35	8220194	2.59		
LOWER LIMIT		1915386	1.35	4110097	1.59		
LAB SAMPLE ID	CLIENT SAMPLE ID						
MB 320-191223/1-A		2707902	1.85	6287436	2.09		
LCS 320-191223/2-A		2767575	1.86	6347084	2.10		
LCSD 320-191223/3-A		2743298	1.86	6235870	2.10		
320-32528-1	WGNA-101817-RW-3933	2963693	1.86	6520024	2.10		
320-32528-2	WGNA-101817-FRB-3933	2682562	1.85	5988598	2.09		
320-32528-3	WGNA-101817-RW-0569	3036731	1.86	6609095	2.10		
320-32528-4	WGNA-101817-FRB-0569	2593193	1.85	5851132	2.09		

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

Area Limit = 70%-140% of internal standard area
RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII 537

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-32528-1

SDG No.:

Sample No.: CCV 320-192277/10 Date Analyzed: 10/31/2017 17:59

Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 2017.10.31_537C_010 Heated Purge: (Y/N) N

Calibration ID: 35621

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		2852910	1.86	6200813	2.10		
UPPER LIMIT		3994074	2.36	8681138	2.60		
LOWER LIMIT		1997037	1.36	4340569	1.60		
LAB SAMPLE ID	CLIENT SAMPLE ID						
MB 320-191223/1-A		2707902	1.85	6287436	2.09		
LCS 320-191223/2-A		2767575	1.86	6347084	2.10		
LCSD 320-191223/3-A		2743298	1.86	6235870	2.10		
320-32528-1	WGNA-101817-RW-3933	2963693	1.86	6520024	2.10		
320-32528-2	WGNA-101817-FRB-3933	2682562	1.85	5988598	2.09		
320-32528-3	WGNA-101817-RW-0569	3036731	1.86	6609095	2.10		
320-32528-4	WGNA-101817-FRB-0569	2593193	1.85	5851132	2.09		

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

Area Limit = 70%-140% of internal standard area
RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII 537

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-32528-1

SDG No.:

Client Sample ID: WGNA-101817-RW-3933 Lab Sample ID: 320-32528-1

Matrix: Water Lab File ID: 2017.10.31_537C_006.d

Analysis Method: 537 Date Collected: 10/18/2017 08:10

Extraction Method: 537 Date Extracted: 10/26/2017 10:34

Sample wt/vol: 253.7(mL) Date Analyzed: 10/31/2017 17:40

Con. Extract Vol.: 1.00(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 192277 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	14	J M	39	16	6.7
335-67-1	Perfluorooctanoic acid (PFOA)	15	J	20	7.9	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U M	24	20	7.9
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	16	J	30	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	5.7	J	9.9	3.9	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	89	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	81		70-130
STL00996	13C2 PFDA	96		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\2017.10.31_537C_006.d
Lims ID: 320-32528-A-1-A
Client ID: WGNA-101817-RW-3933
Sample Type: Client
Inject. Date: 31-Oct-2017 17:40:08 ALS Bottle#: 4 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-32528-a-1-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 01-Nov-2017 11:06:54 Calib Date: 31-Oct-2017 12:08:27
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK027

First Level Reviewer: barnettj Date: 01-Nov-2017 11:07:12

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.404	1.405	-0.001	1.000	321228	1.32		69.9	
298.90 > 99.00	1.404	1.405	-0.001	1.000	220606		1.46(0.00-0.00)	209	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.525	1.528	-0.003	1.000	2706999	8.09		4088	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.677	1.677	0.0	1.000	405679	1.46		42.5	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.677	1.678	-0.001	1.000	1461171	3.95		300	
* 6 13C2-PFOA									
415.00 > 370.00	1.859	1.863	-0.004		2963693	10.0		4033	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.859	1.864	-0.005	1.000	1072895	3.89		59.7	
413.00 > 169.00	1.859	1.864	-0.005	1.000	634902		1.69(0.00-0.00)	109	
8 Perfluorooctane sulfonic acid									M
499.00 > 80.00	2.102	2.094	0.008	1.000	729620	3.46		68.5	M
499.00 > 99.00	2.102	2.094	0.008	1.000	129201		5.65(0.00-0.00)	76.1	M
* 7 13C4 PFOS									
503.00 > 80.00	2.102	2.107	-0.005		6520024	28.7		2583	
9 Perfluorononanoic acid									M
463.00 > 419.00	2.109	2.116	-0.007	1.000	94372	0.4879		12.7	M
$ 10 13C2 PFDA									
515.00 > 470.00	2.276	2.277	-0.001	1.000	2307103	9.62		6791	

QC Flag Legend

Review Flags

M - Manually Integrated

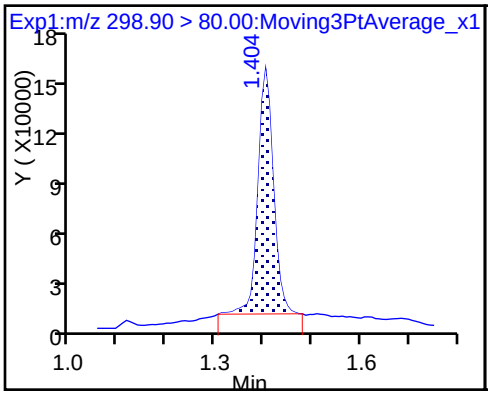
Report Date: 01-Nov-2017 11:07:12 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

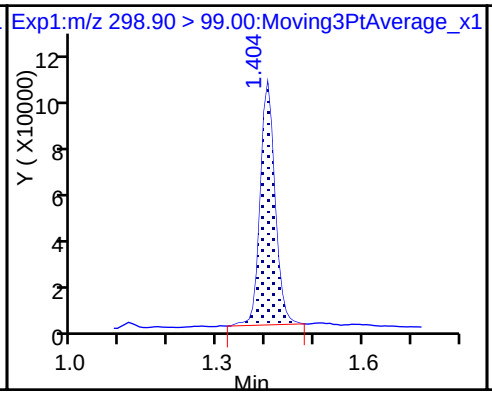
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\2017.10.31_537C_006.d

Injection Date:	31-Oct-2017 17:40:08	Instrument ID:	A8_N		
Lims ID:	320-32528-A-1-A	Lab Sample ID:	320-32528-1		
Client ID:	WGNA-101817-RW-3933				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	4	Worklist Smp#:	6
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		

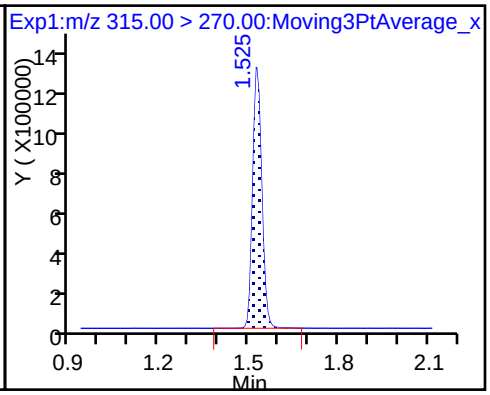
1 Perfluorobutanesulfonic acid



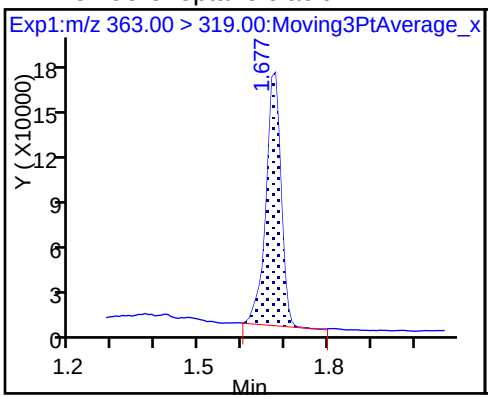
1 Perfluorobutanesulfonic acid



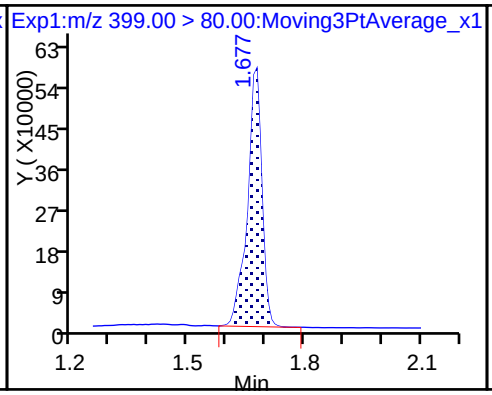
$ 2 13C2 PFHxA



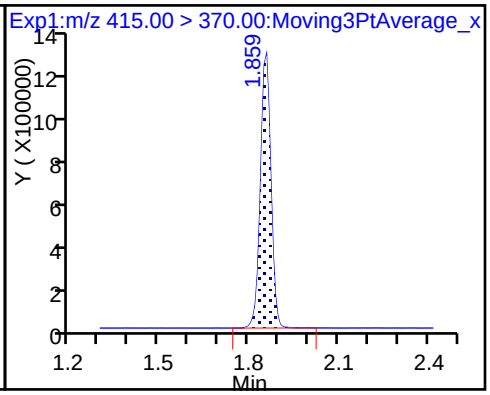
4 Perfluoroheptanoic acid



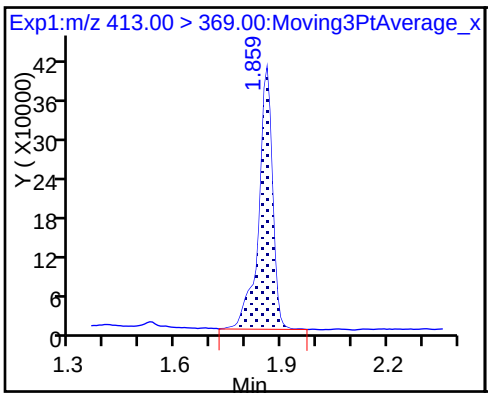
3 Perfluorohexanesulfonic acid



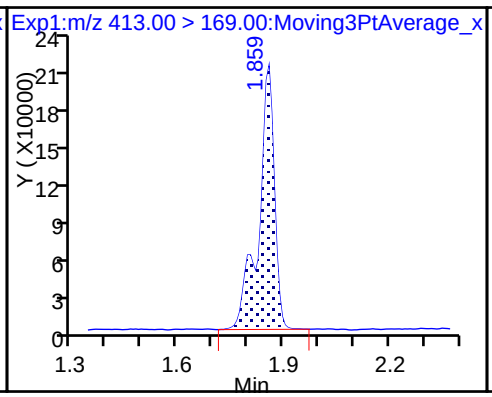
* 6 13C2-PFOA



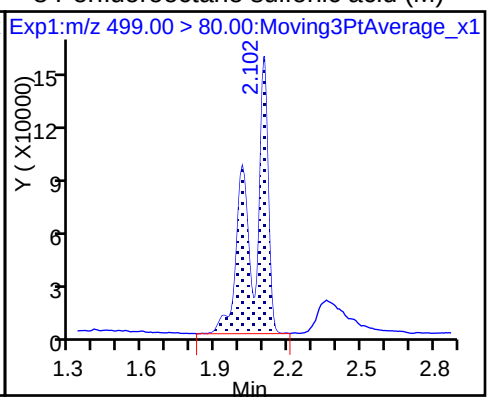
5 Perfluorooctanoic acid



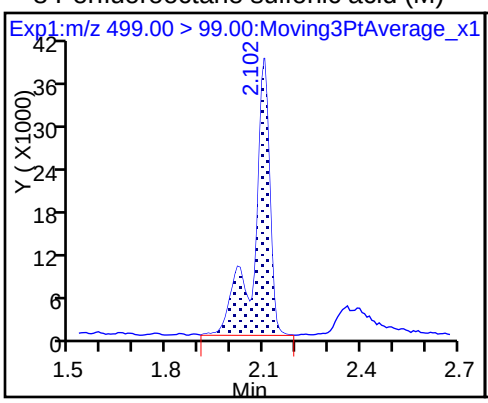
5 Perfluorooctanoic acid



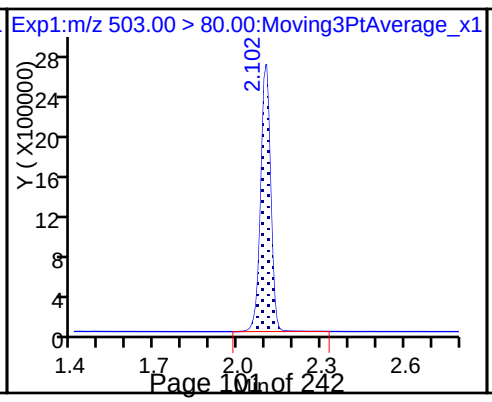
8 Perfluorooctane sulfonic acid (M)



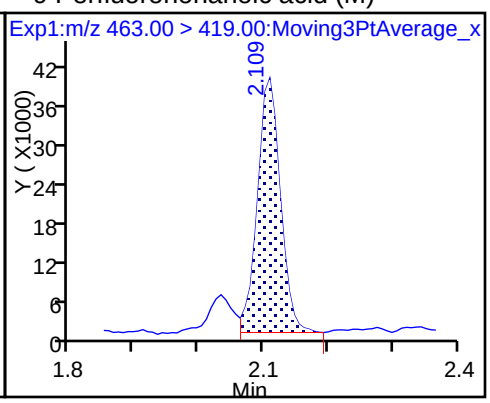
8 Perfluorooctane sulfonic acid (M)



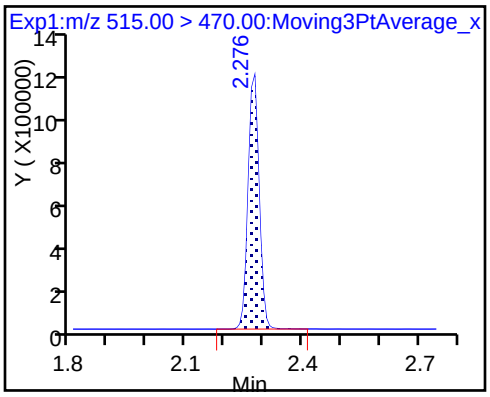
* 7 13C4 PFOS



9 Perfluorononanoic acid (M)



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.276
Y (X100000)
14
12
10
8
6
4
2
0
1.8
2.1
2.4
2.7
Min

TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\2017.10.31_537C_006.d
Lims ID: 320-32528-A-1-A
Client ID: WGNA-101817-RW-3933
Sample Type: Client
Inject. Date: 31-Oct-2017 17:40:08 ALS Bottle#: 4 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-32528-a-1-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 01-Nov-2017 11:06:54 Calib Date: 31-Oct-2017 12:08:27
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK027

First Level Reviewer: barnettj Date: 01-Nov-2017 11:07:12

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	8.09	80.94
$ 10 13C2 PFDA	10.0	9.62	96.18

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

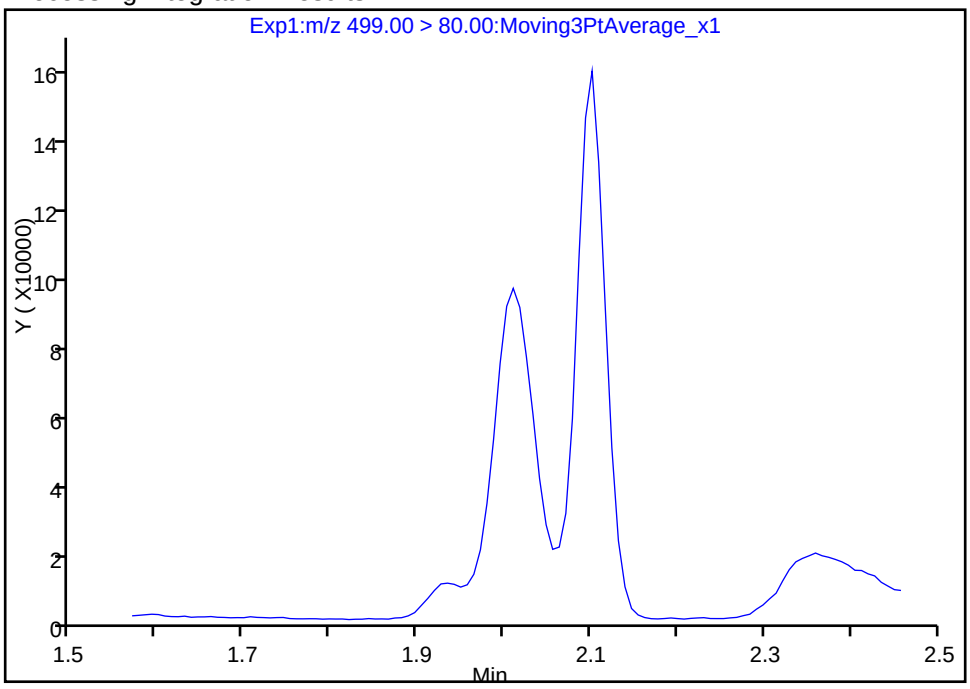
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\2017.10.31_537C_006.d				
Injection Date:	31-Oct-2017 17:40:08	Instrument ID:	A8_N		
Lims ID:	320-32528-A-1-A	Lab Sample ID:	320-32528-1		
Client ID:	WGNA-101817-RW-3933				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	4	Worklist Smp#:	6
Injection 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

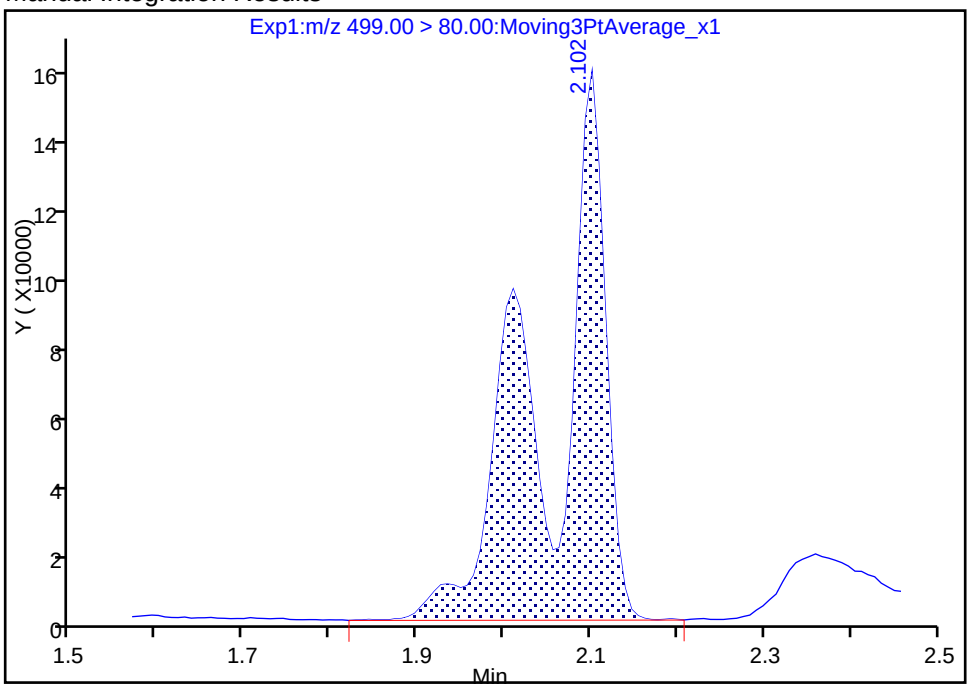
Not Detected
Expected RT: 2.09

Processing Integration Results



Manual Integration Results

RT: 2.10
Area: 729620
Amount: 3.457424
Amount Units: ng/ml



Reviewer: barnettj, 01-Nov-2017 10:42:02
Audit Action: Assigned Compound ID Audit Reason: Missed Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\2017.10.31_537C_006.d

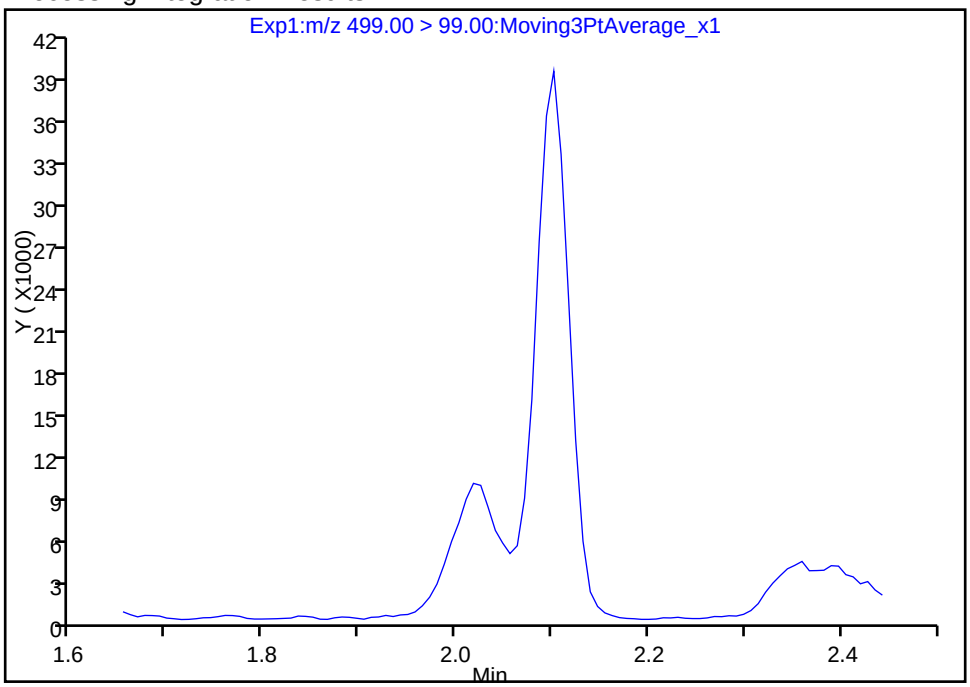
Injection Date:	31-Oct-2017 17:40:08	Instrument ID:	A8_N		
Lims ID:	320-32528-A-1-A	Lab Sample ID:	320-32528-1		
Client ID:	WGNA-101817-RW-3933				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	4	Worklist Smp#:	6
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

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

Signal: 2

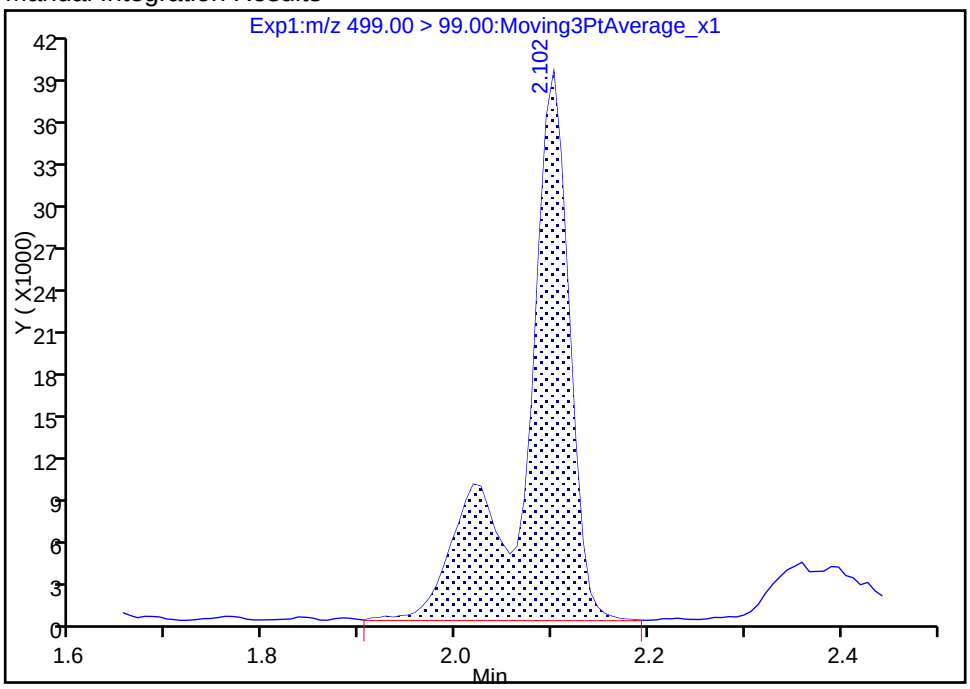
Not Detected
Expected RT: 2.09

Processing Integration Results



Manual Integration Results

RT: 2.10
Area: 129201
Amount: 3.457424
Amount Units: ng/ml



Reviewer: barnettj, 01-Nov-2017 10:42:16
Audit Action: Manually Integrated Audit Reason: Missed Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

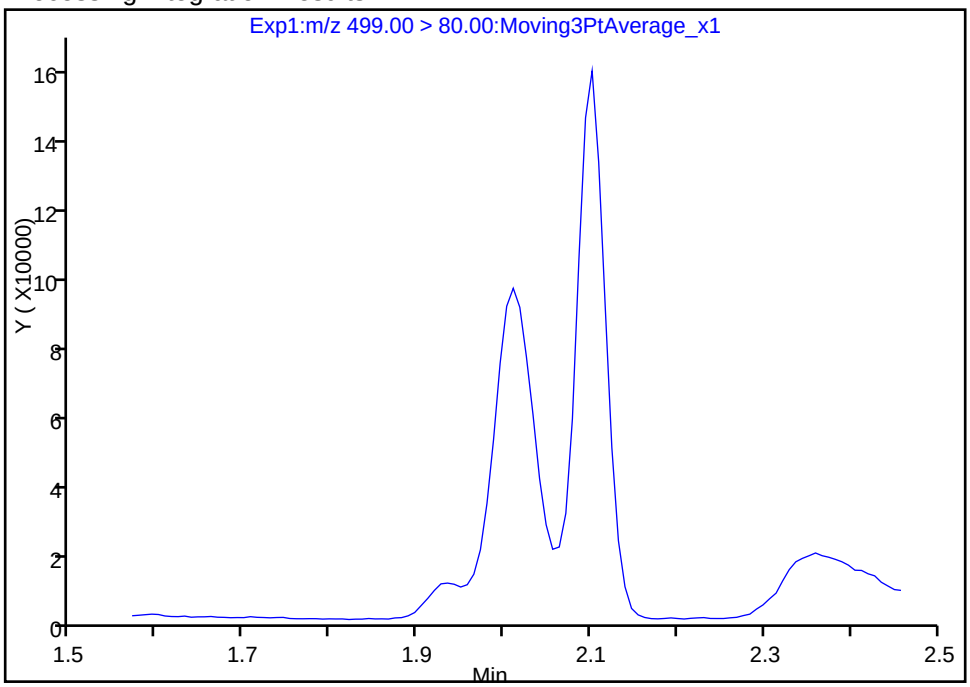
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\2017.10.31_537C_006.d				
Injection Date:	31-Oct-2017 17:40:08	Instrument ID:	A8_N		
Lims ID:	320-32528-A-1-A	Lab Sample ID:	320-32528-1		
Client ID:	WGNA-101817-RW-3933				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	4	Worklist Smp#:	6
Injection 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

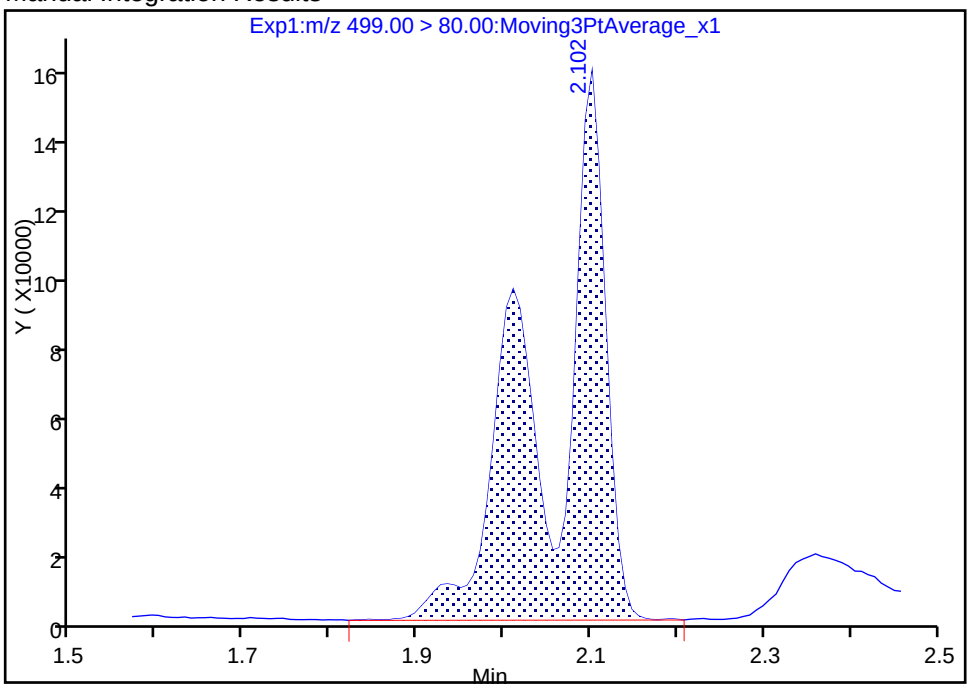
Not Detected
Expected RT: 2.09

Processing Integration Results



Manual Integration Results

RT: 2.10
Area: 729620
Amount: 3.457424
Amount Units: ng/ml



Reviewer: barnettj, 01-Nov-2017 10:42:16
Audit Action: Manually Integrated Audit Reason: Missed Peak

TestAmerica Sacramento

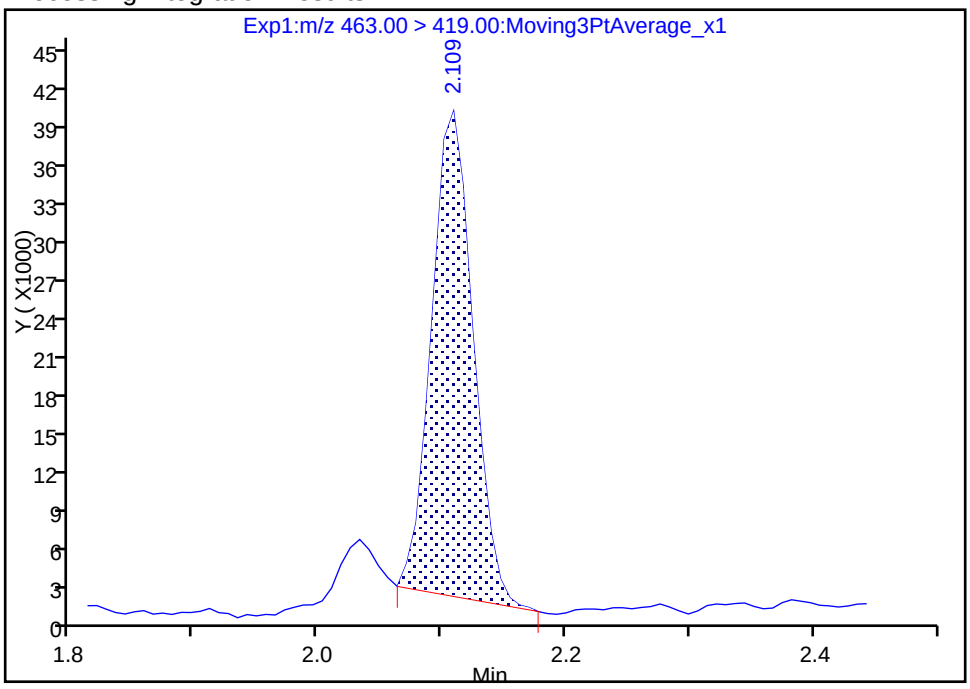
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\2017.10.31_537C_006.d				
Injection Date:	31-Oct-2017 17:40:08	Instrument ID:	A8_N		
Lims ID:	320-32528-A-1-A	Lab Sample ID:	320-32528-1		
Client ID:	WGNA-101817-RW-3933				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	4	Worklist Smp#:	6
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

9 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

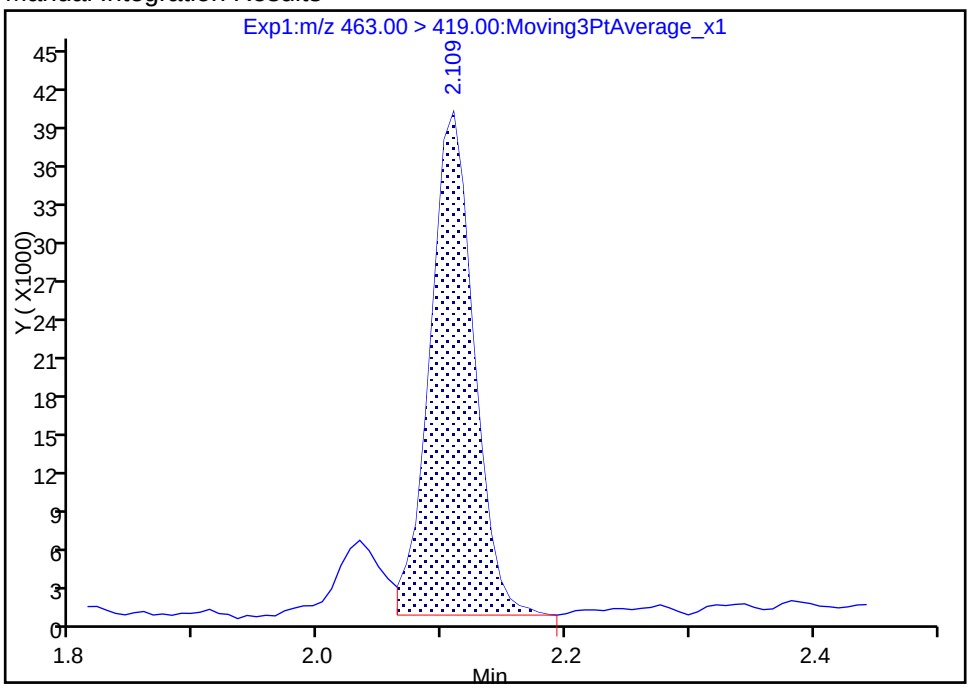
Processing Integration Results

RT: 2.11
Area: 86335
Amount: 0.446336
Amount Units: ng/ml



Manual Integration Results

RT: 2.11
Area: 94372
Amount: 0.487886
Amount Units: ng/ml



Reviewer: barnettj, 01-Nov-2017 10:57:58
Audit Action: Manually Integrated Audit Reason: Baseline

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-32528-1

SDG No.:

Client Sample ID: WGNA-101817-FRB-3933 Lab Sample ID: 320-32528-2

Matrix: Water Lab File ID: 2017.10.31_537C_007.d

Analysis Method: 537 Date Collected: 10/18/2017 08:05

Extraction Method: 537 Date Extracted: 10/26/2017 10:34

Sample wt/vol: 260.1(mL) Date Analyzed: 10/31/2017 17:44

Con. Extract Vol.: 1.00(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 192277 Units: ng/L

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)	7.7	U	19	7.7	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.7
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.8	U	9.6	3.8	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	87	35	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	98		70-130
STL00996	13C2 PFDA	102		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\2017.10.31_537C_007.d
Lims ID: 320-32528-A-2-A
Client ID: WGNA-101817-FRB-3933
Sample Type: Client
Inject. Date: 31-Oct-2017 17:44:54 ALS Bottle#: 5 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-32528-a-2-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 01-Nov-2017 10:58:24 Calib Date: 31-Oct-2017 12:08:27
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK027

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
$ 2 13C2 PFHxA									
315.00 > 270.00	1.525	1.528	-0.003	1.000	2957016	9.77		4121	
* 6 13C2-PFOA									
415.00 > 370.00	1.851	1.863	-0.012		2682562	10.0		3528	
* 7 13C4 PFOS									
503.00 > 80.00	2.094	2.107	-0.013		5988598	28.7		4276	
$ 10 13C2 PFDA									
515.00 > 470.00	2.269	2.277	-0.009	1.000	2215407	10.2		6328	

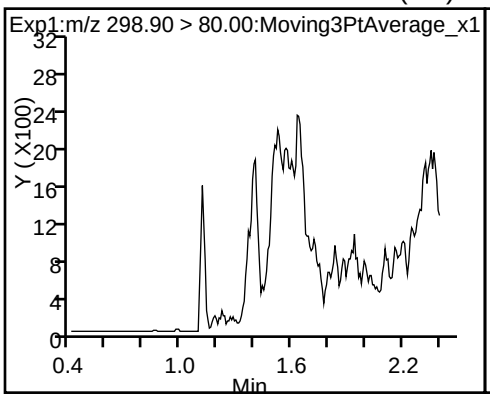
Report Date: 01-Nov-2017 10:58:34 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

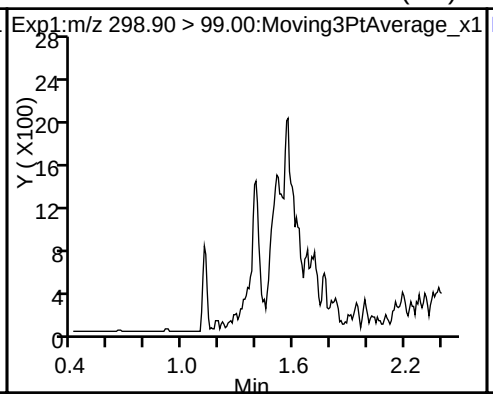
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\2017.10.31_537C_007.d

Injection Date:	31-Oct-2017 17:44:54	Instrument ID:	A8_N		
Lims ID:	320-32528-A-2-A	Lab Sample ID:	320-32528-2		
Client ID:	WGNA-101817-FRB-3933				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	5	Worklist Smp#:	7
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		

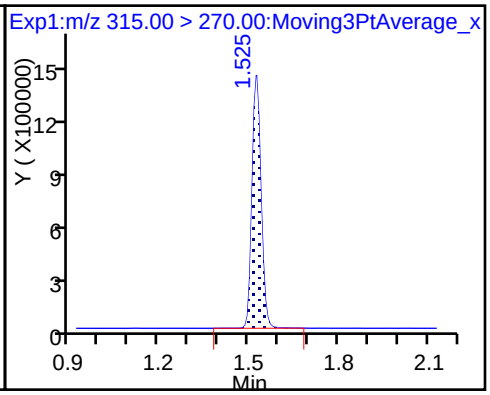
1 Perfluorobutanesulfonic acid (ND)



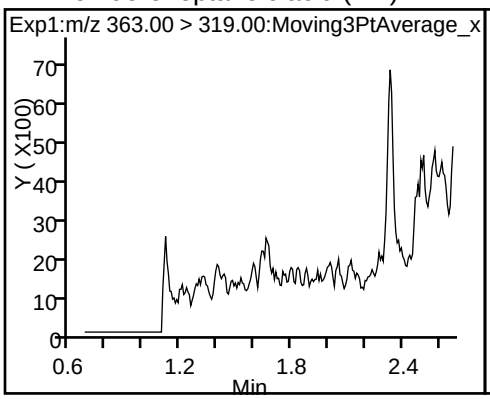
1 Perfluorobutanesulfonic acid (ND)



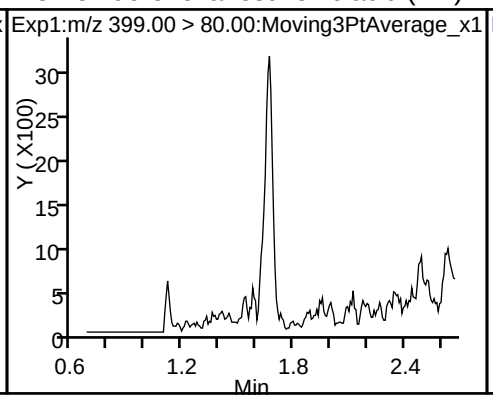
$ 2 13C2 PFHxA

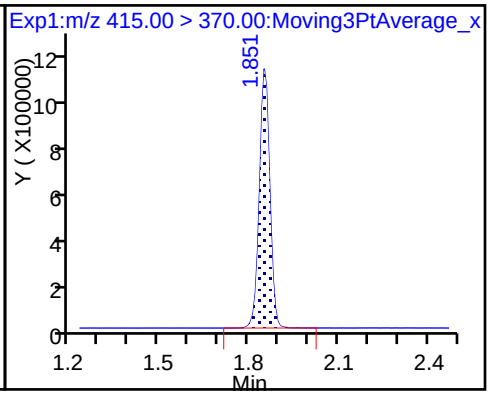


4 Perfluoroheptanoic acid (ND)

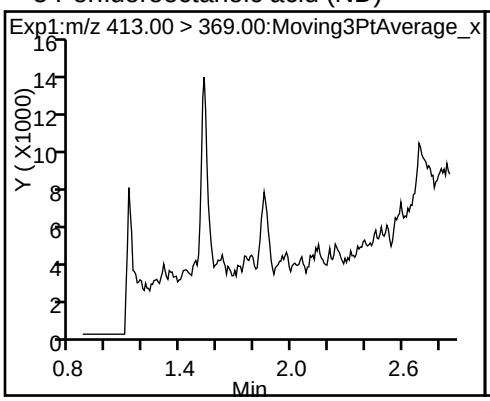


3 Perfluorohexanesulfonic acid (ND) * 6 13C2-PFOA

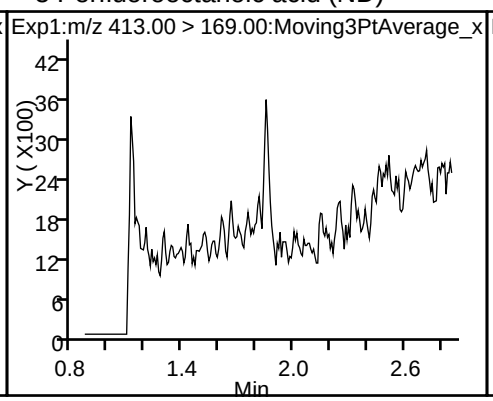




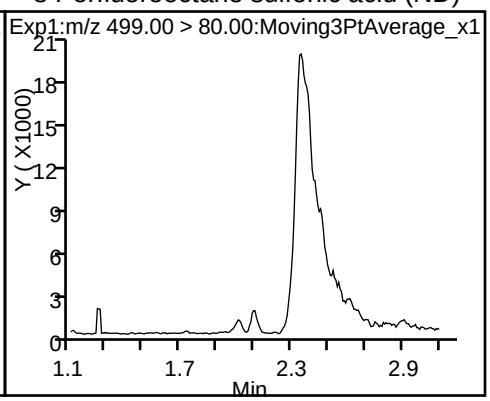
5 Perfluorooctanoic acid (ND)



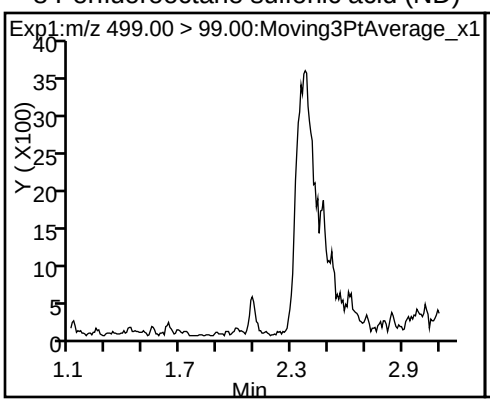
5 Perfluorooctanoic acid (ND)

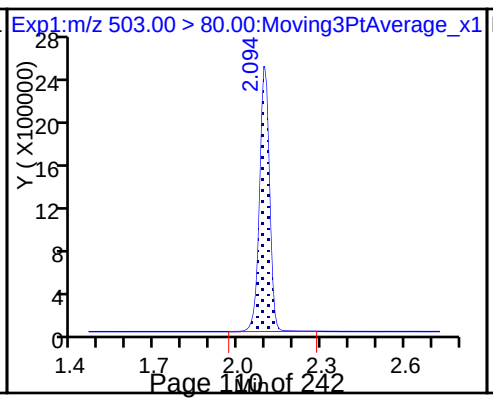


8 Perfluorooctane sulfonic acid (ND)

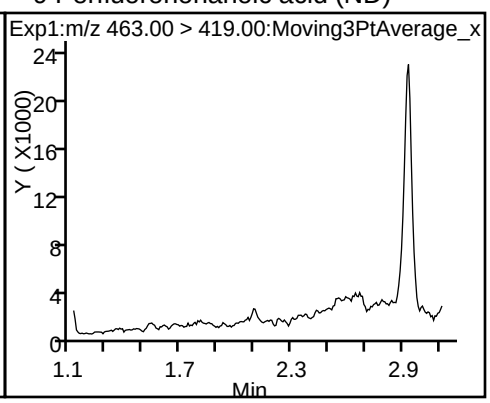


8 Perfluorooctane sulfonic acid (ND) * 7 13C4 PFOS

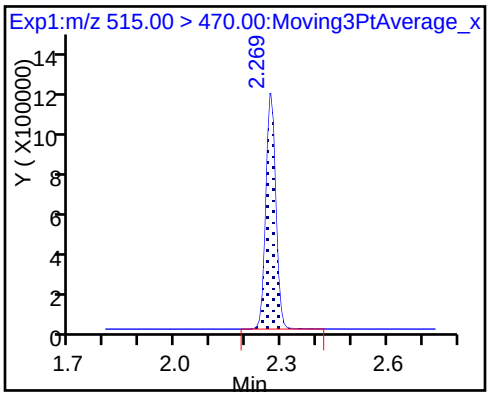




9 Perfluorononanoic acid (ND)



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.269
Y (X100000)
14
12
10
8
6
4
2
0
1.7
2.0
2.3
2.6
Min

TestAmerica Sacramento
Recovery Report

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\2017.10.31_537C_007.d				
Lims ID:	320-32528-A-2-A				
Client ID:	WGNA-101817-FRB-3933				
Sample Type:	Client				
Inject. Date:	31-Oct-2017 17:44:54	ALS Bottle#:	5	Worklist Smp#:	7
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Sample Info:	320-32528-a-2-a				
Misc. Info.:	Plate: 1 Rack: 6				
Operator ID:	SACINSTLCMS01	Instrument ID:	A8_N		
Method:	\\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\537_A8_N.m				
Limit Group:	LC 537 ICAL				
Last Update:	01-Nov-2017 10:58:24	Calib Date:	31-Oct-2017 12:08:27		
Integrator:	Picker				
Quant Method:	Internal Standard	Quant By:	Initial Calibration		
Last ICal File:	\\ChromNA\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_009.d				
Column 1 :			Det: EXP1		
Process Host:	XAWRK027				

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	9.77	97.68
$ 10 13C2 PFDA	10.0	10.2	102.03

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-32528-1

SDG No.:

Client Sample ID: WGNA-101817-RW-0569 Lab Sample ID: 320-32528-3

Matrix: Water Lab File ID: 2017.10.31_537C_008.d

Analysis Method: 537 Date Collected: 10/18/2017 09:10

Extraction Method: 537 Date Extracted: 10/26/2017 10:34

Sample wt/vol: 260.2(mL) Date Analyzed: 10/31/2017 17:49

Con. Extract Vol.: 1.00(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 192277 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	26	J M	38	15	6.5
335-67-1	Perfluorooctanoic acid (PFOA)	26		19	7.7	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U M	23	19	7.7
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	7.0	J	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	7.5	J	9.6	3.8	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	86	35	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	80		70-130
STL00996	13C2 PFDA	99		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\2017.10.31_537C_008.d
Lims ID: 320-32528-A-3-A
Client ID: WGNA-101817-RW-0569
Sample Type: Client
Inject. Date: 31-Oct-2017 17:49:38 ALS Bottle#: 6 Worklist Smp#: 8
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-32528-a-3-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 01-Nov-2017 11:06:54 Calib Date: 31-Oct-2017 12:08:27
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK027

First Level Reviewer: barnettj Date: 01-Nov-2017 10:57:41

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.404	1.405	-0.001	1.000	705358	2.88		180	
298.90 > 99.00	1.404	1.405	-0.001	1.000	486368		1.45(0.00-0.00)	545	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.525	1.528	-0.003	1.000	2729522	7.96		4517	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.677	1.677	0.0	1.000	553820	1.94		56.4	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.677	1.678	-0.001	1.000	679777	1.81		155	
* 6 13C2-PFOA									
415.00 > 370.00	1.859	1.863	-0.004		3036731	10.0		4211	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.859	1.864	-0.005	1.000	1945052	6.89		107	
413.00 > 169.00	1.859	1.864	-0.005	1.000	1132145		1.72(0.00-0.00)	205	
8 Perfluorooctane sulfonic acid									M
499.00 > 80.00	2.102	2.094	0.008	1.000	1451416	6.79		120	M
499.00 > 99.00	2.102	2.094	0.008	1.000	242778		5.98(0.00-0.00)	142	M
* 7 13C4 PFOS									
503.00 > 80.00	2.102	2.107	-0.005		6609095	28.7		2612	
9 Perfluorononanoic acid									M
463.00 > 419.00	2.109	2.116	-0.007	1.000	177046	0.8933		22.5	M
$ 10 13C2 PFDA									
515.00 > 470.00	2.276	2.277	-0.001	1.000	2437133	9.92		7513	

QC Flag Legend

Review Flags

M - Manually Integrated

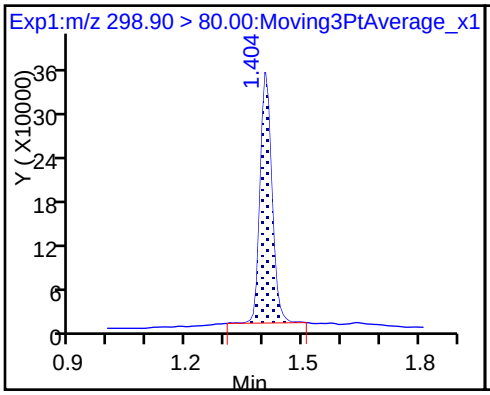
Report Date: 01-Nov-2017 11:07:28 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

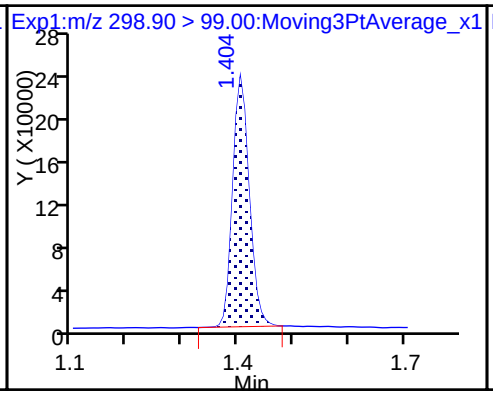
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\2017.10.31_537C_008.d

Injection Date:	31-Oct-2017 17:49:38	Instrument ID:	A8_N		
Lims ID:	320-32528-A-3-A	Lab Sample ID:	320-32528-3		
Client ID:	WGNA-101817-RW-0569				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	6	Worklist Smp#:	8
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		

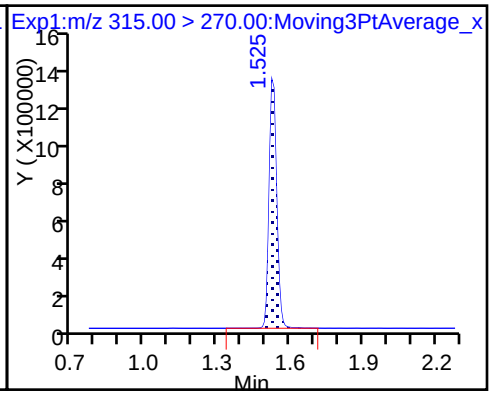
1 Perfluorobutanesulfonic acid



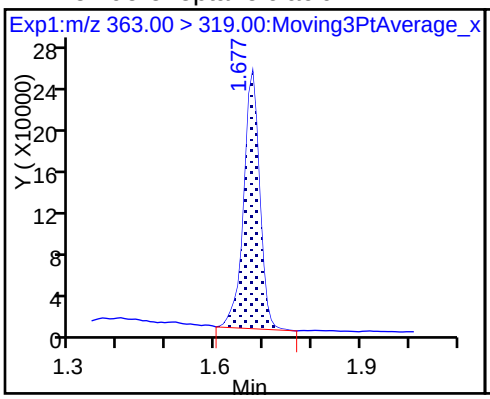
1 Perfluorobutanesulfonic acid



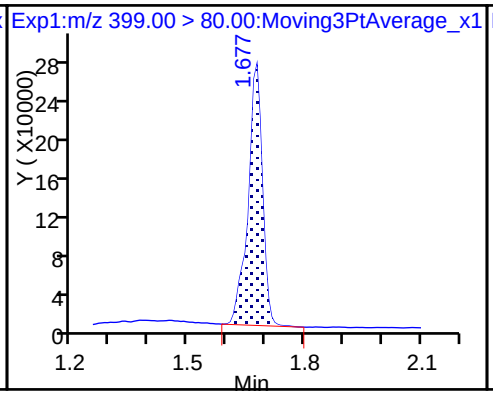
$ 2 13C2 PFHxA



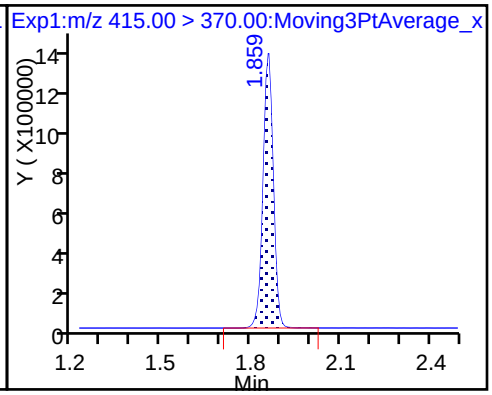
4 Perfluoroheptanoic acid



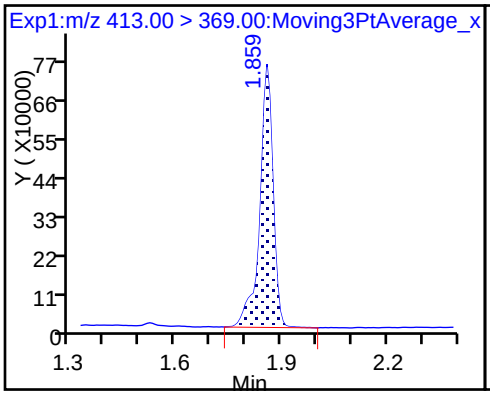
3 Perfluorohexanesulfonic acid



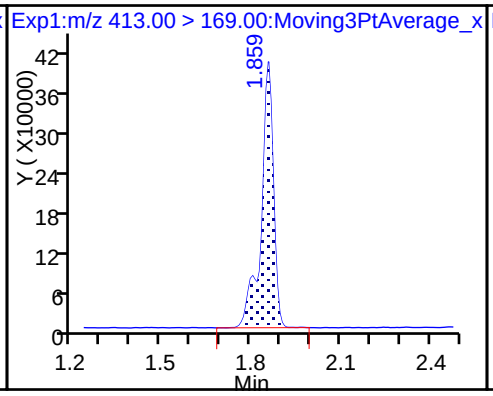
* 6 13C2-PFOA



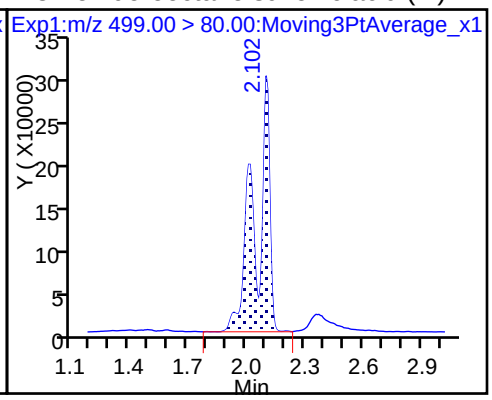
5 Perfluorooctanoic acid



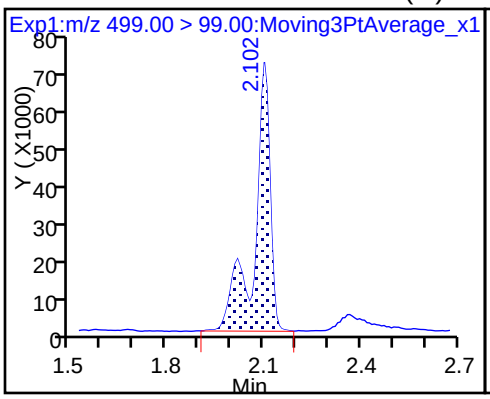
5 Perfluorooctanoic acid



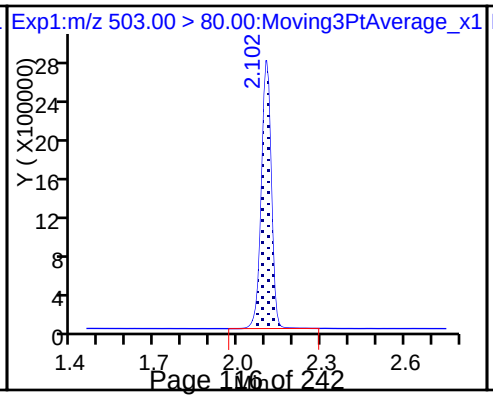
8 Perfluorooctane sulfonic acid (M)



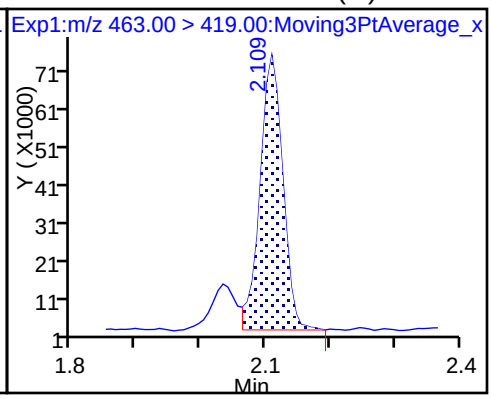
8 Perfluorooctane sulfonic acid (M)



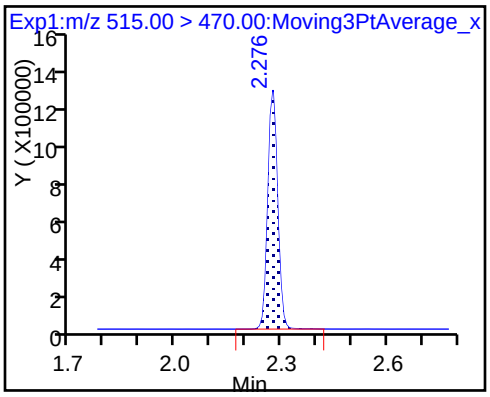
* 7 13C4 PFOS



9 Perfluorononanoic acid (M)



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.276
Y (X100000)
16
14
12
10
8
6
4
2
0
1.7
2.0
2.3
2.6
Min

TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\2017.10.31_537C_008.d
Lims ID: 320-32528-A-3-A
Client ID: WGNA-101817-RW-0569
Sample Type: Client
Inject. Date: 31-Oct-2017 17:49:38 ALS Bottle#: 6 Worklist Smp#: 8
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-32528-a-3-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 01-Nov-2017 11:06:54 Calib Date: 31-Oct-2017 12:08:27
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK027

First Level Reviewer: barnettj Date: 01-Nov-2017 10:57:41

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	7.96	79.65
$ 10 13C2 PFDA	10.0	9.92	99.16

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

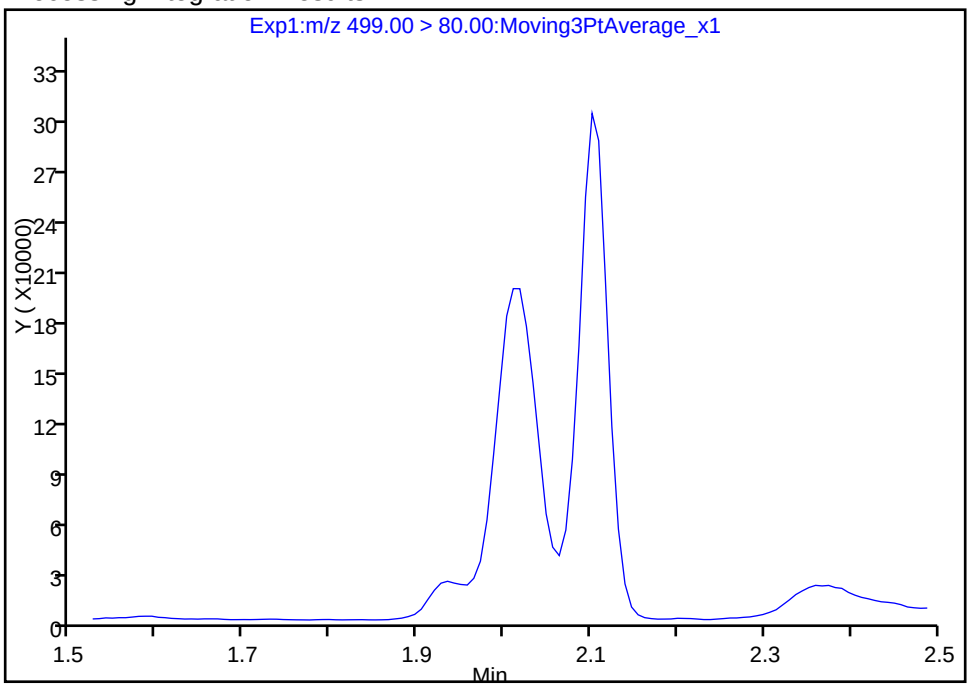
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\2017.10.31_537C_008.d				
Injection Date:	31-Oct-2017 17:49:38	Instrument ID:	A8_N		
Lims ID:	320-32528-A-3-A	Lab Sample ID:	320-32528-3		
Client ID:	WGNA-101817-RW-0569				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	6	Worklist Smp#:	8
Injection 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

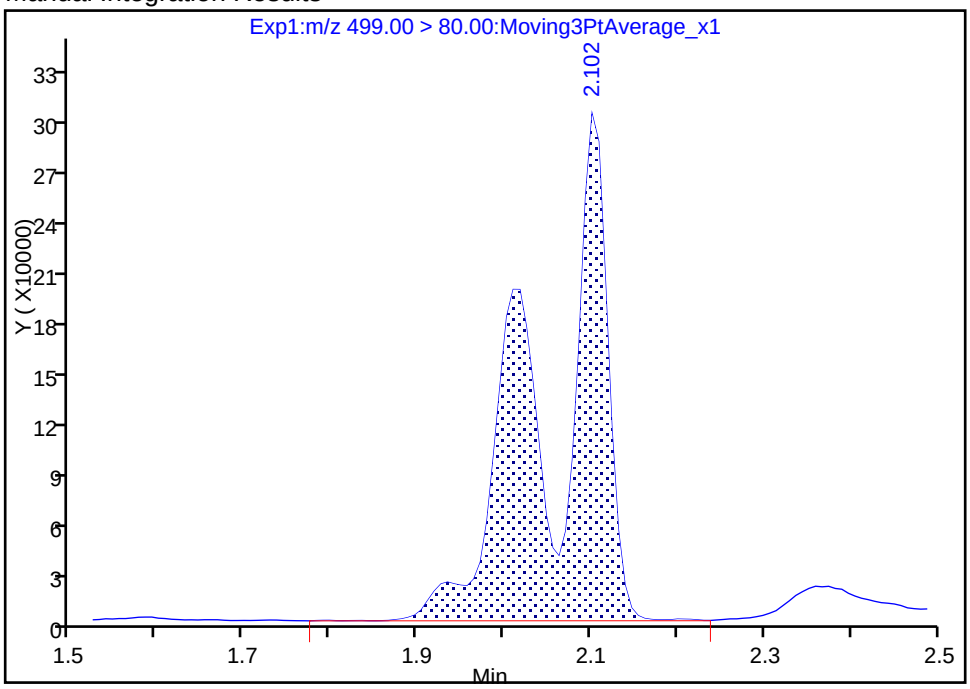
Not Detected
Expected RT: 2.09

Processing Integration Results



Manual Integration Results

RT: 2.10
Area: 1451416
Amount: 6.785080
Amount Units: ng/ml



Reviewer: barnettj, 01-Nov-2017 10:56:57
Audit Action: Assigned Compound ID Audit Reason: Missed Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

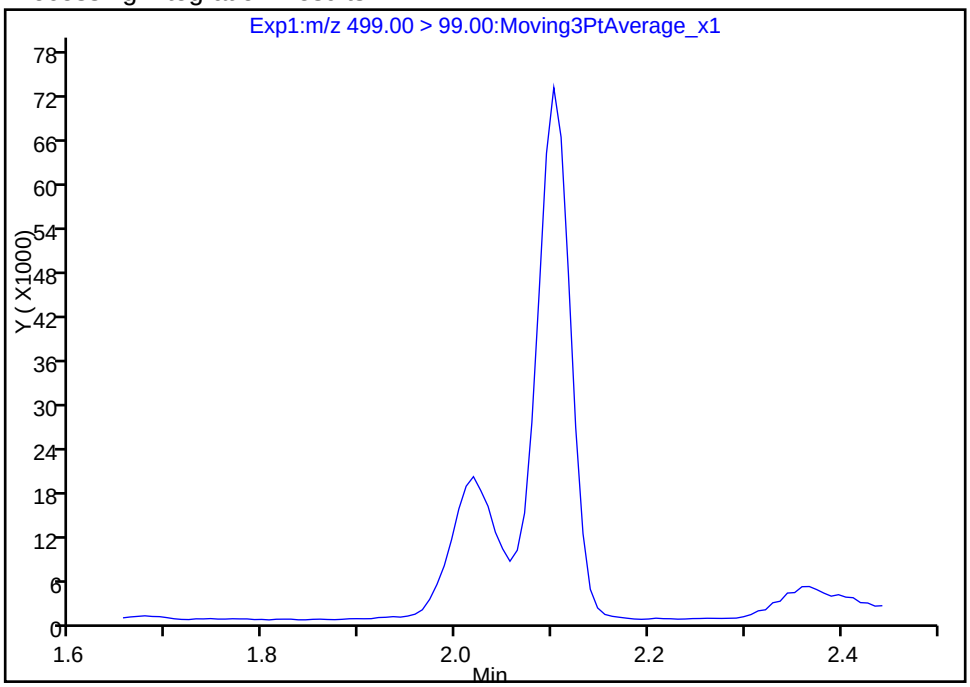
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\2017.10.31_537C_008.d				
Injection Date:	31-Oct-2017 17:49:38	Instrument ID:	A8_N		
Lims ID:	320-32528-A-3-A	Lab Sample ID:	320-32528-3		
Client ID:	WGNA-101817-RW-0569				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	6	Worklist Smp#:	8
Injection 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

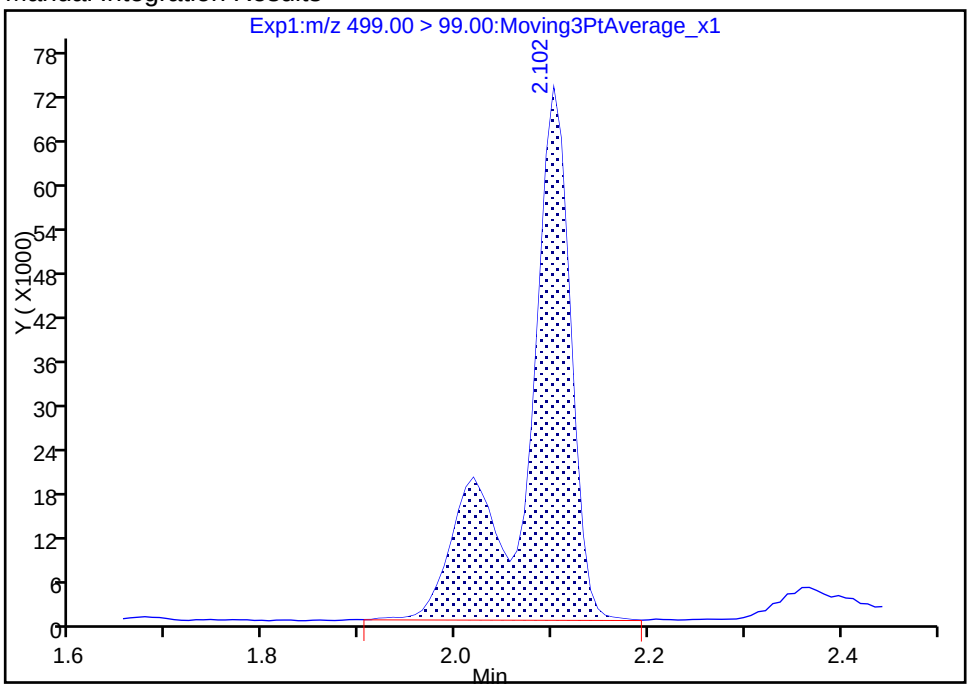
Processing Integration Results

Not Detected
Expected RT: 2.09



Manual Integration Results

RT: 2.10
Area: 242778
Amount: 6.785080
Amount Units: ng/ml



Reviewer: barnettj, 01-Nov-2017 10:57:13
Audit Action: Manually Integrated Audit Reason: Missed Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

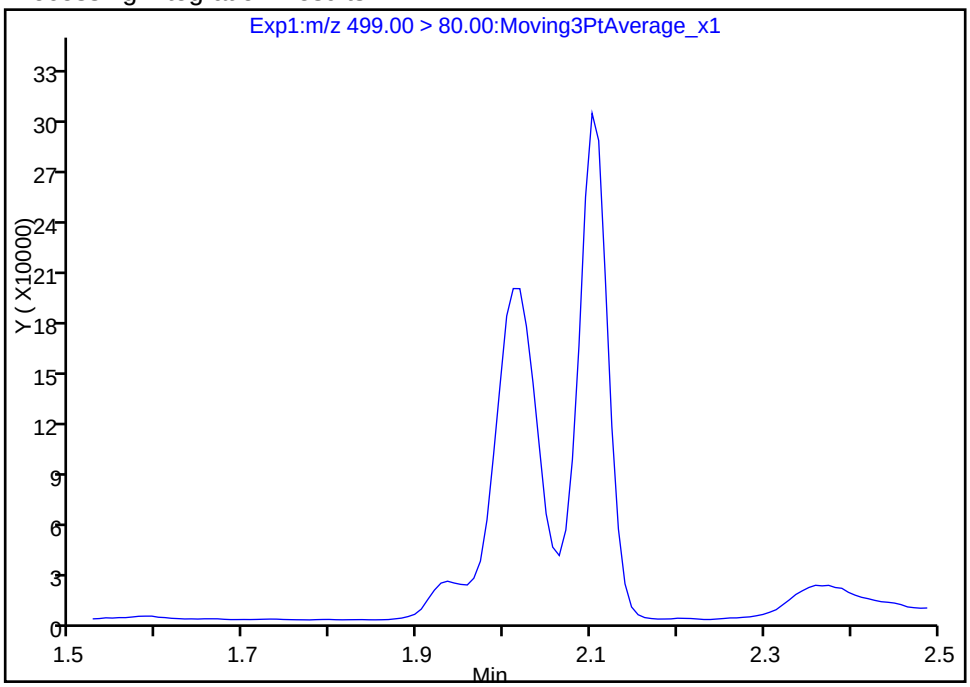
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\2017.10.31_537C_008.d				
Injection Date:	31-Oct-2017 17:49:38	Instrument ID:	A8_N		
Lims ID:	320-32528-A-3-A	Lab Sample ID:	320-32528-3		
Client ID:	WGNA-101817-RW-0569				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	6	Worklist Smp#:	8
Injection 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

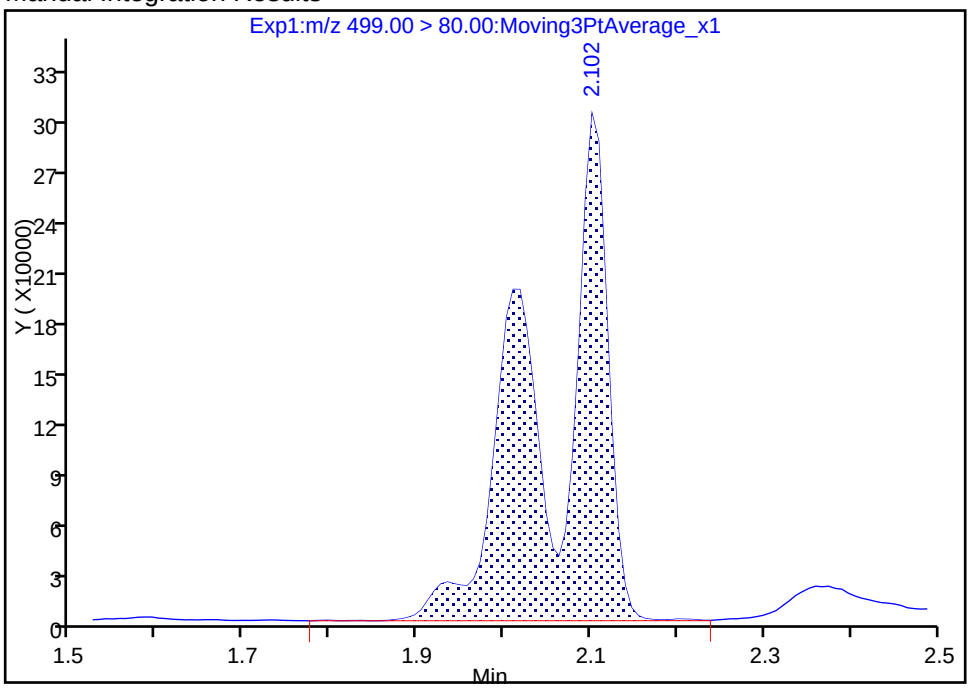
Not Detected
Expected RT: 2.09

Processing Integration Results



Manual Integration Results

RT: 2.10
Area: 1451416
Amount: 6.785080
Amount Units: ng/ml



Reviewer: barnettj, 01-Nov-2017 10:57:13
Audit Action: Manually Integrated Audit Reason: Missed Peak

TestAmerica Sacramento

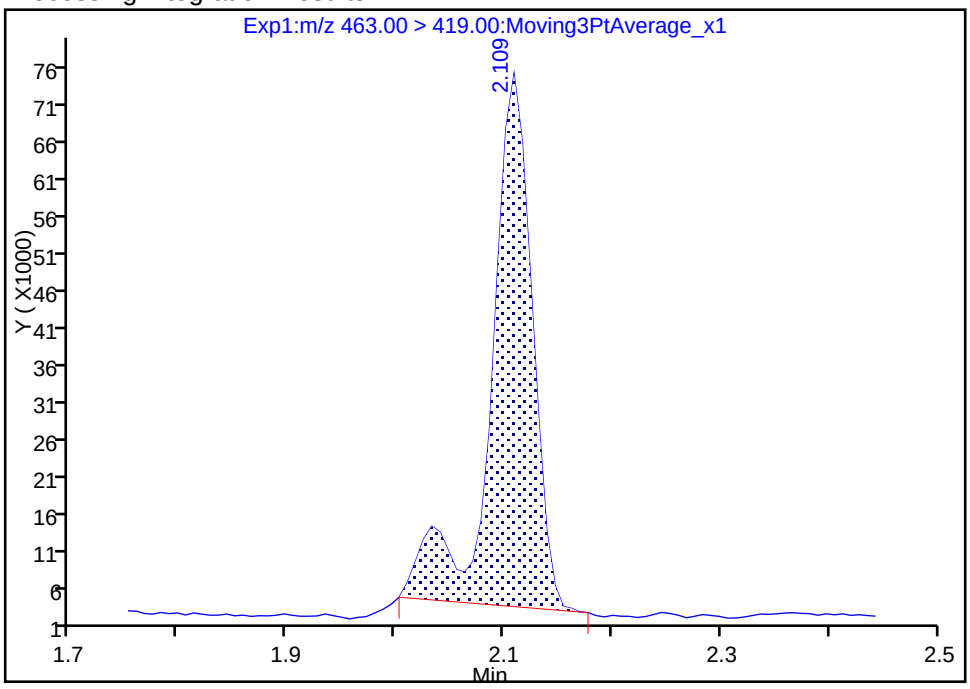
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\2017.10.31_537C_008.d				
Injection Date:	31-Oct-2017 17:49:38	Instrument ID:	A8_N		
Lims ID:	320-32528-A-3-A	Lab Sample ID:	320-32528-3		
Client ID:	WGNA-101817-RW-0569				
Operator ID:	SACINSTLCMS01	ALS Bottle#:	6	Worklist Smp#:	8
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

9 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

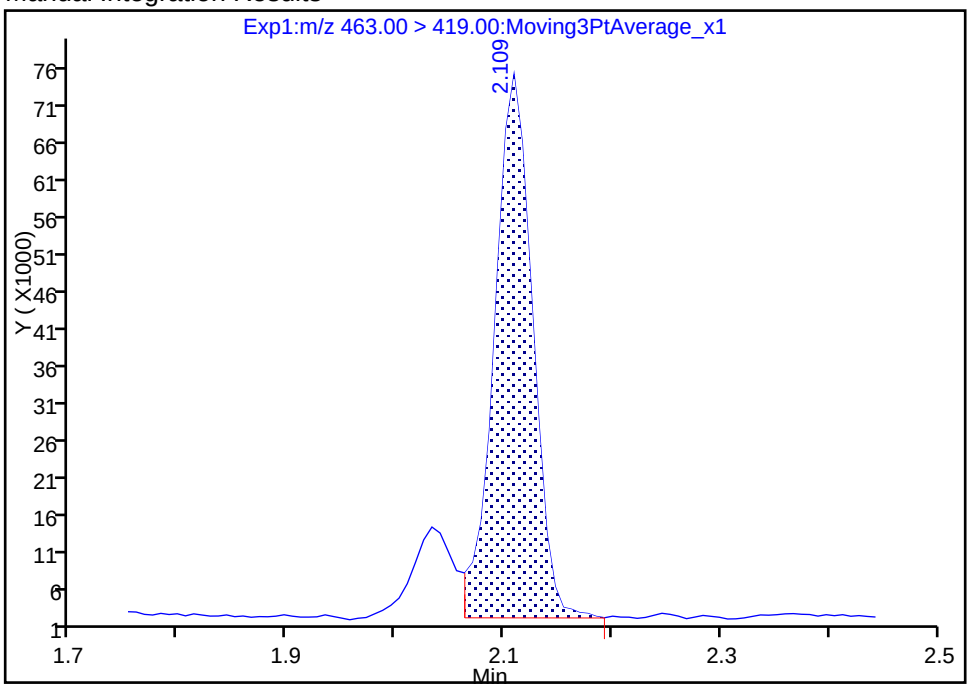
Processing Integration Results

RT: 2.11
Area: 189714
Amount: 0.957198
Amount Units: ng/ml



Manual Integration Results

RT: 2.11
Area: 177046
Amount: 0.893281
Amount Units: ng/ml



Reviewer: barnettj, 01-Nov-2017 10:57:30
Audit Action: Manually Integrated Audit Reason: Split Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-32528-1

SDG No.:

Client Sample ID: WGNA-101817-FRB-0569 | Lab Sample ID: 320-32528-4

Matrix: Water | Lab File ID: 2017.10.31_537C_009.d

Analysis Method: 537 | Date Collected: 10/18/2017 09:05

Extraction Method: 537 | Date Extracted: 10/26/2017 10:34

Sample wt/vol: 284.6(mL) | Date Analyzed: 10/31/2017 17:54

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 192277 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	14	U	35	14	6.0
335-67-1	Perfluorooctanoic acid (PFOA)	7.0	U	18	7.0	2.5
375-95-1	Perfluorononanoic acid (PFNA)	18	U	21	18	7.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	26	11	4.8
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.5	U	8.8	3.5	1.7
375-73-5	Perfluorobutanesulfonic acid (PFBS)	32	U	79	32	14

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	101		70-130
STL00996	13C2 PFDA	105		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\2017.10.31_537C_009.d
Lims ID: 320-32528-A-4-A
Client ID: WGNA-101817-FRB-0569
Sample Type: Client
Inject. Date: 31-Oct-2017 17:54:23 ALS Bottle#: 7 Worklist Smp#: 9
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: 320-32528-a-4-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 01-Nov-2017 10:58:24 Calib Date: 31-Oct-2017 12:08:27
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK027

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
$ 2 13C2 PFHxA									
315.00 > 270.00	1.525	1.528	-0.003	1.000	2947406	10.1		4578	
* 6 13C2-PFOA									
415.00 > 370.00	1.851	1.863	-0.012		2593193	10.0		3416	
* 7 13C4 PFOS									
503.00 > 80.00	2.094	2.107	-0.013		5851132	28.7		3721	
$ 10 13C2 PFDA									
515.00 > 470.00	2.276	2.277	-0.001	1.000	2206179	10.5		6337	

Report Date: 01-Nov-2017 10:58:36 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\2017.10.31_537C_009.d

Injection Date: 31-Oct-2017 17:54:23 Instrument ID: A8_N

Lims ID: 320-32528-A-4-A Lab Sample ID: 320-32528-4

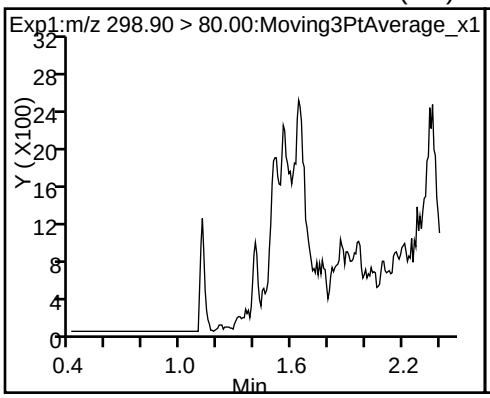
Client ID: WGNA-101817-FRB-0569

Operator ID: SACINSTLCMS01 ALS Bottle#: 7 Worklist Smp#: 9

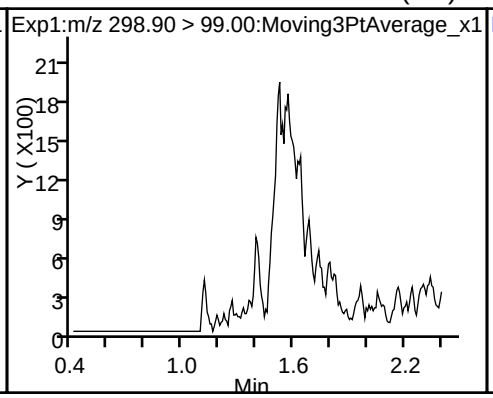
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

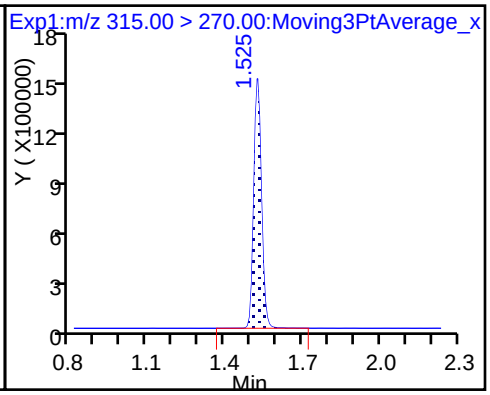
1 Perfluorobutanesulfonic acid (ND)



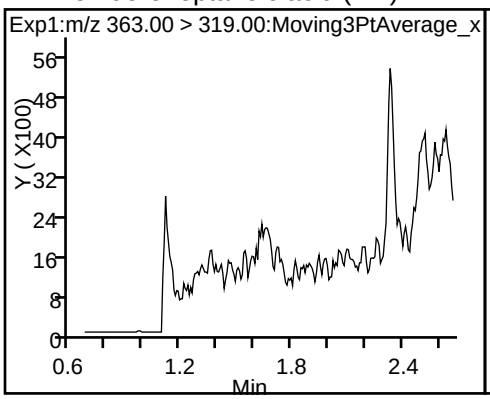
1 Perfluorobutanesulfonic acid (ND)



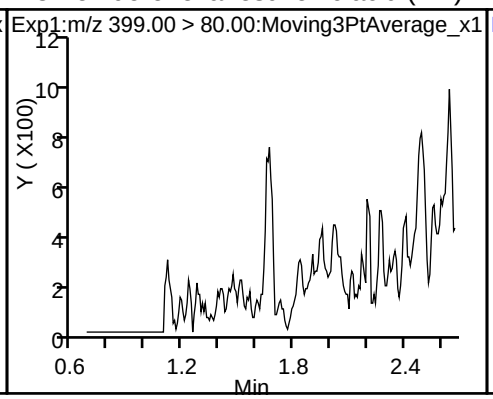
$ 2 13C2 PFHxA

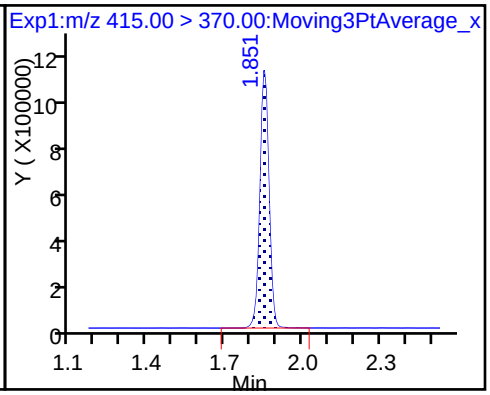


4 Perfluoroheptanoic acid (ND)

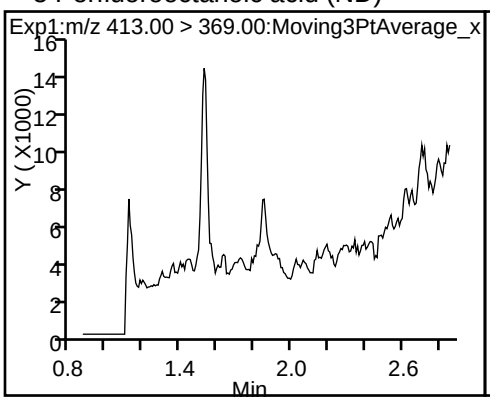


3 Perfluorohexanesulfonic acid (ND) * 6 13C2-PFOA

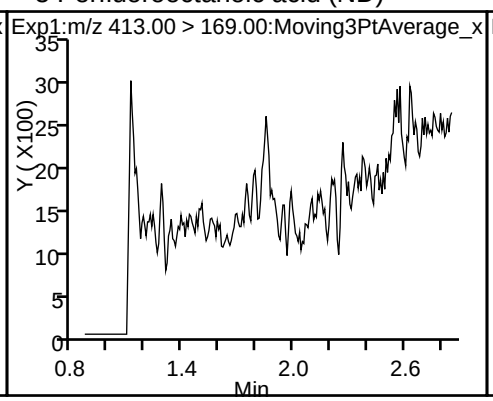




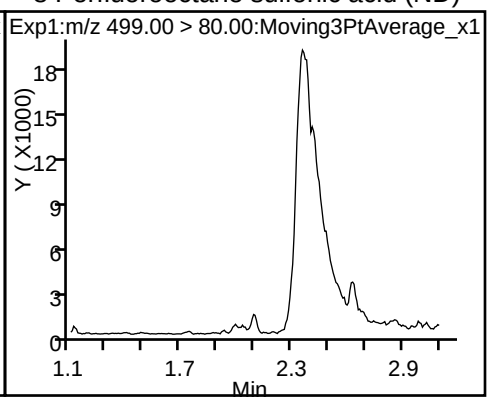
5 Perfluorooctanoic acid (ND)



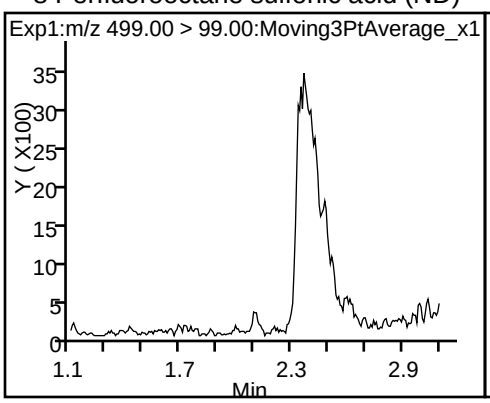
5 Perfluorooctanoic acid (ND)

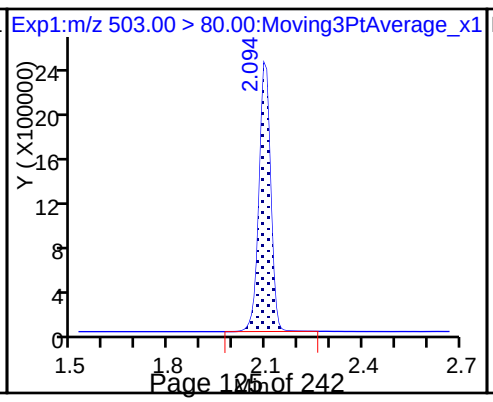


8 Perfluorooctane sulfonic acid (ND)

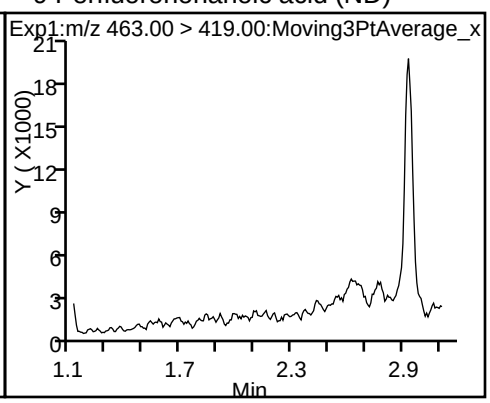


8 Perfluorooctane sulfonic acid (ND) * 7 13C4 PFOS

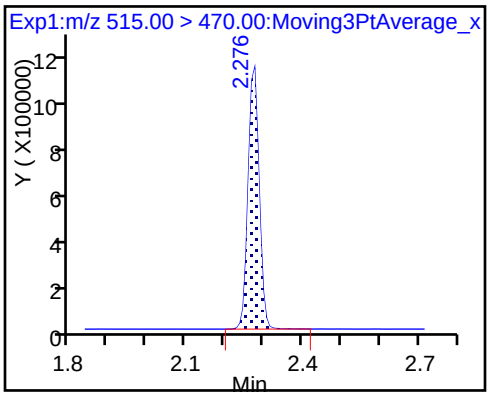




9 Perfluorononanoic acid (ND)



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.276
Y (X100000)
12
10
8
6
4
2
0
1.8
2.1
2.4
2.7
Min

TestAmerica Sacramento
Recovery Report

Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\2017.10.31_537C_009.d				
Lims ID:	320-32528-A-4-A				
Client ID:	WGNA-101817-FRB-0569				
Sample Type:	Client				
Inject. Date:	31-Oct-2017 17:54:23	ALS Bottle#:	7	Worklist Smp#:	9
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Sample Info:	320-32528-a-4-a				
Misc. Info.:	Plate: 1 Rack: 6				
Operator ID:	SACINSTLCMS01	Instrument ID:	A8_N		
Method:	\\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\537_A8_N.m				
Limit Group:	LC 537 ICAL				
Last Update:	01-Nov-2017 10:58:24	Calib Date:	31-Oct-2017 12:08:27		
Integrator:	Picker				
Quant Method:	Internal Standard	Quant By:	Initial Calibration		
Last ICal File:	\\ChromNA\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_009.d				
Column 1 :			Det: EXP1		
Process Host:	XAWRK027				

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	10.1	100.72
$ 10 13C2 PFDA	10.0	10.5	105.11

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

Lab Name: TestAmerica Sacramento Job No.: 320-32528-1 Analy Batch No.: 192162

SDG No.:

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

Calibration Start Date: 10/31/2017 11:44 Calibration End Date: 10/31/2017 12:08 Calibration ID: 35621

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-192162/4	2017.10.31_537ICAL_004.d
Level 2	IC 320-192162/5	2017.10.31_537ICAL_005.d
Level 3	IC 320-192162/6	2017.10.31_537ICAL_006.d
Level 4	IC 320-192162/7	2017.10.31_537ICAL_007.d
Level 5	IC 320-192162/8	2017.10.31_537ICAL_008.d
Level 6	IC 320-192162/9	2017.10.31_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)	1.0555 0.7230	1.1099	1.0105	0.8851	0.8003	QuaF		1.0703	-0.001949						0.9990		0.9600
Perfluoroheptanoic acid (PFHpA)	0.9747 0.9495	0.9317	0.9152	0.9490	0.9245	Ave		0.9408				2.3		30.0			
Perfluorohexanesulfonic acid (PFHxS)	1.6000 1.5277	1.6916	1.7164	1.6515	1.5848	Ave		1.6287				4.4		30.0			
Perfluorooctanoic acid (PFOA)	0.9001 0.9319	0.9648	0.9220	0.9359	0.9258	Ave		0.9301				2.3		30.0			
Perfluorooctanesulfonic acid (PFOS)	0.8822 0.9438	0.9288	0.9148	0.9474	0.9527	Ave		0.9283				2.9		30.0			
Perfluorononanoic acid (PFNA)	0.6310 0.6692	0.6490	0.6407	0.6829	0.6432	Ave		0.6527				3.0		30.0			
13C2 PFHxA	1.1162 1.1576	1.0680	1.0953	1.1948	1.1392	Ave		1.1285				4.0		30.0			
13C2 PFDA	0.7945 0.8580	0.7675	0.7780	0.8355	0.8229	Ave		0.8094				4.3		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.: 320-32528-1 Analy Batch No.: 192162

SDG No.:

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

Calibration Start Date: 10/31/2017 11:44 Calibration End Date: 10/31/2017 12:08 Calibration ID: 35621

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-192162/4	2017.10.31_537ICAL_004.d
Level 2	IC 320-192162/5	2017.10.31_537ICAL_005.d
Level 3	IC 320-192162/6	2017.10.31_537ICAL_006.d
Level 4	IC 320-192162/7	2017.10.31_537ICAL_007.d
Level 5	IC 320-192162/8	2017.10.31_537ICAL_008.d
Level 6	IC 320-192162/9	2017.10.31_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	2055386 27165476	4905442	9915456	16876130	21956734	9.00 180	20.0	45.0	90.0	135
Perfluoroheptanoic acid (PFHpA)	13PFOA	Ave	275477 5107421	614703	1311091	2526779	3670615	1.00 20.0	2.22	5.00	10.0	15.0
Perfluorohexanesulfonic acid (PFHxS)	PFOS	Ave	1038660 19137035	2492517	5615014	10497872	14494918	3.00 60.0	6.67	15.0	30.0	45.0
Perfluorooctanoic acid (PFOA)	13PFOA	Ave	509095 10031020	1273846	2643153	4986613	7356038	2.00 40.0	4.45	10.0	20.0	30.0
Perfluorooctanesulfonic acid (PFOS)	PFOS	Ave	763610 15763683	1824729	3990091	8030345	11617530	4.00 80.0	8.89	20.0	40.0	60.0
Perfluorononanoic acid (PFNA)	13PFOA	Ave	356641 7198655	856305	1835636	3636277	5107150	2.00 40.0	4.45	10.0	20.0	30.0
13C2 PFHxA	13PFOA	Ave	3153457 3112456	3170056	3137333	3180555	3014571	10.0 10.0	10.0	10.0	10.0	10.0
13C2 PFDA	13PFOA	Ave	2244762 2306925	2277991	2228390	2223928	2177702	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.: 320-32528-1 Analy Batch No.: 192162

SDG No.:

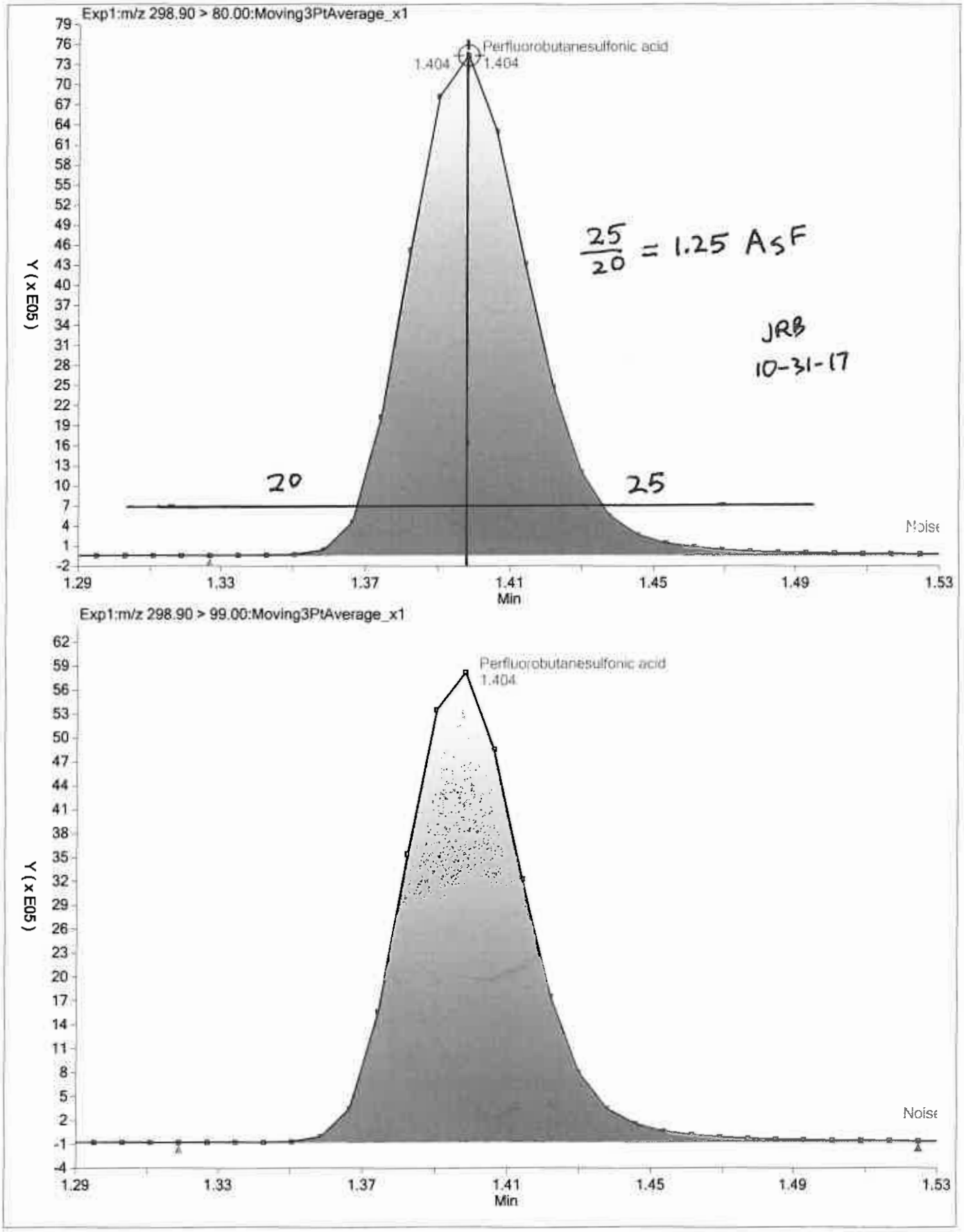
Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 10/31/2017 11:44 Calibration End Date: 10/31/2017 12:08 Calibration ID: 35621

Calibration Files:

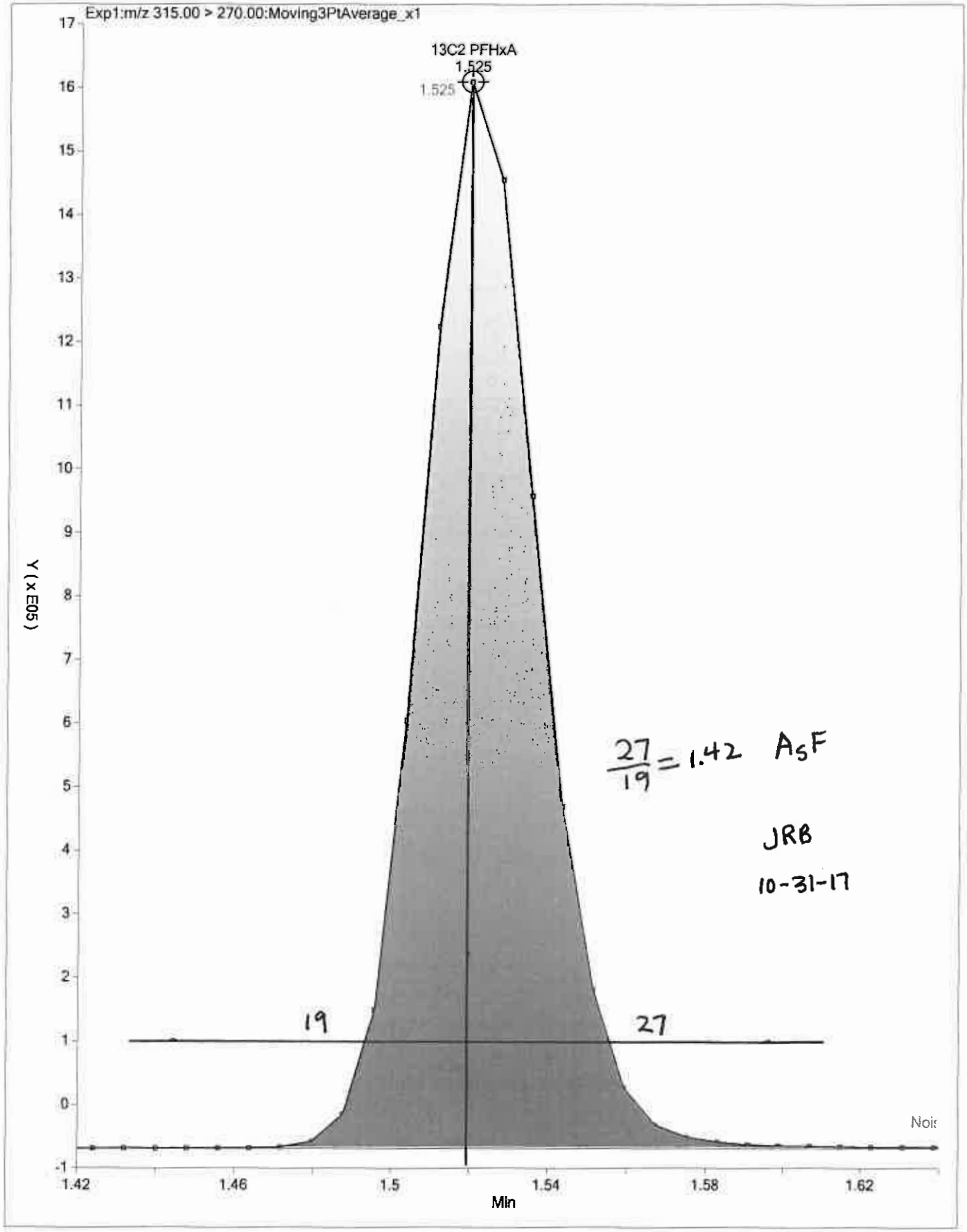
LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-192162/4	2017.10.31_537ICAL_004.d
Level 2	IC 320-192162/5	2017.10.31_537ICAL_005.d
Level 3	IC 320-192162/6	2017.10.31_537ICAL_006.d
Level 4	IC 320-192162/7	2017.10.31_537ICAL_007.d
Level 5	IC 320-192162/8	2017.10.31_537ICAL_008.d
Level 6	IC 320-192162/9	2017.10.31_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)	0.3	7.9	3.1	-1.4	-1.2	1.0	50	30	30	30	30	30
Perfluoroheptanoic acid (PFHpA)	3.6	-1.0	-2.7	0.9	-1.7	0.9	50	30	30	30	30	30
Perfluorohexanesulfonic acid (PFHxS)	-1.8	3.9	5.4	1.4	-2.7	-6.2	50	30	30	30	30	30
Perfluorooctanoic acid (PFOA)	-3.2	3.7	-0.9	0.6	-0.5	0.2	50	30	30	30	30	30
Perfluorooctanesulfonic acid (PFOS)	-5.0	0.1	-1.5	2.1	2.6	1.7	50	30	30	30	30	30
Perfluorononanoic acid (PFNA)	-3.3	-0.6	-1.8	4.6	-1.5	2.5	50	30	30	30	30	30
13C2 PFHxA	-1.1	-5.4	-2.9	5.9	0.9	2.6	30	30	30	30	30	30
13C2 PFDA	-1.8	-5.2	-3.9	3.2	1.7	6.0	30	30	30	30	30	30



$\frac{25}{20} = 1.25$ AsF

JRB
10-31-17


Exp1:m/z 315.00 > 270.00:Moving3PtAverage_x1
13C2 PFHxA
1.525
1.525
Y (x E05)
Min
1.42
1.46
1.5
1.54
1.58
1.62
19
27
27/19 = 1.42 AsF
JRB
10-31-17

TestAmerica Laboratories
Istd/Surrogate Recovery Report

Worklist Name: 31OCT2017_537_ICAL Worklist Num: 49808
Instrument: A8_N Method: 537_A8_N
Batch Directory: \\ChromNa\Sacramento\ChromData\A8_N\20171031-49808.b
Limit Group: LC 537 ICAL
Analysis Type: SemiVOA
Inj Volume: 2.00 Inj Vol Units: ul

Lims Batch: 192162
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			2075481 1.85	5478893 2.10
# 1 RB 31-Oct-2017 11:30:30			1.88 2827290 136.2	2.12 6263224 114.3
# 2 RB 31-Oct-2017 11:35:15			1.87 2445339 117.8	2.11 5641209 103.0
# 3 RB 31-Oct-2017 11:39:58			1.87 2657492 128.0	2.12 5954650 108.7
IS Std				
# 4 IC L1 31-Oct-2017 11:44:43	1.53 98.91	2.28 98.17	1.86 2825241> 100.0*	2.10 6203989> 100.0*
# 5 IC L2 31-Oct-2017 11:49:28	1.53 94.64	2.28 94.82	1.87 2968175> 105.1*	2.11 6337478> 102.2*
# 6 IC L3 31-Oct-2017 11:54:13	1.53 97.06	2.28 96.12	1.87 2864400> 101.4*	2.11 6253426> 100.8*
# 7 IC L4 31-Oct-2017 11:58:57	1.53 105.90	2.28 103.20	1.86 2661913> 94.2*	2.11 6075693> 97.9*
# 8 IC L5 31-Oct-2017 12:03:42	1.53 100.90	2.28 101.70	1.86 2646287> 93.7*	2.10 5827765> 93.9*
# 9 IC L6 31-Oct-2017 12:08:27	1.53 102.60	2.28 106.00	1.87 2688817> 95.2*	2.11 5986294> 96.5*

13C2-PFOA

$$RPD = \frac{2968175 - 2646287}{\left(\frac{2968175 + 2646287}{2}\right)} (100) = 11.5$$

13C4-PFOS

$$RPD = \frac{6337478 - 5827765}{\left(\frac{6337478 + 5827765}{2}\right)} (100) = 8.4$$

JRB
10-31-17

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_004.d
Lims ID: IC L1
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 31-Oct-2017 11:44:43 ALS Bottle#: 1 Worklist Smp#: 4
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\20171031-49808.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 31-Oct-2017 15:26:02 Calib Date: 31-Oct-2017 12:08:27
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK004

First Level Reviewer: phomsophat Date: 31-Oct-2017 13:17:51

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.404	1.405	-0.001	1.000	2055386	9.03		938	
298.90 > 99.00	1.404	1.405	-0.001	1.000	1477718		1.39(0.00-0.00)	1790	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.525	1.528	-0.003	1.000	3153457	9.89		3952	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.677	1.677	0.0	1.000	275477	1.04		57.1	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.677	1.678	-0.001	1.000	1038660	2.95		1502	
* 6 13C2-PFOA									
415.00 > 370.00	1.859	1.863	-0.004		2825241	10.0		2716	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.866	1.864	0.002	1.000	509095	1.94		15.6	
413.00 > 169.00	1.859	1.864	-0.005	0.996	289513		1.76(0.00-0.00)	17.1	
* 7 13C4 PFOS									
503.00 > 80.00	2.102	2.107	-0.005		6203989	28.7		4696	
8 Perfluorooctane sulfonic acid									M
499.00 > 80.00	2.109	2.109	0.0	1.000	763610	3.80		116	M
499.00 > 99.00	2.102	2.109	-0.007	0.996	158418		4.82(0.00-0.00)	135	M
9 Perfluorononanoic acid									
463.00 > 419.00	2.117	2.116	0.001	1.000	356641	1.93		83.2	
$ 10 13C2 PFDA									
515.00 > 470.00	2.276	2.277	-0.001	1.000	2244762	9.82		5730	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L1_00020 Amount Added: 1.00 Units: mL

Report Date: 31-Oct-2017 15:26:02 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_004.d

Injection Date: 31-Oct-2017 11:44:43 Instrument ID: A8_N

Lims ID: IC L1

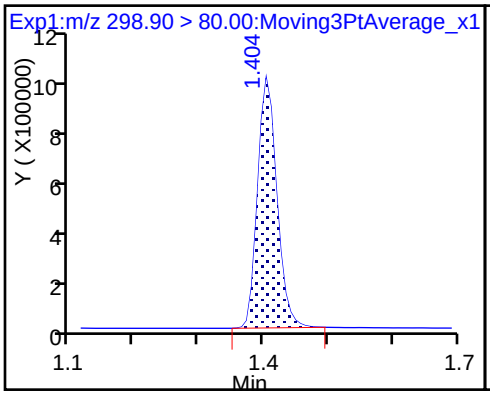
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 1 Worklist Smp#: 4

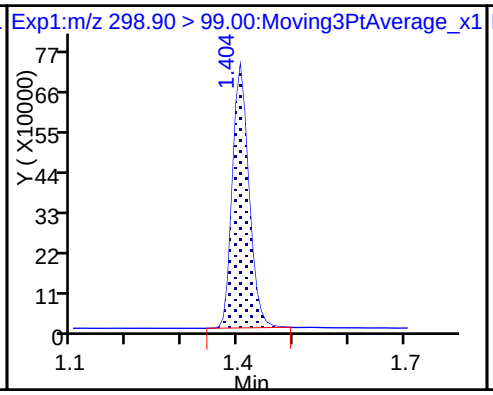
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

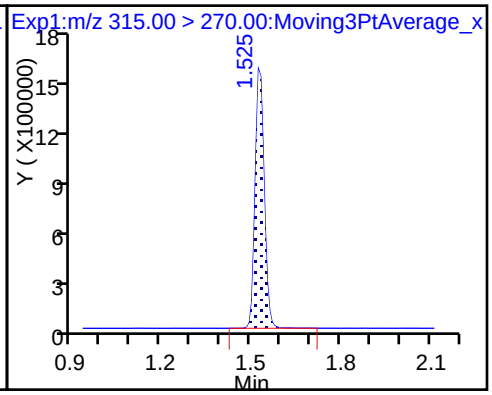
1 Perfluorobutanesulfonic acid



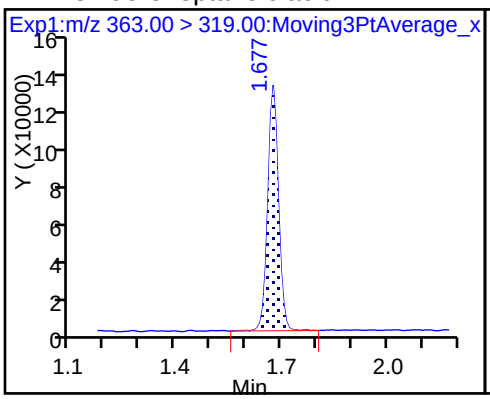
1 Perfluorobutanesulfonic acid



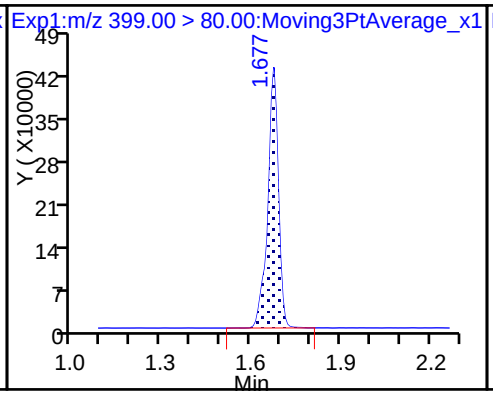
$ 2 13C2 PFHxA



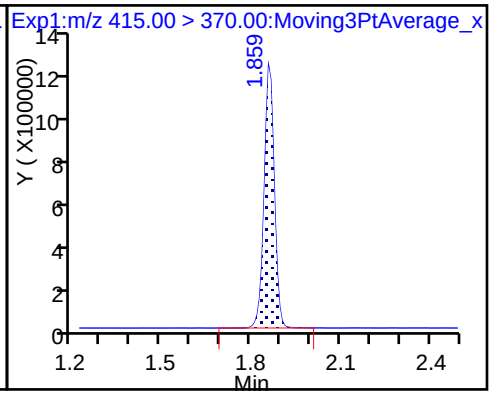
4 Perfluoroheptanoic acid



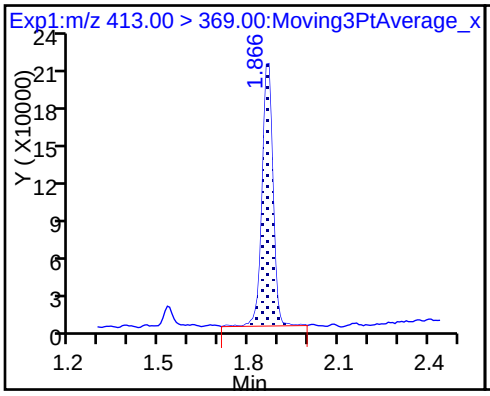
3 Perfluorohexanesulfonic acid



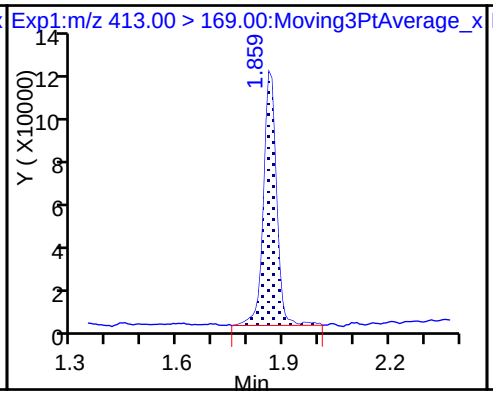
* 6 13C2-PFOA



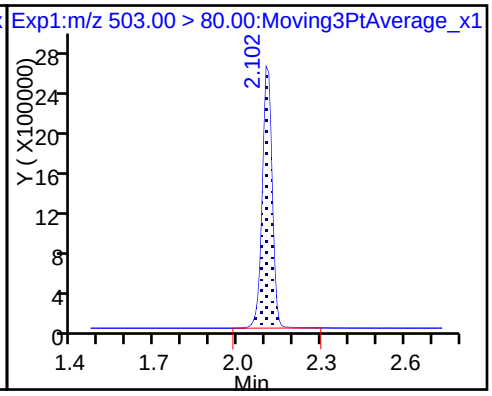
5 Perfluorooctanoic acid



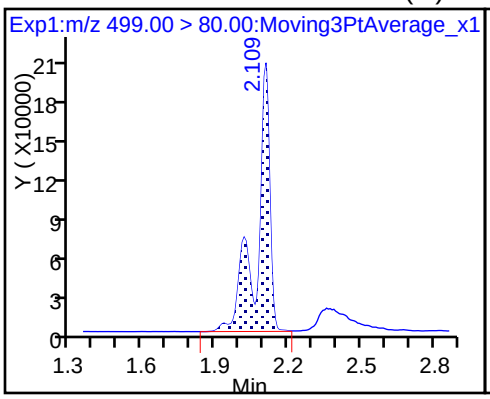
5 Perfluorooctanoic acid



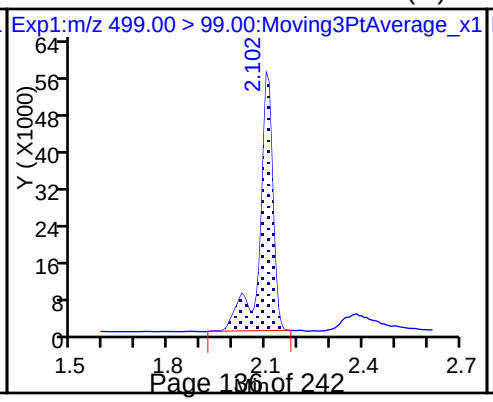
* 7 13C4 PFOS



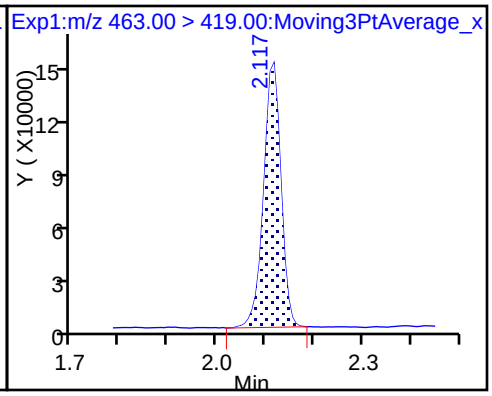
8 Perfluorooctane sulfonic acid (M)



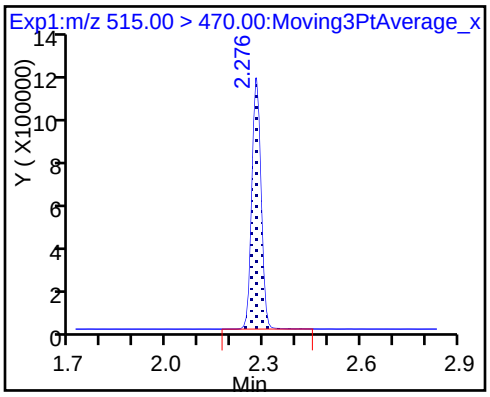
8 Perfluorooctane sulfonic acid (M)



9 Perfluorononanoic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.276
Y (X100000)
14
12
10
8
6
4
2
0
1.7
2.0
2.3
2.6
2.9
Min

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

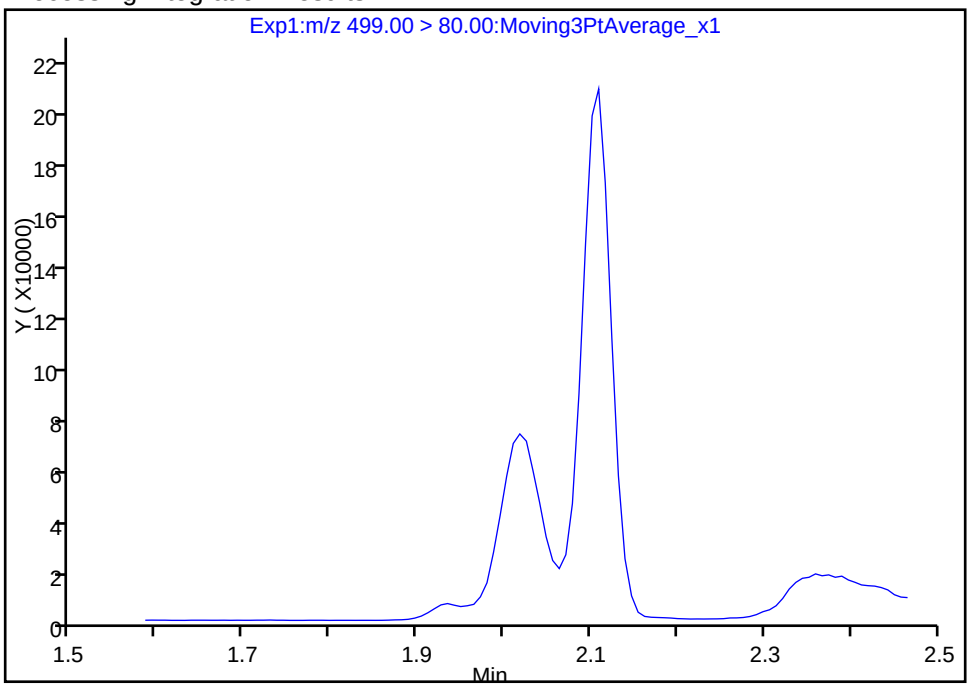
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_004.d
Injection Date: 31-Oct-2017 11:44:43 Instrument ID: A8_N
Lims ID: IC L1
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 1 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

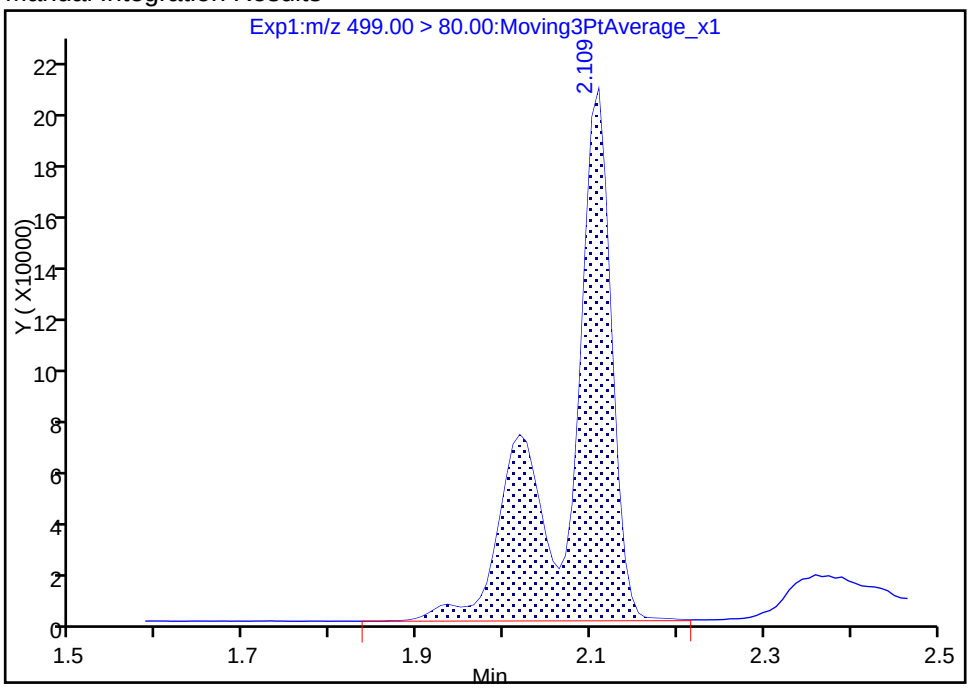
Not Detected
Expected RT: 2.11

Processing Integration Results



Manual Integration Results

RT: 2.11
Area: 763610
Amount: 3.802819
Amount Units: ng/ml



Reviewer: phomsophat, 31-Oct-2017 12:19:42
Audit Action: Assigned Compound ID Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

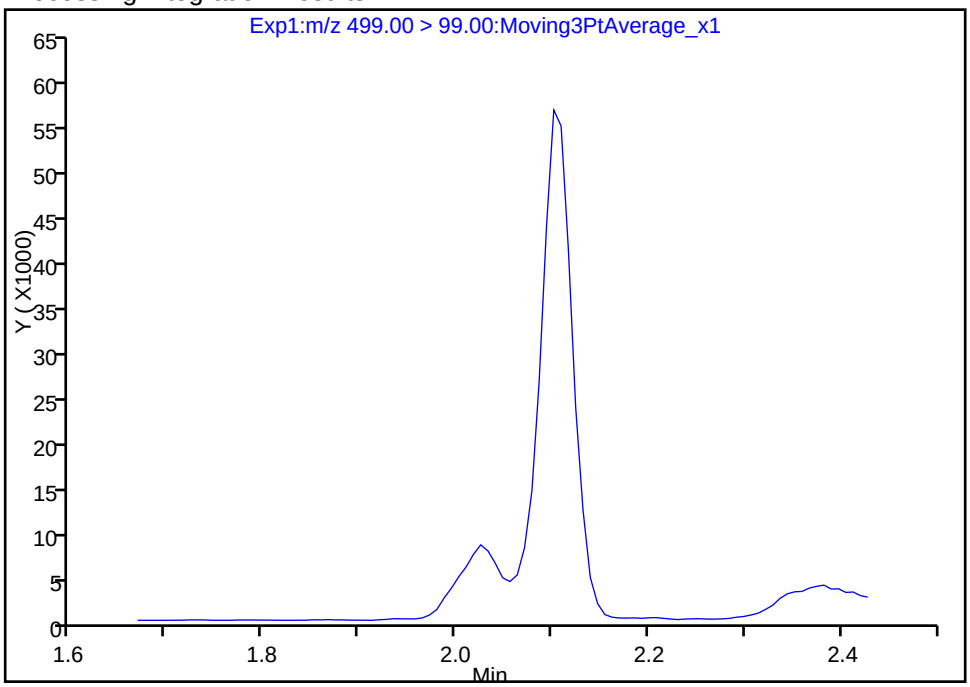
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_004.d
Injection Date: 31-Oct-2017 11:44:43 Instrument ID: A8_N
Lims ID: IC L1
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 1 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

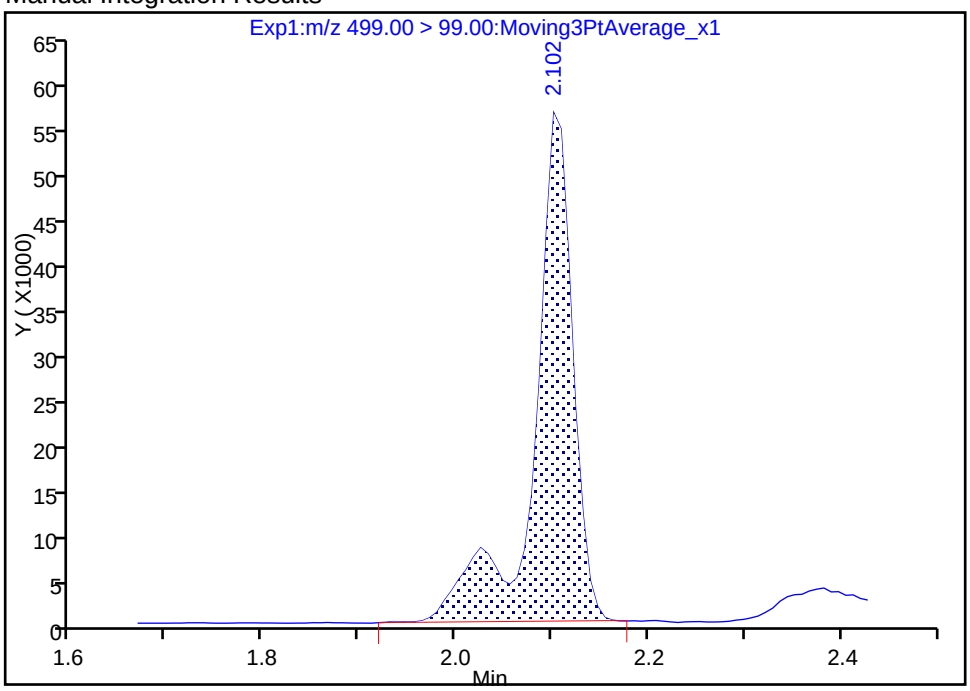
Processing Integration Results

Not Detected
Expected RT: 2.11



Manual Integration Results

RT: 2.10
Area: 158418
Amount: 3.802819
Amount Units: ng/ml



Reviewer: phomsophat, 31-Oct-2017 12:20:04
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

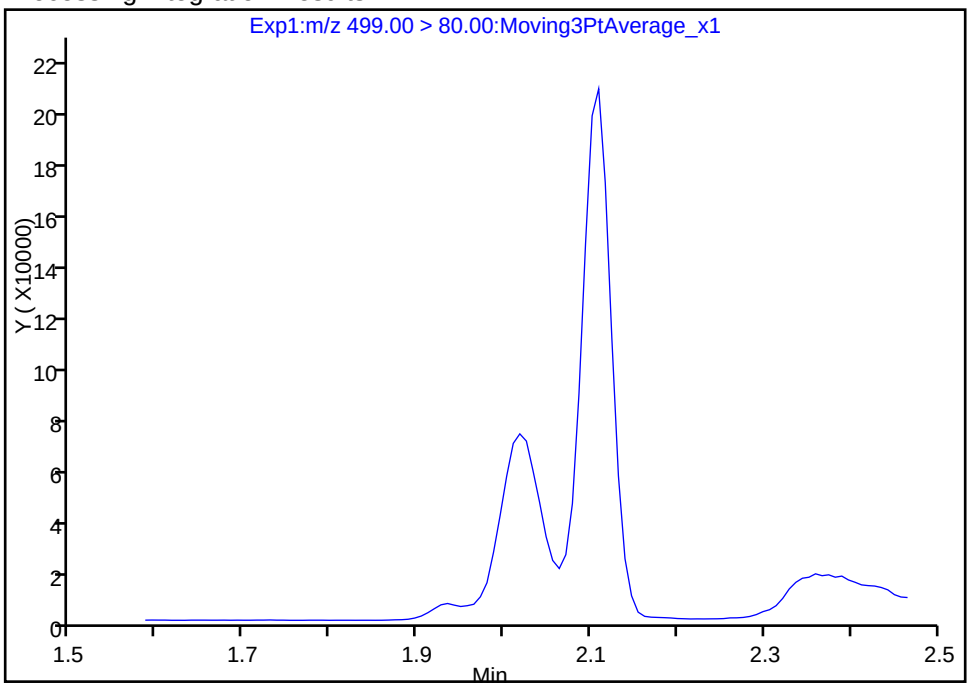
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_004.d
Injection Date: 31-Oct-2017 11:44:43 Instrument ID: A8_N
Lims ID: IC L1
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 1 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

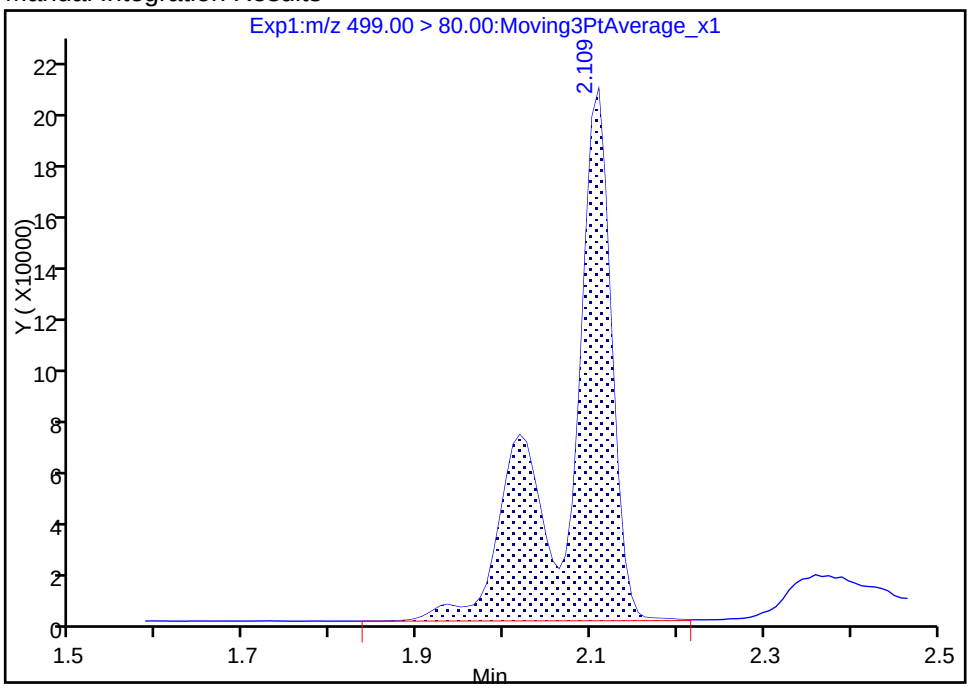
Not Detected
Expected RT: 2.11

Processing Integration Results



Manual Integration Results

RT: 2.11
Area: 763610
Amount: 3.802819
Amount Units: ng/ml



Reviewer: phomsophat, 31-Oct-2017 12:20:04
Audit Action: Manually Integrated Audit Reason: Assign Peak

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_005.d
Lims ID: IC L2
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 31-Oct-2017 11:49:28 ALS Bottle#: 2 Worklist Smp#: 5
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\20171031-49808.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 31-Oct-2017 15:26:03 Calib Date: 31-Oct-2017 12:08:27
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK004

First Level Reviewer: phomsophat Date: 31-Oct-2017 13:18:33

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.404	1.405	-0.001	1.000	4905442	21.6		1994	
298.90 > 99.00	1.404	1.405	-0.001	1.000	3389563		1.45(0.00-0.00)	3096	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.525	1.528	-0.003	1.000	3170056	9.46		3619	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.677	1.677	0.0	1.000	614703	2.20		120	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.677	1.678	-0.001	1.000	2492517	6.93		2875	
* 6 13C2-PFOA									
415.00 > 370.00	1.866	1.863	0.003		2968175	10.0		2970	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.866	1.864	0.002	1.000	1273846	4.61		38.8	
413.00 > 169.00	1.866	1.864	0.002	1.000	684504		1.86(0.00-0.00)	40.5	
* 7 13C4 PFOS									
503.00 > 80.00	2.109	2.107	0.002		6337478	28.7		4510	
8 Perfluorooctane sulfonic acid									M
499.00 > 80.00	2.109	2.109	0.0	1.000	1824729	8.90		289	M
499.00 > 99.00	2.109	2.109	0.0	1.000	388629		4.70(0.00-0.00)	336	M
9 Perfluorononanoic acid									
463.00 > 419.00	2.117	2.116	0.001	1.000	856305	4.42		193	
$ 10 13C2 PFDA									
515.00 > 470.00	2.276	2.277	-0.001	1.000	2277991	9.48		5288	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L2_00020 Amount Added: 1.00 Units: mL

Report Date: 31-Oct-2017 15:26:03 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_005.d

Injection Date: 31-Oct-2017 11:49:28 Instrument ID: A8_N

Lims ID: IC L2

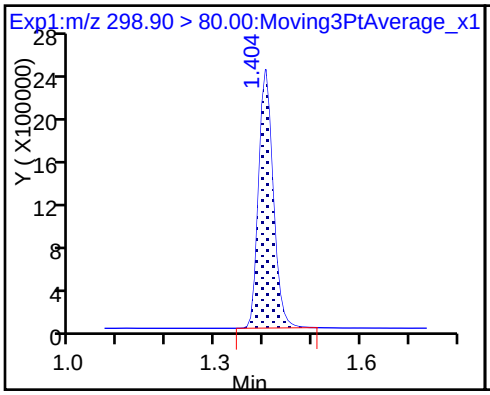
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 5

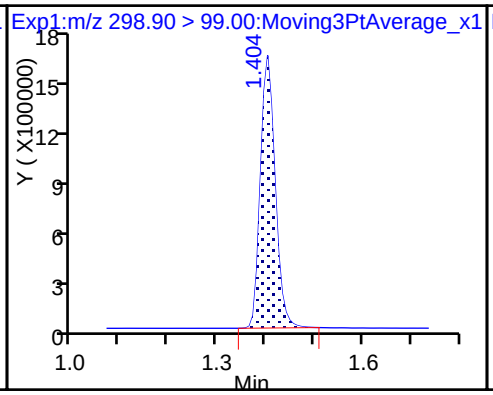
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

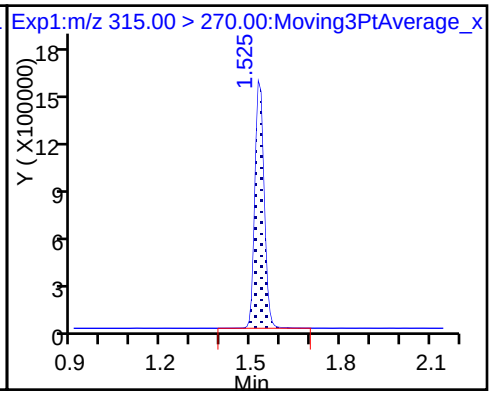
1 Perfluorobutanesulfonic acid



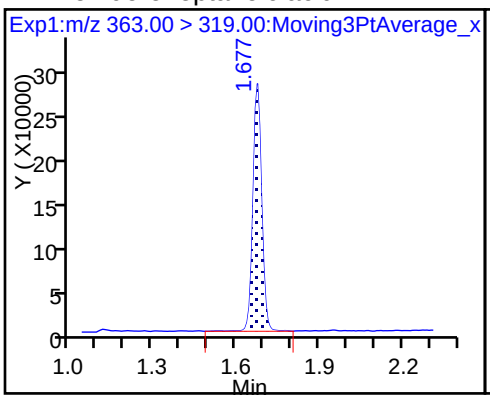
1 Perfluorobutanesulfonic acid



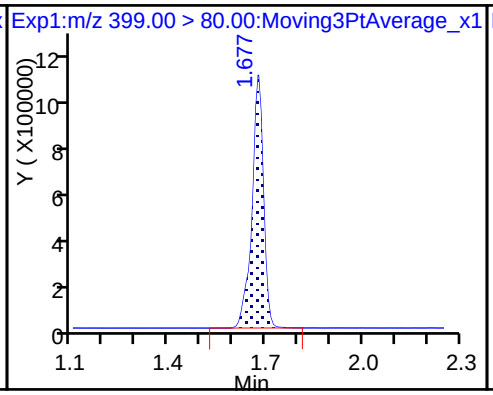
$ 2 13C2 PFHxA



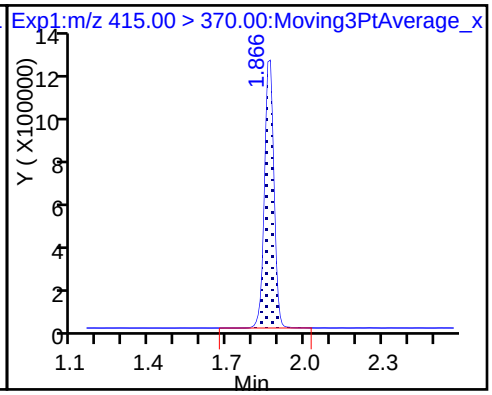
4 Perfluoroheptanoic acid



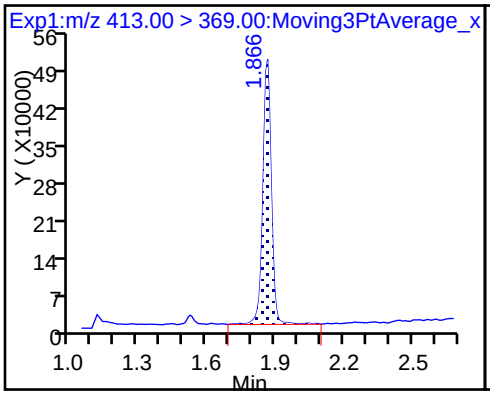
3 Perfluorohexanesulfonic acid



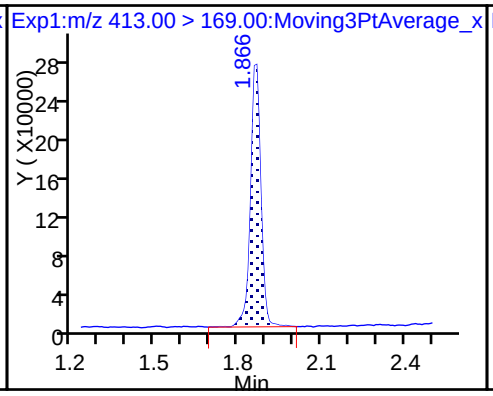
* 6 13C2-PFOA



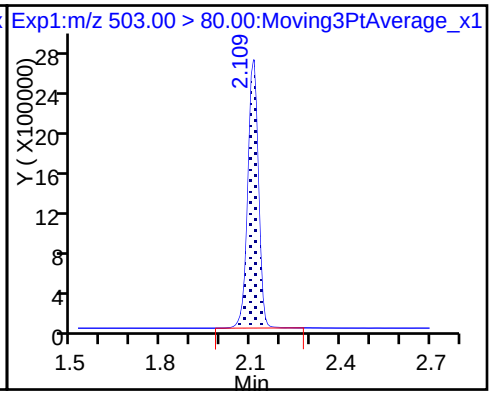
5 Perfluorooctanoic acid



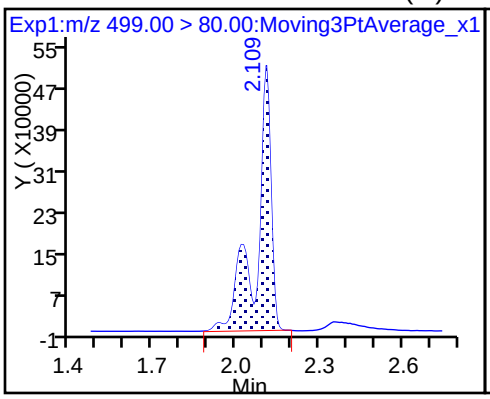
5 Perfluorooctanoic acid



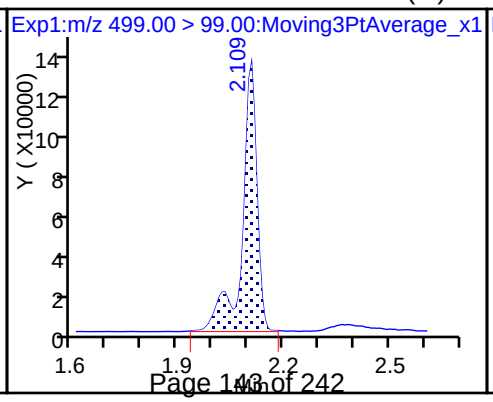
* 7 13C4 PFOS



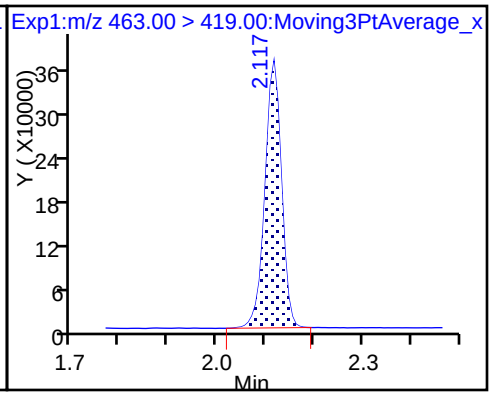
8 Perfluorooctane sulfonic acid (M)



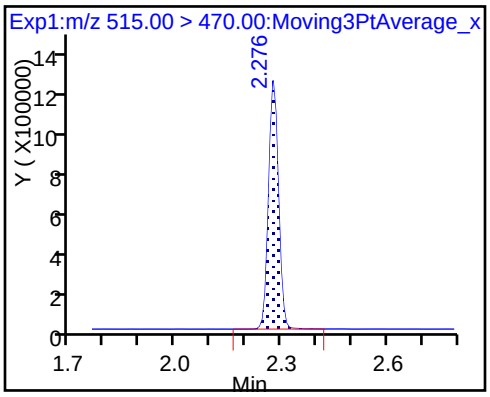
8 Perfluorooctane sulfonic acid (M)



9 Perfluorononanoic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.276
Y (X100000)
14
12
10
8
6
4
2
0
1.7
2.0
2.3
2.6
Min

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

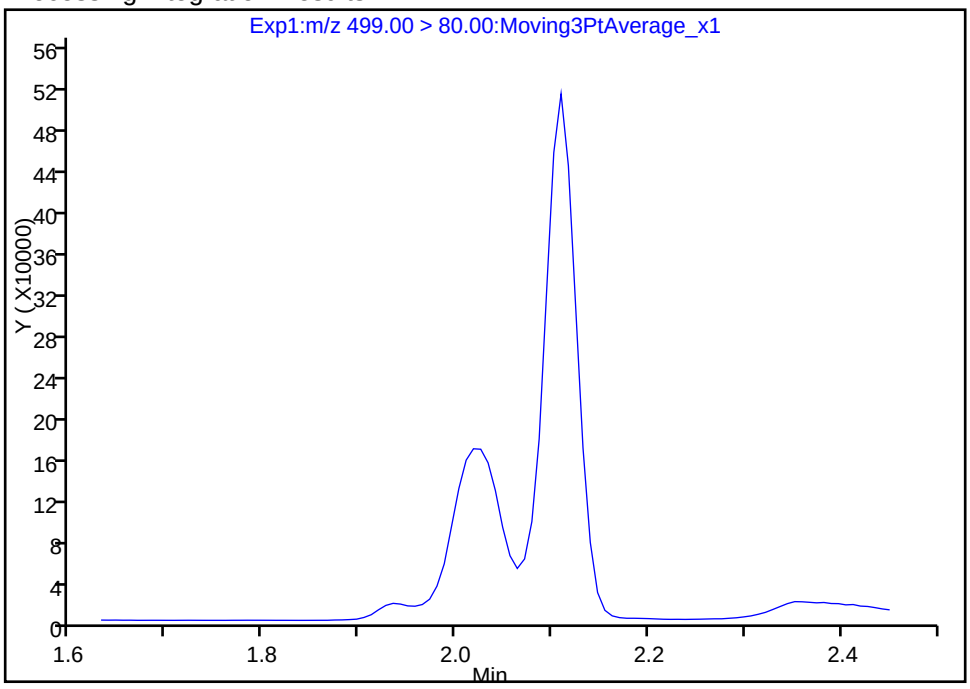
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_005.d
Injection Date: 31-Oct-2017 11:49:28 Instrument ID: A8_N
Lims ID: IC L2
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

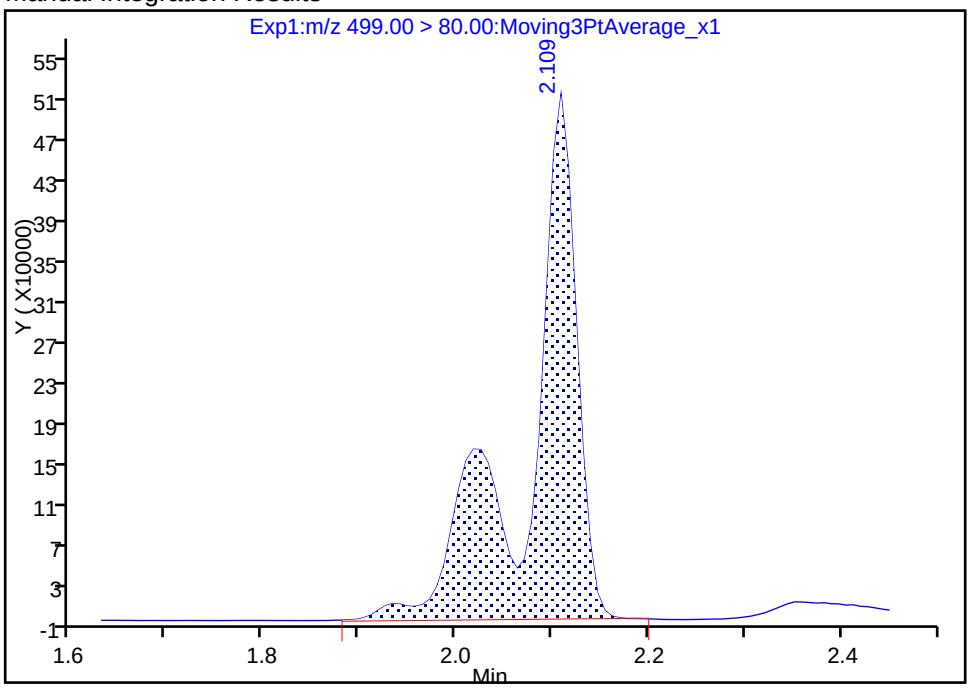
Not Detected
Expected RT: 2.11

Processing Integration Results



Manual Integration Results

RT: 2.11
Area: 1824729
Amount: 8.895840
Amount Units: ng/ml



Reviewer: phomsophat, 31-Oct-2017 13:18:03
Audit Action: Assigned Compound ID Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

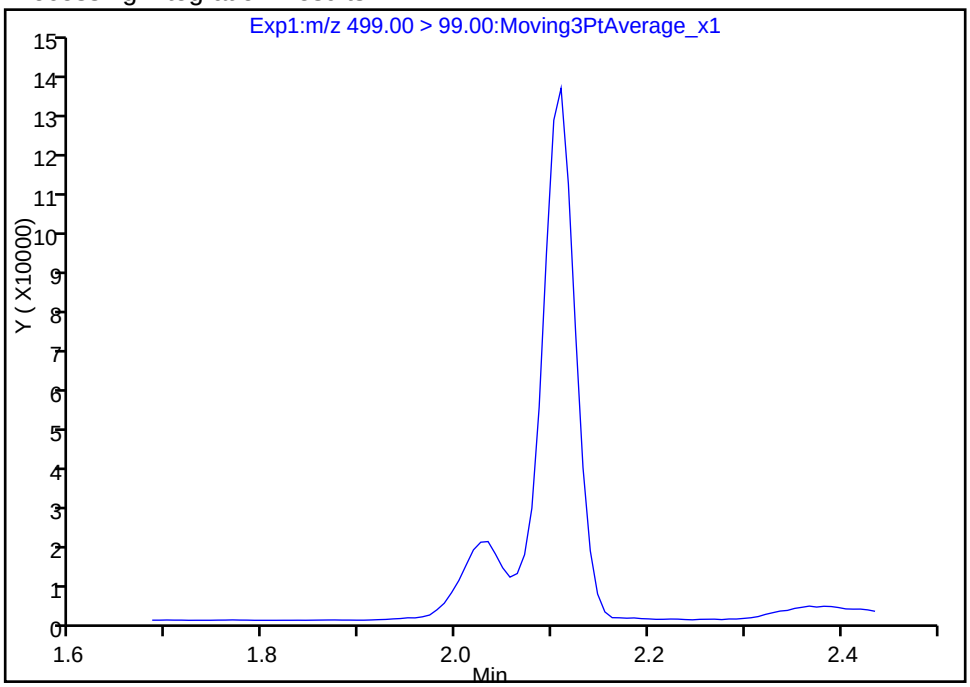
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_005.d
Injection Date: 31-Oct-2017 11:49:28 Instrument ID: A8_N
Lims ID: IC L2
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

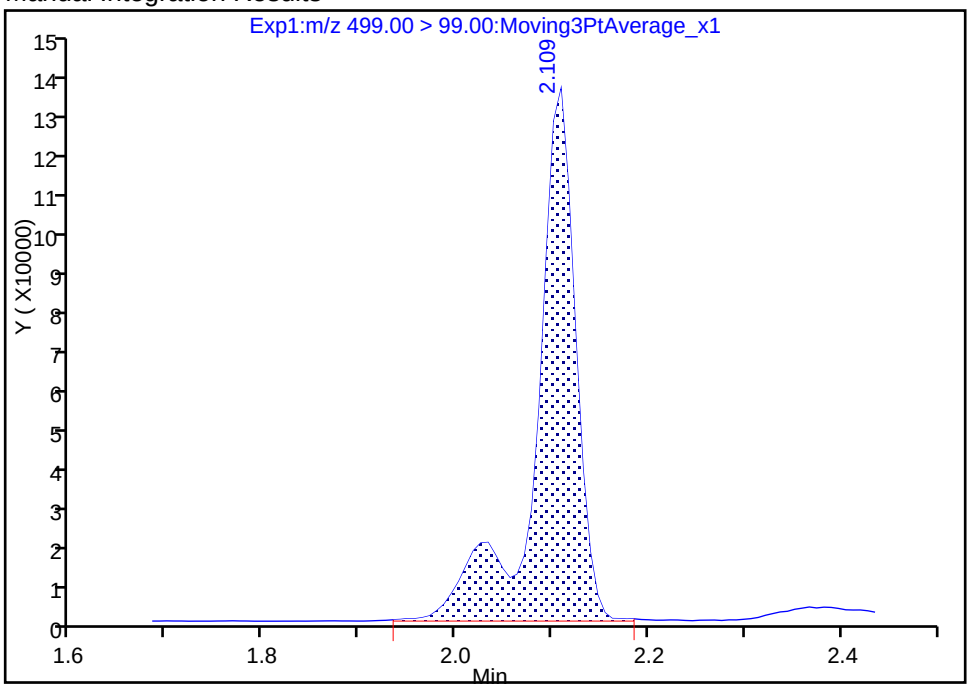
Not Detected
Expected RT: 2.11

Processing Integration Results



Manual Integration Results

RT: 2.11
Area: 388629
Amount: 8.895840
Amount Units: ng/ml



Reviewer: phomsophat, 31-Oct-2017 13:18:07
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

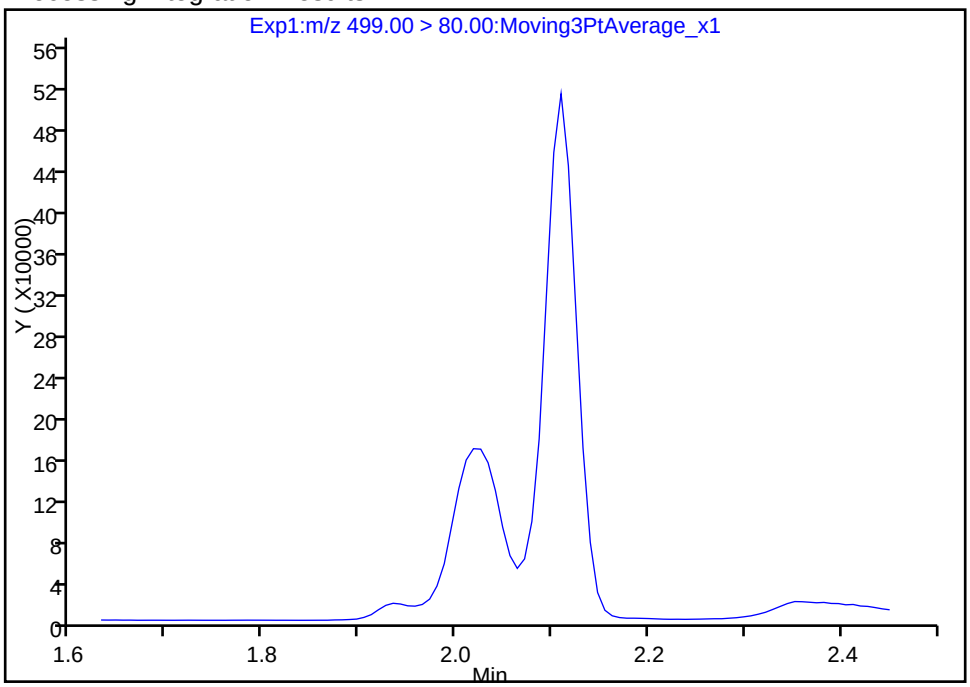
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_005.d
Injection Date: 31-Oct-2017 11:49:28 Instrument ID: A8_N
Lims ID: IC L2
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

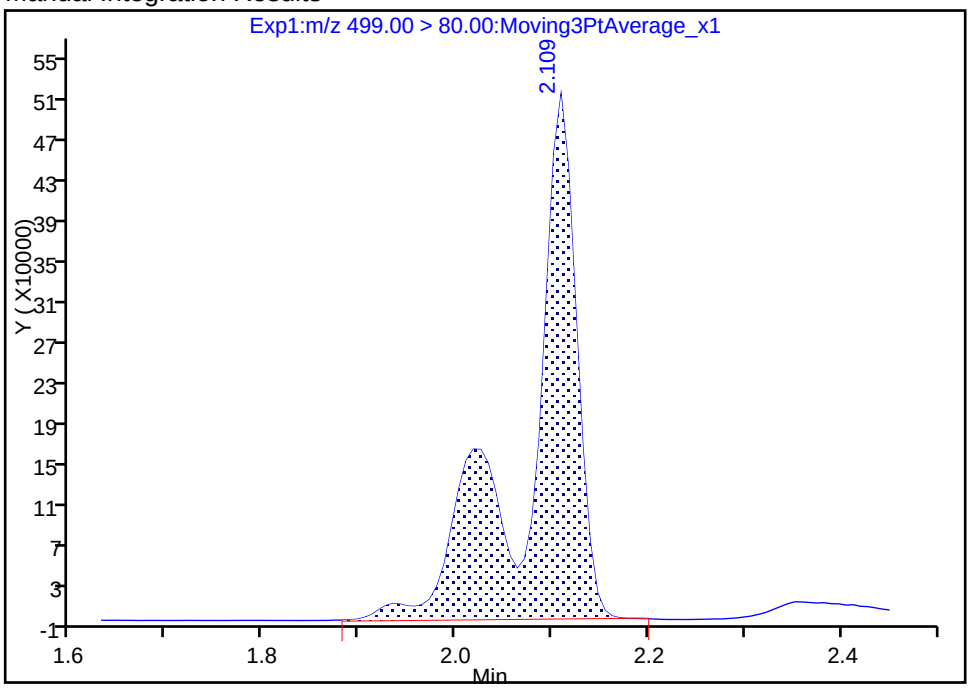
Not Detected
Expected RT: 2.11

Processing Integration Results



Manual Integration Results

RT: 2.11
Area: 1824729
Amount: 8.895840
Amount Units: ng/ml



Reviewer: phomsophat, 31-Oct-2017 13:18:15
Audit Action: Manually Integrated Audit Reason: Assign Peak

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_006.d
Lims ID: IC L3
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 31-Oct-2017 11:54:13 ALS Bottle#: 3 Worklist Smp#: 6
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\20171031-49808.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 31-Oct-2017 15:26:04 Calib Date: 31-Oct-2017 12:08:27
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK004

First Level Reviewer: phomsophat Date: 31-Oct-2017 13:19:26

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.404	1.405	-0.001	1.000	9915456	46.4		2784	
298.90 > 99.00	1.404	1.405	-0.001	1.000	7375640		1.34(0.00-0.00)	4222	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.533	1.528	0.005	1.000	3137333	9.71		3516	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.677	1.677	0.0	1.000	1311091	4.87		257	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.677	1.678	-0.001	1.000	5615014	15.8		4292	
* 6 13C2-PFOA									
415.00 > 370.00	1.866	1.863	0.003		2864400	10.0		2870	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.866	1.864	0.002	1.000	2643153	9.92		83.8	
413.00 > 169.00	1.866	1.864	0.002	1.000	1411735		1.87(0.00-0.00)	90.1	
* 7 13C4 PFOS									
503.00 > 80.00	2.109	2.107	0.002		6253426	28.7		4891	
8 Perfluorooctane sulfonic acid									M
499.00 > 80.00	2.109	2.109	0.0	1.000	3990091	19.7		546	M
499.00 > 99.00	2.109	2.109	0.0	1.000	831932		4.80(0.00-0.00)	594	M
9 Perfluorononanoic acid									
463.00 > 419.00	2.117	2.116	0.001	1.000	1835636	9.82		397	
$ 10 13C2 PFDA									
515.00 > 470.00	2.276	2.277	-0.001	1.000	2228390	9.61		5084	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L3_00023 Amount Added: 1.00 Units: mL

Report Date: 31-Oct-2017 15:26:04 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_006.d

Injection Date: 31-Oct-2017 11:54:13 Instrument ID: A8_N

Lims ID: IC L3

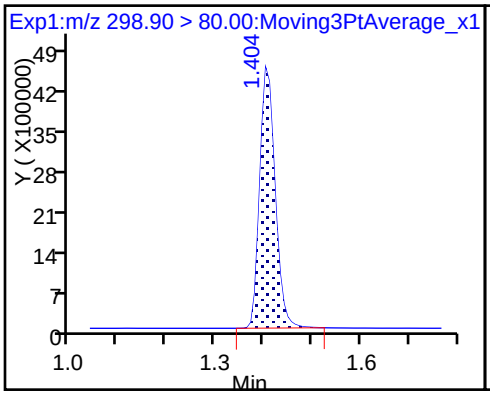
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 6

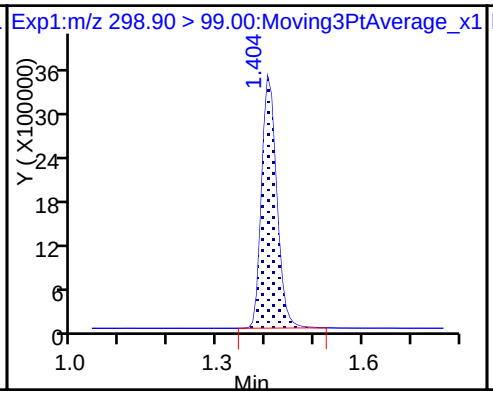
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

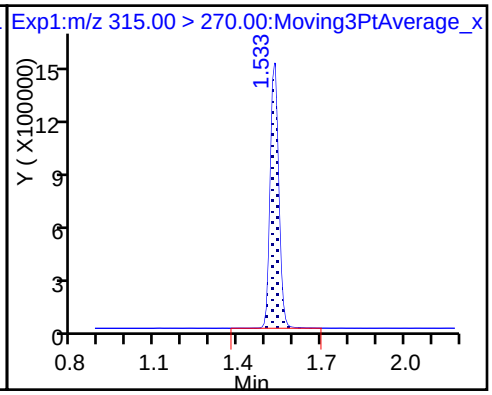
1 Perfluorobutanesulfonic acid



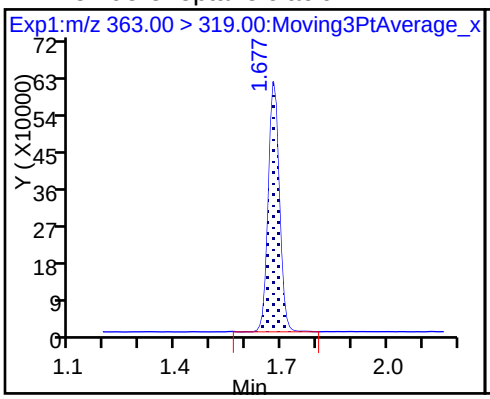
1 Perfluorobutanesulfonic acid



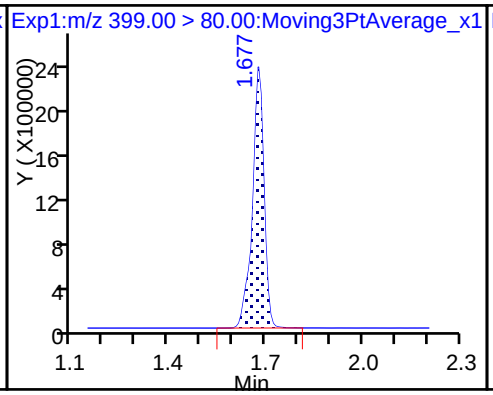
$ 2 13C2 PFHxA



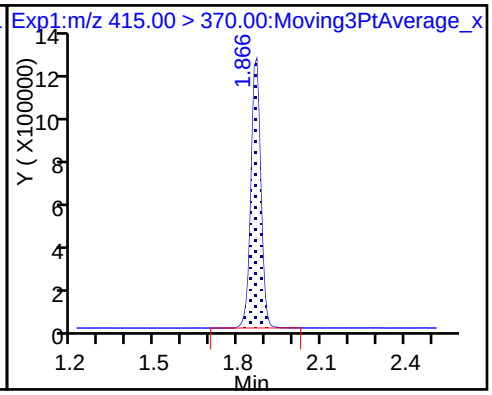
4 Perfluoroheptanoic acid



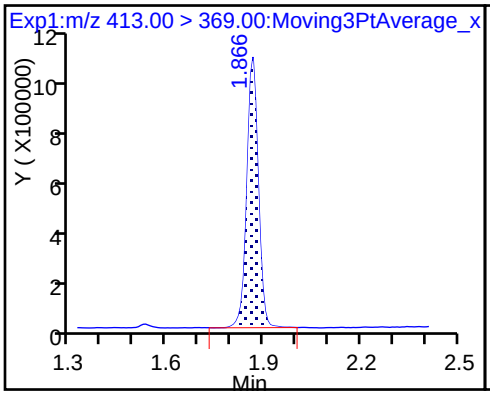
3 Perfluorohexanesulfonic acid



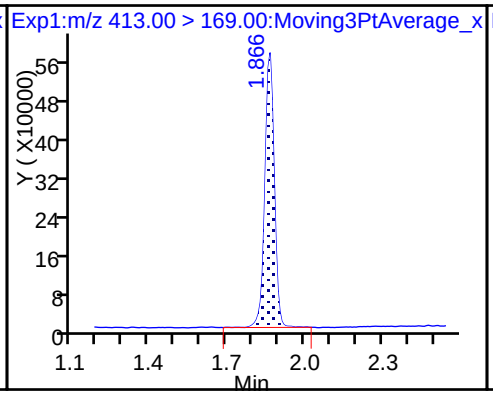
* 6 13C2-PFOA



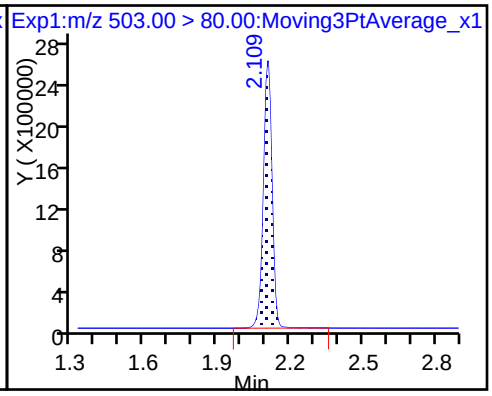
5 Perfluorooctanoic acid



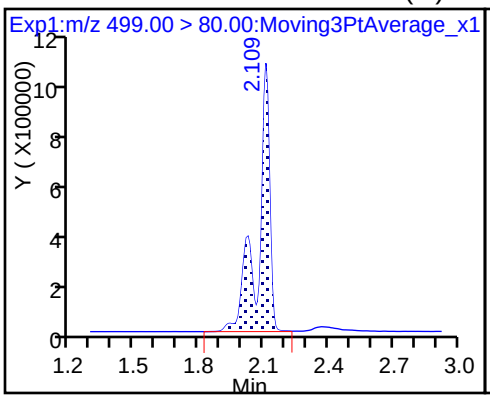
5 Perfluorooctanoic acid



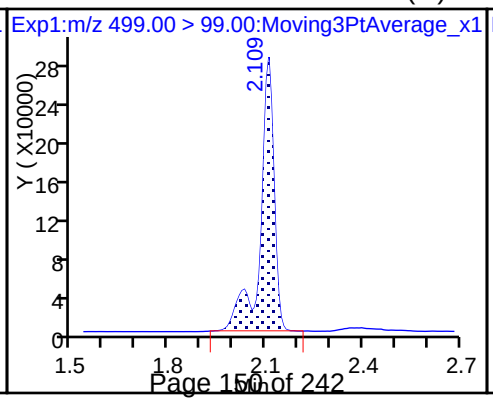
* 7 13C4 PFOS



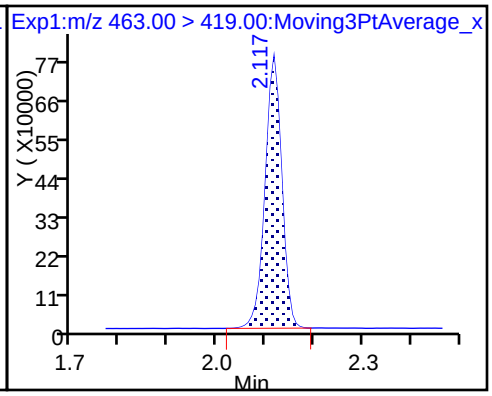
8 Perfluorooctane sulfonic acid (M)



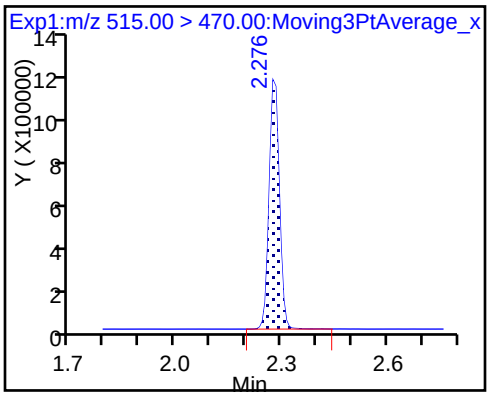
8 Perfluorooctane sulfonic acid (M)



9 Perfluorononanoic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.276
Y (X100000)
14
12
10
8
6
4
2
0
1.7
2.0
2.3
2.6
Min

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

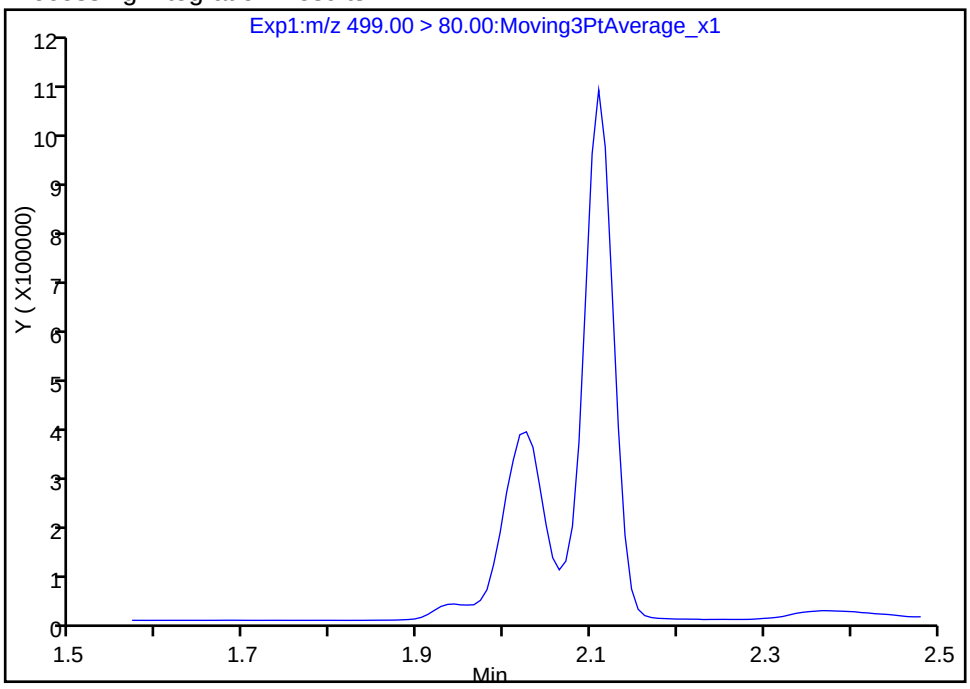
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_006.d
Injection Date: 31-Oct-2017 11:54:13 Instrument ID: A8_N
Lims ID: IC L3
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

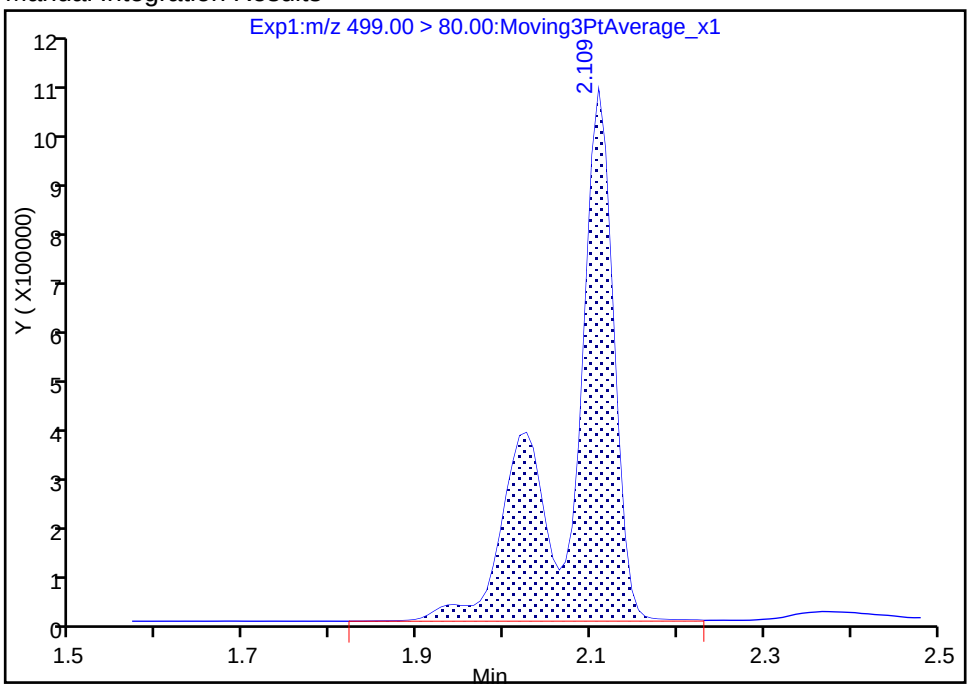
Not Detected
Expected RT: 2.11

Processing Integration Results



Manual Integration Results

RT: 2.11
Area: 3990091
Amount: 19.713777
Amount Units: ng/ml



Reviewer: phomsophat, 31-Oct-2017 13:18:39
Audit Action: Assigned Compound ID Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

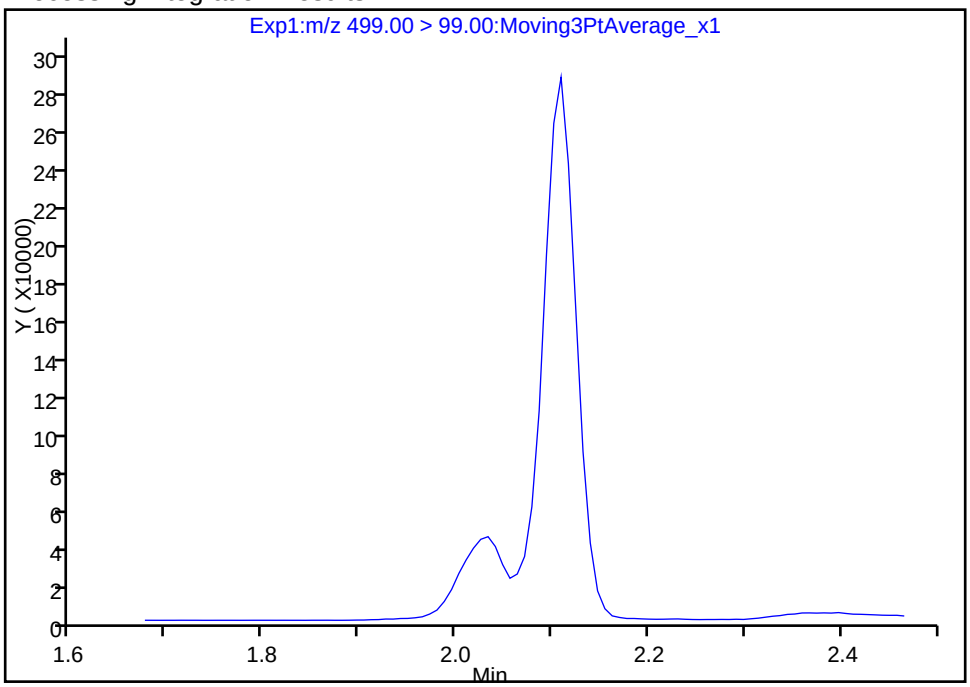
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_006.d
Injection Date: 31-Oct-2017 11:54:13 Instrument ID: A8_N
Lims ID: IC L3
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

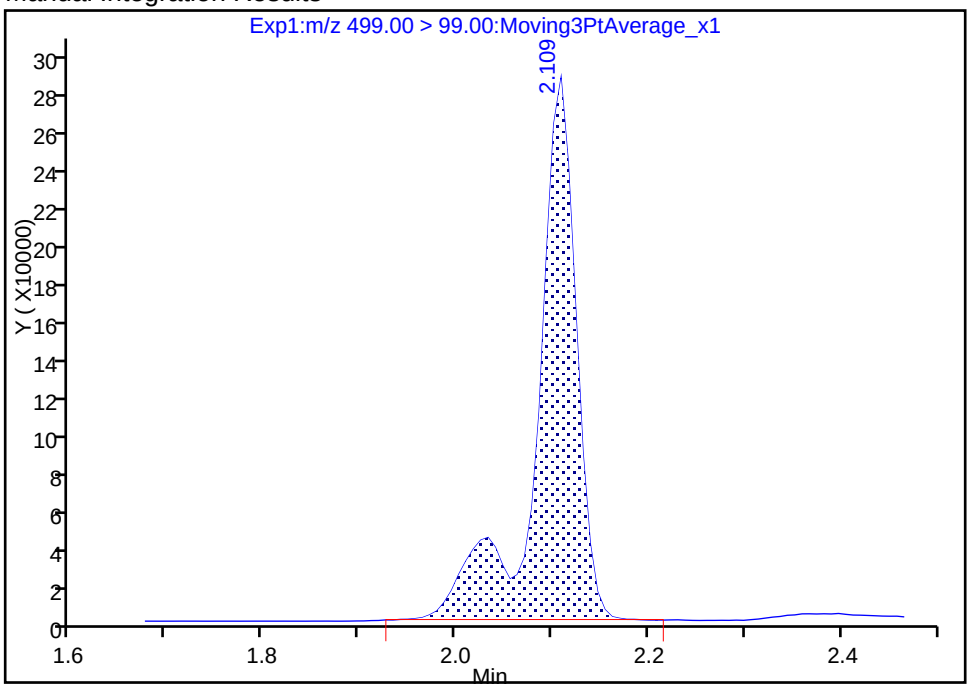
Not Detected
Expected RT: 2.11

Processing Integration Results



Manual Integration Results

RT: 2.11
Area: 831932
Amount: 19.713777
Amount Units: ng/ml



Reviewer: phomsophat, 31-Oct-2017 13:18:53
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

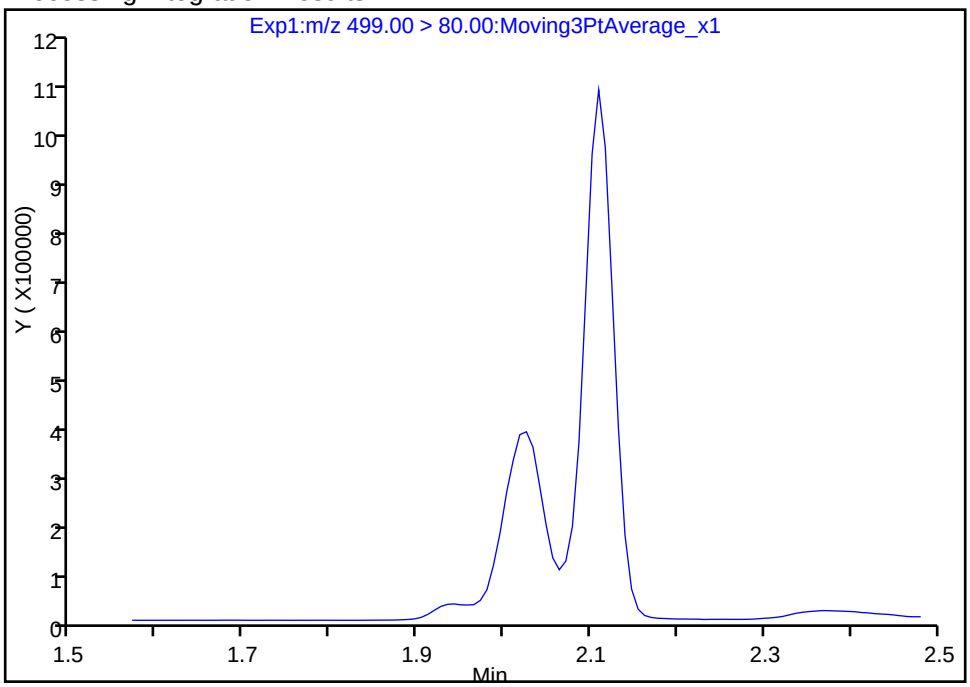
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_006.d
Injection Date: 31-Oct-2017 11:54:13 Instrument ID: A8_N
Lims ID: IC L3
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

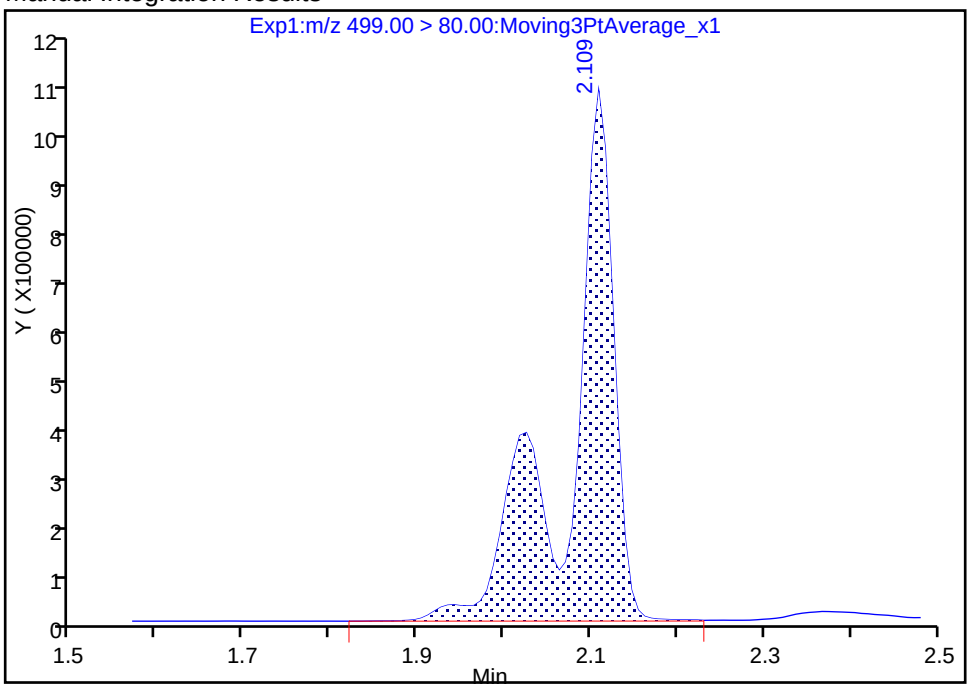
Processing Integration Results

Not Detected
Expected RT: 2.11



Manual Integration Results

RT: 2.11
Area: 3990091
Amount: 19.713777
Amount Units: ng/ml



Reviewer: phomsophat, 31-Oct-2017 13:18:53
Audit Action: Manually Integrated Audit Reason: Assign Peak

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_007.d
Lims ID: IC L4
Client ID:
Sample Type: ICISAV Calib Level: 4
Inject. Date: 31-Oct-2017 11:58:57 ALS Bottle#: 4 Worklist Smp#: 7
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\20171031-49808.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 31-Oct-2017 15:26:05 Calib Date: 31-Oct-2017 12:08:27
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK004

First Level Reviewer: phomsophat Date: 31-Oct-2017 13:19:59

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.404	1.405	-0.001	1.000	16876130	88.8		2843	
298.90 > 99.00	1.404	1.405	-0.001	1.000	12859332		1.31(0.00-0.00)	3659	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.525	1.528	-0.003	1.000	3180555	10.6		3583	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.677	1.677	0.0	1.000	2526779	10.1		485	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.677	1.678	-0.001	1.000	10497872	30.4		4311	
* 6 13C2-PFOA									
415.00 > 370.00	1.859	1.863	-0.004		2661913	10.0		2517	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.859	1.864	-0.005	1.000	4986613	20.1		156	
413.00 > 169.00	1.859	1.864	-0.005	1.000	2700868		1.85(0.00-0.00)	194	
* 7 13C4 PFOS									
503.00 > 80.00	2.109	2.107	0.002		6075693	28.7		4017	
8 Perfluorooctane sulfonic acid									M
499.00 > 80.00	2.109	2.109	0.0	1.000	8030345	40.8		2995	M
499.00 > 99.00	2.109	2.109	0.0	1.000	1667728		4.82(0.00-0.00)	1040	M
9 Perfluorononanoic acid									
463.00 > 419.00	2.117	2.116	0.001	1.000	3636277	20.9		740	
$ 10 13C2 PFDA									
515.00 > 470.00	2.276	2.277	-0.001	1.000	2223928	10.3		4842	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L4_00020 Amount Added: 1.00 Units: mL

Report Date: 31-Oct-2017 15:26:05 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_007.d

Injection Date: 31-Oct-2017 11:58:57 Instrument ID: A8_N

Lims ID: IC L4

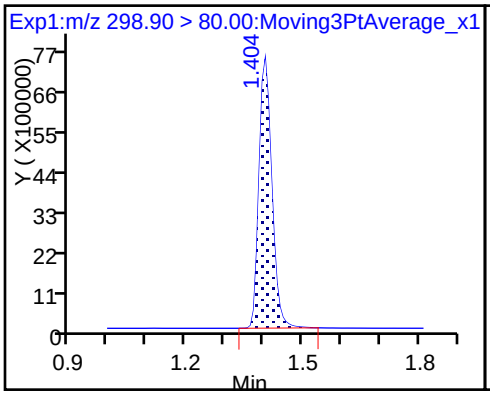
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 4 Worklist Smp#: 7

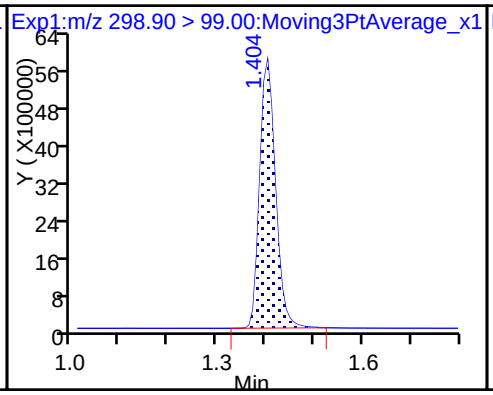
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

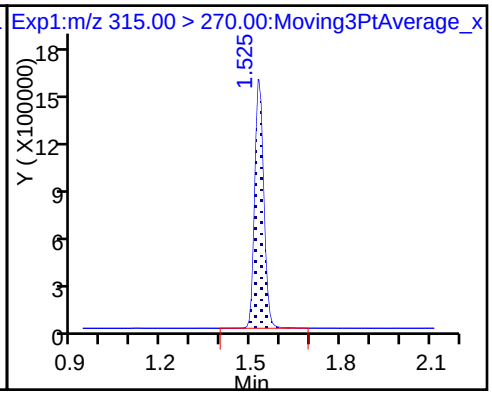
1 Perfluorobutanesulfonic acid



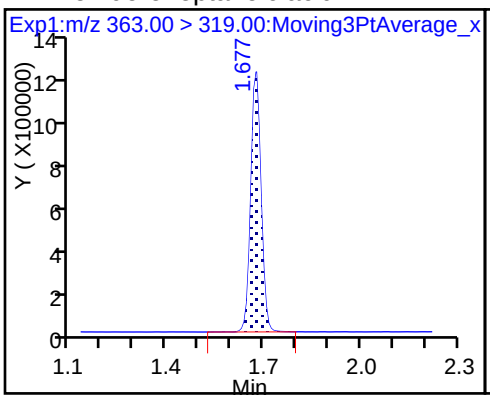
1 Perfluorobutanesulfonic acid



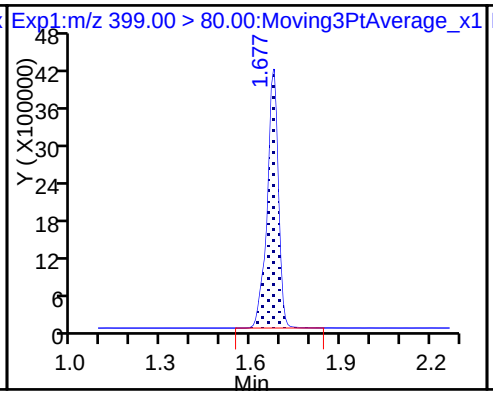
$ 2 13C2 PFHxA



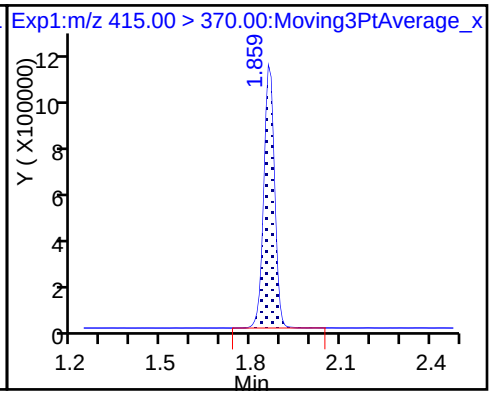
4 Perfluoroheptanoic acid



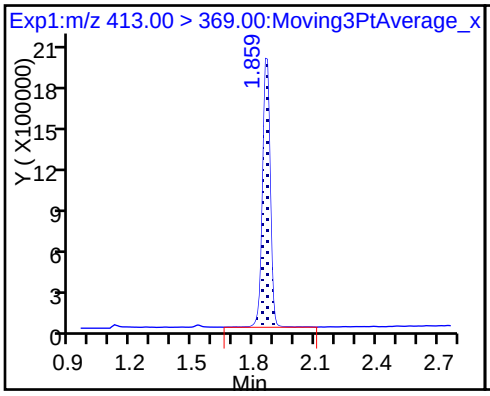
3 Perfluorohexanesulfonic acid



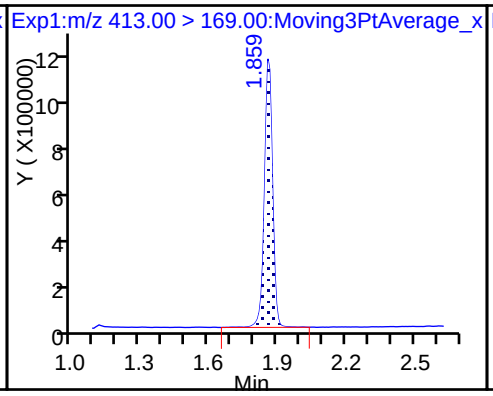
* 6 13C2-PFOA



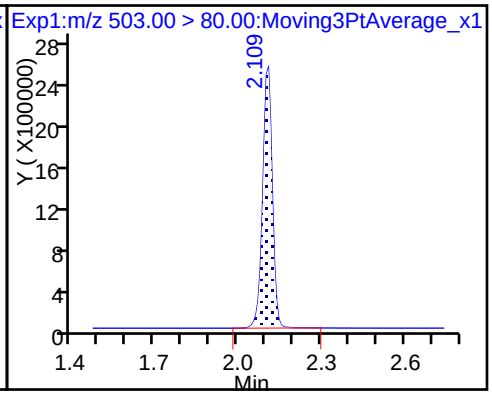
5 Perfluorooctanoic acid



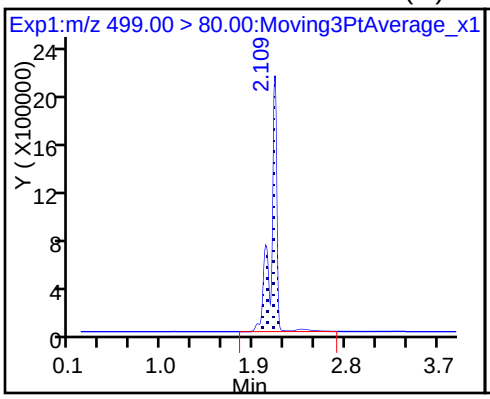
5 Perfluorooctanoic acid



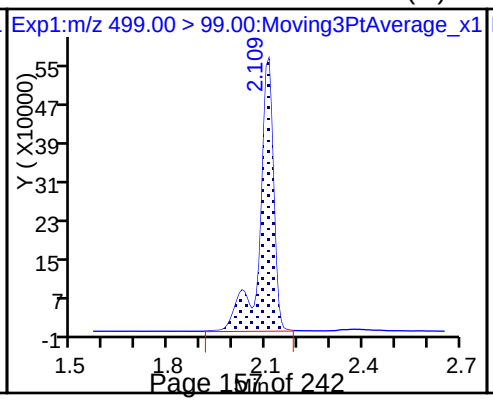
* 7 13C4 PFOS



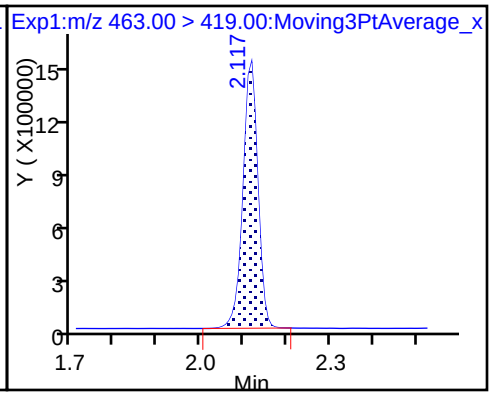
8 Perfluorooctane sulfonic acid (M)



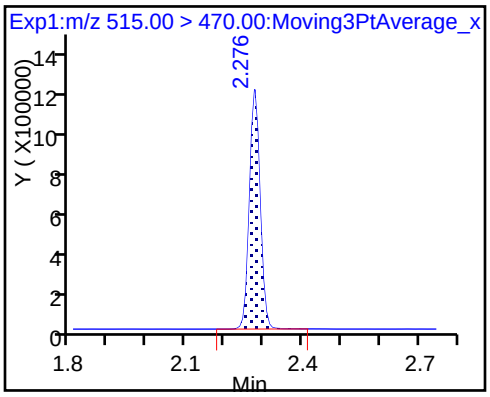
8 Perfluorooctane sulfonic acid (M)



9 Perfluorononanoic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.276
Y (X100000)
14
12
10
8
6
4
2
0
1.8
2.1
2.4
2.7
Min

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

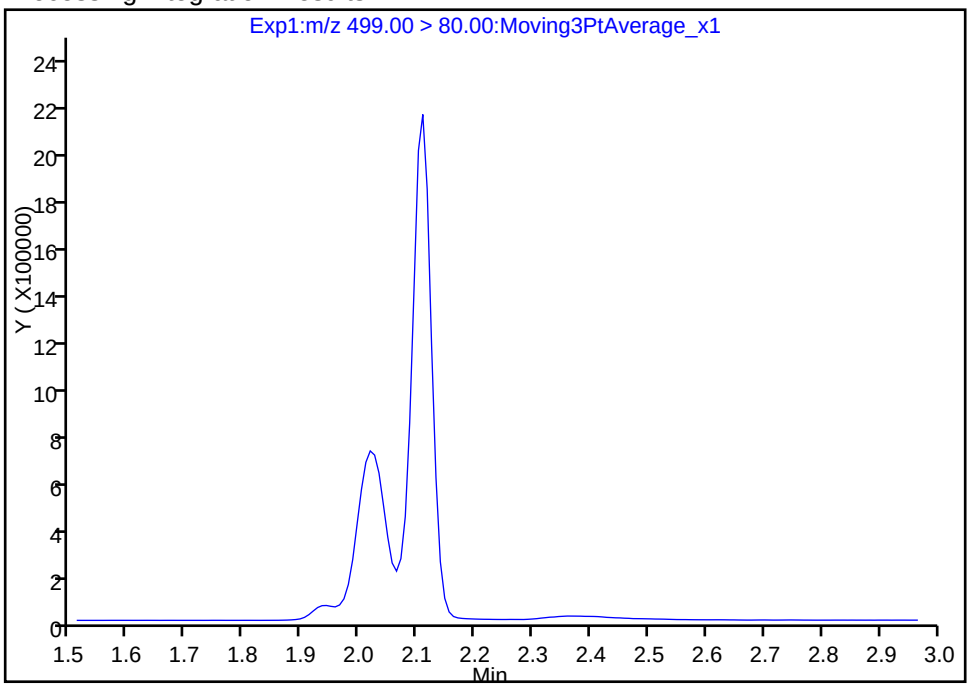
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_007.d				
Injection Date:	31-Oct-2017 11:58:57	Instrument ID:	A8_N		
Lims ID:	IC L4				
Client ID:					
Operator ID:	SACINSTLCMS01	ALS Bottle#:	4	Worklist Smp#:	7
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

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

Signal: 1

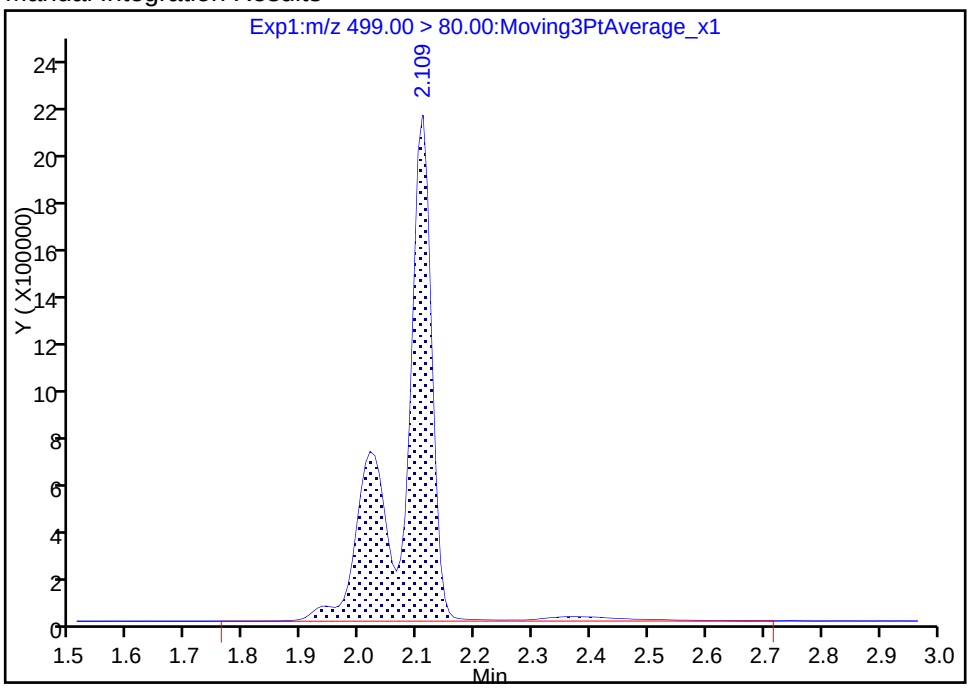
Not Detected
Expected RT: 2.11

Processing Integration Results



Manual Integration Results

RT: 2.11
Area: 8030345
Amount: 40.836023
Amount Units: ng/ml



Reviewer: phomsophat, 31-Oct-2017 13:19:34
Audit Action: Assigned Compound ID Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

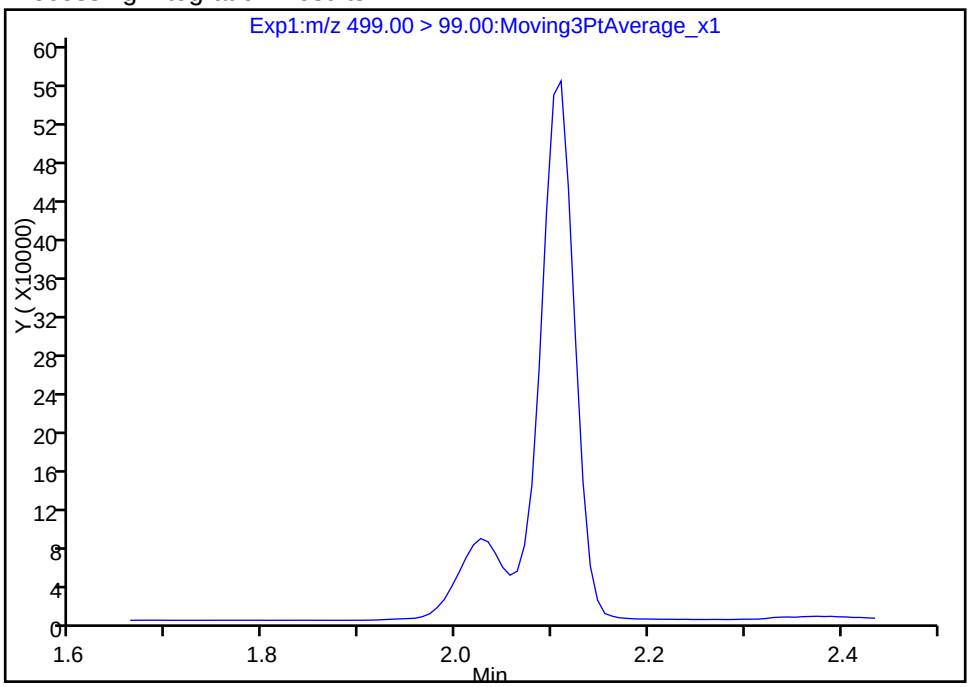
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_007.d
Injection Date: 31-Oct-2017 11:58:57 Instrument ID: A8_N
Lims ID: IC L4
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 4 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

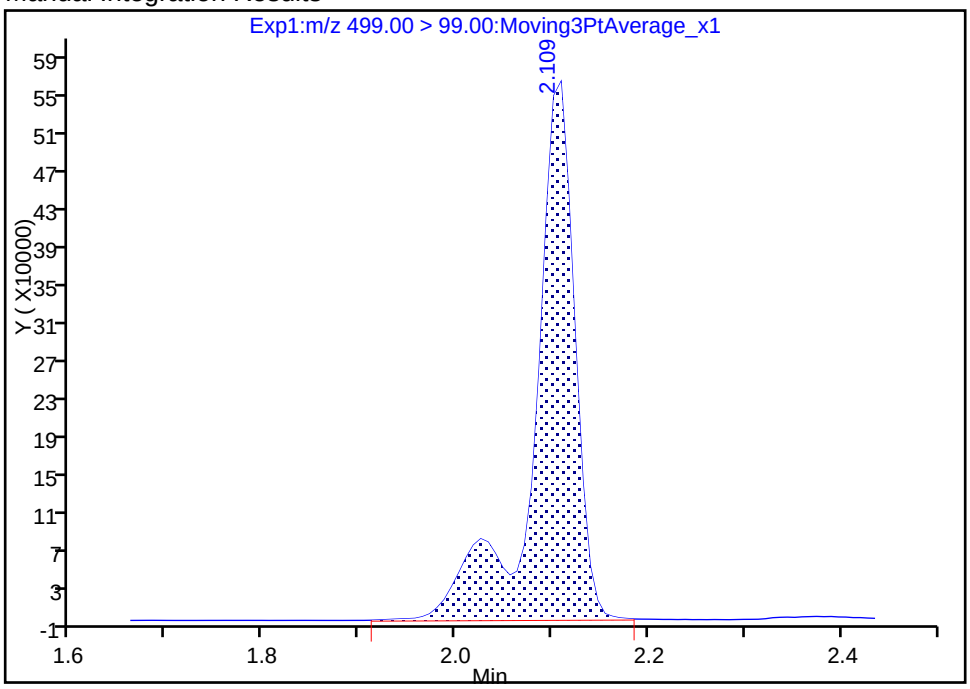
Not Detected
Expected RT: 2.11

Processing Integration Results



Manual Integration Results

RT: 2.11
Area: 1667728
Amount: 40.836023
Amount Units: ng/ml



Reviewer: phomsophat, 31-Oct-2017 13:19:43
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

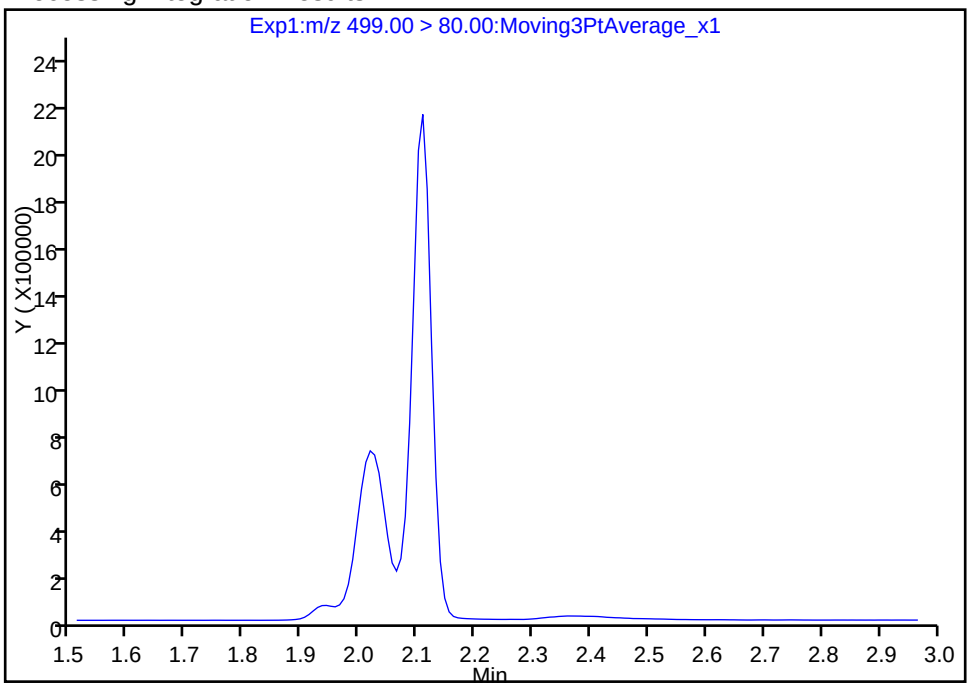
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_007.d
Injection Date: 31-Oct-2017 11:58:57 Instrument ID: A8_N
Lims ID: IC L4
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 4 Worklist Smp#: 7
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

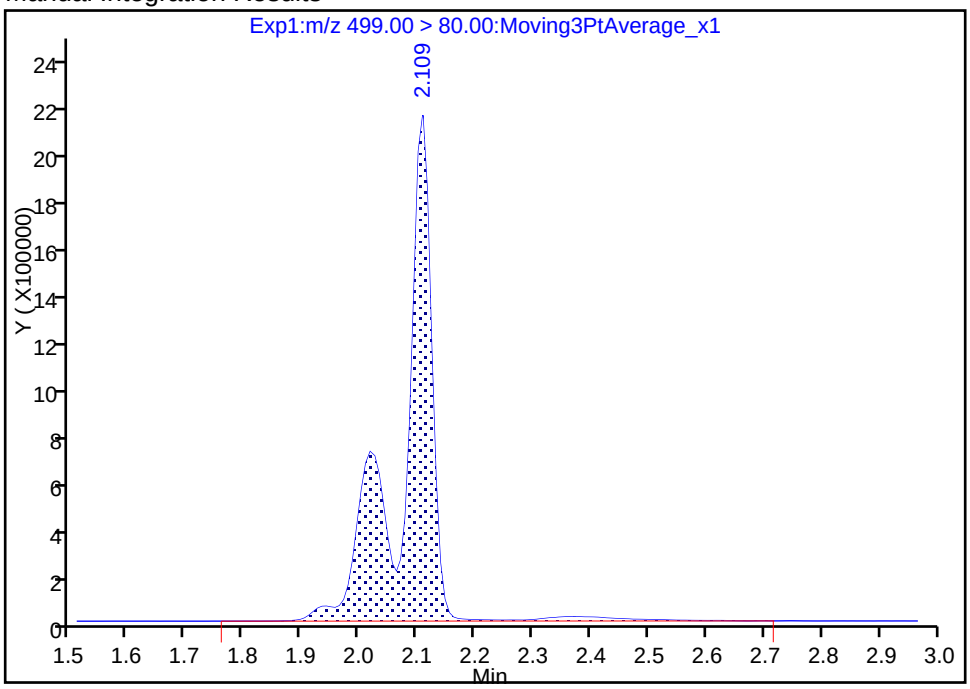
Not Detected
Expected RT: 2.11

Processing Integration Results



Manual Integration Results

RT: 2.11
Area: 8030345
Amount: 40.836023
Amount Units: ng/ml



Reviewer: phomsophat, 31-Oct-2017 13:19:43
Audit Action: Manually Integrated Audit Reason: Assign Peak

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_008.d
Lims ID: IC L5
Client ID:
Sample Type: IC Calib Level: 5
Inject. Date: 31-Oct-2017 12:03:42 ALS Bottle#: 5 Worklist Smp#: 8
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\20171031-49808.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 31-Oct-2017 15:26:06 Calib Date: 31-Oct-2017 12:08:27
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK004

First Level Reviewer: barnettj Date: 31-Oct-2017 15:25:45

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.404	1.405	-0.001	1.000	21956734	133.3		2615	
298.90 > 99.00	1.404	1.405	-0.001	1.000	17051539		1.29(0.00-0.00)	3328	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.525	1.528	-0.003	1.000	3014571	10.1		3152	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.677	1.677	0.0	1.000	3670615	14.7		668	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.677	1.678	-0.001	1.000	14494918	43.8		4061	
* 6 13C2-PFOA									
415.00 > 370.00	1.859	1.863	-0.004		2646287	10.0		2621	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.859	1.864	-0.005	1.000	7356038	29.9		245	
413.00 > 169.00	1.859	1.864	-0.005	1.000	3978749		1.85(0.00-0.00)	284	
* 7 13C4 PFOS									
503.00 > 80.00	2.102	2.107	-0.005		5827765	28.7		4187	
8 Perfluorooctane sulfonic acid									M
499.00 > 80.00	2.102	2.109	-0.007	1.000	11617530	61.6		3284	M
499.00 > 99.00	2.102	2.109	-0.007	1.000	2399643		4.84(0.00-0.00)	1360	M
9 Perfluorononanoic acid									
463.00 > 419.00	2.109	2.116	-0.007	1.000	5107150	29.6		883	
$ 10 13C2 PFDA									
515.00 > 470.00	2.276	2.277	-0.001	1.000	2177702	10.2		5529	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L5_00024 Amount Added: 1.00 Units: mL

Report Date: 31-Oct-2017 15:26:06 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_008.d

Injection Date: 31-Oct-2017 12:03:42 Instrument ID: A8_N

Lims ID: IC L5

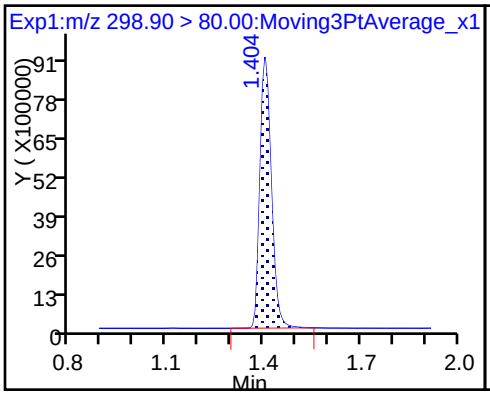
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 8

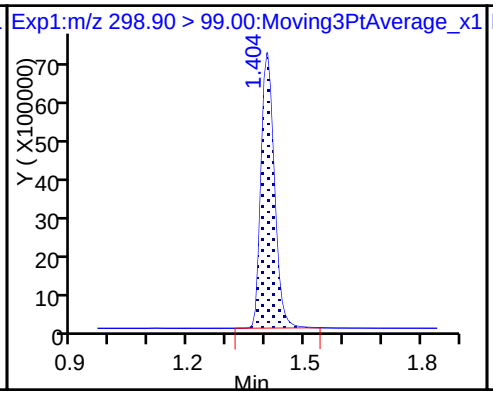
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

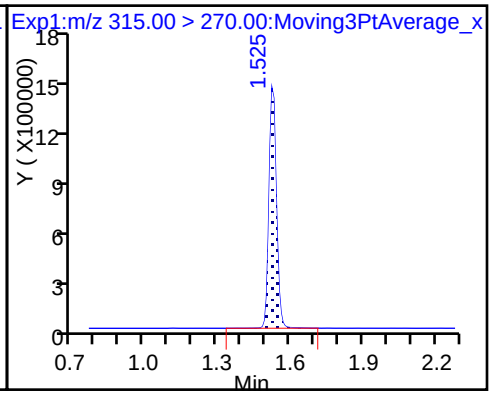
1 Perfluorobutanesulfonic acid



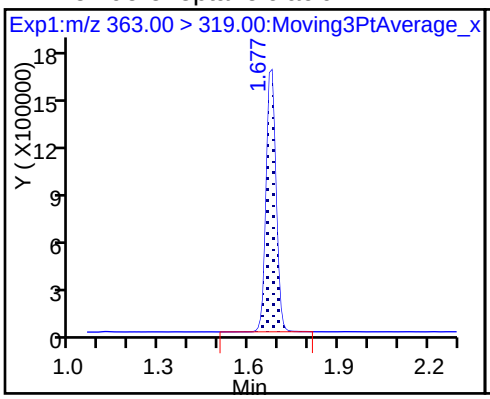
1 Perfluorobutanesulfonic acid



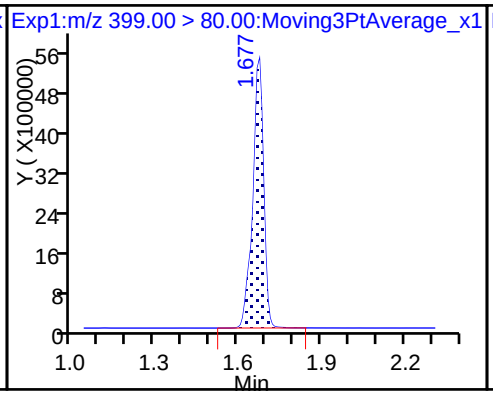
$ 2 13C2 PFHxA



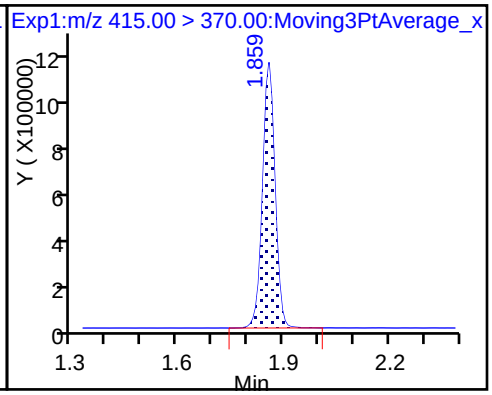
4 Perfluoroheptanoic acid



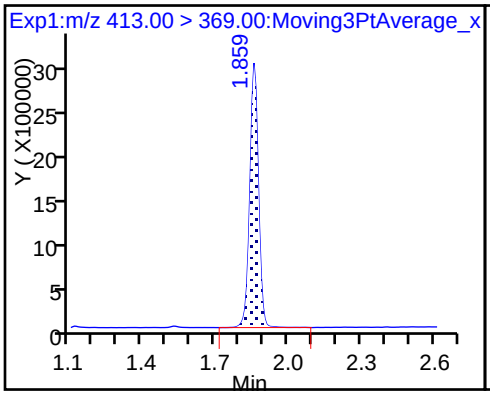
3 Perfluorohexanesulfonic acid



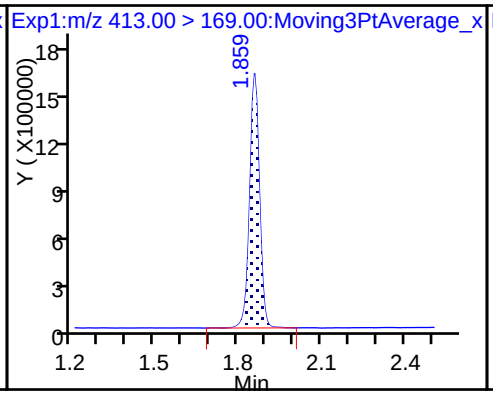
* 6 13C2-PFOA



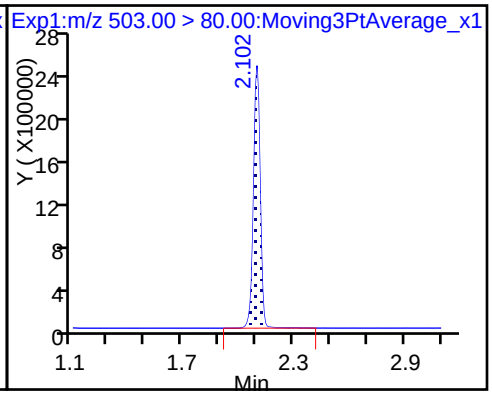
5 Perfluorooctanoic acid



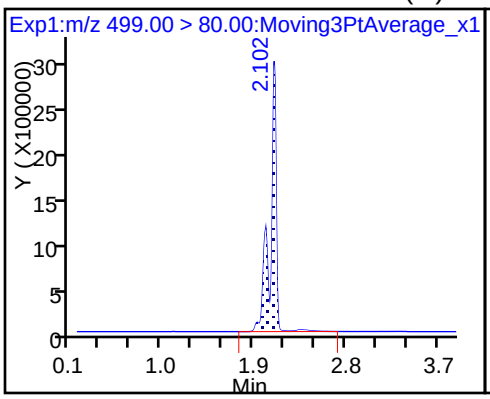
5 Perfluorooctanoic acid



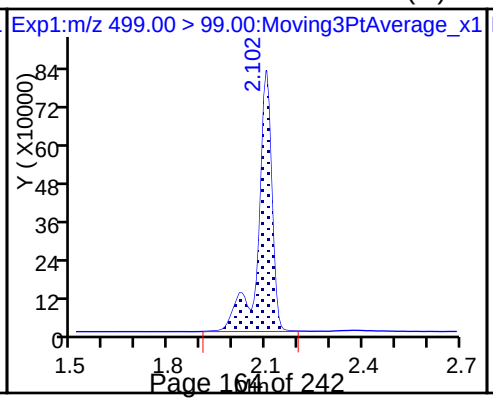
* 7 13C4 PFOS



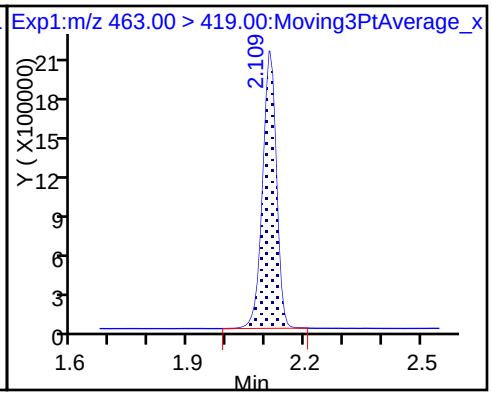
8 Perfluorooctane sulfonic acid (M)



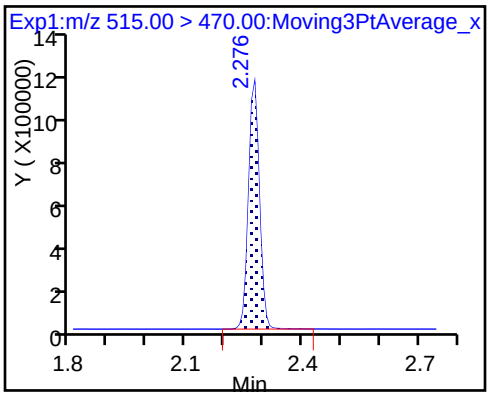
8 Perfluorooctane sulfonic acid (M)



9 Perfluorononanoic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.276
Y (X100000)
14
12
10
8
6
4
2
0
1.8
2.1
2.4
2.7
Min

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

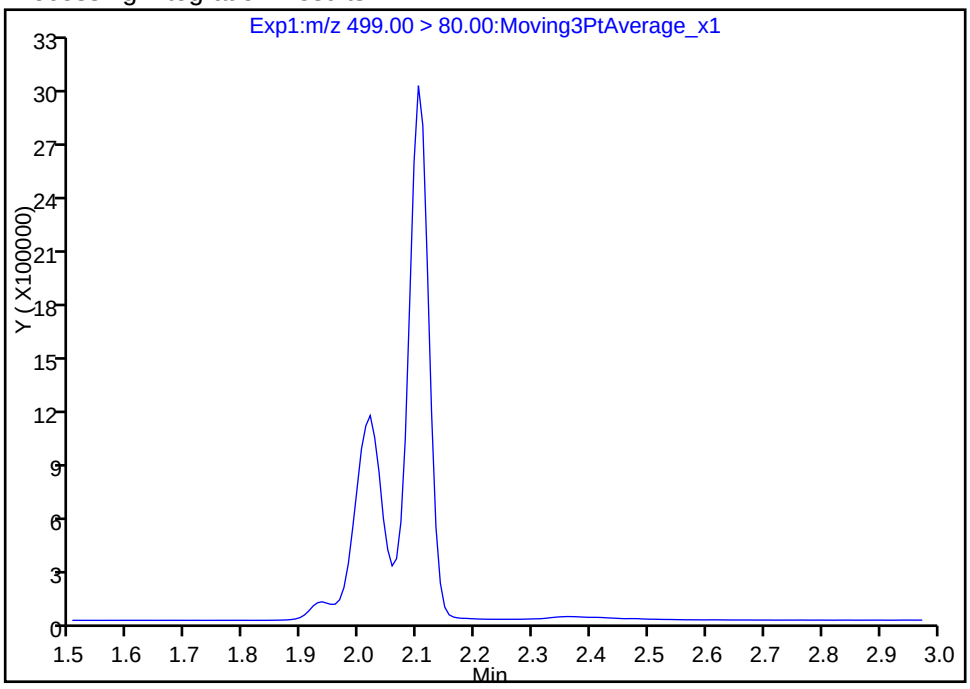
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_008.d
Injection Date: 31-Oct-2017 12:03:42 Instrument ID: A8_N
Lims ID: IC L5
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 8
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

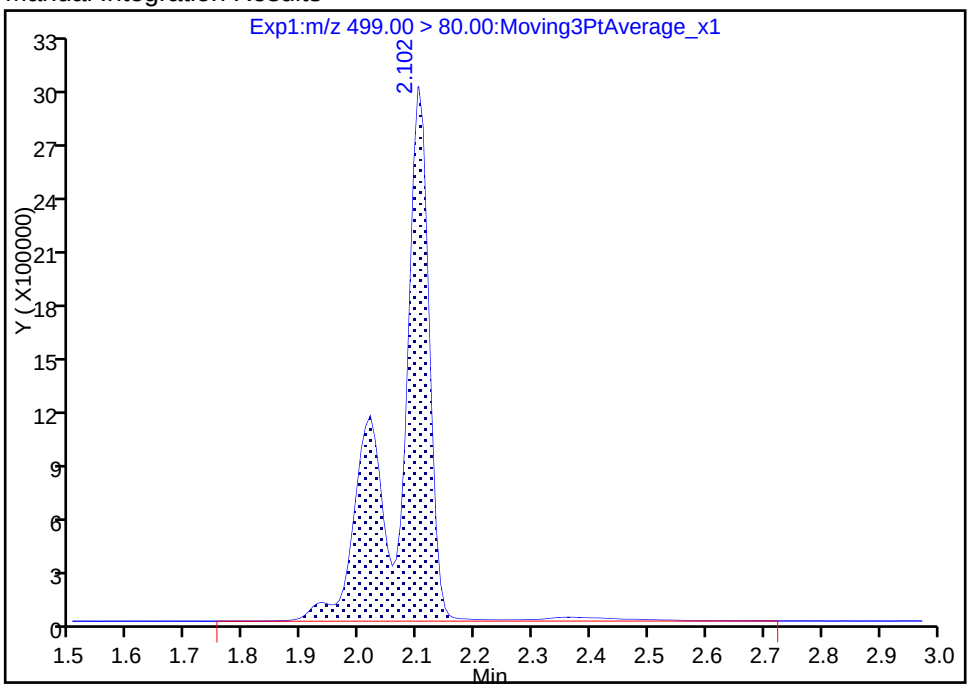
Not Detected
Expected RT: 2.11

Processing Integration Results



Manual Integration Results

RT: 2.10
Area: 11617530
Amount: 61.590940
Amount Units: ng/ml



Reviewer: phomsophat, 31-Oct-2017 13:20:08
Audit Action: Assigned Compound ID Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

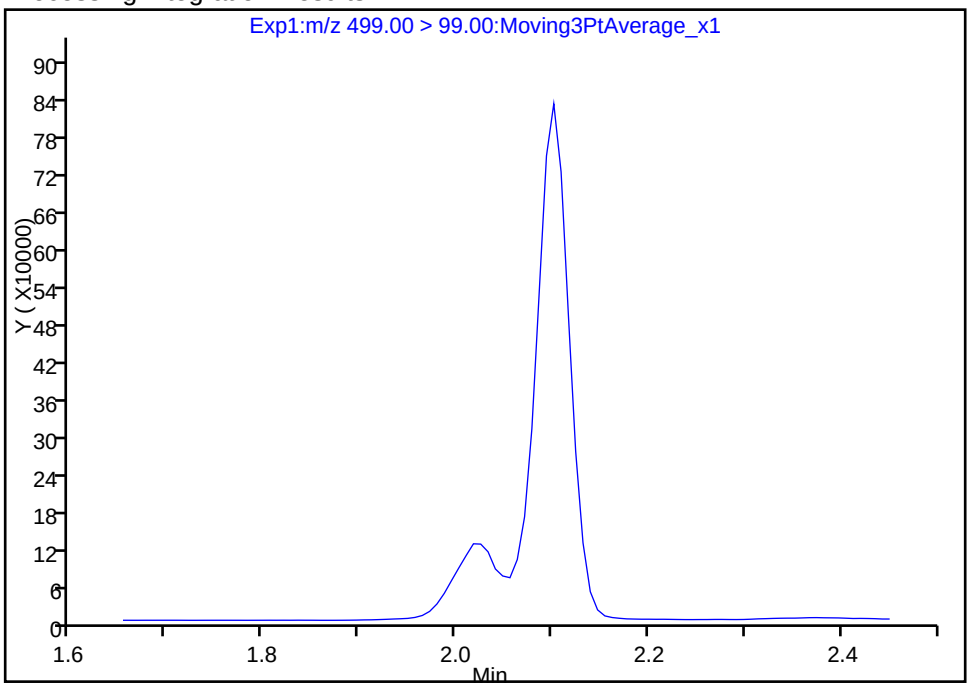
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_008.d
Injection Date: 31-Oct-2017 12:03:42 Instrument ID: A8_N
Lims ID: IC L5
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 8
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

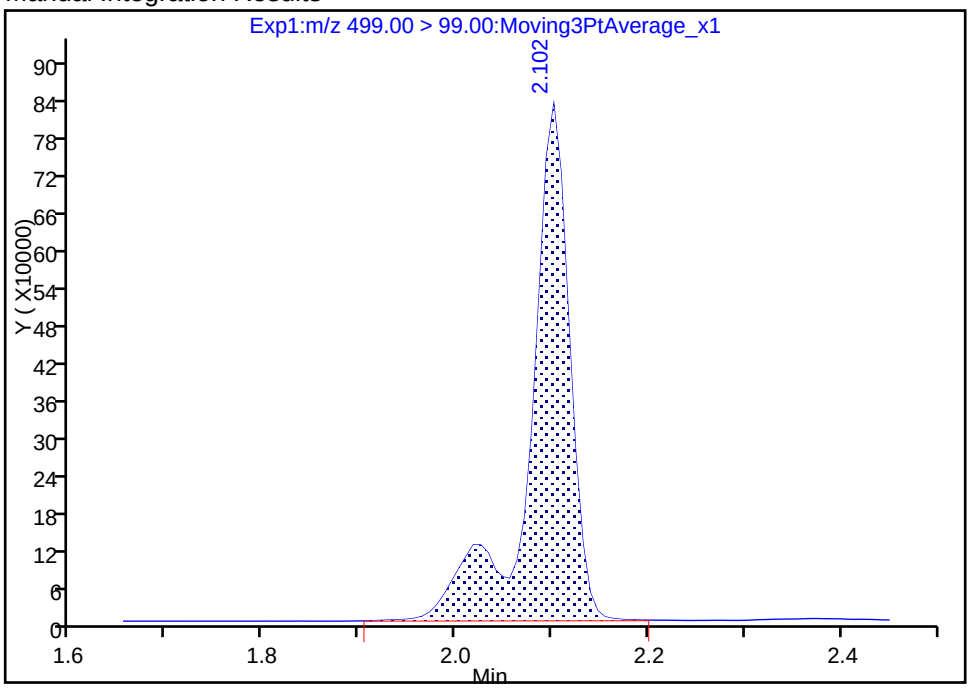
Processing Integration Results

Not Detected
Expected RT: 2.11



Manual Integration Results

RT: 2.10
Area: 2399643
Amount: 61.590940
Amount Units: ng/ml



Reviewer: phomsophat, 31-Oct-2017 13:20:16
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

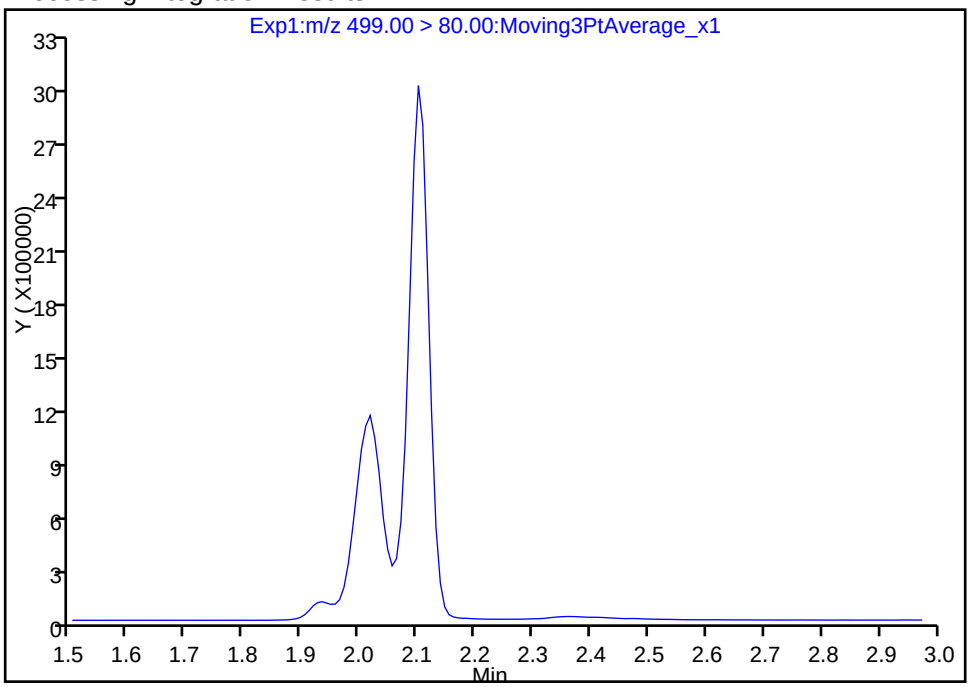
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_008.d
Injection Date: 31-Oct-2017 12:03:42 Instrument ID: A8_N
Lims ID: IC L5
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 8
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

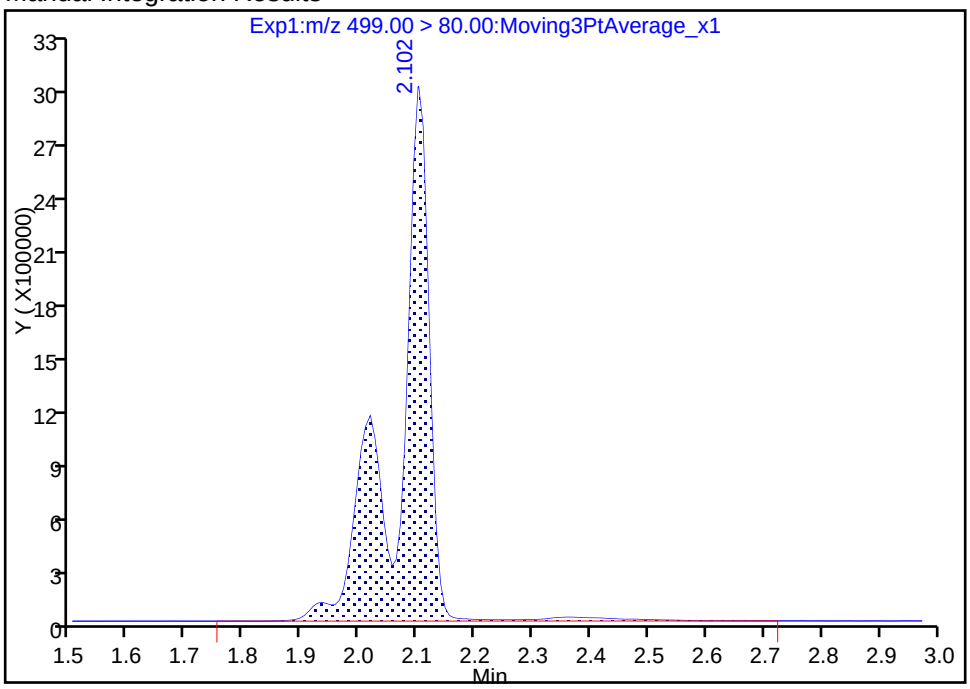
Not Detected
Expected RT: 2.11

Processing Integration Results



Manual Integration Results

RT: 2.10
Area: 11617530
Amount: 61.590940
Amount Units: ng/ml



Reviewer: phomsophat, 31-Oct-2017 13:20:16
Audit Action: Manually Integrated Audit Reason: Assign Peak

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_009.d
Lims ID: IC L6
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 31-Oct-2017 12:08:27 ALS Bottle#: 6 Worklist Smp#: 9
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\20171031-49808.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 31-Oct-2017 15:26:07 Calib Date: 31-Oct-2017 12:08:27
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK004

First Level Reviewer: phomsophat Date: 31-Oct-2017 13:22:53

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.411	1.405	0.006	1.000	27165476	181.8		2852	
298.90 > 99.00	1.411	1.405	0.006	1.000	20927026		1.30(0.00-0.00)	3478	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.533	1.528	0.005	1.000	3112456	10.3		3699	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.677	1.677	0.0	1.000	5107421	20.2		924	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.684	1.678	0.006	1.000	19137035	56.3		4304	
* 6 13C2-PFOA									
415.00 > 370.00	1.866	1.863	0.003		2688817	10.0		2801	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.866	1.864	0.002	1.000	10031020	40.1		364	
413.00 > 169.00	1.866	1.864	0.002	1.000	5458522		1.84(0.00-0.00)	401	
* 7 13C4 PFOS									
503.00 > 80.00	2.109	2.107	0.002		5986294	28.7		4032	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.109	2.109	0.0	1.000	15763683	81.4		1273	
499.00 > 99.00	2.109	2.109	0.0	1.000	3417607		4.61(0.00-0.00)	1767	
9 Perfluorononanoic acid									
463.00 > 419.00	2.117	2.116	0.001	1.000	7198655	41.0		1257	
$ 10 13C2 PFDA									
515.00 > 470.00	2.284	2.277	0.007	1.000	2306925	10.6		5660	

Reagents:

LC537-L6_00020 Amount Added: 1.00 Units: mL

Report Date: 31-Oct-2017 15:26:07 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_009.d

Injection Date: 31-Oct-2017 12:08:27 Instrument ID: A8_N

Lims ID: IC L6

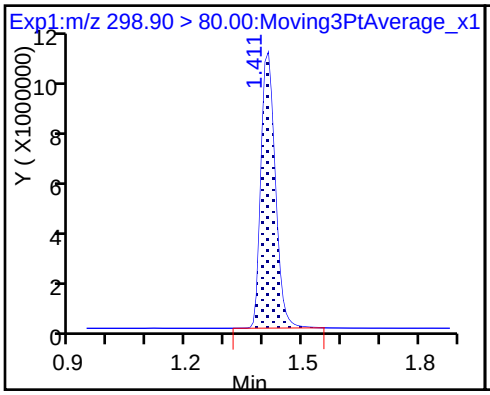
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 6 Worklist Smp#: 9

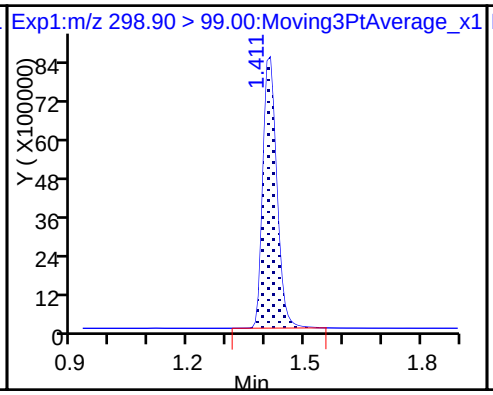
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

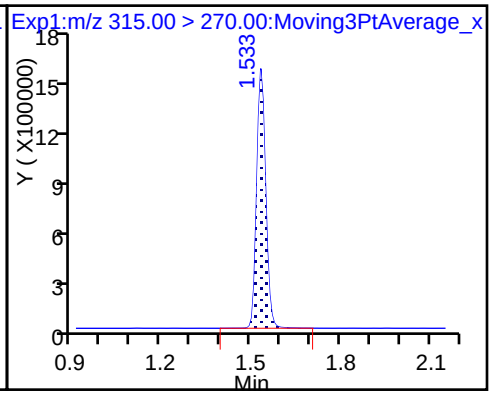
1 Perfluorobutanesulfonic acid



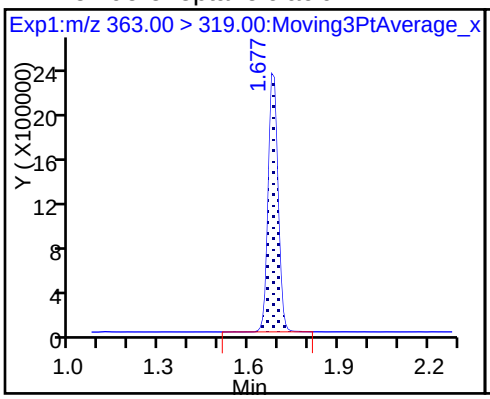
1 Perfluorobutanesulfonic acid



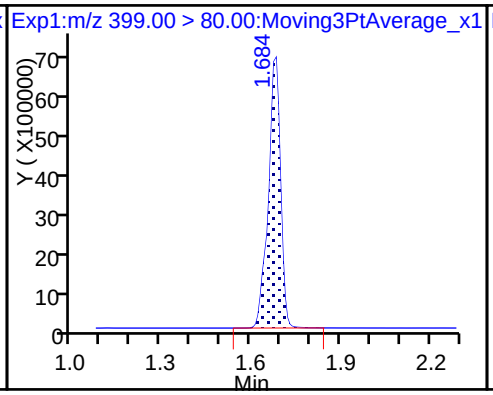
$ 2 13C2 PFHxA



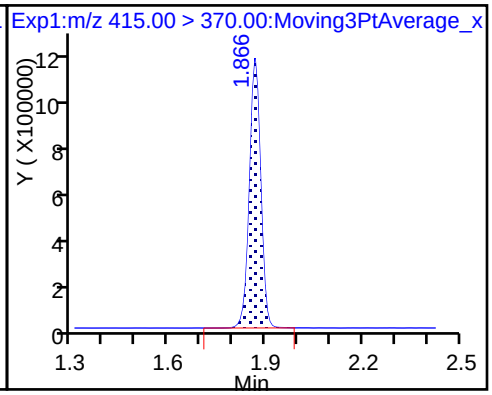
4 Perfluoroheptanoic acid



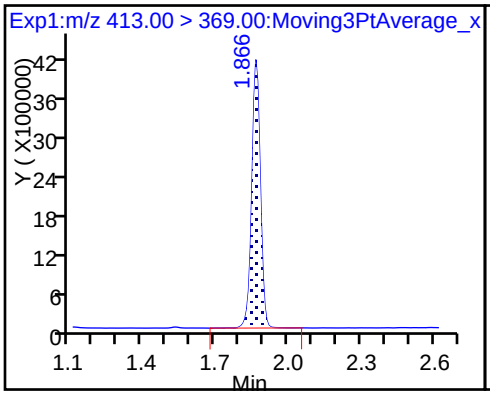
3 Perfluorohexanesulfonic acid



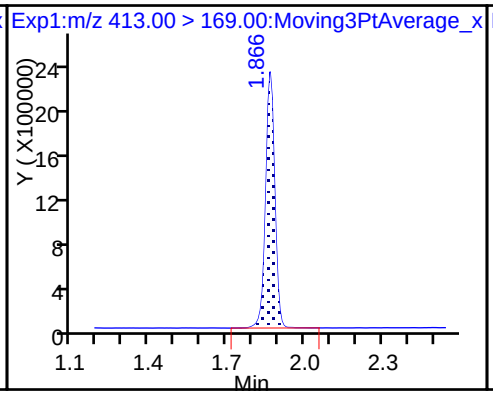
* 6 13C2-PFOA



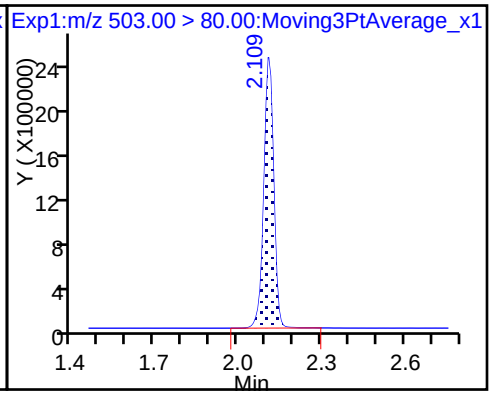
5 Perfluorooctanoic acid



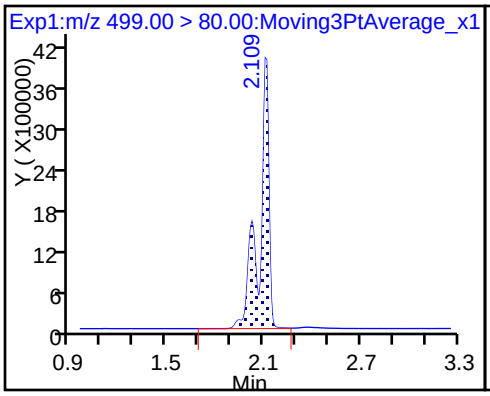
5 Perfluorooctanoic acid



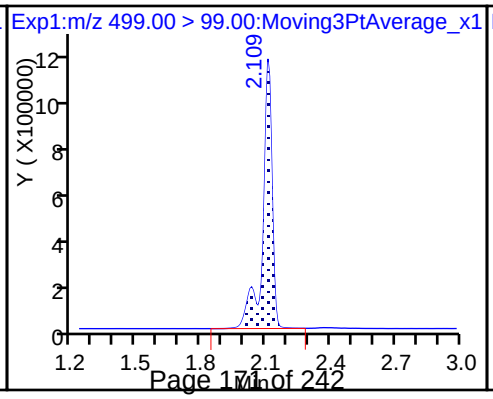
* 7 13C4 PFOS



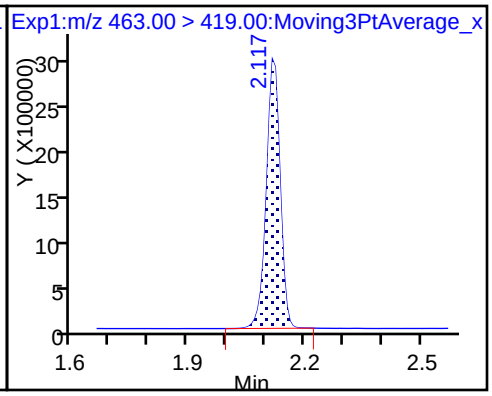
8 Perfluorooctane sulfonic acid



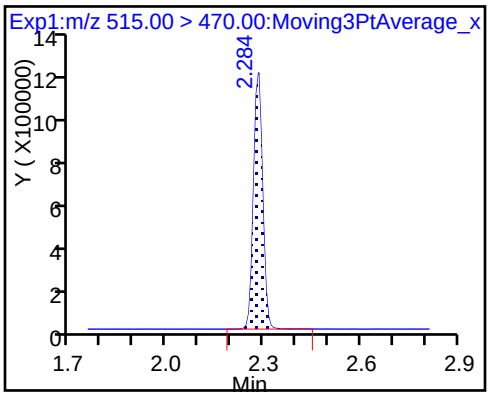
8 Perfluorooctane sulfonic acid



9 Perfluorononanoic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.284
Y (X100000)
14
12
10
8
6
4
2
0
1.7
2.0
2.3
2.6
2.9
Min

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-32528-1

SDG No.:

Lab Sample ID: CCVL 320-192162/11 Calibration Date: 10/31/2017 12:17

Instrument ID: A8_N Calib Start Date: 10/31/2017 11:44

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 10/31/2017 12:08

Lab File ID: 2017.10.31_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		1.102		21.4	20.0	7.2	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9408	0.9641		2.28	2.22	2.5	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.629	1.689		6.92	6.67	3.7	50.0
Perfluorooctanoic acid (PFOA)	Ave	0.9301	0.9239		4.42	4.45	-0.7	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9283	0.9317		8.92	8.89	0.4	50.0
Perfluorononanoic acid (PFNA)	Ave	0.6527	0.6672		4.54	4.45	2.2	50.0
13C2 PFHxA	Ave	1.129	1.083		9.59	10.0	-4.1	30.0
13C2 PFDA	Ave	0.8094	0.8119		10.0	10.0	0.3	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_011.d
Lims ID: CCVL
Client ID:
Sample Type: CCVL
Inject. Date: 31-Oct-2017 12:17:57 ALS Bottle#: 2 Worklist Smp#: 11
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\20171031-49808.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 31-Oct-2017 15:26:08 Calib Date: 31-Oct-2017 12:08:27
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK004

First Level Reviewer: barnettj Date: 31-Oct-2017 14:37:43

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.404	1.405	-0.001	1.000	4914906	21.4		1706	
298.90 > 99.00	1.404	1.405	-0.001	1.000	3545641		1.39(0.00-0.00)	2817	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.533	1.528	0.005	1.000	3102038	9.59		3913	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.677	1.677	0.0	1.000	614012	2.28		130	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.677	1.678	-0.001	1.000	2511290	6.92		2640	
* 6 13C2-PFOA									
415.00 > 370.00	1.866	1.863	0.003		2865147	10.0		2953	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.866	1.864	0.002	1.000	1177501	4.42		44.8	
413.00 > 169.00	1.866	1.864	0.002	1.000	624441		1.89(0.00-0.00)	49.3	
* 7 13C4 PFOS									
503.00 > 80.00	2.109	2.107	0.002		6394781	28.7		4537	
8 Perfluorooctane sulfonic acid									M
499.00 > 80.00	2.109	2.109	0.0	1.000	1847034	8.92		264	M
499.00 > 99.00	2.109	2.109	0.0	1.000	381259		4.84(0.00-0.00)	311	M
9 Perfluorononanoic acid									
463.00 > 419.00	2.117	2.116	0.001	1.000	849819	4.54		183	
$ 10 13C2 PFDA									
515.00 > 470.00	2.276	2.277	-0.001	1.000	2326112	10.0		5726	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L2_00020 Amount Added: 1.00 Units: mL

Report Date: 31-Oct-2017 15:26:09 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_011.d

Injection Date: 31-Oct-2017 12:17:57 Instrument ID: A8_N

Lims ID: CCVL

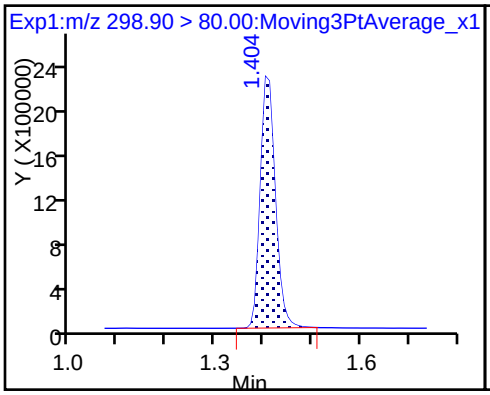
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 11

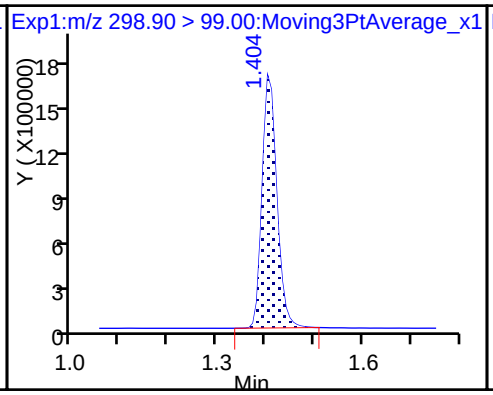
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

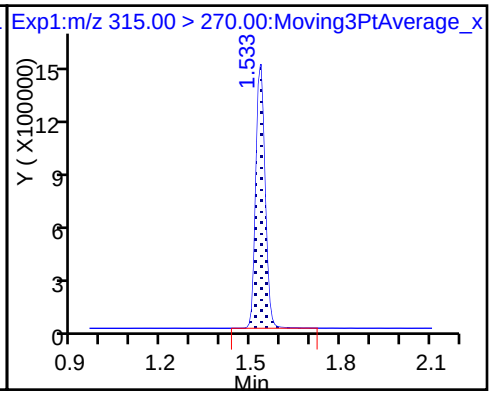
1 Perfluorobutanesulfonic acid



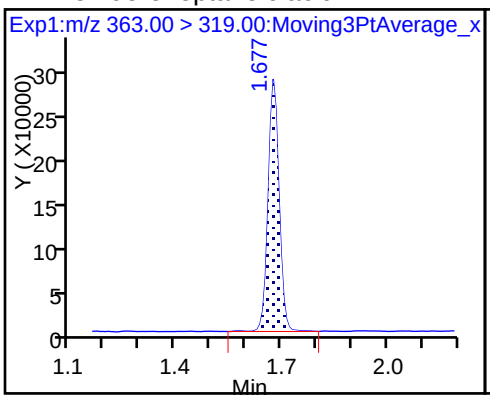
1 Perfluorobutanesulfonic acid



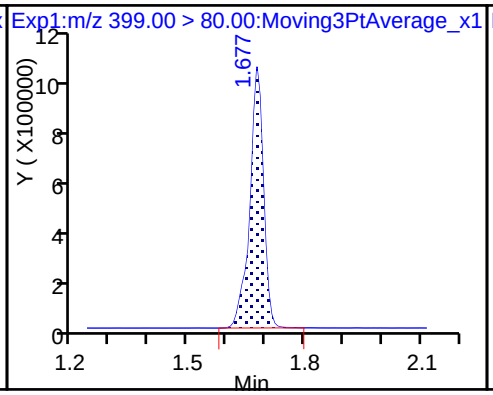
$ 2 13C2 PFHxA



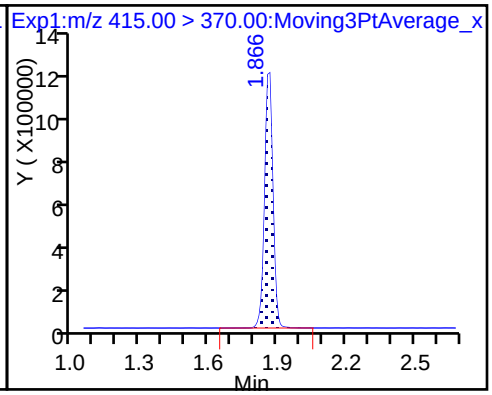
4 Perfluoroheptanoic acid



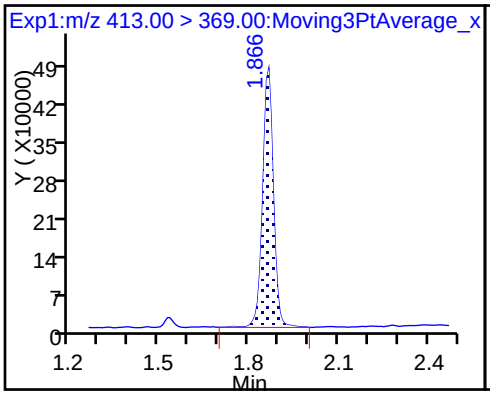
3 Perfluorohexanesulfonic acid



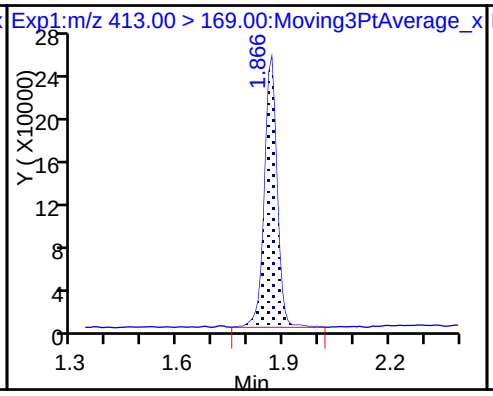
* 6 13C2-PFOA



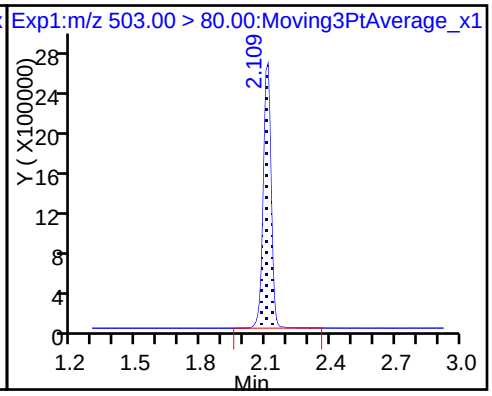
5 Perfluorooctanoic acid



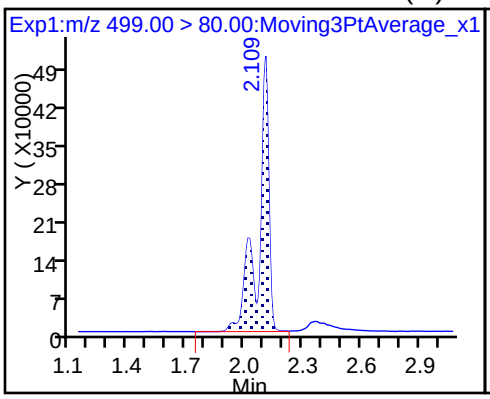
5 Perfluorooctanoic acid



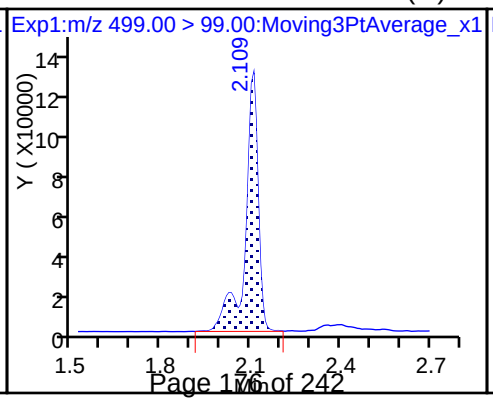
* 7 13C4 PFOS



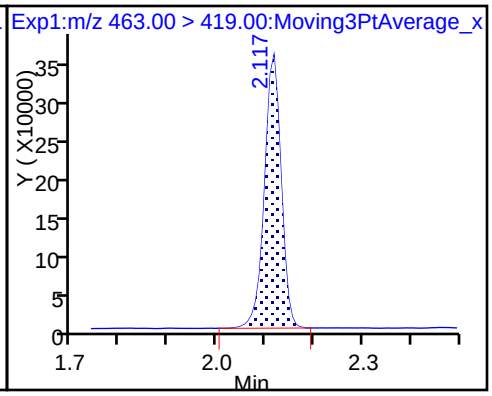
8 Perfluorooctane sulfonic acid (M)



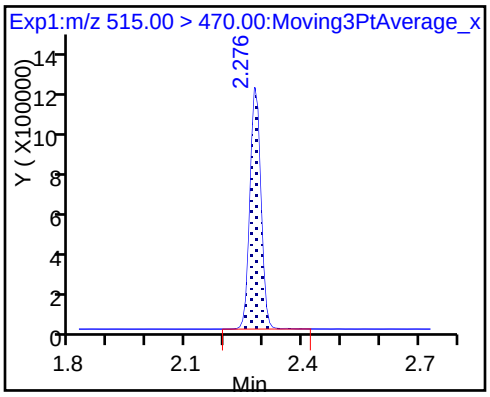
8 Perfluorooctane sulfonic acid (M)



9 Perfluorononanoic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.276
Y (X100000)
14
12
10
8
6
4
2
0
1.8
2.1
2.4
2.7
Min

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

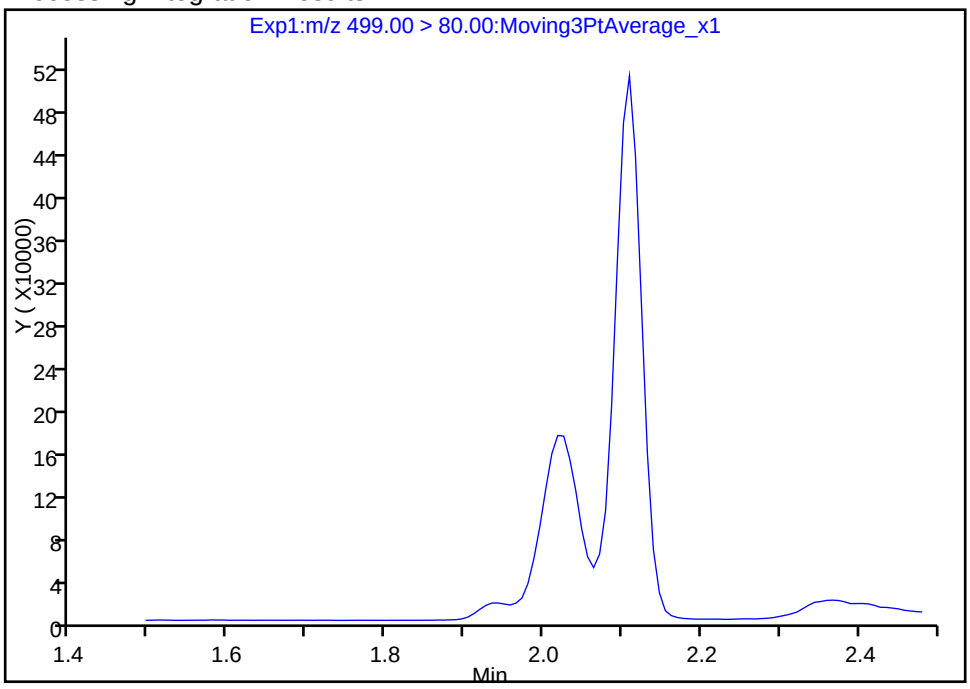
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_011.d
Injection Date: 31-Oct-2017 12:17:57 Instrument ID: A8_N
Lims ID: CCVL
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 11
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

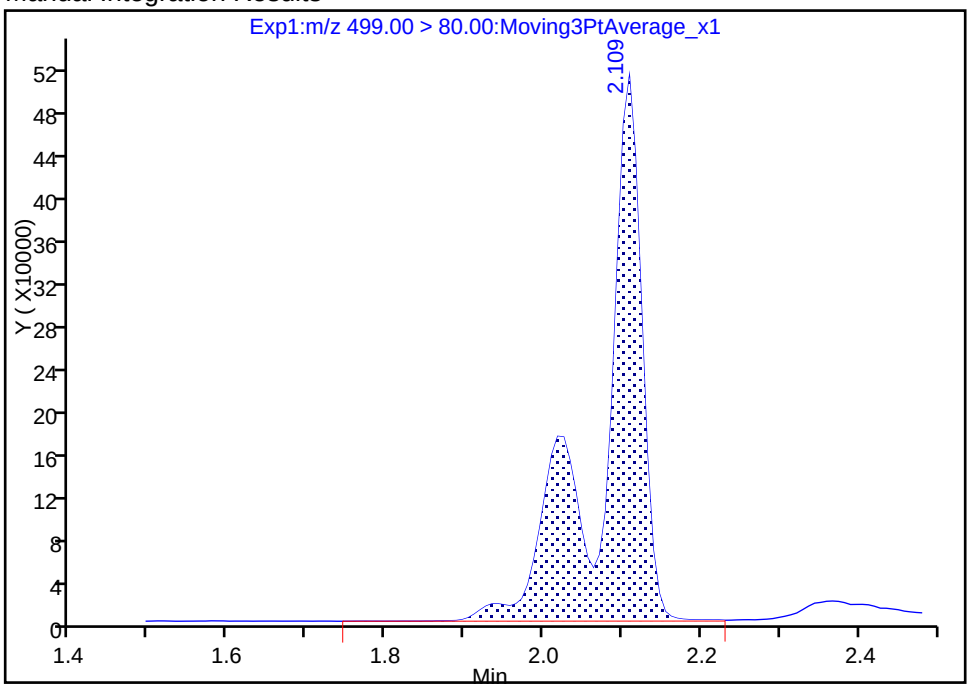
Not Detected
Expected RT: 2.11

Processing Integration Results



Manual Integration Results

RT: 2.11
Area: 1847034
Amount: 8.923891
Amount Units: ng/ml



Reviewer: barnettj, 31-Oct-2017 14:36:47
Audit Action: Assigned Compound ID Audit Reason: Missed Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

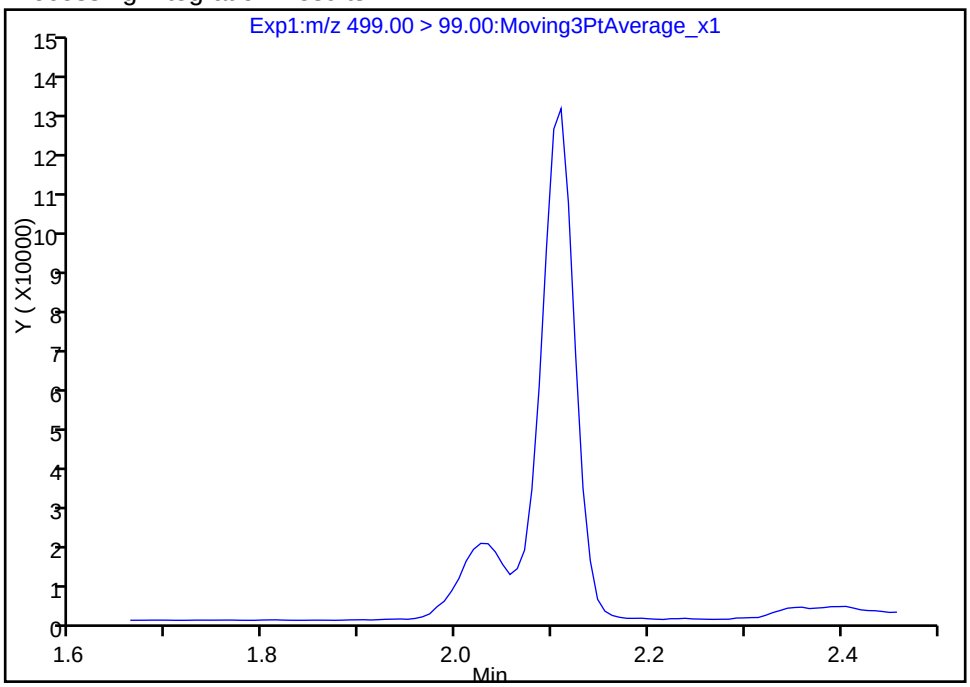
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_011.d
Injection Date: 31-Oct-2017 12:17:57 Instrument ID: A8_N
Lims ID: CCVL
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 11
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

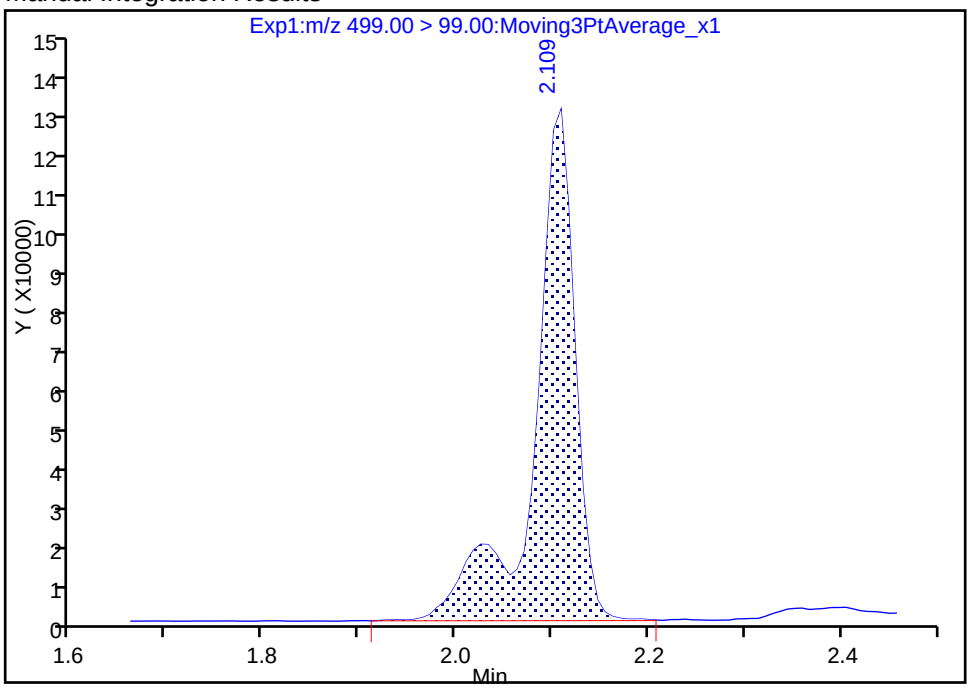
Not Detected
Expected RT: 2.11

Processing Integration Results



Manual Integration Results

RT: 2.11
Area: 381259
Amount: 8.923891
Amount Units: ng/ml



Reviewer: barnettj, 31-Oct-2017 14:37:04
Audit Action: Manually Integrated Audit Reason: Missed Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

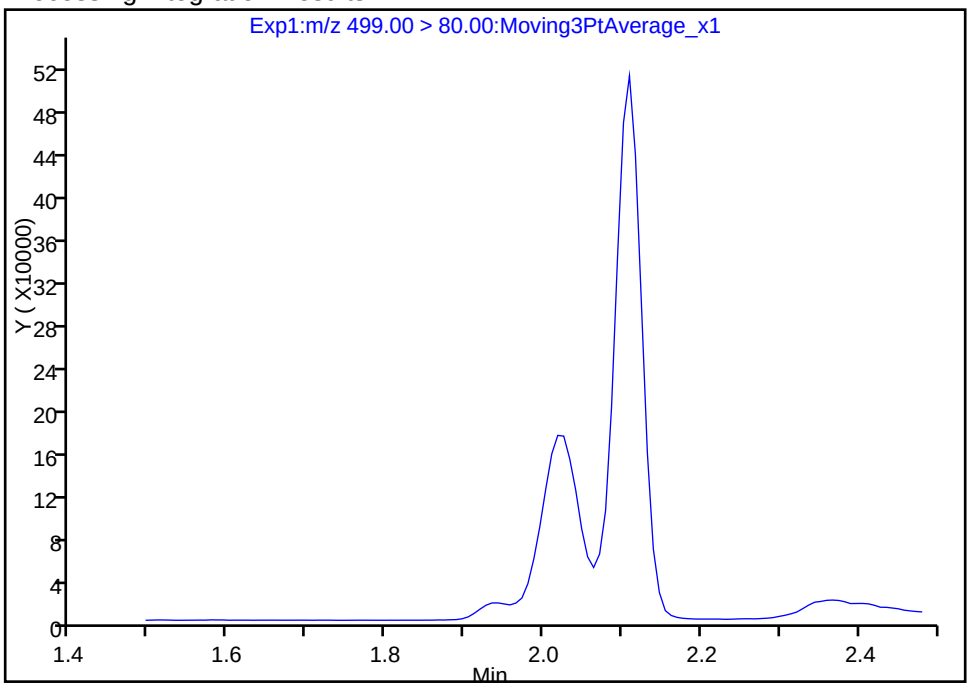
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_011.d
Injection Date: 31-Oct-2017 12:17:57 Instrument ID: A8_N
Lims ID: CCVL
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 11
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

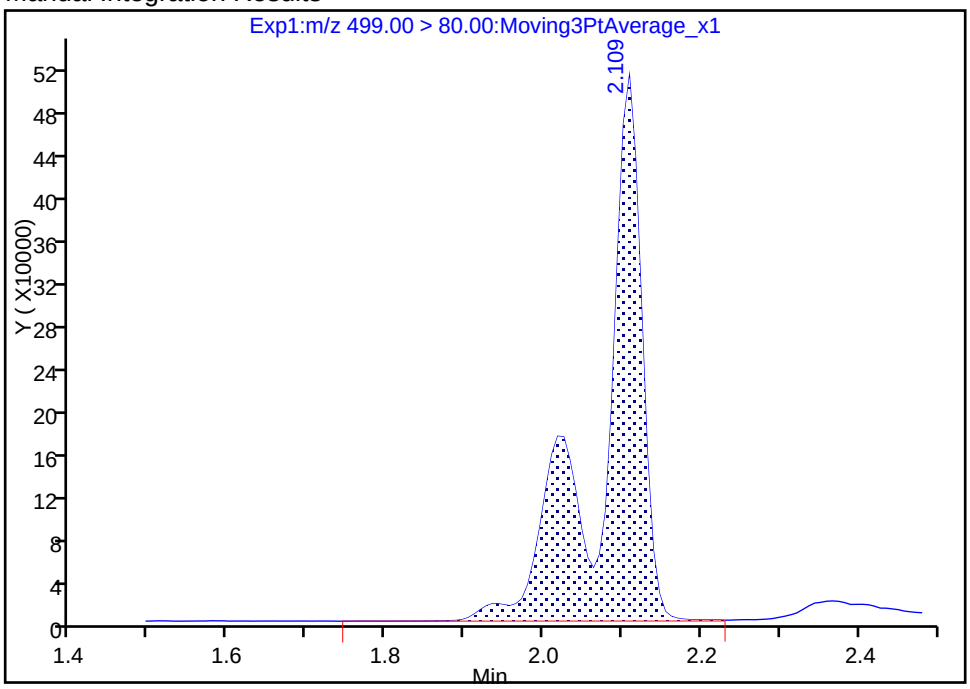
Processing Integration Results

Not Detected
Expected RT: 2.11



Manual Integration Results

RT: 2.11
Area: 1847034
Amount: 8.923891
Amount Units: ng/ml



Reviewer: barnettj, 31-Oct-2017 14:37:04
Audit Action: Manually Integrated Audit Reason: Missed Peak

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-32528-1

SDG No.:

Lab Sample ID: ICV 320-192162/16 Calibration Date: 10/31/2017 14:58

Instrument ID: A8_N Calib Start Date: 10/31/2017 11:44

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 10/31/2017 12:08

Lab File ID: 2017.10.31_537AICAL_003.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		0.7489		82.4	100	-17.7	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9408	0.8366		8.89	10.0	-11.1	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.629	1.474		18.2	20.1	-9.5	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9301	0.8041		17.7	20.5	-13.5	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9283	0.8488		18.0	19.7	-8.6	30.0
Perfluorononanoic acid (PFNA)	Ave	0.6527	0.6148		19.0	20.1	-5.8	30.0
13C2 PFHxA	Ave	1.129	1.069		9.47	10.0	-5.3	30.0
13C2 PFDA	Ave	0.8094	0.7781		9.61	10.0	-3.9	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537AICAL_003.d
Lims ID: ICV
Client ID:
Sample Type: ICV
Inject. Date: 31-Oct-2017 14:58:42 ALS Bottle#: 7 Worklist Smp#: 16
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\20171031-49808.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 31-Oct-2017 15:26:10 Calib Date: 31-Oct-2017 12:08:27
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK004

First Level Reviewer: barnettj Date: 31-Oct-2017 15:13:20

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.411	1.405	0.006	1.000	17157551	82.4		3502	
298.90 > 99.00	1.411	1.405	0.006	1.000	12954498		1.32(0.00-0.00)	4512	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.533	1.528	0.005	1.000	3000464	9.47		5827	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.677	1.677	0.0	1.000	2347598	8.89		509	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.677	1.678	-0.001	1.000	6771103	18.2		4918	
* 6 13C2-PFOA									
415.00 > 370.00	1.866	1.863	0.003		2807375	10.0		3695	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.866	1.864	0.002	1.000	4624349	17.7		288	
413.00 > 169.00	1.866	1.864	0.002	1.000	2450141		1.89(0.00-0.00)	377	
* 7 13C4 PFOS									
503.00 > 80.00	2.109	2.107	0.002		6562646	28.7		4663	
8 Perfluorooctane sulfonic acid									M
499.00 > 80.00	2.109	2.109	0.0	1.000	3825846	18.0		529	M
499.00 > 99.00	2.109	2.109	0.0	1.000	748921		5.11(0.00-0.00)	558	M
9 Perfluorononanoic acid									
463.00 > 419.00	2.117	2.116	0.001	1.000	3473716	19.0		695	
$ 10 13C2 PFDA									
515.00 > 470.00	2.276	2.277	-0.001	1.000	2184301	9.61		6529	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-ICV_00028 Amount Added: 1.00 Units: mL

Report Date: 31-Oct-2017 15:26:11 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537AICAL_003.d

Injection Date: 31-Oct-2017 14:58:42 Instrument ID: A8_N

Lims ID: ICV

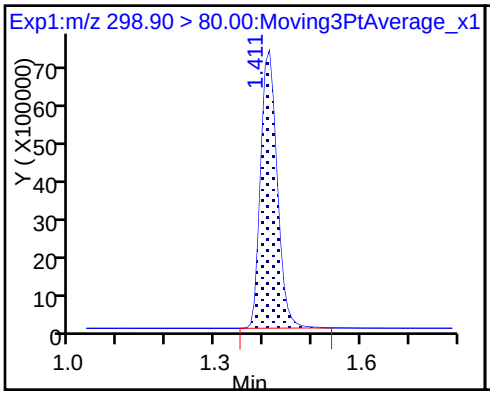
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 7 Worklist Smp#: 16

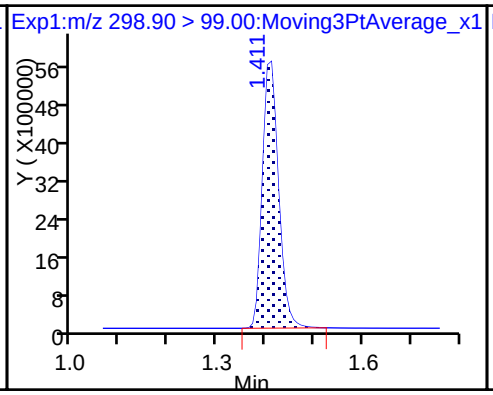
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

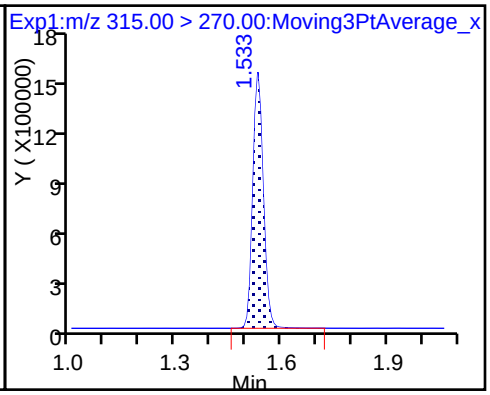
1 Perfluorobutanesulfonic acid



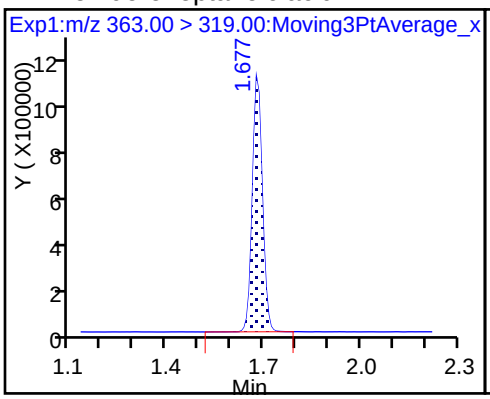
1 Perfluorobutanesulfonic acid



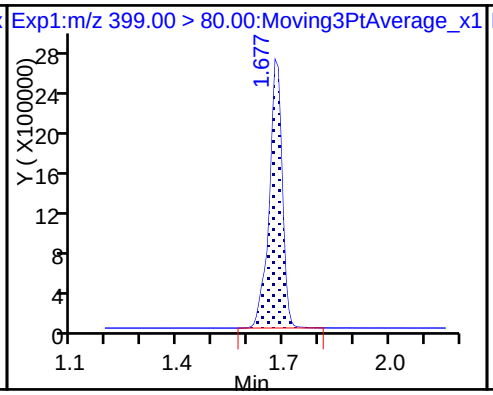
$ 2 13C2 PFHxA



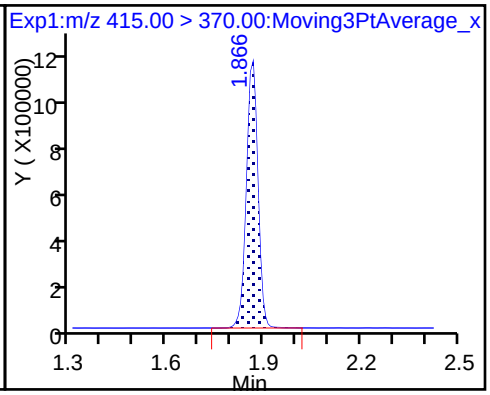
4 Perfluoroheptanoic acid



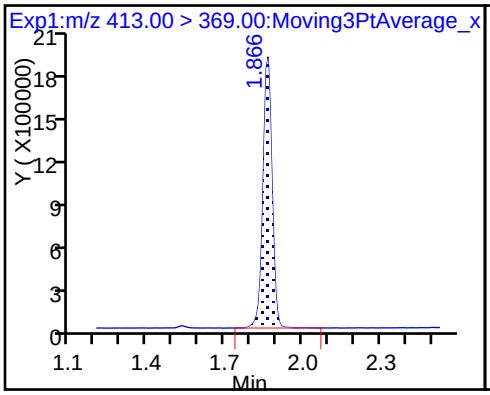
3 Perfluorohexanesulfonic acid



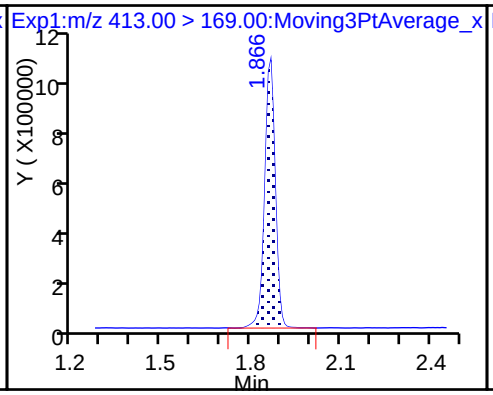
* 6 13C2-PFOA



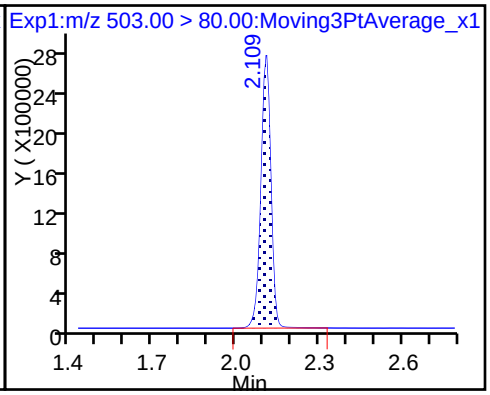
5 Perfluorooctanoic acid



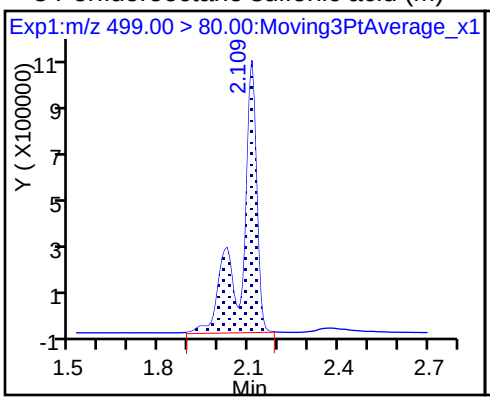
5 Perfluorooctanoic acid



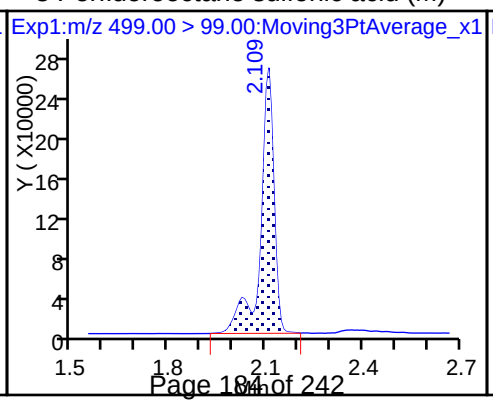
* 7 13C4 PFOS



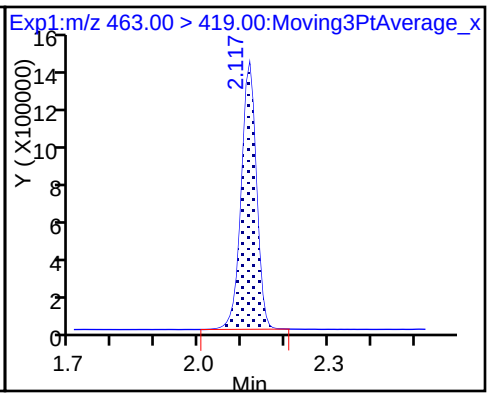
8 Perfluorooctane sulfonic acid (M)



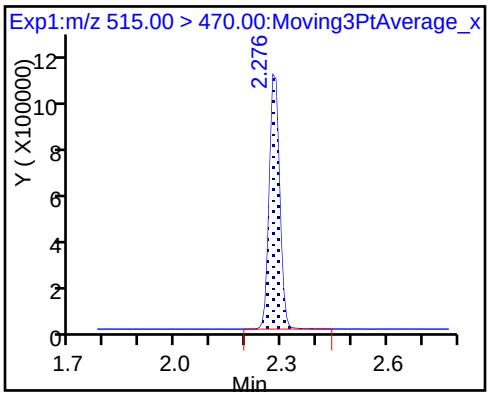
8 Perfluorooctane sulfonic acid (M)



9 Perfluorononanoic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.276
Y (X100000)
12
10
8
6
4
2
0
1.7
2.0
2.3
2.6
Min

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

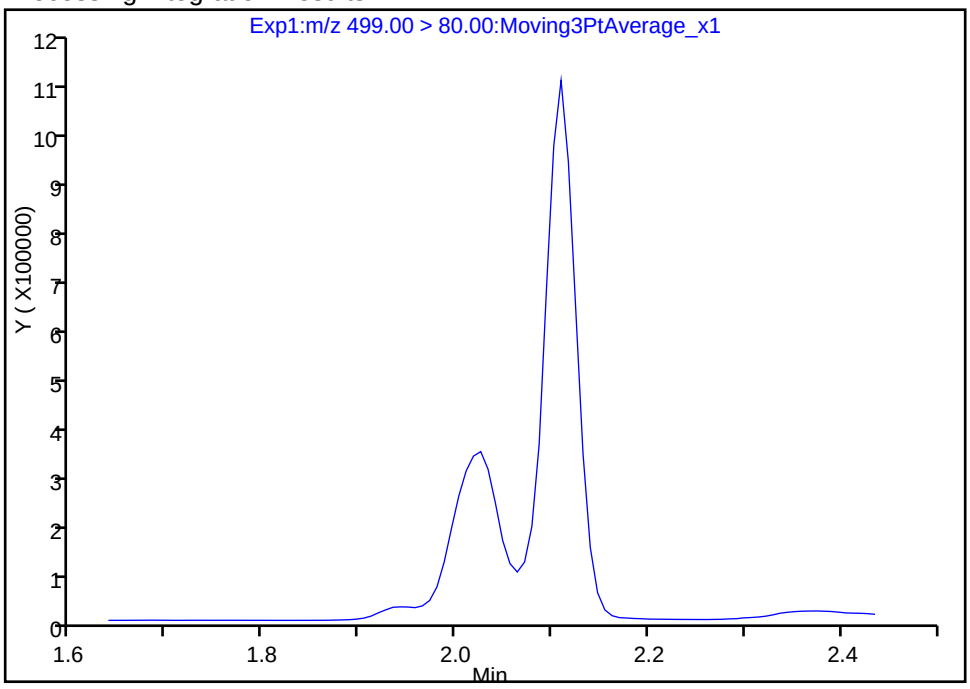
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537AICAL_003.d
Injection Date: 31-Oct-2017 14:58:42 Instrument ID: A8_N
Lims ID: ICV
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 7 Worklist Smp#: 16
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

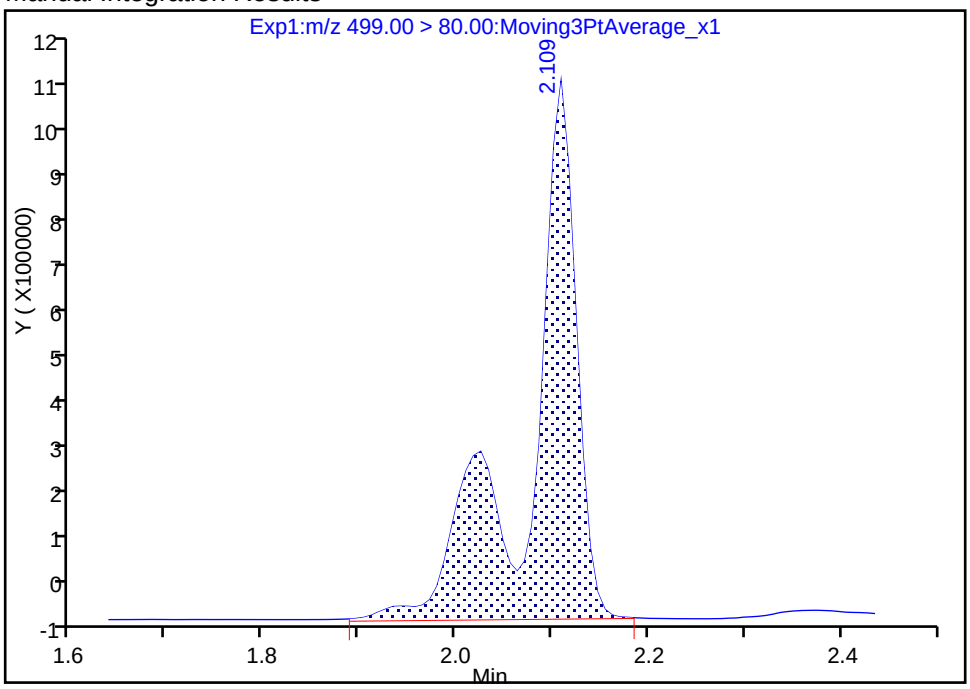
Not Detected
Expected RT: 2.11

Processing Integration Results



Manual Integration Results

RT: 2.11
Area: 3825846
Amount: 18.011653
Amount Units: ng/ml



Reviewer: barnettj, 31-Oct-2017 15:07:46
Audit Action: Assigned Compound ID Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

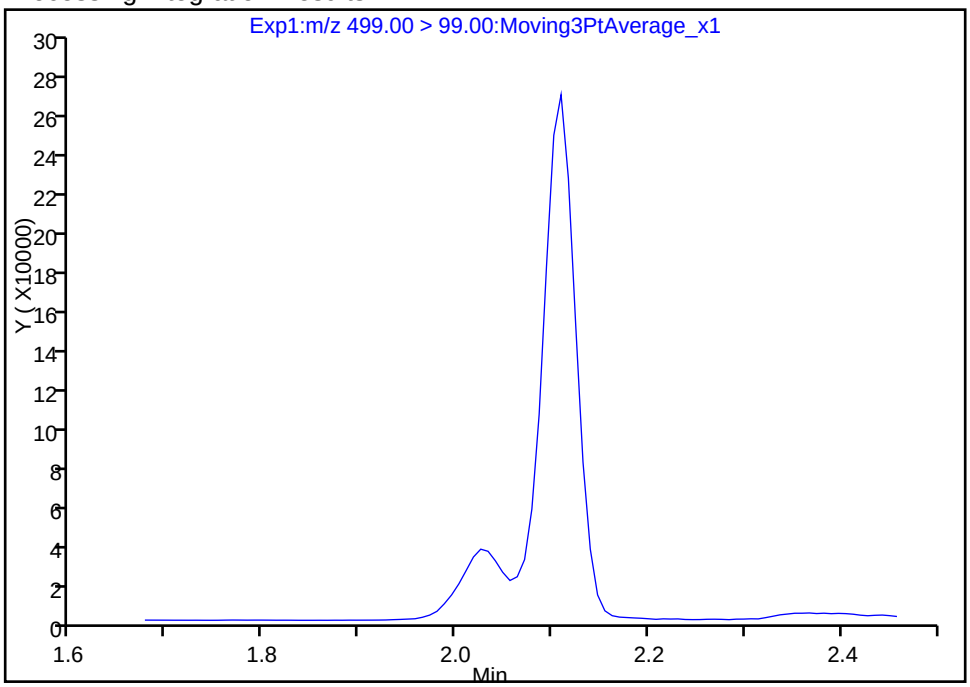
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537AICAL_003.d
Injection Date: 31-Oct-2017 14:58:42 Instrument ID: A8_N
Lims ID: ICV
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 7 Worklist Smp#: 16
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

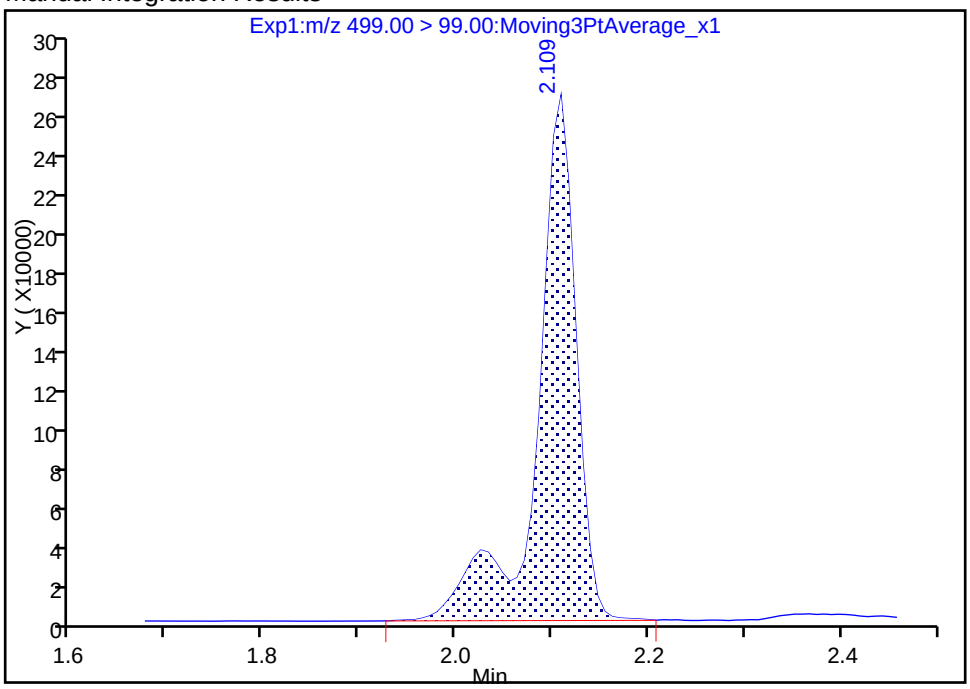
Not Detected
Expected RT: 2.11

Processing Integration Results



Manual Integration Results

RT: 2.11
Area: 748921
Amount: 18.011653
Amount Units: ng/ml



Reviewer: barnettj, 31-Oct-2017 15:08:57
Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

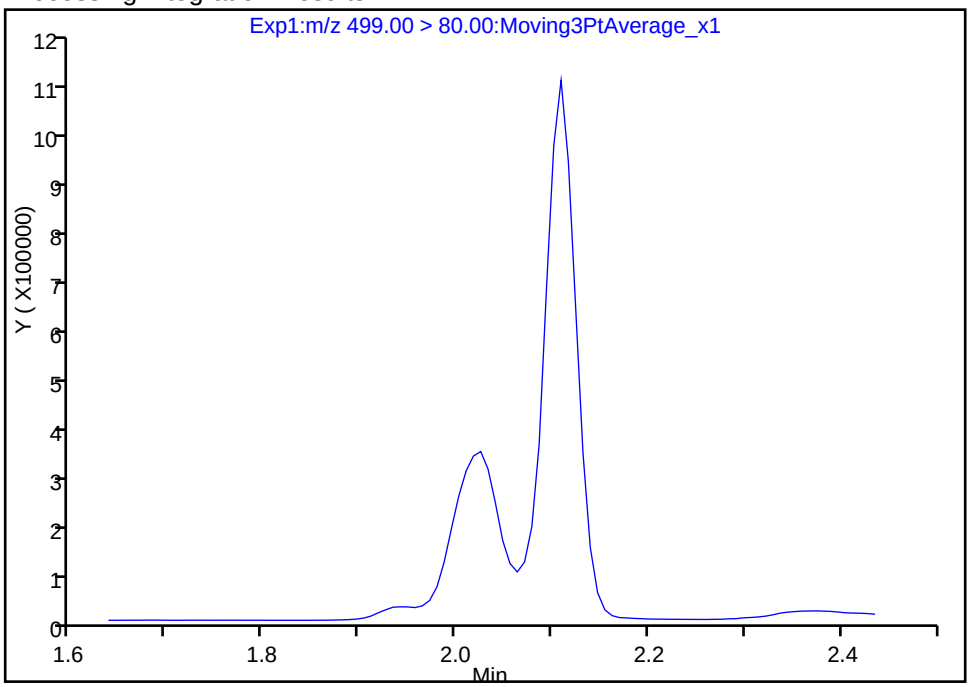
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537AICAL_003.d
Injection Date: 31-Oct-2017 14:58:42 Instrument ID: A8_N
Lims ID: ICV
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 7 Worklist Smp#: 16
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

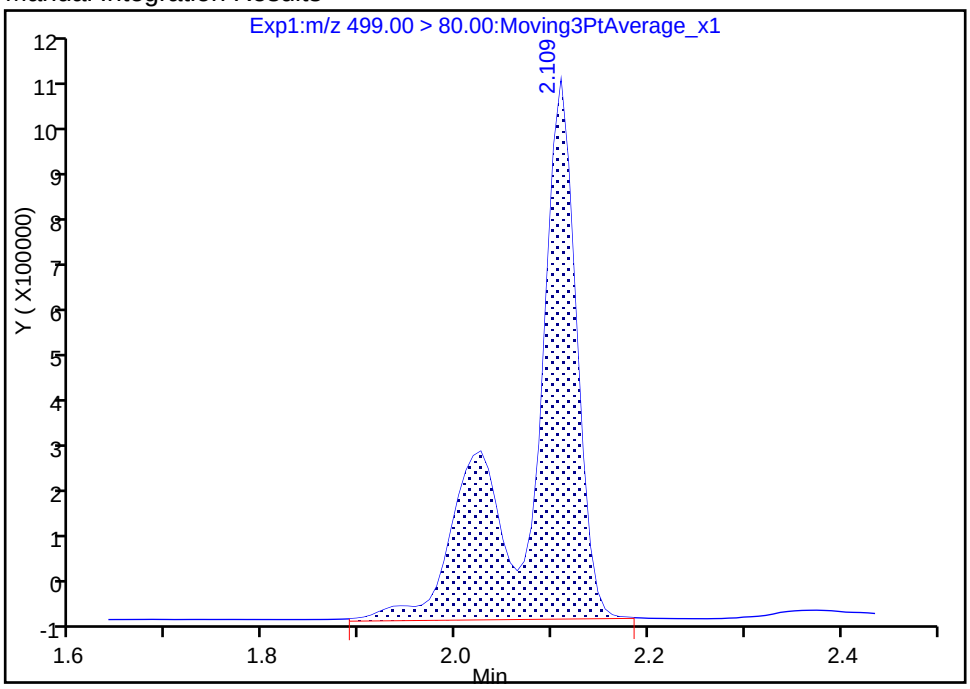
Not Detected
Expected RT: 2.11

Processing Integration Results



Manual Integration Results

RT: 2.11
Area: 3825846
Amount: 18.011653
Amount Units: ng/ml



Reviewer: barnettj, 31-Oct-2017 15:08:57
Audit Action: Manually Integrated Audit Reason: Isomers

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-32528-1

SDG No.:

Lab Sample ID: CCV 320-192277/1 Calibration Date: 10/31/2017 17:16

Instrument ID: A8_N Calib Start Date: 10/31/2017 11:44

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 10/31/2017 12:08

Lab File ID: 2017.10.31_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		1.038		47.8	45.0	6.2	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9408	0.9313		4.95	5.00	-1.0	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.629	1.735		16.0	15.0	6.5	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9301	0.8914		9.59	10.0	-4.2	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9283	0.9413		20.3	20.0	1.4	30.0
Perfluorononanoic acid (PFNA)	Ave	0.6527	0.6434		9.86	10.0	-1.4	30.0
13C2 PFHxA	Ave	1.129	1.074		9.52	10.0	-4.8	30.0
13C2 PFDA	Ave	0.8094	0.8032		9.92	10.0	-0.8	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\2017.10.31_537C_001.d
Lims ID: CCV L3
Client ID:
Sample Type: CCVIS
Inject. Date: 31-Oct-2017 17:16:19 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\20171101-49829.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 01-Nov-2017 10:58:24 Calib Date: 31-Oct-2017 12:08:27
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK027

First Level Reviewer: hannigana Date: 01-Nov-2017 09:45:56

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.404	1.405	-0.001	1.000	9563987	47.8		2302	
298.90 > 99.00	1.404	1.405	-0.001	1.000	7149716		1.34(0.00-0.00)	3441	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.525	1.528	-0.003	1.000	2938250	9.52		4232	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.669	1.677	-0.008	1.000	1274381	4.95		311	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.669	1.678	-0.009	1.000	5329366	16.0		3581	
* 6 13C2-PFOA									
415.00 > 370.00	1.851	1.863	-0.012		2736266	10.0		3517	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.851	1.864	-0.013	1.000	2441012	9.59		193	
413.00 > 169.00	1.851	1.864	-0.013	1.000	1304211		1.87(0.00-0.00)	270	
8 Perfluorooctane sulfonic acid									M
499.00 > 80.00	2.094	2.094	0.0	1.000	3855122	20.3		495	M
499.00 > 99.00	2.094	2.094	0.0	1.000	805289		4.79(0.00-0.00)	586	M
* 7 13C4 PFOS									
503.00 > 80.00	2.094	2.107	-0.013		5871567	28.7		3698	
9 Perfluorononanoic acid									
463.00 > 419.00	2.102	2.116	-0.014	1.000	1760698	9.86		361	
$ 10 13C2 PFDA									
515.00 > 470.00	2.269	2.277	-0.009	1.000	2197747	9.92		5913	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L3_00023 Amount Added: 1.00 Units: mL

Report Date: 01-Nov-2017 10:58:24 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\2017.10.31_537C_001.d

Injection Date: 31-Oct-2017 17:16:19 Instrument ID: A8_N

Lims ID: CCV L3

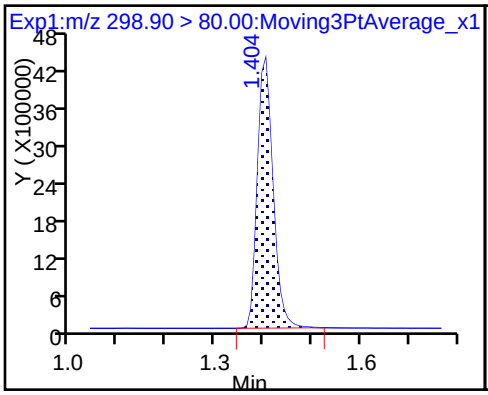
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 1

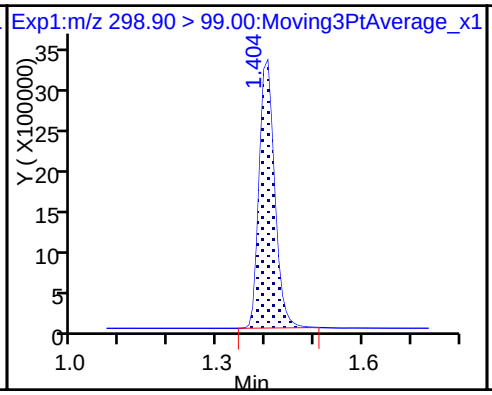
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

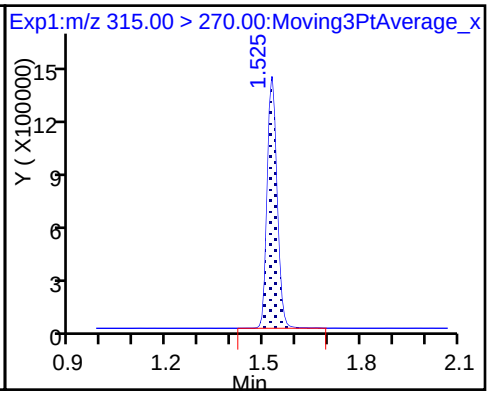
1 Perfluorobutanesulfonic acid



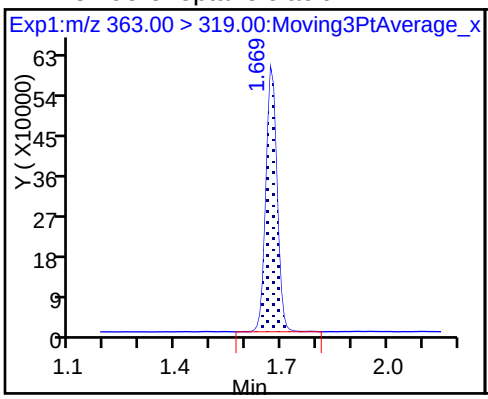
1 Perfluorobutanesulfonic acid



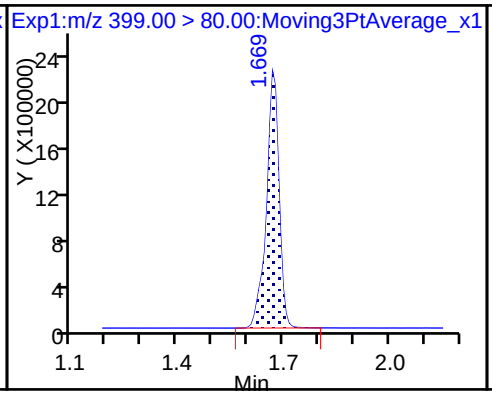
$ 2 13C2 PFHxA



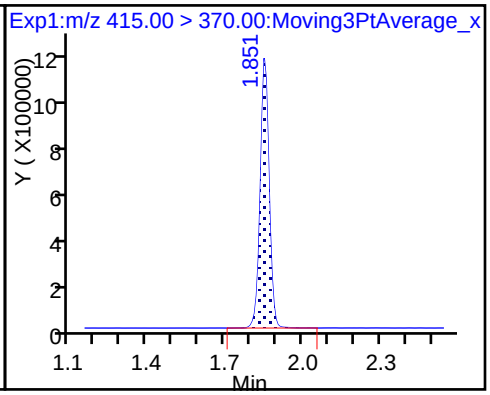
4 Perfluoroheptanoic acid



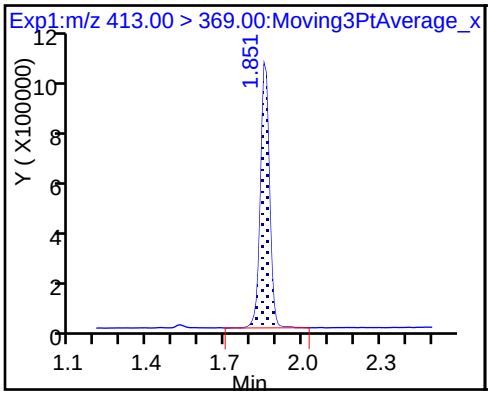
3 Perfluorohexanesulfonic acid



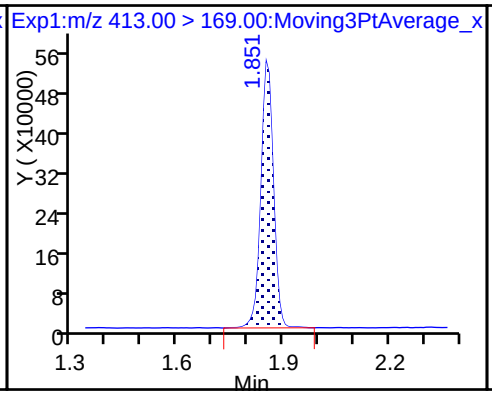
* 6 13C2-PFOA



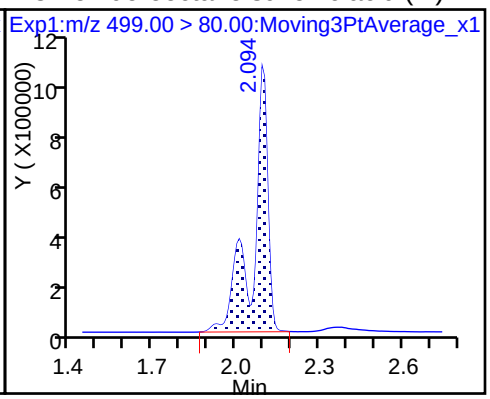
5 Perfluorooctanoic acid



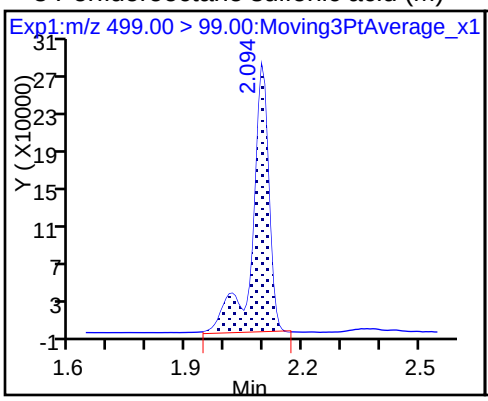
5 Perfluorooctanoic acid



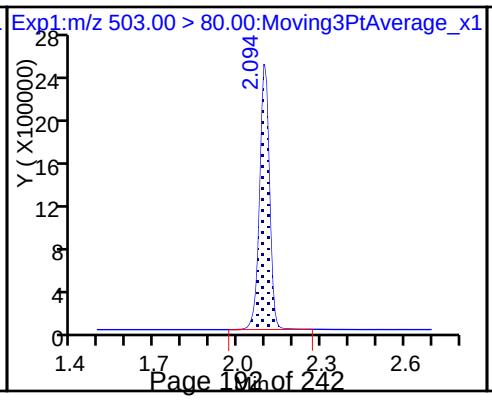
8 Perfluorooctane sulfonic acid (M)



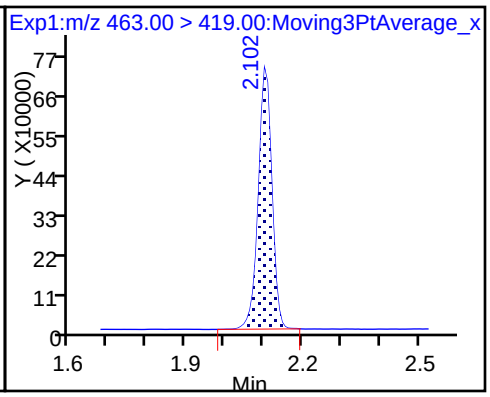
8 Perfluorooctane sulfonic acid (M)



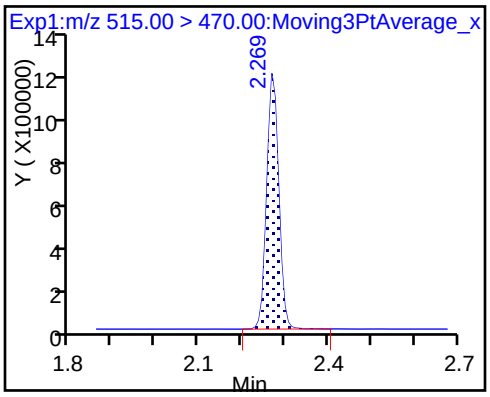
* 7 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.269
Y (X100000)
14
12
10
8
6
4
2
0
1.8
2.1
2.4
2.7
Min

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

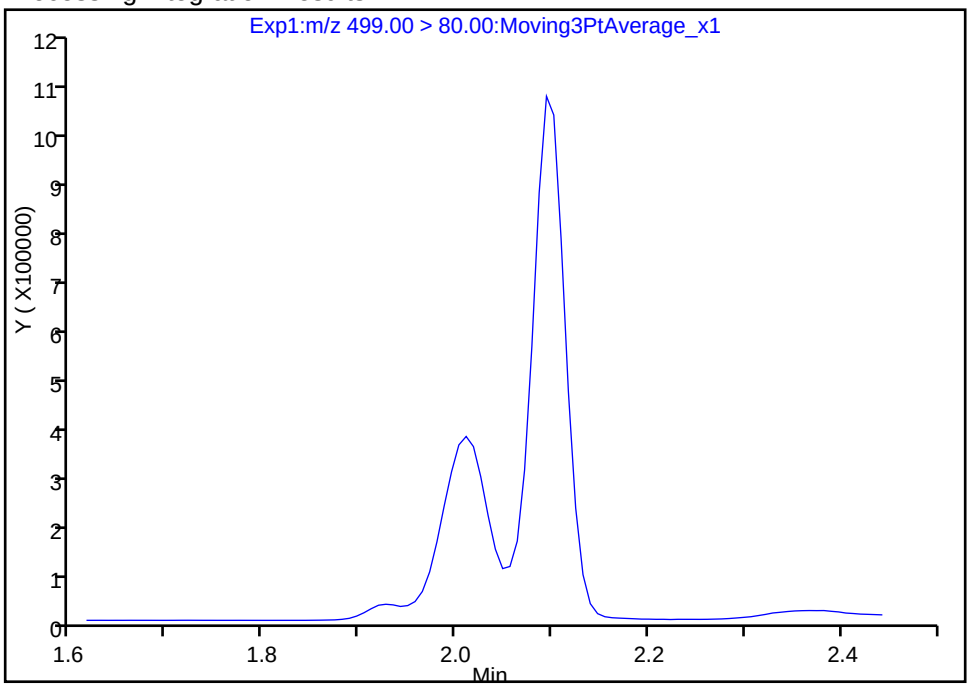
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\2017.10.31_537C_001.d
Injection Date: 31-Oct-2017 17:16:19 Instrument ID: A8_N
Lims ID: CCV L3
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

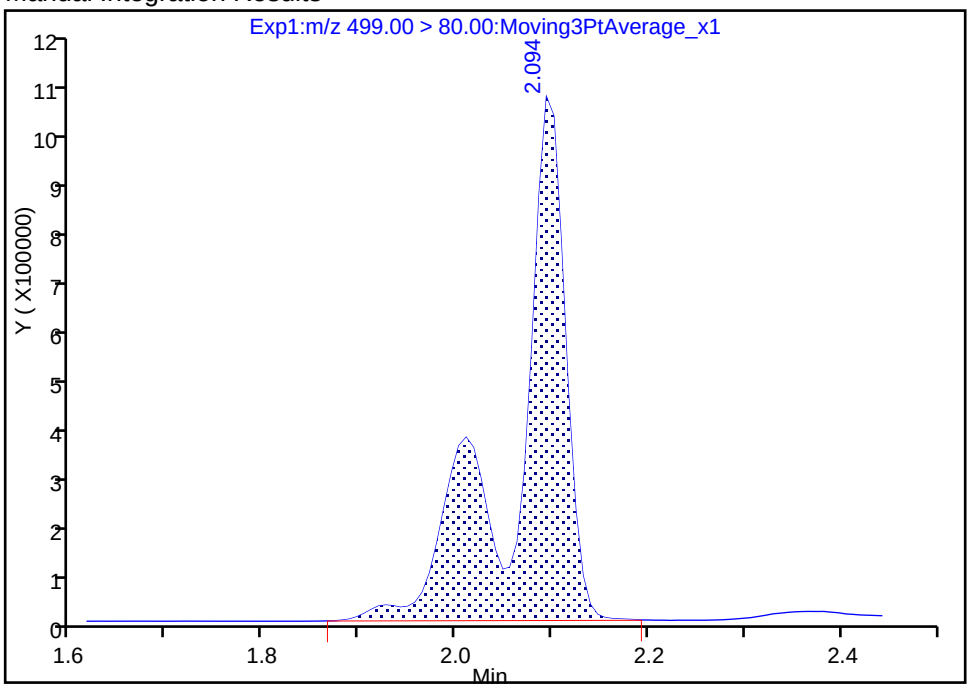
Not Detected
Expected RT: 2.09

Processing Integration Results



Manual Integration Results

RT: 2.09
Area: 3855122
Amount: 20.285661
Amount Units: ng/ml



Reviewer: hannigana, 01-Nov-2017 09:41:26
Audit Action: Assigned Compound ID Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

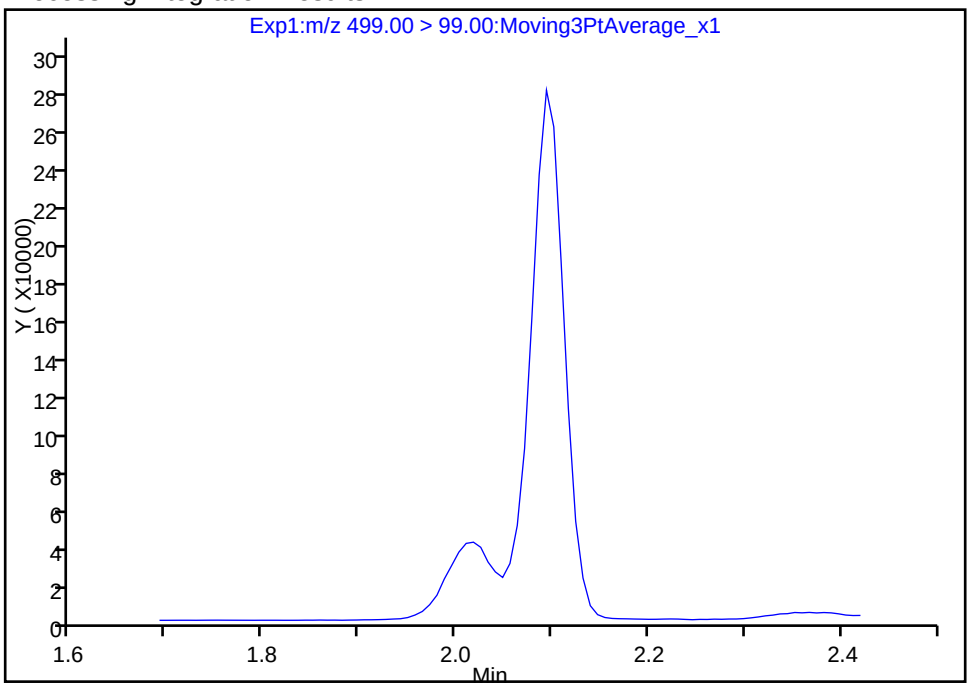
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\2017.10.31_537C_001.d
Injection Date: 31-Oct-2017 17:16:19 Instrument ID: A8_N
Lims ID: CCV L3
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

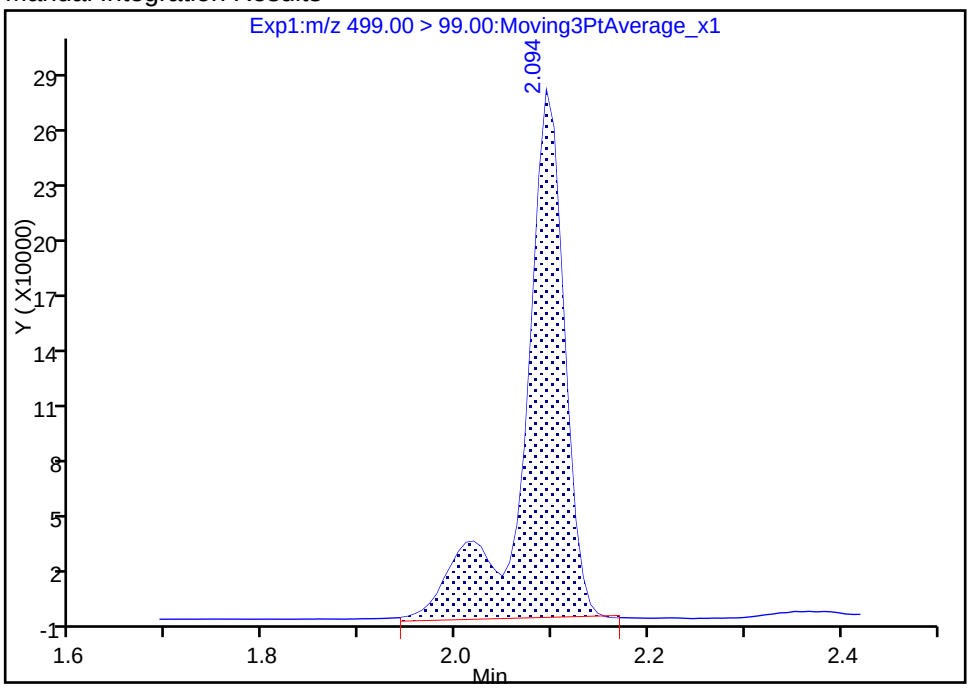
Not Detected
Expected RT: 2.09

Processing Integration Results



Manual Integration Results

RT: 2.09
Area: 805289
Amount: 20.285661
Amount Units: ng/ml



Reviewer: hannigana, 01-Nov-2017 09:42:03
Audit Action: Manually Integrated Audit Reason: Assign Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

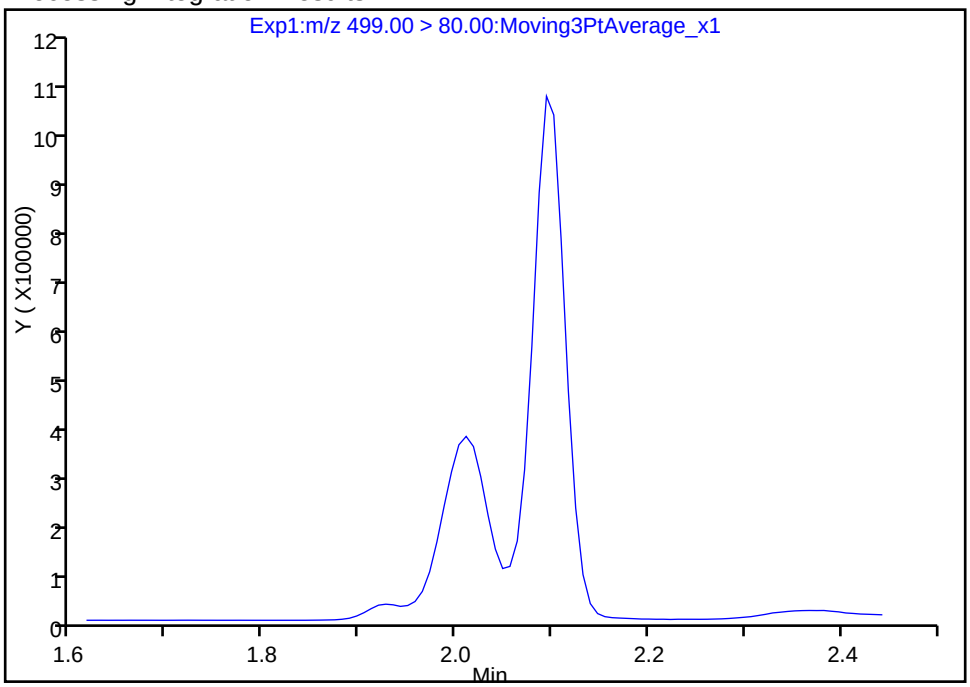
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\2017.10.31_537C_001.d
Injection Date: 31-Oct-2017 17:16:19 Instrument ID: A8_N
Lims ID: CCV L3
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

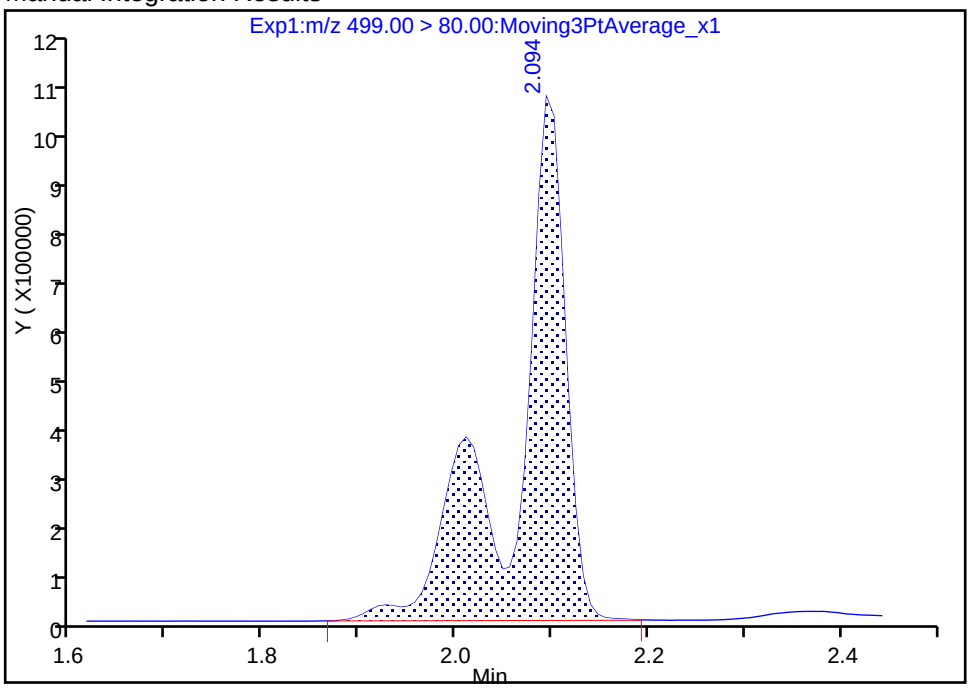
Not Detected
Expected RT: 2.09

Processing Integration Results



Manual Integration Results

RT: 2.09
Area: 3855122
Amount: 20.285661
Amount Units: ng/ml



Reviewer: hannigana, 01-Nov-2017 09:42:03
Audit Action: Manually Integrated Audit Reason: Assign Peak

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-32528-1

SDG No.:

Lab Sample ID: CCV 320-192277/10 Calibration Date: 10/31/2017 17:59

Instrument ID: A8_N Calib Start Date: 10/31/2017 11:44

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 10/31/2017 12:08

Lab File ID: 2017.10.31_537C_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		0.7669		125	135	-7.1	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9408	0.9197		14.7	15.0	-2.2	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.629	1.564		43.2	45.0	-4.0	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9301	0.9192		29.7	30.0	-1.2	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9283	0.9333		60.3	60.0	0.5	30.0
Perfluorononanoic acid (PFNA)	Ave	0.6527	0.6543		30.1	30.0	0.3	30.0
13C2 PFHxA	Ave	1.129	1.145		10.1	10.0	1.5	30.0
13C2 PFDA	Ave	0.8094	0.8077		9.98	10.0	-0.2	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\2017.10.31_537C_010.d
Lims ID: CCV L5
Client ID:
Sample Type: CCVIS
Inject. Date: 31-Oct-2017 17:59:10 ALS Bottle#: 5 Worklist Smp#: 10
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\20171101-49829.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 01-Nov-2017 10:58:36 Calib Date: 31-Oct-2017 12:08:27
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK027

First Level Reviewer: barnettj Date: 01-Nov-2017 10:39:25

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.404	1.405	-0.001	1.000	22386185	125.4		3340	
298.90 > 99.00	1.404	1.405	-0.001	1.000	17594633		1.27(0.00-0.00)	4399	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.525	1.528	-0.003	1.000	3266354	10.1		5162	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.677	1.677	0.0	1.000	3936707	14.7		849	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.677	1.678	-0.001	1.000	15219351	43.2		5375	
* 6 13C2-PFOA									
415.00 > 370.00	1.859	1.863	-0.004		2852910	10.0		3847	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.859	1.864	-0.005	1.000	7873676	29.7		626	
413.00 > 169.00	1.859	1.864	-0.005	1.000	4126828		1.91(0.00-0.00)	883	
8 Perfluorooctane sulfonic acid									M
499.00 > 80.00	2.102	2.094	0.008	1.000	12110391	60.3		1271	M
499.00 > 99.00	2.102	2.094	0.008	1.000	2495876		4.85(0.00-0.00)	1430	M
* 7 13C4 PFOS									
503.00 > 80.00	2.102	2.107	-0.005		6200813	28.7		4571	
9 Perfluorononanoic acid									
463.00 > 419.00	2.109	2.116	-0.007	1.000	5601204	30.1		1007	
$ 10 13C2 PFDA									
515.00 > 470.00	2.276	2.277	-0.001	1.000	2304418	9.98		6834	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L5_00024 Amount Added: 1.00 Units: mL

Report Date: 01-Nov-2017 10:58:37 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\2017.10.31_537C_010.d

Injection Date: 31-Oct-2017 17:59:10 Instrument ID: A8_N

Lims ID: CCV L5

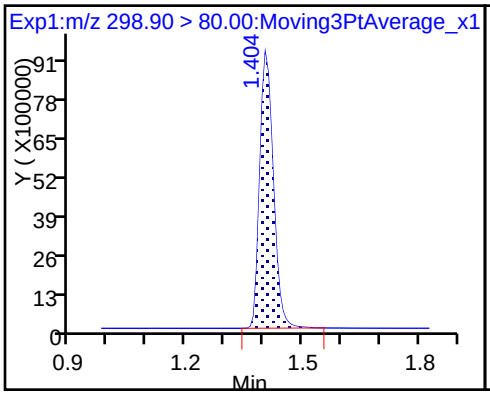
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 10

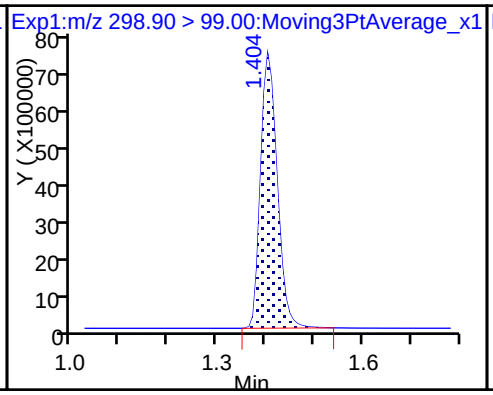
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

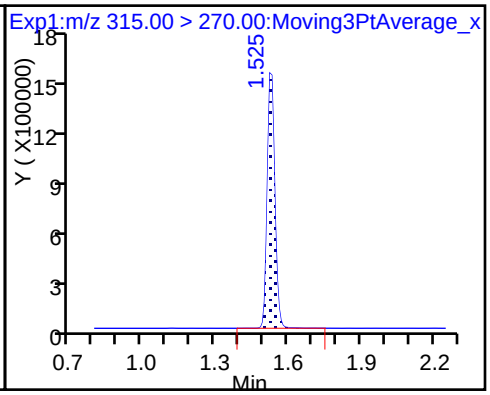
1 Perfluorobutanesulfonic acid



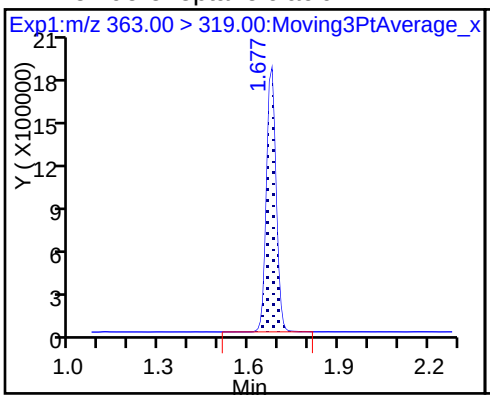
1 Perfluorobutanesulfonic acid



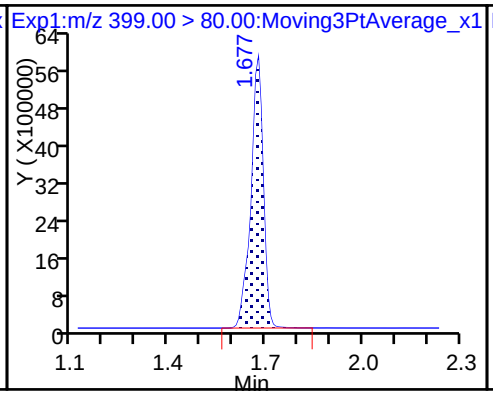
$ 2 13C2 PFHxA



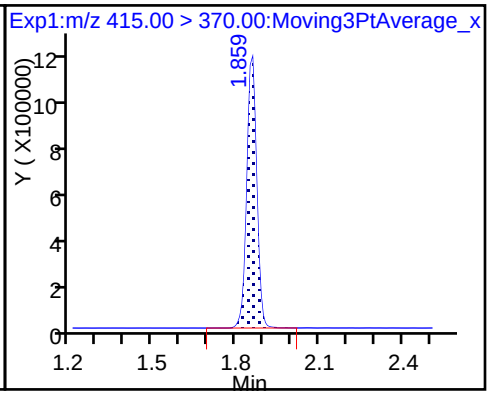
4 Perfluoroheptanoic acid



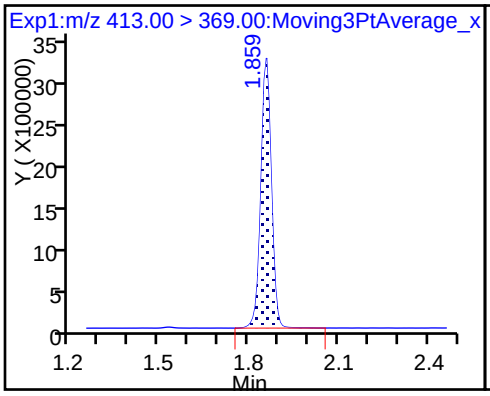
3 Perfluorohexanesulfonic acid



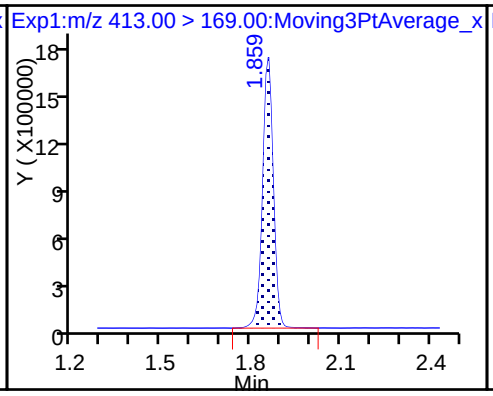
* 6 13C2-PFOA



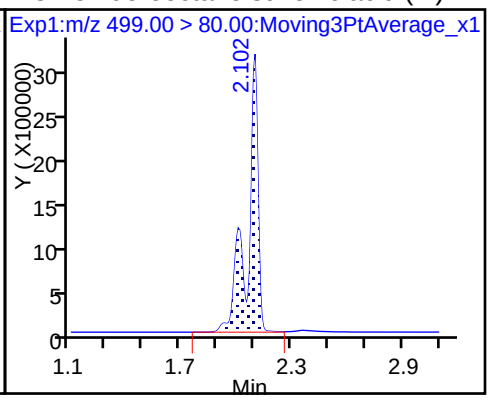
5 Perfluorooctanoic acid



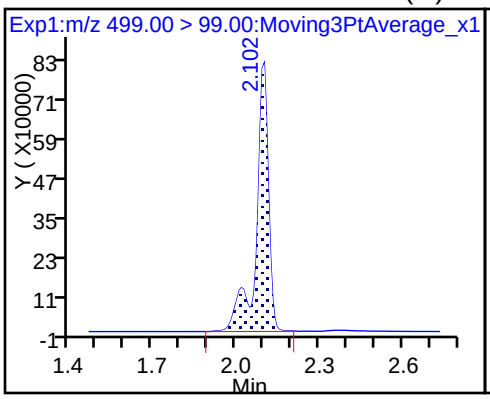
5 Perfluorooctanoic acid



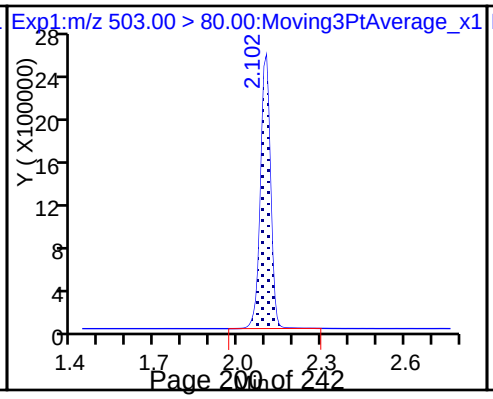
8 Perfluorooctane sulfonic acid (M)



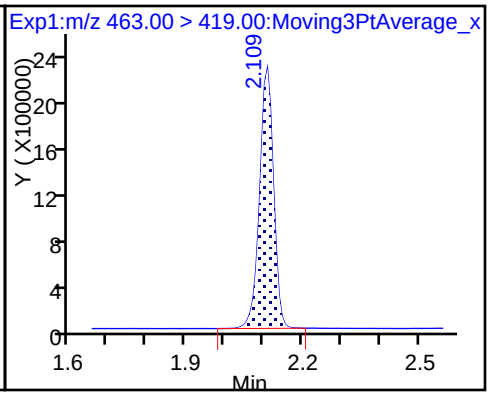
8 Perfluorooctane sulfonic acid (M)



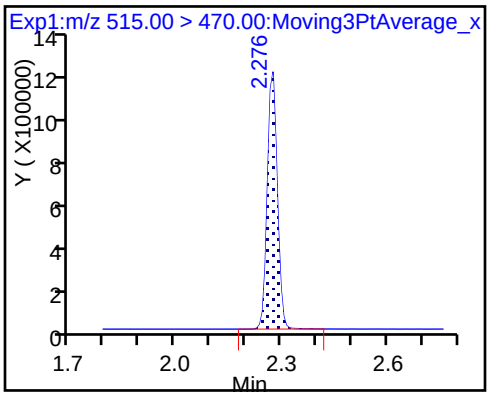
* 7 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.276
Y (X100000)
14
12
10
8
6
4
2
0
1.7
2.0
2.3
2.6
Min

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

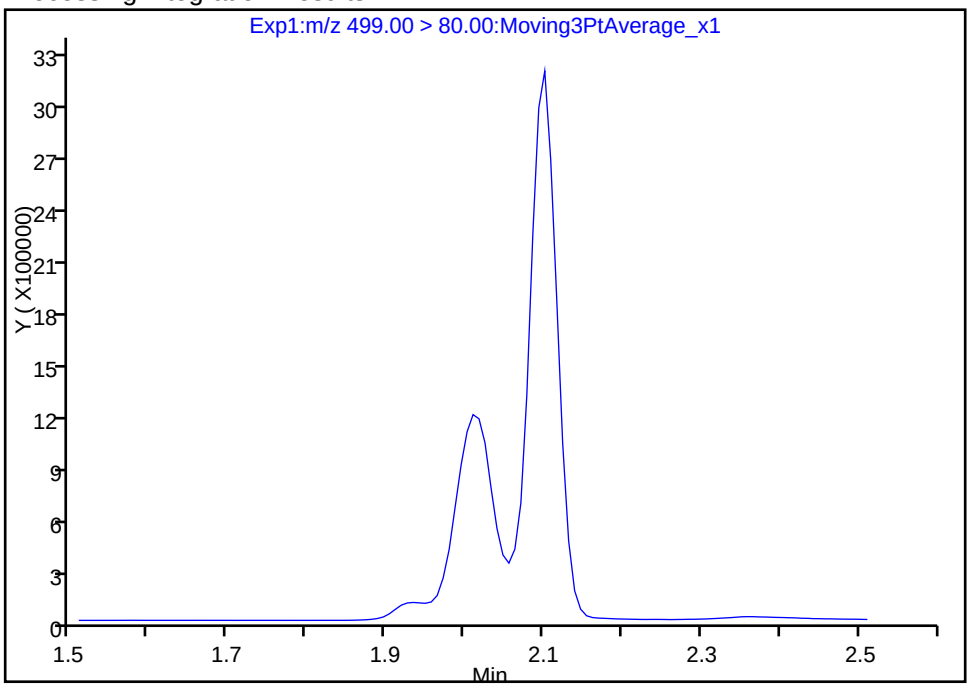
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\2017.10.31_537C_010.d
Injection Date: 31-Oct-2017 17:59:10 Instrument ID: A8_N
Lims ID: CCV L5
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 10
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

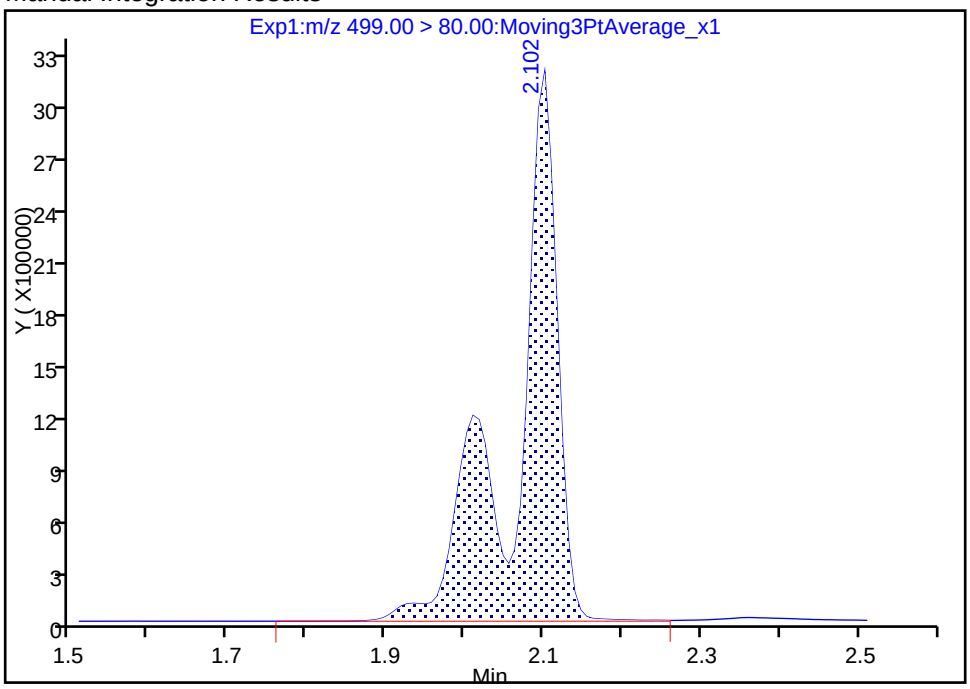
Not Detected
Expected RT: 2.09

Processing Integration Results



Manual Integration Results

RT: 2.10
Area: 12110391
Amount: 60.341290
Amount Units: ng/ml



Reviewer: barnettj, 01-Nov-2017 10:39:04
Audit Action: Assigned Compound ID Audit Reason: Missed Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

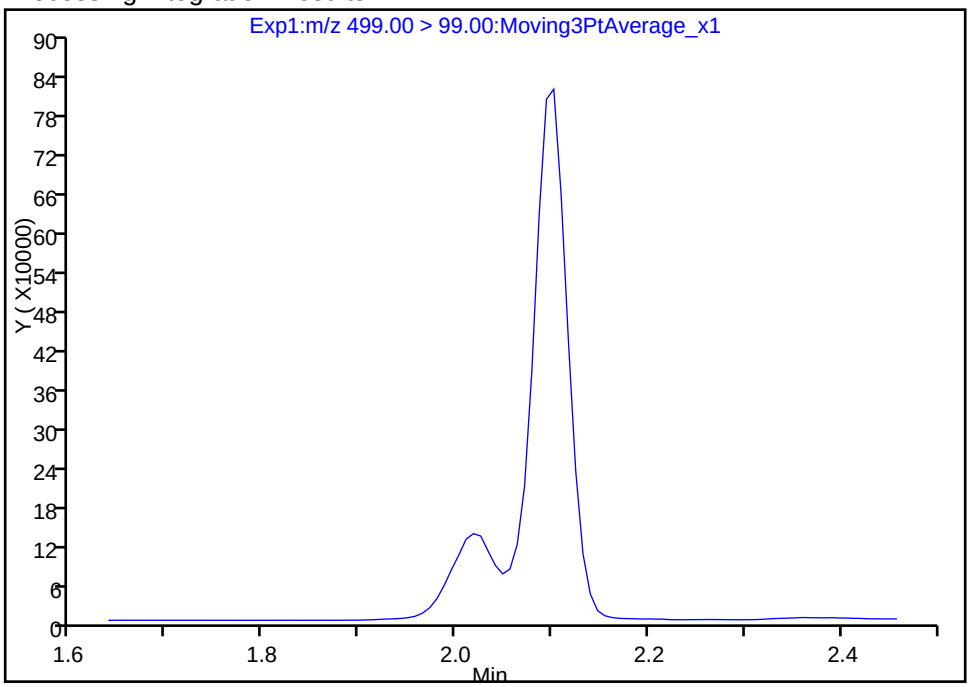
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\2017.10.31_537C_010.d
Injection Date: 31-Oct-2017 17:59:10 Instrument ID: A8_N
Lims ID: CCV L5
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 10
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

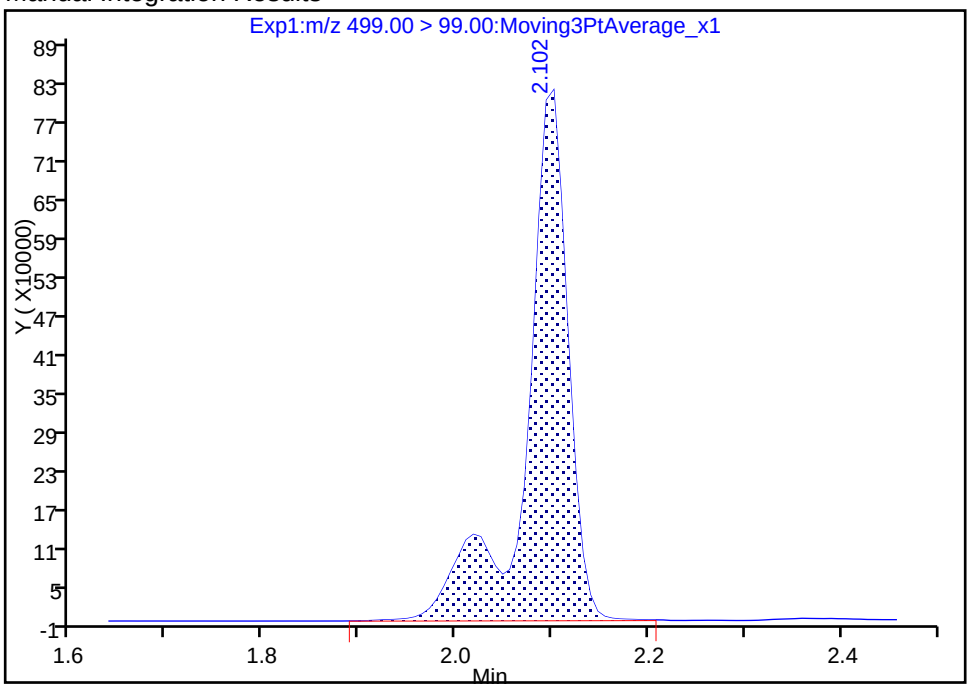
Not Detected
Expected RT: 2.09

Processing Integration Results



Manual Integration Results

RT: 2.10
Area: 2495876
Amount: 60.341290
Amount Units: ng/ml



Reviewer: barnettj, 01-Nov-2017 10:39:17
Audit Action: Manually Integrated Audit Reason: Missed Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

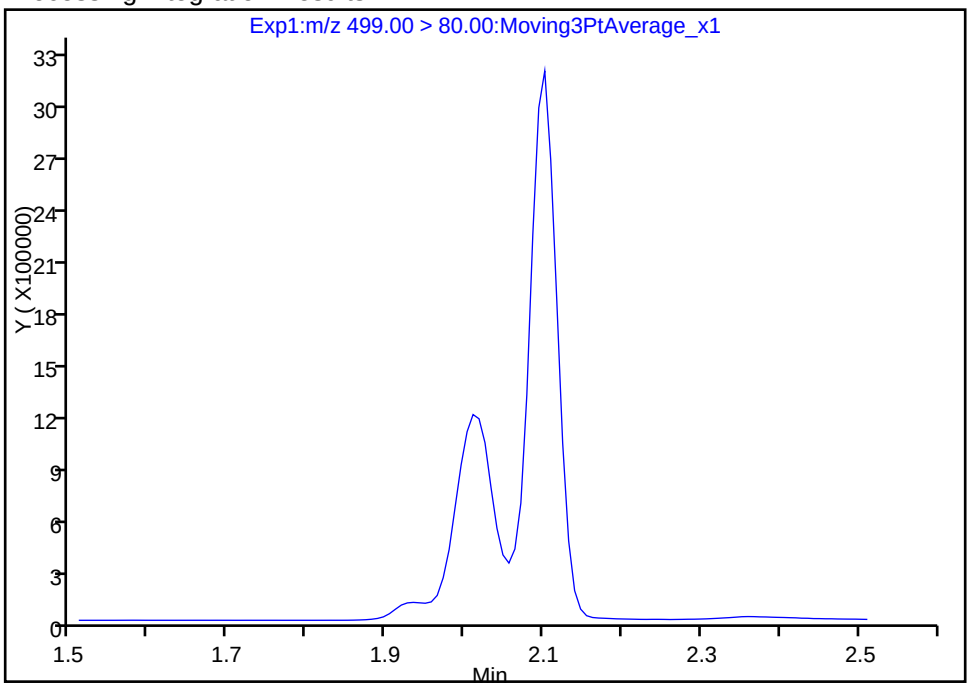
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\2017.10.31_537C_010.d
Injection Date: 31-Oct-2017 17:59:10 Instrument ID: A8_N
Lims ID: CCV L5
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 5 Worklist Smp#: 10
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

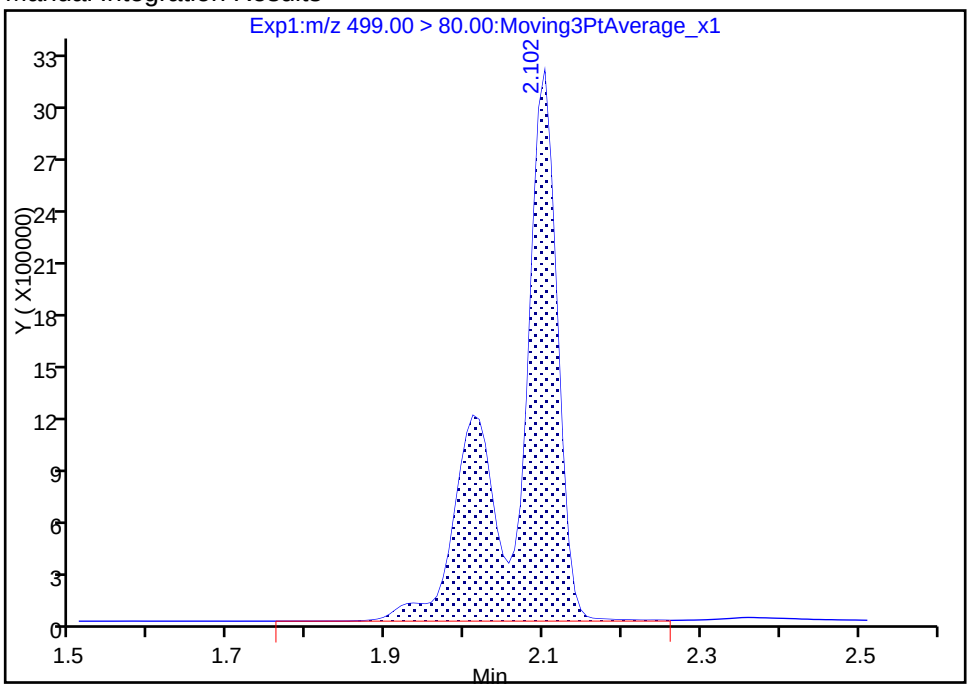
Not Detected
Expected RT: 2.09

Processing Integration Results



Manual Integration Results

RT: 2.10
Area: 12110391
Amount: 60.341290
Amount Units: ng/ml



Reviewer: barnettj, 01-Nov-2017 10:39:17
Audit Action: Manually Integrated Audit Reason: Missed Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-32528-1

SDG No.:

Client Sample ID: | Lab Sample ID: MB 320-191223/1-A

Matrix: Water | Lab File ID: 2017.10.31_537C_003.d

Analysis Method: 537 | Date Collected:

Extraction Method: 537 | Date Extracted: 10/26/2017 10:34

Sample wt/vol: 250(mL) | Date Analyzed: 10/31/2017 17:25

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 192277 | Units: ng/L

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	94		70-130
STL00996	13C2 PFDA	95		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\2017.10.31_537C_003.d
Lims ID: MB 320-191223/1-A
Client ID:
Sample Type: MB
Inject. Date: 31-Oct-2017 17:25:49 ALS Bottle#: 1 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: mb 320-191223/1-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 01-Nov-2017 10:58:24 Calib Date: 31-Oct-2017 12:08:27
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK027

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
$ 2 13C2 PFHxA									
315.00 > 270.00	1.525	1.528	-0.003	1.000	2882517	9.43		4707	
* 6 13C2-PFOA									
415.00 > 370.00	1.851	1.863	-0.012		2707902	10.0		3541	
* 7 13C4 PFOS									
503.00 > 80.00	2.094	2.107	-0.013		6287436	28.7		4222	
$ 10 13C2 PFDA									
515.00 > 470.00	2.269	2.277	-0.009	1.000	2090633	9.54		6594	

Report Date: 01-Nov-2017 10:58:28 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\2017.10.31_537C_003.d

Injection Date: 31-Oct-2017 17:25:49 Instrument ID: A8_N

Lims ID: MB 320-191223/1-A

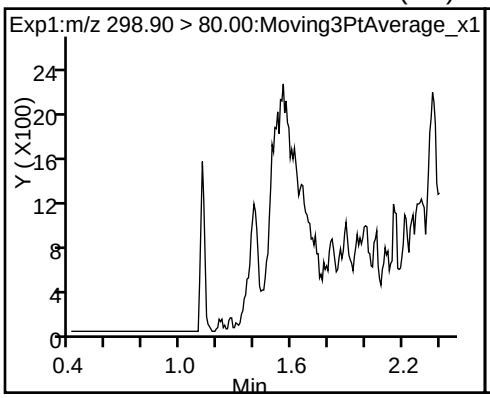
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 1 Worklist Smp#: 3

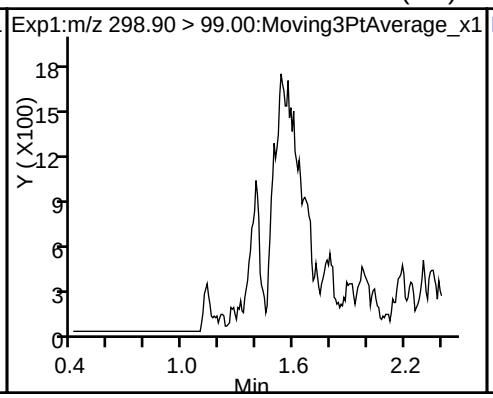
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

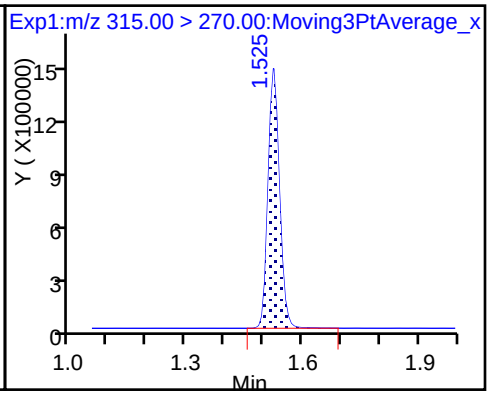
1 Perfluorobutanesulfonic acid (ND)



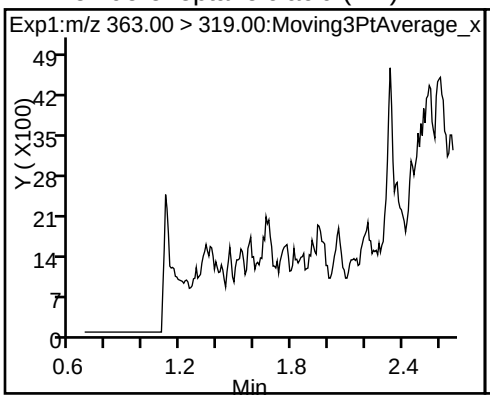
1 Perfluorobutanesulfonic acid (ND)



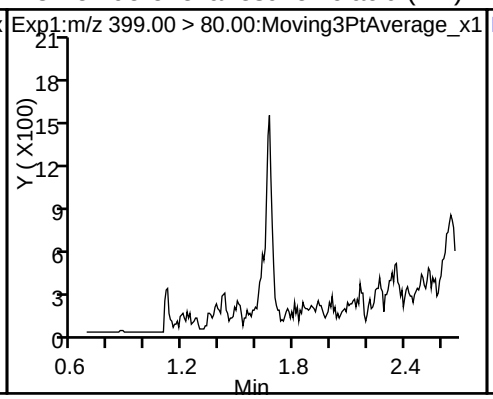
$ 2 13C2 PFHxA

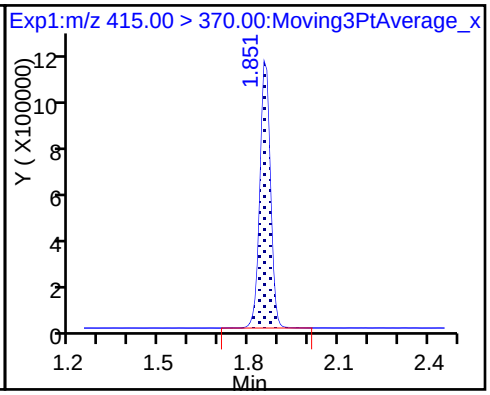


4 Perfluoroheptanoic acid (ND)

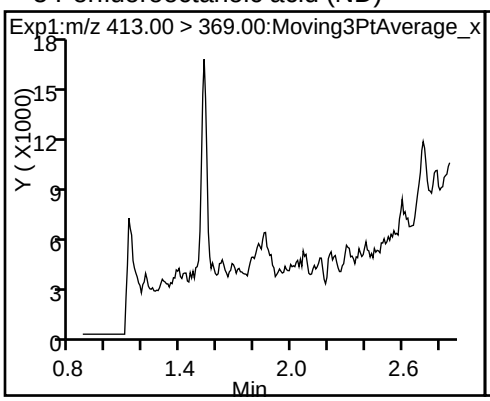


3 Perfluorohexanesulfonic acid (ND) * 6 13C2-PFOA

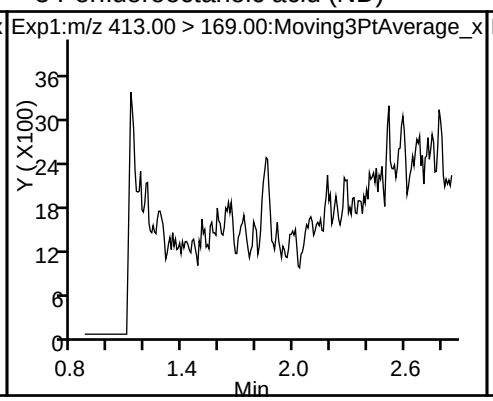




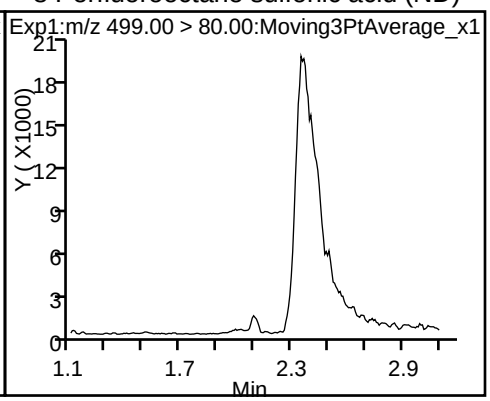
5 Perfluorooctanoic acid (ND)



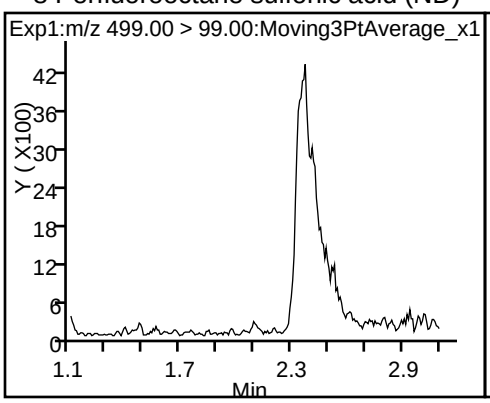
5 Perfluorooctanoic acid (ND)

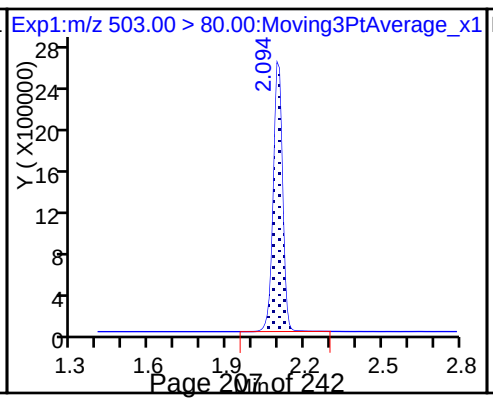


8 Perfluorooctane sulfonic acid (ND)

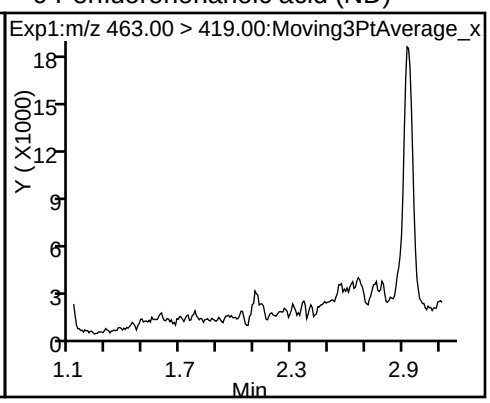


8 Perfluorooctane sulfonic acid (ND) * 7 13C4 PFOS

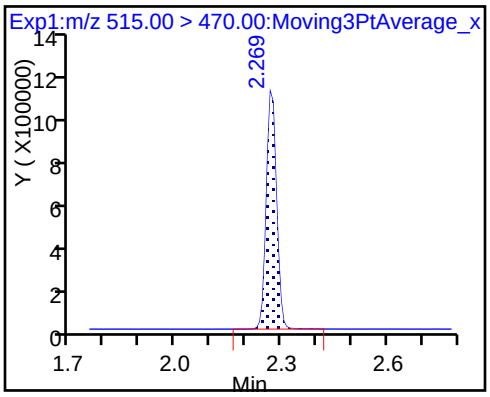




9 Perfluorononanoic acid (ND)



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.269
Y (X100000)
14
12
10
8
6
4
2
0
1.7
2.0
2.3
2.6
Min

TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\2017.10.31_537C_003.d
Lims ID: MB 320-191223/1-A
Client ID:
Sample Type: MB
Inject. Date: 31-Oct-2017 17:25:49 ALS Bottle#: 1 Worklist Smp#: 3
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: mb 320-191223/1-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 01-Nov-2017 10:58:24 Calib Date: 31-Oct-2017 12:08:27
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK027

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	9.43	94.33
$ 10 13C2 PFDA	10.0	9.54	95.39

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-32528-1

SDG No.:

Client Sample ID: | Lab Sample ID: LCS 320-191223/2-A

Matrix: Water | Lab File ID: 2017.10.31_537C_004.d

Analysis Method: 537 | Date Collected:

Extraction Method: 537 | Date Extracted: 10/26/2017 10:34

Sample wt/vol: 250(mL) | Date Analyzed: 10/31/2017 17:30

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 192277 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	214	M	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	111		20	8.0	2.8
375-95-1	Perfluorononanoic acid (PFNA)	113		24	20	8.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	160		30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	56.4		10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	466		90	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	101		70-130
STL00996	13C2 PFDA	104		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\2017.10.31_537C_004.d
Lims ID: LCS 320-191223/2-A
Client ID:
Sample Type: LCS
Inject. Date: 31-Oct-2017 17:30:35 ALS Bottle#: 2 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: lcs 320-191223/2-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 01-Nov-2017 10:58:24 Calib Date: 31-Oct-2017 12:08:27
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK027

First Level Reviewer: barnettj Date: 01-Nov-2017 10:41:07

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.404	1.405	-0.001	1.000	21733082	116.4		2993	
298.90 > 99.00	1.404	1.405	-0.001	1.000	16916162		1.28(0.00-0.00)	4092	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.533	1.528	0.005	1.000	3146288	10.1		4427	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.677	1.677	0.0	1.000	3671154	14.1		808	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.677	1.678	-0.001	1.000	14389814	39.9		4727	
* 6 13C2-PFOA									
415.00 > 370.00	1.859	1.863	-0.004		2767575	10.0		3391	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.859	1.864	-0.005	1.000	7121447	27.7		514	
413.00 > 169.00	1.859	1.864	-0.005	1.000	3850988		1.85(0.00-0.00)	771	
8 Perfluorooctane sulfonic acid									M
499.00 > 80.00	2.109	2.094	0.015	1.000	10985853	53.5		1106	M
499.00 > 99.00	2.102	2.094	0.008	0.996	2302214		4.77(0.00-0.00)	1257	M
* 7 13C4 PFOS									
503.00 > 80.00	2.102	2.107	-0.005		6347084	28.7		4176	
9 Perfluorononanoic acid									
463.00 > 419.00	2.117	2.116	0.001	1.000	5099727	28.2		883	
$ 10 13C2 PFDA									
515.00 > 470.00	2.276	2.277	-0.001	1.000	2332190	10.4		6815	

QC Flag Legend

Review Flags

M - Manually Integrated

Report Date: 01-Nov-2017 10:58:30 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\2017.10.31_537C_004.d

Injection Date: 31-Oct-2017 17:30:35 Instrument ID: A8_N

Lims ID: LCS 320-191223/2-A

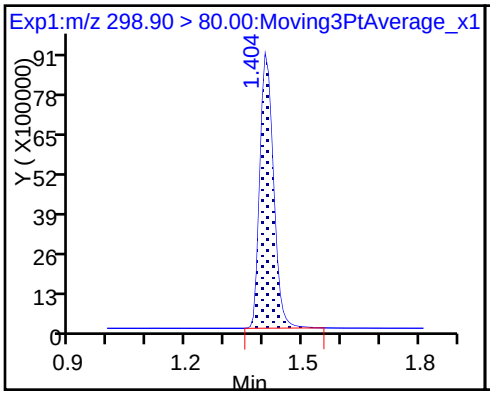
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 4

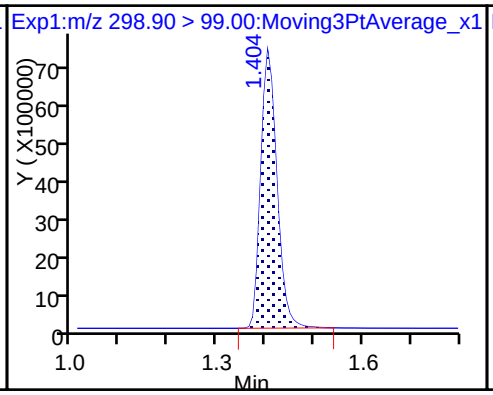
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

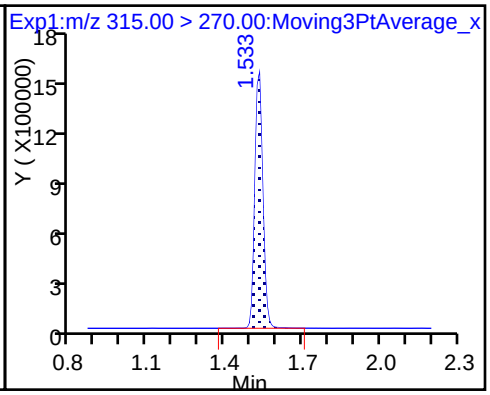
1 Perfluorobutanesulfonic acid



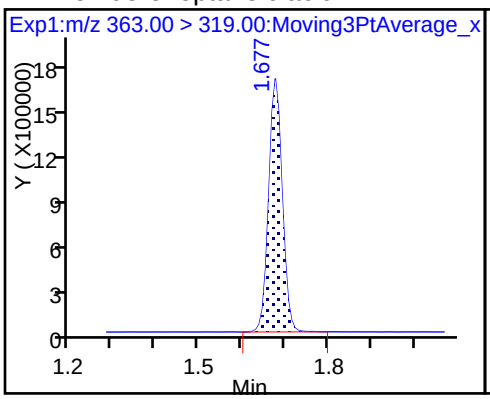
1 Perfluorobutanesulfonic acid



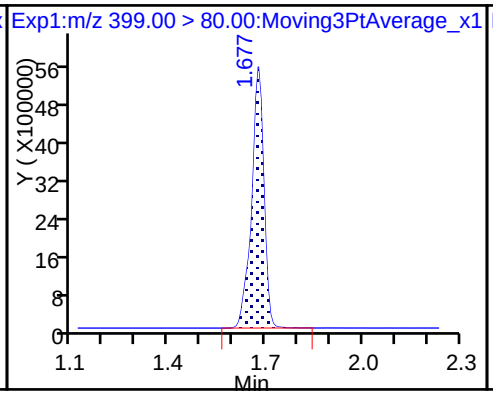
$ 2 13C2 PFHxA



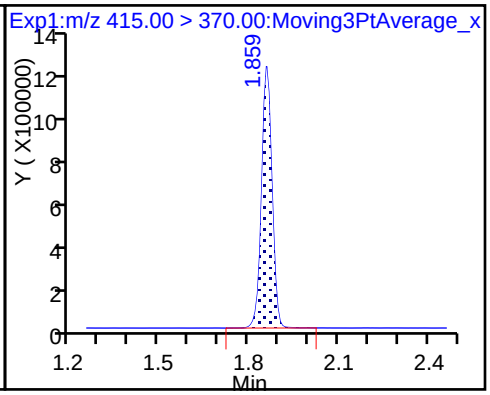
4 Perfluoroheptanoic acid



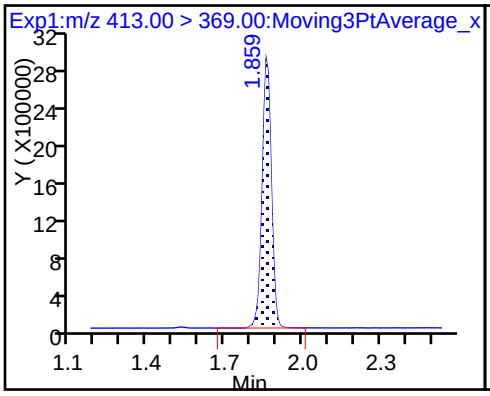
3 Perfluorohexanesulfonic acid



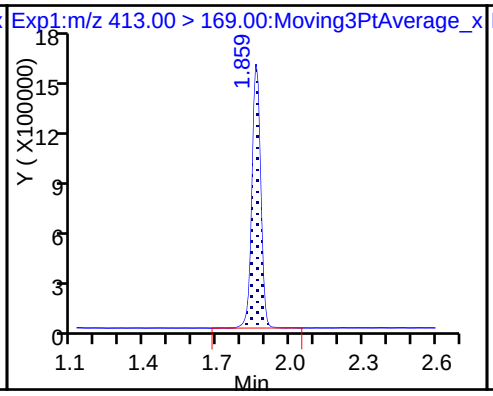
* 6 13C2-PFOA



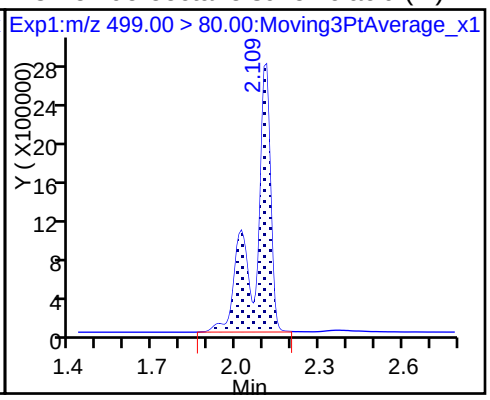
5 Perfluorooctanoic acid



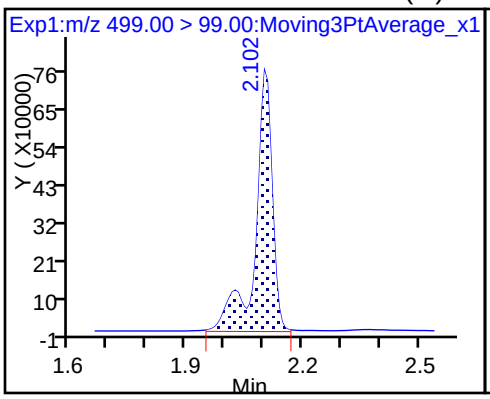
5 Perfluorooctanoic acid



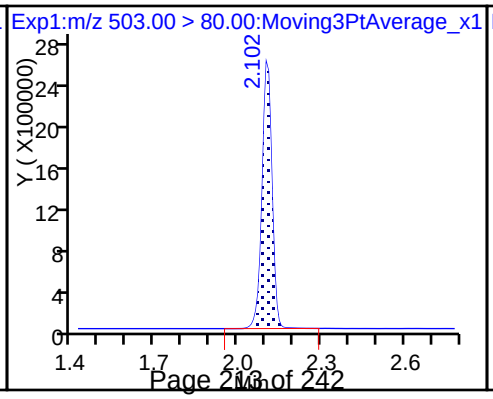
8 Perfluorooctane sulfonic acid (M)



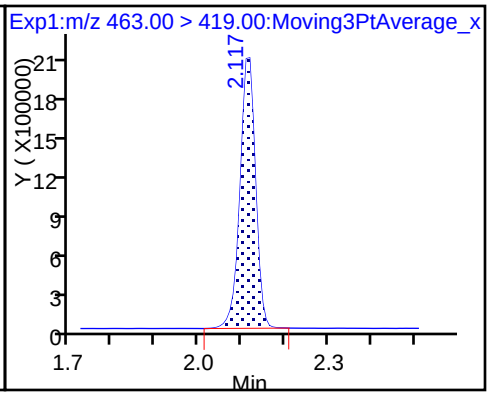
8 Perfluorooctane sulfonic acid (M)



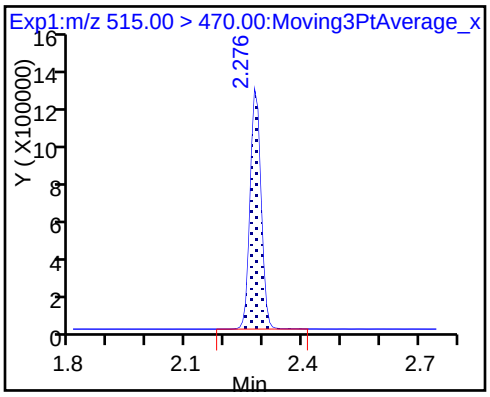
* 7 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.276
Y (X100000)
16
14
12
10
8
6
4
2
0
1.8
2.1
2.4
2.7
Min

TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\2017.10.31_537C_004.d
Lims ID: LCS 320-191223/2-A
Client ID:
Sample Type: LCS
Inject. Date: 31-Oct-2017 17:30:35 ALS Bottle#: 2 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: lcs 320-191223/2-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 01-Nov-2017 10:58:24 Calib Date: 31-Oct-2017 12:08:27
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK027

First Level Reviewer: barnettj Date: 01-Nov-2017 10:41:07

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	10.1	100.74
$ 10 13C2 PFDA	10.0	10.4	104.11

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

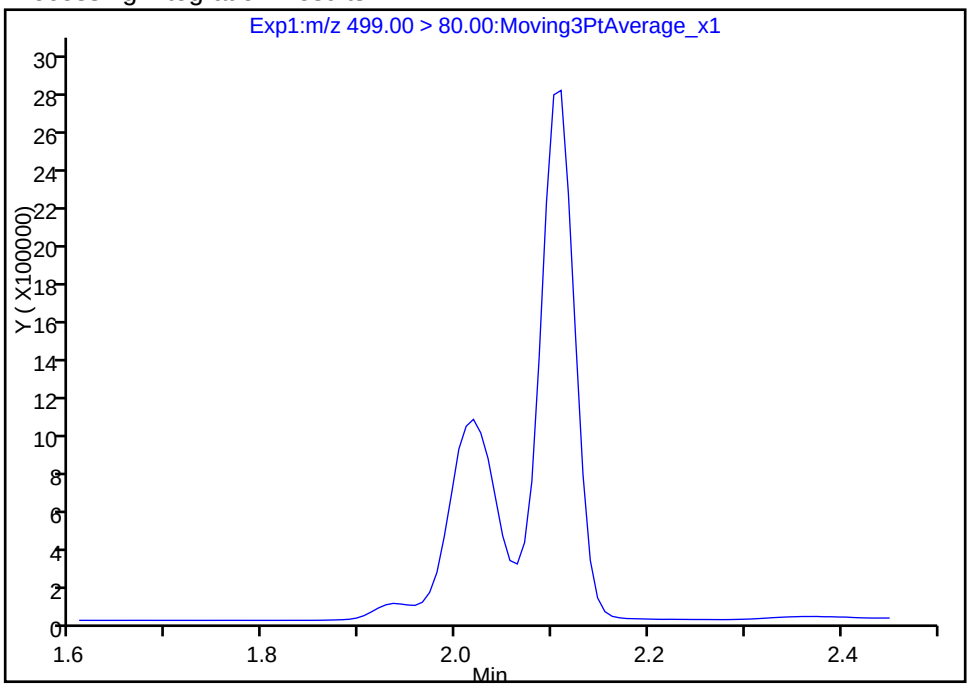
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\2017.10.31_537C_004.d				
Injection Date:	31-Oct-2017 17:30:35	Instrument ID:	A8_N		
Lims ID:	LCS 320-191223/2-A				
Client ID:					
Operator ID:	SACINSTLCMS01	ALS Bottle#:	2	Worklist Smp#:	4
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

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

Signal: 1

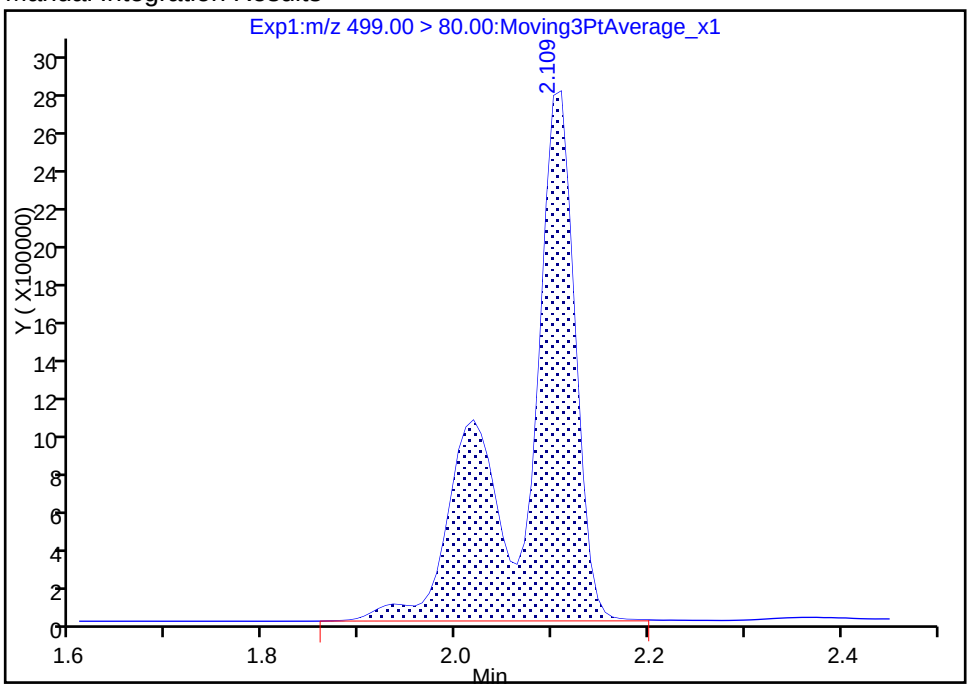
Processing Integration Results

Not Detected
Expected RT: 2.09



Manual Integration Results

RT: 2.11
Area: 10985853
Amount: 53.476700
Amount Units: ng/ml



Reviewer: barnettj, 01-Nov-2017 10:40:10
Audit Action: Assigned Compound ID Audit Reason: Missed Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

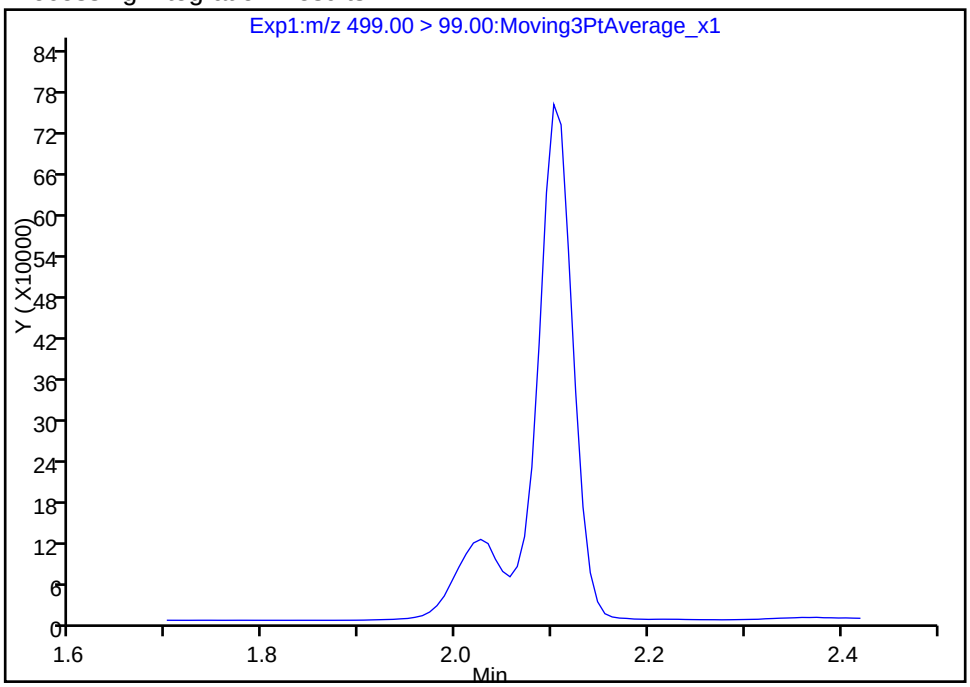
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\2017.10.31_537C_004.d
Injection Date: 31-Oct-2017 17:30:35 Instrument ID: A8_N
Lims ID: LCS 320-191223/2-A
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

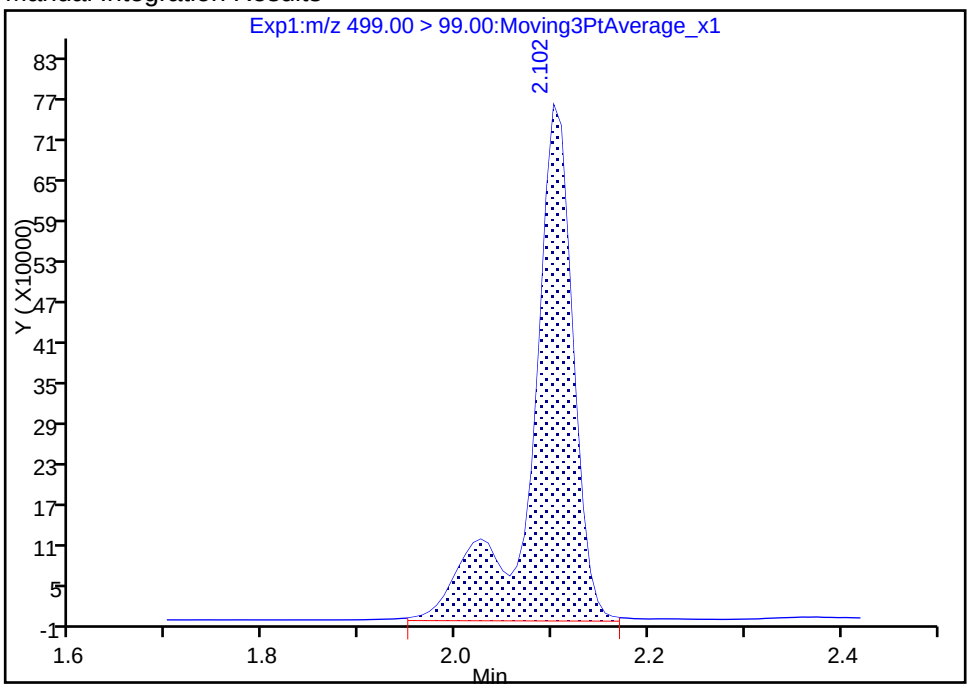
Not Detected
Expected RT: 2.09

Processing Integration Results



Manual Integration Results

RT: 2.10
Area: 2302214
Amount: 53.476700
Amount Units: ng/ml



Reviewer: barnettj, 01-Nov-2017 10:40:42
Audit Action: Manually Integrated Audit Reason: Missed Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

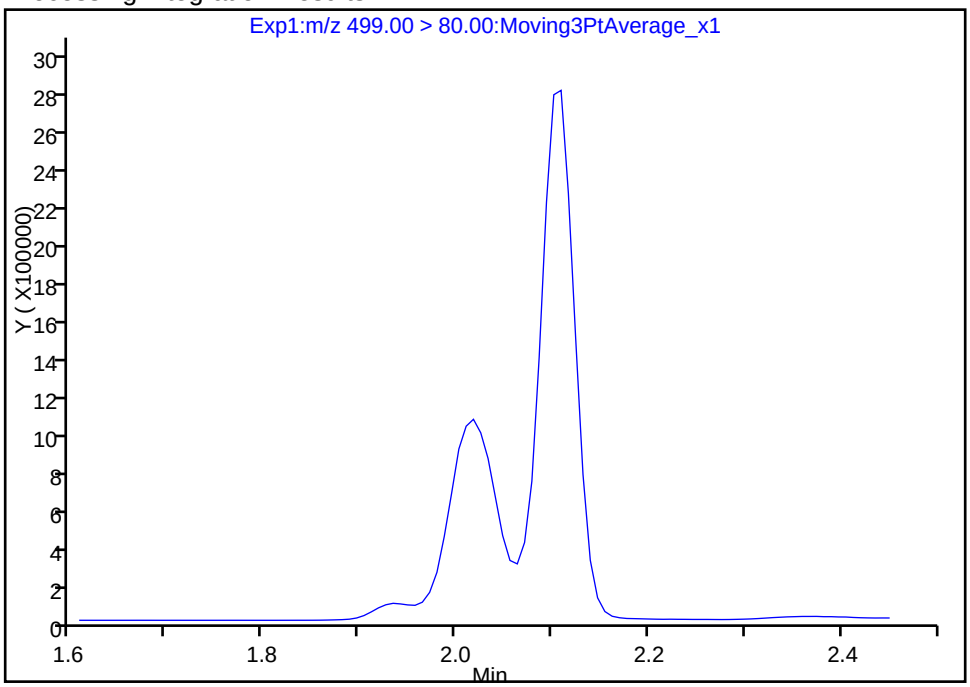
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\2017.10.31_537C_004.d
Injection Date: 31-Oct-2017 17:30:35 Instrument ID: A8_N
Lims ID: LCS 320-191223/2-A
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 2 Worklist Smp#: 4
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

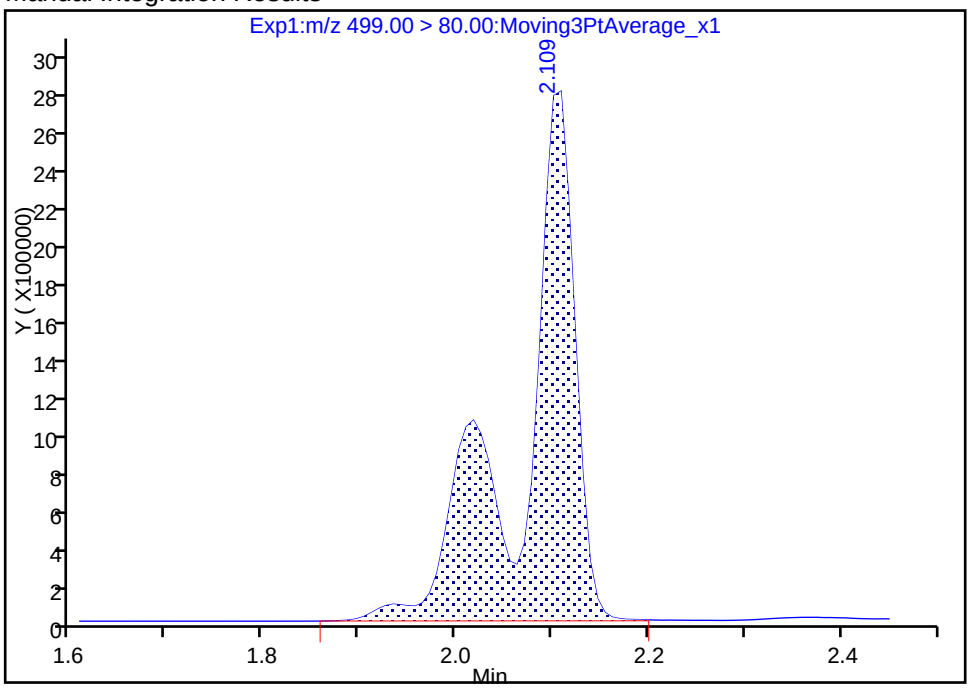
Not Detected
Expected RT: 2.09

Processing Integration Results



Manual Integration Results

RT: 2.11
Area: 10985853
Amount: 53.476700
Amount Units: ng/ml



Reviewer: barnettj, 01-Nov-2017 10:40:42
Audit Action: Manually Integrated Audit Reason: Missed Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-32528-1

SDG No.:

Client Sample ID: | Lab Sample ID: LCSD 320-191223/3-A

Matrix: Water | Lab File ID: 2017.10.31_537C_005.d

Analysis Method: 537 | Date Collected:

Extraction Method: 537 | Date Extracted: 10/26/2017 10:34

Sample wt/vol: 250(mL) | Date Analyzed: 10/31/2017 17:35

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 192277 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	218	M	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	113		20	8.0	2.8
375-95-1	Perfluorononanoic acid (PFNA)	115		24	20	8.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	166		30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	58.4		10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	483		90	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	102		70-130
STL00996	13C2 PFDA	103		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\2017.10.31_537C_005.d
Lims ID: LCSD 320-191223/3-A
Client ID:
Sample Type: LCSD
Inject. Date: 31-Oct-2017 17:35:21 ALS Bottle#: 3 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: lcsd 320-191223/3-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 01-Nov-2017 10:58:24 Calib Date: 31-Oct-2017 12:08:27
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK027

First Level Reviewer: barnettj Date: 01-Nov-2017 10:41:54

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.411	1.405	0.006	1.000	21932568	120.8		3167	
298.90 > 99.00	1.411	1.405	0.006	1.000	16819317		1.30(0.00-0.00)	4247	
$ 2 13C2 PFHxA									
315.00 > 270.00	1.533	1.528	0.005	1.000	3148328	10.2		5470	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.677	1.677	0.0	1.000	3764968	14.6		806	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.677	1.678	-0.001	1.000	14664787	41.4		5384	
* 6 13C2-PFOA									
415.00 > 370.00	1.859	1.863	-0.004		2743298	10.0		3854	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.866	1.864	0.002	1.000	7227557	28.3		538	
413.00 > 169.00	1.859	1.864	-0.005	0.996	3919184		1.84(0.00-0.00)	800	
8 Perfluorooctane sulfonic acid									M
499.00 > 80.00	2.102	2.094	0.008	1.000	11013439	54.6		1133	M
499.00 > 99.00	2.102	2.094	0.008	1.000	2350668		4.69(0.00-0.00)	1418	M
* 7 13C4 PFOS									
503.00 > 80.00	2.102	2.107	-0.005		6235870	28.7		4689	
9 Perfluorononanoic acid									
463.00 > 419.00	2.109	2.116	-0.007	1.000	5130403	28.7		854	
$ 10 13C2 PFDA									
515.00 > 470.00	2.276	2.277	-0.001	1.000	2288770	10.3		7369	

QC Flag Legend

Review Flags

M - Manually Integrated

Report Date: 01-Nov-2017 10:58:32 Chrom Revision: 2.2 16-Aug-2017 16:24:46

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\2017.10.31_537C_005.d

Injection Date: 31-Oct-2017 17:35:21 Instrument ID: A8_N

Lims ID: LCSD 320-191223/3-A

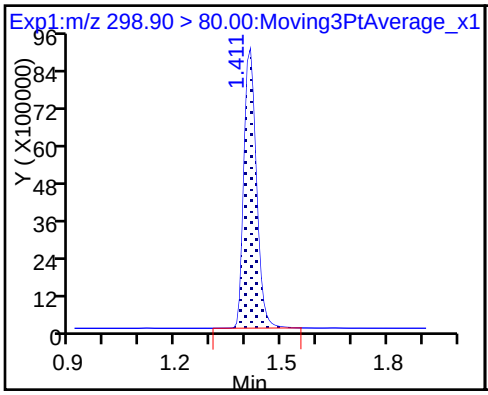
Client ID:

Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 5

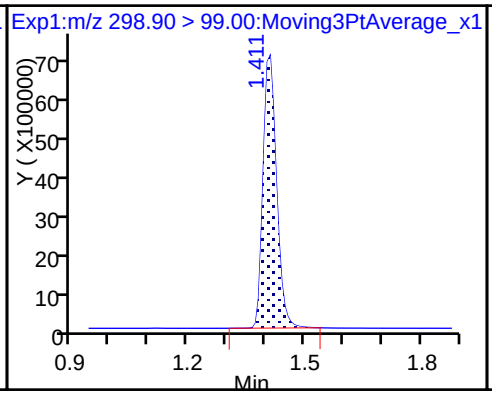
Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: 537_A8_N Limit Group: LC 537 ICAL

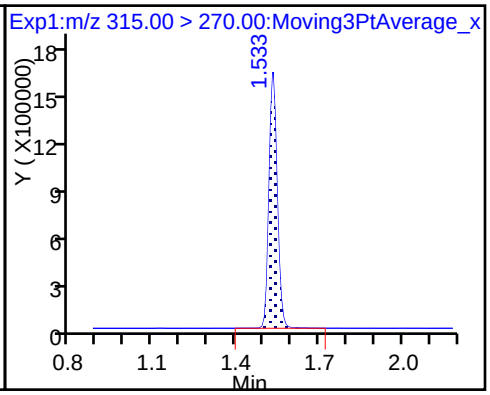
1 Perfluorobutanesulfonic acid



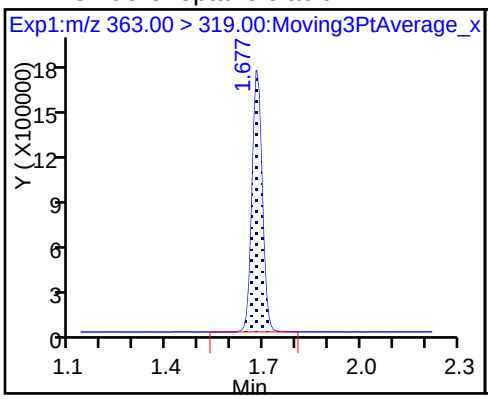
1 Perfluorobutanesulfonic acid



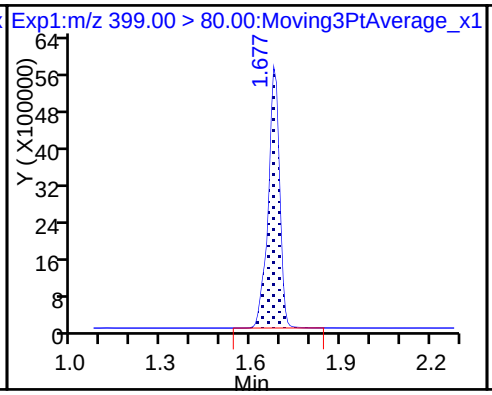
$ 2 13C2 PFHxA



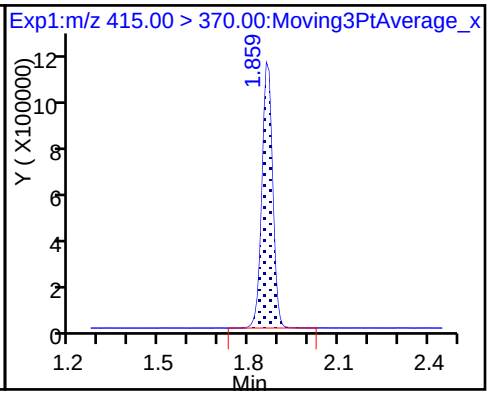
4 Perfluoroheptanoic acid



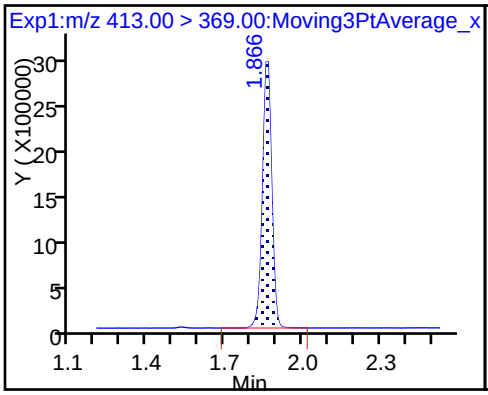
3 Perfluorohexanesulfonic acid



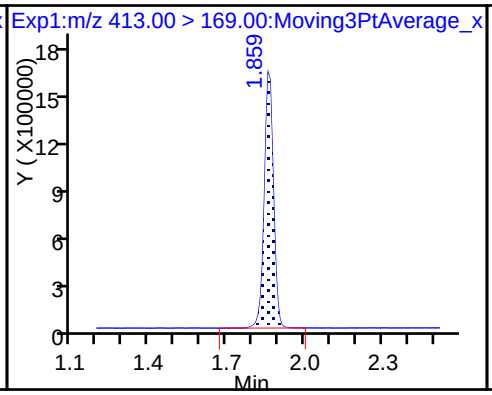
* 6 13C2-PFOA



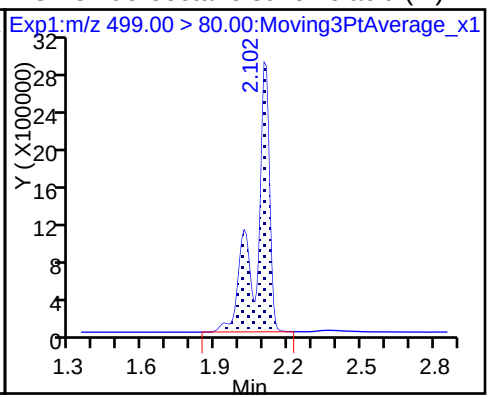
5 Perfluorooctanoic acid



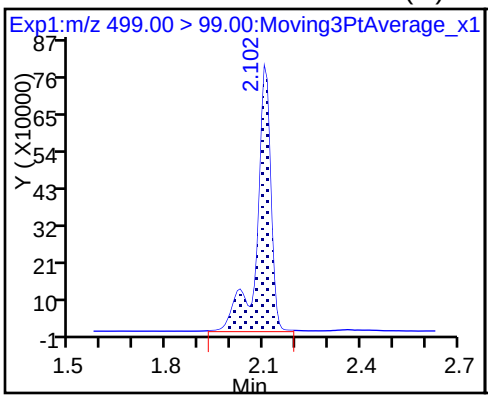
5 Perfluorooctanoic acid



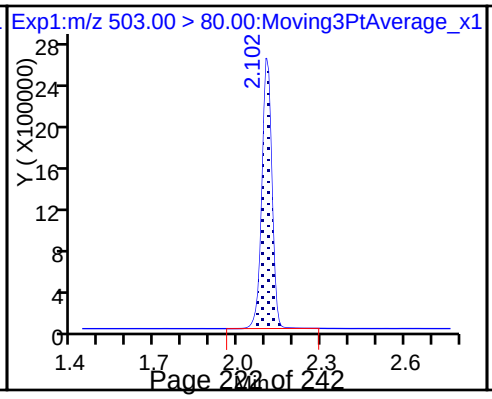
8 Perfluorooctane sulfonic acid (M)



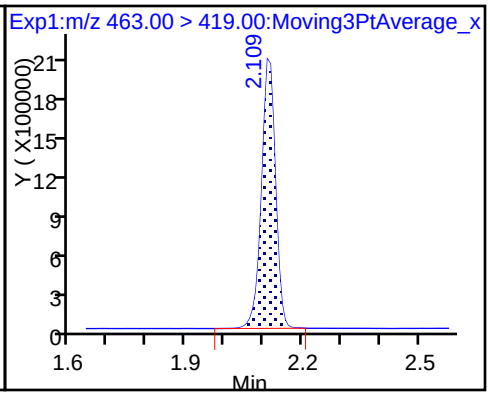
8 Perfluorooctane sulfonic acid (M)



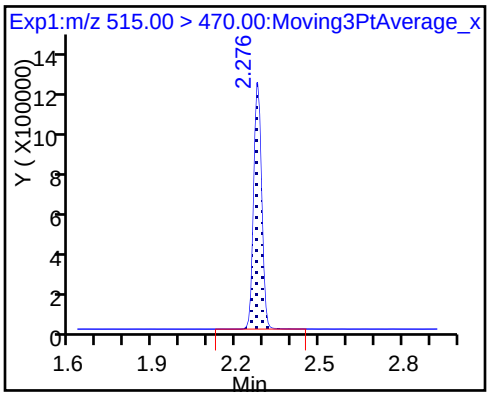
* 7 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA


Exp1:m/z 515.00 > 470.00:Moving3PtAverage_x
2.276
Y (X100000)
14
12
10
8
6
4
2
0
1.6
1.9
2.2
2.5
2.8
Min

TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\2017.10.31_537C_005.d
Lims ID: LCSD 320-191223/3-A
Client ID:
Sample Type: LCSD
Inject. Date: 31-Oct-2017 17:35:21 ALS Bottle#: 3 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Sample Info: lcsd 320-191223/3-a
Misc. Info.: Plate: 1 Rack: 6
Operator ID: SACINSTLCMS01 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\537_A8_N.m
Limit Group: LC 537 ICAL
Last Update: 01-Nov-2017 10:58:24 Calib Date: 31-Oct-2017 12:08:27
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20171031-49808.b\2017.10.31_537ICAL_009.d

Column 1 : Det: EXP1
Process Host: XAWRK027

First Level Reviewer: barnettj Date: 01-Nov-2017 10:41:54

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	10.2	101.70
$ 10 13C2 PFDA	10.0	10.3	103.08

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

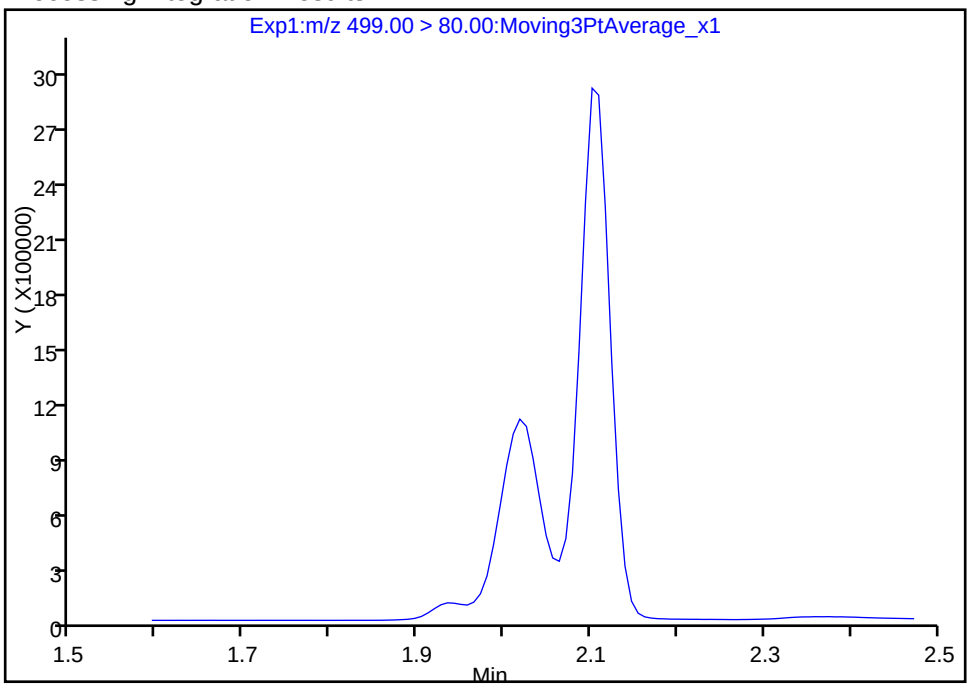
Data File:	\\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\2017.10.31_537C_005.d				
Injection Date:	31-Oct-2017 17:35:21	Instrument ID:	A8_N		
Lims ID:	LCSD 320-191223/3-A				
Client ID:					
Operator ID:	SACINSTLCMS01	ALS Bottle#:	3	Worklist Smp#:	5
Injection Vol:	2.0 ul	Dil. Factor:	1.0000		
Method:	537_A8_N	Limit Group:	LC 537 ICAL		
Column:		Detector	EXP1		

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

Signal: 1

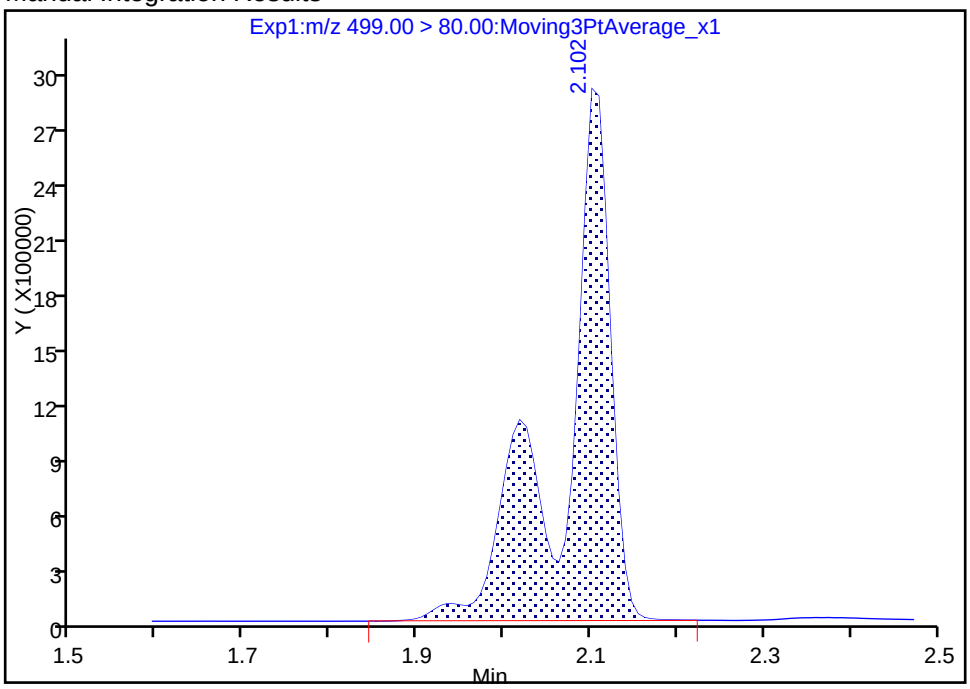
Not Detected
Expected RT: 2.09

Processing Integration Results



Manual Integration Results

RT: 2.10
Area: 11013439
Amount: 54.567110
Amount Units: ng/ml



Reviewer: barnettj, 01-Nov-2017 10:41:12
Audit Action: Assigned Compound ID Audit Reason: Missed Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

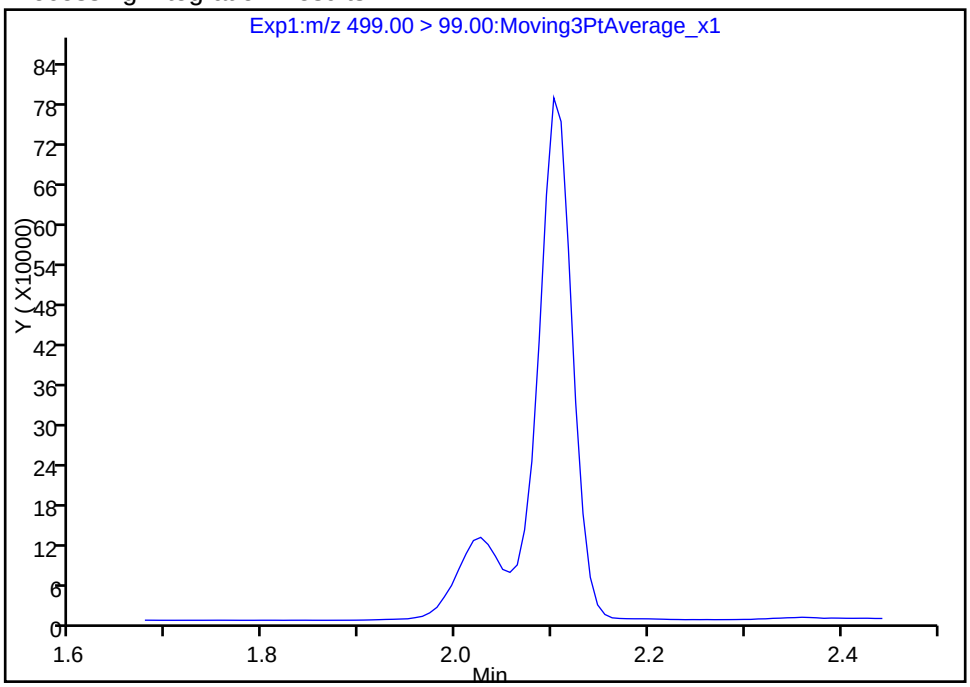
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\2017.10.31_537C_005.d
Injection Date: 31-Oct-2017 17:35:21 Instrument ID: A8_N
Lims ID: LCSD 320-191223/3-A
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

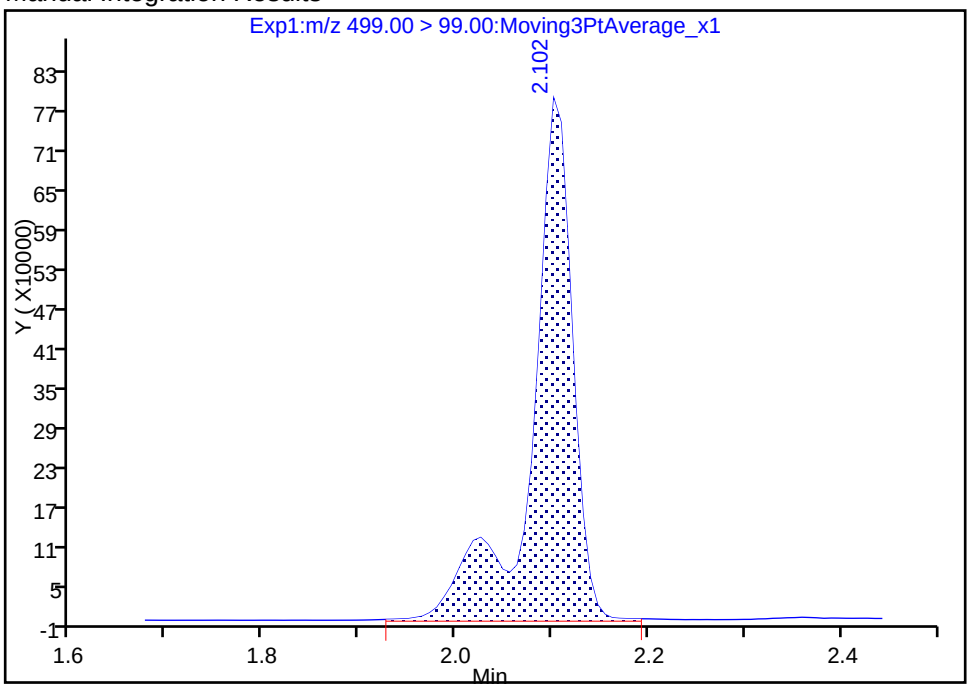
Not Detected
Expected RT: 2.09

Processing Integration Results



Manual Integration Results

RT: 2.10
Area: 2350668
Amount: 54.567110
Amount Units: ng/ml



Reviewer: barnettj, 01-Nov-2017 10:41:36
Audit Action: Manually Integrated Audit Reason: Missed Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

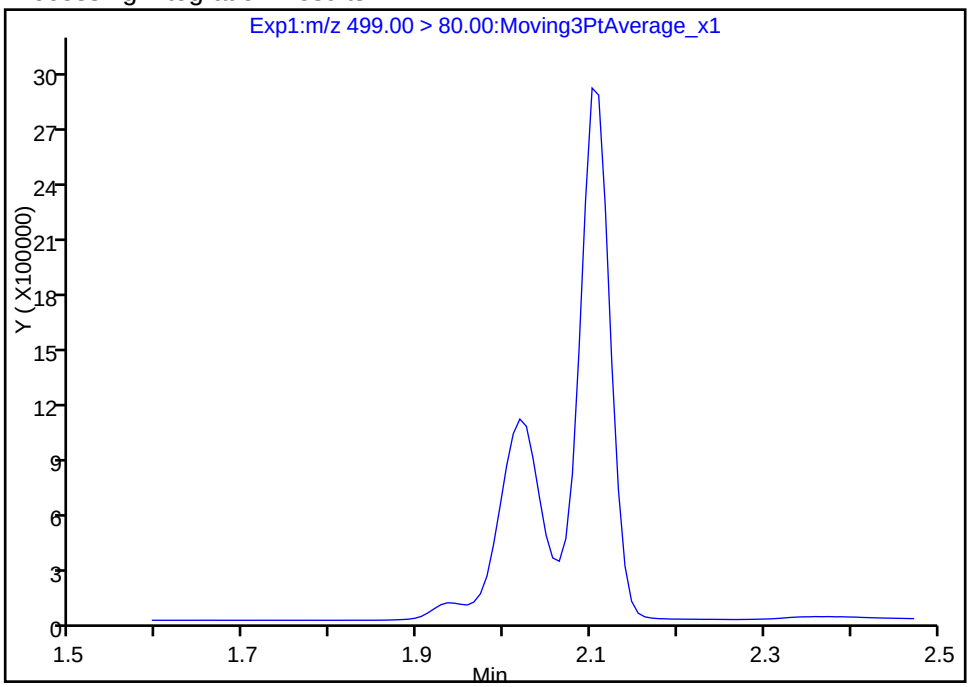
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b\2017.10.31_537C_005.d
Injection Date: 31-Oct-2017 17:35:21 Instrument ID: A8_N
Lims ID: LCSD 320-191223/3-A
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 5
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

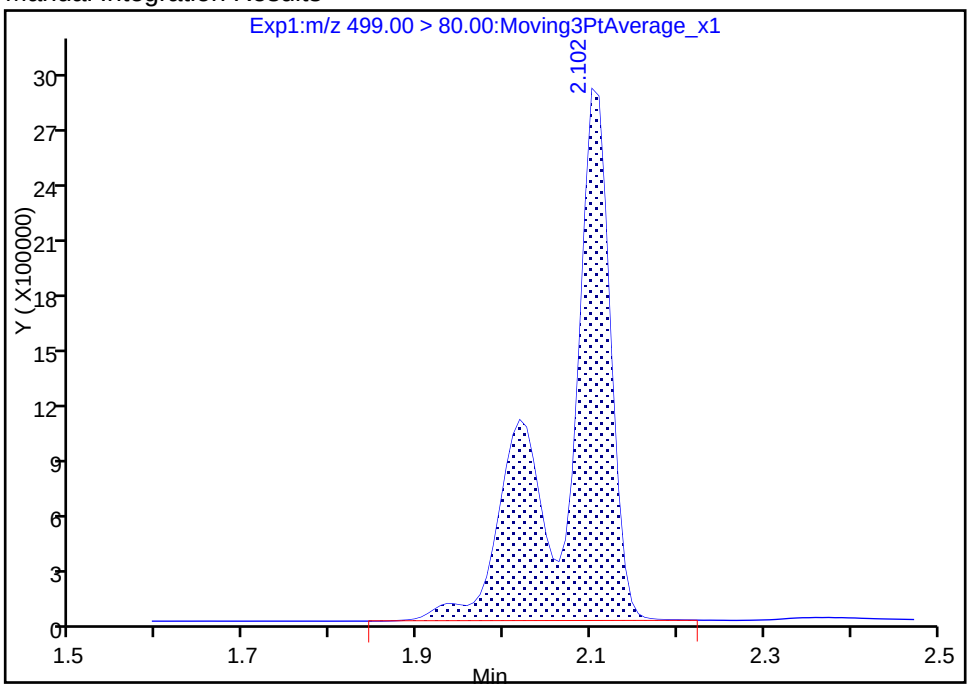
Not Detected
Expected RT: 2.09

Processing Integration Results



Manual Integration Results

RT: 2.10
Area: 11013439
Amount: 54.567110
Amount Units: ng/ml



Reviewer: barnettj, 01-Nov-2017 10:41:36
Audit Action: Manually Integrated Audit Reason: Missed Peak

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-32528-1

SDG No.:

Instrument ID: A8_N Start Date: 10/31/2017 11:44

Analysis Batch Number: 192162 End Date: 10/31/2017 14:58

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-192162/4		10/31/2017 11:44	1	2017.10.31_537ICAL_004.d	GeminiC18 3x100 3(mm)
IC 320-192162/5		10/31/2017 11:49	1	2017.10.31_537ICAL_005.d	GeminiC18 3x100 3(mm)
IC 320-192162/6		10/31/2017 11:54	1	2017.10.31_537ICAL_006.d	GeminiC18 3x100 3(mm)
IC 320-192162/7 ICISAV		10/31/2017 11:58	1	2017.10.31_537ICAL_007.d	GeminiC18 3x100 3(mm)
IC 320-192162/8		10/31/2017 12:03	1	2017.10.31_537ICAL_008.d	GeminiC18 3x100 3(mm)
IC 320-192162/9		10/31/2017 12:08	1	2017.10.31_537ICAL_009.d	GeminiC18 3x100 3(mm)
ZZZZZ		10/31/2017 12:13	1		GeminiC18 3x100 3(mm)
CCVL 320-192162/11		10/31/2017 12:17	1	2017.10.31_537ICAL_011.d	GeminiC18 3x100 3(mm)
ZZZZZ		10/31/2017 14:53	1		GeminiC18 3x100 3(mm)
ICV 320-192162/16		10/31/2017 14:58	1	2017.10.31_537AICAL_003.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-32528-1

SDG No.:

Instrument ID: A8_N Start Date: 10/31/2017 17:16

Analysis Batch Number: 192277 End Date: 10/31/2017 17:59

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-192277/1 CCVIS		10/31/2017 17:16	1	2017.10.31_537C_001.d	GeminiC18 3x100 3(mm)
ZZZZZ		10/31/2017 17:21	1		GeminiC18 3x100 3(mm)
MB 320-191223/1-A		10/31/2017 17:25	1	2017.10.31_537C_003.d	GeminiC18 3x100 3(mm)
LCS 320-191223/2-A		10/31/2017 17:30	1	2017.10.31_537C_004.d	GeminiC18 3x100 3(mm)
LCSD 320-191223/3-A		10/31/2017 17:35	1	2017.10.31_537C_005.d	GeminiC18 3x100 3(mm)
320-32528-1		10/31/2017 17:40	1	2017.10.31_537C_006.d	GeminiC18 3x100 3(mm)
320-32528-2		10/31/2017 17:44	1	2017.10.31_537C_007.d	GeminiC18 3x100 3(mm)
320-32528-3		10/31/2017 17:49	1	2017.10.31_537C_008.d	GeminiC18 3x100 3(mm)
320-32528-4		10/31/2017 17:54	1	2017.10.31_537C_009.d	GeminiC18 3x100 3(mm)
CCV 320-192277/10 CCVIS		10/31/2017 17:59	1	2017.10.31_537C_010.d	GeminiC18 3x100 3(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-32528-1

SDG No.:

Batch Number: 191223 Batch Start Date: 10/26/17 10:33 Batch Analyst: Branscum, Cassie

Batch Method: 537 Batch End Date: 10/27/17 17:03

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	ReceivedpH	LC537-HSP 00022
MB 320-191223/1		537, 537				250 mL	1.00 mL	7 SU	
LCS 320-191223/2		537, 537				250 mL	1.00 mL	7 SU	100 uL
LCSD 320-191223/3		537, 537				250 mL	1.00 mL	7 SU	100 uL
320-32528-A-1	WGNA-101817-RW-3933	537, 537	T	281.47 g	27.80 g	253.7 mL	1.00 mL	7 SU	
320-32528-A-2	WGNA-101817-FRB-3933	537, 537	T	287.35 g	27.21 g	260.1 mL	1.00 mL	7 SU	
320-32528-A-3	WGNA-101817-RW-0569	537, 537	T	288.15 g	27.95 g	260.2 mL	1.00 mL	7 SU	
320-32528-A-4	WGNA-101817-FRB-0569	537, 537	T	311.95 g	27.33 g	284.6 mL	1.00 mL	7 SU	

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-IS 00051	LC537-SU 00050	AnalysisComment			
MB 320-191223/1		537, 537		100 uL	100 uL	ch nd			
LCS 320-191223/2		537, 537		100 uL	100 uL	ch nd			
LCSD 320-191223/3		537, 537		100 uL	100 uL	ch nd			
320-32528-A-1	WGNA-101817-RW-3933	537, 537	T	100 uL	100 uL	ch nd			
320-32528-A-2	WGNA-101817-FRB-3933	537, 537	T	100 uL	100 uL	ch nd			
320-32528-A-3	WGNA-101817-RW-0569	537, 537	T	100 uL	100 uL	ch nd			
320-32528-A-4	WGNA-101817-FRB-0569	537, 537	T	100 uL	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.: 320-32528-1

SDG No.:

Batch Number: 191223 Batch Start Date: 10/26/17 10:33 Batch Analyst: Branscum, Cassie

Batch Method: 537 Batch End Date: 10/27/17 17:03

Batch Notes	
Analyst ID - Aliquot Step	TQN
Analyst ID - Concentration	CCB
Analyst ID - Final Volume Step	TQN
Internal Standard ID#	1041860
Manifold ID	9
Methanol ID	1061669
Pipette ID	N32728F
Analyst ID - IS Reagent Drop	JER
Analyst ID - IS Reagent Drop Witness	TQN
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	6357081-09
Trizma ID	SLBR4303V
Reagent Water ID	10/25/17

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.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sacramento

Method 537 CCV/Data Review Checklist

A8

Job No: 32528 Instrument ID & Date: 10-31-17 ICAL Batch: 192162

Extraction Batch: 191223 Worklist #: 49829 TALS Batch: 192277

Review Items	--- Level 1 --- Yes	No	N/A	Level 2
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 ±50% of true value Mid and High-range within ±30% of true value	✓			✓
4. Internal Standard areas in control? Areas ≥ 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? ±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 11-1-17 2nd Level Reviewer / Date: Mcwey 11/1/2017

NCM # and Comments: _____

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sacramento

Method 537 ICAL Checklist

Instrument ID & Date: A8 10-31-17 Worklist#: 49808

ICAL Batch: 192162, 192163 Calibration ID number: 35621, 35622

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): (Average) Linear (1/x²)Linear (Quadratic) (6 points minimum)				
4. Meets fit criteria? Intercept ≤ ½ RL RSD ≤ 30% for Average $R^2 \geq 0.990$ for Linear $R^2 \geq 0.990$ 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 (2nd source) ± 30% of true value?	✓			✓
11. Is ICV (2nd 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 10-31-17 2nd Level Reviewer / Date: MWeily 10/31/2017

NCM # and Comments: ______________________

TestAmerica Laboratories
Worklist QC Batch Report

Worklist Name: 31OCT2017_537B Worklist Number: 49829
Instrument Name: A8_N Chrom Method: 537_A8_N
Data Directory: \\ChromNa\Sacramento\ChromData\A8_N\20171101-49829.b
QC Batching: Enabled Limit Group Batching: Enabled

QC Batch: 1	LC 537 ICAL Raw Batch: 192277
#1 CCV L3	# 1 CCV L3
# 2 RB	# 2 RB
# 3 MB 320-191223/1-A	# 3 MB 320-191223/1-A
# 4 LCS 320-191223/2-A	# 4 LCS 320-191223/2-A
# 5 LCSD 320-191223/3-A	# 5 LCSD 320-191223/3-A
# 6 320-32528-A-1-A	# 6 320-32528-A-1-A
# 7 320-32528-A-2-A	# 7 320-32528-A-2-A
# 8 320-32528-A-3-A	# 8 320-32528-A-3-A
# 9 320-32528-A-4-A	# 9 320-32528-A-4-A
#10 CCV L5	#10 CCV L5

QC Batch: 2	LC 537 ICAL Raw Batch: 192279
#10 CCV L5	#10 CCV L5
#11 RB	#11 RB
#12 MB 320-191138/1-A	#12 MB 320-191138/1-A
#13 LCS 320-191138/2-A	#13 LCS 320-191138/2-A
#14 LCSD 320-191138/3-A	#14 LCSD 320-191138/3-A
#15 320-32464-A-1-A	#15 320-32464-A-1-A
#16 320-32464-A-2-A	#16 320-32464-A-2-A
#17 320-32464-A-3-A	#17 320-32464-A-3-A
#18 320-32464-A-4-A	#18 320-32464-A-4-A
#19 320-32464-A-5-A	#19 320-32464-A-5-A
#20 320-32464-A-6-A	#20 320-32464-A-6-A
#21 320-32464-A-7-A	#21 320-32464-A-7-A
#22 CCV L3	#22 CCV L3

QC Batch: 3	LC 537 ICAL Raw Batch: 192281	LC 537 CS ICAL Raw Batch: 192282
#22 CCV L3	#22 CCV L3	
#23 RB	#23 RB	
#24 320-32464-A-8-A	#24 320-32464-A-8-A	
#25 320-32464-A-9-A	#25 320-32464-A-9-A	
#26 320-32464-A-10-A	#26 320-32464-A-10-A	
#27 320-32464-A-11-A	#27 320-32464-A-11-A	
#28 320-32464-A-12-A	#28 320-32464-A-12-A	
#29 320-32464-A-13-A	#29 320-32464-A-13-A	
#30 CCV L5	#30 CCV L5	#30 CCV L5

QC Batch: 4	LC 537 ICAL Raw Batch: 192283	LC 537 CS ICAL Raw Batch: 192284
#30 CCV L5	#30 CCV L5	#30 CCV L5
#31 RB		#31 RB
#32 MB 320-191008/1-A		#32 MB 320-191008/1-A
#33 LCS 320-191008/2-A		#33 LCS 320-191008/2-A
#34 LCSD 320-191008/3-A		#34 LCSD 320-191008/3-A
#35 320-32552-A-1-A		#35 320-32552-A-1-A
#36 320-32552-A-1-B MS		#36 320-32552-A-1-B MS
#37 320-32552-A-1-C MSD		#37 320-32552-A-1-C MSD
#38 320-32552-A-2-A		#38 320-32552-A-2-A

QC Batch: 4	LC 537 ICAL Raw Batch: 192283	LC 537 CS ICAL Raw Batch: 192284
#39 320-32552-A-3-A		#39 320-32552-A-3-A
#40 320-32552-A-4-A		#40 320-32552-A-4-A
#41 320-32552-A-5-A		#41 320-32552-A-5-A
#42 CCV L3		#42 CCV L3

QC Batch: 5	LC 537 CS ICAL Raw Batch: 192286
#42 CCV L3	#42 CCV L3
#43 RB	#43 RB
#44 320-32552-A-6-B	#44 320-32552-A-6-B
#45 320-32552-A-7-B	#45 320-32552-A-7-B
#46 320-32551-A-1-A	#46 320-32551-A-1-A
#47 320-32551-A-2-A	#47 320-32551-A-2-A
#48 320-32551-A-3-A	#48 320-32551-A-3-A
#49 320-32551-A-3-B MS	#49 320-32551-A-3-B MS
#50 320-32551-A-3-C MSD	#50 320-32551-A-3-C MSD
#51 320-32551-A-4-A	#51 320-32551-A-4-A
#52 320-32551-A-5-A	#52 320-32551-A-5-A
#53 320-32551-A-6-A	#53 320-32551-A-6-A
#54 CCV L5	#54 CCV L5
#55 RB	#55 RB

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Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

AB 10/31/17
TP ~~10/30~~ 10/31/17

Batch Number: 320-191223
Method Code: 320-537_Prep-320

Analyst: Branscum, Cassie

Batch Open: 10/26/2017 10:33:00AM
Batch End: 10/27/2017 5:03:00PM

Extraction of Perfluorinated Alkyl Acids

	Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmnt FinAmnt	PHs Rcvd	PHs Adj1	PHs Adj2	Due Date	Analytical TAT	Dlv Rank	Comments	Output Sample Lab ID
1	MB~320-191223/1 N/A	N/A		250 mL	7			N/A	N/A	N/A	ch nd	MB 320-191223/1-A
				1.00 mL								
2	LCS~320-191223/2 N/A	N/A		250 mL	7			N/A	N/A	N/A	ch nd	LCS 320-191223/2-A
				1.00 mL								
3	LCSD~320-191223/3 N/A	N/A		250 mL	7			N/A	N/A	N/A	ch nd	LCSD 320-191223/3-A
				1.00 mL								
4	320-32528-A-1 (537_DOD5)	N/A (320-32528-1)	281.47 g	253.7 mL	7			10/23/17	16_Days	4	ch nd	320-32528-A-1-A
			27.80 g	1.00 mL								
5	320-32528-A-2 (537_DOD5)	N/A (320-32528-1)	287.35 g	260.1 mL	7			10/23/17	16_Days	4	ch nd	320-32528-A-2-A
			27.21 g	1.00 mL								
6	320-32528-A-3 (537_DOD5)	N/A (320-32528-1)	288.15 g	260.2 mL	7			10/23/17	16_Days	4	ch nd	320-32528-A-3-A
			27.95 g	1.00 mL								
7	320-32528-A-4 (537_DOD5)	N/A (320-32528-1)	311.95 g	284.6 mL	7			10/23/17	16_Days	4	ch nd	320-32528-A-4-A
			27.33 g	1.00 mL								

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-191223 Analyst: Branscum, Cassie Batch Open: 10/26/2017 10:33:00AM

Method Code: 320-537_Prep-320 Batch End: 10/27/2017 5:03:00PM

Batch Notes

Manifold ID	9
Trizma ID	SLBR4303V
SPE Cartridge ID	6357081-09
Methanol ID	1061669
Reagent Water ID	10/25/17
Internal Standard ID#	1041860
Pipette ID	N32728F
Analyst ID - TA Reagent Drop	CCB
Analyst ID - TA Reagent Drop Witness	JNS
Analyst ID - SU Reagent Drop	CCB
Analyst ID - SU Reagent Drop Witness	JNS
Analyst ID - IS Reagent Drop	JER
Analyst ID - IS Reagent Drop Witness	TQN
Analyst ID - Concentration	CCB
Analyst ID - Aliquot Step	TQN
Analyst ID - Final Volume Step	TQN
Batch Comment	N/A

Comments

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-191223 Analyst: Branscum, Cassie Batch Open: 10/26/2017 10:33:00AM

Method Code: 320-537_Prep-320 Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-191223/1	LC537-SU_00050	100 uL	1.00 mL	CB 10-26-17	HSA 10-26-17
LCS 320-191223/2	LC537-HSP_00022	100 uL	1.00 mL		
LCS 320-191223/2	LC537-SU_00050	100 uL	1.00 mL		
LCSD 320-191223/3	LC537-HSP_00022	100 uL	1.00 mL		
LCSD 320-191223/3	LC537-SU_00050	100 uL	1.00 mL		
320-32528-A-1	LC537-SU_00050	100 uL	1.00 mL		
320-32528-A-2	LC537-SU_00050	100 uL	1.00 mL		
320-32528-A-3	LC537-SU_00050	100 uL	1.00 mL		
320-32528-A-4	LC537-SU_00050	100 uL	1.00 mL		

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Other Reagents:

Reagent	Amount/Units	Lot#:
1041860		
537 IS : 100 µL	LC537-IS_00051 @ 0.1-0.2868 mg/mL	Exp: 3/20/18
spiked:	10/27/17	
witness: TBH 10/27/17		

TestAmerica
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Sacramento
Preparation Data Review Checklist

Preparation Batch Number(s) 191223 Test 537_DODS

Earliest Holding Time 11-1-17

Batch Information	1st Level Reviewer	2nd Level Reviewer
Date and time accurate and entered into TALS correctly	✓	✓
All necessary batch information complete and entered into TALS correctly	✓	✓
BD, FV, and AL initials are transcribed into the batch comment	✓	✓
Sample List Tab	1st Level Reviewer	2nd Level Reviewer
Samples identified to the correct method	✓	✓
Holding time violation NCM filed	N/A	NA
MS/MSD or MS/DU NCM filed	✓	✓
NCM for any anomalies filed	N/A	NA
All NCMs include method code, matrix, and prep batch	✓	✓
Method/sample/login/QAS checked and correct	✓	✓
Batch contains no more than 20 live samples	✓	✓
Worksheet Tab	1st Level Reviewer	2nd Level Reviewer
All samples properly preserved	✓	✓
Weights in anticipated range and not targeted	✓	✓
All additional test requirements performed, documented, and uploaded to TALS correctly (e.g. final amount, initial amount, turbidity, and CI Check)	✓	✓
The pH is transcribed properly in TALS	✓	✓
All additional information is transcribed into TALS and is correct and raw data is attached	✓	✓
Comments/Observations are transcribed correctly in TALS	✓	✓
Reagents Tab	1st Level Reviewer	2nd Level Reviewer
All necessary reagents not expired and checked into TALS	✓	✓
All spike amounts correct and added to necessary samples and QC	✓	✓
Internal Standard is added to the reagents	✓	✓
All units are correctly transcribed into TALS	✓	✓

1st Level Reviewer: TAN Date: 10/27/17

2nd Level Reviewer: VPM Date: 10/28/17

Comments: _____

Shipping and Receiving Documents

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

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Regulatory Program: ☑ DW ☐ NPDES ☐ RCRA ☐ Other:

Client Contact	Project Manager: Andy Frebowitz	Site Contact: Mary Kay Bond	Date: 10/18/2017	COC No:
TetraTech	Tel/Fax: 610.382.1170	Lab Contact: Dave Alltucker	Carrier: FedEx	1 of 1 COCs
234 Mall Boulevard Suite 260	**Analysis Turnaround Time**			Sampler: Mary Kay Bond
King of Prussia, PA 19406	☐ CALENDAR DAYS ☐ WORKING DAYS			**For Lab Use Only:**
610-382-1174	TAT if different from Below 21			Walk-in Client:
610-491-9688	☐ 2 weeks			Lab Sampling:
Project Name: WE04	☐ 1 week			
Site: WE04	☐ 2 days			Job / SDG No.:
P O # 1132358 (through EarthToxics)	☐ 1 day			

320-32528 Chain of Custody

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	EPA 537 UCMR3	Sample Specific Notes:
WGNA-101817-RW-3933	10/18/2017	08:10	G	DW	2	N	N	Y	
WGNA-101817-FRB-3933	10/18/2017	08:05	G	DW	2	N	N	Y	Field Reagent Blank
WGNA-101817-RW-0569	10/18/2017	9:10	G	DW	2	N	N	Y	
WGNA-101817-FRB-0569	10/18/2017	9:05	G	DW	2	N	N	Y	Field Reagent Blank

Preservation Used: 1= Ice, 2= HCl; 3= H_2SO_4; 4=HNO_3; 5=NaOH; 6= Other: Trizma

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the

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

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☐ Disposal by Lab ☐ Archive for Months

Fed Ex Tracking: 7705 1746 9064

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd: 1.9 Corr'd: | Therm ID No.: A163

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Mary K Bond	Tetra Tech	10/18/2017 16:00		TA WS	10/19/17 1015
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Form No. CA-C-WI-002, Rev. 4.11, dated 1/24/2017

Login Sample Receipt Checklist

Client: Tetra Tech, Inc.

Job Number: 320-32528-1

Login Number: 32528
List Number: 1
Creator: Hytrek, Cheryl

List Source: TestAmerica Sacramento

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

"WGNA-101817-RW-3933","537","RES","320-32528-1","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","14","ng/L","J M","6.7","DL","","TRG","","","39","LOQ","YES","-99","","253.7","1.00","16",""
"WGNA-101817-RW-3933","537","RES","320-32528-1","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","15","ng/L","J","2.8","DL","","TRG","","","20","LOQ","YES","-99","","253.7","1.00","7.9",""
"WGNA-101817-RW-3933","537","RES","320-32528-1","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","16","ng/L","J","5.4","DL","","TRG","","","30","LOQ","YES","-99","","253.7","1.00","12",""
"WGNA-101817-RW-3933","537","RES","320-32528-1","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","35","ng/L","U","16","DL","","TRG","","","89","LOQ","YES","-99","","253.7","1.00","35",""
"WGNA-101817-RW-3933","537","RES","320-32528-1","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","5.7","ng/L","J","1.9","DL","","TRG","","","9.9","LOQ","YES","-99","","253.7","1.00","3.9",""
"WGNA-101817-RW-3933","537","RES","320-32528-1","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","20","ng/L","U M","7.9","DL","","TRG","","","24","LOQ","YES","-99","","253.7","1.00","20",""
"WGNA-101817-RW-3933","537","RES","320-32528-1","TALSAC","STL00993","13C2 PFHxA","32","ng/L","","-99","DL","","SURR","81","","-99","LOQ","YES","39.4","","253.7","1.00","0",""
"WGNA-101817-RW-3933","537","RES","320-32528-1","TALSAC","STL00996","13C2 PFDA","38","ng/L","","-99","DL","","SURR","96","","-99","LOQ","YES","39.4","","253.7","1.00","0",""
"WGNA-101817-FRB-3933","537","RES","320-32528-2","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","15","ng/L","U","6.5","DL","","TRG","","","38","LOQ","YES","-99","","260.1","1.00","15",""
"WGNA-101817-FRB-3933","537","RES","320-32528-2","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","7.7","ng/L","U","2.7","DL","","TRG","","","19","LOQ","YES","-99","","260.1","1.00","7.7",""
"WGNA-101817-FRB-3933","537","RES","320-32528-2","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","12","ng/L","U","5.3","DL","","TRG","","","29","LOQ","YES","-99","","260.1","1.00","12",""
"WGNA-101817-FRB-3933","537","RES","320-32528-2","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","35","ng/L","U","15","DL","","TRG","","","87","LOQ","YES","-99","","260.1","1.00","35",""
"WGNA-101817-FRB-3933","537","RES","320-32528-2","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","3.8","ng/L","U","1.8","DL","","TRG","","","9.6","LOQ","YES","-99","","260.1","1.00","3.8",""
"WGNA-101817-FRB-3933","537","RES","320-32528-2","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","19","ng/L","U","7.7","DL","","TRG","","","23","LOQ","YES","-99","","260.1","1.00","19",""
"WGNA-101817-FRB-3933","537","RES","320-32528-2","TALSAC","STL00993","13C2 PFHxA","38","ng/L","","-99","DL","","SURR","98","","-99","LOQ","YES","38.4","","260.1","1.00","0",""
"WGNA-101817-FRB-3933","537","RES","320-32528-2","TALSAC","STL00996","13C2 PFDA","39","ng/L","","-99","DL","","SURR","102","","-99","LOQ","YES","38.4","","260.1","1.00","0",""
"WGNA-101817-RW-0569","537","RES","320-32528-3","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","26","ng/L","J M","6.5","DL","","TRG","","","38","LOQ","YES","-99","","260.2","1.00","15",""
"WGNA-101817-RW-0569","537","RES","320-32528-3","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","26","ng/L","","2.7","DL","","TRG","","","19","LOQ","YES","-99","","260.2","1.00","7.7",""
"WGNA-101817-RW-0569","537","RES","320-32528-3","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","7.0","ng/L","J","5.3","DL","","TRG","","","29","LOQ","YES","-99","","260.2","1.00","12",""
"WGNA-101817-RW-0569","537","RES","320-32528-3","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","35","ng/L","U","15","DL","","TRG","","","86","LOQ","YES","-99","","260.2","1.00","35",""
"WGNA-101817-RW-0569","537","RES","320-32528-3","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","7.5","ng/L","J","1.8","DL","","TRG","","","9.6","LOQ","YES","-99","","260.2","1.00","3.8",""
"WGNA-101817-RW-0569","537","RES","320-32528-3","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","19","ng/L","U M","7.7","DL","","TRG","","","23","LOQ","YES","-99","","260.2","1.00","19",""
"WGNA-101817-RW-0569","537","RES","320-32528-3","TALSAC","STL00993","13C2 PFHxA","31","ng/L","","-99","DL","","SURR","80","","-99","LOQ","YES","38.4","","260.2","1.00","0",""
"WGNA-101817-RW-0569","537","RES","320-32528-3","TALSAC","STL00996","13C2 PFDA","38","ng/L","","-99","DL","","SURR","99","","-99","LOQ","YES","38.4","","260.2","1.00","0",""
"WGNA-101817-FRB-0569","537","RES","320-32528-4","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","14","ng/L","U","6.0","DL","","TRG","","","35","LOQ","YES","-99","","284.6","1.00","14",""
"WGNA-101817-FRB-0569","537","RES","320-32528-4","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","7.0","ng/L","U","2.5","DL","","TRG","","","18","LOQ","YES","-99","","284.6","1.00","7.0",""
"WGNA-101817-FRB-0569","537","RES","320-32528-4","TALSAC","355-46-4","Perfluorohexanesulfonic acid

(PFHxS)","11","ng/L","U","4.8","DL","","TRG","","","26","LOQ","YES","-99","","284.6","1.00","11",""
"WGNA-101817-FRB-0569","537","RES","320-32528-4","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","32","ng/L","U","14","DL","","TRG","","","79","LOQ","YES","-99","","284.6","1.00","32",""
"WGNA-101817-FRB-0569","537","RES","320-32528-4","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","3.5","ng/L","U","1.7","DL","","TRG","","","8.8","LOQ","YES","-99","","284.6","1.00","3.5",""
"WGNA-101817-FRB-0569","537","RES","320-32528-4","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","18","ng/L","U","7.0","DL","","TRG","","","21","LOQ","YES","-99","","284.6","1.00","18",""
"WGNA-101817-FRB-0569","537","RES","320-32528-4","TALSAC","STL00993","13C2
PFHxA","35","ng/L","","-99","DL","","SURR","101","","-99","LOQ","YES","35.1","","284.6","1.00","0",""
"WGNA-101817-FRB-0569","537","RES","320-32528-4","TALSAC","STL00996","13C2
PFDA","37","ng/L","","-99","DL","","SURR","105","","-99","LOQ","YES","35.1","","284.6","1.00","0",""
"LCS 320-191223/2-A","537","RES","LCS 320-191223/2-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","214","ng/L","M","6.8","DL","","SPK","96","","40","LOQ","YES","222","","250","1.00","16",""
"LCS 320-191223/2-A","537","RES","LCS 320-191223/2-A","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","111","ng/L","","2.8","DL","","SPK","100","","20","LOQ","YES","111","","250","1.00","8.0",""
"LCS 320-191223/2-A","537","RES","LCS 320-191223/2-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","160","ng/L","","5.5","DL","","SPK","96","","30","LOQ","YES","167","","250","1.00","12",""
"LCS 320-191223/2-A","537","RES","LCS 320-191223/2-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","466","ng/L","","16","DL","","SPK","93","","90","LOQ","YES","500","","250","1.00","36",""
"LCS 320-191223/2-A","537","RES","LCS 320-191223/2-A","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","56.4","ng/L","","1.9","DL","","SPK","101","","10","LOQ","YES","55.6","","250","1.00","4.0",""
"LCS 320-191223/2-A","537","RES","LCS 320-191223/2-A","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","113","ng/L","","8.0","DL","","SPK","102","","24","LOQ","YES","111","","250","1.00","20",""
"LCS 320-191223/2-A","537","RES","LCS 320-191223/2-A","TALSAC","STL00993","13C2
PFHxA","40.3","ng/L","","-99","DL","","SURR","101","","-99","LOQ","YES","40.0","","250","1.00","0",""
"LCS 320-191223/2-A","537","RES","LCS 320-191223/2-A","TALSAC","STL00996","13C2
PFDA","41.6","ng/L","","-99","DL","","SURR","104","","-99","LOQ","YES","40.0","","250","1.00","0",""
"LCSD 320-191223/3-A","537","RES","LCSD 320-191223/3-A","TALSAC","1763-23-1","Perfluorooctanesulfonic
acid (PFOS)","218","ng/L","M","6.8","DL","","SPK","98","2","40","LOQ","YES","222","LCS 320-191223/2-
A","250","1.00","16",""
"LCSD 320-191223/3-A","537","RES","LCSD 320-191223/3-A","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","113","ng/L","","2.8","DL","","SPK","102","2","20","LOQ","YES","111","LCS 320-191223/2-
A","250","1.00","8.0",""
"LCSD 320-191223/3-A","537","RES","LCSD 320-191223/3-A","TALSAC","355-46-4","Perfluorohexanesulfonic
acid (PFHxS)","166","ng/L","","5.5","DL","","SPK","99","4","30","LOQ","YES","167","LCS 320-191223/2-
A","250","1.00","12",""
"LCSD 320-191223/3-A","537","RES","LCSD 320-191223/3-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","483","ng/L","","16","DL","","SPK","97","4","90","LOQ","YES","500","LCS 320-191223/2-
A","250","1.00","36",""
"LCSD 320-191223/3-A","537","RES","LCSD 320-191223/3-A","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","58.4","ng/L","","1.9","DL","","SPK","105","3","10","LOQ","YES","55.6","LCS 320-191223/2-
A","250","1.00","4.0",""
"LCSD 320-191223/3-A","537","RES","LCSD 320-191223/3-A","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","115","ng/L","","8.0","DL","","SPK","103","1","24","LOQ","YES","111","LCS 320-191223/2-
A","250","1.00","20",""
"LCSD 320-191223/3-A","537","RES","LCSD 320-191223/3-A","TALSAC","STL00993","13C2
PFHxA","40.7","ng/L","","-99","DL","","SURR","102","","-99","LOQ","YES","40.0","LCS 320-191223/2-
A","250","1.00","0",""
"LCSD 320-191223/3-A","537","RES","LCSD 320-191223/3-A","TALSAC","STL00996","13C2
PFDA","41.2","ng/L","","-99","DL","","SURR","103","","-99","LOQ","YES","40.0","LCS 320-191223/2-
A","250","1.00","0",""
"MB 320-191223/1-A","537","RES","MB 320-191223/1-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 320-191223/1-A","537","RES","MB 320-191223/1-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 320-191223/1-A","537","RES","MB 320-191223/1-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 320-191223/1-A","537","RES","MB 320-191223/1-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","36","ng/L","U","16","DL","","TRG","","","90","LOQ","YES","-99","","250","1.00","36",""
"MB 320-191223/1-A","537","RES","MB 320-191223/1-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 320-191223/1-A","537","RES","MB 320-191223/1-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 320-191223/1-A","537","RES","MB 320-191223/1-A","TALSAC","STL00993","13C2
PFHxA","37.7","ng/L","","-99","DL","","SURR","94","","-99","LOQ","YES","40.0","","250","1.00","0",""
"MB 320-191223/1-A","537","RES","MB 320-191223/1-A","TALSAC","STL00996","13C2
PFDA","38.2","ng/L","","-99","DL","","SURR","95","","-99","LOQ","YES","40.0","","250","1.00","0",""
"Unknown","Unknown","WGNA-101817-RW-3933","10/18/2017 08:10","AQ","320-32528-
1","NM","","1.90","537","METHOD","RES","10/26/2017 10:34","10/31/2017
17:40","TALSAC","COA","WET","NA","1","NA","NA","","100","320-191223","320-191223","NA","320-
192277","320-32528-1","10/19/2017 10:15","11/01/2017 14:04",""
"Unknown","Unknown","WGNA-101817-FRB-3933","10/18/2017 08:05","AQ","320-32528-
2","FB","","1.90","537","METHOD","RES","10/26/2017 10:34","10/31/2017
17:44","TALSAC","COA","WET","NA","1","NA","NA","","100","320-191223","320-191223","NA","320-
192277","320-32528-1","10/19/2017 10:15","11/01/2017 14:04",""
"Unknown","Unknown","WGNA-101817-RW-0569","10/18/2017 09:10","AQ","320-32528-
3","NM","","1.90","537","METHOD","RES","10/26/2017 10:34","10/31/2017
17:49","TALSAC","COA","WET","NA","1","NA","NA","","100","320-191223","320-191223","NA","320-
192277","320-32528-1","10/19/2017 10:15","11/01/2017 14:04",""
"Unknown","Unknown","WGNA-101817-FRB-0569","10/18/2017 09:05","AQ","320-32528-
4","FB","","1.90","537","METHOD","RES","10/26/2017 10:34","10/31/2017
17:54","TALSAC","COA","WET","NA","1","NA","NA","","100","320-191223","320-191223","NA","320-
192277","320-32528-1","10/19/2017 10:15","11/01/2017 14:04",""
"Unknown","Unknown","LCS 320-191223/2-A","","AQ","LCS 320-191223/2-
A","LCS","","-99","537","METHOD","RES","10/26/2017 10:34","10/31/2017
17:30","TALSAC","COA","WET","NA","1","NA","NA","","100","320-191223","320-191223","NA","320-
192277","320-32528-1","10/26/2017 10:34","11/01/2017 14:04",""
"Unknown","Unknown","LCSD 320-191223/3-A","","AQ","LCSD 320-191223/3-
A","LCSD","","-99","537","METHOD","RES","10/26/2017 10:34","10/31/2017
17:35","TALSAC","COA","WET","NA","1","NA","NA","","100","320-191223","320-191223","NA","320-
192277","320-32528-1","10/26/2017 10:34","11/01/2017 14:04",""
"Unknown","Unknown","MB 320-191223/1-A","","AQ","MB 320-191223/1-
A","MB","","-99","537","METHOD","RES","10/26/2017 10:34","10/31/2017
17:25","TALSAC","COA","WET","NA","1","NA","NA","","100","320-191223","320-191223","NA","320-
192277","320-32528-1","10/26/2017 10:34","11/01/2017 14:04",""

TETRA TECH

INTERNAL CORRESPONDENCE

TO: **A. FREBOWITZ** **DATE:** **NOVEMBER 21, 2017**

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

SUBJECT: **ORGANIC DATA VALIDATION –POLYFLUOROALKYL SUBSTANCES (PFAS)**
NAS JRB WILLOW GROVE
SAMPLE DELIVERY GROUP (SDG) 320-32528-1

SAMPLES: 2/Field Reagent Blank (FRB)
WGNA-101817-FRB-0569 WGNA-101817-FRB-3933

2/Drinking Water
WGNA-101817-RW-0569 WGNA-101817-RW-3933

Overview

The sample set for NAS JRB Willow Grove, SDG 320-32528-1, consisted of two (2) drinking water samples and two (2) FRB samples. All samples were analyzed for select polyfluorinated 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 sample pairs were included in this SDG.

The samples were collected by Tetra Tech on October 18, 2017 and analyzed by Test America-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

Detected results reported below the limit of quantitation (LOQ) but above the detection limit (DL) were qualified as estimated, (J).

Notes

Samples with detections and their associated FRBs are summarized below. No detected results were present in any FRBs.

Sample	**Associated FRB**
WGNA-101817-RW-0569	WGNA-101817-FRB-0569
WGNA-101817-RW-3933	WGNA-101817-FRB-3933

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

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

Executive Summary

Laboratory Performance: None.

Other Factors Affecting Data Quality: Results below the RL were estimated.

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 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues; i.e.chromatography,interferences, etc.)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = RPD between columns/detectors >40% for positive results determined via GC/HPLC
V = Non-linear calibrations; correlation coefficient $r < 0.995$
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 standard deviations is greater than sample activity
Z1 = Tentatively Identified Compound considered presumptively present
Z2 = Tentatively Identified Compound column bleed
Z3 = Tentatively Identified Compound aldol condensate
Z4 = Sample activity is less than the at uncertainty at 3 standard deviations and greater than the MDC
Z5 = Sample activity is less than the at uncertainty at 3 standard deviations and less than the MDC

PROJ_NO: 08005-WE04	NSAMPLE	WGNA-101817-FRB-0569			WGNA-101817-FRB-3933			WGNA-101817-RW-0569			WGNA-101817-RW-3933		
SDG: 320-32528-1	LAB_ID	320-32528-4			320-32528-2			320-32528-3			320-32528-1		
FRACTION: PFAS	SAMP_DATE	10/18/2017			10/18/2017			10/18/2017			10/18/2017		
MEDIA: WATER	QC_TYPE	FB			FB			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PENTADECAFLUOROOCTANOIC ACID		7	U		7.7	U		26			15	J	P
PERFLUOROBUTANESULFONIC ACID		32	U		35	U		35	U		35	U	
PERFLUOROHEPTANOIC ACID		3.5	U		3.8	U		7.5	J	P	5.7	J	P
PERFLUOROHEXANESULFONIC ACID		11	U		12	U		7	J	P	16	J	P
PERFLUORONONANOIC ACID		18	U		19	U		19	U		20	U	
PERFLUOROOCTANE SULFONIC ACID		14	U		15	U		26	J	P	14	J	P

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-32528-1

SDG No.:

Client Sample ID: WGNA-101817-RW-3933 | Lab Sample ID: 320-32528-1

Matrix: Water | Lab File ID: 2017.10.31_537C_006.d

Analysis Method: 537 | Date Collected: 10/18/2017 08:10

Extraction Method: 537 | Date Extracted: 10/26/2017 10:34

Sample wt/vol: 253.7(mL) | Date Analyzed: 10/31/2017 17:40

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 192277 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	14	J ~~M~~	39	16	6.7
335-67-1	Perfluorooctanoic acid (PFOA)	15	J	20	7.9	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U ~~M~~	24	20	7.9
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	16	J	30	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	5.7	J	9.9	3.9	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	89	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	81		70-130
STL00996	13C2 PFDA	96		70-130

11/09/2017

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-32528-1

SDG No.:

Client Sample ID: WGNA-101817-FRB-3933 | Lab Sample ID: 320-32528-2

Matrix: Water | Lab File ID: 2017.10.31_537C_007.d

Analysis Method: 537 | Date Collected: 10/18/2017 08:05

Extraction Method: 537 | Date Extracted: 10/26/2017 10:34

Sample wt/vol: 260.1(mL) | Date Analyzed: 10/31/2017 17:44

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 192277 | Units: ng/L

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)	7.7	U	19	7.7	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.7
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.8	U	9.6	3.8	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	87	35	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	98		70-130
STL00996	13C2 PFDA	102		70-130

11/09/2017

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-32528-1

SDG No.:

Client Sample ID: WGNA-101817-RW-0569 | Lab Sample ID: 320-32528-3

Matrix: Water | Lab File ID: 2017.10.31_537C_008.d

Analysis Method: 537 | Date Collected: 10/18/2017 09:10

Extraction Method: 537 | Date Extracted: 10/26/2017 10:34

Sample wt/vol: 260.2(mL) | Date Analyzed: 10/31/2017 17:49

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 192277 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	26	J ~~M~~	38	15	6.5
335-67-1	Perfluorooctanoic acid (PFOA)	26		19	7.7	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U ~~M~~	23	19	7.7
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	7.0	J	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	7.5	J	9.6	3.8	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	86	35	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	80		70-130
STL00996	13C2 PFDA	99		70-130

11/09/2017

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-32528-1

SDG No.:

Client Sample ID: WGNA-101817-FRB-0569 | Lab Sample ID: 320-32528-4

Matrix: Water | Lab File ID: 2017.10.31_537C_009.d

Analysis Method: 537 | Date Collected: 10/18/2017 09:05

Extraction Method: 537 | Date Extracted: 10/26/2017 10:34

Sample wt/vol: 284.6(mL) | Date Analyzed: 10/31/2017 17:54

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 192277 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	14	U	35	14	6.0
335-67-1	Perfluorooctanoic acid (PFOA)	7.0	U	18	7.0	2.5
375-95-1	Perfluorononanoic acid (PFNA)	18	U	21	18	7.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	26	11	4.8
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.5	U	8.8	3.5	1.7
375-73-5	Perfluorobutanesulfonic acid (PFBS)	32	U	79	32	14

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	101		70-130
STL00996	13C2 PFDA	105		70-130

11/09/2017

Appendix B

Results as Reported by the Laboratory

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-32528-1

SDG No.:

Client Sample ID: WGNA-101817-RW-3933 Lab Sample ID: 320-32528-1

Matrix: Water Lab File ID: 2017.10.31_537C_006.d

Analysis Method: 537 Date Collected: 10/18/2017 08:10

Extraction Method: 537 Date Extracted: 10/26/2017 10:34

Sample wt/vol: 253.7(mL) Date Analyzed: 10/31/2017 17:40

Con. Extract Vol.: 1.00(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 192277 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	14	J M	39	16	6.7
335-67-1	Perfluorooctanoic acid (PFOA)	15	J	20	7.9	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U M	24	20	7.9
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	16	J	30	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	5.7	J	9.9	3.9	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	89	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	81		70-130
STL00996	13C2 PFDA	96		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-32528-1

SDG No.:

Client Sample ID: WGNA-101817-FRB-3933 Lab Sample ID: 320-32528-2

Matrix: Water Lab File ID: 2017.10.31_537C_007.d

Analysis Method: 537 Date Collected: 10/18/2017 08:05

Extraction Method: 537 Date Extracted: 10/26/2017 10:34

Sample wt/vol: 260.1(mL) Date Analyzed: 10/31/2017 17:44

Con. Extract Vol.: 1.00(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 192277 Units: ng/L

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)	7.7	U	19	7.7	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.7
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.8	U	9.6	3.8	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	87	35	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	98		70-130
STL00996	13C2 PFDA	102		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-32528-1

SDG No.:

Client Sample ID: WGNA-101817-RW-0569 Lab Sample ID: 320-32528-3

Matrix: Water Lab File ID: 2017.10.31_537C_008.d

Analysis Method: 537 Date Collected: 10/18/2017 09:10

Extraction Method: 537 Date Extracted: 10/26/2017 10:34

Sample wt/vol: 260.2(mL) Date Analyzed: 10/31/2017 17:49

Con. Extract Vol.: 1.00(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 192277 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	26	J M	38	15	6.5
335-67-1	Perfluorooctanoic acid (PFOA)	26		19	7.7	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U M	23	19	7.7
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	7.0	J	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	7.5	J	9.6	3.8	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	86	35	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	80		70-130
STL00996	13C2 PFDA	99		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-32528-1

SDG No.:

Client Sample ID: WGNA-101817-FRB-0569 | Lab Sample ID: 320-32528-4

Matrix: Water | Lab File ID: 2017.10.31_537C_009.d

Analysis Method: 537 | Date Collected: 10/18/2017 09:05

Extraction Method: 537 | Date Extracted: 10/26/2017 10:34

Sample wt/vol: 284.6(mL) | Date Analyzed: 10/31/2017 17:54

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 192277 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	14	U	35	14	6.0
335-67-1	Perfluorooctanoic acid (PFOA)	7.0	U	18	7.0	2.5
375-95-1	Perfluorononanoic acid (PFNA)	18	U	21	18	7.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	26	11	4.8
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.5	U	8.8	3.5	1.7
375-73-5	Perfluorobutanesulfonic acid (PFBS)	32	U	79	32	14

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	101		70-130
STL00996	13C2 PFDA	105		70-130

Appendix C

Support Documentation

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

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
TestAmerica Laboratories, Inc.

Regulatory Program: ☑ DW ☐ NPDES ☐ RCRA ☐ Other:

Client Contact	**Project Manager:** Andy Frebowitz	**Site Contact:** Mary Kay Bond	**Date:** 10/18/2017	COC No:
TetraTech	**Tel/Fax:** 610.382.1170	**Lab Contact:** Dave Alltucker	**Carrier:** FedEx	1 of 1 COCs
234 Mall Boulevard Suite 260	**Analysis Turnaround Time**			Sampler: Mary Kay Bond
King of Prussia, PA 19406	☐ CALENDAR DAYS ☐ WORKING DAYS			**For Lab Use Only:**
610-382-1174	TAT if different from Below 21			Walk-in Client:
610-491-9688	☐ 2 weeks			Lab Sampling:
Project Name: WE04	☐ 1 week			
Site: WE04	☐ 2 days			Job / SDG No.:
P O # 1132358 (through EarthToxics)	☐ 1 day			

320-32528 Chain of Custody

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	EPA 537 UCMR3	Sample Specific Notes:
WGNA-101817-RW-3933	10/18/2017	08:10	G	DW	2	N	N	Y	
WGNA-101817-FRB-3933	10/18/2017	08:05	G	DW	2	N	N	Y	Field Reagent Blank
WGNA-101817-RW-0569	10/18/2017	9:10	G	DW	2	N	N	Y	
WGNA-101817-FRB-0569	10/18/2017	9:05	G	DW	2	N	N	Y	Field Reagent Blank

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other: Trizma

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the

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

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☐ Disposal by Lab ☐ Archive for Months

Fed Ex Tracking: 7705 1746 9064

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd: 1.9 Corr'd: | Therm ID No.: AF67

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Mary K Bond	Tetra Tech	10/18/2017 16:00		TA WS	10/19/17 1015
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Form No. CA-C-WI-002, Rev. 4.11, dated 1/24/2017

Job Narrative
320-32528-1

Receipt
The samples were received on 10/19/2017 10:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.9º C.

LCMS
Method(s) 537, 537 DW: 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 320-191223.

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. TestAmerica Job ID: 320-32528-1
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

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.
TestAmerica Job ID: 320-32528-1
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-32528-1	WGNA-101817-RW-3933	Water	10/18/17 08:10	10/19/17 10:15
320-32528-2	WGNA-101817-FRB-3933	Water	10/18/17 08:05	10/19/17 10:15
320-32528-3	WGNA-101817-RW-0569	Water	10/18/17 09:10	10/19/17 10:15
320-32528-4	WGNA-101817-FRB-0569	Water	10/18/17 09:05	10/19/17 10:15

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-32528-1

SDG No.:

Matrix: Water Level: Low

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

Client Sample ID	Lab Sample ID	PFHxA #	PFDA #
WGNA-101817-RW-3933	320-32528-1	81	96
WGNA-101817-FRB-3933	320-32528-2	98	102
WGNA-101817-RW-0569	320-32528-3	80	99
WGNA-101817-FRB-0569	320-32528-4	101	105
	MB 320-191223/1-A	94	95
	LCS 320-191223/2-A	101	104
	LCSD 320-191223/3-A	102	103

	QC LIMITS
PFHxA = 13C2 PFHxA	70-130
PFDA = 13C2 PFDA	70-130

Column to be used to flag recovery values

FORM II 537

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-32528-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2017.10.31_537C_004.d

Lab ID: LCS 320-191223/2-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	222	214	96	70-130	M
Perfluorooctanoic acid (PFOA)	111	111	100	70-130	
Perfluorononanoic acid (PFNA)	111	113	102	70-130	
Perfluorohexanesulfonic acid (PFHxS)	167	160	96	70-130	
Perfluoroheptanoic acid (PFHpA)	55.6	56.4	101	70-130	
Perfluorobutanesulfonic acid (PFBS)	500	466	93	70-130	

Column to be used to flag recovery and RPD values

FORM III 537

FORM III
LCMS LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-32528-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 2017.10.31_537C_005.d

Lab ID: LCSD 320-191223/3-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LCSD CONCENTRATION (ng/L)	LCSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	222	218	98	2	30	70-130	M
Perfluorooctanoic acid (PFOA)	111	113	102	2	30	70-130	
Perfluorononanoic acid (PFNA)	111	115	103	1	30	70-130	
Perfluorohexanesulfonic acid (PFHxS)	167	166	99	4	30	70-130	
Perfluoroheptanoic acid (PFHpA)	55.6	58.4	105	3	30	70-130	
Perfluorobutanesulfonic acid (PFBS)	500	483	97	4	30	70-130	

Column to be used to flag recovery and RPD values

FORM III 537

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-32528-1

SDG No.:

Lab File ID: 2017.10.31_537C_003.d Lab Sample ID: MB 320-191223/1-A

Matrix: Water Date Extracted: 10/26/2017 10:34

Instrument ID: A8_N Date Analyzed: 10/31/2017 17:25

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-191223/2-A	2017.10.31_537C_004.d	10/31/2017 17:30
	LCSD 320-191223/3-A	2017.10.31_537C_005.d	10/31/2017 17:35
WGNA-101817-RW-3933	320-32528-1	2017.10.31_537C_006.d	10/31/2017 17:40
WGNA-101817-FRB-3933	320-32528-2	2017.10.31_537C_007.d	10/31/2017 17:44
WGNA-101817-RW-0569	320-32528-3	2017.10.31_537C_008.d	10/31/2017 17:49
WGNA-101817-FRB-0569	320-32528-4	2017.10.31_537C_009.d	10/31/2017 17:54

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-32528-1

SDG No.:

Client Sample ID: | Lab Sample ID: MB 320-191223/1-A

Matrix: Water | Lab File ID: 2017.10.31_537C_003.d

Analysis Method: 537 | Date Collected:

Extraction Method: 537 | Date Extracted: 10/26/2017 10:34

Sample wt/vol: 250(mL) | Date Analyzed: 10/31/2017 17:25

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 2(uL) | GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 192277 | Units: ng/L

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	94		70-130
STL00996	13C2 PFDA	95		70-130

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-32528-1

SDG No.:

Instrument ID: A8_N Calibration Start Date: 10/31/2017 11:44

GC Column: GeminiC18 3x100 ID: 3(mm) Calibration End Date: 10/31/2017 12:08

Calibration ID: 35621

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MEAN AREA AND MEAN RT		2775806	1.86	6114108	2.11		
UPPER LIMIT		4163709	2.36	9171162	2.61		
LOWER LIMIT		1387903	1.36	3057054	1.61		
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCVL 320-192162/11		2865147	1.87	6394781	2.11		
ICV 320-192162/16		2807375	1.87	6562646	2.11		
CCV 320-192277/1 CCVIS		2736266	1.85	5871567	2.09		
MB 320-191223/1-A		2707902	1.85	6287436	2.09		
LCS 320-191223/2-A		2767575	1.86	6347084	2.10		
LCSD 320-191223/3-A		2743298	1.86	6235870	2.10		
320-32528-1	WGNA-101817-RW-3933	2963693	1.86	6520024	2.10		
320-32528-2	WGNA-101817-FRB-3933	2682562	1.85	5988598	2.09		
320-32528-3	WGNA-101817-RW-0569	3036731	1.86	6609095	2.10		
320-32528-4	WGNA-101817-FRB-0569	2593193	1.85	5851132	2.09		
CCV 320-192277/10 CCVIS		2852910	1.86	6200813	2.10		

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

Area Limit = 50%-150% of internal standard area
RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII 537

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-32528-1

SDG No.:

Sample No.: CCV 320-192277/1 Date Analyzed: 10/31/2017 17:16

Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 2017.10.31_537C_001 Heated Purge: (Y/N) N

Calibration ID: 35621

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		2736266	1.85	5871567	2.09		
UPPER LIMIT		3830772	2.35	8220194	2.59		
LOWER LIMIT		1915386	1.35	4110097	1.59		
LAB SAMPLE ID	CLIENT SAMPLE ID						
MB 320-191223/1-A		2707902	1.85	6287436	2.09		
LCS 320-191223/2-A		2767575	1.86	6347084	2.10		
LCSD 320-191223/3-A		2743298	1.86	6235870	2.10		
320-32528-1	WGNA-101817-RW-3933	2963693	1.86	6520024	2.10		
320-32528-2	WGNA-101817-FRB-3933	2682562	1.85	5988598	2.09		
320-32528-3	WGNA-101817-RW-0569	3036731	1.86	6609095	2.10		
320-32528-4	WGNA-101817-FRB-0569	2593193	1.85	5851132	2.09		

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

Area Limit = 70%-140% of internal standard area
RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII 537

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-32528-1

SDG No.:

Sample No.: CCV 320-192277/10 Date Analyzed: 10/31/2017 17:59

Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3(mm)

Lab File ID (Standard): 2017.10.31_537C_010 Heated Purge: (Y/N) N

Calibration ID: 35621

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		2852910	1.86	6200813	2.10		
UPPER LIMIT		3994074	2.36	8681138	2.60		
LOWER LIMIT		1997037	1.36	4340569	1.60		
LAB SAMPLE ID	CLIENT SAMPLE ID						
MB 320-191223/1-A		2707902	1.85	6287436	2.09		
LCS 320-191223/2-A		2767575	1.86	6347084	2.10		
LCSD 320-191223/3-A		2743298	1.86	6235870	2.10		
320-32528-1	WGNA-101817-RW-3933	2963693	1.86	6520024	2.10		
320-32528-2	WGNA-101817-FRB-3933	2682562	1.85	5988598	2.09		
320-32528-3	WGNA-101817-RW-0569	3036731	1.86	6609095	2.10		
320-32528-4	WGNA-101817-FRB-0569	2593193	1.85	5851132	2.09		

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

Area Limit = 70%-140% of internal standard area
RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII 537

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

Lab Name: TestAmerica Sacramento Job No.: 320-32528-1 Analy Batch No.: 192162

SDG No.:

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

Calibration Start Date: 10/31/2017 11:44 Calibration End Date: 10/31/2017 12:08 Calibration ID: 35621

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-192162/4	2017.10.31_537ICAL_004.d
Level 2	IC 320-192162/5	2017.10.31_537ICAL_005.d
Level 3	IC 320-192162/6	2017.10.31_537ICAL_006.d
Level 4	IC 320-192162/7	2017.10.31_537ICAL_007.d
Level 5	IC 320-192162/8	2017.10.31_537ICAL_008.d
Level 6	IC 320-192162/9	2017.10.31_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)	1.0555 0.7230	1.1099	1.0105	0.8851	0.8003	QuaF		1.0703	-0.001949						0.9990		0.9600
Perfluoroheptanoic acid (PFHpA)	0.9747 0.9495	0.9317	0.9152	0.9490	0.9245	Ave		0.9408				2.3		30.0			
Perfluorohexanesulfonic acid (PFHxS)	1.6000 1.5277	1.6916	1.7164	1.6515	1.5848	Ave		1.6287				4.4		30.0			
Perfluorooctanoic acid (PFOA)	0.9001 0.9319	0.9648	0.9220	0.9359	0.9258	Ave		0.9301				2.3		30.0			
Perfluorooctanesulfonic acid (PFOS)	0.8822 0.9438	0.9288	0.9148	0.9474	0.9527	Ave		0.9283				2.9		30.0			
Perfluorononanoic acid (PFNA)	0.6310 0.6692	0.6490	0.6407	0.6829	0.6432	Ave		0.6527				3.0		30.0			
13C2 PFHxA	1.1162 1.1576	1.0680	1.0953	1.1948	1.1392	Ave		1.1285				4.0		30.0			
13C2 PFDA	0.7945 0.8580	0.7675	0.7780	0.8355	0.8229	Ave		0.8094				4.3		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.: 320-32528-1 Analy Batch No.: 192162

SDG No.:

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

Calibration Start Date: 10/31/2017 11:44 Calibration End Date: 10/31/2017 12:08 Calibration ID: 35621

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-192162/4	2017.10.31_537ICAL_004.d
Level 2	IC 320-192162/5	2017.10.31_537ICAL_005.d
Level 3	IC 320-192162/6	2017.10.31_537ICAL_006.d
Level 4	IC 320-192162/7	2017.10.31_537ICAL_007.d
Level 5	IC 320-192162/8	2017.10.31_537ICAL_008.d
Level 6	IC 320-192162/9	2017.10.31_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	2055386 27165476	4905442	9915456	16876130	21956734	9.00 180	20.0	45.0	90.0	135
Perfluoroheptanoic acid (PFHpA)	13PFOA	Ave	275477 5107421	614703	1311091	2526779	3670615	1.00 20.0	2.22	5.00	10.0	15.0
Perfluorohexanesulfonic acid (PFHxS)	PFOS	Ave	1038660 19137035	2492517	5615014	10497872	14494918	3.00 60.0	6.67	15.0	30.0	45.0
Perfluorooctanoic acid (PFOA)	13PFOA	Ave	509095 10031020	1273846	2643153	4986613	7356038	2.00 40.0	4.45	10.0	20.0	30.0
Perfluorooctanesulfonic acid (PFOS)	PFOS	Ave	763610 15763683	1824729	3990091	8030345	11617530	4.00 80.0	8.89	20.0	40.0	60.0
Perfluorononanoic acid (PFNA)	13PFOA	Ave	356641 7198655	856305	1835636	3636277	5107150	2.00 40.0	4.45	10.0	20.0	30.0
13C2 PFHxA	13PFOA	Ave	3153457 3112456	3170056	3137333	3180555	3014571	10.0 10.0	10.0	10.0	10.0	10.0
13C2 PFDA	13PFOA	Ave	2244762 2306925	2277991	2228390	2223928	2177702	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.: 320-32528-1 Analy Batch No.: 192162

SDG No.:

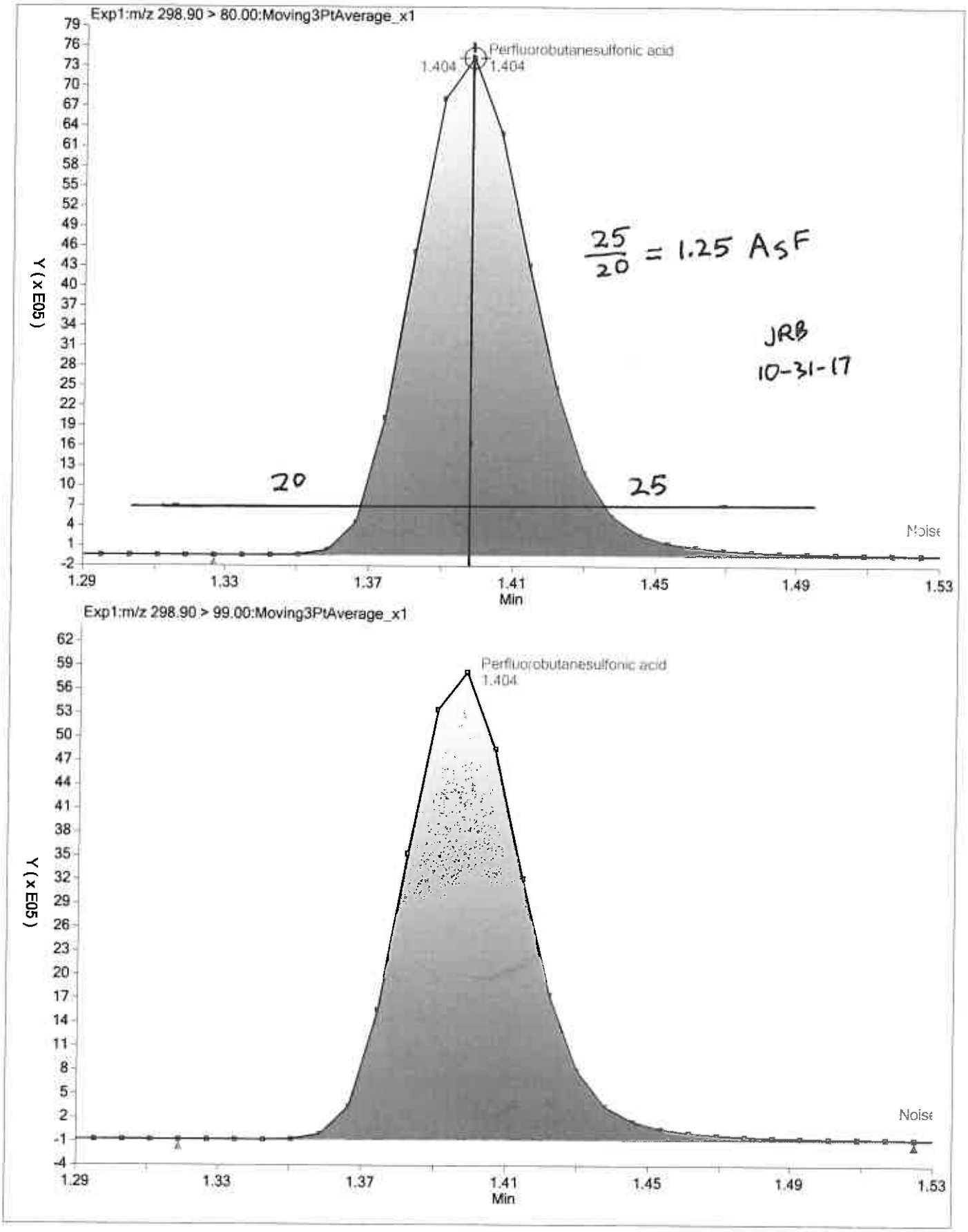
Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 10/31/2017 11:44 Calibration End Date: 10/31/2017 12:08 Calibration ID: 35621

Calibration Files:

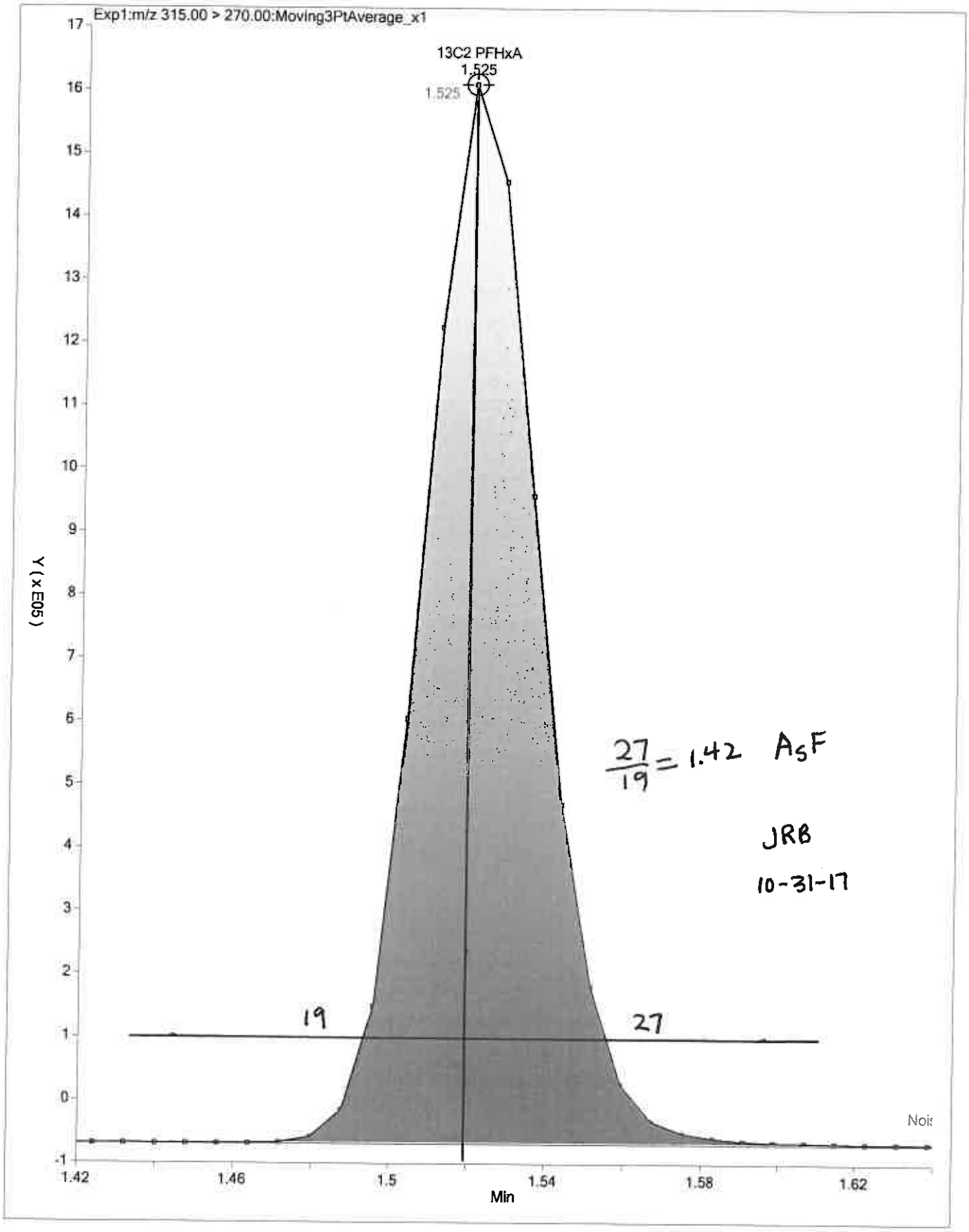
LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-192162/4	2017.10.31_537ICAL_004.d
Level 2	IC 320-192162/5	2017.10.31_537ICAL_005.d
Level 3	IC 320-192162/6	2017.10.31_537ICAL_006.d
Level 4	IC 320-192162/7	2017.10.31_537ICAL_007.d
Level 5	IC 320-192162/8	2017.10.31_537ICAL_008.d
Level 6	IC 320-192162/9	2017.10.31_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)	0.3	7.9	3.1	-1.4	-1.2	1.0	50	30	30	30	30	30
Perfluoroheptanoic acid (PFHpA)	3.6	-1.0	-2.7	0.9	-1.7	0.9	50	30	30	30	30	30
Perfluorohexanesulfonic acid (PFHxS)	-1.8	3.9	5.4	1.4	-2.7	-6.2	50	30	30	30	30	30
Perfluorooctanoic acid (PFOA)	-3.2	3.7	-0.9	0.6	-0.5	0.2	50	30	30	30	30	30
Perfluorooctanesulfonic acid (PFOS)	-5.0	0.1	-1.5	2.1	2.6	1.7	50	30	30	30	30	30
Perfluorononanoic acid (PFNA)	-3.3	-0.6	-1.8	4.6	-1.5	2.5	50	30	30	30	30	30
13C2 PFHxA	-1.1	-5.4	-2.9	5.9	0.9	2.6	30	30	30	30	30	30
13C2 PFDA	-1.8	-5.2	-3.9	3.2	1.7	6.0	30	30	30	30	30	30



$\frac{25}{20} = 1.25$ AsF

JRB
10-31-17


Exp1:m/z 315.00 > 270.00:Moving3PtAverage_x1
13C2 PFHxA
1.525
1.525
Y (x E05)
Min
1.42
1.46
1.5
1.54
1.58
1.62
19
27
27/19 = 1.42 ASF
JRB
10-31-17

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-32528-1

SDG No.:

Lab Sample ID: CCVL 320-192162/11 Calibration Date: 10/31/2017 12:17

Instrument ID: A8_N Calib Start Date: 10/31/2017 11:44

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 10/31/2017 12:08

Lab File ID: 2017.10.31_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		1.102		21.4	20.0	7.2	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9408	0.9641		2.28	2.22	2.5	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.629	1.689		6.92	6.67	3.7	50.0
Perfluorooctanoic acid (PFOA)	Ave	0.9301	0.9239		4.42	4.45	-0.7	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9283	0.9317		8.92	8.89	0.4	50.0
Perfluorononanoic acid (PFNA)	Ave	0.6527	0.6672		4.54	4.45	2.2	50.0
13C2 PFHxA	Ave	1.129	1.083		9.59	10.0	-4.1	30.0
13C2 PFDA	Ave	0.8094	0.8119		10.0	10.0	0.3	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-32528-1

SDG No.:

Lab Sample ID: ICV 320-192162/16 Calibration Date: 10/31/2017 14:58

Instrument ID: A8_N Calib Start Date: 10/31/2017 11:44

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 10/31/2017 12:08

Lab File ID: 2017.10.31_537AICAL_003.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		0.7489		82.4	100	-17.7	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9408	0.8366		8.89	10.0	-11.1	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.629	1.474		18.2	20.1	-9.5	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9301	0.8041		17.7	20.5	-13.5	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9283	0.8488		18.0	19.7	-8.6	30.0
Perfluorononanoic acid (PFNA)	Ave	0.6527	0.6148		19.0	20.1	-5.8	30.0
13C2 PFHxA	Ave	1.129	1.069		9.47	10.0	-5.3	30.0
13C2 PFDA	Ave	0.8094	0.7781		9.61	10.0	-3.9	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-32528-1

SDG No.:

Lab Sample ID: CCV 320-192277/1 Calibration Date: 10/31/2017 17:16

Instrument ID: A8_N Calib Start Date: 10/31/2017 11:44

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 10/31/2017 12:08

Lab File ID: 2017.10.31_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		1.038		47.8	45.0	6.2	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9408	0.9313		4.95	5.00	-1.0	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.629	1.735		16.0	15.0	6.5	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9301	0.8914		9.59	10.0	-4.2	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9283	0.9413		20.3	20.0	1.4	30.0
Perfluorononanoic acid (PFNA)	Ave	0.6527	0.6434		9.86	10.0	-1.4	30.0
13C2 PFHxA	Ave	1.129	1.074		9.52	10.0	-4.8	30.0
13C2 PFDA	Ave	0.8094	0.8032		9.92	10.0	-0.8	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-32528-1

SDG No.:

Lab Sample ID: CCV 320-192277/10 Calibration Date: 10/31/2017 17:59

Instrument ID: A8_N Calib Start Date: 10/31/2017 11:44

GC Column: GeminiC18 3x100 ID: 3.00(mm) Calib End Date: 10/31/2017 12:08

Lab File ID: 2017.10.31_537C_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		0.7669		125	135	-7.1	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.9408	0.9197		14.7	15.0	-2.2	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.629	1.564		43.2	45.0	-4.0	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9301	0.9192		29.7	30.0	-1.2	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9283	0.9333		60.3	60.0	0.5	30.0
Perfluorononanoic acid (PFNA)	Ave	0.6527	0.6543		30.1	30.0	0.3	30.0
13C2 PFHxA	Ave	1.129	1.145		10.1	10.0	1.5	30.0
13C2 PFDA	Ave	0.8094	0.8077		9.98	10.0	-0.2	30.0

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-32528-1

SDG No.:

Instrument ID: A8_N Start Date: 10/31/2017 11:44

Analysis Batch Number: 192162 End Date: 10/31/2017 14:58

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-192162/4		10/31/2017 11:44	1	2017.10.31_537ICAL_004.d	GeminiC18 3x100 3(mm)
IC 320-192162/5		10/31/2017 11:49	1	2017.10.31_537ICAL_005.d	GeminiC18 3x100 3(mm)
IC 320-192162/6		10/31/2017 11:54	1	2017.10.31_537ICAL_006.d	GeminiC18 3x100 3(mm)
IC 320-192162/7 ICISAV		10/31/2017 11:58	1	2017.10.31_537ICAL_007.d	GeminiC18 3x100 3(mm)
IC 320-192162/8		10/31/2017 12:03	1	2017.10.31_537ICAL_008.d	GeminiC18 3x100 3(mm)
IC 320-192162/9		10/31/2017 12:08	1	2017.10.31_537ICAL_009.d	GeminiC18 3x100 3(mm)
ZZZZZ		10/31/2017 12:13	1		GeminiC18 3x100 3(mm)
CCVL 320-192162/11		10/31/2017 12:17	1	2017.10.31_537ICAL_011.d	GeminiC18 3x100 3(mm)
ZZZZZ		10/31/2017 14:53	1		GeminiC18 3x100 3(mm)
ICV 320-192162/16		10/31/2017 14:58	1	2017.10.31_537AICAL_003.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-32528-1

SDG No.:

Instrument ID: A8_N Start Date: 10/31/2017 17:16

Analysis Batch Number: 192277 End Date: 10/31/2017 17:59

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-192277/1 CCVIS		10/31/2017 17:16	1	2017.10.31_537C_001.d	GeminiC18 3x100 3(mm)
ZZZZZ		10/31/2017 17:21	1		GeminiC18 3x100 3(mm)
MB 320-191223/1-A		10/31/2017 17:25	1	2017.10.31_537C_003.d	GeminiC18 3x100 3(mm)
LCS 320-191223/2-A		10/31/2017 17:30	1	2017.10.31_537C_004.d	GeminiC18 3x100 3(mm)
LCSD 320-191223/3-A		10/31/2017 17:35	1	2017.10.31_537C_005.d	GeminiC18 3x100 3(mm)
320-32528-1		10/31/2017 17:40	1	2017.10.31_537C_006.d	GeminiC18 3x100 3(mm)
320-32528-2		10/31/2017 17:44	1	2017.10.31_537C_007.d	GeminiC18 3x100 3(mm)
320-32528-3		10/31/2017 17:49	1	2017.10.31_537C_008.d	GeminiC18 3x100 3(mm)
320-32528-4		10/31/2017 17:54	1	2017.10.31_537C_009.d	GeminiC18 3x100 3(mm)
CCV 320-192277/10 CCVIS		10/31/2017 17:59	1	2017.10.31_537C_010.d	GeminiC18 3x100 3(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-32528-1

SDG No.:

Batch Number: 191223 Batch Start Date: 10/26/17 10:33 Batch Analyst: Branscum, Cassie

Batch Method: 537 Batch End Date: 10/27/17 17:03

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	ReceivedpH	LC537-HSP 00022
MB 320-191223/1		537, 537				250 mL	1.00 mL	7 SU	
LCS 320-191223/2		537, 537				250 mL	1.00 mL	7 SU	100 uL
LCSD 320-191223/3		537, 537				250 mL	1.00 mL	7 SU	100 uL
320-32528-A-1	WGNA-101817-RW-3933	537, 537	T	281.47 g	27.80 g	253.7 mL	1.00 mL	7 SU	
320-32528-A-2	WGNA-101817-FRB-3933	537, 537	T	287.35 g	27.21 g	260.1 mL	1.00 mL	7 SU	
320-32528-A-3	WGNA-101817-RW-0569	537, 537	T	288.15 g	27.95 g	260.2 mL	1.00 mL	7 SU	
320-32528-A-4	WGNA-101817-FRB-0569	537, 537	T	311.95 g	27.33 g	284.6 mL	1.00 mL	7 SU	

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-IS 00051	LC537-SU 00050	AnalysisComment			
MB 320-191223/1		537, 537		100 uL	100 uL	ch nd			
LCS 320-191223/2		537, 537		100 uL	100 uL	ch nd			
LCSD 320-191223/3		537, 537		100 uL	100 uL	ch nd			
320-32528-A-1	WGNA-101817-RW-3933	537, 537	T	100 uL	100 uL	ch nd			
320-32528-A-2	WGNA-101817-FRB-3933	537, 537	T	100 uL	100 uL	ch nd			
320-32528-A-3	WGNA-101817-RW-0569	537, 537	T	100 uL	100 uL	ch nd			
320-32528-A-4	WGNA-101817-FRB-0569	537, 537	T	100 uL	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.: 320-32528-1

SDG No.:

Batch Number: 191223 Batch Start Date: 10/26/17 10:33 Batch Analyst: Branscum, Cassie

Batch Method: 537 Batch End Date: 10/27/17 17:03

Batch Notes	
Analyst ID - Aliquot Step	TQN
Analyst ID - Concentration	CCB
Analyst ID - Final Volume Step	TQN
Internal Standard ID#	1041860
Manifold ID	9
Methanol ID	1061669
Pipette ID	N32728F
Analyst ID - IS Reagent Drop	JER
Analyst ID - IS Reagent Drop Witness	TQN
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	6357081-09
Trizma ID	SLBR4303V
Reagent Water ID	10/25/17

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.

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Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

AB 10/31/17
TP ~~10/30~~ 10/31/17

Batch Number: 320-191223

Method Code: 320-537_Prep-320

Analyst: Branscum, Cassie

Batch Open: 10/26/2017 10:33:00AM

Batch End: 10/27/2017 5:03:00PM

Extraction of Perfluorinated Alkyl Acids

	Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmnt FinAmnt	PHs Rcvd	PHs Adj1	PHs Adj2	Due Date	Analytical TAT	Dlv Rank	Comments	Output Sample Lab ID
1	MB~320-191223/1 N/A	N/A		250 mL 1.00 mL	7			N/A	N/A	N/A	ch nd	MB 320-191223/1-A
2	LCS~320-191223/2 N/A	N/A		250 mL 1.00 mL	7			N/A	N/A	N/A	ch nd	LCS 320-191223/2-A
3	LCSD~320-191223/3 N/A	N/A		250 mL 1.00 mL	7			N/A	N/A	N/A	ch nd	LCSD 320-191223/3-A
4	320-32528-A-1 (537_DOD5)	N/A (320-32528-1)	281.47 g 27.80 g	253.7 mL 1.00 mL	7			10/23/17	16_Days	4	ch nd	320-32528-A-1-A
5	320-32528-A-2 (537_DOD5)	N/A (320-32528-1)	287.35 g 27.21 g	260.1 mL 1.00 mL	7			10/23/17	16_Days	4	ch nd	320-32528-A-2-A
6	320-32528-A-3 (537_DOD5)	N/A (320-32528-1)	288.15 g 27.95 g	260.2 mL 1.00 mL	7			10/23/17	16_Days	4	ch nd	320-32528-A-3-A
7	320-32528-A-4 (537_DOD5)	N/A (320-32528-1)	311.95 g 27.33 g	284.6 mL 1.00 mL	7			10/23/17	16_Days	4	ch nd	320-32528-A-4-A

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-191223

Method Code: 320-537_Prep-320

Analyst: Branscum, Cassie

Batch Open: 10/26/2017 10:33:00AM

Batch End: 10/27/2017 5:03:00PM

Batch Notes

Manifold ID	9
Trizma ID	SLBR4303V
SPE Cartridge ID	6357081-09
Methanol ID	1061669
Reagent Water ID	10/25/17
Internal Standard ID#	1041860
Pipette ID	N32728F
Analyst ID - TA Reagent Drop	CCB
Analyst ID - TA Reagent Drop Witness	JNS
Analyst ID - SU Reagent Drop	CCB
Analyst ID - SU Reagent Drop Witness	JNS
Analyst ID - IS Reagent Drop	JER
Analyst ID - IS Reagent Drop Witness	TQN
Analyst ID - Concentration	CCB
Analyst ID - Aliquot Step	TQN
Analyst ID - Final Volume Step	TQN
Batch Comment	N/A

Comments

PFAS Calibration Calculations:

Initial Calibration 10/31/2017
Instrument A8_N

Perfluorohexanesulfonic acid

Analyte Concentration	Analyte Response	Internal Standard Response	Internal Standard Amount	RRF	Reported RRF
3	1038660	6203989	28.7	1.60163	1.6
6.67	2492517	6337478	28.7	1.69230	1.6916
15	5615014	6253426	28.7	1.71800	1.7164
30	10497872	6075693	28.7	1.65297	1.6515
45	14494918	5827765	28.7	1.58629	1.5848
60	19137035	5986294	28.7	1.52914	1.5277
			Average	1.63006	1.6287
			Standard Deviation	0.0708	
			RSD	0.0434	
			%RSD	4.34151	4.4

Continuing Calibration 10/31/2017 @ 17:16
A8_N

Perfluorohexanesulfonic acid

Analyte Concentration	Analyte Response	Internal Standard Response	Internal Standard Amount	RRF	%D	Reported RRF	Reported %D
15	5329366	5871567	28.7	1.7366	6.6279519	1.735	6.5

Willow Grove
SDG 320-32528-1

Sample Identification	WGNA-101817-RW-3933
Compound	Perfluorohexanesulfonic acid
Compound Area	1461171
Internal Standard Amount (ng)	28.7
Dilution Factor	1
Internal Standard Area	6520024
Average RRF	1.6287
Sample Volume(ml)	253.7
Volume Extract (ml)	1
Injection Volume (µl)	1
Concentration	15.5658 ug/L

ng/L

JAS 11/21/17

Preliminary Data - For Official Use Only

C:\All_Projects\112G08005\WE04\FS.DR.03\WGNA_201901.mxd MKB 2/14/2019

N

NSDALE

UPPER GWYNEDD

MONTGOMERY

WARRINGTON

WARWICK

NORTHAMPTON

IVYLAND

WARMINSTER

HORSHAM

HAGS

NASJRB Willow Grove

LOWER GWYNEDD

HATBORO

UPPER SOUTHAMPTON

UPPER DUBLIN

UPPER MORELAND

LOWER MORELAND

LEGEND

- PFOA & PFOS BELOW DETECTION LIMITS
- SUM OF PFOA & PFOS CONCENTRATIONS AT OR BELOW 40 PPT
- SUM OF PFOA & PFOS CONCENTRATIONS BETWEEN 40 PPT AND 70 PPT
- SUM OF PFOA & PFOS CONCENTRATIONS ABOVE 70 PPT
- PUBLIC WATER CONNECTION (SOME NOT BY NAVY)
- SAMPLING AREA
- HORSHAM AIR GUARD (HAGS)
- FORMER NASJRB WILLOW GROVE
- TOWNSHIP BOUNDARY

5,000 2,500 0 5,000

Feet

NAVFAC

PFC SAMPLE RESULTS MAP
FORMER NASJRB WILLOW GROVE
AND HORSHAM AIR GUARD
MONTGOMERY COUNTY, PENNSYLVANIA

SCALE	
AS NOTED	
FILE	
WGNA	
REV	DATE
0	02/14/19
FIGURE NUMBER	
FIGURE 1	