



**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 320-30142-1**

*Naval Air Warfare Center Warminster
Warminster, Pennsylvania*

August 2019

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WARMINSTER_NAWC
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LABORATORY DATA PACKAGE, 320-30142-1, NAS WILLOW GROVE NAWC
WARMINSTER PA
08/18/2017
TESTAMERICA LABORATORIES INC

Approved for public release: distribution unlimited.

ANALYTICAL REPORT

Job Number: 320-30142-1

Job Description: Warminster: PFAS, NAS JRB Willow Grove

For:
Tetra Tech, Inc.
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Attention: Andy Frebowitz



Approved for release.
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Project Manager I
8/18/2017 10:05 AM

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Definitions/Glossary

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

TestAmerica Job ID: 320-30142-1

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.
Q	One or more quality control criteria failed.
E	Result exceeded calibration range.

Glossary

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

Job Narrative
320-30142-1

Receipt

The samples were received on 7/26/2017 9:20 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.5° C.

LCMS

Method(s) 537: The laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) have E flags because they are spiked at the upper level of the calibration curve as specified in the method. (LCS 320-177417/2-A) and (LCSD 320-177417/3-A)

Method(s) 537: Surrogate recovery for the following sample was outside control limits: (LCSD 320-177417/3-A). Re-analysis was performed with concurring results. The original analysis has been reported.

Method(s) 537: Surrogate recovery for the following sample was outside control limits: NAWC-072517-FRB-335 (320-30142-8). Re-analysis was performed with concurring results. The original analysis has been reported.

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

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

Organic Prep

Method(s) 537: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-177417.

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: 320-30142-1

Client Sample ID: NAWC-072517-RW-331

Lab Sample ID: 320-30142-1

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	18	J	40	6.8	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	14	J M	20	2.8	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	4.7	J	10	1.9	ng/L	1		537	Total/NA

Client Sample ID: NAWC-072517-FRB-331

Lab Sample ID: 320-30142-2

No Detections.

Client Sample ID: NAWC-072517-RW-334

Lab Sample ID: 320-30142-3

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	9.7	J M	19	2.7	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	3.5	J	9.7	1.9	ng/L	1		537	Total/NA

Client Sample ID: NAWC-072517-FRB-334

Lab Sample ID: 320-30142-4

No Detections.

Client Sample ID: NAWC-072517-RW-347

Lab Sample ID: 320-30142-5

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	11	J M	39	6.7	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	10	J M	20	2.7	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	3.9	J	9.8	1.9	ng/L	1		537	Total/NA

Client Sample ID: NAWC-072517-FRB-347

Lab Sample ID: 320-30142-6

No Detections.

Client Sample ID: NAWC-072517-RW-335

Lab Sample ID: 320-30142-7

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	21	J	39	6.6	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	21	M	19	2.7	ng/L	1		537	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	8.1	J	29	5.3	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	8.7	J	9.6	1.8	ng/L	1		537	Total/NA

Client Sample ID: NAWC-072517-FRB-335

Lab Sample ID: 320-30142-8

No Detections.

This Detection Summary does not include radiochemical test results.

TestAmerica Sacramento

Client Sample Results

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

TestAmerica Job ID: 320-30142-1

Client Sample ID: NAWC-072517-RW-331

Lab Sample ID: 320-30142-1

Date Collected: 07/25/17 09:00

Matrix: Water

Date Received: 07/26/17 09:20

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	18	J	40	6.8	ng/L		08/03/17 10:02	08/14/17 19:47	1
Perfluorooctanoic acid (PFOA)	14	J M	20	2.8	ng/L		08/03/17 10:02	08/14/17 19:47	1
Perfluorononanoic acid (PFNA)	20	U	24	8.0	ng/L		08/03/17 10:02	08/14/17 19:47	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.5	ng/L		08/03/17 10:02	08/14/17 19:47	1
Perfluoroheptanoic acid (PFHpA)	4.7	J	10	1.9	ng/L		08/03/17 10:02	08/14/17 19:47	1
Perfluorobutanesulfonic acid (PFBS)	36	U	90	16	ng/L		08/03/17 10:02	08/14/17 19:47	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	77		70 - 130	08/03/17 10:02	08/14/17 19:47	1
13C2 PFDA	114		70 - 130	08/03/17 10:02	08/14/17 19:47	1

Client Sample ID: NAWC-072517-FRB-331

Lab Sample ID: 320-30142-2

Date Collected: 07/25/17 08:55

Matrix: Water

Date Received: 07/26/17 09:20

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	16	U	41	6.9	ng/L		08/03/17 10:02	08/14/17 19:52	1
Perfluorooctanoic acid (PFOA)	8.1	U	20	2.8	ng/L		08/03/17 10:02	08/14/17 19:52	1
Perfluorononanoic acid (PFNA)	20	U	24	8.1	ng/L		08/03/17 10:02	08/14/17 19:52	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.6	ng/L		08/03/17 10:02	08/14/17 19:52	1
Perfluoroheptanoic acid (PFHpA)	4.1	U	10	1.9	ng/L		08/03/17 10:02	08/14/17 19:52	1
Perfluorobutanesulfonic acid (PFBS)	36	U	91	16	ng/L		08/03/17 10:02	08/14/17 19:52	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	84		70 - 130	08/03/17 10:02	08/14/17 19:52	1
13C2 PFDA	105		70 - 130	08/03/17 10:02	08/14/17 19:52	1

Client Sample ID: NAWC-072517-RW-334

Lab Sample ID: 320-30142-3

Date Collected: 07/25/17 09:25

Matrix: Water

Date Received: 07/26/17 09:20

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	16	U	39	6.6	ng/L		08/03/17 10:02	08/14/17 19:57	1
Perfluorooctanoic acid (PFOA)	9.7	J M	19	2.7	ng/L		08/03/17 10:02	08/14/17 19:57	1
Perfluorononanoic acid (PFNA)	19	U	23	7.8	ng/L		08/03/17 10:02	08/14/17 19:57	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	29	5.4	ng/L		08/03/17 10:02	08/14/17 19:57	1
Perfluoroheptanoic acid (PFHpA)	3.5	J	9.7	1.9	ng/L		08/03/17 10:02	08/14/17 19:57	1
Perfluorobutanesulfonic acid (PFBS)	35	U	88	16	ng/L		08/03/17 10:02	08/14/17 19:57	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	85		70 - 130	08/03/17 10:02	08/14/17 19:57	1
13C2 PFDA	118		70 - 130	08/03/17 10:02	08/14/17 19:57	1

Client Sample Results

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

TestAmerica Job ID: 320-30142-1

Client Sample ID: NAWC-072517-FRB-334

Lab Sample ID: 320-30142-4

Date Collected: 07/25/17 09:20

Matrix: Water

Date Received: 07/26/17 09:20

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	16	U	41	6.9	ng/L		08/03/17 10:02	08/14/17 20:02	1
Perfluorooctanoic acid (PFOA)	8.1	U	20	2.8	ng/L		08/03/17 10:02	08/14/17 20:02	1
Perfluorononanoic acid (PFNA)	20	U	24	8.1	ng/L		08/03/17 10:02	08/14/17 20:02	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.6	ng/L		08/03/17 10:02	08/14/17 20:02	1
Perfluoroheptanoic acid (PFHpA)	4.1	U	10	1.9	ng/L		08/03/17 10:02	08/14/17 20:02	1
Perfluorobutanesulfonic acid (PFBS)	37	U	91	16	ng/L		08/03/17 10:02	08/14/17 20:02	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	100		70 - 130	08/03/17 10:02	08/14/17 20:02	1
13C2 PFDA	116		70 - 130	08/03/17 10:02	08/14/17 20:02	1

Client Sample ID: NAWC-072517-RW-347

Lab Sample ID: 320-30142-5

Date Collected: 07/25/17 12:05

Matrix: Water

Date Received: 07/26/17 09:20

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	11	J M	39	6.7	ng/L		08/03/17 10:02	08/14/17 20:06	1
Perfluorooctanoic acid (PFOA)	10	J M	20	2.7	ng/L		08/03/17 10:02	08/14/17 20:06	1
Perfluorononanoic acid (PFNA)	20	U	24	7.8	ng/L		08/03/17 10:02	08/14/17 20:06	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	29	5.4	ng/L		08/03/17 10:02	08/14/17 20:06	1
Perfluoroheptanoic acid (PFHpA)	3.9	J	9.8	1.9	ng/L		08/03/17 10:02	08/14/17 20:06	1
Perfluorobutanesulfonic acid (PFBS)	35	U	88	16	ng/L		08/03/17 10:02	08/14/17 20:06	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	76		70 - 130	08/03/17 10:02	08/14/17 20:06	1
13C2 PFDA	117		70 - 130	08/03/17 10:02	08/14/17 20:06	1

Client Sample ID: NAWC-072517-FRB-347

Lab Sample ID: 320-30142-6

Date Collected: 07/25/17 12:00

Matrix: Water

Date Received: 07/26/17 09:20

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		08/03/17 10:02	08/14/17 20:11	1
Perfluorooctanoic acid (PFOA)	7.6	U	19	2.7	ng/L		08/03/17 10:02	08/14/17 20:11	1
Perfluorononanoic acid (PFNA)	19	U	23	7.6	ng/L		08/03/17 10:02	08/14/17 20:11	1
Perfluorohexanesulfonic acid (PFHxS)	11	U	29	5.2	ng/L		08/03/17 10:02	08/14/17 20:11	1
Perfluoroheptanoic acid (PFHpA)	3.8	U	9.5	1.8	ng/L		08/03/17 10:02	08/14/17 20:11	1
Perfluorobutanesulfonic acid (PFBS)	34	U	86	15	ng/L		08/03/17 10:02	08/14/17 20:11	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	103		70 - 130	08/03/17 10:02	08/14/17 20:11	1
13C2 PFDA	125		70 - 130	08/03/17 10:02	08/14/17 20:11	1

Client Sample Results

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

TestAmerica Job ID: 320-30142-1

Client Sample ID: NAWC-072517-RW-335

Lab Sample ID: 320-30142-7

Date Collected: 07/25/17 13:30

Matrix: Water

Date Received: 07/26/17 09:20

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	21	J	39	6.6	ng/L		08/03/17 10:02	08/14/17 20:16	1
Perfluorooctanoic acid (PFOA)	21	M	19	2.7	ng/L		08/03/17 10:02	08/14/17 20:16	1
Perfluorononanoic acid (PFNA)	19	U	23	7.7	ng/L		08/03/17 10:02	08/14/17 20:16	1
Perfluorohexanesulfonic acid (PFHxS)	8.1	J	29	5.3	ng/L		08/03/17 10:02	08/14/17 20:16	1
Perfluoroheptanoic acid (PFHpA)	8.7	J	9.6	1.8	ng/L		08/03/17 10:02	08/14/17 20:16	1
Perfluorobutanesulfonic acid (PFBS)	35	U	87	16	ng/L		08/03/17 10:02	08/14/17 20:16	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	93		70 - 130	08/03/17 10:02	08/14/17 20:16	1
13C2 PFDA	126		70 - 130	08/03/17 10:02	08/14/17 20:16	1

Client Sample ID: NAWC-072517-FRB-335

Lab Sample ID: 320-30142-8

Date Collected: 07/25/17 13:25

Matrix: Water

Date Received: 07/26/17 09:20

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	15	U	39	6.6	ng/L		08/03/17 10:02	08/14/17 20:30	1
Perfluorooctanoic acid (PFOA)	7.7	U	19	2.7	ng/L		08/03/17 10:02	08/14/17 20:30	1
Perfluorononanoic acid (PFNA)	19	U	23	7.7	ng/L		08/03/17 10:02	08/14/17 20:30	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	29	5.3	ng/L		08/03/17 10:02	08/14/17 20:30	1
Perfluoroheptanoic acid (PFHpA)	3.9	U	9.6	1.8	ng/L		08/03/17 10:02	08/14/17 20:30	1
Perfluorobutanesulfonic acid (PFBS)	35	U	87	16	ng/L		08/03/17 10:02	08/14/17 20:30	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	109		70 - 130	08/03/17 10:02	08/14/17 20:30	1
13C2 PFDA	137	Q	70 - 130	08/03/17 10:02	08/14/17 20:30	1

Default Detection Limits

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

TestAmerica Job ID: 320-30142-1

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: 320-30142-1

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

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)	
		3C2 PFHx (70-130)	3C2 PFDA (70-130)
320-30142-1	NAWC-072517-RW-331	77	114
320-30142-2	NAWC-072517-FRB-331	84	105
320-30142-3	NAWC-072517-RW-334	85	118
320-30142-4	NAWC-072517-FRB-334	100	116
320-30142-5	NAWC-072517-RW-347	76	117
320-30142-6	NAWC-072517-FRB-347	103	125
320-30142-7	NAWC-072517-RW-335	93	126
320-30142-8	NAWC-072517-FRB-335	109	137 Q
LCS 320-177417/2-A	Lab Control Sample	94	116
LCSD 320-177417/3-A	Lab Control Sample Dup	97	132 Q
MB 320-177417/1-A	Method Blank	98	124

Surrogate Legend

13C2 PFHxA = 13C2 PFHxA

13C2 PFDA = 13C2 PFDA

QC Sample Results

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

TestAmerica Job ID: 320-30142-1

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

Lab Sample ID: MB 320-177417/1-A
Matrix: Water
Analysis Batch: 179510

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 177417

Analyte	MB	MB	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Perfluorooctanesulfonic acid (PFOS)	16	U	40	6.8	ng/L		08/03/17 10:02	08/14/17 19:33	1
Perfluorooctanoic acid (PFOA)	8.0	U	20	2.8	ng/L		08/03/17 10:02	08/14/17 19:33	1
Perfluorononanoic acid (PFNA)	20	U	24	8.0	ng/L		08/03/17 10:02	08/14/17 19:33	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.5	ng/L		08/03/17 10:02	08/14/17 19:33	1
Perfluoroheptanoic acid (PFHpA)	4.0	U	10	1.9	ng/L		08/03/17 10:02	08/14/17 19:33	1
Perfluorobutanesulfonic acid (PFBS)	36	U	90	16	ng/L		08/03/17 10:02	08/14/17 19:33	1

Surrogate	MB	MB	Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
13C2 PFHxA	98		70 - 130	08/03/17 10:02	08/14/17 19:33	1
13C2 PFDA	124		70 - 130	08/03/17 10:02	08/14/17 19:33	1

Lab Sample ID: LCS 320-177417/2-A
Matrix: Water
Analysis Batch: 179510

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 177417
%Rec.

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Perfluorooctanoic acid (PFOA)	150	144		ng/L		96	70 - 130
Perfluorononanoic acid (PFNA)	144	164	E	ng/L		113	70 - 130
Perfluorohexanesulfonic acid (PFHxS)	225	201		ng/L		89	70 - 130
Perfluoroheptanoic acid (PFHpA)	74.3	91.6	E	ng/L		123	70 - 130
Perfluorobutanesulfonic acid (PFBS)	663	589		ng/L		89	70 - 130

Surrogate	LCS	LCS	Limits
	%Recovery	Qualifier	
13C2 PFHxA	94		70 - 130
13C2 PFDA	116		70 - 130

Lab Sample ID: LCSD 320-177417/3-A
Matrix: Water
Analysis Batch: 179510

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 177417
%Rec.

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	Limits	RPD	RPD Limit
Perfluorooctanoic acid (PFOA)	150	145		ng/L		97	70 - 130	0	30
Perfluorononanoic acid (PFNA)	144	172	E	ng/L		119	70 - 130	5	30
Perfluorohexanesulfonic acid (PFHxS)	225	198		ng/L		88	70 - 130	2	30
Perfluoroheptanoic acid (PFHpA)	74.3	89.2	E	ng/L		120	70 - 130	3	30
Perfluorobutanesulfonic acid (PFBS)	663	575		ng/L		87	70 - 130	3	30

Surrogate	LCSD	LCSD	Limits
	%Recovery	Qualifier	
13C2 PFHxA	97		70 - 130
13C2 PFDA	132	Q	70 - 130

QC Association Summary

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

TestAmerica Job ID: 320-30142-1

LCMS

Prep Batch: 177417

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-30142-1	NAWC-072517-RW-331	Total/NA	Water	537	
320-30142-2	NAWC-072517-FRB-331	Total/NA	Water	537	
320-30142-3	NAWC-072517-RW-334	Total/NA	Water	537	
320-30142-4	NAWC-072517-FRB-334	Total/NA	Water	537	
320-30142-5	NAWC-072517-RW-347	Total/NA	Water	537	
320-30142-6	NAWC-072517-FRB-347	Total/NA	Water	537	
320-30142-7	NAWC-072517-RW-335	Total/NA	Water	537	
320-30142-8	NAWC-072517-FRB-335	Total/NA	Water	537	
MB 320-177417/1-A	Method Blank	Total/NA	Water	537	
LCS 320-177417/2-A	Lab Control Sample	Total/NA	Water	537	
LCSD 320-177417/3-A	Lab Control Sample Dup	Total/NA	Water	537	

Analysis Batch: 179510

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-30142-1	NAWC-072517-RW-331	Total/NA	Water	537	177417
320-30142-2	NAWC-072517-FRB-331	Total/NA	Water	537	177417
320-30142-3	NAWC-072517-RW-334	Total/NA	Water	537	177417
320-30142-4	NAWC-072517-FRB-334	Total/NA	Water	537	177417
320-30142-5	NAWC-072517-RW-347	Total/NA	Water	537	177417
320-30142-6	NAWC-072517-FRB-347	Total/NA	Water	537	177417
320-30142-7	NAWC-072517-RW-335	Total/NA	Water	537	177417
MB 320-177417/1-A	Method Blank	Total/NA	Water	537	177417
LCS 320-177417/2-A	Lab Control Sample	Total/NA	Water	537	177417
LCSD 320-177417/3-A	Lab Control Sample Dup	Total/NA	Water	537	177417

Analysis Batch: 179511

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-30142-8	NAWC-072517-FRB-335	Total/NA	Water	537	177417

Lab Chronicle

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

TestAmerica Job ID: 320-30142-1

Client Sample ID: NAWC-072517-RW-331

Date Collected: 07/25/17 09:00

Date Received: 07/26/17 09:20

Lab Sample ID: 320-30142-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			177417	08/03/17 10:02	CCB	TAL SAC
Total/NA	Analysis	537		1	179510	08/14/17 19:47	JRB	TAL SAC

Client Sample ID: NAWC-072517-FRB-331

Date Collected: 07/25/17 08:55

Date Received: 07/26/17 09:20

Lab Sample ID: 320-30142-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			177417	08/03/17 10:02	CCB	TAL SAC
Total/NA	Analysis	537		1	179510	08/14/17 19:52	JRB	TAL SAC

Client Sample ID: NAWC-072517-RW-334

Date Collected: 07/25/17 09:25

Date Received: 07/26/17 09:20

Lab Sample ID: 320-30142-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			177417	08/03/17 10:02	CCB	TAL SAC
Total/NA	Analysis	537		1	179510	08/14/17 19:57	JRB	TAL SAC

Client Sample ID: NAWC-072517-FRB-334

Date Collected: 07/25/17 09:20

Date Received: 07/26/17 09:20

Lab Sample ID: 320-30142-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			177417	08/03/17 10:02	CCB	TAL SAC
Total/NA	Analysis	537		1	179510	08/14/17 20:02	JRB	TAL SAC

Client Sample ID: NAWC-072517-RW-347

Date Collected: 07/25/17 12:05

Date Received: 07/26/17 09:20

Lab Sample ID: 320-30142-5

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			177417	08/03/17 10:02	CCB	TAL SAC
Total/NA	Analysis	537		1	179510	08/14/17 20:06	JRB	TAL SAC

Client Sample ID: NAWC-072517-FRB-347

Date Collected: 07/25/17 12:00

Date Received: 07/26/17 09:20

Lab Sample ID: 320-30142-6

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			177417	08/03/17 10:02	CCB	TAL SAC
Total/NA	Analysis	537		1	179510	08/14/17 20:11	JRB	TAL SAC

TestAmerica Sacramento

Lab Chronicle

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

TestAmerica Job ID: 320-30142-1

Client Sample ID: NAWC-072517-RW-335

Lab Sample ID: 320-30142-7

Date Collected: 07/25/17 13:30

Matrix: Water

Date Received: 07/26/17 09:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			177417	08/03/17 10:02	CCB	TAL SAC
Total/NA	Analysis	537		1	179510	08/14/17 20:16	JRB	TAL SAC

Client Sample ID: NAWC-072517-FRB-335

Lab Sample ID: 320-30142-8

Date Collected: 07/25/17 13:25

Matrix: Water

Date Received: 07/26/17 09:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			177417	08/03/17 10:02	CCB	TAL SAC
Total/NA	Analysis	537		1	179511	08/14/17 20:30	JRB	TAL SAC

Laboratory References:

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

Accreditation/Certification Summary

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

TestAmerica Job ID: 320-30142-1

Laboratory: TestAmerica Sacramento

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

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

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

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

Method Summary

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

TestAmerica Job ID: 320-30142-1

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: 320-30142-1

Project/Site: Warminster: PFAS, NAS JRB Willow Grove

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-30142-1	NAWC-072517-RW-331	Water	07/25/17 09:00	07/26/17 09:20
320-30142-2	NAWC-072517-FRB-331	Water	07/25/17 08:55	07/26/17 09:20
320-30142-3	NAWC-072517-RW-334	Water	07/25/17 09:25	07/26/17 09:20
320-30142-4	NAWC-072517-FRB-334	Water	07/25/17 09:20	07/26/17 09:20
320-30142-5	NAWC-072517-RW-347	Water	07/25/17 12:05	07/26/17 09:20
320-30142-6	NAWC-072517-FRB-347	Water	07/25/17 12:00	07/26/17 09:20
320-30142-7	NAWC-072517-RW-335	Water	07/25/17 13:30	07/26/17 09:20
320-30142-8	NAWC-072517-FRB-335	Water	07/25/17 13:25	07/26/17 09:20

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 179510

Lab Sample ID: CCV 320-179510/1 CCVIS Client Sample ID: _____

Date Analyzed: 08/14/17 19:24 Lab File ID: 2017.08.14_537B_001.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.17	Missed Peak	barnettj	08/15/17 13:57

Lab Sample ID: 320-30142-1 Client Sample ID: NAWC-072517-RW-331

Date Analyzed: 08/14/17 19:47 Lab File ID: 2017.08.14_537B_006.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	1.92	Isomers	barnettj	08/15/17 14:00

Lab Sample ID: 320-30142-3 Client Sample ID: NAWC-072517-RW-334

Date Analyzed: 08/14/17 19:57 Lab File ID: 2017.08.14_537B_008.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	1.91	Isomers	barnettj	08/15/17 14:01

Lab Sample ID: 320-30142-5 Client Sample ID: NAWC-072517-RW-347

Date Analyzed: 08/14/17 20:06 Lab File ID: 2017.08.14_537B_010.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	1.91	Isomers	barnettj	08/15/17 14:02
Perfluorooctanesulfonic acid (PFOS)	2.17	Split Peak	barnettj	08/15/17 14:03

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 179510

Lab Sample ID: 320-30142-7 Client Sample ID: NAWC-072517-RW-335

Date Analyzed: 08/14/17 20:16 Lab File ID: 2017.08.14_537B_012.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	1.92	Isomers	barnettj	08/15/17 14:04

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1

SDG No.: _____

Instrument ID: A8_N Analysis Batch Number: 179511

Lab Sample ID: CCV 320-179511/18 CCVIS Client Sample ID: _____

Date Analyzed: 08/14/17 20:44 Lab File ID: 2017.08.14_537B_018.d GC Column: GeminiC18 3x1 ID: 3(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	2.17	Missed Peak	barnettj	08/15/17 13:58

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-30142-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration		
					Reagent ID	Volume Added				
LC537-HSP_00018	08/09/17	03/23/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00022	375 uL	Perfluorobutane Sulfonate	1656.41 ng/mL		
							Perfluorobutanesulfonic acid (PFBS)	1656.41 ng/mL		
							Perfluoroheptanoic acid (PFHpA)	185.625 ng/mL		
							Perfluorohexanesulfonic acid (PFHxS)	563.639 ng/mL		
							Perfluorononanoic acid (PFNA)	361.125 ng/mL		
							Perfluorooctanoic acid (PFOA)	374.625 ng/mL		
.LC537SPIM_00022	08/09/17	03/22/17	Methanol, Lot 104453	10000 uL	LC537-PFBS_00007	440 uL	Perfluorobutane Sulfonate	88.3417 ug/mL		
							Perfluorobutanesulfonic acid (PFBS)	88.3417 ug/mL		
							LC537-PFHpA_00014	100 uL	Perfluoroheptanoic acid (PFHpA)	9.9 ug/mL
							LC537-PFHxS_00009	150 uL	Perfluorohexanesulfonic acid (PFHxS)	30.0607 ug/mL
							LC537-PFNA_00012	200 uL	Perfluorononanoic acid (PFNA)	19.26 ug/mL
							LC537-PFOA_00012	200 uL	Perfluorooctanoic acid (PFOA)	19.98 ug/mL
..LC537-PFOS_00007	01/04/18	01/04/17	Methanol, Lot 090285	51.5 mL	LC537_PFOS_00002	0.1034 g	Perfluorobutane Sulfonate	2007.77 ug/mL		
							Perfluorobutanesulfonic acid (PFBS)	2007.77 ug/mL		
...LC537_PFOS_00002	04/01/18	Sigma, Lot MKBP8842V			(Purchased Reagent)		Perfluorobutane Sulfonate	1 g/g		
		Perfluorobutanesulfonic acid (PFBS)		1 g/g						
..LC537-PFHpA_00014	03/22/18	03/22/17	Methanol, Lot 090285	50 mL	LC537_PFHpA_00002	0.05 g	Perfluoroheptanoic acid (PFHpA)	990 ug/mL		
							...LC537_PFHpA_00002	04/01/18	Aldrich, Lot BCBM2579V	
..LC537-PFHxS_00009	01/04/18	01/04/17	Methanol, Lot 090285	54 mL	LC537_PFHxS_00002	0.119 g	Perfluorohexanesulfonic acid (PFHxS)	2004.05 ug/mL		
							...LC537_PFHxS_00002	04/01/18	Sigma, Lot BCBL3545V	
..LC537-PFNA_00012	03/22/18	03/22/17	Methanol, Lot 090285	23 mL	LC537 PFNA_00002	0.023 g	Perfluorononanoic acid (PFNA)	963 ug/mL		
							...LC537 PFNA_00002	04/01/18	TCI America, Lot QN44F	
..LC537-PFOA_00012	03/22/18	03/22/17	Methanol, Lot 090285	21.5 mL	LC537 PFOA_00002	0.0215 g	Perfluorooctanoic acid (PFOA)	999 ug/mL		
							...LC537 PFOA_00002	11/04/18	Fluka, Lot SZBD308XV	
..LC537-PFOS_00007	08/09/17	01/04/17	Methanol, Lot 090285	48.95 mL	LC537_PFOS_00002	0.0538 g	Perfluorooctanesulfonic acid (PFOS)	1000.82 ug/mL		
							...LC537_PFOS_00002	08/09/17	Fluka, Lot SZBC222XV	
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.: 320-30142-1

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_00044	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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-30142-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration		
					Reagent ID	Volume Added				
.LCM2PFOA_00007	02/12/21		Wellington Laboratories, Lot M2PFOA0216		(Purchased Reagent)		13C2-PFOA	50 ug/mL		
.LCMPFOS_00019	08/03/21		Wellington Laboratories, Lot MPFOS0816		(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		
					LC537-MSP_00029	60 uL	13C4 PFOS	28.68 ng/mL		
							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							
.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.: 320-30142-1

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-PFHxA_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.: 320-30142-1

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 BCM2579V		(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.: 320-30142-1

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.: 320-30142-1

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-HSP_00025	02/10/18	08/10/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00023	277.8 uL	13C2 PFDA	10 ng/mL							
							13C2 PFHxA	10 ng/mL							
							Perfluorobutanesulfonic acid (PFBS)	1250.1 ng/mL							
							Perfluoroheptanoic acid (PFHpA)	138.923 ng/mL							
							Perfluorohexanesulfonic acid (PFHxS)	416.76 ng/mL							
							Perfluorononanoic acid (PFNA)	277.827 ng/mL							
..LC537SPIM_00023	02/10/18	08/10/17	Methanol, Lot 104453	10000 uL	LC537-PFBS_00008	450 uL	Perfluorooctanoic acid (PFOA)	278.01 ng/mL							
							Perfluorooctanesulfonic acid (PFOS)	555.691 ng/mL							
							Perfluorobutanesulfonic acid (PFBS)	90 ug/mL							
							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-PFBS_00008	02/10/18	08/10/17	Methanol, Lot 090285	49.6 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_PFBUS_00002	0.0992 g	Perfluorobutanesulfonic acid (PFBS)	2 mg/mL					
						LC537_PFBUS_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.: 320-30142-1

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.: 320-30142-1

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 BCM2579V		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.99 g/g
...LC537-PFHxS_00010	02/10/18	08/10/17	Methanol, Lot 090285	55.92 mL	LC537_PFHxS_00002	0.123 g	Perfluorohexanesulfonic acid (PFHxS)	2.00029 mg/mL
....LC537_PFHxS_00002	04/01/18		Sigma, Lot BCBL3545V		(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
...LC537-PFNA_00013	02/10/18	08/10/17	Methanol, Lot 090285	62.3 mL	LC537_PFNA_00002	0.0647 g	Perfluorononanoic acid (PFNA)	1000.1 ug/mL
....LC537 PFNA_00002	04/01/18		TCI America, Lot QN44F		(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g
...LC537-PFOA_00013	02/10/18	08/10/17	Methanol, Lot 090285	22.76 mL	LC537_PFOA_00003	0.0228 g	Perfluorooctanoic acid (PFOA)	1.00076 mg/mL
....LC537_PFOA_00003	10/31/23		SIGMA ALDRICH, Lot BCBS1198V		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
...LC537-PFOS_00008	02/10/18	08/10/17	Methanol, Lot 090285	44.43 mL	LC537_PFOS_00003	0.0488 g	Perfluorooctanesulfonic acid (PFOS)	1.00016 mg/mL
....LC537_PFOS_00003	04/17/19		sigma alrich, Lot SZBE107XV		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-IS_00048	02/04/18	08/04/17	Methanol, Lot 090285	30000 uL	LCM2PFOA_00007	60 uL	13C2-PFOA	0.1 ug/mL
..LCM2PFOA_00007	02/12/21		Wellington Laboratories, Lot M2PFOA0216		LCMPFOS_00021	180 uL	13C4 PFOS	0.2868 ug/mL
..LCMPFOS_00021	12/12/21		Wellington Laboratories, Lot MPFOS1216		(Purchased Reagent)		13C2-PFOA	50 ug/mL
.LC537-SU_00049	02/04/18	08/04/17	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL
..LCMPFDA_00012	09/30/21		Wellington Laboratories, Lot MPFDA0916		LCMPFHxA_00013	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFHxA_00013	04/08/21		Wellington Laboratories, Lot MPFHxA0416		(Purchased Reagent)		13C2 PFDA	50 ug/mL
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
LC537-SU_00049	500 uL	13C4 PFOS	28.68 ng/mL					
.LC537-HSP_00025	02/10/18	08/10/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00023	277.8 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	1250.1 ng/mL
							Perfluoroheptanoic acid (PFHpA)	138.923 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	416.76 ng/mL
							Perfluorononanoic acid (PFNA)	277.827 ng/mL
Perfluorooctanoic acid (PFOA)	278.01 ng/mL							
Perfluorooctanesulfonic acid (PFOS)	555.691 ng/mL							
..LC537SPIM_00023	02/10/18	08/10/17	Methanol, Lot 104453	10000 uL	LC537-PFBS_00008	450 uL	Perfluorobutanesulfonic acid (PFBS)	90 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-30142-1

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 BCM2579V			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.99 g/g
...LC537-PFHxS_00010	02/10/18	08/10/17	Methanol, Lot 090285	55.92 mL	LC537_PFHxS_00002	0.123 g	Perfluorohexanesulfonic acid (PFHxS)	2.00029 mg/mL
....LC537_PFHxS_00002	04/01/18	Sigma, Lot BCBL3545V			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
...LC537-PFNA_00013	02/10/18	08/10/17	Methanol, Lot 090285	62.3 mL	LC537_PFNA_00002	0.0647 g	Perfluorononanoic acid (PFNA)	1000.1 ug/mL
....LC537 PFNA_00002	04/01/18	TCI America, Lot QN44F			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g
...LC537-PFOA_00013	02/10/18	08/10/17	Methanol, Lot 090285	22.76 mL	LC537_PFOA_00003	0.0228 g	Perfluorooctanoic acid (PFOA)	1.00076 mg/mL
....LC537_PFOA_00003	10/31/23	SIGMA ALDRICH, Lot BCBS1198V			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
...LC537-PFOS_00008	02/10/18	08/10/17	Methanol, Lot 090285	44.43 mL	LC537_PFOS_00003	0.0488 g	Perfluorooctanesulfonic acid (PFOS)	1.00016 mg/mL
....LC537_PFOS_00003	04/17/19	sigma alrich, Lot SZBE107XV			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-IS_00048	02/04/18	08/04/17	Methanol, Lot 090285	30000 uL	LCM2PFOA_00007	60 uL	13C2-PFOA	0.1 ug/mL
..LCM2PFOA_00007	02/12/21	Wellington Laboratories, Lot M2PFOA0216			LCMPFOS_00021	180 uL	13C4 PFOS	0.2868 ug/mL
..LCMPFOS_00021	12/12/21	Wellington Laboratories, Lot MPFOS1216			(Purchased Reagent)		13C2-PFOA	50 ug/mL
.LC537-SU_00049	02/04/18	08/04/17	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	47.8 ug/mL
..LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			LCMPFHxA_00013	60 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFHxA_00013	04/08/21	Wellington Laboratories, Lot MPFHxA0416			(Purchased Reagent)		13C2 PFDA	50 ug/mL
LC537-SU_00046	01/05/18	07/05/17	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL
.LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			LCMPFHxA_00013	60 uL	13C2 PFHxA	0.1 ug/mL
.LCMPFHxA_00013	04/08/21	Wellington Laboratories, Lot MPFHxA0416			(Purchased Reagent)		13C2 PFDA	50 ug/mL
					(Purchased Reagent)		13C2 PFHxA	50 ug/mL

Reagent

LC537_PFB_00002

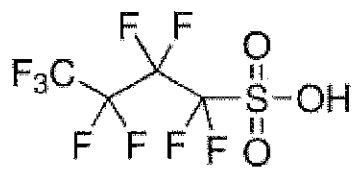
7: 4/1/15 SPV

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

Certificate of Analysis

Product Name:
Nonafluorobutane-1-sulfonic acid - 97%

Product Number: 562629
Batch Number: MKBP8842V
Brand: ALDRICH
CAS Number: 375-73-5
MDL Number: MFCD01320794
Formula: C4HF9O3S
Formula Weight: 300.10 g/mol
Storage Temperature: Store at 2 - 8 °C
Quality Release Date: 11 OCT 2013



PFBS

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

Jamie Gleason

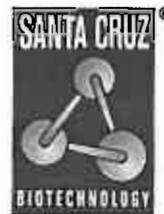
Jamie Gleason, Manager
Quality Control
Milwaukee, Wisconsin US

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Reagent

LC537_PFB2_00002

F: 6.8.17 SW



CERTIFICATE OF ANALYSIS

The Power to Question

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

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

Reagent

LC537_PFHpA_00002

R: 4/1/15 4V

Certificate of Analysis

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

PFHpA

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

Dr. Claudia Geitner
 Manager Quality Control
 Buchs, Switzerland

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Reagent

LC537_PFHpA2_00002

Certificate of analysis

r:6.13.17 SW

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

PFHe A

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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ThermoFisher
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Reagent

LC537_PFHxS_00002

r: 4/1/15 stw

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: C₆F₁₃KO₃S

Formula Weight: 438.20

Quality Release Date: 20 JUN 2013

PFH₁₃S-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

Dr. Claudia Geitner
Manager Quality Control
Buchs, Switzerland

$$MW_{corr} = \frac{(k_{form}) - (k) + (H)}{438.20 (k_{form})} = \frac{(438.20 - 3910 + 101)}{438.20 (k_{form})} = 0.91307 \text{ (anion form)}$$

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

stw 4/1/15

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

Reagent

LC537_PFHxS2_00002

n: 6-8-17 SKJ

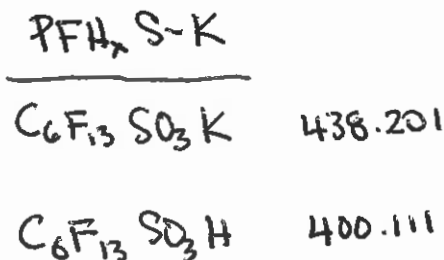


The Future of Science

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%



MW correction = $\frac{400.11}{438.201} = 0.91307$ PFH₁₃S
 CAS# 355-46-4

Purity $\frac{1}{9}$ MW correction = 90.9%

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Reagent

LC537_PENA_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_PFN2_00002

P: 6.14.17 SKW

3050 Spruce Street, Saint Louis, MO 63103, USA

Website: www.sigmaaldrich.com

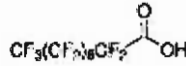
Email USA: techserv@sial.com

Outside USA: eurtechserv@sial.com

Certificate of Analysis

Product Name:
Perfluorononanoic acid - 97%

Product Number: 394459
Batch Number: MKCC0699
Brand: ALDRICH
CAS Number: 375-95-1
MDL Number: MFCD00039605
Formula: 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

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Reagent

LC537_PFOA_00002

3/21/15

SIGMA-ALDRICH

CERTIFICATE OF ANALYSIS

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

Seelze, 13.11.2013/505378/13/24029
Order-No.:
Customer-No.:
Order-Code:
Quantity:
Production Date: 04.Nov.2013
Expiry Date: 04.Nov.2018

Article/Product: 33824	Batch : SZBD308XV	PFOA
Pentadecafluorooctanoic acid OEKANAL®		

Reference Material (RM)

1. General Information

Formula: C₈H_F15O₂
CAS-No.: [335-67-1]
Usage : PFOA

Molar mass: 414.07 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 (GC-MS)
Assay (GCMS)
Date of Analysis

complying
99.4 %
13.Nov.2013

3. Advice and Remarks

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

Sigma-Aldrich Laborchemikalien GmbH
Quality Management SA-LC

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GC/MS-Method

Analytical Department

Article: Pentadecafluorooctanoic acid OEKANAL

Article-No.: 33824

Batch: SZBD308XV

Column: XTI-5 (Restek); 30 m; fs cap.; I.D.:0.25 mm; 1 µm df

Injector: Split mode

Injection: approx. 1 µl of reaction mixture with MSTFA (approx. 10 mg + 200 µl MSTFA)

Inj.-temp.: 280°C

Oven-temp.: 40°C (for 2 min) to 320°C (6°C/min) hold for 2 min

Split: 1:100

Flow: 1 ml He/min (Constant flow mode)

Detector: MSD

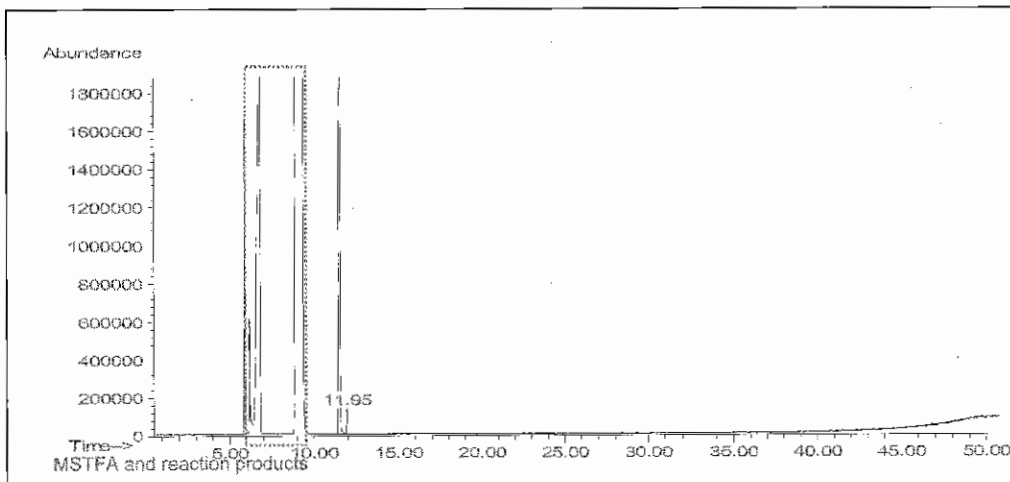
Mass range: 10-600 amu (Scan mode)

Evaluation: Purity: Total Ion Chromatogram
(MSTFA and reaction products blinded out in report)

Identity: Mass spectrum complies

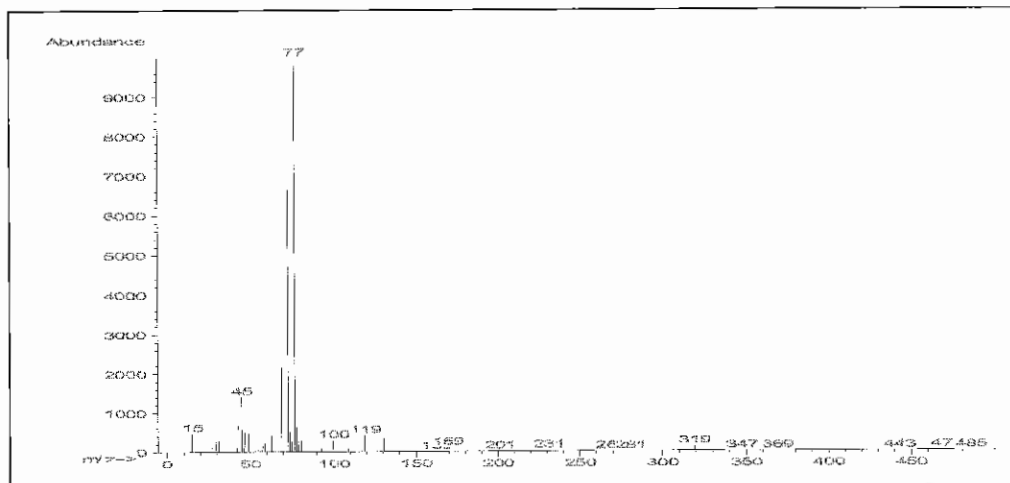
Operator: Ahrens / 2013-11-13

Total Ion Chromatogram:



Ret.time	Area	Area-%	Com
11.54	565.1670	99.4	Pentadecafluorooctanoic acid (as TMS-ester)
11.95	3.6792	0.64	

Mass spectrum (rt = 11.54 min):



Reagent

LC537_PFOA_00003

P: 11/30/16 SKV
PFA

SIGMA-ALDRICH

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

Certificate of Analysis

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

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



Dr. Claudia Geitner
Manager Quality Control
Buchs, Switzerland

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

Reagent

LC537_PFOA2_00002

Certificate of analysis

P: 6/21/17 SW

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

PFOA

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

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Reagent

LC537_PFO5_00002

F: 4/115 SV

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CERTIFICATE OF ANALYSIS

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

Seelze, 13.08.2012/419060/12/17583
Order-No.:
Customer-No.:
Order-Code:
Quantity:
Production Date: 09.Aug.2012
Expiry Date: 09.Aug.2017 - ex date

Article/Product: 33829	Batch : SZBC222XV
Heptadecafluorooctanesulfonic acid potassium salt OEKANAL®	
	PFOS-K ⁺

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	10.Aug.2012

P/W-correction:

$$\frac{538.22 - 39.10 + 1.01}{538.22} = \frac{500.13}{538.22} = 0.92923$$

Purity = 91.66%

3. Advice and Remarks

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

Sigma-Aldrich Laborchemikalien GmbH
Quality Management SA-LC

Reagent

LC537_PFOs_00003

n: 11/30/16 SV
PFOS

SIGMA-ALDRICH

CERTIFICATE OF ANALYSIS

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

Seelze, 22.04.2014/524107/14/08646
Order-No.:
Customer-No.:
Order-Code:
Quantity:
Production Date: 17.Apr.2014
Expiry Date: 17.Apr.2019

Article/Product: 33829	Batch : SZBE107XV
Heptadecafluorooctanesulfonic acid potassium salt OEKANAL®	

Reference Material (RM)

1. General Information

Formula: C8F17KO3S	Molar mass: 538.22 g/Mole
CAS-No.: [2795-39-3]	Recomm. storage temp.: roomtemp.
Usage : PFOS	

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 aliquot portions of the substance, the person handling the substance must assure, that the integrity of the substance is maintained and proper records of all its handlings are kept. Special care has to be taken to avoid any contamination or adulteration of the substance.
- We herewith confirm that the delivery is effected according to the technical delivery conditions agreed.
- Particular properties of the products or the suitability for a particular area of application are not assured.
- We guarantee a proper quality within our General Conditions of Sales.

Sigma-Aldrich Laborchemikalien GmbH
Quality Management SA-LC

Reagent

LC537_PFOs2_00002

R: 6.14.17 SKV

Certificate of Analysis

Product Name: HEPTADEC AFLUORO OCTANESULFONIC 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

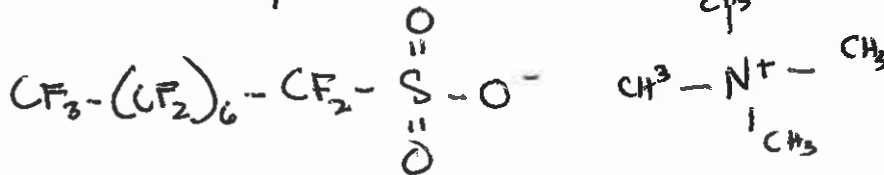
TEST	SPECIFICATION	RESULT
APPEARANCE (COLOR)	WHITE TO OFF WHITE	OFF-WHITE
APPEARANCE (FORM)	POWDER OR POWDER WITH CHUNK(S)	POWDER
CARBON CONTENT	29.77 % - 31.29 %	29.97 %
INFRARED SPECTRUM	CONFORMS TO STRUCTURE	CONFORMS

Claudia Geitner

Dr. Claudia Geitner
 Manager Quality Control
 Buchs, Switzerland

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

Purity & MW correction = 77.37%



	$C_{17}F_{17}SO_3^+H$	$C_8H_{20}N$
C = 12.011	96.088	96.088
F = 18.998	322.966	-
S = 32.066	32.066	-
O = 16.999	47.997	20.60
H = 1.008	1.008	14.007
N = 14.007	-	14.007
	<hr/>	<hr/>
	500.125	130.255

Reagent

LCM2PFOA_00007

P: 5/11/17 SKV



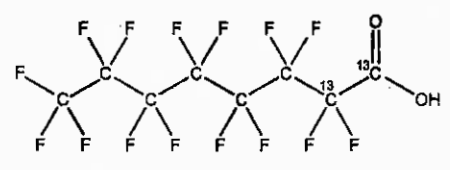
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

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

LOT NUMBER: M2PFOA0216

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₂¹²C₆HF₁₆O₂
CONCENTRATION: 50 ± 2.5 µg/ml

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

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 02/12/2016
EXPIRY DATE: (mm/dd/yyyy) 02/12/2021

ISOTOPIC PURITY: ≥99% ¹³C
(1,2-¹³C₂)

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

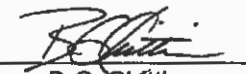
DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: 
B.G. Chittim

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

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

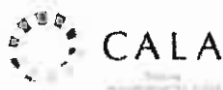
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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

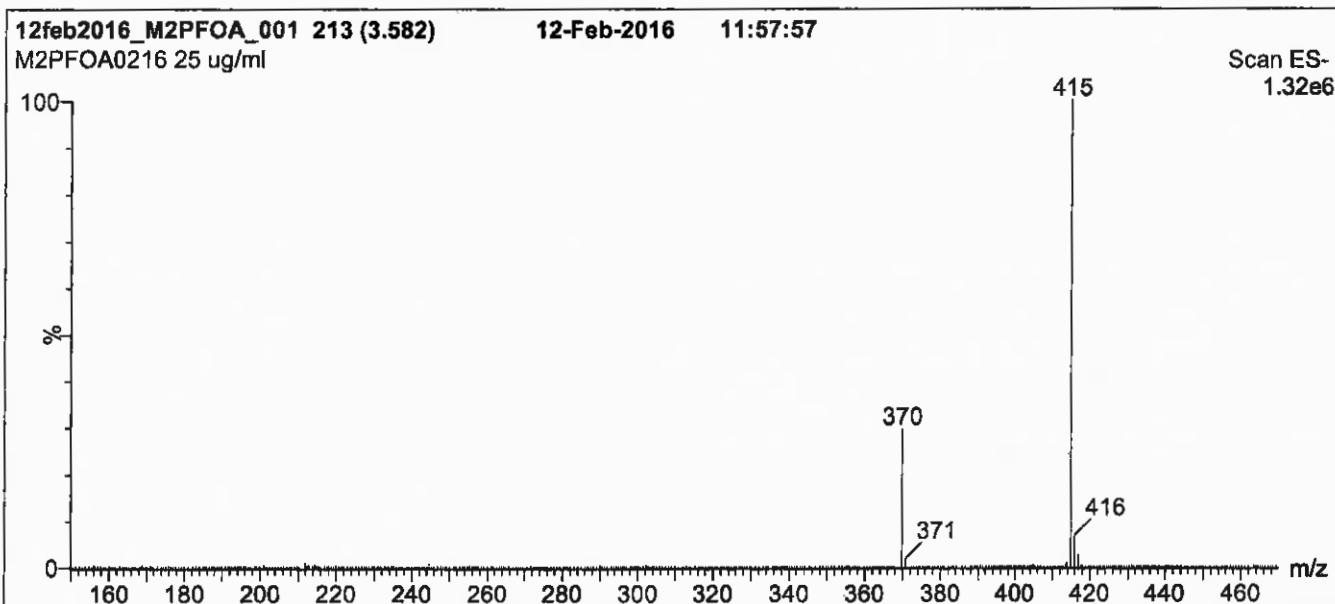
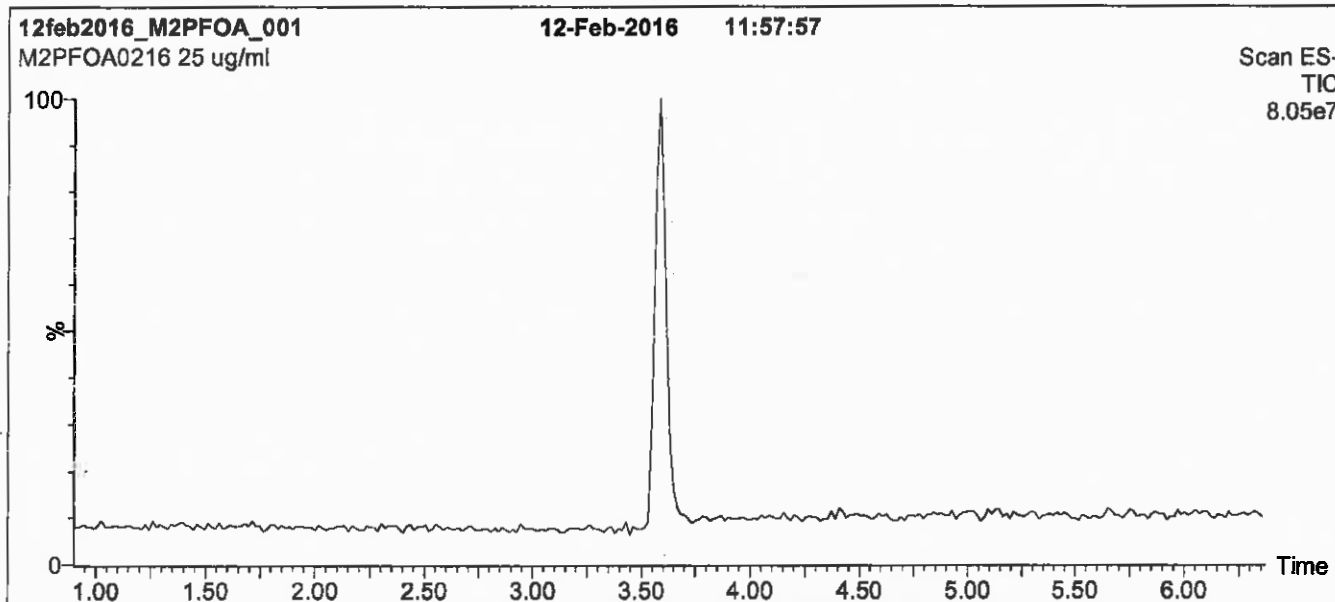
QUALITY MANAGEMENT:

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



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

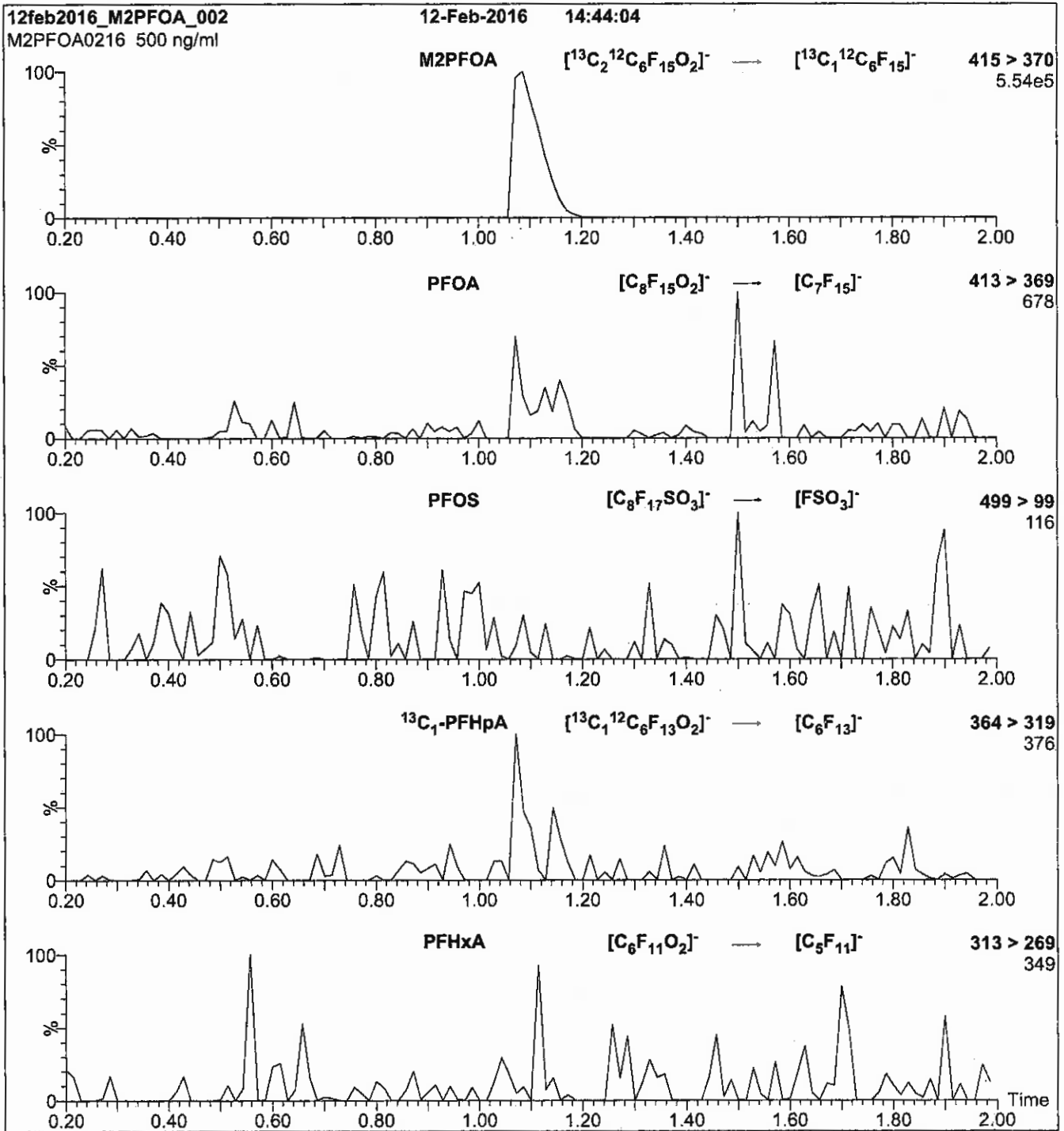
Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

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

MS Parameters

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

Reagent

LCMPFDA_00012

R: SBC 12/21/16



814255

ID: LCMPPFDA_00012

Exp: 09/30/21 Prpd: SBC

13C2-Perfluorodecanoic acid

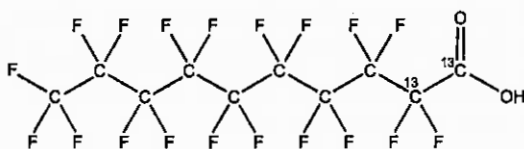


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFDA **LOT NUMBER:** MPFDA0916
COMPOUND: Perfluoro-n-[1,2-¹³C₂]decanoic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₂¹²C₈HF₁₉O₂
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 516.07
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%

ISOTOPIC PURITY: ≥99% ¹³C
(1,2-¹³C₂)

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 ¹³C₁-PFNA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:
B.G. Chríttim

Date: 10/07/2016
(mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

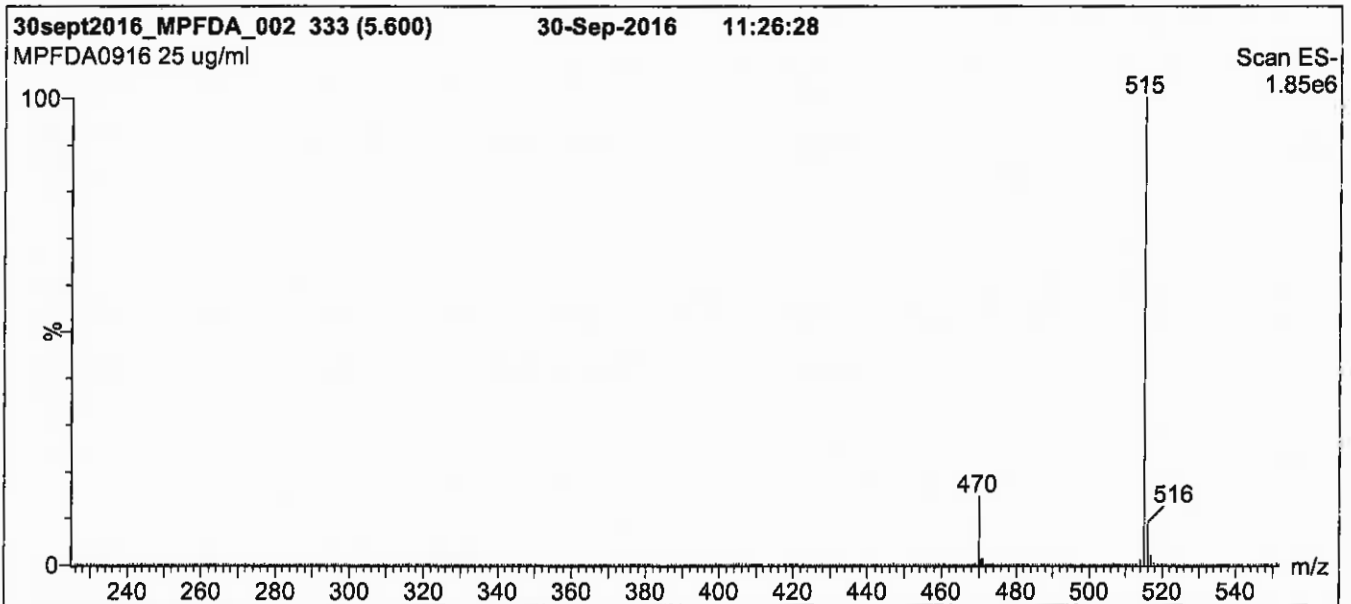
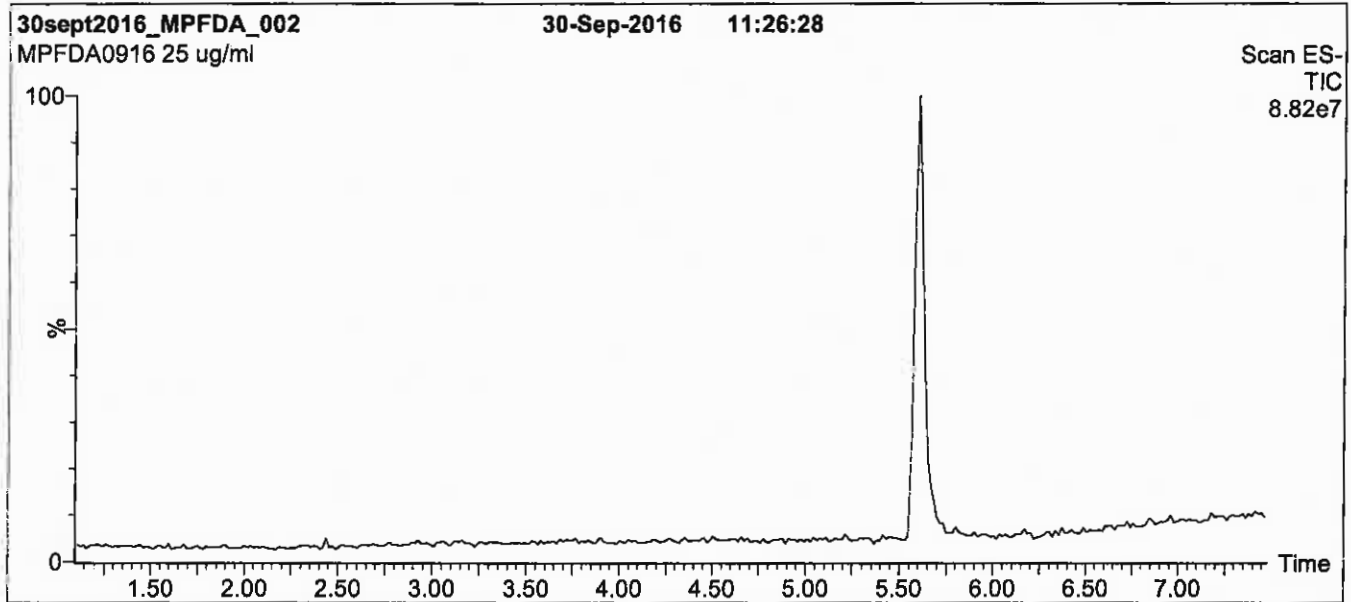
QUALITY MANAGEMENT:

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



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

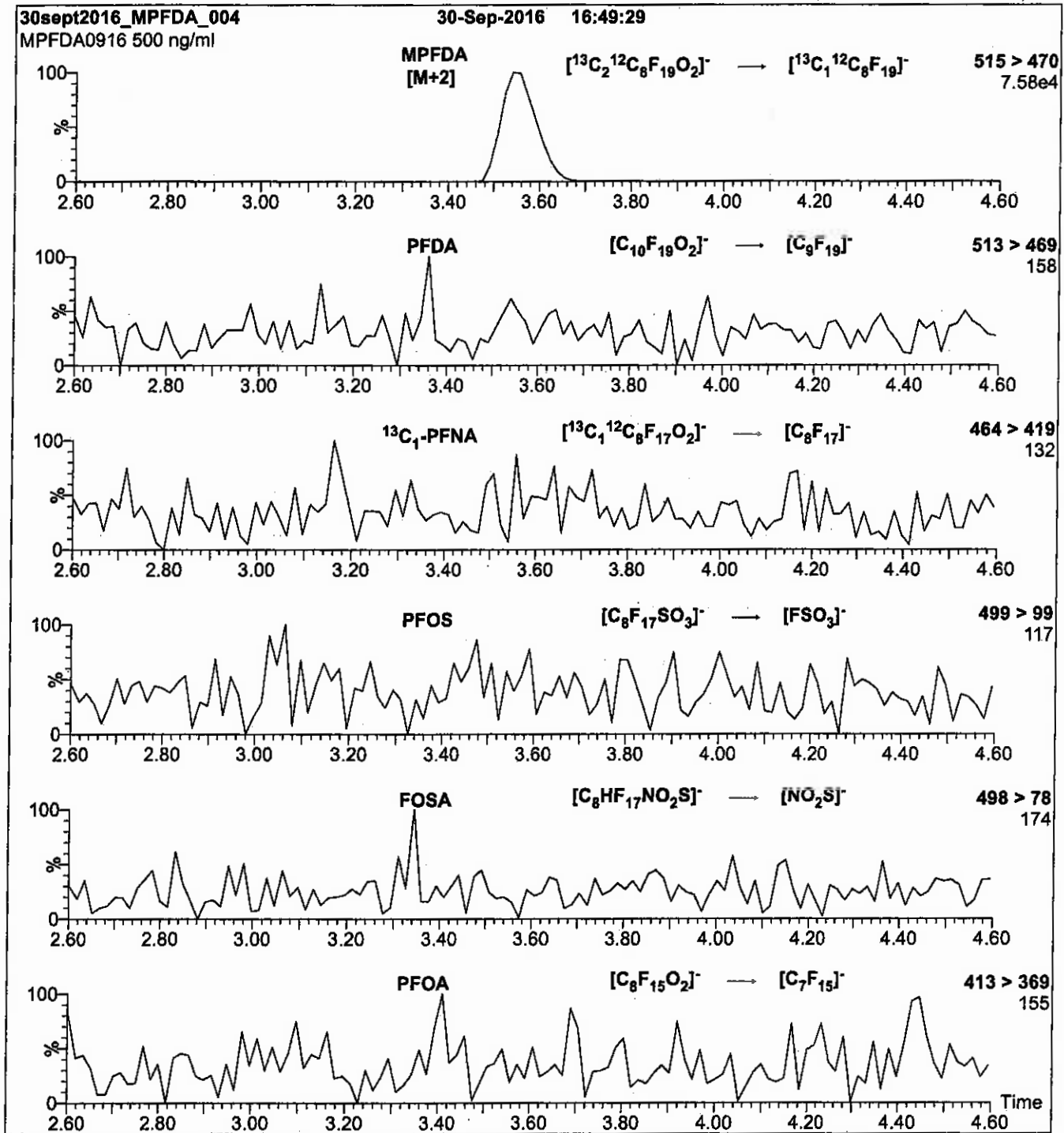
Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm
Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)
Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCMPFHxA_00013

R: SBC 12/21/16



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



WELLINGTON LABORATORIES

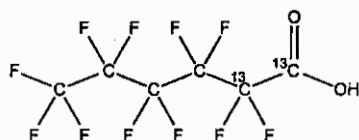
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFHxA
COMPOUND: Perfluoro-n-[1,2-¹³C₂]hexanoic acid

LOT NUMBER: MPFHxA0416

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: ¹³C₂¹²C₄HF₁₁O₂
CONCENTRATION: 50 ± 2.5 µg/ml

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

CHEMICAL PURITY: >98%

ISOTOPIC PURITY: ≥99%¹³C
(1,2-¹³C₂)

LAST TESTED: (mm/dd/yyyy) 04/08/2016

EXPIRY DATE: (mm/dd/yyyy) 04/08/2021

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:
B.G. Chittim

Date: 04/29/2016
(mm/dd/yyyy)

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

INTENDED USE:

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HAZARDS:

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

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TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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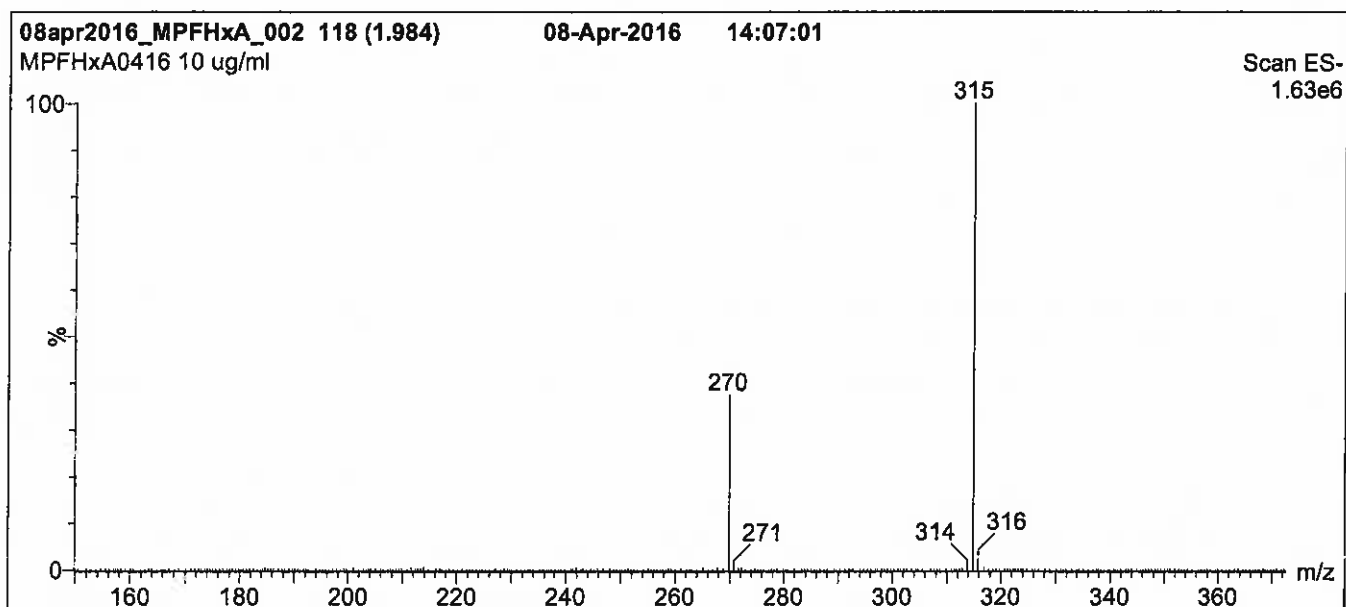
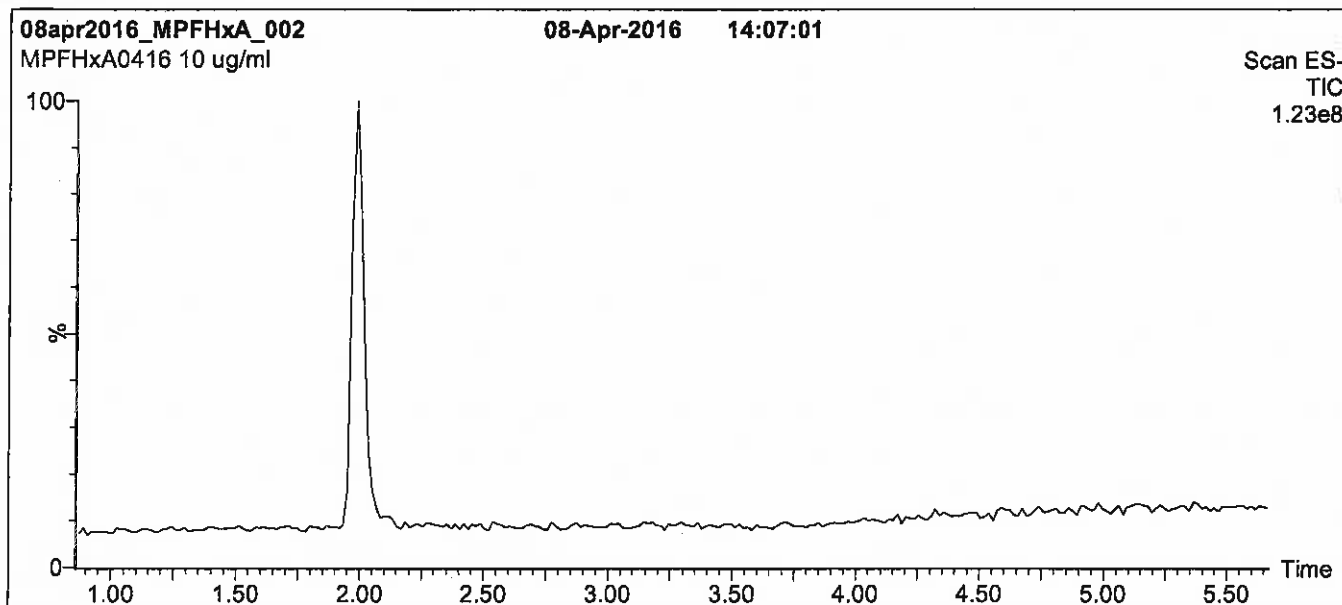
QUALITY MANAGEMENT:

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



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

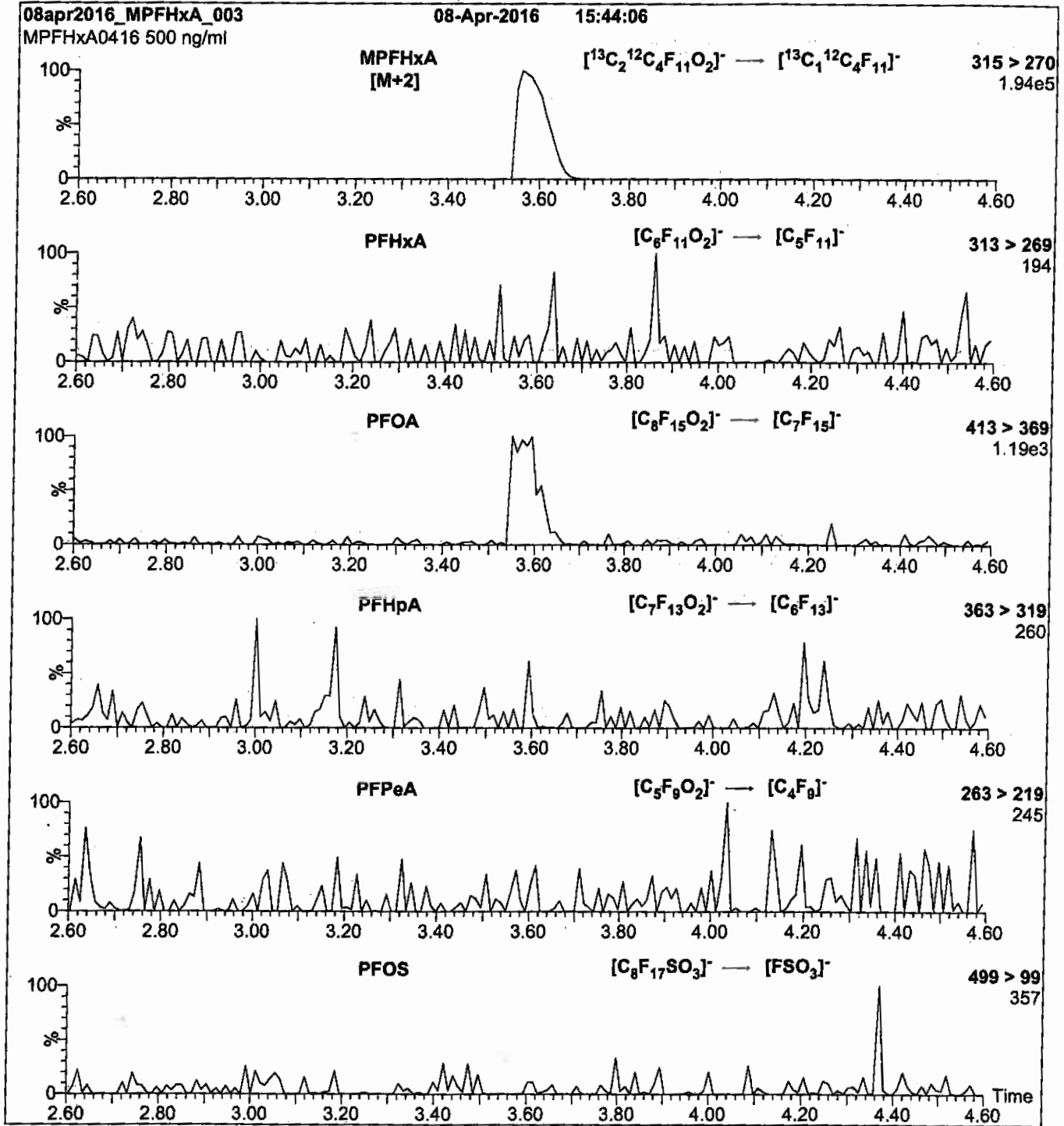
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O
(both with 10 mM NH₄OAc buffer)

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCMPFOS_00019

R: SBC 12/21/16



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

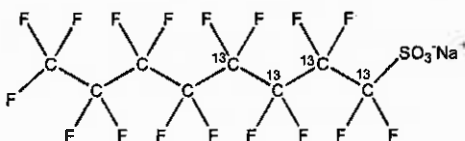


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFOS **LOT NUMBER:** MPFOS0816
COMPOUND: Sodium perfluoro-1-[1,2,3,4-¹³C₄]octanesulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₄¹²C₄F₁₇SO₃Na **MOLECULAR WEIGHT:** 526.08
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt) **SOLVENT(S):** Methanol
47.8 ± 2.4 µg/ml (MPFOS anion)
CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99% ¹³C
LAST TESTED: (mm/dd/yyyy) 08/03/2016 (1,2,3,4-¹³C₄)
EXPIRY DATE: (mm/dd/yyyy) 08/03/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place


DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

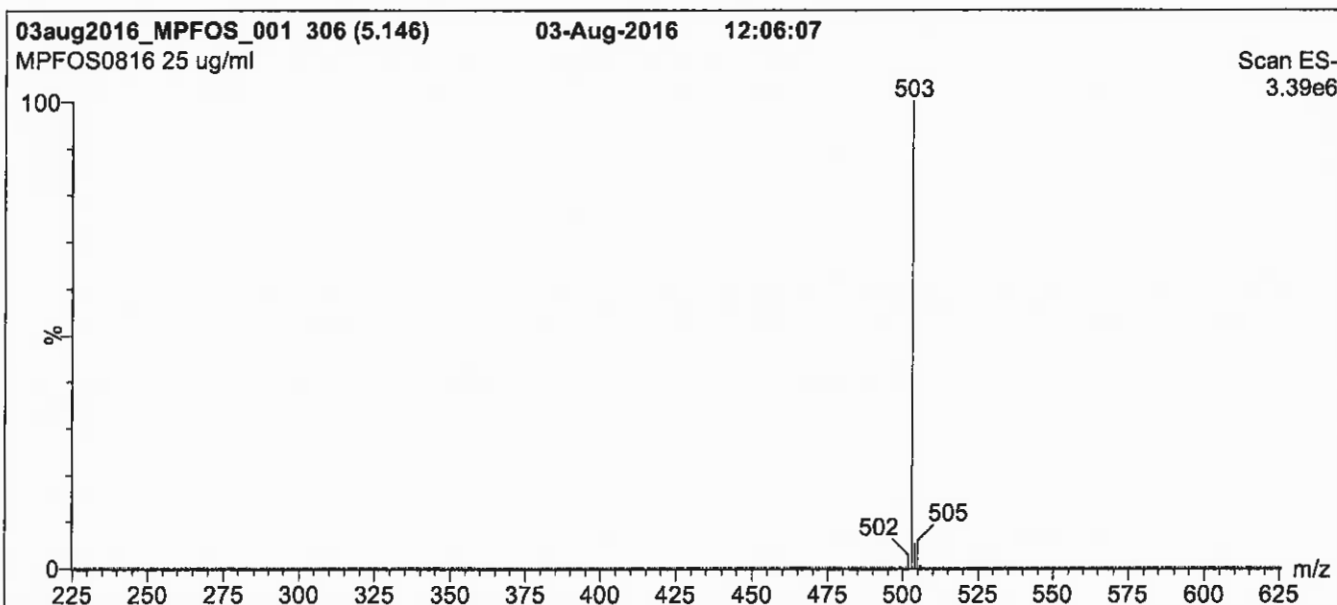
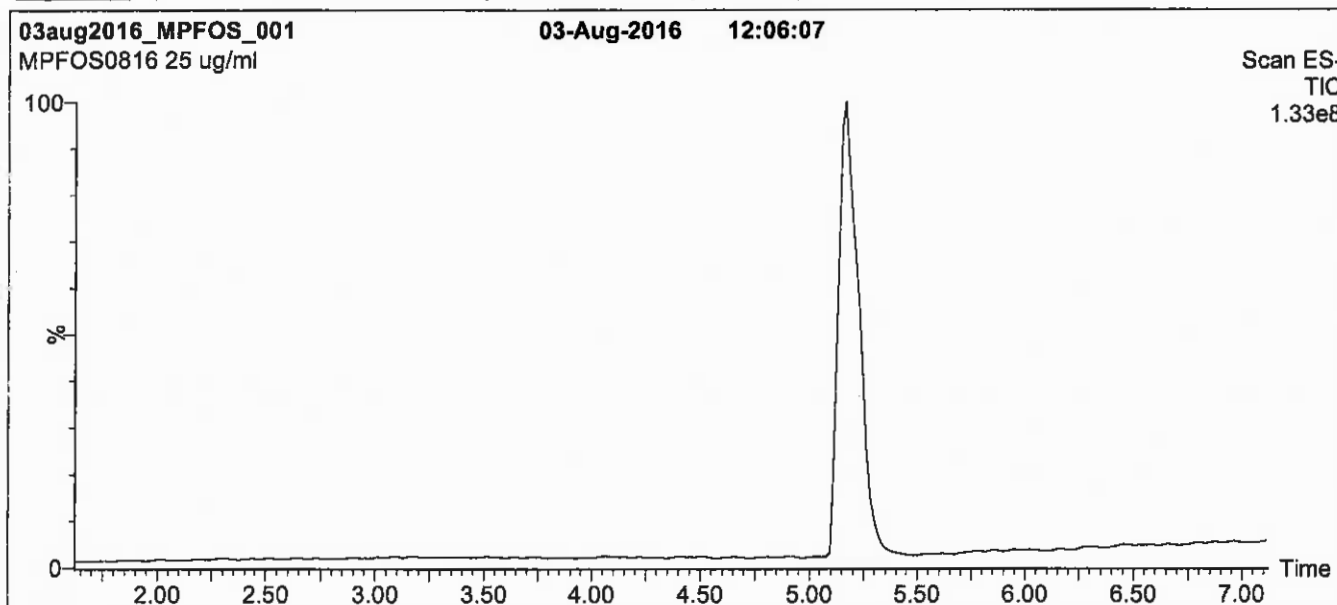
QUALITY MANAGEMENT:

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



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

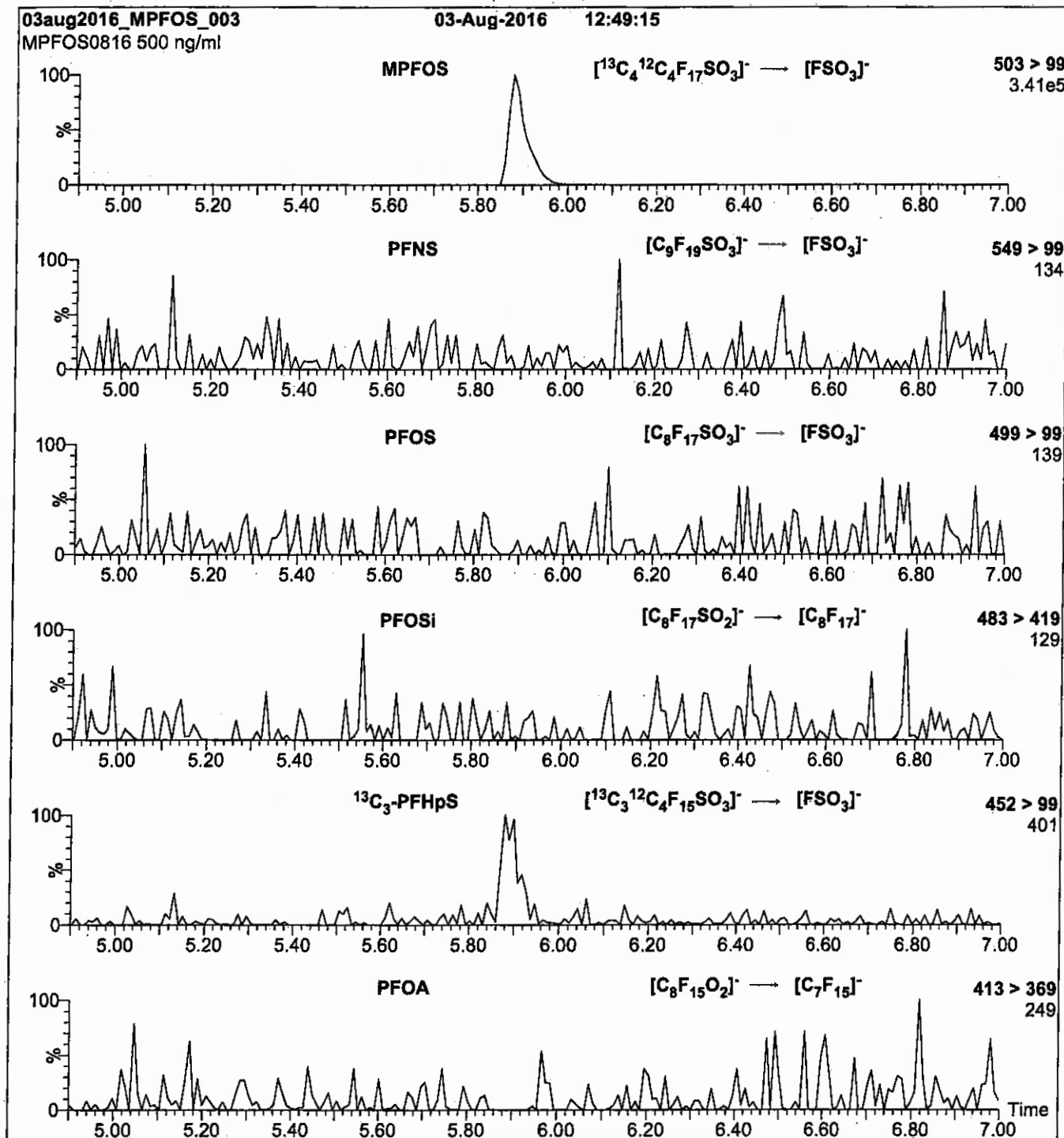
Flow: 300 μl/min

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 $\mu\text{l}/\text{min}$

MS Parameters

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

Reagent

LCMPFOS_00021

r: 5/6/17 SKV

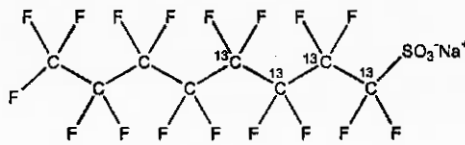


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFOS **LOT NUMBER:** MPFOS1216
COMPOUND: Sodium perfluoro-1-[1,2,3,4-¹³C₄]octanesulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	¹³ C ₄ ¹² C ₄ F ₁₇ SO ₃ Na	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)	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-[1,2,3-¹³C₃]heptanesulfonate.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

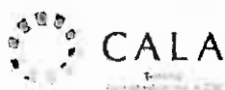
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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

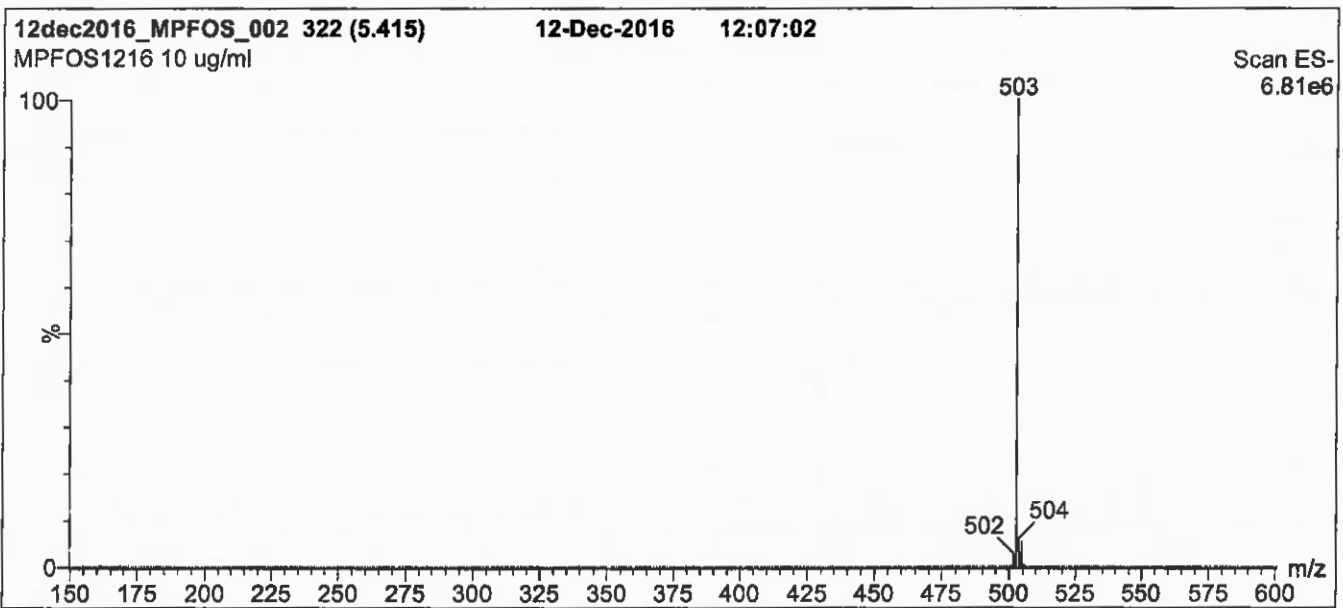
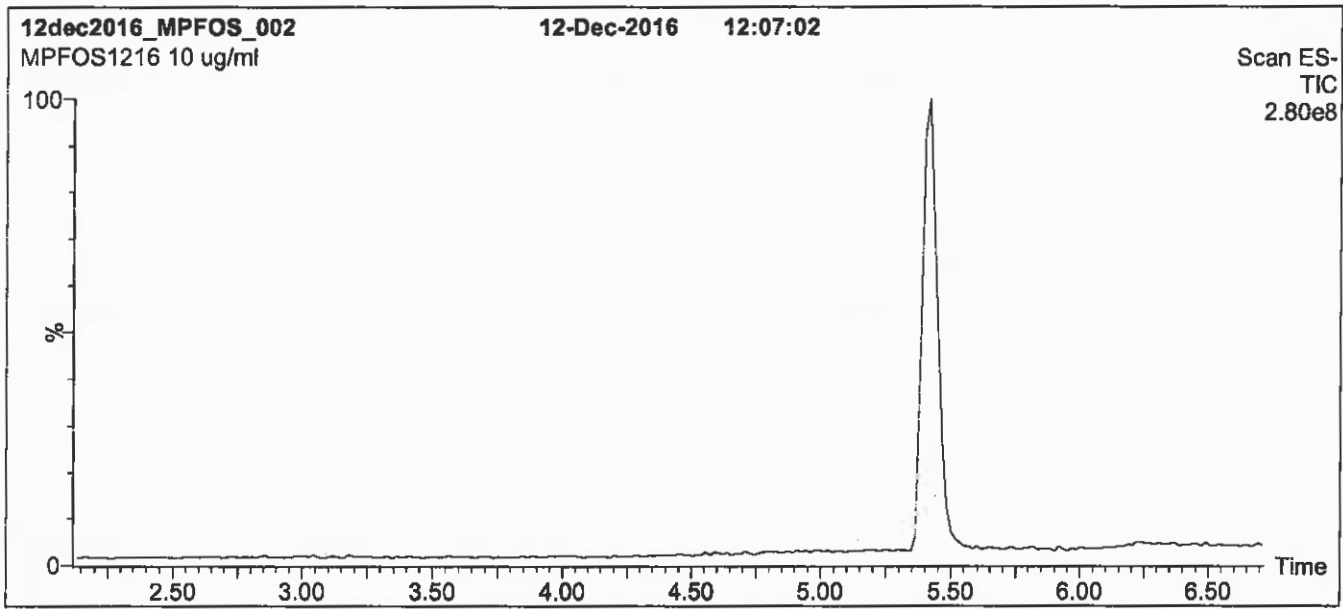
QUALITY MANAGEMENT:

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



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

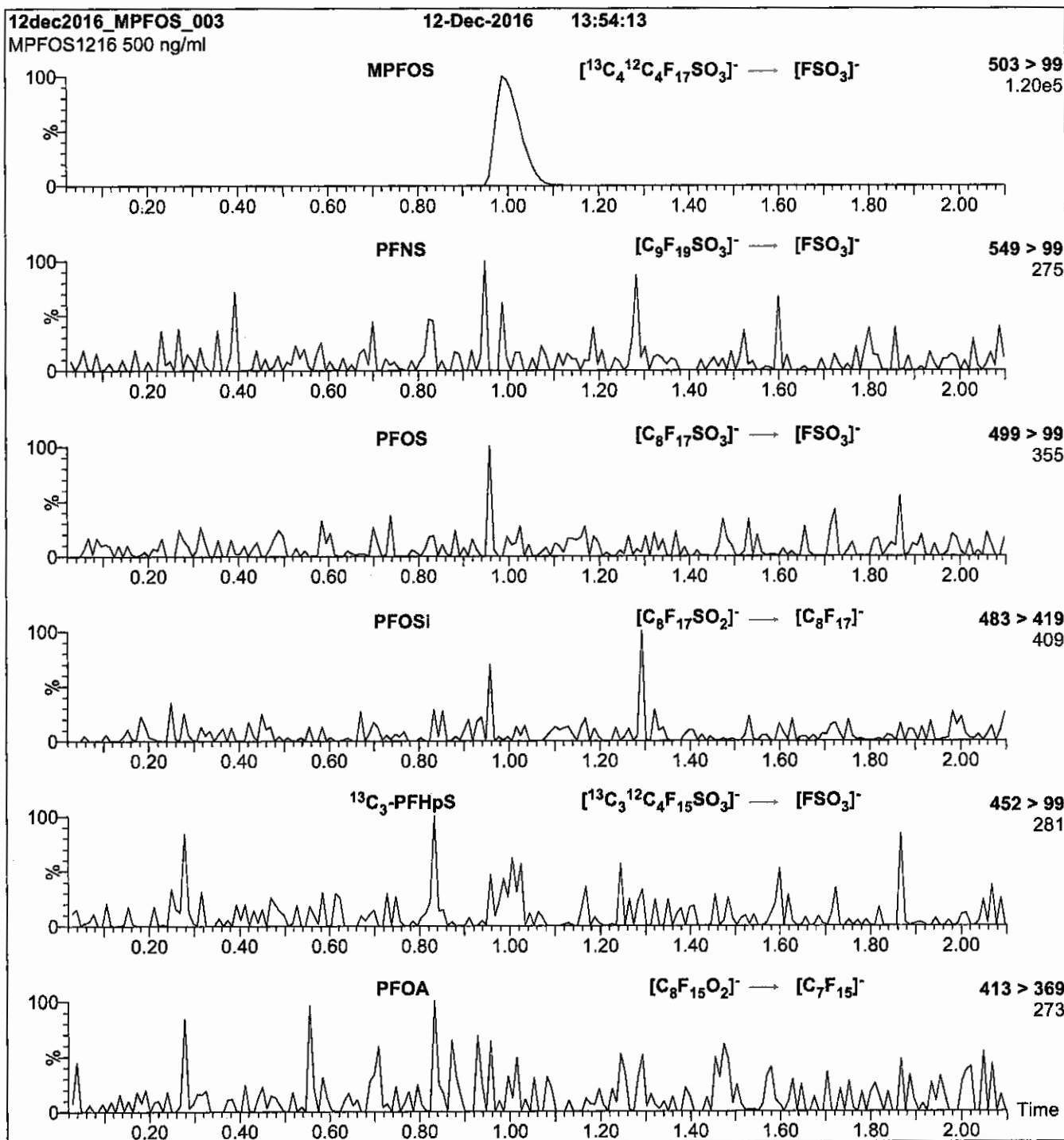
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

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

MS Parameters

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

Method 537 DOD

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

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento

Job No.: 320-30142-1

SDG No.: _____

Matrix: Water

Level: Low

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

Client Sample ID	Lab Sample ID	PFHxA #	PFDA #
NAWC-072517-RW-331	320-30142-1	77	114
NAWC-072517-FRB-331	320-30142-2	84	105
NAWC-072517-RW-334	320-30142-3	85	118
NAWC-072517-FRB-334	320-30142-4	100	116
NAWC-072517-RW-347	320-30142-5	76	117
NAWC-072517-FRB-347	320-30142-6	103	125
NAWC-072517-RW-335	320-30142-7	93	126
NAWC-072517-FRB-335	320-30142-8	109	137 Q
	MB 320-177417/1-A	98	124
	LCS 320-177417/2-A	94	116
	LCSD 320-177417/3-A	97	132 Q

PFHxA = 13C2 PFHxA
PFDA = 13C2 PFDA

QC LIMITS
70-130
70-130

Column to be used to flag recovery values

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 2017.08.14_537B_004.d
 Lab ID: LCS 320-177417/2-A Client ID: _____

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	300	323	108	70-130	E
Perfluorooctanoic acid (PFOA)	150	144	96	70-130	
Perfluorononanoic acid (PFNA)	144	164	113	70-130	E
Perfluorohexanesulfonic acid (PFHxS)	225	201	89	70-130	
Perfluoroheptanoic acid (PFHpA)	74.3	91.6	123	70-130	E
Perfluorobutanesulfonic acid (PFBS)	663	589	89	70-130	

Column to be used to flag recovery and RPD values

FORM III
LCMS LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1

SDG No.: _____

Matrix: Water Level: Low Lab File ID: 2017.08.14_537B_005.d

Lab ID: LCSD 320-177417/3-A Client ID: _____

COMPOUND	SPIKE ADDED (ng/L)	LCSD CONCENTRATION (ng/L)	LCSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
Perfluorooctanesulfonic acid (PFOS)	300	315	105	3	30	70-130	
Perfluorooctanoic acid (PFOA)	150	145	97	0	30	70-130	
Perfluorononanoic acid (PFNA)	144	172	119	5	30	70-130	E
Perfluorohexanesulfonic acid (PFHxS)	225	198	88	2	30	70-130	
Perfluoroheptanoic acid (PFHpA)	74.3	89.2	120	3	30	70-130	E
Perfluorobutanesulfonic acid (PFBS)	663	575	87	3	30	70-130	

Column to be used to flag recovery and RPD values

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Lab File ID: 2017.08.14_537B_003.d Lab Sample ID: MB 320-177417/1-A
 Matrix: Water Date Extracted: 08/03/2017 10:02
 Instrument ID: A8_N Date Analyzed: 08/14/2017 19:33
 Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-177417/2-A	2017.08.14_537B_004.d	08/14/2017 19:38
	LCSD 320-177417/3-A	2017.08.14_537B_005.d	08/14/2017 19:43
NAWC-072517-RW-331	320-30142-1	2017.08.14_537B_006.d	08/14/2017 19:47
NAWC-072517-FRB-331	320-30142-2	2017.08.14_537B_007.d	08/14/2017 19:52
NAWC-072517-RW-334	320-30142-3	2017.08.14_537B_008.d	08/14/2017 19:57
NAWC-072517-FRB-334	320-30142-4	2017.08.14_537B_009.d	08/14/2017 20:02
NAWC-072517-RW-347	320-30142-5	2017.08.14_537B_010.d	08/14/2017 20:06
NAWC-072517-FRB-347	320-30142-6	2017.08.14_537B_011.d	08/14/2017 20:11
NAWC-072517-RW-335	320-30142-7	2017.08.14_537B_012.d	08/14/2017 20:16
NAWC-072517-FRB-335	320-30142-8	2017.08.14_537B_015.d	08/14/2017 20:30

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Instrument ID: A8_N Calibration Start Date: 08/14/2017 12:48
 GC Column: GeminiC18 3x100 ID: 3(mm) Calibration End Date: 08/14/2017 13:12
 Calibration ID: 33517

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
INITIAL CALIBRATION MEAN AREA AND MEAN RT	2250916	1.95	5850602	2.21		
UPPER LIMIT	3376374	2.45	8775903	2.71		
LOWER LIMIT	1125458	1.45	2925301	1.71		
LAB SAMPLE ID	CLIENT SAMPLE ID					
CCVL 320-179319/9		2177935	1.94	5998180	2.20	
ICV 320-179319/11		1980065	1.94	5824653	2.19	
CCV 320-179510/1 CCVIS		2104942	1.91	5804729	2.17	
MB 320-177417/1-A		2249354	1.92	6501071	2.18	
LCS 320-177417/2-A		2259712	1.92	6216901	2.18	
LCSD 320-177417/3-A		2198507	1.91	6213934	2.17	
320-30142-1	NAWC-072517-RW-331	2242801	1.92	6474631	2.18	
320-30142-2	NAWC-072517-FRB-331	2205400	1.91	6421825	2.17	
320-30142-3	NAWC-072517-RW-334	2361478	1.91	6616874	2.17	
320-30142-4	NAWC-072517-FRB-334	2307400	1.92	6481747	2.18	
320-30142-5	NAWC-072517-RW-347	2292452	1.91	6391356	2.17	
320-30142-6	NAWC-072517-FRB-347	2211331	1.92	6242811	2.17	
320-30142-7	NAWC-072517-RW-335	2160262	1.92	6338998	2.18	
CCV 320-179510/13 CCVIS		2051129	1.92	5683418	2.17	
CCV 320-179511/13 CCVIS		2051129	1.92	5683418	2.17	
320-30142-8	NAWC-072517-FRB-335	2112681	1.92	6199564	2.17	
CCV 320-179511/18 CCVIS		2005679	1.91	5754725	2.17	

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
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Sample No.: CCV 320-179510/1 Date Analyzed: 08/14/2017 19:24
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2017.08.14_537B_001 Heated Purge: (Y/N) N
 Calibration ID: 33517

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	2104942	1.91	5804729	2.17		
UPPER LIMIT	2946919	2.41	8126621	2.67		
LOWER LIMIT	1473459	1.41	4063310	1.67		
LAB SAMPLE ID	CLIENT SAMPLE ID					
MB 320-177417/1-A		2249354	1.92	6501071	2.18	
LCS 320-177417/2-A		2259712	1.92	6216901	2.18	
LCSD 320-177417/3-A		2198507	1.91	6213934	2.17	
320-30142-1	NAWC-072517-RW-331	2242801	1.92	6474631	2.18	
320-30142-2	NAWC-072517-FRB-331	2205400	1.91	6421825	2.17	
320-30142-3	NAWC-072517-RW-334	2361478	1.91	6616874	2.17	
320-30142-4	NAWC-072517-FRB-334	2307400	1.92	6481747	2.18	
320-30142-5	NAWC-072517-RW-347	2292452	1.91	6391356	2.17	
320-30142-6	NAWC-072517-FRB-347	2211331	1.92	6242811	2.17	
320-30142-7	NAWC-072517-RW-335	2160262	1.92	6338998	2.18	

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
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Sample No.: CCV 320-179510/13 Date Analyzed: 08/14/2017 20:21
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2017.08.14_537B_013 Heated Purge: (Y/N) N
 Calibration ID: 33517

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	2051129	1.92	5683418	2.17		
UPPER LIMIT	2871581	2.42	7956785	2.67		
LOWER LIMIT	1435790	1.42	3978393	1.67		
LAB SAMPLE ID	CLIENT SAMPLE ID					
MB 320-177417/1-A		2249354	1.92	6501071	2.18	
LCS 320-177417/2-A		2259712	1.92	6216901	2.18	
LCSD 320-177417/3-A		2198507	1.91	6213934	2.17	
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320-30142-3	NAWC-072517-RW-334	2361478	1.91	6616874	2.17	
320-30142-4	NAWC-072517-FRB-334	2307400	1.92	6481747	2.18	
320-30142-5	NAWC-072517-RW-347	2292452	1.91	6391356	2.17	
320-30142-6	NAWC-072517-FRB-347	2211331	1.92	6242811	2.17	
320-30142-7	NAWC-072517-RW-335	2160262	1.92	6338998	2.18	

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
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Sample No.: CCV 320-179511/13 Date Analyzed: 08/14/2017 20:21
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2017.08.14_537B_013 Heated Purge: (Y/N) N
 Calibration ID: 33517

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	2051129	1.92	5683418	2.17		
UPPER LIMIT	2871581	2.42	7956785	2.67		
LOWER LIMIT	1435790	1.42	3978393	1.67		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-30142-8	NAWC-072517-FRB-335		2112681	1.92	6199564	2.17

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
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Sample No.: CCV 320-179511/18 Date Analyzed: 08/14/2017 20:44
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2017.08.14_537B_018 Heated Purge: (Y/N) N
 Calibration ID: 33517

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	2005679	1.91	5754725	2.17		
UPPER LIMIT	2807951	2.41	8056615	2.67		
LOWER LIMIT	1403975	1.41	4028308	1.67		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-30142-8	NAWC-072517-FRB-335		2112681	1.92	6199564	2.17

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 I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Client Sample ID: NAWC-072517-RW-331 Lab Sample ID: 320-30142-1
 Matrix: Water Lab File ID: 2017.08.14_537B_006.d
 Analysis Method: 537 Date Collected: 07/25/2017 09:00
 Extraction Method: 537 Date Extracted: 08/03/2017 10:02
 Sample wt/vol: 250.5 (mL) Date Analyzed: 08/14/2017 19:47
 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.: 179510 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	18	J	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	14	J M	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)	4.7	J	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	77		70-130
STL00996	13C2 PFDA	114		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\2017.08.14_537B_006.d
 Lims ID: 320-30142-A-1-A
 Client ID: NAWC-072517-RW-331
 Sample Type: Client
 Inject. Date: 14-Aug-2017 19:47:52 ALS Bottle#: 4 Worklist Smp#: 6
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-30142-a-1-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 16-Aug-2017 14:14:15 Calib Date: 14-Aug-2017 13:12:40
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170814-46675.b\2017.08.14_537ICAL_007.d
 Column 1 : Det: EXP1
 Process Host: XAWRK009

First Level Reviewer: barnettj Date: 15-Aug-2017 14:00:58

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.442	1.453	-0.011	1.000	329200	1.30		41.3	
298.90 > 99.00	1.442	1.453	-0.011	1.000	213708		1.54(0.00-0.00)	43.1	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.571	1.582	-0.012	1.000	1852251	7.72		6937	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.722	1.742	-0.020	1.000	324927	0.9633		44.7	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.722	1.742	-0.020	1.000	227534	1.19		16.5	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.920	1.955	-0.035	1.000	695920	3.42		34.4	M
413.00 > 169.00	1.920	1.955	-0.035	1.000	414146		1.68(0.00-0.00)	461	M
* 6 13C2-PFOA									
415.00 > 370.00	1.920	1.955	-0.035		2242801	10.0		9038	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.177	2.170	0.007	1.000	946878	4.54		342	
499.00 > 99.00	2.177	2.170	0.007	1.000	170434		5.56(0.00-0.00)	129	
* 7 13C4 PFOS									
503.00 > 80.00	2.177	2.205	-0.028		6474631	28.7		3656	
9 Perfluorononanoic acid									
463.00 > 419.00	2.185	2.213	-0.028	1.000	49800	0.3920		1.6	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.329	2.354	-0.025	1.000	1505465	11.4		9615	

QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\2017.08.14_537B_006.d

Injection Date: 14-Aug-2017 19:47:52

Instrument ID: A8_N

Lims ID: 320-30142-A-1-A

Lab Sample ID: 320-30142-1

Client ID: NAWC-072517-RW-331

Operator ID: SACINSTLCMS01

ALS Bottle#: 4

Worklist Smp#: 6

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

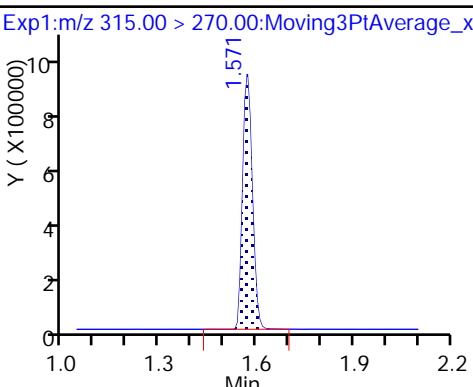
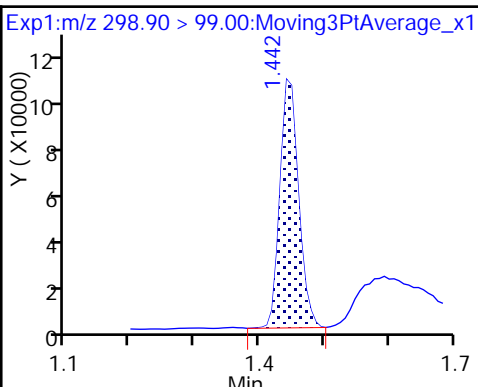
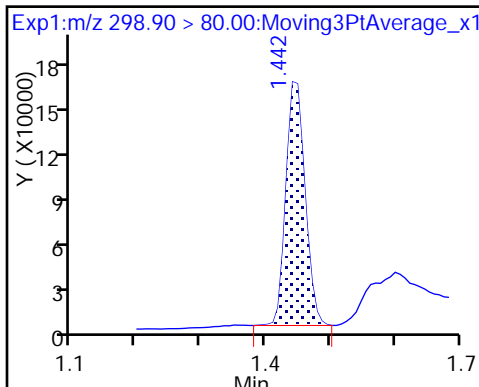
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

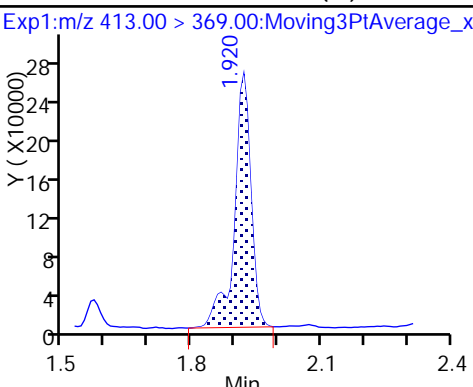
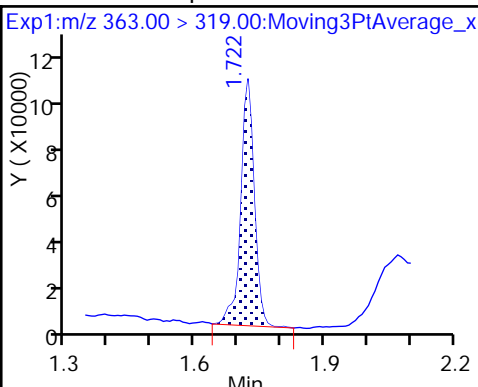
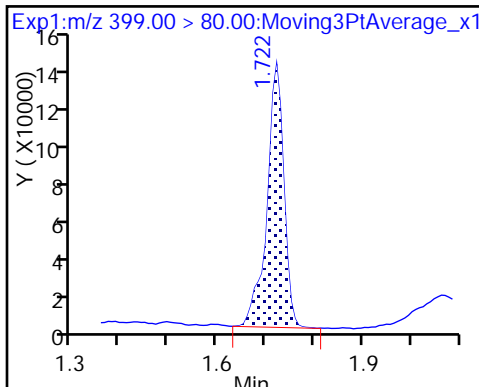
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

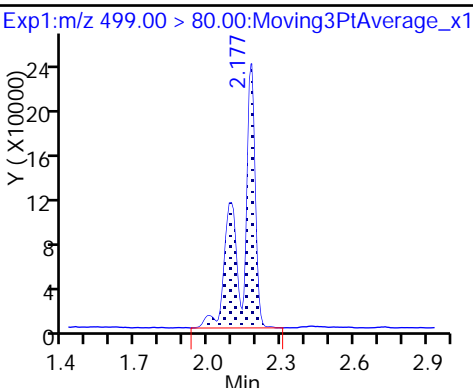
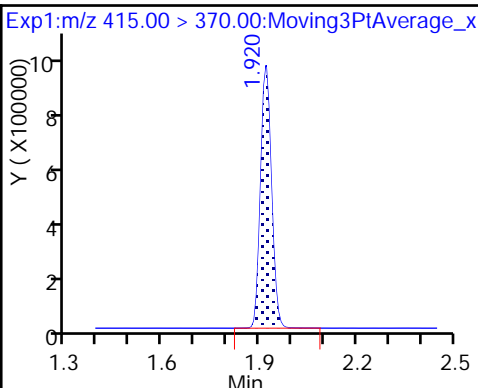
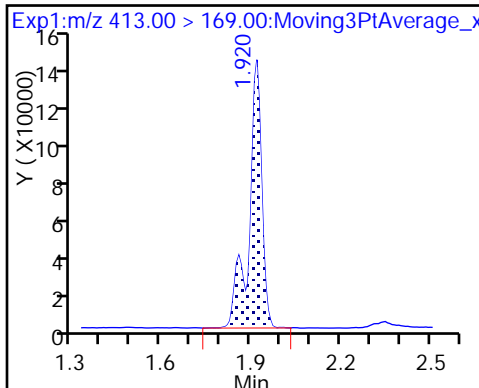
5 Perfluorooctanoic acid (M)



5 Perfluorooctanoic acid

* 6 13C2-PFOA

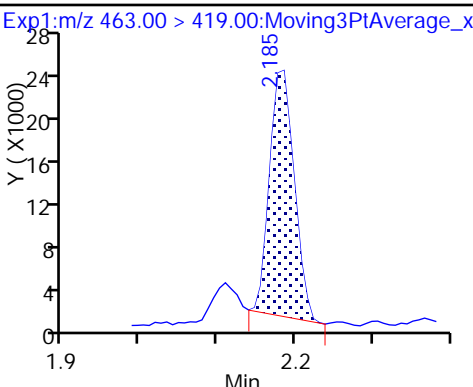
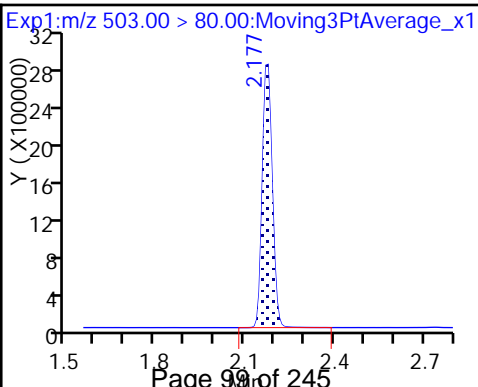
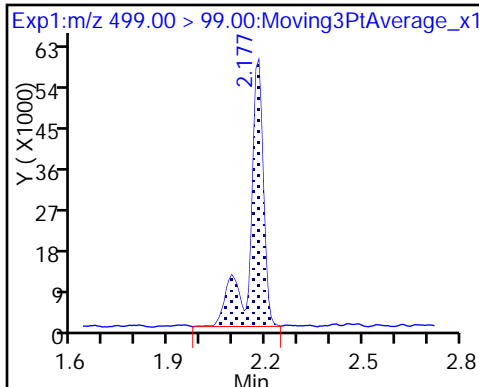
8 Perfluorooctane sulfonic acid



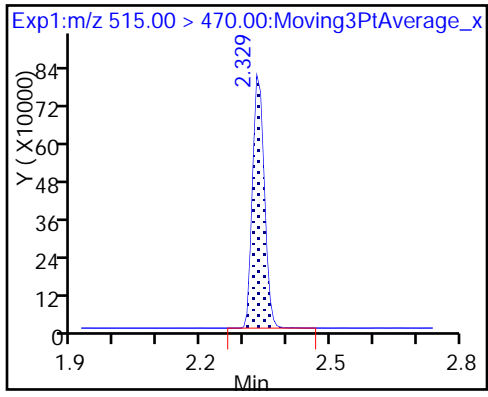
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\2017.08.14_537B_006.d
 Lims ID: 320-30142-A-1-A
 Client ID: NAWC-072517-RW-331
 Sample Type: Client
 Inject. Date: 14-Aug-2017 19:47:52 ALS Bottle#: 4 Worklist Smp#: 6
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-30142-a-1-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 16-Aug-2017 14:14:15 Calib Date: 14-Aug-2017 13:12:40
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170814-46675.b\2017.08.14_537ICAL_007.d
 Column 1 : Det: EXP1
 Process Host: XAWRK009

First Level Reviewer: barnettj Date: 15-Aug-2017 14:00:58

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	7.72	77.24
\$ 10 13C2 PFDA	10.0	11.4	114.22

TestAmerica Sacramento

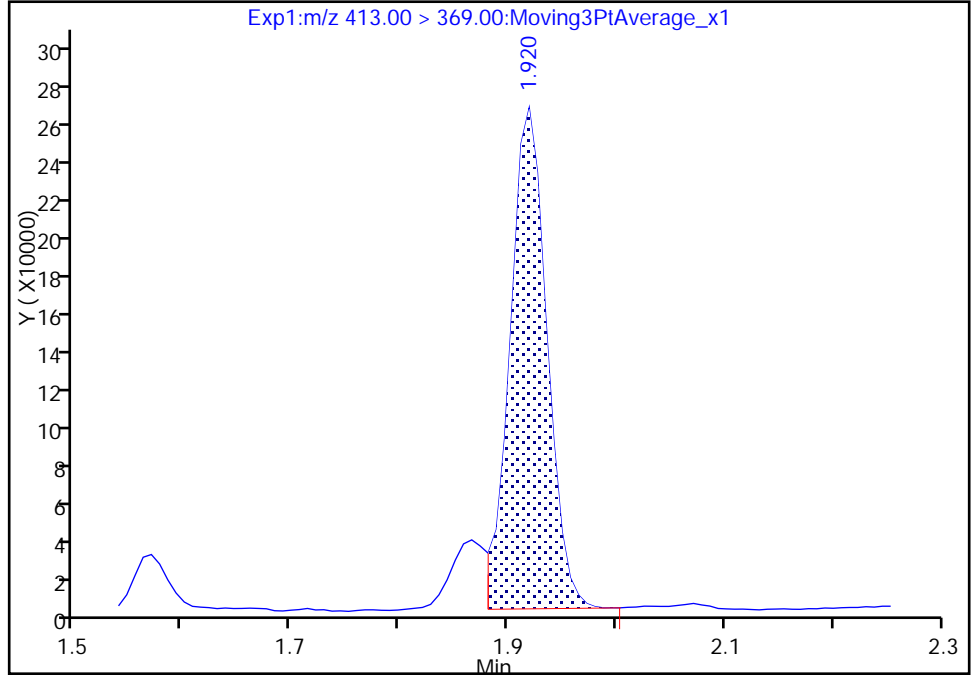
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Injection Date: 14-Aug-2017 19:47:52 Instrument ID: A8_N
Lims ID: 320-30142-A-1-A Lab Sample ID: 320-30142-1
Client ID: NAWC-072517-RW-331
Operator ID: SACINSTLCMS01 ALS Bottle#: 4 Worklist Smp#: 6
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

5 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

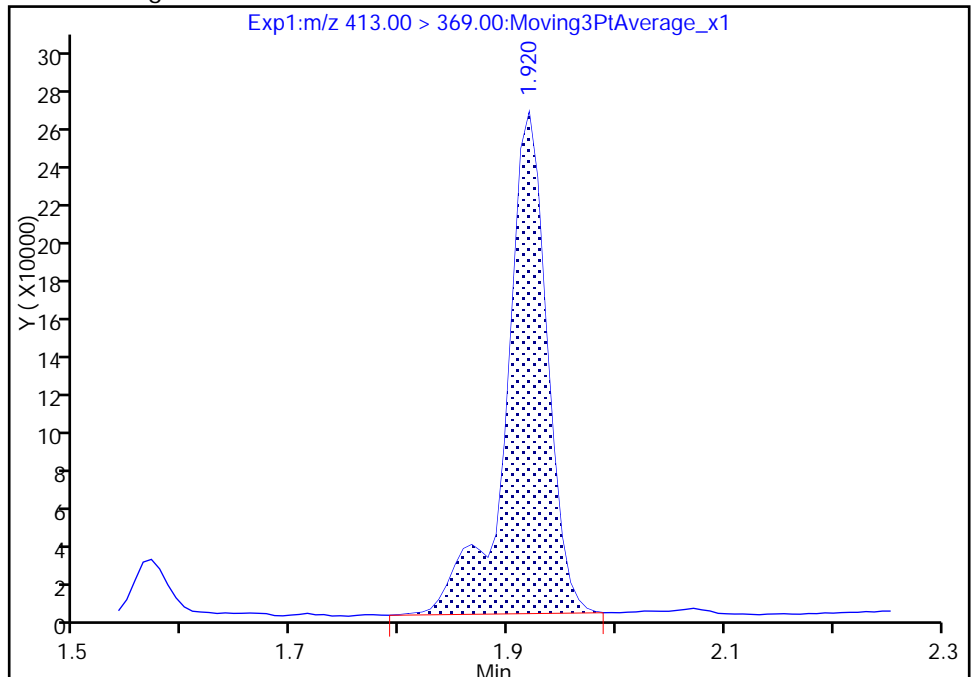
RT: 1.92
Area: 617038
Amount: 3.033834
Amount Units: ng/ml

Processing Integration Results



RT: 1.92
Area: 695920
Amount: 3.421679
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 15-Aug-2017 14:00:39
Audit Action: Manually Integrated

Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Client Sample ID: NAWC-072517-FRB-331 Lab Sample ID: 320-30142-2
 Matrix: Water Lab File ID: 2017.08.14_537B_007.d
 Analysis Method: 537 Date Collected: 07/25/2017 08:55
 Extraction Method: 537 Date Extracted: 08/03/2017 10:02
 Sample wt/vol: 246.7(mL) Date Analyzed: 08/14/2017 19:52
 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.: 179510 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	41	16	6.9
335-67-1	Perfluorooctanoic acid (PFOA)	8.1	U	20	8.1	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	8.1
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	30	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.1	U	10	4.1	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	91	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	84		70-130
STL00996	13C2 PFDA	105		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\2017.08.14_537B_007.d
 Lims ID: 320-30142-A-2-A
 Client ID: NAWC-072517-FRB-331
 Sample Type: Client
 Inject. Date: 14-Aug-2017 19:52:36 ALS Bottle#: 5 Worklist Smp#: 7
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-30142-a-2-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 16-Aug-2017 14:14:15 Calib Date: 14-Aug-2017 13:12:40
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170814-46675.b\2017.08.14_537ICAL_007.d

Column 1 : Det: EXP1
 Process Host: XAWRK009

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
\$ 2 13C2 PFHxA	315.00 > 270.00	1.563	1.582	-0.019	1.000	1985580	8.42	9085	
* 6 13C2-PFOA	415.00 > 370.00	1.912	1.955	-0.043		2205400	10.0	9284	
* 7 13C4 PFOS	503.00 > 80.00	2.170	2.205	-0.035		6421825	28.7	4527	
\$ 10 13C2 PFDA	515.00 > 470.00	2.329	2.354	-0.025	1.000	1359789	10.5	10046	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\2017.08.14_537B_007.d

Injection Date: 14-Aug-2017 19:52:36

Instrument ID: A8_N

Lims ID: 320-30142-A-2-A

Lab Sample ID: 320-30142-2

Client ID: NAWC-072517-FRB-331

Operator ID: SACINSTLCMS01

ALS Bottle#: 5

Worklist Smp#: 7

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

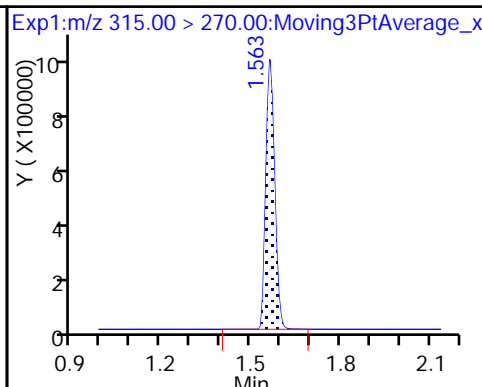
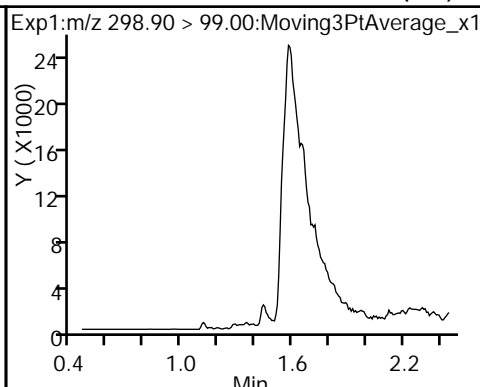
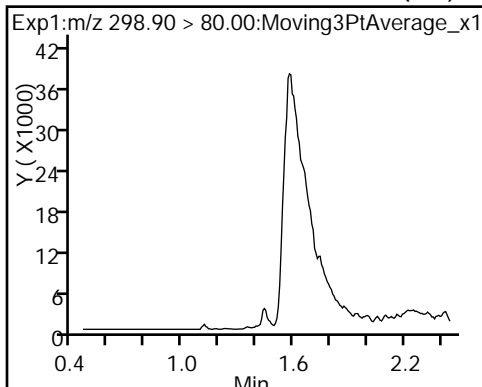
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

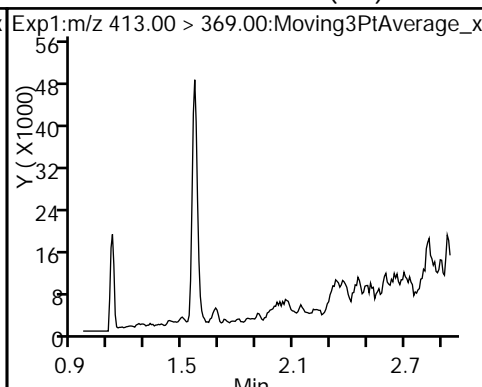
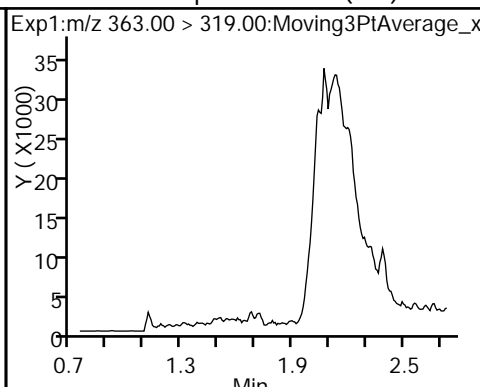
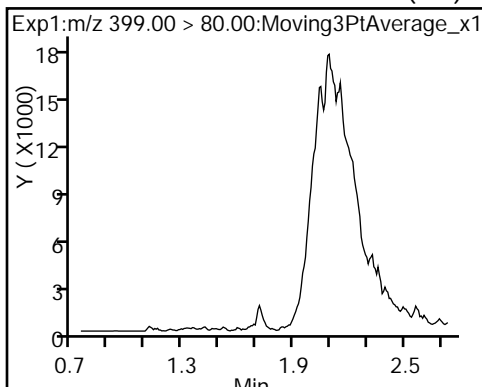
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (ND)

4 Perfluoroheptanoic acid (ND)

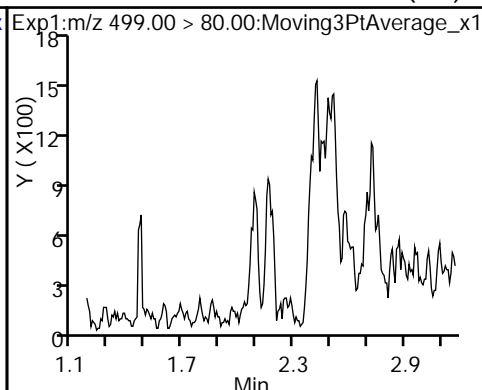
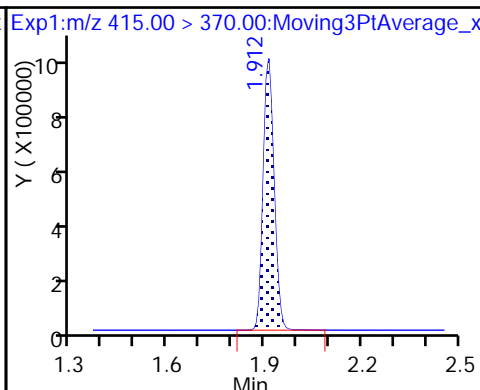
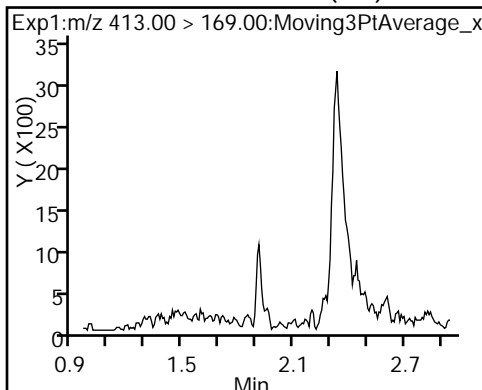
5 Perfluorooctanoic acid (ND)



5 Perfluorooctanoic acid (ND)

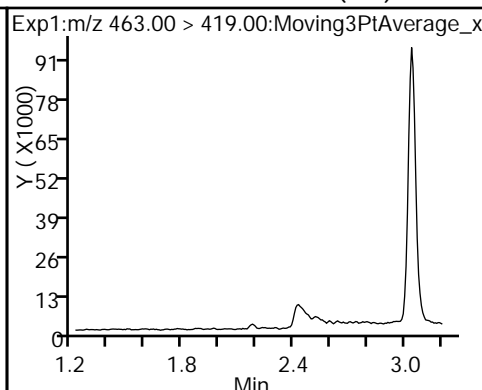
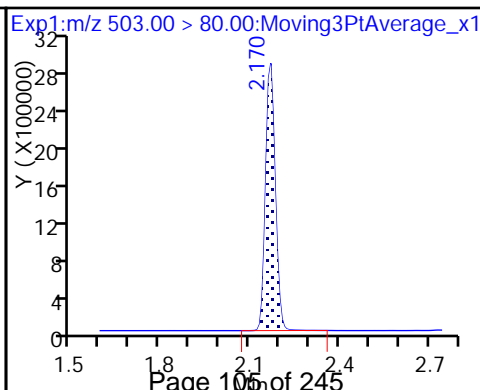
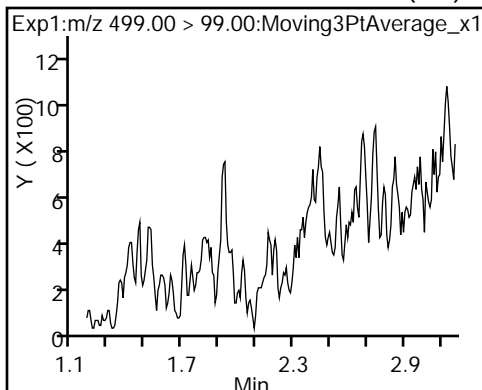
* 6 13C2-PFOA

8 Perfluorooctane sulfonic acid (ND)

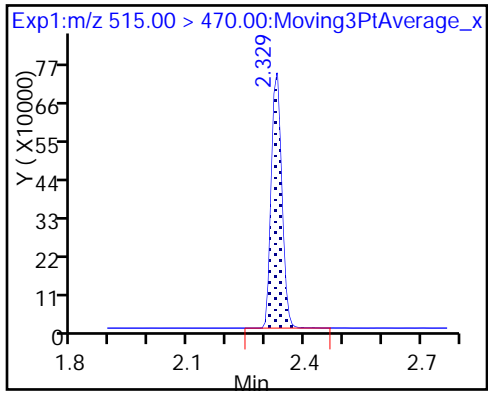


8 Perfluorooctane sulfonic acid (ND) * 7 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\2017.08.14_537B_007.d
 Lims ID: 320-30142-A-2-A
 Client ID: NAWC-072517-FRB-331
 Sample Type: Client
 Inject. Date: 14-Aug-2017 19:52:36 ALS Bottle#: 5 Worklist Smp#: 7
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-30142-a-2-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 16-Aug-2017 14:14:15 Calib Date: 14-Aug-2017 13:12:40
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170814-46675.b\2017.08.14_537ICAL_007.d

Column 1 : Det: EXP1
 Process Host: XAWRK009

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	8.42	84.20
\$ 10 13C2 PFDA	10.0	10.5	104.92

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Client Sample ID: NAWC-072517-RW-334 Lab Sample ID: 320-30142-3
 Matrix: Water Lab File ID: 2017.08.14_537B_008.d
 Analysis Method: 537 Date Collected: 07/25/2017 09:25
 Extraction Method: 537 Date Extracted: 08/03/2017 10:02
 Sample wt/vol: 256.7(mL) Date Analyzed: 08/14/2017 19:57
 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.: 179510 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	39	16	6.6
335-67-1	Perfluorooctanoic acid (PFOA)	9.7	J M	19	7.8	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.8
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	29	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.5	J	9.7	3.9	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	88	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	85		70-130
STL00996	13C2 PFDA	118		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\2017.08.14_537B_008.d
 Lims ID: 320-30142-A-3-A
 Client ID: NAWC-072517-RW-334
 Sample Type: Client
 Inject. Date: 14-Aug-2017 19:57:22 ALS Bottle#: 6 Worklist Smp#: 8
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-30142-a-3-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 16-Aug-2017 14:14:15 Calib Date: 14-Aug-2017 13:12:40
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170814-46675.b\2017.08.14_537ICAL_007.d
 Column 1 : Det: EXP1
 Process Host: XAWRK009

First Level Reviewer: barnettj Date: 15-Aug-2017 14:02:01

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.442	1.453	-0.011	1.000	219825	0.8472		29.0	
298.90 > 99.00	1.442	1.453	-0.011	1.000	145447		1.51(0.00-0.00)	30.6	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.563	1.582	-0.019	1.000	2154996	8.53		8420	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.715	1.742	-0.027	1.000	301683	0.8752		38.2	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.715	1.742	-0.027	1.000	180674	0.8938		13.3	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.912	1.955	-0.043	1.000	534364	2.50		26.0	M
413.00 > 169.00	1.912	1.955	-0.043	1.000	322212		1.66(0.00-0.00)	368	M
* 6 13C2-PFOA									
415.00 > 370.00	1.912	1.955	-0.043		2361478	10.0		8949	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.086	2.170	-0.084	1.000	353699	1.66		97.9	
499.00 > 99.00	2.170	2.170	0.0	1.040	58249		6.07(0.00-0.00)	38.2	
* 7 13C4 PFOS									
503.00 > 80.00	2.170	2.205	-0.035		6616874	28.7		4255	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.329	2.354	-0.025	1.000	1631542	11.8		10302	

QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\2017.08.14_537B_008.d

Injection Date: 14-Aug-2017 19:57:22

Instrument ID: A8_N

Lims ID: 320-30142-A-3-A

Lab Sample ID: 320-30142-3

Client ID: NAWC-072517-RW-334

Operator ID: SACINSTLCMS01

ALS Bottle#: 6

Worklist Smp#: 8

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

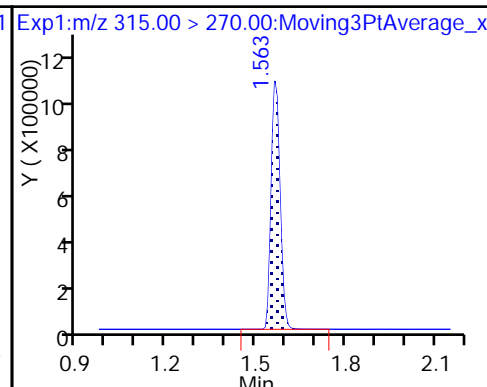
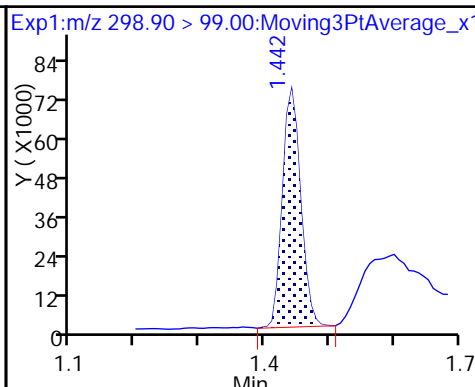
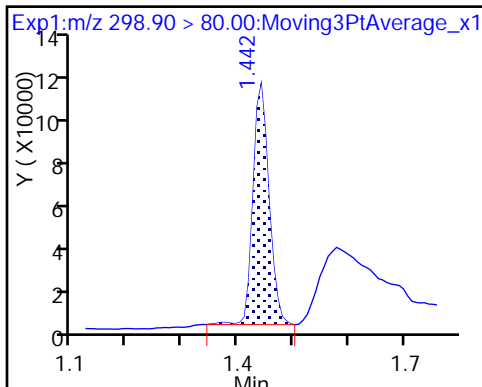
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

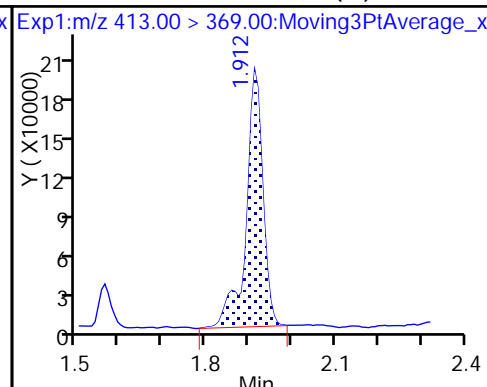
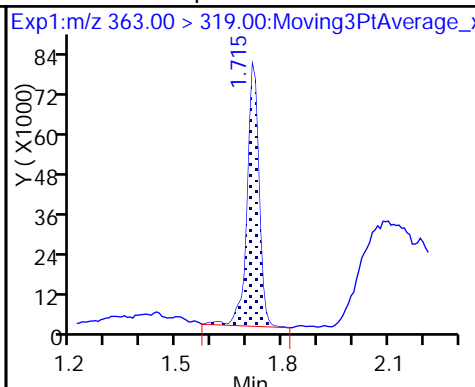
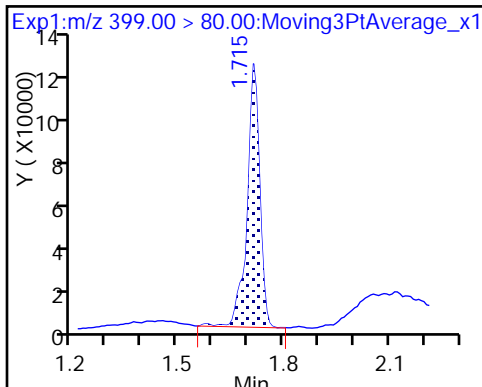
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

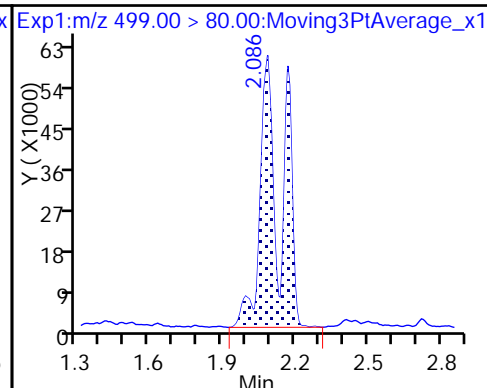
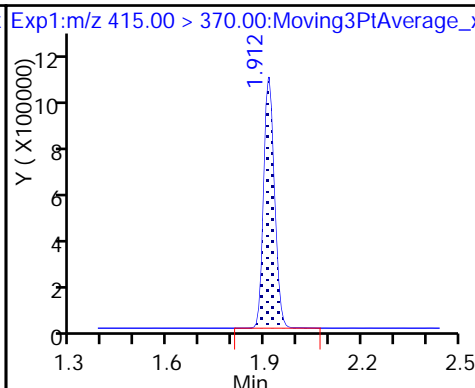
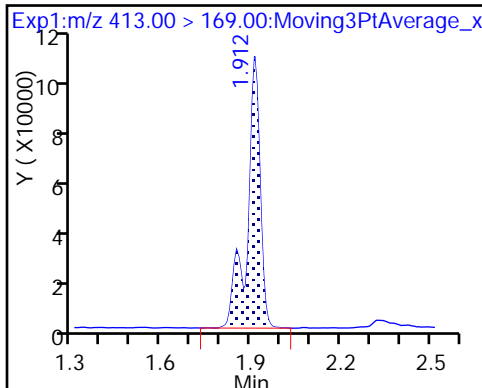
5 Perfluorooctanoic acid (M)



5 Perfluorooctanoic acid

* 6 13C2-PFOA

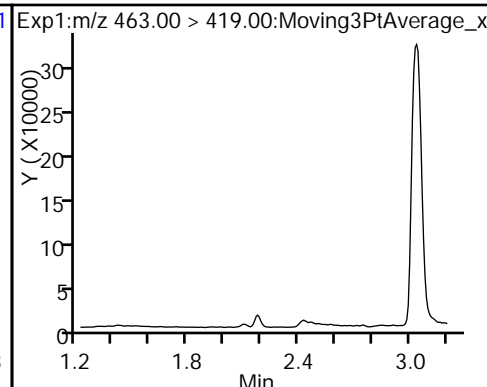
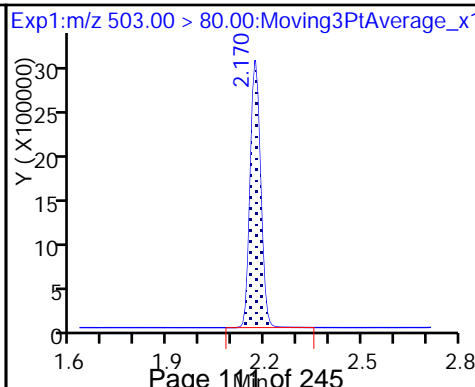
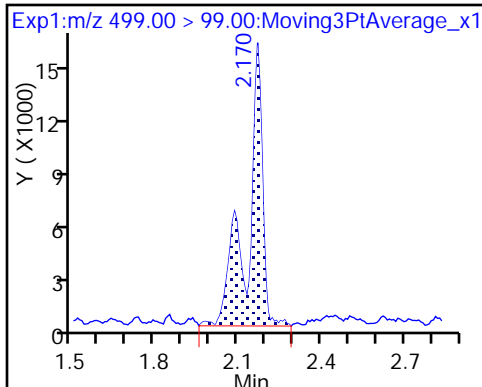
8 Perfluorooctane sulfonic acid



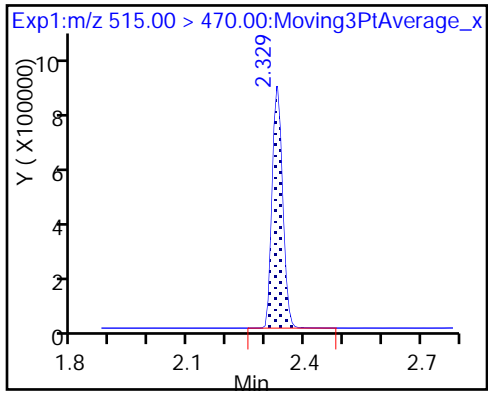
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\2017.08.14_537B_008.d
 Lims ID: 320-30142-A-3-A
 Client ID: NAWC-072517-RW-334
 Sample Type: Client
 Inject. Date: 14-Aug-2017 19:57:22 ALS Bottle#: 6 Worklist Smp#: 8
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-30142-a-3-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 16-Aug-2017 14:14:15 Calib Date: 14-Aug-2017 13:12:40
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170814-46675.b\2017.08.14_537ICAL_007.d
 Column 1 : Det: EXP1
 Process Host: XAWRK009

First Level Reviewer: barnettj Date: 15-Aug-2017 14:02:01

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	8.53	85.34
\$ 10 13C2 PFDA	10.0	11.8	117.57

TestAmerica Sacramento

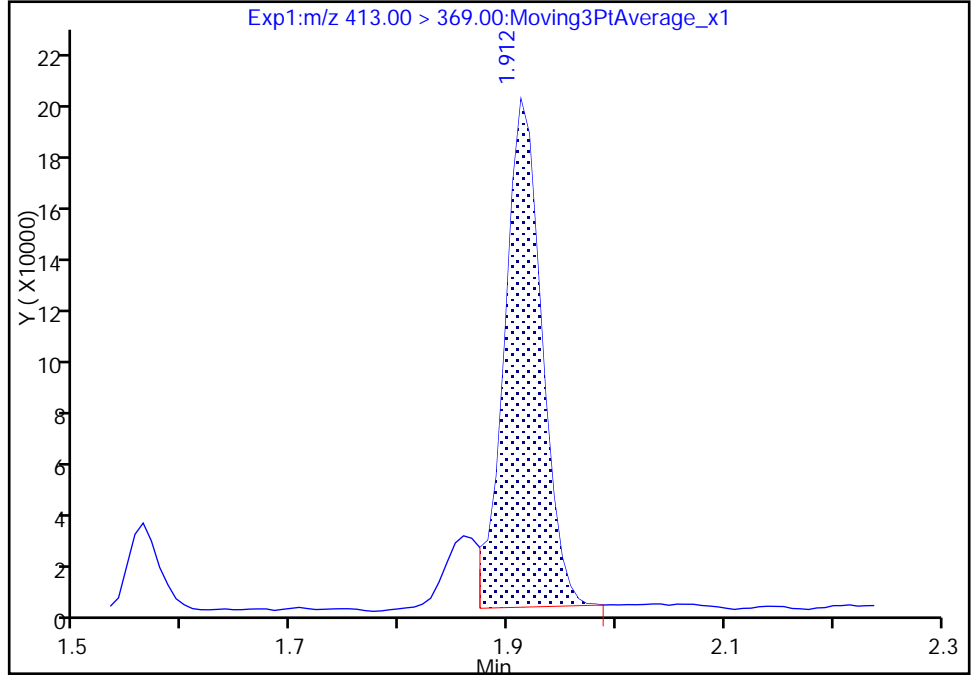
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\2017.08.14_537B_008.d
Injection Date: 14-Aug-2017 19:57:22 Instrument ID: A8_N
Lims ID: 320-30142-A-3-A Lab Sample ID: 320-30142-3
Client ID: NAWC-072517-RW-334
Operator ID: SACINSTLCMS01 ALS Bottle#: 6 Worklist Smp#: 8
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

5 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

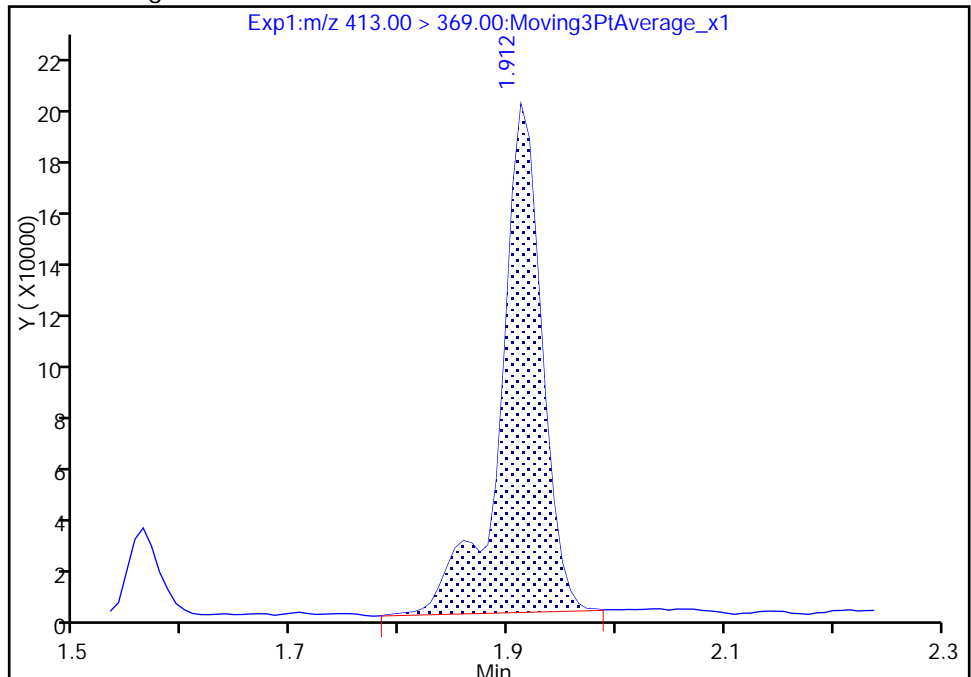
RT: 1.91
Area: 472242
Amount: 2.205217
Amount Units: ng/ml

Processing Integration Results



RT: 1.91
Area: 534364
Amount: 2.495307
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 15-Aug-2017 14:01:42
Audit Action: Manually Integrated

Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Client Sample ID: NAWC-072517-FRB-334 Lab Sample ID: 320-30142-4
 Matrix: Water Lab File ID: 2017.08.14_537B_009.d
 Analysis Method: 537 Date Collected: 07/25/2017 09:20
 Extraction Method: 537 Date Extracted: 08/03/2017 10:02
 Sample wt/vol: 246.3(mL) Date Analyzed: 08/14/2017 20:02
 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.: 179510 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	41	16	6.9
335-67-1	Perfluorooctanoic acid (PFOA)	8.1	U	20	8.1	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	8.1
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	30	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.1	U	10	4.1	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	37	U	91	37	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	100		70-130
STL00996	13C2 PFDA	116		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\2017.08.14_537B_009.d
 Lims ID: 320-30142-A-4-A
 Client ID: NAWC-072517-FRB-334
 Sample Type: Client
 Inject. Date: 14-Aug-2017 20:02:07 ALS Bottle#: 7 Worklist Smp#: 9
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-30142-a-4-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 16-Aug-2017 14:14:15 Calib Date: 14-Aug-2017 13:12:40
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170814-46675.b\2017.08.14_537ICAL_007.d

Column 1 : Det: EXP1
 Process Host: XAWRK009

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
\$ 2 13C2 PFHxA	315.00 > 270.00	1.571	1.582	-0.012	1.000	2478050	10.0	9375	
* 6 13C2-PFOA	415.00 > 370.00	1.920	1.955	-0.035		2307400	10.0	8851	
* 7 13C4 PFOS	503.00 > 80.00	2.177	2.205	-0.028		6481747	28.7	4998	
\$ 10 13C2 PFDA	515.00 > 470.00	2.329	2.354	-0.025	1.000	1573208	11.6	9068	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\2017.08.14_537B_009.d

Injection Date: 14-Aug-2017 20:02:07

Instrument ID: A8_N

Lims ID: 320-30142-A-4-A

Lab Sample ID: 320-30142-4

Client ID: NAWC-072517-FRB-334

Operator ID: SACINSTLCMS01

ALS Bottle#: 7

Worklist Smp#: 9

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

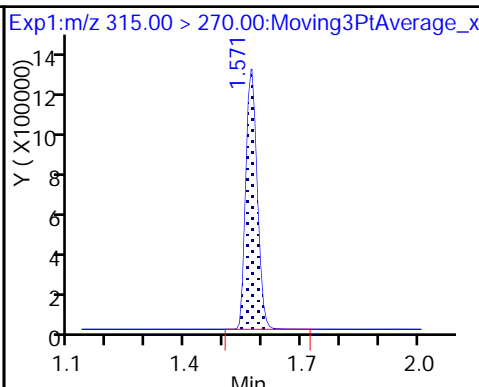
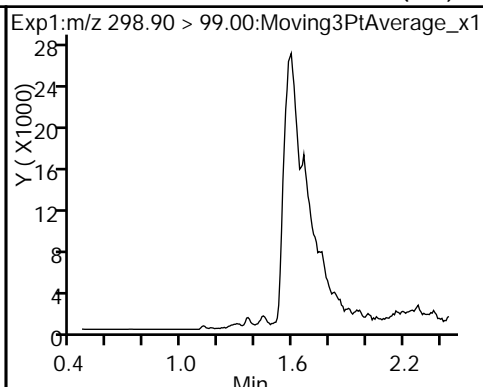
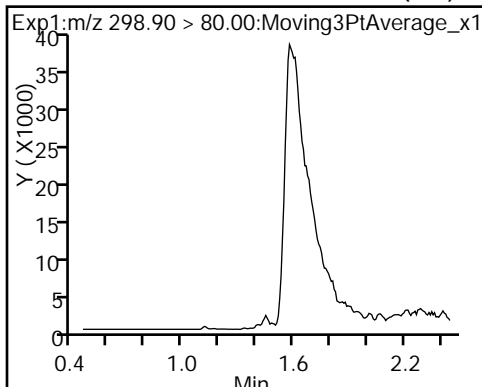
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

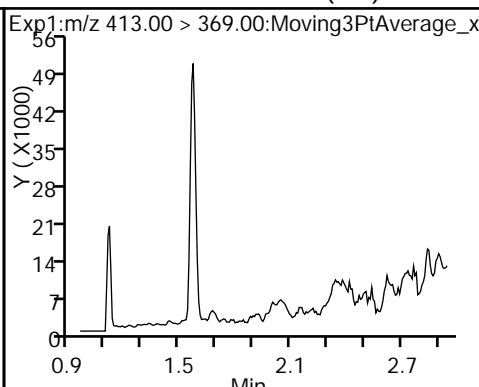
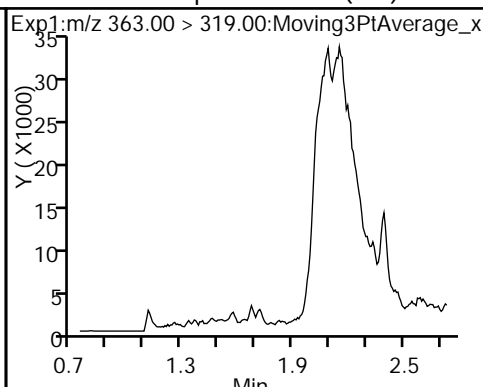
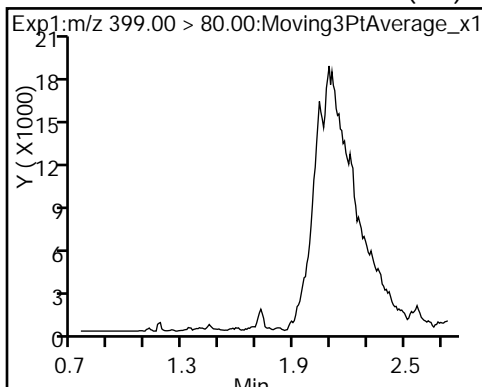
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (ND)

4 Perfluoroheptanoic acid (ND)

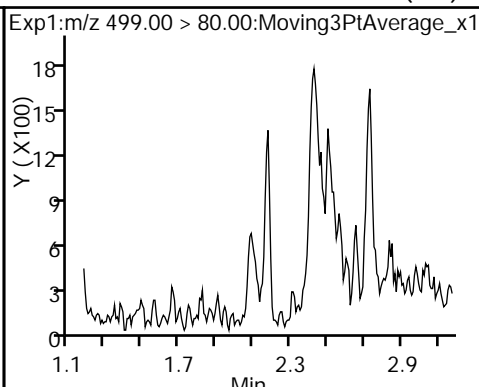
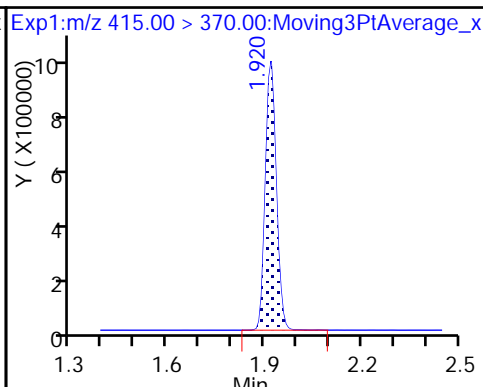
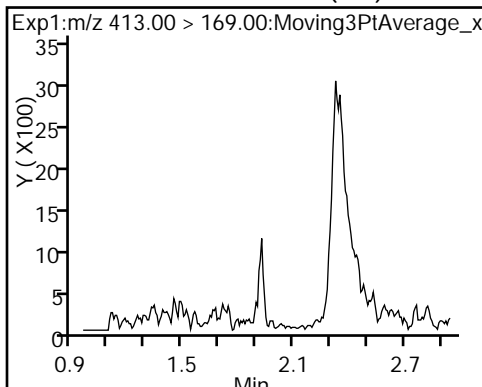
5 Perfluorooctanoic acid (ND)



5 Perfluorooctanoic acid (ND)

* 6 13C2-PFOA

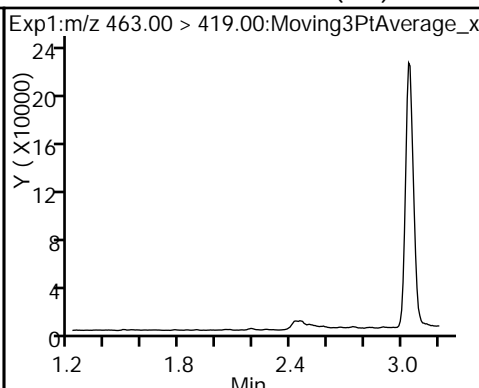
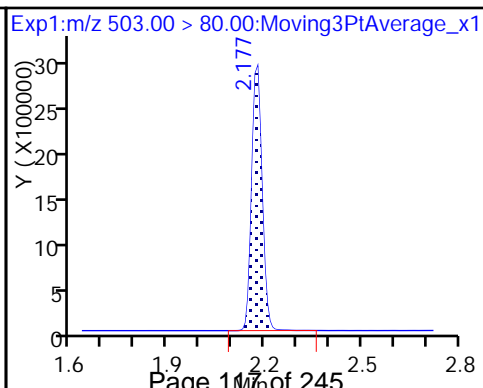
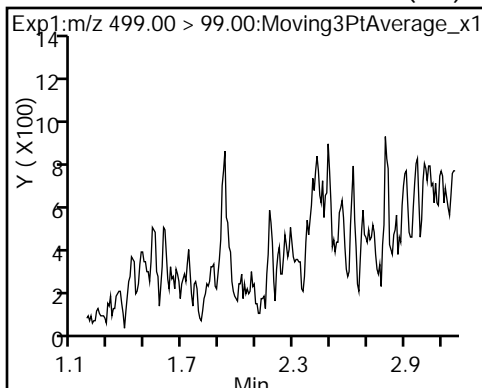
8 Perfluorooctane sulfonic acid (ND)



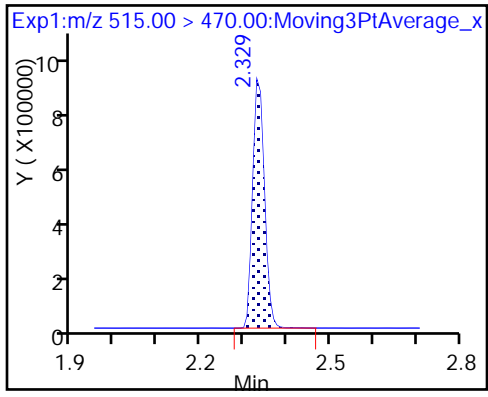
8 Perfluorooctane sulfonic acid (ND)

* 7 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\2017.08.14_537B_009.d
 Lims ID: 320-30142-A-4-A
 Client ID: NAWC-072517-FRB-334
 Sample Type: Client
 Inject. Date: 14-Aug-2017 20:02:07 ALS Bottle#: 7 Worklist Smp#: 9
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-30142-a-4-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 16-Aug-2017 14:14:15 Calib Date: 14-Aug-2017 13:12:40
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170814-46675.b\2017.08.14_537ICAL_007.d

Column 1 : Det: EXP1
 Process Host: XAWRK009

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	10.0	100.44
\$ 10 13C2 PFDA	10.0	11.6	116.02

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Client Sample ID: NAWC-072517-RW-347 Lab Sample ID: 320-30142-5
 Matrix: Water Lab File ID: 2017.08.14_537B_010.d
 Analysis Method: 537 Date Collected: 07/25/2017 12:05
 Extraction Method: 537 Date Extracted: 08/03/2017 10:02
 Sample wt/vol: 255 (mL) Date Analyzed: 08/14/2017 20:06
 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.: 179510 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	11	J M	39	16	6.7
335-67-1	Perfluorooctanoic acid (PFOA)	10	J M	20	7.8	2.7
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	7.8
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	29	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.9	J	9.8	3.9	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	88	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	76		70-130
STL00996	13C2 PFDA	117		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\2017.08.14_537B_010.d
 Lims ID: 320-30142-A-5-A
 Client ID: NAWC-072517-RW-347
 Sample Type: Client
 Inject. Date: 14-Aug-2017 20:06:52 ALS Bottle#: 8 Worklist Smp#: 10
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-30142-a-5-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 16-Aug-2017 14:14:15 Calib Date: 14-Aug-2017 13:12:40
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170814-46675.b\2017.08.14_537ICAL_007.d
 Column 1 : Det: EXP1
 Process Host: XAWRK009

First Level Reviewer: barnettj Date: 15-Aug-2017 14:03:28

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.442	1.453	-0.011	1.000	255985	1.02		32.0	
298.90 > 99.00	1.442	1.453	-0.011	1.000	167420		1.53(0.00-0.00)	38.5	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.563	1.582	-0.019	1.000	1857651	7.58		6912	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.715	1.742	-0.027	1.000	344223	1.03		42.6	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.715	1.742	-0.027	1.000	194610	0.99		13.5	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.912	1.955	-0.043	1.000	534647	2.57		24.6	M
413.00 > 169.00	1.912	1.955	-0.043	1.000	323235		1.65(0.00-0.00)	419	M
* 6 13C2-PFOA									
415.00 > 370.00	1.912	1.955	-0.043		2292452	10.0		8461	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.170	2.170	0.0	1.000	585741	2.85		166	M
499.00 > 99.00	2.170	2.170	0.0	1.000	104378		5.61(0.00-0.00)	82.3	M
* 7 13C4 PFOS									
503.00 > 80.00	2.170	2.205	-0.035		6391356	28.7		3084	
9 Perfluorononanoic acid									
463.00 > 419.00	2.177	2.213	-0.036	1.000	67658	0.5210		3.3	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.329	2.354	-0.025	1.000	1572269	11.7		9864	

QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\2017.08.14_537B_010.d

Injection Date: 14-Aug-2017 20:06:52

Instrument ID: A8_N

Lims ID: 320-30142-A-5-A

Lab Sample ID: 320-30142-5

Client ID: NAWC-072517-RW-347

Operator ID: SACINSTLCMS01

ALS Bottle#: 8

Worklist Smp#: 10

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

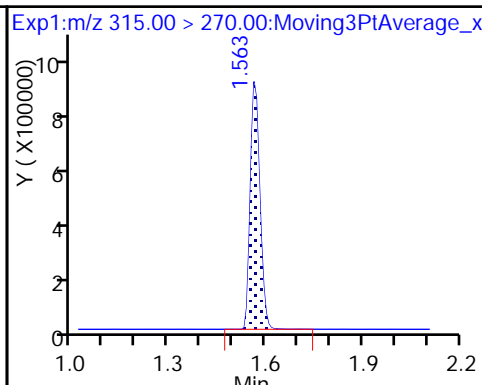
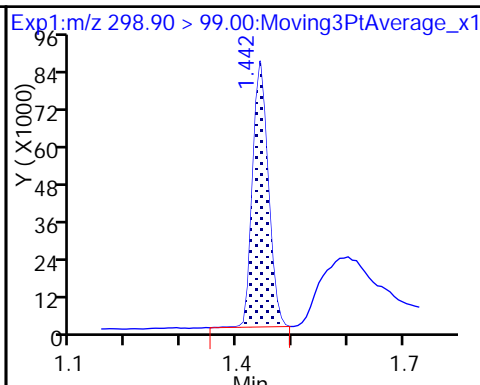
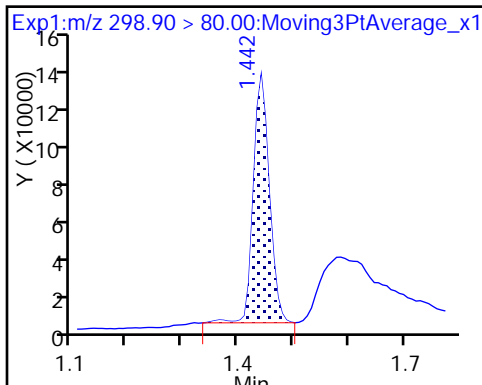
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

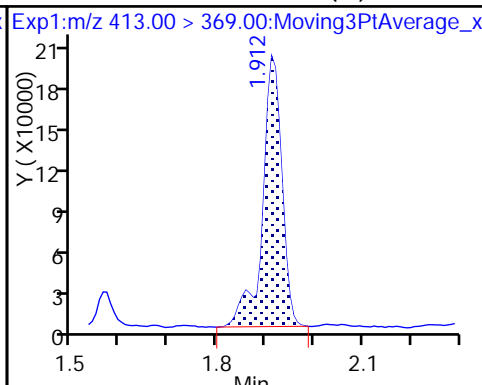
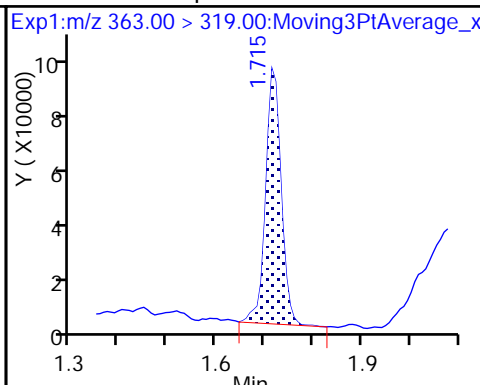
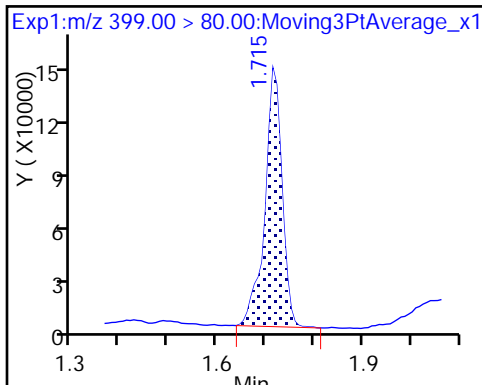
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

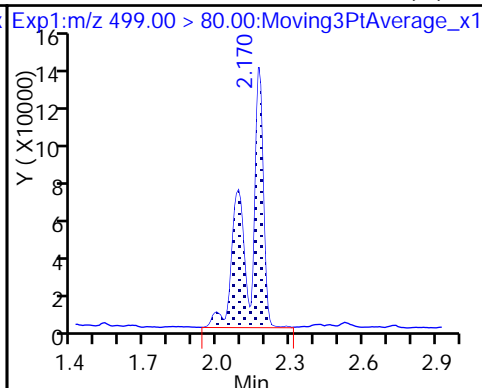
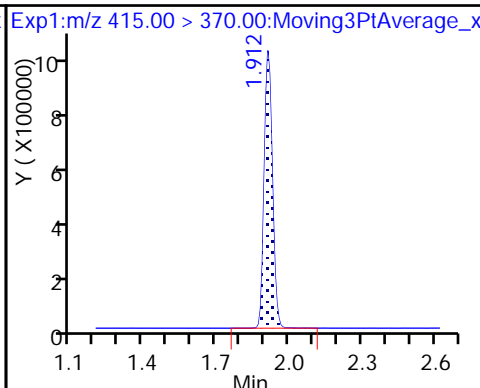
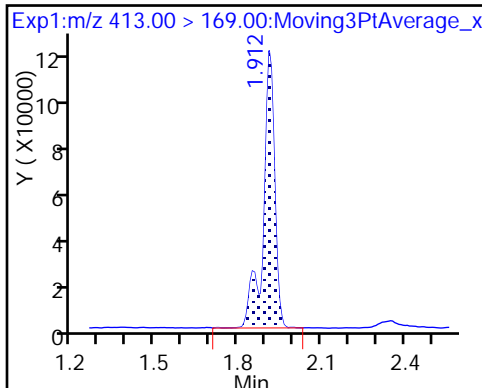
5 Perfluorooctanoic acid (M)



5 Perfluorooctanoic acid

* 6 13C2-PFOA

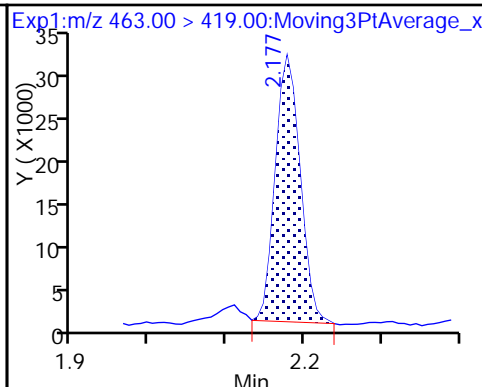
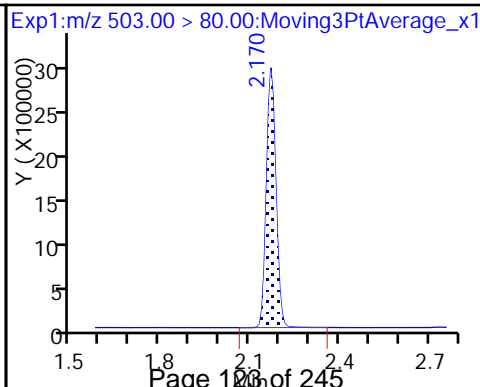
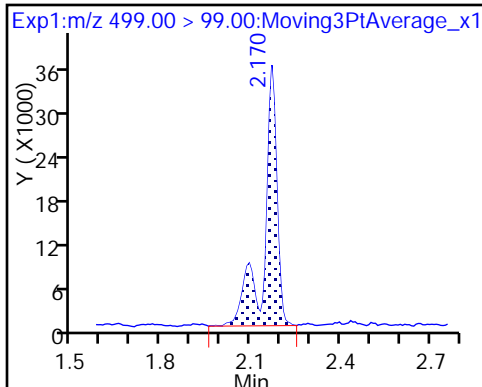
8 Perfluorooctane sulfonic acid (M)



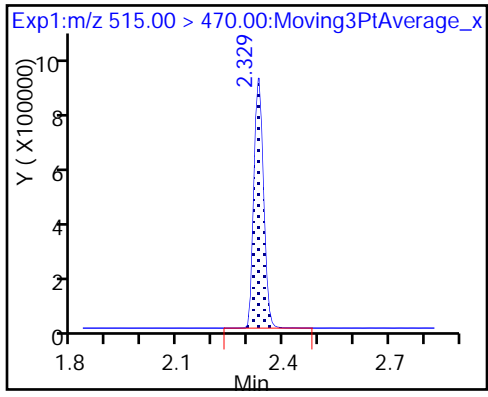
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\2017.08.14_537B_010.d
 Lims ID: 320-30142-A-5-A
 Client ID: NAWC-072517-RW-347
 Sample Type: Client
 Inject. Date: 14-Aug-2017 20:06:52 ALS Bottle#: 8 Worklist Smp#: 10
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-30142-a-5-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 16-Aug-2017 14:14:15 Calib Date: 14-Aug-2017 13:12:40
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170814-46675.b\2017.08.14_537ICAL_007.d
 Column 1 : Det: EXP1
 Process Host: XAWRK009

First Level Reviewer: barnettj Date: 15-Aug-2017 14:03:28

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	7.58	75.78
\$ 10 13C2 PFDA	10.0	11.7	116.71

TestAmerica Sacramento

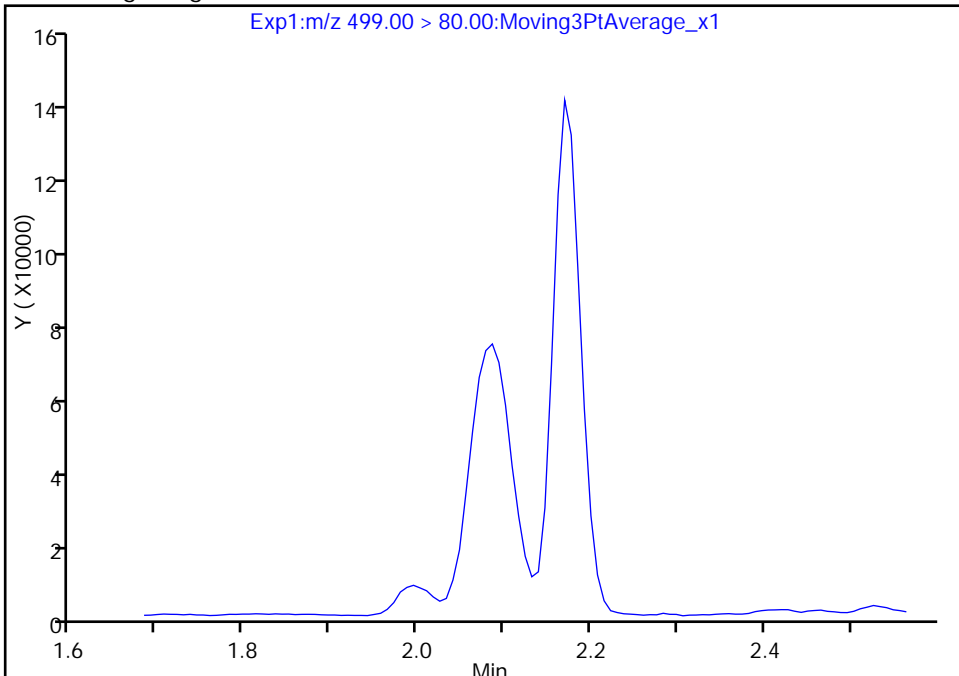
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Injection Date: 14-Aug-2017 20:06:52 Instrument ID: A8_N
Lims ID: 320-30142-A-5-A Lab Sample ID: 320-30142-5
Client ID: NAWC-072517-RW-347
Operator ID: SACINSTLCMS01 ALS Bottle#: 8 Worklist Smp#: 10
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

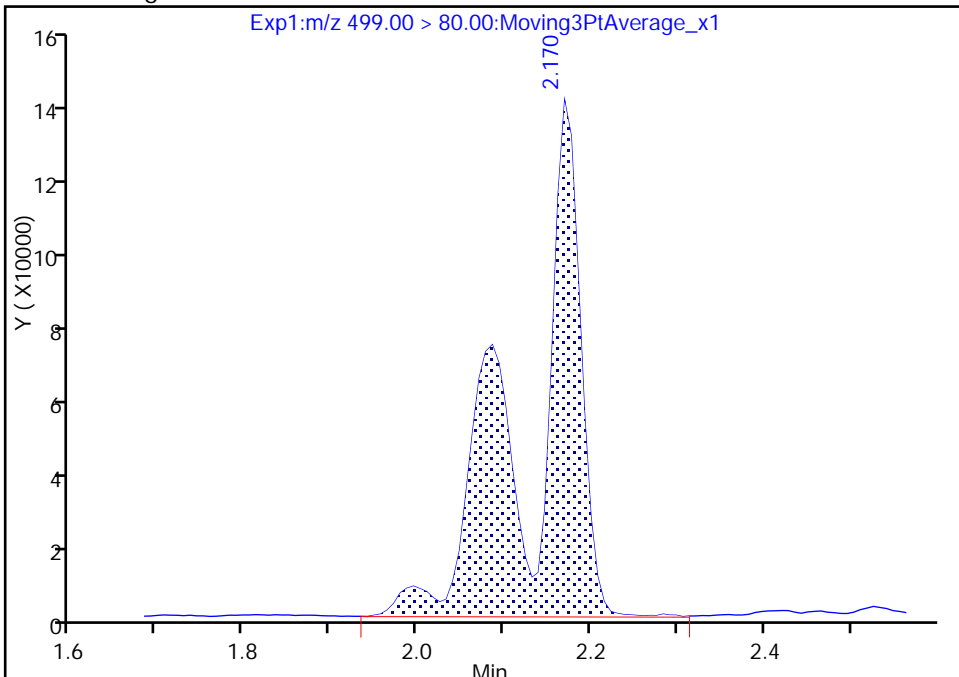
Not Detected
Expected RT: 2.17

Processing Integration Results



Manual Integration Results

RT: 2.17
Area: 585741
Amount: 2.845738
Amount Units: ng/ml



Reviewer: barnettj, 15-Aug-2017 14:02:15
Audit Action: Assigned Compound ID

Audit Reason: Split Peak

TestAmerica Sacramento

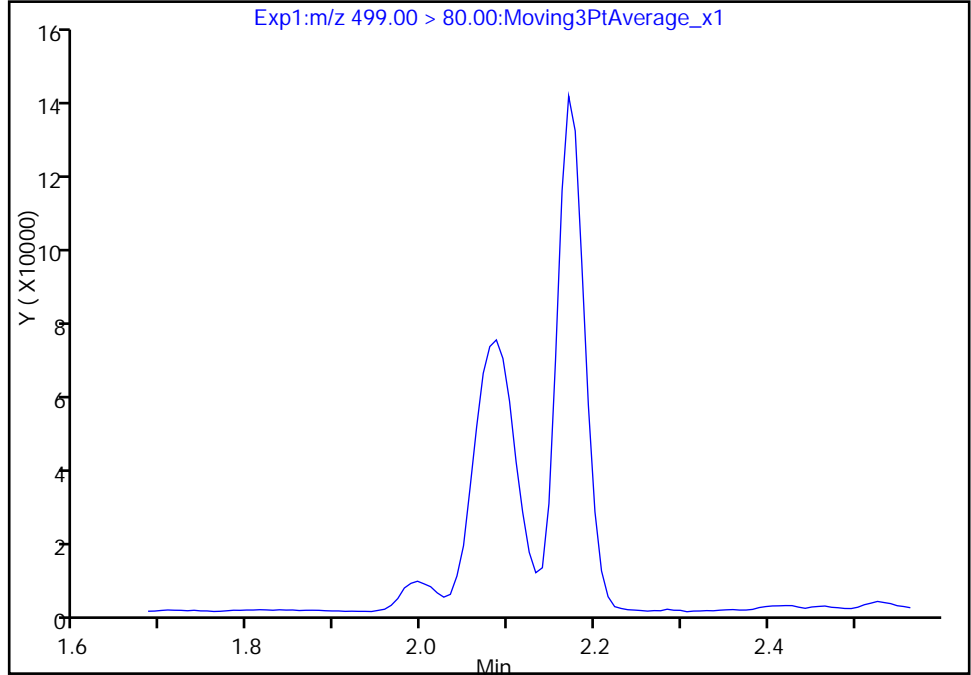
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\2017.08.14_537B_010.d
Injection Date: 14-Aug-2017 20:06:52 Instrument ID: A8_N
Lims ID: 320-30142-A-5-A Lab Sample ID: 320-30142-5
Client ID: NAWC-072517-RW-347
Operator ID: SACINSTLCMS01 ALS Bottle#: 8 Worklist Smp#: 10
Injection Vol: 2.0 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

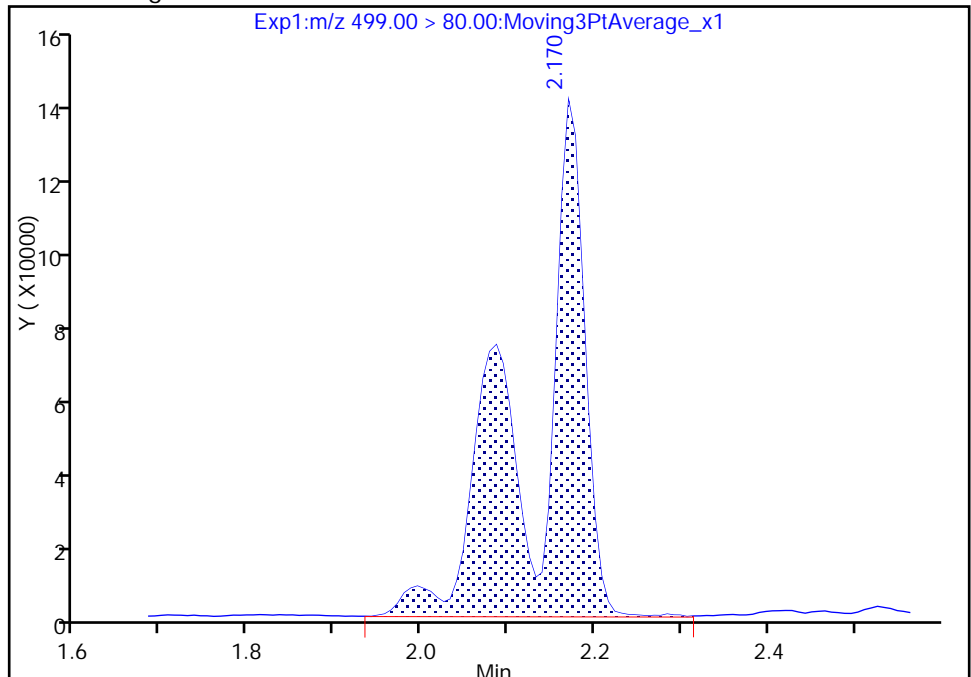
Not Detected
Expected RT: 2.17

Processing Integration Results



Manual Integration Results

RT: 2.17
Area: 585741
Amount: 2.845738
Amount Units: ng/ml



Reviewer: barnettj, 15-Aug-2017 14:03:16

Audit Action: Manually Integrated

Audit Reason: Split Peak

TestAmerica Sacramento

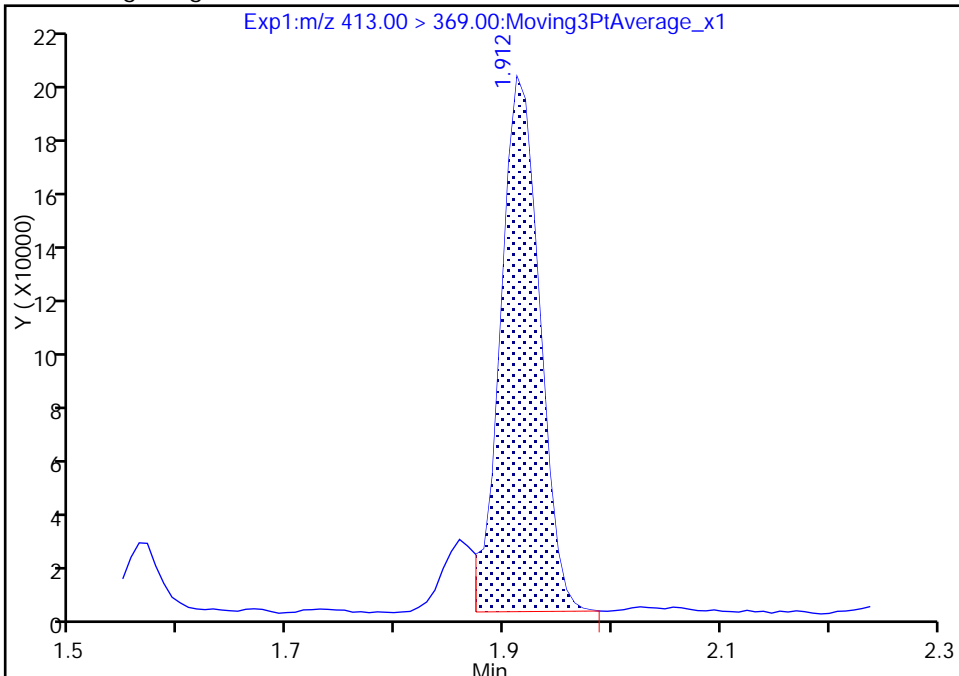
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\2017.08.14_537B_010.d
Injection Date: 14-Aug-2017 20:06:52 Instrument ID: A8_N
Lims ID: 320-30142-A-5-A Lab Sample ID: 320-30142-5
Client ID: NAWC-072517-RW-347
Operator ID: SACINSTLCMS01 ALS Bottle#: 8 Worklist Smp#: 10
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

5 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

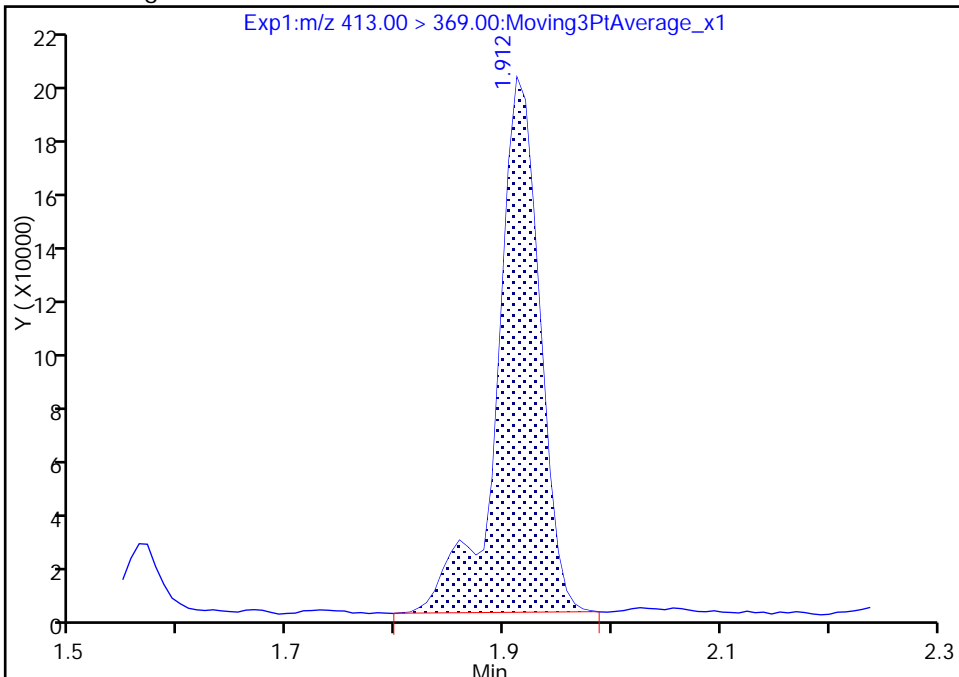
RT: 1.91
Area: 484186
Amount: 2.329071
Amount Units: ng/ml

Processing Integration Results



RT: 1.91
Area: 534647
Amount: 2.571802
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 15-Aug-2017 14:02:31
Audit Action: Manually Integrated

Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Client Sample ID: NAWC-072517-FRB-347 Lab Sample ID: 320-30142-6
 Matrix: Water Lab File ID: 2017.08.14_537B_011.d
 Analysis Method: 537 Date Collected: 07/25/2017 12:00
 Extraction Method: 537 Date Extracted: 08/03/2017 10:02
 Sample wt/vol: 262.7(mL) Date Analyzed: 08/14/2017 20:11
 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.: 179510 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)	7.6	U	19	7.6	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.6
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	29	11	5.2
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.8	U	9.5	3.8	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	34	U	86	34	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	103		70-130
STL00996	13C2 PFDA	125		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\2017.08.14_537B_011.d
 Lims ID: 320-30142-A-6-A
 Client ID: NAWC-072517-FRB-347
 Sample Type: Client
 Inject. Date: 14-Aug-2017 20:11:37 ALS Bottle#: 9 Worklist Smp#: 11
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-30142-a-6-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 16-Aug-2017 14:14:15 Calib Date: 14-Aug-2017 13:12:40
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170814-46675.b\2017.08.14_537ICAL_007.d

Column 1 : Det: EXP1
 Process Host: XAWRK009

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
\$ 2 13C2 PFHxA	315.00 > 270.00	1.571	1.582	-0.012	1.000	2424617	10.3	10723	
* 6 13C2-PFOA	415.00 > 370.00	1.920	1.955	-0.035		2211331	10.0	7906	
* 7 13C4 PFOS	503.00 > 80.00	2.170	2.205	-0.035		6242811	28.7	4010	
\$ 10 13C2 PFDA	515.00 > 470.00	2.329	2.354	-0.025	1.000	1630149	12.5	10518	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\2017.08.14_537B_011.d

Injection Date: 14-Aug-2017 20:11:37

Instrument ID: A8_N

Lims ID: 320-30142-A-6-A

Lab Sample ID: 320-30142-6

Client ID: NAWC-072517-FRB-347

Operator ID: SACINSTLCMS01

ALS Bottle#: 9

Worklist Smp#: 11

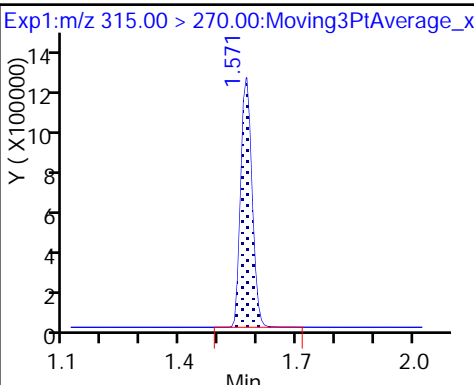
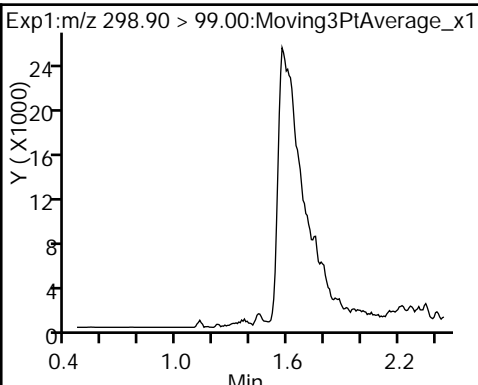
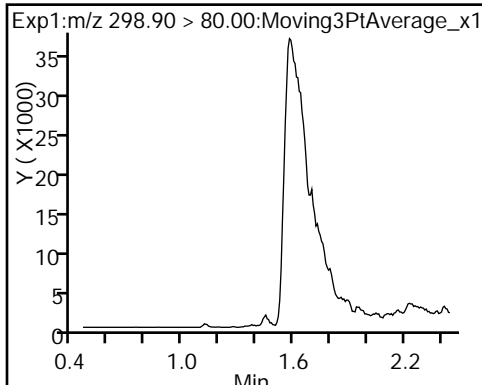
Injection Vol: 2.0 ul

Dil. Factor: 1.0000

Method: 537_A8_N

Limit Group: LC 537 ICAL

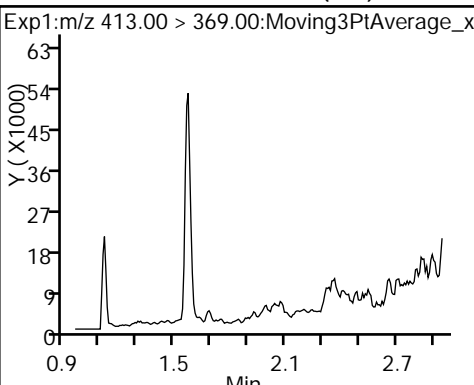
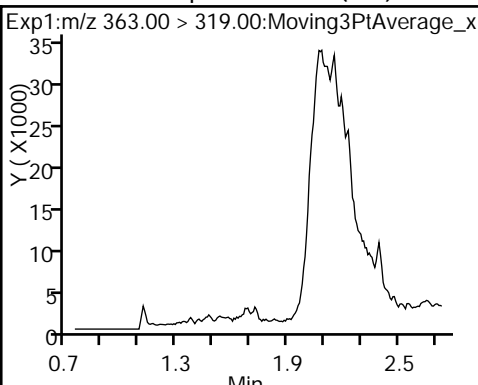
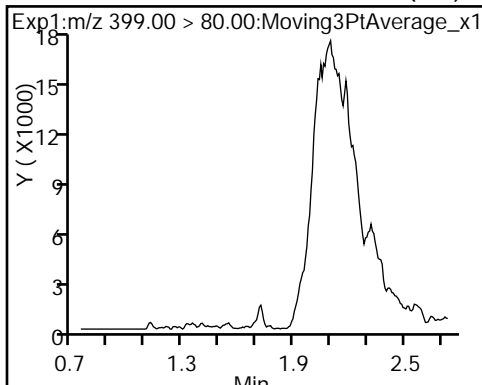
1 Perfluorobutanesulfonic acid (ND) 1 Perfluorobutanesulfonic acid (ND) \$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (ND)

4 Perfluoroheptanoic acid (ND)

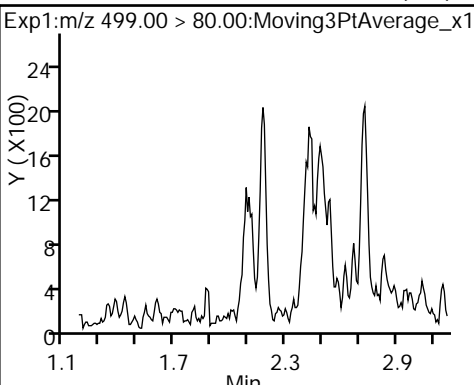
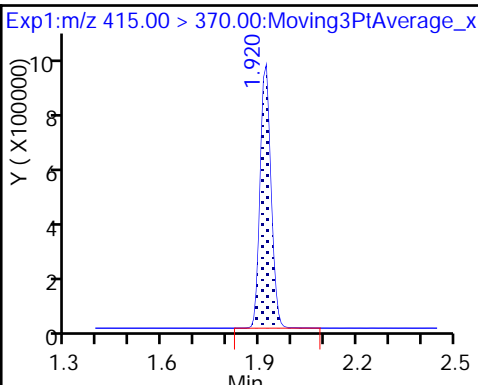
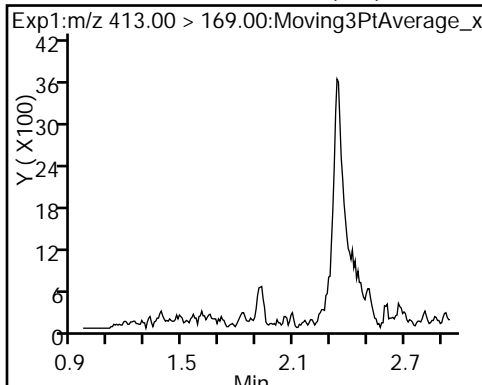
5 Perfluorooctanoic acid (ND)



5 Perfluorooctanoic acid (ND)

* 6 13C2-PFOA

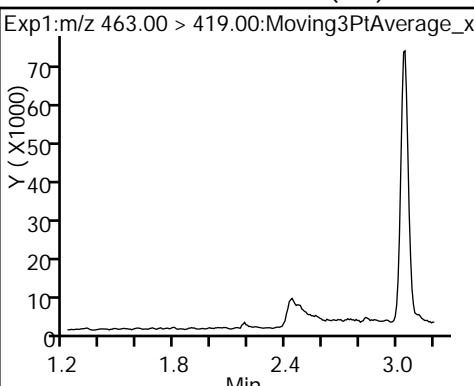
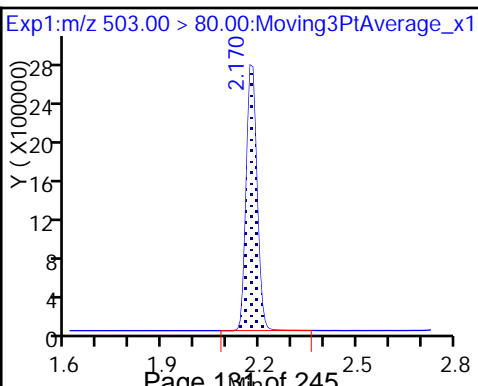
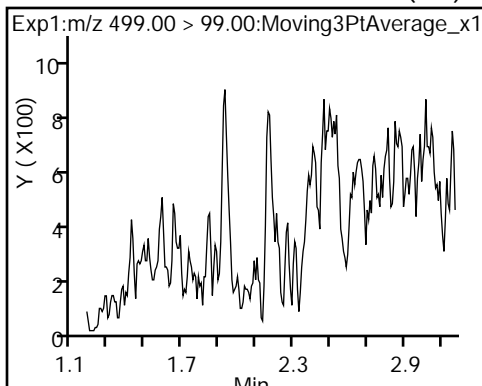
8 Perfluorooctane sulfonic acid (ND)



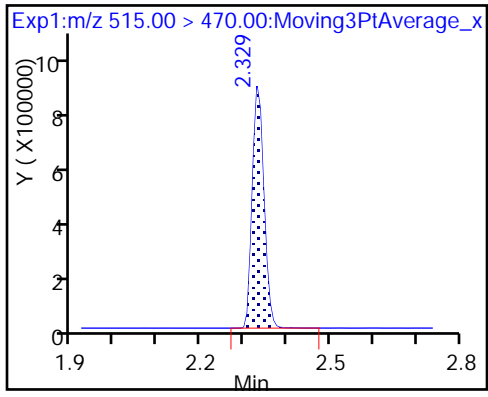
8 Perfluorooctane sulfonic acid (ND)

* 7 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\2017.08.14_537B_011.d
 Lims ID: 320-30142-A-6-A
 Client ID: NAWC-072517-FRB-347
 Sample Type: Client
 Inject. Date: 14-Aug-2017 20:11:37 ALS Bottle#: 9 Worklist Smp#: 11
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-30142-a-6-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 16-Aug-2017 14:14:15 Calib Date: 14-Aug-2017 13:12:40
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170814-46675.b\2017.08.14_537ICAL_007.d

Column 1 : Det: EXP1
 Process Host: XAWRK009

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	10.3	102.54
\$ 10 13C2 PFDA	10.0	12.5	125.44

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Client Sample ID: NAWC-072517-RW-335 Lab Sample ID: 320-30142-7
 Matrix: Water Lab File ID: 2017.08.14_537B_012.d
 Analysis Method: 537 Date Collected: 07/25/2017 13:30
 Extraction Method: 537 Date Extracted: 08/03/2017 10:02
 Sample wt/vol: 259.1(mL) Date Analyzed: 08/14/2017 20:16
 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.: 179510 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	21	J	39	15	6.6
335-67-1	Perfluorooctanoic acid (PFOA)	21	M	19	7.7	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.7
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	8.1	J	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	8.7	J	9.6	3.9	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	87	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	93		70-130
STL00996	13C2 PFDA	126		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\2017.08.14_537B_012.d
 Lims ID: 320-30142-A-7-A
 Client ID: NAWC-072517-RW-335
 Sample Type: Client
 Inject. Date: 14-Aug-2017 20:16:22 ALS Bottle#: 10 Worklist Smp#: 12
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-30142-a-7-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 16-Aug-2017 14:14:15 Calib Date: 14-Aug-2017 13:12:40
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170814-46675.b\2017.08.14_537ICAL_007.d
 Column 1 : Det: EXP1
 Process Host: XAWRK009

First Level Reviewer: barnettj Date: 15-Aug-2017 14:04:28

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.449	1.453	-0.004	1.000	230525	0.9275		30.3	
298.90 > 99.00	1.449	1.453	-0.004	1.000	138491		1.66(0.00-0.00)	30.3	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.571	1.582	-0.012	1.000	2156507	9.34		7803	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.722	1.742	-0.020	1.000	693304	2.10		86.8	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.722	1.742	-0.020	1.000	416114	2.25		32.1	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.920	1.955	-0.035	1.000	1079606	5.51		54.2	M
413.00 > 169.00	1.920	1.955	-0.035	1.000	634571		1.70(0.00-0.00)	726	M
* 6 13C2-PFOA									
415.00 > 370.00	1.920	1.955	-0.035		2160262	10.0		8316	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.177	2.170	0.007	1.000	1115094	5.46		355	
499.00 > 99.00	2.177	2.170	0.007	1.000	190942		5.84(0.00-0.00)	152	
* 7 13C4 PFOS									
503.00 > 80.00	2.177	2.205	-0.028		6338998	28.7		3452	
9 Perfluorononanoic acid									
463.00 > 419.00	2.185	2.213	-0.028	1.000	78038	0.6377		4.2	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.337	2.354	-0.017	1.000	1598515	12.6		12005	

QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\2017.08.14_537B_012.d

Injection Date: 14-Aug-2017 20:16:22

Instrument ID: A8_N

Lims ID: 320-30142-A-7-A

Lab Sample ID: 320-30142-7

Client ID: NAWC-072517-RW-335

Operator ID: SACINSTLCMS01

ALS Bottle#: 10

Worklist Smp#: 12

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

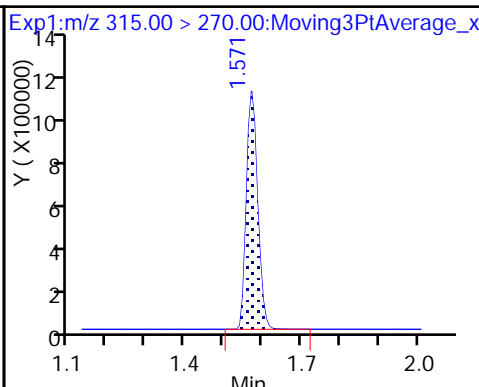
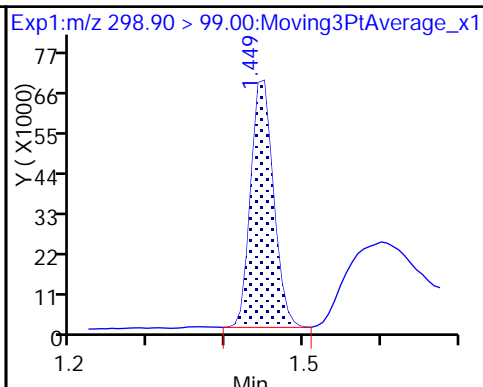
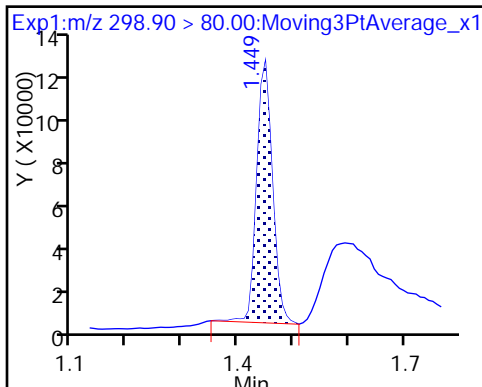
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

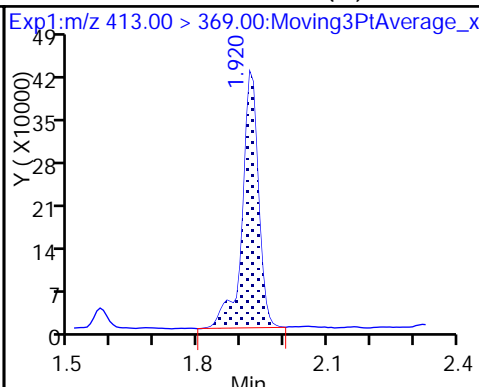
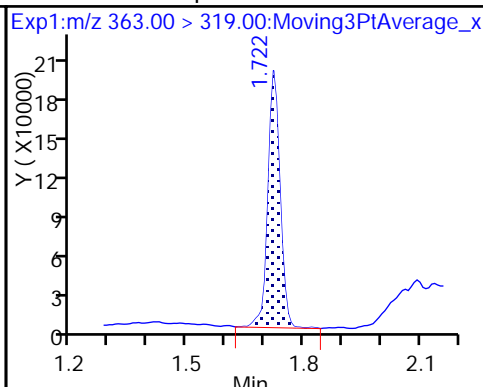
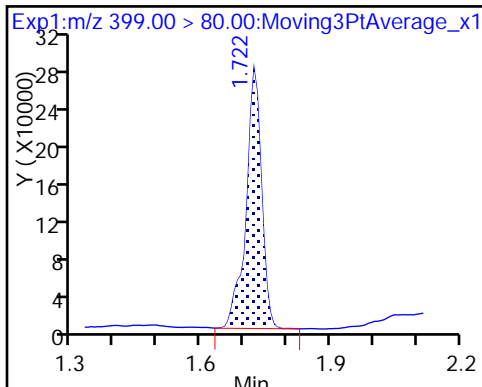
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

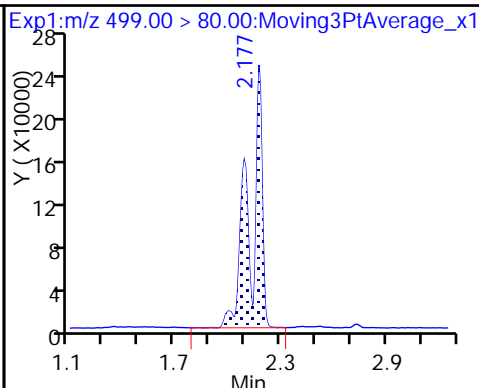
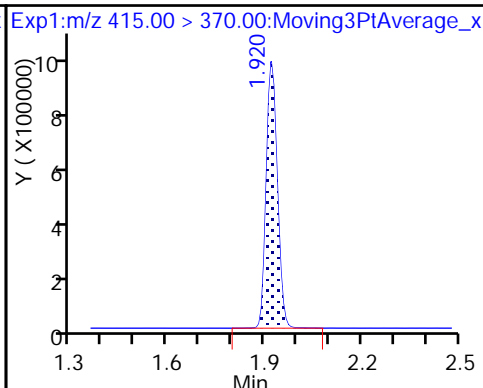
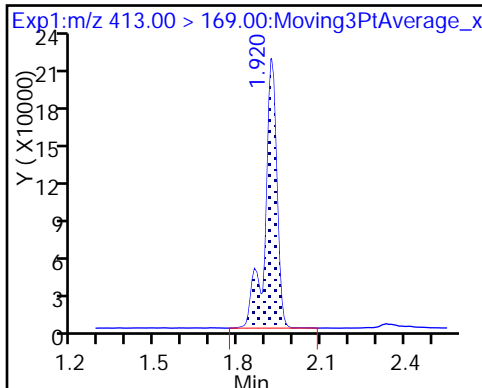
5 Perfluorooctanoic acid (M)



5 Perfluorooctanoic acid

* 6 13C2-PFOA

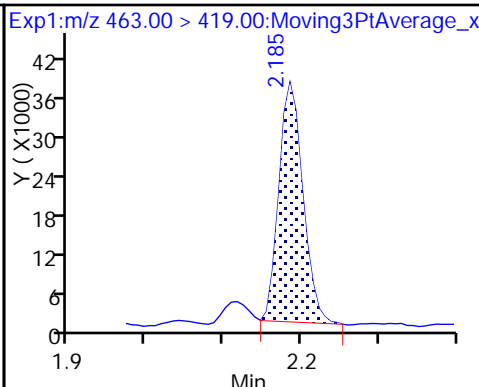
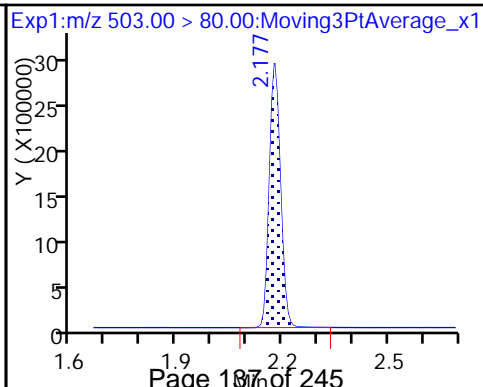
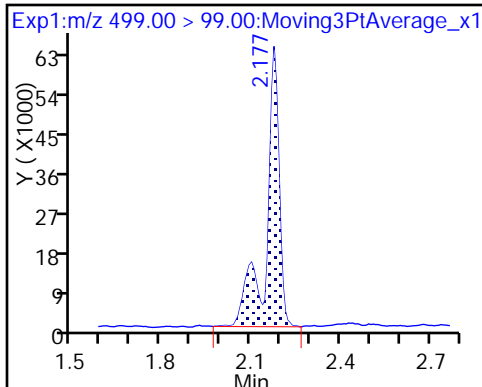
8 Perfluorooctane sulfonic acid



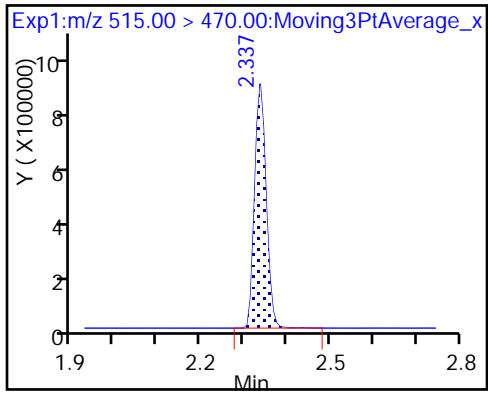
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\2017.08.14_537B_012.d
 Lims ID: 320-30142-A-7-A
 Client ID: NAWC-072517-RW-335
 Sample Type: Client
 Inject. Date: 14-Aug-2017 20:16:22 ALS Bottle#: 10 Worklist Smp#: 12
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-30142-a-7-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 16-Aug-2017 14:14:15 Calib Date: 14-Aug-2017 13:12:40
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170814-46675.b\2017.08.14_537ICAL_007.d
 Column 1 : Det: EXP1
 Process Host: XAWRK009

First Level Reviewer: barnettj Date: 15-Aug-2017 14:04:28

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.34	93.36
\$ 10 13C2 PFDA	10.0	12.6	125.92

TestAmerica Sacramento

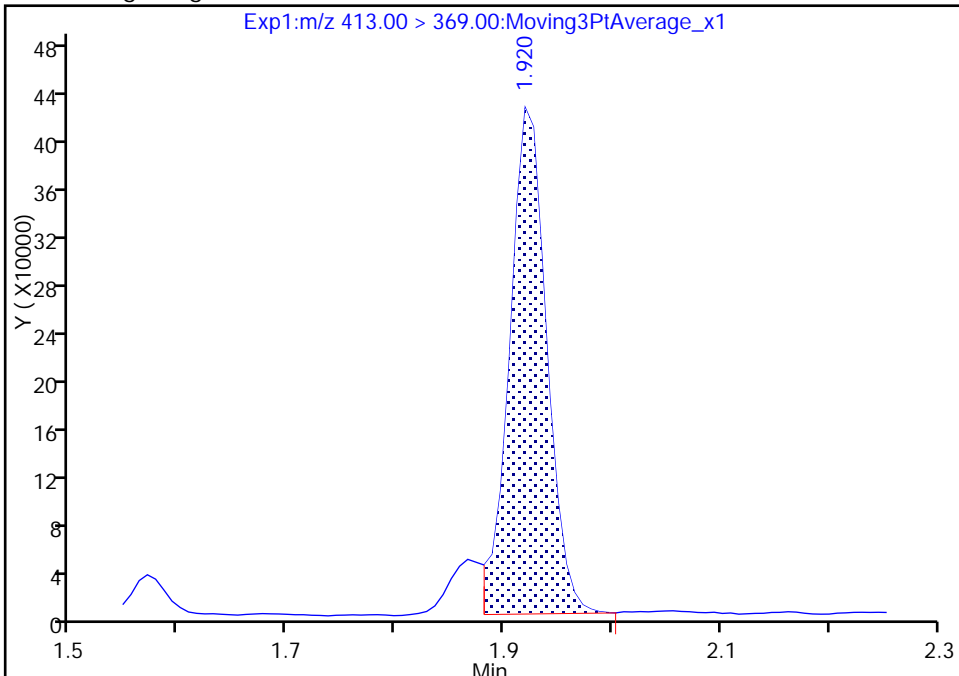
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\2017.08.14_537B_012.d
Injection Date: 14-Aug-2017 20:16:22 Instrument ID: A8_N
Lims ID: 320-30142-A-7-A Lab Sample ID: 320-30142-7
Client ID: NAWC-072517-RW-335
Operator ID: SACINSTLCMS01 ALS Bottle#: 10 Worklist Smp#: 12
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

5 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

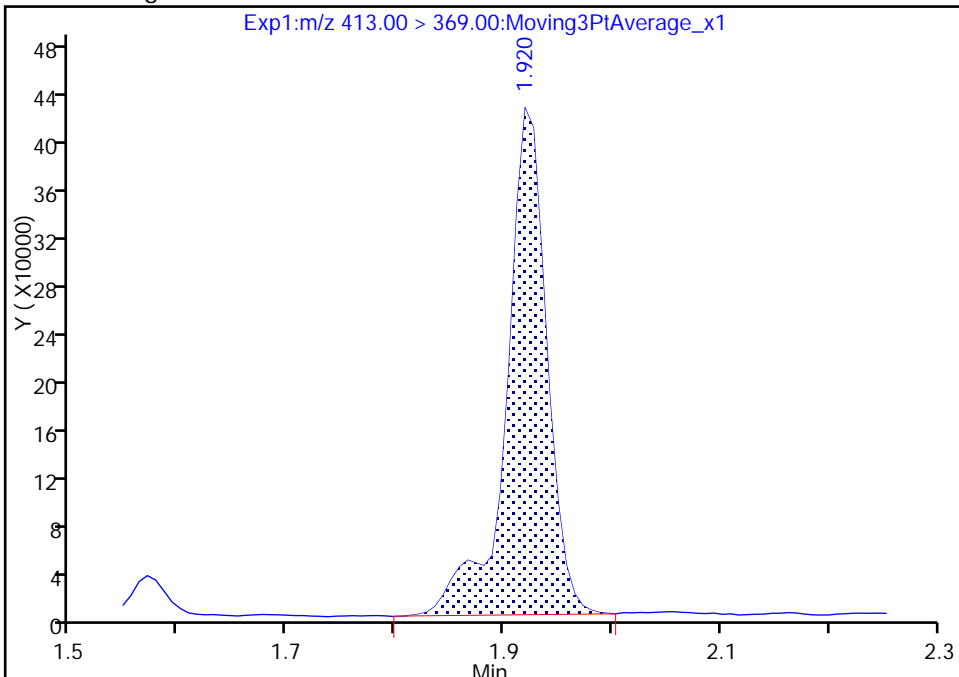
RT: 1.92
Area: 986464
Amount: 5.035534
Amount Units: ng/ml

Processing Integration Results



RT: 1.92
Area: 1079606
Amount: 5.510989
Amount Units: ng/ml

Manual Integration Results



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Client Sample ID: NAWC-072517-FRB-335 Lab Sample ID: 320-30142-8
 Matrix: Water Lab File ID: 2017.08.14_537B_015.d
 Analysis Method: 537 Date Collected: 07/25/2017 13:25
 Extraction Method: 537 Date Extracted: 08/03/2017 10:02
 Sample wt/vol: 259.3(mL) Date Analyzed: 08/14/2017 20:30
 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.: 179511 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	U	39	15	6.6
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)	3.9	U	9.6	3.9	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	87	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	109		70-130
STL00996	13C2 PFDA	137	Q	70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\2017.08.14_537B_015.d
 Lims ID: 320-30142-A-8-A
 Client ID: NAWC-072517-FRB-335
 Sample Type: Client
 Inject. Date: 14-Aug-2017 20:30:37 ALS Bottle#: 11 Worklist Smp#: 15
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-30142-a-8-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 16-Aug-2017 14:14:25 Calib Date: 14-Aug-2017 13:12:40
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170814-46675.b\2017.08.14_537ICAL_007.d
 Column 1 : Det: EXP1
 Process Host: XAWRK009

First Level Reviewer: barnettj Date: 15-Aug-2017 14:05:21

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
\$ 2 13C2 PFHxA	315.00 > 270.00	1.571	1.582	-0.012	1.000	2469636	10.9	9485	
* 6 13C2-PFOA	415.00 > 370.00	1.920	1.955	-0.035		2112681	10.0	7986	
* 7 13C4 PFOS	503.00 > 80.00	2.170	2.205	-0.035		6199564	28.7	3818	
\$ 10 13C2 PFDA	515.00 > 470.00	2.329	2.354	-0.025	1.000	1702304	13.7	10333	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\2017.08.14_537B_015.d

Injection Date: 14-Aug-2017 20:30:37

Instrument ID: A8_N

Lims ID: 320-30142-A-8-A

Lab Sample ID: 320-30142-8

Client ID: NAWC-072517-FRB-335

Operator ID: SACINSTLCMS01

ALS Bottle#: 11

Worklist Smp#: 15

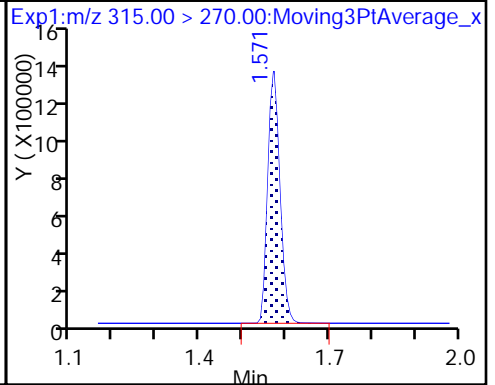
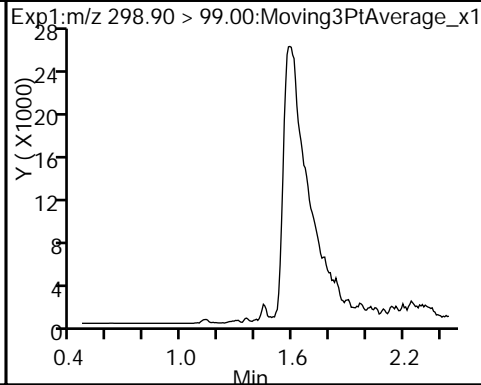
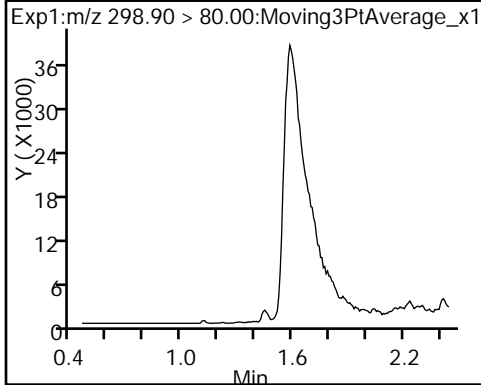
Injection Vol: 2.0 ul

Dil. Factor: 1.0000

Method: 537_A8_N

Limit Group: LC 537 ICAL

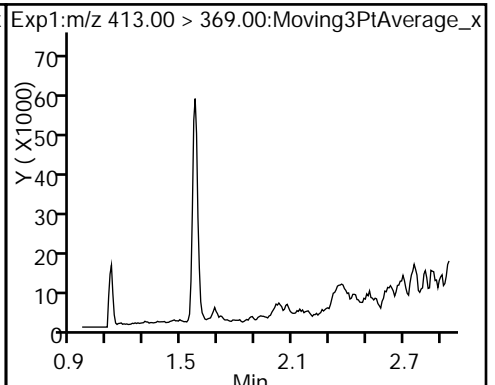
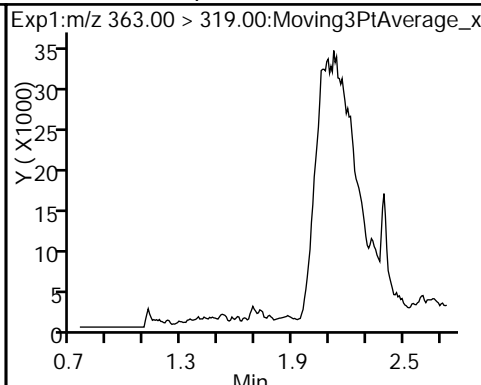
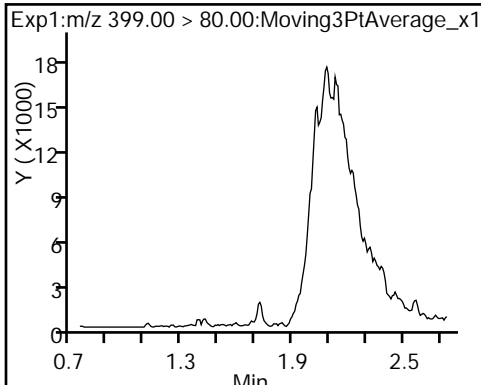
1 Perfluorobutanesulfonic acid (ND) 1 Perfluorobutanesulfonic acid (ND) \$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (ND)

4 Perfluoroheptanoic acid (ND)

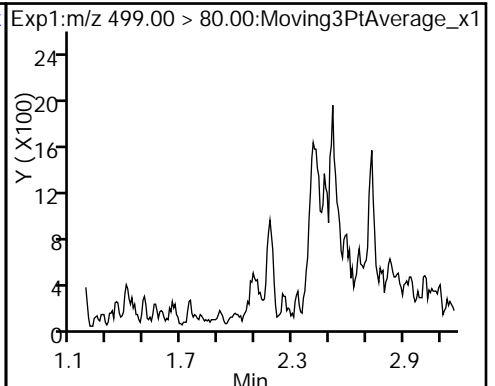
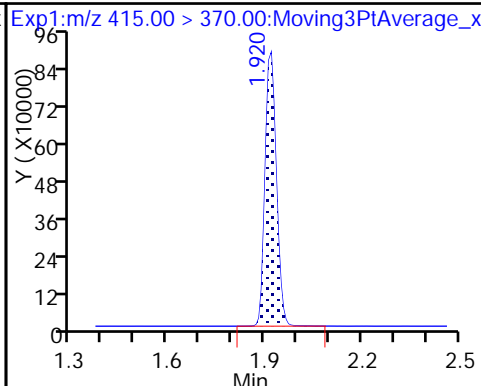
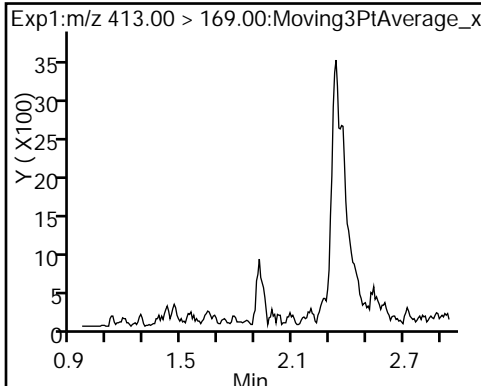
5 Perfluorooctanoic acid (ND)



5 Perfluorooctanoic acid (ND)

* 6 13C2-PFOA

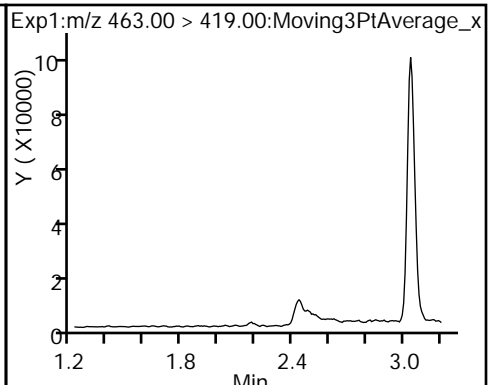
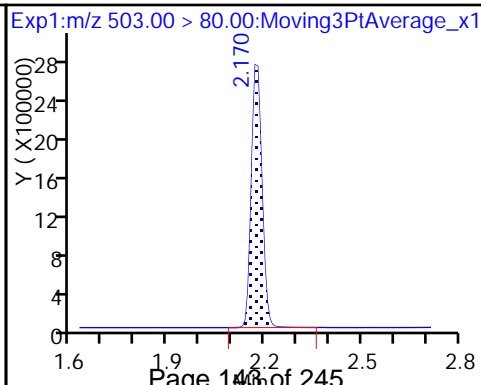
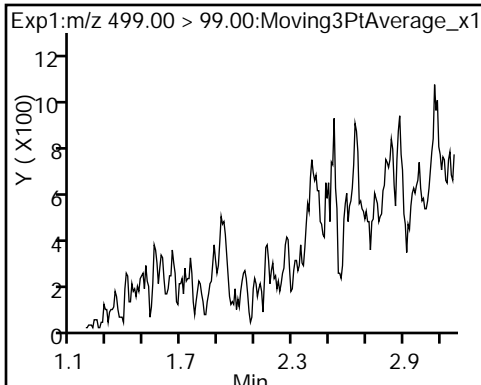
8 Perfluorooctane sulfonic acid (ND)



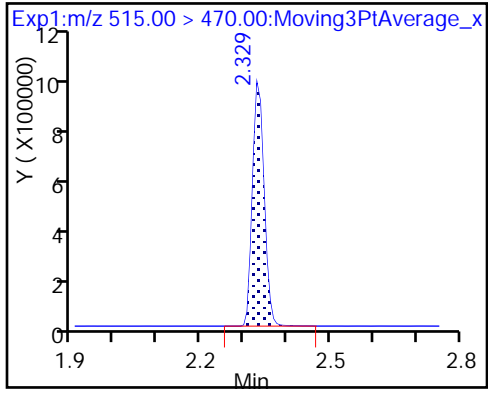
8 Perfluorooctane sulfonic acid (ND)

* 7 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\2017.08.14_537B_015.d
 Lims ID: 320-30142-A-8-A
 Client ID: NAWC-072517-FRB-335
 Sample Type: Client
 Inject. Date: 14-Aug-2017 20:30:37 ALS Bottle#: 11 Worklist Smp#: 15
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: 320-30142-a-8-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 16-Aug-2017 14:14:25 Calib Date: 14-Aug-2017 13:12:40
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170814-46675.b\2017.08.14_537ICAL_007.d
 Column 1 : Det: EXP1
 Process Host: XAWRK009

First Level Reviewer: barnettj Date: 15-Aug-2017 14:05:21

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	10.9	109.32
\$ 10 13C2 PFDA	10.0	13.7	137.11

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

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1 Analy Batch No.: 179319

SDG No.: _____

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

Calibration Start Date: 08/14/2017 12:48 Calibration End Date: 08/14/2017 13:12 Calibration ID: 33517

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-179319/2	2017.08.14_537ICAL_002.d
Level 2	IC 320-179319/3	2017.08.14_537ICAL_003.d
Level 3	IC 320-179319/4	2017.08.14_537ICAL_004.d
Level 4	IC 320-179319/5	2017.08.14_537ICAL_005.d
Level 5	IC 320-179319/6	2017.08.14_537ICAL_006.d
Level 6	IC 320-179319/7	2017.08.14_537ICAL_007.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)	1.1417 0.7313	1.1495	1.0943	0.9210	0.7959	QuaF		1.1266	-0.002254					0.9980			0.9600
Perfluoroheptanoic acid (PFHpA)	0.8346 0.8325	0.8724	0.8737	0.8715	0.8517	Ave		0.8560			2.2		30.0				
Perfluorohexanesulfonic acid (PFHxS)	1.4757 1.3970	1.5378	1.5080	1.5703	1.4756	Ave		1.4941			4.0		30.0				
Perfluorooctanoic acid (PFOA)	0.8851 0.9102	0.8837	0.8984	0.9375	0.9261	Ave		0.9068			2.4		30.0				
Perfluorooctanesulfonic acid (PFOS)	0.8922 0.9252	0.9148	0.9148	0.9461	0.9486	Ave		0.9236			2.3		30.0				
Perfluorononanoic acid (PFNA)	0.5491 0.5714	0.5670	0.5764	0.5665	0.5686	Ave		0.5665			1.6		30.0				
13C2 PFHxA	1.0141 1.0999	1.0032	1.0998	1.0933	1.1053	Ave		1.0693			4.4		30.0				
13C2 PFDA	0.5512 0.6012	0.5785	0.5919	0.5906	0.6127	Ave		0.5877			3.6		30.0				

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

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

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1 Analy Batch No.: 179319

SDG No.: _____

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

Calibration Start Date: 08/14/2017 12:48 Calibration End Date: 08/14/2017 13:12 Calibration ID: 33517

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-179319/2	2017.08.14_537ICAL_002.d
Level 2	IC 320-179319/3	2017.08.14_537ICAL_003.d
Level 3	IC 320-179319/4	2017.08.14_537ICAL_004.d
Level 4	IC 320-179319/5	2017.08.14_537ICAL_005.d
Level 5	IC 320-179319/6	2017.08.14_537ICAL_006.d
Level 6	IC 320-179319/7	2017.08.14_537ICAL_007.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	2176776 26040065	4858409	10071471	16707104	21165476	9.00 180	20.0	45.0	90.0	135
Perfluoroheptanoic acid (PFHpA)	13PF OA	Ave	198176 3589599	455479	965342	1966143	2763295	1.00 20.0	2.22	5.00	10.0	15.0
Perfluorohexanesulfonic acid (PFHxS)	PFOS	Ave	938005 16584369	2166866	4626981	9496666	13083092	3.00 60.0	6.67	15.0	30.0	45.0
Perfluorooctanoic acid (PFOA)	13PF OA	Ave	420599 7854398	923370	1986507	4232647	6012905	2.00 40.0	4.45	10.0	20.0	30.0
Perfluorooctanesulfonic acid (PFOS)	PFOS	Ave	756213 14645432	1718775	3742396	7629588	11213929	4.00 80.0	8.89	20.0	40.0	60.0
Perfluorononanoic acid (PFNA)	13PF OA	Ave	260762 4927051	592024	1273686	2556105	3689416	2.00 40.0	4.45	10.0	20.0	30.0
13C2 PFHxA	13PF OA	Ave	2407096 2370885	2356458	2429839	2465941	2390227	10.0 10.0	10.0	10.0	10.0	10.0
13C2 PFDA	13PF OA	Ave	1308306 1295768	1358920	1307668	1332089	1324957	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.: 320-30142-1 Analy Batch No.: 179319

SDG No.: _____

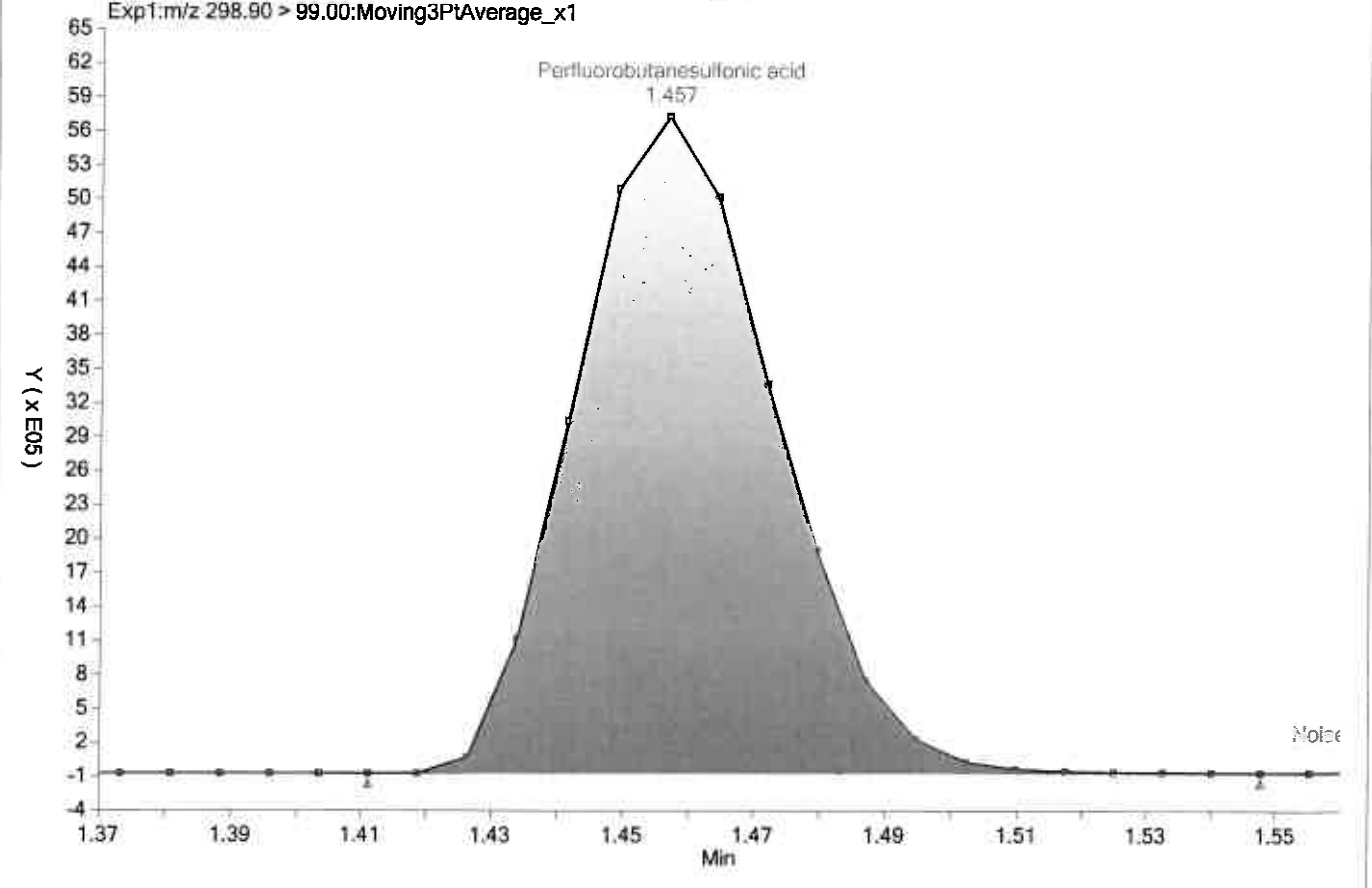
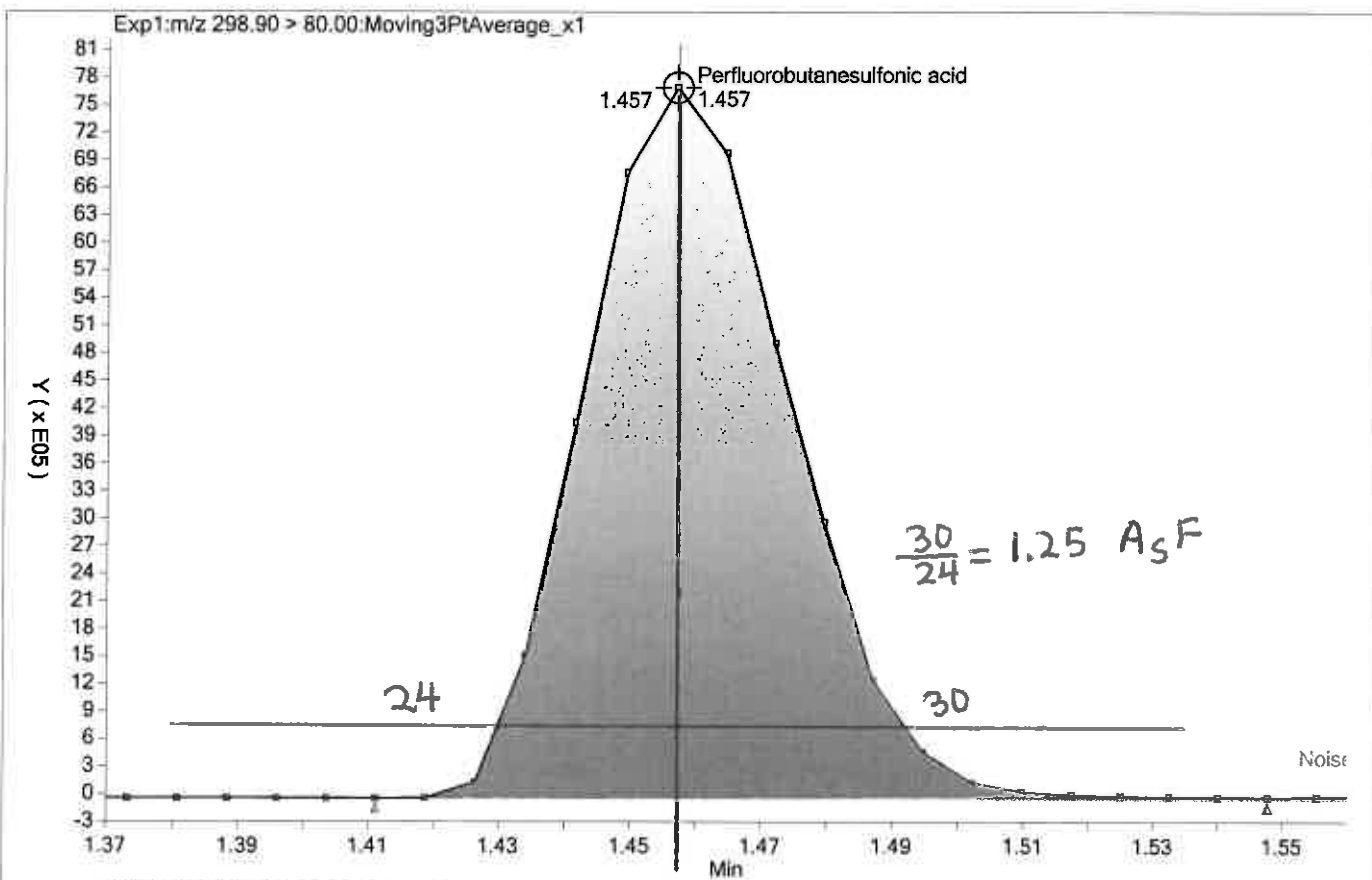
Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

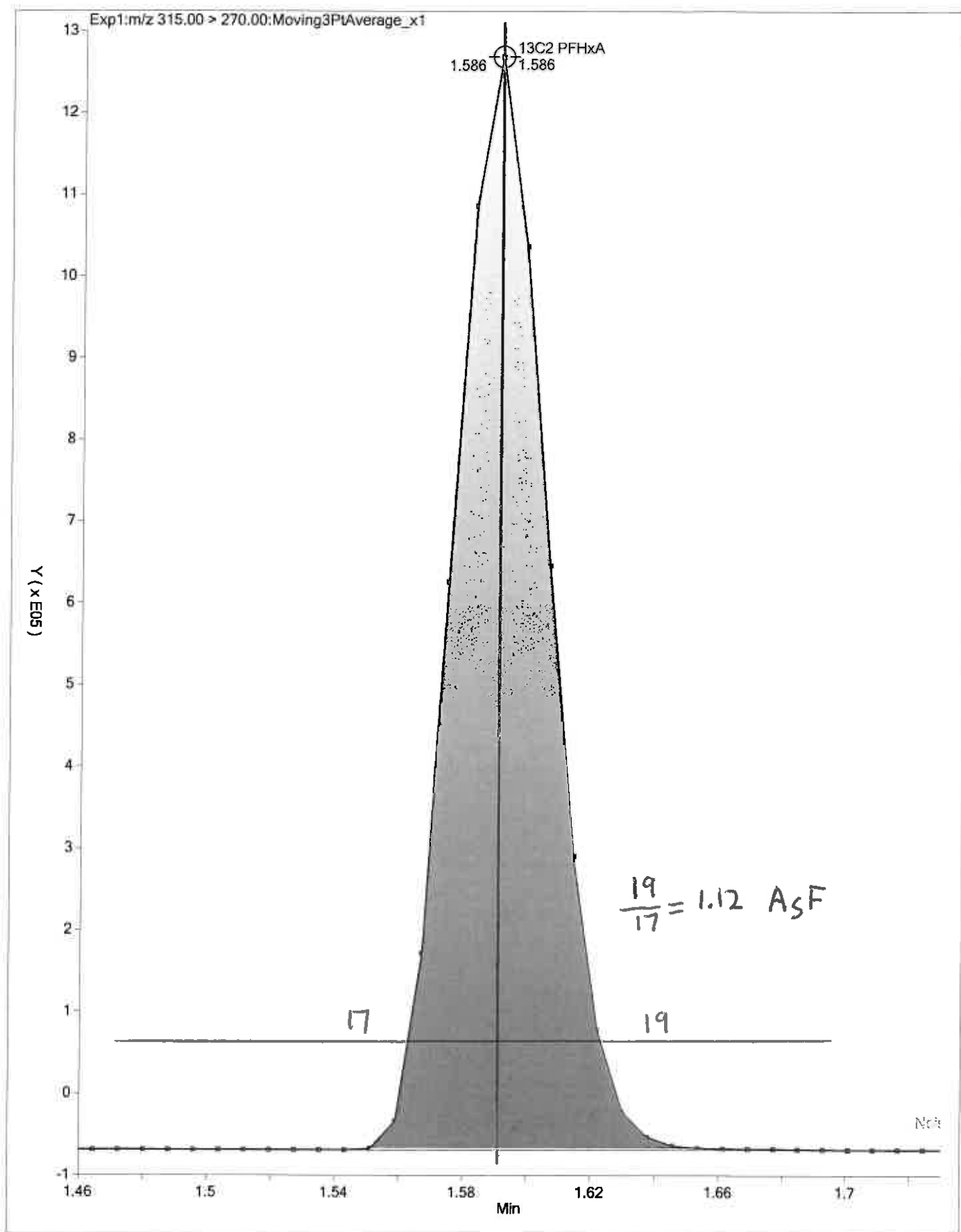
Calibration Start Date: 08/14/2017 12:48 Calibration End Date: 08/14/2017 13:12 Calibration ID: 33517

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-179319/2	2017.08.14_537ICAL_002.d
Level 2	IC 320-179319/3	2017.08.14_537ICAL_003.d
Level 3	IC 320-179319/4	2017.08.14_537ICAL_004.d
Level 4	IC 320-179319/5	2017.08.14_537ICAL_005.d
Level 5	IC 320-179319/6	2017.08.14_537ICAL_006.d
Level 6	IC 320-179319/7	2017.08.14_537ICAL_007.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)	3.3	6.6	7.5	-0.4	-5.0	3.4	50	50	50	50	50	50
Perfluoroheptanoic acid (PFHpA)	-2.5	1.9	2.1	1.8	-0.5	-2.8	50	50	50	50	50	50
Perfluorohexanesulfonic acid (PFHxS)	-1.2	2.9	0.9	5.1	-1.2	-6.5	50	50	50	50	50	50
Perfluorooctanoic acid (PFOA)	-2.4	-2.5	-0.9	3.4	2.1	0.4	50	50	50	50	50	50
Perfluorooctanesulfonic acid (PFOS)	-3.4	-1.0	-1.0	2.4	2.7	0.2	50	50	50	50	50	50
Perfluorononanoic acid (PFNA)	-3.1	0.1	1.7	0.0	0.4	0.9	50	50	50	50	50	50
13C2 PFHxA	-5.2	-6.2	2.9	2.2	3.4	2.9	30	30	30	30	30	30
13C2 PFDA	-6.2	-1.6	0.7	0.5	4.3	2.3	30	30	30	30	30	30





TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170814-46675.b\2017.08.14_537ICAL_002.d
 Lims ID: IC L1
 Client ID:
 Sample Type: IC Calib Level: 1
 Inject. Date: 14-Aug-2017 12:48:56 ALS Bottle#: 1 Worklist Smp#: 2
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L1_537
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub1

Method: \\ChromNa\Sacramento\ChromData\A8_N\20170814-46675.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 14-Aug-2017 14:36:02 Calib Date: 14-Aug-2017 13:12:40
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170814-46675.b\2017.08.14_537ICAL_007.d

Column 1 : Det: EXP1
 Process Host: XAWRK023

First Level Reviewer: phomsophat Date: 14-Aug-2017 14:08:06

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.449	1.453	-0.004	1.000	2176776	9.30		309	
298.90 > 99.00	1.449	1.453	-0.004	1.000	1426588		1.53(0.00-0.00)	311	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.578	1.582	-0.004	1.000	2407096	9.48		6502	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.745	1.742	0.003	1.000	198176	0.9753		16.5	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.745	1.742	0.003	1.000	938005	2.96		150	
* 6 13C2-PFOA									
415.00 > 370.00	1.957	1.955	0.002		2373611	10.0		11876	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.957	1.955	0.002	1.000	420599	1.95		27.8	
413.00 > 169.00	1.957	1.955	0.002	1.000	229992		1.83(0.00-0.00)	416	
* 7 13C4 PFOS									
503.00 > 80.00	2.208	2.205	0.003		6074703	28.7		6398	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.215	2.208	0.007	1.000	756213	3.87		746	
499.00 > 99.00	2.208	2.208	0.0	0.997	158187		4.78(0.00-0.00)	215	
9 Perfluorononanoic acid									
463.00 > 419.00	2.215	2.213	0.002	1.000	260762	1.94		63.7	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.360	2.354	0.006	1.000	1308306	9.38		6900	

Reagents:

LC537-L1_00020

Amount Added: 1.00

Units: mL

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170814-46675.b\2017.08.14_537ICAL_002.d

Injection Date: 14-Aug-2017 12:48:56

Instrument ID: A8_N

Lims ID: IC L1

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 1

Worklist Smp#: 2

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

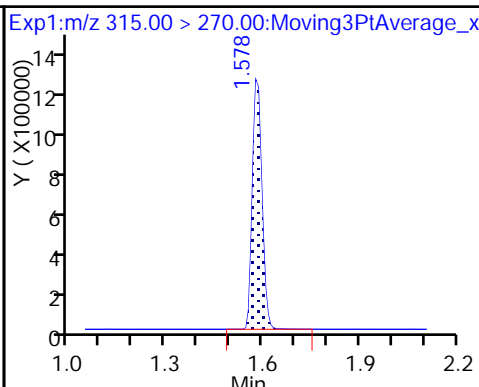
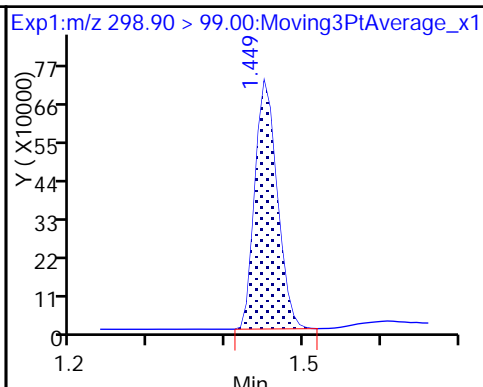
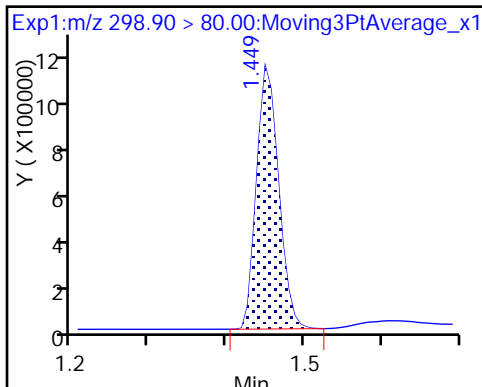
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

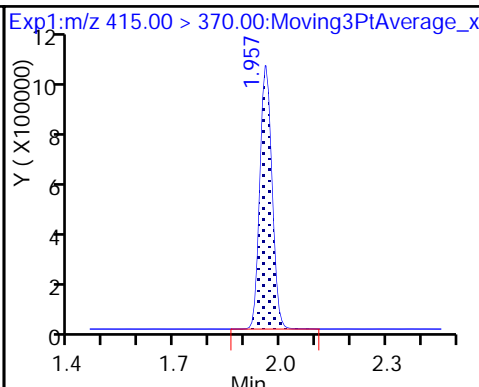
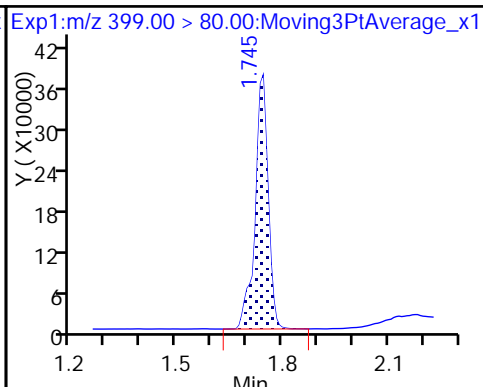
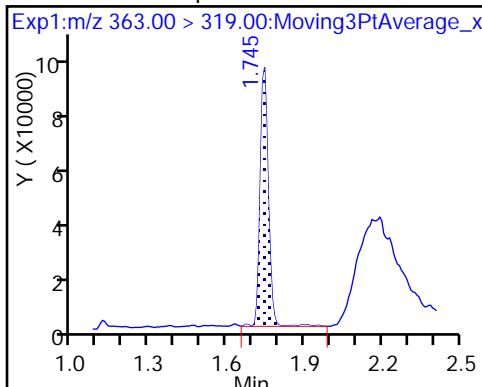
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

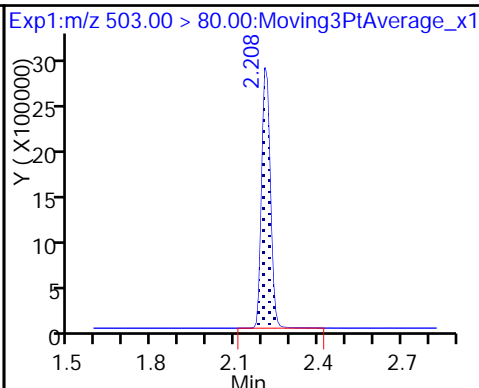
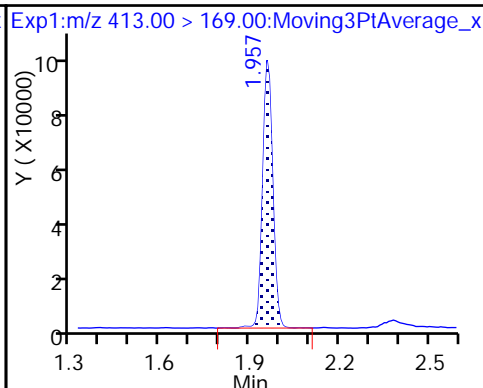
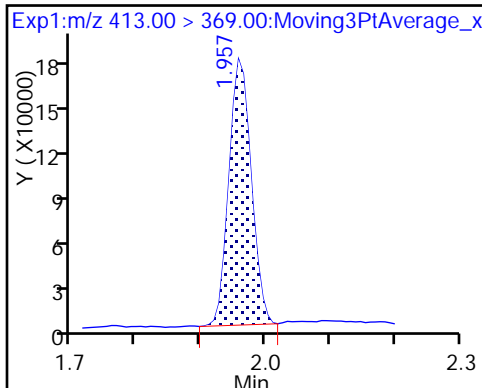
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

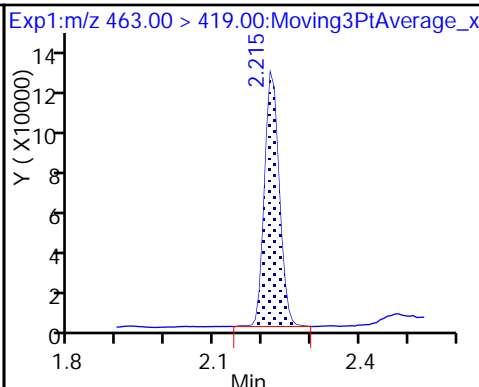
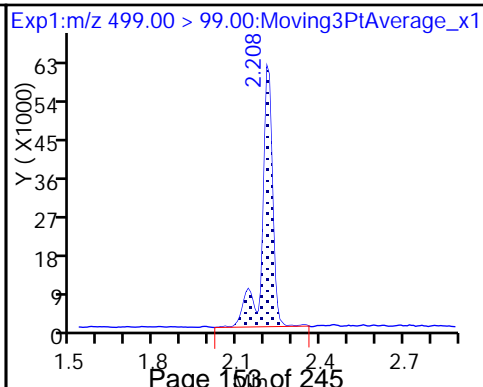
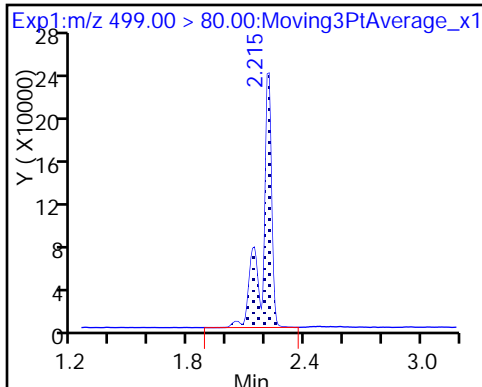
* 7 13C4 PFOS



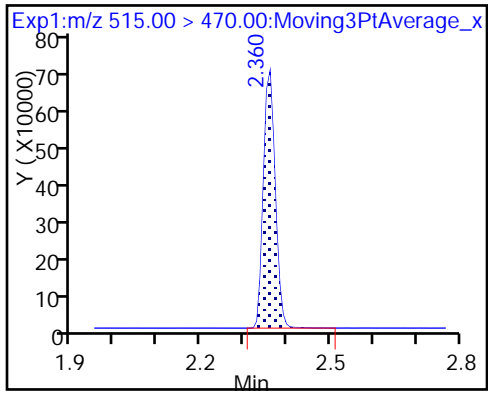
8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170814-46675.b\2017.08.14_537ICAL_003.d
 Lims ID: IC L2
 Client ID:
 Sample Type: IC Calib Level: 2
 Inject. Date: 14-Aug-2017 12:53:41 ALS Bottle#: 2 Worklist Smp#: 3
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L2_537
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub1

Method: \\ChromNa\Sacramento\ChromData\A8_N\20170814-46675.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 14-Aug-2017 14:36:03 Calib Date: 14-Aug-2017 13:12:40
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170814-46675.b\2017.08.14_537ICAL_007.d

Column 1 : Det: EXP1
 Process Host: XAWRK023

First Level Reviewer: phomsophat Date: 14-Aug-2017 14:08:26

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.457	1.453	0.004	1.000	4858409	21.3		661	
298.90 > 99.00	1.457	1.453	0.004	1.000	3160338		1.54(0.00-0.00)	670	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.586	1.582	0.004	1.000	2356458	9.38		6407	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.745	1.742	0.003	1.000	2166866	6.86		343	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.745	1.742	0.003	1.000	455479	2.27		38.5	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.957	1.955	0.002	1.000	923370	4.33		60.6	
413.00 > 169.00	1.957	1.955	0.002	1.000	484643		1.91(0.00-0.00)	845	
* 6 13C2-PFOA									
415.00 > 370.00	1.957	1.955	0.002		2348990	10.0		11507	
* 7 13C4 PFOS									
503.00 > 80.00	2.208	2.205	0.003		6060332	28.7		6159	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.215	2.208	0.007	1.000	1718775	8.81		1524	
499.00 > 99.00	2.215	2.208	0.007	1.000	367461		4.68(0.00-0.00)	477	
9 Perfluorononanoic acid									
463.00 > 419.00	2.215	2.213	0.002	1.000	592024	4.45		150	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.360	2.354	0.006	1.000	1358920	9.84		7130	

Reagents:

LC537-L2_00020

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170814-46675.b\2017.08.14_537ICAL_003.d

Injection Date: 14-Aug-2017 12:53:41

Instrument ID: A8_N

Lims ID: IC L2

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 2

Worklist Smp#: 3

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

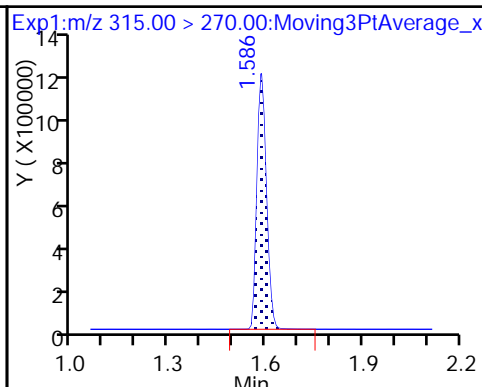
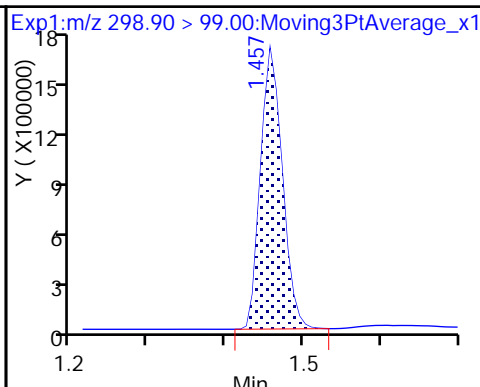
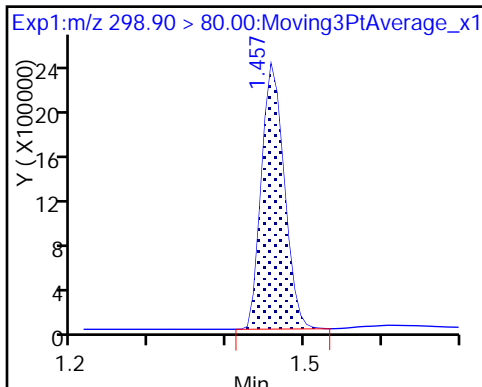
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

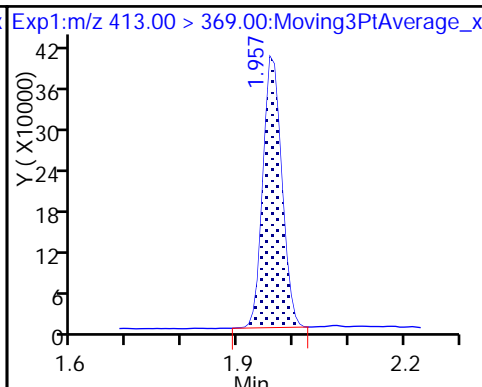
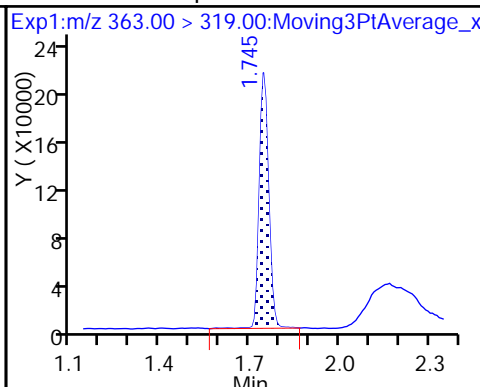
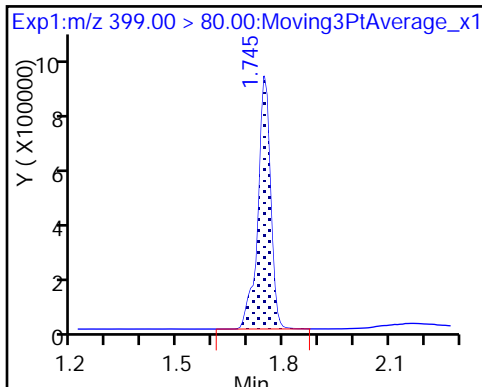
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

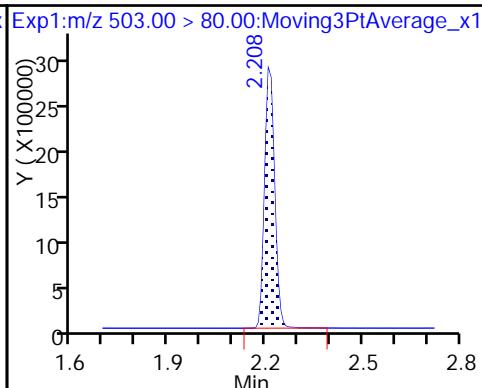
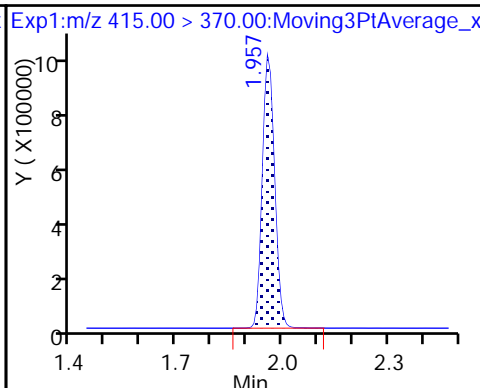
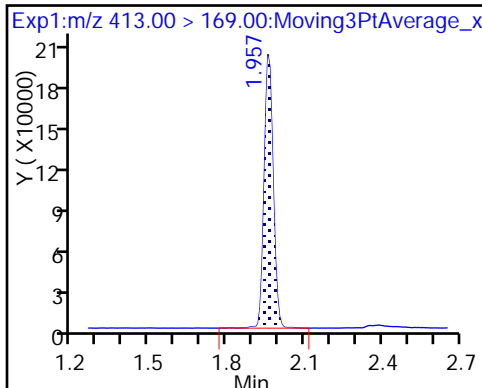
5 Perfluorooctanoic acid



5 Perfluorooctanoic acid

* 6 13C2-PFOA

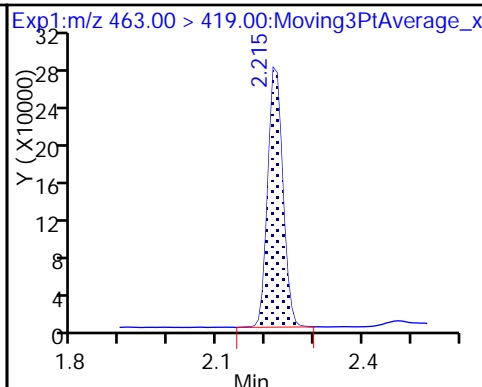
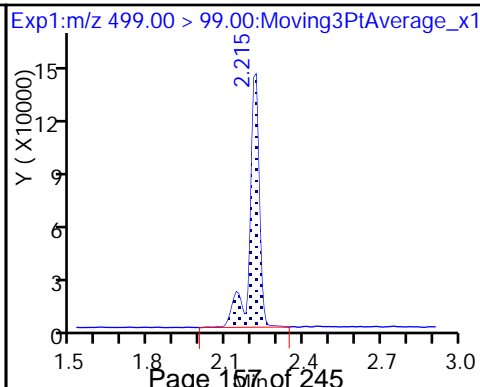
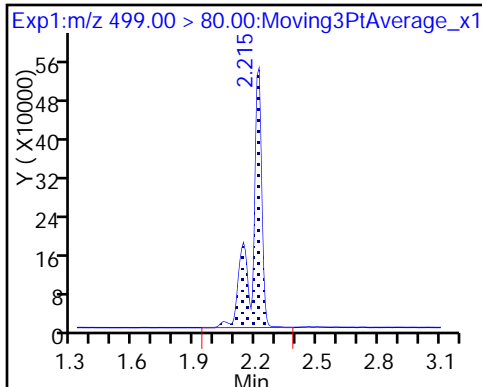
* 7 13C4 PFOS



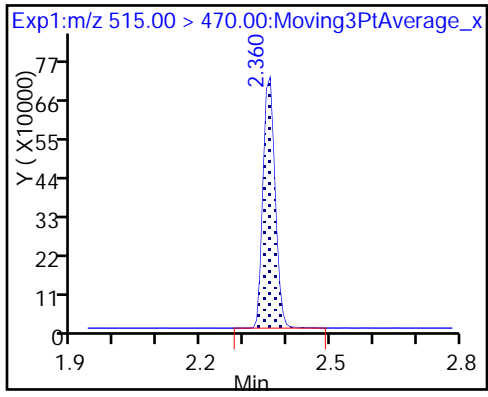
8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170814-46675.b\2017.08.14_537ICAL_004.d
 Lims ID: IC L3
 Client ID:
 Sample Type: IC Calib Level: 3
 Inject. Date: 14-Aug-2017 12:58:26 ALS Bottle#: 3 Worklist Smp#: 4
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L3_537
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub1
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170814-46675.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 14-Aug-2017 14:36:04 Calib Date: 14-Aug-2017 13:12:40
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170814-46675.b\2017.08.14_537ICAL_007.d
 Column 1 : Det: EXP1
 Process Host: XAWRK023

First Level Reviewer: phomsophat Date: 14-Aug-2017 14:08:41

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.457	1.453	0.004	1.000	10071471	48.4		1362	
298.90 > 99.00	1.457	1.453	0.004	1.000	6755881		1.49(0.00-0.00)	1317	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.586	1.582	0.004	1.000	2429839	10.3		6722	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.745	1.742	0.003	1.000	965342	5.10		85.2	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.745	1.742	0.003	1.000	4626981	15.1		718	
* 6 13C2-PFOA									
415.00 > 370.00	1.957	1.955	0.002		2209361	10.0		11698	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.957	1.955	0.002	1.000	1986507	9.92		125	
413.00 > 169.00	1.957	1.955	0.002	1.000	1014880		1.96(0.00-0.00)	1650	
* 7 13C4 PFOS									
503.00 > 80.00	2.208	2.205	0.003		5865253	28.7		6014	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.208	2.208	0.0	1.000	3742396	19.8		2971	
499.00 > 99.00	2.208	2.208	0.0	1.000	760295		4.92(0.00-0.00)	903	
9 Perfluorononanoic acid									
463.00 > 419.00	2.215	2.213	0.002	1.000	1273686	10.2		298	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.352	2.354	-0.002	1.000	1307668	10.1		7842	

Reagents:

LC537-L3_00023

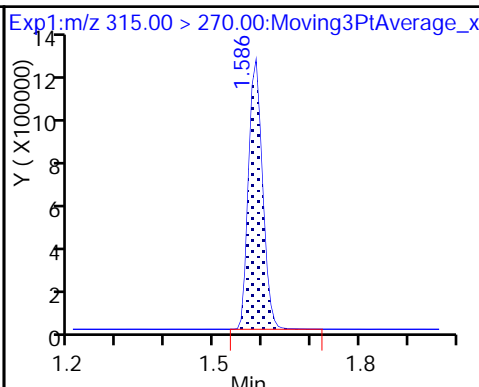
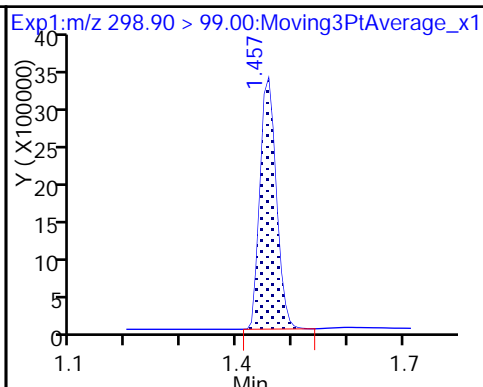
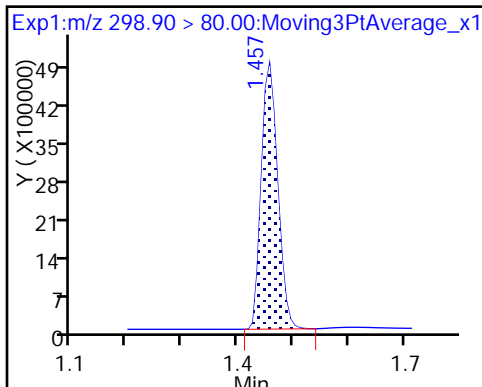
Amount Added: 1.00

Units: mL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

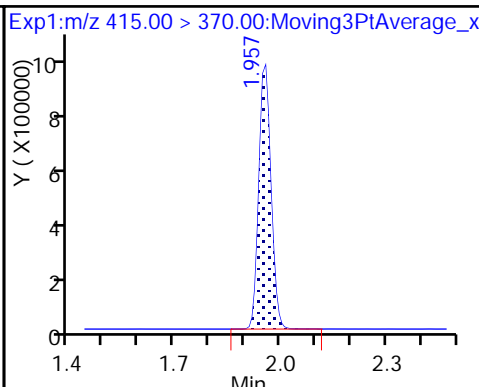
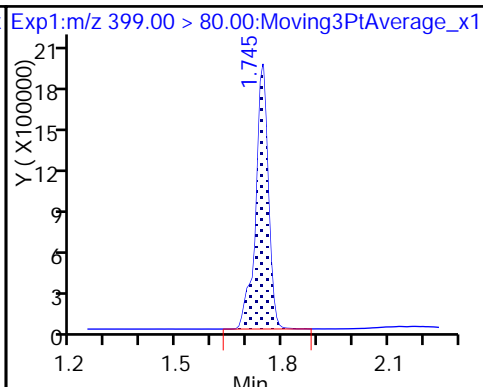
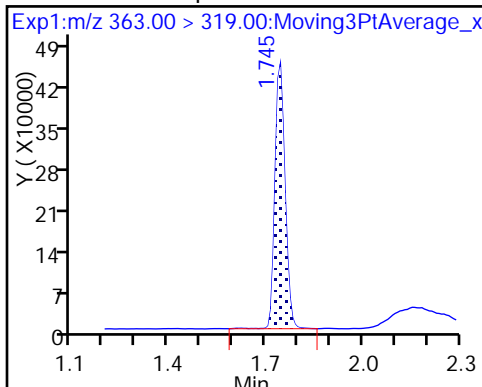
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

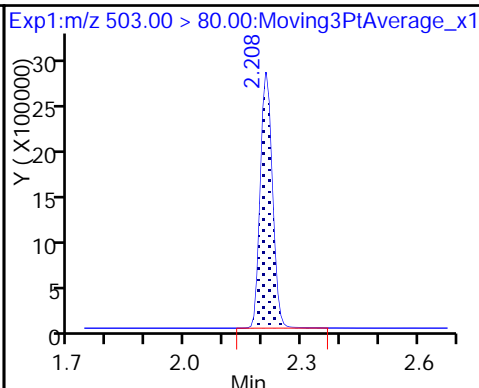
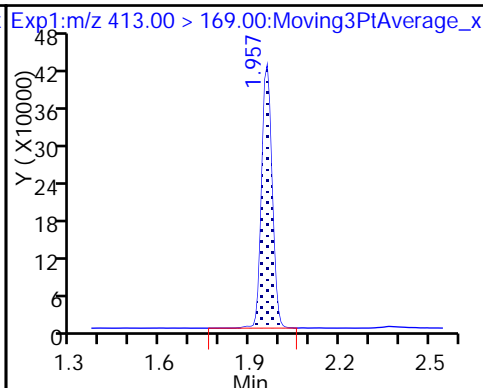
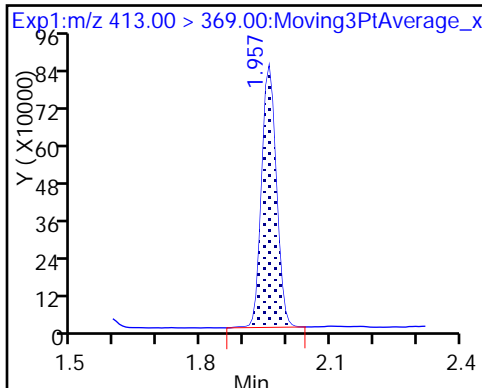
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

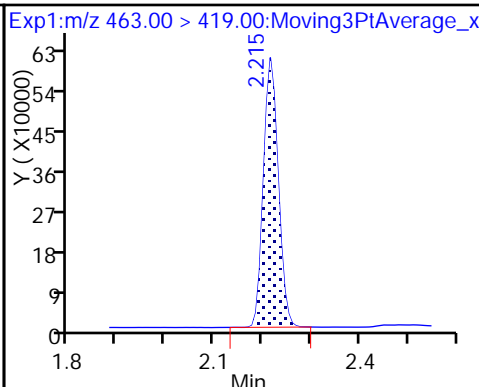
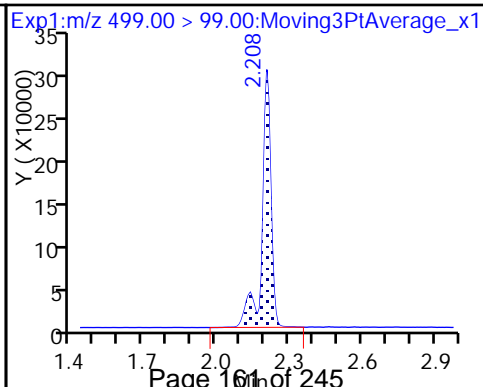
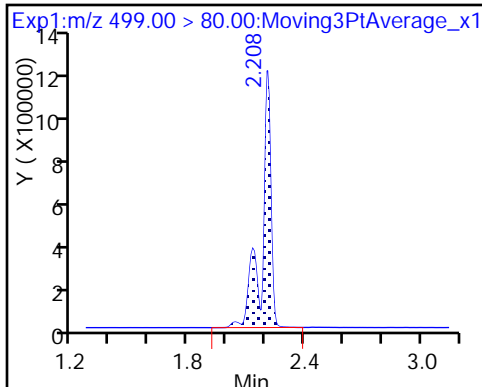
* 7 13C4 PFOS



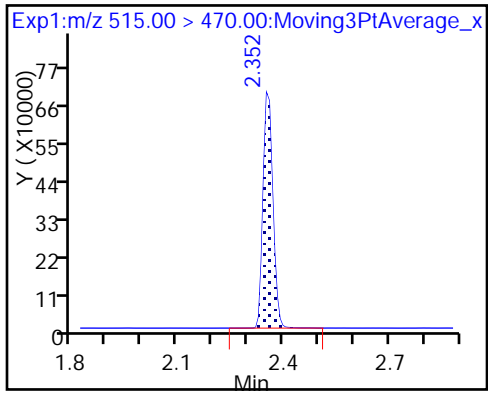
8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170814-46675.b\2017.08.14_537ICAL_005.d
 Lims ID: IC L4
 Client ID:
 Sample Type: ICISAV Calib Level: 4
 Inject. Date: 14-Aug-2017 13:03:11 ALS Bottle#: 4 Worklist Smp#: 5
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L4_537
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub1

Method: \\ChromNa\Sacramento\ChromData\A8_N\20170814-46675.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 14-Aug-2017 14:36:04 Calib Date: 14-Aug-2017 13:12:40
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170814-46675.b\2017.08.14_537ICAL_007.d

Column 1 : Det: EXP1
 Process Host: XAWRK023

First Level Reviewer: phomsophat Date: 14-Aug-2017 14:08:55

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.457	1.453	0.004	1.000	16707104	89.7		1918	
298.90 > 99.00	1.457	1.453	0.004	1.000	12133728		1.38(0.00-0.00)	2117	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.586	1.582	0.004	1.000	2465941	10.2		6561	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.745	1.742	0.003	1.000	9496666	31.5		1386	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.745	1.742	0.003	1.000	1966143	10.2		175	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.957	1.955	0.002	1.000	4232647	20.7		258	
413.00 > 169.00	1.957	1.955	0.002	1.000	2149139		1.97(0.00-0.00)	3387	
* 6 13C2-PFOA									
415.00 > 370.00	1.957	1.955	0.002		2255521	10.0		11927	
* 7 13C4 PFOS									
503.00 > 80.00	2.208	2.205	0.003		5780409	28.7		6098	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.208	2.208	0.0	1.000	7629588	41.0		6465	
499.00 > 99.00	2.208	2.208	0.0	1.000	1600291		4.77(0.00-0.00)	1799	
9 Perfluorononanoic acid									
463.00 > 419.00	2.215	2.213	0.002	1.000	2556105	20.0		585	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.352	2.354	-0.002	1.000	1332089	10.0		7263	

Reagents:

LC537-L4_00020

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170814-46675.b\2017.08.14_537ICAL_005.d

Injection Date: 14-Aug-2017 13:03:11

Instrument ID: A8_N

Lims ID: IC L4

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 4

Worklist Smp#: 5

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

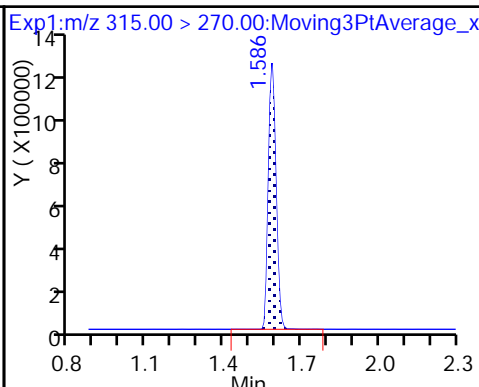
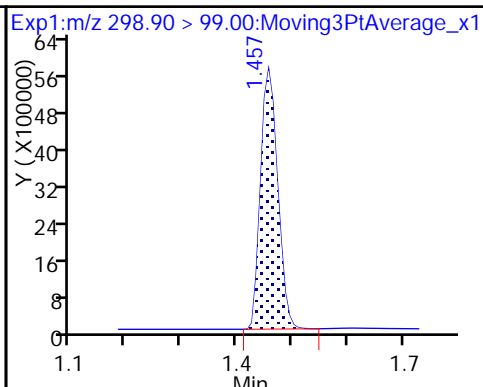
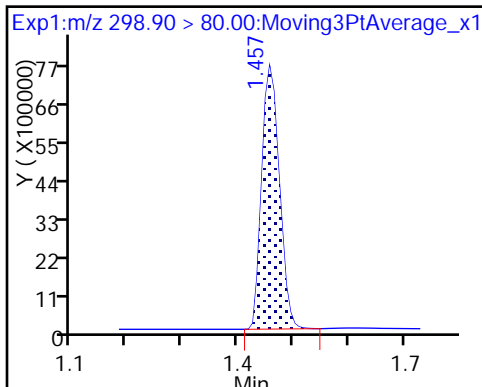
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

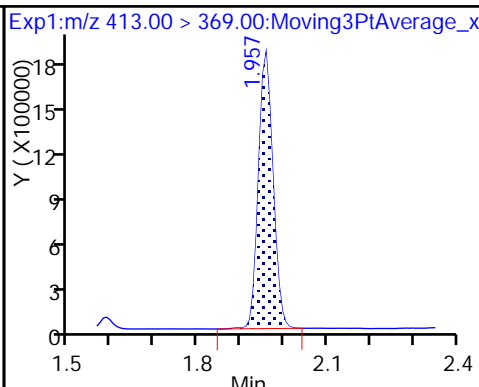
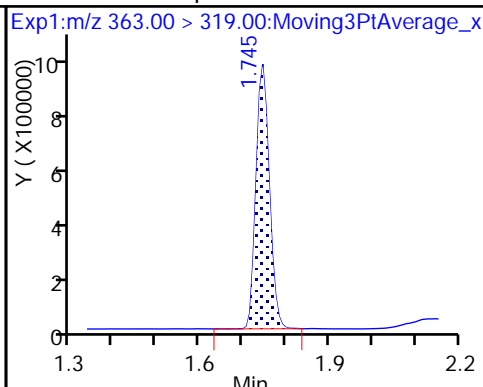
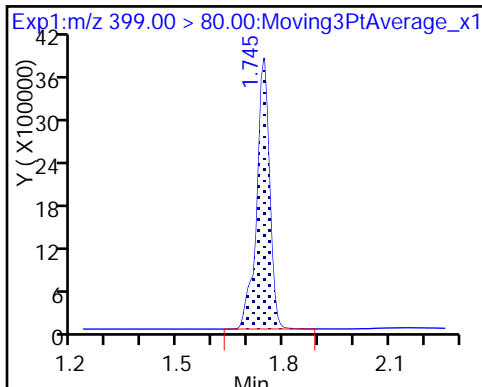
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

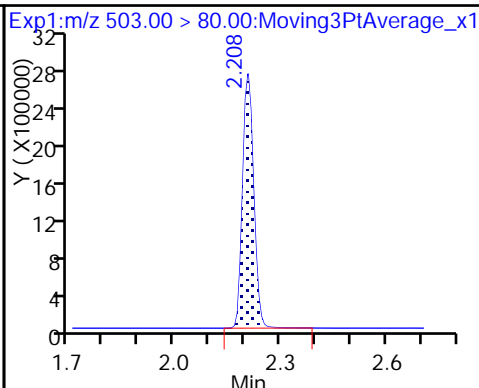
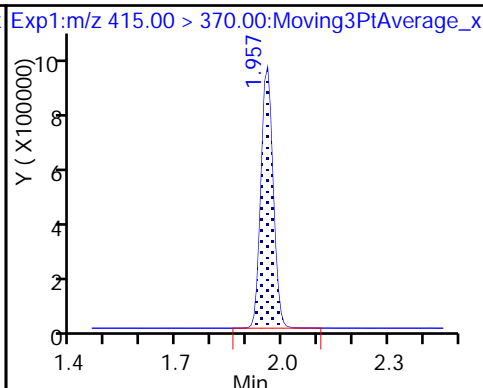
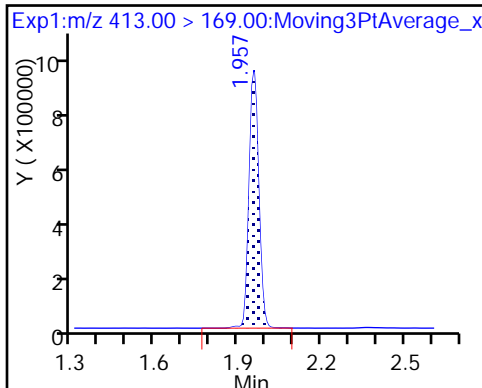
5 Perfluorooctanoic acid



5 Perfluorooctanoic acid

* 6 13C2-PFOA

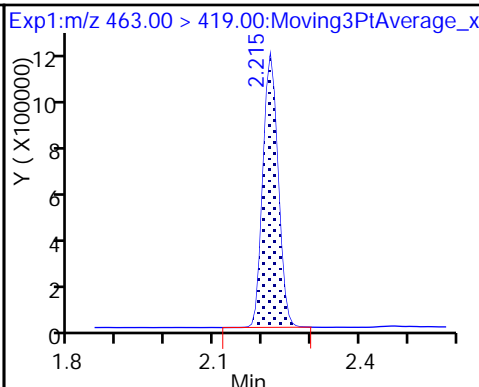
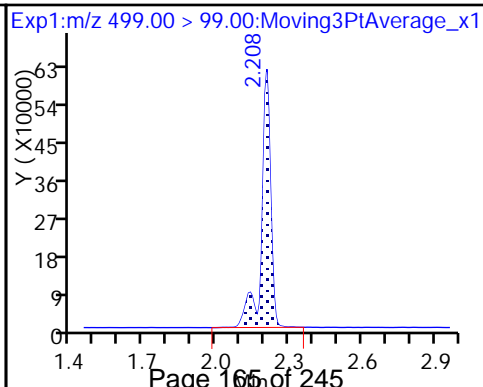
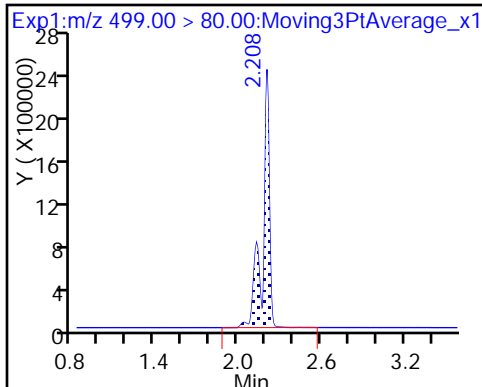
* 7 13C4 PFOS



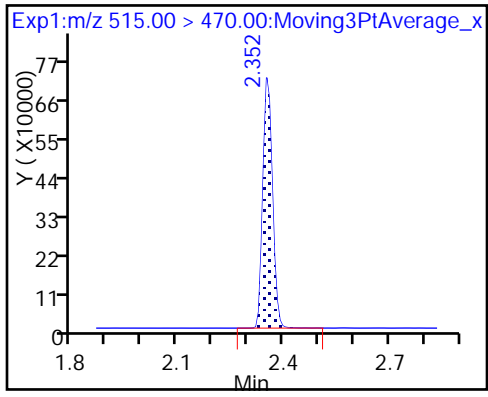
8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170814-46675.b\2017.08.14_537ICAL_006.d
 Lims ID: IC L5
 Client ID:
 Sample Type: IC Calib Level: 5
 Inject. Date: 14-Aug-2017 13:07:55 ALS Bottle#: 5 Worklist Smp#: 6
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L5_537
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub1
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170814-46675.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 14-Aug-2017 14:36:05 Calib Date: 14-Aug-2017 13:12:40
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170814-46675.b\2017.08.14_537ICAL_007.d
 Column 1 : Det: EXP1
 Process Host: XAWRK023

First Level Reviewer: phomsophat Date: 14-Aug-2017 14:09:10

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.449	1.453	-0.004	1.000	21165476	128.3		1973	
298.90 > 99.00	1.449	1.453	-0.004	1.000	15381000		1.38(0.00-0.00)	2392	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.578	1.582	-0.004	1.000	2390227	10.3		7171	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.737	1.742	-0.005	1.000	2763295	14.9		247	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.737	1.742	-0.005	1.000	13083092	44.5		1759	
* 6 13C2-PFOA									
415.00 > 370.00	1.950	1.955	-0.005		2162548	10.0		10597	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.950	1.955	-0.005	1.000	6012905	30.7		331	
413.00 > 169.00	1.950	1.955	-0.005	1.000	3169462		1.90(0.00-0.00)	4885	
* 7 13C4 PFOS									
503.00 > 80.00	2.200	2.205	-0.005		5649456	28.7		5877	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.208	2.208	0.0	1.000	11213929	61.6		7515	
499.00 > 99.00	2.200	2.208	-0.008	0.997	2357369		4.76(0.00-0.00)	2390	
9 Perfluorononanoic acid									
463.00 > 419.00	2.208	2.213	-0.005	1.000	3689416	30.1		869	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.352	2.354	-0.002	1.000	1324957	10.4		7073	

Reagents:

LC537-L5_00024

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170814-46675.b\2017.08.14_537ICAL_006.d

Injection Date: 14-Aug-2017 13:07:55

Instrument ID: A8_N

Lims ID: IC L5

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 5

Worklist Smp#: 6

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

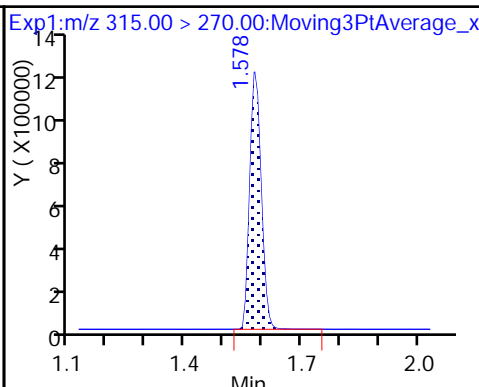
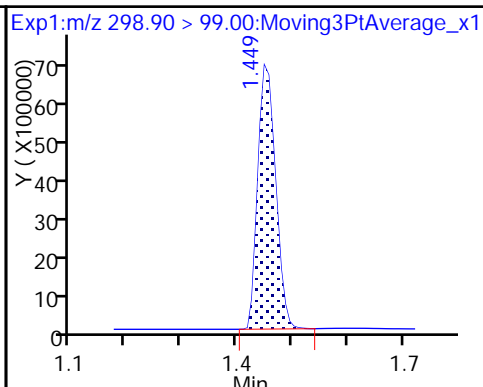
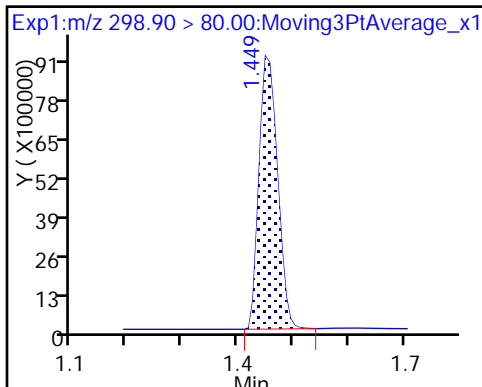
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

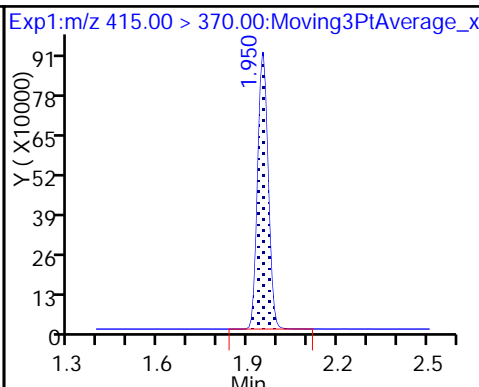
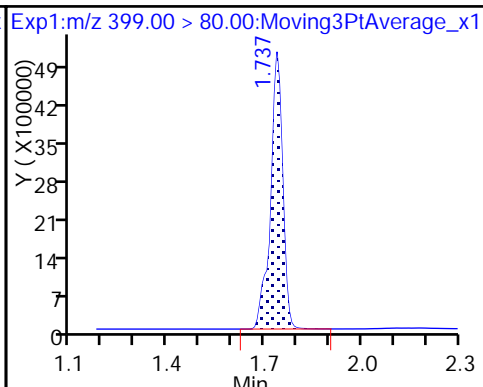
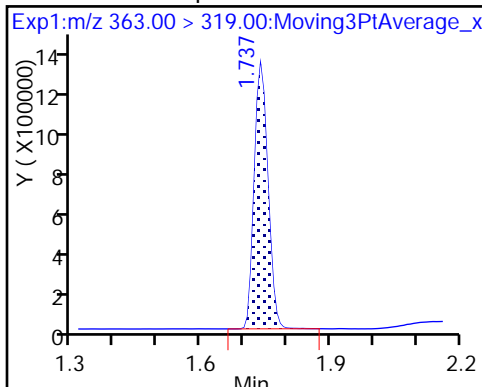
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

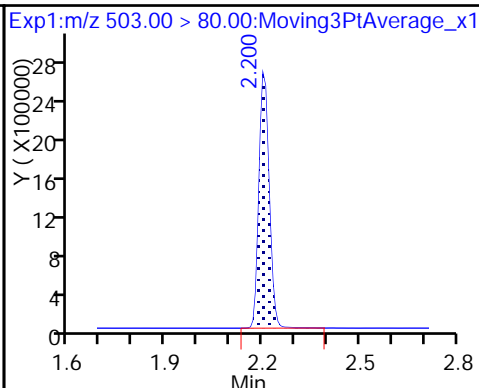
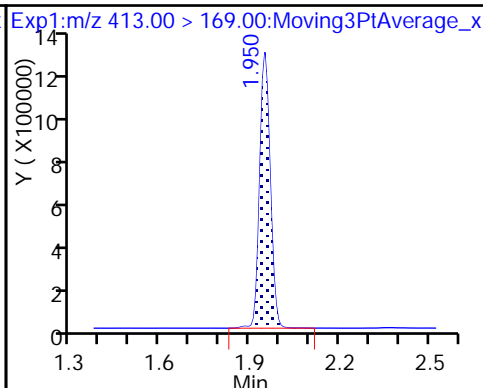
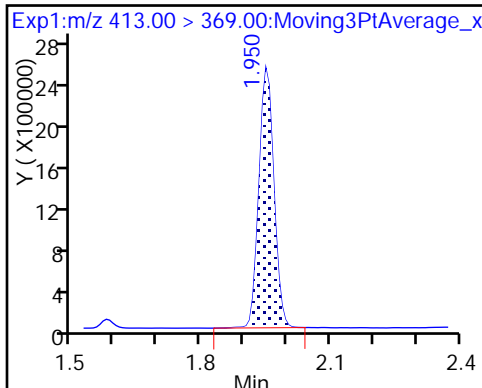
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

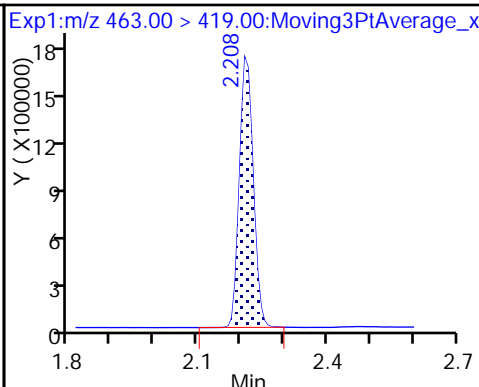
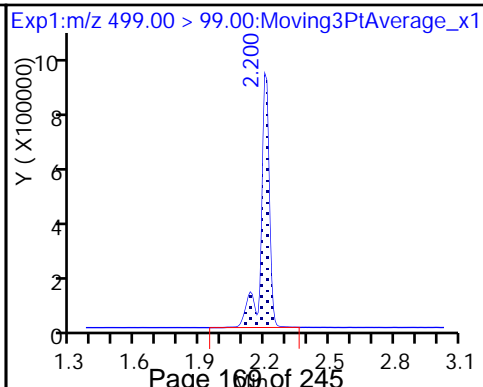
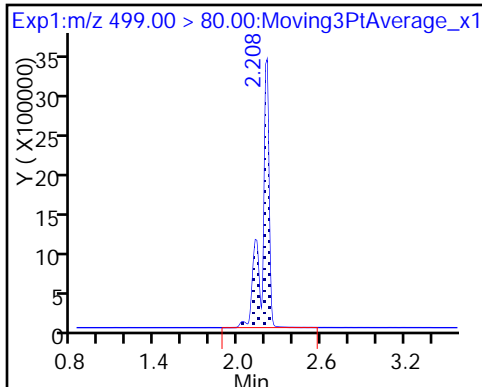
* 7 13C4 PFOS



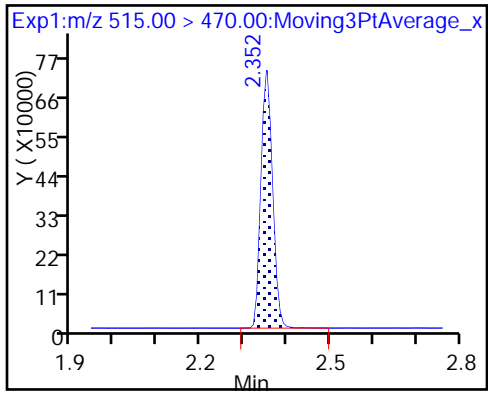
8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170814-46675.b\2017.08.14_537ICAL_007.d
 Lims ID: IC L6
 Client ID:
 Sample Type: IC Calib Level: 6
 Inject. Date: 14-Aug-2017 13:12:40 ALS Bottle#: 6 Worklist Smp#: 7
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: L6_537
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub1

Method: \\ChromNa\Sacramento\ChromData\A8_N\20170814-46675.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 14-Aug-2017 14:36:07 Calib Date: 14-Aug-2017 13:12:40
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last Ical File: \\ChromNA\Sacramento\ChromData\A8_N\20170814-46675.b\2017.08.14_537ICAL_007.d

Column 1 : Det: EXP1
 Process Host: XAWRK023

First Level Reviewer: phomsophat Date: 14-Aug-2017 14:09:40

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.449	1.453	-0.004	1.000	26040065	186.2		2319	
298.90 > 99.00	1.449	1.453	-0.004	1.000	19002053		1.37(0.00-0.00)	2644	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.578	1.582	-0.004	1.000	2370885	10.3		6962	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.737	1.742	-0.005	1.000	16584369	56.1		1968	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.737	1.742	-0.005	1.000	3589599	19.5		307	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.950	1.955	-0.005	1.000	7854398	40.2		429	
413.00 > 169.00	1.950	1.955	-0.005	1.000	4254502		1.85(0.00-0.00)	6275	
* 6 13C2-PFOA									
415.00 > 370.00	1.950	1.955	-0.005		2155463	10.0		11567	
* 7 13C4 PFOS									
503.00 > 80.00	2.200	2.205	-0.005		5673459	28.7		5607	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.208	2.208	0.0	1.000	14645432	80.2		8157	
499.00 > 99.00	2.200	2.208	-0.008	0.997	3183566		4.60(0.00-0.00)	2767	
9 Perfluorononanoic acid									
463.00 > 419.00	2.208	2.213	-0.005	1.000	4927051	40.4		1112	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.352	2.354	-0.002	1.000	1295768	10.2		7545	

Reagents:

LC537-L6_00020

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170814-46675.b\2017.08.14_537ICAL_007.d

Injection Date: 14-Aug-2017 13:12:40

Instrument ID: A8_N

Lims ID: IC L6

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 6

Worklist Smp#: 7

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

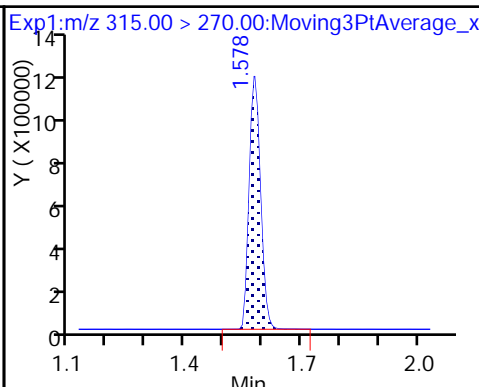
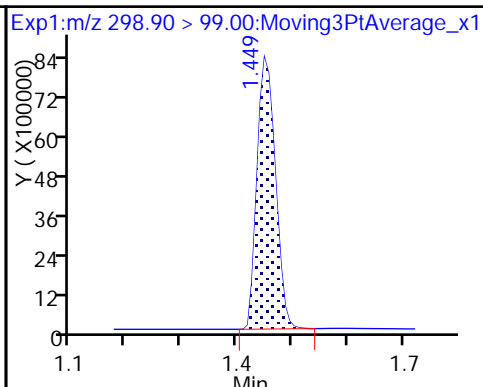
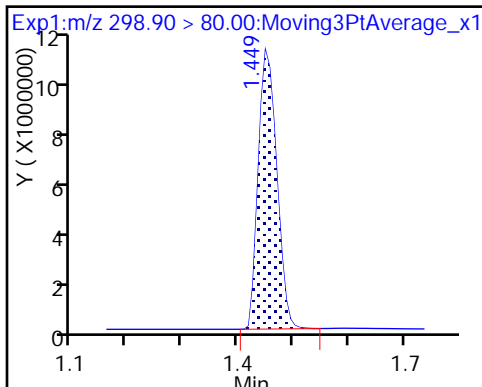
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

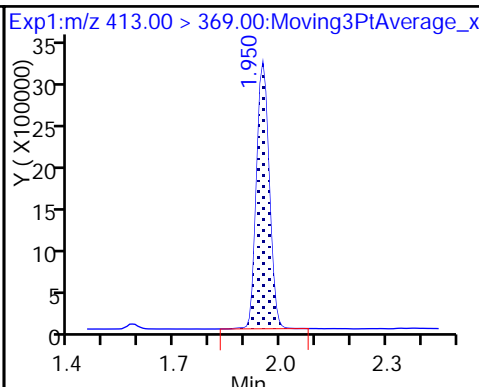
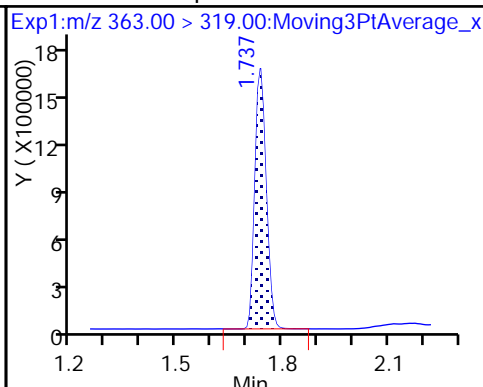
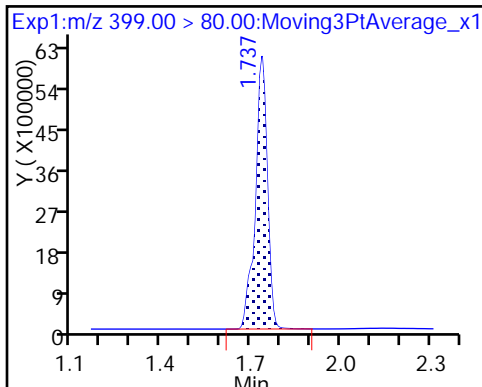
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

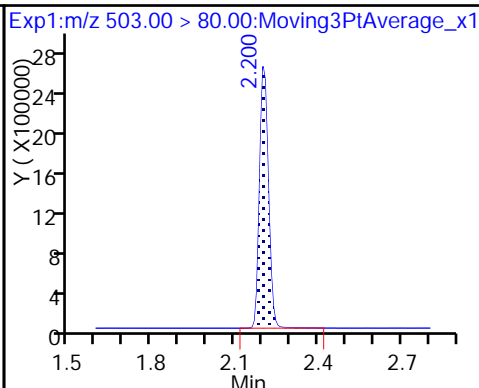
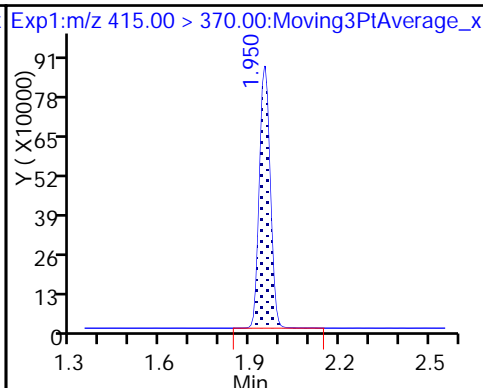
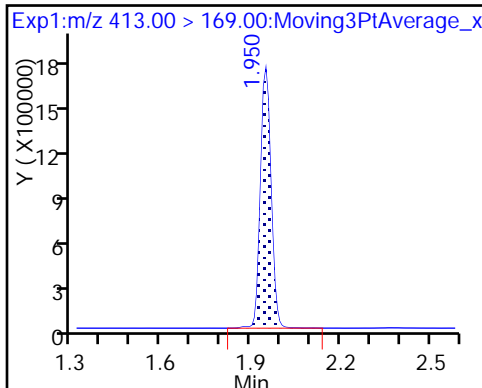
5 Perfluorooctanoic acid



5 Perfluorooctanoic acid

* 6 13C2-PFOA

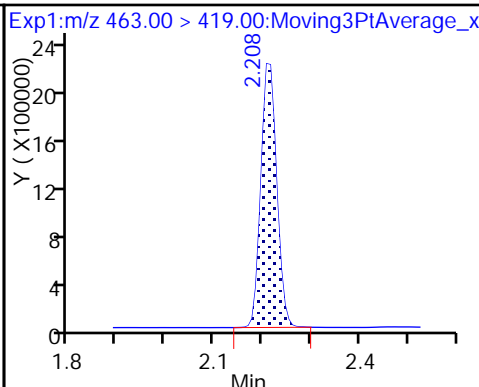
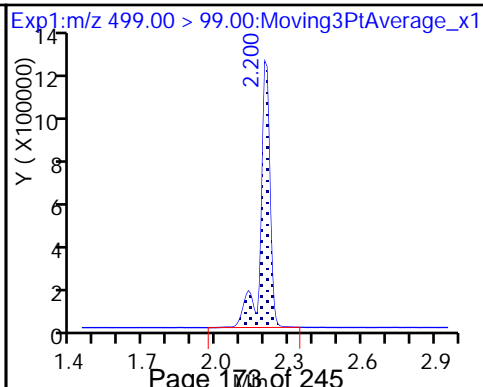
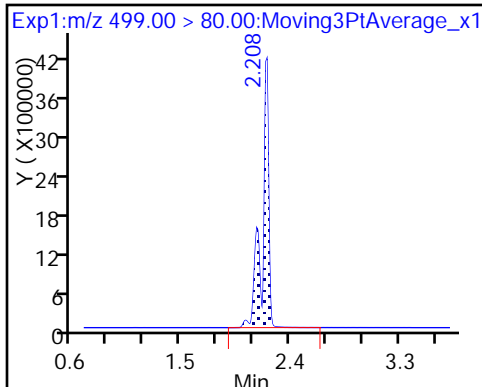
* 7 13C4 PFOS



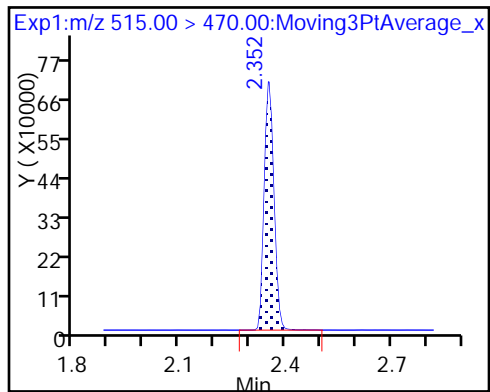
8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Lab Sample ID: CCVL 320-179319/9 Calibration Date: 08/14/2017 13:22
 Instrument ID: A8_N Calib Start Date: 08/14/2017 12:48
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/14/2017 13:12
 Lab File ID: 2017.08.14_537ICAL_009.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		1.212		22.5	20.0	12.7	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.8560	0.9386		2.44	2.22	9.6	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.494	1.568		7.00	6.67	4.9	50.0
Perfluorooctanoic acid (PFOA)	Ave	0.9068	0.9308		4.57	4.45	2.6	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9236	0.9255		8.91	8.89	0.2	50.0
Perfluorononanoic acid (PFNA)	Ave	0.5665	0.6283		4.93	4.45	10.9	50.0
13C2 PFHxA	Ave	1.069	1.128		10.5	10.0	5.5	30.0
13C2 PFDA	Ave	0.5877	0.6289		10.7	10.0	7.0	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170814-46675.b\2017.08.14_537ICAL_009.d
 Lims ID: CCVL
 Client ID:
 Sample Type: CCVL
 Inject. Date: 14-Aug-2017 13:22:09 ALS Bottle#: 2 Worklist Smp#: 9
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L2
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub1

Method: \\ChromNa\Sacramento\ChromData\A8_N\20170814-46675.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 14-Aug-2017 14:36:08 Calib Date: 14-Aug-2017 13:12:40
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170814-46675.b\2017.08.14_537ICAL_007.d

Column 1 : Det: EXP1
 Process Host: XAWRK023

First Level Reviewer: phomsophat Date: 14-Aug-2017 14:17:21

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.449	1.453	-0.004	1.000	5069955	22.5		689	
298.90 > 99.00	1.449	1.453	-0.004	1.000	3233517		1.57(0.00-0.00)	644	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.578	1.582	-0.004	1.000	2456705	10.5		7072	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.737	1.742	-0.005	1.000	454396	2.44		40.4	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.737	1.742	-0.005	1.000	2186681	7.00		343	
* 6 13C2-PFOA									
415.00 > 370.00	1.942	1.955	-0.013		2177935	10.0		9587	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.942	1.955	-0.013	1.000	901705	4.57		50.1	
413.00 > 169.00	1.942	1.955	-0.013	1.000	476593		1.89(0.00-0.00)	869	
* 7 13C4 PFOS									
503.00 > 80.00	2.200	2.205	-0.005		5998180	28.7		5754	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.200	2.208	-0.008	1.000	1720862	8.91		1437	
499.00 > 99.00	2.200	2.208	-0.008	1.000	364893		4.72(0.00-0.00)	416	
9 Perfluorononanoic acid									
463.00 > 419.00	2.208	2.213	-0.005	1.000	608257	4.93		144	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.352	2.354	-0.002	1.000	1369753	10.7		8253	

Reagents:

LC537-L2_00020

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170814-46675.b\2017.08.14_537ICAL_009.d

Injection Date: 14-Aug-2017 13:22:09

Instrument ID: A8_N

Lims ID: CCVL

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 2

Worklist Smp#: 9

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

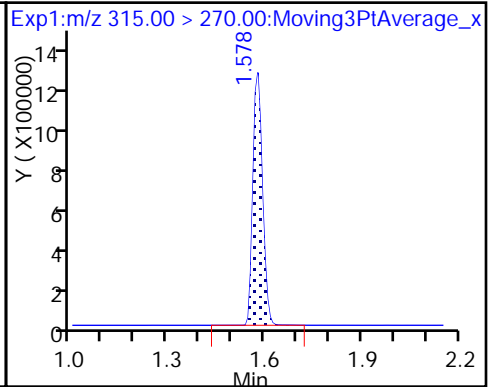
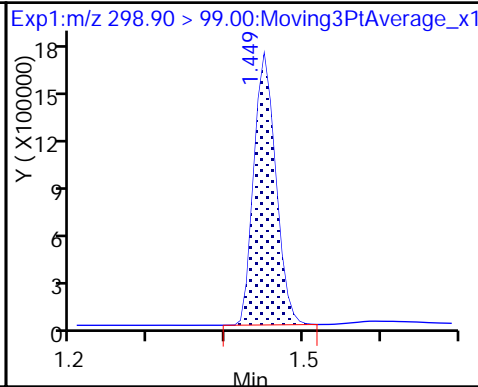
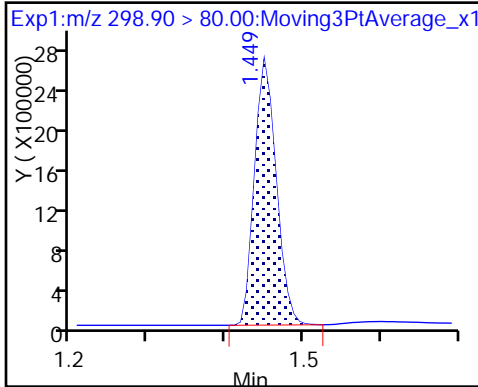
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

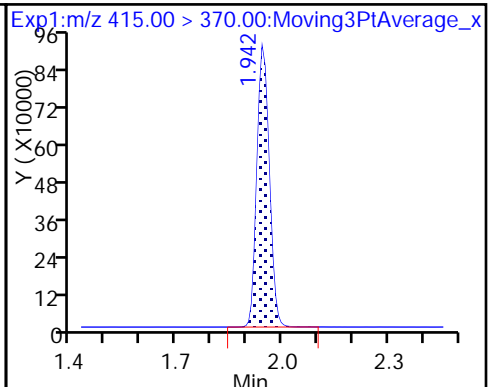
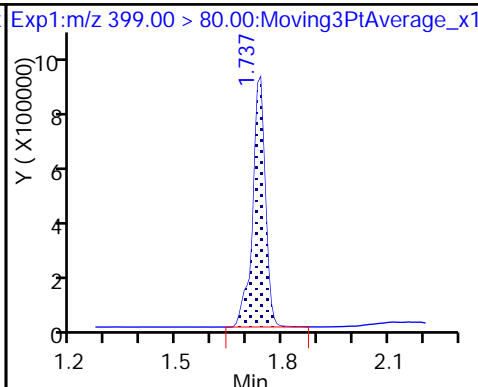
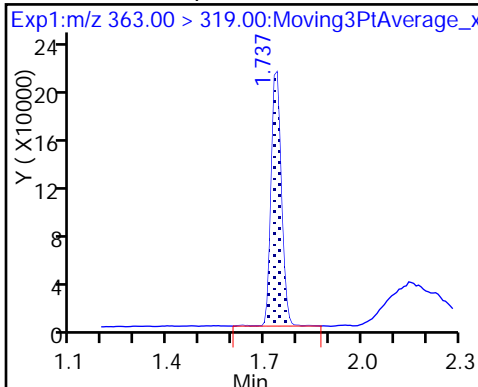
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

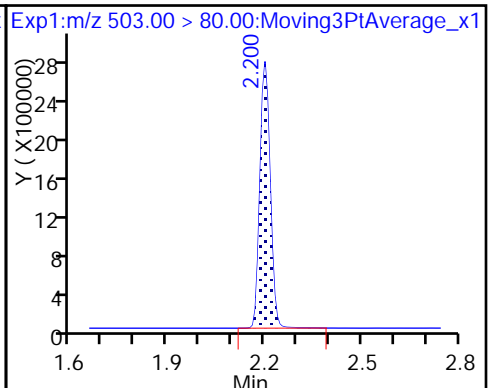
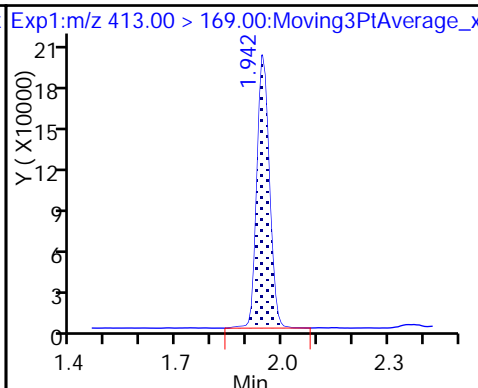
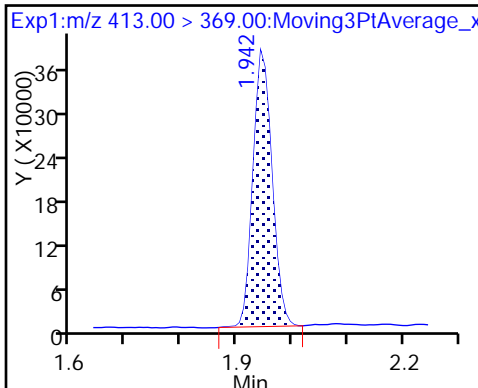
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

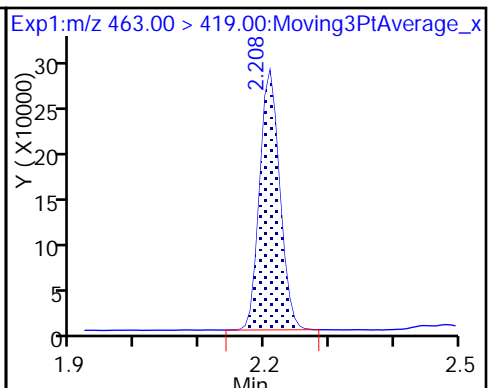
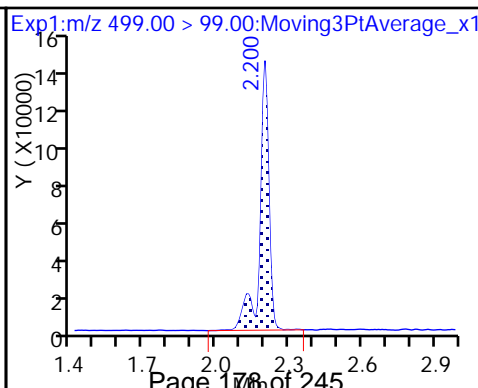
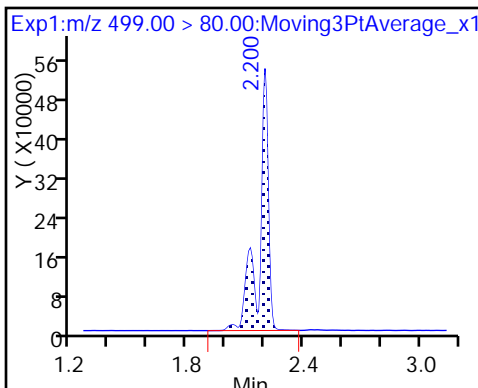
* 7 13C4 PFOS



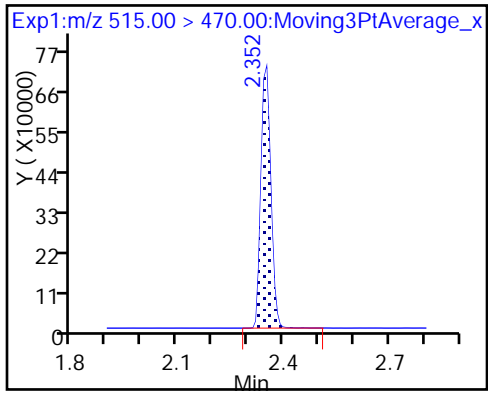
8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Lab Sample ID: ICV 320-179319/11 Calibration Date: 08/14/2017 13:31
 Instrument ID: A8_N Calib Start Date: 08/14/2017 12:48
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/14/2017 13:12
 Lab File ID: 2017.08.14_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		0.9251		104	100	3.6	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.8560	0.9672		11.3	10.0	13.0	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.494	1.761		23.7	20.1	17.9	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9068	0.9396		21.2	20.5	3.6	30.0
Perfluorononanoic acid (PFNA)	Ave	0.5665	0.7333		26.1	20.1	29.4	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9236	1.121		23.9	19.7	21.3	30.0
13C2 PFHxA	Ave	1.069	1.124		10.5	10.0	5.1	30.0
13C2 PFDA	Ave	0.5877	0.6385		10.9	10.0	8.7	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170814-46675.b\2017.08.14_537ICAL_011.d
 Lims ID: ICV
 Client ID:
 Sample Type: ICV
 Inject. Date: 14-Aug-2017 13:31:37 ALS Bottle#: 7 Worklist Smp#: 11
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: ICV
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist:
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170814-46675.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 14-Aug-2017 14:36:10 Calib Date: 14-Aug-2017 13:12:40
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last Ical File: \\ChromNA\Sacramento\ChromData\A8_N\20170814-46675.b\2017.08.14_537ICAL_007.d
 Column 1 : Det: EXP1
 Process Host: XAWRK023

First Level Reviewer: phomsophat Date: 14-Aug-2017 14:18:36

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.449	1.453	-0.004	1.000	18809532	103.7		1920	
298.90 > 99.00	1.449	1.453	-0.004	1.000	13567533		1.39(0.00-0.00)	2047	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.578	1.582	-0.004	1.000	2224871	10.5		6402	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.730	1.742	-0.012	1.000	1914446	11.3		166	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.730	1.742	-0.012	1.000	7180754	23.7		1082	
* 6 13C2-PFOA									
415.00 > 370.00	1.942	1.955	-0.013		1980065	10.0		9656	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.942	1.955	-0.013	1.000	3810943	21.2		220	
413.00 > 169.00	1.942	1.955	-0.013	1.000	2037831		1.87(0.00-0.00)	3256	
* 7 13C4 PFOS									
503.00 > 80.00	2.193	2.205	-0.012		5824653	28.7		5480	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.200	2.208	-0.008	1.000	4482668	23.9		3801	
499.00 > 99.00	2.200	2.208	-0.008	1.000	847951		5.29(0.00-0.00)	940	
9 Perfluorononanoic acid									
463.00 > 419.00	2.200	2.213	-0.013	1.000	2922223	26.1		737	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.344	2.354	-0.010	1.000	1264298	10.9		7686	

Reagents:

LC537-ICV_00028

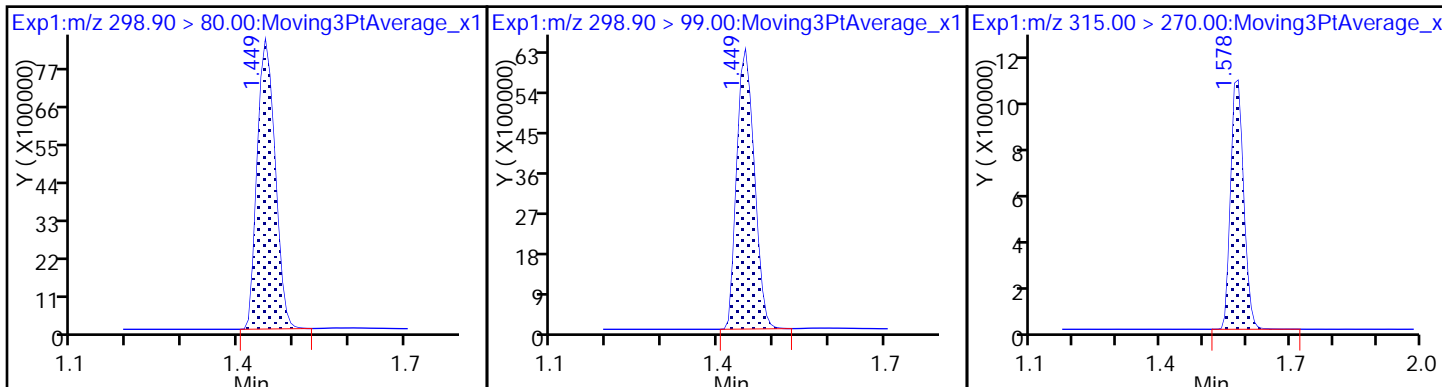
Amount Added: 1.00

Units: mL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

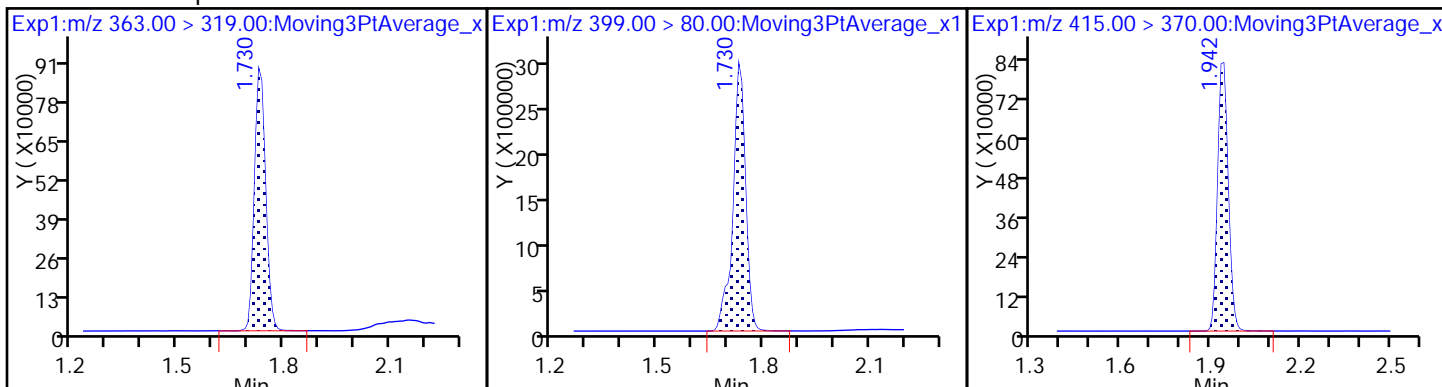
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

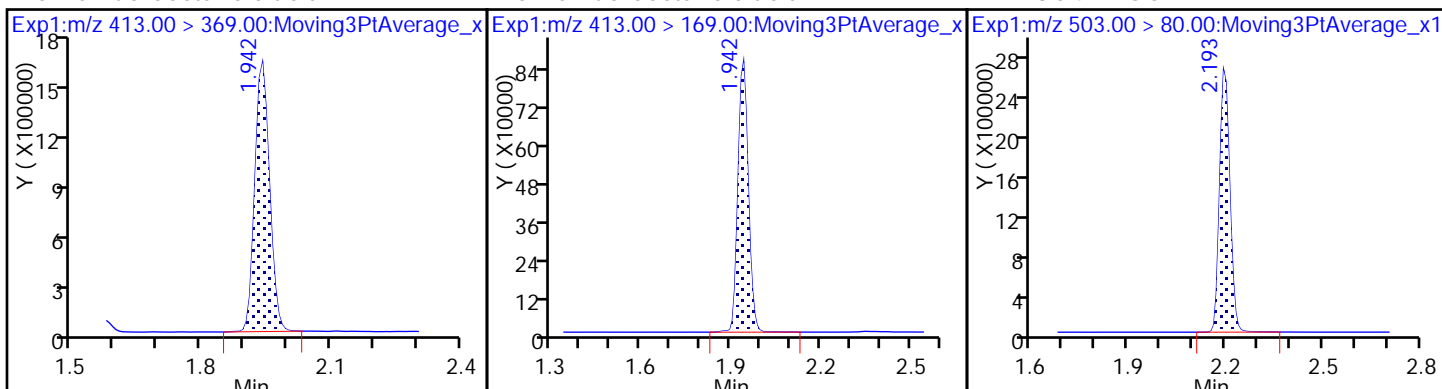
* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

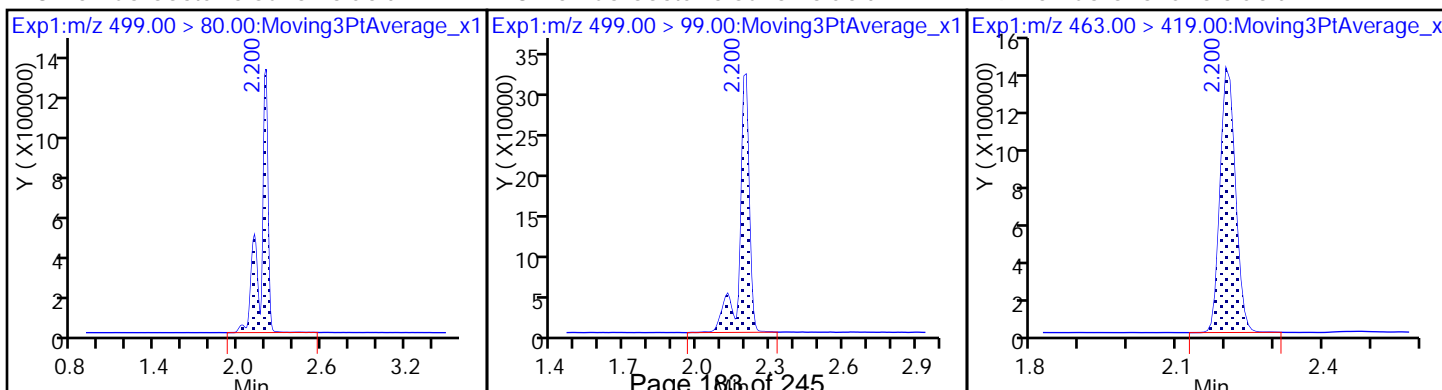
* 7 13C4 PFOS



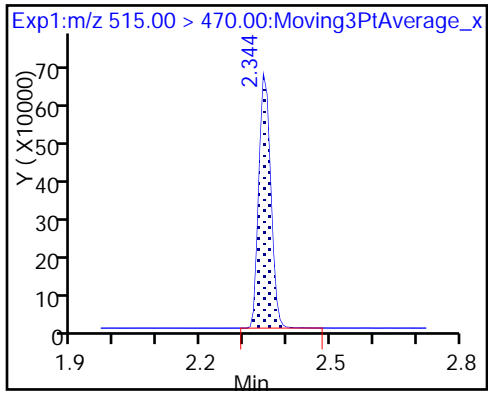
8 Perfluorooctane sulfonic acid

8 Perfluorooctane sulfonic acid

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Lab Sample ID: CCV 320-179510/1 Calibration Date: 08/14/2017 19:24
 Instrument ID: A8_N Calib Start Date: 08/14/2017 12:48
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/14/2017 13:12
 Lab File ID: 2017.08.14_537B_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		1.087		48.0	45.0	6.7	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.8560	0.9611		5.61	5.00	12.3	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.494	1.657		16.6	15.0	10.9	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9068	0.9103		10.0	10.0	0.4	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9236	0.9052		19.6	20.0	-2.0	30.0
Perfluorononanoic acid (PFNA)	Ave	0.5665	0.6404		11.3	10.0	13.0	30.0
13C2 PFHxA	Ave	1.069	1.167		10.9	10.0	9.1	30.0
13C2 PFDA	Ave	0.5877	0.6255		10.6	10.0	6.4	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\2017.08.14_537B_001.d
 Lims ID: CCV L3
 Client ID:
 Sample Type: CCVIS
 Inject. Date: 14-Aug-2017 19:24:06 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\20170815-46718.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 16-Aug-2017 14:14:15 Calib Date: 14-Aug-2017 13:12:40
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170814-46675.b\2017.08.14_537ICAL_007.d

Column 1 : Det: EXP1
 Process Host: XAWRK009

First Level Reviewer: barnettj Date: 15-Aug-2017 13:57:36

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.442	1.453	-0.011	1.000	9898491	48.0		1225	
298.90 > 99.00	1.442	1.453	-0.011	1.000	7059770		1.40(0.00-0.00)	1378	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.563	1.582	-0.019	1.000	2455545	10.9		10284	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.715	1.742	-0.027	1.000	5030742	16.6		811	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.715	1.742	-0.027	1.000	1011757	5.61		86.1	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.912	1.955	-0.043	1.000	1917804	10.0		97.9	
413.00 > 169.00	1.912	1.955	-0.043	1.000	999463		1.92(0.00-0.00)	1700	
* 6 13C2-PFOA									
415.00 > 370.00	1.912	1.955	-0.043		2104942	10.0		8620	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.170	2.170	0.0	1.000	3665050	19.6		3792	M
499.00 > 99.00	2.170	2.170	0.0	1.000	759268		4.83(0.00-0.00)	725	M
* 7 13C4 PFOS									
503.00 > 80.00	2.170	2.205	-0.035		5804729	28.7		5399	
9 Perfluorononanoic acid									
463.00 > 419.00	2.177	2.213	-0.036	1.000	1348237	11.3		273	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.329	2.354	-0.025	1.000	1316550	10.6		9514	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L3_00023

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\2017.08.14_537B_001.d

Injection Date: 14-Aug-2017 19:24:06

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

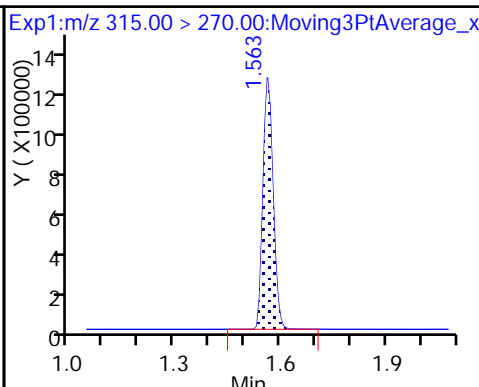
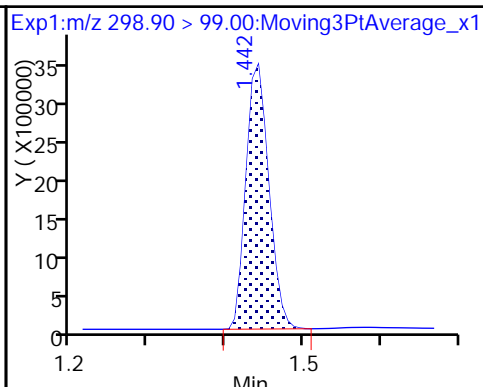
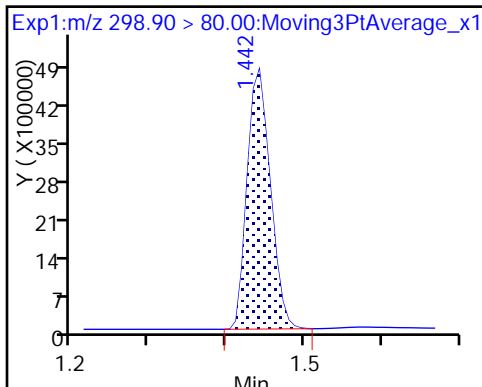
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

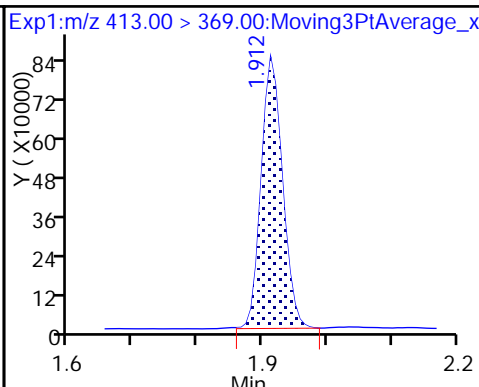
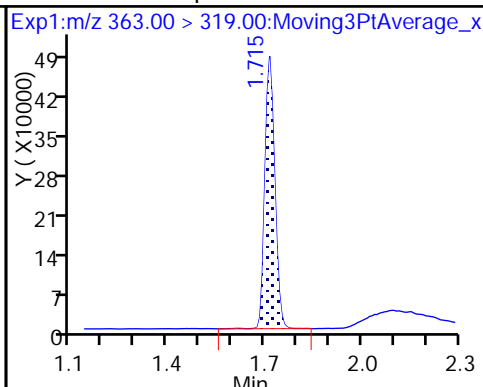
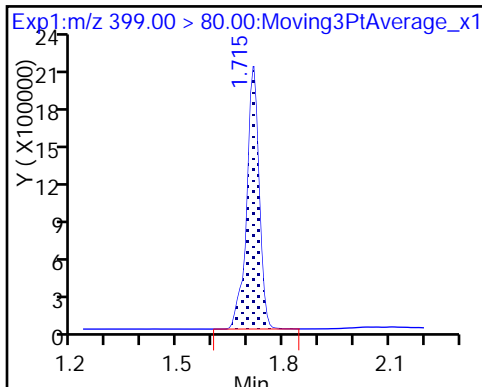
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

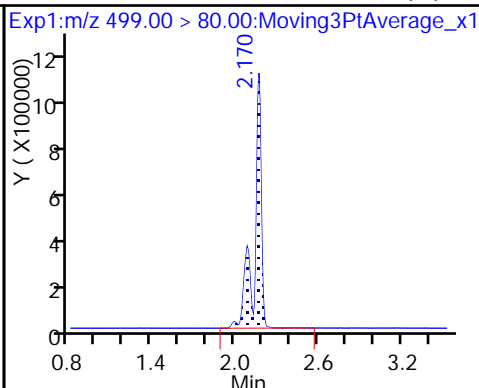
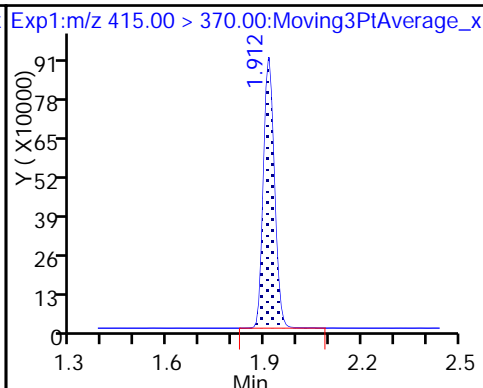
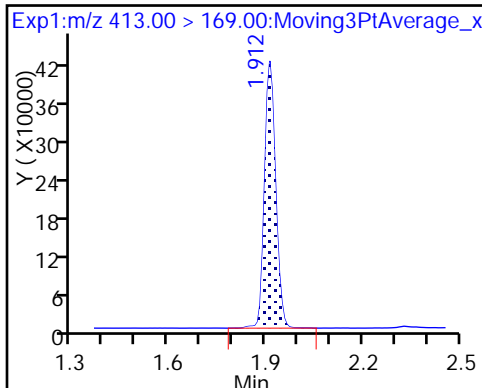
5 Perfluorooctanoic acid



5 Perfluorooctanoic acid

* 6 13C2-PFOA

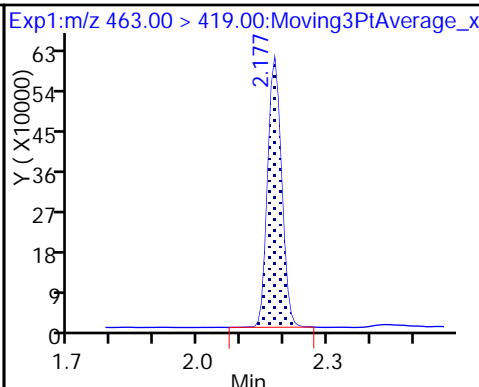
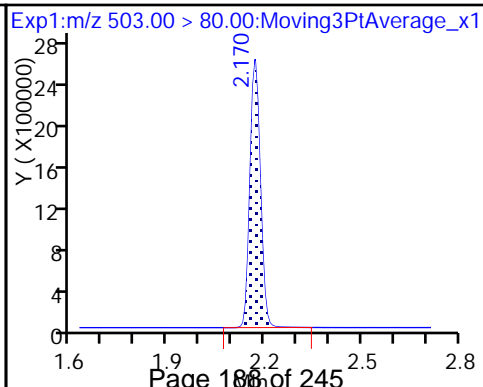
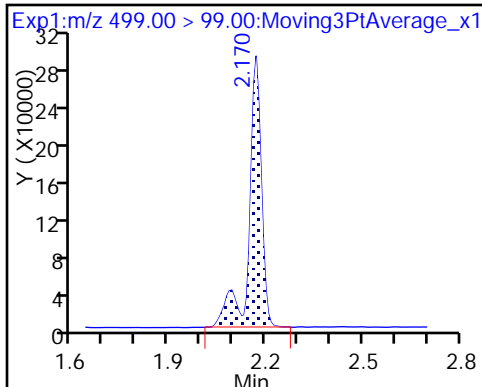
8 Perfluorooctane sulfonic acid (M)



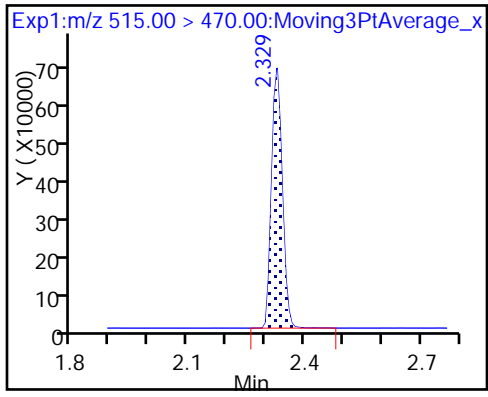
8 Perfluorooctane sulfonic acid (M)

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

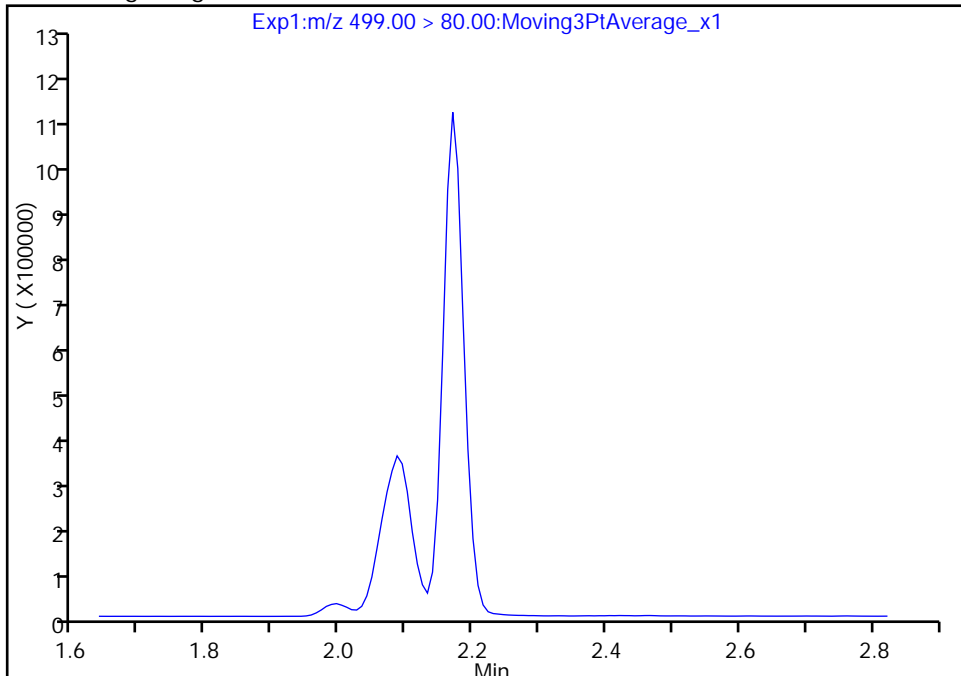
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\2017.08.14_537B_001.d
Injection Date: 14-Aug-2017 19:24:06 Instrument ID: A8_N
Lims ID: CCV L3
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

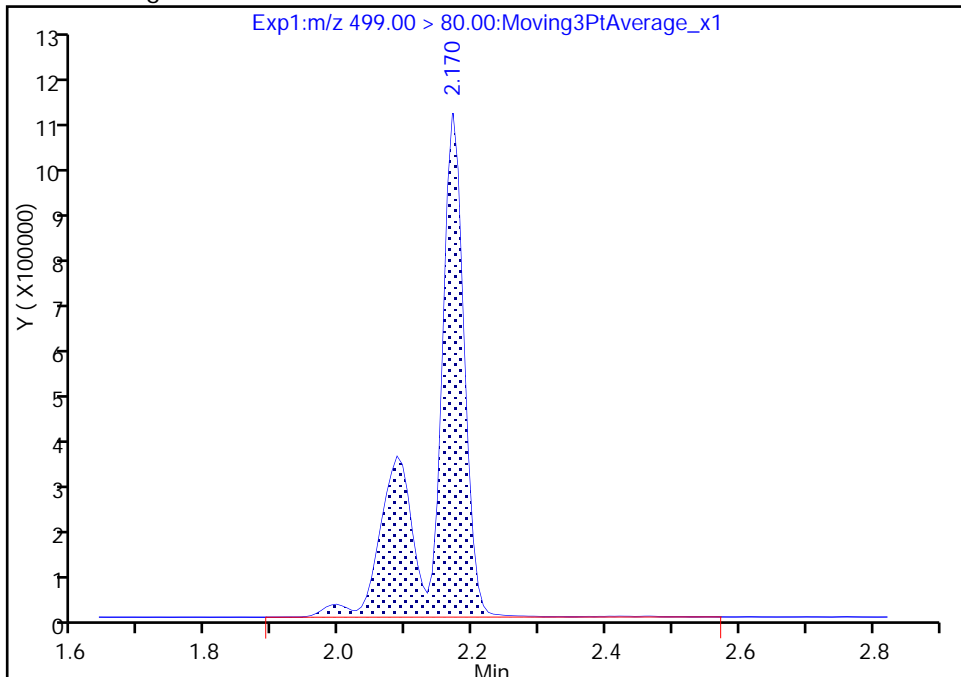
Not Detected
Expected RT: 2.17

Processing Integration Results



Manual Integration Results

RT: 2.17
Area: 3665050
Amount: 19.605605
Amount Units: ng/ml



Reviewer: barnettj, 15-Aug-2017 13:56:44
Audit Action: Assigned Compound ID

Audit Reason: Missed Peak

TestAmerica Sacramento

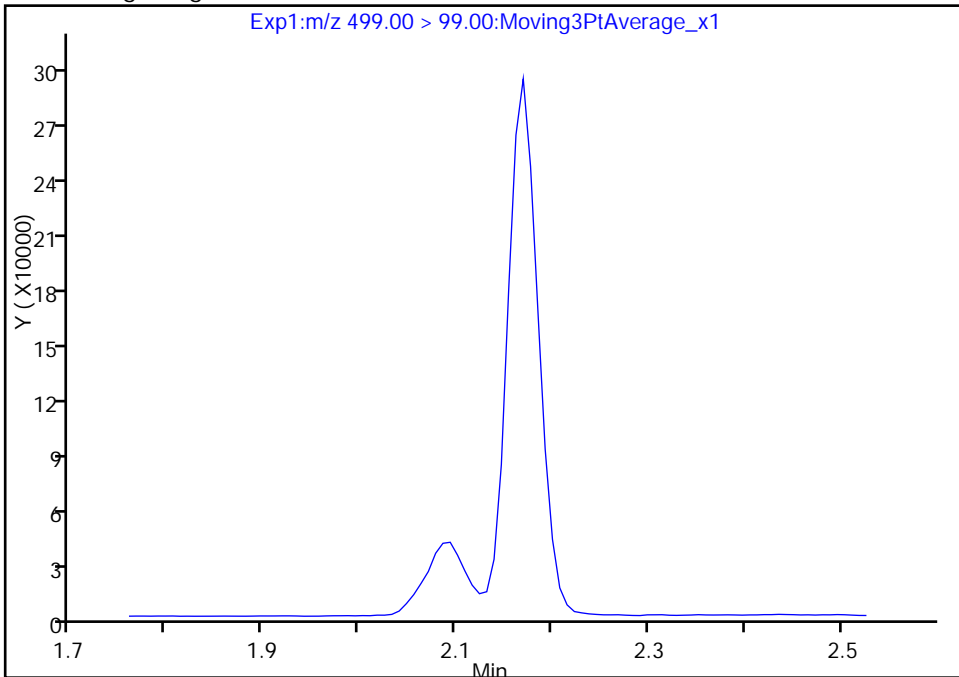
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Injection Date: 14-Aug-2017 19:24:06 Instrument ID: A8_N
Lims ID: CCV L3
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

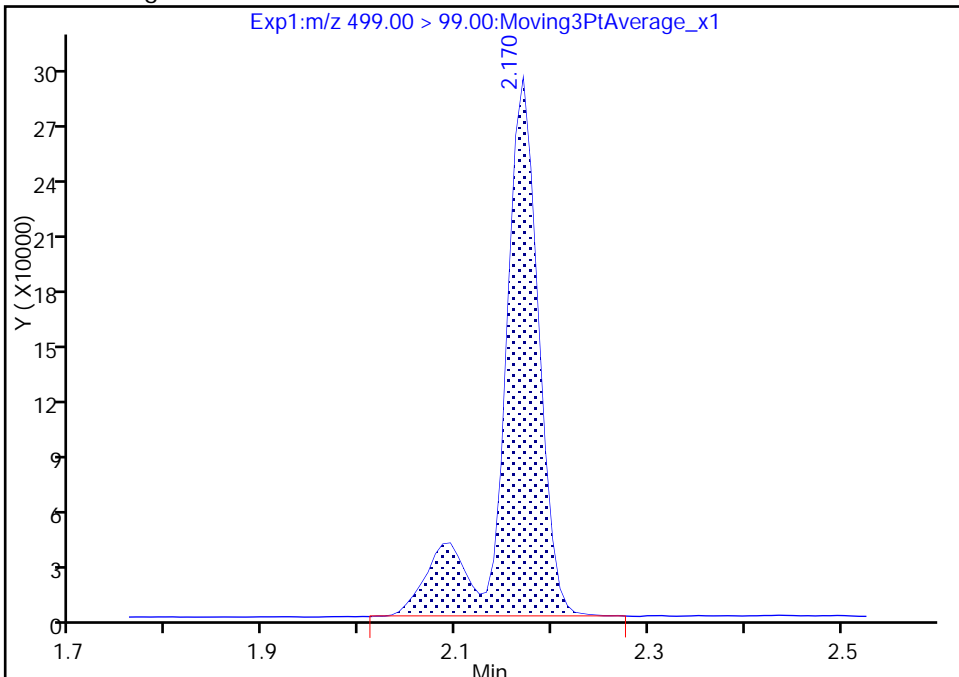
Not Detected
Expected RT: 2.17

Processing Integration Results



Manual Integration Results

RT: 2.17
Area: 759268
Amount: 19.605605
Amount Units: ng/ml



Reviewer: barnettj, 15-Aug-2017 13:57:05
Audit Action: Manually Integrated

TestAmerica Sacramento

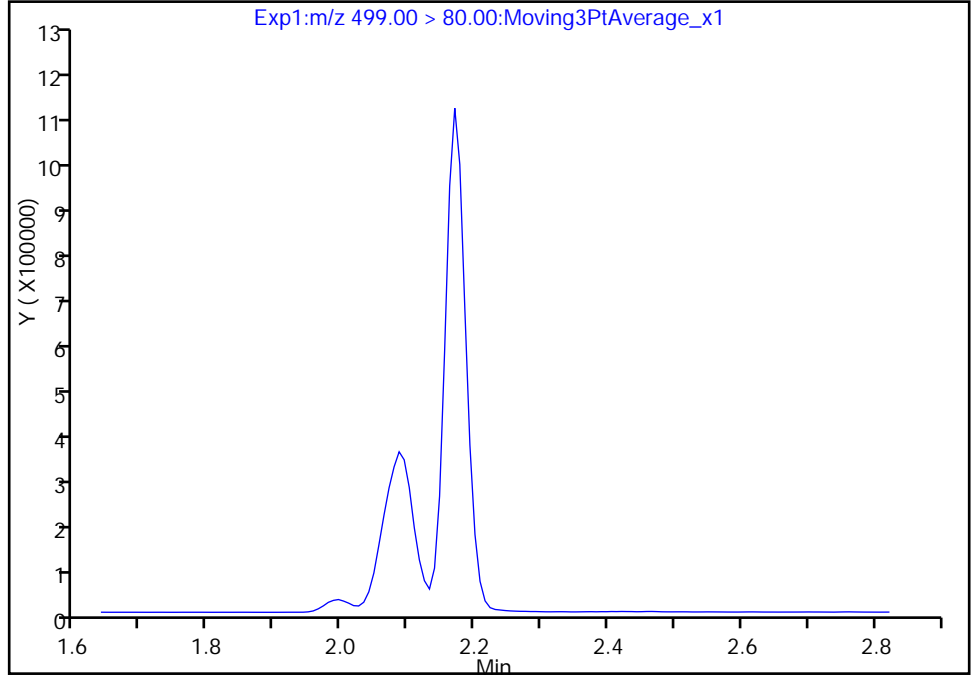
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Injection Date: 14-Aug-2017 19:24:06 Instrument ID: A8_N
Lims ID: CCV L3
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 1
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

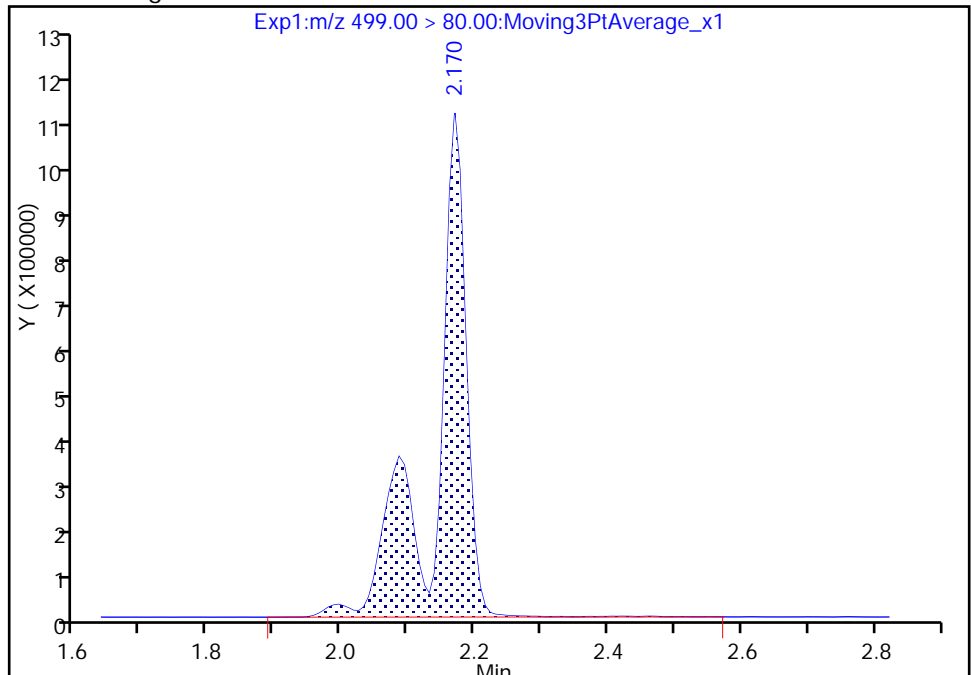
Not Detected
Expected RT: 2.17

Processing Integration Results



Manual Integration Results

RT: 2.17
Area: 3665050
Amount: 19.605605
Amount Units: ng/ml



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Lab Sample ID: CCV 320-179510/13 Calibration Date: 08/14/2017 20:21
 Instrument ID: A8_N Calib Start Date: 08/14/2017 12:48
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/14/2017 13:12
 Lab File ID: 2017.08.14_537B_013.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		0.8027		130	135	-3.7	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.8560	0.9404		16.5	15.0	9.9	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.494	1.460		44.0	45.0	-2.3	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9068	0.9327		30.9	30.0	2.8	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9236	0.9291		60.4	60.0	0.6	30.0
Perfluorononanoic acid (PFNA)	Ave	0.5665	0.6467		34.3	30.0	14.2	30.0
13C2 PFHxA	Ave	1.069	1.189		11.1	10.0	11.2	30.0
13C2 PFDA	Ave	0.5877	0.6635		11.3	10.0	12.9	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Lab Sample ID: CCV 320-179511/13 Calibration Date: 08/14/2017 20:21
 Instrument ID: A8_N Calib Start Date: 08/14/2017 12:48
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/14/2017 13:12
 Lab File ID: 2017.08.14_537B_013.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		0.8027		130	135	-3.7	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.8560	0.9404		16.5	15.0	9.9	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.494	1.460		44.0	45.0	-2.3	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9068	0.9327		30.9	30.0	2.8	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9236	0.9291		60.4	60.0	0.6	30.0
Perfluorononanoic acid (PFNA)	Ave	0.5665	0.6467		34.3	30.0	14.2	30.0
13C2 PFHxA	Ave	1.069	1.189		11.1	10.0	11.2	30.0
13C2 PFDA	Ave	0.5877	0.6635		11.3	10.0	12.9	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\2017.08.14_537B_013.d
 Lims ID: CCV L5
 Client ID:
 Sample Type: CCVIS
 Inject. Date: 14-Aug-2017 20:21:08 ALS Bottle#: 5 Worklist Smp#: 13
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L5
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub1
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 16-Aug-2017 14:14:25 Calib Date: 14-Aug-2017 13:12:40
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170814-46675.b\2017.08.14_537ICAL_007.d
 Column 1 : Det: EXP1
 Process Host: XAWRK009

First Level Reviewer: barnettj Date: 15-Aug-2017 13:58:13

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.442	1.453	-0.011	1.000	21474944	130.0		1995	
298.90 > 99.00	1.442	1.453	-0.011	1.000	15709404		1.37(0.00-0.00)	2220	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.571	1.582	-0.012	1.000	2438362	11.1		10596	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.722	1.742	-0.020	1.000	13025345	44.0		1642	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.722	1.742	-0.020	1.000	2894049	16.5		247	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.920	1.955	-0.035	1.000	5743896	30.9		282	
413.00 > 169.00	1.920	1.955	-0.035	1.000	2977580		1.93(0.00-0.00)	4286	
* 6 13C2-PFOA									
415.00 > 370.00	1.920	1.955	-0.035		2051129	10.0		8102	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.177	2.170	0.007	1.000	11049701	60.4		5917	
499.00 > 99.00	2.170	2.170	0.0	0.997	2365908		4.67(0.00-0.00)	1850	
* 7 13C4 PFOS									
503.00 > 80.00	2.170	2.205	-0.035		5683418	28.7		5329	
9 Perfluorononanoic acid									
463.00 > 419.00	2.185	2.213	-0.028	1.000	3980345	34.3		657	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.329	2.354	-0.025	1.000	1361016	11.3		9975	

Reagents:

LC537-L5_00024

Amount Added: 1.00

Units: mL

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\2017.08.14_537B_013.d
 Lims ID: CCV L5
 Client ID:
 Sample Type: CCVIS
 Inject. Date: 14-Aug-2017 20:21:08 ALS Bottle#: 5 Worklist Smp#: 13
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L5
 Misc. Info.: Plate: 1 Rack: 1
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Sublist: chrom-537_A8_N*sub1
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 16-Aug-2017 14:14:25 Calib Date: 14-Aug-2017 13:12:40
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170814-46675.b\2017.08.14_537ICAL_007.d

Column 1 : Det: EXP1
 Process Host: XAWRK009

First Level Reviewer: barnettj Date: 15-Aug-2017 13:58:13

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.442	1.453	-0.011	1.000	21474944	130.0		1995	
298.90 > 99.00	1.442	1.453	-0.011	1.000	15709404		1.37(0.00-0.00)	2220	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.571	1.582	-0.012	1.000	2438362	11.1		10596	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.722	1.742	-0.020	1.000	13025345	44.0		1642	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.722	1.742	-0.020	1.000	2894049	16.5		247	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.920	1.955	-0.035	1.000	5743896	30.9		282	
413.00 > 169.00	1.920	1.955	-0.035	1.000	2977580		1.93(0.00-0.00)	4286	
* 6 13C2-PFOA									
415.00 > 370.00	1.920	1.955	-0.035		2051129	10.0		8102	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.177	2.170	0.007	1.000	11049701	60.4		5917	
499.00 > 99.00	2.170	2.170	0.0	0.997	2365908		4.67(0.00-0.00)	1850	
* 7 13C4 PFOS									
503.00 > 80.00	2.170	2.205	-0.035		5683418	28.7		5329	
9 Perfluorononanoic acid									
463.00 > 419.00	2.185	2.213	-0.028	1.000	3980345	34.3		657	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.329	2.354	-0.025	1.000	1361016	11.3		9975	

Reagents:

LC537-L5_00024

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\2017.08.14_537B_013.d

Injection Date: 14-Aug-2017 20:21:08

Instrument ID: A8_N

Lims ID: CCV L5

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 5

Worklist Smp#: 13

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

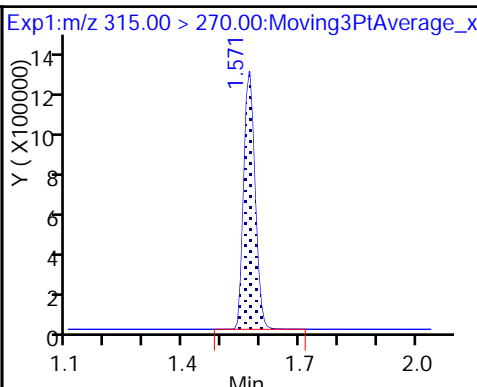
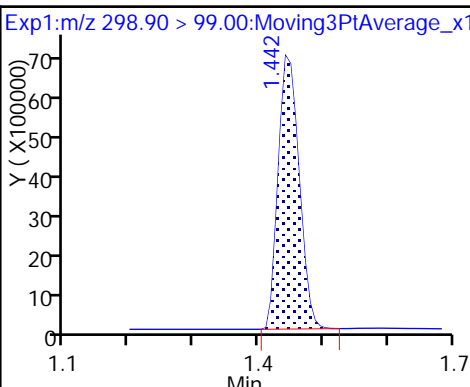
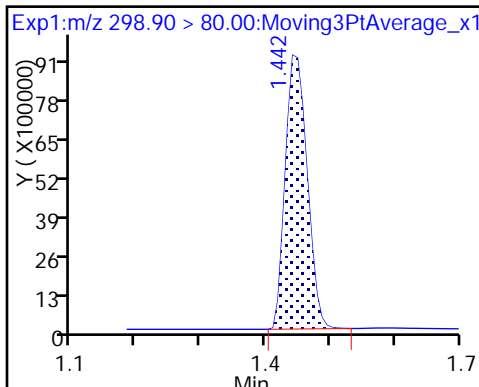
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

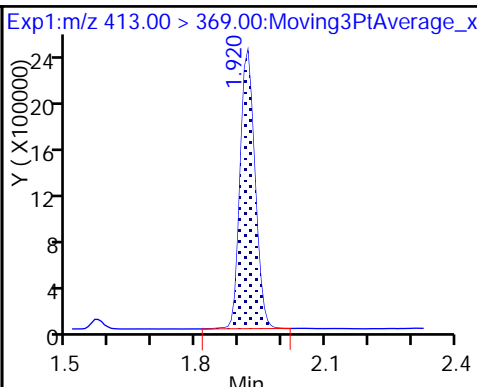
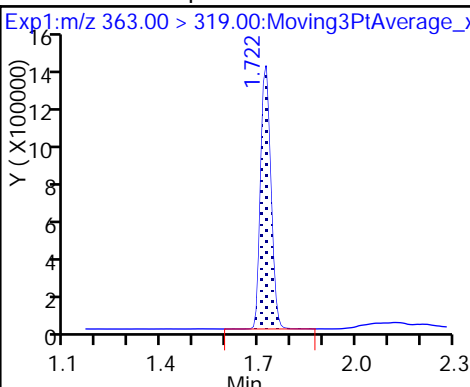
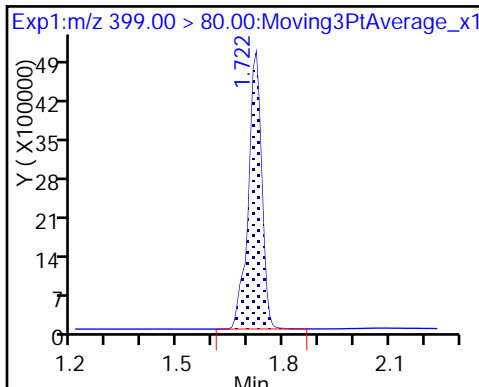
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

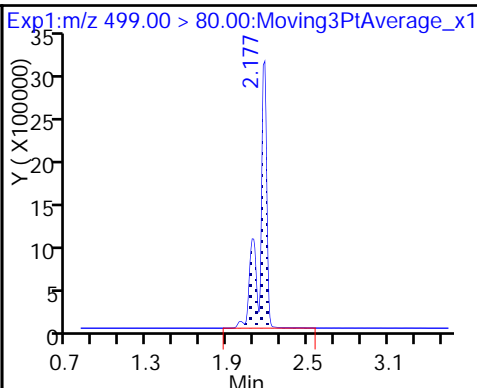
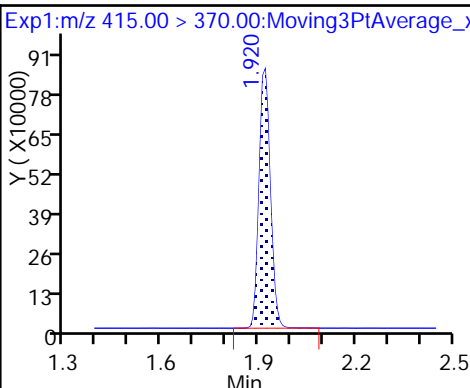
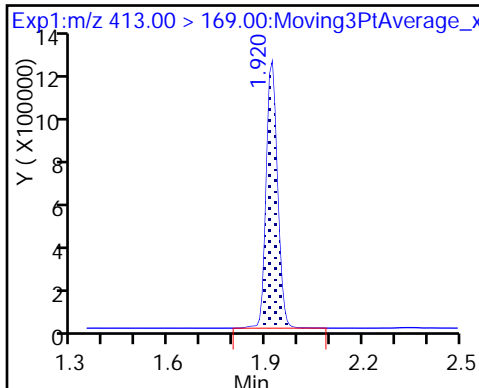
5 Perfluorooctanoic acid



5 Perfluorooctanoic acid

* 6 13C2-PFOA

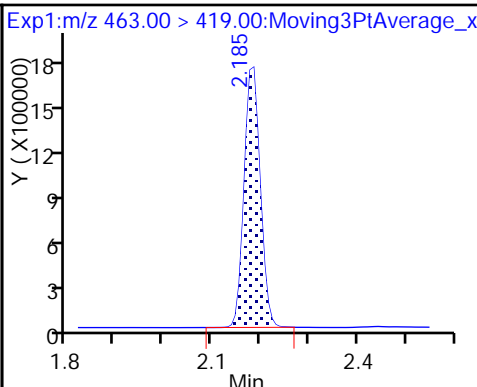
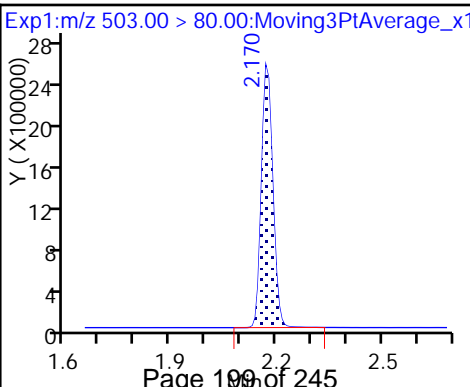
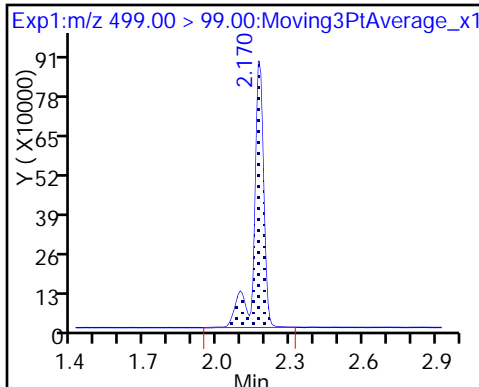
8 Perfluorooctane sulfonic acid



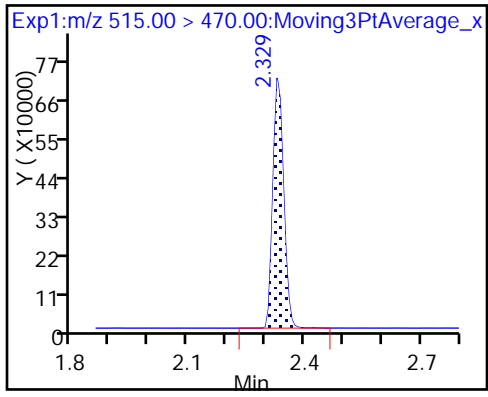
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\2017.08.14_537B_013.d

Injection Date: 14-Aug-2017 20:21:08

Instrument ID: A8_N

Lims ID: CCV L5

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 5

Worklist Smp#: 13

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

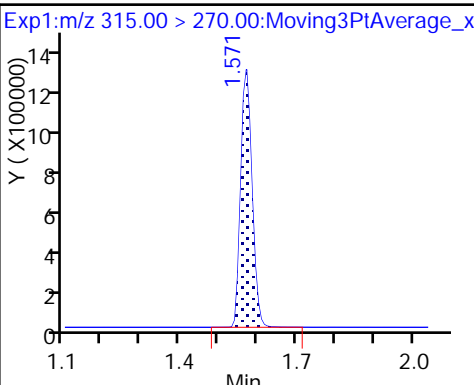
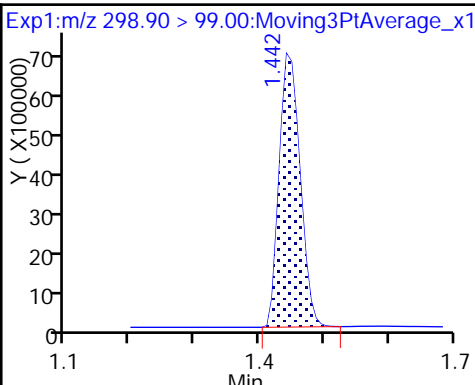
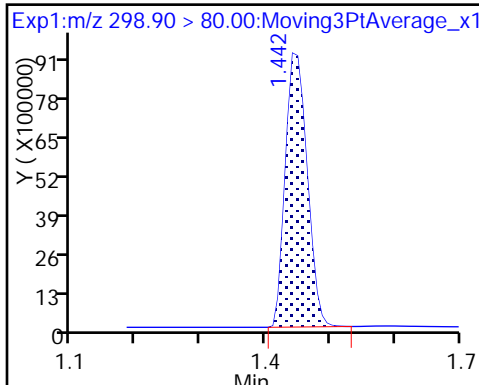
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

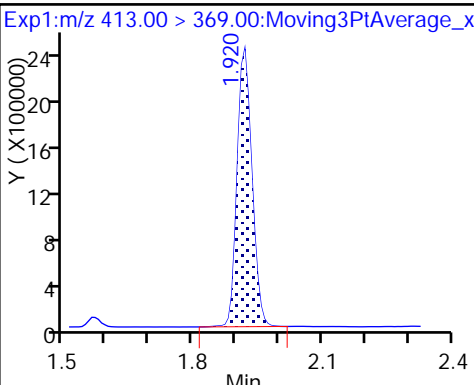
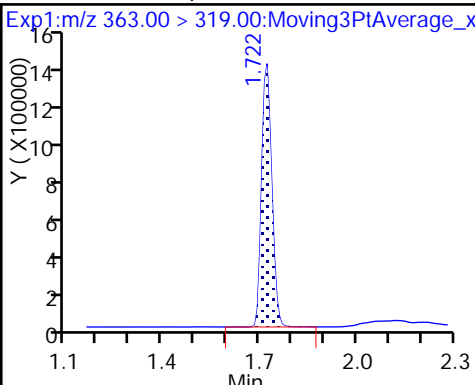
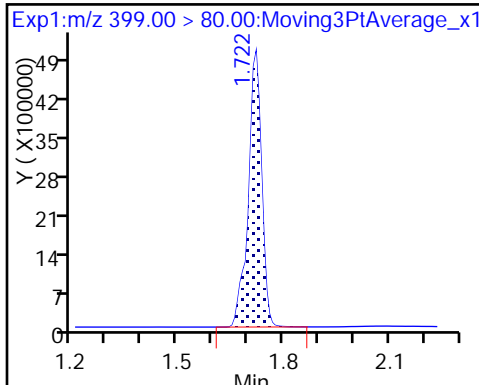
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

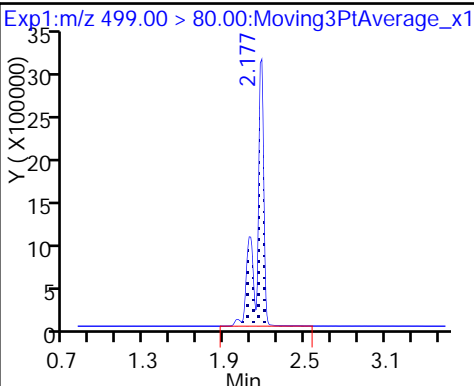
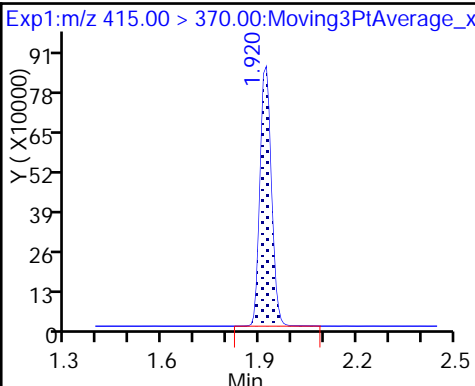
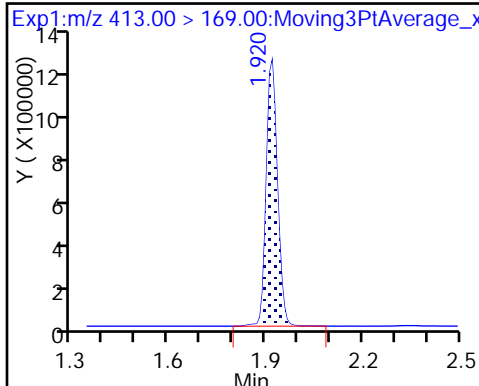
5 Perfluorooctanoic acid



5 Perfluorooctanoic acid

* 6 13C2-PFOA

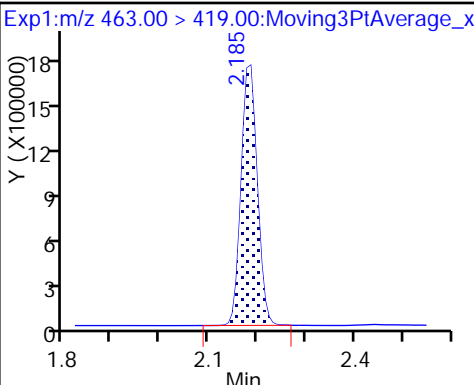
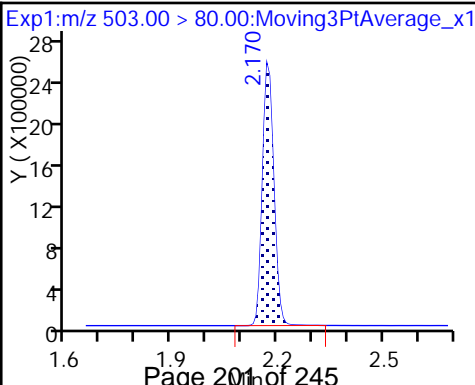
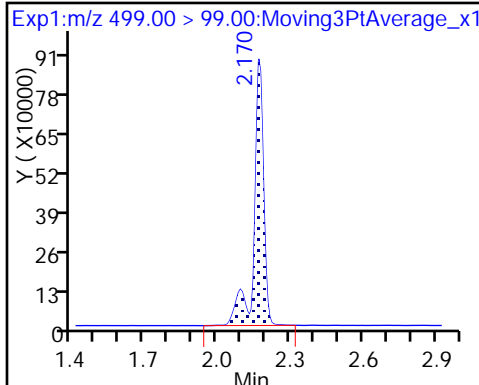
8 Perfluorooctane sulfonic acid



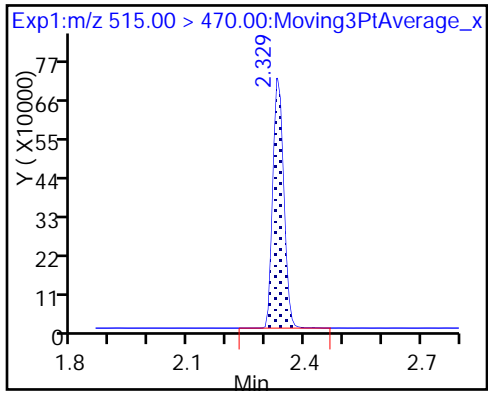
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Lab Sample ID: CCV 320-179511/18 Calibration Date: 08/14/2017 20:44
 Instrument ID: A8_N Calib Start Date: 08/14/2017 12:48
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/14/2017 13:12
 Lab File ID: 2017.08.14_537B_018.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		1.087		48.0	45.0	6.8	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.8560	0.9288		5.43	5.00	8.5	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.494	1.563		15.7	15.0	4.6	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9068	0.8915		9.84	10.0	-1.7	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9236	0.9111		19.7	20.0	-1.4	30.0
Perfluorononanoic acid (PFNA)	Ave	0.5665	0.6652		11.7	10.0	17.4	30.0
13C2 PFHxA	Ave	1.069	1.221		11.4	10.0	14.2	30.0
13C2 PFDA	Ave	0.5877	0.6649		11.3	10.0	13.1	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\2017.08.14_537B_018.d
 Lims ID: CCV L3
 Client ID:
 Sample Type: CCVIS
 Inject. Date: 14-Aug-2017 20:44:54 ALS Bottle#: 3 Worklist Smp#: 18
 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\20170815-46718.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 16-Aug-2017 14:14:28 Calib Date: 14-Aug-2017 13:12:40
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170814-46675.b\2017.08.14_537ICAL_007.d
 Column 1 : Det: EXP1
 Process Host: XAWRK009

First Level Reviewer: barnettj Date: 15-Aug-2017 13:58:50

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.442	1.453	-0.011	1.000	9816613	48.0		1242	
298.90 > 99.00	1.442	1.453	-0.011	1.000	7014563		1.40(0.00-0.00)	1372	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.563	1.582	-0.019	1.000	2448237	11.4		9286	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.715	1.742	-0.027	1.000	4705842	15.7		758	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.715	1.742	-0.027	1.000	931638	5.43		85.9	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.912	1.955	-0.043	1.000	1789585	9.84		87.1	
413.00 > 169.00	1.912	1.955	-0.043	1.000	963240		1.86(0.00-0.00)	1477	
* 6 13C2-PFOA									
415.00 > 370.00	1.912	1.955	-0.043		2005679	10.0		9352	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.170	2.170	0.0	1.000	3657034	19.7		2669	M
499.00 > 99.00	2.170	2.170	0.0	1.000	773193		4.73(0.00-0.00)	726	M
* 7 13C4 PFOS									
503.00 > 80.00	2.170	2.205	-0.035		5754725	28.7		5970	
9 Perfluorononanoic acid									
463.00 > 419.00	2.177	2.213	-0.036	1.000	1334492	11.7		258	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.329	2.354	-0.025	1.000	1333481	11.3		8774	

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L3_00023

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\2017.08.14_537B_018.d

Injection Date: 14-Aug-2017 20:44:54

Instrument ID: A8_N

Lims ID: CCV L3

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 3

Worklist Smp#: 18

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

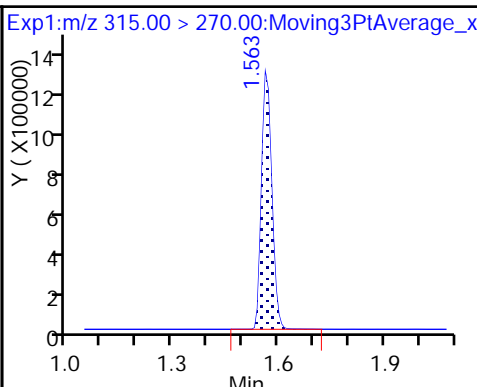
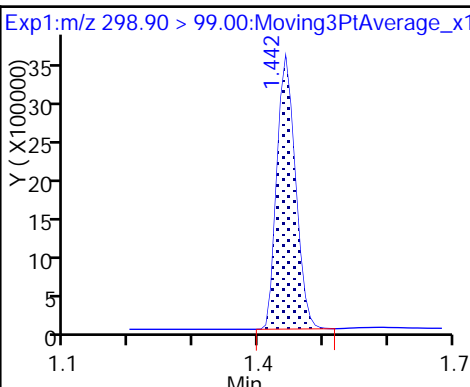
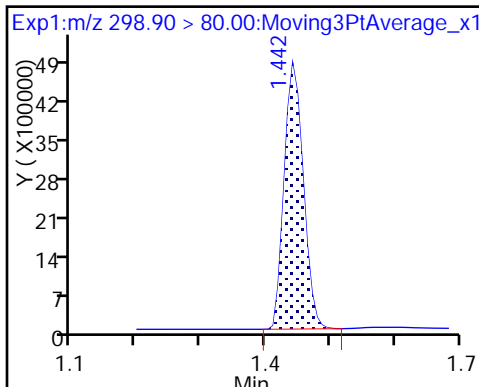
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

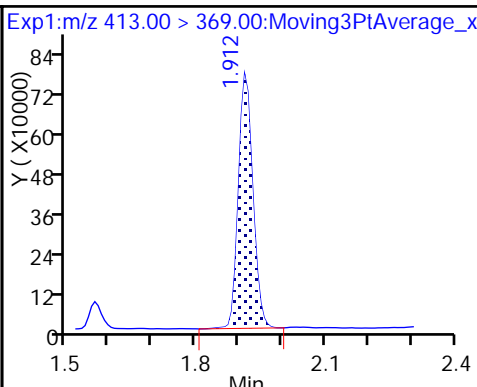
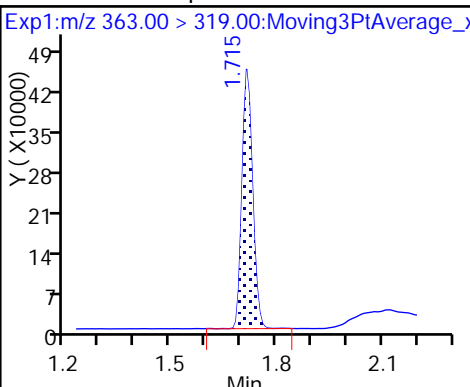
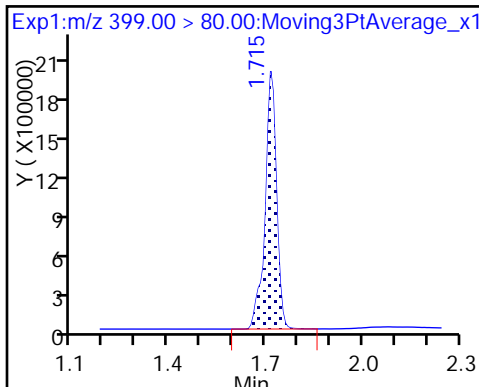
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

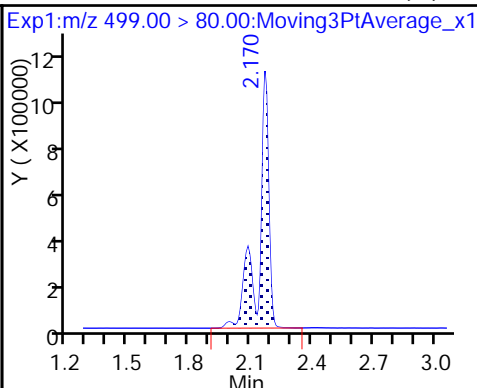
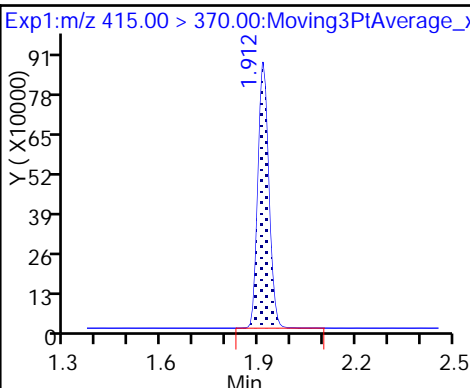
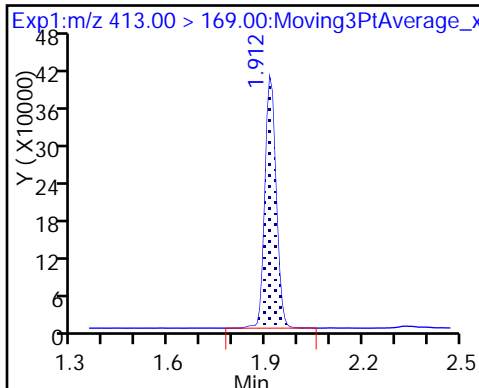
5 Perfluorooctanoic acid



5 Perfluorooctanoic acid

* 6 13C2-PFOA

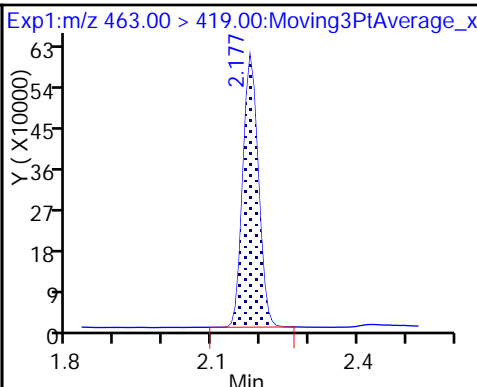
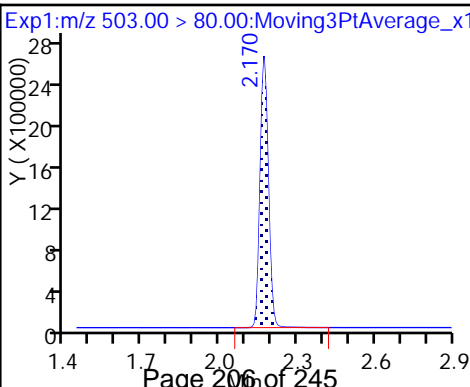
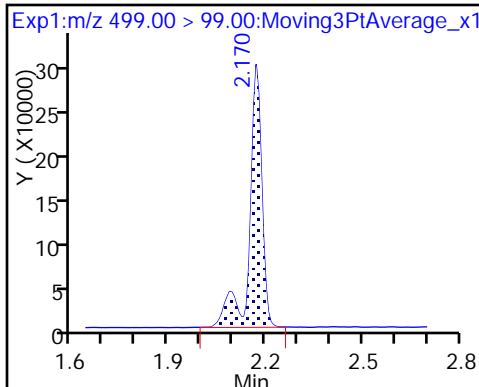
8 Perfluorooctane sulfonic acid (M)



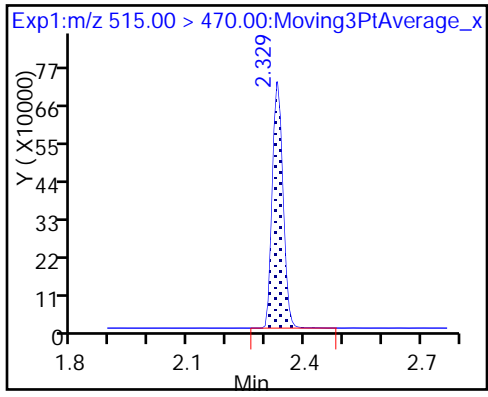
8 Perfluorooctane sulfonic acid (M)

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

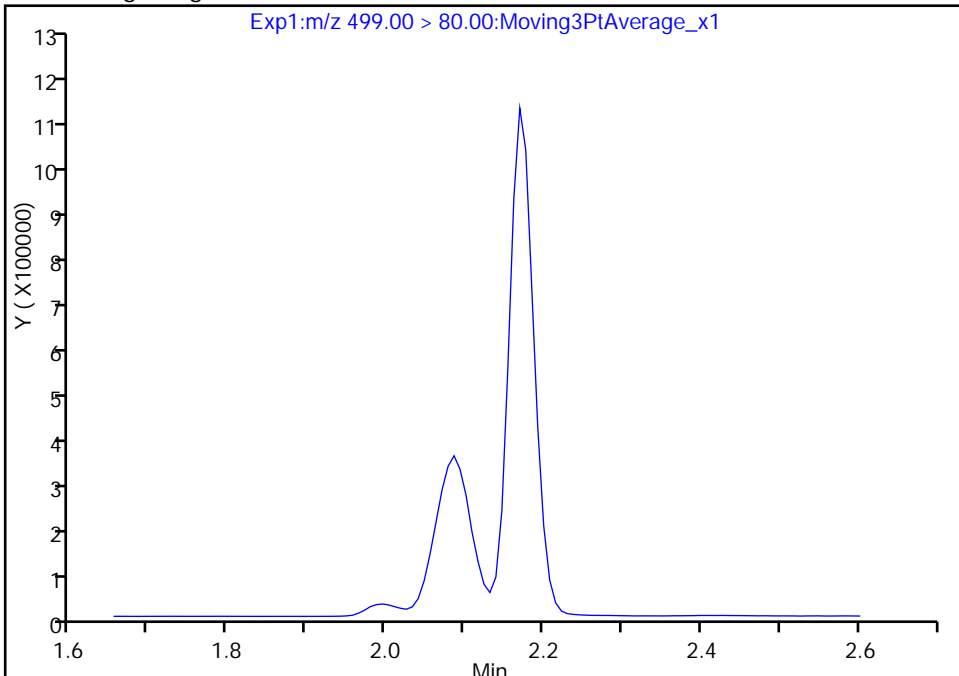
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Injection Date: 14-Aug-2017 20:44:54 Instrument ID: A8_N
Lims ID: CCV L3
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 18
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

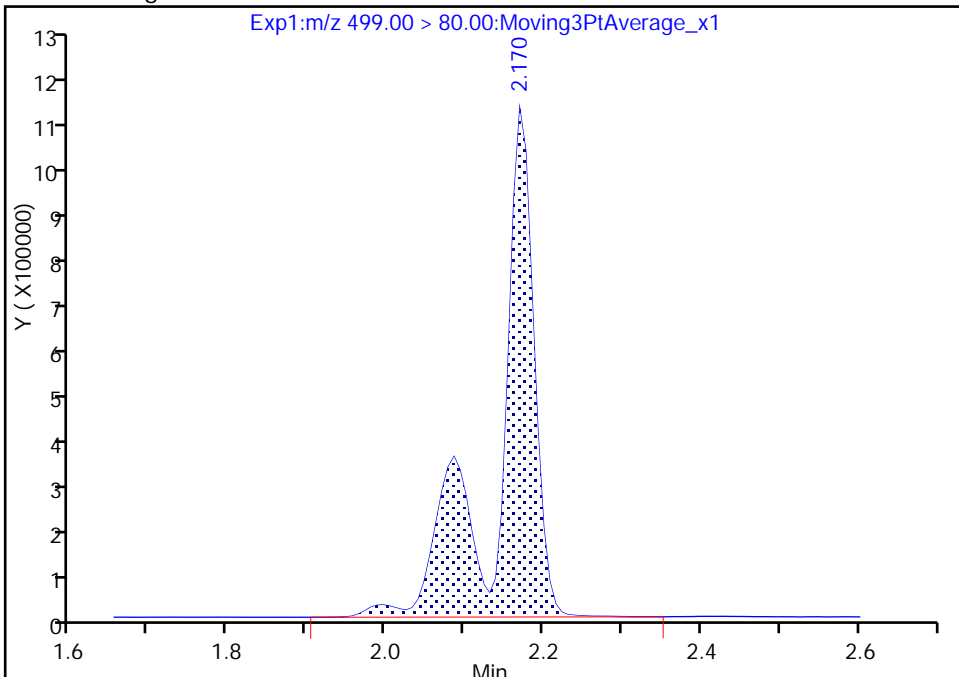
Not Detected
Expected RT: 2.17

Processing Integration Results



Manual Integration Results

RT: 2.17
Area: 3657034
Amount: 19.732709
Amount Units: ng/ml



Reviewer: barnettj, 15-Aug-2017 13:58:19
Audit Action: Assigned Compound ID

Audit Reason: Missed Peak

TestAmerica Sacramento

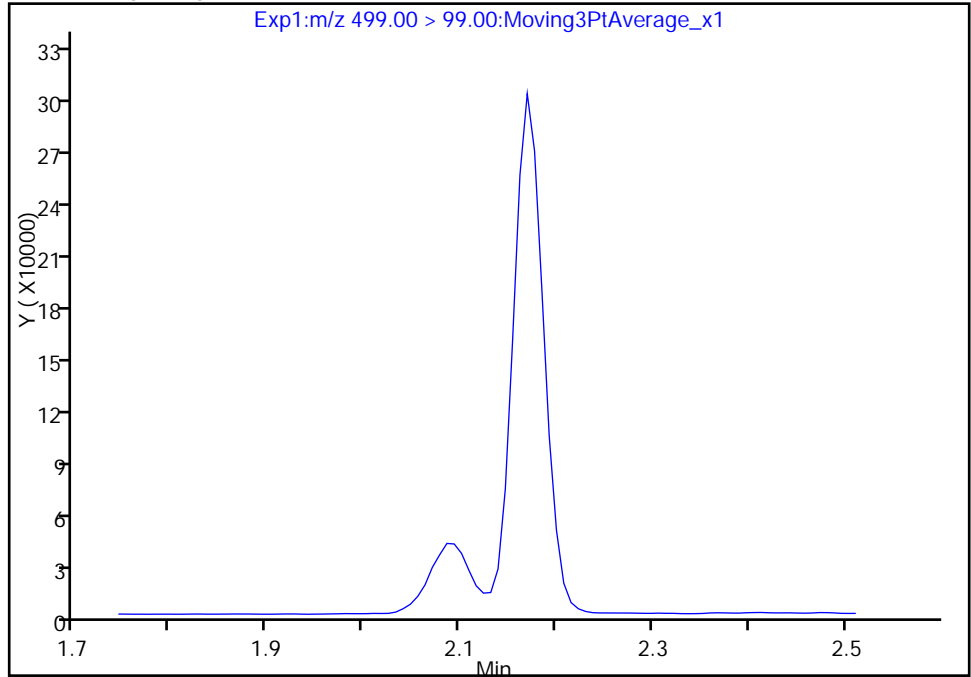
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Lims ID: CCV L3
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 18
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 2

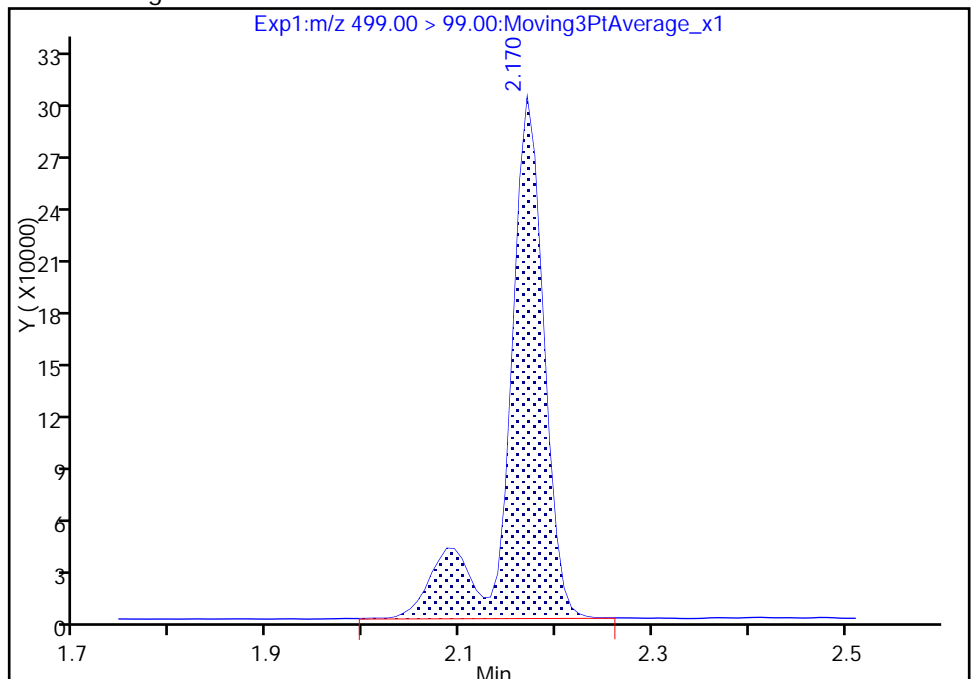
Not Detected
Expected RT: 2.17

Processing Integration Results



Manual Integration Results

RT: 2.17
Area: 773193
Amount: 19.732709
Amount Units: ng/ml



Reviewer: barnettj, 15-Aug-2017 13:58:41

Audit Action: Manually Integrated

Audit Reason: Missed Peak

TestAmerica Sacramento

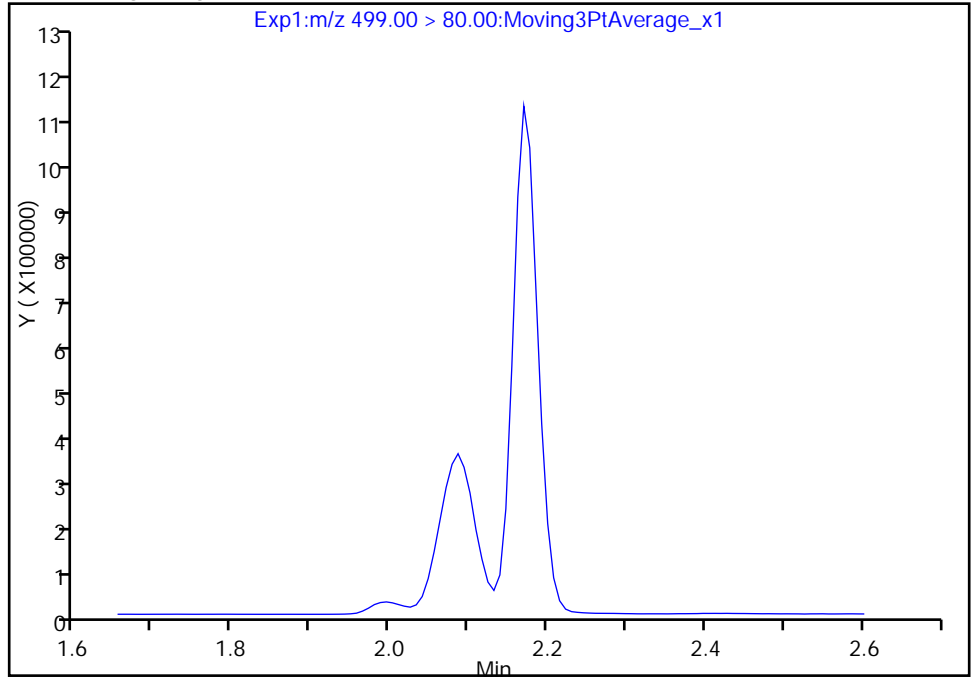
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Injection Date: 14-Aug-2017 20:44:54 Instrument ID: A8_N
Lims ID: CCV L3
Client ID:
Operator ID: SACINSTLCMS01 ALS Bottle#: 3 Worklist Smp#: 18
Injection Vol: 2.0 ul Dil. Factor: 1.0000
Method: 537_A8_N Limit Group: LC 537 ICAL
Column: Detector EXP1

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

Signal: 1

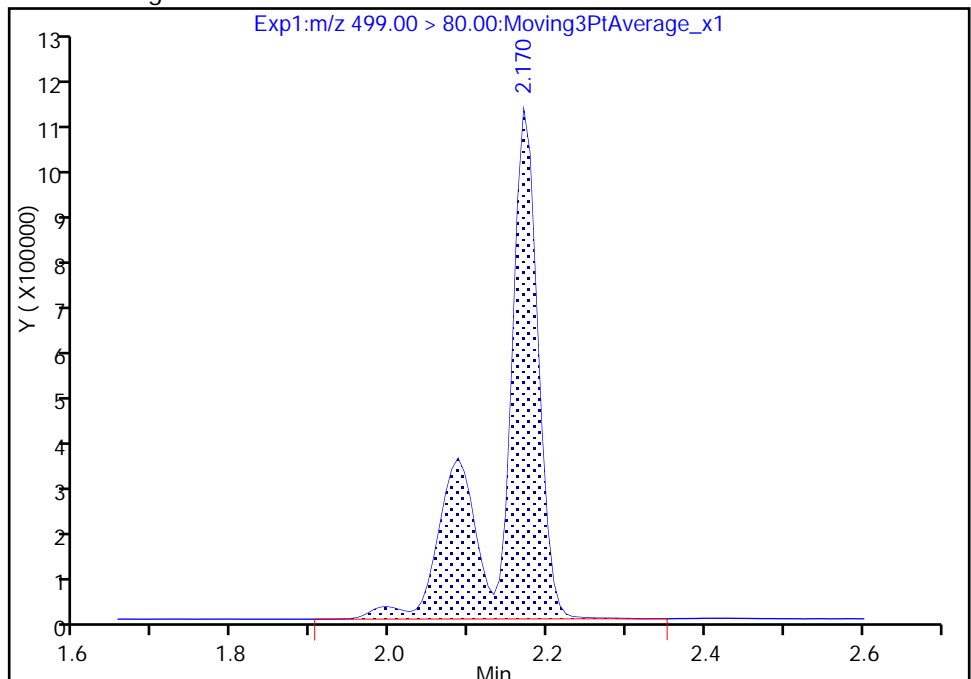
Not Detected
Expected RT: 2.17

Processing Integration Results



Manual Integration Results

RT: 2.17
Area: 3657034
Amount: 19.732709
Amount Units: ng/ml



Reviewer: barnettj, 15-Aug-2017 13:58:41

Audit Action: Manually Integrated

Audit Reason: Missed Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: MB 320-177417/1-A
 Matrix: Water Lab File ID: 2017.08.14_537B_003.d
 Analysis Method: 537 Date Collected: _____
 Extraction Method: 537 Date Extracted: 08/03/2017 10:02
 Sample wt/vol: 250 (mL) Date Analyzed: 08/14/2017 19:33
 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.: 179510 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	98		70-130
STL00996	13C2 PFDA	124		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\2017.08.14_537B_003.d
 Lims ID: MB 320-177417/1-A
 Client ID:
 Sample Type: MB
 Inject. Date: 14-Aug-2017 19:33:36 ALS Bottle#: 1 Worklist Smp#: 3
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: mb 320-177417/1-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 16-Aug-2017 14:14:15 Calib Date: 14-Aug-2017 13:12:40
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170814-46675.b\2017.08.14_537ICAL_007.d

Column 1 : Det: EXP1
 Process Host: XAWRK009

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
\$ 2 13C2 PFHxA	315.00 > 270.00	1.571	1.582	-0.012	1.000	2357589	9.80	8184	
* 6 13C2-PFOA	415.00 > 370.00	1.920	1.955	-0.035		2249354	10.0	8207	
* 7 13C4 PFOS	503.00 > 80.00	2.177	2.205	-0.028		6501071	28.7	4841	
\$ 10 13C2 PFDA	515.00 > 470.00	2.337	2.354	-0.017	1.000	1636879	12.4	9342	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\2017.08.14_537B_003.d

Injection Date: 14-Aug-2017 19:33:36

Instrument ID: A8_N

Lims ID: MB 320-177417/1-A

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 1

Worklist Smp#: 3

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

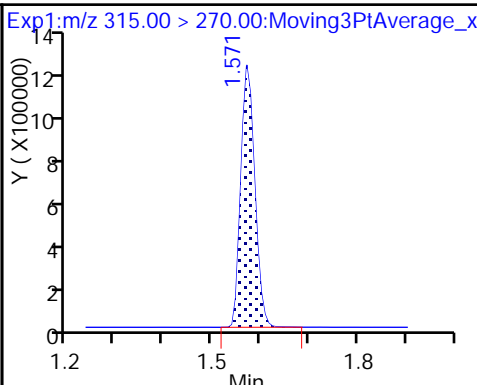
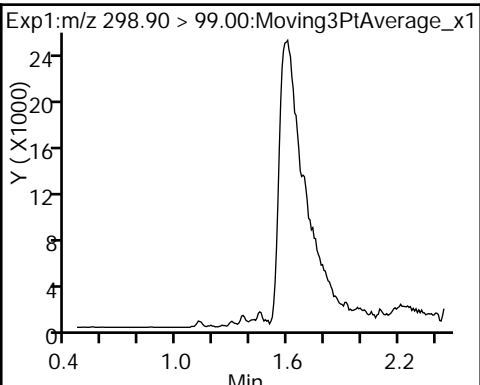
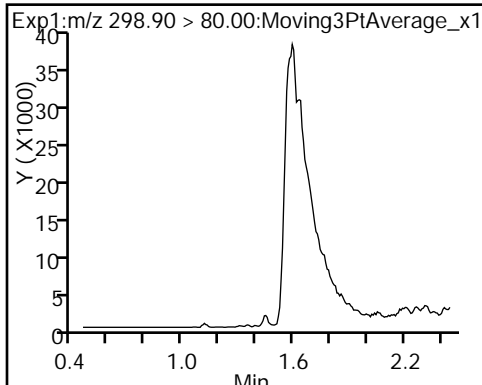
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

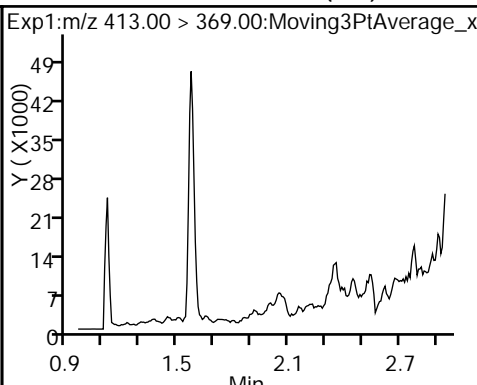
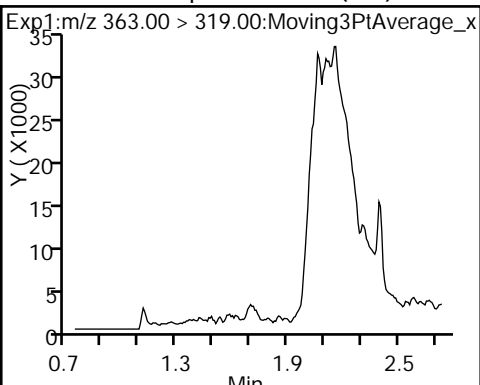
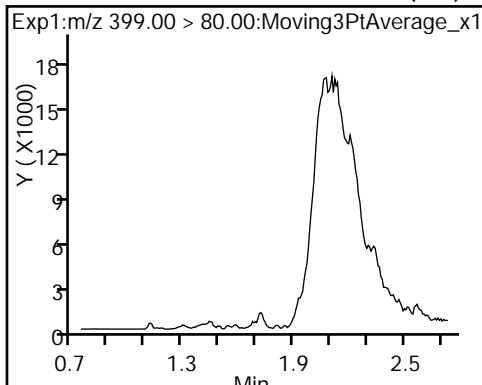
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (ND)

4 Perfluoroheptanoic acid (ND)

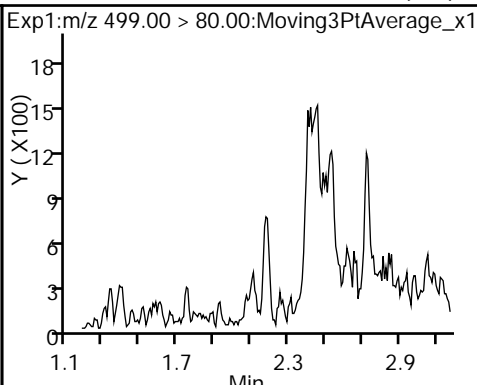
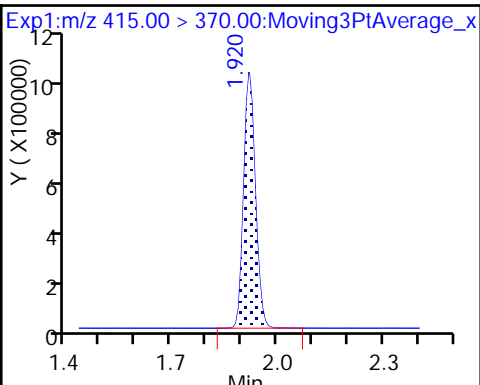
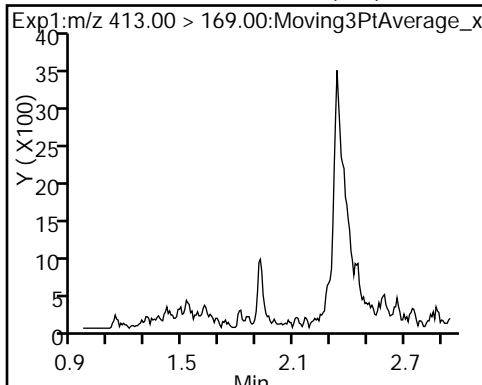
5 Perfluorooctanoic acid (ND)



5 Perfluorooctanoic acid (ND)

* 6 13C2-PFOA

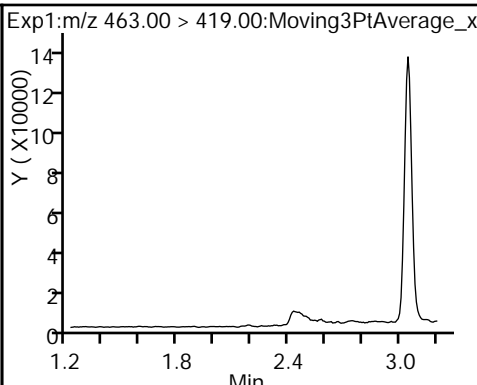
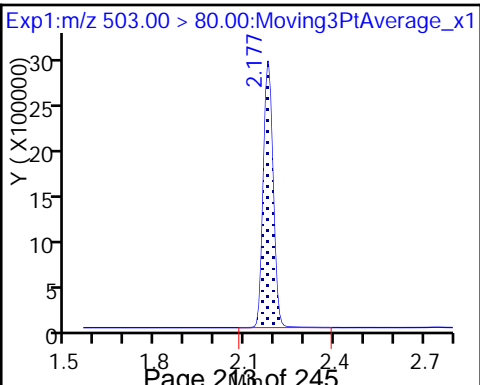
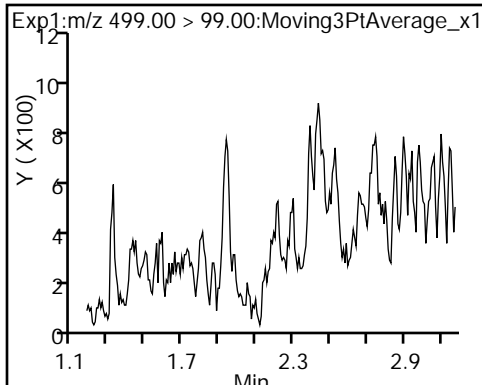
8 Perfluorooctane sulfonic acid (ND)



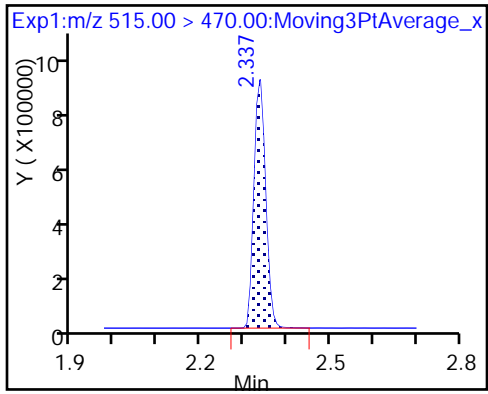
8 Perfluorooctane sulfonic acid (ND)

* 7 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\2017.08.14_537B_003.d
 Lims ID: MB 320-177417/1-A
 Client ID:
 Sample Type: MB
 Inject. Date: 14-Aug-2017 19:33:36 ALS Bottle#: 1 Worklist Smp#: 3
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: mb 320-177417/1-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 16-Aug-2017 14:14:15 Calib Date: 14-Aug-2017 13:12:40
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170814-46675.b\2017.08.14_537ICAL_007.d

Column 1 : Det: EXP1
 Process Host: XAWRK009

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.80	98.02
\$ 10 13C2 PFDA	10.0	12.4	123.83

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: LCS 320-177417/2-A
 Matrix: Water Lab File ID: 2017.08.14_537B_004.d
 Analysis Method: 537 Date Collected: _____
 Extraction Method: 537 Date Extracted: 08/03/2017 10:02
 Sample wt/vol: 250 (mL) Date Analyzed: 08/14/2017 19:38
 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.: 179510 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	323	E	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	144		20	8.0	2.8
375-95-1	Perfluorononanoic acid (PFNA)	164	E	24	20	8.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	201		30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	91.6	E	10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	589		90	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	94		70-130
STL00996	13C2 PFDA	116		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\2017.08.14_537B_004.d
 Lims ID: LCS 320-177417/2-A
 Client ID:
 Sample Type: LCS
 Inject. Date: 14-Aug-2017 19:38:21 ALS Bottle#: 2 Worklist Smp#: 4
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: lcs 320-177417/2-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 16-Aug-2017 14:14:15 Calib Date: 14-Aug-2017 13:12:40
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170814-46675.b\2017.08.14_537ICAL_007.d
 Column 1 : Det: EXP1
 Process Host: XAWRK009

First Level Reviewer: barnettj Date: 15-Aug-2017 13:59:27

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.449	1.453	-0.004	1.000	25374780	147.3		3094	
298.90 > 99.00	1.449	1.453	-0.004	1.000	18767378		1.35(0.00-0.00)	2316	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.571	1.582	-0.012	1.000	2266919	9.38		8407	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.722	1.742	-0.020	1.000	16302563	50.3		2014	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.722	1.742	-0.020	1.000	4429408	22.9		377	E
5 Perfluorooctanoic acid									
413.00 > 369.00	1.920	1.955	-0.035	1.000	7378095	36.0		426	
413.00 > 169.00	1.920	1.955	-0.035	1.000	4071300		1.81(0.00-0.00)	5045	
* 6 13C2-PFOA									
415.00 > 370.00	1.920	1.955	-0.035		2259712	10.0		8207	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.177	2.170	0.007	1.000	16165376	80.7		6013	E
499.00 > 99.00	2.177	2.170	0.007	1.000	3777395		4.28(0.00-0.00)	2735	E
* 7 13C4 PFOS									
503.00 > 80.00	2.177	2.205	-0.028		6216901	28.7		4842	
9 Perfluorononanoic acid									
463.00 > 419.00	2.185	2.213	-0.028	1.000	5243776	41.0		534	E
\$ 10 13C2 PFDA									
515.00 > 470.00	2.337	2.354	-0.017	1.000	1542917	11.6		9923	

[QC Flag Legend](#)

Processing Flags

E - Exceeded Maximum Amount

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\2017.08.14_537B_004.d

Injection Date: 14-Aug-2017 19:38:21

Instrument ID: A8_N

Lims ID: LCS 320-177417/2-A

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 2

Worklist Smp#: 4

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

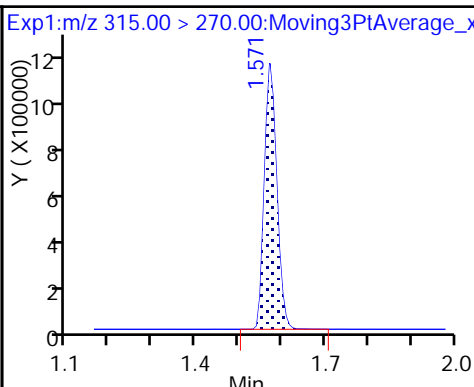
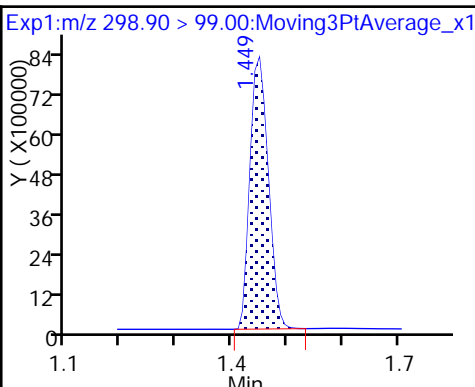
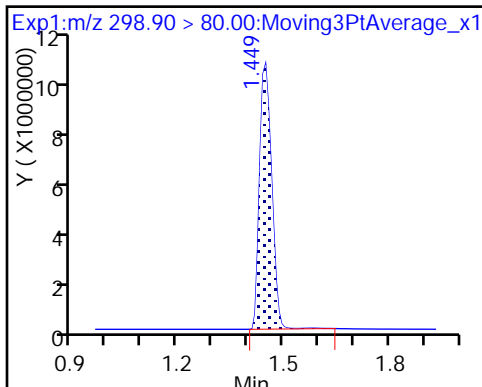
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

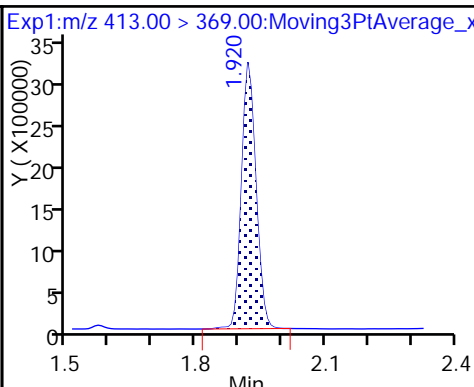
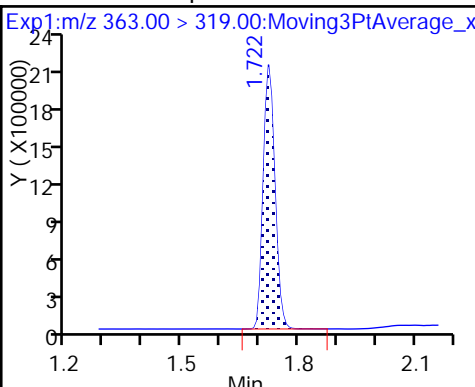
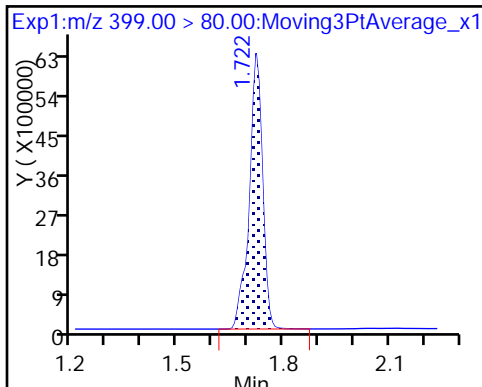
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

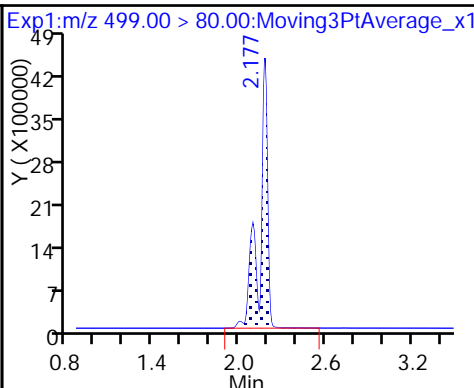
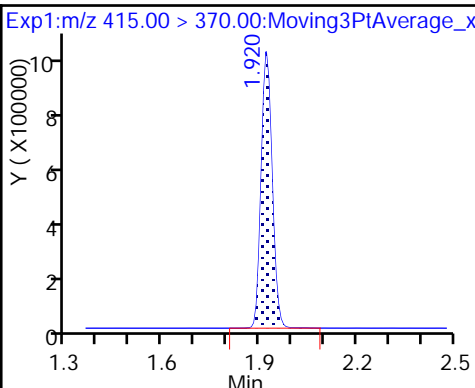
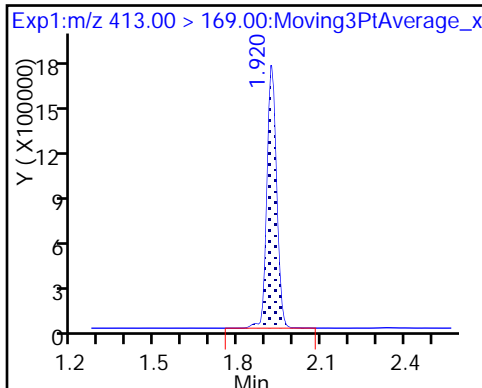
5 Perfluorooctanoic acid



5 Perfluorooctanoic acid

* 6 13C2-PFOA

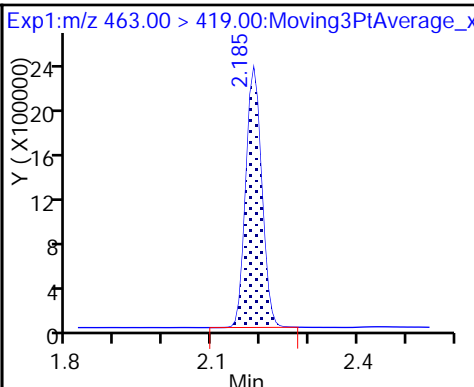
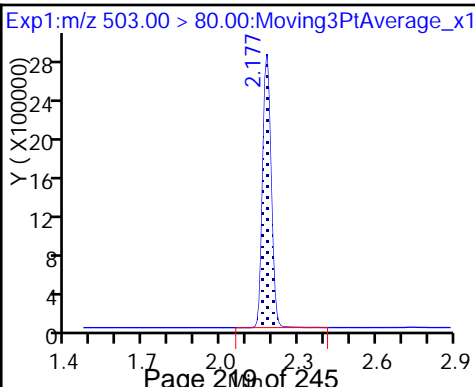
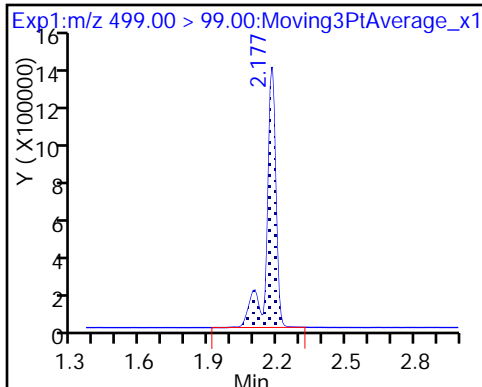
8 Perfluorooctane sulfonic acid



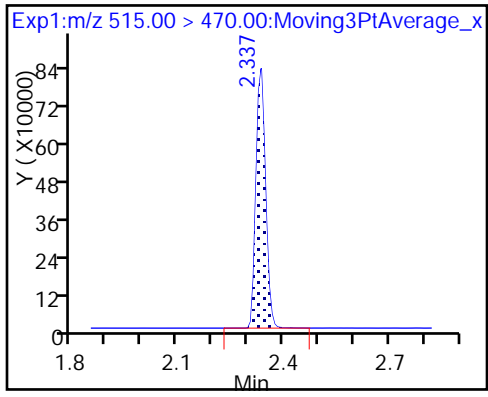
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\2017.08.14_537B_004.d
 Lims ID: LCS 320-177417/2-A
 Client ID:
 Sample Type: LCS
 Inject. Date: 14-Aug-2017 19:38:21 ALS Bottle#: 2 Worklist Smp#: 4
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: lcs 320-177417/2-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 16-Aug-2017 14:14:15 Calib Date: 14-Aug-2017 13:12:40
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170814-46675.b\2017.08.14_537ICAL_007.d
 Column 1 : Det: EXP1
 Process Host: XAWRK009

First Level Reviewer: barnettj Date: 15-Aug-2017 13:59:27

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.38	93.82
\$ 10 13C2 PFDA	10.0	11.6	116.19

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: LCSD 320-177417/3-A
 Matrix: Water Lab File ID: 2017.08.14_537B_005.d
 Analysis Method: 537 Date Collected: _____
 Extraction Method: 537 Date Extracted: 08/03/2017 10:02
 Sample wt/vol: 250 (mL) Date Analyzed: 08/14/2017 19:43
 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.: 179510 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	315		40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	145		20	8.0	2.8
375-95-1	Perfluorononanoic acid (PFNA)	172	E	24	20	8.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	198		30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	89.2	E	10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	575		90	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	97		70-130
STL00996	13C2 PFDA	132	Q	70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\2017.08.14_537B_005.d
 Lims ID: LCSD 320-177417/3-A
 Client ID:
 Sample Type: LCSD
 Inject. Date: 14-Aug-2017 19:43:06 ALS Bottle#: 3 Worklist Smp#: 5
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: lcsd 320-177417/3-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 16-Aug-2017 14:14:15 Calib Date: 14-Aug-2017 13:12:40
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170814-46675.b\2017.08.14_537ICAL_007.d
 Column 1 : Det: EXP1
 Process Host: XAWRK009

First Level Reviewer: barnettj Date: 15-Aug-2017 14:00:01

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.442	1.453	-0.011	1.000	24986038	143.6		3006	
298.90 > 99.00	1.442	1.453	-0.011	1.000	18502070		1.35(0.00-0.00)	3543	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.571	1.582	-0.012	1.000	2272556	9.67		9175	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.722	1.742	-0.020	1.000	16021765	49.5		1913	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.722	1.742	-0.020	1.000	4194535	22.3		365	E
5 Perfluorooctanoic acid									
413.00 > 369.00	1.912	1.955	-0.043	1.000	7211013	36.2		417	
413.00 > 169.00	1.912	1.955	-0.043	1.000	3950573		1.83(0.00-0.00)	4399	
* 6 13C2-PFOA									
415.00 > 370.00	1.912	1.955	-0.043		2198507	10.0		7845	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.170	2.170	0.0	1.000	15745089	78.7		5521	
499.00 > 99.00	2.170	2.170	0.0	1.000	3710726		4.24(0.00-0.00)	2525	
* 7 13C4 PFOS									
503.00 > 80.00	2.170	2.205	-0.035		6213934	28.7		3652	
9 Perfluorononanoic acid									
463.00 > 419.00	2.177	2.213	-0.036	1.000	5341524	42.9		305	E
\$ 10 13C2 PFDA									
515.00 > 470.00	2.329	2.354	-0.025	1.000	1700951	13.2		10839	

[QC Flag Legend](#)

Processing Flags

E - Exceeded Maximum Amount

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\2017.08.14_537B_005.d

Injection Date: 14-Aug-2017 19:43:06

Instrument ID: A8_N

Lims ID: LCSD 320-177417/3-A

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 3

Worklist Smp#: 5

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

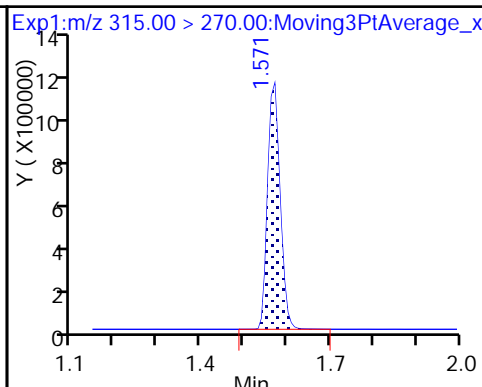
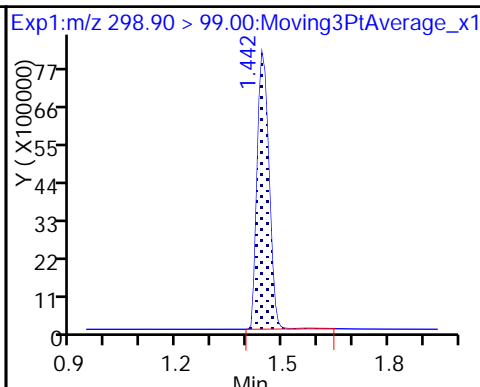
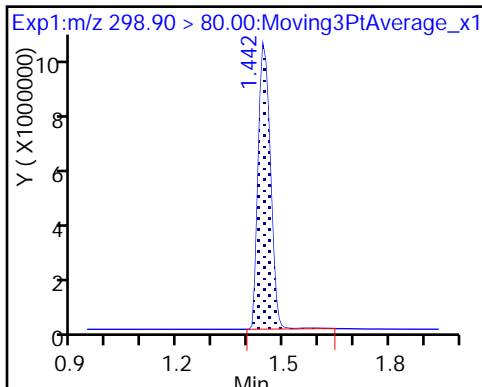
Method: 537_A8_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

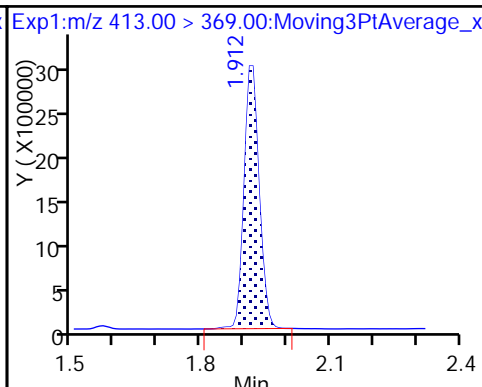
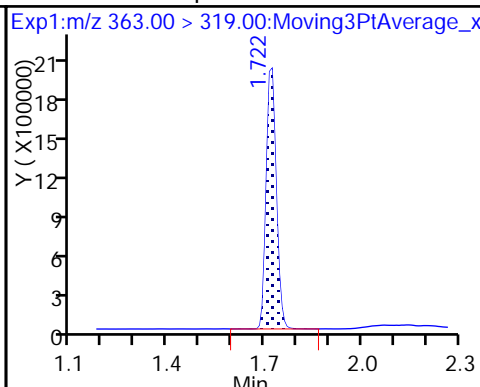
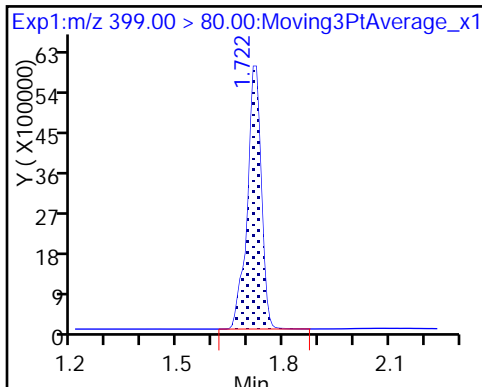
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

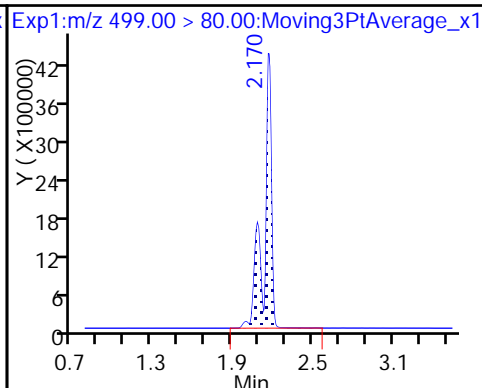
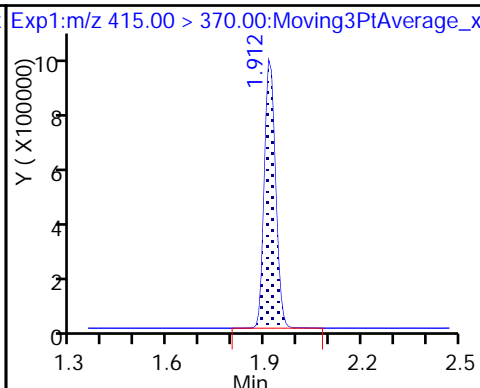
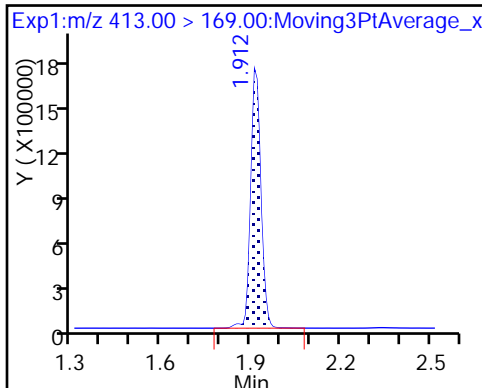
5 Perfluorooctanoic acid



5 Perfluorooctanoic acid

* 6 13C2-PFOA

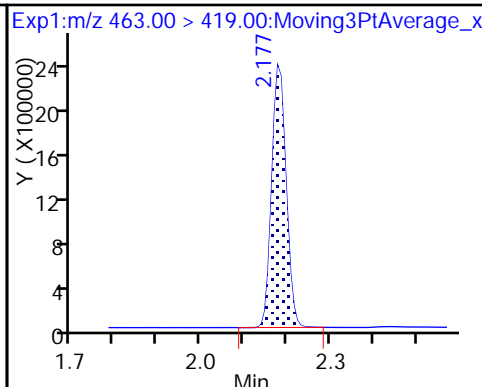
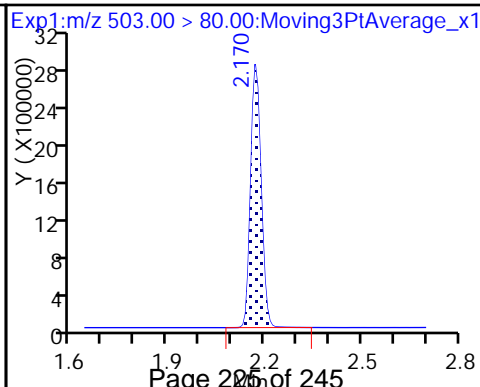
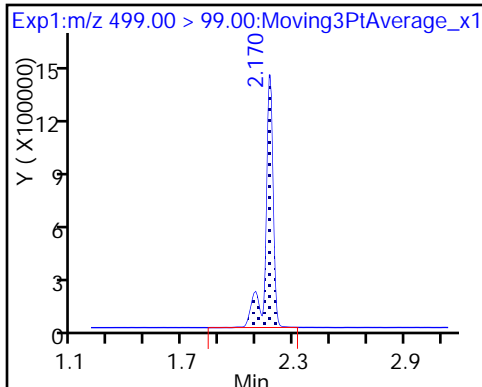
8 Perfluorooctane sulfonic acid



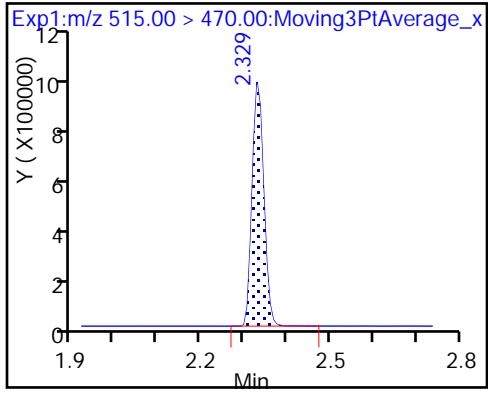
8 Perfluorooctane sulfonic acid

* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\2017.08.14_537B_005.d
 Lims ID: LCSD 320-177417/3-A
 Client ID:
 Sample Type: LCSD
 Inject. Date: 14-Aug-2017 19:43:06 ALS Bottle#: 3 Worklist Smp#: 5
 Injection Vol: 2.0 ul Dil. Factor: 1.0000
 Sample Info: lcsd 320-177417/3-a
 Misc. Info.: Plate: 1 Rack: 3
 Operator ID: SACINSTLCMS01 Instrument ID: A8_N
 Method: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b\537_A8_N.m
 Limit Group: LC 537 ICAL
 Last Update: 16-Aug-2017 14:14:15 Calib Date: 14-Aug-2017 13:12:40
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20170814-46675.b\2017.08.14_537ICAL_007.d
 Column 1 : Det: EXP1
 Process Host: XAWRK009

First Level Reviewer: barnettj Date: 15-Aug-2017 14:00:01

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.67	96.67
\$ 10 13C2 PFDA	10.0	13.2	131.65

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1

SDG No.: _____

Instrument ID: A8_N Start Date: 08/14/2017 12:48

Analysis Batch Number: 179319 End Date: 08/14/2017 13:31

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-179319/2		08/14/2017 12:48	1	2017.08.14_537I CAL 002.d	GeminiC18 3x100 3(mm)
IC 320-179319/3		08/14/2017 12:53	1	2017.08.14_537I CAL 003.d	GeminiC18 3x100 3(mm)
IC 320-179319/4		08/14/2017 12:58	1	2017.08.14_537I CAL 004.d	GeminiC18 3x100 3(mm)
IC 320-179319/5 ICISAV		08/14/2017 13:03	1	2017.08.14_537I CAL 005.d	GeminiC18 3x100 3(mm)
IC 320-179319/6		08/14/2017 13:07	1	2017.08.14_537I CAL 006.d	GeminiC18 3x100 3(mm)
IC 320-179319/7		08/14/2017 13:12	1	2017.08.14_537I CAL 007.d	GeminiC18 3x100 3(mm)
ZZZZZ		08/14/2017 13:17	1		GeminiC18 3x100 3(mm)
CCVL 320-179319/9		08/14/2017 13:22	1	2017.08.14_537I CAL 009.d	GeminiC18 3x100 3(mm)
ZZZZZ		08/14/2017 13:26	1		GeminiC18 3x100 3(mm)
ICV 320-179319/11		08/14/2017 13:31	1	2017.08.14_537I CAL 011.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1

SDG No.: _____

Instrument ID: A8_N Start Date: 08/14/2017 19:24

Analysis Batch Number: 179510 End Date: 08/14/2017 20:21

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-179510/1 CCVIS ZZZZZ		08/14/2017 19:24	1	2017.08.14_537B 001.d	GeminiC18 3x100 3(mm)
MB 320-177417/1-A		08/14/2017 19:33	1	2017.08.14_537B 003.d	GeminiC18 3x100 3(mm)
LCS 320-177417/2-A		08/14/2017 19:38	1	2017.08.14_537B 004.d	GeminiC18 3x100 3(mm)
LCSD 320-177417/3-A		08/14/2017 19:43	1	2017.08.14_537B 005.d	GeminiC18 3x100 3(mm)
320-30142-1		08/14/2017 19:47	1	2017.08.14_537B 006.d	GeminiC18 3x100 3(mm)
320-30142-2		08/14/2017 19:52	1	2017.08.14_537B 007.d	GeminiC18 3x100 3(mm)
320-30142-3		08/14/2017 19:57	1	2017.08.14_537B 008.d	GeminiC18 3x100 3(mm)
320-30142-4		08/14/2017 20:02	1	2017.08.14_537B 009.d	GeminiC18 3x100 3(mm)
320-30142-5		08/14/2017 20:06	1	2017.08.14_537B 010.d	GeminiC18 3x100 3(mm)
320-30142-6		08/14/2017 20:11	1	2017.08.14_537B 011.d	GeminiC18 3x100 3(mm)
320-30142-7		08/14/2017 20:16	1	2017.08.14_537B 012.d	GeminiC18 3x100 3(mm)
CCV 320-179510/13 CCVIS		08/14/2017 20:21	1	2017.08.14_537B 013.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1

SDG No.: _____

Instrument ID: A8_N Start Date: 08/14/2017 20:21

Analysis Batch Number: 179511 End Date: 08/14/2017 20:44

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-179511/13 CCVIS		08/14/2017 20:21	1	2017.08.14_537B 013.d	GeminiC18 3x100 3(mm)
ZZZZZ		08/14/2017 20:25	1		GeminiC18 3x100 3(mm)
320-30142-8		08/14/2017 20:30	1	2017.08.14_537B 015.d	GeminiC18 3x100 3(mm)
CCV 320-179511/18 CCVIS		08/14/2017 20:44	1	2017.08.14_537B 018.d	GeminiC18 3x100 3(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1

SDG No.: _____

Batch Number: 177417 Batch Start Date: 08/03/17 10:02 Batch Analyst: Branscum, Cassie

Batch Method: 537 Batch End Date: 08/04/17 21:08

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	ReceivedpH	LC537-HSP 00018
MB 320-177417/1		537, 537				250 mL	1.00 mL	7 SU	
LCS 320-177417/2		537, 537				250 mL	1.00 mL	7 SU	100 uL
LCSD 320-177417/3		537, 537				250 mL	1.00 mL	7 SU	100 uL
320-30142-A-1	NAWC-072517-RW-331	537, 537	T	278.99 g	28.48 g	250.5 mL	1.00 mL	7 SU	
320-30142-A-2	NAWC-072517-FRB-331	537, 537	T	275.17 g	28.52 g	246.7 mL	1.00 mL	7 SU	
320-30142-A-3	NAWC-072517-RW-334	537, 537	T	286.01 g	29.36 g	256.7 mL	1.00 mL	7 SU	
320-30142-A-4	NAWC-072517-FRB-334	537, 537	T	274.19 g	27.88 g	246.3 mL	1.00 mL	7 SU	
320-30142-A-5	NAWC-072517-RW-347	537, 537	T	283.69 g	28.65 g	255 mL	1.00 mL	7 SU	
320-30142-A-6	NAWC-072517-FRB-347	537, 537	T	291.31 g	28.61 g	262.7 mL	1.00 mL	7 SU	
320-30142-A-7	NAWC-072517-RW-335	537, 537	T	287.28 g	28.23 g	259.1 mL	1.00 mL	7 SU	
320-30142-A-8	NAWC-072517-FRB-335	537, 537	T	286.99 g	27.71 g	259.3 mL	1.00 mL	7 SU	

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-IS 00044	LC537-SU 00046	AnalysisComment			
MB 320-177417/1		537, 537		100 uL	100 uL	ch nd			
LCS 320-177417/2		537, 537		100 uL	100 uL	ch nd			
LCSD 320-177417/3		537, 537		100 uL	100 uL	ch nd			
320-30142-A-1	NAWC-072517-RW-331	537, 537	T	100 uL	100 uL	ch nd			
320-30142-A-2	NAWC-072517-FRB-331	537, 537	T	100 uL	100 uL	ch nd			
320-30142-A-3	NAWC-072517-RW-334	537, 537	T	100 uL	100 uL	ch nd			
320-30142-A-4	NAWC-072517-FRB-334	537, 537	T	100 uL	100 uL	ch nd			
320-30142-A-5	NAWC-072517-RW-347	537, 537	T	100 uL	100 uL	ch nd			
320-30142-A-6	NAWC-072517-FRB-347	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.: 320-30142-1

SDG No.: _____

Batch Number: 177417 Batch Start Date: 08/03/17 10:02 Batch Analyst: Branscum, Cassie

Batch Method: 537 Batch End Date: 08/04/17 21:08

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-IS 00044	LC537-SU 00046	AnalysisComment			
320-30142-A-7	NAWC-072517-RW-335	537, 537	T	100 uL	100 uL	ch nd			
320-30142-A-8	NAWC-072517-FRB-335	537, 537	T	100 uL	100 uL	ch nd			

Batch Notes	
Batch Comment	IS:975029/1002798
Manifold ID	3,9
Methanol ID	988835
Pipette ID	M16387D
Analyst ID - IS Reagent Drop	JER/CCB
Analyst ID - IS Reagent Drop Witness	TN
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	6357081-02
Trizma ID	SLBR4303V
Reagent Water ID	8-1-17

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

A8

Job No: 30142, 30136 Instrument ID & Date: 8-14-17 ICAL Batch: 179319
 Extraction Batch: 177417 Worklist #: 46718, 46765 TALS Batch: 179510, 179511, 179701

Review Items	— Level 1 —			Level 2
	Yes	No	N/A	
Initial Calibration				
1. Is ICAL verified and locked in Chrom & TALS?	✓			✓
2. Is ICV properly linked in TALS?	✓			✓
Continuing Calibration				
1. Low-range CCV injected at start of analytical run? CCV injected after every 10 samples and at the end of the analytical run and alternated between Low-range, Mid-range and High-range?	✓			✓
2. If sequence was not after an ICAL was a low and mid range CCV injected at the start of the analytical run?	✓			✓
3. Native compounds and surrogates in control? Low-range within ±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	NCM ✓			✓
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 8-16-17 2nd Level Reviewer / Date: Melroy Ritzdorf

NCM # and Comments: 97843, 97844, 97852, 97853

A8

Instrument ID & Date: 8-14-17 Worklist#: 46675

ICAL Batch: 179319, 179320 Calibration ID number: 33517

Review Items	--- Level 1 ---			Level 2
	Yes	No	N/A	
Initial Calibration				
1. Mass calibration, as needed, verified by full scan of PFC stock standard. All PFC ions used for quantitation are within 0.3 m/z of true mass?	✓			✓
2. Responses increase with increasing concentration?	✓			✓
3. Fit used (circle): <u>Average</u> Linear (1/x ²)Linear <u>Quadratic</u> (6 points minimum)				
4. Meets fit criteria? Intercept ≤ ½ RL RSD ≤ 30% for Average R ² ≥ 0.990 for Linear R ² ≥ 0.990 for Quadratic NOTE: "Force through Zero" must be used and weighted if needed	✓			✓
5. If quadratic fit used the curve does not "bend over".	✓			✓
6. Feed calibration points into the calculated curve. Are points ≤MRL within ±50% of true value? Are points >MRL within ±30% of true value?	✓			✓
7. Any carryover from the high calibration point must be ≤ 1/3 RL	✓			✓
8. Asymmetry check meets criteria for the first two eluting peaks? (0.8 - 1.5).	✓			✓
9. Is the asymmetry check scanned and linked in TALS to the calibration point?	✓			✓
10. Is ICV (2 nd source) ± 30% of true value?	✓			✓
11. Is ICV (2 nd source) internal standards ±50% of average area of the ICAL?	✓			✓
12. ICAL locked in Chrom and uploaded to TALS?	✓			
13. ICAL locked in TALS and scanned?				✓

1st Level Reviewer / Date: JRB 8-14-17

2nd Level Reviewer / Date: caw 8/14/17

NCM # and Comments: _____

TestAmerica Laboratories
Worklist QC Batch Report

Worklist Name: 14AUG2017_537C

Worklist Number: 46718

Instrument Name: A8_N

Chrom Method: 537_A8_N

Data Directory: \\ChromNa\Sacramento\ChromData\A8_N\20170815-46718.b

QC Batching: Enabled

Limit Group Batching: Enabled

QC Batch: 1	LC 537 ICAL Raw Batch: 179510
# 1 CCV L3	# 1 CCV L3
# 2 RB	# 2 RB
# 3 MB 320-177417/1-A	# 3 MB 320-177417/1-A
# 4 LCS 320-177417/2-A	# 4 LCS 320-177417/2-A
# 5 LCSD 320-177417/3-A	# 5 LCSD 320-177417/3-A
# 6 320-30142-A-1-A	# 6 320-30142-A-1-A
# 7 320-30142-A-2-A	# 7 320-30142-A-2-A
# 8 320-30142-A-3-A	# 8 320-30142-A-3-A
# 9 320-30142-A-4-A	# 9 320-30142-A-4-A
#10 320-30142-A-5-A	#10 320-30142-A-5-A
#11 320-30142-A-6-A	#11 320-30142-A-6-A
#12 320-30142-A-7-A	#12 320-30142-A-7-A
#13 CCV L5	#13 CCV L5

QC Batch: 2	LC 537 ICAL Raw Batch: 179511
#13 CCV L5	#13 CCV L5
#14 RB	#14 RB
#15 320-30142-A-8-A	#15 320-30142-A-8-A
#16 320-30136-A-1-B	#16 320-30136-A-1-B
#17 320-30136-A-2-B	#17 320-30136-A-2-B
#18 CCV L3	#18 CCV L3
#19 RB	#19 RB

} No IS.

TestAmerica Laboratories
Worklist QC Batch Report

Worklist Name: 16AUG2017_537C Worklist Number: 46765
Instrument Name: A8_N Chrom Method: 537_A8_N
Data Directory: \\ChromNa\Sacramento\ChromData\A8_N\20170816-46765.b
QC Batching: Enabled Limit Group Batching: Enabled

QC Batch: 1	LC 537 ICAL Raw Batch: 179700
# 1 CCV L5	# 1 CCV L5
# 2 RB	# 2 RB
# 3 MB 320-177904/1-A	# 3 MB 320-177904/1-A
# 4 LCS 320-177904/2-A	# 4 LCS 320-177904/2-A
# 5 LCSD 320-177904/3-A	# 5 LCSD 320-177904/3-A
# 6 320-29930-B-11-A	# 6 320-29930-B-11-A
# 7 320-29930-B-12-A	# 7 320-29930-B-12-A
# 8 320-30327-A-1-A	# 8 320-30327-A-1-A
# 9 320-30327-A-2-A	# 9 320-30327-A-2-A
#10 320-30327-A-3-A	#10 320-30327-A-3-A
#11 320-30327-A-4-A	#11 320-30327-A-4-A
#12 320-30327-A-5-A	#12 320-30327-A-5-A
#13 CCV L3	#13 CCV L3

QC Batch: 2	LC 537 ICAL Raw Batch: 179701
#13 CCV L3	#13 CCV L3
#14 RB	#14 RB
#15 320-30327-A-6-A	#15 320-30327-A-6-A
#16 RINSE	#16 RINSE
#17 LCSD 320-177417/3-A	#17 LCSD 320-177417/3-A
#18 320-30142-A-8-A	#18 320-30142-A-8-A
#19 320-30136-A-1-B	#19 320-30136-A-1-B
#20 320-30136-A-2-B	#20 320-30136-A-2-B
#21 320-30136-A-1-B	#21 320-30136-A-1-B
#22 320-30136-A-2-B	#22 320-30136-A-2-B
#23 CCV L5	#23 CCV L5
#24 RB	#24 RB

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Aqueous Extraction Analysis Sheet

RI 8/16/17

(To Accompany Samples to Instruments)

Batch Number: 320-177417

Analyst: Branscum, Cassie

Batch Open: 8/3/2017 10:02:00AM

Method Code: 320-537_Prep-320

Batch End: 8/4/2017 9:08:00PM

8/23

Extraction of Perfluorinated Alkyl Acids

Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmnt FinAmnt	Rcvd	PHs Adj1	Adj2	Due Date	Analytical TAT	Div Rank	Comments	Output Sample Lab ID
1 MB-320-177417/1 N/A	N/A		250 mL	7			N/A	N/A	N/A	ch nd	
			1.00 mL								
2 LCS-320-177417/2 N/A	N/A		250 mL	7			N/A	N/A	N/A	ch nd	
			1.00 mL								
3 LCSD-320-177417/3 N/A	N/A		250 mL	7			N/A	N/A	N/A	ch nd RI	
			1.00 mL								
4 320-30142-A-1 (537_DOD5)	N/A (320-30142-1)	278.99 g	250.5 mL	7			8/1/17	16_Days	4	ch nd	
		28.48 g	1.00 mL								
5 320-30142-A-2 (537_DOD5)	N/A (320-30142-1)	275.17 g	246.7 mL	7			8/1/17	16_Days	4	ch nd	
		28.52 g	1.00 mL								
6 320-30142-A-3 (537_DOD5)	N/A (320-30142-1)	286.01 g	256.7 mL	7			8/1/17	16_Days	4	ch nd	
		29.36 g	1.00 mL								
7 320-30142-A-4 (537_DOD5)	N/A (320-30142-1)	274.19 g	246.3 mL	7			8/1/17	16_Days	4	ch nd	
		27.88 g	1.00 mL								
8 320-30142-A-5 (537_DOD5)	N/A (320-30142-1)	283.69 g	255 mL	7			8/1/17	16_Days	4	ch nd	
		28.65 g	1.00 mL								
9 320-30142-A-6 (537_DOD5)	N/A (320-30142-1)	291.31 g	262.7 mL	7			8/1/17	16_Days	4	ch nd	
		28.61 g	1.00 mL								
10 320-30142-A-7 (537_DOD5)	N/A (320-30142-1)	287.28 g	259.1 mL	7			8/1/17	16_Days	4	ch nd	
		28.23 g	1.00 mL								

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)




Batch Number: 320-177417

Analyst: Branscum, Cassie

Batch Open: 8/3/2017 10:02:00AM

Method Code: 320-537_Prep-320

Batch End: 8/4/2017 9:08:00PM

11	320-30142-A-8 (537_DOD5)	N/A (320-30142-1)	286.99 g	259.3 mL	7			8/1/17	16_Days	4	ch nd	<i>RI</i>	
			27.71 g	1.00 mL									
12	320-30136-A-1 (537_DOD5)	N/A (320-30136-1)	284.32 g	256.1 mL	7			8/1/17	16_Days	4	ch nd	<i>RI</i>	
			28.18 g	1.00 mL									
13	320-30136-A-2 (537_DOD5)	N/A (320-30136-1)	286.87 g	258.6 mL	7			8/1/17	16_Days	4	ch nd	<i>RI</i>	
			28.31 g	1.00 mL									

Batch Notes

Manifold ID 3,9

Trizma ID SLBR4303V

SPE Cartridge ID 6357081-02

Methanol ID 988835

Reagent Water ID 8-1-17

Pipette ID M16387D

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/CCB

Analyst ID - IS Reagent Drop Witness TN

Batch Comment IS:975029/1002798

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-177417

Analyst: Branscum, Cassie

Batch Open: 8/3/2017 10:02:00AM

Method Code: 320-537_Prep-320

Batch End:

Comments

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-177417

Analyst: Branscum, Cassie

Batch Open: 8/3/2017 10:02:00AM

Method Code: 320-537_Prep-320

Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-177417/1	LC537-SU_00046	100 uL	1.00 mL	<i>CAS 8-3-17</i> 	<i>JNS 8/3/17</i>
LCS 320-177417/2	LC537-HSP_00018	100 uL	1.00 mL		
LCS 320-177417/2	LC537-SU_00046	100 uL	1.00 mL		
LCSD 320-177417/3	LC537-HSP_00018	100 uL	1.00 mL		
LCSD 320-177417/3	LC537-SU_00046	100 uL	1.00 mL		
320-30142-A-1	LC537-SU_00046	100 uL	1.00 mL		
320-30142-A-2	LC537-SU_00046	100 uL	1.00 mL		
320-30142-A-3	LC537-SU_00046	100 uL	1.00 mL		
320-30142-A-4	LC537-SU_00046	100 uL	1.00 mL		
320-30142-A-5	LC537-SU_00046	100 uL	1.00 mL		
320-30142-A-6	LC537-SU_00046	100 uL	1.00 mL		
320-30142-A-7	LC537-SU_00046	100 uL	1.00 mL		
320-30142-A-8	LC537-SU_00046	100 uL	1.00 mL		
320-30136-A-2	LC537-SU_00046	100 uL	1.00 mL		
320-30136-A-1	LC537-SU_00046	100 uL	1.00 mL		

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Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-177417

Analyst: Branscum, Cassie

Batch Open: 8/3/2017 10:02:00AM

Method Code: 320-537_Prep-320

Batch End:

Other Reagents:		
Reagent	Amount/Units	Lot#:

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Preparation Batch Number(s): 177417 Test: 537 - DOD5
 Earliest Holding Time: 8-8-17

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

1st Level Reviewer: TN

Date: 08/04/17

2nd Level Reviewer: NSH

Date: 8/5/17

Comments: _____

Shipping and Receiving Documents

Login Sample Receipt Checklist

Client: Tetra Tech, Inc.

Job Number: 320-30142-1

Login Number: 30142

List Source: TestAmerica Sacramento

List Number: 1

Creator: Turpen, Troy

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

"NAWC-072517-RW-331","537","RES","320-30142-1","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","18","ng/L","J","6.8","DL","","TRG","","","40","LOQ","YES","-99","","250.5","1.00","16",""
"NAWC-072517-RW-331","537","RES","320-30142-1","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","14","ng/L","J M","2.8","DL","","TRG","","","20","LOQ","YES","-99","","250.5","1.00","8.0",""
"NAWC-072517-RW-331","537","RES","320-30142-1","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","12","ng/L","U","5.5","DL","","TRG","","","30","LOQ","YES","-99","","250.5","1.00","12",""
"NAWC-072517-RW-331","537","RES","320-30142-1","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","36","ng/L","U","16","DL","","TRG","","","90","LOQ","YES","-99","","250.5","1.00","36",""
"NAWC-072517-RW-331","537","RES","320-30142-1","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","4.7","ng/L","J","1.9","DL","","TRG","","","10","LOQ","YES","-99","","250.5","1.00","4.0",""
"NAWC-072517-RW-331","537","RES","320-30142-1","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","20","ng/L","U","8.0","DL","","TRG","","","24","LOQ","YES","-99","","250.5","1.00","20",""
"NAWC-072517-RW-331","537","RES","320-30142-1","TALSAC","STL00993","13C2
PFHxA","31","ng/L","","-99","DL","","SURR","77","","-99","LOQ","YES","39.9","","250.5","1.00","0",""
"NAWC-072517-RW-331","537","RES","320-30142-1","TALSAC","STL00996","13C2
PFDA","46","ng/L","","-99","DL","","SURR","114","","-99","LOQ","YES","39.9","","250.5","1.00","0",""
"NAWC-072517-FRB-331","537","RES","320-30142-2","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","16","ng/L","U","6.9","DL","","TRG","","","41","LOQ","YES","-99","","246.7","1.00","16",""
"NAWC-072517-FRB-331","537","RES","320-30142-2","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","8.1","ng/L","U","2.8","DL","","TRG","","","20","LOQ","YES","-99","","246.7","1.00","8.1",""
"NAWC-072517-FRB-331","537","RES","320-30142-2","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","12","ng/L","U","5.6","DL","","TRG","","","30","LOQ","YES","-99","","246.7","1.00","12",""
"NAWC-072517-FRB-331","537","RES","320-30142-2","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","36","ng/L","U","16","DL","","TRG","","","91","LOQ","YES","-99","","246.7","1.00","36",""
"NAWC-072517-FRB-331","537","RES","320-30142-2","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","4.1","ng/L","U","1.9","DL","","TRG","","","10","LOQ","YES","-99","","246.7","1.00","4.1",""
"NAWC-072517-FRB-331","537","RES","320-30142-2","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","20","ng/L","U","8.1","DL","","TRG","","","24","LOQ","YES","-99","","246.7","1.00","20",""
"NAWC-072517-FRB-331","537","RES","320-30142-2","TALSAC","STL00993","13C2
PFHxA","34","ng/L","","-99","DL","","SURR","84","","-99","LOQ","YES","40.5","","246.7","1.00","0",""
"NAWC-072517-FRB-331","537","RES","320-30142-2","TALSAC","STL00996","13C2
PFDA","43","ng/L","","-99","DL","","SURR","105","","-99","LOQ","YES","40.5","","246.7","1.00","0",""
"NAWC-072517-RW-334","537","RES","320-30142-3","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","16","ng/L","U","6.6","DL","","TRG","","","39","LOQ","YES","-99","","256.7","1.00","16",""
"NAWC-072517-RW-334","537","RES","320-30142-3","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","9.7","ng/L","J M","2.7","DL","","TRG","","","19","LOQ","YES","-99","","256.7","1.00","7.8",""
"NAWC-072517-RW-334","537","RES","320-30142-3","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS)","12","ng/L","U","5.4","DL","","TRG","","","29","LOQ","YES","-99","","256.7","1.00","12",""
"NAWC-072517-RW-334","537","RES","320-30142-3","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS)","35","ng/L","U","16","DL","","TRG","","","88","LOQ","YES","-99","","256.7","1.00","35",""
"NAWC-072517-RW-334","537","RES","320-30142-3","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA)","3.5","ng/L","J","1.9","DL","","TRG","","","9.7","LOQ","YES","-99","","256.7","1.00","3.9",""
"NAWC-072517-RW-334","537","RES","320-30142-3","TALSAC","375-95-1","Perfluorononanoic acid (PFNA)","19","ng/L","U","7.8","DL","","TRG","","","23","LOQ","YES","-99","","256.7","1.00","19",""
"NAWC-072517-RW-334","537","RES","320-30142-3","TALSAC","STL00993","13C2
PFHxA","33","ng/L","","-99","DL","","SURR","85","","-99","LOQ","YES","39.0","","256.7","1.00","0",""
"NAWC-072517-RW-334","537","RES","320-30142-3","TALSAC","STL00996","13C2
PFDA","46","ng/L","","-99","DL","","SURR","118","","-99","LOQ","YES","39.0","","256.7","1.00","0",""
"NAWC-072517-FRB-334","537","RES","320-30142-4","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS)","16","ng/L","U","6.9","DL","","TRG","","","41","LOQ","YES","-99","","246.3","1.00","16",""
"NAWC-072517-FRB-334","537","RES","320-30142-4","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA)","8.1","ng/L","U","2.8","DL","","TRG","","","20","LOQ","YES","-99","","246.3","1.00","8.1",""
"NAWC-072517-FRB-334","537","RES","320-30142-4","TALSAC","355-46-4","Perfluorohexanesulfonic acid

(PFHxS),"12","ng/L","U","5.6","DL","","TRG","","","30","LOQ","YES",-99","","246.3","1.00","12","","
"NAWC-072517-FRB-334","537","RES","320-30142-4","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS),"37","ng/L","U","16","DL","","TRG","","","91","LOQ","YES",-99","","246.3","1.00","37","","
"NAWC-072517-FRB-334","537","RES","320-30142-4","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA),"4.1","ng/L","U","1.9","DL","","TRG","","","10","LOQ","YES",-99","","246.3","1.00","4.1","","
"NAWC-072517-FRB-334","537","RES","320-30142-4","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA),"20","ng/L","U","8.1","DL","","TRG","","","24","LOQ","YES",-99","","246.3","1.00","20","","
"NAWC-072517-FRB-334","537","RES","320-30142-4","TALSAC","STL00993","13C2
PFHxA","41","ng/L","","-99","DL","","SURR","100","","-99","LOQ","YES","40.6","","246.3","1.00","0","","
"NAWC-072517-FRB-334","537","RES","320-30142-4","TALSAC","STL00996","13C2
PFDA","47","ng/L","","-99","DL","","SURR","116","","-99","LOQ","YES","40.6","","246.3","1.00","0","","
"NAWC-072517-RW-347","537","RES","320-30142-5","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS),"11","ng/L","J M","6.7","DL","","TRG","","","39","LOQ","YES",-99","","255","1.00","16","","
"NAWC-072517-RW-347","537","RES","320-30142-5","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA),"10","ng/L","J M","2.7","DL","","TRG","","","20","LOQ","YES",-99","","255","1.00","7.8","","
"NAWC-072517-RW-347","537","RES","320-30142-5","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS),"12","ng/L","U","5.4","DL","","TRG","","","29","LOQ","YES",-99","","255","1.00","12","","
"NAWC-072517-RW-347","537","RES","320-30142-5","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS),"35","ng/L","U","16","DL","","TRG","","","88","LOQ","YES",-99","","255","1.00","35","","
"NAWC-072517-RW-347","537","RES","320-30142-5","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA),"3.9","ng/L","J","1.9","DL","","TRG","","","9.8","LOQ","YES",-99","","255","1.00","3.9","","
"NAWC-072517-RW-347","537","RES","320-30142-5","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA),"20","ng/L","U","7.8","DL","","TRG","","","24","LOQ","YES",-99","","255","1.00","20","","
"NAWC-072517-RW-347","537","RES","320-30142-5","TALSAC","STL00993","13C2
PFHxA","30","ng/L","","-99","DL","","SURR","76","","-99","LOQ","YES","39.2","","255","1.00","0","","
"NAWC-072517-RW-347","537","RES","320-30142-5","TALSAC","STL00996","13C2
PFDA","46","ng/L","","-99","DL","","SURR","117","","-99","LOQ","YES","39.2","","255","1.00","0","","
"NAWC-072517-FRB-347","537","RES","320-30142-6","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS),"15","ng/L","U","6.5","DL","","TRG","","","38","LOQ","YES",-99","","262.7","1.00","15","","
"NAWC-072517-FRB-347","537","RES","320-30142-6","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA),"7.6","ng/L","U","2.7","DL","","TRG","","","19","LOQ","YES",-99","","262.7","1.00","7.6","","
"NAWC-072517-FRB-347","537","RES","320-30142-6","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS),"11","ng/L","U","5.2","DL","","TRG","","","29","LOQ","YES",-99","","262.7","1.00","11","","
"NAWC-072517-FRB-347","537","RES","320-30142-6","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS),"34","ng/L","U","15","DL","","TRG","","","86","LOQ","YES",-99","","262.7","1.00","34","","
"NAWC-072517-FRB-347","537","RES","320-30142-6","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA),"3.8","ng/L","U","1.8","DL","","TRG","","","9.5","LOQ","YES",-99","","262.7","1.00","3.8","","
"NAWC-072517-FRB-347","537","RES","320-30142-6","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA),"19","ng/L","U","7.6","DL","","TRG","","","23","LOQ","YES",-99","","262.7","1.00","19","","
"NAWC-072517-FRB-347","537","RES","320-30142-6","TALSAC","STL00993","13C2
PFHxA","39","ng/L","","-99","DL","","SURR","103","","-99","LOQ","YES","38.1","","262.7","1.00","0","","
"NAWC-072517-FRB-347","537","RES","320-30142-6","TALSAC","STL00996","13C2
PFDA","48","ng/L","","-99","DL","","SURR","125","","-99","LOQ","YES","38.1","","262.7","1.00","0","","
"NAWC-072517-RW-335","537","RES","320-30142-7","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS),"21","ng/L","J","6.6","DL","","TRG","","","39","LOQ","YES",-99","","259.1","1.00","15","","
"NAWC-072517-RW-335","537","RES","320-30142-7","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA),"21","ng/L","M","2.7","DL","","TRG","","","19","LOQ","YES",-99","","259.1","1.00","7.7","","
"NAWC-072517-RW-335","537","RES","320-30142-7","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS),"8.1","ng/L","J","5.3","DL","","TRG","","","29","LOQ","YES",-99","","259.1","1.00","12","","
"NAWC-072517-RW-335","537","RES","320-30142-7","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS),"35","ng/L","U","16","DL","","TRG","","","87","LOQ","YES",-99","","259.1","1.00","35","","
"NAWC-072517-RW-335","537","RES","320-30142-7","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA),"8.7","ng/L","J","1.8","DL","","TRG","","","9.6","LOQ","YES",-99","","259.1","1.00","3.9","","
"NAWC-072517-RW-335","537","RES","320-30142-7","TALSAC","375-95-1","Perfluorononanoic acid

(PFNA),"19","ng/L","U","7.7","DL","","TRG","","","23","LOQ","YES",-99","","259.1","1.00","19","","
"NAWC-072517-RW-335","537","RES","320-30142-7","TALSAC","STL00993","13C2
PFHxA","36","ng/L","","-99","DL","","SURR","93","","-99","LOQ","YES","38.6","","259.1","1.00","0","","
"NAWC-072517-RW-335","537","RES","320-30142-7","TALSAC","STL00996","13C2
PFDA","49","ng/L","","-99","DL","","SURR","126","","-99","LOQ","YES","38.6","","259.1","1.00","0","","
"NAWC-072517-FRB-335","537","RES","320-30142-8","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","15","ng/L","U","6.6","DL","","TRG","","","39","LOQ","YES",-99","","259.3","1.00","15","","
"NAWC-072517-FRB-335","537","RES","320-30142-8","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","7.7","ng/L","U","2.7","DL","","TRG","","","19","LOQ","YES",-99","","259.3","1.00","7.7","","
"NAWC-072517-FRB-335","537","RES","320-30142-8","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","12","ng/L","U","5.3","DL","","TRG","","","29","LOQ","YES",-99","","259.3","1.00","12","","
"NAWC-072517-FRB-335","537","RES","320-30142-8","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","35","ng/L","U","16","DL","","TRG","","","87","LOQ","YES",-99","","259.3","1.00","35","","
"NAWC-072517-FRB-335","537","RES","320-30142-8","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","3.9","ng/L","U","1.8","DL","","TRG","","","9.6","LOQ","YES",-99","","259.3","1.00","3.9","","
"NAWC-072517-FRB-335","537","RES","320-30142-8","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","19","ng/L","U","7.7","DL","","TRG","","","23","LOQ","YES",-99","","259.3","1.00","19","","
"NAWC-072517-FRB-335","537","RES","320-30142-8","TALSAC","STL00993","13C2
PFHxA","42","ng/L","","-99","DL","","SURR","109","","-99","LOQ","YES","38.6","","259.3","1.00","0","","
"NAWC-072517-FRB-335","537","RES","320-30142-8","TALSAC","STL00996","13C2
PFDA","53","ng/L","Q","-99","DL","","SURR","137","","-99","LOQ","YES","38.6","","259.3","1.00","0","","
"LCS 320-177417/2-A","537","RES","LCS 320-177417/2-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid
(PFOS)","323","ng/L","E","6.8","DL","","SPK","108","","40","LOQ","YES","300","","250","1.00","16","","
"LCS 320-177417/2-A","537","RES","LCS 320-177417/2-A","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","144","ng/L","","2.8","DL","","SPK","96","","20","LOQ","YES","150","","250","1.00","8.0","","
"LCS 320-177417/2-A","537","RES","LCS 320-177417/2-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid
(PFHxS)","201","ng/L","","5.5","DL","","SPK","89","","30","LOQ","YES","225","","250","1.00","12","","
"LCS 320-177417/2-A","537","RES","LCS 320-177417/2-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","589","ng/L","","16","DL","","SPK","89","","90","LOQ","YES","663","","250","1.00","36","","
"LCS 320-177417/2-A","537","RES","LCS 320-177417/2-A","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","91.6","ng/L","E","1.9","DL","","SPK","123","","10","LOQ","YES","74.3","","250","1.00","4.0","","
"LCS 320-177417/2-A","537","RES","LCS 320-177417/2-A","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","164","ng/L","E","8.0","DL","","SPK","113","","24","LOQ","YES","144","","250","1.00","20","","
"LCS 320-177417/2-A","537","RES","LCS 320-177417/2-A","TALSAC","STL00993","13C2
PFHxA","37.5","ng/L","","-99","DL","","SURR","94","","-99","LOQ","YES","40.0","","250","1.00","0","","
"LCS 320-177417/2-A","537","RES","LCS 320-177417/2-A","TALSAC","STL00996","13C2
PFDA","46.5","ng/L","","-99","DL","","SURR","116","","-99","LOQ","YES","40.0","","250","1.00","0","","
"LCSD 320-177417/3-A","537","RES","LCSD 320-177417/3-A","TALSAC","1763-23-1","Perfluorooctanesulfonic
acid (PFOS)","315","ng/L","","6.8","DL","","SPK","105","3","40","LOQ","YES","300","LCS 320-177417/2-
A","250","1.00","16","","
"LCSD 320-177417/3-A","537","RES","LCSD 320-177417/3-A","TALSAC","335-67-1","Perfluorooctanoic acid
(PFOA)","145","ng/L","","2.8","DL","","SPK","97","0","20","LOQ","YES","150","LCS 320-177417/2-
A","250","1.00","8.0","","
"LCSD 320-177417/3-A","537","RES","LCSD 320-177417/3-A","TALSAC","355-46-4","Perfluorohexanesulfonic
acid (PFHxS)","198","ng/L","","5.5","DL","","SPK","88","2","30","LOQ","YES","225","LCS 320-177417/2-
A","250","1.00","12","","
"LCSD 320-177417/3-A","537","RES","LCSD 320-177417/3-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid
(PFBS)","575","ng/L","","16","DL","","SPK","87","3","90","LOQ","YES","663","LCS 320-177417/2-
A","250","1.00","36","","
"LCSD 320-177417/3-A","537","RES","LCSD 320-177417/3-A","TALSAC","375-85-9","Perfluoroheptanoic acid
(PFHpA)","89.2","ng/L","E","1.9","DL","","SPK","120","3","10","LOQ","YES","74.3","LCS 320-177417/2-
A","250","1.00","4.0","","
"LCSD 320-177417/3-A","537","RES","LCSD 320-177417/3-A","TALSAC","375-95-1","Perfluorononanoic acid
(PFNA)","172","ng/L","E","8.0","DL","","SPK","119","5","24","LOQ","YES","144","LCS 320-177417/2-

A", "250", "1.00", "20", ""
"LCSD 320-177417/3-A", "537", "RES", "LCSD 320-177417/3-A", "TALSAC", "STL00993", "13C2
PFHxA", "38.7", "ng/L", "", "-99", "DL", "", "SURR", "97", "", "-99", "LOQ", "YES", "40.0", "LCS 320-177417/2-
A", "250", "1.00", "0", ""
"LCSD 320-177417/3-A", "537", "RES", "LCSD 320-177417/3-A", "TALSAC", "STL00996", "13C2
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(PFOS)", "16", "ng/L", "U", "6.8", "DL", "", "TRG", "", "", "40", "LOQ", "YES", "-99", "", "250", "1.00", "16", ""
"MB 320-177417/1-A", "537", "RES", "MB 320-177417/1-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", ""
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(PFHxS)", "12", "ng/L", "U", "5.5", "DL", "", "TRG", "", "", "30", "LOQ", "YES", "-99", "", "250", "1.00", "12", ""
"MB 320-177417/1-A", "537", "RES", "MB 320-177417/1-A", "TALSAC", "375-73-5", "Perfluorobutanesulfonic acid
(PFBS)", "36", "ng/L", "U", "16", "DL", "", "TRG", "", "", "90", "LOQ", "YES", "-99", "", "250", "1.00", "36", ""
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(PFHpA)", "4.0", "ng/L", "U", "1.9", "DL", "", "TRG", "", "", "10", "LOQ", "YES", "-99", "", "250", "1.00", "4.0", ""
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(PFNA)", "20", "ng/L", "U", "8.0", "DL", "", "TRG", "", "", "24", "LOQ", "YES", "-99", "", "250", "1.00", "20", ""
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2", "FB", "", "3.50", "537", "METHOD", "RES", "08/03/2017 10:02", "08/14/2017
19:52", "TALSAC", "COA", "WET", "NA", "1", "NA", "NA", "", "100", "320-177417", "320-177417", "NA", "320-
179510", "320-30142-1", "07/26/2017 09:20", "07/27/2017 09:50", ""
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3", "NM", "", "3.50", "537", "METHOD", "RES", "08/03/2017 10:02", "08/14/2017
19:57", "TALSAC", "COA", "WET", "NA", "1", "NA", "NA", "", "100", "320-177417", "320-177417", "NA", "320-
179510", "320-30142-1", "07/26/2017 09:20", "07/27/2017 09:50", ""
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20:02", "TALSAC", "COA", "WET", "NA", "1", "NA", "NA", "", "100", "320-177417", "320-177417", "NA", "320-
179510", "320-30142-1", "07/26/2017 09:20", "07/27/2017 09:50", ""
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5", "NM", "", "3.50", "537", "METHOD", "RES", "08/03/2017 10:02", "08/14/2017
20:06", "TALSAC", "COA", "WET", "NA", "1", "NA", "NA", "", "100", "320-177417", "320-177417", "NA", "320-
179510", "320-30142-1", "07/26/2017 09:20", "07/27/2017 09:50", ""
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6", "FB", "", "3.50", "537", "METHOD", "RES", "08/03/2017 10:02", "08/14/2017
20:11", "TALSAC", "COA", "WET", "NA", "1", "NA", "NA", "", "100", "320-177417", "320-177417", "NA", "320-
179510", "320-30142-1", "07/26/2017 09:20", "07/27/2017 09:50", ""
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7", "NM", "", "3.50", "537", "METHOD", "RES", "08/03/2017 10:02", "08/14/2017
20:16", "TALSAC", "COA", "WET", "NA", "1", "NA", "NA", "", "100", "320-177417", "320-177417", "NA", "320-
179510", "320-30142-1", "07/26/2017 09:20", "07/27/2017 09:50", ""
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8", "FB", "", "3.50", "537", "METHOD", "RES", "08/03/2017 10:02", "08/14/2017
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A","LCS","",-99","537","METHOD","RES","08/03/2017 10:02","08/14/2017
19:38","TALSAC","COA","WET","NA","1","NA","NA","","100","320-177417","320-177417","NA","320-
179510","320-30142-1","08/03/2017 10:02","07/27/2017 09:50",""
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179510","320-30142-1","08/03/2017 10:02","07/27/2017 09:50",""
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A","MB","",-99","537","METHOD","RES","08/03/2017 10:02","08/14/2017
19:33","TALSAC","COA","WET","NA","1","NA","NA","","100","320-177417","320-177417","NA","320-
179510","320-30142-1","08/03/2017 10:02","07/27/2017 09:50",""

TO: A. FREBOWITZ
SDG: 320-30142-1

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Samples with detections and their associated FRBs are summarized below. No detected results were present in any FRBs.

<u>Sample</u>	<u>Associated FRB</u>
NAWC-072517-RW-331	NAWC-072517-FRB-331
NAWC-072517-RW-334	NAWC-072517-FRB-334
NAWC-072517-RW-335	NAWC-072517-FRB-335
NAWC-072517-RW-347	NAWC-072517-FRB-347

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

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

Executive Summary

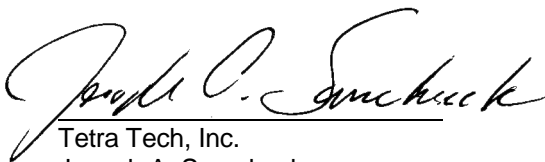
Laboratory Performance: None.

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 ($< 2 \times$ 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 SDG: 320-30142-1 FRACTION: PFAS MEDIA: WATER	NSAMPLE	NAWC-072517-FRB-331			NAWC-072517-FRB-334			NAWC-072517-FRB-335			NAWC-072517-FRB-347		
	LAB_ID	320-30142-2			320-30142-4			320-30142-8			320-30142-6		
	SAMP_DATE	7/25/2017			7/25/2017			7/25/2017			7/25/2017		
	QC_TYPE	FB			FB			FB			FB		
	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	8.1	U		8.1	U		7.7	U		7.6	U		
PERFLUOROBUTANESULFONIC ACID	36	U		37	U		35	U		34	U		
PERFLUOROHEPTANOIC ACID	4.1	U		4.1	U		3.9	U		3.8	U		
PERFLUOROHXANESULFONIC ACID	12	U		12	U		12	U		11	U		
PERFLUORONONANOIC ACID	20	U		20	U		19	U		19	U		
PERFLUOROOCTANE SULFONIC ACID	16	U		16	U		15	U		15	U		

PROJ_NO: 08005-WE04 SDG: 320-30142-1 FRACTION: PFAS MEDIA: WATER	NSAMPLE	NAWC-072517-RW-331			NAWC-072517-RW-334			NAWC-072517-RW-335			NAWC-072517-RW-347		
	LAB_ID	320-30142-1			320-30142-3			320-30142-7			320-30142-5		
	SAMP_DATE	7/25/2017			7/25/2017			7/25/2017			7/25/2017		
	QC_TYPE	NM			NM			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	14	J	P	9.7	J	P	21			10	J	P	
PERFLUOROBUTANESULFONIC ACID	36	U		35	U		35	U		35	U		
PERFLUOROHEPTANOIC ACID	4.7	J	P	3.5	J	P	8.7	J	P	3.9	J	P	
PERFLUOROHXANESULFONIC ACID	12	U		12	U		8.1	J	P	12	U		
PERFLUORONONANOIC ACID	20	U		19	U		19	U		20	U		
PERFLUOROOCTANE SULFONIC ACID	18	J	P	16	U		21	J	P	11	J	P	

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Client Sample ID: NAWC-072517-RW-331 Lab Sample ID: 320-30142-1
 Matrix: Water Lab File ID: 2017.08.14_537B_006.d
 Analysis Method: 537 Date Collected: 07/25/2017 09:00
 Extraction Method: 537 Date Extracted: 08/03/2017 10:02
 Sample wt/vol: 250.5 (mL) Date Analyzed: 08/14/2017 19:47
 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.: 179510 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	18	J	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	14	J M	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)	4.7	J	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	77		70-130
STL00996	13C2 PFDA	114		70-130

Steve L. Salomon
08/28/2017

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Client Sample ID: NAWC-072517-FRB-331 Lab Sample ID: 320-30142-2
 Matrix: Water Lab File ID: 2017.08.14_537B_007.d
 Analysis Method: 537 Date Collected: 07/25/2017 08:55
 Extraction Method: 537 Date Extracted: 08/03/2017 10:02
 Sample wt/vol: 246.7(mL) Date Analyzed: 08/14/2017 19:52
 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.: 179510 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	41	16	6.9
335-67-1	Perfluorooctanoic acid (PFOA)	8.1	U	20	8.1	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	8.1
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	30	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.1	U	10	4.1	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	91	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	84		70-130
STL00996	13C2 PFDA	105		70-130

Teri L. Selman
08/28/2017

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Client Sample ID: NAWC-072517-RW-334 Lab Sample ID: 320-30142-3
 Matrix: Water Lab File ID: 2017.08.14_537B_008.d
 Analysis Method: 537 Date Collected: 07/25/2017 09:25
 Extraction Method: 537 Date Extracted: 08/03/2017 10:02
 Sample wt/vol: 256.7(mL) Date Analyzed: 08/14/2017 19:57
 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.: 179510 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	39	16	6.6
335-67-1	Perfluorooctanoic acid (PFOA)	9.7	J M	19	7.8	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.8
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	29	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.5	J	9.7	3.9	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	88	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	85		70-130
STL00996	13C2 PFDA	118		70-130

Wesley L. Salomon
08/28/2017

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Client Sample ID: NAWC-072517-FRB-334 Lab Sample ID: 320-30142-4
 Matrix: Water Lab File ID: 2017.08.14_537B_009.d
 Analysis Method: 537 Date Collected: 07/25/2017 09:20
 Extraction Method: 537 Date Extracted: 08/03/2017 10:02
 Sample wt/vol: 246.3(mL) Date Analyzed: 08/14/2017 20:02
 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.: 179510 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	41	16	6.9
335-67-1	Perfluorooctanoic acid (PFOA)	8.1	U	20	8.1	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	8.1
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	30	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.1	U	10	4.1	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	37	U	91	37	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	100		70-130
STL00996	13C2 PFDA	116		70-130

Steve L. Selman
08/28/2017

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Client Sample ID: NAWC-072517-RW-347 Lab Sample ID: 320-30142-5
 Matrix: Water Lab File ID: 2017.08.14_537B_010.d
 Analysis Method: 537 Date Collected: 07/25/2017 12:05
 Extraction Method: 537 Date Extracted: 08/03/2017 10:02
 Sample wt/vol: 255 (mL) Date Analyzed: 08/14/2017 20:06
 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.: 179510 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	11	J-M	39	16	6.7
335-67-1	Perfluorooctanoic acid (PFOA)	10	J-M	20	7.8	2.7
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	7.8
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	29	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.9	J	9.8	3.9	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	88	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	76		70-130
STL00996	13C2 PFDA	117		70-130

Steve L. Selman

08/28/2017

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Client Sample ID: NAWC-072517-FRB-347 Lab Sample ID: 320-30142-6
 Matrix: Water Lab File ID: 2017.08.14_537B_011.d
 Analysis Method: 537 Date Collected: 07/25/2017 12:00
 Extraction Method: 537 Date Extracted: 08/03/2017 10:02
 Sample wt/vol: 262.7(mL) Date Analyzed: 08/14/2017 20:11
 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.: 179510 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)	7.6	U	19	7.6	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.6
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	29	11	5.2
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.8	U	9.5	3.8	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	34	U	86	34	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	103		70-130
STL00996	13C2 PFDA	125		70-130

Ali L. Selman

08/28/2017

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Client Sample ID: NAWC-072517-RW-335 Lab Sample ID: 320-30142-7
 Matrix: Water Lab File ID: 2017.08.14_537B_012.d
 Analysis Method: 537 Date Collected: 07/25/2017 13:30
 Extraction Method: 537 Date Extracted: 08/03/2017 10:02
 Sample wt/vol: 259.1(mL) Date Analyzed: 08/14/2017 20:16
 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.: 179510 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	21	J	39	15	6.6
335-67-1	Perfluorooctanoic acid (PFOA)	21	M	19	7.7	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.7
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	8.1	J	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	8.7	J	9.6	3.9	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	87	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	93		70-130
STL00996	13C2 PFDA	126		70-130

Atqui L. Salaman
08/28/2017

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Client Sample ID: NAWC-072517-FRB-335 Lab Sample ID: 320-30142-8
 Matrix: Water Lab File ID: 2017.08.14_537B_015.d
 Analysis Method: 537 Date Collected: 07/25/2017 13:25
 Extraction Method: 537 Date Extracted: 08/03/2017 10:02
 Sample wt/vol: 259.3(mL) Date Analyzed: 08/14/2017 20:30
 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.: 179511 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	U	39	15	6.6
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)	3.9	U	9.6	3.9	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	87	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	109		70-130
STL00996	13C2 PFDA	137	Q	70-130

Amir L. Salaman
08/28/2017

Appendix B

Results as Reported by the Laboratory

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Client Sample ID: NAWC-072517-RW-331 Lab Sample ID: 320-30142-1
 Matrix: Water Lab File ID: 2017.08.14_537B_006.d
 Analysis Method: 537 Date Collected: 07/25/2017 09:00
 Extraction Method: 537 Date Extracted: 08/03/2017 10:02
 Sample wt/vol: 250.5 (mL) Date Analyzed: 08/14/2017 19:47
 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.: 179510 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	18	J	40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	14	J M	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)	4.7	J	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	77		70-130
STL00996	13C2 PFDA	114		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Client Sample ID: NAWC-072517-FRB-331 Lab Sample ID: 320-30142-2
 Matrix: Water Lab File ID: 2017.08.14_537B_007.d
 Analysis Method: 537 Date Collected: 07/25/2017 08:55
 Extraction Method: 537 Date Extracted: 08/03/2017 10:02
 Sample wt/vol: 246.7(mL) Date Analyzed: 08/14/2017 19:52
 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.: 179510 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	41	16	6.9
335-67-1	Perfluorooctanoic acid (PFOA)	8.1	U	20	8.1	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	8.1
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	30	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.1	U	10	4.1	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	36	U	91	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	84		70-130
STL00996	13C2 PFDA	105		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Client Sample ID: NAWC-072517-RW-334 Lab Sample ID: 320-30142-3
 Matrix: Water Lab File ID: 2017.08.14_537B_008.d
 Analysis Method: 537 Date Collected: 07/25/2017 09:25
 Extraction Method: 537 Date Extracted: 08/03/2017 10:02
 Sample wt/vol: 256.7(mL) Date Analyzed: 08/14/2017 19:57
 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.: 179510 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	39	16	6.6
335-67-1	Perfluorooctanoic acid (PFOA)	9.7	J M	19	7.8	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.8
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	29	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.5	J	9.7	3.9	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	88	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	85		70-130
STL00996	13C2 PFDA	118		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Client Sample ID: NAWC-072517-FRB-334 Lab Sample ID: 320-30142-4
 Matrix: Water Lab File ID: 2017.08.14_537B_009.d
 Analysis Method: 537 Date Collected: 07/25/2017 09:20
 Extraction Method: 537 Date Extracted: 08/03/2017 10:02
 Sample wt/vol: 246.3(mL) Date Analyzed: 08/14/2017 20:02
 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.: 179510 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	16	U	41	16	6.9
335-67-1	Perfluorooctanoic acid (PFOA)	8.1	U	20	8.1	2.8
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	8.1
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	30	12	5.6
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.1	U	10	4.1	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	37	U	91	37	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	100		70-130
STL00996	13C2 PFDA	116		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Client Sample ID: NAWC-072517-RW-347 Lab Sample ID: 320-30142-5
 Matrix: Water Lab File ID: 2017.08.14_537B_010.d
 Analysis Method: 537 Date Collected: 07/25/2017 12:05
 Extraction Method: 537 Date Extracted: 08/03/2017 10:02
 Sample wt/vol: 255 (mL) Date Analyzed: 08/14/2017 20:06
 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.: 179510 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	11	J M	39	16	6.7
335-67-1	Perfluorooctanoic acid (PFOA)	10	J M	20	7.8	2.7
375-95-1	Perfluorononanoic acid (PFNA)	20	U	24	20	7.8
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	12	U	29	12	5.4
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.9	J	9.8	3.9	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	88	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	76		70-130
STL00996	13C2 PFDA	117		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Client Sample ID: NAWC-072517-FRB-347 Lab Sample ID: 320-30142-6
 Matrix: Water Lab File ID: 2017.08.14_537B_011.d
 Analysis Method: 537 Date Collected: 07/25/2017 12:00
 Extraction Method: 537 Date Extracted: 08/03/2017 10:02
 Sample wt/vol: 262.7(mL) Date Analyzed: 08/14/2017 20:11
 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.: 179510 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)	7.6	U	19	7.6	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.6
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	29	11	5.2
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.8	U	9.5	3.8	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	34	U	86	34	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	103		70-130
STL00996	13C2 PFDA	125		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Client Sample ID: NAWC-072517-RW-335 Lab Sample ID: 320-30142-7
 Matrix: Water Lab File ID: 2017.08.14_537B_012.d
 Analysis Method: 537 Date Collected: 07/25/2017 13:30
 Extraction Method: 537 Date Extracted: 08/03/2017 10:02
 Sample wt/vol: 259.1(mL) Date Analyzed: 08/14/2017 20:16
 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.: 179510 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	21	J	39	15	6.6
335-67-1	Perfluorooctanoic acid (PFOA)	21	M	19	7.7	2.7
375-95-1	Perfluorononanoic acid (PFNA)	19	U	23	19	7.7
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	8.1	J	29	12	5.3
375-85-9	Perfluoroheptanoic acid (PFHpA)	8.7	J	9.6	3.9	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	87	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	93		70-130
STL00996	13C2 PFDA	126		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Client Sample ID: NAWC-072517-FRB-335 Lab Sample ID: 320-30142-8
 Matrix: Water Lab File ID: 2017.08.14_537B_015.d
 Analysis Method: 537 Date Collected: 07/25/2017 13:25
 Extraction Method: 537 Date Extracted: 08/03/2017 10:02
 Sample wt/vol: 259.3(mL) Date Analyzed: 08/14/2017 20:30
 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.: 179511 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	U	39	15	6.6
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)	3.9	U	9.6	3.9	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35	U	87	35	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	109		70-130
STL00996	13C2 PFDA	137	Q	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: 7/25/17		COC No:																	
TetraTech		Tel/Fax: 610.382.1170		Lab Contact: Dave Alltucker		Carrier: FedEx		1 of 2 COCs																	
234 Mall Boulevard Suite 260		<table border="1"> <tr> <th colspan="2">Analysis Turnaround Time</th> </tr> <tr> <td><input type="checkbox"/> CALENDAR DAYS</td> <td><input type="checkbox"/> WORKING DAYS</td> </tr> <tr> <td colspan="2">TAT if different from Below _____</td> </tr> <tr> <td><input type="checkbox"/></td> <td>2 weeks</td> </tr> <tr> <td><input type="checkbox"/></td> <td>1 week</td> </tr> <tr> <td><input type="checkbox"/></td> <td>2 days</td> </tr> <tr> <td><input type="checkbox"/></td> <td>1 day</td> </tr> </table>								Analysis Turnaround Time		<input type="checkbox"/> CALENDAR DAYS	<input type="checkbox"/> WORKING DAYS	TAT if different from Below _____		<input type="checkbox"/>	2 weeks	<input type="checkbox"/>	1 week	<input type="checkbox"/>	2 days	<input type="checkbox"/>	1 day	Sampler: Mary Kay Bond	
Analysis Turnaround Time																									
<input type="checkbox"/> CALENDAR DAYS	<input type="checkbox"/> WORKING DAYS																								
TAT if different from Below _____																									
<input type="checkbox"/>	2 weeks																								
<input type="checkbox"/>	1 week																								
<input type="checkbox"/>	2 days																								
<input type="checkbox"/>	1 day																								
King of Prussia, PA 19406		610-382-1174		610-491-9688		Project Name: Warminster		Site: Warminster																	
P O # 1132358 (through EarthToxics)		Filtered Sample (Y/N)		Perform MS / MSD (Y/N)		EPA 537 UCMR3		For Lab Use Only:																	
						320-30142 Chain of Custody		Walk-in Client:																	
								Lab Sampling:																	
								Job / SDG No.:																	

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:
NAWC-072517-RW-331	7/25/2017	09:00	G	DW	2	N	N	Y	
NAWC-072517-FRB-331	7/25/2017	08:55	G	BLK	2	N	N	Y	Field Reagent Blank
NAWC-072517-RW-334	7/25/2017	09:25	G	DW	2	N	N	Y	
NAWC-072517-FRB-334	7/25/2017	09:20	G	BLK	2	N	N	Y	Field Reagent Blank
NAWC-072517-RW-347	7/25/2017	12:05	G	DW	2	N	N	Y	
NAWC-072517-FRB-347	7/25/2017	12:00	G	BLK	2	N	N	Y	Field Reagent Blank
NAWC-072517-RW-335	7/25/2017	13:30	G	DW	2	N	N	Y	
NAWC-072517-FRB-335	7/25/2017	13:25	G	BLK	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 Comments Section if the lab is to dispose of the sample.

Non-Hazard Flammable Skin Irritant Poison B Unknown

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

Return to Client Disposal by Lab Archive for _____ Months

Fed Ex Tracking 6612 1992 7530

Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Cooler Temp. (°C): Obs'd: 3.5 Corr'd: —		Therm ID No.: AR-1	
Relinquished by: Mary Kay Bond	Company: Tetra Tech	Date/Time: 7/25/17 18:00	Received by: [Signature]	Company: [Signature]	Date/Time: 7/26/17 920		
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:		
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:		

Job Narrative
320-30142-1

Receipt

The samples were received on 7/26/2017 9:20 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.5° C.

LCMS

Method(s) 537: The laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) have E flags because they are spiked at the upper level of the calibration curve as specified in the method. (LCS 320-177417/2-A) and (LCSD 320-177417/3-A)

Method(s) 537: Surrogate recovery for the following sample was outside control limits: (LCSD 320-177417/3-A). Re-analysis was performed with concurring results. The original analysis has been reported.

Method(s) 537: Surrogate recovery for the following sample was outside control limits: NAWC-072517-FRB-335 (320-30142-8). Re-analysis was performed with concurring results. The original analysis has been reported.

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

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

Organic Prep

Method(s) 537: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-177417.

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

Method Summary

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

TestAmerica Job ID: 320-30142-1

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: 320-30142-1

Project/Site: Warminster: PFAS, NAS JRB Willow Grove

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-30142-1	NAWC-072517-RW-331	Water	07/25/17 09:00	07/26/17 09:20
320-30142-2	NAWC-072517-FRB-331	Water	07/25/17 08:55	07/26/17 09:20
320-30142-3	NAWC-072517-RW-334	Water	07/25/17 09:25	07/26/17 09:20
320-30142-4	NAWC-072517-FRB-334	Water	07/25/17 09:20	07/26/17 09:20
320-30142-5	NAWC-072517-RW-347	Water	07/25/17 12:05	07/26/17 09:20
320-30142-6	NAWC-072517-FRB-347	Water	07/25/17 12:00	07/26/17 09:20
320-30142-7	NAWC-072517-RW-335	Water	07/25/17 13:30	07/26/17 09:20
320-30142-8	NAWC-072517-FRB-335	Water	07/25/17 13:25	07/26/17 09:20

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento

Job No.: 320-30142-1

SDG No.: _____

Matrix: Water

Level: Low

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

Client Sample ID	Lab Sample ID	PFHxA #	PFDA #
NAWC-072517-RW-331	320-30142-1	77	114
NAWC-072517-FRB-331	320-30142-2	84	105
NAWC-072517-RW-334	320-30142-3	85	118
NAWC-072517-FRB-334	320-30142-4	100	116
NAWC-072517-RW-347	320-30142-5	76	117
NAWC-072517-FRB-347	320-30142-6	103	125
NAWC-072517-RW-335	320-30142-7	93	126
NAWC-072517-FRB-335	320-30142-8	109	137 Q
	MB 320-177417/1-A	98	124
	LCS 320-177417/2-A	94	116
	LCSD 320-177417/3-A	97	132 Q

PFHxA = 13C2 PFHxA
PFDA = 13C2 PFDA

QC LIMITS
70-130
70-130

Column to be used to flag recovery values

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 2017.08.14_537B_004.d
 Lab ID: LCS 320-177417/2-A Client ID: _____

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	300	323	108	70-130	E
Perfluorooctanoic acid (PFOA)	150	144	96	70-130	
Perfluorononanoic acid (PFNA)	144	164	113	70-130	E
Perfluorohexanesulfonic acid (PFHxS)	225	201	89	70-130	
Perfluoroheptanoic acid (PFHpA)	74.3	91.6	123	70-130	E
Perfluorobutanesulfonic acid (PFBS)	663	589	89	70-130	

Column to be used to flag recovery and RPD values

FORM III
LCMS LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1

SDG No.: _____

Matrix: Water Level: Low Lab File ID: 2017.08.14_537B_005.d

Lab ID: LCSD 320-177417/3-A Client ID: _____

COMPOUND	SPIKE ADDED (ng/L)	LCSD CONCENTRATION (ng/L)	LCSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
Perfluorooctanesulfonic acid (PFOS)	300	315	105	3	30	70-130	
Perfluorooctanoic acid (PFOA)	150	145	97	0	30	70-130	
Perfluorononanoic acid (PFNA)	144	172	119	5	30	70-130	E
Perfluorohexanesulfonic acid (PFHxS)	225	198	88	2	30	70-130	
Perfluoroheptanoic acid (PFHpA)	74.3	89.2	120	3	30	70-130	E
Perfluorobutanesulfonic acid (PFBS)	663	575	87	3	30	70-130	

Column to be used to flag recovery and RPD values

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Lab File ID: 2017.08.14_537B_003.d Lab Sample ID: MB 320-177417/1-A
 Matrix: Water Date Extracted: 08/03/2017 10:02
 Instrument ID: A8_N Date Analyzed: 08/14/2017 19:33
 Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-177417/2-A	2017.08.14_537B 004.d	08/14/2017 19:38
	LCSD 320-177417/3-A	2017.08.14_537B 005.d	08/14/2017 19:43
NAWC-072517-RW-331	320-30142-1	2017.08.14_537B 006.d	08/14/2017 19:47
NAWC-072517-FRB-331	320-30142-2	2017.08.14_537B 007.d	08/14/2017 19:52
NAWC-072517-RW-334	320-30142-3	2017.08.14_537B 008.d	08/14/2017 19:57
NAWC-072517-FRB-334	320-30142-4	2017.08.14_537B 009.d	08/14/2017 20:02
NAWC-072517-RW-347	320-30142-5	2017.08.14_537B 010.d	08/14/2017 20:06
NAWC-072517-FRB-347	320-30142-6	2017.08.14_537B 011.d	08/14/2017 20:11
NAWC-072517-RW-335	320-30142-7	2017.08.14_537B 012.d	08/14/2017 20:16
NAWC-072517-FRB-335	320-30142-8	2017.08.14_537B 015.d	08/14/2017 20:30

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: MB 320-177417/1-A
 Matrix: Water Lab File ID: 2017.08.14_537B_003.d
 Analysis Method: 537 Date Collected: _____
 Extraction Method: 537 Date Extracted: 08/03/2017 10:02
 Sample wt/vol: 250 (mL) Date Analyzed: 08/14/2017 19:33
 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.: 179510 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	98		70-130
STL00996	13C2 PFDA	124		70-130

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Instrument ID: A8_N Calibration Start Date: 08/14/2017 12:48
 GC Column: GeminiC18 3x100 ID: 3(mm) Calibration End Date: 08/14/2017 13:12
 Calibration ID: 33517

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
INITIAL CALIBRATION MEAN AREA AND MEAN RT	2250916	1.95	5850602	2.21		
UPPER LIMIT	3376374	2.45	8775903	2.71		
LOWER LIMIT	1125458	1.45	2925301	1.71		
LAB SAMPLE ID	CLIENT SAMPLE ID					
CCVL 320-179319/9		2177935	1.94	5998180	2.20	
ICV 320-179319/11		1980065	1.94	5824653	2.19	
CCV 320-179510/1 CCVIS		2104942	1.91	5804729	2.17	
MB 320-177417/1-A		2249354	1.92	6501071	2.18	
LCS 320-177417/2-A		2259712	1.92	6216901	2.18	
LCSD 320-177417/3-A		2198507	1.91	6213934	2.17	
320-30142-1	NAWC-072517-RW-331	2242801	1.92	6474631	2.18	
320-30142-2	NAWC-072517-FRB-331	2205400	1.91	6421825	2.17	
320-30142-3	NAWC-072517-RW-334	2361478	1.91	6616874	2.17	
320-30142-4	NAWC-072517-FRB-334	2307400	1.92	6481747	2.18	
320-30142-5	NAWC-072517-RW-347	2292452	1.91	6391356	2.17	
320-30142-6	NAWC-072517-FRB-347	2211331	1.92	6242811	2.17	
320-30142-7	NAWC-072517-RW-335	2160262	1.92	6338998	2.18	
CCV 320-179510/13 CCVIS		2051129	1.92	5683418	2.17	
CCV 320-179511/13 CCVIS		2051129	1.92	5683418	2.17	
320-30142-8	NAWC-072517-FRB-335	2112681	1.92	6199564	2.17	
CCV 320-179511/18 CCVIS		2005679	1.91	5754725	2.17	

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
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Sample No.: CCV 320-179510/1 Date Analyzed: 08/14/2017 19:24
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2017.08.14_537B_001 Heated Purge: (Y/N) N
 Calibration ID: 33517

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	2104942	1.91	5804729	2.17		
UPPER LIMIT	2946919	2.41	8126621	2.67		
LOWER LIMIT	1473459	1.41	4063310	1.67		
LAB SAMPLE ID	CLIENT SAMPLE ID					
MB 320-177417/1-A		2249354	1.92	6501071	2.18	
LCS 320-177417/2-A		2259712	1.92	6216901	2.18	
LCSD 320-177417/3-A		2198507	1.91	6213934	2.17	
320-30142-1	NAWC-072517-RW-331	2242801	1.92	6474631	2.18	
320-30142-2	NAWC-072517-FRB-331	2205400	1.91	6421825	2.17	
320-30142-3	NAWC-072517-RW-334	2361478	1.91	6616874	2.17	
320-30142-4	NAWC-072517-FRB-334	2307400	1.92	6481747	2.18	
320-30142-5	NAWC-072517-RW-347	2292452	1.91	6391356	2.17	
320-30142-6	NAWC-072517-FRB-347	2211331	1.92	6242811	2.17	
320-30142-7	NAWC-072517-RW-335	2160262	1.92	6338998	2.18	

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
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Sample No.: CCV 320-179510/13 Date Analyzed: 08/14/2017 20:21
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2017.08.14_537B_013 Heated Purge: (Y/N) N
 Calibration ID: 33517

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	2051129	1.92	5683418	2.17		
UPPER LIMIT	2871581	2.42	7956785	2.67		
LOWER LIMIT	1435790	1.42	3978393	1.67		
LAB SAMPLE ID	CLIENT SAMPLE ID					
MB 320-177417/1-A		2249354	1.92	6501071	2.18	
LCS 320-177417/2-A		2259712	1.92	6216901	2.18	
LCSD 320-177417/3-A		2198507	1.91	6213934	2.17	
320-30142-1	NAWC-072517-RW-331	2242801	1.92	6474631	2.18	
320-30142-2	NAWC-072517-FRB-331	2205400	1.91	6421825	2.17	
320-30142-3	NAWC-072517-RW-334	2361478	1.91	6616874	2.17	
320-30142-4	NAWC-072517-FRB-334	2307400	1.92	6481747	2.18	
320-30142-5	NAWC-072517-RW-347	2292452	1.91	6391356	2.17	
320-30142-6	NAWC-072517-FRB-347	2211331	1.92	6242811	2.17	
320-30142-7	NAWC-072517-RW-335	2160262	1.92	6338998	2.18	

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
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Sample No.: CCV 320-179511/13 Date Analyzed: 08/14/2017 20:21
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2017.08.14_537B_013 Heated Purge: (Y/N) N
 Calibration ID: 33517

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	2051129	1.92	5683418	2.17		
UPPER LIMIT	2871581	2.42	7956785	2.67		
LOWER LIMIT	1435790	1.42	3978393	1.67		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-30142-8	NAWC-072517-FRB-335		2112681	1.92	6199564	2.17

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
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Sample No.: CCV 320-179511/18 Date Analyzed: 08/14/2017 20:44
 Instrument ID: A8_N GC Column: GeminiC18 3x100 ID: 3 (mm)
 Lab File ID (Standard): 2017.08.14_537B_018 Heated Purge: (Y/N) N
 Calibration ID: 33517

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	2005679	1.91	5754725	2.17		
UPPER LIMIT	2807951	2.41	8056615	2.67		
LOWER LIMIT	1403975	1.41	4028308	1.67		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-30142-8	NAWC-072517-FRB-335		2112681	1.92	6199564	2.17

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 VI
 LCMS BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
 CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1 Analy Batch No.: 179319

SDG No.: _____

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

Calibration Start Date: 08/14/2017 12:48 Calibration End Date: 08/14/2017 13:12 Calibration ID: 33517

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-179319/2	2017.08.14_537ICAL_002.d
Level 2	IC 320-179319/3	2017.08.14_537ICAL_003.d
Level 3	IC 320-179319/4	2017.08.14_537ICAL_004.d
Level 4	IC 320-179319/5	2017.08.14_537ICAL_005.d
Level 5	IC 320-179319/6	2017.08.14_537ICAL_006.d
Level 6	IC 320-179319/7	2017.08.14_537ICAL_007.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)	1.1417 0.7313	1.1495	1.0943	0.9210	0.7959	QuaF		1.1266	-0.002254					0.9980			0.9600
Perfluoroheptanoic acid (PFHpA)	0.8346 0.8325	0.8724	0.8737	0.8715	0.8517	Ave		0.8560			2.2		30.0				
Perfluorohexanesulfonic acid (PFHxS)	1.4757 1.3970	1.5378	1.5080	1.5703	1.4756	Ave		1.4941			4.0		30.0				
Perfluorooctanoic acid (PFOA)	0.8851 0.9102	0.8837	0.8984	0.9375	0.9261	Ave		0.9068			2.4		30.0				
Perfluorooctanesulfonic acid (PFOS)	0.8922 0.9252	0.9148	0.9148	0.9461	0.9486	Ave		0.9236			2.3		30.0				
Perfluorononanoic acid (PFNA)	0.5491 0.5714	0.5670	0.5764	0.5665	0.5686	Ave		0.5665			1.6		30.0				
13C2 PFHxA	1.0141 1.0999	1.0032	1.0998	1.0933	1.1053	Ave		1.0693			4.4		30.0				
13C2 PFDA	0.5512 0.6012	0.5785	0.5919	0.5906	0.6127	Ave		0.5877			3.6		30.0				

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

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

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1 Analy Batch No.: 179319

SDG No.: _____

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

Calibration Start Date: 08/14/2017 12:48 Calibration End Date: 08/14/2017 13:12 Calibration ID: 33517

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-179319/2	2017.08.14_537ICAL_002.d
Level 2	IC 320-179319/3	2017.08.14_537ICAL_003.d
Level 3	IC 320-179319/4	2017.08.14_537ICAL_004.d
Level 4	IC 320-179319/5	2017.08.14_537ICAL_005.d
Level 5	IC 320-179319/6	2017.08.14_537ICAL_006.d
Level 6	IC 320-179319/7	2017.08.14_537ICAL_007.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	2176776 26040065	4858409	10071471	16707104	21165476	9.00 180	20.0	45.0	90.0	135
Perfluoroheptanoic acid (PFHpA)	13PF OA	Ave	198176 3589599	455479	965342	1966143	2763295	1.00 20.0	2.22	5.00	10.0	15.0
Perfluorohexanesulfonic acid (PFHxS)	PFOS	Ave	938005 16584369	2166866	4626981	9496666	13083092	3.00 60.0	6.67	15.0	30.0	45.0
Perfluorooctanoic acid (PFOA)	13PF OA	Ave	420599 7854398	923370	1986507	4232647	6012905	2.00 40.0	4.45	10.0	20.0	30.0
Perfluorooctanesulfonic acid (PFOS)	PFOS	Ave	756213 14645432	1718775	3742396	7629588	11213929	4.00 80.0	8.89	20.0	40.0	60.0
Perfluorononanoic acid (PFNA)	13PF OA	Ave	260762 4927051	592024	1273686	2556105	3689416	2.00 40.0	4.45	10.0	20.0	30.0
13C2 PFHxA	13PF OA	Ave	2407096 2370885	2356458	2429839	2465941	2390227	10.0 10.0	10.0	10.0	10.0	10.0
13C2 PFDA	13PF OA	Ave	1308306 1295768	1358920	1307668	1332089	1324957	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.: 320-30142-1 Analy Batch No.: 179319

SDG No.: _____

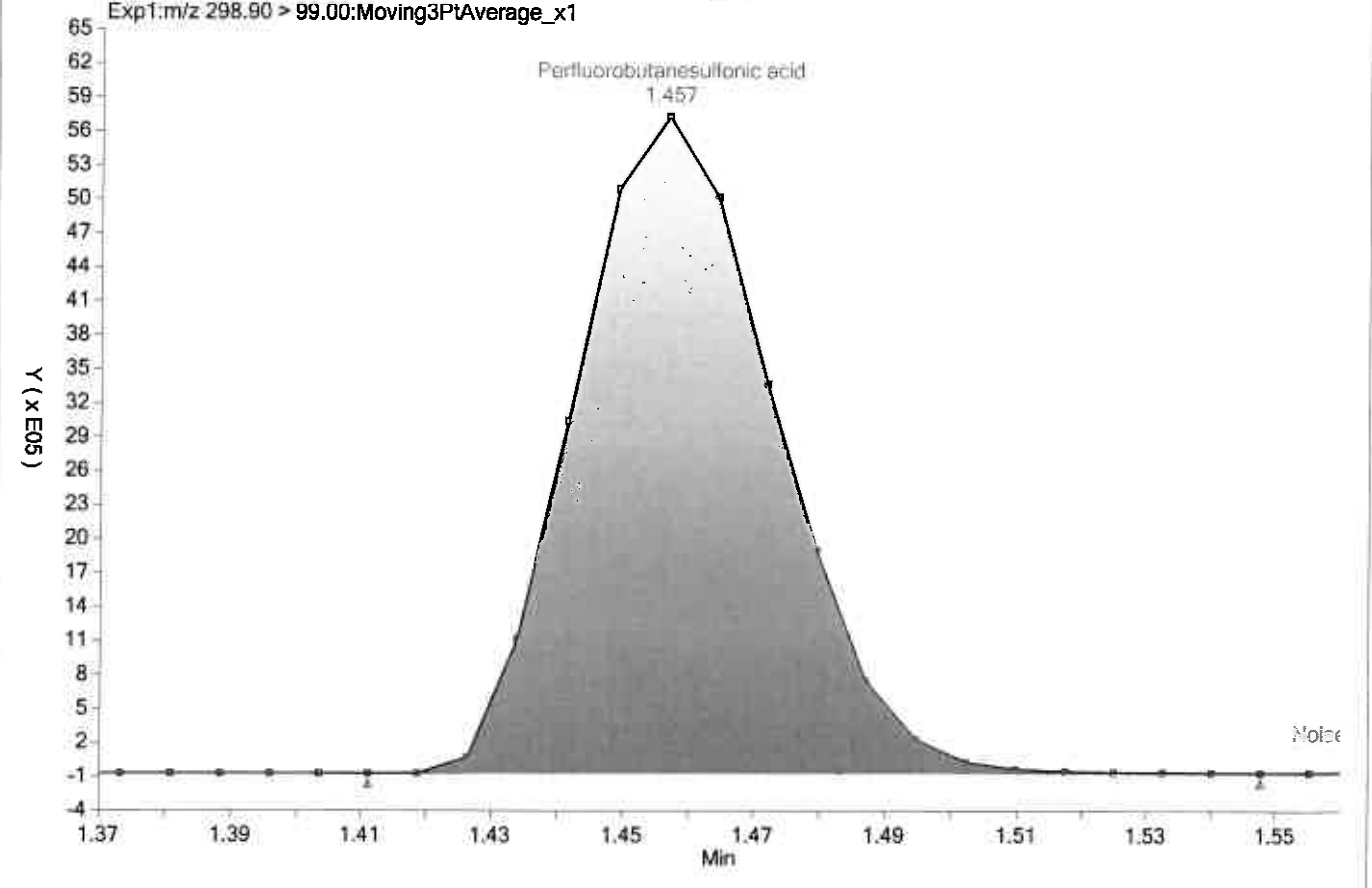
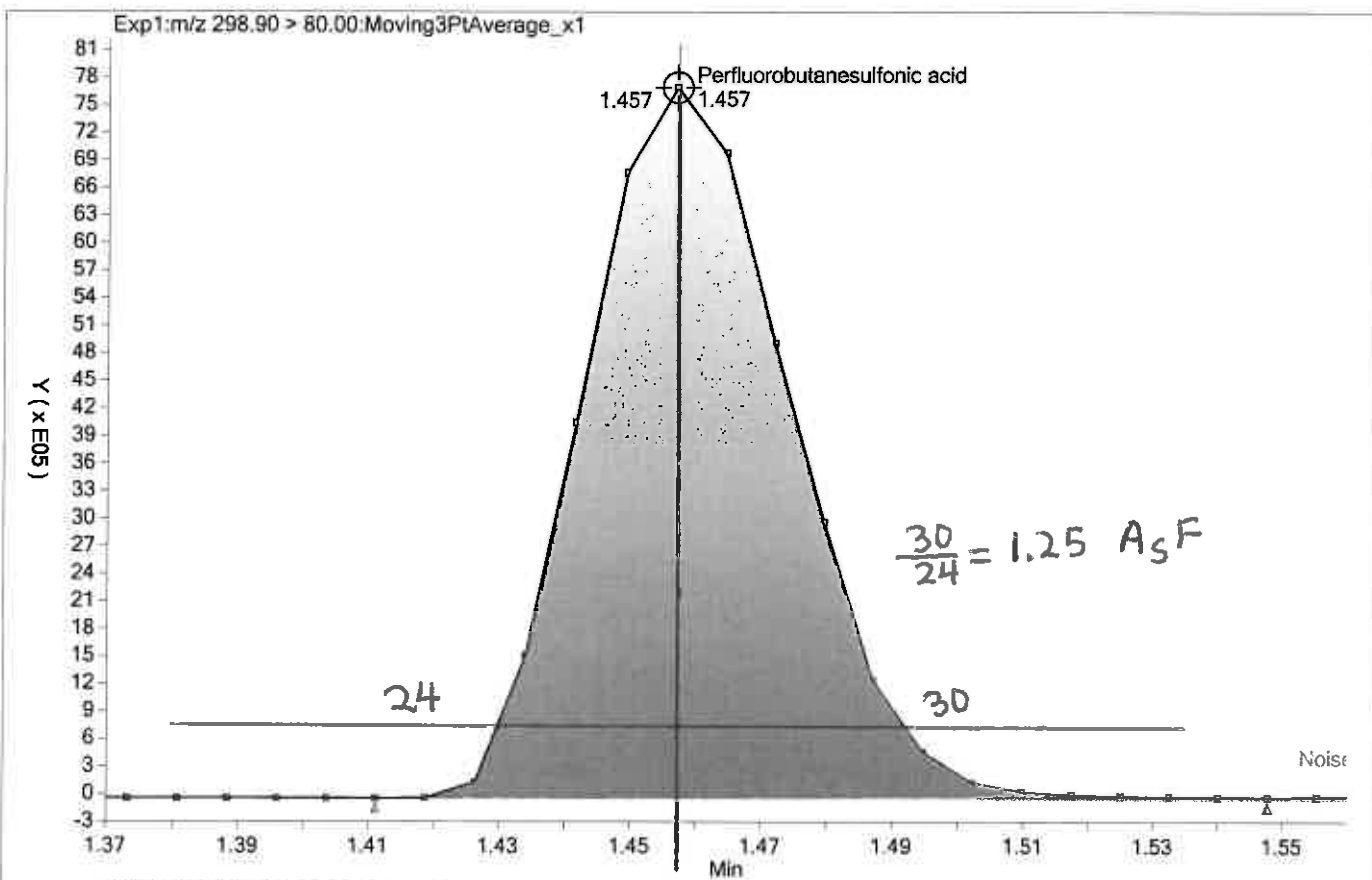
Instrument ID: A8_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

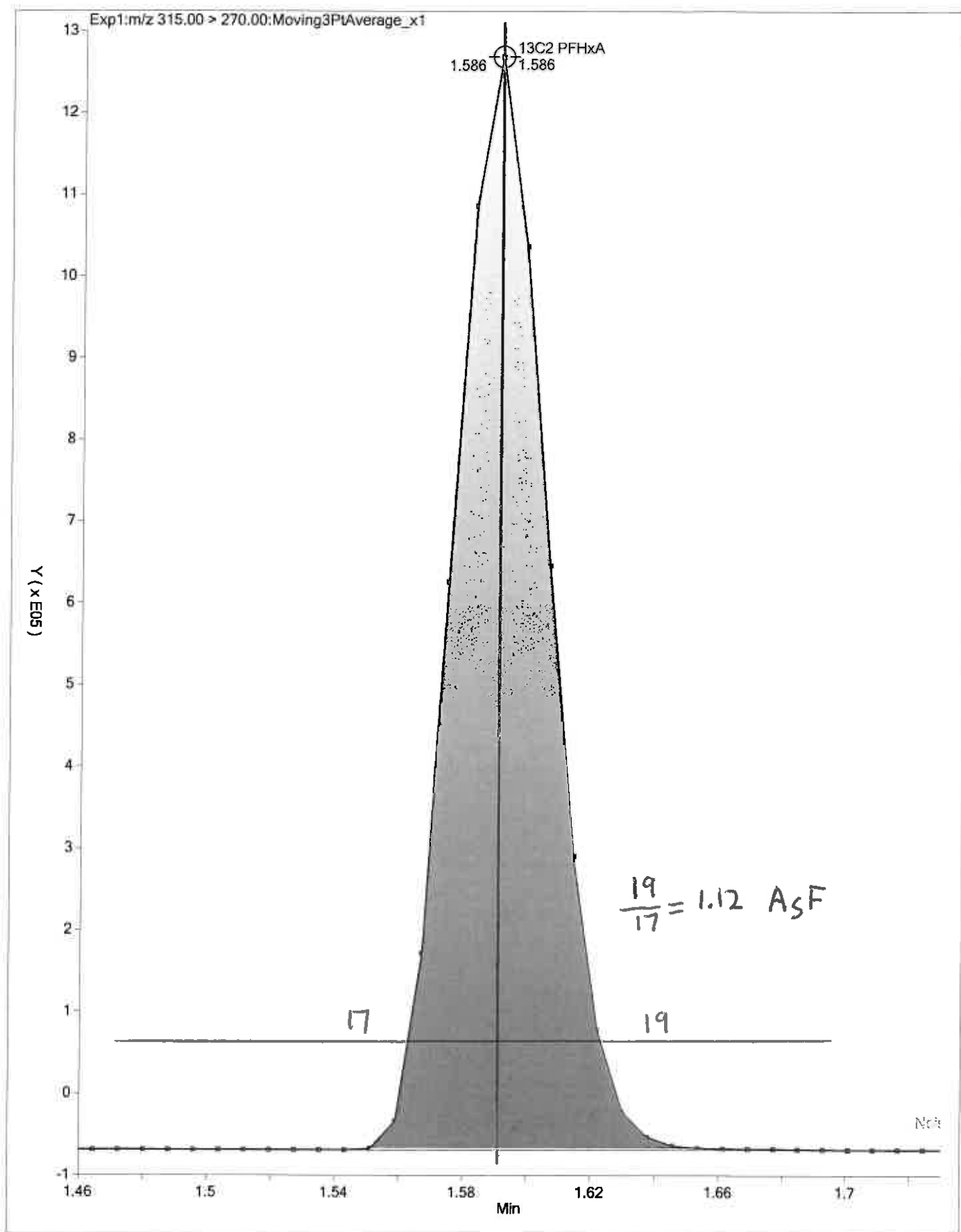
Calibration Start Date: 08/14/2017 12:48 Calibration End Date: 08/14/2017 13:12 Calibration ID: 33517

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-179319/2	2017.08.14_537ICAL_002.d
Level 2	IC 320-179319/3	2017.08.14_537ICAL_003.d
Level 3	IC 320-179319/4	2017.08.14_537ICAL_004.d
Level 4	IC 320-179319/5	2017.08.14_537ICAL_005.d
Level 5	IC 320-179319/6	2017.08.14_537ICAL_006.d
Level 6	IC 320-179319/7	2017.08.14_537ICAL_007.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)	3.3	6.6	7.5	-0.4	-5.0	3.4	50	50	50	50	50	50
Perfluoroheptanoic acid (PFHpA)	-2.5	1.9	2.1	1.8	-0.5	-2.8	50	50	50	50	50	50
Perfluorohexanesulfonic acid (PFHxS)	-1.2	2.9	0.9	5.1	-1.2	-6.5	50	50	50	50	50	50
Perfluorooctanoic acid (PFOA)	-2.4	-2.5	-0.9	3.4	2.1	0.4	50	50	50	50	50	50
Perfluorooctanesulfonic acid (PFOS)	-3.4	-1.0	-1.0	2.4	2.7	0.2	50	50	50	50	50	50
Perfluorononanoic acid (PFNA)	-3.1	0.1	1.7	0.0	0.4	0.9	50	50	50	50	50	50
13C2 PFHxA	-5.2	-6.2	2.9	2.2	3.4	2.9	30	30	30	30	30	30
13C2 PFDA	-6.2	-1.6	0.7	0.5	4.3	2.3	30	30	30	30	30	30





FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Lab Sample ID: CCVL 320-179319/9 Calibration Date: 08/14/2017 13:22
 Instrument ID: A8_N Calib Start Date: 08/14/2017 12:48
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/14/2017 13:12
 Lab File ID: 2017.08.14_537ICAL_009.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		1.212		22.5	20.0	12.7	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.8560	0.9386		2.44	2.22	9.6	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.494	1.568		7.00	6.67	4.9	50.0
Perfluorooctanoic acid (PFOA)	Ave	0.9068	0.9308		4.57	4.45	2.6	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9236	0.9255		8.91	8.89	0.2	50.0
Perfluorononanoic acid (PFNA)	Ave	0.5665	0.6283		4.93	4.45	10.9	50.0
13C2 PFHxA	Ave	1.069	1.128		10.5	10.0	5.5	30.0
13C2 PFDA	Ave	0.5877	0.6289		10.7	10.0	7.0	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Lab Sample ID: ICV 320-179319/11 Calibration Date: 08/14/2017 13:31
 Instrument ID: A8_N Calib Start Date: 08/14/2017 12:48
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/14/2017 13:12
 Lab File ID: 2017.08.14_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		0.9251		104	100	3.6	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.8560	0.9672		11.3	10.0	13.0	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.494	1.761		23.7	20.1	17.9	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9068	0.9396		21.2	20.5	3.6	30.0
Perfluorononanoic acid (PFNA)	Ave	0.5665	0.7333		26.1	20.1	29.4	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9236	1.121		23.9	19.7	21.3	30.0
13C2 PFHxA	Ave	1.069	1.124		10.5	10.0	5.1	30.0
13C2 PFDA	Ave	0.5877	0.6385		10.9	10.0	8.7	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Lab Sample ID: CCV 320-179510/1 Calibration Date: 08/14/2017 19:24
 Instrument ID: A8_N Calib Start Date: 08/14/2017 12:48
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/14/2017 13:12
 Lab File ID: 2017.08.14_537B_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		1.087		48.0	45.0	6.7	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.8560	0.9611		5.61	5.00	12.3	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.494	1.657		16.6	15.0	10.9	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9068	0.9103		10.0	10.0	0.4	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9236	0.9052		19.6	20.0	-2.0	30.0
Perfluorononanoic acid (PFNA)	Ave	0.5665	0.6404		11.3	10.0	13.0	30.0
13C2 PFHxA	Ave	1.069	1.167		10.9	10.0	9.1	30.0
13C2 PFDA	Ave	0.5877	0.6255		10.6	10.0	6.4	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Lab Sample ID: CCV 320-179510/13 Calibration Date: 08/14/2017 20:21
 Instrument ID: A8_N Calib Start Date: 08/14/2017 12:48
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/14/2017 13:12
 Lab File ID: 2017.08.14_537B_013.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		0.8027		130	135	-3.7	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.8560	0.9404		16.5	15.0	9.9	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.494	1.460		44.0	45.0	-2.3	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9068	0.9327		30.9	30.0	2.8	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9236	0.9291		60.4	60.0	0.6	30.0
Perfluorononanoic acid (PFNA)	Ave	0.5665	0.6467		34.3	30.0	14.2	30.0
13C2 PFHxA	Ave	1.069	1.189		11.1	10.0	11.2	30.0
13C2 PFDA	Ave	0.5877	0.6635		11.3	10.0	12.9	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Lab Sample ID: CCV 320-179511/13 Calibration Date: 08/14/2017 20:21
 Instrument ID: A8_N Calib Start Date: 08/14/2017 12:48
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/14/2017 13:12
 Lab File ID: 2017.08.14_537B_013.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		0.8027		130	135	-3.7	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.8560	0.9404		16.5	15.0	9.9	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.494	1.460		44.0	45.0	-2.3	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9068	0.9327		30.9	30.0	2.8	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9236	0.9291		60.4	60.0	0.6	30.0
Perfluorononanoic acid (PFNA)	Ave	0.5665	0.6467		34.3	30.0	14.2	30.0
13C2 PFHxA	Ave	1.069	1.189		11.1	10.0	11.2	30.0
13C2 PFDA	Ave	0.5877	0.6635		11.3	10.0	12.9	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1
 SDG No.: _____
 Lab Sample ID: CCV 320-179511/18 Calibration Date: 08/14/2017 20:44
 Instrument ID: A8_N Calib Start Date: 08/14/2017 12:48
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 08/14/2017 13:12
 Lab File ID: 2017.08.14_537B_018.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	QuaF		1.087		48.0	45.0	6.8	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.8560	0.9288		5.43	5.00	8.5	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.494	1.563		15.7	15.0	4.6	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.9068	0.8915		9.84	10.0	-1.7	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	0.9236	0.9111		19.7	20.0	-1.4	30.0
Perfluorononanoic acid (PFNA)	Ave	0.5665	0.6652		11.7	10.0	17.4	30.0
13C2 PFHxA	Ave	1.069	1.221		11.4	10.0	14.2	30.0
13C2 PFDA	Ave	0.5877	0.6649		11.3	10.0	13.1	30.0

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1

SDG No.: _____

Instrument ID: A8_N Start Date: 08/14/2017 12:48

Analysis Batch Number: 179319 End Date: 08/14/2017 13:31

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-179319/2		08/14/2017 12:48	1	2017.08.14_537I CAL 002.d	GeminiC18 3x100 3(mm)
IC 320-179319/3		08/14/2017 12:53	1	2017.08.14_537I CAL 003.d	GeminiC18 3x100 3(mm)
IC 320-179319/4		08/14/2017 12:58	1	2017.08.14_537I CAL 004.d	GeminiC18 3x100 3(mm)
IC 320-179319/5 ICISAV		08/14/2017 13:03	1	2017.08.14_537I CAL 005.d	GeminiC18 3x100 3(mm)
IC 320-179319/6		08/14/2017 13:07	1	2017.08.14_537I CAL 006.d	GeminiC18 3x100 3(mm)
IC 320-179319/7		08/14/2017 13:12	1	2017.08.14_537I CAL 007.d	GeminiC18 3x100 3(mm)
ZZZZZ		08/14/2017 13:17	1		GeminiC18 3x100 3(mm)
CCVL 320-179319/9		08/14/2017 13:22	1	2017.08.14_537I CAL 009.d	GeminiC18 3x100 3(mm)
ZZZZZ		08/14/2017 13:26	1		GeminiC18 3x100 3(mm)
ICV 320-179319/11		08/14/2017 13:31	1	2017.08.14_537I CAL 011.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1

SDG No.: _____

Instrument ID: A8_N Start Date: 08/14/2017 19:24

Analysis Batch Number: 179510 End Date: 08/14/2017 20:21

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-179510/1 CCVIS ZZZZZ		08/14/2017 19:24	1	2017.08.14_537B 001.d	GeminiC18 3x100 3(mm)
MB 320-177417/1-A		08/14/2017 19:33	1	2017.08.14_537B 003.d	GeminiC18 3x100 3(mm)
LCS 320-177417/2-A		08/14/2017 19:38	1	2017.08.14_537B 004.d	GeminiC18 3x100 3(mm)
LCSD 320-177417/3-A		08/14/2017 19:43	1	2017.08.14_537B 005.d	GeminiC18 3x100 3(mm)
320-30142-1		08/14/2017 19:47	1	2017.08.14_537B 006.d	GeminiC18 3x100 3(mm)
320-30142-2		08/14/2017 19:52	1	2017.08.14_537B 007.d	GeminiC18 3x100 3(mm)
320-30142-3		08/14/2017 19:57	1	2017.08.14_537B 008.d	GeminiC18 3x100 3(mm)
320-30142-4		08/14/2017 20:02	1	2017.08.14_537B 009.d	GeminiC18 3x100 3(mm)
320-30142-5		08/14/2017 20:06	1	2017.08.14_537B 010.d	GeminiC18 3x100 3(mm)
320-30142-6		08/14/2017 20:11	1	2017.08.14_537B 011.d	GeminiC18 3x100 3(mm)
320-30142-7		08/14/2017 20:16	1	2017.08.14_537B 012.d	GeminiC18 3x100 3(mm)
CCV 320-179510/13 CCVIS		08/14/2017 20:21	1	2017.08.14_537B 013.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1

SDG No.: _____

Instrument ID: A8_N Start Date: 08/14/2017 20:21

Analysis Batch Number: 179511 End Date: 08/14/2017 20:44

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-179511/13 CCVIS		08/14/2017 20:21	1	2017.08.14_537B 013.d	GeminiC18 3x100 3(mm)
ZZZZZ		08/14/2017 20:25	1		GeminiC18 3x100 3(mm)
320-30142-8		08/14/2017 20:30	1	2017.08.14_537B 015.d	GeminiC18 3x100 3(mm)
CCV 320-179511/18 CCVIS		08/14/2017 20:44	1	2017.08.14_537B 018.d	GeminiC18 3x100 3(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-30142-1

SDG No.: _____

Batch Number: 177417 Batch Start Date: 08/03/17 10:02 Batch Analyst: Branscum, Cassie

Batch Method: 537 Batch End Date: 08/04/17 21:08

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	ReceivedpH	LC537-HSP 00018
MB 320-177417/1		537, 537				250 mL	1.00 mL	7 SU	
LCS 320-177417/2		537, 537				250 mL	1.00 mL	7 SU	100 uL
LCSD 320-177417/3		537, 537				250 mL	1.00 mL	7 SU	100 uL
320-30142-A-1	NAWC-072517-RW-331	537, 537	T	278.99 g	28.48 g	250.5 mL	1.00 mL	7 SU	
320-30142-A-2	NAWC-072517-FRB-331	537, 537	T	275.17 g	28.52 g	246.7 mL	1.00 mL	7 SU	
320-30142-A-3	NAWC-072517-RW-334	537, 537	T	286.01 g	29.36 g	256.7 mL	1.00 mL	7 SU	
320-30142-A-4	NAWC-072517-FRB-334	537, 537	T	274.19 g	27.88 g	246.3 mL	1.00 mL	7 SU	
320-30142-A-5	NAWC-072517-RW-347	537, 537	T	283.69 g	28.65 g	255 mL	1.00 mL	7 SU	
320-30142-A-6	NAWC-072517-FRB-347	537, 537	T	291.31 g	28.61 g	262.7 mL	1.00 mL	7 SU	
320-30142-A-7	NAWC-072517-RW-335	537, 537	T	287.28 g	28.23 g	259.1 mL	1.00 mL	7 SU	
320-30142-A-8	NAWC-072517-FRB-335	537, 537	T	286.99 g	27.71 g	259.3 mL	1.00 mL	7 SU	

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-IS 00044	LC537-SU 00046	AnalysisComment			
MB 320-177417/1		537, 537		100 uL	100 uL	ch nd			
LCS 320-177417/2		537, 537		100 uL	100 uL	ch nd			
LCSD 320-177417/3		537, 537		100 uL	100 uL	ch nd			
320-30142-A-1	NAWC-072517-RW-331	537, 537	T	100 uL	100 uL	ch nd			
320-30142-A-2	NAWC-072517-FRB-331	537, 537	T	100 uL	100 uL	ch nd			
320-30142-A-3	NAWC-072517-RW-334	537, 537	T	100 uL	100 uL	ch nd			
320-30142-A-4	NAWC-072517-FRB-334	537, 537	T	100 uL	100 uL	ch nd			
320-30142-A-5	NAWC-072517-RW-347	537, 537	T	100 uL	100 uL	ch nd			
320-30142-A-6	NAWC-072517-FRB-347	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.: 320-30142-1

SDG No.: _____

Batch Number: 177417 Batch Start Date: 08/03/17 10:02 Batch Analyst: Branscum, Cassie

Batch Method: 537 Batch End Date: 08/04/17 21:08

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-IS 00044	LC537-SU 00046	AnalysisComment			
320-30142-A-7	NAWC-072517-RW-335	537, 537	T	100 uL	100 uL	ch nd			
320-30142-A-8	NAWC-072517-FRB-335	537, 537	T	100 uL	100 uL	ch nd			

Batch Notes	
Batch Comment	IS:975029/1002798
Manifold ID	3,9
Methanol ID	988835
Pipette ID	M16387D
Analyst ID - IS Reagent Drop	JER/CCB
Analyst ID - IS Reagent Drop Witness	TN
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	6357081-02
Trizma ID	SLBR4303V
Reagent Water ID	8-1-17

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

RI AB 16/17

(To Accompany Samples to Instruments)

Batch Number: 320-177417

Analyst: Branscum, Cassie

Batch Open: 8/3/2017 10:02:00AM

Method Code: 320-537_Prep-320

Batch End: 8/4/2017 9:08:00PM

8/23

Extraction of Perfluorinated Alkyl Acids

Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmnt FinAmnt	Rcvd	PHs Adj1 Adj2	Due Date	Analytical TAT	Div Rank	Comments	Output Sample Lab ID
1 MB-320-177417/1 N/A	N/A		250 mL	7		N/A	N/A	N/A	ch nd	
			1.00 mL							
2 LCS-320-177417/2 N/A	N/A		250 mL	7		N/A	N/A	N/A	ch nd	
			1.00 mL							
3 LCSD-320-177417/3 N/A	N/A		250 mL	7		N/A	N/A	N/A	ch nd	RI
			1.00 mL							
4 320-30142-A-1 (537_DOD5)	N/A (320-30142-1)	278.99 g	250.5 mL	7		8/1/17	16_Days	4	ch nd	
		28.48 g	1.00 mL							
5 320-30142-A-2 (537_DOD5)	N/A (320-30142-1)	275.17 g	246.7 mL	7		8/1/17	16_Days	4	ch nd	
		28.52 g	1.00 mL							
6 320-30142-A-3 (537_DOD5)	N/A (320-30142-1)	286.01 g	256.7 mL	7		8/1/17	16_Days	4	ch nd	
		29.36 g	1.00 mL							
7 320-30142-A-4 (537_DOD5)	N/A (320-30142-1)	274.19 g	246.3 mL	7		8/1/17	16_Days	4	ch nd	
		27.88 g	1.00 mL							
8 320-30142-A-5 (537_DOD5)	N/A (320-30142-1)	283.69 g	255 mL	7		8/1/17	16_Days	4	ch nd	
		28.65 g	1.00 mL							
9 320-30142-A-6 (537_DOD5)	N/A (320-30142-1)	291.31 g	262.7 mL	7		8/1/17	16_Days	4	ch nd	
		28.61 g	1.00 mL							
10 320-30142-A-7 (537_DOD5)	N/A (320-30142-1)	287.28 g	259.1 mL	7		8/1/17	16_Days	4	ch nd	
		28.23 g	1.00 mL							

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Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)




Batch Number: 320-177417

Analyst: Branscum, Cassie

Batch Open: 8/3/2017 10:02:00AM

Method Code: 320-537_Prep-320

Batch End: 8/4/2017 9:08:00PM

11	320-30142-A-8 (537_DOD5)	N/A (320-30142-1)	286.99 g	259.3 mL	7			8/1/17	16_Days	4	ch nd	<i>RI</i>	
			27.71 g	1.00 mL									
12	320-30136-A-1 (537_DOD5)	N/A (320-30136-1)	284.32 g	256.1 mL	7			8/1/17	16_Days	4	ch nd	<i>RI</i>	
			28.18 g	1.00 mL									
13	320-30136-A-2 (537_DOD5)	N/A (320-30136-1)	286.87 g	258.6 mL	7			8/1/17	16_Days	4	ch nd	<i>RI</i>	
			28.31 g	1.00 mL									

Batch Notes

Manifold ID 3,9

Trizma ID SLBR4303V

SPE Cartridge ID 6357081-02

Methanol ID 988835

Reagent Water ID 8-1-17

Pipette ID M16387D

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/CCB

Analyst ID - IS Reagent Drop Witness TN

Batch Comment IS:975029/1002798

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PFAS Calibration Calculations:

Initial Calibration 8/14/2017
 Instrument A8_N

Perfluorohexanesulfonic acid

Analyte Concentration	Analyte Response	Internal Standard Response	Internal Standard Amount	RRF	Reported RRF
3	938005	6074703	28.7	1.47720	1.4757
6.67	2166866	6060332	28.7	1.53848	1.5378
15	4626981	5865253	28.7	1.50939	1.508
30	9496666	5780409	28.7	1.57171	1.5703
45	13083092	5649456	28.7	1.47698	1.4756
60	16584369	5673459	28.7	1.39824	1.397
Average				1.49533	1.4941
Standard Deviation				0.0600	
RSD				0.0401	
%RSD				4.01090	4

Continuing Calibration 08/14/2017 @ 19:24
 A8_N

Perfluorohexanesulfonic acid

Analyte Concentration	Analyte Response	Internal Standard Response	Internal Standard Amount	RRF	%D	Reported RRF	Reported %D
15	5030742	5804729	28.7	1.6582	10.984178	1.657	10.9

Willow Grove
SDG 320-30142-1

Sample Identification NAWC-072517-RW-331

Compound Perfluoroheptanoic acid

Compound Area 227534

Internal Standard Amount (ng) 28.7

Dilution Factor 1

Internal Standard Area 6474631

Average RRF 0.856

Sample Volume(ml) 250.5

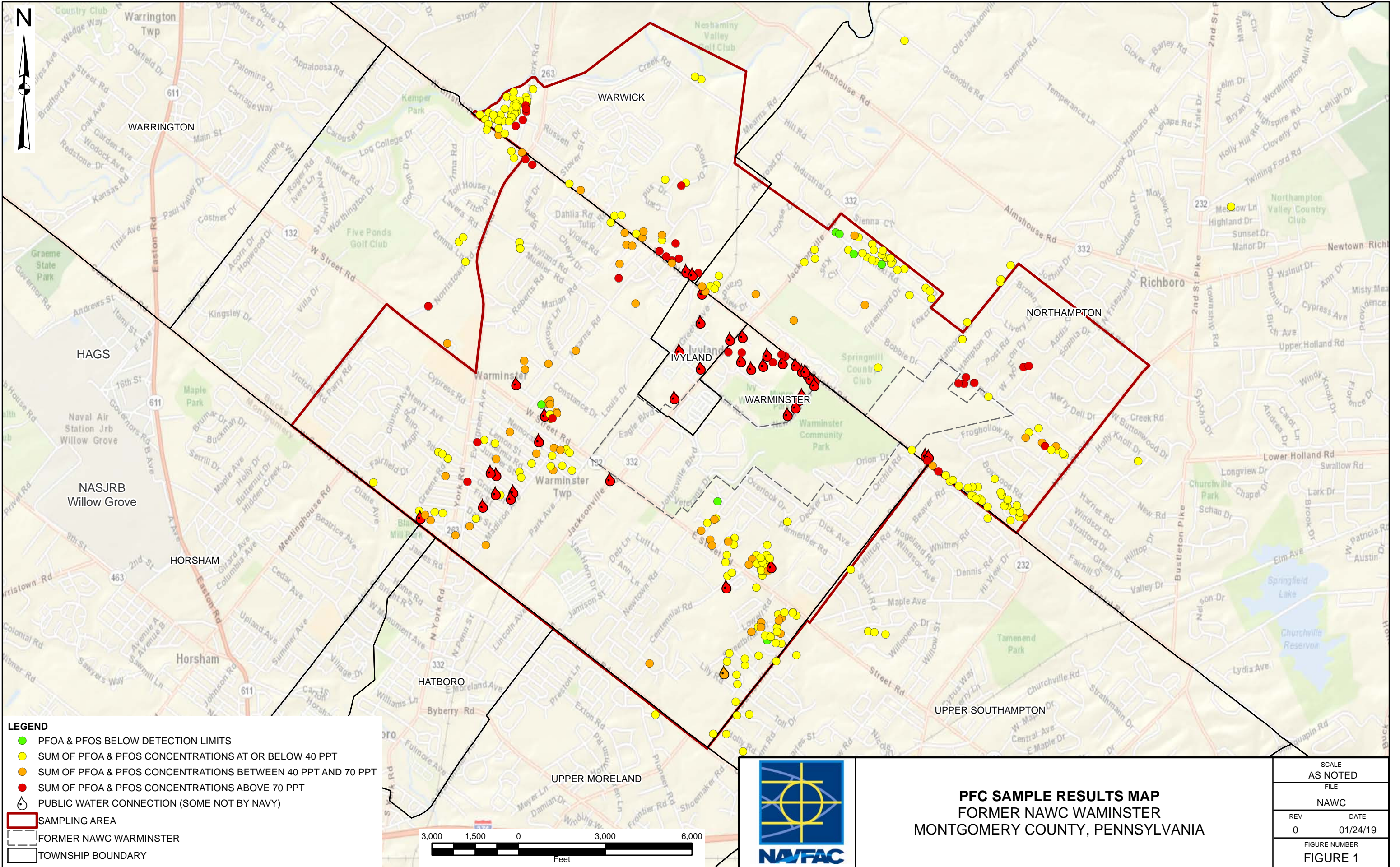
Volume Extract (ml) 1

Injection Volume (μ l) 1

μ l to ml 1000.00

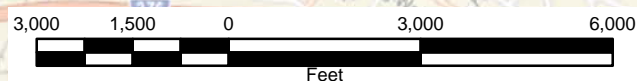
Concentration 4.70 ng/L

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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
- FORMER NAWC WARRINSTER
- TOWNSHIP BOUNDARY



PFC SAMPLE RESULTS MAP
 FORMER NAWC WARRINSTER
 MONTGOMERY COUNTY, PENNSYLVANIA

SCALE AS NOTED	
FILE	
NAWC	
REV 0	DATE 01/24/19
FIGURE NUMBER	
FIGURE 1	