



**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 320-28987-1**

*Naval Air Warfare Center Warminster  
Warminster, Pennsylvania*

August 2019

N62269\_001151  
WARMINSTER\_NAWC  
SSIC 5000-33c

**LABORATORY DATA PACKAGE, 320-28987-1 NAS WILLOW GROVE NAWC  
WARMINSTER PA**  
06/30/2017  
TESTAMERICA LABORATORIES INC

Approved for public release: distribution unlimited.

## ANALYTICAL REPORT

Job Number: 320-28987-1

Job Description: TetraT: PFAS, NAS JRB Willow Grove

For:  
Tetra Tech, Inc.  
234 Mall Boulevard  
Suite 260  
King of Prussia, PA 19406  
Attention: Andy Frebowitz



Approved for release.  
David R Alltucker  
Project Manager I  
6/30/2017 2:37 PM

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06/30/2017

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# Definitions/Glossary

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

TestAmerica Job ID: 320-28987-1

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## Qualifiers

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### LCMS

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

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## Glossary

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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**  
**320-28987-1**

**Receipt**

The samples were received on 6/9/2017 9:25 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 8.1° C.

**Receipt Exceptions**

The following samples was received at the laboratory outside the laboratory required temperature criteria: NAWC-060817-RW-303 (320-28987-1) and NAWC-060817-FRB-303 (320-28987-2). It should be noted that method 537 indicated that samples should be recieved at or less than 10° C., which these were.

One or two containers for the following sample was received with 2 holes and leaking and transferred to another bottle.: NAWC-060817-RW-303 (320-28987-1). This bottle was marked as back-up only.

**LCMS**

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

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

**Organic Prep**

Method(s) 537: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-169764.

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: TetraT: PFAS, NAS JRB Willow Grove

TestAmerica Job ID: 320-28987-1

## Client Sample ID: NAWC-060817-RW-303

## Lab Sample ID: 320-28987-1

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	20	J	37	6.3	ng/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA)	20		18	2.6	ng/L	1		537	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	7.6	J	28	5.1	ng/L	1		537	Total/NA
Perfluoroheptanoic acid (PFHpA)	5.4	J	9.2	1.8	ng/L	1		537	Total/NA

## Client Sample ID: NAWC-060817-FRB-303

## Lab Sample ID: 320-28987-2

No Detections.

This Detection Summary does not include radiochemical test results.

TestAmerica Sacramento



# Client Sample Results

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

TestAmerica Job ID: 320-28987-1

**Client Sample ID: NAWC-060817-RW-303**

**Lab Sample ID: 320-28987-1**

Date Collected: 06/08/17 08:05

Matrix: Water

Date Received: 06/09/17 09:25

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	20	J	37	6.3	ng/L		06/19/17 09:24	06/24/17 00:13	1
Perfluorooctanoic acid (PFOA)	20		18	2.6	ng/L		06/19/17 09:24	06/24/17 00:13	1
Perfluorononanoic acid (PFNA)	18	U	22	7.4	ng/L		06/19/17 09:24	06/24/17 00:13	1
Perfluorohexanesulfonic acid (PFHxS)	7.6	J	28	5.1	ng/L		06/19/17 09:24	06/24/17 00:13	1
Perfluoroheptanoic acid (PFHpA)	5.4	J	9.2	1.8	ng/L		06/19/17 09:24	06/24/17 00:13	1
Perfluorobutanesulfonic acid (PFBS)	33	U M	83	15	ng/L		06/19/17 09:24	06/24/17 00:13	1
<b>Surrogate</b>	<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>				<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
13C2 PFHxA	84		70 - 130				06/19/17 09:24	06/24/17 00:13	1
13C2 PFDA	73		70 - 130				06/19/17 09:24	06/24/17 00:13	1

**Client Sample ID: NAWC-060817-FRB-303**

**Lab Sample ID: 320-28987-2**

Date Collected: 06/08/17 08:00

Matrix: Water

Date Received: 06/09/17 09:25

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	15	U	37	6.2	ng/L		06/19/17 09:24	06/24/17 00:18	1
Perfluorooctanoic acid (PFOA)	7.3	U	18	2.6	ng/L		06/19/17 09:24	06/24/17 00:18	1
Perfluorononanoic acid (PFNA)	18	U	22	7.3	ng/L		06/19/17 09:24	06/24/17 00:18	1
Perfluorohexanesulfonic acid (PFHxS)	11	U	28	5.0	ng/L		06/19/17 09:24	06/24/17 00:18	1
Perfluoroheptanoic acid (PFHpA)	3.7	U	9.2	1.7	ng/L		06/19/17 09:24	06/24/17 00:18	1
Perfluorobutanesulfonic acid (PFBS)	33	U	83	15	ng/L		06/19/17 09:24	06/24/17 00:18	1
<b>Surrogate</b>	<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>				<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
13C2 PFHxA	90		70 - 130				06/19/17 09:24	06/24/17 00:18	1
13C2 PFDA	77		70 - 130				06/19/17 09:24	06/24/17 00:18	1

# Default Detection Limits

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

TestAmerica Job ID: 320-28987-1

## 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: TetraT: PFAS, NAS JRB Willow Grove

TestAmerica Job ID: 320-28987-1

## 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)
320-28987-1	NAWC-060817-RW-303	84	73
320-28987-2	NAWC-060817-FRB-303	90	77
LCS 320-169764/2-A	Lab Control Sample	91	81
LCSD 320-169764/3-A	Lab Control Sample Dup	82	92
MB 320-169764/1-A	Method Blank	90	72

### Surrogate Legend

13C2 PFHxA = 13C2 PFHxA

13C2 PFDA = 13C2 PFDA

# QC Sample Results

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

TestAmerica Job ID: 320-28987-1

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

**Lab Sample ID: MB 320-169764/1-A**  
**Matrix: Water**  
**Analysis Batch: 170757**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 169764**

Analyte	MB	MB	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Perfluorooctanesulfonic acid (PFOS)	16	U	40	6.8	ng/L		06/19/17 09:24	06/23/17 22:39	1
Perfluorooctanoic acid (PFOA)	8.0	U	20	2.8	ng/L		06/19/17 09:24	06/23/17 22:39	1
Perfluorononanoic acid (PFNA)	20	U	24	8.0	ng/L		06/19/17 09:24	06/23/17 22:39	1
Perfluorohexanesulfonic acid (PFHxS)	12	U	30	5.5	ng/L		06/19/17 09:24	06/23/17 22:39	1
Perfluoroheptanoic acid (PFHpA)	4.0	U	10	1.9	ng/L		06/19/17 09:24	06/23/17 22:39	1
Perfluorobutanesulfonic acid (PFBS)	36	U	90	16	ng/L		06/19/17 09:24	06/23/17 22:39	1

Surrogate	MB	MB	Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
13C2 PFHxA	90		70 - 130	06/19/17 09:24	06/23/17 22:39	1
13C2 PFDA	72		70 - 130	06/19/17 09:24	06/23/17 22:39	1

**Lab Sample ID: LCS 320-169764/2-A**  
**Matrix: Water**  
**Analysis Batch: 170757**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 169764**  
**%Rec.**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Perfluorooctanoic acid (PFOA)	79.9	82.3		ng/L		103	70 - 130
Perfluorononanoic acid (PFNA)	77.0	66.1		ng/L		86	70 - 130
Perfluorohexanesulfonic acid (PFHxS)	120	122		ng/L		102	70 - 130
Perfluoroheptanoic acid (PFHpA)	39.6	45.4		ng/L		115	70 - 130
Perfluorobutanesulfonic acid (PFBS)	353	383		ng/L		108	70 - 130

Surrogate	LCS	LCS	Limits
	%Recovery	Qualifier	
13C2 PFHxA	91		70 - 130
13C2 PFDA	81		70 - 130

**Lab Sample ID: LCSD 320-169764/3-A**  
**Matrix: Water**  
**Analysis Batch: 171486**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 169764**  
**%Rec.**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	Limits	RPD	RPD Limit
Perfluorooctanoic acid (PFOA)	79.9	75.0		ng/L		94	70 - 130	9	30
Perfluorononanoic acid (PFNA)	77.0	71.6		ng/L		93	70 - 130	8	30
Perfluorohexanesulfonic acid (PFHxS)	120	116		ng/L		97	70 - 130	5	30
Perfluoroheptanoic acid (PFHpA)	39.6	40.3		ng/L		102	70 - 130	12	30
Perfluorobutanesulfonic acid (PFBS)	353	365		ng/L		103	70 - 130	5	30

Surrogate	LCSD	LCSD	Limits
	%Recovery	Qualifier	
13C2 PFHxA	82		70 - 130
13C2 PFDA	92		70 - 130

# QC Association Summary

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

TestAmerica Job ID: 320-28987-1

## LCMS

### Prep Batch: 169764

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-28987-1	NAWC-060817-RW-303	Total/NA	Water	537	
320-28987-2	NAWC-060817-FRB-303	Total/NA	Water	537	
MB 320-169764/1-A	Method Blank	Total/NA	Water	537	
LCS 320-169764/2-A	Lab Control Sample	Total/NA	Water	537	
LCSD 320-169764/3-A	Lab Control Sample Dup	Total/NA	Water	537	

### Analysis Batch: 170757

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 320-169764/1-A	Method Blank	Total/NA	Water	537	169764
LCS 320-169764/2-A	Lab Control Sample	Total/NA	Water	537	169764

### Analysis Batch: 170758

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-28987-1	NAWC-060817-RW-303	Total/NA	Water	537	169764
320-28987-2	NAWC-060817-FRB-303	Total/NA	Water	537	169764

### Analysis Batch: 171486

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCSD 320-169764/3-A	Lab Control Sample Dup	Total/NA	Water	537	169764

# Lab Chronicle

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

TestAmerica Job ID: 320-28987-1

**Client Sample ID: NAWC-060817-RW-303**

**Lab Sample ID: 320-28987-1**

**Date Collected: 06/08/17 08:05**

**Matrix: Water**

**Date Received: 06/09/17 09:25**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			169764	06/19/17 09:24	NS1	TAL SAC
Total/NA	Analysis	537		1	170758	06/24/17 00:13	JRB	TAL SAC

**Client Sample ID: NAWC-060817-FRB-303**

**Lab Sample ID: 320-28987-2**

**Date Collected: 06/08/17 08:00**

**Matrix: Water**

**Date Received: 06/09/17 09:25**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			169764	06/19/17 09:24	NS1	TAL SAC
Total/NA	Analysis	537		1	170758	06/24/17 00:18	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: TetraT: PFAS, NAS JRB Willow Grove

TestAmerica Job ID: 320-28987-1

## 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: TetraT: PFAS, NAS JRB Willow Grove

TestAmerica Job ID: 320-28987-1

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

**Protocol References:**

EPA = US Environmental Protection Agency

**Laboratory References:**

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



# Sample Summary

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

TestAmerica Job ID: 320-28987-1

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<b>Lab Sample ID</b>	<b>Client Sample ID</b>	<b>Matrix</b>	<b>Collected</b>	<b>Received</b>
320-28987-1	NAWC-060817-RW-303	Water	06/08/17 08:05	06/09/17 09:25
320-28987-2	NAWC-060817-FRB-303	Water	06/08/17 08:00	06/09/17 09:25

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-28987-1

SDG No.: \_\_\_\_\_

Instrument ID: A8\_N Analysis Batch Number: 170758

Lab Sample ID: 320-28987-1 Client Sample ID: NAWC-060817-RW-303

Date Analyzed: 06/24/17 00:13 Lab File ID: 2017.06.23\_537\_038.d GC Column: GeminiC18 3x1 ID: 3 (mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorobutanesulfonic acid (PFBS)	2.31	Baseline	barnettj	06/26/17 13:42



REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-28987-1

SDG No.: \_\_\_\_\_

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LC537-PFOS2_00007	07/26/17	02/20/17	Methanol, Lot 090285	11 mL	LC537_PFOS2_00001	0.0174 g	Perfluorooctanesulfonic acid (PFOS)	1231.76 ug/mL
...LC537_PFOS2_00001	07/26/17		Sigma, Lot BCBF5116V		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.7787 g/g
<b>LC537-IS_00038</b>	10/26/17	04/26/17	Methanol, Lot 090285	20000 uL	LCM2PFOA_00005	40 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00019	120 uL	13C4 PFOS	0.2868 ug/mL
..LCM2PFOA_00005	06/19/18		Wellington Laboratories, Lot M2PFOA0613		(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00019	08/03/21		Wellington Laboratories, Lot MPFOS0816		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
<b>LC537-L1_00018</b>	08/09/17	03/23/17	MeOH/H2O, Lot 090285	5 mL	LC537-IS_00034	500 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-MSP_00022	50 uL	Perfluorobutanesulfonic acid (PFBS)	8.83417 ng/mL
							Perfluoroheptanoic acid (PFHpA)	0.99 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	3.00607 ng/mL
							Perfluorononanoic acid (PFNA)	1.926 ng/mL
							Perfluorooctanoic acid (PFOA)	1.998 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	4.00329 ng/mL
					LC537-SU_00035	500 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
..LC537-IS_00034	09/22/17	03/22/17	Methanol, Lot 090285	20000 uL	LCM2PFOA_00005	40 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00019	120 uL	13C4 PFOS	0.2868 ug/mL
..LCM2PFOA_00005	06/19/18		Wellington Laboratories, Lot M2PFOA0613		(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-MSP_00022	08/09/17	03/23/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00022	200 uL	Perfluorobutanesulfonic acid (PFBS)	883.417 ng/mL
							Perfluoroheptanoic acid (PFHpA)	99 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	300.607 ng/mL
							Perfluorononanoic acid (PFNA)	192.6 ng/mL
							Perfluorooctanoic acid (PFOA)	199.8 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	400.329 ng/mL
..LC537SPIM_00022	08/09/17	03/22/17	Methanol, Lot 104453	10000 uL	LC537-PFBS_00007	440 uL	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	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0329 ug/mL
...LC537-PFBS_00007	01/04/18	01/04/17	Methanol, Lot 090285	51.5 mL	LC537_PFBS_00002	0.1034 g	Perfluorobutanesulfonic acid (PFBS)	2007.77 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-28987-1

SDG No.: \_\_\_\_\_

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
....LC537_PFB_S_00002	04/01/18		Sigma, Lot MKBP8842V			(Purchased Reagent)	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			(Purchased Reagent)	Perfluoroheptanoic acid (PFHpA)	0.99 g/g
...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			(Purchased Reagent)	Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
..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			(Purchased Reagent)	Perfluorononanoic acid (PFNA)	0.963 g/g
..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			(Purchased Reagent)	Perfluorooctanoic acid (PFOA)	0.999 g/g
..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			(Purchased Reagent)	Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-SU_00035	09/22/17	03/22/17	Methanol, Lot 104453	20000 uL	LCMPFDA_00012	40 uL	13C2 PFDA	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		LCMPFHxA_00013	40 uL	13C2 PFHxA	0.1 ug/mL
..LCMPFHxA_00013	04/08/21		Wellington Laboratories, Lot MPFHxA0416			(Purchased Reagent)	13C2 PFHxA	50 ug/mL
<b>LC537-L2_00018</b>	08/09/17	03/23/17	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00018	64 uL	Perfluorobutanesulfonic acid (PFBS)	21.202 ng/mL
							Perfluoroheptanoic acid (PFHpA)	2.376 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	7.21457 ng/mL
							Perfluorononanoic acid (PFNA)	4.6224 ng/mL
							Perfluorooctanoic acid (PFOA)	4.7952 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	9.6079 ng/mL
					LC537-IS_00034	500 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00035	500 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00018	08/09/17	03/23/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00022	375 uL	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
							Perfluorooctanesulfonic acid (PFOS)	750.617 ng/mL
..LC537SPIM_00022	08/09/17	03/22/17	Methanol, Lot 104453	10000 uL	LC537-PFBS_00007	440 uL	Perfluorobutanesulfonic acid (PFBS)	88.3417 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-28987-1

SDG No.: \_\_\_\_\_

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					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	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0329 ug/mL
...LC537-PFBS_00007	01/04/18	01/04/17	Methanol, Lot 090285	51.5 mL	LC537_PFBS_00002	0.1034 g	Perfluorobutanesulfonic acid (PFBS)	2007.77 ug/mL
....LC537_PFBS_00002	04/01/18		Sigma, Lot MKBP8842V		(Purchased Reagent)		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 BCM2579V		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.99 g/g
...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		(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
...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		(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g
...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		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
...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		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-IS_00034	09/22/17	03/22/17	Methanol, Lot 090285	20000 uL	LCM2PFOA_00005	40 uL	13C2-PFOA	0.1 ug/mL
..LCM2PFOA_00005	06/19/18		Wellington Laboratories, Lot M2PFOA0613		(Purchased Reagent)		13C4 PFOS	0.2868 ug/mL
..LCMPFOS_00019	08/03/21		Wellington Laboratories, Lot MPFOS0816		(Purchased Reagent)		13C2-PFOA	50 ug/mL
.LC537-SU_00035	09/22/17	03/22/17	Methanol, Lot 104453	20000 uL	LCMPFDA_00012	40 uL	13C4 PFOS	47.8 ug/mL
..LCMPFDA_00012	09/30/21		Wellington Laboratories, Lot MPFDA0916		(Purchased Reagent)		13C2 PFDA	0.1 ug/mL
..LCMPFHxA_00013	04/08/21		Wellington Laboratories, Lot MPFHxA0416		(Purchased Reagent)		13C2 PFDA	50 ug/mL
<b>LC537-L3_00020</b>	08/09/17	03/23/17	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00018	134 uL	Perfluorobutanesulfonic acid (PFBS)	44.3917 ng/mL
							Perfluoroheptanoic acid (PFHpA)	4.97475 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	15.1055 ng/mL
							Perfluorononanoic acid (PFNA)	9.67815 ng/mL
							Perfluorooctanoic acid (PFOA)	10.0399 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	20.1165 ng/mL
					LC537-IS_00034	500 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00035	500 uL	13C2 PFDA	10 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-28987-1

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	13C2 PFHxA	10 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									
Perfluorooctanesulfonic acid (PFOS)	750.617 ng/mL									
..LC537SPIM_00022	08/09/17	03/22/17	Methanol, Lot 104453	10000 uL	LC537-PFBS_00007	440 uL	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	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0329 ug/mL
...LC537-PFBS_00007	01/04/18	01/04/17	Methanol, Lot 090285	51.5 mL	LC537_PFBS_00002	0.1034 g	Perfluorobutanesulfonic acid (PFBS)	2007.77 ug/mL		
....LC537_PFBS_00002	04/01/18		Sigma, Lot MKBP8842V		(Purchased Reagent)		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		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.99 g/g		
...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		(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g		
...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		(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g		
...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		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g		
...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		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g		
.LC537-IS_00034	09/22/17	03/22/17	Methanol, Lot 090285	20000 uL	LCM2PFOA_00005	40 uL	13C2-PFOA	0.1 ug/mL		
					LCMPFOS_00019	120 uL	13C4 PFOS	0.2868 ug/mL		
..LCM2PFOA_00005	06/19/18		Wellington Laboratories, Lot M2PFOA0613		(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-SU_00035	09/22/17	03/22/17	Methanol, Lot 104453	20000 uL	LCMPFDA_00012	40 uL	13C2 PFDA	0.1 ug/mL		
					LCMPFHxA_00013	40 uL	13C2 PFHxA	0.1 ug/mL		
..LCMPFDA_00012	09/30/21		Wellington Laboratories, Lot MPFDA0916		(Purchased Reagent)		13C2 PFDA	50 ug/mL		
..LCMPFHxA_00013	04/08/21		Wellington Laboratories, Lot MPFHxA0416		(Purchased Reagent)		13C2 PFHxA	50 ug/mL		

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-28987-1

SDG No.: \_\_\_\_\_

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration		
					Reagent ID	Volume Added				
LC537-L4_00018	08/09/17	03/23/17	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00018	270 uL	Perfluorobutanesulfonic acid (PFBS)	89.446 ng/mL		
							Perfluoroheptanoic acid (PFHpA)	10.0238 ng/mL		
							Perfluorohexanesulfonic acid (PFHxS)	30.4365 ng/mL		
							Perfluorononanoic acid (PFNA)	19.5008 ng/mL		
							Perfluorooctanoic acid (PFOA)	20.2297 ng/mL		
					Perfluorooctanesulfonic acid (PFOS)	40.5333 ng/mL				
					LC537-IS_00034	500 uL	13C2-PFOA	10 ng/mL		
LC537-SU_00035	500 uL	13C2 PFDA	10 ng/mL							
.LC537-HSP_00018	08/09/17	03/23/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00022	375 uL	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		
Perfluorooctanesulfonic acid (PFOS)	750.617 ng/mL									
..LC537SPIM_00022	08/09/17	03/22/17	Methanol, Lot 104453	10000 uL	LC537-PFBS_00007	440 uL	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	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0329 ug/mL
...LC537-PFBS_00007	01/04/18	01/04/17	Methanol, Lot 090285	51.5 mL	LC537_PFBS_00002	0.1034 g	Perfluorobutanesulfonic acid (PFBS)	2007.77 ug/mL		
....LC537_PFBS_00002	04/01/18		Sigma, Lot MKBP8842V		(Purchased Reagent)		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		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.99 g/g		
...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		(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g		
...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		(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g		
...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		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g		



REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-28987-1

SDG No.: \_\_\_\_\_

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...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		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-IS_00034	09/22/17	03/22/17	Methanol, Lot 090285	20000 uL	LCM2PFOA 00005	40 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS 00019	120 uL	13C4 PFOS	0.2868 ug/mL
..LCM2PFOA 00005	06/19/18		Wellington Laboratories, Lot M2PFOA0613		(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-SU_00035	09/22/17	03/22/17	Methanol, Lot 104453	20000 uL	LCMPFDA 00012	40 uL	13C2 PFDA	0.1 ug/mL
					LCMPFHxA 00013	40 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
<b>LC537-L5_00021</b>	08/09/17	03/23/17	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00018	400 uL	Perfluorobutanesulfonic acid (PFBS)	132.513 ng/mL
							Perfluoroheptanoic acid (PFHpA)	14.85 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	45.0911 ng/mL
							Perfluorononanoic acid (PFNA)	28.89 ng/mL
							Perfluorooctanoic acid (PFOA)	29.97 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	60.0494 ng/mL
					LC537-IS_00034	500 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00035	500 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00018	08/09/17	03/23/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00022	375 uL	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
							Perfluorooctanesulfonic acid (PFOS)	750.617 ng/mL
..LC537SPIM_00022	08/09/17	03/22/17	Methanol, Lot 104453	10000 uL	LC537-PFBS_00007	440 uL	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	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0329 ug/mL
...LC537-PFBS_00007	01/04/18	01/04/17	Methanol, Lot 090285	51.5 mL	LC537_PFBS_00002	0.1034 g	Perfluorobutanesulfonic acid (PFBS)	2007.77 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-28987-1

SDG No.: \_\_\_\_\_

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
....LC537_PFB_S_00002	04/01/18		Sigma, Lot MKBP8842V		(Purchased Reagent)		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		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.99 g/g
...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		(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
..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		(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g
..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		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
..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		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-IS_00034	09/22/17	03/22/17	Methanol, Lot 090285	20000 uL	LCM2PFOA_00005	40 uL	13C2-PFOA	0.1 ug/mL
..LCM2PFOA_00005	06/19/18		Wellington Laboratories, Lot M2PFOA0613		(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-SU_00035	09/22/17	03/22/17	Methanol, Lot 104453	20000 uL	LCMPFDA_00012	40 uL	13C2 PFDA	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
<b>LC537-L6_00017</b>	08/09/17	03/23/17	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00018	530 uL	Perfluorobutanesulfonic acid (PFBS)	175.579 ng/mL
							Perfluoroheptanoic acid (PFHpA)	19.6763 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	59.7457 ng/mL
							Perfluorononanoic acid (PFNA)	38.2792 ng/mL
							Perfluorooctanoic acid (PFOA)	39.7103 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	79.5654 ng/mL
					LC537-IS_00034	500 uL	13C2-PFOA	10 ng/mL
LC537-SU_00035	500 uL	13C4 PFOS	28.68 ng/mL					
		13C2 PFDA	10 ng/mL					
		13C2 PFHxA	10 ng/mL					
.LC537-HSP_00018	08/09/17	03/23/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00022	375 uL	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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-28987-1

SDG No.: \_\_\_\_\_

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorooctanesulfonic acid (PFOS)	750.617 ng/mL
..LC537SPIM_00022	08/09/17	03/22/17	Methanol, Lot 104453	10000 uL	LC537-PFBS_00007	440 uL	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	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0329 ug/mL
...LC537-PFBS_00007	01/04/18	01/04/17	Methanol, Lot 090285	51.5 mL	LC537_PFBS_00002	0.1034 g	Perfluorobutanesulfonic acid (PFBS)	2007.77 ug/mL
....LC537_PFBS_00002	04/01/18		Sigma, Lot MKBP8842V		(Purchased Reagent)		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		(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.99 g/g
...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		(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
...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		(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g
...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		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
...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		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-IS_00034	09/22/17	03/22/17	Methanol, Lot 090285	20000 uL	LCM2PFOA_00005	40 uL	13C2-PFOA	0.1 ug/mL
					LCMPFOS_00019	120 uL	13C4 PFOS	0.2868 ug/mL
..LCM2PFOA_00005	06/19/18		Wellington Laboratories, Lot M2PFOA0613		(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-SU_00035	09/22/17	03/22/17	Methanol, Lot 104453	20000 uL	LCMPFDA_00012	40 uL	13C2 PFDA	0.1 ug/mL
					LCMPFHxA_00013	40 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
<b>LC537-MSP_00021</b>	08/09/17	03/23/17	Methanol, Lot 141039	20000 uL	LC537SPIM_00022	200 uL	Perfluorobutane Sulfonate	883.417 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	883.417 ng/mL
							Perfluoroheptanoic acid (PFHpA)	99 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	300.607 ng/mL
							Perfluorononanoic acid (PFNA)	192.6 ng/mL
Perfluorooctanoic acid (PFOA)	199.8 ng/mL							

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-28987-1

SDG No.: \_\_\_\_\_

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorooctanesulfonic acid (PFOS)	400.329 ug/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	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0329 ug/mL
..LC537-PFBS_00007	01/04/18	01/04/17	Methanol, Lot 090285	51.5 mL	LC537_PFB_00002	0.1034 g	Perfluorobutane Sulfonate	2007.77 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	2007.77 ug/mL
...LC537_PFB_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 BCM2579V			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	0.99 g/g
..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			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	0.9094 g/g
..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			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	0.963 g/g
..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			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
..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			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
<b>LC537-SU_00042</b>	11/09/17	05/09/17	Methanol, Lot 104453	30000 uL	LCMPFDA_00012	60 uL	13C2 PFDA	0.1 ug/mL
					LCMPFHxA_00013	60 uL	13C2 PFHxA	0.1 ug/mL
.LCMPFDA_00012	09/30/21	Wellington Laboratories, Lot MPFDA0916			(Purchased Reagent)		13C2 PFDA	50 ug/mL
.LCMPFHxA_00013	04/08/21	Wellington Laboratories, Lot MPFHxA0416			(Purchased Reagent)		13C2 PFHxA	50 ug/mL

Reagent

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**LC537\_PFB\_S\_00002**

#: 4/1/15 SPV

3050 Spruce Street, Saint Louis, MO 63103, USA

Website: www.sigmaaldrich.com

Email USA: techserv@sial.com

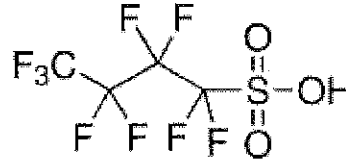
Outside USA: eurtechserv@sial.com

## 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: C<sub>4</sub>HF<sub>9</sub>O<sub>3</sub>S  
 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, Manager  
 Quality Control  
 Milwaukee, Wisconsin US

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

Reagent

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**LC537\_PFB2\_00001**



*The Power to Question*

# CERTIFICATE OF ANALYSIS

Catalog Number: sc-236187  
Product Name: Nonafluorobutane-1-sulfonic acid  
CAS Number: 375-73-5  
Molecular Formula:  $C_4HF_9O_3S$   
Molecular Weight: 300.10  
Lot Number: H0112

Test		Result
Refractive Index	1.3200 to 1.3290	1.3219
Purity (Titration)	min. 98.0%	99.8%

Test Conditions: Refractive Index: n<sub>20</sub>/D



Reagent

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**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

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**LC537\_PFHpA2\_00001**

# Certificate of Analysis

**Alfa Aesar**<sup>®</sup>  
A Johnson Matthey Company

Product No.: A12092  
Product: Perfluoroheptanoic acid, 98+%  
Lot No.: 10160443

PFHpA

Appearance: White crystalline powder  
Melting Point: 28.2 (slip point)  
Assay (Aqueous acid-base titration): 100.2%

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Fax: +82-2-3140-6002  
Email: [saleskorea@alfa-asia.com](mailto:saleskorea@alfa-asia.com)

Reagent

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**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:** C<sub>6</sub>F<sub>13</sub>KO<sub>3</sub>S

**Formula Weight:** 438.20

**Quality Release Date:** 20 JUN 2013

PFH<sub>13</sub>S-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

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

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

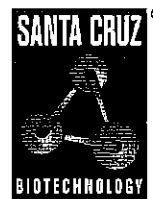
stw 4/1/15

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Reagent

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**LC537\_PFHxS2\_00001**

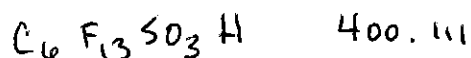
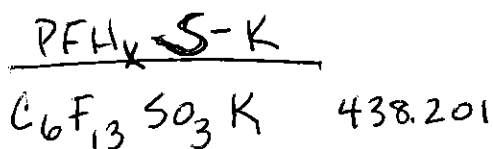


The Power to Question

# CERTIFICATE OF ANALYSIS

Catalog Number: sc-237289  
Product Name: Tridecafluorohexane-1-sulfonic acid potassium salt  
CAS Number: 3871-99-6  
Molecular Formula:  $C_6F_{13}KO_3S$   
Molecular Weight: 438.20  
Lot Number: F2612

Test	Specification	Result
Appearance	White to faint beige powder or crystals	White powder
Infrared Spectrum	Conforms to structure	Complies
Purity (Titration, Ion Exchange)	$\geq 98.0\%$	99.6 %



$$\text{MW correction} = \frac{400.111}{438.201} = 0.91307 \quad \frac{\text{PFH}_{13}\text{S}}{\text{CAS } 355-46-4}$$

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



Reagent

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**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

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**LC537\_PFN2\_00001**

3050 Spruce Street, Saint Louis, MO 63103, USA

Website: www.sigmaaldrich.com

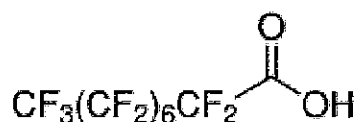
Email USA: techserv@sial.com

Outside USA: eurtechserv@sial.com

## Certificate of Analysis

Product Name:  
Perfluorononanoic acid - 97%

Product Number: 394459  
 Lot Number: MKBJ2926V  
 Brand: ALDRICH  
 CAS Number: 375-95-1  
 MDL Number: MFCD00039605  
 Formula: C<sub>9</sub>H<sub>17</sub>O<sub>2</sub>  
 Formula Weight: 464.08 g/mol  
 Quality Release Date: 20 OCT 2011



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
Purity (Titration by NaOH)	96.5 - 103.5 %	100.3 %
GC (area %)	≥ 96.5 %	99.6 %

*Jamie Gleason*

Jamie Gleason, Manager  
 Quality Control  
 Milwaukee, Wisconsin US

PFNA

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Reagent

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**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: C<sub>8</sub>HF<sub>15</sub>O<sub>2</sub>  
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

This document was produced electronically and is valid without a signature

# 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

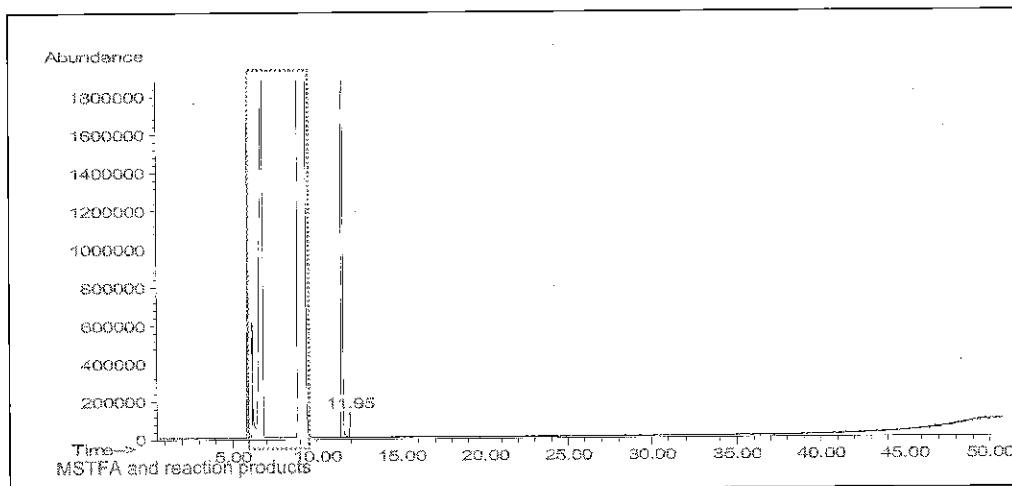
Mass range: 10-600 amu (Scan mode)

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

Identity: Mass spectrum complies

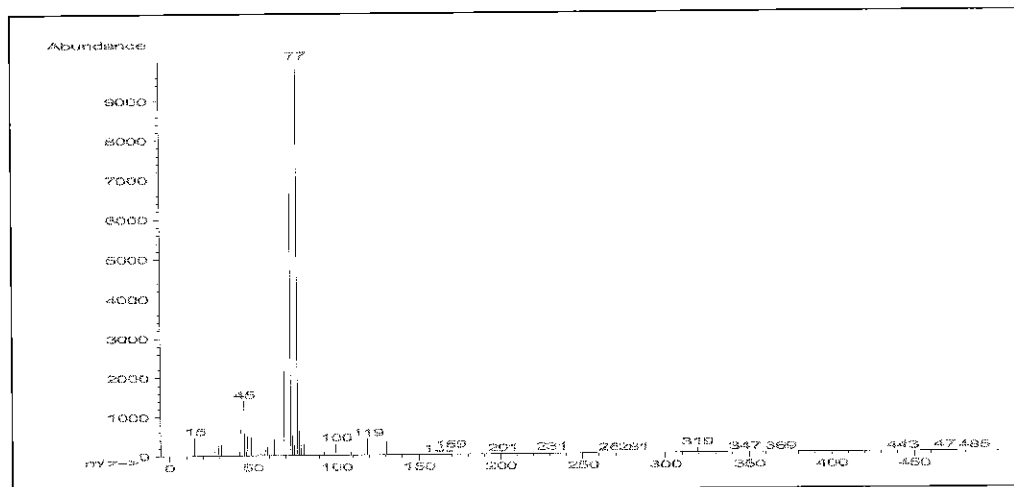
Operator: Ahrens / 2013-11-13

## 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

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**LC537\_PFOA2\_00001**



# Certificate of Analysis

**Alfa Aesar**<sup>®</sup>  
A Johnson Matthey Company

Product No.: L08862  
Product: Perfluorooctanoic acid, 95%  
Lot No.: D24Y026

PFOA

Appearance White solid  
Melting point 58 - 60°C  
Assay 99 %  
Identity Matches reference

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

[www.alfa.com](http://www.alfa.com)

**NORTH AMERICA**  
Tel: +1-800-343-0660 or  
+1-978-521-6300  
Fax: +1-800-322-4757  
Email: [info@alfa.com](mailto:info@alfa.com)

**GERMANY**  
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Fax: 00800 4577 4577 or  
+49 721 84007 300  
Email: [Eurosales@alfa.com](mailto:Eurosales@alfa.com)

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Fax: +44 (0)1524-850608  
Email: [UKsales@alfa.com](mailto:UKsales@alfa.com)

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Fax: 0800 10 20 67 or  
+33 (0)3 8862 6864  
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Fax: +91 8418 260060  
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Tel: +82-2-3140-6000  
Fax: +82-2-3140-6002  
Email: [saleskorea@alfa-asia.com](mailto:saleskorea@alfa-asia.com)

Reagent

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**LC537\_PFOs\_00002**

F: 4/115 SV

# SIGMA-ALDRICH®

## 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 <sup>+</sup>

### 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

FW-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

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**LC537\_PFOs2\_00001**

Certificate of Analysis

Inw 820  
12LCMS 0579

Product Name: HEPTADEC AFLUORO OCTANESULFONIC ACID TETRAETHYLAMMONIUM SALT  
98 %  
Product Number: 365289  
Product Brand: Aldrich  
Molecular Formula: C<sub>16</sub>H<sub>20</sub>F<sub>17</sub>NO<sub>3</sub>S  
Molecular Mass: 629.37  
CAS Number: 56773-42-3

TEST	SPECIFICATION	LOT BCBF5116V RESULTS
APPEARANCE (COLOR)	OFF-WHITE TO WHITE	WHITE
APPEARANCE (FORM)	POWDER, LUMPS OR CHUNKS	POWDER WITH LUMPS
CARBON CONTENT	29.77 % - 31.29 %	30.52
INFRARED SPECTRUM	CONFORMS TO STRUCTURE	CONFORMS

QC RELEASE DATE 13/APR/11

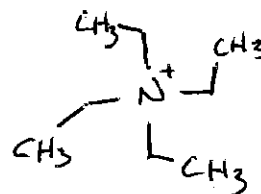
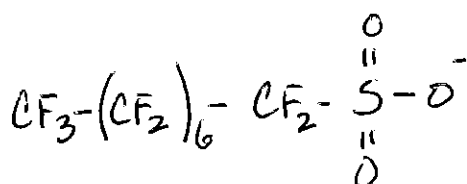
$$\text{Mw correction} = \frac{500.125}{629.37} = 0.7946$$

~~79.46%~~ det 7-26-12

*E. Schwarzler*

Purity + Mw Correction = 77.87%

Edeltraud Schwarzler, Manager  
Quality Control  
Buchs, Switzerland



	<u>C<sub>8</sub>F<sub>17</sub>SO<sub>3</sub>H</u>	<u>C<sub>8</sub>H<sub>20</sub>N</u>
C = 12.011	96.088	96.088
F = 18.998	322.966	-
S = 32.066	32.066	-
O = 15.999	47.997	-
H = 1.008	1.008	20.160
N = 14.007	-	14.007
	<u>500.125</u>	<u>130.255</u> →

Sigma-Aldrich warrants, that its products conform to the information contained in this and other Sigma-Aldrich publications. Purchaser must determine the suitability of the product for its particular use. See reverse side of invoice for additional terms and conditions of sale. The values given on the 'Certificate of Analysis' are the results determined at the time of analysis.

## Certificate of Origin

**Product Name:** Heptadecafluorooctanesulfonic acid tetraethylammonium salt  
 98 %  
**Product Number:** 365289  
**Product Brand:** Aldrich  
**Lot:** BCBF5116V  
**Molecular Formula:**  $C_{16}H_{20}F_{17}NO_3S$   
**Molecular Mass:** 629.37  
**CAS Number:** 56773-42-3  
**Date of Issue:** 30-MAR-11

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**Country of Origin** China

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product is of synthetic origin	yes
only synthetic materials used in the manufacturing process	yes
compounds of animal origin used	no
genetically modified organisms used	no
allergenic materials used	no
procedures in place to avoid cross contamination with residue of animal, human, GMO or allergenes in manufacturing process	yes

Sigma-Aldrich has quality systems and procedures in place for monitoring the production process, traceability and batch consistency.

Document issued by Sigma-Aldrich Corporation "Sigma-Aldrich". This document is valid without signature and has been produced digitally.

This information is to be used for the purpose of determining animal or other biological origin only and not to be confused with "Country of Origin" for import/export purposes. Data provided on this document are property of Sigma-Aldrich.

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Sigma-Aldrich shall not be held liable for any damage resulting from handling or from processing the above product(s). This document does not make any warranty, express or implied, of fitness for any particular use of the product(s). Purchaser must determine the suitability of the product(s) for its use under the applicable law and regulations.

For further questions please contact your local Sigma-Aldrich representative.

*We are committed to the success of our Customers, Employees and Shareholders through leadership in Life Science, High Technology and Service.*

Reagent

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**LCM2PFOA\_00005**

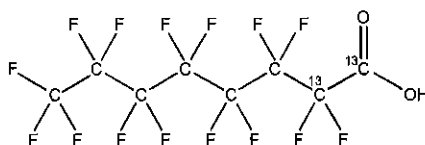


# WELLINGTON LABORATORIES

## CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:** M2PFOA **LOT NUMBER:** M2PFOA0613  
**COMPOUND:** Perfluoro-n-[1,2-<sup>13</sup>C<sub>2</sub>]octanoic acid

**STRUCTURE:** **CAS #:** Not available



**MOLECULAR FORMULA:** <sup>13</sup>C<sub>2</sub><sup>12</sup>C<sub>6</sub>HF<sub>15</sub>O<sub>2</sub> **MOLECULAR WEIGHT:** 416.05  
**CONCENTRATION:** 50 ± 2.5 µg/ml **SOLVENT(S):** Methanol  
 Water (<1%)  
**CHEMICAL PURITY:** >98% **ISOTOPIC PURITY:** ≥99%<sup>13</sup>C  
 (1,2-<sup>13</sup>C<sub>2</sub>)  
**LAST TESTED:** (mm/dd/yyyy) 06/19/2013  
**EXPIRY DATE:** (mm/dd/yyyy) 06/19/2018  
**RECOMMENDED STORAGE:** Store ampoule in a cool, dark place

### DOCUMENTATION/ DATA ATTACHED:

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

### ADDITIONAL INFORMATION:

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

**FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE**

Certified By: \_\_\_\_\_

  
B.G. Chittim

Date: 07/16/2013  
(mm/dd/yyyy)

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



**INTENDED USE:**

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

**HAZARDS:**

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

**SYNTHESIS / CHARACTERIZATION:**

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

**HOMOGENEITY:**

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

**UNCERTAINTY:**

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

The combined relative standard uncertainty,  $u_c(y)$ , of a value  $y$  and the uncertainty of the independent parameters  $x_1, x_2, \dots, x_n$  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 our products.

**TRACEABILITY:**

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external, ISO/IEC 17025:2005 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

**EXPIRY DATE / PERIOD OF VALIDITY:**

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

**LIMITED WARRANTY:**

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

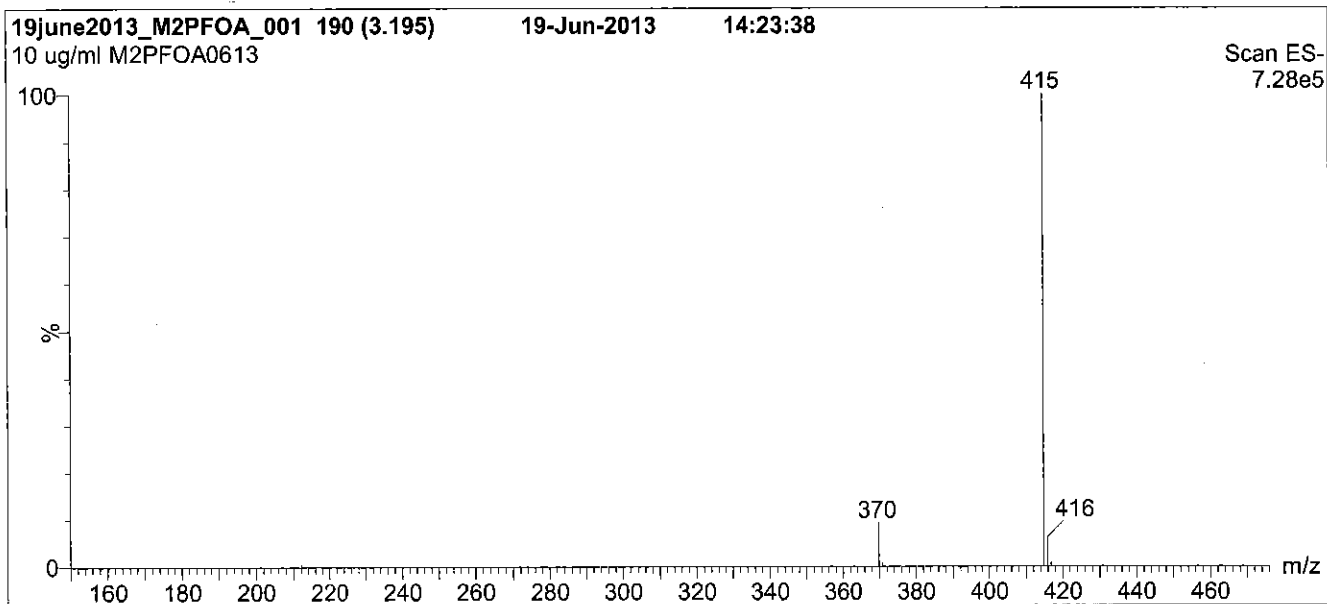
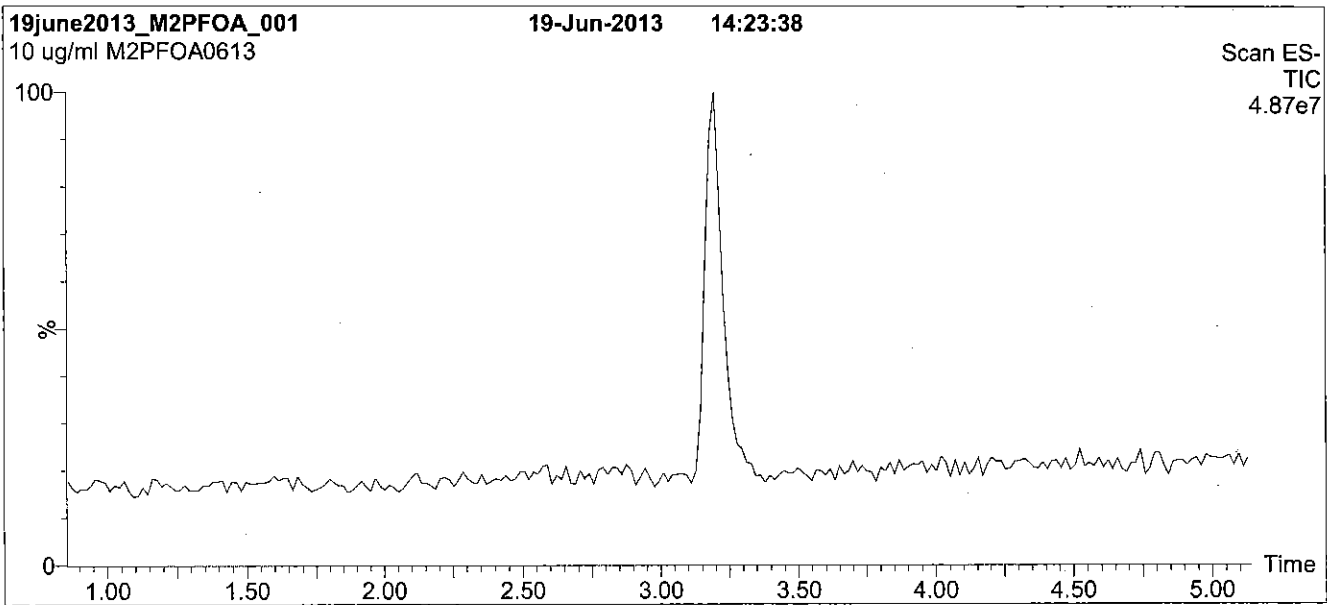
**QUALITY MANAGEMENT:**

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



\*\*For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at [www.well-labs.com](http://www.well-labs.com) or contact us directly at [info@well-labs.com](mailto: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 RP<sub>18</sub>  
1.7 μm, 2.1 x 100 mm

Mobile phase: Gradient  
Start: 50% (80:20 MeOH:ACN) / 50% H<sub>2</sub>O  
(both with 10 mM NH<sub>4</sub>OAc buffer)  
Ramp to 90% organic over 7 min and hold for 1.5 min  
before returning to initial conditions in 0.5 min.  
Time: 10 min

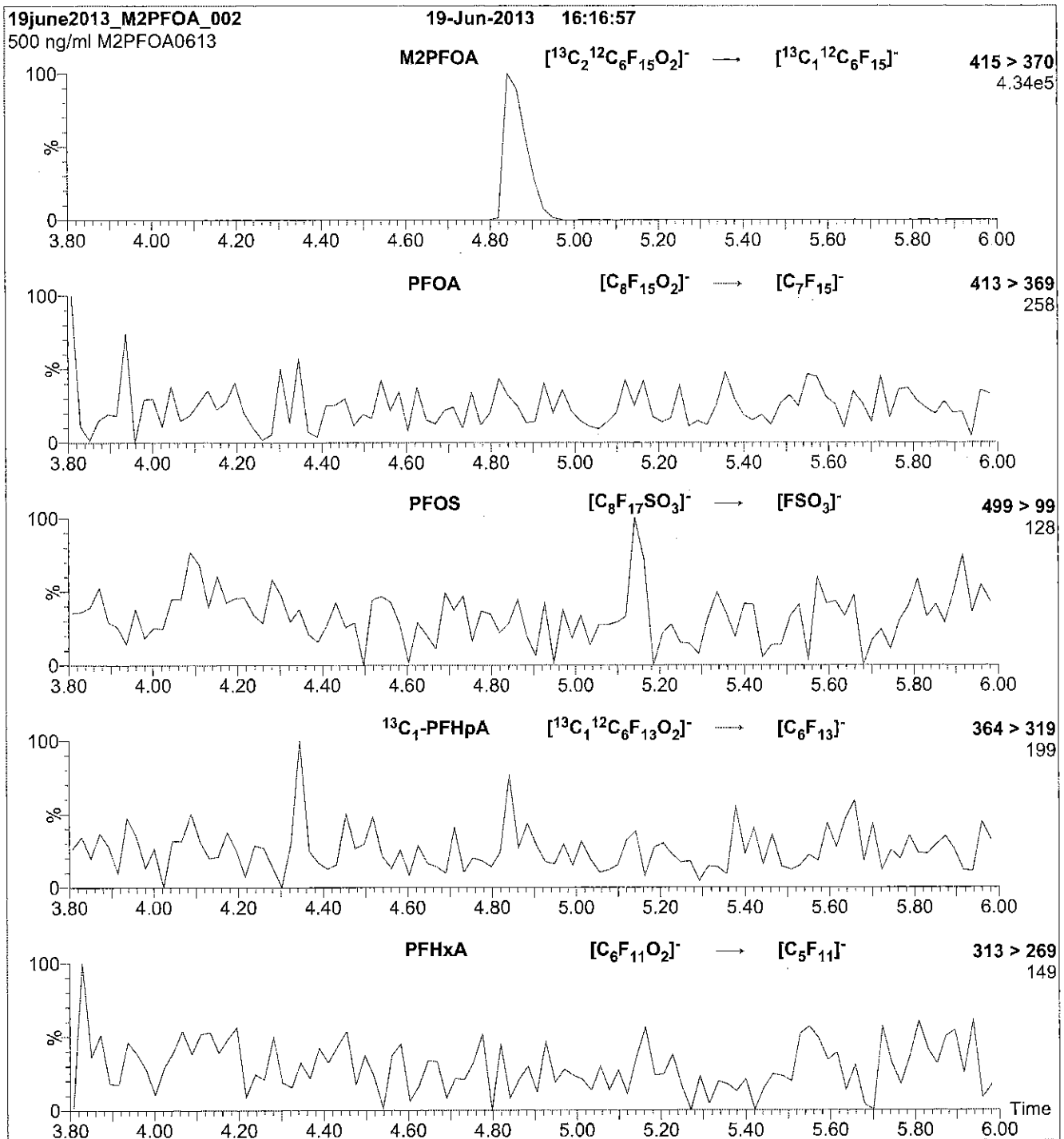
Flow: 300 μl/min

**MS Parameters**

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)  
Capillary Voltage (kV) = 2.00  
Cone Voltage (V) = 15.00  
Cone Gas Flow (l/hr) = 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  $\mu\text{l}$  (500 ng/ml M2PFOA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20%  $\text{H}_2\text{O}$   
(both with 10 mM  $\text{NH}_4\text{OAc}$  buffer)

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

**MS Parameters**

Collision Gas (mbar) = 3.66e-3  
Collision Energy (eV) = 11

Reagent

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**LCMPFDA\_00012**

R: SBC 12/21/16



814255

ID: LCMPPFDA\_00012

Exp: 09/30/21 Prpd: SBC

13C2-Perfluorodecanoic acid

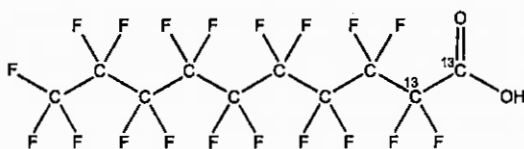


# WELLINGTON LABORATORIES

## CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:** MPFDA **LOT NUMBER:** MPFDA0916  
**COMPOUND:** Perfluoro-n-[1,2-<sup>13</sup>C<sub>2</sub>]decanoic acid

**STRUCTURE:** **CAS #:** Not available



**MOLECULAR FORMULA:** <sup>13</sup>C<sub>2</sub><sup>12</sup>C<sub>8</sub>HF<sub>19</sub>O<sub>2</sub>  
**CONCENTRATION:** 50 ± 2.5 µg/ml

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

**CHEMICAL PURITY:** >98%

**ISOTOPIC PURITY:** ≥99% <sup>13</sup>C  
(1,2-<sup>13</sup>C<sub>2</sub>)

**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 <sup>13</sup>C<sub>1</sub>-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.

### **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.

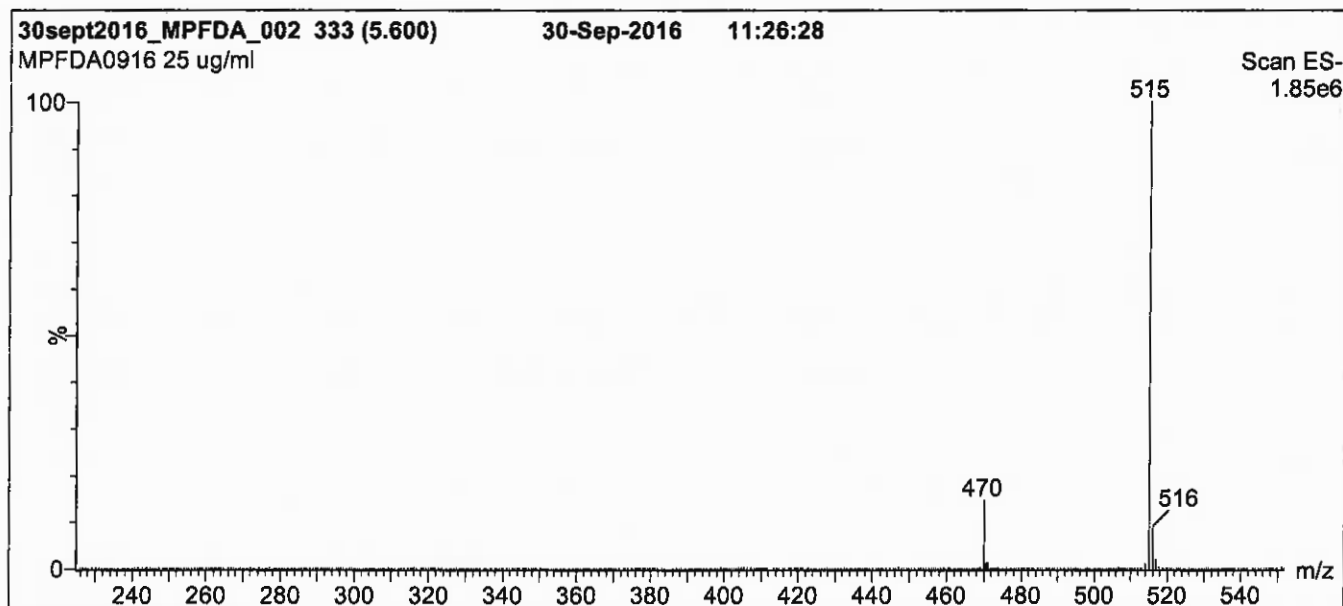
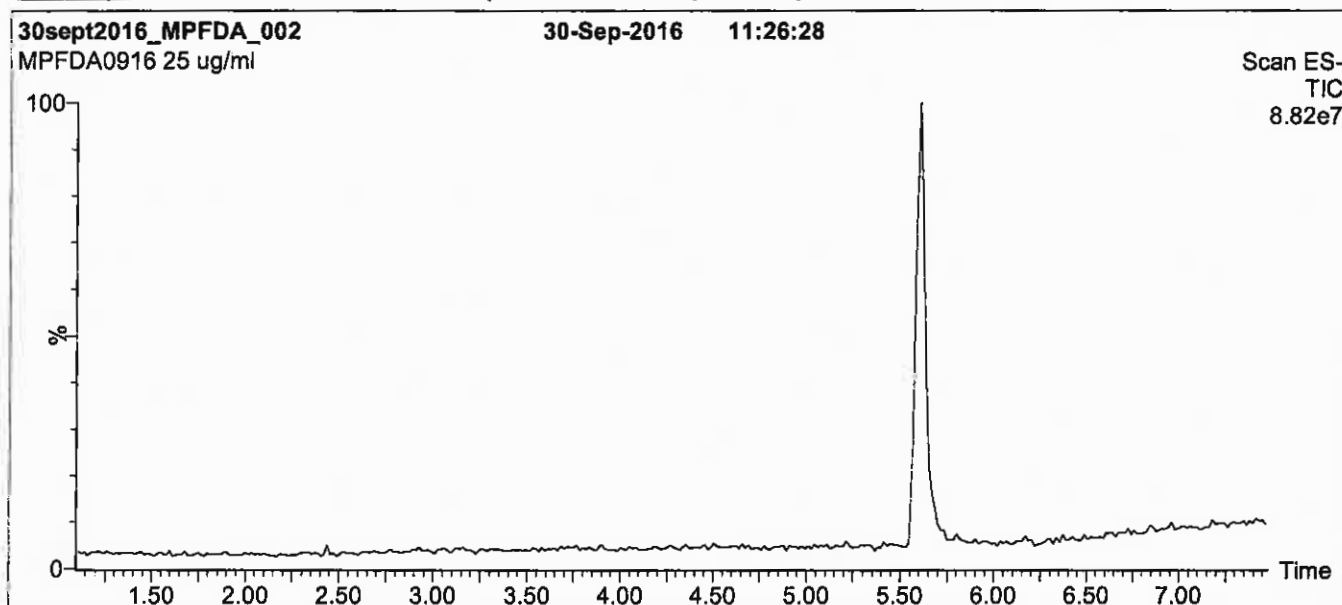
### **QUALITY MANAGEMENT:**

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](http://www.well-labs.com) or contact us directly at [info@well-labs.com](mailto:info@well-labs.com)\*\*

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



**Conditions for Figure 1:**

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

**Chromatographic Conditions**

Column: Acquity UPLC BEH Shield RP<sub>18</sub>  
1.7  $\mu$ m, 2.1 x 100 mm

Mobile phase: Gradient  
Start: 50% (80:20 MeOH:ACN) / 50% H<sub>2</sub>O  
(both with 10 mM NH<sub>4</sub>OAc 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

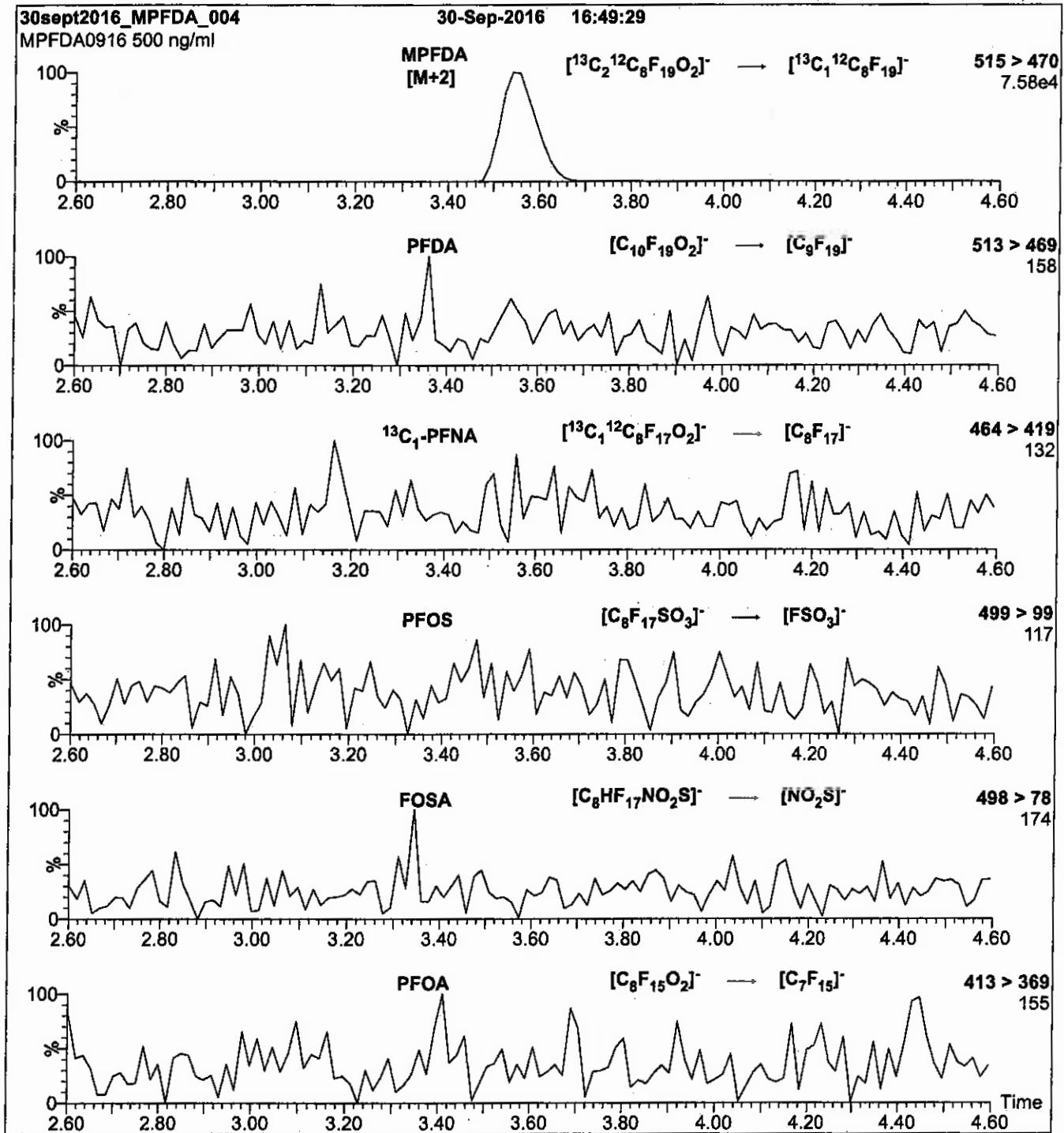
Flow: 300  $\mu$ l/min

**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  $\mu$ l (500 ng/ml MPFDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H<sub>2</sub>O  
(both with 10 mM NH<sub>4</sub>OAc buffer)

Flow: 300  $\mu$ l/min

**MS Parameters**

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



Reagent

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**LCMPFHxA\_00013**

R: SBC 12/21/16



814258  
ID: LCMPFHxA\_00013  
Exp: 04/08/21 Ppdt. SBC  
13C2-Perfluorohexanoic ac



# WELLINGTON LABORATORIES

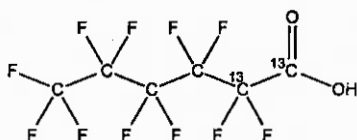
## CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:** MPFHxA  
**COMPOUND:** Perfluoro-n-[1,2-<sup>13</sup>C<sub>2</sub>]hexanoic acid

**LOT NUMBER:** MPFHxA0416

**STRUCTURE:**

**CAS #:** Not available



**MOLECULAR FORMULA:** <sup>13</sup>C<sub>2</sub><sup>12</sup>C<sub>4</sub>HF<sub>11</sub>O<sub>2</sub>  
**CONCENTRATION:** 50 ± 2.5 µg/ml

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

**CHEMICAL PURITY:** >98%

**ISOTOPIC PURITY:** ≥99%<sup>13</sup>C  
(1,2-<sup>13</sup>C<sub>2</sub>)

**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:**

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.

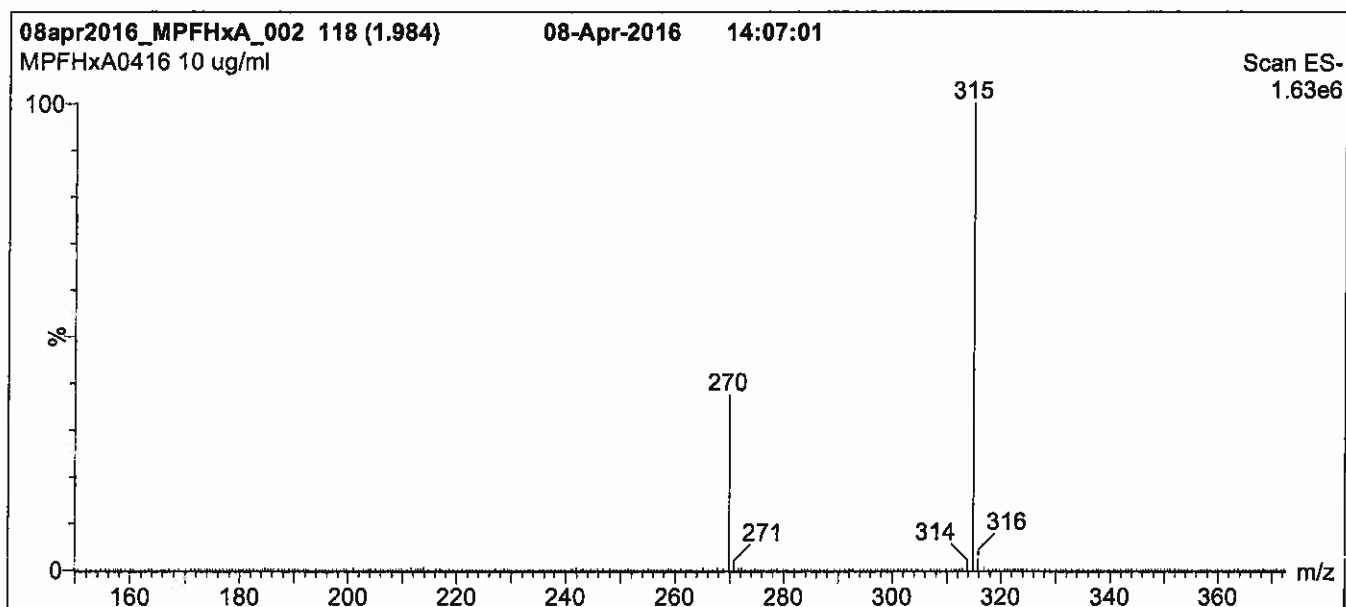
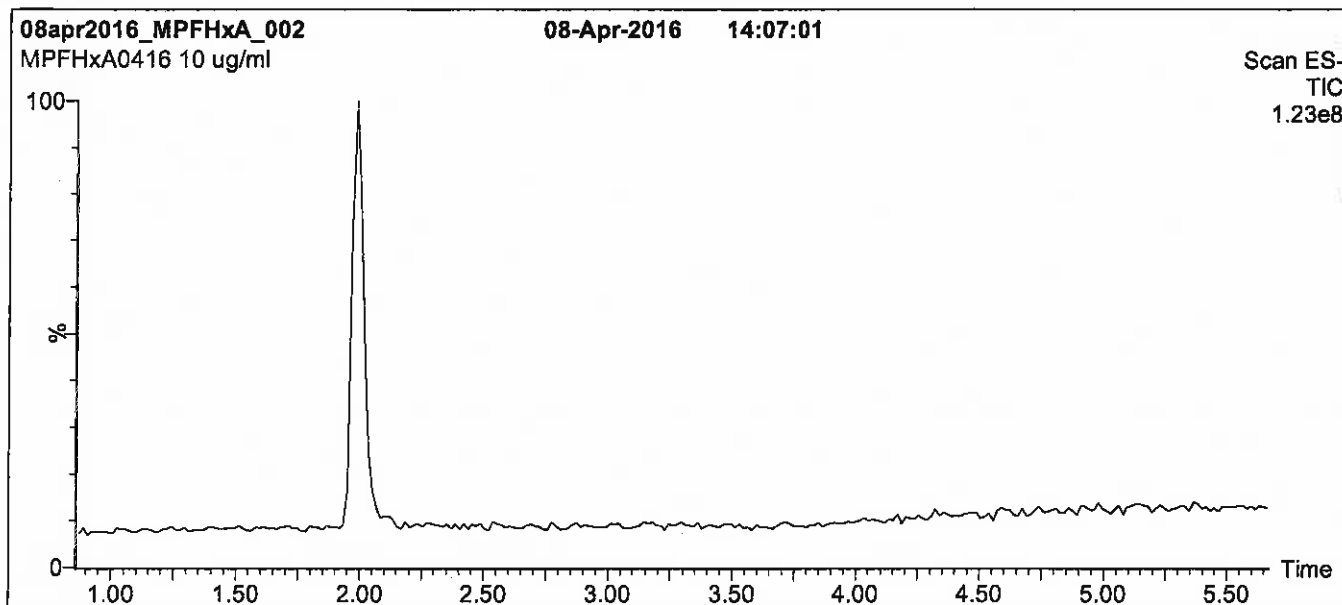
### **QUALITY MANAGEMENT:**

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](http://www.well-labs.com) or contact us directly at [info@well-labs.com](mailto:info@well-labs.com)\*\*

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



**Conditions for Figure 1:**

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

**Chromatographic Conditions**

Column: Acquity UPLC BEH Shield RP<sub>18</sub>  
 1.7  $\mu$ m, 2.1 x 100 mm

Mobile phase: Gradient  
 Start: 50% (80:20 MeOH:ACN) / 50% H<sub>2</sub>O  
 (both with 10 mM NH<sub>4</sub>OAc 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

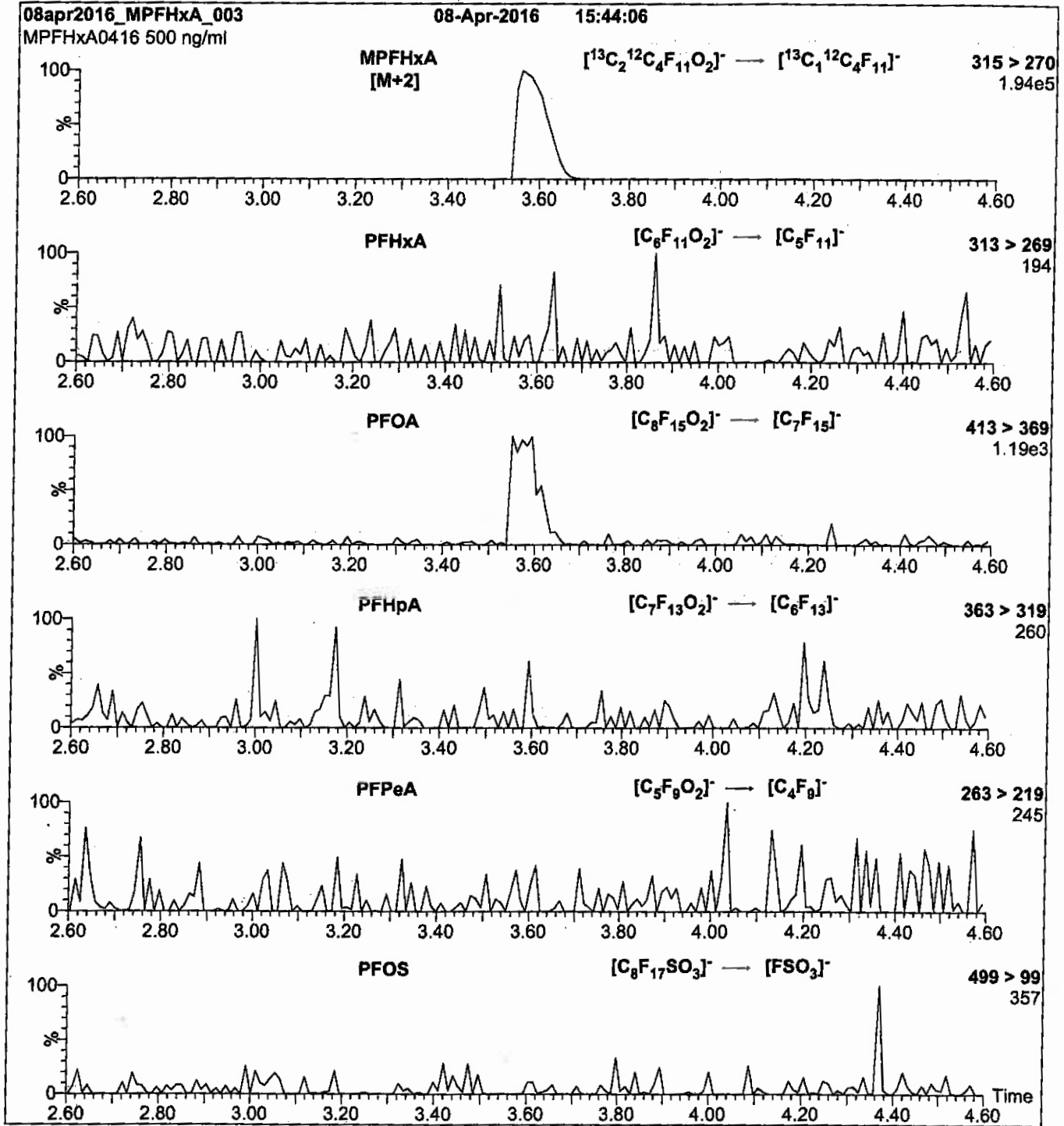
Flow: 300  $\mu$ l/min

**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  $\mu$ l (500 ng/ml MPFHxA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H<sub>2</sub>O  
(both with 10 mM NH<sub>4</sub>OAc buffer)

Flow: 300  $\mu$ l/min

**MS Parameters**

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

Reagent

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**LCMPFOS\_00019**

R: SBC 12/21/16



814253  
ID: LCMPFOS\_00019  
Exp: 08/03/21 Ppfd: SBC  
13C4-Perfluorooctanesulfo

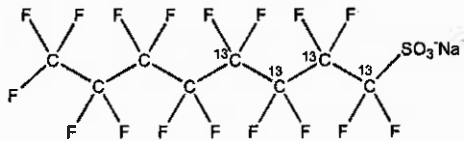


# WELLINGTON LABORATORIES

## CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:** MPFOS      **LOT NUMBER:** MPFOS0816  
**COMPOUND:** Sodium perfluoro-1-[1,2,3,4-<sup>13</sup>C<sub>4</sub>]octanesulfonate

**STRUCTURE:**      **CAS #:** Not available



<b>MOLECULAR FORMULA:</b>	<sup>13</sup> C <sub>4</sub> <sup>12</sup> C <sub>4</sub> F <sub>17</sub> SO <sub>3</sub> Na	<b>MOLECULAR WEIGHT:</b>	526.08
<b>CONCENTRATION:</b>	50.0 ± 2.5 µg/ml (Na salt) 47.8 ± 2.4 µg/ml (MPFOS anion)	<b>SOLVENT(S):</b>	Methanol
<b>CHEMICAL PURITY:</b>	>98%	<b>ISOTOPIC PURITY:</b>	≥99% <sup>13</sup> C (1,2,3,4- <sup>13</sup> C <sub>4</sub> )
<b>LAST TESTED:</b> (mm/dd/yyyy)	08/03/2016		
<b>EXPIRY DATE:</b> (mm/dd/yyyy)	08/03/2021		
<b>RECOMMENDED STORAGE:</b>	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-<sup>13</sup>C<sub>3</sub>]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

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

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### **EXPIRY DATE / PERIOD OF VALIDITY:**

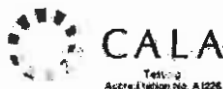
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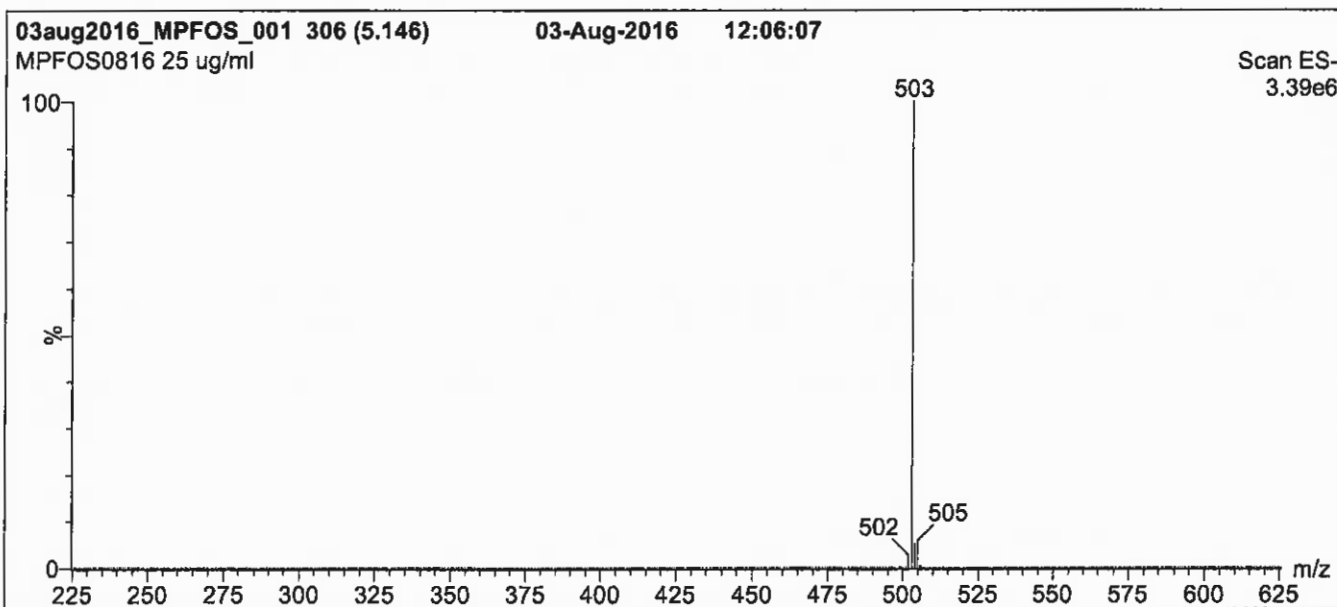
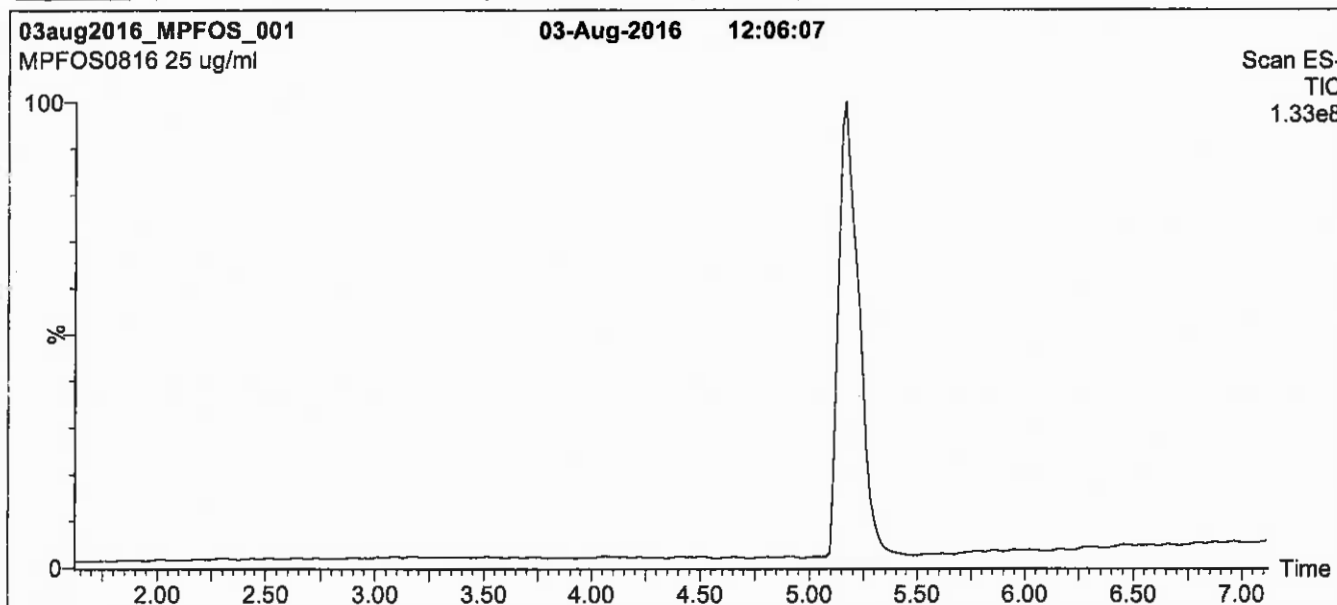
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**Figure 1: MPFOS; LC/MS Data (TIC and Mass Spectrum)**



**Conditions for Figure 1:**

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

**Chromatographic Conditions**

**Column:** Acquity UPLC BEH Shield RP<sub>18</sub>,  
 1.7  $\mu$ m, 2.1 x 100 mm

**Mobile phase:** Gradient  
 Start: 45% (80:20 MeOH:ACN) / 55% H<sub>2</sub>O  
 (both with 10 mM NH<sub>4</sub>OAc 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

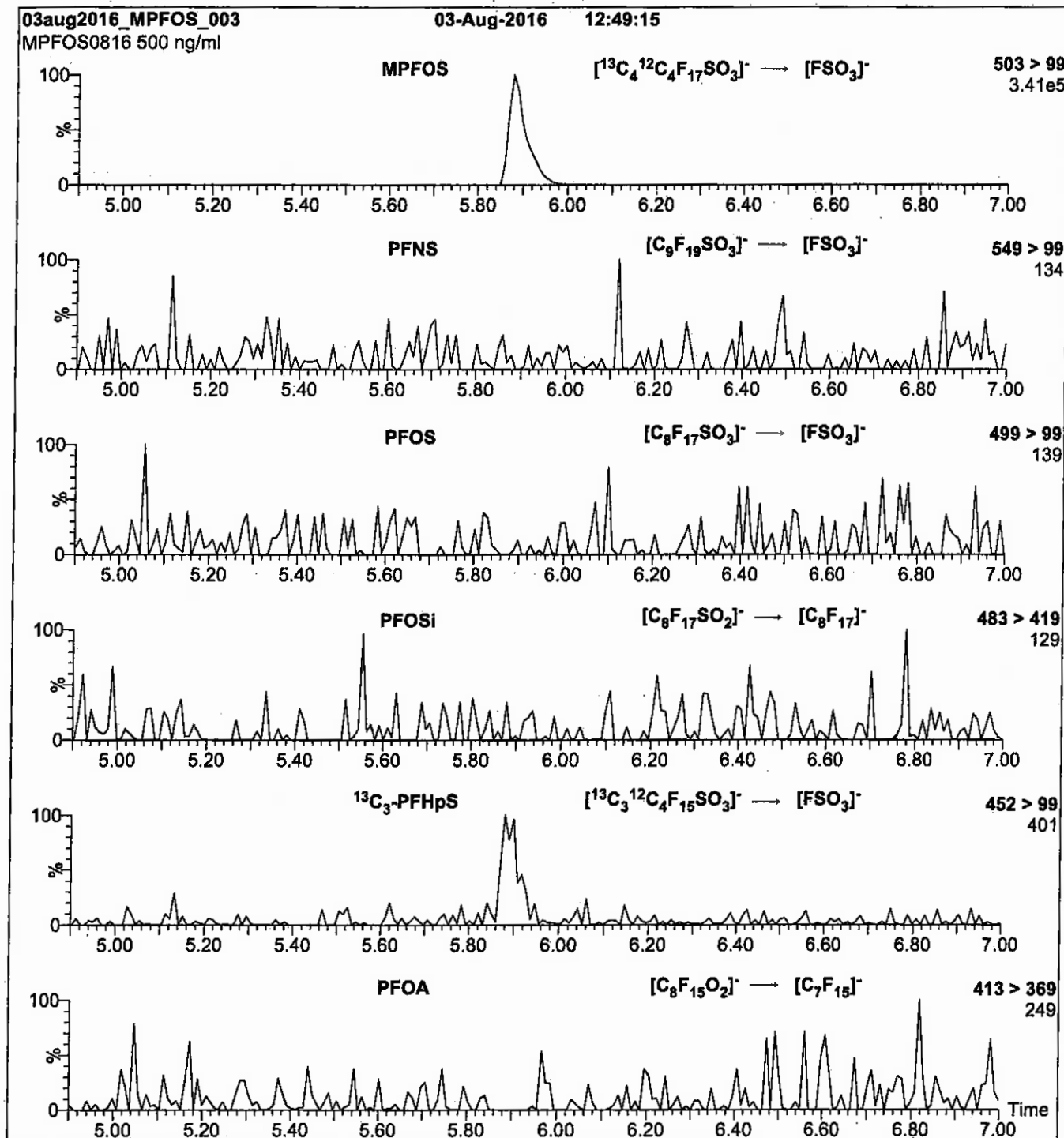
**Flow:** 300  $\mu$ l/min

**MS Parameters**

**Experiment:** Full Scan (225 - 850 amu)

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

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



**Conditions for Figure 2:**

Injection: Direct loop injection  
10  $\mu\text{l}$  (500 ng/ml MPFOS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20%  $\text{H}_2\text{O}$   
(both with 10 mM  $\text{NH}_4\text{OAc}$  buffer)

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

**MS Parameters**

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

# Method 537 DOD

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

FORM II  
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-28987-1

SDG No.: \_\_\_\_\_

Matrix: Water Level: Low

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

Client Sample ID	Lab Sample ID	PFHxA #	PFDA #
NAWC-060817-RW-303	320-28987-1	84	73
NAWC-060817-FRB-303	320-28987-2	90	77
	MB 320-169764/1-A	90	72
	LCS 320-169764/2-A	91	81
	LCSD 320-169764/3-A	82	92

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.: 320-28987-1  
 SDG No.: \_\_\_\_\_  
 Matrix: Water Level: Low Lab File ID: 2017.06.23\_537\_019.d  
 Lab ID: LCS 320-169764/2-A Client ID: \_\_\_\_\_

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	160	157	98	70-130	
Perfluorooctanoic acid (PFOA)	79.9	82.3	103	70-130	
Perfluorononanoic acid (PFNA)	77.0	66.1	86	70-130	
Perfluorohexanesulfonic acid (PFHxS)	120	122	102	70-130	
Perfluoroheptanoic acid (PFHpA)	39.6	45.4	115	70-130	
Perfluorobutanesulfonic acid (PFBS)	353	383	108	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.: 320-28987-1

SDG No.: \_\_\_\_\_

Matrix: Water Level: Low Lab File ID: 2017.06.28\_537B\_005.d

Lab ID: LCSD 320-169764/3-A Client ID: \_\_\_\_\_

COMPOUND	SPIKE ADDED (ng/L)	LCSD CONCENTRATION (ng/L)	LCSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
Perfluorooctanesulfonic acid (PFOS)	160	148	93	6	30	70-130	
Perfluorooctanoic acid (PFOA)	79.9	75.0	94	9	30	70-130	
Perfluorononanoic acid (PFNA)	77.0	71.6	93	8	30	70-130	
Perfluorohexanesulfonic acid (PFHxS)	120	116	97	5	30	70-130	
Perfluoroheptanoic acid (PFHpA)	39.6	40.3	102	12	30	70-130	
Perfluorobutanesulfonic acid (PFBS)	353	365	103	5	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.: 320-28987-1  
 SDG No.: \_\_\_\_\_  
 Lab File ID: 2017.06.23\_537\_018.d Lab Sample ID: MB 320-169764/1-A  
 Matrix: Water Date Extracted: 06/19/2017 09:24  
 Instrument ID: A8\_N Date Analyzed: 06/23/2017 22:39  
 Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-169764/2-A	2017.06.23_537_019.d	06/23/2017 22:43
NAWC-060817-RW-303	320-28987-1	2017.06.23_537_038.d	06/24/2017 00:13
NAWC-060817-FRB-303	320-28987-2	2017.06.23_537_039.d	06/24/2017 00:18
	LCSD 320-169764/3-A	2017.06.28_537B_005.d	06/28/2017 17:22

FORM VIII  
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-28987-1  
 SDG No.: \_\_\_\_\_  
 Instrument ID: A8\_N Calibration Start Date: 06/19/2017 17:40  
 GC Column: GeminiC18 3x100 ID: 3(mm) Calibration End Date: 06/19/2017 18:04  
 Calibration ID: 31800

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
INITIAL CALIBRATION MEAN AREA AND MEAN RT	3870975	2.86	9204122	2.99		
UPPER LIMIT	5806463	3.36	13806183	3.49		
LOWER LIMIT	1935488	2.36	4602061	2.49		
LAB SAMPLE ID	CLIENT SAMPLE ID					
CCVL 320-169955/11	3724287	2.86	8759638	2.99		
ICV 320-169955/13	3818724	2.85	9420237	2.99		
CCVL 320-170756/4	3324713	2.97	9202106	3.10		
CCV 320-170757/16 CCVIS	3755516	3.00	10146250	3.13		
MB 320-169764/1-A	3675107	2.99	9517190	3.13		
LCS 320-169764/2-A	3410881	3.00	8977613	3.13		
CCV 320-170757/28 CCVIS	3741048	3.00	10476733	3.13		
CCV 320-170758/28 CCVIS	3741048	3.00	10476733	3.13		
320-28987-1	NAWC-060817-RW-303	3314802	2.99	9451660	3.13	
320-28987-2	NAWC-060817-FRB-303	3555932	3.00	9727375	3.13	
CCV 320-170758/40 CCVIS		3800811	3.00	10834949	3.13	

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.: 320-28987-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-170757/16 Date Analyzed: 06/23/2017 22:29  
 Instrument ID: A8\_N GC Column: GeminiC18 3x100 ID: 3 (mm)  
 Lab File ID (Standard): 2017.06.23\_537\_016. Heated Purge: (Y/N) N  
 Calibration ID: 31800

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	3755516	3.00	10146250	3.13		
UPPER LIMIT	5257722	3.50	14204750	3.63		
LOWER LIMIT	2628861	2.50	7102375	2.63		
LAB SAMPLE ID	CLIENT SAMPLE ID					
MB 320-169764/1-A		3675107	2.99	9517190	3.13	
LCS 320-169764/2-A		3410881	3.00	8977613	3.13	

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.: 320-28987-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-170757/28 Date Analyzed: 06/23/2017 23:26  
 Instrument ID: A8\_N GC Column: GeminiC18 3x100 ID: 3 (mm)  
 Lab File ID (Standard): 2017.06.23\_537\_028. Heated Purge: (Y/N) N  
 Calibration ID: 31800

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	3741048	3.00	10476733	3.13		
UPPER LIMIT	5237467	3.50	14667426	3.63		
LOWER LIMIT	2618734	2.50	7333713	2.63		
LAB SAMPLE ID	CLIENT SAMPLE ID					
MB 320-169764/1-A	3675107	2.99	9517190	3.13		
LCS 320-169764/2-A	3410881	3.00	8977613	3.13		

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.: 320-28987-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-170758/28 Date Analyzed: 06/23/2017 23:26  
 Instrument ID: A8\_N GC Column: GeminiC18 3x100 ID: 3 (mm)  
 Lab File ID (Standard): 2017.06.23\_537\_028. Heated Purge: (Y/N) N  
 Calibration ID: 31800

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	3741048	3.00	10476733	3.13		
UPPER LIMIT	5237467	3.50	14667426	3.63		
LOWER LIMIT	2618734	2.50	7333713	2.63		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-28987-1	NAWC-060817-RW-303	3314802	2.99	9451660	3.13	
320-28987-2	NAWC-060817-FRB-303	3555932	3.00	9727375	3.13	

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

Area Limit = 70%-140% of internal standard area  
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LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-28987-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-170758/40 Date Analyzed: 06/24/2017 00:23  
 Instrument ID: A8\_N GC Column: GeminiC18 3x100 ID: 3 (mm)  
 Lab File ID (Standard): 2017.06.23\_537\_040. Heated Purge: (Y/N) N  
 Calibration ID: 31800

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	3800811	3.00	10834949	3.13		
UPPER LIMIT	5321135	3.50	15168929	3.63		
LOWER LIMIT	2660568	2.50	7584464	2.63		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-28987-1	NAWC-060817-RW-303	3314802	2.99	9451660	3.13	
320-28987-2	NAWC-060817-FRB-303	3555932	3.00	9727375	3.13	

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.: 320-28987-1  
 SDG No.: \_\_\_\_\_  
 Instrument ID: A8\_N Calibration Start Date: 06/28/2017 16:11  
 GC Column: GeminiC18 3x100 ID: 3(mm) Calibration End Date: 06/28/2017 16:35  
 Calibration ID: 32056

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
INITIAL CALIBRATION MEAN AREA AND MEAN RT	1994745	1.88	5921908	2.12		
UPPER LIMIT	2992118	2.38	8882862	2.62		
LOWER LIMIT	997373	1.38	2960954	1.62		
LAB SAMPLE ID	CLIENT SAMPLE ID					
CCVL 320-171480/11		1582044	1.88	4789035	2.12	
ICV 320-171480/13		1851564	1.87	5746016	2.12	
CCV 320-171486/1 CCVIS		2273492	1.88	7068921	2.12	
LCSD 320-169764/3-A		1735559	1.88	4861097Q	2.12	
CCV 320-171486/13 CCVIS		2250330	1.87	6965525	2.11	

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.: 320-28987-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-171486/1 Date Analyzed: 06/28/2017 17:03  
 Instrument ID: A8\_N GC Column: GeminiC18 3x100 ID: 3 (mm)  
 Lab File ID (Standard): 2017.06.28\_537B\_001 Heated Purge: (Y/N) N  
 Calibration ID: 32056

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	2273492	1.88	7068921	2.12		
UPPER LIMIT	3182889	2.38	9896489	2.62		
LOWER LIMIT	1591444	1.38	4948245	1.62		
LAB SAMPLE ID	CLIENT SAMPLE ID					
LCSD 320-169764/3-A	1735559	1.88	4861097Q	2.12		

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.: 320-28987-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-171486/13 Date Analyzed: 06/28/2017 18:00  
 Instrument ID: A8\_N GC Column: GeminiC18 3x100 ID: 3 (mm)  
 Lab File ID (Standard): 2017.06.28\_537B\_013 Heated Purge: (Y/N) N  
 Calibration ID: 32056

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	2250330	1.87	6965525	2.11		
UPPER LIMIT	3150462	2.37	9751735	2.61		
LOWER LIMIT	1575231	1.37	4875868	1.61		
LAB SAMPLE ID	CLIENT SAMPLE ID					
LCSD 320-169764/3-A	1735559	1.88	4861097Q	2.12		

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.: 320-28987-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-060817-RW-303 Lab Sample ID: 320-28987-1  
 Matrix: Water Lab File ID: 2017.06.23\_537\_038.d  
 Analysis Method: 537 Date Collected: 06/08/2017 08:05  
 Extraction Method: 537 Date Extracted: 06/19/2017 09:24  
 Sample wt/vol: 270.6(mL) Date Analyzed: 06/24/2017 00:13  
 Con. Extract Vol.: 1.0(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 170758 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	20	J	37	15	6.3
335-67-1	Perfluorooctanoic acid (PFOA)	20		18	7.4	2.6
375-95-1	Perfluorononanoic acid (PFNA)	18	U	22	18	7.4
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	7.6	J	28	11	5.1
375-85-9	Perfluoroheptanoic acid (PFHpA)	5.4	J	9.2	3.7	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	33	U M	83	33	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	84		70-130
STL00996	13C2 PFDA	73		70-130



TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170623-44660.b\2017.06.23\_537\_038.d  
 Lims ID: 320-28987-A-1-A  
 Client ID: NAWC-060817-RW-303  
 Sample Type: Client  
 Inject. Date: 24-Jun-2017 00:13:59 ALS Bottle#: 28 Worklist Smp#: 38  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-28987-A-1-A  
 Misc. Info.: Plate: 1 Rack: 2  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20170623-44660.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 29-Jun-2017 11:06:41 Calib Date: 19-Jun-2017 18:04:42  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20170619-44448.b\2017.06.19\_537A\_ICAL\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK033

First Level Reviewer: barnettj Date: 26-Jun-2017 13:43:10

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	2.314	2.183	0.131	1.000	505269	1.77		40.7	M
298.90 > 99.00	2.322	2.183	0.139	1.003	400429		1.26(0.00-0.00)	90.1	M
\$ 2 13C2 PFHxA									
315.00 > 270.00	2.526	2.381	0.145	1.000	2881363	8.38		3996	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	2.769	2.625	0.144	1.000	795785	2.07		58.9	
4 Perfluoroheptanoic acid									
363.00 > 319.00	2.784	2.630	0.154	1.000	409453	1.46		15.9	
* 6 13C2-PFOA									
415.00 > 370.00	2.989	2.859	0.130		3314802	10.0		7136	
5 Perfluorooctanoic acid									
413.00 > 369.00	2.997	2.859	0.138	1.000	1559134	5.37		77.2	
413.00 > 169.00	2.989	2.859	0.130	0.997	986410		1.58(0.00-0.00)	813	
* 7 13C4 PFOS									
503.00 > 80.00	3.126	2.991	0.135		9451660	28.7		3661	
\$ 10 13C2 PFDA									
515.00 > 470.00	3.262	3.123	0.139	1.000	2330471	7.31		4870	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	3.118	3.126	-0.008	1.000	1823821	5.45		373	
499.00 > 99.00	3.126	3.126	0.0	1.002	301123		6.06(0.00-0.00)	188	

## QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170623-44660.b\2017.06.23\_537\_038.d

Injection Date: 24-Jun-2017 00:13:59

Instrument ID: A8\_N

Lims ID: 320-28987-A-1-A

Lab Sample ID: 320-28987-1

Client ID: NAWC-060817-RW-303

Operator ID: SACINSTLCMS01

ALS Bottle#: 28

Worklist Smp#: 38

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

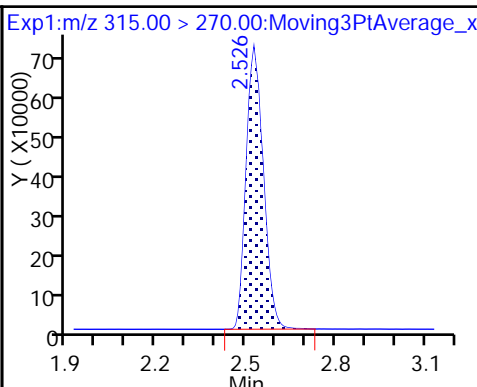
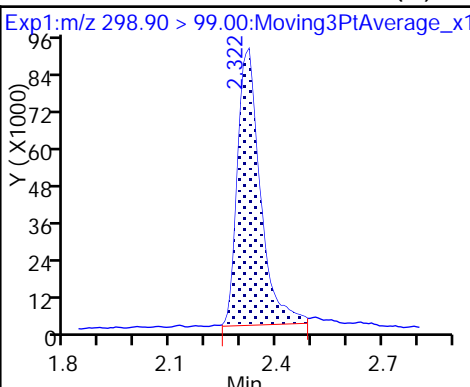
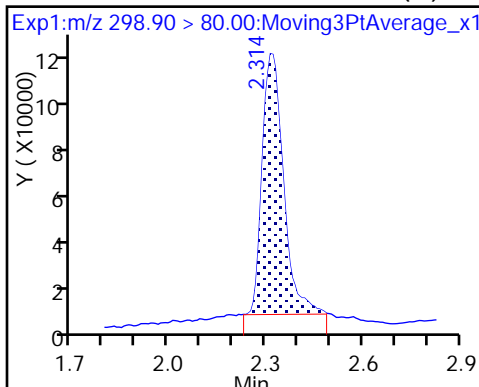
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (M)

1 Perfluorobutanesulfonic acid (M)

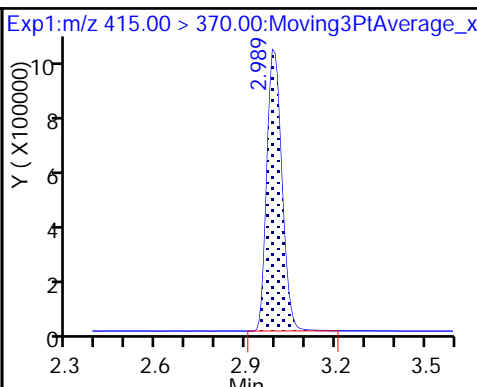
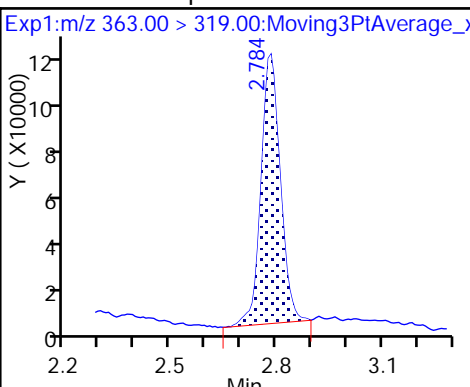
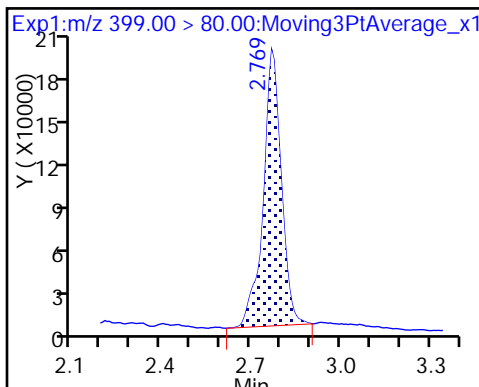
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

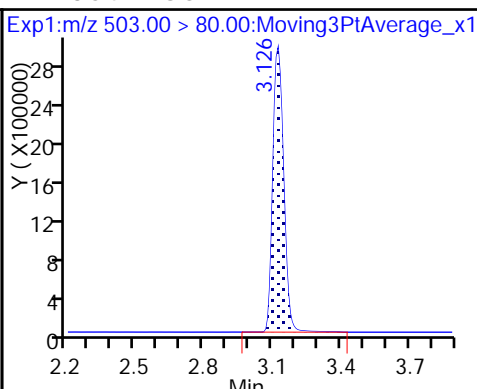
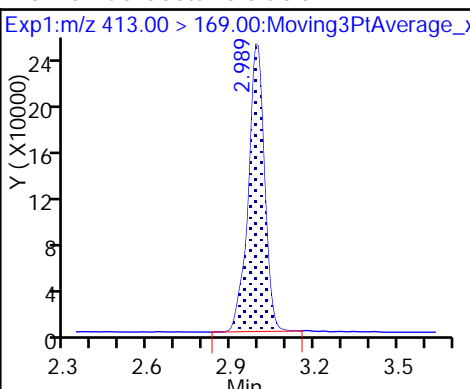
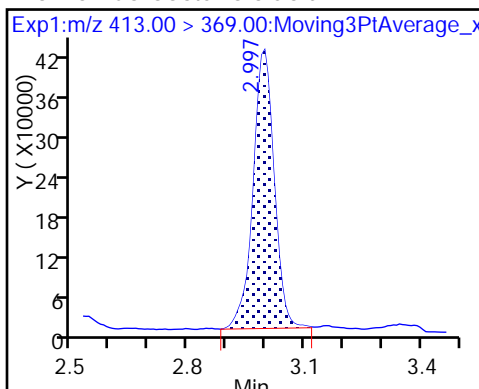
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

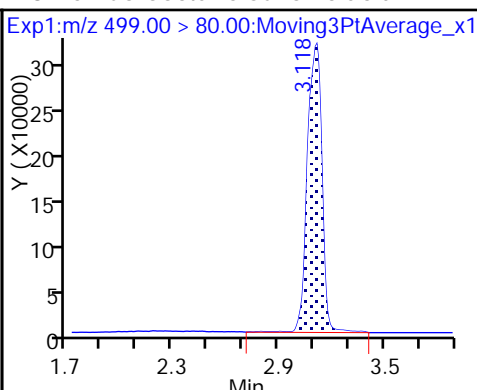
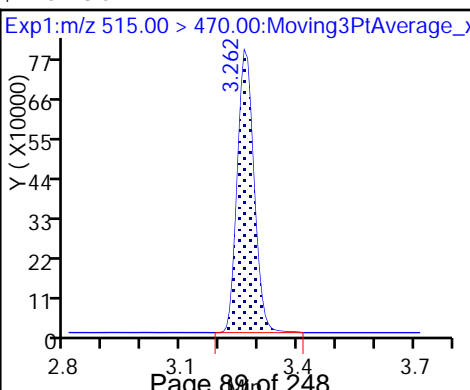
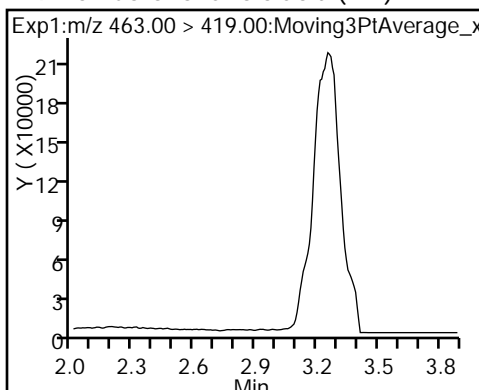
\* 7 13C4 PFOS



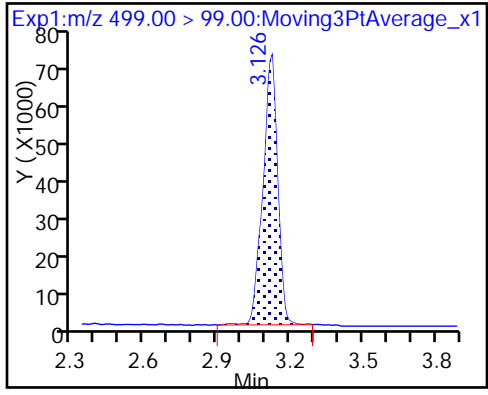
9 Perfluorononanoic acid (ND)

\$ 10 13C2 PFDA

8 Perfluorooctane sulfonic acid



8 Perfluorooctane sulfonic acid



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170623-44660.b\2017.06.23\_537\_038.d  
 Lims ID: 320-28987-A-1-A  
 Client ID: NAWC-060817-RW-303  
 Sample Type: Client  
 Inject. Date: 24-Jun-2017 00:13:59 ALS Bottle#: 28 Worklist Smp#: 38  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-28987-A-1-A  
 Misc. Info.: Plate: 1 Rack: 2  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20170623-44660.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 29-Jun-2017 11:06:41 Calib Date: 19-Jun-2017 18:04:42  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20170619-44448.b\2017.06.19\_537A\_ICAL\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK033

First Level Reviewer: barnettj Date: 26-Jun-2017 13:43:10

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	8.38	83.77
\$ 10 13C2 PFDA	10.0	7.31	73.06

TestAmerica Sacramento

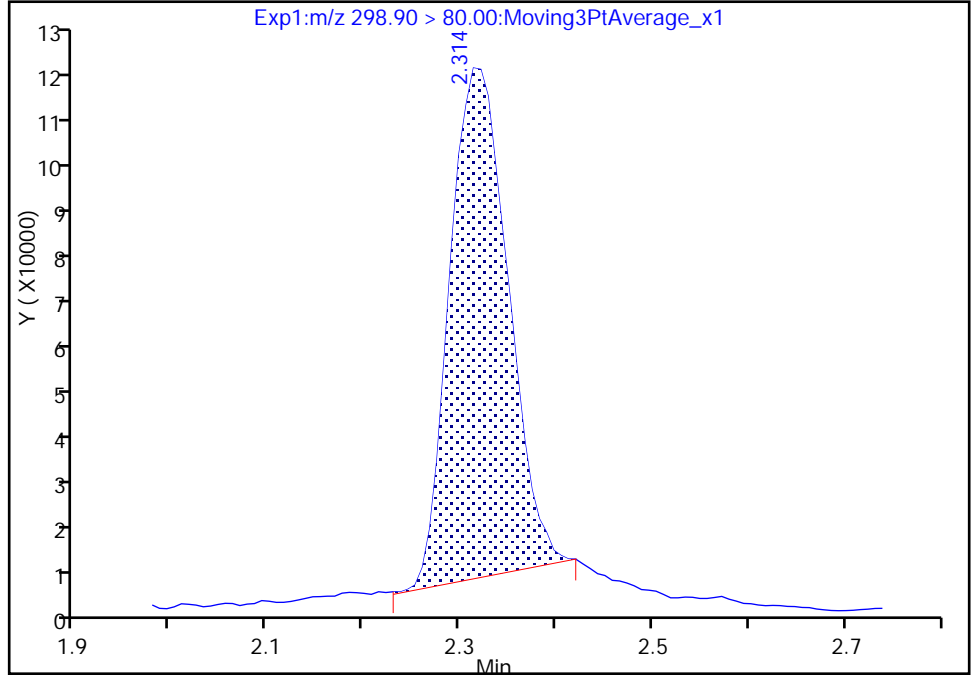
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Injection Date: 24-Jun-2017 00:13:59 Instrument ID: A8\_N  
Lims ID: 320-28987-A-1-A Lab Sample ID: 320-28987-1  
Client ID: NAWC-060817-RW-303  
Operator ID: SACINSTLCMS01 ALS Bottle#: 28 Worklist Smp#: 38  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

1 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 1

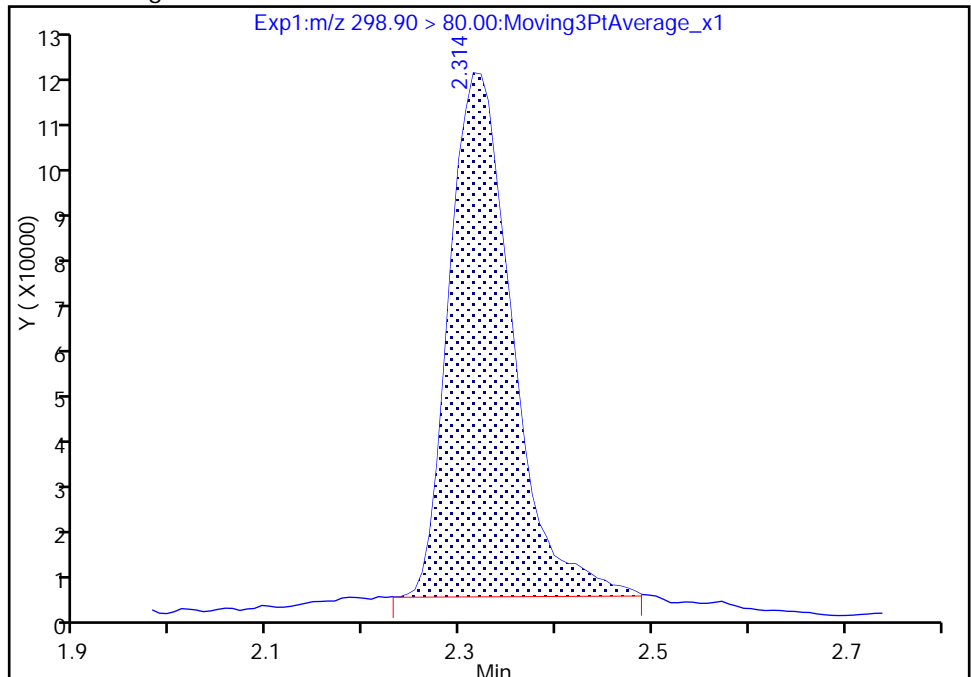
RT: 2.31  
Area: 455343  
Amount: 1.598283  
Amount Units: ng/ml

Processing Integration Results



RT: 2.31  
Area: 505269  
Amount: 1.773526  
Amount Units: ng/ml

Manual Integration Results



TestAmerica Sacramento

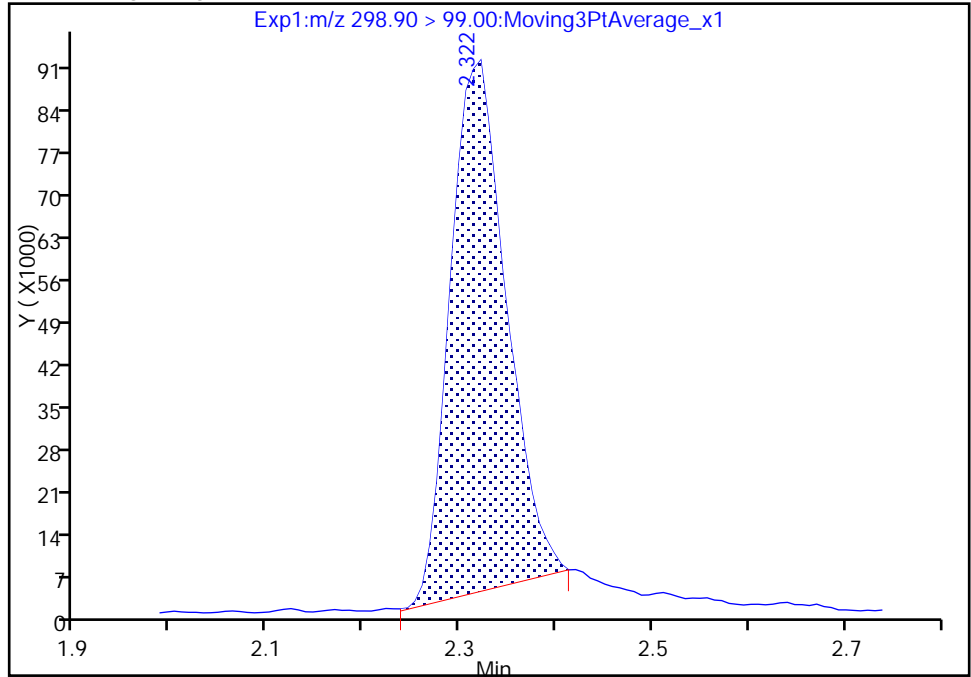
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Injection Date: 24-Jun-2017 00:13:59 Instrument ID: A8\_N  
Lims ID: 320-28987-A-1-A Lab Sample ID: 320-28987-1  
Client ID: NAWC-060817-RW-303  
Operator ID: SACINSTLCMS01 ALS Bottle#: 28 Worklist Smp#: 38  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: 537\_A8\_N Limit Group: LC 537 ICAL  
Column: Detector EXP1

1 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 2

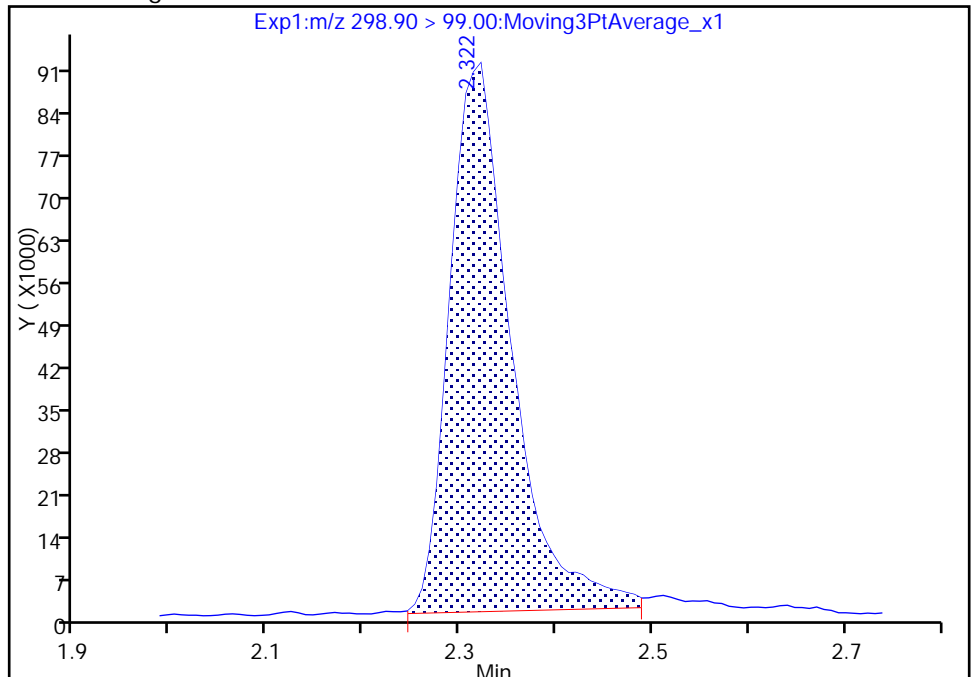
RT: 2.32  
Area: 351799  
Amount: 1.598283  
Amount Units: ng/ml

Processing Integration Results



RT: 2.32  
Area: 400429  
Amount: 1.773526  
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 26-Jun-2017 13:42:42

Audit Action: Manually Integrated

Audit Reason: Baseline

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-28987-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-060817-FRB-303 Lab Sample ID: 320-28987-2  
 Matrix: Water Lab File ID: 2017.06.23\_537\_039.d  
 Analysis Method: 537 Date Collected: 06/08/2017 08:00  
 Extraction Method: 537 Date Extracted: 06/19/2017 09:24  
 Sample wt/vol: 272.5 (mL) Date Analyzed: 06/24/2017 00:18  
 Con. Extract Vol.: 1.0 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 170758 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	U	37	15	6.2
335-67-1	Perfluorooctanoic acid (PFOA)	7.3	U	18	7.3	2.6
375-95-1	Perfluorononanoic acid (PFNA)	18	U	22	18	7.3
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	28	11	5.0
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.7	U	9.2	3.7	1.7
375-73-5	Perfluorobutanesulfonic acid (PFBS)	33	U	83	33	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	90		70-130
STL00996	13C2 PFDA	77		70-130



TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170623-44660.b\2017.06.23\_537\_039.d  
 Lims ID: 320-28987-A-2-A  
 Client ID: NAWC-060817-FRB-303  
 Sample Type: Client  
 Inject. Date: 24-Jun-2017 00:18:45 ALS Bottle#: 29 Worklist Smp#: 39  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-28987-A-2-A  
 Misc. Info.: Plate: 1 Rack: 2  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20170623-44660.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 29-Jun-2017 11:06:41 Calib Date: 19-Jun-2017 18:04:42  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20170619-44448.b\2017.06.19\_537A\_ICAL\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK033

First Level Reviewer: barnettj Date: 26-Jun-2017 13:43:31

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
\$ 2 13C2 PFHxA	315.00 > 270.00	2.526	2.381	0.145	1.000	3313698	8.98	5606	
* 6 13C2-PFOA	415.00 > 370.00	2.997	2.859	0.138		3555932	10.0	7022	
* 7 13C4 PFOS	503.00 > 80.00	3.126	2.991	0.135		9727375	28.7	21033	
\$ 10 13C2 PFDA	515.00 > 470.00	3.270	3.123	0.147	1.000	2627626	7.68	5322	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170623-44660.b\2017.06.23\_537\_039.d

Injection Date: 24-Jun-2017 00:18:45

Instrument ID: A8\_N

Lims ID: 320-28987-A-2-A

Lab Sample ID: 320-28987-2

Client ID: NAWC-060817-FRB-303

Operator ID: SACINSTLCMS01

ALS Bottle#: 29

Worklist Smp#: 39

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

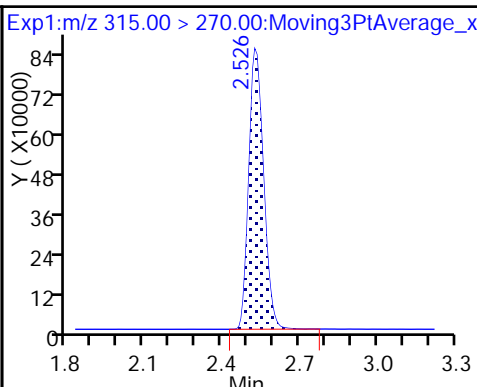
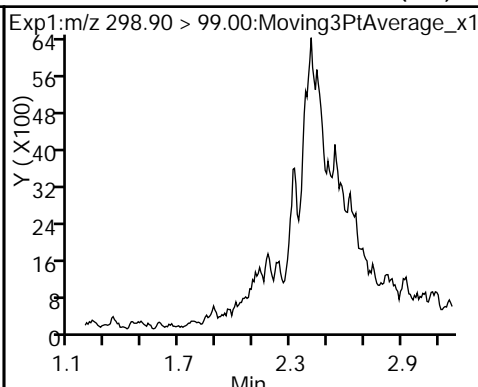
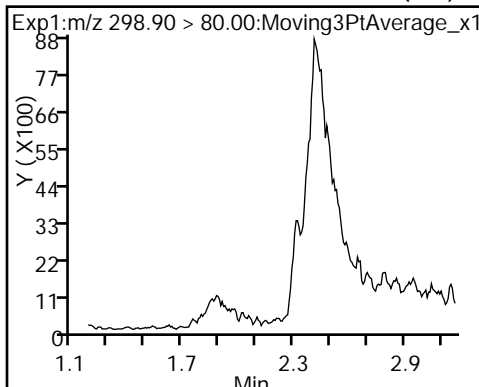
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

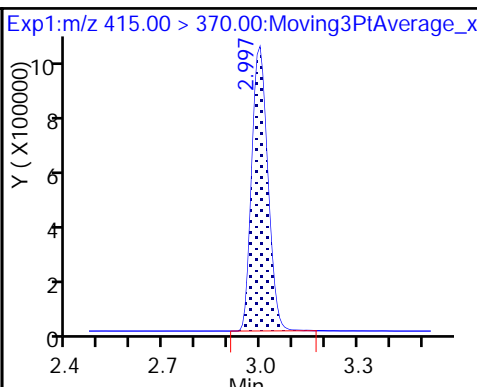
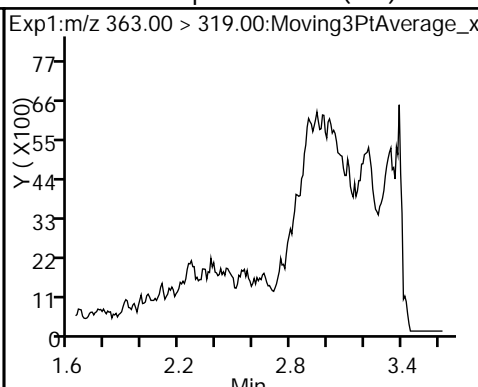
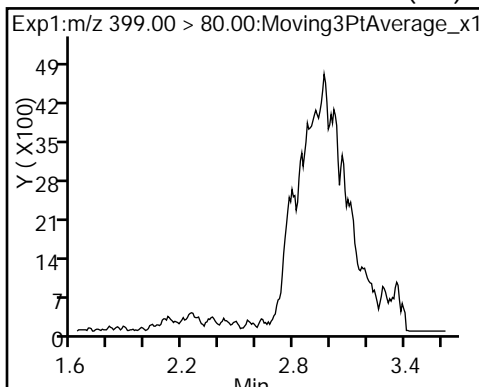
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (ND)

4 Perfluoroheptanoic acid (ND)

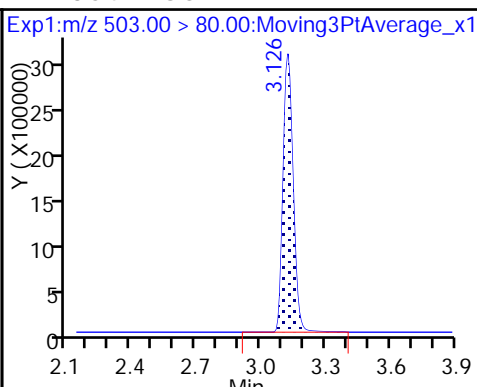
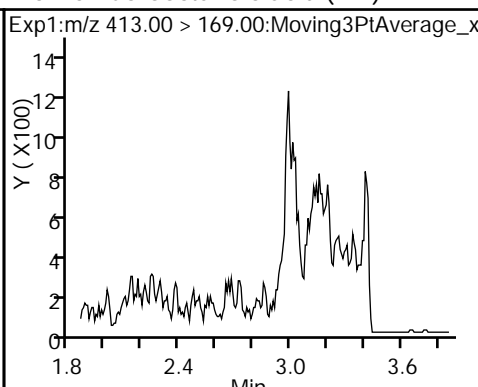
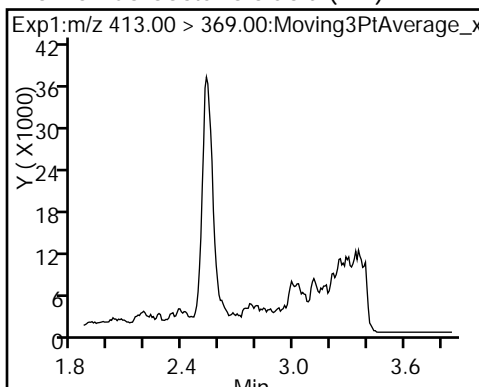
\* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

5 Perfluorooctanoic acid (ND)

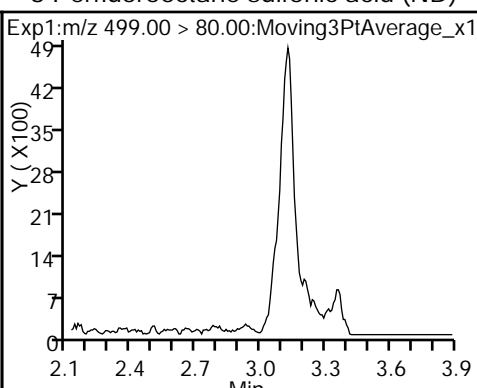
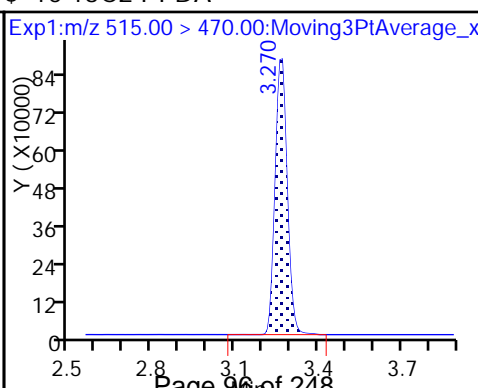
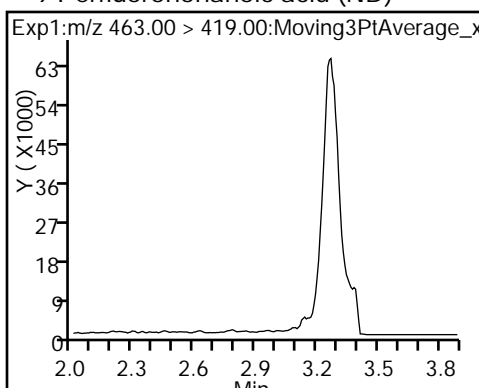
\* 7 13C4 PFOS



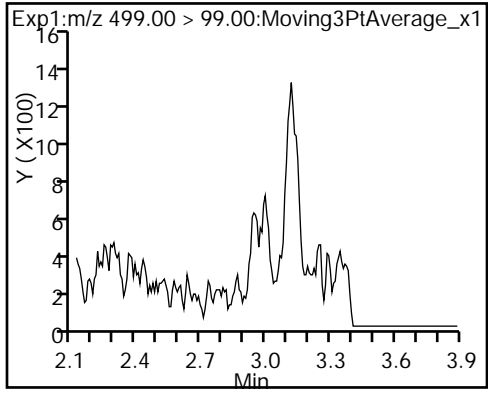
9 Perfluorononanoic acid (ND)

\$ 10 13C2 PFDA

8 Perfluorooctane sulfonic acid (ND)



8 Perfluorooctane sulfonic acid (ND)



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170623-44660.b\2017.06.23\_537\_039.d  
 Lims ID: 320-28987-A-2-A  
 Client ID: NAWC-060817-FRB-303  
 Sample Type: Client  
 Inject. Date: 24-Jun-2017 00:18:45 ALS Bottle#: 29 Worklist Smp#: 39  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-28987-A-2-A  
 Misc. Info.: Plate: 1 Rack: 2  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20170623-44660.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 29-Jun-2017 11:06:41 Calib Date: 19-Jun-2017 18:04:42  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20170619-44448.b\2017.06.19\_537A\_ICAL\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK033

First Level Reviewer: barnettj Date: 26-Jun-2017 13:43:31

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	8.98	89.81
\$ 10 13C2 PFDA	10.0	7.68	76.79

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

Lab Name: TestAmerica Sacramento Job No.: 320-28987-1 Analy Batch No.: 169955

SDG No.: \_\_\_\_\_

Instrument ID: A8\_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 06/19/2017 17:40 Calibration End Date: 06/19/2017 18:04 Calibration ID: 31800

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-169955/4	2017.06.19_537A_ICAL_004.d
Level 2	IC 320-169955/5	2017.06.19_537A_ICAL_005.d
Level 3	IC 320-169955/6	2017.06.19_537A_ICAL_006.d
Level 4	IC 320-169955/7	2017.06.19_537A_ICAL_007.d
Level 5	IC 320-169955/8	2017.06.19_537A_ICAL_008.d
Level 6	IC 320-169955/9	2017.06.19_537A_ICAL_009.d

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
Perfluorobutanesulfonic acid (PFBS)	0.8507 0.7713	0.9245	0.9209	0.8993	0.8202	Ave		0.8645			7.1		30.0				
Perfluorohexanesulfonic acid (PFHxS)	1.0986 1.2032	1.1398	1.1650	1.2147	1.1817	Ave		1.1672			3.7		30.0				
Perfluoroheptanoic acid (PFHpA)	0.7891 0.8718	0.8248	0.8229	0.8642	0.8866	Ave		0.8433			4.4		30.0				
Perfluorooctanoic acid (PFOA)	0.8301 0.8992	0.8817	0.8545	0.8779	0.9114	Ave		0.8758			3.4		30.0				
Perfluorooctanesulfonic acid (PFOS)	0.9620 1.0275	1.0017	1.0209	1.0440	1.0387	Ave		1.0158			3.0		30.0				
Perfluorononanoic acid (PFNA)	0.8823 0.8046	0.8981	0.8287	0.8656	0.8391	Ave		0.8531			4.1		30.0				
13C2 PFHxA	0.9940 1.0771	1.0270	1.0324	1.0293	1.0661	Ave		1.0377			2.9		30.0				
13C2 PFDA	0.9372 1.0284	0.9499	0.8947	0.9980	0.9652	Ave		0.9622			4.9		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.: 320-28987-1 Analy Batch No.: 169955

SDG No.: \_\_\_\_\_

Instrument ID: A8\_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 06/19/2017 17:40 Calibration End Date: 06/19/2017 18:04 Calibration ID: 31800

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-169955/4	2017.06.19_537A_ICAL_004.d
Level 2	IC 320-169955/5	2017.06.19_537A_ICAL_005.d
Level 3	IC 320-169955/6	2017.06.19_537A_ICAL_006.d
Level 4	IC 320-169955/7	2017.06.19_537A_ICAL_007.d
Level 5	IC 320-169955/8	2017.06.19_537A_ICAL_008.d
Level 6	IC 320-169955/9	2017.06.19_537A_ICAL_009.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5
Perfluorobutanesulfonic acid (PFBS)	PFOS	Ave	2332510 46244402	5989080	14078909	23681909	35795970	8.83 176	21.2	44.4	89.4	133
Perfluorohexanesulfonic acid (PFHxS)	PFOS	Ave	1024970 24546576	2512643	6060498	10884436	17549225	3.01 59.7	7.21	15.1	30.4	45.1
Perfluoroheptanoic acid (PFHpA)	13PF OA	Ave	289244 7166616	730235	1714811	3092048	5084081	0.990 19.7	2.38	4.97	10.0	14.9
Perfluorooctanoic acid (PFOA)	13PF OA	Ave	614079 14918357	1575504	3593653	6339348	10547603	2.00 39.7	4.80	10.0	20.2	30.0
Perfluorooctanesulfonic acid (PFOS)	PFOS	Ave	1195186 27918279	2940776	7072765	12458294	20543461	4.00 79.6	9.61	20.1	40.5	60.0
Perfluorononanoic acid (PFNA)	13PF OA	Ave	629127 12866660	1546914	3359467	6025078	9360498	1.93 38.3	4.62	9.68	19.5	28.9
13C2 PFHxA	13PF OA	Ave	3680309 4499723	3826956	4324388	3674058	4116656	10.0 10.0	10.0	10.0	10.0	10.0
13C2 PFDA	13PF OA	Ave	3469979 4296473	3539389	3747801	3562371	3726982	10.0 10.0	10.0	10.0	10.0	10.0

Curve Type Legend:

Ave = Average ISTD

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

Lab Name: TestAmerica Sacramento Job No.: 320-28987-1 Analy Batch No.: 169955

SDG No.: \_\_\_\_\_

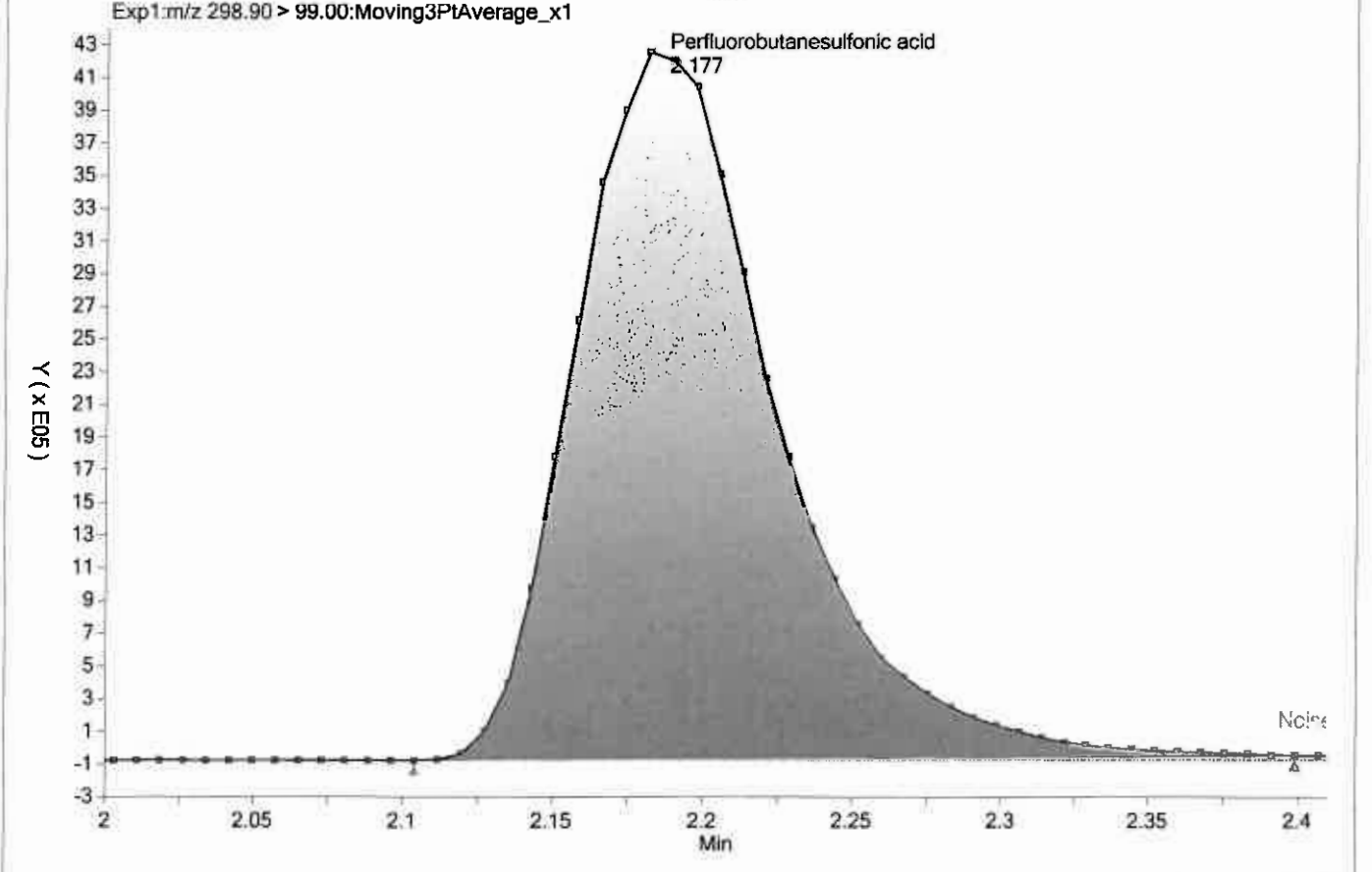
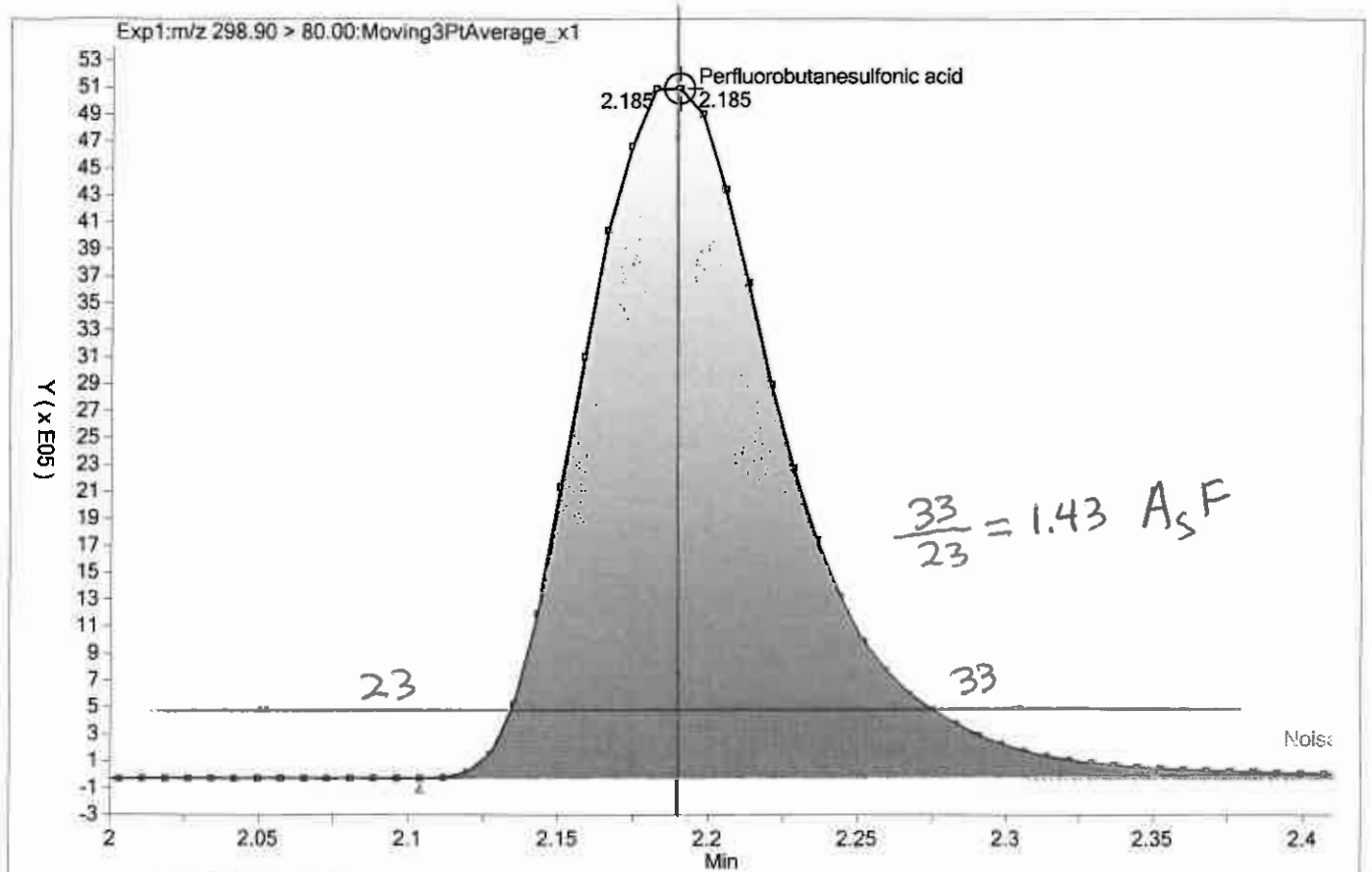
Instrument ID: A8\_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 06/19/2017 17:40 Calibration End Date: 06/19/2017 18:04 Calibration ID: 31800

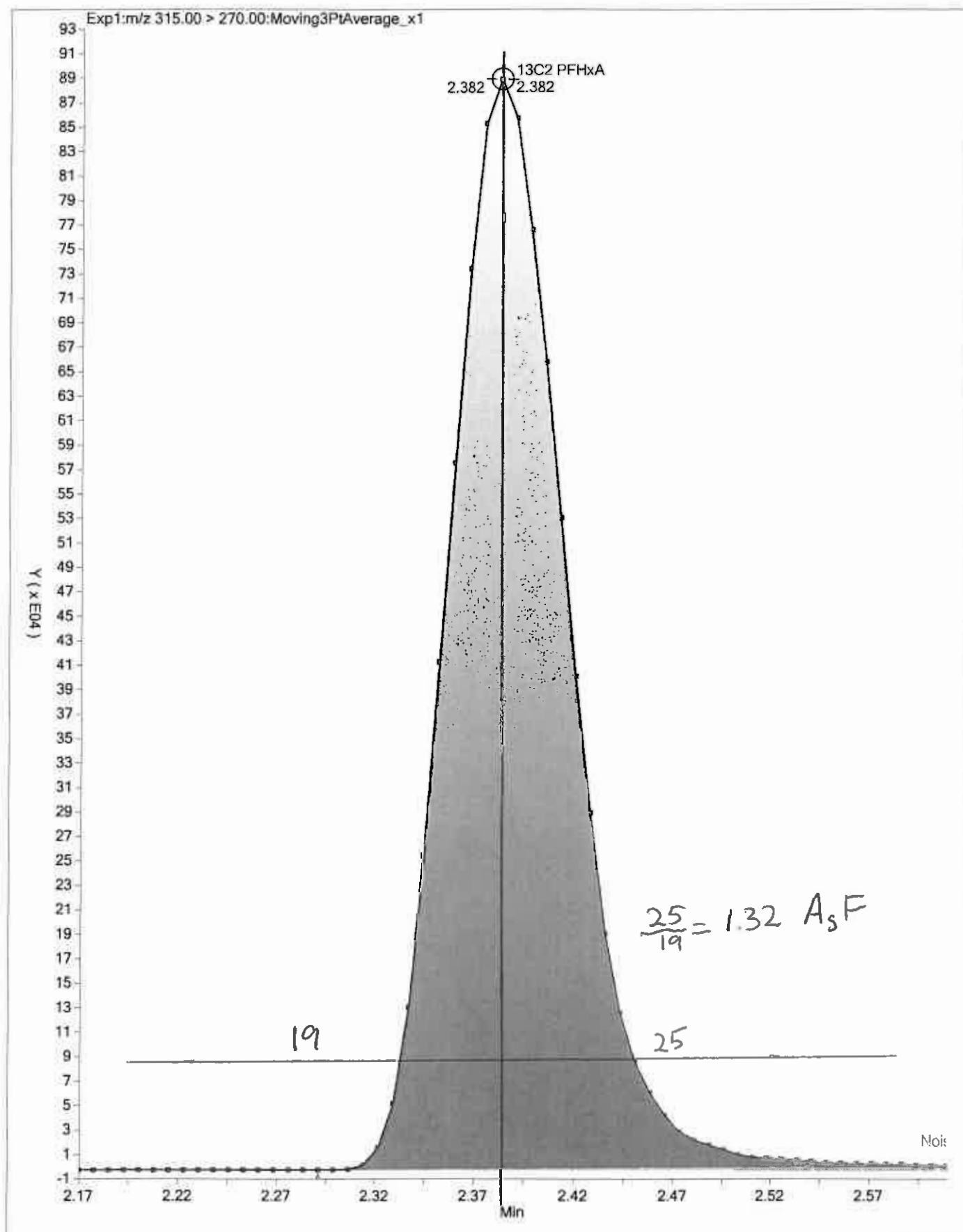
Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
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Level 3	IC 320-169955/6	2017.06.19_537A_ICAL_006.d
Level 4	IC 320-169955/7	2017.06.19_537A_ICAL_007.d
Level 5	IC 320-169955/8	2017.06.19_537A_ICAL_008.d
Level 6	IC 320-169955/9	2017.06.19_537A_ICAL_009.d

ANALYTE	PERCENT ERROR						PERCENT ERROR LIMIT					
	LVL 1 #	LVL 2 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6
Perfluorobutanesulfonic acid (PFBS)	-1.6	6.9	6.5	4.0	-5.1	-10.8	50	50	50	50	50	50
Perfluorohexanesulfonic acid (PFHxS)	-5.9	-2.3	-0.2	4.1	1.2	3.1	50	50	50	50	50	50
Perfluoroheptanoic acid (PFHpA)	-6.4	-2.2	-2.4	2.5	5.1	3.4	50	50	50	50	50	50
Perfluorooctanoic acid (PFOA)	-5.2	0.7	-2.4	0.2	4.1	2.7	50	50	50	50	50	50
Perfluorooctanesulfonic acid (PFOS)	-5.3	-1.4	0.5	2.8	2.3	1.2	50	50	50	50	50	50
Perfluorononanoic acid (PFNA)	3.4	5.3	-2.9	1.5	-1.6	-5.7	50	50	50	50	50	50
13C2 PFHxA	-4.2	-1.0	-0.5	-0.8	2.7	3.8	30	30	30	30	30	30
13C2 PFDA	-2.6	-1.3	-7.0	3.7	0.3	6.9	30	30	30	30	30	30







TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170619-44448.b\2017.06.19\_537A\_ICAL\_004.d  
 Lims ID: IC L1  
 Client ID:  
 Sample Type: IC Calib Level: 1  
 Inject. Date: 19-Jun-2017 17:40:57 ALS Bottle#: 1 Worklist Smp#: 4  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: L1\_537  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub1  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20170619-44448.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 20-Jun-2017 10:57:40 Calib Date: 19-Jun-2017 18:04:42  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20170619-44448.b\2017.06.19\_537A\_ICAL\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK019

First Level Reviewer: phomsophat Date: 19-Jun-2017 19:22:37

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	2.177	2.183	-0.006	1.000	2332510	8.69		505	
298.90 > 99.00	2.185	2.183	0.002	1.003	1908008		1.22(0.00-0.00)	450	
\$ 2 13C2 PFHxA									
315.00 > 270.00	2.382	2.381	0.001	1.000	3680309	9.58		3596	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	2.633	2.625	0.008	1.000	1024970	2.83		411	
4 Perfluoroheptanoic acid									
363.00 > 319.00	2.633	2.630	0.003	1.000	289244	0.9264		43.6	
5 Perfluorooctanoic acid									
413.00 > 369.00	2.860	2.859	0.001	1.000	614079	1.89		110	
413.00 > 169.00	2.860	2.859	0.001	1.000	349047		1.76(0.00-0.00)	389	
* 6 13C2-PFOA									
415.00 > 370.00	2.860	2.859	0.001		3702444	10.0		7418	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.989	2.982	0.007	1.000	1195186	3.79		3927	
499.00 > 99.00	2.989	2.982	0.007	1.000	252400		4.74(0.00-0.00)	772	
* 7 13C4 PFOS									
503.00 > 80.00	2.989	2.991	-0.002		8901064	28.7		12694	
9 Perfluorononanoic acid									
463.00 > 419.00	3.004	3.003	0.001	1.000	629127	1.99		317	
\$ 10 13C2 PFDA									
515.00 > 470.00	3.126	3.123	0.003	1.000	3469979	9.74		12506	

**Reagents:**

LC537-L1\_00018

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170619-44448.b\2017.06.19\_537A\_ICAL\_004.d

Injection Date: 19-Jun-2017 17:40:57

Instrument ID: A8\_N

Lims ID: IC L1

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 1

Worklist Smp#: 4

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

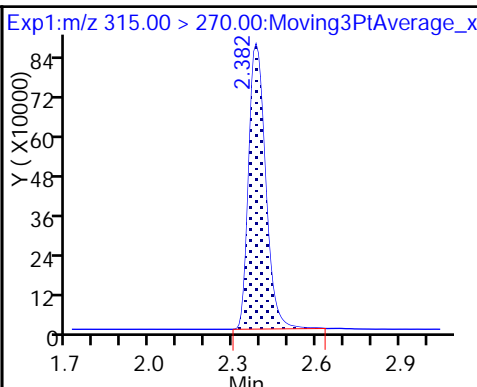
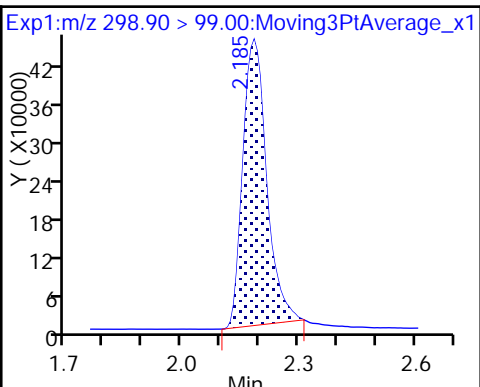
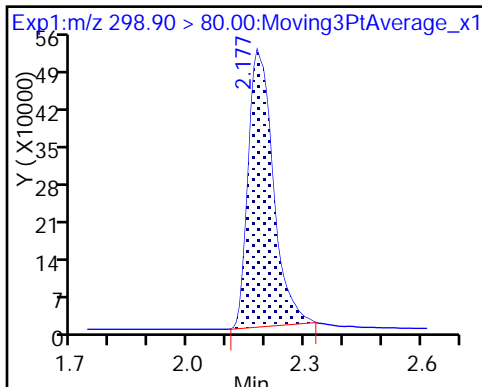
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

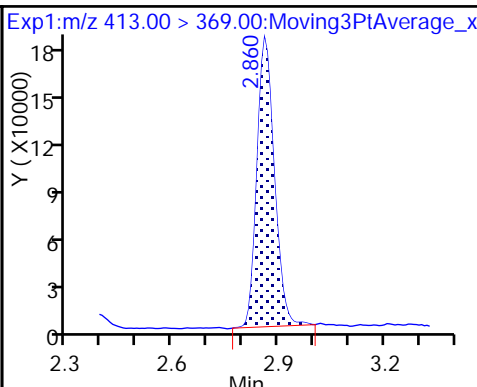
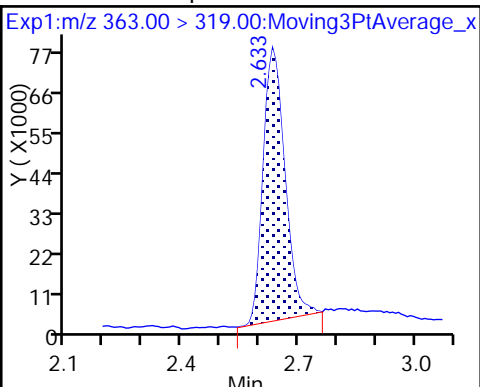
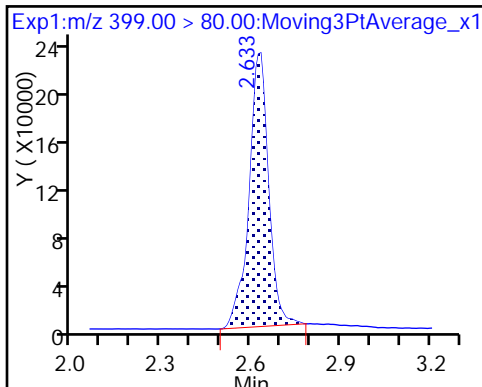
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

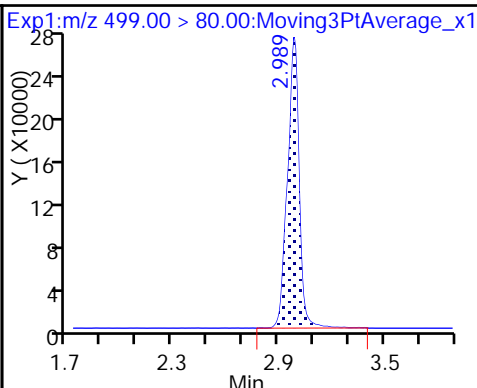
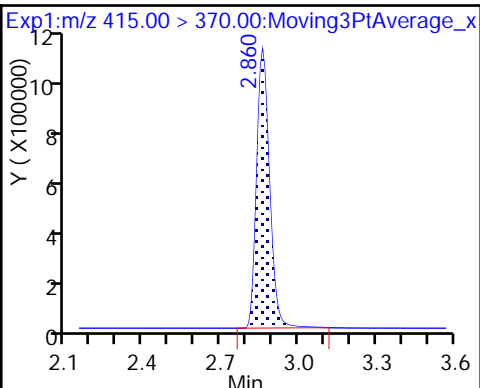
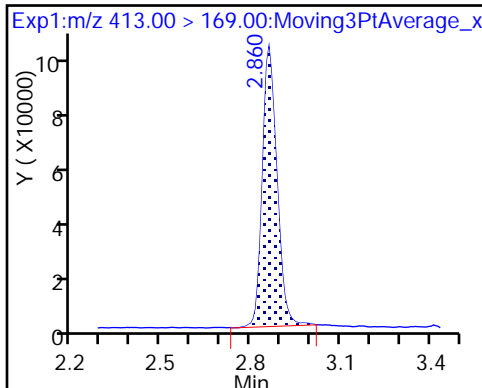
5 Perfluorooctanoic acid



5 Perfluorooctanoic acid

\* 6 13C2-PFOA

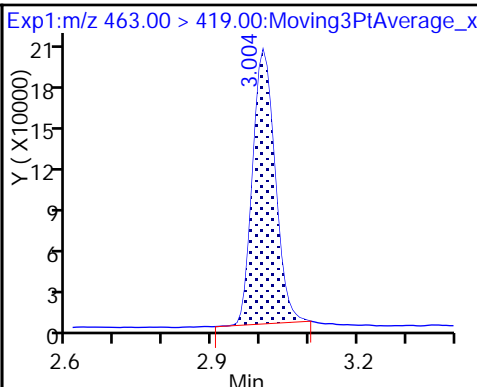
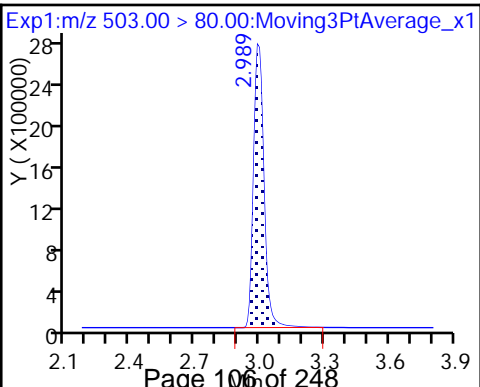
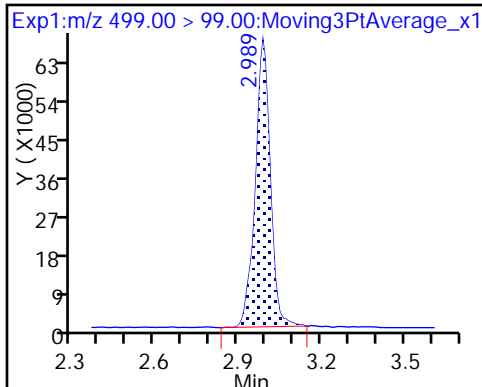
8 Perfluorooctane sulfonic acid



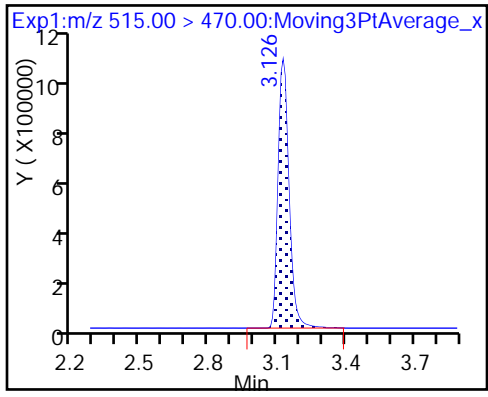
8 Perfluorooctane sulfonic acid

\* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170619-44448.b\2017.06.19\_537A\_ICAL\_005.d  
 Lims ID: IC L2  
 Client ID:  
 Sample Type: IC Calib Level: 2  
 Inject. Date: 19-Jun-2017 17:45:45 ALS Bottle#: 2 Worklist Smp#: 5  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: L2\_537  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub1

Method: \\ChromNa\Sacramento\ChromData\A8\_N\20170619-44448.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 20-Jun-2017 10:57:41 Calib Date: 19-Jun-2017 18:04:42  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20170619-44448.b\2017.06.19\_537A\_ICAL\_009.d

Column 1 : Det: EXP1  
 Process Host: XAWRK019

First Level Reviewer: phomsophat Date: 19-Jun-2017 19:22:53

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	2.185	2.183	0.002	1.000	5989080	22.7		1091	
298.90 > 99.00	2.185	2.183	0.002	1.000	4863302		1.23(0.00-0.00)	925	
\$ 2 13C2 PFHxA									
315.00 > 270.00	2.382	2.381	0.001	1.000	3826956	9.90		4102	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	2.625	2.625	0.0	1.000	2512643	7.05		933	
4 Perfluoroheptanoic acid									
363.00 > 319.00	2.633	2.630	0.003	1.000	730235	2.32		97.2	
* 6 13C2-PFOA									
415.00 > 370.00	2.860	2.859	0.001		3726225	10.0		7660	
5 Perfluorooctanoic acid									
413.00 > 369.00	2.860	2.859	0.001	1.000	1575504	4.83		271	
413.00 > 169.00	2.860	2.859	0.001	1.000	868749		1.81(0.00-0.00)	913	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.989	2.982	0.007	1.000	2940776	9.47		8105	
499.00 > 99.00	2.989	2.982	0.007	1.000	644706		4.56(0.00-0.00)	1875	
* 7 13C4 PFOS									
503.00 > 80.00	2.997	2.991	0.006		8763141	28.7		16058	
9 Perfluorononanoic acid									
463.00 > 419.00	3.004	3.003	0.001	1.000	1546914	4.87		742	
\$ 10 13C2 PFDA									
515.00 > 470.00	3.126	3.123	0.003	1.000	3539389	9.87		10257	

**Reagents:**

LC537-L2\_00018

Amount Added: 1.00

Units: mL

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170619-44448.b\2017.06.19\_537A\_ICAL\_005.d

Injection Date: 19-Jun-2017 17:45:45

Instrument ID: A8\_N

Lims ID: IC L2

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 2

Worklist Smp#: 5

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

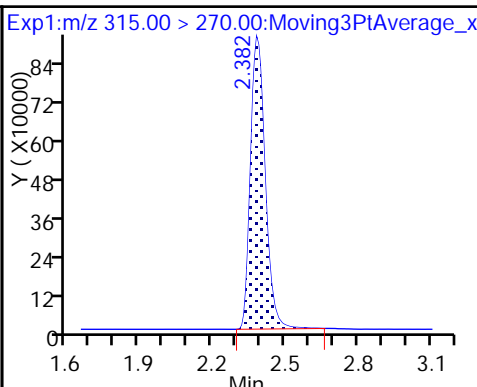
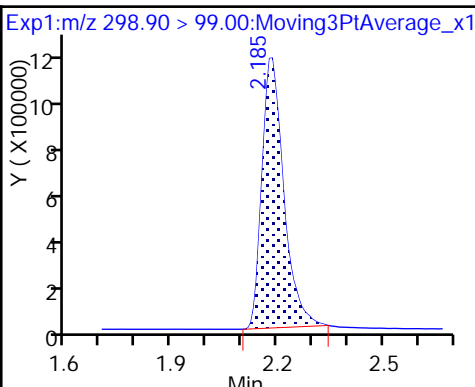
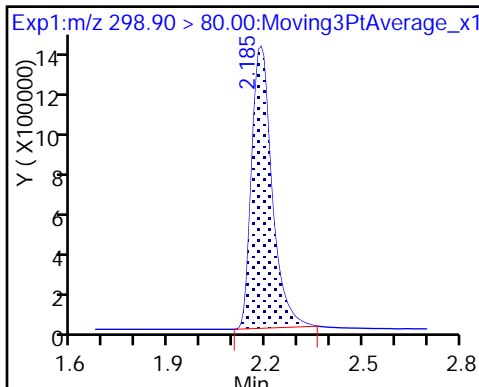
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

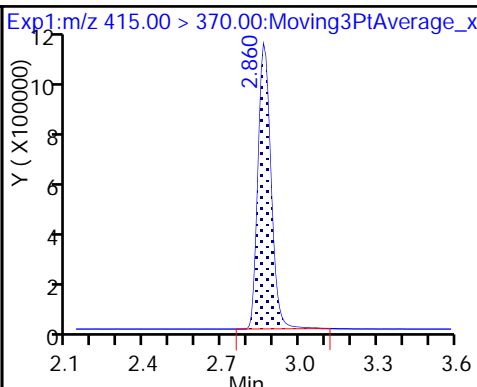
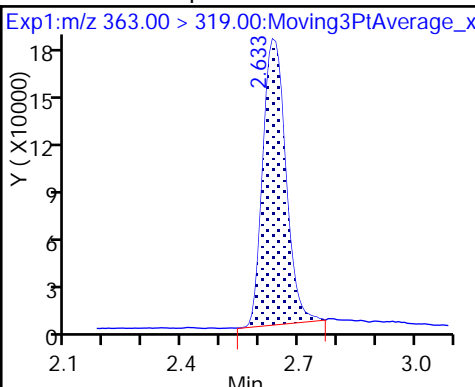
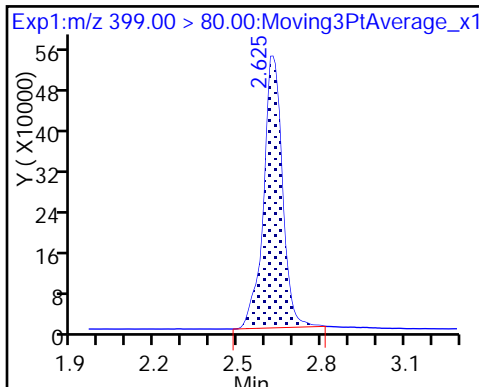
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

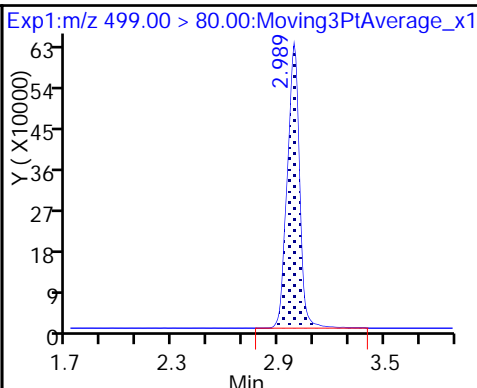
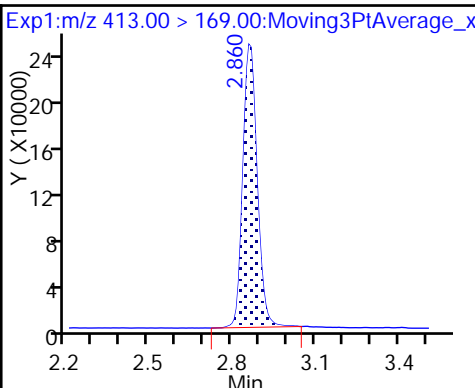
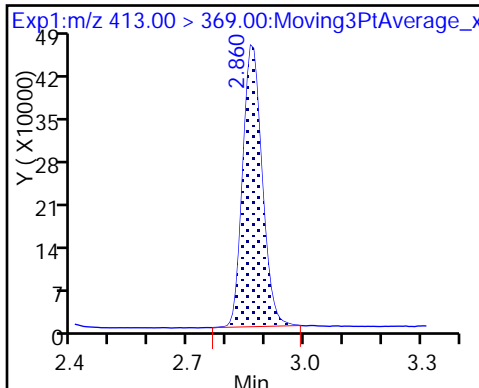
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

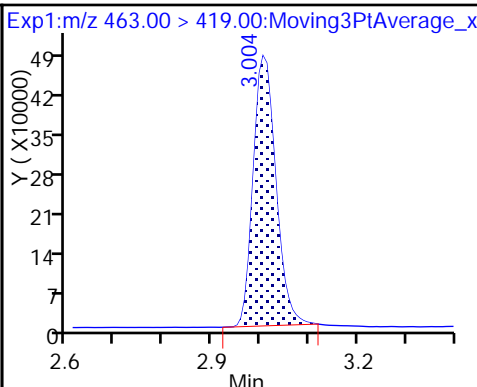
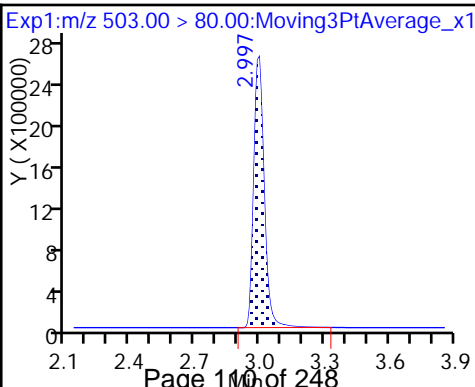
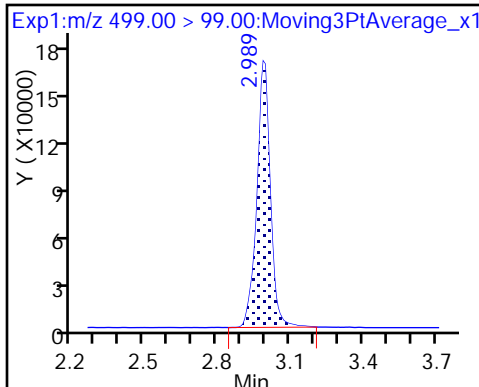
8 Perfluorooctane sulfonic acid



8 Perfluorooctane sulfonic acid

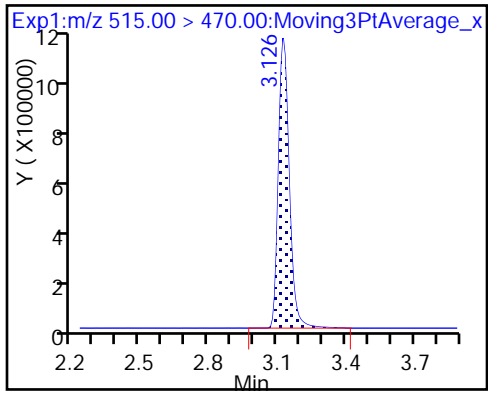
\* 7 13C4 PFOS

9 Perfluorononanoic acid





\$ 10 13C2 PFDA



TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170619-44448.b\2017.06.19\_537A\_ICAL\_006.d  
 Lims ID: IC L3  
 Client ID:  
 Sample Type: IC Calib Level: 3  
 Inject. Date: 19-Jun-2017 17:50:31 ALS Bottle#: 3 Worklist Smp#: 6  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: L3\_537  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub1  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20170619-44448.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 20-Jun-2017 10:57:42 Calib Date: 19-Jun-2017 18:04:42  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20170619-44448.b\2017.06.19\_537A\_ICAL\_009.d

Column 1 : Det: EXP1  
 Process Host: XAWRK019

First Level Reviewer: phomsophat Date: 19-Jun-2017 19:23:10

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	2.177	2.183	-0.006	1.000	14078909	47.3		1725	
298.90 > 99.00	2.177	2.183	-0.006	1.000	11416286		1.23(0.00-0.00)	1531	
\$ 2 13C2 PFHxA									
315.00 > 270.00	2.375	2.381	-0.006	1.000	4324388	9.95		4628	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	2.625	2.625	0.0	1.000	6060498	15.1		2120	
4 Perfluoroheptanoic acid									
363.00 > 319.00	2.625	2.630	-0.005	1.000	1714811	4.85		230	
5 Perfluorooctanoic acid									
413.00 > 369.00	2.860	2.859	0.001	1.000	3593653	9.80		599	
413.00 > 169.00	2.860	2.859	0.001	1.000	2004974		1.79(0.00-0.00)	2034	
* 6 13C2-PFOA									
415.00 > 370.00	2.860	2.859	0.001		4188714	10.0		10342	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.989	2.982	0.007	1.000	7072765	20.2		16591	
499.00 > 99.00	2.989	2.982	0.007	1.000	1570517		4.50(0.00-0.00)	4323	
* 7 13C4 PFOS									
503.00 > 80.00	2.989	2.991	-0.002		9877270	28.7		17530	
9 Perfluorononanoic acid									
463.00 > 419.00	3.004	3.003	0.001	1.000	3359467	9.40		1478	
\$ 10 13C2 PFDA									
515.00 > 470.00	3.126	3.123	0.003	1.000	3747801	9.30		10298	

**Reagents:**

LC537-L3\_00020

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170619-44448.b\2017.06.19\_537A\_ICAL\_006.d

Injection Date: 19-Jun-2017 17:50:31

Instrument ID: A8\_N

Lims ID: IC L3

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 3

Worklist Smp#: 6

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

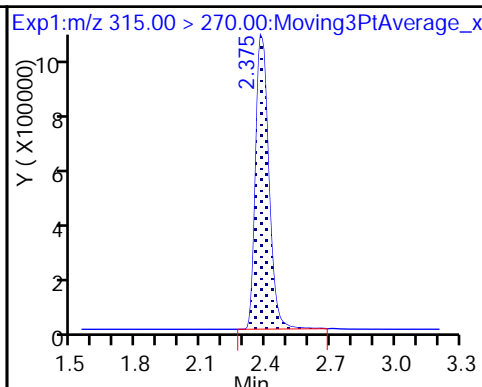
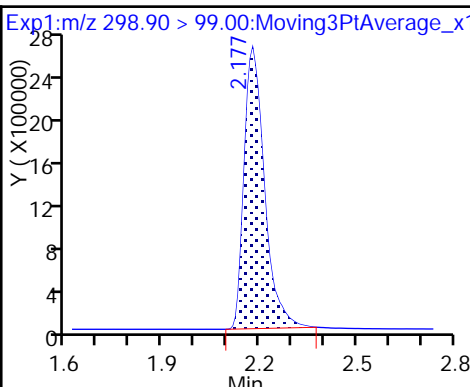
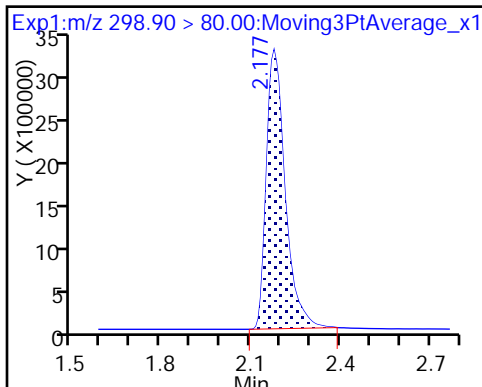
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

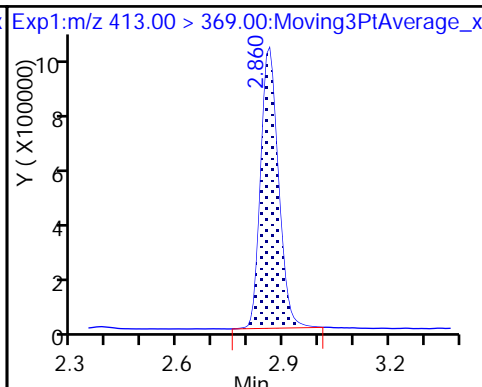
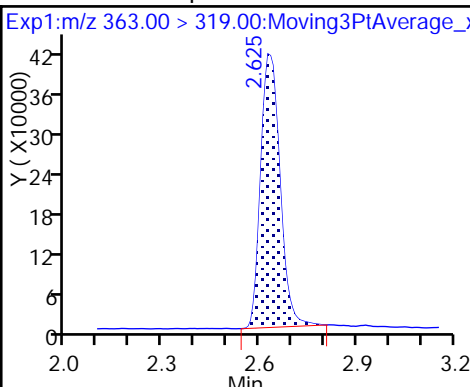
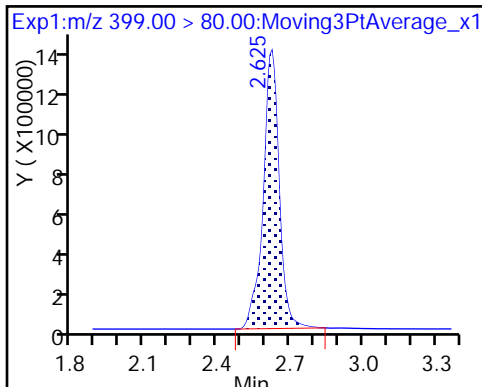
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

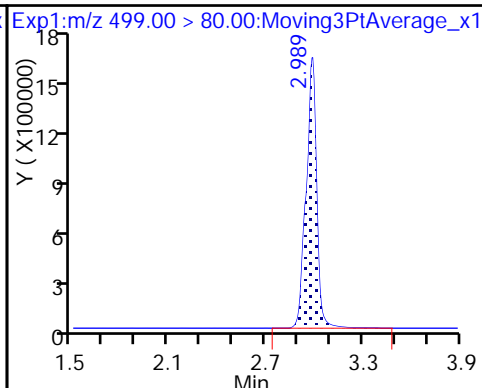
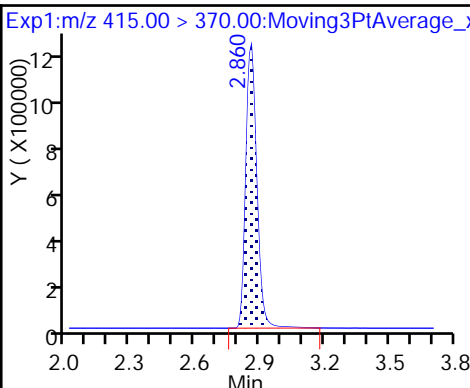
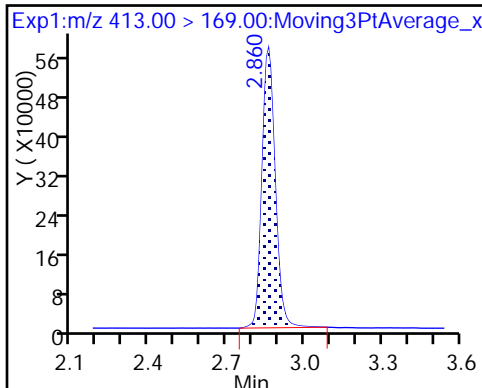
5 Perfluorooctanoic acid



5 Perfluorooctanoic acid

\* 6 13C2-PFOA

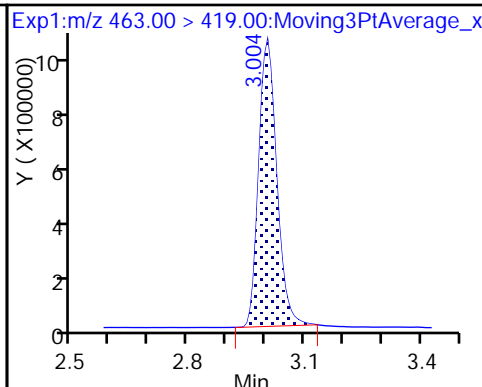
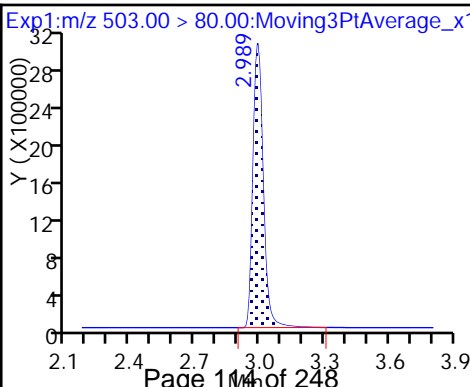
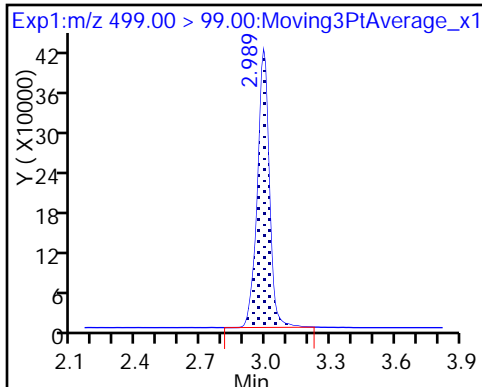
8 Perfluorooctane sulfonic acid



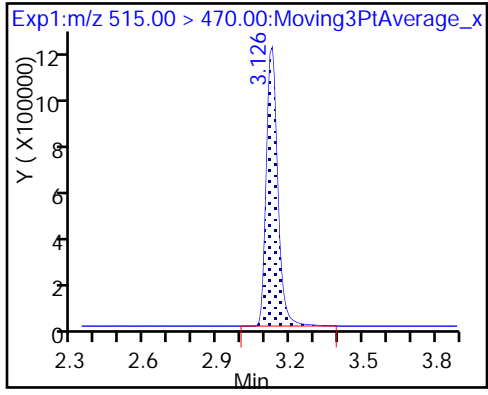
8 Perfluorooctane sulfonic acid

\* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170619-44448.b\2017.06.19\_537A\_ICAL\_007.d  
 Lims ID: IC L4  
 Client ID:  
 Sample Type: ICISAV Calib Level: 4  
 Inject. Date: 19-Jun-2017 17:55:14 ALS Bottle#: 4 Worklist Smp#: 7  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: L4\_537  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub1

Method: \\ChromNa\Sacramento\ChromData\A8\_N\20170619-44448.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 20-Jun-2017 10:57:43 Calib Date: 19-Jun-2017 18:04:42  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20170619-44448.b\2017.06.19\_537A\_ICAL\_009.d

Column 1 : Det: EXP1  
 Process Host: XAWRK019

First Level Reviewer: phomsophat Date: 19-Jun-2017 19:22:09

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	2.185	2.183	0.002	1.000	23681909	93.0		2103	
298.90 > 99.00	2.177	2.183	-0.006	0.997	19279111		1.23(0.00-0.00)	1851	
\$ 2 13C2 PFHxA									
315.00 > 270.00	2.382	2.381	0.001	1.000	3674058	9.92		3533	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	2.625	2.625	0.0	1.000	10884436	31.7		2979	
4 Perfluoroheptanoic acid									
363.00 > 319.00	2.633	2.630	0.003	1.000	3092048	10.3		423	
* 6 13C2-PFOA									
415.00 > 370.00	2.860	2.859	0.001		3569446	10.0		7613	
5 Perfluorooctanoic acid									
413.00 > 369.00	2.860	2.859	0.001	1.000	6339348	20.3		910	
413.00 > 169.00	2.860	2.859	0.001	1.000	3614623		1.75(0.00-0.00)	2747	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.989	2.982	0.007	1.000	12458294	41.7		22549	
499.00 > 99.00	2.989	2.982	0.007	1.000	2773908		4.49(0.00-0.00)	6283	
* 7 13C4 PFOS									
503.00 > 80.00	2.989	2.991	-0.002		8443710	28.7		17037	
9 Perfluorononanoic acid									
463.00 > 419.00	3.004	3.003	0.001	1.000	6025078	19.8		2149	
\$ 10 13C2 PFDA									
515.00 > 470.00	3.126	3.123	0.003	1.000	3562371	10.4		8880	

**Reagents:**

LC537-L4\_00018

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170619-44448.b\2017.06.19\_537A\_ICAL\_007.d

Injection Date: 19-Jun-2017 17:55:14

Instrument ID: A8\_N

Lims ID: IC L4

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 4

Worklist Smp#: 7

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

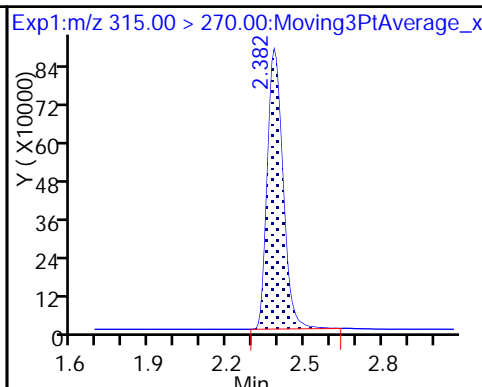
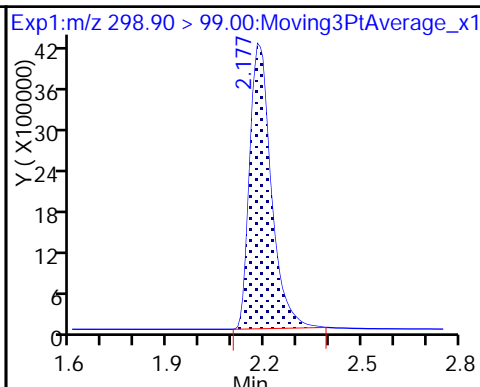
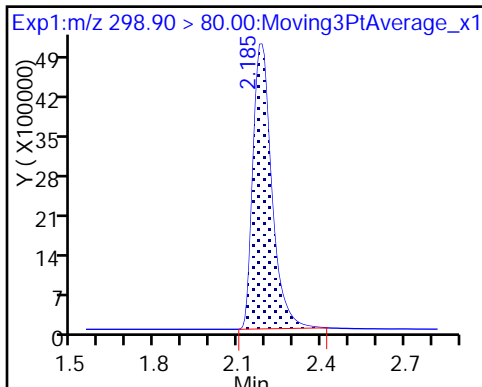
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

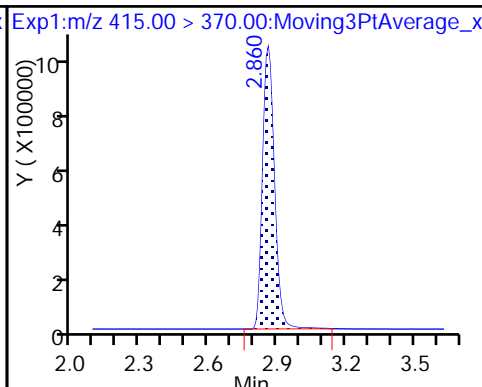
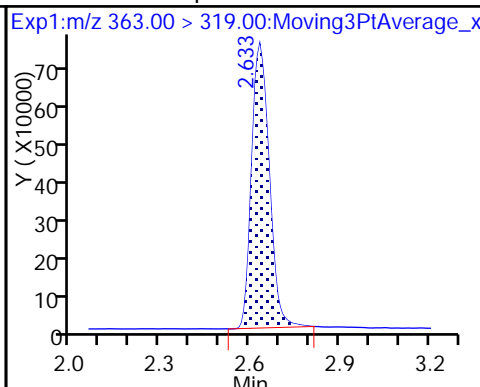
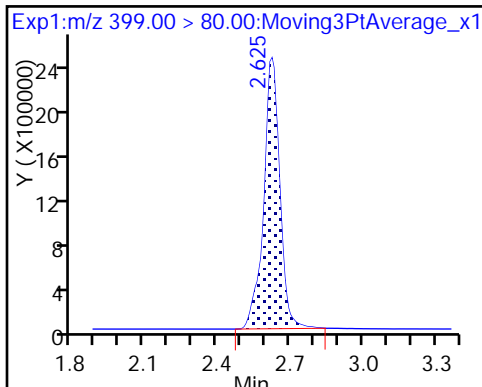
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

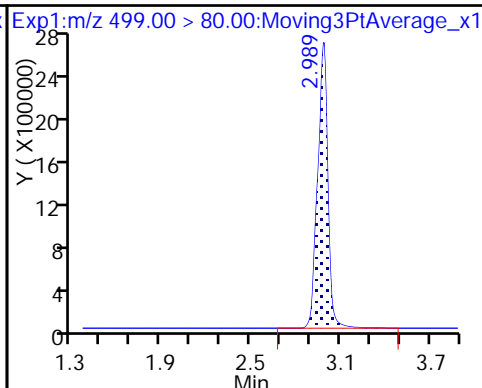
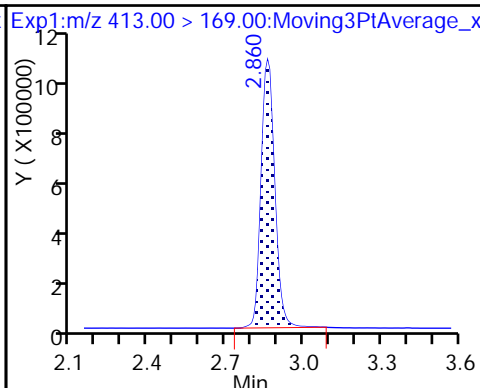
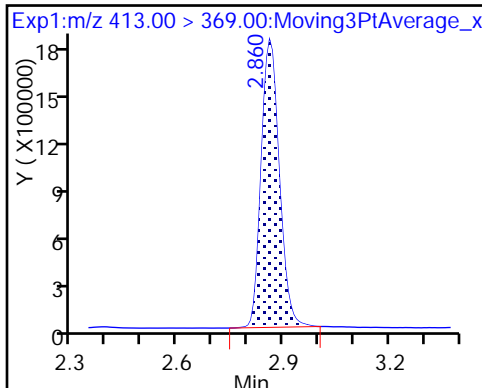
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

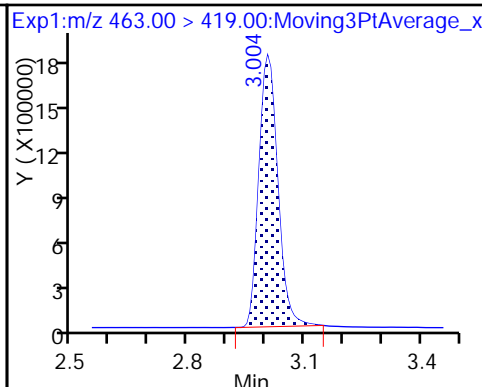
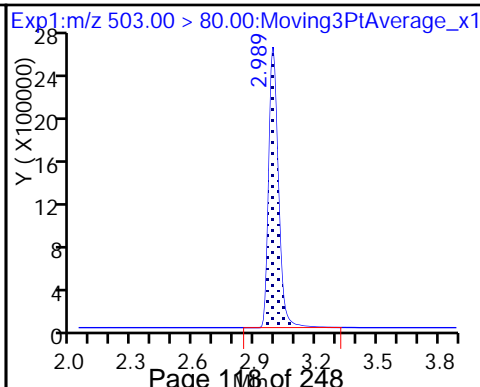
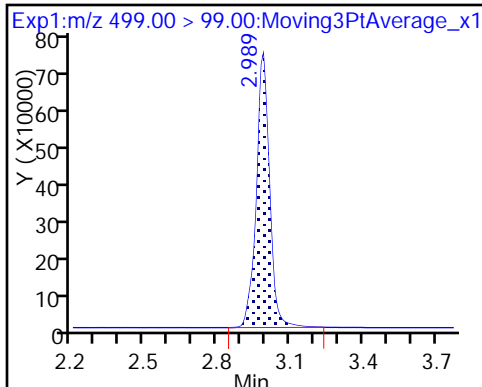
8 Perfluorooctane sulfonic acid



8 Perfluorooctane sulfonic acid

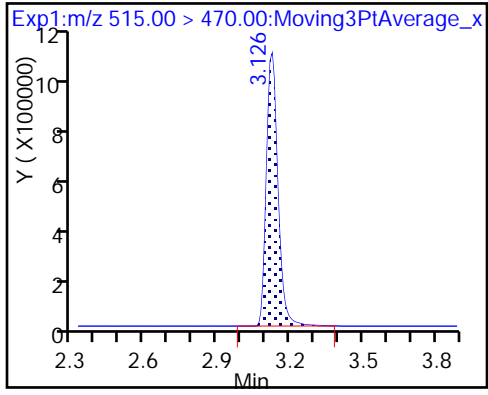
\* 7 13C4 PFOS

9 Perfluorononanoic acid





\$ 10 13C2 PFDA



TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170619-44448.b\2017.06.19\_537A\_ICAL\_008.d  
 Lims ID: IC L5  
 Client ID:  
 Sample Type: IC Calib Level: 5  
 Inject. Date: 19-Jun-2017 17:59:58 ALS Bottle#: 5 Worklist Smp#: 8  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: L5\_537  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub1

Method: \\ChromNa\Sacramento\ChromData\A8\_N\20170619-44448.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 20-Jun-2017 10:57:44 Calib Date: 19-Jun-2017 18:04:42  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20170619-44448.b\2017.06.19\_537A\_ICAL\_009.d

Column 1 : Det: EXP1  
 Process Host: XAWRK019

First Level Reviewer: phomsophat Date: 19-Jun-2017 19:23:34

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	2.185	2.183	0.002	1.000	35795970	125.7		2021	
298.90 > 99.00	2.185	2.183	0.002	1.000	29851648		1.20(0.00-0.00)	2318	
\$ 2 13C2 PFHxA									
315.00 > 270.00	2.382	2.381	0.001	1.000	4116656	10.3		3234	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	2.625	2.625	0.0	1.000	17549225	45.7		4202	
4 Perfluoroheptanoic acid									
363.00 > 319.00	2.633	2.630	0.003	1.000	5084081	15.6		737	
5 Perfluorooctanoic acid									
413.00 > 369.00	2.860	2.859	0.001	1.000	10547603	31.2		1518	
413.00 > 169.00	2.860	2.859	0.001	1.000	5893768		1.79(0.00-0.00)	5500	
* 6 13C2-PFOA									
415.00 > 370.00	2.860	2.859	0.001		3861310	10.0		6380	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.989	2.982	0.007	1.000	20543461	61.4		27604	
499.00 > 99.00	2.989	2.982	0.007	1.000	4568104		4.50(0.00-0.00)	9840	
* 7 13C4 PFOS									
503.00 > 80.00	2.989	2.991	-0.002		9445975	28.7		13989	
9 Perfluorononanoic acid									
463.00 > 419.00	3.004	3.003	0.001	1.000	9360498	28.4		2543	
\$ 10 13C2 PFDA									
515.00 > 470.00	3.118	3.123	-0.005	1.000	3726982	10.0		9457	

**Reagents:**

LC537-L5\_00021

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170619-44448.b\2017.06.19\_537A\_ICAL\_008.d

Injection Date: 19-Jun-2017 17:59:58

Instrument ID: A8\_N

Lims ID: IC L5

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 5

Worklist Smp#: 8

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

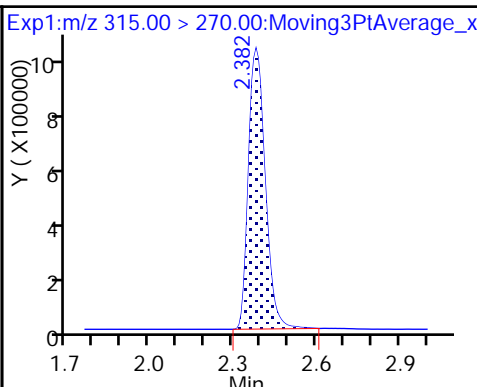
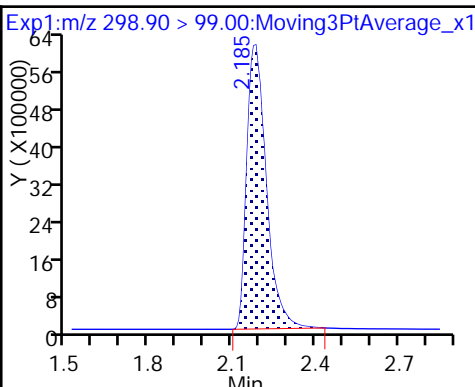
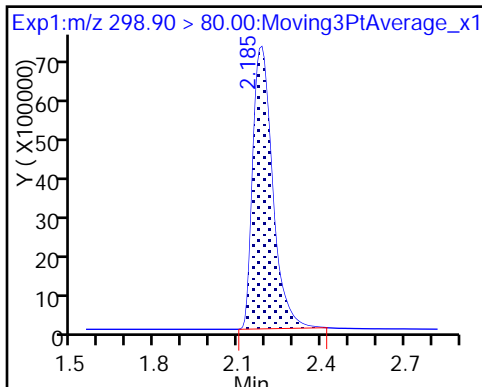
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

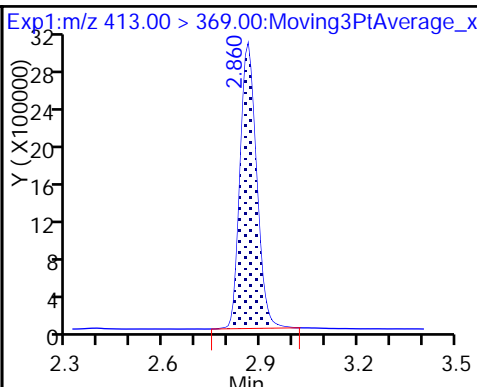
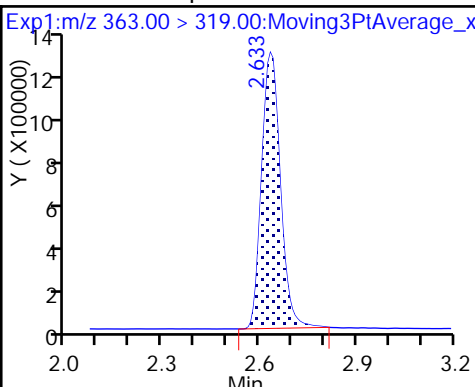
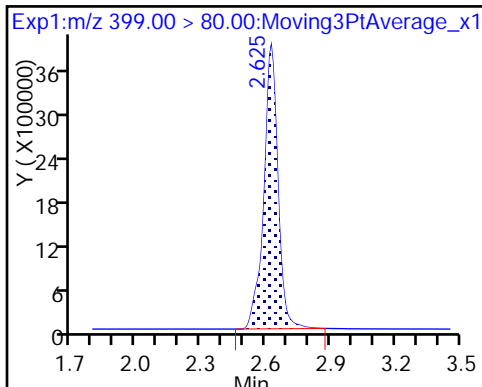
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

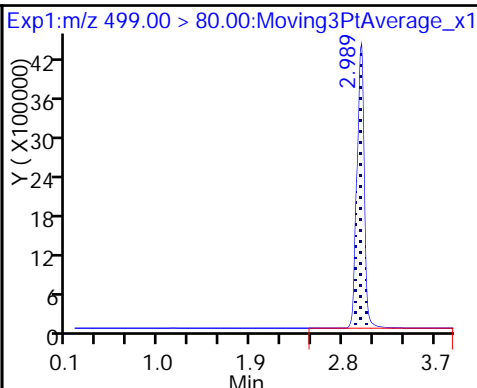
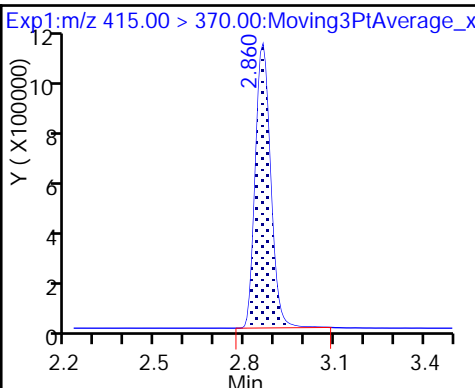
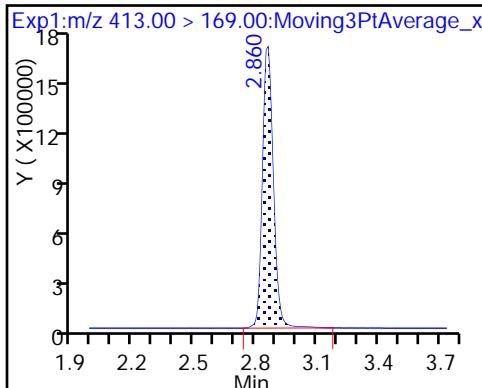
5 Perfluorooctanoic acid



5 Perfluorooctanoic acid

\* 6 13C2-PFOA

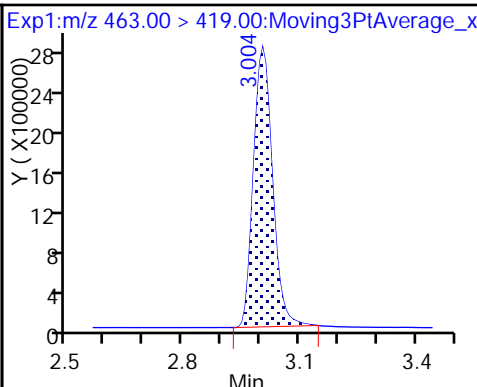
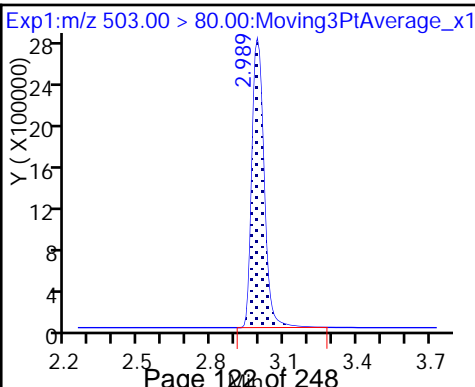
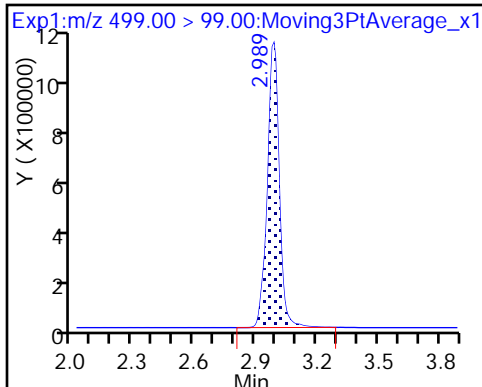
8 Perfluorooctane sulfonic acid



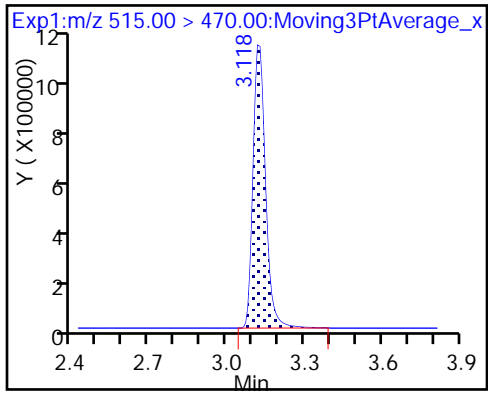
8 Perfluorooctane sulfonic acid

\* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170619-44448.b\2017.06.19\_537A\_ICAL\_009.d  
 Lims ID: IC L6  
 Client ID:  
 Sample Type: IC Calib Level: 6  
 Inject. Date: 19-Jun-2017 18:04:42 ALS Bottle#: 6 Worklist Smp#: 9  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: L6\_537  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub1

Method: \\ChromNa\Sacramento\ChromData\A8\_N\20170619-44448.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 20-Jun-2017 10:57:45 Calib Date: 19-Jun-2017 18:04:42  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20170619-44448.b\2017.06.19\_537A\_ICAL\_009.d

Column 1 : Det: EXP1  
 Process Host: XAWRK019

First Level Reviewer: phomsophat Date: 19-Jun-2017 19:23:51

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	2.185	2.183	0.002	1.000	46244402	156.7		1994	
298.90 > 99.00	2.177	2.183	-0.006	0.997	38450203		1.20(0.00-0.00)	2037	
\$ 2 13C2 PFHxA									
315.00 > 270.00	2.382	2.381	0.001	1.000	4499723	10.4		3470	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	2.618	2.625	-0.007	1.000	24546576	61.6		4971	
4 Perfluoroheptanoic acid									
363.00 > 319.00	2.625	2.630	-0.005	1.000	7166616	20.3		1025	
* 6 13C2-PFOA									
415.00 > 370.00	2.853	2.859	-0.006		4177713	10.0		6058	
5 Perfluorooctanoic acid									
413.00 > 369.00	2.853	2.859	-0.006	1.000	14918357	40.8		1802	
413.00 > 169.00	2.853	2.859	-0.006	1.000	8666954		1.72(0.00-0.00)	8092	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.982	2.982	0.0	1.000	27918279	80.5		31072	
499.00 > 99.00	2.982	2.982	0.0	1.000	6349926		4.40(0.00-0.00)	18668	
* 7 13C4 PFOS									
503.00 > 80.00	2.989	2.991	-0.002		9793572	28.7		19130	
9 Perfluorononanoic acid									
463.00 > 419.00	2.997	3.003	-0.006	1.000	12866660	36.1		3609	
\$ 10 13C2 PFDA									
515.00 > 470.00	3.118	3.123	-0.005	1.000	4296473	10.7		11949	

**Reagents:**

LC537-L6\_00017

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170619-44448.b\2017.06.19\_537A\_ICAL\_009.d

Injection Date: 19-Jun-2017 18:04:42

Instrument ID: A8\_N

Lims ID: IC L6

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 6

Worklist Smp#: 9

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

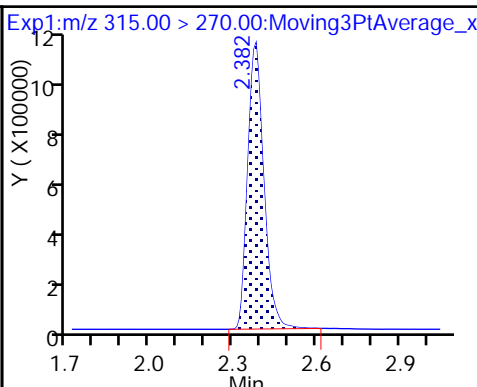
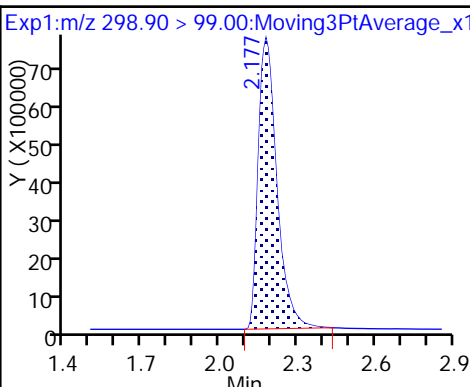
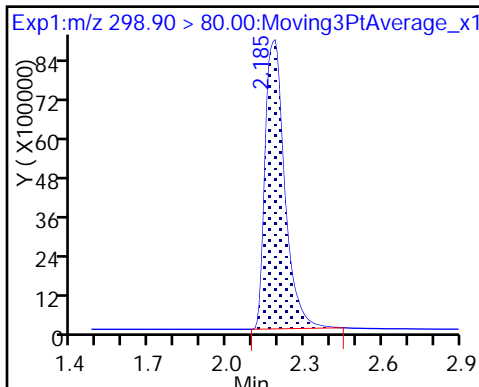
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

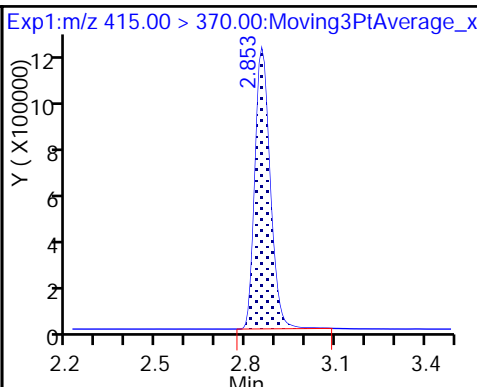
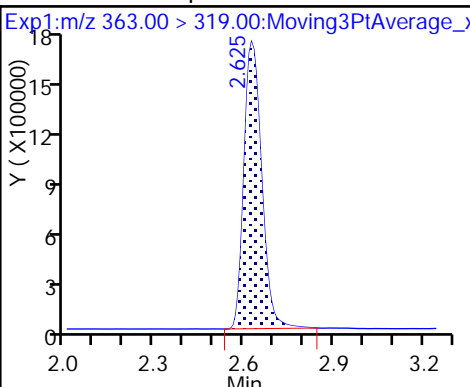
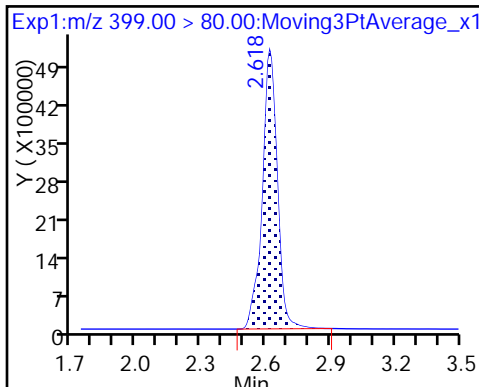
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

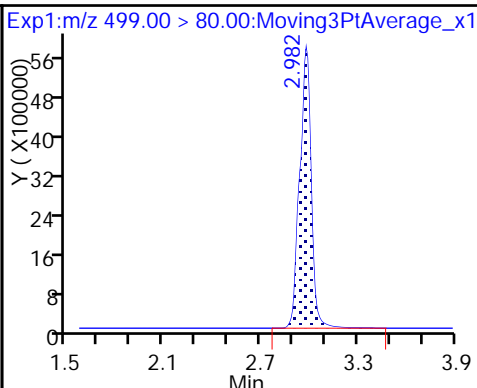
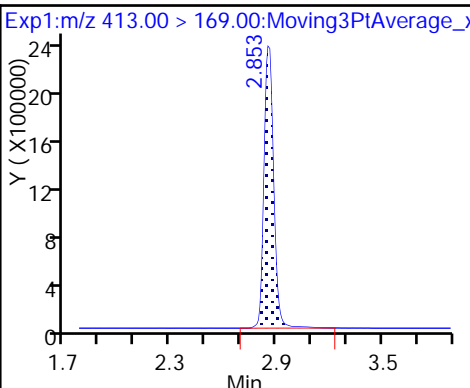
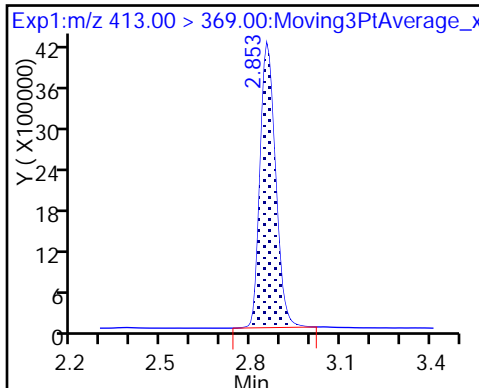
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

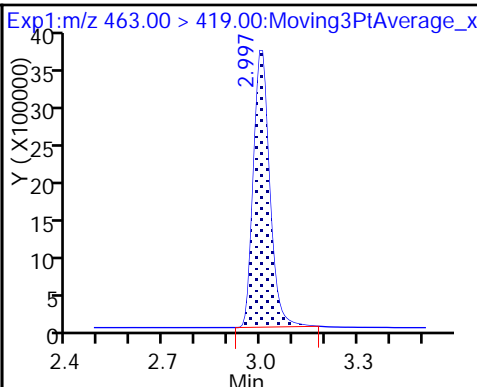
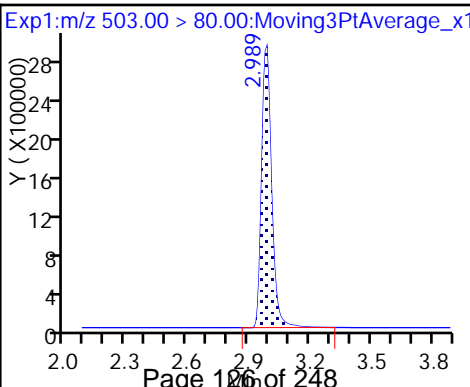
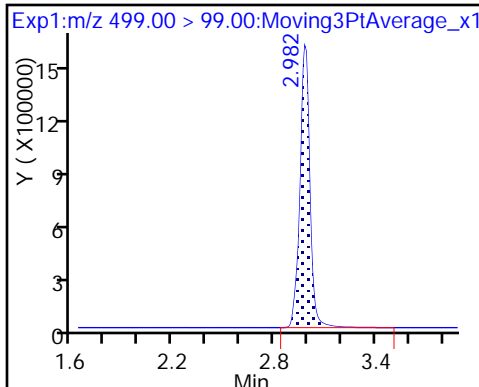
8 Perfluorooctane sulfonic acid



8 Perfluorooctane sulfonic acid

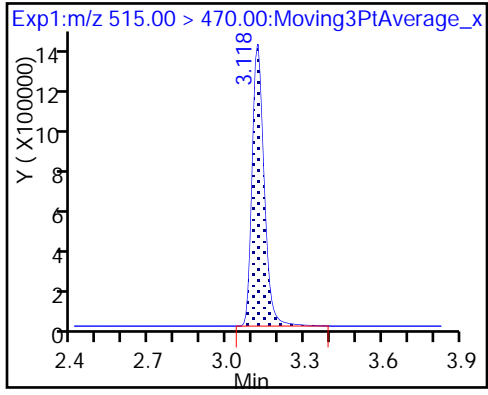
\* 7 13C4 PFOS

9 Perfluorononanoic acid





\$ 10 13C2 PFDA



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

Lab Name: TestAmerica Sacramento Job No.: 320-28987-1 Analy Batch No.: 171480

SDG No.: \_\_\_\_\_

Instrument ID: A8\_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 06/28/2017 16:11 Calibration End Date: 06/28/2017 16:35 Calibration ID: 32056

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-171480/4	2017.06.28_537_CURVE_004.d
Level 2	IC 320-171480/5	2017.06.28_537_CURVE_005.d
Level 3	IC 320-171480/6	2017.06.28_537_CURVE_006.d
Level 4	IC 320-171480/7	2017.06.28_537_CURVE_007.d
Level 5	IC 320-171480/8	2017.06.28_537_CURVE_008.d
Level 6	IC 320-171480/9	2017.06.28_537_CURVE_009.d

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R <sup>2</sup> OR COD	#	MIN R <sup>2</sup> OR COD
	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
Perfluorobutanesulfonic acid	1.0542 0.7747	1.1911	1.1019	0.9631	0.8595	QuaF		1.1739	-0.002299					0.9990			0.9600
Perfluoroheptanoic acid	0.9802 0.9208	1.0349	0.9965	1.0023	0.9814	Ave		0.9860			3.8		30.0				
Perfluorohexanesulfonic acid	1.4453 1.4041	1.5145	1.5704	1.4814	1.4492	Ave		1.4774			4.0		30.0				
Perfluorooctanoic acid	0.7781 0.8844	0.9090	0.8846	0.8950	0.9189	Ave		0.8783			5.8		30.0				
Perfluorooctane sulfonic acid	1.0077 1.0654	1.0142	1.0631	1.0030	1.0482	Ave		1.0336			2.8		30.0				
Perfluorononanoic acid	0.6497 0.6570	0.7320	0.7099	0.6959	0.6634	Ave		0.6847			4.8		30.0				
13C2 PFHxA	1.1301 1.2157	1.2214	1.2083	1.2062	1.2378	Ave		1.2033			3.1		30.0				
13C2 PFDA	0.6178 0.6956	0.6701	0.6547	0.6457	0.6660	Ave		0.6583			4.0		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.: 320-28987-1 Analy Batch No.: 171480

SDG No.: \_\_\_\_\_

Instrument ID: A8\_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 06/28/2017 16:11 Calibration End Date: 06/28/2017 16:35 Calibration ID: 32056

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-171480/4	2017.06.28_537_CURVE_004.d
Level 2	IC 320-171480/5	2017.06.28_537_CURVE_005.d
Level 3	IC 320-171480/6	2017.06.28_537_CURVE_006.d
Level 4	IC 320-171480/7	2017.06.28_537_CURVE_007.d
Level 5	IC 320-171480/8	2017.06.28_537_CURVE_008.d
Level 6	IC 320-171480/9	2017.06.28_537_CURVE_009.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5
Perfluorobutanesulfonic acid	PFOS	QuaF	1790966 30127104	4119763	11524329	15979460	27434944	8.83 176	21.2	44.4	89.4	133
Perfluoroheptanoic acid	13PF OA	Ave	189804 3839119	382424	1150592	1723856	3354002	0.990 19.7	2.38	4.97	10.0	14.9
Perfluorohexanesulfonic acid	PFOS	Ave	835502 18580566	1782416	5588395	8363563	15739710	3.01 59.7	7.21	15.1	30.4	45.1
Perfluorooctanoic acid	13PF OA	Ave	304104 7442161	677915	2061378	3106405	6337635	2.00 39.7	4.80	10.0	20.2	30.0
Perfluorooctane sulfonic acid	PFOS	Ave	775815 18774908	1589627	5038246	7541349	15161771	4.00 79.6	9.61	20.1	40.5	60.0
Perfluorononanoic acid	13PF OA	Ave	244768 5329596	526209	1594605	2328532	4410928	1.93 38.3	4.62	9.68	19.5	28.9
13C2 PFHxA	13PF OA	Ave	2210545 2576119	1899539	2804666	2069475	2848725	10.0 10.0	10.0	10.0	10.0	10.0
13C2 PFDA	13PF OA	Ave	1208487 1473923	1042170	1519617	1107876	1532613	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.: 320-28987-1 Analy Batch No.: 171480

SDG No.: \_\_\_\_\_

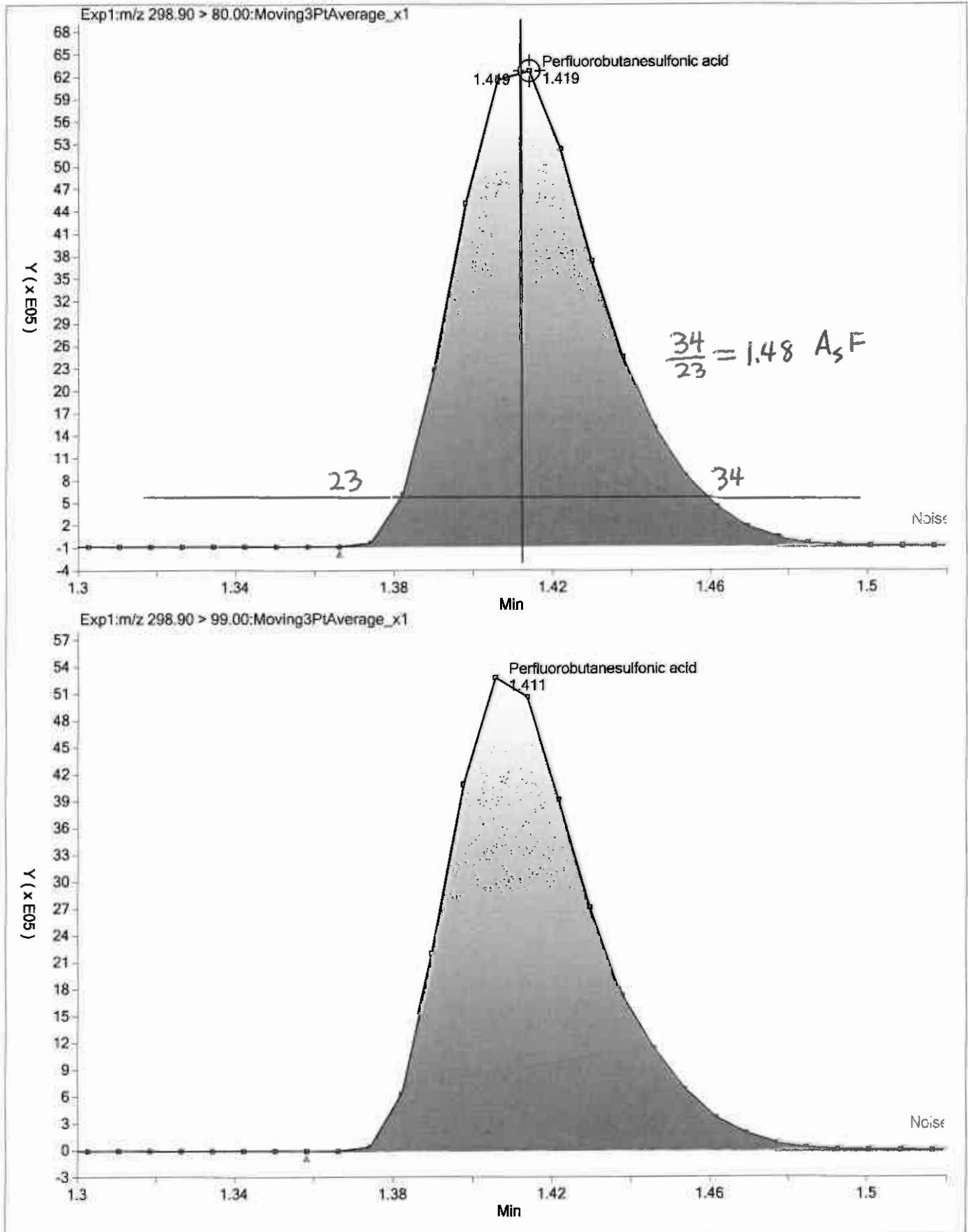
Instrument ID: A8\_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

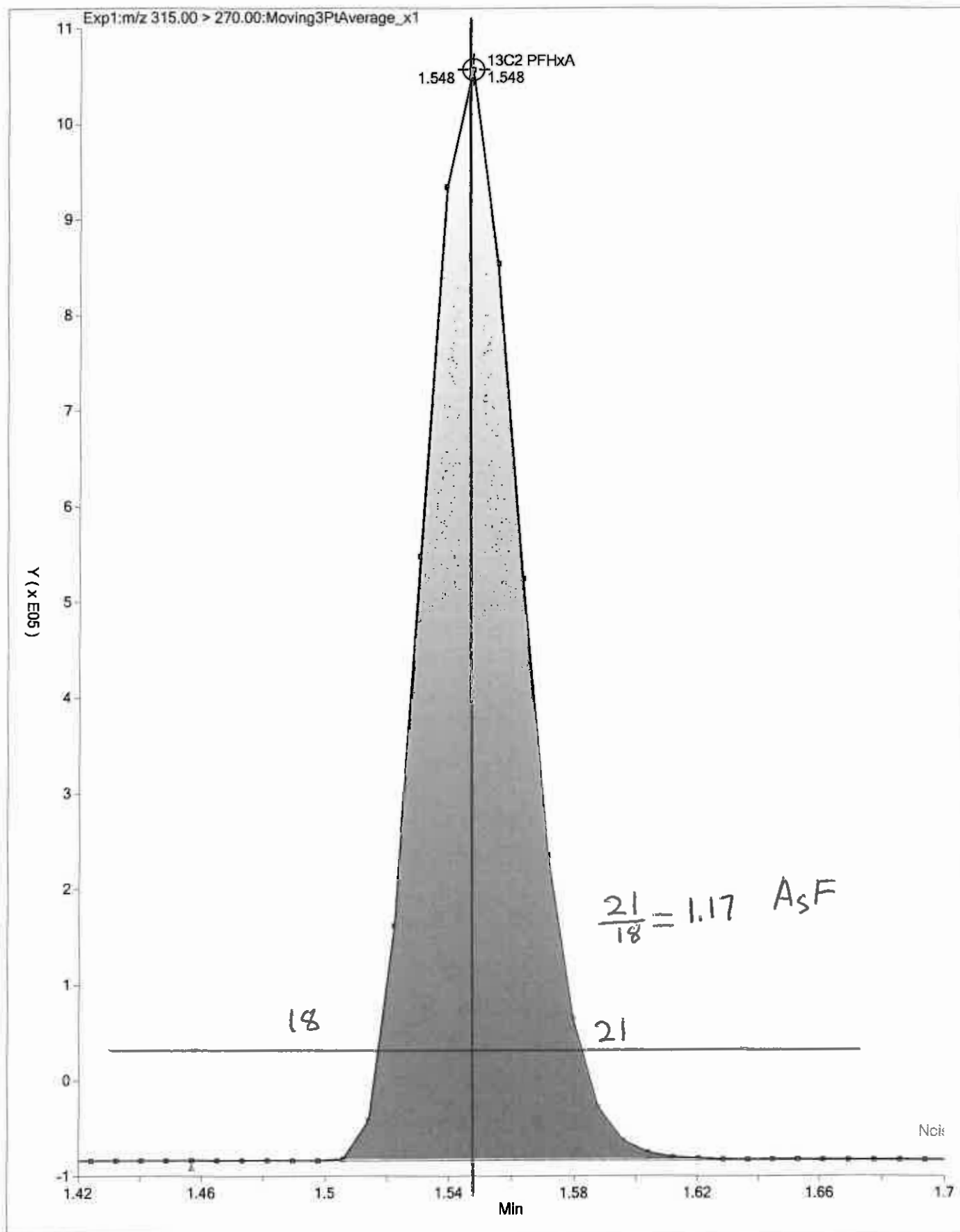
Calibration Start Date: 06/28/2017 16:11 Calibration End Date: 06/28/2017 16:35 Calibration ID: 32056

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-171480/4	2017.06.28_537_CURVE_004.d
Level 2	IC 320-171480/5	2017.06.28_537_CURVE_005.d
Level 3	IC 320-171480/6	2017.06.28_537_CURVE_006.d
Level 4	IC 320-171480/7	2017.06.28_537_CURVE_007.d
Level 5	IC 320-171480/8	2017.06.28_537_CURVE_008.d
Level 6	IC 320-171480/9	2017.06.28_537_CURVE_009.d

ANALYTE	PERCENT ERROR						PERCENT ERROR LIMIT					
	LVL 1 #	LVL 2 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6
Perfluorobutanesulfonic acid	-8.8	6.1	3.1	-0.7	-1.7	1.2	50	50	50	50	50	50
Perfluoroheptanoic acid	-0.6	5.0	1.1	1.7	-0.5	-6.6	50	50	50	50	50	50
Perfluorohexanesulfonic acid	-2.2	2.5	6.3	0.3	-1.9	-5.0	50	50	50	50	50	50
Perfluorooctanoic acid	-11.4	3.5	0.7	1.9	4.6	0.7	50	50	50	50	50	50
Perfluorooctane sulfonic acid	-2.5	-1.9	2.9	-3.0	1.4	3.1	50	50	50	50	50	50
Perfluorononanoic acid	-5.1	6.9	3.7	1.6	-3.1	-4.0	50	50	50	50	50	50
13C2 PFHxA	-6.1	1.5	0.4	0.2	2.9	1.0	30	30	30	30	30	30
13C2 PFDA	-6.1	1.8	-0.5	-1.9	1.2	5.7	30	30	30	30	30	30





TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170628-44832.b\2017.06.28\_537\_CURVE\_004.d  
 Lims ID: IC L1  
 Client ID:  
 Sample Type: IC Calib Level: 1  
 Inject. Date: 28-Jun-2017 16:11:22 ALS Bottle#: 1 Worklist Smp#: 4  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: L1\_537  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub1  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20170628-44832.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 28-Jun-2017 16:55:27 Calib Date: 28-Jun-2017 16:35:04  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20170628-44832.b\2017.06.28\_537\_CURVE\_009.d

Column 1 : Det: EXP1  
 Process Host: XAWRK008

First Level Reviewer: barnettj Date: 28-Jun-2017 16:43:57

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.411	1.415	-0.004	1.000	1790966	8.06		545	
298.90 > 99.00	1.411	1.415	-0.004	1.000	1409413		1.27(0.00-0.00)	649	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.548	1.548	0.0	1.000	2210545	9.39		5756	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.699	1.697	0.002	1.000	189804	0.9841		35.4	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.699	1.698	0.001	1.000	835502	2.94		332	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.882	1.882	0.0	1.000	304104	1.77		16.2	
413.00 > 169.00	1.882	1.882	0.0	1.000	188306		1.61(0.00-0.00)	293	
* 6 13C2-PFOA									
415.00 > 370.00	1.882	1.882	0.0		1955989	10.0		4940	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.124	2.117	0.007	1.000	775815	3.90		640	
499.00 > 99.00	2.117	2.117	0.0	0.996	168832		4.60(0.00-0.00)	217	
* 7 13C4 PFOS									
503.00 > 80.00	2.117	2.119	-0.002		5515470	28.7		3323	
9 Perfluorononanoic acid									
463.00 > 419.00	2.132	2.131	0.001	1.000	244768	1.83		21.7	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.291	2.291	0.0	1.000	1208487	9.39		3415	

**Reagents:**

LC537-L1\_00018

Amount Added: 1.00

Units: mL



TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170628-44832.b\2017.06.28\_537\_CURVE\_004.d

Injection Date: 28-Jun-2017 16:11:22

Instrument ID: A8\_N

Lims ID: IC L1

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 1

Worklist Smp#: 4

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

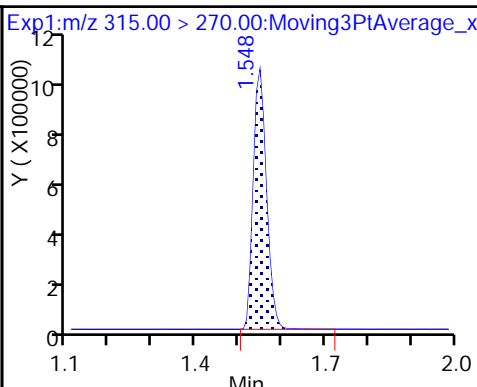
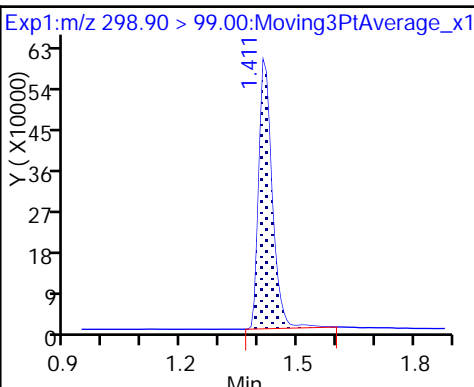
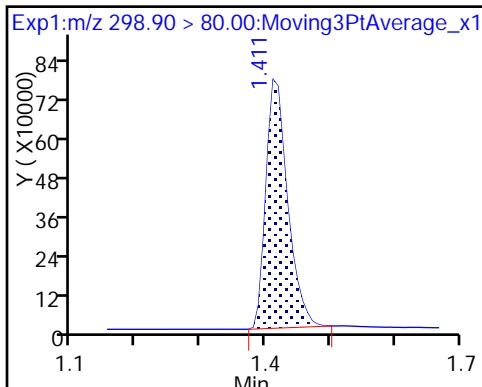
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

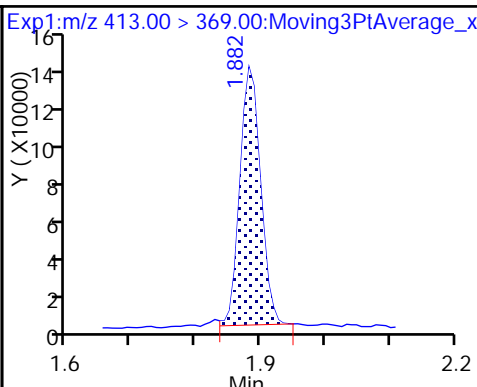
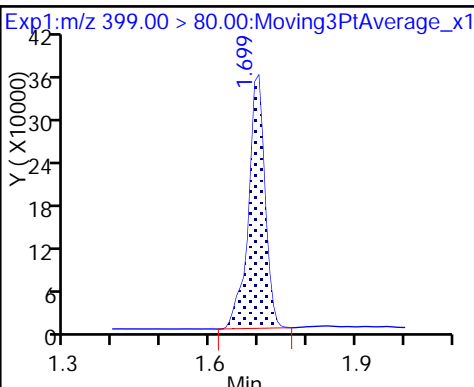
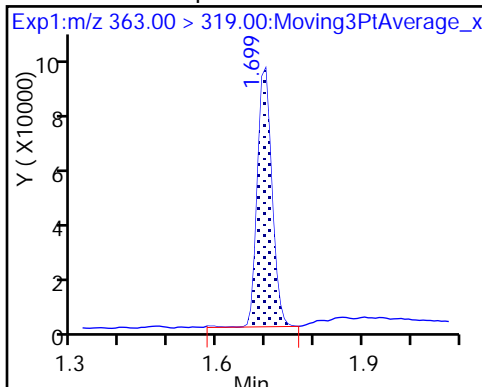
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

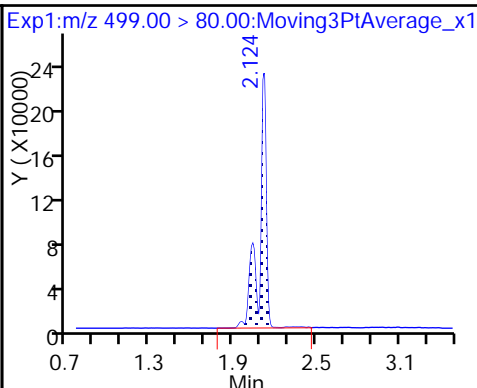
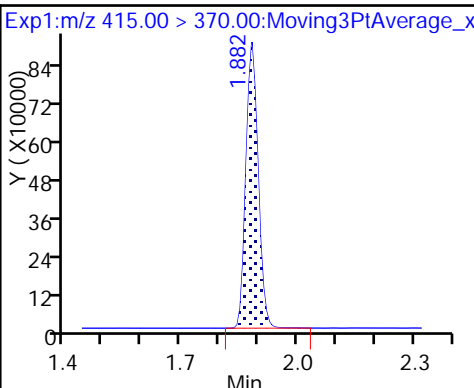
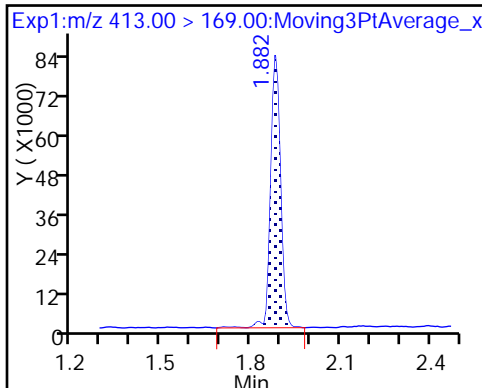
5 Perfluorooctanoic acid



5 Perfluorooctanoic acid

\* 6 13C2-PFOA

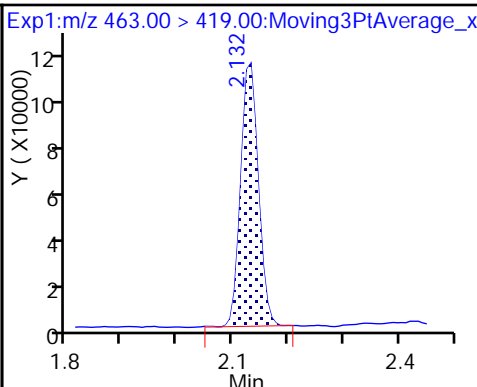
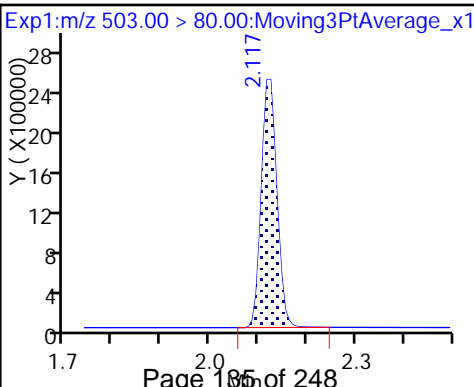
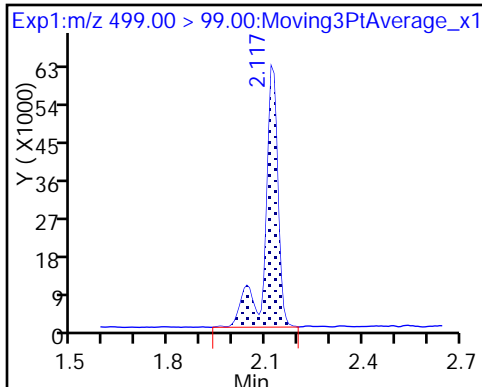
8 Perfluorooctane sulfonic acid



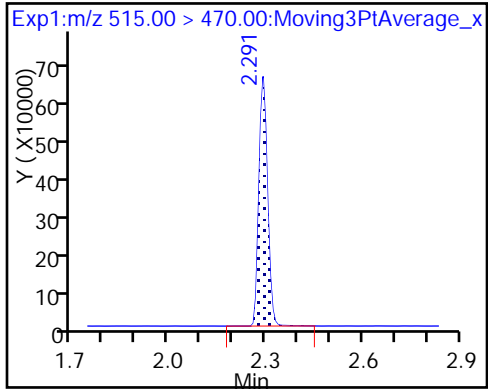
8 Perfluorooctane sulfonic acid

\* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170628-44832.b\2017.06.28\_537\_CURVE\_005.d  
 Lims ID: IC L2  
 Client ID:  
 Sample Type: IC Calib Level: 2  
 Inject. Date: 28-Jun-2017 16:16:06 ALS Bottle#: 2 Worklist Smp#: 5  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: L2\_537  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub1  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20170628-44832.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 28-Jun-2017 16:55:28 Calib Date: 28-Jun-2017 16:35:04  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20170628-44832.b\2017.06.28\_537\_CURVE\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK008

First Level Reviewer: barnettj Date: 28-Jun-2017 16:35:28

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.419	1.415	0.004	1.000	4119763	22.5		1210	
298.90 > 99.00	1.419	1.415	0.004	1.000	3074490		1.34(0.00-0.00)	1108	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.548	1.548	0.0	1.000	1899539	10.2		5966	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.699	1.697	0.002	1.000	382424	2.49		66.6	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.699	1.698	0.001	1.000	1782416	7.40		819	
* 6 13C2-PFOA									
415.00 > 370.00	1.882	1.882	0.0		1555217	10.0		3952	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.882	1.882	0.0	1.000	677915	4.96		38.6	
413.00 > 169.00	1.882	1.882	0.0	1.000	409648		1.65(0.00-0.00)	660	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.124	2.117	0.007	1.000	1589627	9.43		1107	
499.00 > 99.00	2.117	2.117	0.0	0.996	355184		4.48(0.00-0.00)	456	
* 7 13C4 PFOS									
503.00 > 80.00	2.124	2.119	0.005		4678665	28.7		3312	
9 Perfluorononanoic acid									
463.00 > 419.00	2.132	2.131	0.001	1.000	526209	4.94		49.3	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.291	2.291	0.0	1.000	1042170	10.2		3269	

**Reagents:**

LC537-L2\_00018

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170628-44832.b\2017.06.28\_537\_CURVE\_005.d

Injection Date: 28-Jun-2017 16:16:06

Instrument ID: A8\_N

Lims ID: IC L2

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 2

Worklist Smp#: 5

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

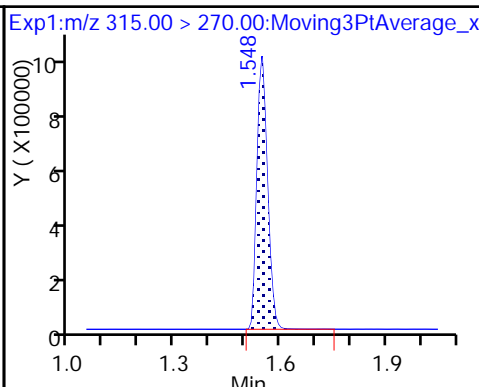
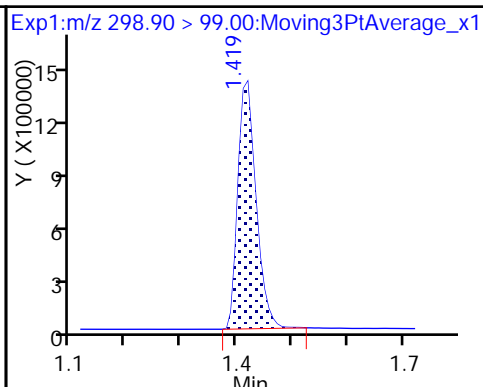
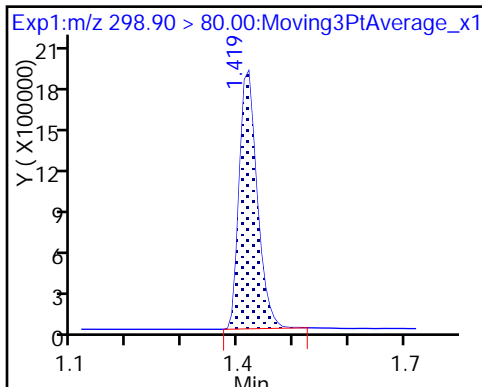
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

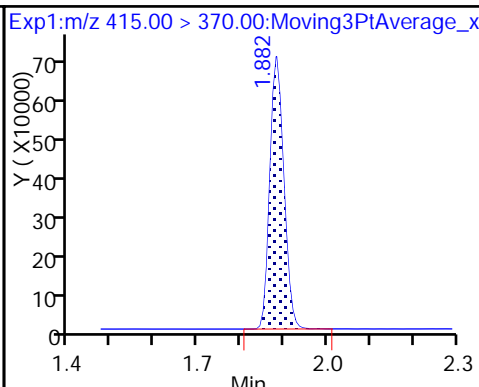
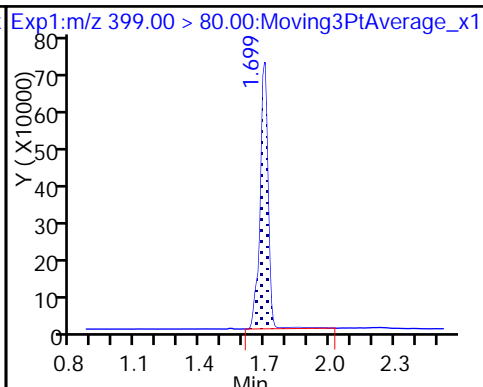
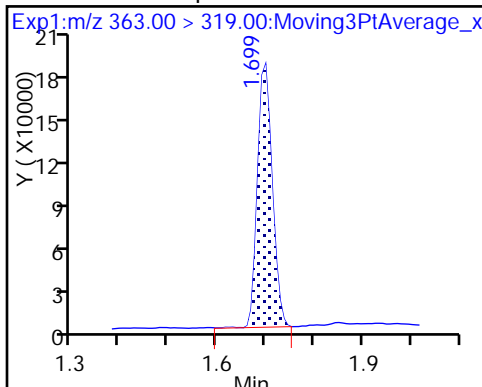
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

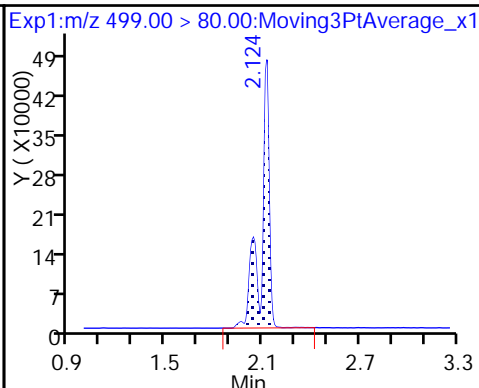
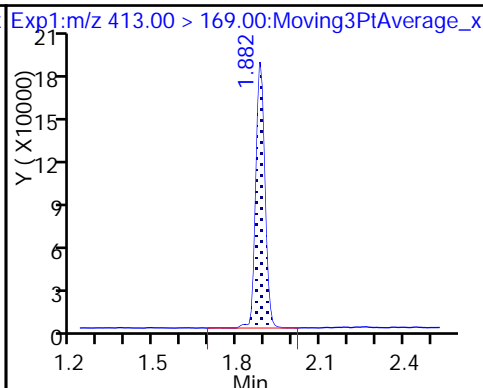
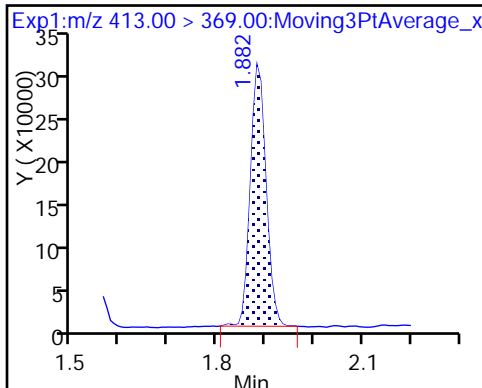
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

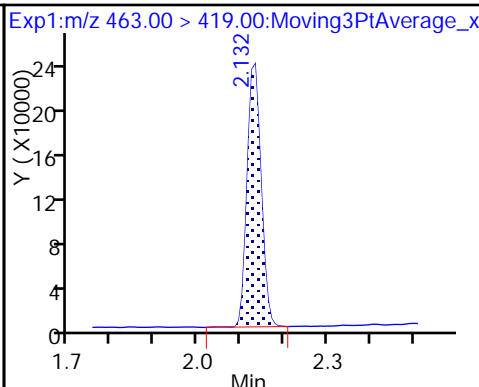
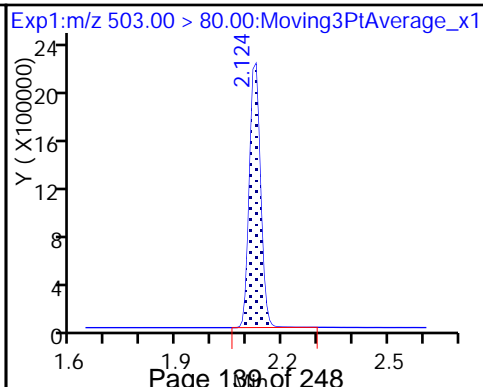
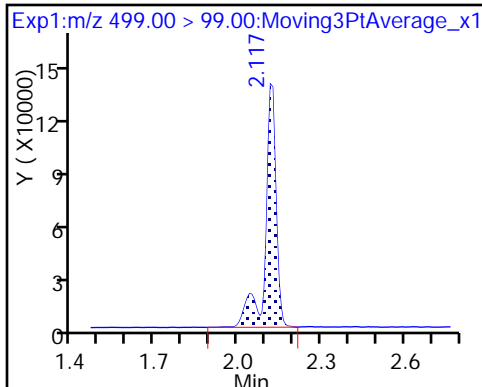
8 Perfluorooctane sulfonic acid



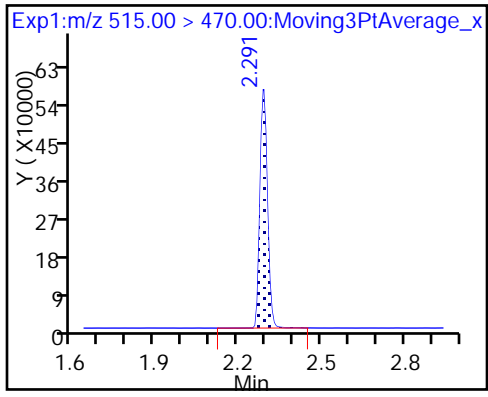
8 Perfluorooctane sulfonic acid

\* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170628-44832.b\2017.06.28\_537\_CURVE\_006.d  
 Lims ID: IC L3  
 Client ID:  
 Sample Type: IC Calib Level: 3  
 Inject. Date: 28-Jun-2017 16:20:50 ALS Bottle#: 3 Worklist Smp#: 6  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: L3\_537  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub1  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20170628-44832.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 28-Jun-2017 16:55:29 Calib Date: 28-Jun-2017 16:35:04  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last Ical File: \\ChromNA\Sacramento\ChromData\A8\_N\20170628-44832.b\2017.06.28\_537\_CURVE\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK008

First Level Reviewer: barnettj Date: 28-Jun-2017 16:32:32

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.411	1.415	-0.004	1.000	11524329	45.8		2493	
298.90 > 99.00	1.411	1.415	-0.004	1.000	8951622		1.29(0.00-0.00)	2436	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.548	1.548	0.0	1.000	2804666	10.0		6939	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.692	1.697	-0.005	1.000	1150592	5.03		197	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.699	1.698	0.001	1.000	5588395	16.1		1987	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.882	1.882	0.0	1.000	2061378	10.1		114	
413.00 > 169.00	1.882	1.882	0.0	1.000	1221192		1.69(0.00-0.00)	1652	
* 6 13C2-PFOA									
415.00 > 370.00	1.882	1.882	0.0		2321071	10.0		5723	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.124	2.117	0.007	1.000	5038246	20.7		2652	
499.00 > 99.00	2.117	2.117	0.0	0.996	1124439		4.48(0.00-0.00)	1216	
* 7 13C4 PFOS									
503.00 > 80.00	2.124	2.119	0.005		6756643	28.7		4106	
9 Perfluorononanoic acid									
463.00 > 419.00	2.132	2.131	0.001	1.000	1594605	10.0		131	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.291	2.291	0.0	1.000	1519617	9.95		4272	

**Reagents:**

LC537-L3\_00020

Amount Added: 1.00

Units: mL



TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170628-44832.b\2017.06.28\_537\_CURVE\_006.d

Injection Date: 28-Jun-2017 16:20:50

Instrument ID: A8\_N

Lims ID: IC L3

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 3

Worklist Smp#: 6

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

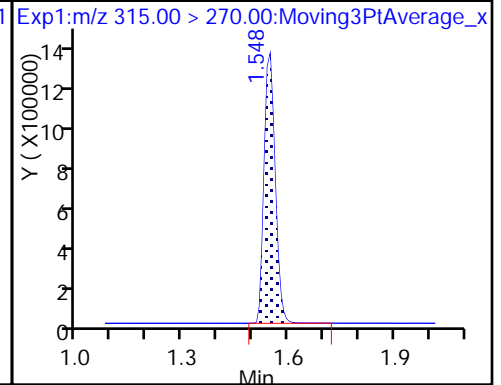
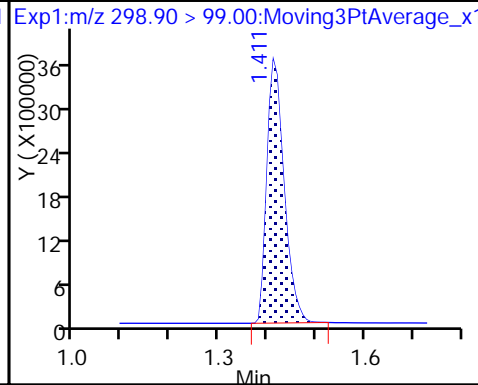
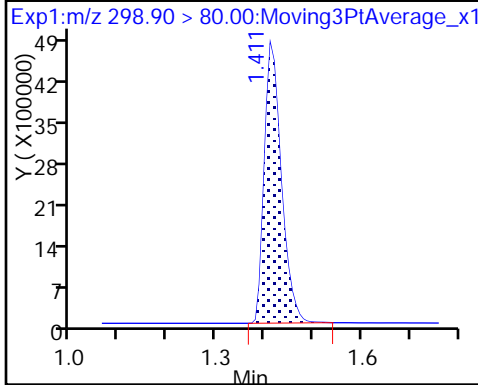
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

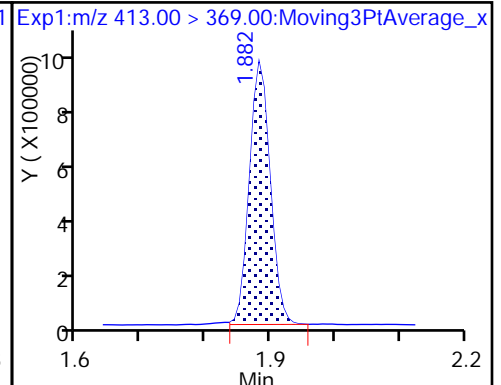
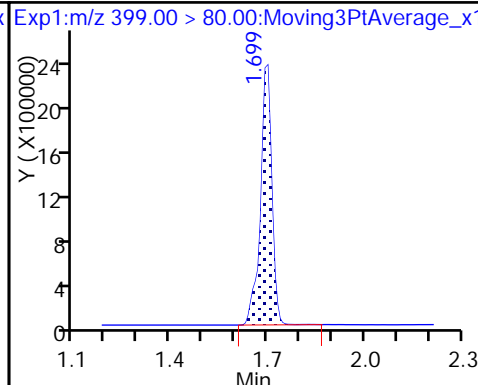
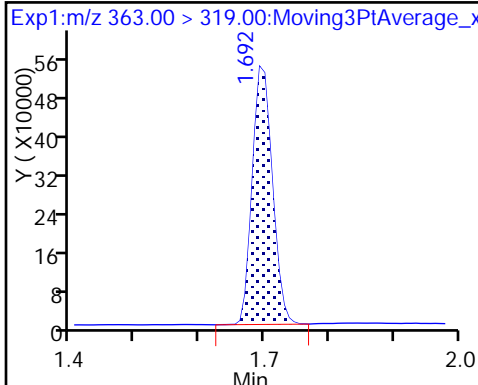
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

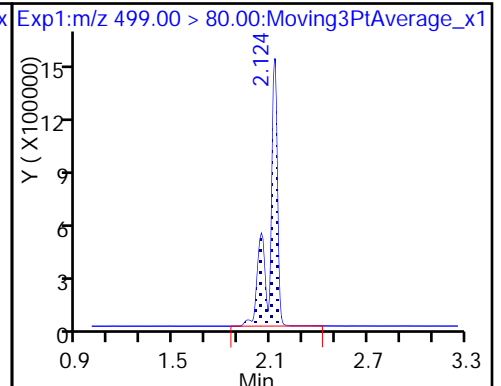
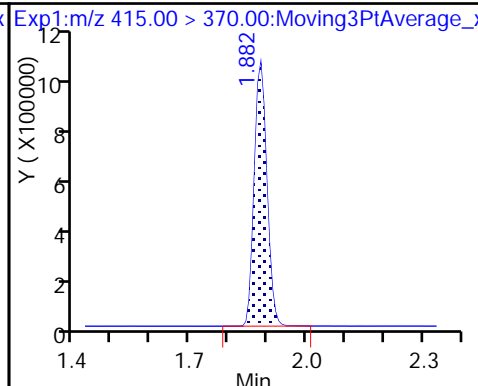
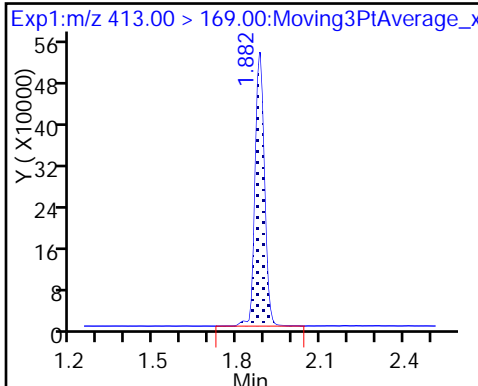
5 Perfluorooctanoic acid



5 Perfluorooctanoic acid

\* 6 13C2-PFOA

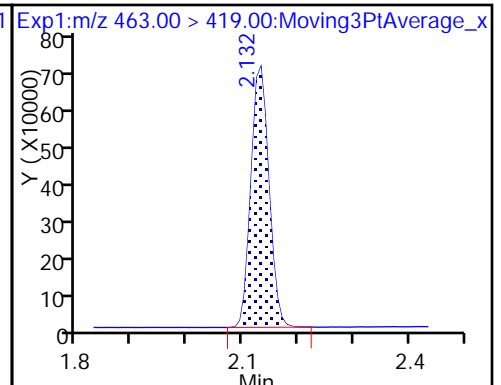
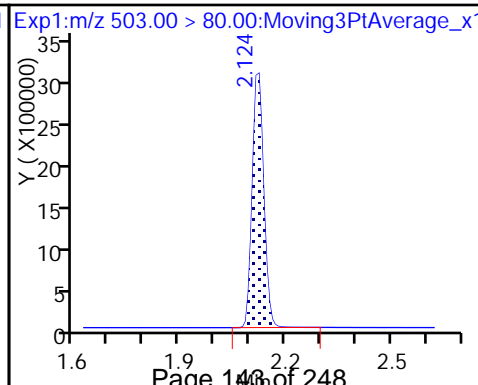
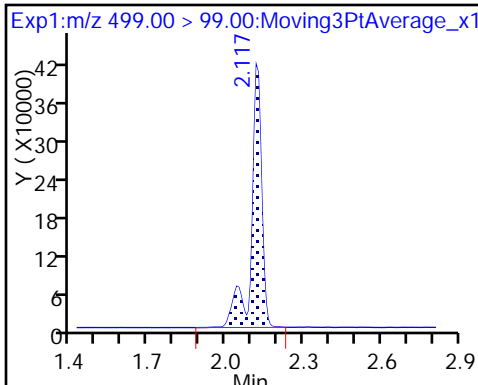
8 Perfluorooctane sulfonic acid



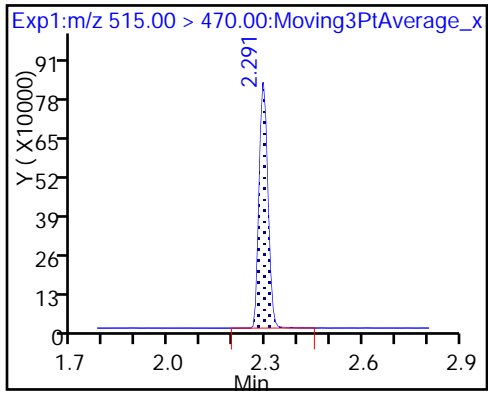
8 Perfluorooctane sulfonic acid

\* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170628-44832.b\2017.06.28\_537\_CURVE\_007.d  
 Lims ID: IC L4  
 Client ID:  
 Sample Type: ICISAV Calib Level: 4  
 Inject. Date: 28-Jun-2017 16:25:35 ALS Bottle#: 4 Worklist Smp#: 7  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: L4\_537  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub1

Method: \\ChromNa\Sacramento\ChromData\A8\_N\20170628-44832.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 28-Jun-2017 16:55:31 Calib Date: 28-Jun-2017 16:35:04  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20170628-44832.b\2017.06.28\_537\_CURVE\_009.d

Column 1 : Det: EXP1  
 Process Host: XAWRK008

First Level Reviewer: barnettj Date: 28-Jun-2017 16:55:13

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.419	1.415	0.004	1.000	15979460	88.8		2331	
298.90 > 99.00	1.411	1.415	-0.004	0.995	12860446		1.24(0.00-0.00)	2491	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.548	1.548	0.0	1.000	2069475	10.0		4999	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.699	1.697	0.002	1.000	1723856	10.2		294	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.699	1.698	0.001	1.000	8363563	30.5		2247	
* 6 13C2-PFOA									
415.00 > 370.00	1.882	1.882	0.0		1715754	10.0		4697	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.882	1.882	0.0	1.000	3106405	20.6		184	
413.00 > 169.00	1.882	1.882	0.0	1.000	1868573		1.66(0.00-0.00)	2128	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.124	2.117	0.007	1.000	7541349	39.3		3213	
499.00 > 99.00	2.117	2.117	0.0	0.996	1752429		4.30(0.00-0.00)	1678	
* 7 13C4 PFOS									
503.00 > 80.00	2.117	2.119	-0.002		5320058	28.7		3607	
9 Perfluorononanoic acid									
463.00 > 419.00	2.132	2.131	0.001	1.000	2328532	19.8		190	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.291	2.291	0.0	1.000	1107876	9.81		3405	

**Reagents:**

LC537-L4\_00018

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170628-44832.b\2017.06.28\_537\_CURVE\_007.d

Injection Date: 28-Jun-2017 16:25:35

Instrument ID: A8\_N

Lims ID: IC L4

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 4

Worklist Smp#: 7

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

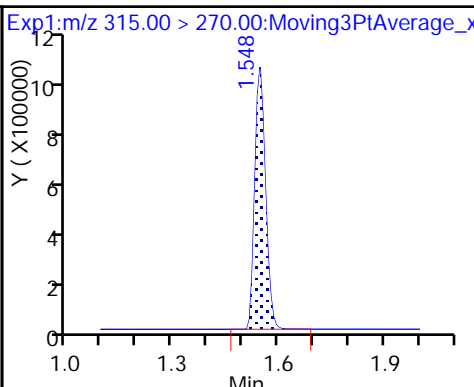
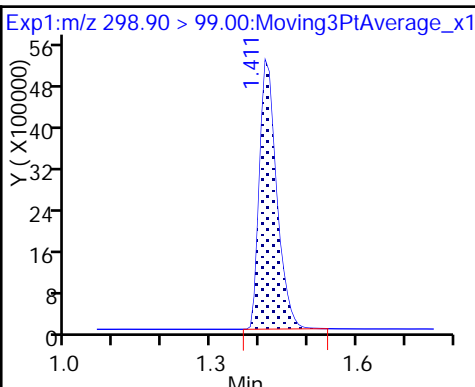
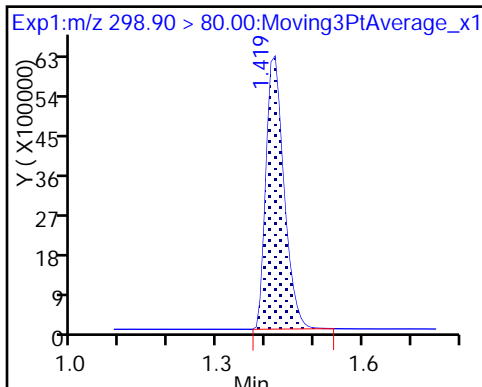
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

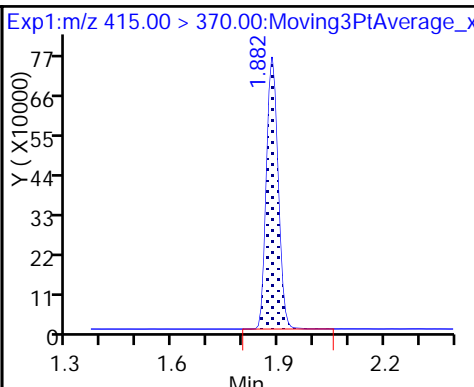
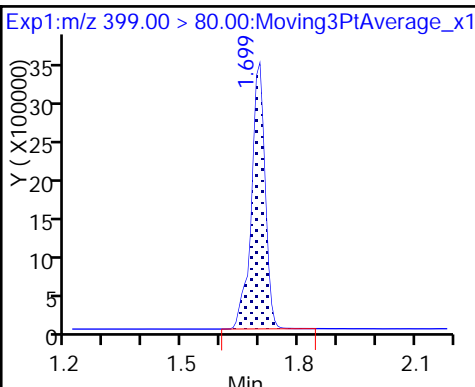
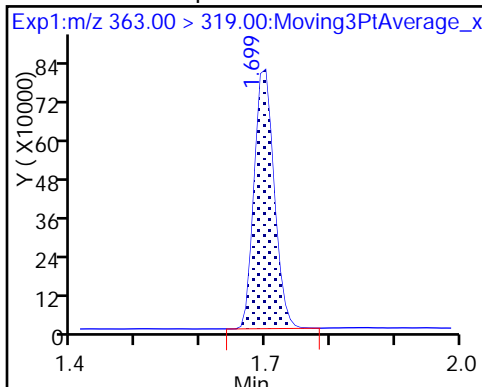
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

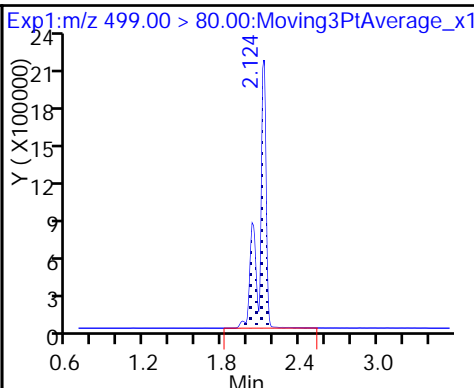
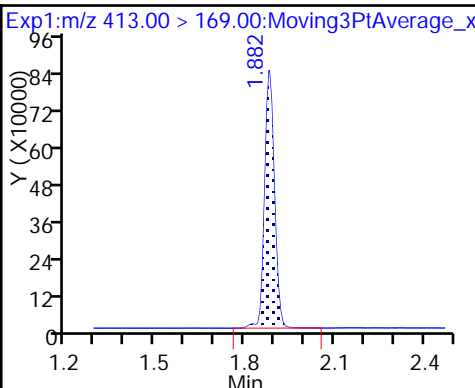
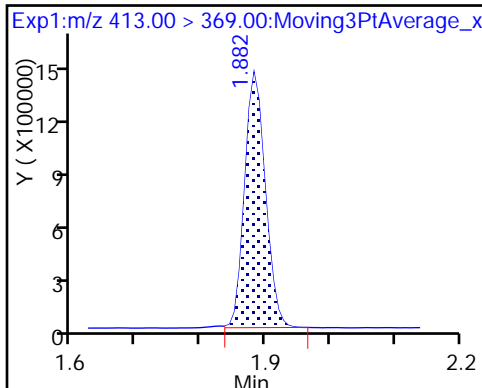
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

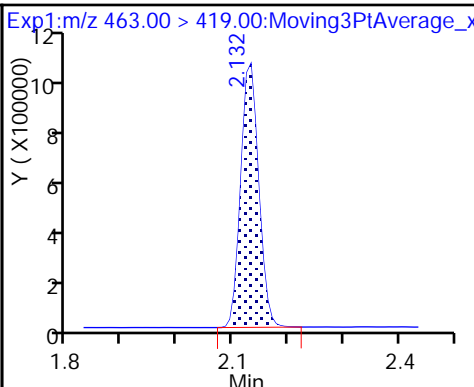
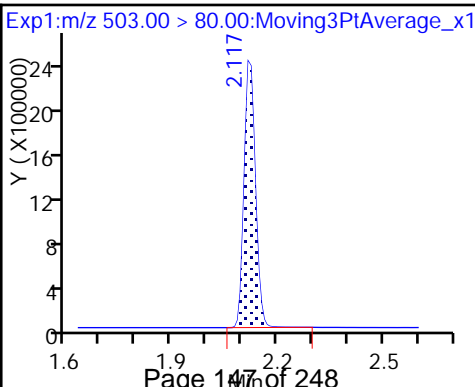
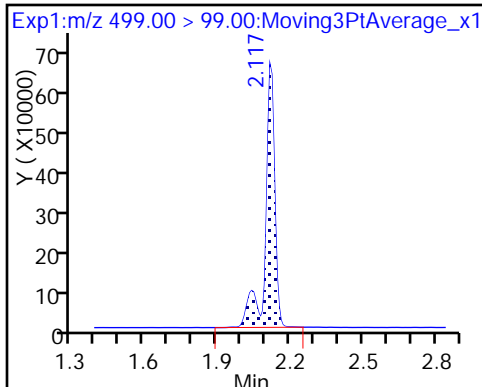
8 Perfluorooctane sulfonic acid



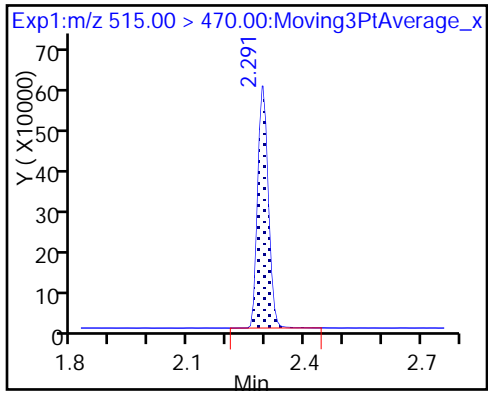
8 Perfluorooctane sulfonic acid

\* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170628-44832.b\2017.06.28\_537\_CURVE\_008.d  
 Lims ID: IC L5  
 Client ID:  
 Sample Type: IC Calib Level: 5  
 Inject. Date: 28-Jun-2017 16:30:19 ALS Bottle#: 5 Worklist Smp#: 8  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: L5\_537  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub1

Method: \\ChromNa\Sacramento\ChromData\A8\_N\20170628-44832.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 28-Jun-2017 16:55:32 Calib Date: 28-Jun-2017 16:35:04  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20170628-44832.b\2017.06.28\_537\_CURVE\_009.d

Column 1 : Det: EXP1  
 Process Host: XAWRK008

First Level Reviewer: barnettj Date: 28-Jun-2017 16:44:25

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.419	1.415	0.004	1.000	27434944	130.2		2906	
298.90 > 99.00	1.411	1.415	-0.004	0.995	21997952		1.25(0.00-0.00)	2902	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.548	1.548	0.0	1.000	2848725	10.3		7994	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.699	1.697	0.002	1.000	3354002	14.8		559	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.699	1.698	0.001	1.000	15739710	44.2		3098	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.882	1.882	0.0	1.000	6337635	31.4		367	
413.00 > 169.00	1.882	1.882	0.0	1.000	3765616		1.68(0.00-0.00)	3658	
* 6 13C2-PFOA									
415.00 > 370.00	1.882	1.882	0.0		2301384	10.0		5680	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.117	2.117	0.0	1.000	15161771	60.9		4851	
499.00 > 99.00	2.117	2.117	0.0	1.000	3453740		4.39(0.00-0.00)	2548	
* 7 13C4 PFOS									
503.00 > 80.00	2.117	2.119	-0.002		6908198	28.7		4041	
9 Perfluorononanoic acid									
463.00 > 419.00	2.132	2.131	0.001	1.000	4410928	28.0		295	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.291	2.291	0.0	1.000	1532613	10.1		4398	

**Reagents:**

LC537-L5\_00021

Amount Added: 1.00

Units: mL



TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170628-44832.b\2017.06.28\_537\_CURVE\_008.d

Injection Date: 28-Jun-2017 16:30:19

Instrument ID: A8\_N

Lims ID: IC L5

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 5

Worklist Smp#: 8

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

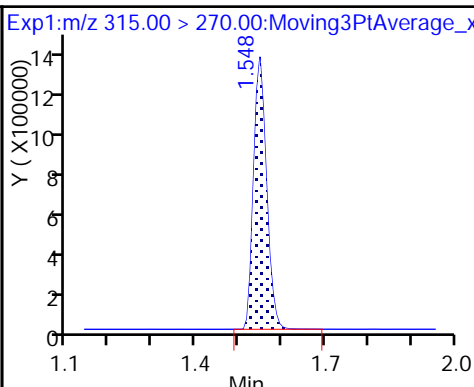
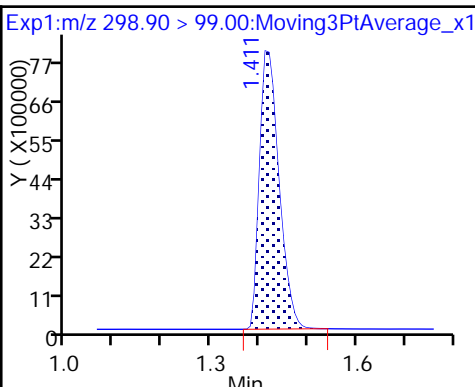
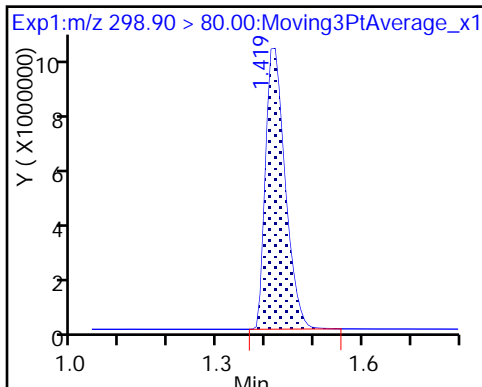
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

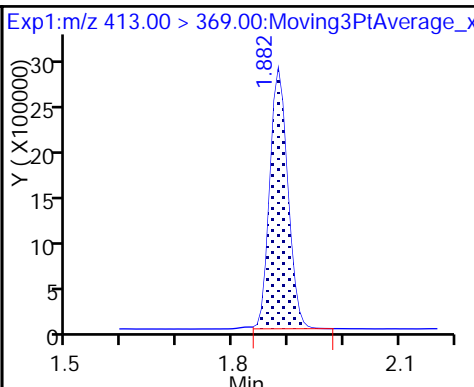
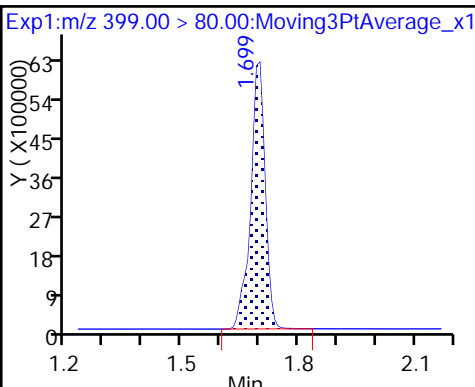
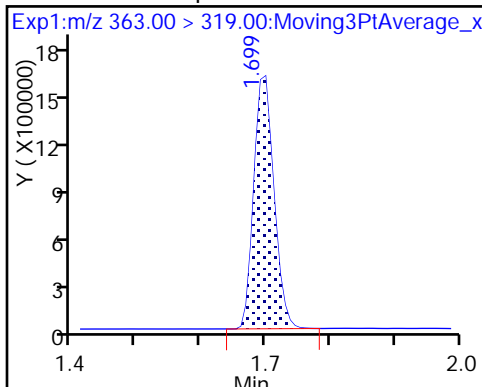
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

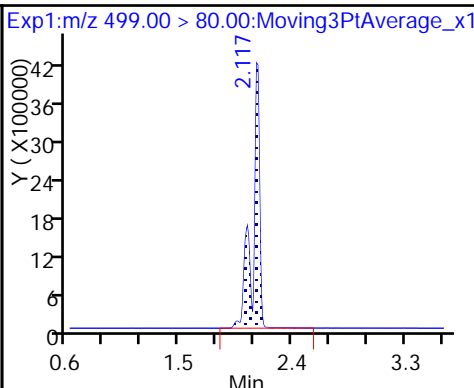
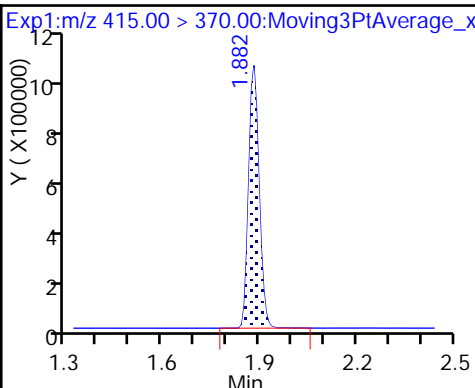
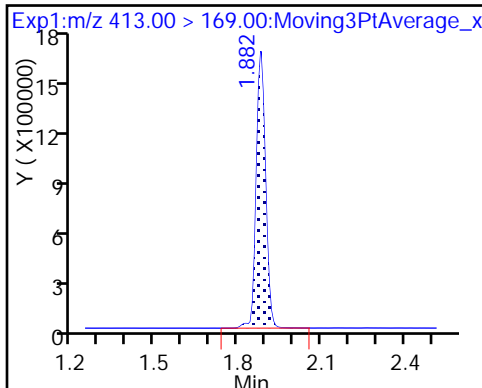
5 Perfluorooctanoic acid



5 Perfluorooctanoic acid

\* 6 13C2-PFOA

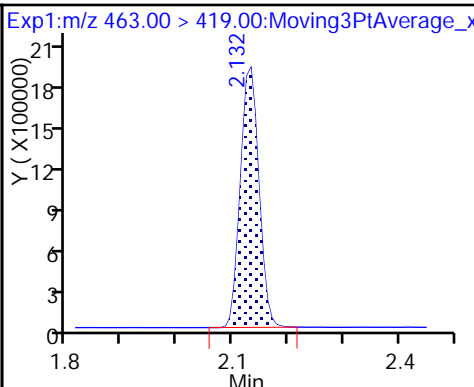
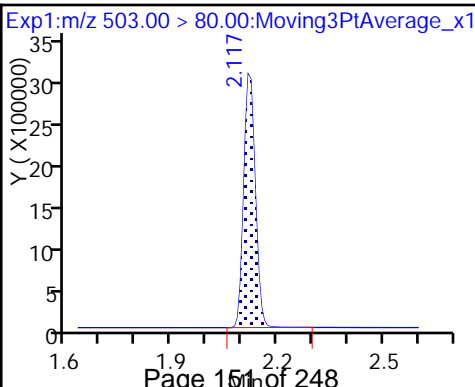
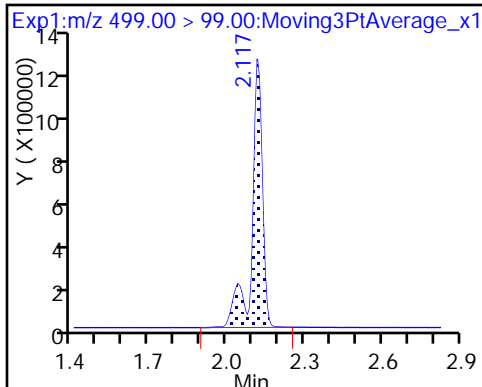
8 Perfluorooctane sulfonic acid



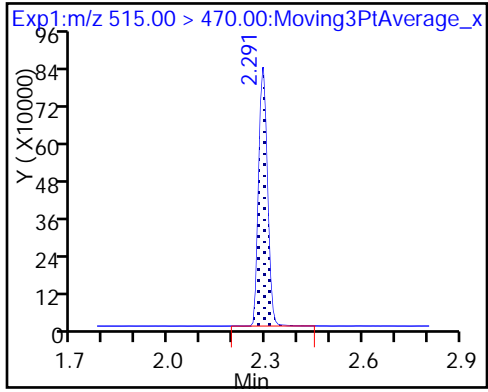
8 Perfluorooctane sulfonic acid

\* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170628-44832.b\2017.06.28\_537\_CURVE\_009.d  
 Lims ID: IC L6  
 Client ID:  
 Sample Type: IC Calib Level: 6  
 Inject. Date: 28-Jun-2017 16:35:04 ALS Bottle#: 6 Worklist Smp#: 9  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: L6\_537  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub1  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20170628-44832.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 28-Jun-2017 16:55:33 Calib Date: 28-Jun-2017 16:35:04  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20170628-44832.b\2017.06.28\_537\_CURVE\_009.d

Column 1 : Det: EXP1  
 Process Host: XAWRK008

First Level Reviewer: barnettj Date: 28-Jun-2017 16:44:36

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.411	1.415	-0.004	1.000	30127104	177.7		2406	
298.90 > 99.00	1.411	1.415	-0.004	1.000	24441009		1.23(0.00-0.00)	2627	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.548	1.548	0.0	1.000	2576119	10.1		6622	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.692	1.697	-0.005	1.000	3839119	18.4		646	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.692	1.698	-0.006	1.000	18580566	56.8		3190	
* 6 13C2-PFOA									
415.00 > 370.00	1.882	1.882	0.0		2119055	10.0		4846	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.882	1.882	0.0	1.000	7442161	40.0		389	
413.00 > 169.00	1.882	1.882	0.0	1.000	4539976		1.64(0.00-0.00)	3482	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.117	2.117	0.0	1.000	18774908	82.0		4721	
499.00 > 99.00	2.117	2.117	0.0	1.000	4251678		4.42(0.00-0.00)	2817	
* 7 13C4 PFOS									
503.00 > 80.00	2.117	2.119	-0.002		6352413	28.7		3631	
9 Perfluorononanoic acid									
463.00 > 419.00	2.124	2.131	-0.007	1.000	5329596	36.7		409	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.291	2.291	0.0	1.000	1473923	10.6		4283	

**Reagents:**

LC537-L6\_00017

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170628-44832.b\2017.06.28\_537\_CURVE\_009.d

Injection Date: 28-Jun-2017 16:35:04

Instrument ID: A8\_N

Lims ID: IC L6

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 6

Worklist Smp#: 9

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

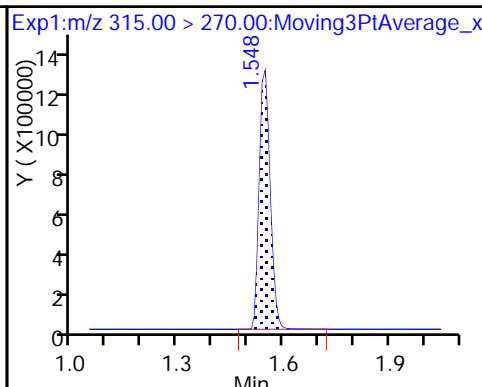
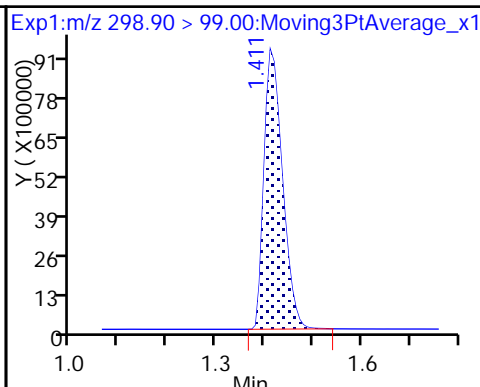
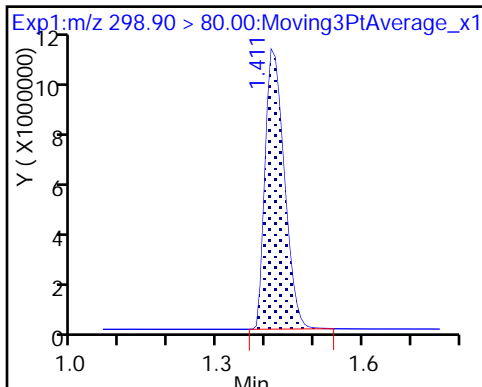
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

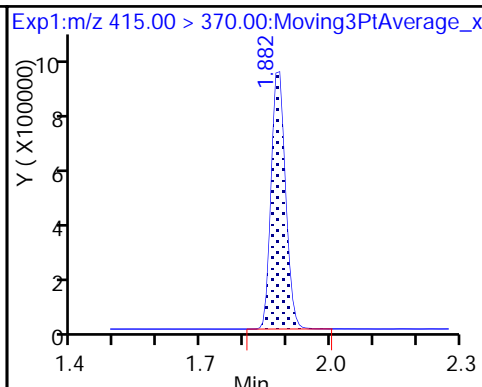
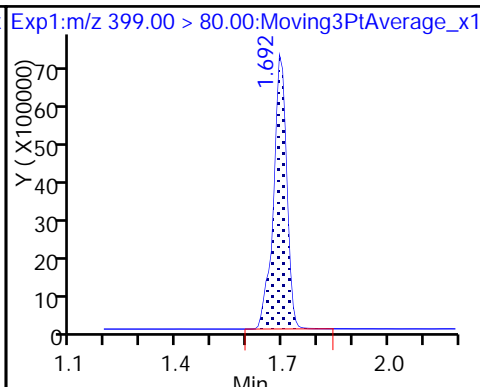
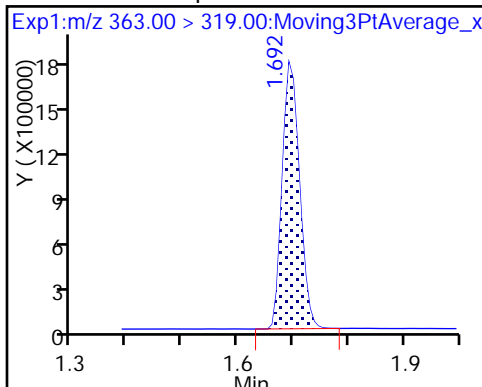
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

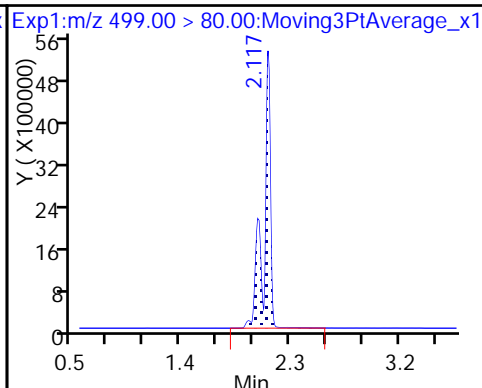
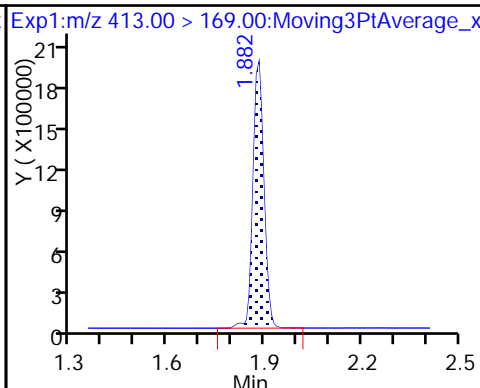
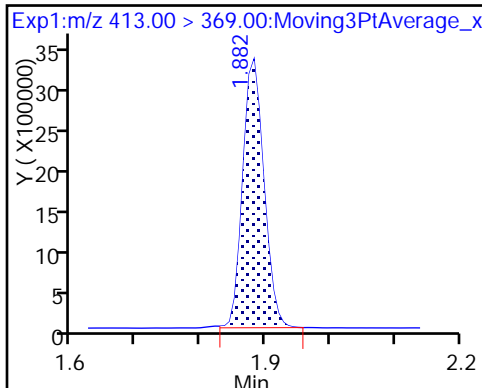
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

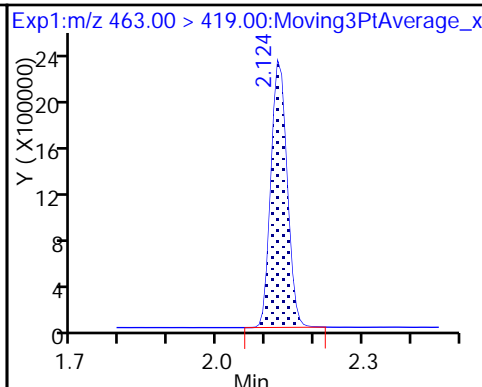
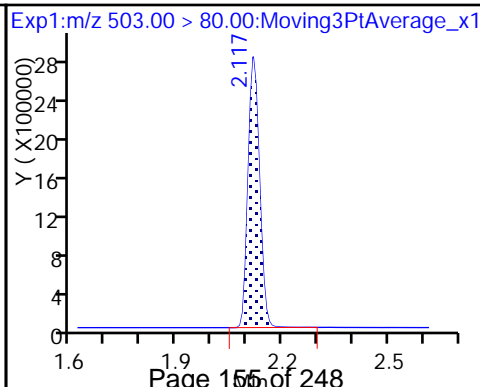
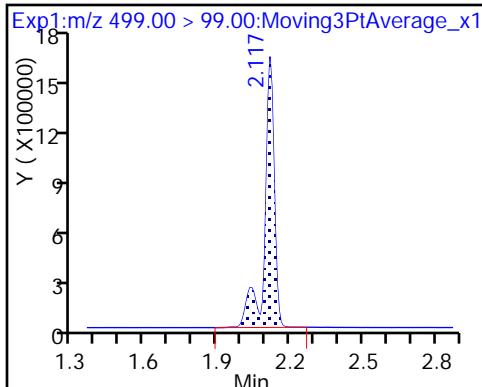
8 Perfluorooctane sulfonic acid



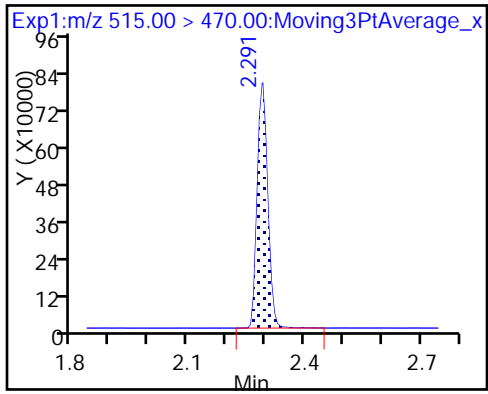
8 Perfluorooctane sulfonic acid

\* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-28987-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCVL 320-169955/11 Calibration Date: 06/19/2017 18:14  
 Instrument ID: A8\_N Calib Start Date: 06/19/2017 17:40  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/19/2017 18:04  
 Lab File ID: 2017.06.19\_537A\_ICAL\_011.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.8645	0.9450		23.2	21.2	9.3	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.167	1.179		7.29	7.21	1.0	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.8433	0.8532		2.40	2.38	1.2	50.0
Perfluorooctanoic acid (PFOA)	Ave	0.8758	0.8753		4.79	4.80	-0.0	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.016	1.024		9.69	9.61	0.8	50.0
Perfluorononanoic acid (PFNA)	Ave	0.8531	0.8772		4.75	4.62	2.8	50.0
13C2 PFHxA	Ave	1.038	1.019		9.82	10.0	-1.8	30.0
13C2 PFDA	Ave	0.9622	0.9654		10.0	10.0	0.3	30.0

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170619-44448.b\2017.06.19\_537A\_ICAL\_011.d  
 Lims ID: CCVL  
 Client ID:  
 Sample Type: CCVL  
 Inject. Date: 19-Jun-2017 18:14:11 ALS Bottle#: 2 Worklist Smp#: 11  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: CCV L2  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub1  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20170619-44448.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 20-Jun-2017 10:57:47 Calib Date: 19-Jun-2017 18:04:42  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20170619-44448.b\2017.06.19\_537A\_ICAL\_009.d

Column 1 : Det: EXP1  
 Process Host: XAWRK019

First Level Reviewer: phomsophat Date: 19-Jun-2017 19:26:36

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	2.177	2.183	-0.006	1.000	6119266	23.2		1090	
298.90 > 99.00	2.177	2.183	-0.006	1.000	4828214		1.27(0.00-0.00)	940	
\$ 2 13C2 PFHxA									
315.00 > 270.00	2.375	2.381	-0.006	1.000	3793675	9.82		3005	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	2.625	2.625	0.0	1.000	2598248	7.29		1032	
4 Perfluoroheptanoic acid									
363.00 > 319.00	2.633	2.630	0.003	1.000	754972	2.40		111	
5 Perfluorooctanoic acid									
413.00 > 369.00	2.860	2.859	0.001	1.000	1563113	4.79		276	
413.00 > 169.00	2.860	2.859	0.001	1.000	891112		1.75(0.00-0.00)	972	
* 6 13C2-PFOA									
415.00 > 370.00	2.860	2.859	0.001		3724287	10.0		7530	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.989	2.982	0.007	1.000	3005378	9.69		8873	
499.00 > 99.00	2.989	2.982	0.007	1.000	647078		4.64(0.00-0.00)	1786	
* 7 13C4 PFOS									
503.00 > 80.00	2.989	2.991	-0.002		8759638	28.7		18344	
9 Perfluorononanoic acid									
463.00 > 419.00	3.004	3.003	0.001	1.000	1510040	4.75		678	
\$ 10 13C2 PFDA									
515.00 > 470.00	3.118	3.123	-0.005	1.000	3595473	10.0		12802	



**Reagents:**

LC537-L2\_00018

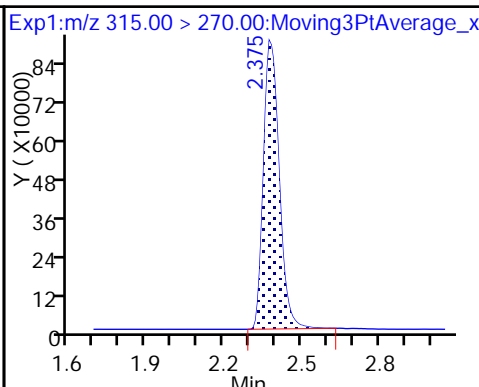
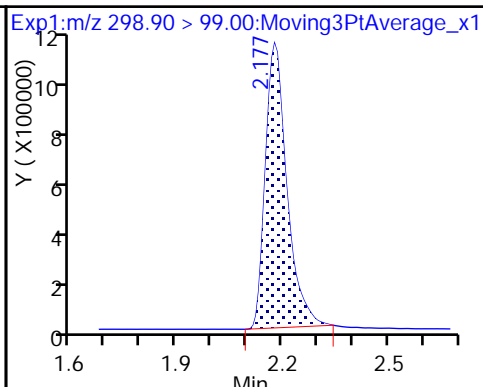
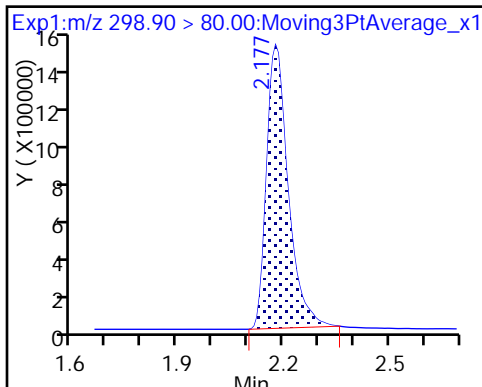
Amount Added: 1.00

Units: mL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

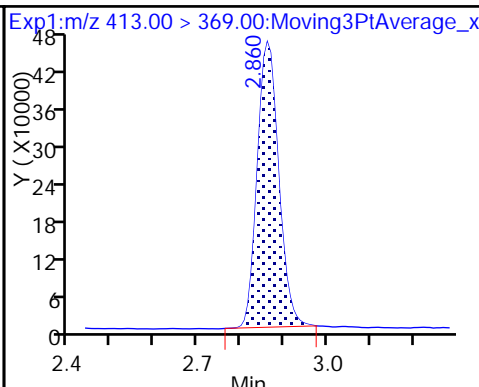
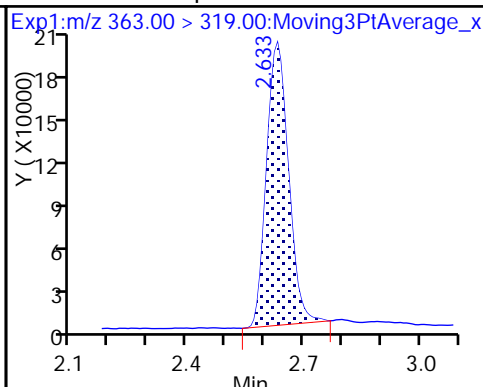
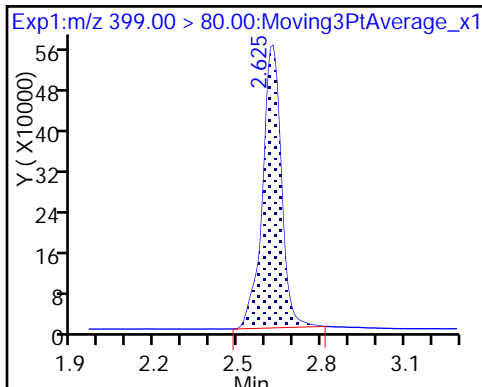
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

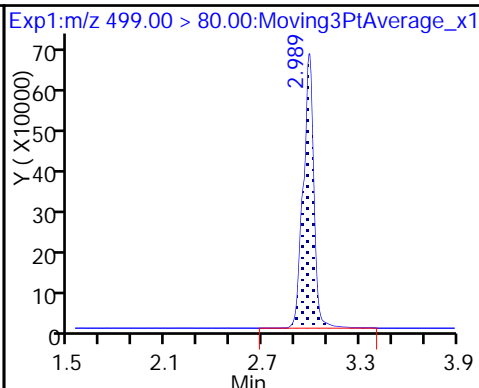
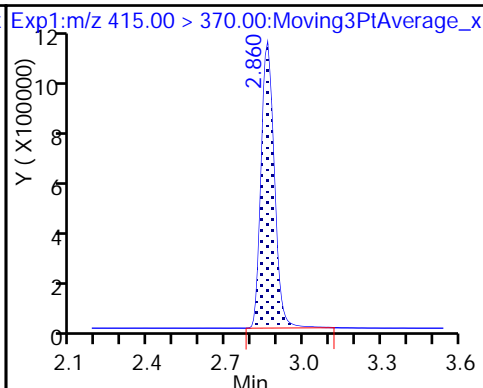
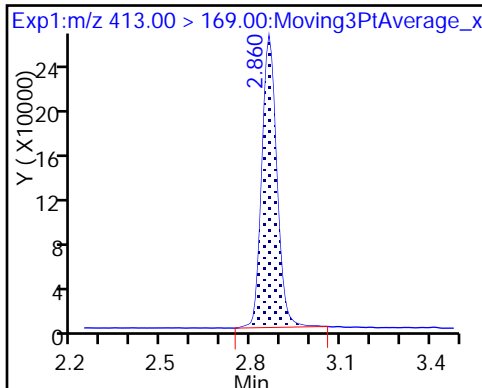
5 Perfluorooctanoic acid



5 Perfluorooctanoic acid

\* 6 13C2-PFOA

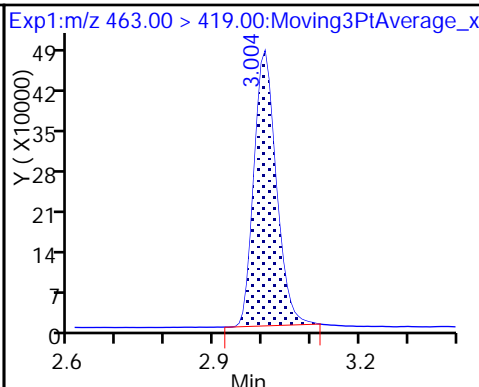
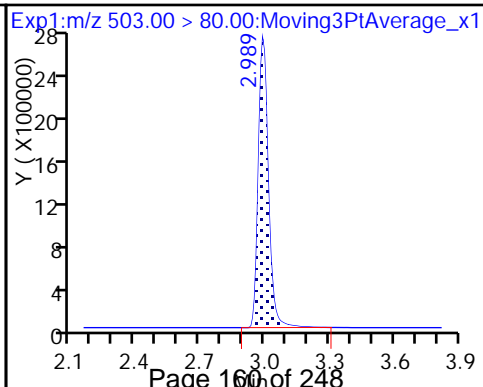
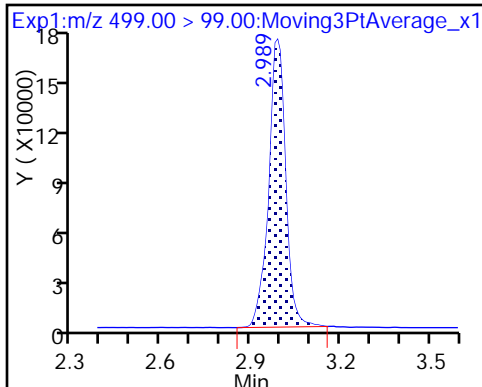
8 Perfluorooctane sulfonic acid



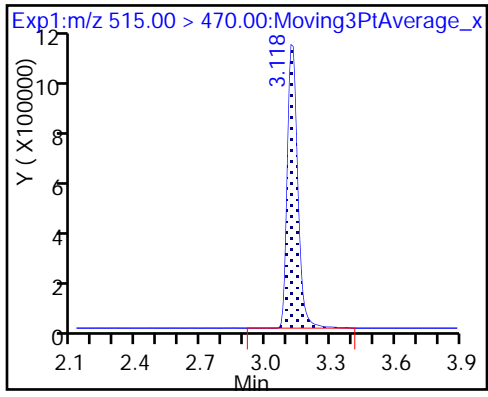
8 Perfluorooctane sulfonic acid

\* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-28987-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: ICV 320-169955/13 Calibration Date: 06/19/2017 18:23  
 Instrument ID: A8\_N Calib Start Date: 06/19/2017 17:40  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/19/2017 18:04  
 Lab File ID: 2017.06.19\_537A\_ICAL\_013.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.8645	0.8921		104	101	3.2	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.167	1.265		23.0	21.2	8.4	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.8433	0.8190		9.79	10.1	-2.9	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.8758	0.9521		21.8	20.0	8.7	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.016	1.080		22.0	20.7	6.3	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8531	0.8825		20.7	20.0	3.5	30.0
13C2 PFHxA	Ave	1.038	1.057		10.2	10.0	1.8	30.0
13C2 PFDA	Ave	0.9622	1.049		10.9	10.0	9.0	30.0

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170619-44448.b\2017.06.19\_537A\_ICAL\_013.d  
 Lims ID: ICV  
 Client ID:  
 Sample Type: ICV  
 Inject. Date: 19-Jun-2017 18:23:38 ALS Bottle#: 7 Worklist Smp#: 13  
 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\20170619-44448.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 20-Jun-2017 10:57:48 Calib Date: 19-Jun-2017 18:04:42  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20170619-44448.b\2017.06.19\_537A\_ICAL\_009.d

Column 1 : Det: EXP1  
 Process Host: XAWRK019

First Level Reviewer: phomsophat Date: 19-Jun-2017 19:34:21

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	2.177	2.183	-0.006	1.000	29499258	103.9		2039	
298.90 > 99.00	2.177	2.183	-0.006	1.000	24839559		1.19(0.00-0.00)	1897	
\$ 2 13C2 PFHxA									
315.00 > 270.00	2.375	2.381	-0.006	1.000	4035623	10.2		4361	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	2.618	2.625	-0.007	1.000	8802712	23.0		2710	
4 Perfluoroheptanoic acid									
363.00 > 319.00	2.625	2.630	-0.005	1.000	3152523	9.79		444	
5 Perfluorooctanoic acid									
413.00 > 369.00	2.860	2.859	0.001	1.000	7278322	21.8		1054	
413.00 > 169.00	2.860	2.859	0.001	1.000	3946679		1.84(0.00-0.00)	3880	
* 6 13C2-PFOA									
415.00 > 370.00	2.853	2.859	-0.006		3818724	10.0		6298	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.982	2.982	0.0	1.000	7338229	22.0		20107	
499.00 > 99.00	2.982	2.982	0.0	1.000	1253171		5.86(0.00-0.00)	3549	
* 7 13C4 PFOS									
503.00 > 80.00	2.989	2.991	-0.002		9420237	28.7		22623	
9 Perfluorononanoic acid									
463.00 > 419.00	2.997	3.003	-0.006	1.000	6742905	20.7		2160	
\$ 10 13C2 PFDA									
515.00 > 470.00	3.118	3.123	-0.005	1.000	4006098	10.9		14118	

**Reagents:**

LC537-ICV\_00020

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170619-44448.b\2017.06.19\_537A\_ICAL\_013.d

Injection Date: 19-Jun-2017 18:23:38

Instrument ID: A8\_N

Lims ID: ICV

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 7

Worklist Smp#: 13

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

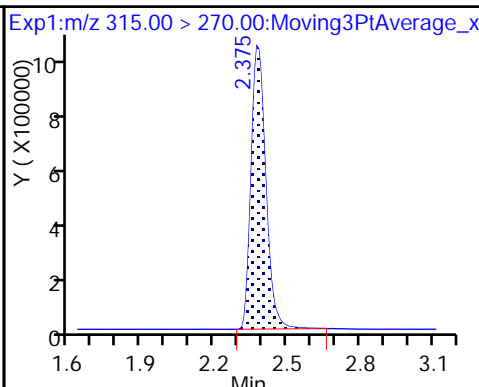
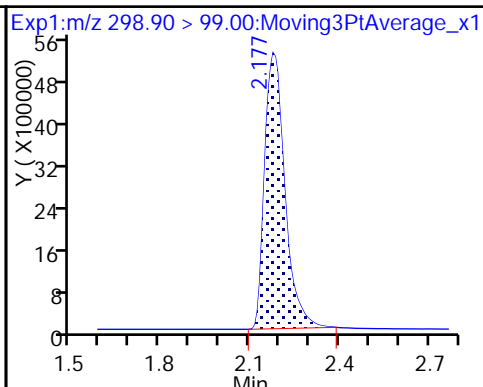
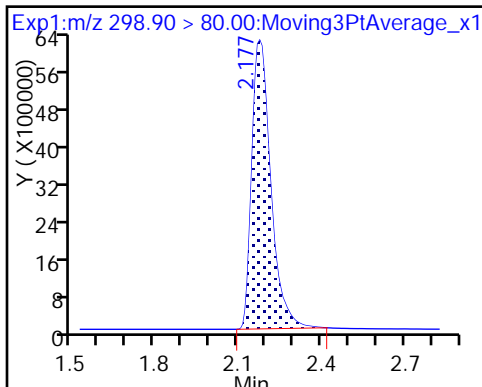
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

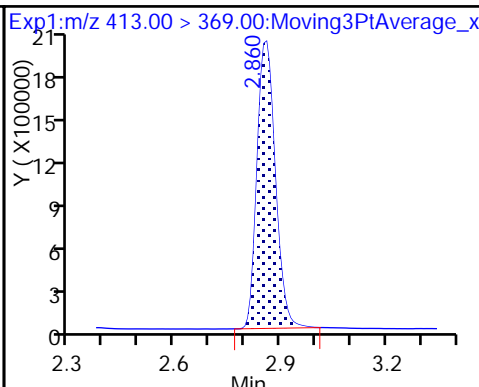
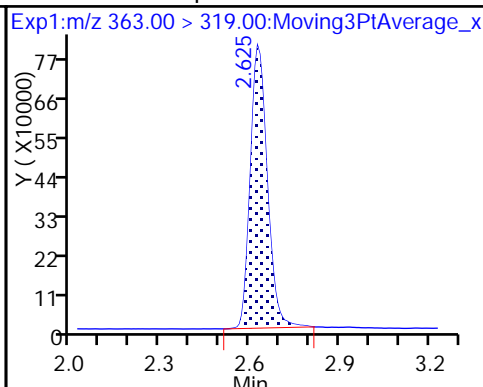
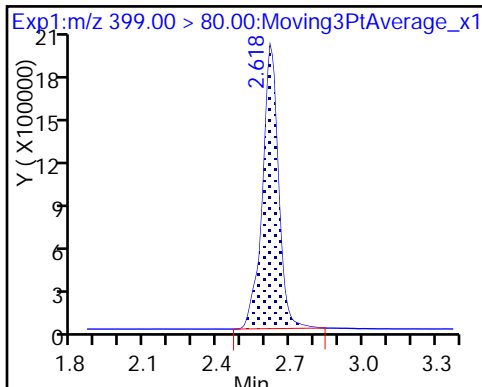
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

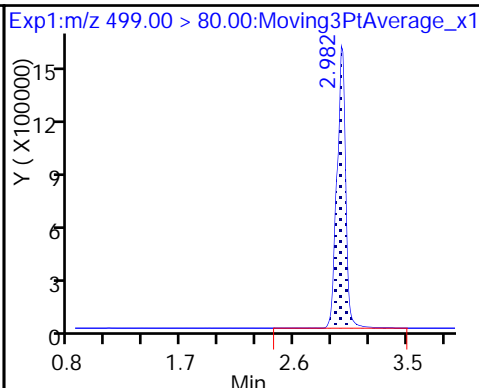
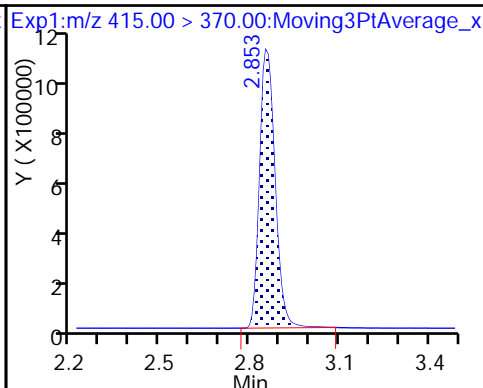
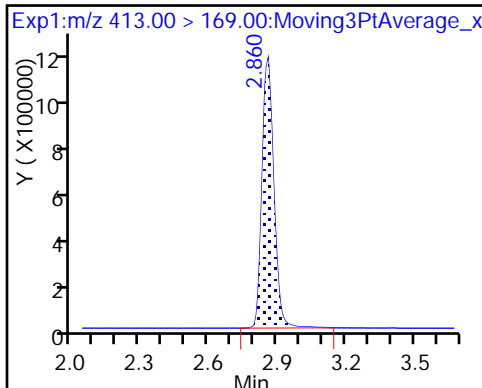
5 Perfluorooctanoic acid



5 Perfluorooctanoic acid

\* 6 13C2-PFOA

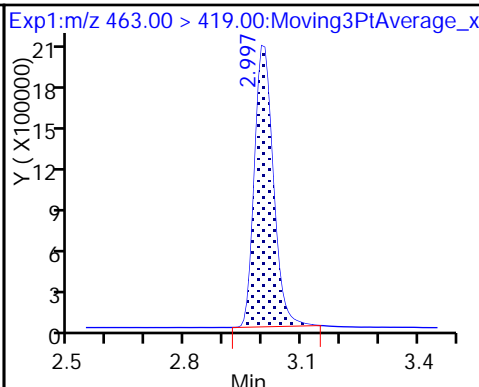
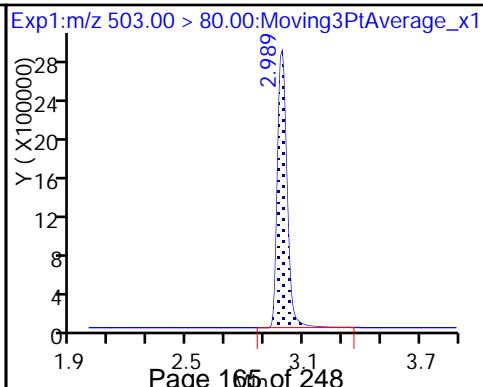
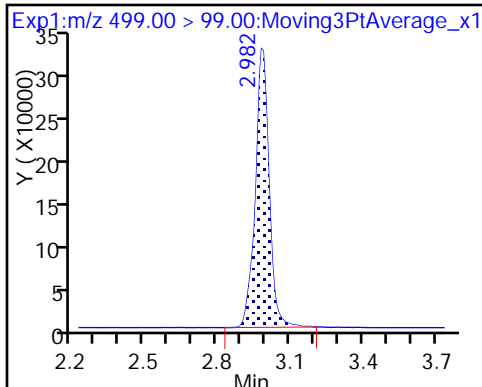
8 Perfluorooctane sulfonic acid



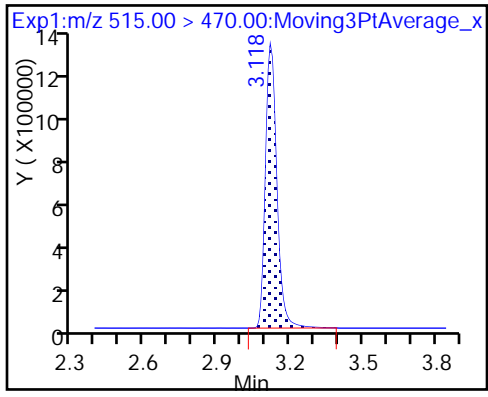
8 Perfluorooctane sulfonic acid

\* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA





FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-28987-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCVL 320-170756/4 Calibration Date: 06/23/2017 21:32  
 Instrument ID: A8\_N Calib Start Date: 06/19/2017 17:40  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/19/2017 18:04  
 Lab File ID: 2017.06.23\_537\_004.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.8645	1.002		24.6	21.2	15.9	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.167	1.202		7.43	7.21	3.0	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.8433	0.8996		2.53	2.38	6.7	50.0
Perfluorooctanoic acid (PFOA)	Ave	0.8758	0.8735		4.78	4.80	-0.3	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.016	1.009		9.54	9.61	-0.7	50.0
Perfluorononanoic acid (PFNA)	Ave	0.8531	0.7965		4.32	4.62	-6.6	50.0
13C2 PFHxA	Ave	1.038	1.061		10.2	10.0	2.2	30.0
13C2 PFDA	Ave	0.9622	0.7546		7.84	10.0	-21.6	30.0

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170623-44660.b\2017.06.23\_537\_004.d  
 Lims ID: CCVL  
 Client ID:  
 Sample Type: CCVL  
 Inject. Date: 23-Jun-2017 21:32:32 ALS Bottle#: 2 Worklist Smp#: 4  
 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\20170623-44660.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 26-Jun-2017 11:19:06 Calib Date: 19-Jun-2017 18:04:42  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last Ical File: \\ChromNA\Sacramento\ChromData\A8\_N\20170619-44448.b\2017.06.19\_537A\_ICAL\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK011

First Level Reviewer: barnettj Date: 26-Jun-2017 11:09:03

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	2.299	2.183	0.116	1.000	6814079	24.6		1203	
298.90 > 99.00	2.291	2.183	0.108	0.997	5285405		1.29(0.00-0.00)	1636	
\$ 2 13C2 PFHxA									
315.00 > 270.00	2.504	2.381	0.123	1.000	3526099	10.2		7010	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	2.746	2.625	0.121	1.000	2781941	7.43		1144	
4 Perfluoroheptanoic acid									
363.00 > 319.00	2.754	2.630	0.124	1.000	710635	2.53		80.4	
* 6 13C2-PFOA									
415.00 > 370.00	2.974	2.859	0.115		3324713	10.0		9023	
5 Perfluorooctanoic acid									
413.00 > 369.00	2.974	2.859	0.115	1.000	1392518	4.78		70.4	
413.00 > 169.00	2.974	2.859	0.115	1.000	815613		1.71(0.00-0.00)	1433	
* 7 13C4 PFOS									
503.00 > 80.00	3.103	2.991	0.112		9202106	28.7		37152	
9 Perfluorononanoic acid									
463.00 > 419.00	3.118	3.003	0.115	1.000	1224127	4.32		533	
\$ 10 13C2 PFDA									
515.00 > 470.00	3.247	3.123	0.124	1.000	2508923	7.84		5212	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	3.103	3.126	-0.023	1.000	3110362	9.54		10552	
499.00 > 99.00	3.103	3.126	-0.023	1.000	688781		4.52(0.00-0.00)	2395	

**Reagents:**

LC537-L2\_00018

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170623-44660.b\2017.06.23\_537\_004.d

Injection Date: 23-Jun-2017 21:32:32

Instrument ID: A8\_N

Lims ID: CCVL

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 2

Worklist Smp#: 4

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

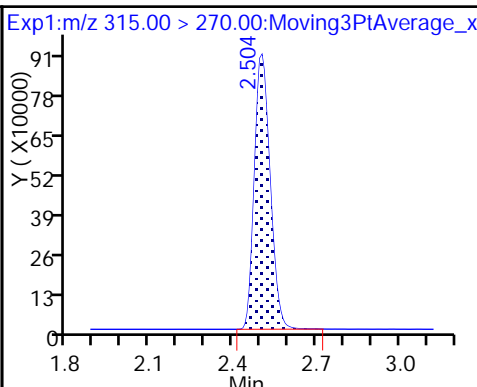
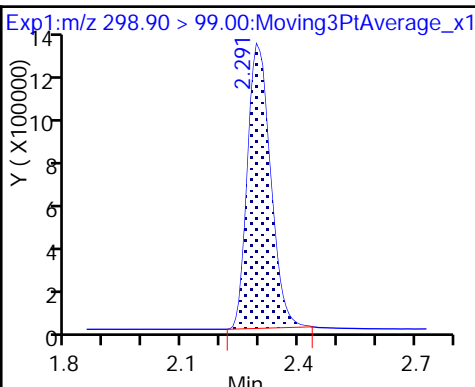
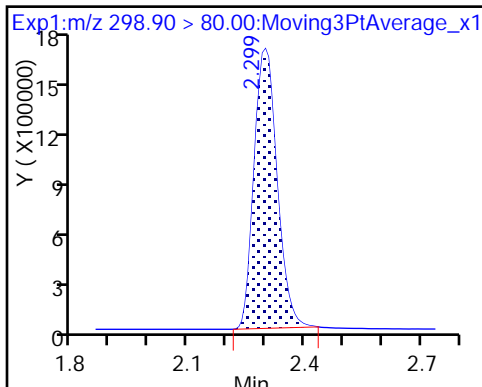
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

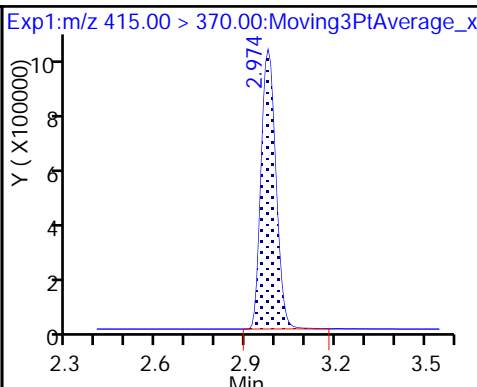
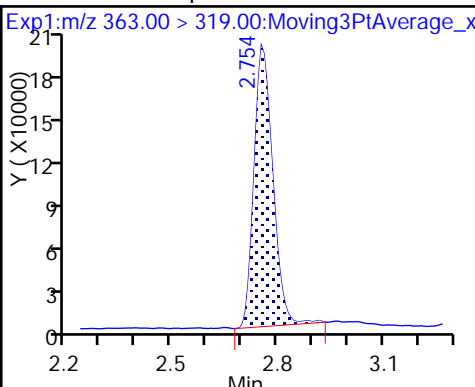
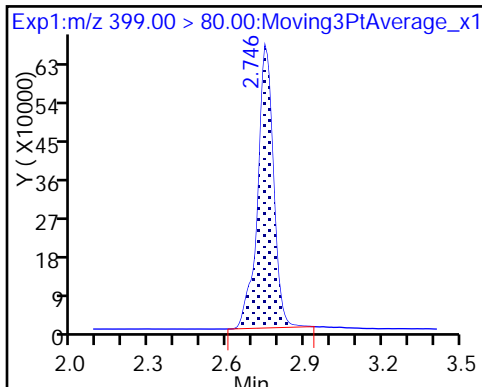
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

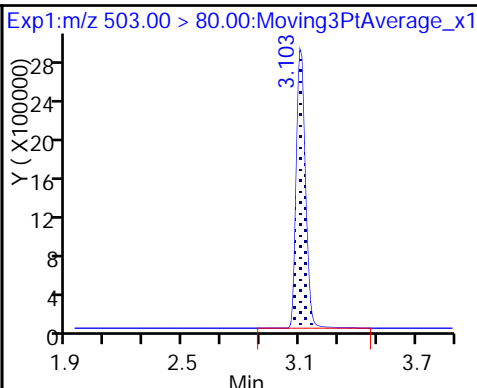
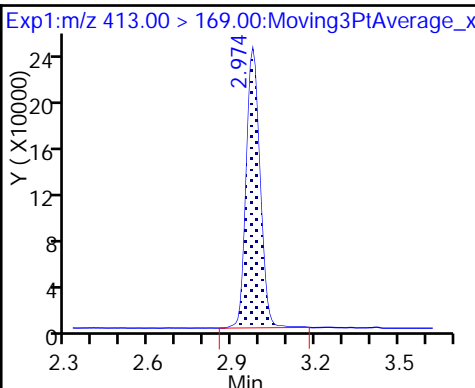
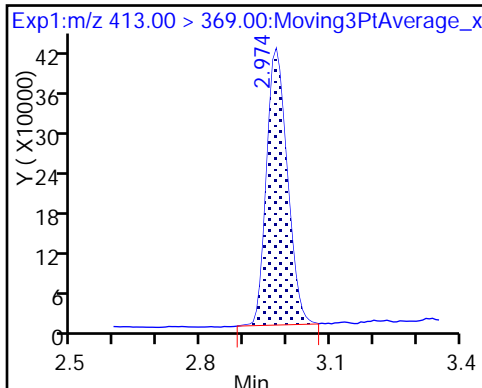
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

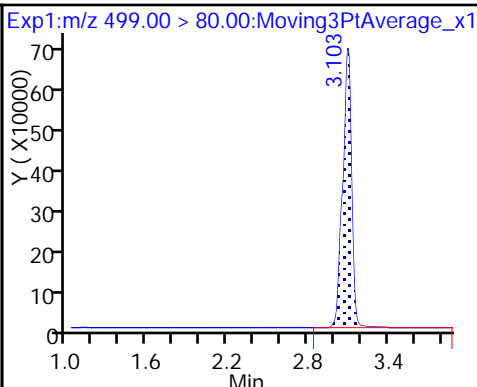
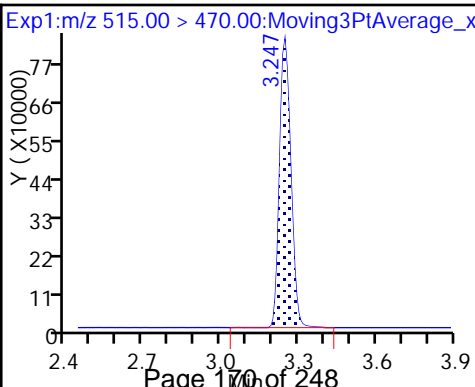
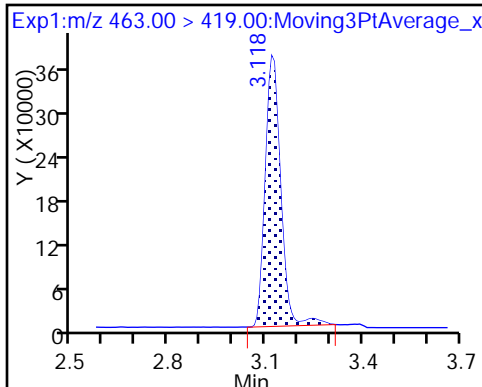
\* 7 13C4 PFOS



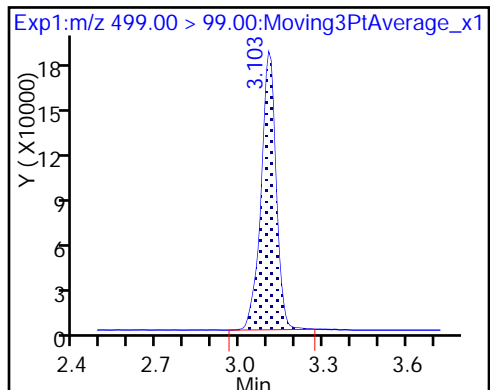
9 Perfluorononanoic acid

\$ 10 13C2 PFDA

8 Perfluorooctane sulfonic acid



8 Perfluorooctane sulfonic acid



FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-28987-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-170757/16 Calibration Date: 06/23/2017 22:29  
 Instrument ID: A8\_N Calib Start Date: 06/19/2017 17:40  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/19/2017 18:04  
 Lab File ID: 2017.06.23\_537\_016.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.8645	1.009		51.8	44.4	16.7	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.167	1.238		16.0	15.1	6.1	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.8433	0.9020		5.32	4.97	7.0	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.8758	0.8757		10.0	10.0	-0.0	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.016	1.029		20.4	20.1	1.3	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8531	0.7570		8.59	9.68	-11.3	30.0
13C2 PFHxA	Ave	1.038	1.071		10.3	10.0	3.2	30.0
13C2 PFDA	Ave	0.9622	0.7334		7.62	10.0	-23.8	30.0

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170623-44660.b\2017.06.23\_537\_016.d  
 Lims ID: CCV L3  
 Client ID:  
 Sample Type: CCVIS  
 Inject. Date: 23-Jun-2017 22:29:32 ALS Bottle#: 3 Worklist Smp#: 16  
 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\20170623-44660.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 26-Jun-2017 11:19:16 Calib Date: 19-Jun-2017 18:04:42  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20170619-44448.b\2017.06.19\_537A\_ICAL\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK011

First Level Reviewer: barnettj Date: 26-Jun-2017 11:18:52

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	2.322	2.183	0.139	1.000	15843259	51.8		2425	
298.90 > 99.00	2.322	2.183	0.139	1.000	12441137		1.27(0.00-0.00)	2570	
\$ 2 13C2 PFHxA									
315.00 > 270.00	2.534	2.381	0.153	1.000	4021468	10.3		6229	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	2.777	2.625	0.152	1.000	6618010	16.0		2129	
4 Perfluoroheptanoic acid									
363.00 > 319.00	2.784	2.630	0.154	1.000	1685134	5.32		224	
* 6 13C2-PFOA									
415.00 > 370.00	2.997	2.859	0.138		3755516	10.0		8525	
5 Perfluorooctanoic acid									
413.00 > 369.00	2.997	2.859	0.138	1.000	3301767	10.0		170	
413.00 > 169.00	2.997	2.859	0.138	1.000	1917503		1.72(0.00-0.00)	2844	
* 7 13C4 PFOS									
503.00 > 80.00	3.126	2.991	0.135		10146250	28.7		26095	
9 Perfluorononanoic acid									
463.00 > 419.00	3.149	3.003	0.146	1.000	2751453	8.59		70.7	
\$ 10 13C2 PFDA									
515.00 > 470.00	3.270	3.123	0.147	1.000	2754431	7.62		3879	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	3.126	3.126	0.0	1.000	7320173	20.4		25790	
499.00 > 99.00	3.126	3.126	0.0	1.000	1625063		4.50(0.00-0.00)	7041	

**Reagents:**

LC537-L3\_00020

Amount Added: 1.00

Units: mL



TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170623-44660.b\2017.06.23\_537\_016.d

Injection Date: 23-Jun-2017 22:29:32

Instrument ID: A8\_N

Lims ID: CCV L3

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 3

Worklist Smp#: 16

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

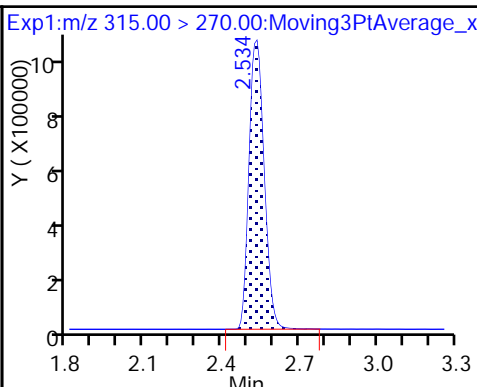
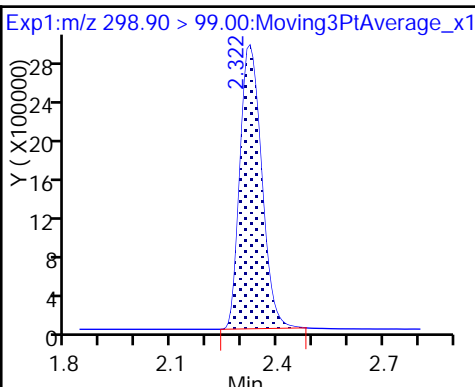
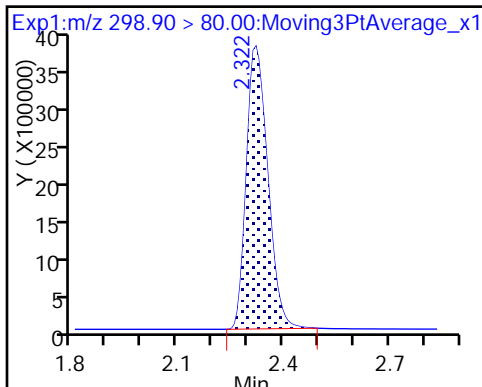
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

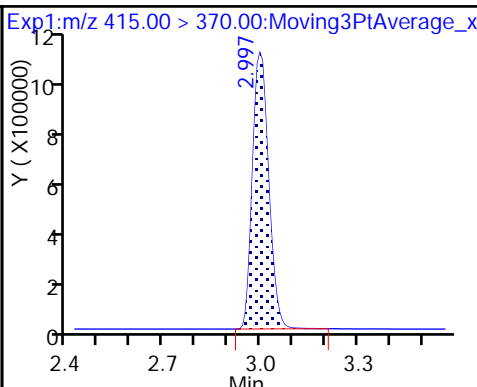
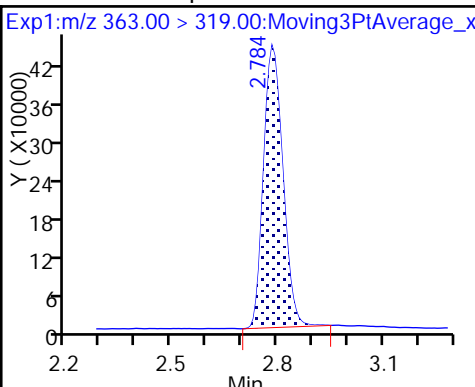
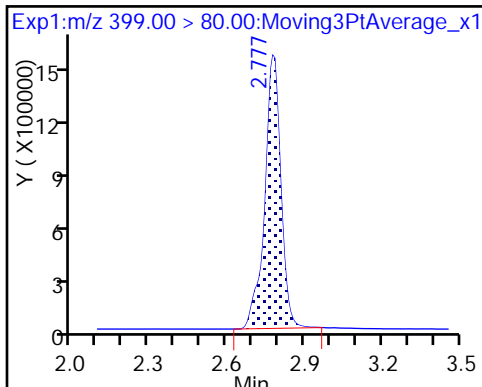
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

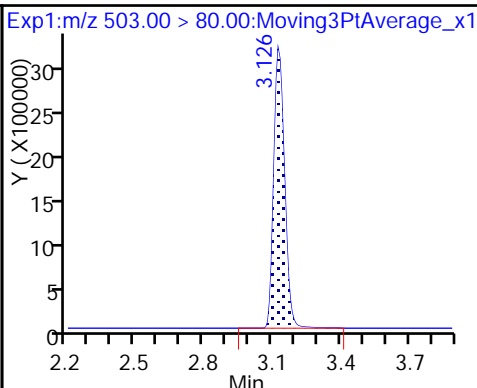
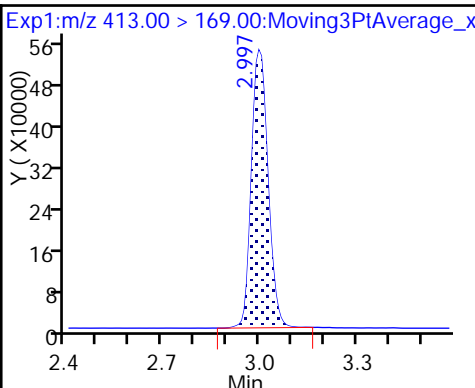
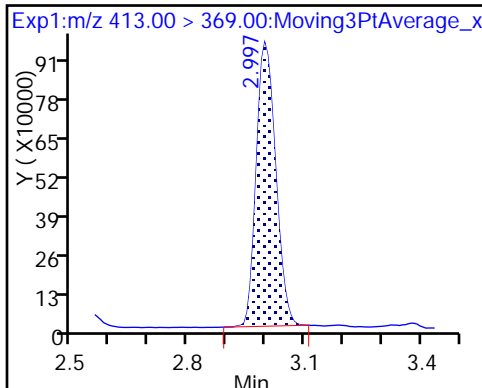
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

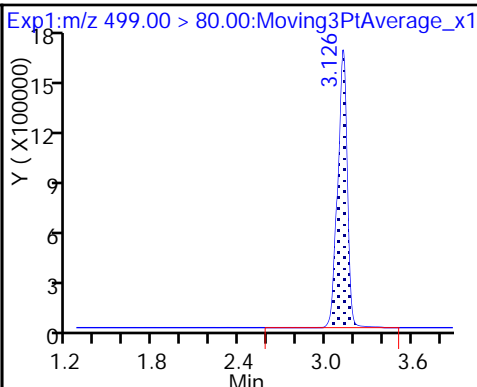
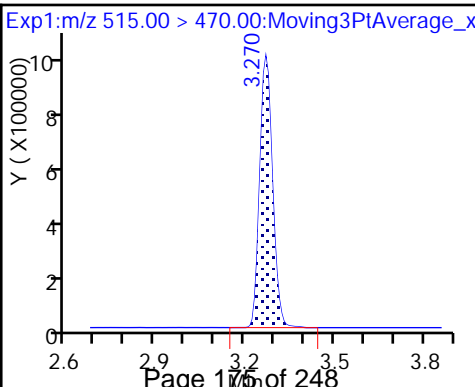
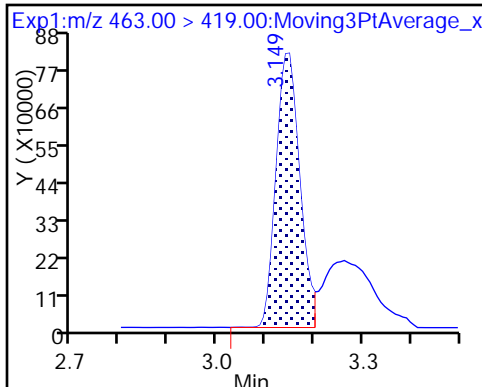
\* 7 13C4 PFOS



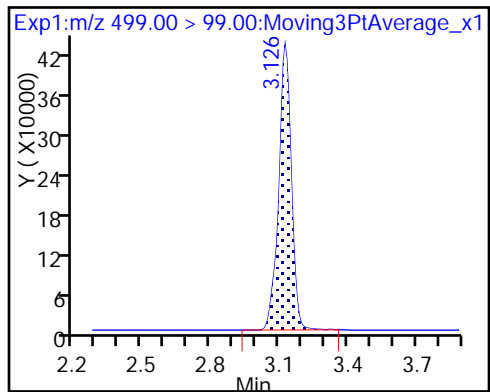
9 Perfluorononanoic acid

\$ 10 13C2 PFDA

8 Perfluorooctane sulfonic acid



8 Perfluorooctane sulfonic acid



FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-28987-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-170757/28 Calibration Date: 06/23/2017 23:26  
 Instrument ID: A8\_N Calib Start Date: 06/19/2017 17:40  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/19/2017 18:04  
 Lab File ID: 2017.06.23\_537\_028.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.8645	0.8619		132	133	-0.3	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.167	1.272		49.1	45.1	9.0	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.8433	0.9206		16.2	14.9	9.2	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.8758	0.9112		31.2	30.0	4.0	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.016	1.030		60.9	60.0	1.4	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8531	0.8118		27.5	28.9	-4.8	30.0
13C2 PFHxA	Ave	1.038	1.114		10.7	10.0	7.3	30.0
13C2 PFDA	Ave	0.9622	0.7612		7.91	10.0	-20.9	30.0

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-28987-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-170758/28 Calibration Date: 06/23/2017 23:26  
 Instrument ID: A8\_N Calib Start Date: 06/19/2017 17:40  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/19/2017 18:04  
 Lab File ID: 2017.06.23\_537\_028.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.8645	0.8619		132	133	-0.3	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.167	1.272		49.1	45.1	9.0	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.8433	0.9206		16.2	14.9	9.2	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.8758	0.9112		31.2	30.0	4.0	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.016	1.030		60.9	60.0	1.4	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8531	0.8118		27.5	28.9	-4.8	30.0
13C2 PFHxA	Ave	1.038	1.114		10.7	10.0	7.3	30.0
13C2 PFDA	Ave	0.9622	0.7612		7.91	10.0	-20.9	30.0

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170623-44660.b\2017.06.23\_537\_028.d  
 Lims ID: CCV L5  
 Client ID:  
 Sample Type: CCVIS  
 Inject. Date: 23-Jun-2017 23:26:32 ALS Bottle#: 5 Worklist Smp#: 28  
 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\20170623-44660.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 29-Jun-2017 11:06:41 Calib Date: 19-Jun-2017 18:04:42  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20170619-44448.b\2017.06.19\_537A\_ICAL\_009.d

Column 1 : Det: EXP1  
 Process Host: XAWRK033

First Level Reviewer: barnettj Date: 26-Jun-2017 13:37:59

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	2.329	2.183	0.146	1.000	41722606	132.1		2870	
298.90 > 99.00	2.329	2.183	0.146	1.000	33825752		1.23(0.00-0.00)	3189	
\$ 2 13C2 PFHxA									
315.00 > 270.00	2.534	2.381	0.153	1.000	4166142	10.7		6873	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	2.784	2.625	0.159	1.000	20948722	49.1		3571	
4 Perfluoroheptanoic acid									
363.00 > 319.00	2.792	2.630	0.162	1.000	5114516	16.2		706	
* 6 13C2-PFOA									
415.00 > 370.00	2.997	2.859	0.138		3741048	10.0		7531	
5 Perfluorooctanoic acid									
413.00 > 369.00	2.997	2.859	0.138	1.000	10216657	31.2		497	
413.00 > 169.00	2.997	2.859	0.138	1.000	6060855		1.69(0.00-0.00)	7325	
* 7 13C4 PFOS									
503.00 > 80.00	3.133	2.991	0.142		10476733	28.7		20841	
9 Perfluorononanoic acid									
463.00 > 419.00	3.149	3.003	0.146	1.000	8774160	27.5		1091	
\$ 10 13C2 PFDA									
515.00 > 470.00	3.270	3.123	0.147	1.000	2847819	7.91		4163	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	3.133	3.126	0.007	1.000	22584562	60.9		58921	
499.00 > 99.00	3.126	3.126	0.0	0.998	5451184		4.14(0.00-0.00)	15023	

**Reagents:**

LC537-L5\_00021

Amount Added: 1.00

Units: mL

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170623-44660.b\2017.06.23\_537\_028.d  
 Lims ID: CCV L5  
 Client ID:  
 Sample Type: CCVIS  
 Inject. Date: 23-Jun-2017 23:26:32 ALS Bottle#: 5 Worklist Smp#: 28  
 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\20170623-44660.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 29-Jun-2017 11:06:41 Calib Date: 19-Jun-2017 18:04:42  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20170619-44448.b\2017.06.19\_537A\_ICAL\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK033

First Level Reviewer: barnettj Date: 26-Jun-2017 13:37:59

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	2.329	2.183	0.146	1.000	41722606	132.1		2870	
298.90 > 99.00	2.329	2.183	0.146	1.000	33825752		1.23(0.00-0.00)	3189	
\$ 2 13C2 PFHxA									
315.00 > 270.00	2.534	2.381	0.153	1.000	4166142	10.7		6873	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	2.784	2.625	0.159	1.000	20948722	49.1		3571	
4 Perfluoroheptanoic acid									
363.00 > 319.00	2.792	2.630	0.162	1.000	5114516	16.2		706	
* 6 13C2-PFOA									
415.00 > 370.00	2.997	2.859	0.138		3741048	10.0		7531	
5 Perfluorooctanoic acid									
413.00 > 369.00	2.997	2.859	0.138	1.000	10216657	31.2		497	
413.00 > 169.00	2.997	2.859	0.138	1.000	6060855		1.69(0.00-0.00)	7325	
* 7 13C4 PFOS									
503.00 > 80.00	3.133	2.991	0.142		10476733	28.7		20841	
9 Perfluorononanoic acid									
463.00 > 419.00	3.149	3.003	0.146	1.000	8774160	27.5		1091	
\$ 10 13C2 PFDA									
515.00 > 470.00	3.270	3.123	0.147	1.000	2847819	7.91		4163	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	3.133	3.126	0.007	1.000	22584562	60.9		58921	
499.00 > 99.00	3.126	3.126	0.0	0.998	5451184		4.14(0.00-0.00)	15023	

**Reagents:**

LC537-L5\_00021

Amount Added: 1.00

Units: mL



TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170623-44660.b\2017.06.23\_537\_028.d

Injection Date: 23-Jun-2017 23:26:32

Instrument ID: A8\_N

Lims ID: CCV L5

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 5

Worklist Smp#: 28

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

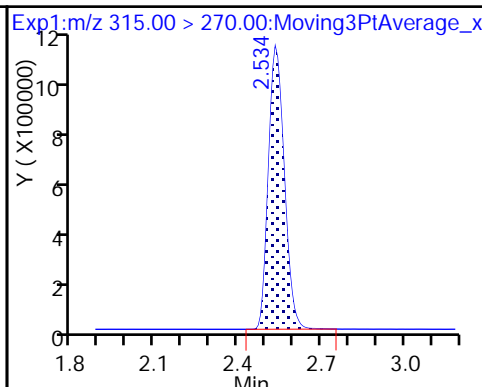
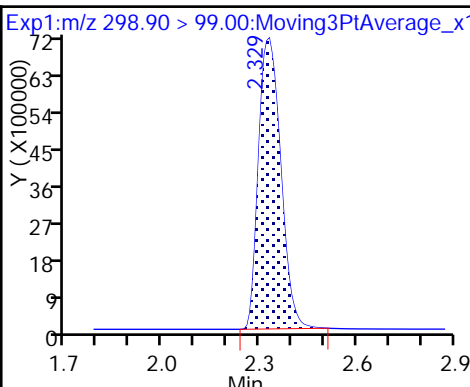
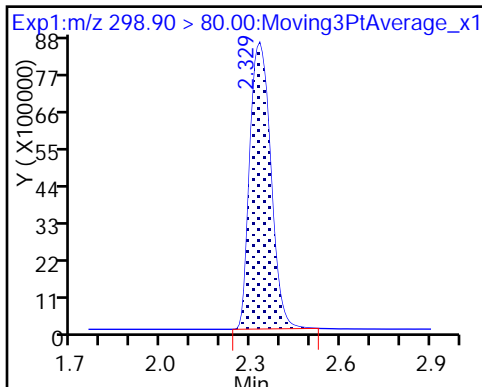
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

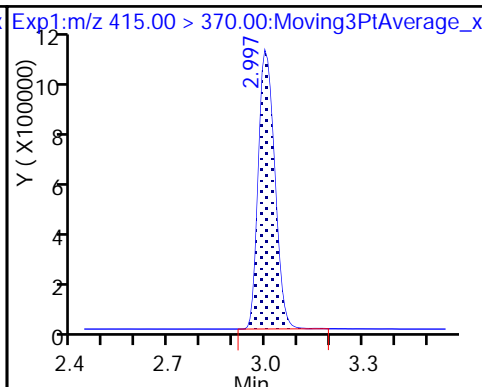
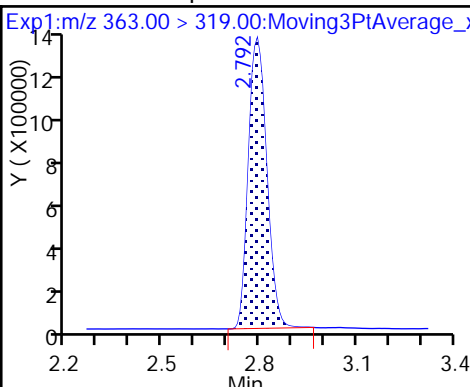
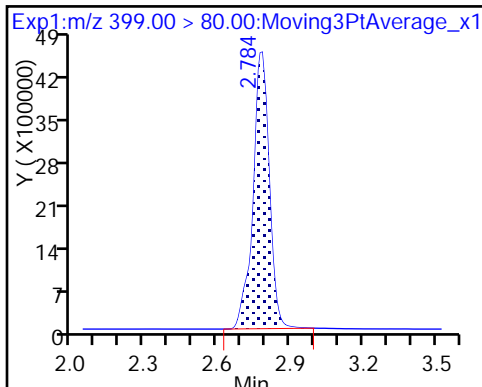
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

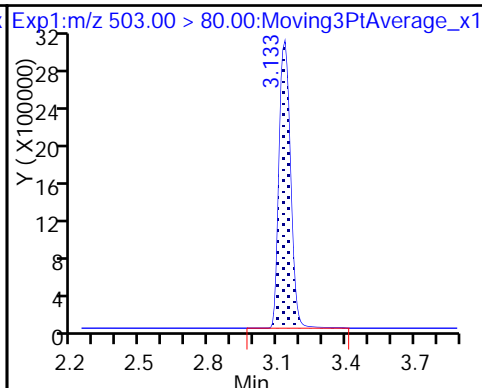
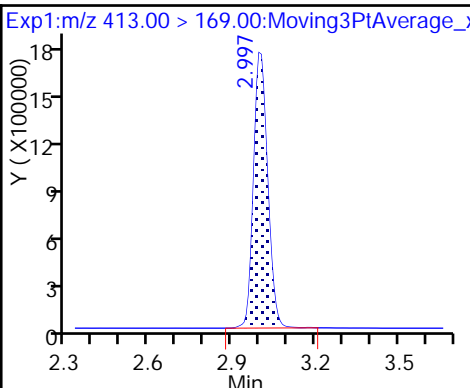
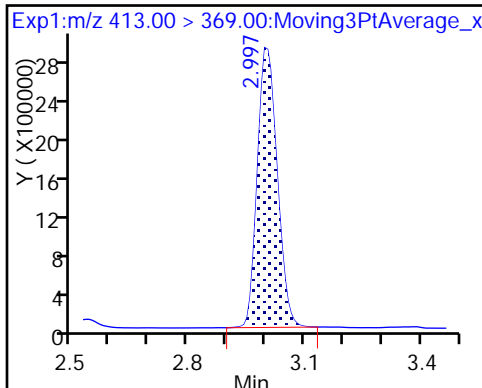
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

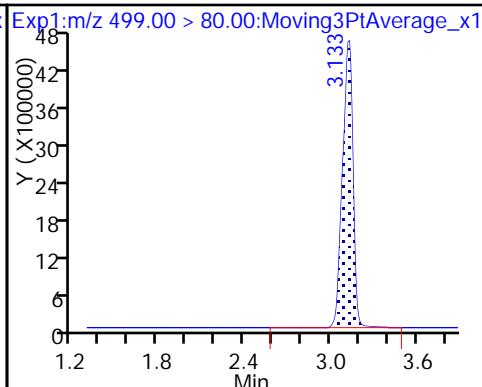
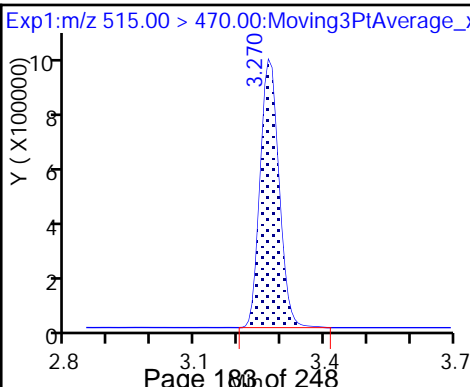
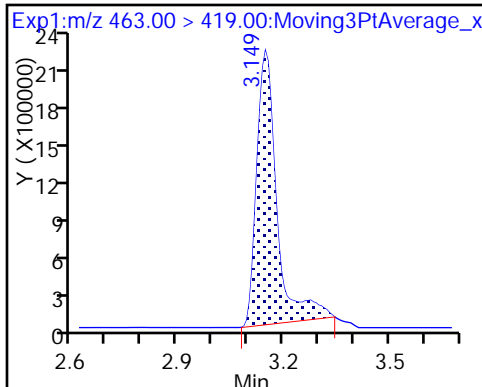
\* 7 13C4 PFOS



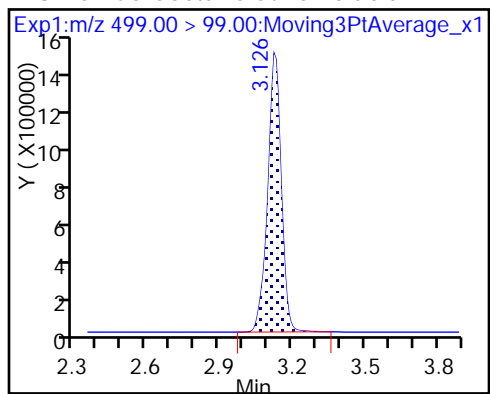
9 Perfluorononanoic acid

\$ 10 13C2 PFDA

8 Perfluorooctane sulfonic acid



8 Perfluorooctane sulfonic acid



TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170623-44660.b\2017.06.23\_537\_028.d

Injection Date: 23-Jun-2017 23:26:32

Instrument ID: A8\_N

Lims ID: CCV L5

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 5

Worklist Smp#: 28

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

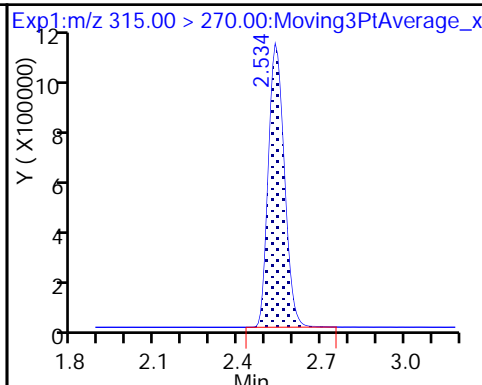
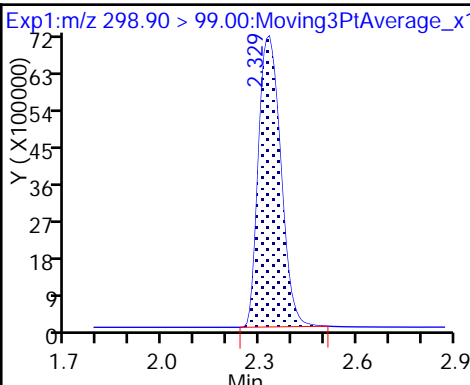
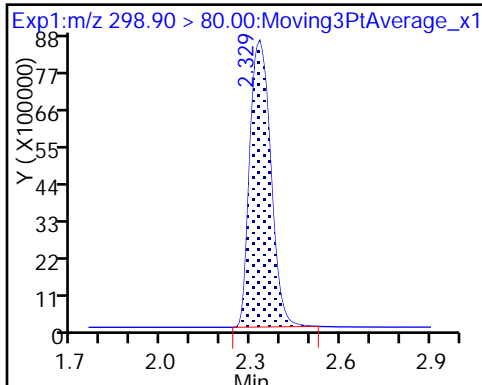
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

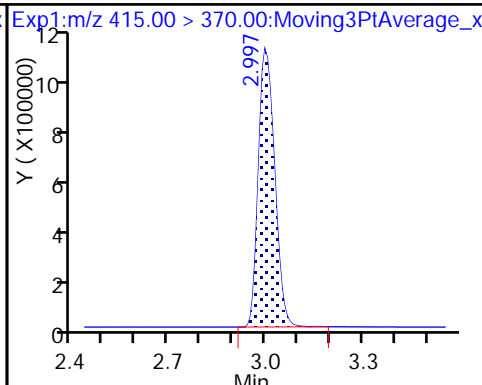
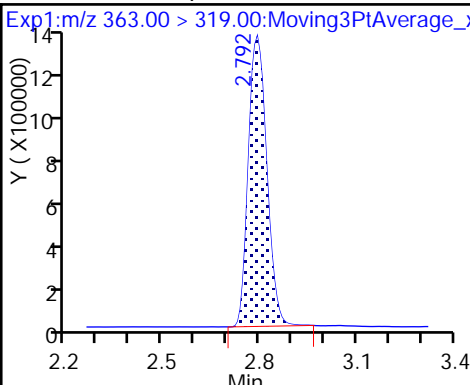
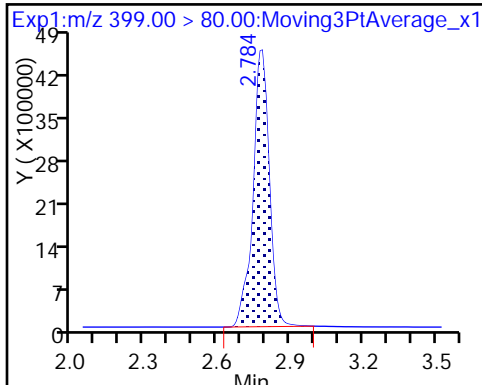
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

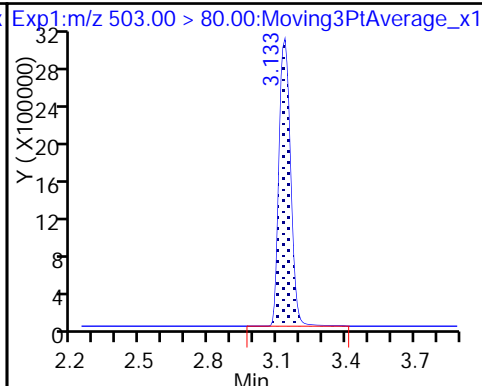
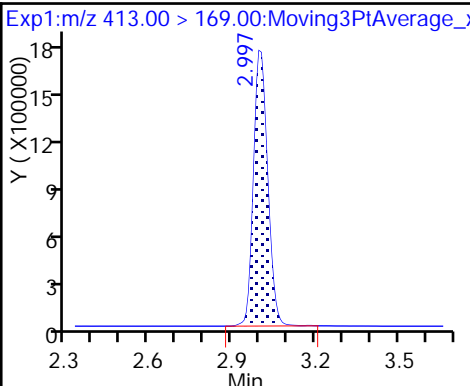
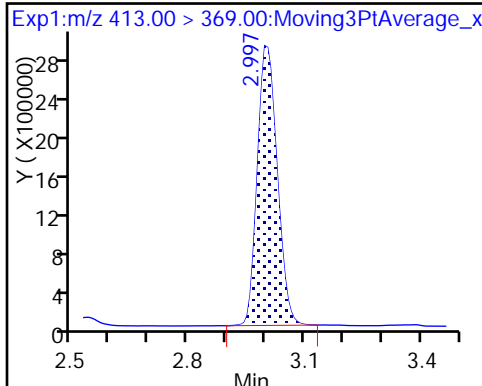
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

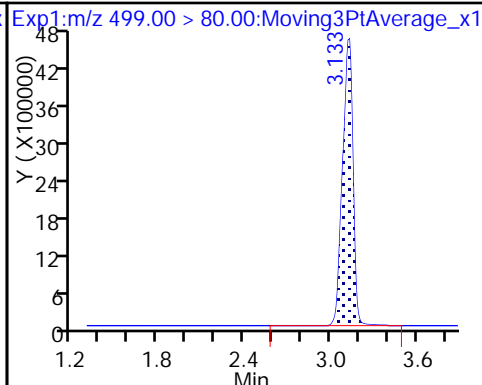
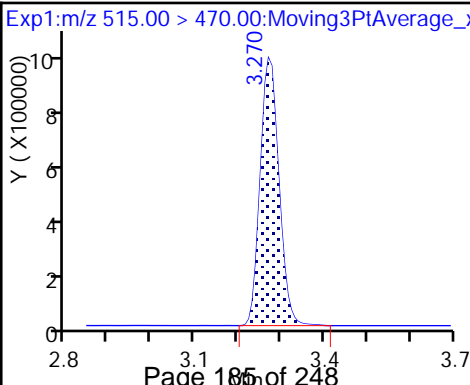
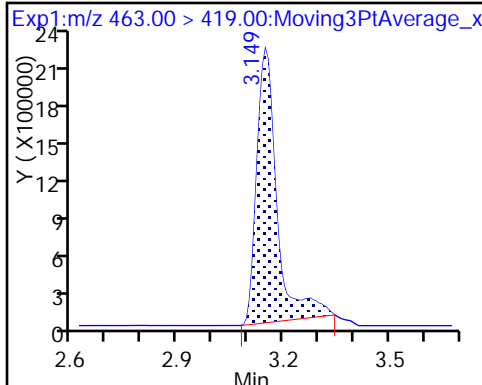
\* 7 13C4 PFOS



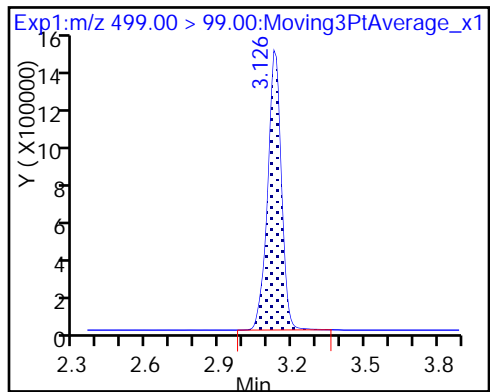
9 Perfluorononanoic acid

\$ 10 13C2 PFDA

8 Perfluorooctane sulfonic acid



8 Perfluorooctane sulfonic acid



FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-28987-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-170758/40 Calibration Date: 06/24/2017 00:23  
 Instrument ID: A8\_N Calib Start Date: 06/19/2017 17:40  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/19/2017 18:04  
 Lab File ID: 2017.06.23\_537\_040.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.8645	1.021		52.4	44.4	18.1	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.167	1.238		16.0	15.1	6.1	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.8433	0.9034		5.33	4.97	7.1	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.8758	0.9028		10.3	10.0	3.1	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.016	1.013		20.1	20.1	-0.3	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8531	0.7437		8.44	9.68	-12.8	30.0
13C2 PFHxA	Ave	1.038	1.047		10.1	10.0	0.9	30.0
13C2 PFDA	Ave	0.9622	0.7496		7.79	10.0	-22.1	30.0

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170623-44660.b\2017.06.23\_537\_040.d  
 Lims ID: CCV L3  
 Client ID:  
 Sample Type: CCVIS  
 Inject. Date: 24-Jun-2017 00:23:31 ALS Bottle#: 3 Worklist Smp#: 40  
 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\20170623-44660.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 29-Jun-2017 11:06:51 Calib Date: 19-Jun-2017 18:04:42  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last Ical File: \\ChromNA\Sacramento\ChromData\A8\_N\20170619-44448.b\2017.06.19\_537A\_ICAL\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK033

First Level Reviewer: barnettj Date: 26-Jun-2017 13:38:23

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	2.322	2.183	0.139	1.000	17118035	52.4		2305	
298.90 > 99.00	2.314	2.183	0.131	0.997	13135147		1.30(0.00-0.00)	2639	
\$ 2 13C2 PFHxA									
315.00 > 270.00	2.526	2.381	0.145	1.000	3979677	10.1		6419	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	2.777	2.625	0.152	1.000	7065978	16.0		1966	
4 Perfluoroheptanoic acid									
363.00 > 319.00	2.784	2.630	0.154	1.000	1708060	5.33		251	
* 6 13C2-PFOA									
415.00 > 370.00	2.997	2.859	0.138		3800811	10.0		8018	
5 Perfluorooctanoic acid									
413.00 > 369.00	2.997	2.859	0.138	1.000	3445171	10.3		178	
413.00 > 169.00	2.997	2.859	0.138	1.000	1982404		1.74(0.00-0.00)	3458	
* 7 13C4 PFOS									
503.00 > 80.00	3.126	2.991	0.135		10834949	28.7		25150	
9 Perfluorononanoic acid									
463.00 > 419.00	3.141	3.003	0.138	1.000	2735755	8.44		107	
\$ 10 13C2 PFDA									
515.00 > 470.00	3.262	3.123	0.139	1.000	2848965	7.79		3825	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	3.126	3.126	0.0	1.000	7698970	20.1		26635	
499.00 > 99.00	3.126	3.126	0.0	1.000	1735038		4.44(0.00-0.00)	4998	

**Reagents:**

LC537-L3\_00020

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170623-44660.b\2017.06.23\_537\_040.d

Injection Date: 24-Jun-2017 00:23:31

Instrument ID: A8\_N

Lims ID: CCV L3

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 3

Worklist Smp#: 40

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

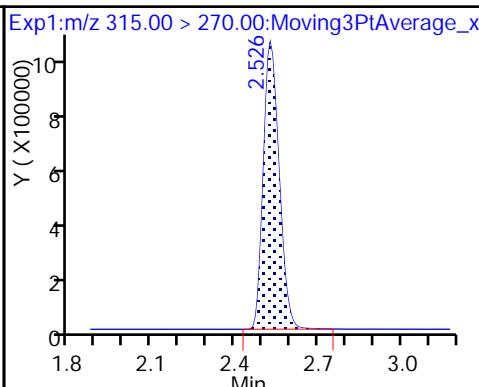
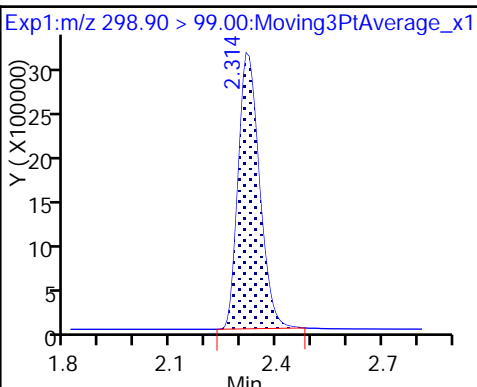
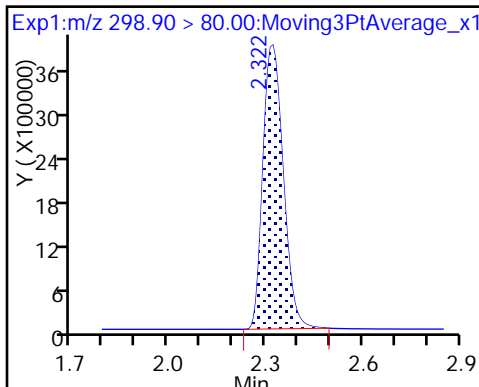
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

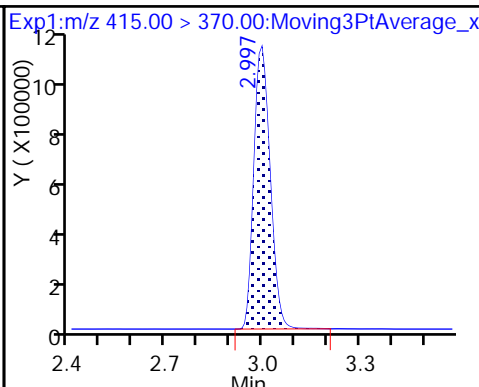
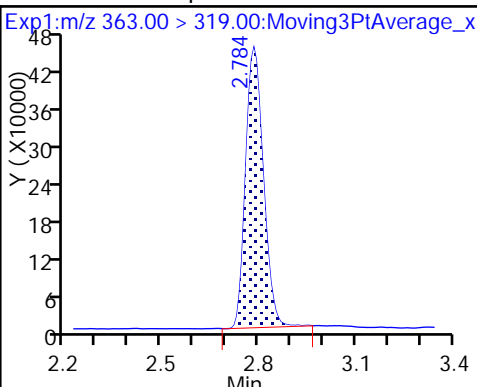
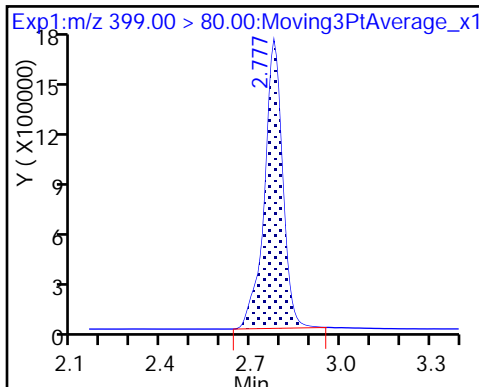
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

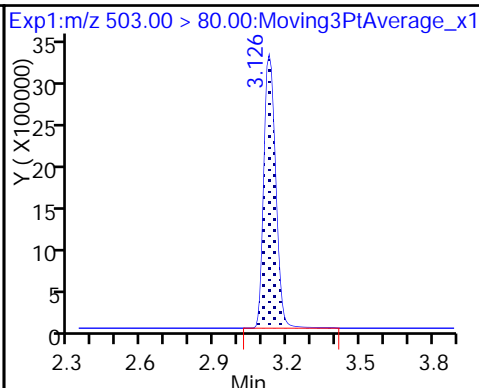
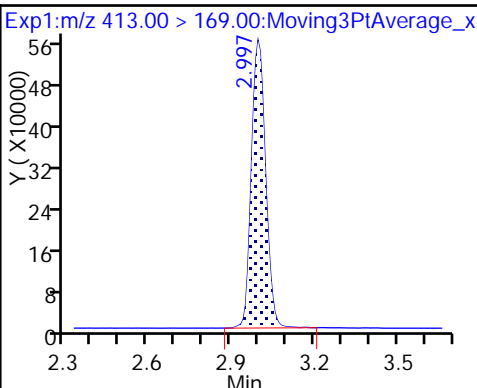
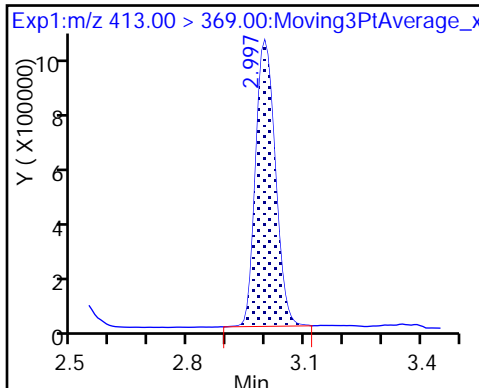
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

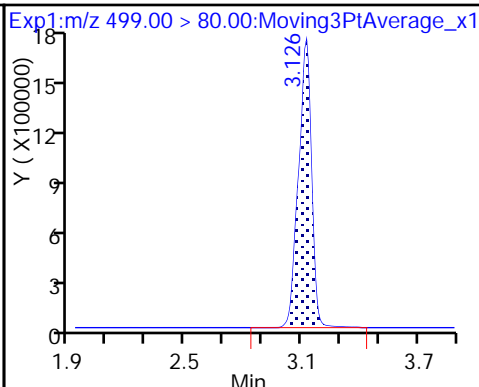
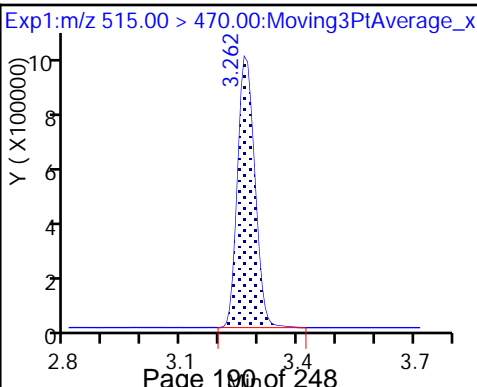
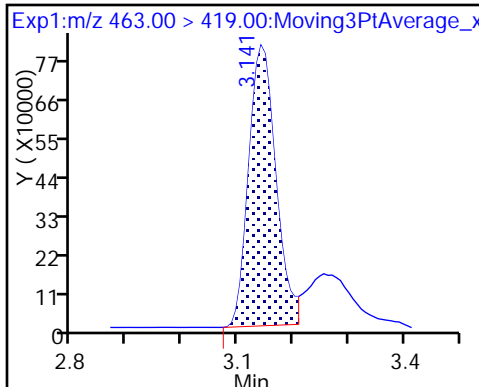
\* 7 13C4 PFOS



9 Perfluorononanoic acid

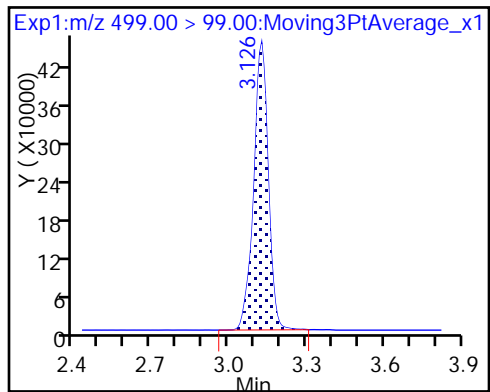
\$ 10 13C2 PFDA

8 Perfluorooctane sulfonic acid





8 Perfluorooctane sulfonic acid



FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-28987-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCVL 320-171480/11 Calibration Date: 06/28/2017 16:44  
 Instrument ID: A8\_N Calib Start Date: 06/28/2017 16:11  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/28/2017 16:35  
 Lab File ID: 2017.06.28\_537\_CURVE\_011.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid	QuaF		1.110		20.9	21.2	-1.4	50.0
Perfluoroheptanoic acid	Ave	0.9860	1.011		2.44	2.38	2.5	50.0
Perfluorohexanesulfonic acid	Ave	1.477	1.461		7.13	7.21	-1.1	50.0
Perfluorooctanoic acid	Ave	0.8783	0.8953		4.89	4.80	1.9	50.0
Perfluorooctane sulfonic acid	Ave	1.034	0.9935		9.24	9.61	-3.9	50.0
Perfluorononanoic acid	Ave	0.6847	0.7253		4.90	4.62	5.9	50.0
13C2 PFHxA	Ave	1.203	1.147		9.53	10.0	-4.7	30.0
13C2 PFDA	Ave	0.6583	0.6379		9.69	10.0	-3.1	30.0

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170628-44832.b\2017.06.28\_537\_CURVE\_011.d  
 Lims ID: CCVL  
 Client ID:  
 Sample Type: CCVL  
 Inject. Date: 28-Jun-2017 16:44:33 ALS Bottle#: 2 Worklist Smp#: 11  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: CCV L2  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub1  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20170628-44832.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 28-Jun-2017 17:07:11 Calib Date: 28-Jun-2017 16:35:04  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20170628-44832.b\2017.06.28\_537\_CURVE\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK008

First Level Reviewer: barnettj Date: 28-Jun-2017 17:06:18

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.419	1.415	0.004	1.000	3928845	20.9		1101	
298.90 > 99.00	1.411	1.415	-0.004	0.995	2994833		1.31(0.00-0.00)	1022	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.548	1.548	0.0	1.000	1813825	9.53		5389	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.699	1.697	0.002	1.000	379920	2.44		69.5	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.699	1.698	0.001	1.000	1759780	7.13		637	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.882	1.882	0.0	1.000	679227	4.89		38.9	
413.00 > 169.00	1.882	1.882	0.0	1.000	397588		1.71(0.00-0.00)	592	
* 6 13C2-PFOA									
415.00 > 370.00	1.882	1.882	0.0		1582044	10.0		4701	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.117	2.117	0.0	1.000	1593927	9.24		1046	
499.00 > 99.00	2.117	2.117	0.0	1.000	361438		4.41(0.00-0.00)	443	
* 7 13C4 PFOS									
503.00 > 80.00	2.117	2.119	-0.002		4789035	28.7		3269	
9 Perfluorononanoic acid									
463.00 > 419.00	2.124	2.131	-0.007	1.000	530394	4.90		54.2	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.291	2.291	0.0	1.000	1009197	9.69		3142	

**Reagents:**

LC537-L2\_00018

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170628-44832.b\2017.06.28\_537\_CURVE\_011.d

Injection Date: 28-Jun-2017 16:44:33

Instrument ID: A8\_N

Lims ID: CCVL

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 2

Worklist Smp#: 11

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

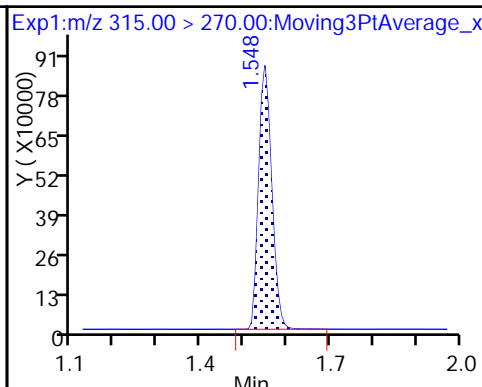
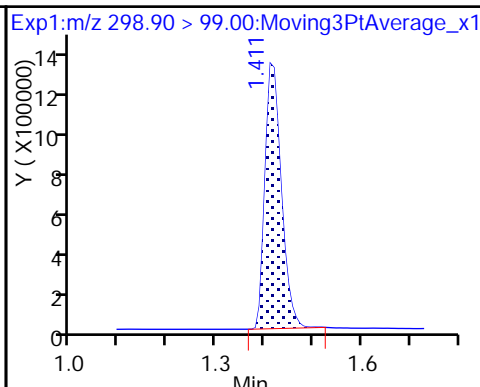
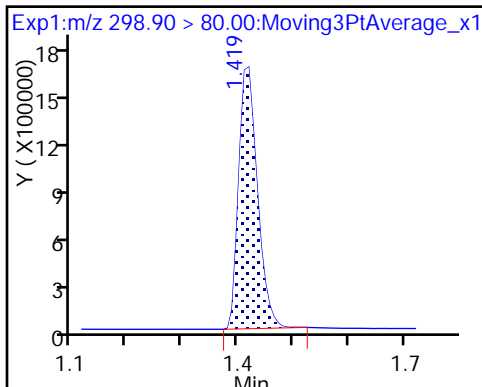
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

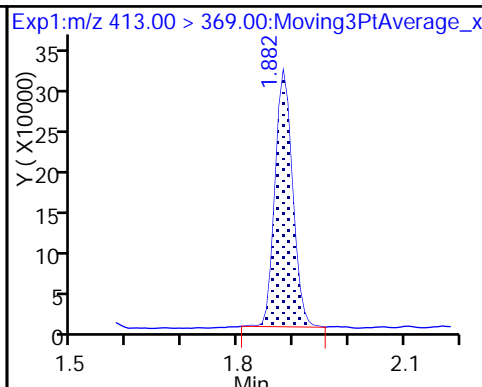
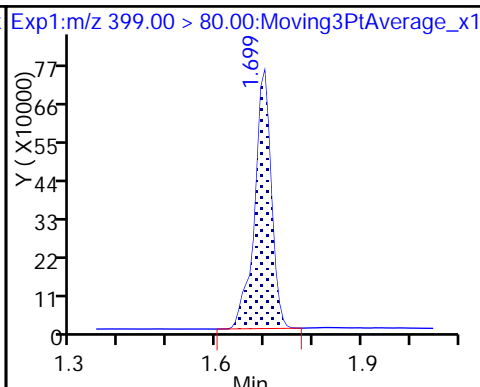
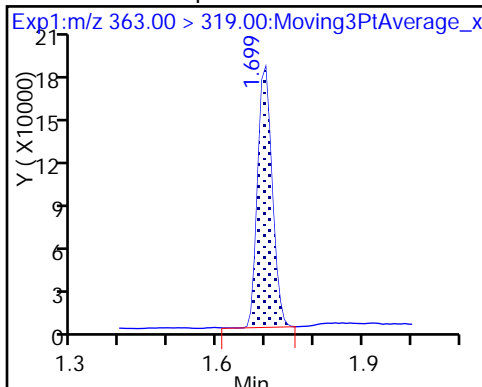
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

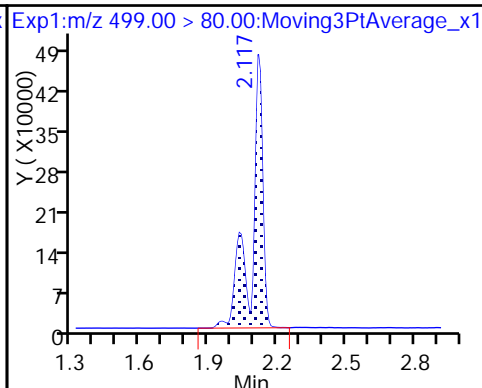
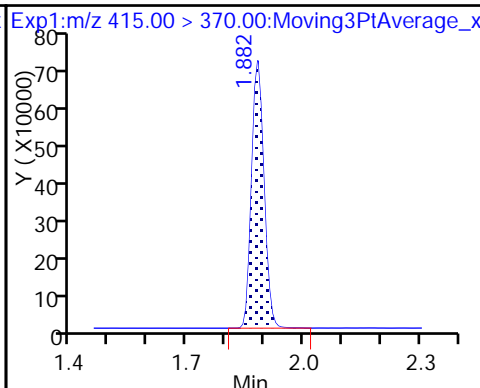
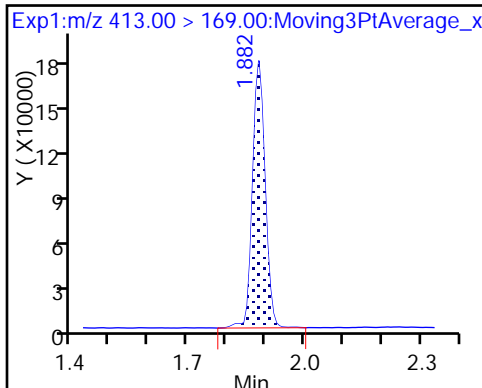
5 Perfluorooctanoic acid



5 Perfluorooctanoic acid

\* 6 13C2-PFOA

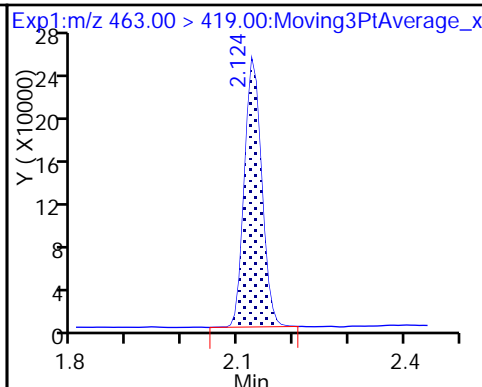
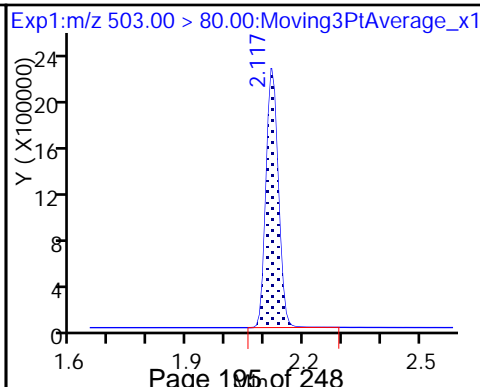
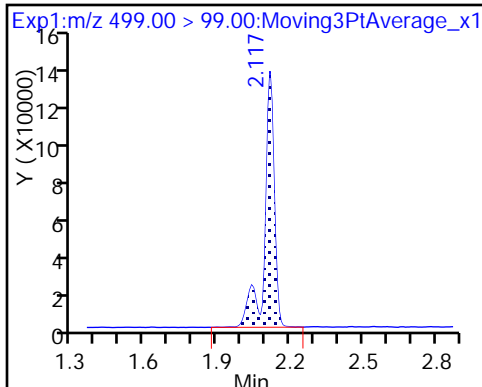
8 Perfluorooctane sulfonic acid



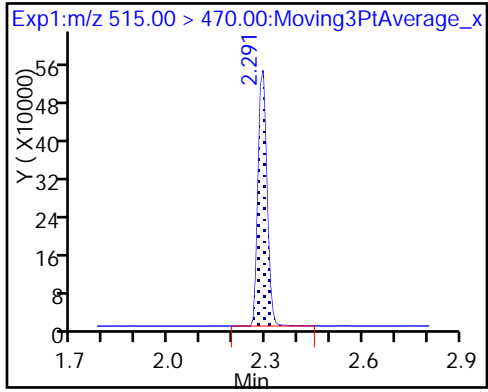
8 Perfluorooctane sulfonic acid

\* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-28987-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: ICV 320-171480/13 Calibration Date: 06/28/2017 16:54  
 Instrument ID: A8\_N Calib Start Date: 06/28/2017 16:11  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/28/2017 16:35  
 Lab File ID: 2017.06.28\_537\_CURVE\_013.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid	QuaF		1.008		110	101	9.4	30.0
Perfluoroheptanoic acid	Ave	0.9860	0.9330		9.54	10.1	-5.4	30.0
Perfluorohexanesulfonic acid	Ave	1.477	1.657		23.8	21.2	12.1	30.0
Perfluorooctanoic acid	Ave	0.8783	0.9424		21.5	20.0	7.3	30.0
Perfluorooctane sulfonic acid	Ave	1.034	1.098		22.0	20.7	6.2	30.0
Perfluorononanoic acid	Ave	0.6847	0.7209		21.1	20.0	5.3	30.0
13C2 PFHxA	Ave	1.203	1.187		9.86	10.0	-1.4	30.0
13C2 PFDA	Ave	0.6583	0.6889		10.5	10.0	4.7	30.0

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170628-44832.b\2017.06.28\_537\_CURVE\_013.d  
 Lims ID: ICV  
 Client ID:  
 Sample Type: ICV  
 Inject. Date: 28-Jun-2017 16:54:03 ALS Bottle#: 7 Worklist Smp#: 13  
 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\20170628-44832.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 28-Jun-2017 17:36:37 Calib Date: 28-Jun-2017 16:35:04  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20170628-44832.b\2017.06.28\_537\_CURVE\_009.d

Column 1 : Det: EXP1  
 Process Host: XAWRK008

First Level Reviewer: barnettj Date: 28-Jun-2017 17:36:37

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.411	1.415	-0.004	1.000	20322669	110.2		2543	
298.90 > 99.00	1.411	1.415	-0.004	1.000	16013247		1.27(0.00-0.00)	2529	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.540	1.548	-0.008	1.000	2197673	9.86		5336	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.692	1.697	-0.005	1.000	1741229	9.54		297	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.692	1.698	-0.006	1.000	7031099	23.8		2079	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.874	1.882	-0.008	1.000	3493109	21.5		193	
413.00 > 169.00	1.874	1.882	-0.008	1.000	2046548		1.71(0.00-0.00)	2161	
* 6 13C2-PFOA									
415.00 > 370.00	1.874	1.882	-0.008		1851564	10.0		4138	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.117	2.117	0.0	1.000	4552562	22.0		2363	
499.00 > 99.00	2.117	2.117	0.0	1.000	853049		5.34(0.00-0.00)	941	
* 7 13C4 PFOS									
503.00 > 80.00	2.117	2.119	-0.002		5746016	28.7		3941	
9 Perfluorononanoic acid									
463.00 > 419.00	2.124	2.131	-0.007	1.000	2670491	21.1		258	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.291	2.291	0.0	1.000	1275595	10.5		3491	



**Reagents:**

LC537-ICV\_00020

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170628-44832.b\2017.06.28\_537\_CURVE\_013.d

Injection Date: 28-Jun-2017 16:54:03

Instrument ID: A8\_N

Lims ID: ICV

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 7

Worklist Smp#: 13

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

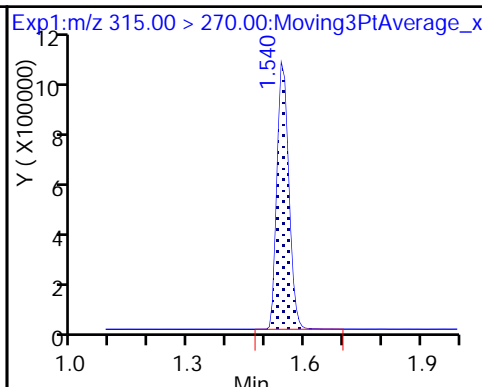
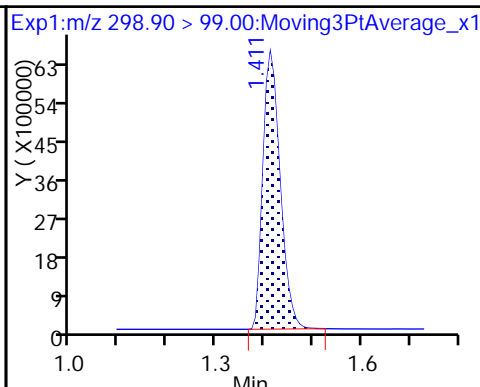
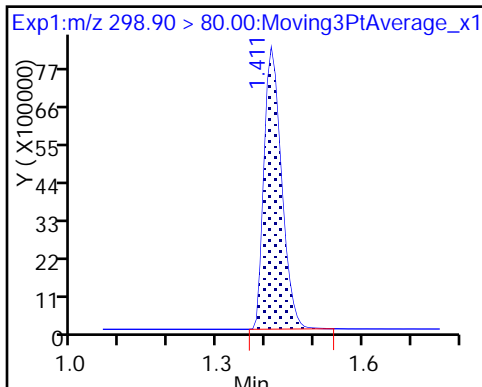
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

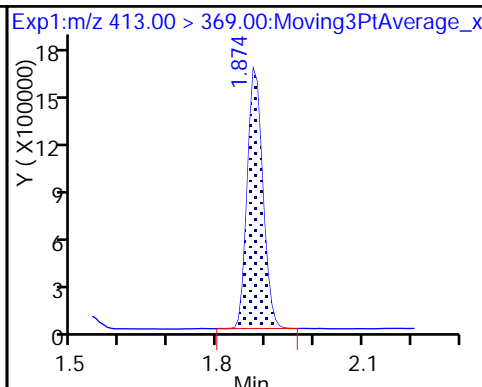
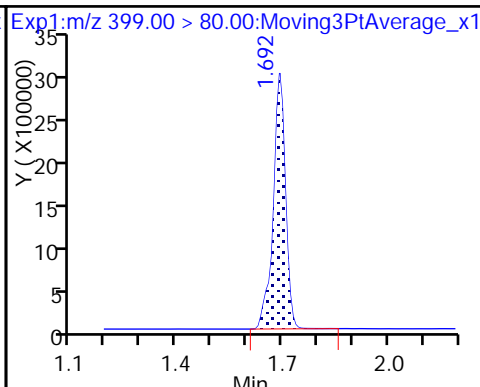
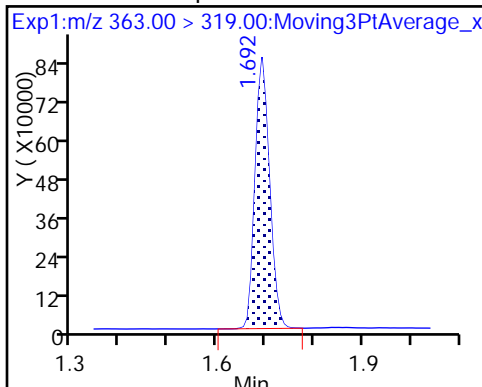
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

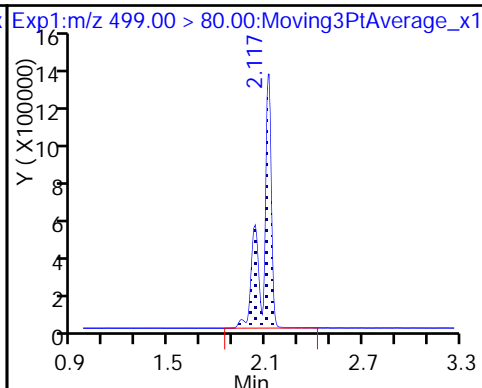
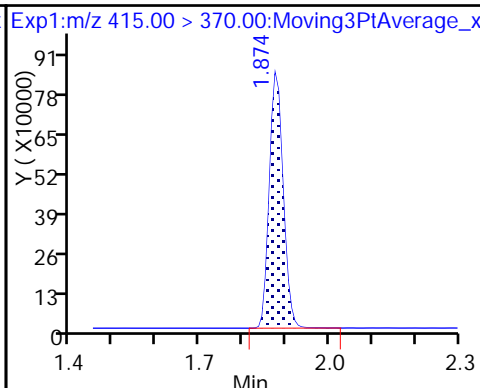
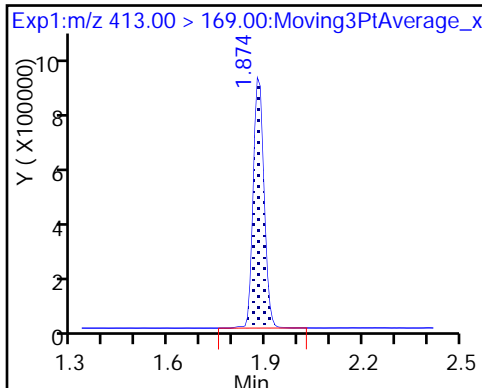
5 Perfluorooctanoic acid



5 Perfluorooctanoic acid

\* 6 13C2-PFOA

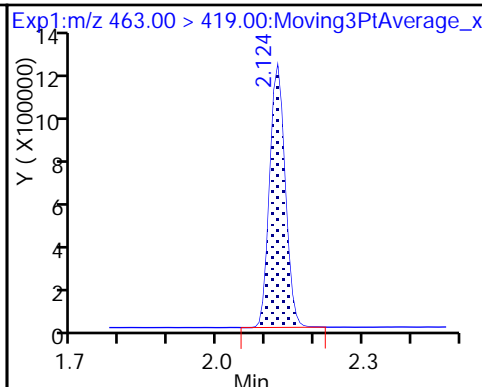
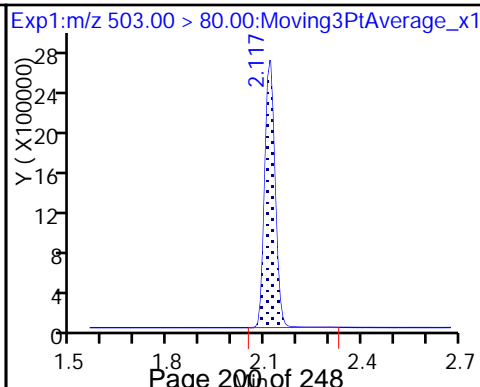
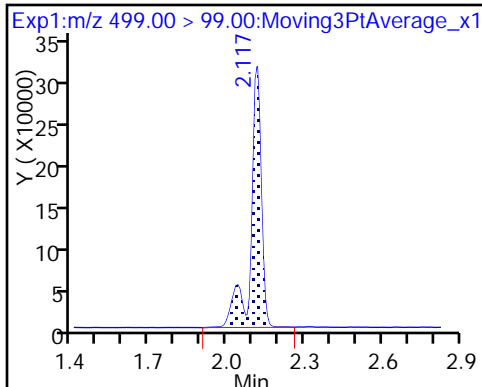
8 Perfluorooctane sulfonic acid



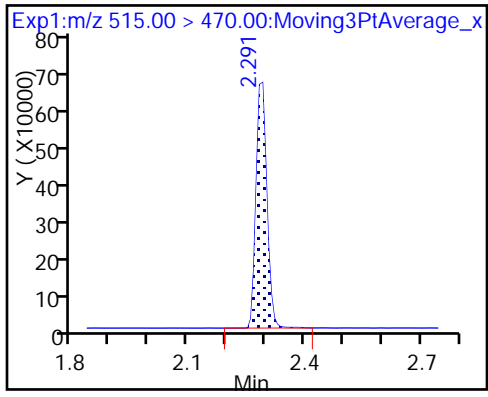
8 Perfluorooctane sulfonic acid

\* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-28987-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-171486/1 Calibration Date: 06/28/2017 17:03  
 Instrument ID: A8\_N Calib Start Date: 06/28/2017 16:11  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/28/2017 16:35  
 Lab File ID: 2017.06.28\_537B\_001.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid	QuaF		0.8414		126	133	-4.8	30.0
Perfluoroheptanoic acid	Ave	0.9860	1.007		15.2	14.9	2.1	30.0
Perfluorohexanesulfonic acid	Ave	1.477	1.428		43.6	45.1	-3.3	30.0
Perfluorooctanoic acid	Ave	0.8783	0.9314		31.8	30.0	6.0	30.0
Perfluorooctane sulfonic acid	Ave	1.034	1.059		61.5	60.0	2.5	30.0
Perfluorononanoic acid	Ave	0.6847	0.6633		28.0	28.9	-3.1	30.0
13C2 PFHxA	Ave	1.203	1.240		10.3	10.0	3.0	30.0
13C2 PFDA	Ave	0.6583	0.6727		10.2	10.0	2.2	30.0

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170628-44833.b\2017.06.28\_537B\_001.d  
 Lims ID: CCV L5  
 Client ID:  
 Sample Type: CCVIS  
 Inject. Date: 28-Jun-2017 17:03:33 ALS Bottle#: 5 Worklist Smp#: 1  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: CCV L5  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Sublist: chrom-537\_A8\_N\*sub1  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20170628-44833.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 29-Jun-2017 13:54:12 Calib Date: 28-Jun-2017 16:35:04  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20170628-44832.b\2017.06.28\_537\_CURVE\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK033

First Level Reviewer: barnettj Date: 28-Jun-2017 17:37:02

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.411	1.415	-0.004	1.000	27481451	126.1		2887	
298.90 > 99.00	1.411	1.415	-0.004	1.000	21903190		1.25(0.00-0.00)	2953	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.548	1.548	0.0	1.000	2818620	10.3		7191	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.692	1.697	-0.005	1.000	3398672	15.2		637	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.692	1.698	-0.006	1.000	15871051	43.6		3346	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.882	1.882	0.0	1.000	6346246	31.8		328	
413.00 > 169.00	1.882	1.882	0.0	1.000	3779895		1.68(0.00-0.00)	3532	
* 6 13C2-PFOA									
415.00 > 370.00	1.882	1.882	0.0		2273492	10.0		5422	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.117	2.117	0.0	1.000	15673325	61.5		5473	
499.00 > 99.00	2.117	2.117	0.0	1.000	3641947		4.30(0.00-0.00)	2814	
* 7 13C4 PFOS									
503.00 > 80.00	2.117	2.119	-0.002		7068921	28.7		4106	
9 Perfluorononanoic acid									
463.00 > 419.00	2.124	2.131	-0.007	1.000	4356814	28.0		297	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.284	2.291	-0.007	1.000	1529474	10.2		3764	

**Reagents:**

LC537-L5\_00021

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170628-44833.b\2017.06.28\_537B\_001.d

Injection Date: 28-Jun-2017 17:03:33

Instrument ID: A8\_N

Lims ID: CCV L5

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 5

Worklist Smp#: 1

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

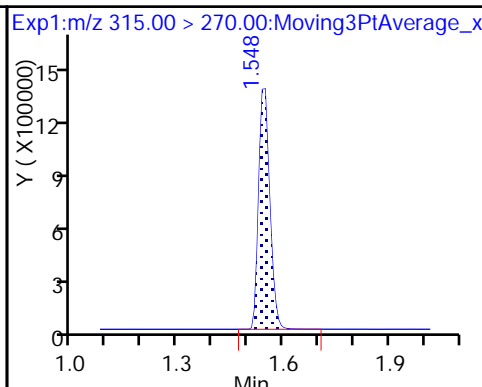
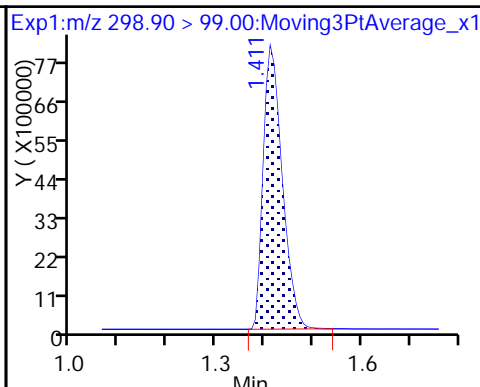
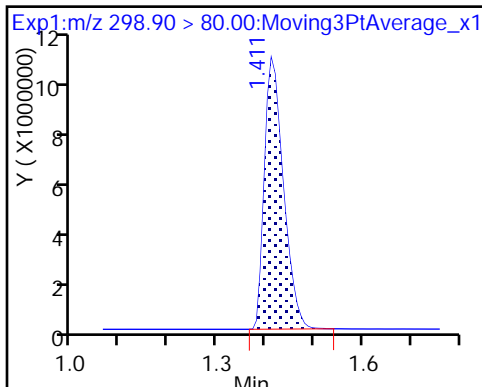
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

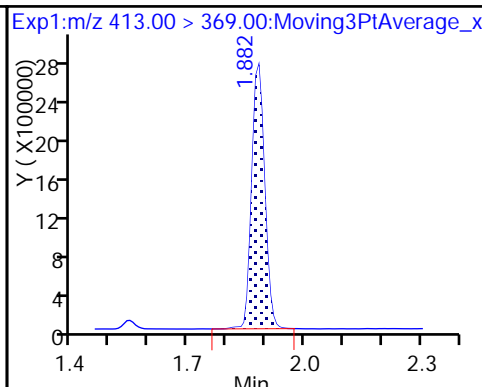
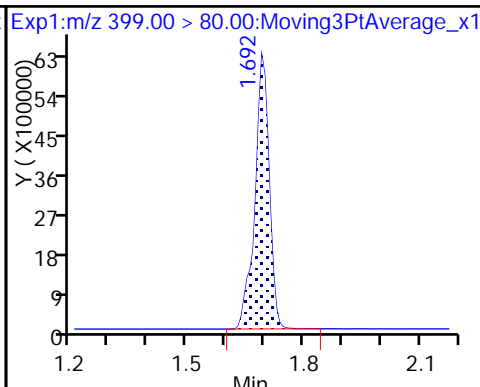
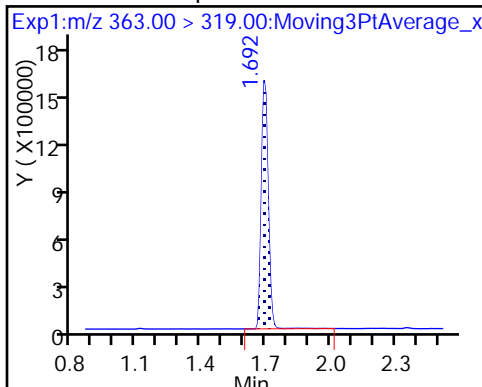
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

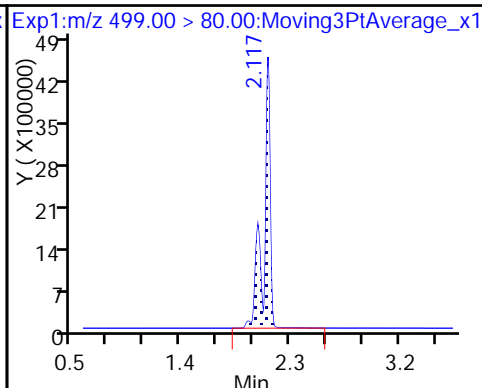
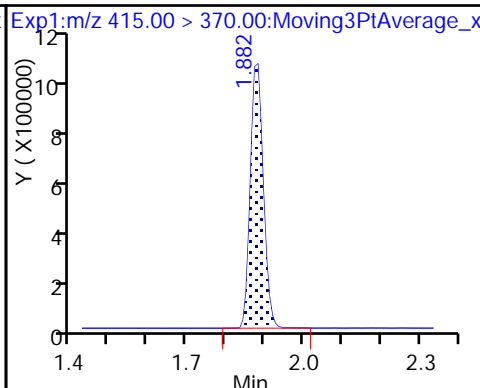
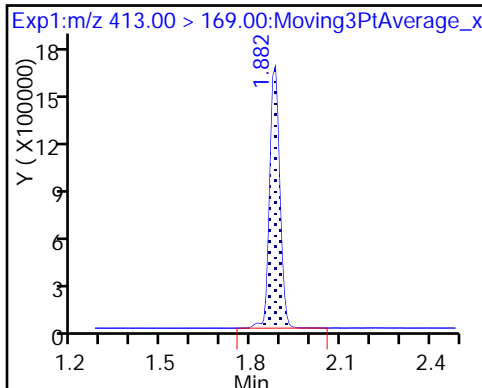
5 Perfluorooctanoic acid



5 Perfluorooctanoic acid

\* 6 13C2-PFOA

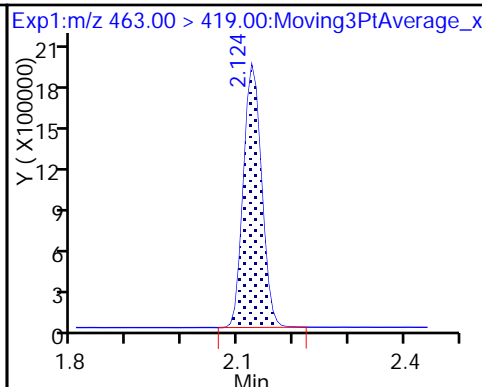
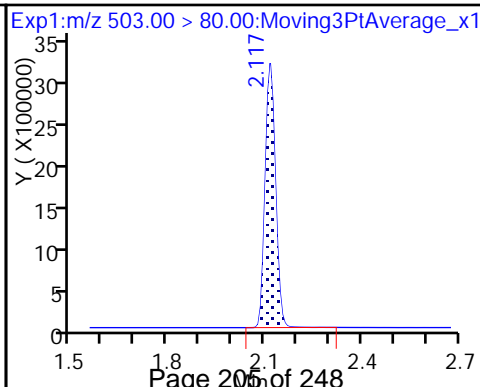
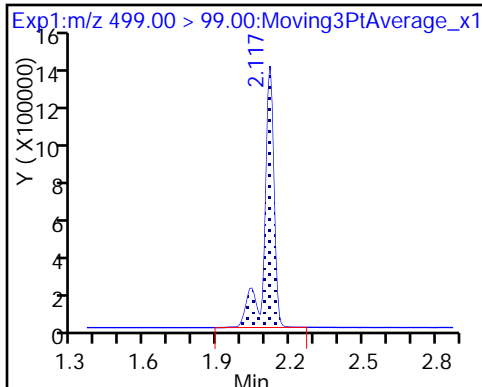
8 Perfluorooctane sulfonic acid



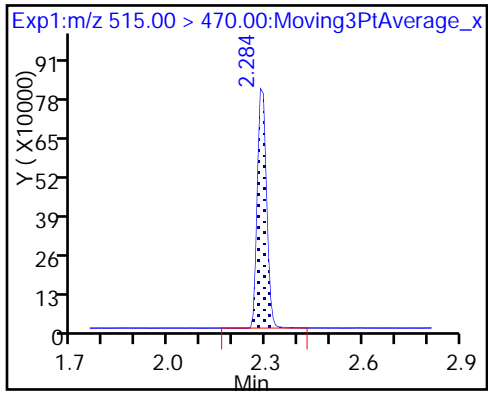
8 Perfluorooctane sulfonic acid

\* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA





FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-28987-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-171486/13 Calibration Date: 06/28/2017 18:00  
 Instrument ID: A8\_N Calib Start Date: 06/28/2017 16:11  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/28/2017 16:35  
 Lab File ID: 2017.06.28\_537B\_013.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid	QuaF		1.120		46.6	44.4	5.0	30.0
Perfluoroheptanoic acid	Ave	0.9860	0.9860		4.97	4.97	0.0	30.0
Perfluorohexanesulfonic acid	Ave	1.477	1.562		16.0	15.1	5.7	30.0
Perfluorooctanoic acid	Ave	0.8783	0.8867		10.1	10.0	0.9	30.0
Perfluorononanoic acid	Ave	0.6847	0.6692		9.46	9.68	-2.3	30.0
Perfluorooctane sulfonic acid	Ave	1.034			4.00	20.1		
13C2 PFHxA	Ave	1.203	1.196		9.94	10.0	-0.6	30.0
13C2 PFDA	Ave	0.6583	0.6190		9.40	10.0	-6.0	30.0

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170628-44833.b\2017.06.28\_537B\_013.d  
 Lims ID: CCV L3  
 Client ID:  
 Sample Type: CCVIS  
 Inject. Date: 28-Jun-2017 18:00:34 ALS Bottle#: 3 Worklist Smp#: 13  
 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\20170628-44833.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 29-Jun-2017 13:54:22 Calib Date: 28-Jun-2017 16:35:04  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20170628-44832.b\2017.06.28\_537\_CURVE\_009.d

Column 1 : Det: EXP1  
 Process Host: XAWRK033

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.411	1.415	-0.004	1.000	12079215	46.6		2787	
298.90 > 99.00	1.411	1.415	-0.004	1.000	9196863		1.31(0.00-0.00)	2519	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.540	1.548	-0.008	1.000	2691859	9.94		7164	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.692	1.697	-0.005	1.000	1103803	4.97		238	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.692	1.698	-0.006	1.000	5730314	16.0		2338	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.874	1.882	-0.008	1.000	2003259	10.1		115	
413.00 > 169.00	1.874	1.882	-0.008	1.000	1211658		1.65(0.00-0.00)	1870	
* 6 13C2-PFOA									
415.00 > 370.00	1.874	1.882	-0.008		2250330	10.0		6285	
* 7 13C4 PFOS									
503.00 > 80.00	2.109	2.119	-0.010		6965525	28.7		4979	
9 Perfluorononanoic acid									
463.00 > 419.00	2.117	2.131	-0.014	1.000	1457519	9.46		81.2	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.284	2.291	-0.007	1.000	1393000	9.40		5257	

Reagents:

LC537-L3\_00020 Amount Added: 1.00 Units: mL

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170628-44833.b\2017.06.28\_537B\_013.d

Injection Date: 28-Jun-2017 18:00:34

Instrument ID: A8\_N

Lims ID: CCV L3

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 3

Worklist Smp#: 13

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

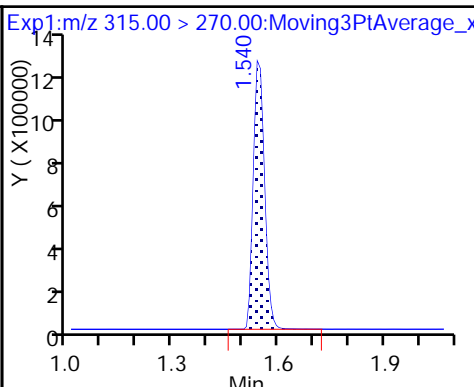
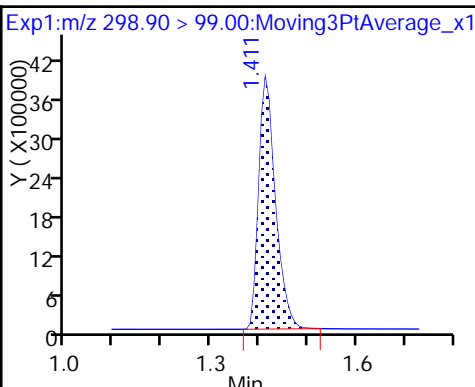
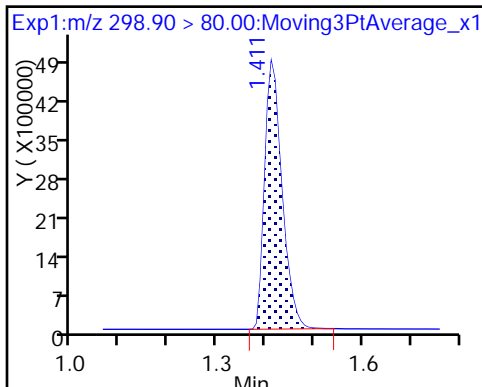
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

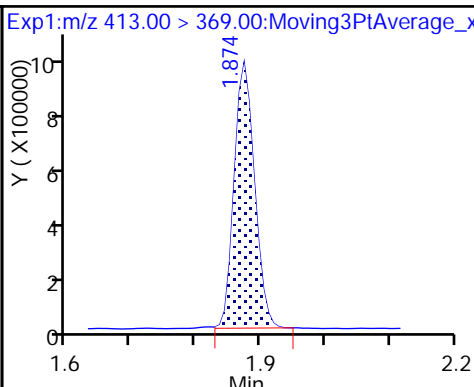
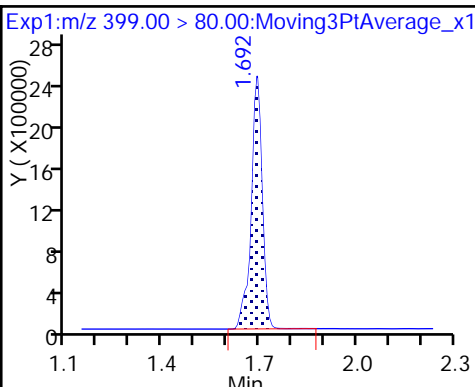
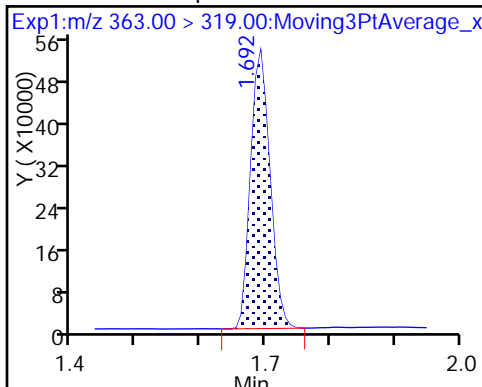
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

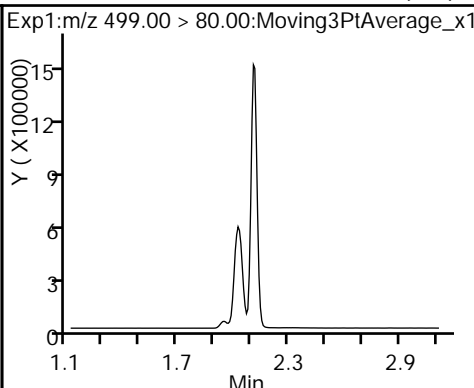
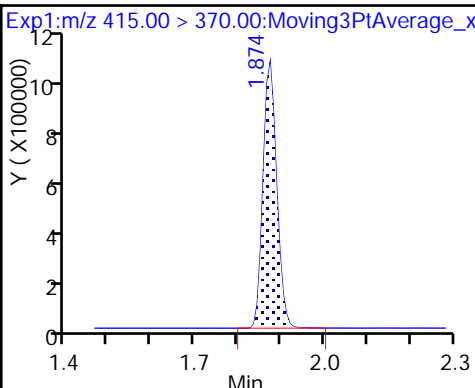
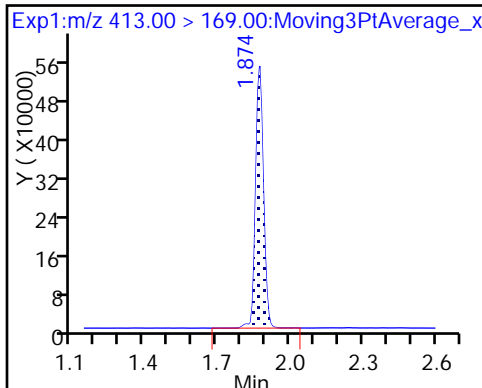
5 Perfluorooctanoic acid



5 Perfluorooctanoic acid

\* 6 13C2-PFOA

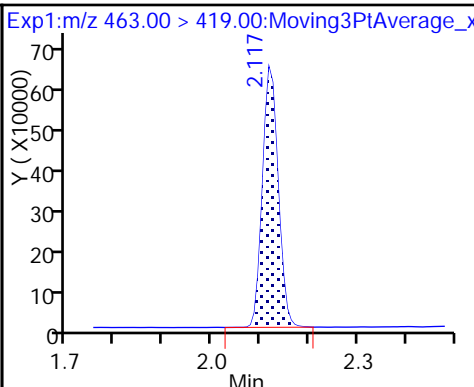
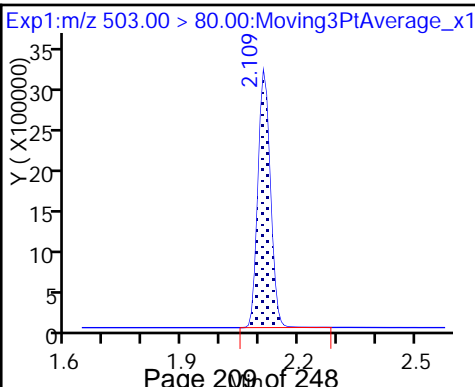
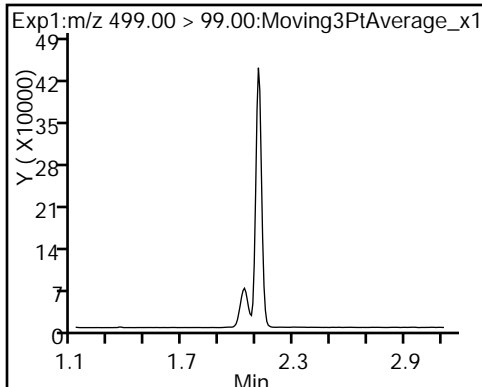
8 Perfluorooctane sulfonic acid (ND)



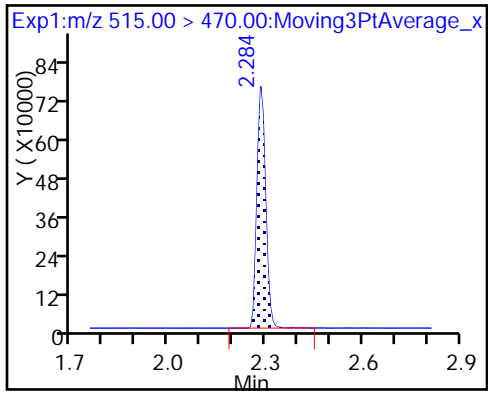
8 Perfluorooctane sulfonic acid (ND)

\* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-28987-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: \_\_\_\_\_ Lab Sample ID: MB 320-169764/1-A  
 Matrix: Water Lab File ID: 2017.06.23\_537\_018.d  
 Analysis Method: 537 Date Collected: \_\_\_\_\_  
 Extraction Method: 537 Date Extracted: 06/19/2017 09:24  
 Sample wt/vol: 250 (mL) Date Analyzed: 06/23/2017 22:39  
 Con. Extract Vol.: 1.0 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 170757 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	90		70-130
STL00996	13C2 PFDA	72		70-130

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170623-44660.b\2017.06.23\_537\_018.d  
 Lims ID: MB 320-169764/1-A  
 Client ID:  
 Sample Type: MB  
 Inject. Date: 23-Jun-2017 22:39:01 ALS Bottle#: 10 Worklist Smp#: 18  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: MB 320-169764/1-A  
 Misc. Info.: Plate: 1 Rack: 2  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20170623-44660.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 26-Jun-2017 13:45:41 Calib Date: 19-Jun-2017 18:04:42  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20170619-44448.b\2017.06.19\_537A\_ICAL\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK033

First Level Reviewer: barnettj Date: 26-Jun-2017 13:23:28

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
\$ 2 13C2 PFHxA	315.00 > 270.00	2.526	2.381	0.145	1.000	3445838	9.04	5997	
* 6 13C2-PFOA	415.00 > 370.00	2.989	2.859	0.130		3675107	10.0	8213	
* 7 13C4 PFOS	503.00 > 80.00	3.126	2.991	0.135		9517190	28.7	23802	
\$ 10 13C2 PFDA	515.00 > 470.00	3.262	3.123	0.139	1.000	2563719	7.25	6842	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170623-44660.b\2017.06.23\_537\_018.d

Injection Date: 23-Jun-2017 22:39:01

Instrument ID: A8\_N

Lims ID: MB 320-169764/1-A

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 10

Worklist Smp#: 18

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

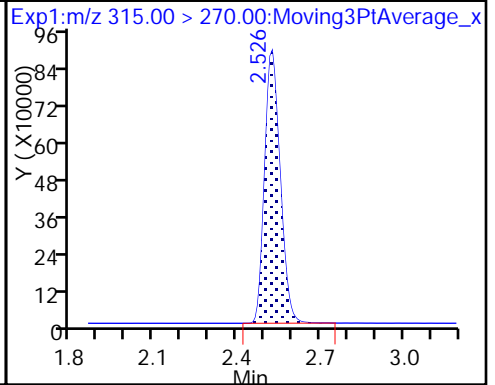
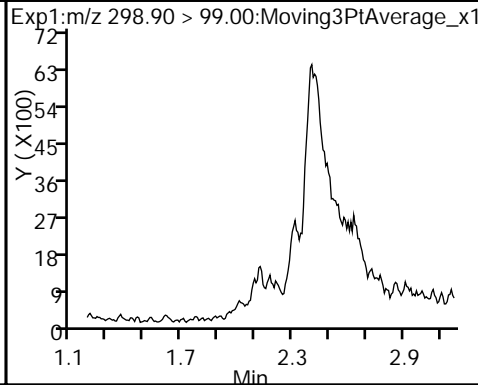
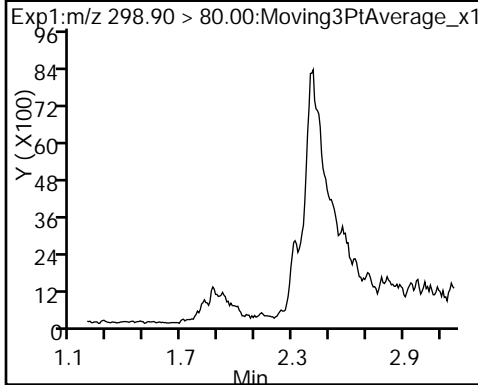
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid (ND)

1 Perfluorobutanesulfonic acid (ND)

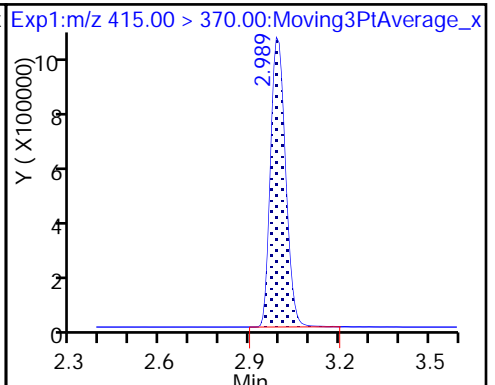
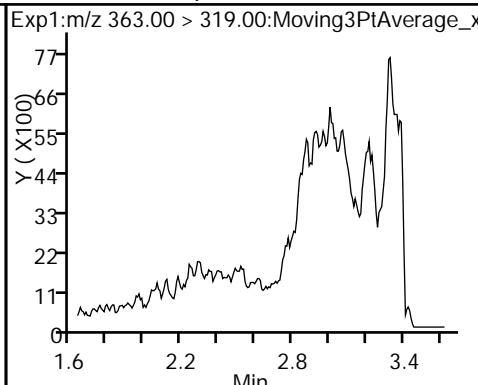
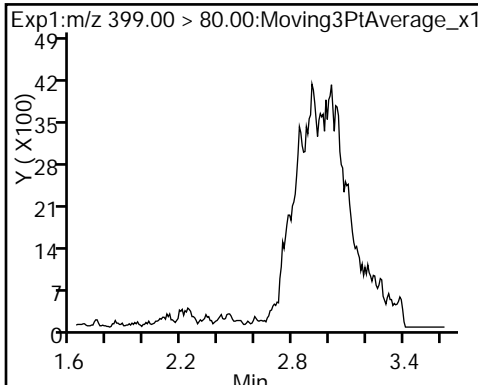
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid (ND)

4 Perfluoroheptanoic acid (ND)

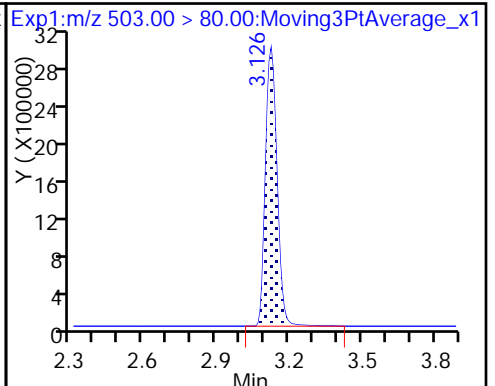
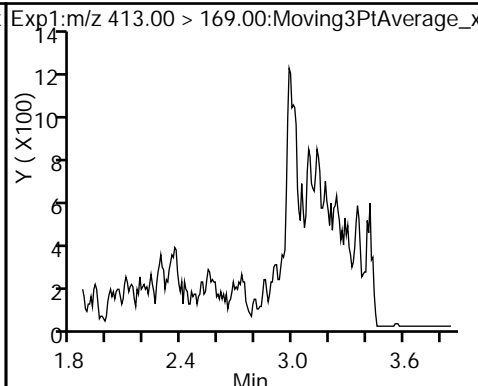
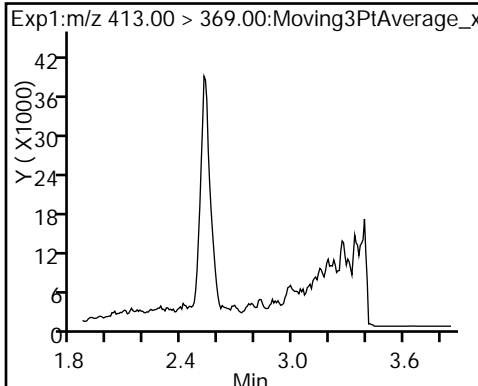
\* 6 13C2-PFOA



5 Perfluorooctanoic acid (ND)

5 Perfluorooctanoic acid (ND)

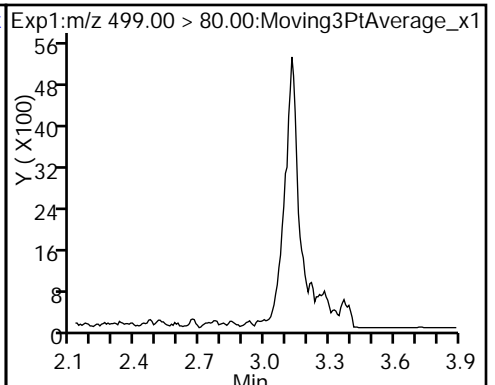
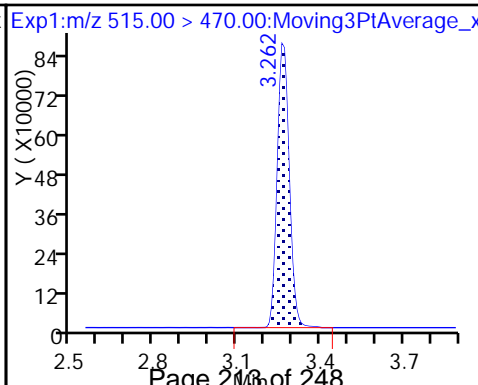
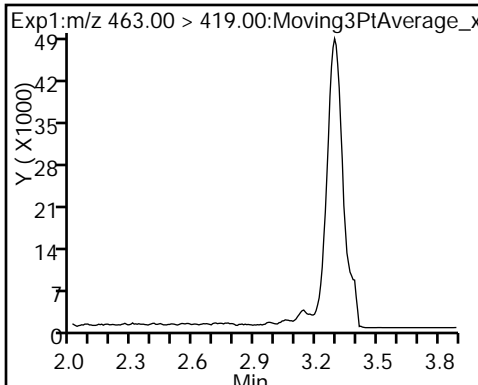
\* 7 13C4 PFOS



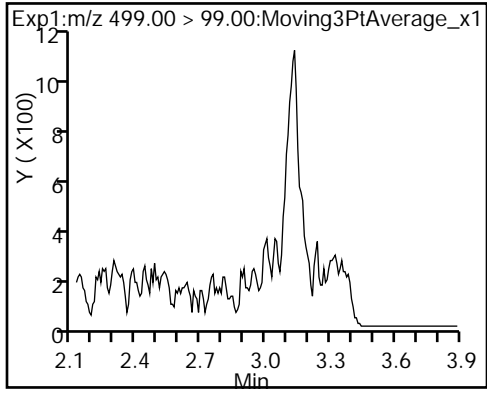
9 Perfluorononanoic acid (ND)

\$ 10 13C2 PFDA

8 Perfluorooctane sulfonic acid (ND)



8 Perfluorooctane sulfonic acid (ND)





TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170623-44660.b\2017.06.23\_537\_018.d  
 Lims ID: MB 320-169764/1-A  
 Client ID:  
 Sample Type: MB  
 Inject. Date: 23-Jun-2017 22:39:01 ALS Bottle#: 10 Worklist Smp#: 18  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: MB 320-169764/1-A  
 Misc. Info.: Plate: 1 Rack: 2  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20170623-44660.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 26-Jun-2017 13:45:41 Calib Date: 19-Jun-2017 18:04:42  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20170619-44448.b\2017.06.19\_537A\_ICAL\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK033

First Level Reviewer: barnettj Date: 26-Jun-2017 13:23:28

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.04	90.36
\$ 10 13C2 PFDA	10.0	7.25	72.50

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-28987-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: \_\_\_\_\_ Lab Sample ID: LCS 320-169764/2-A  
 Matrix: Water Lab File ID: 2017.06.23\_537\_019.d  
 Analysis Method: 537 Date Collected: \_\_\_\_\_  
 Extraction Method: 537 Date Extracted: 06/19/2017 09:24  
 Sample wt/vol: 250 (mL) Date Analyzed: 06/23/2017 22:43  
 Con. Extract Vol.: 1.0 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 170757 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	157		40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	82.3		20	8.0	2.8
375-95-1	Perfluorononanoic acid (PFNA)	66.1		24	20	8.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	122		30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	45.4		10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	383		90	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	91		70-130
STL00996	13C2 PFDA	81		70-130

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170623-44660.b\2017.06.23\_537\_019.d  
 Lims ID: LCS 320-169764/2-A  
 Client ID:  
 Sample Type: LCS  
 Inject. Date: 23-Jun-2017 22:43:46 ALS Bottle#: 11 Worklist Smp#: 19  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: LCS 320-169764/2-A  
 Misc. Info.: Plate: 1 Rack: 2  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20170623-44660.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 26-Jun-2017 13:45:41 Calib Date: 19-Jun-2017 18:04:42  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20170619-44448.b\2017.06.19\_537A\_ICAL\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK033

First Level Reviewer: barnettj Date: 26-Jun-2017 13:23:55

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	2.322	2.183	0.139	1.000	25908419	95.7		2874	
298.90 > 99.00	2.322	2.183	0.139	1.000	20565880		1.26(0.00-0.00)	2697	
\$ 2 13C2 PFHxA									
315.00 > 270.00	2.534	2.381	0.153	1.000	3229797	9.13		5552	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	2.777	2.625	0.152	1.000	11181172	30.6		2706	
4 Perfluoroheptanoic acid									
363.00 > 319.00	2.784	2.630	0.154	1.000	3263498	11.3		410	
* 6 13C2-PFOA									
415.00 > 370.00	2.997	2.859	0.138		3410881	10.0		7522	
5 Perfluorooctanoic acid									
413.00 > 369.00	2.997	2.859	0.138	1.000	6143758	20.6		422	
413.00 > 169.00	2.997	2.859	0.138	1.000	3560097		1.73(0.00-0.00)	4975	
* 7 13C4 PFOS									
503.00 > 80.00	3.126	2.991	0.135		8977613	28.7		20293	
9 Perfluorononanoic acid									
463.00 > 419.00	3.141	3.003	0.138	1.000	4809777	16.5		1890	
\$ 10 13C2 PFDA									
515.00 > 470.00	3.270	3.123	0.147	1.000	2643134	8.05		5268	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	3.126	3.126	0.0	1.000	12481976	39.3		39203	
499.00 > 99.00	3.126	3.126	0.0	1.000	2786228		4.48(0.00-0.00)	4398	

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170623-44660.b\2017.06.23\_537\_019.d

Injection Date: 23-Jun-2017 22:43:46

Instrument ID: A8\_N

Lims ID: LCS 320-169764/2-A

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 11

Worklist Smp#: 19

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

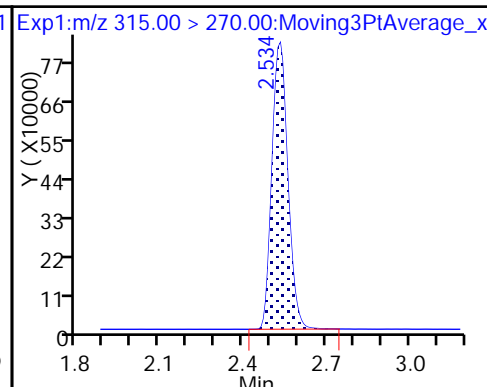
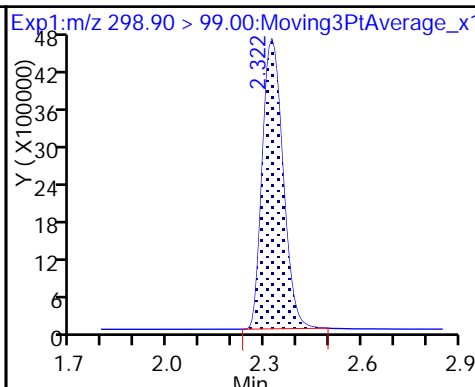
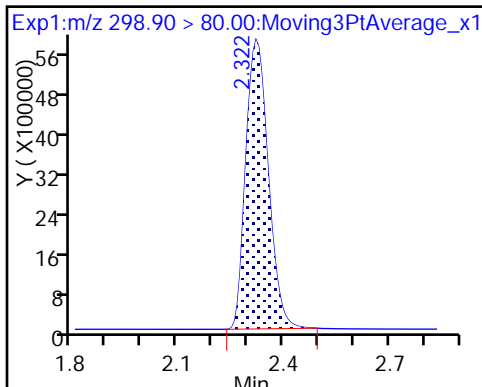
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

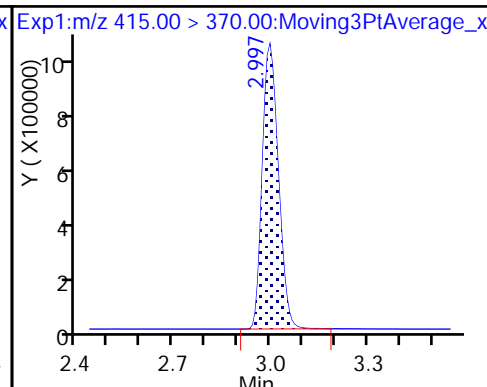
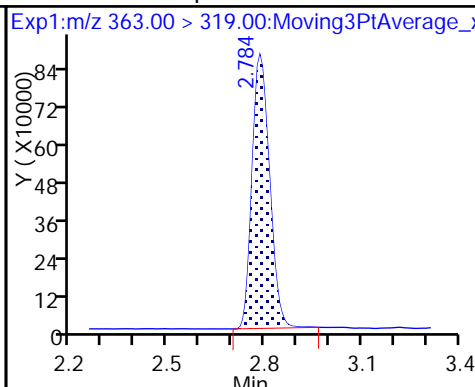
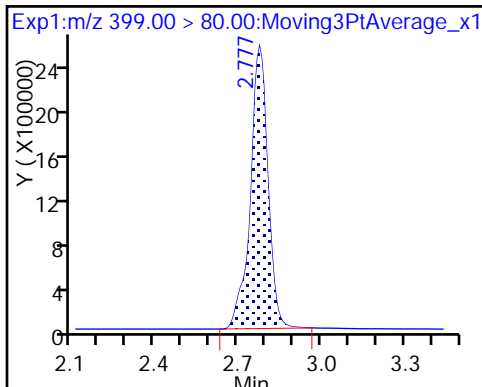
\$ 2 13C2 PFHxA



3 Perfluorohexanesulfonic acid

4 Perfluoroheptanoic acid

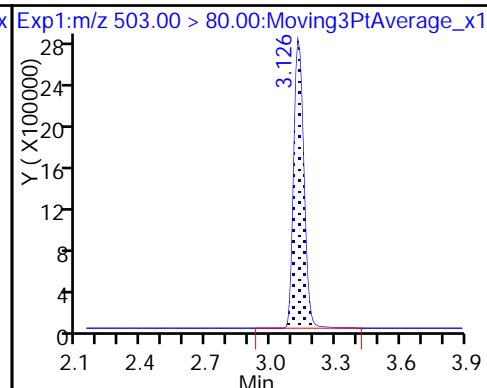
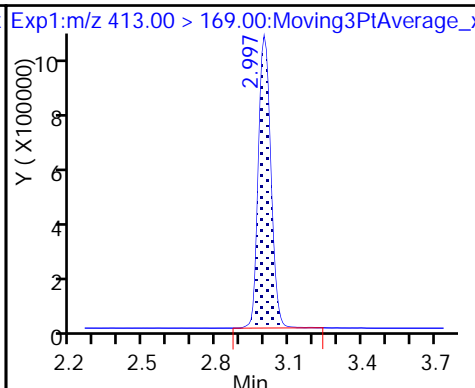
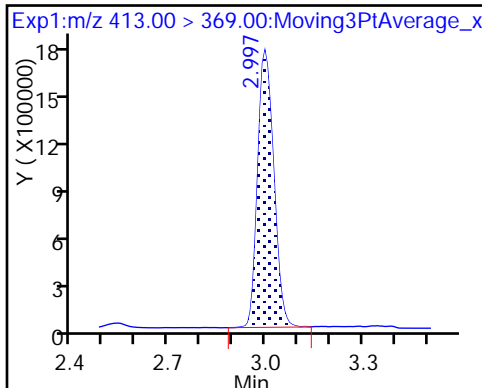
\* 6 13C2-PFOA



5 Perfluorooctanoic acid

5 Perfluorooctanoic acid

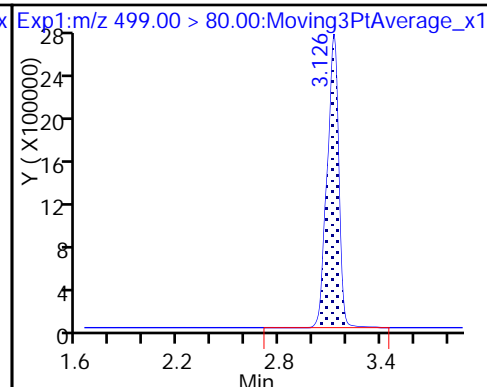
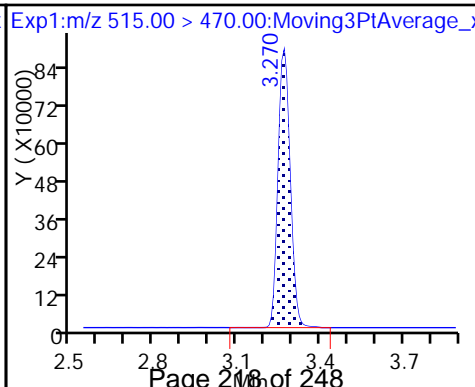
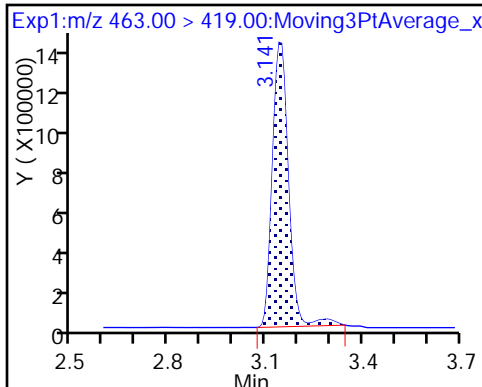
\* 7 13C4 PFOS



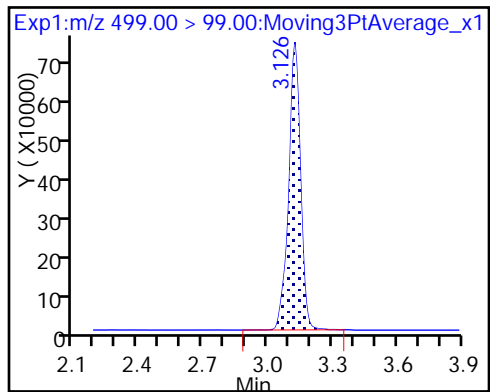
9 Perfluorononanoic acid

\$ 10 13C2 PFDA

8 Perfluorooctane sulfonic acid



8 Perfluorooctane sulfonic acid



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170623-44660.b\2017.06.23\_537\_019.d  
 Lims ID: LCS 320-169764/2-A  
 Client ID:  
 Sample Type: LCS  
 Inject. Date: 23-Jun-2017 22:43:46 ALS Bottle#: 11 Worklist Smp#: 19  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: LCS 320-169764/2-A  
 Misc. Info.: Plate: 1 Rack: 2  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20170623-44660.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 26-Jun-2017 13:45:41 Calib Date: 19-Jun-2017 18:04:42  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20170619-44448.b\2017.06.19\_537A\_ICAL\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK033

First Level Reviewer: barnettj Date: 26-Jun-2017 13:23:55

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.13	91.25
\$ 10 13C2 PFDA	10.0	8.05	80.53

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-28987-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: \_\_\_\_\_ Lab Sample ID: LCSD 320-169764/3-A  
 Matrix: Water Lab File ID: 2017.06.28\_537B\_005.d  
 Analysis Method: 537 Date Collected: \_\_\_\_\_  
 Extraction Method: 537 Date Extracted: 06/19/2017 09:24  
 Sample wt/vol: 250 (mL) Date Analyzed: 06/28/2017 17:22  
 Con. Extract Vol.: 1.0 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 171486 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	148		40	16	6.8
335-67-1	Perfluorooctanoic acid (PFOA)	75.0		20	8.0	2.8
375-95-1	Perfluorononanoic acid (PFNA)	71.6		24	20	8.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	116		30	12	5.5
375-85-9	Perfluoroheptanoic acid (PFHpA)	40.3		10	4.0	1.9
375-73-5	Perfluorobutanesulfonic acid (PFBS)	365		90	36	16

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	82		70-130
STL00996	13C2 PFDA	92		70-130

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170628-44833.b\2017.06.28\_537B\_005.d  
 Lims ID: LCSD 320-169764/3-A  
 Client ID:  
 Sample Type: LCSD  
 Inject. Date: 28-Jun-2017 17:22:33 ALS Bottle#: 3 Worklist Smp#: 5  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: lcsd 320-169764/3-a  
 Misc. Info.: Plate: 1 Rack: 2  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20170628-44833.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 29-Jun-2017 13:54:12 Calib Date: 28-Jun-2017 16:35:04  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20170628-44832.b\2017.06.28\_537\_CURVE\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK033

First Level Reviewer: barnettj Date: 29-Jun-2017 11:01:52

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.419	1.415	0.004	1.000	14899919	91.2		2655	
298.90 > 99.00	1.419	1.415	0.004	1.000	11715162		1.27(0.00-0.00)	2433	
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.548	1.548	0.0	1.000	1719070	8.23		4956	
4 Perfluoroheptanoic acid									
363.00 > 319.00	1.699	1.697	0.002	1.000	1723145	10.1		279	
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	1.699	1.698	0.001	1.000	7274195	29.0		2108	
5 Perfluorooctanoic acid									
413.00 > 369.00	1.882	1.882	0.0	1.000	2859471	18.8		192	
413.00 > 169.00	1.882	1.882	0.0	1.000	1788510		1.60(0.00-0.00)	1984	
* 6 13C2-PFOA									
415.00 > 370.00	1.882	1.882	0.0		1735559	10.0		4822	
8 Perfluorooctane sulfonic acid									
499.00 > 80.00	2.117	2.117	0.0	1.000	6489304	37.0		2696	
499.00 > 99.00	2.117	2.117	0.0	1.000	1444674		4.49(0.00-0.00)	1227	
* 7 13C4 PFOS									
503.00 > 80.00	2.117	2.119	-0.002		4861097	28.7		2871	S
9 Perfluorononanoic acid									
463.00 > 419.00	2.124	2.131	-0.007	1.000	2128358	17.9		81.1	
\$ 10 13C2 PFDA									
515.00 > 470.00	2.291	2.291	0.0	1.000	1046326	9.16		3288	



[QC Flag Legend](#)

Processing Flags

s - Failed ISTD Recovery Test

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170628-44833.b\2017.06.28\_537B\_005.d

Injection Date: 28-Jun-2017 17:22:33

Instrument ID: A8\_N

Lims ID: LCSD 320-169764/3-A

Client ID:

Operator ID: SACINSTLCMS01

ALS Bottle#: 3

Worklist Smp#: 5

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

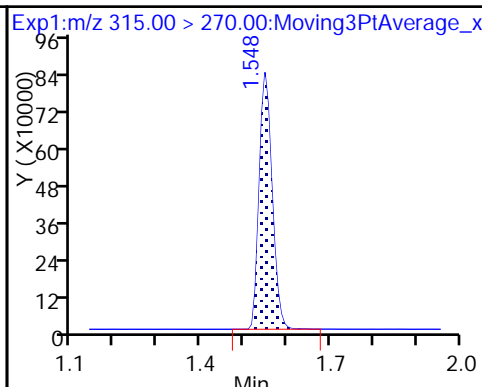
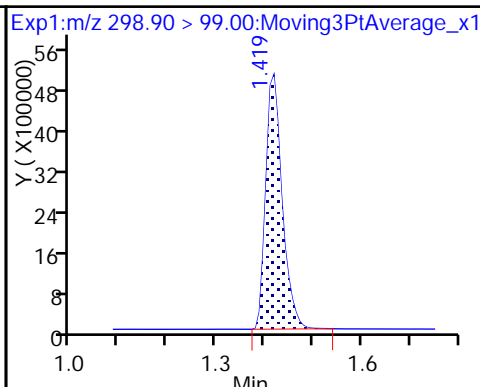
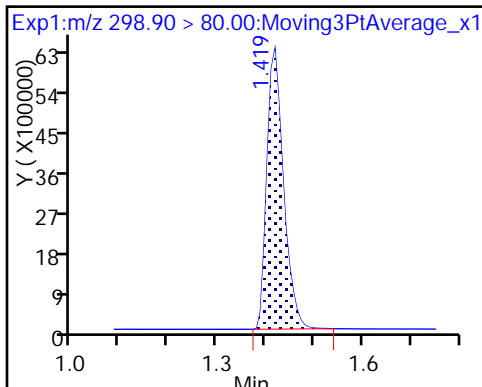
Method: 537\_A8\_N

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

1 Perfluorobutanesulfonic acid

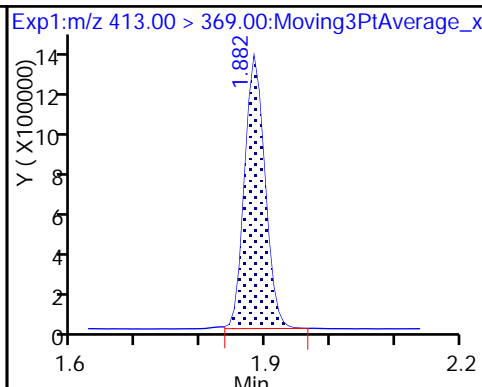
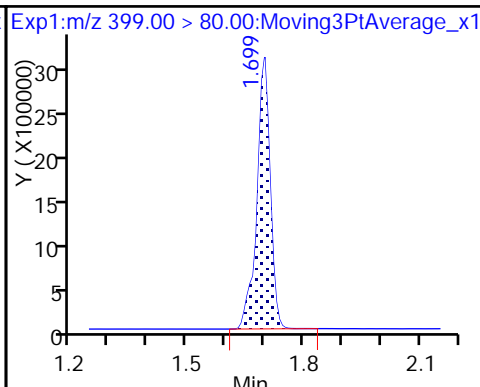
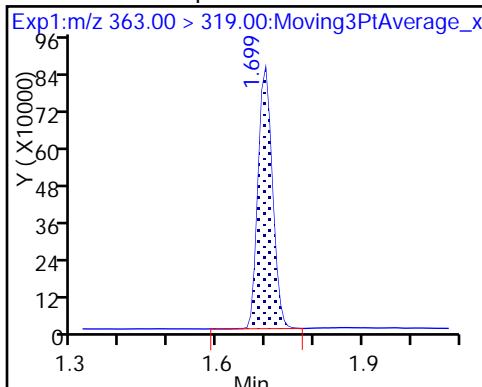
\$ 2 13C2 PFHxA



4 Perfluoroheptanoic acid

3 Perfluorohexanesulfonic acid

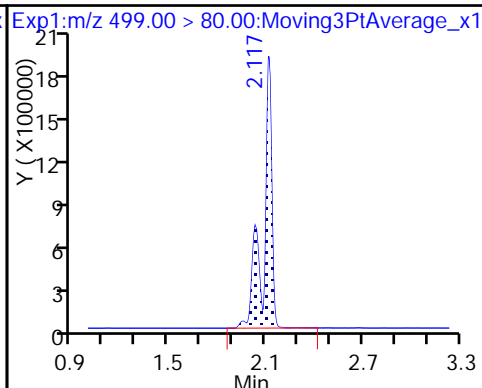
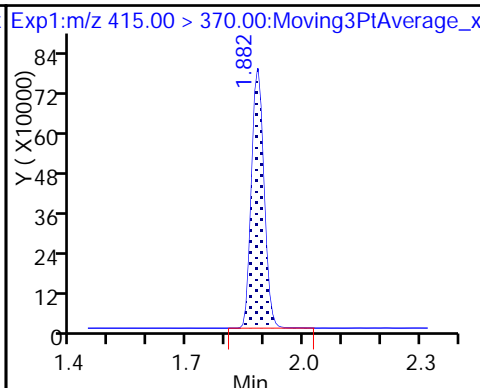
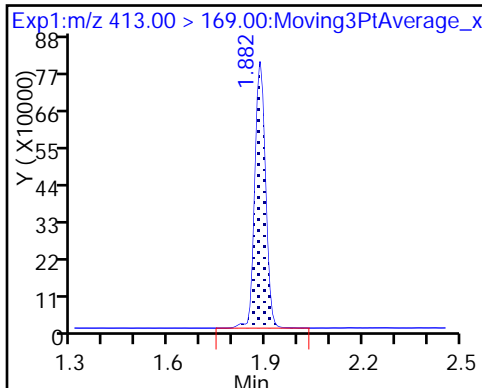
5 Perfluorooctanoic acid



5 Perfluorooctanoic acid

\* 6 13C2-PFOA

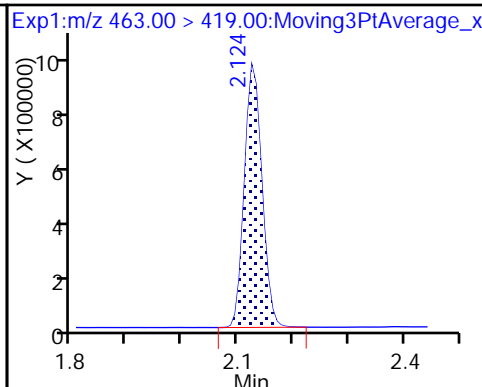
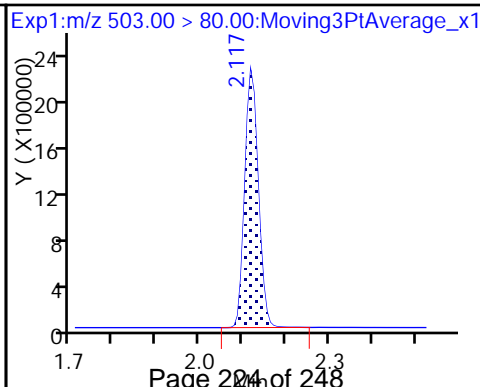
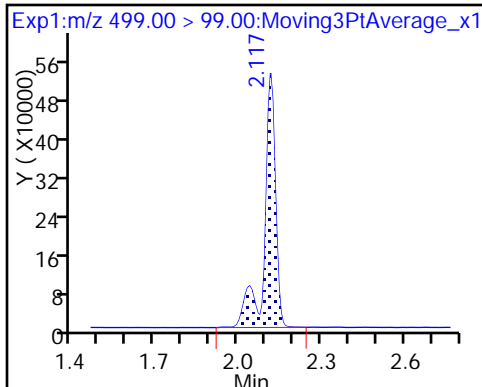
8 Perfluorooctane sulfonic acid



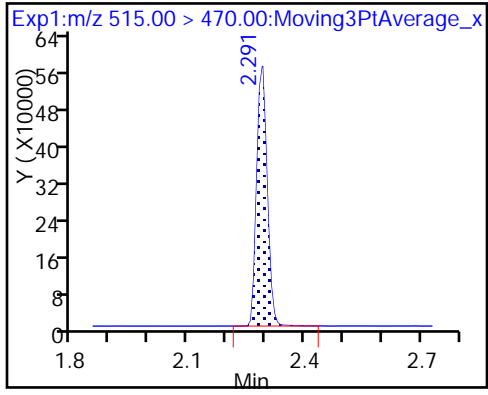
8 Perfluorooctane sulfonic acid

\* 7 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170628-44833.b\2017.06.28\_537B\_005.d  
 Lims ID: LCSD 320-169764/3-A  
 Client ID:  
 Sample Type: LCSD  
 Inject. Date: 28-Jun-2017 17:22:33 ALS Bottle#: 3 Worklist Smp#: 5  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: lcsd 320-169764/3-a  
 Misc. Info.: Plate: 1 Rack: 2  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20170628-44833.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 29-Jun-2017 13:54:12 Calib Date: 28-Jun-2017 16:35:04  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20170628-44832.b\2017.06.28\_537\_CURVE\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK033

First Level Reviewer: barnettj Date: 29-Jun-2017 11:01:52

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	8.23	82.32
\$ 10 13C2 PFDA	10.0	9.16	91.58

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-28987-1

SDG No.: \_\_\_\_\_

Instrument ID: A8\_N Start Date: 06/19/2017 17:40

Analysis Batch Number: 169955 End Date: 06/19/2017 18:23

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-169955/4		06/19/2017 17:40	1	2017.06.19_537A ICAL 004.d	GeminiC18 3x100 3(mm)
IC 320-169955/5		06/19/2017 17:45	1	2017.06.19_537A ICAL 005.d	GeminiC18 3x100 3(mm)
IC 320-169955/6		06/19/2017 17:50	1	2017.06.19_537A ICAL 006.d	GeminiC18 3x100 3(mm)
IC 320-169955/7 ICISAV		06/19/2017 17:55	1	2017.06.19_537A ICAL 007.d	GeminiC18 3x100 3(mm)
IC 320-169955/8		06/19/2017 17:59	1	2017.06.19_537A ICAL 008.d	GeminiC18 3x100 3(mm)
IC 320-169955/9		06/19/2017 18:04	1	2017.06.19_537A ICAL 009.d	GeminiC18 3x100 3(mm)
ZZZZZ		06/19/2017 18:09	1		GeminiC18 3x100 3(mm)
CCVL 320-169955/11		06/19/2017 18:14	1	2017.06.19_537A ICAL 011.d	GeminiC18 3x100 3(mm)
ICV 320-169955/13		06/19/2017 18:23	1	2017.06.19_537A ICAL 013.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-28987-1

SDG No.: \_\_\_\_\_

Instrument ID: A8\_N Start Date: 06/23/2017 21:32

Analysis Batch Number: 170756 End Date: 06/23/2017 22:29

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCVL 320-170756/4		06/23/2017 21:32	1	2017.06.23_537_004.d	GeminiC18 3x100 3(mm)
CCV 320-170756/5 CCVIS		06/23/2017 21:37	1		GeminiC18 3x100 3(mm)
ZZZZZ		06/23/2017 21:42	1		GeminiC18 3x100 3(mm)
ZZZZZ		06/23/2017 21:46	1		GeminiC18 3x100 3(mm)
ZZZZZ		06/23/2017 21:51	1		GeminiC18 3x100 3(mm)
ZZZZZ		06/23/2017 21:56	1		GeminiC18 3x100 3(mm)
ZZZZZ		06/23/2017 22:01	1		GeminiC18 3x100 3(mm)
ZZZZZ		06/23/2017 22:05	1		GeminiC18 3x100 3(mm)
ZZZZZ		06/23/2017 22:10	1		GeminiC18 3x100 3(mm)
ZZZZZ		06/23/2017 22:15	1		GeminiC18 3x100 3(mm)
ZZZZZ		06/23/2017 22:20	1		GeminiC18 3x100 3(mm)
ZZZZZ		06/23/2017 22:24	1		GeminiC18 3x100 3(mm)
CCV 320-170756/16 CCVIS		06/23/2017 22:29	1		GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-28987-1

SDG No.: \_\_\_\_\_

Instrument ID: A8\_N Start Date: 06/23/2017 22:29

Analysis Batch Number: 170757 End Date: 06/23/2017 23:26

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-170757/16 CCVIS		06/23/2017 22:29	1	2017.06.23_537_016.d	GeminiC18 3x100 3(mm)
ZZZZZ		06/23/2017 22:34	1		GeminiC18 3x100 3(mm)
MB 320-169764/1-A		06/23/2017 22:39	1	2017.06.23_537_018.d	GeminiC18 3x100 3(mm)
LCS 320-169764/2-A		06/23/2017 22:43	1	2017.06.23_537_019.d	GeminiC18 3x100 3(mm)
ZZZZZ		06/23/2017 22:48	1		GeminiC18 3x100 3(mm)
ZZZZZ		06/23/2017 22:53	1		GeminiC18 3x100 3(mm)
ZZZZZ		06/23/2017 22:58	1		GeminiC18 3x100 3(mm)
ZZZZZ		06/23/2017 23:02	1		GeminiC18 3x100 3(mm)
ZZZZZ		06/23/2017 23:07	1		GeminiC18 3x100 3(mm)
ZZZZZ		06/23/2017 23:12	1		GeminiC18 3x100 3(mm)
ZZZZZ		06/23/2017 23:17	1		GeminiC18 3x100 3(mm)
ZZZZZ		06/23/2017 23:21	1		GeminiC18 3x100 3(mm)
CCV 320-170757/28 CCVIS		06/23/2017 23:26	1	2017.06.23_537_028.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-28987-1

SDG No.: \_\_\_\_\_

Instrument ID: A8\_N Start Date: 06/23/2017 23:26

Analysis Batch Number: 170758 End Date: 06/24/2017 00:23

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-170758/28 CCVIS		06/23/2017 23:26	1	2017.06.23_537_028.d	GeminiC18 3x100 3(mm)
ZZZZZ		06/23/2017 23:31	1		GeminiC18 3x100 3(mm)
ZZZZZ		06/23/2017 23:36	1		GeminiC18 3x100 3(mm)
ZZZZZ		06/23/2017 23:40	1		GeminiC18 3x100 3(mm)
ZZZZZ		06/23/2017 23:45	1		GeminiC18 3x100 3(mm)
ZZZZZ		06/23/2017 23:50	1		GeminiC18 3x100 3(mm)
ZZZZZ		06/23/2017 23:55	1		GeminiC18 3x100 3(mm)
ZZZZZ		06/23/2017 23:59	1		GeminiC18 3x100 3(mm)
ZZZZZ		06/24/2017 00:04	1		GeminiC18 3x100 3(mm)
ZZZZZ		06/24/2017 00:09	1		GeminiC18 3x100 3(mm)
320-28987-1		06/24/2017 00:13	1	2017.06.23_537_038.d	GeminiC18 3x100 3(mm)
320-28987-2		06/24/2017 00:18	1	2017.06.23_537_039.d	GeminiC18 3x100 3(mm)
CCV 320-170758/40 CCVIS		06/24/2017 00:23	1	2017.06.23_537_040.d	GeminiC18 3x100 3(mm)



LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-28987-1

SDG No.: \_\_\_\_\_

Instrument ID: A8\_N Start Date: 06/28/2017 16:11

Analysis Batch Number: 171480 End Date: 06/28/2017 16:54

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-171480/4		06/28/2017 16:11	1	2017.06.28_537_ CURVE 004.d	GeminiC18 3x100 3(mm)
IC 320-171480/5		06/28/2017 16:16	1	2017.06.28_537_ CURVE 005.d	GeminiC18 3x100 3(mm)
IC 320-171480/6		06/28/2017 16:20	1	2017.06.28_537_ CURVE 006.d	GeminiC18 3x100 3(mm)
IC 320-171480/7 ICISAV		06/28/2017 16:25	1	2017.06.28_537_ CURVE 007.d	GeminiC18 3x100 3(mm)
IC 320-171480/8		06/28/2017 16:30	1	2017.06.28_537_ CURVE 008.d	GeminiC18 3x100 3(mm)
IC 320-171480/9		06/28/2017 16:35	1	2017.06.28_537_ CURVE 009.d	GeminiC18 3x100 3(mm)
ZZZZZ		06/28/2017 16:39	1		GeminiC18 3x100 3(mm)
CCVL 320-171480/11		06/28/2017 16:44	1	2017.06.28_537_ CURVE 011.d	GeminiC18 3x100 3(mm)
ZZZZZ		06/28/2017 16:49	1		GeminiC18 3x100 3(mm)
ICV 320-171480/13		06/28/2017 16:54	1	2017.06.28_537_ CURVE 013.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-28987-1

SDG No.: \_\_\_\_\_

Instrument ID: A8\_N Start Date: 06/28/2017 17:03

Analysis Batch Number: 171486 End Date: 06/28/2017 18:00

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-171486/1 CCVIS		06/28/2017 17:03	1	2017.06.28_537B 001.d	GeminiC18 3x100 3(mm)
ZZZZZ		06/28/2017 17:08	1		GeminiC18 3x100 3(mm)
ZZZZZ		06/28/2017 17:13	1		GeminiC18 3x100 3(mm)
ZZZZZ		06/28/2017 17:17	1		GeminiC18 3x100 3(mm)
LCSD 320-169764/3-A		06/28/2017 17:22	1	2017.06.28_537B 005.d	GeminiC18 3x100 3(mm)
ZZZZZ		06/28/2017 17:27	1		GeminiC18 3x100 3(mm)
ZZZZZ		06/28/2017 17:32	1		GeminiC18 3x100 3(mm)
ZZZZZ		06/28/2017 17:36	1		GeminiC18 3x100 3(mm)
ZZZZZ		06/28/2017 17:41	1		GeminiC18 3x100 3(mm)
ZZZZZ		06/28/2017 17:46	1		GeminiC18 3x100 3(mm)
ZZZZZ		06/28/2017 17:51	1		GeminiC18 3x100 3(mm)
ZZZZZ		06/28/2017 17:55	1		GeminiC18 3x100 3(mm)
CCV 320-171486/13 CCVIS		06/28/2017 18:00	1	2017.06.28_537B 013.d	GeminiC18 3x100 3(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-28987-1

SDG No.: \_\_\_\_\_

Batch Number: 169764 Batch Start Date: 06/19/17 09:24 Batch Analyst: Sharifi, Nooshin

Batch Method: 537 Batch End Date: 06/20/17 19:18

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	ReceivedpH	LC537-IS 00038
MB 320-169764/1		537, 537				250 mL	1.0 mL	7 SU	100 uL
LCS 320-169764/2		537, 537				250 mL	1.0 mL	7 SU	100 uL
LCSD 320-169764/3		537, 537				250 mL	1.0 mL	7 SU	100 uL
320-28987-A-1	NAWC-060817-RW-303	537, 537	T	298.63 g	27.99 g	270.6 mL	1.0 mL	7 SU	100 uL
320-28987-A-2	NAWC-060817-FRB-303	537, 537	T	299.65 g	27.13 g	272.5 mL	1.0 mL	7 SU	100 uL

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-MSP 00021	LC537-SU 00042	AnalysisComment			
MB 320-169764/1		537, 537			100 uL	CH ND			
LCS 320-169764/2		537, 537		100 uL	100 uL	CH ND			
LCSD 320-169764/3		537, 537		100 uL	100 uL	CH ND			
320-28987-A-1	NAWC-060817-RW-303	537, 537	T		100 uL	CH ND			
320-28987-A-2	NAWC-060817-FRB-303	537, 537	T		100 uL	CH ND			

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

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-28987-1

SDG No.: \_\_\_\_\_

Batch Number: 169764 Batch Start Date: 06/19/17 09:24 Batch Analyst: Sharifi, Nooshin

Batch Method: 537 Batch End Date: 06/20/17 19:18

Batch Notes	
Batch Comment	IS: 911914
Manifold ID	4, 1
Methanol ID	952645
Pipette ID	M16387D
Analyst ID - IS Reagent Drop	VPM
Analyst ID - IS Reagent Drop Witness	TN
Analyst ID - SU Reagent Drop	NSH
Analyst ID - SU Reagent Drop Witness	JNS
Analyst ID - TA Reagent Drop	NSH
Analyst ID - TA Reagent Drop Witness	JNS
SPE Cartridge ID	6346595-04
Trizma ID	SLBR4303V
Reagent Water ID	6-14-17

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: 28916, 28987 Instrument ID & Date: 6-23-17 ICAL Batch: 169955, 171480  
 Extraction Batch: 169764 Worklist #: 44660, 44833 TALS Batch: 170757, 170758, 171486, 171487

Review Items	--- Level 1 ---			Level 2
	Yes	No	N/A	
<b>Initial Calibration</b>				
1. Is ICAL verified and locked in Chrom & TALS?	✓			✓
2. Is ICV properly linked in TALS?	✓			✓
<b>Continuing Calibration</b>				
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.	✓			✓
<b>Client Samples &amp; QC Sample Results</b>				
1. Were preparation and analysis done within holding times?	✓			✓
2. Are Chromatograms reviewed and spectra verified?	✓			✓
3. Are positive results within calibration range?	✓			✓
4. Dilutions due to target cpds? _____ Dilutions due to non-targets? _____			✓	
5. All target compounds in MB < 1/3 RL ? (Requires NCM if "no.")	✓			✓
6. Are target constituents in LCS/LCSD within method control limits?	✓			✓
7. Internal Standard areas in control for all samples and QC reported? ±50% from the average area of the ICAL and 70-140% of the most recent CCV	✓			✓
8. Do results (e.g., dilutions/trip blanks) make sense?	✓			✓
9. Are MS/MSD recoveries and RPDs within method control limits?			✓	
10. Are all QC samples properly linked in TALS?	✓			✓
11. All manual integrations appropriate and completely documented?	✓			✓
12. Are nonconformances documented as NCMs?	✓			✓
13. Are all Chrom graphics uploaded?	✓			✓

1st Level Reviewer / Date: JRB 6-29-17 2nd Level Reviewer / Date: MKwaf 6/30/2017

NCM # and Comments: 92430 (Re-prep ncm)

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A8

Instrument ID & Date: 6-19-17 Worklist#: 44448

ICAL Batch: 169955, 169956 Calibration ID number: 31800, 31801

Review Items	-- Level 1 --			Level 2
	Yes	No	N/A	
<b>Initial Calibration</b>				
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 <sup>2</sup> ) Linear Quadratic (6 points minimum)				
4. Meets fit criteria? Intercept ≤ 1/2 RL RSD ≤ 30% for Average R <sup>2</sup> ≥ 0.990 for Linear R <sup>2</sup> ≥ 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 <sup>nd</sup> source) ± 30% of true value?	✓			✓
11. Is ICV (2 <sup>nd</sup> 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?				✓

1<sup>st</sup> Level Reviewer / Date: JRB 6-20-17 2<sup>nd</sup> Level Reviewer / Date: Murphy 6/20/2017

NCM # and Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

A8

Instrument ID & Date: 6-28-17 Worklist#: 44832

ICAL Batch: 171480, 171481 Calibration ID number: 32056, 32057

Review Items	-- Level 1 --			Level 2
	Yes	No	N/A	
<b>Initial Calibration</b>				
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 <sup>2</sup> )Linear <u>Quadratic</u> (6 points minimum)				
4. Meets fit criteria? Intercept ≤ 1/2 RL RSD ≤ 30% for Average R <sup>2</sup> ≥ 0.990 for Linear R <sup>2</sup> ≥ 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 <sup>nd</sup> source) ± 30% of true value?	✓			✓
11. Is ICV (2 <sup>nd</sup> 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?				✓

1<sup>st</sup> Level Reviewer / Date: JRB 6-29-17

2<sup>nd</sup> Level Reviewer / Date: MKWAY 6/29/2017

NCM # and Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

TestAmerica Laboratories  
Worklist QC Batch Report

Worklist Name: 23JUN2017A\_537A                      Worklist Number: 44660  
 Instrument Name: A8\_N                                  Chrom Method: 537\_A8\_N  
 Data Directory: \\ChromNa\Sacramento\ChromData\A8\_N\20170623-44660.b  
 QC Batching: Enabled                                  Limit Group Batching: Enabled

QC Batch: 1	LC 537 ICAL Raw Batch: 170756
# 1 RINSE	# 1 RINSE
# 2 RINSE	# 2 RINSE
# 3 RINSE	# 3 RINSE
# 4 CCVL	# 4 CCVL
# 5 CCV L5	# 5 CCV L5
# 6 RB	# 6 RB
# 7 MB 320-169979/1-A	# 7 MB 320-169979/1-A
# 8 LCS 320-169979/2-A	# 8 LCS 320-169979/2-A
# 9 LCSD 320-169979/3-A	# 9 LCSD 320-169979/3-A
#10 590-6274-A-1-A	#10 590-6274-A-1-A
#11 320-29094-A-1-A	#11 320-29094-A-1-A
#12 440-186667-A-3-A	#12 440-186667-A-3-A
#13 440-186667-A-4-A	#13 440-186667-A-4-A
#14 440-186667-A-5-A	#14 440-186667-A-5-A
#15 440-186667-A-6-A	#15 440-186667-A-6-A
#16 CCV L3	#16 CCV L3

QC Batch: 2	LC 537 ICAL Raw Batch: 170757
#16 CCV L3	#16 CCV L3
#17 RB	#17 RB
#18 MB 320-169764/1-A	#18 MB 320-169764/1-A
#19 LCS 320-169764/2-A	#19 LCS 320-169764/2-A
#20 LCSD 320-169764/3-A	#20 LCSD 320-169764/3-A
#21 320-28916-A-1-A	#21 320-28916-A-1-A
#22 320-28916-A-2-A	#22 320-28916-A-2-A
#23 320-28916-A-3-A	#23 320-28916-A-3-A
#24 320-28916-A-4-A	#24 320-28916-A-4-A
#25 320-28916-A-5-A	#25 320-28916-A-5-A
#26 320-28916-A-6-A	#26 320-28916-A-6-A
#27 320-28916-A-7-A	#27 320-28916-A-7-A
#28 CCV L5	#28 CCV L5

QC Batch: 3	LC 537 ICAL Raw Batch: 170758
#28 CCV L5	#28 CCV L5
#29 RB	#29 RB
#30 320-28916-A-8-A	#30 320-28916-A-8-A
#31 320-28916-A-9-A	#31 320-28916-A-9-A
#32 320-28916-A-10-A	#32 320-28916-A-10-A
#33 320-28916-A-11-A	#33 320-28916-A-11-A
#34 320-28916-A-12-A	#34 320-28916-A-12-A
#35 320-28916-A-13-A	#35 320-28916-A-13-A
#36 320-28916-A-14-A	#36 320-28916-A-14-A
#37 320-28916-A-15-A	#37 320-28916-A-15-A
#38 320-28987-A-1-A	#38 320-28987-A-1-A
#39 320-28987-A-2-A	#39 320-28987-A-2-A
#40 CCV L3	#40 CCV L3
#41 RB	#41 RB



TestAmerica Laboratories  
 Worklist QC Batch Report

Worklist Name: 28JUN2017A\_537A                      Worklist Number: 44833  
 Instrument Name: A8\_N                                      Chrom Method: 537\_A8\_N  
 Data Directory: \\ChromNa\Sacramento\ChromData\A8\_N\20170628-44833.b  
 QC Batching: Enabled                                      Limit Group Batching: Enabled

QC Batch: 1	LC 537 ICAL Raw Batch: 171486
# 1 CCV L5	# 1 CCV L5
# 2 RB	# 2 RB
# 3 MB 320-169764/1-A	# 3 MB 320-169764/1-A
# 4 LCS 320-169764/2-A	# 4 LCS 320-169764/2-A
# 5 LCSD 320-169764/3-A	# 5 LCSD 320-169764/3-A
# 6 320-28916-A-1-A	# 6 320-28916-A-1-A
# 7 320-28916-A-2-A	# 7 320-28916-A-2-A
# 8 320-28916-A-3-A	# 8 320-28916-A-3-A
# 9 320-28916-A-4-A	# 9 320-28916-A-4-A
#10 320-28916-A-5-A	#10 320-28916-A-5-A
#11 320-28916-A-6-A	#11 320-28916-A-6-A
#12 320-28916-A-7-A	#12 320-28916-A-7-A
#13 CCV L3	#13 CCV L3

QC Batch: 2	LC 537 ICAL Raw Batch: 171487
#13 CCV L3	#13 CCV L3
#14 RB	#14 RB
#15 320-28916-A-8-A	#15 320-28916-A-8-A
#16 320-28916-A-9-A	#16 320-28916-A-9-A
#17 320-28916-A-10-A	#17 320-28916-A-10-A
#18 320-28916-A-11-A	#18 320-28916-A-11-A
#19 320-28916-A-12-A	#19 320-28916-A-12-A
#20 320-28916-A-13-A	#20 320-28916-A-13-A
#21 320-28916-A-14-A	#21 320-28916-A-14-A
#22 320-28916-A-15-A	#22 320-28916-A-15-A
#23 320-28987-A-1-A	#23 320-28987-A-1-A
#24 320-28987-A-2-A	#24 320-28987-A-2-A
#25 CCV L5	#25 CCV L5
#26 RB	#26 RB

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AS 6/24/17

# Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-169764











Analyst: Sharifi, Nooshin

Batch Open: 6/19/2017 9:24:00AM

Method Code: 320-537\_Prep-320

Batch End: 6/20/2017 7:18:00PM

## 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~320-169764/1 N/A	N/A		250 mL	7			N/A	N/A	N/A	CH ND	
			1.0 mL								
2 LCS~320-169764/2 N/A	N/A		250 mL	7			N/A	N/A	N/A	CH ND	
			1.0 mL								
3 LCSD~320-169764/3 N/A	N/A		250 mL	7			N/A	N/A	N/A	CH ND	
			1.0 mL								
4 320-28916-A-1 (537_DOD5)	N/A (320-28916-1)	284.82 g	257.5 mL	7			6/14/17	16_Days	4	CH ND	
		27.36 g	1.0 mL								
5 320-28916-A-2 (537_DOD5)	N/A (320-28916-1)	290.73 g	264.1 mL	7			6/14/17	16_Days	4	CH ND	
		26.64 g	1.0 mL								
6 320-28916-A-3 (537_DOD5)	N/A (320-28916-1)	290.03 g	262.4 mL	7			6/14/17	16_Days	4	CH ND	
		27.61 g	1.0 mL								
7 320-28916-A-4 (537_DOD5)	N/A (320-28916-1)	297.40 g	270 mL	7			6/14/17	16_Days	4	CH ND	
		27.45 g	1.0 mL								
8 320-28916-A-5 (537_DOD5)	N/A (320-28916-1)	291.29 g	264 mL	7			6/14/17	16_Days	4	CH ND	
		27.27 g	1.0 mL								
9 320-28916-A-6 (537_DOD5)	N/A (320-28916-1)	284.91 g	257.3 mL	7			6/14/17	16_Days	4	CH ND	
		27.63 g	1.0 mL								
10 320-28916-A-7 (537_DOD5)	N/A (320-28916-1)	285.67 g	258.2 mL	7			6/14/17	16_Days	4	CH ND	
		27.44 g	1.0 mL								

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# Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)











Batch Number: 320-169764

Analyst: Sharifi, Nooshin

Batch Open: 6/19/2017 9:24:00AM

Method Code: 320-537\_Prep-320

Batch End: 6/20/2017 7:18:00PM

11	320-28916-A-8 (537_DOD5)	N/A (320-28916-1)	294.30 g	267.2 mL	7		6/14/17	16_Days	4	CH ND	
			27.13 g	1.0 mL							
12	320-28916-A-9 (537_DOD5)	N/A (320-28916-1)	284.71 g	257.1 mL	7		6/14/17	16_Days	4	CH ND	
			27.62 g	1.0 mL							
13	320-28916-A-10 (537_DOD5)	N/A (320-28916-1)	288.47 g	261.7 mL	7		6/14/17	16_Days	4	CH ND	
			26.74 g	1.0 mL							
14	320-28916-A-11 (537_DOD5)	N/A (320-28916-1)	287.74 g	259.8 mL	7		6/14/17	16_Days	4	CH ND	
			27.98 g	1.0 mL							
15	320-28916-A-12 (537_DOD5)	N/A (320-28916-1)	289.91 g	261.8 mL	7		6/14/17	16_Days	4	CH ND	
			28.15 g	1.0 mL							
16	320-28916-A-13 (537_DOD5)	N/A (320-28916-1)	286.04 g	258 mL	7		6/14/17	16_Days	4	CH ND	
			28.00 g	1.0 mL							
17	320-28916-A-14 (537_DOD5)	N/A (320-28916-1)	295.46 g	268.3 mL	7		6/14/17	16_Days	4	CH ND	
			27.15 g	1.0 mL							
18	320-28916-A-15 (537_DOD5)	N/A (320-28916-1)	296.93 g	269.9 mL	7		6/14/17	16_Days	4	CH ND	
			27.08 g	1.0 mL							
19	320-28987-A-1 (537_DOD5)	N/A (320-28987-1)	298.63 g	270.6 mL	7		6/15/17	16_Days	4	CH ND	
			27.99 g	1.0 mL							
20	320-28987-A-2 (537_DOD5)	N/A (320-28987-1)	299.65 g	272.5 mL	7		6/15/17	16_Days	4	CH ND	
			27.13 g	1.0 mL							

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# Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-169764

Analyst: Sharifi, Nooshin

Batch Open: 6/19/2017 9:24:00AM

Method Code: 320-537\_Prep-320

Batch End: 6/20/2017 7:18:00PM

## Batch Notes

Manifold ID 4, 1

Trizma ID SLBR4303V

SPE Cartridge ID 6346595-04

Methanol ID 952645

Reagent Water ID 6-14-17

Pipette ID M16387D

Analyst ID - TA Reagent Drop NSH

Analyst ID - TA Reagent Drop JNS

Witness

Analyst ID - SU Reagent Drop NSH

Analyst ID - SU Reagent Drop JNS

Witness

Analyst ID - IS Reagent Drop VPM

Analyst ID - IS Reagent Drop TN

Witness

Batch Comment IS: 911914

## Comments

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# Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-169764

Analyst: Sharifi, Nooshin

Batch Open: 6/19/2017 9:24:00AM

Method Code: 320-537\_Prep-320

Batch End:

## Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-169764/1	LC537-SU_00042	100 uL	1.0 mL	NSH 6-19-17	JNS 6/19/17
LCS 320-169764/2	LC537-MSP_00021	100 uL	1.0 mL	↓	↓
LCS 320-169764/2	LC537-SU_00042	100 uL	1.0 mL		
LCSD 320-169764/3	LC537-MSP_00021	100 uL	1.0 mL		
LCSD 320-169764/3	LC537-SU_00042	100 uL	1.0 mL		
320-28916-A-1	LC537-SU_00042	100 uL	1.0 mL		
320-28916-A-2	LC537-SU_00042	100 uL	1.0 mL		
320-28916-A-3	LC537-SU_00042	100 uL	1.0 mL		
320-28916-A-4	LC537-SU_00042	100 uL	1.0 mL		
320-28916-A-5	LC537-SU_00042	100 uL	1.0 mL		
320-28916-A-6	LC537-SU_00042	100 uL	1.0 mL		
320-28916-A-7	LC537-SU_00042	100 uL	1.0 mL		
320-28916-A-8	LC537-SU_00042	100 uL	1.0 mL		
320-28916-A-9	LC537-SU_00042	100 uL	1.0 mL		
320-28916-A-10	LC537-SU_00042	100 uL	1.0 mL		
320-28916-A-11	LC537-SU_00042	100 uL	1.0 mL		
320-28916-A-12	LC537-SU_00042	100 uL	1.0 mL		
320-28916-A-13	LC537-SU_00042	100 uL	1.0 mL		

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# Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-169764

Analyst: Sharifi, Nooshin

Batch Open: 6/19/2017 9:24:00AM

Method Code: 320-537\_Prep-320

Batch End:

320-28916-A-14	LC537-SU_00042	100 uL	1.0 mL	NSH 6-19-17	JNS 6/19/17
320-28916-A-15	LC537-SU_00042	100 uL	1.0 mL	↓	↓
320-28987-A-1	LC537-SU_00042	100 uL	1.0 mL		
320-28987-A-2	LC537-SU_00042	100 uL	1.0 mL	↓	↓

### Other Reagents:

Reagent	Amount/Units	Lot#:

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Preparation Batch Number(s): 169764 Test: 587-0005  
 Earliest Holding Time: 06-21-17

<b>Sample List Tab</b>		1 <sup>st</sup> Level Reviewer	2 <sup>nd</sup> Level Reviewer
Samples identified to the correct method		✓	✓
All necessary NCMs filed (including holding time)		✓	✓
Method/sample/login/QAS checked and correct		✓	✓
<b>Worksheet Tab</b>		1 <sup>st</sup> Level Reviewer	2 <sup>nd</sup> 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		✓	✓
<b>Reagents Tab</b>		1 <sup>st</sup> Level Reviewer	2 <sup>nd</sup> Level Reviewer
All necessary reagents not expired and entered into TALS		✓	✓
All spike amounts correct and added to necessary samples and QC		✓	✓
<b>Batch Information</b>		1 <sup>st</sup> Level Reviewer	2 <sup>nd</sup> Level Reviewer
Date and time accurate and entered into TALS correctly		✓	✓
All necessary 'batch information' complete and entered into TALS correctly		✓	✓

1<sup>st</sup> Level Reviewer: TNF

Date: 06/20/17

2<sup>nd</sup> Level Reviewer: VPM

Date: 6/20/17

Comments: \_\_\_\_\_

# Shipping and Receiving Documents



**TestAmerica Sacramento**

880 Riverside Parkway

West Sacramento, CA 95605-1500  
phone 916.373.5600 fax 303.467.7248


**Chain of Custody Record**

**TestAmerica**

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Regulatory Program:  DW  NPDES  RCRA  Other:

<b>Client Contact</b>		<b>Project Manager: Andy Frebowitz</b>		<b>Site Contact: Mary Kay Bond</b>		<b>Date: 6/8/2017</b>		<b>COC No:</b>		
TetraTech		Tel/Fax: 610-382-1170		Lab Contact: Dave Alltucker		Carrier: FedEx		1 of 1 COCs		
234 Mall Boulevard Suite 260		<b>Analysis Turnaround Time</b>		Filtered Sample (Y/N) Perform MS / MSD (Y/N) EPA 537 UCMR3		 320-28987 Chain of Custody		Samplers: Andy Frebowitz, Mary Kay Bond		
King of Prussia, PA 19406		<input checked="" type="checkbox"/> CALENDAR DAYS <input type="checkbox"/> WORKING DAYS TAT if different from Below <u>21</u> days						For Lab Use Only:		
(610) 382-1174 Phone		<input type="checkbox"/> 2 weeks						Walk-in Client:		
(610) 491-9645 FAX		<input type="checkbox"/> 1 week						Lab Sampling:		
Project Name: Warminster		<input type="checkbox"/> 2 days						Job / SDG No.:		
Site: Warminster		<input type="checkbox"/> 1 day								
P O # 1132358 (through EarthToxics)										
<b>Sample Identification</b>		<b>Sample Date</b>	<b>Sample Time</b>	<b>Sample Type (C=Comp, G=Grab)</b>	<b>Matrix</b>	<b># of Cont.</b>	<b>Filtered Sample (Y/N)</b>	<b>Perform MS / MSD (Y/N)</b>	<b>EPA 537 UCMR3</b>	<b>Sample Specific Notes:</b>
* NAWC-060817-RW-303	6/8/17	08:05	G	DW	2	N	Y			
NAWC-060817-FRB-303	6/8/17	08:00	G	BLK	2	N	Y			Field Reagent Blank
* rec'd with 1 bottle with punctured straw found by 6-9-17										
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other <u>Trizma</u>							6			
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.							Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)			
<input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown							<input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab <input type="checkbox"/> Archive for _____ Months			
Special Instructions/QC Requirements & Comments: FedEx Air Bill <del>8122 0163 9128</del> 6612 1992 5950										
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Cooler Temp. (°C): Obs'd: <u>8.1</u> Corr'd: <u>8.1</u>		Therm ID No.: <u>AK-2</u>				
Relinquished by: <u>Mary Kay Bond</u>		Company: <u>Tetra Tech</u>		Date/Time: <u>6/8/17 10:00</u>		Received by: <u>Joe P. Bl</u>		Company: <u>TAW5</u>		Date/Time: <u>6/9/17 0925</u>
Relinquished by:		Company:		Date/Time:		Received by:		Company:		Date/Time:
Relinquished by:		Company:		Date/Time:		Received in Laboratory by:		Company:		Date/Time:

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# Login Sample Receipt Checklist

Client: Tetra Tech, Inc.

Job Number: 320-28987-1

**Login Number: 28987**  
**List Number: 1**  
**Creator: Hytrek, Cheryl**

**List Source: TestAmerica Sacramento**

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	False	Cooler temperature outside required temperature criteria.
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.	False	Containers recd broken. Sufficient sample in remaining containers for analysis.
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

"NAWC-060817-RW-303", "537", "RES", "320-28987-1", "TALSAC", "1763-23-1", "Perfluorooctanesulfonic acid (PFOS)", "20", "ng/L", "J", "6.3", "DL", "", "TRG", "", "", "37", "LOQ", "YES", "-99", "", "270.6", "1.0", "15", ""

"NAWC-060817-RW-303", "537", "RES", "320-28987-1", "TALSAC", "335-67-1", "Perfluorooctanoic acid (PFOA)", "20", "ng/L", "", "2.6", "DL", "", "TRG", "", "", "18", "LOQ", "YES", "-99", "", "270.6", "1.0", "7.4", ""

"NAWC-060817-RW-303", "537", "RES", "320-28987-1", "TALSAC", "355-46-4", "Perfluorohexanesulfonic acid (PFHxS)", "7.6", "ng/L", "J", "5.1", "DL", "", "TRG", "", "", "28", "LOQ", "YES", "-99", "", "270.6", "1.0", "11", ""

"NAWC-060817-RW-303", "537", "RES", "320-28987-1", "TALSAC", "375-73-5", "Perfluorobutanesulfonic acid (PFBS)", "33", "ng/L", "U M", "15", "DL", "", "TRG", "", "", "83", "LOQ", "YES", "-99", "", "270.6", "1.0", "33", ""

"NAWC-060817-RW-303", "537", "RES", "320-28987-1", "TALSAC", "375-85-9", "Perfluoroheptanoic acid (PFHpA)", "5.4", "ng/L", "J", "1.8", "DL", "", "TRG", "", "", "9.2", "LOQ", "YES", "-99", "", "270.6", "1.0", "3.7", ""

"NAWC-060817-RW-303", "537", "RES", "320-28987-1", "TALSAC", "375-95-1", "Perfluorononanoic acid (PFNA)", "18", "ng/L", "U", "7.4", "DL", "", "TRG", "", "", "22", "LOQ", "YES", "-99", "", "270.6", "1.0", "18", ""

"NAWC-060817-RW-303", "537", "RES", "320-28987-1", "TALSAC", "STL00993", "13C2  
PFHxA", "31", "ng/L", "", "-99", "DL", "", "SURR", "84", "", "-99", "LOQ", "YES", "37.0", "", "270.6", "1.0", "0", ""

"NAWC-060817-RW-303", "537", "RES", "320-28987-1", "TALSAC", "STL00996", "13C2  
PFDA", "27", "ng/L", "", "-99", "DL", "", "SURR", "73", "", "-99", "LOQ", "YES", "37.0", "", "270.6", "1.0", "0", ""

"NAWC-060817-FRB-303", "537", "RES", "320-28987-2", "TALSAC", "1763-23-1", "Perfluorooctanesulfonic acid (PFOS)", "15", "ng/L", "U", "6.2", "DL", "", "TRG", "", "", "37", "LOQ", "YES", "-99", "", "272.5", "1.0", "15", ""

"NAWC-060817-FRB-303", "537", "RES", "320-28987-2", "TALSAC", "335-67-1", "Perfluorooctanoic acid (PFOA)", "7.3", "ng/L", "U", "2.6", "DL", "", "TRG", "", "", "18", "LOQ", "YES", "-99", "", "272.5", "1.0", "7.3", ""

"NAWC-060817-FRB-303", "537", "RES", "320-28987-2", "TALSAC", "355-46-4", "Perfluorohexanesulfonic acid (PFHxS)", "11", "ng/L", "U", "5.0", "DL", "", "TRG", "", "", "28", "LOQ", "YES", "-99", "", "272.5", "1.0", "11", ""

"NAWC-060817-FRB-303", "537", "RES", "320-28987-2", "TALSAC", "375-73-5", "Perfluorobutanesulfonic acid (PFBS)", "33", "ng/L", "U", "15", "DL", "", "TRG", "", "", "83", "LOQ", "YES", "-99", "", "272.5", "1.0", "33", ""

"NAWC-060817-FRB-303", "537", "RES", "320-28987-2", "TALSAC", "375-85-9", "Perfluoroheptanoic acid (PFHpA)", "3.7", "ng/L", "U", "1.7", "DL", "", "TRG", "", "", "9.2", "LOQ", "YES", "-99", "", "272.5", "1.0", "3.7", ""

"NAWC-060817-FRB-303", "537", "RES", "320-28987-2", "TALSAC", "375-95-1", "Perfluorononanoic acid (PFNA)", "18", "ng/L", "U", "7.3", "DL", "", "TRG", "", "", "22", "LOQ", "YES", "-99", "", "272.5", "1.0", "18", ""

"NAWC-060817-FRB-303", "537", "RES", "320-28987-2", "TALSAC", "STL00993", "13C2  
PFHxA", "33", "ng/L", "", "-99", "DL", "", "SURR", "90", "", "-99", "LOQ", "YES", "36.7", "", "272.5", "1.0", "0", ""

"NAWC-060817-FRB-303", "537", "RES", "320-28987-2", "TALSAC", "STL00996", "13C2  
PFDA", "28", "ng/L", "", "-99", "DL", "", "SURR", "77", "", "-99", "LOQ", "YES", "36.7", "", "272.5", "1.0", "0", ""

"LCS 320-169764/2-A", "537", "RES", "LCS 320-169764/2-A", "TALSAC", "1763-23-1", "Perfluorooctanesulfonic acid (PFOS)", "157", "ng/L", "", "6.8", "DL", "", "SPK", "98", "", "40", "LOQ", "YES", "160", "", "250", "1.0", "16", ""

"LCS 320-169764/2-A", "537", "RES", "LCS 320-169764/2-A", "TALSAC", "335-67-1", "Perfluorooctanoic acid (PFOA)", "82.3", "ng/L", "", "2.8", "DL", "", "SPK", "103", "", "20", "LOQ", "YES", "79.9", "", "250", "1.0", "8.0", ""

"LCS 320-169764/2-A", "537", "RES", "LCS 320-169764/2-A", "TALSAC", "355-46-4", "Perfluorohexanesulfonic acid (PFHxS)", "122", "ng/L", "", "5.5", "DL", "", "SPK", "102", "", "30", "LOQ", "YES", "120", "", "250", "1.0", "12", ""

"LCS 320-169764/2-A", "537", "RES", "LCS 320-169764/2-A", "TALSAC", "375-73-5", "Perfluorobutanesulfonic acid (PFBS)", "383", "ng/L", "", "16", "DL", "", "SPK", "108", "", "90", "LOQ", "YES", "353", "", "250", "1.0", "36", ""

"LCS 320-169764/2-A", "537", "RES", "LCS 320-169764/2-A", "TALSAC", "375-85-9", "Perfluoroheptanoic acid (PFHpA)", "45.4", "ng/L", "", "1.9", "DL", "", "SPK", "115", "", "10", "LOQ", "YES", "39.6", "", "250", "1.0", "4.0", ""

"LCS 320-169764/2-A", "537", "RES", "LCS 320-169764/2-A", "TALSAC", "375-95-1", "Perfluorononanoic acid (PFNA)", "66.1", "ng/L", "", "8.0", "DL", "", "SPK", "86", "", "24", "LOQ", "YES", "77.0", "", "250", "1.0", "20", ""

"LCS 320-169764/2-A", "537", "RES", "LCS 320-169764/2-A", "TALSAC", "STL00993", "13C2  
PFHxA", "36.5", "ng/L", "", "-99", "DL", "", "SURR", "91", "", "-99", "LOQ", "YES", "40.0", "", "250", "1.0", "0", ""

"LCS 320-169764/2-A", "537", "RES", "LCS 320-169764/2-A", "TALSAC", "STL00996", "13C2  
PFDA", "32.2", "ng/L", "", "-99", "DL", "", "SURR", "81", "", "-99", "LOQ", "YES", "40.0", "", "250", "1.0", "0", ""

"LCSD 320-169764/3-A", "537", "RES", "LCSD 320-169764/3-A", "TALSAC", "1763-23-1", "Perfluorooctanesulfonic acid (PFOS)", "148", "ng/L", "", "6.8", "DL", "", "SPK", "93", "6", "40", "LOQ", "YES", "160", "LCS 320-169764/2-A", "250", "1.0", "16", ""

"LCSD 320-169764/3-A", "537", "RES", "LCSD 320-169764/3-A", "TALSAC", "335-67-1", "Perfluorooctanoic acid (PFOA)", "75.0", "ng/L", "", "2.8", "DL", "", "SPK", "94", "9", "20", "LOQ", "YES", "79.9", "LCS 320-169764/2-

A", "250", "1.0", "8.0", ""  
"LCSD 320-169764/3-A", "537", "RES", "LCSD 320-169764/3-A", "TALSAC", "355-46-4", "Perfluorohexanesulfonic acid (PFHxS)", "116", "ng/L", "", "5.5", "DL", "", "SPK", "97", "5", "30", "LOQ", "YES", "120", "LCS 320-169764/2-A", "250", "1.0", "12", ""  
"LCSD 320-169764/3-A", "537", "RES", "LCSD 320-169764/3-A", "TALSAC", "375-73-5", "Perfluorobutanesulfonic acid (PFBS)", "365", "ng/L", "", "16", "DL", "", "SPK", "103", "5", "90", "LOQ", "YES", "353", "LCS 320-169764/2-A", "250", "1.0", "36", ""  
"LCSD 320-169764/3-A", "537", "RES", "LCSD 320-169764/3-A", "TALSAC", "375-85-9", "Perfluoroheptanoic acid (PFHpA)", "40.3", "ng/L", "", "1.9", "DL", "", "SPK", "102", "12", "10", "LOQ", "YES", "39.6", "LCS 320-169764/2-A", "250", "1.0", "4.0", ""  
"LCSD 320-169764/3-A", "537", "RES", "LCSD 320-169764/3-A", "TALSAC", "375-95-1", "Perfluorononanoic acid (PFNA)", "71.6", "ng/L", "", "8.0", "DL", "", "SPK", "93", "8", "24", "LOQ", "YES", "77.0", "LCS 320-169764/2-A", "250", "1.0", "20", ""  
"LCSD 320-169764/3-A", "537", "RES", "LCSD 320-169764/3-A", "TALSAC", "STL00993", "13C2 PFHxA", "32.9", "ng/L", "", "-99", "DL", "", "SURR", "82", "", "-99", "LOQ", "YES", "40.0", "LCS 320-169764/2-A", "250", "1.0", "0", ""  
"LCSD 320-169764/3-A", "537", "RES", "LCSD 320-169764/3-A", "TALSAC", "STL00996", "13C2 PFDA", "36.6", "ng/L", "", "-99", "DL", "", "SURR", "92", "", "-99", "LOQ", "YES", "40.0", "LCS 320-169764/2-A", "250", "1.0", "0", ""  
"MB 320-169764/1-A", "537", "RES", "MB 320-169764/1-A", "TALSAC", "1763-23-1", "Perfluorooctanesulfonic acid (PFOS)", "16", "ng/L", "U", "6.8", "DL", "", "TRG", "", "", "40", "LOQ", "YES", "-99", "", "250", "1.0", "16", ""  
"MB 320-169764/1-A", "537", "RES", "MB 320-169764/1-A", "TALSAC", "335-67-1", "Perfluorooctanoic acid (PFOA)", "8.0", "ng/L", "U", "2.8", "DL", "", "TRG", "", "", "20", "LOQ", "YES", "-99", "", "250", "1.0", "8.0", ""  
"MB 320-169764/1-A", "537", "RES", "MB 320-169764/1-A", "TALSAC", "355-46-4", "Perfluorohexanesulfonic acid (PFHxS)", "12", "ng/L", "U", "5.5", "DL", "", "TRG", "", "", "30", "LOQ", "YES", "-99", "", "250", "1.0", "12", ""  
"MB 320-169764/1-A", "537", "RES", "MB 320-169764/1-A", "TALSAC", "375-73-5", "Perfluorobutanesulfonic acid (PFBS)", "36", "ng/L", "U", "16", "DL", "", "TRG", "", "", "90", "LOQ", "YES", "-99", "", "250", "1.0", "36", ""  
"MB 320-169764/1-A", "537", "RES", "MB 320-169764/1-A", "TALSAC", "375-85-9", "Perfluoroheptanoic acid (PFHpA)", "4.0", "ng/L", "U", "1.9", "DL", "", "TRG", "", "", "10", "LOQ", "YES", "-99", "", "250", "1.0", "4.0", ""  
"MB 320-169764/1-A", "537", "RES", "MB 320-169764/1-A", "TALSAC", "375-95-1", "Perfluorononanoic acid (PFNA)", "20", "ng/L", "U", "8.0", "DL", "", "TRG", "", "", "24", "LOQ", "YES", "-99", "", "250", "1.0", "20", ""  
"MB 320-169764/1-A", "537", "RES", "MB 320-169764/1-A", "TALSAC", "STL00993", "13C2 PFHxA", "36.1", "ng/L", "", "-99", "DL", "", "SURR", "90", "", "-99", "LOQ", "YES", "40.0", "", "250", "1.0", "0", ""  
"MB 320-169764/1-A", "537", "RES", "MB 320-169764/1-A", "TALSAC", "STL00996", "13C2 PFDA", "29.0", "ng/L", "", "-99", "DL", "", "SURR", "72", "", "-99", "LOQ", "YES", "40.0", "", "250", "1.0", "0", ""  
"Unknown", "Unknown", "NAWC-060817-RW-303", "06/08/2017 08:05", "AQ", "320-28987-1", "NM", "", "8.10", "537", "METHOD", "RES", "06/19/2017 09:24", "06/24/2017 00:13", "TALSAC", "COA", "WET", "NA", "1", "NA", "NA", "", "100", "320-169764", "320-169764", "NA", "320-170758", "320-28987-1", "06/09/2017 09:25", "06/12/2017 13:20", ""  
"Unknown", "Unknown", "NAWC-060817-FRB-303", "06/08/2017 08:00", "AQ", "320-28987-2", "NM", "", "8.10", "537", "METHOD", "RES", "06/19/2017 09:24", "06/24/2017 00:18", "TALSAC", "COA", "WET", "NA", "1", "NA", "NA", "", "100", "320-169764", "320-169764", "NA", "320-170758", "320-28987-1", "06/09/2017 09:25", "06/12/2017 13:20", ""  
"Unknown", "Unknown", "LCS 320-169764/2-A", "", "AQ", "LCS 320-169764/2-A", "LCS", "", "-99", "537", "METHOD", "RES", "06/19/2017 09:24", "06/23/2017 22:43", "TALSAC", "COA", "WET", "NA", "1", "NA", "NA", "", "100", "320-169764", "320-169764", "NA", "320-170757", "320-28987-1", "06/19/2017 09:24", "06/12/2017 13:20", ""  
"Unknown", "Unknown", "LCSD 320-169764/3-A", "", "AQ", "LCSD 320-169764/3-A", "LCSD", "", "-99", "537", "METHOD", "RES", "06/19/2017 09:24", "06/28/2017 17:22", "TALSAC", "COA", "WET", "NA", "1", "NA", "NA", "", "100", "320-169764", "320-169764", "NA", "320-171486", "320-28987-1", "06/19/2017 09:24", "06/12/2017 13:20", ""  
"Unknown", "Unknown", "MB 320-169764/1-A", "", "AQ", "MB 320-169764/1-A", "MB", "", "-99", "537", "METHOD", "RES", "06/19/2017 09:24", "06/23/2017 22:39", "TALSAC", "COA", "WET", "NA", "1", "NA", "NA", "", "100", "320-169764", "320-169764", "NA", "320-

170757","320-28987-1","06/19/2017 09:24","06/12/2017 13:20",""



TO: A. FREBOWITZ  
SDG: 320-28987-1

PAGE 2

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.

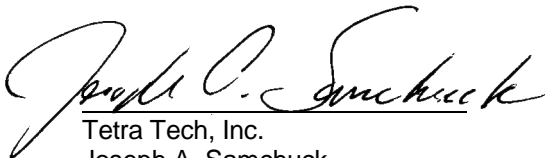
**Other Factors Affecting Data Quality:** Results below the RL were estimated.

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.



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



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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.

<b>U</b>	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.
<b>J</b>	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).
<b>J+</b>	The result is an estimated quantity, but the result may be biased high.
<b>J-</b>	The result is an estimated quantity, but the result may be biased low.
<b>UJ</b>	The analyte was analyzed for, but was not detected. The reported detection limit is approximate and may be inaccurate or imprecise.
<b>R</b>	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.
<b>UR</b>	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

<b>PROJ_NO: 08005-WE04</b> <b>SDG: 320-28987-1</b> <b>FRACTION: PFAS</b> <b>MEDIA: WATER</b>	NSAMPLE	NAWC-060817-FRB-303			NAWC-060817-RW-303		
	LAB_ID	320-28987-2			320-28987-1		
	SAMP_DATE	6/8/2017			6/8/2017		
	QC_TYPE	NM			NM		
	UNITS	NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0		
	DUP_OF						
PARAMETER	RESULT	VQL	QLCD	RESULT	VQL	QLCD	
PENTADECAFLUOROOCTANOIC ACID	7.3	U		20			
PERFLUOROBUTANE SULFONATE	33	U		33	U		
PERFLUOROHEPTANOIC ACID	3.7	U		5.4	J	P	
PERFLUOROHXANESULFONIC ACID	11	U		7.6	J	P	
PERFLUORONONANOIC ACID	18	U		18	U		
PERFLUOROOCTANE SULFONIC ACID	15	U		20	J	P	

**Appendix B**

Results as Reported by the Laboratory

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-28987-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-060817-RW-303 Lab Sample ID: 320-28987-1  
 Matrix: Water Lab File ID: 2017.06.23\_537\_038.d  
 Analysis Method: 537 Date Collected: 06/08/2017 08:05  
 Extraction Method: 537 Date Extracted: 06/19/2017 09:24  
 Sample wt/vol: 270.6(mL) Date Analyzed: 06/24/2017 00:13  
 Con. Extract Vol.: 1.0(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 170758 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	20	J	37	15	6.3
335-67-1	Perfluorooctanoic acid (PFOA)	20		18	7.4	2.6
375-95-1	Perfluorononanoic acid (PFNA)	18	U	22	18	7.4
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	7.6	J	28	11	5.1
375-85-9	Perfluoroheptanoic acid (PFHpA)	5.4	J	9.2	3.7	1.8
375-73-5	Perfluorobutanesulfonic acid (PFBS)	33	U M	83	33	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	84		70-130
STL00996	13C2 PFDA	73		70-130

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-28987-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: NAWC-060817-FRB-303 Lab Sample ID: 320-28987-2  
 Matrix: Water Lab File ID: 2017.06.23\_537\_039.d  
 Analysis Method: 537 Date Collected: 06/08/2017 08:00  
 Extraction Method: 537 Date Extracted: 06/19/2017 09:24  
 Sample wt/vol: 272.5 (mL) Date Analyzed: 06/24/2017 00:18  
 Con. Extract Vol.: 1.0 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 170758 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	15	U	37	15	6.2
335-67-1	Perfluorooctanoic acid (PFOA)	7.3	U	18	7.3	2.6
375-95-1	Perfluorononanoic acid (PFNA)	18	U	22	18	7.3
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	11	U	28	11	5.0
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.7	U	9.2	3.7	1.7
375-73-5	Perfluorobutanesulfonic acid (PFBS)	33	U	83	33	15

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	90		70-130
STL00996	13C2 PFDA	77		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: 6/8/2017		COC No:															
TetraTech		Tel/Fax: 610-382-1170		Lab Contact: Dave Alltucker		Carrier: FedEx		1 of 1 COCs															
234 Mall Boulevard Suite 260		Analysis Turnaround Time <input checked="" type="checkbox"/> CALENDAR DAYS <input type="checkbox"/> WORKING DAYS TAT if different from Below <u>21 days</u>		Filtered Sample (Y/N)		Perform MS / MSD (Y/N)		EPA 537 UCMR3		Samplers: Andy Frebowitz, Mary Kay Bond													
King of Prussia, PA 19406										For Lab Use Only: Walk-in Client:													
(610) 382-1174 Phone		<input type="checkbox"/> 2 weeks		320-28987 Chain of Custody				Lab Sampling:															
(610) 491-9645 FAX		<input type="checkbox"/> 1 week						Job / SDG No.:															
Project Name: Warminster		<input type="checkbox"/> 2 days		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:	
Site: Warminster		<input type="checkbox"/> 1 day																					
P O # 1132358 (through EarthToxics)																							
* NAWC-060817-RW-303		6/8/17		08:05		G		DW		2		N		Y									
NAWC-060817-FRB-303		6/8/17		08:00		G		BLK		2		N		Y								Field Reagent Blank	
* rec'd with 1 bottle with punctured straw sealed by 6-9-17																							
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other <u>Trizma</u>										6													
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.										Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)													
<input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown										<input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab <input type="checkbox"/> Archive for _____ Months													
Special Instructions/QC Requirements & Comments: FedEx Air Bill <u>6612 1992 5950</u>																							
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No				Custody Seal No.:				Cooler Temp. (°C): Obs'd: <u>8.1</u> Corr'd: <u>8.1</u>				Therm ID No.: <u>Alt-2</u>											
Relinquished by: <u>Mary Kay Bond</u>				Company: <u>Tetra Tech</u>				Date/Time: <u>6/8/17 10:00</u>				Received by: <u>Core ?</u>				Company: <u>TAWS</u>				Date/Time: <u>6/9/17 0925</u>			
Relinquished by:				Company:				Date/Time:				Received by:				Company:				Date/Time:			
Relinquished by:				Company:				Date/Time:				Received in Laboratory by:				Company:				Date/Time:			

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# Login Sample Receipt Checklist

Client: Tetra Tech, Inc.

Job Number: 320-28987-1

**Login Number: 28987**  
**List Number: 1**  
**Creator: Hytrek, Cheryl**

**List Source: TestAmerica Sacramento**

Question	Answer	Comment
Radioactivity wasn't checked or is <math>\leq</math> 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.	False	Cooler temperature outside required temperature criteria.
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.	False	Containers recd broken. Sufficient sample in remaining containers for analysis.
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 <math><6\text{mm}</math> (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

**Job Narrative**  
**320-28987-1**

**Receipt**

The samples were received on 6/9/2017 9:25 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 8.1° C.

**Receipt Exceptions**

The following samples was received at the laboratory outside the laboratory required temperature criteria: NAWC-060817-RW-303 (320-28987-1) and NAWC-060817-FRB-303 (320-28987-2). It should be noted that method 537 indicated that samples should be recieved at or less than 10° C., which these were.

One or two containers for the following sample was received with 2 holes and leaking and transferred to another bottle.: NAWC-060817-RW-303 (320-28987-1). This bottle was marked as back-up only.

**LCMS**

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

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

**Organic Prep**

Method(s) 537: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-169764.

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: TetraT: PFAS, NAS JRB Willow Grove

TestAmerica Job ID: 320-28987-1

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

**Protocol References:**

EPA = US Environmental Protection Agency

**Laboratory References:**

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

# Sample Summary

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

TestAmerica Job ID: 320-28987-1

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<b>Lab Sample ID</b>	<b>Client Sample ID</b>	<b>Matrix</b>	<b>Collected</b>	<b>Received</b>
320-28987-1	NAWC-060817-RW-303	Water	06/08/17 08:05	06/09/17 09:25
320-28987-2	NAWC-060817-FRB-303	Water	06/08/17 08:00	06/09/17 09:25

FORM II  
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-28987-1

SDG No.: \_\_\_\_\_

Matrix: Water Level: Low

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

Client Sample ID	Lab Sample ID	PFHxA #	PFDA #
NAWC-060817-RW-303	320-28987-1	84	73
NAWC-060817-FRB-303	320-28987-2	90	77
	MB 320-169764/1-A	90	72
	LCS 320-169764/2-A	91	81
	LCSD 320-169764/3-A	82	92

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.: 320-28987-1  
 SDG No.: \_\_\_\_\_  
 Matrix: Water Level: Low Lab File ID: 2017.06.23\_537\_019.d  
 Lab ID: LCS 320-169764/2-A Client ID: \_\_\_\_\_

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	160	157	98	70-130	
Perfluorooctanoic acid (PFOA)	79.9	82.3	103	70-130	
Perfluorononanoic acid (PFNA)	77.0	66.1	86	70-130	
Perfluorohexanesulfonic acid (PFHxS)	120	122	102	70-130	
Perfluoroheptanoic acid (PFHpA)	39.6	45.4	115	70-130	
Perfluorobutanesulfonic acid (PFBS)	353	383	108	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.: 320-28987-1

SDG No.: \_\_\_\_\_

Matrix: Water Level: Low Lab File ID: 2017.06.28\_537B\_005.d

Lab ID: LCSD 320-169764/3-A Client ID: \_\_\_\_\_

COMPOUND	SPIKE ADDED (ng/L)	LCSD CONCENTRATION (ng/L)	LCSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
Perfluorooctanesulfonic acid (PFOS)	160	148	93	6	30	70-130	
Perfluorooctanoic acid (PFOA)	79.9	75.0	94	9	30	70-130	
Perfluorononanoic acid (PFNA)	77.0	71.6	93	8	30	70-130	
Perfluorohexanesulfonic acid (PFHxS)	120	116	97	5	30	70-130	
Perfluoroheptanoic acid (PFHpA)	39.6	40.3	102	12	30	70-130	
Perfluorobutanesulfonic acid (PFBS)	353	365	103	5	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.: 320-28987-1  
 SDG No.: \_\_\_\_\_  
 Lab File ID: 2017.06.23\_537\_018.d Lab Sample ID: MB 320-169764/1-A  
 Matrix: Water Date Extracted: 06/19/2017 09:24  
 Instrument ID: A8\_N Date Analyzed: 06/23/2017 22:39  
 Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-169764/2-A	2017.06.23_537_019.d	06/23/2017 22:43
NAWC-060817-RW-303	320-28987-1	2017.06.23_537_038.d	06/24/2017 00:13
NAWC-060817-FRB-303	320-28987-2	2017.06.23_537_039.d	06/24/2017 00:18
	LCSD 320-169764/3-A	2017.06.28_537B_005.d	06/28/2017 17:22



FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-28987-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: \_\_\_\_\_ Lab Sample ID: MB 320-169764/1-A  
 Matrix: Water Lab File ID: 2017.06.23\_537\_018.d  
 Analysis Method: 537 Date Collected: \_\_\_\_\_  
 Extraction Method: 537 Date Extracted: 06/19/2017 09:24  
 Sample wt/vol: 250 (mL) Date Analyzed: 06/23/2017 22:39  
 Con. Extract Vol.: 1.0 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 170757 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	90		70-130
STL00996	13C2 PFDA	72		70-130

FORM VIII  
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-28987-1  
 SDG No.: \_\_\_\_\_  
 Instrument ID: A8\_N Calibration Start Date: 06/19/2017 17:40  
 GC Column: GeminiC18 3x100 ID: 3(mm) Calibration End Date: 06/19/2017 18:04  
 Calibration ID: 31800

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
INITIAL CALIBRATION MEAN AREA AND MEAN RT	3870975	2.86	9204122	2.99		
UPPER LIMIT	5806463	3.36	13806183	3.49		
LOWER LIMIT	1935488	2.36	4602061	2.49		
LAB SAMPLE ID	CLIENT SAMPLE ID					
CCVL 320-169955/11		3724287	2.86	8759638	2.99	
ICV 320-169955/13		3818724	2.85	9420237	2.99	
CCVL 320-170756/4		3324713	2.97	9202106	3.10	
CCV 320-170757/16 CCVIS		3755516	3.00	10146250	3.13	
MB 320-169764/1-A		3675107	2.99	9517190	3.13	
LCS 320-169764/2-A		3410881	3.00	8977613	3.13	
CCV 320-170757/28 CCVIS		3741048	3.00	10476733	3.13	
CCV 320-170758/28 CCVIS		3741048	3.00	10476733	3.13	
320-28987-1	NAWC-060817-RW-303	3314802	2.99	9451660	3.13	
320-28987-2	NAWC-060817-FRB-303	3555932	3.00	9727375	3.13	
CCV 320-170758/40 CCVIS		3800811	3.00	10834949	3.13	

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.: 320-28987-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-170757/16 Date Analyzed: 06/23/2017 22:29  
 Instrument ID: A8\_N GC Column: GeminiC18 3x100 ID: 3 (mm)  
 Lab File ID (Standard): 2017.06.23\_537\_016. Heated Purge: (Y/N) N  
 Calibration ID: 31800

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	3755516	3.00	10146250	3.13		
UPPER LIMIT	5257722	3.50	14204750	3.63		
LOWER LIMIT	2628861	2.50	7102375	2.63		
LAB SAMPLE ID	CLIENT SAMPLE ID					
MB 320-169764/1-A		3675107	2.99	9517190	3.13	
LCS 320-169764/2-A		3410881	3.00	8977613	3.13	

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.: 320-28987-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-170757/28 Date Analyzed: 06/23/2017 23:26  
 Instrument ID: A8\_N GC Column: GeminiC18 3x100 ID: 3 (mm)  
 Lab File ID (Standard): 2017.06.23\_537\_028. Heated Purge: (Y/N) N  
 Calibration ID: 31800

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	3741048	3.00	10476733	3.13		
UPPER LIMIT	5237467	3.50	14667426	3.63		
LOWER LIMIT	2618734	2.50	7333713	2.63		
LAB SAMPLE ID	CLIENT SAMPLE ID					
MB 320-169764/1-A		3675107	2.99	9517190	3.13	
LCS 320-169764/2-A		3410881	3.00	8977613	3.13	

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.: 320-28987-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-170758/28 Date Analyzed: 06/23/2017 23:26  
 Instrument ID: A8\_N GC Column: GeminiC18 3x100 ID: 3 (mm)  
 Lab File ID (Standard): 2017.06.23\_537\_028. Heated Purge: (Y/N) N  
 Calibration ID: 31800

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	3741048	3.00	10476733	3.13		
UPPER LIMIT	5237467	3.50	14667426	3.63		
LOWER LIMIT	2618734	2.50	7333713	2.63		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-28987-1	NAWC-060817-RW-303	3314802	2.99	9451660	3.13	
320-28987-2	NAWC-060817-FRB-303	3555932	3.00	9727375	3.13	

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.: 320-28987-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-170758/40 Date Analyzed: 06/24/2017 00:23  
 Instrument ID: A8\_N GC Column: GeminiC18 3x100 ID: 3 (mm)  
 Lab File ID (Standard): 2017.06.23\_537\_040. Heated Purge: (Y/N) N  
 Calibration ID: 31800

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	3800811	3.00	10834949	3.13		
UPPER LIMIT	5321135	3.50	15168929	3.63		
LOWER LIMIT	2660568	2.50	7584464	2.63		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-28987-1	NAWC-060817-RW-303	3314802	2.99	9451660	3.13	
320-28987-2	NAWC-060817-FRB-303	3555932	3.00	9727375	3.13	

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.: 320-28987-1  
 SDG No.: \_\_\_\_\_  
 Instrument ID: A8\_N Calibration Start Date: 06/28/2017 16:11  
 GC Column: GeminiC18 3x100 ID: 3(mm) Calibration End Date: 06/28/2017 16:35  
 Calibration ID: 32056

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
INITIAL CALIBRATION MEAN AREA AND MEAN RT	1994745	1.88	5921908	2.12		
UPPER LIMIT	2992118	2.38	8882862	2.62		
LOWER LIMIT	997373	1.38	2960954	1.62		
LAB SAMPLE ID	CLIENT SAMPLE ID					
CCVL 320-171480/11	1582044	1.88	4789035	2.12		
ICV 320-171480/13	1851564	1.87	5746016	2.12		
CCV 320-171486/1 CCVIS	2273492	1.88	7068921	2.12		
LCSD 320-169764/3-A	1735559	1.88	4861097Q	2.12		
CCV 320-171486/13 CCVIS	2250330	1.87	6965525	2.11		

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.: 320-28987-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-171486/1 Date Analyzed: 06/28/2017 17:03  
 Instrument ID: A8\_N GC Column: GeminiC18 3x100 ID: 3 (mm)  
 Lab File ID (Standard): 2017.06.28\_537B\_001 Heated Purge: (Y/N) N  
 Calibration ID: 32056

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	2273492	1.88	7068921	2.12		
UPPER LIMIT	3182889	2.38	9896489	2.62		
LOWER LIMIT	1591444	1.38	4948245	1.62		
LAB SAMPLE ID	CLIENT SAMPLE ID					
LCSD 320-169764/3-A	1735559	1.88	4861097Q	2.12		

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.: 320-28987-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-171486/13 Date Analyzed: 06/28/2017 18:00  
 Instrument ID: A8\_N GC Column: GeminiC18 3x100 ID: 3 (mm)  
 Lab File ID (Standard): 2017.06.28\_537B\_013 Heated Purge: (Y/N) N  
 Calibration ID: 32056

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	2250330	1.87	6965525	2.11		
UPPER LIMIT	3150462	2.37	9751735	2.61		
LOWER LIMIT	1575231	1.37	4875868	1.61		
LAB SAMPLE ID	CLIENT SAMPLE ID					
LCSD 320-169764/3-A		1735559	1.88	4861097Q	2.12	

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.: 320-28987-1 Analy Batch No.: 169955

SDG No.: \_\_\_\_\_

Instrument ID: A8\_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 06/19/2017 17:40 Calibration End Date: 06/19/2017 18:04 Calibration ID: 31800

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-169955/4	2017.06.19_537A_ICAL_004.d
Level 2	IC 320-169955/5	2017.06.19_537A_ICAL_005.d
Level 3	IC 320-169955/6	2017.06.19_537A_ICAL_006.d
Level 4	IC 320-169955/7	2017.06.19_537A_ICAL_007.d
Level 5	IC 320-169955/8	2017.06.19_537A_ICAL_008.d
Level 6	IC 320-169955/9	2017.06.19_537A_ICAL_009.d

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
Perfluorobutanesulfonic acid (PFBS)	0.8507 0.7713	0.9245	0.9209	0.8993	0.8202	Ave		0.8645			7.1		30.0				
Perfluorohexanesulfonic acid (PFHxS)	1.0986 1.2032	1.1398	1.1650	1.2147	1.1817	Ave		1.1672			3.7		30.0				
Perfluoroheptanoic acid (PFHpA)	0.7891 0.8718	0.8248	0.8229	0.8642	0.8866	Ave		0.8433			4.4		30.0				
Perfluorooctanoic acid (PFOA)	0.8301 0.8992	0.8817	0.8545	0.8779	0.9114	Ave		0.8758			3.4		30.0				
Perfluorooctanesulfonic acid (PFOS)	0.9620 1.0275	1.0017	1.0209	1.0440	1.0387	Ave		1.0158			3.0		30.0				
Perfluorononanoic acid (PFNA)	0.8823 0.8046	0.8981	0.8287	0.8656	0.8391	Ave		0.8531			4.1		30.0				
13C2 PFHxA	0.9940 1.0771	1.0270	1.0324	1.0293	1.0661	Ave		1.0377			2.9		30.0				
13C2 PFDA	0.9372 1.0284	0.9499	0.8947	0.9980	0.9652	Ave		0.9622			4.9		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.: 320-28987-1 Analy Batch No.: 169955

SDG No.: \_\_\_\_\_

Instrument ID: A8\_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 06/19/2017 17:40 Calibration End Date: 06/19/2017 18:04 Calibration ID: 31800

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-169955/4	2017.06.19_537A_ICAL_004.d
Level 2	IC 320-169955/5	2017.06.19_537A_ICAL_005.d
Level 3	IC 320-169955/6	2017.06.19_537A_ICAL_006.d
Level 4	IC 320-169955/7	2017.06.19_537A_ICAL_007.d
Level 5	IC 320-169955/8	2017.06.19_537A_ICAL_008.d
Level 6	IC 320-169955/9	2017.06.19_537A_ICAL_009.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5
Perfluorobutanesulfonic acid (PFBS)	PFOS	Ave	2332510 46244402	5989080	14078909	23681909	35795970	8.83 176	21.2	44.4	89.4	133
Perfluorohexanesulfonic acid (PFHxS)	PFOS	Ave	1024970 24546576	2512643	6060498	10884436	17549225	3.01 59.7	7.21	15.1	30.4	45.1
Perfluoroheptanoic acid (PFHpA)	13PF OA	Ave	289244 7166616	730235	1714811	3092048	5084081	0.990 19.7	2.38	4.97	10.0	14.9
Perfluorooctanoic acid (PFOA)	13PF OA	Ave	614079 14918357	1575504	3593653	6339348	10547603	2.00 39.7	4.80	10.0	20.2	30.0
Perfluorooctanesulfonic acid (PFOS)	PFOS	Ave	1195186 27918279	2940776	7072765	12458294	20543461	4.00 79.6	9.61	20.1	40.5	60.0
Perfluorononanoic acid (PFNA)	13PF OA	Ave	629127 12866660	1546914	3359467	6025078	9360498	1.93 38.3	4.62	9.68	19.5	28.9
13C2 PFHxA	13PF OA	Ave	3680309 4499723	3826956	4324388	3674058	4116656	10.0 10.0	10.0	10.0	10.0	10.0
13C2 PFDA	13PF OA	Ave	3469979 4296473	3539389	3747801	3562371	3726982	10.0 10.0	10.0	10.0	10.0	10.0

Curve Type Legend:

Ave = Average ISTD

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

Lab Name: TestAmerica Sacramento Job No.: 320-28987-1 Analy Batch No.: 169955

SDG No.: \_\_\_\_\_

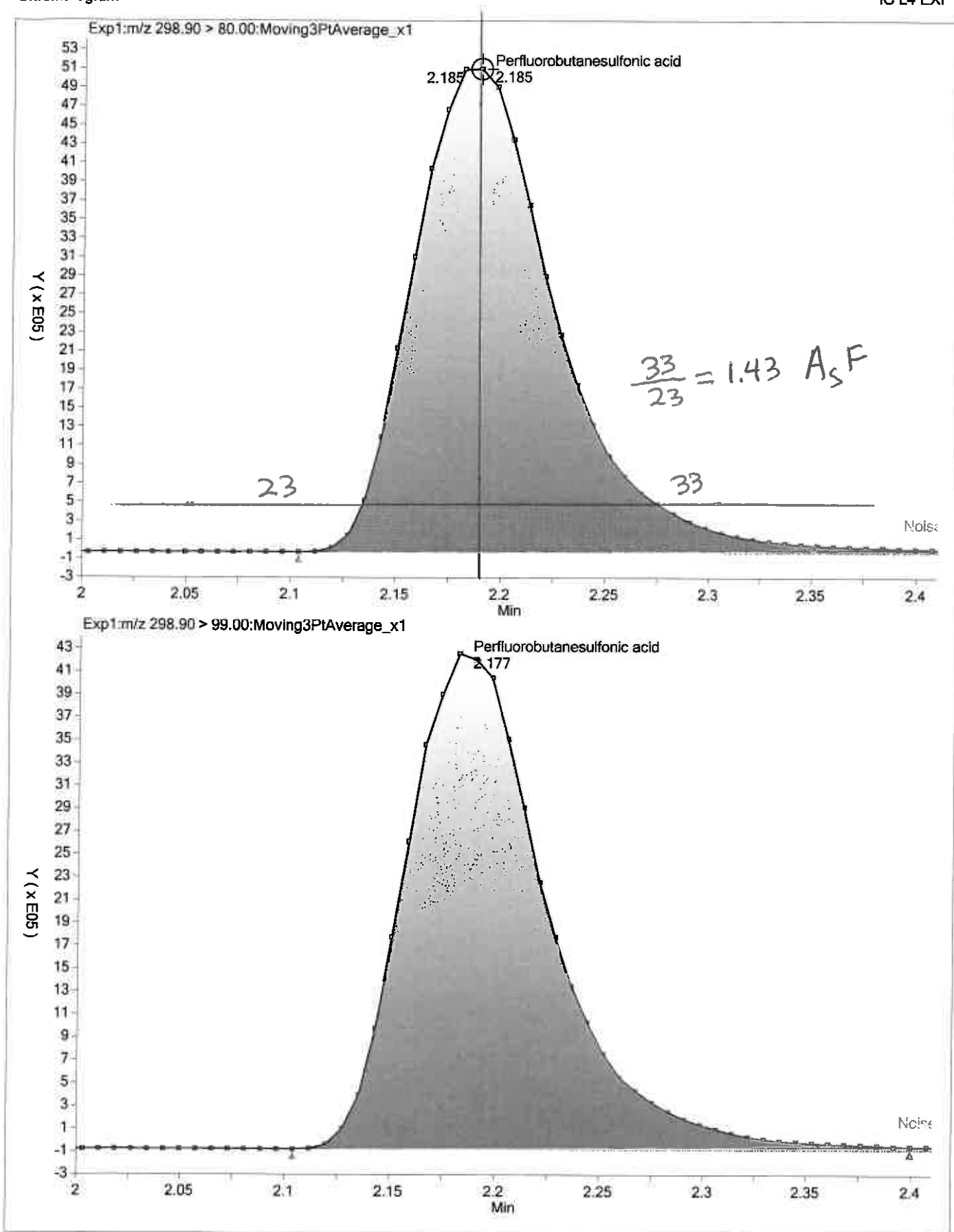
Instrument ID: A8\_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

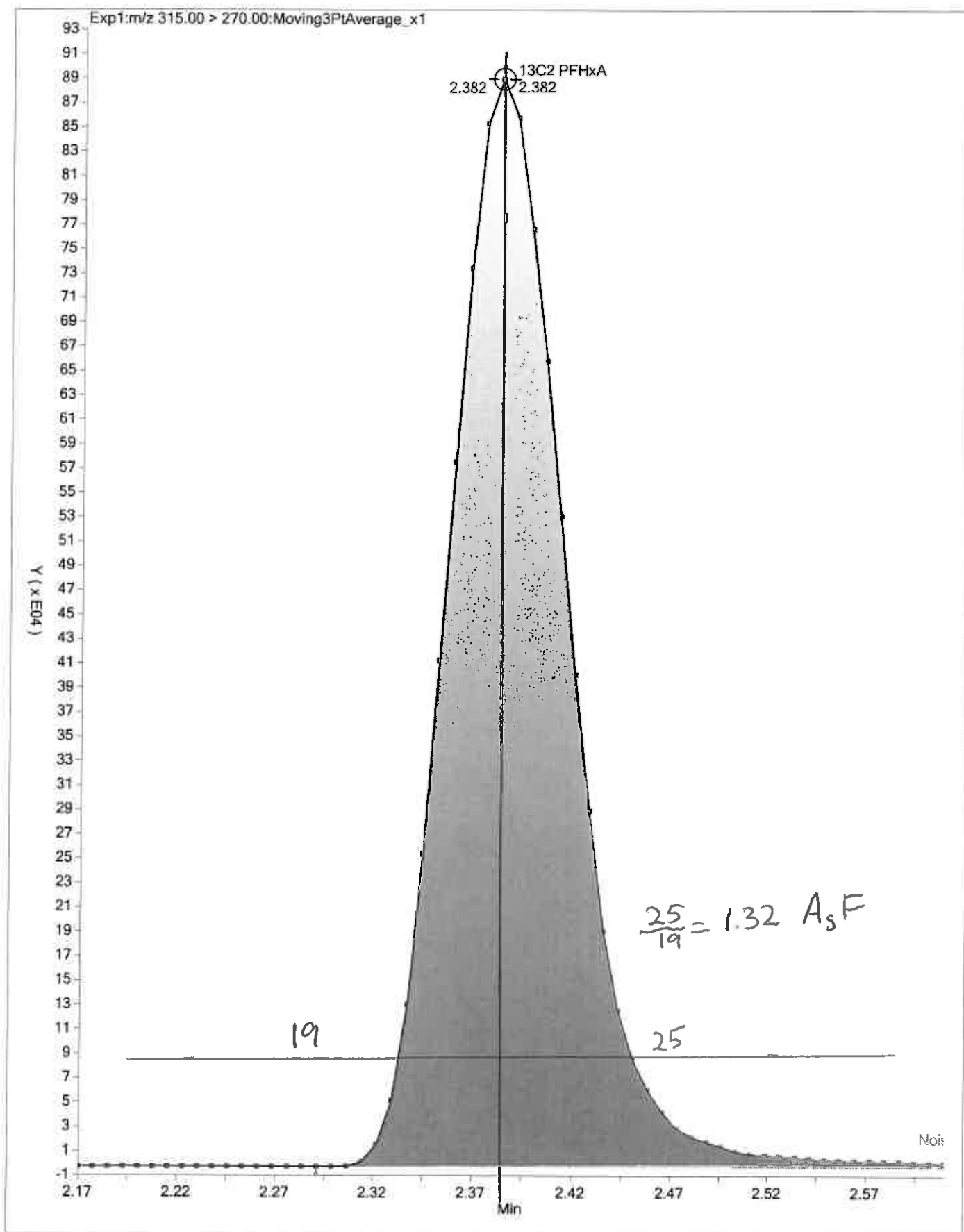
Calibration Start Date: 06/19/2017 17:40 Calibration End Date: 06/19/2017 18:04 Calibration ID: 31800

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-169955/4	2017.06.19_537A_ICAL_004.d
Level 2	IC 320-169955/5	2017.06.19_537A_ICAL_005.d
Level 3	IC 320-169955/6	2017.06.19_537A_ICAL_006.d
Level 4	IC 320-169955/7	2017.06.19_537A_ICAL_007.d
Level 5	IC 320-169955/8	2017.06.19_537A_ICAL_008.d
Level 6	IC 320-169955/9	2017.06.19_537A_ICAL_009.d

ANALYTE	PERCENT ERROR						PERCENT ERROR LIMIT					
	LVL 1 #	LVL 2 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6
Perfluorobutanesulfonic acid (PFBS)	-1.6	6.9	6.5	4.0	-5.1	-10.8	50	50	50	50	50	50
Perfluorohexanesulfonic acid (PFHxS)	-5.9	-2.3	-0.2	4.1	1.2	3.1	50	50	50	50	50	50
Perfluoroheptanoic acid (PFHpA)	-6.4	-2.2	-2.4	2.5	5.1	3.4	50	50	50	50	50	50
Perfluorooctanoic acid (PFOA)	-5.2	0.7	-2.4	0.2	4.1	2.7	50	50	50	50	50	50
Perfluorooctanesulfonic acid (PFOS)	-5.3	-1.4	0.5	2.8	2.3	1.2	50	50	50	50	50	50
Perfluorononanoic acid (PFNA)	3.4	5.3	-2.9	1.5	-1.6	-5.7	50	50	50	50	50	50
13C2 PFHxA	-4.2	-1.0	-0.5	-0.8	2.7	3.8	30	30	30	30	30	30
13C2 PFDA	-2.6	-1.3	-7.0	3.7	0.3	6.9	30	30	30	30	30	30





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

Lab Name: TestAmerica Sacramento Job No.: 320-28987-1 Analy Batch No.: 171480

SDG No.: \_\_\_\_\_

Instrument ID: A8\_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 06/28/2017 16:11 Calibration End Date: 06/28/2017 16:35 Calibration ID: 32056

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-171480/4	2017.06.28_537_CURVE_004.d
Level 2	IC 320-171480/5	2017.06.28_537_CURVE_005.d
Level 3	IC 320-171480/6	2017.06.28_537_CURVE_006.d
Level 4	IC 320-171480/7	2017.06.28_537_CURVE_007.d
Level 5	IC 320-171480/8	2017.06.28_537_CURVE_008.d
Level 6	IC 320-171480/9	2017.06.28_537_CURVE_009.d

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
Perfluorobutanesulfonic acid	1.0542 0.7747	1.1911	1.1019	0.9631	0.8595	QuaF		1.1739	-0.002299					0.9990			0.9600
Perfluoroheptanoic acid	0.9802 0.9208	1.0349	0.9965	1.0023	0.9814	Ave		0.9860			3.8		30.0				
Perfluorohexanesulfonic acid	1.4453 1.4041	1.5145	1.5704	1.4814	1.4492	Ave		1.4774			4.0		30.0				
Perfluorooctanoic acid	0.7781 0.8844	0.9090	0.8846	0.8950	0.9189	Ave		0.8783			5.8		30.0				
Perfluorooctane sulfonic acid	1.0077 1.0654	1.0142	1.0631	1.0030	1.0482	Ave		1.0336			2.8		30.0				
Perfluorononanoic acid	0.6497 0.6570	0.7320	0.7099	0.6959	0.6634	Ave		0.6847			4.8		30.0				
13C2 PFHxA	1.1301 1.2157	1.2214	1.2083	1.2062	1.2378	Ave		1.2033			3.1		30.0				
13C2 PFDA	0.6178 0.6956	0.6701	0.6547	0.6457	0.6660	Ave		0.6583			4.0		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.: 320-28987-1 Analy Batch No.: 171480

SDG No.: \_\_\_\_\_

Instrument ID: A8\_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

Calibration Start Date: 06/28/2017 16:11 Calibration End Date: 06/28/2017 16:35 Calibration ID: 32056

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-171480/4	2017.06.28_537_CURVE_004.d
Level 2	IC 320-171480/5	2017.06.28_537_CURVE_005.d
Level 3	IC 320-171480/6	2017.06.28_537_CURVE_006.d
Level 4	IC 320-171480/7	2017.06.28_537_CURVE_007.d
Level 5	IC 320-171480/8	2017.06.28_537_CURVE_008.d
Level 6	IC 320-171480/9	2017.06.28_537_CURVE_009.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5
Perfluorobutanesulfonic acid	PFOS	QuaF	1790966 30127104	4119763	11524329	15979460	27434944	8.83 176	21.2	44.4	89.4	133
Perfluoroheptanoic acid	13PF OA	Ave	189804 3839119	382424	1150592	1723856	3354002	0.990 19.7	2.38	4.97	10.0	14.9
Perfluorohexanesulfonic acid	PFOS	Ave	835502 18580566	1782416	5588395	8363563	15739710	3.01 59.7	7.21	15.1	30.4	45.1
Perfluorooctanoic acid	13PF OA	Ave	304104 7442161	677915	2061378	3106405	6337635	2.00 39.7	4.80	10.0	20.2	30.0
Perfluorooctane sulfonic acid	PFOS	Ave	775815 18774908	1589627	5038246	7541349	15161771	4.00 79.6	9.61	20.1	40.5	60.0
Perfluorononanoic acid	13PF OA	Ave	244768 5329596	526209	1594605	2328532	4410928	1.93 38.3	4.62	9.68	19.5	28.9
13C2 PFHxA	13PF OA	Ave	2210545 2576119	1899539	2804666	2069475	2848725	10.0 10.0	10.0	10.0	10.0	10.0
13C2 PFDA	13PF OA	Ave	1208487 1473923	1042170	1519617	1107876	1532613	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.: 320-28987-1 Analy Batch No.: 171480

SDG No.: \_\_\_\_\_

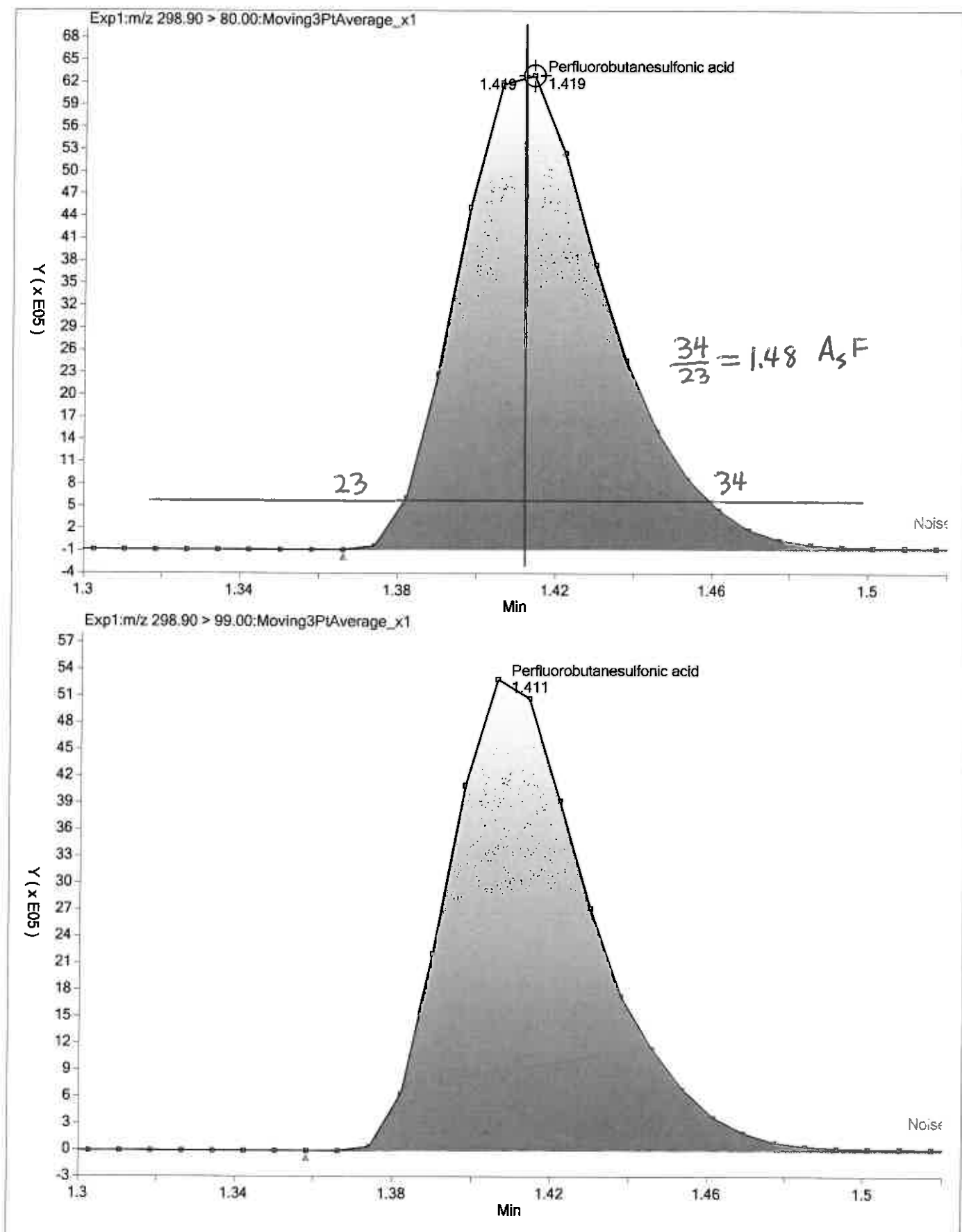
Instrument ID: A8\_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

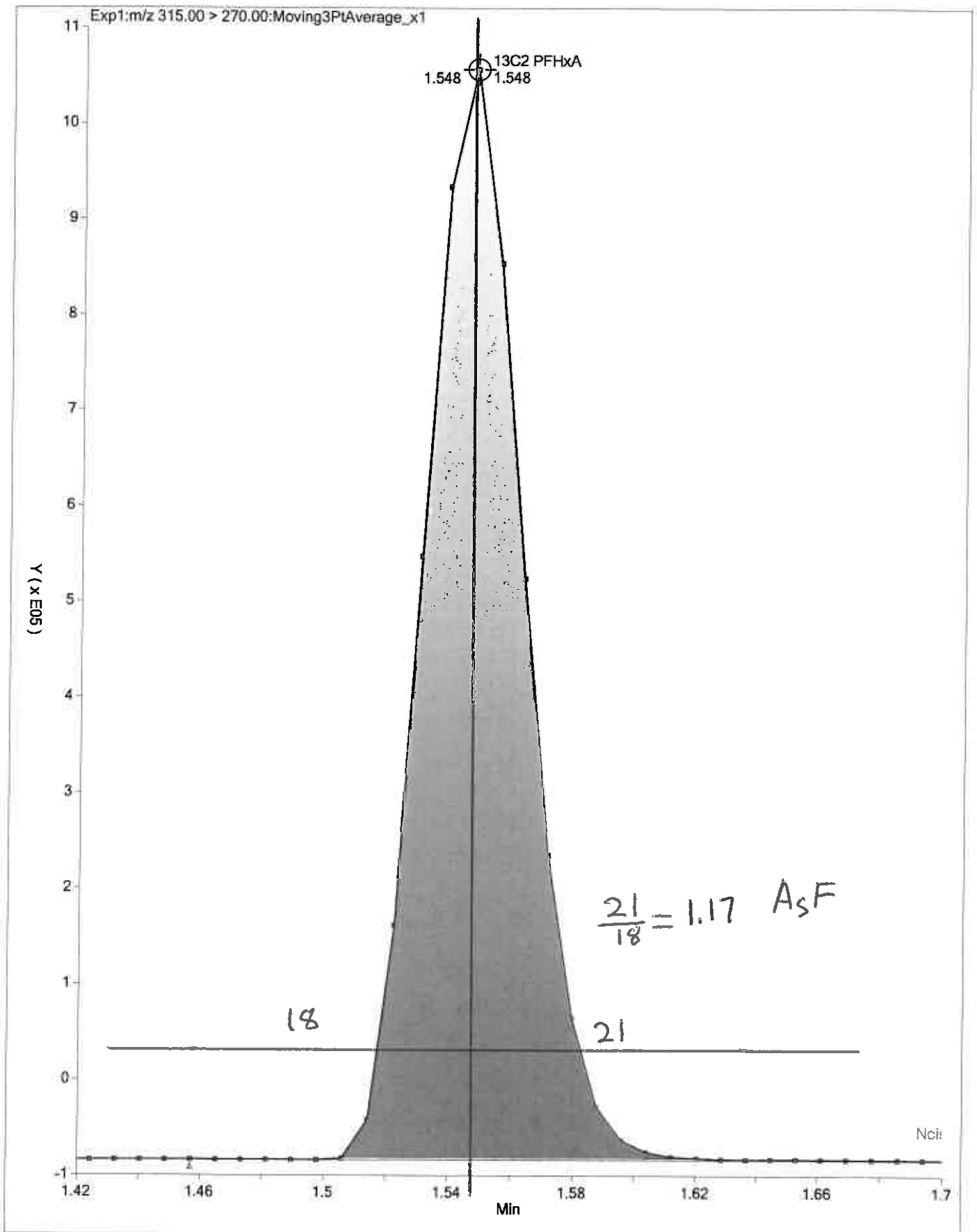
Calibration Start Date: 06/28/2017 16:11 Calibration End Date: 06/28/2017 16:35 Calibration ID: 32056

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-171480/4	2017.06.28_537_CURVE_004.d
Level 2	IC 320-171480/5	2017.06.28_537_CURVE_005.d
Level 3	IC 320-171480/6	2017.06.28_537_CURVE_006.d
Level 4	IC 320-171480/7	2017.06.28_537_CURVE_007.d
Level 5	IC 320-171480/8	2017.06.28_537_CURVE_008.d
Level 6	IC 320-171480/9	2017.06.28_537_CURVE_009.d

ANALYTE	PERCENT ERROR						PERCENT ERROR LIMIT					
	LVL 1 #	LVL 2 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6
Perfluorobutanesulfonic acid	-8.8	6.1	3.1	-0.7	-1.7	1.2	50	50	50	50	50	50
Perfluoroheptanoic acid	-0.6	5.0	1.1	1.7	-0.5	-6.6	50	50	50	50	50	50
Perfluorohexanesulfonic acid	-2.2	2.5	6.3	0.3	-1.9	-5.0	50	50	50	50	50	50
Perfluorooctanoic acid	-11.4	3.5	0.7	1.9	4.6	0.7	50	50	50	50	50	50
Perfluorooctane sulfonic acid	-2.5	-1.9	2.9	-3.0	1.4	3.1	50	50	50	50	50	50
Perfluorononanoic acid	-5.1	6.9	3.7	1.6	-3.1	-4.0	50	50	50	50	50	50
13C2 PFHxA	-6.1	1.5	0.4	0.2	2.9	1.0	30	30	30	30	30	30
13C2 PFDA	-6.1	1.8	-0.5	-1.9	1.2	5.7	30	30	30	30	30	30





FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-28987-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCVL 320-169955/11 Calibration Date: 06/19/2017 18:14  
 Instrument ID: A8\_N Calib Start Date: 06/19/2017 17:40  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/19/2017 18:04  
 Lab File ID: 2017.06.19\_537A\_ICAL\_011.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.8645	0.9450		23.2	21.2	9.3	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.167	1.179		7.29	7.21	1.0	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.8433	0.8532		2.40	2.38	1.2	50.0
Perfluorooctanoic acid (PFOA)	Ave	0.8758	0.8753		4.79	4.80	-0.0	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.016	1.024		9.69	9.61	0.8	50.0
Perfluorononanoic acid (PFNA)	Ave	0.8531	0.8772		4.75	4.62	2.8	50.0
13C2 PFHxA	Ave	1.038	1.019		9.82	10.0	-1.8	30.0
13C2 PFDA	Ave	0.9622	0.9654		10.0	10.0	0.3	30.0

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-28987-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: ICV 320-169955/13 Calibration Date: 06/19/2017 18:23  
 Instrument ID: A8\_N Calib Start Date: 06/19/2017 17:40  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/19/2017 18:04  
 Lab File ID: 2017.06.19\_537A\_ICAL\_013.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.8645	0.8921		104	101	3.2	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.167	1.265		23.0	21.2	8.4	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.8433	0.8190		9.79	10.1	-2.9	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.8758	0.9521		21.8	20.0	8.7	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.016	1.080		22.0	20.7	6.3	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8531	0.8825		20.7	20.0	3.5	30.0
13C2 PFHxA	Ave	1.038	1.057		10.2	10.0	1.8	30.0
13C2 PFDA	Ave	0.9622	1.049		10.9	10.0	9.0	30.0

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-28987-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCVL 320-170756/4 Calibration Date: 06/23/2017 21:32  
 Instrument ID: A8\_N Calib Start Date: 06/19/2017 17:40  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/19/2017 18:04  
 Lab File ID: 2017.06.23\_537\_004.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.8645	1.002		24.6	21.2	15.9	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.167	1.202		7.43	7.21	3.0	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.8433	0.8996		2.53	2.38	6.7	50.0
Perfluorooctanoic acid (PFOA)	Ave	0.8758	0.8735		4.78	4.80	-0.3	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.016	1.009		9.54	9.61	-0.7	50.0
Perfluorononanoic acid (PFNA)	Ave	0.8531	0.7965		4.32	4.62	-6.6	50.0
13C2 PFHxA	Ave	1.038	1.061		10.2	10.0	2.2	30.0
13C2 PFDA	Ave	0.9622	0.7546		7.84	10.0	-21.6	30.0

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-28987-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-170757/16 Calibration Date: 06/23/2017 22:29  
 Instrument ID: A8\_N Calib Start Date: 06/19/2017 17:40  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/19/2017 18:04  
 Lab File ID: 2017.06.23\_537\_016.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.8645	1.009		51.8	44.4	16.7	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.167	1.238		16.0	15.1	6.1	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.8433	0.9020		5.32	4.97	7.0	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.8758	0.8757		10.0	10.0	-0.0	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.016	1.029		20.4	20.1	1.3	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8531	0.7570		8.59	9.68	-11.3	30.0
13C2 PFHxA	Ave	1.038	1.071		10.3	10.0	3.2	30.0
13C2 PFDA	Ave	0.9622	0.7334		7.62	10.0	-23.8	30.0

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-28987-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-170757/28 Calibration Date: 06/23/2017 23:26  
 Instrument ID: A8\_N Calib Start Date: 06/19/2017 17:40  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/19/2017 18:04  
 Lab File ID: 2017.06.23\_537\_028.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.8645	0.8619		132	133	-0.3	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.167	1.272		49.1	45.1	9.0	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.8433	0.9206		16.2	14.9	9.2	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.8758	0.9112		31.2	30.0	4.0	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.016	1.030		60.9	60.0	1.4	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8531	0.8118		27.5	28.9	-4.8	30.0
13C2 PFHxA	Ave	1.038	1.114		10.7	10.0	7.3	30.0
13C2 PFDA	Ave	0.9622	0.7612		7.91	10.0	-20.9	30.0



FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-28987-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-170758/28 Calibration Date: 06/23/2017 23:26  
 Instrument ID: A8\_N Calib Start Date: 06/19/2017 17:40  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/19/2017 18:04  
 Lab File ID: 2017.06.23\_537\_028.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.8645	0.8619		132	133	-0.3	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.167	1.272		49.1	45.1	9.0	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.8433	0.9206		16.2	14.9	9.2	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.8758	0.9112		31.2	30.0	4.0	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.016	1.030		60.9	60.0	1.4	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8531	0.8118		27.5	28.9	-4.8	30.0
13C2 PFHxA	Ave	1.038	1.114		10.7	10.0	7.3	30.0
13C2 PFDA	Ave	0.9622	0.7612		7.91	10.0	-20.9	30.0

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-28987-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-170758/40 Calibration Date: 06/24/2017 00:23  
 Instrument ID: A8\_N Calib Start Date: 06/19/2017 17:40  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/19/2017 18:04  
 Lab File ID: 2017.06.23\_537\_040.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.8645	1.021		52.4	44.4	18.1	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.167	1.238		16.0	15.1	6.1	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	0.8433	0.9034		5.33	4.97	7.1	30.0
Perfluorooctanoic acid (PFOA)	Ave	0.8758	0.9028		10.3	10.0	3.1	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.016	1.013		20.1	20.1	-0.3	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8531	0.7437		8.44	9.68	-12.8	30.0
13C2 PFHxA	Ave	1.038	1.047		10.1	10.0	0.9	30.0
13C2 PFDA	Ave	0.9622	0.7496		7.79	10.0	-22.1	30.0

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-28987-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCVL 320-171480/11 Calibration Date: 06/28/2017 16:44  
 Instrument ID: A8\_N Calib Start Date: 06/28/2017 16:11  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/28/2017 16:35  
 Lab File ID: 2017.06.28\_537\_CURVE\_011.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid	QuaF		1.110		20.9	21.2	-1.4	50.0
Perfluoroheptanoic acid	Ave	0.9860	1.011		2.44	2.38	2.5	50.0
Perfluorohexanesulfonic acid	Ave	1.477	1.461		7.13	7.21	-1.1	50.0
Perfluorooctanoic acid	Ave	0.8783	0.8953		4.89	4.80	1.9	50.0
Perfluorooctane sulfonic acid	Ave	1.034	0.9935		9.24	9.61	-3.9	50.0
Perfluorononanoic acid	Ave	0.6847	0.7253		4.90	4.62	5.9	50.0
13C2 PFHxA	Ave	1.203	1.147		9.53	10.0	-4.7	30.0
13C2 PFDA	Ave	0.6583	0.6379		9.69	10.0	-3.1	30.0

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-28987-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: ICV 320-171480/13 Calibration Date: 06/28/2017 16:54  
 Instrument ID: A8\_N Calib Start Date: 06/28/2017 16:11  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/28/2017 16:35  
 Lab File ID: 2017.06.28\_537\_CURVE\_013.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid	QuaF		1.008		110	101	9.4	30.0
Perfluoroheptanoic acid	Ave	0.9860	0.9330		9.54	10.1	-5.4	30.0
Perfluorohexanesulfonic acid	Ave	1.477	1.657		23.8	21.2	12.1	30.0
Perfluorooctanoic acid	Ave	0.8783	0.9424		21.5	20.0	7.3	30.0
Perfluorooctane sulfonic acid	Ave	1.034	1.098		22.0	20.7	6.2	30.0
Perfluorononanoic acid	Ave	0.6847	0.7209		21.1	20.0	5.3	30.0
13C2 PFHxA	Ave	1.203	1.187		9.86	10.0	-1.4	30.0
13C2 PFDA	Ave	0.6583	0.6889		10.5	10.0	4.7	30.0

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-28987-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-171486/1 Calibration Date: 06/28/2017 17:03  
 Instrument ID: A8\_N Calib Start Date: 06/28/2017 16:11  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/28/2017 16:35  
 Lab File ID: 2017.06.28\_537B\_001.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid	QuaF		0.8414		126	133	-4.8	30.0
Perfluoroheptanoic acid	Ave	0.9860	1.007		15.2	14.9	2.1	30.0
Perfluorohexanesulfonic acid	Ave	1.477	1.428		43.6	45.1	-3.3	30.0
Perfluorooctanoic acid	Ave	0.8783	0.9314		31.8	30.0	6.0	30.0
Perfluorooctane sulfonic acid	Ave	1.034	1.059		61.5	60.0	2.5	30.0
Perfluorononanoic acid	Ave	0.6847	0.6633		28.0	28.9	-3.1	30.0
13C2 PFHxA	Ave	1.203	1.240		10.3	10.0	3.0	30.0
13C2 PFDA	Ave	0.6583	0.6727		10.2	10.0	2.2	30.0

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-28987-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-171486/13 Calibration Date: 06/28/2017 18:00  
 Instrument ID: A8\_N Calib Start Date: 06/28/2017 16:11  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 06/28/2017 16:35  
 Lab File ID: 2017.06.28\_537B\_013.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid	QuaF		1.120		46.6	44.4	5.0	30.0
Perfluoroheptanoic acid	Ave	0.9860	0.9860		4.97	4.97	0.0	30.0
Perfluorohexanesulfonic acid	Ave	1.477	1.562		16.0	15.1	5.7	30.0
Perfluorooctanoic acid	Ave	0.8783	0.8867		10.1	10.0	0.9	30.0
Perfluorononanoic acid	Ave	0.6847	0.6692		9.46	9.68	-2.3	30.0
Perfluorooctane sulfonic acid	Ave	1.034			4.00	20.1		
13C2 PFHxA	Ave	1.203	1.196		9.94	10.0	-0.6	30.0
13C2 PFDA	Ave	0.6583	0.6190		9.40	10.0	-6.0	30.0

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AS 6/26/17

# Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-169764











Analyst: Sharifi, Nooshin

Batch Open: 6/19/2017 9:24:00AM

Method Code: 320-537\_Prep-320

Batch End: 6/20/2017 7:18:00PM

## 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-320-169764/1 N/A	N/A		250 mL	7			N/A	N/A	N/A	CH ND	
			1.0 mL								
2 LCS-320-169764/2 N/A	N/A		250 mL	7			N/A	N/A	N/A	CH ND	
			1.0 mL								
3 LCSD-320-169764/3 N/A	N/A		250 mL	7			N/A	N/A	N/A	CH ND	
			1.0 mL								
4 320-28916-A-1 (537_DOD5)	N/A (320-28916-1)	284.82 g	257.5 mL	7			6/14/17	16_Days	4	CH ND	
		27.36 g	1.0 mL								
5 320-28916-A-2 (537_DOD5)	N/A (320-28916-1)	290.73 g	264.1 mL	7			6/14/17	16_Days	4	CH ND	
		26.64 g	1.0 mL								
6 320-28916-A-3 (537_DOD5)	N/A (320-28916-1)	290.03 g	262.4 mL	7			6/14/17	16_Days	4	CH ND	
		27.61 g	1.0 mL								
7 320-28916-A-4 (537_DOD5)	N/A (320-28916-1)	297.40 g	270 mL	7			6/14/17	16_Days	4	CH ND	
		27.45 g	1.0 mL								
8 320-28916-A-5 (537_DOD5)	N/A (320-28916-1)	291.29 g	264 mL	7			6/14/17	16_Days	4	CH ND	
		27.27 g	1.0 mL								
9 320-28916-A-6 (537_DOD5)	N/A (320-28916-1)	284.91 g	257.3 mL	7			6/14/17	16_Days	4	CH ND	
		27.63 g	1.0 mL								
10 320-28916-A-7 (537_DOD5)	N/A (320-28916-1)	285.67 g	258.2 mL	7			6/14/17	16_Days	4	CH ND	
		27.44 g	1.0 mL								

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# Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)











Batch Number: 320-169764

Analyst: Sharifi, Nooshin

Batch Open: 6/19/2017 9:24:00AM

Method Code: 320-537\_Prep-320

Batch End: 6/20/2017 7:18:00PM

11	320-28916-A-8 (537_DOD5)	N/A (320-28916-1)	294.30 g	267.2 mL	7			6/14/17	16_Days	4	CH ND	
			27.13 g	1.0 mL								
12	320-28916-A-9 (537_DOD5)	N/A (320-28916-1)	284.71 g	257.1 mL	7			6/14/17	16_Days	4	CH ND	
			27.62 g	1.0 mL								
13	320-28916-A-10 (537_DOD5)	N/A (320-28916-1)	288.47 g	261.7 mL	7			6/14/17	16_Days	4	CH ND	
			26.74 g	1.0 mL								
14	320-28916-A-11 (537_DOD5)	N/A (320-28916-1)	287.74 g	259.8 mL	7			6/14/17	16_Days	4	CH ND	
			27.98 g	1.0 mL								
15	320-28916-A-12 (537_DOD5)	N/A (320-28916-1)	289.91 g	261.8 mL	7			6/14/17	16_Days	4	CH ND	
			28.15 g	1.0 mL								
16	320-28916-A-13 (537_DOD5)	N/A (320-28916-1)	286.04 g	258 mL	7			6/14/17	16_Days	4	CH ND	
			28.00 g	1.0 mL								
17	320-28916-A-14 (537_DOD5)	N/A (320-28916-1)	295.46 g	268.3 mL	7			6/14/17	16_Days	4	CH ND	
			27.15 g	1.0 mL								
18	320-28916-A-15 (537_DOD5)	N/A (320-28916-1)	296.93 g	269.9 mL	7			6/14/17	16_Days	4	CH ND	
			27.08 g	1.0 mL								
19	320-28987-A-1 (537_DOD5)	N/A (320-28987-1)	298.63 g	270.6 mL	7			6/15/17	16_Days	4	CH ND	
			27.99 g	1.0 mL								
20	320-28987-A-2 (537_DOD5)	N/A (320-28987-1)	299.65 g	272.5 mL	7			6/15/17	16_Days	4	CH ND	
			27.13 g	1.0 mL								

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# Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-169764

Analyst: Sharifi, Nooshin

Batch Open: 6/19/2017 9:24:00AM

Method Code: 320-537\_Prep-320

Batch End: 6/20/2017 7:18:00PM

## Batch Notes

Manifold ID 4, 1

Trizma ID SLBR4303V

SPE Cartridge ID 6346595-04

Methanol ID 952645

Reagent Water ID 6-14-17

Pipette ID M16387D

Analyst ID - TA Reagent Drop NSH

Analyst ID - TA Reagent Drop JNS  
Witness

Analyst ID - SU Reagent Drop NSH

Analyst ID - SU Reagent Drop JNS  
Witness

Analyst ID - IS Reagent Drop VPM

Analyst ID - IS Reagent Drop TN  
Witness

Batch Comment IS: 911914

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## Comments

PFAS Calibration Calculations:

Initial Calibration 6/19/2017  
 Instrument A8\_N

Perfluoroheptanoic acid

Analyte Concentration	Analyte Response	Internal Standard Response	Internal Standard Amount	RRF	Reported RRF
0.99	289244	3702444	10	0.78912	0.7891
2.38	730235	3726225	10	0.82341	0.8248
4.97	1714811	4188714	10	0.82372	0.8229
10	3092048	3569446	10	0.86625	0.8642
14.9	5084081	3861310	10	0.88367	0.8866
19.7	7166616	4177713	10	0.87078	0.8718
Average				0.84283	0.8433
Standard Deviation				0.0364	
RSD				0.0432	
%RSD				4.31910	4.4

Continuing Calibration 06/23/2017 @ 21:32  
 A8\_N

Perfluoroheptanoic acid

Analyte Concentration	Analyte Response	Internal Standard Response	Internal Standard Amount	RRF	%D	Reported RRF	Reported %D
2.38	710635	3324713	10	0.8981	6.4960193	0.8996	6.7

Willow Grove  
SDG 28987-1

Sample Identification NAWC-060817-RW-303

Compound Perfluorohexanesulfonic acid

Compound Area 795785

Internal Standard Amount (ng) 10

Dilution Factor 1

Internal Standard Area 3314802

Average RRF 1.1672

Sample Volume(ml) 270.6

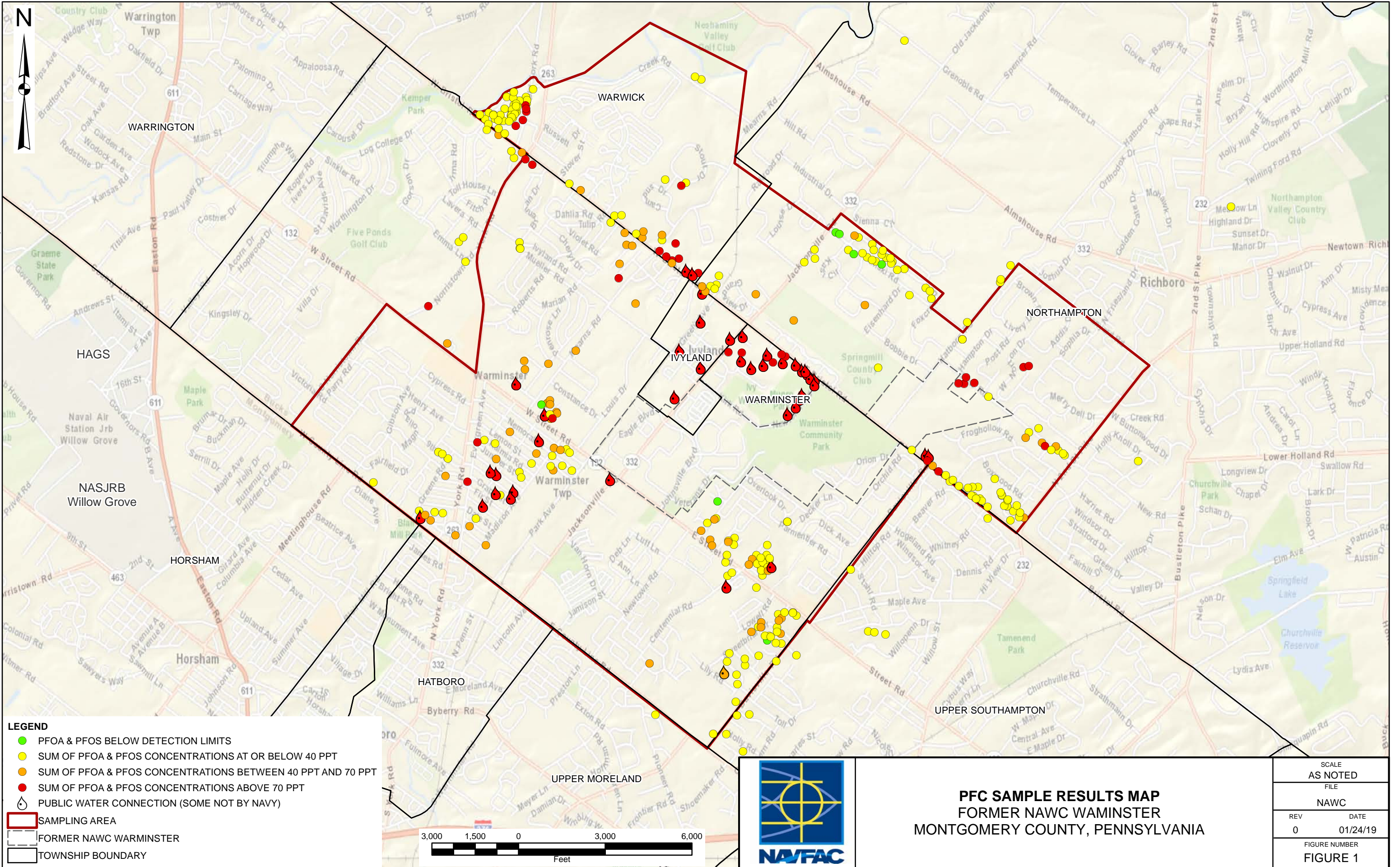
Volume Extract (ml) 1

Injection Volume ( $\mu$ l) 1

$\mu$ l to ml 1000.00

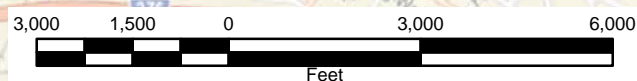
Concentration 7.60 ng/L

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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	