



**Off-Base Drinking Water Sample Results,  
Level 2 Laboratory Report, Level 4 Laboratory Report,  
Electronic Data Deliverable, Data Validation Report,  
and the Sample Location Figure, SDG J25119-1**

*Naval Air Station Whidbey Island  
Oak Harbor, Washington*

June 2019

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

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

TestAmerica Job ID: 320-25119-1  
Client Project/Site: Whidbey Island

For:  
CH2M Hill Constructors, Inc.  
1100 NE Circle Blvd  
Corvallis, Oregon 97330

Attn: Tiffany Hill



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Authorized for release by:  
1/26/2017 8:31:40 AM

Laura Turpen, Project Manager I  
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### LINKS

Review your project  
results through  
**TotalAccess**

Have a Question?



Visit us at:  
[www.testamericainc.com](http://www.testamericainc.com)

*The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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# Definitions/Glossary

Client: CH2M Hill Constructors, Inc.  
Project/Site: Whidbey Island

TestAmerica Job ID: 320-25119-1

## Qualifiers

### LCMS

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

## Glossary

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

# Case Narrative

Client: CH2M Hill Constructors, Inc.  
Project/Site: Whidbey Island

TestAmerica Job ID: 320-25119-1

**Job ID: 320-25119-1**

**Laboratory: TestAmerica Sacramento**

**Narrative**

## CASE NARRATIVE

**Client: CH2M Hill Constructors, Inc.**

**Project: Whidbey Island**

**Report Number: 320-25119-1**

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

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

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

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

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

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

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

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

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

### **RECEIPT**

The samples were received on 01/19/2017; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 1.9 C.

### **Receipt Exceptions**

The container labels and the Chain-of-Custody (COC) for the following samples did not match the sample IDs requested by the client: WI-CV-1RW59-0117 (320-25119-1), WI-CV-1FB59-0117 (320-25119-2), WI-CV-1RW60-0117 (320-25119-3) and WI-CV-1FB60-0117 (320-25119-4). Due to a sample ID error on the COC sent, the samples were logged as below:  
WI-CV-1RW48-0117 & WI-CV-1FB48-0117 logged as WI-CV-1RW59-0117 & WI-CV-1FB59-0117  
WI-CV-1RW49-0117 & WI-CV-1FB49-0117 logged as WI-CV-1RW60-0117 & WI-CV-1FB60-0117

### **PFOA/PFOS**

Samples WI-CV-1RW59-0117 (320-25119-1), WI-CV-1FB59-0117 (320-25119-2), WI-CV-1RW60-0117 (320-25119-3) and WI-CV-1FB60-0117 (320-25119-4) were analyzed for PFOA/PFOS in accordance with 537. The samples were prepared on 01/21/2017 and

# Case Narrative

Client: CH2M Hill Constructors, Inc.  
Project/Site: Whidbey Island

TestAmerica Job ID: 320-25119-1

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## Job ID: 320-25119-1 (Continued)

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### Laboratory: TestAmerica Sacramento (Continued)

analyzed on 01/25/2017.

The following sample was centrifuged prior to extraction:  
WI-CV-1RW60-0117 (320-25119-3)

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

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# Detection Summary

Client: CH2M Hill Constructors, Inc.  
Project/Site: Whidbey Island

TestAmerica Job ID: 320-25119-1

**Client Sample ID: WI-CV-1RW59-0117**

**Lab Sample ID: 320-25119-1**

No Detections.

**Client Sample ID: WI-CV-1FB59-0117**

**Lab Sample ID: 320-25119-2**

No Detections.

**Client Sample ID: WI-CV-1RW60-0117**

**Lab Sample ID: 320-25119-3**

No Detections.

**Client Sample ID: WI-CV-1FB60-0117**

**Lab Sample ID: 320-25119-4**

No Detections.

This Detection Summary does not include radiochemical test results.

TestAmerica Sacramento

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# Client Sample Results

Client: CH2M Hill Constructors, Inc.  
Project/Site: Whidbey Island

TestAmerica Job ID: 320-25119-1

**Client Sample ID: WI-CV-1RW59-0117**

**Lab Sample ID: 320-25119-1**

**Date Collected: 01/17/17 09:14**

**Matrix: Water**

**Date Received: 01/19/17 09:30**

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.048	U	0.060	0.016	ug/L		01/21/17 11:49	01/25/17 12:18	1
Perfluorooctanoic acid (PFOA)	0.024	U	0.030	0.0095	ug/L		01/21/17 11:49	01/25/17 12:18	1
Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.14	0.048	ug/L		01/21/17 11:49	01/25/17 12:18	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	110		70 - 130				01/21/17 11:49	01/25/17 12:18	1
13C2 PFDA	110		70 - 130				01/21/17 11:49	01/25/17 12:18	1

**Client Sample ID: WI-CV-1FB59-0117**

**Lab Sample ID: 320-25119-2**

**Date Collected: 01/17/17 09:13**

**Matrix: Water**

**Date Received: 01/19/17 09:30**

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.048	U	0.059	0.015	ug/L		01/21/17 11:49	01/25/17 12:48	1
Perfluorooctanoic acid (PFOA)	0.024	U	0.030	0.0093	ug/L		01/21/17 11:49	01/25/17 12:48	1
Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.14	0.047	ug/L		01/21/17 11:49	01/25/17 12:48	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	105		70 - 130				01/21/17 11:49	01/25/17 12:48	1
13C2 PFDA	104		70 - 130				01/21/17 11:49	01/25/17 12:48	1

**Client Sample ID: WI-CV-1RW60-0117**

**Lab Sample ID: 320-25119-3**

**Date Collected: 01/18/17 09:31**

**Matrix: Water**

**Date Received: 01/19/17 09:30**

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.049	U	0.061	0.016	ug/L		01/21/17 11:49	01/25/17 13:18	1
Perfluorooctanoic acid (PFOA)	0.024	U	0.030	0.0096	ug/L		01/21/17 11:49	01/25/17 13:18	1
Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.14	0.048	ug/L		01/21/17 11:49	01/25/17 13:18	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	100		70 - 130				01/21/17 11:49	01/25/17 13:18	1
13C2 PFDA	104		70 - 130				01/21/17 11:49	01/25/17 13:18	1

**Client Sample ID: WI-CV-1FB60-0117**

**Lab Sample ID: 320-25119-4**

**Date Collected: 01/18/17 09:30**

**Matrix: Water**

**Date Received: 01/19/17 09:30**

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.047	U	0.059	0.015	ug/L		01/21/17 11:49	01/25/17 13:47	1
Perfluorooctanoic acid (PFOA)	0.024	U	0.029	0.0092	ug/L		01/21/17 11:49	01/25/17 13:47	1
Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.14	0.047	ug/L		01/21/17 11:49	01/25/17 13:47	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	100		70 - 130				01/21/17 11:49	01/25/17 13:47	1
13C2 PFDA	95		70 - 130				01/21/17 11:49	01/25/17 13:47	1

TestAmerica Sacramento



# Surrogate Summary

Client: CH2M Hill Constructors, Inc.  
Project/Site: Whidbey Island

TestAmerica Job ID: 320-25119-1

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

Matrix: Water

Prep Type: Total/NA

### Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)	
		3C2 PFHx (70-130)	3C2 PFDA (70-130)
320-25119-1	WI-CV-1RW59-0117	110	110
320-25119-2	WI-CV-1FB59-0117	105	104
320-25119-3	WI-CV-1RW60-0117	100	104
320-25119-4	WI-CV-1FB60-0117	100	95
LLCS 320-147297/2-A	Lab Control Sample	104	107
MB 320-147297/1-A	Method Blank	98	102

### Surrogate Legend

13C2 PFHxA = 13C2 PFHxA

13C2 PFDA = 13C2 PFDA

# QC Sample Results

Client: CH2M Hill Constructors, Inc.  
Project/Site: Whidbey Island

TestAmerica Job ID: 320-25119-1

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

**Lab Sample ID: MB 320-147297/1-A**  
**Matrix: Water**  
**Analysis Batch: 147664**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 147297**

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.048	U	0.060	0.016	ug/L		01/21/17 11:49	01/25/17 09:19	1
Perfluorooctanoic acid (PFOA)	0.024	U	0.030	0.0094	ug/L		01/21/17 11:49	01/25/17 09:19	1
Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.14	0.048	ug/L		01/21/17 11:49	01/25/17 09:19	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	98		70 - 130	01/21/17 11:49	01/25/17 09:19	1
13C2 PFDA	102		70 - 130	01/21/17 11:49	01/25/17 09:19	1

**Lab Sample ID: LLCS 320-147297/2-A**  
**Matrix: Water**  
**Analysis Batch: 147664**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 147297**

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	Limits
Perfluorooctanesulfonic acid (PFOS)	0.0401	0.0306	J	ug/L		76	50 - 150
Perfluorooctanoic acid (PFOA)	0.0198	0.0174	J M	ug/L		88	50 - 150
Perfluorobutanesulfonic acid (PFBS)	0.0898	0.0729	J	ug/L		81	50 - 150

Surrogate	LLCS %Recovery	LLCS Qualifier	Limits
13C2 PFHxA	104		70 - 130
13C2 PFDA	107		70 - 130

# QC Association Summary

Client: CH2M Hill Constructors, Inc.  
Project/Site: Whidbey Island

TestAmerica Job ID: 320-25119-1

## LCMS

### Prep Batch: 147297

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-25119-1	WI-CV-1RW59-0117	Total/NA	Water	537	
320-25119-2	WI-CV-1FB59-0117	Total/NA	Water	537	
320-25119-3	WI-CV-1RW60-0117	Total/NA	Water	537	
320-25119-4	WI-CV-1FB60-0117	Total/NA	Water	537	
MB 320-147297/1-A	Method Blank	Total/NA	Water	537	
LLCS 320-147297/2-A	Lab Control Sample	Total/NA	Water	537	

### Analysis Batch: 147664

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-25119-1	WI-CV-1RW59-0117	Total/NA	Water	537	147297
320-25119-2	WI-CV-1FB59-0117	Total/NA	Water	537	147297
320-25119-3	WI-CV-1RW60-0117	Total/NA	Water	537	147297
320-25119-4	WI-CV-1FB60-0117	Total/NA	Water	537	147297
MB 320-147297/1-A	Method Blank	Total/NA	Water	537	147297
LLCS 320-147297/2-A	Lab Control Sample	Total/NA	Water	537	147297

# Lab Chronicle

Client: CH2M Hill Constructors, Inc.  
Project/Site: Whidbey Island

TestAmerica Job ID: 320-25119-1

**Client Sample ID: WI-CV-1RW59-0117**

**Lab Sample ID: 320-25119-1**

**Date Collected: 01/17/17 09:14**

**Matrix: Water**

**Date Received: 01/19/17 09:30**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			249.2 mL	1 mL	147297	01/21/17 11:49	KMK	TAL SAC
Total/NA	Analysis	537		1			147664	01/25/17 12:18	JRB	TAL SAC

**Client Sample ID: WI-CV-1FB59-0117**

**Lab Sample ID: 320-25119-2**

**Date Collected: 01/17/17 09:13**

**Matrix: Water**

**Date Received: 01/19/17 09:30**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			252.5 mL	1 mL	147297	01/21/17 11:49	KMK	TAL SAC
Total/NA	Analysis	537		1			147664	01/25/17 12:48	JRB	TAL SAC

**Client Sample ID: WI-CV-1RW60-0117**

**Lab Sample ID: 320-25119-3**

**Date Collected: 01/18/17 09:31**

**Matrix: Water**

**Date Received: 01/19/17 09:30**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			246.4 mL	1 mL	147297	01/21/17 11:49	KMK	TAL SAC
Total/NA	Analysis	537		1			147664	01/25/17 13:18	JRB	TAL SAC

**Client Sample ID: WI-CV-1FB60-0117**

**Lab Sample ID: 320-25119-4**

**Date Collected: 01/18/17 09:30**

**Matrix: Water**

**Date Received: 01/19/17 09:30**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			254.7 mL	1 mL	147297	01/21/17 11:49	KMK	TAL SAC
Total/NA	Analysis	537		1			147664	01/25/17 13:47	JRB	TAL SAC

**Laboratory References:**

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

# Certification Summary

Client: CH2M Hill Constructors, Inc.  
Project/Site: Whidbey Island

TestAmerica Job ID: 320-25119-1

## Laboratory: TestAmerica Sacramento

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

Authority	Program	EPA Region	Certification ID	Expiration Date
A2LA	DoD ELAP		2928-01	01-31-17

Analysis Method	Prep Method	Matrix	Analyte
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# Method Summary

Client: CH2M Hill Constructors, Inc.  
Project/Site: Whidbey Island

TestAmerica Job ID: 320-25119-1

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

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**Protocol References:**

EPA = US Environmental Protection Agency

**Laboratory References:**

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

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# Sample Summary

Client: CH2M Hill Constructors, Inc.  
Project/Site: Whidbey Island

TestAmerica Job ID: 320-25119-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-25119-1	WI-CV-1RW59-0117	Water	01/17/17 09:14	01/19/17 09:30
320-25119-2	WI-CV-1FB59-0117	Water	01/17/17 09:13	01/19/17 09:30
320-25119-3	WI-CV-1RW60-0117	Water	01/18/17 09:31	01/19/17 09:30
320-25119-4	WI-CV-1FB60-0117	Water	01/18/17 09:30	01/19/17 09:30

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West Sacramento, CA 95605  
phone 916.373.5600 fax

TestAmerica Laboratories, Inc.  
COC No: 1 of COCs

Regulatory Program:  DW  NPDES  RCRA  Other: \_\_\_\_\_

Project Manager: Katie Tippin  
Tel/Fax: (757) 671-6258

Date: 1/18/2017  
Carrier: FedEx

Site Contact: Eric Epple  
Lab Contact: Laura Turpen

Project Name: CTO-08  
Site: OLF Coupeville  
P O #: 100067106050 - 679580.09.F.I.F.S

Client Contact  
Tiffany Hill  
Project Chemist

Analysis Turnaround Time  
 CALENDAR DAYS  WORKING DAYS  
TAT if different from Below \_\_\_ Day \_\_\_\_\_  
 2 weeks  
 1 week  
 2 days  
 1 day

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS/MSD (Y/N)	US EPA Method 537 (PFOA, PFOS, and PFBS)	Sample Specific Notes:
WI-CV-1FB48-0117	1/17/16	9:13	G	DW	2	N	X		
WI-CV-1RW49-0117	1/18/16	9:31	G	DW	2	N	X		
WI-CV-1FB49-0117	1/18/16	9:30	G	DW	2	N	X		



Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4= HNO3; 5= NaOH; 6= Other \_\_\_ Trizma\_\_\_  
Possible Hazard Identification: Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.  
 Non-Hazard  Flammable  Skin Irritant  Poison B  Unknown

Special Instructions/QC Requirements & Comments:  
Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)  
 Return to Client  Dispose by Lab  Archive for \_\_\_ Months

Custody Seal No.: \_\_\_\_\_  
Company: CH2M  
Date/Time: 1/18/17 12:09  
Received by: *Eric Epple*  
Company: *TRUSS*

Cooler Temp. (°C): Obs'd: *2.2* Corr'd: *1.9* Therm ID No.: *12*  
Date/Time: 1/19/17 09:30  
Received by: \_\_\_\_\_  
Company: \_\_\_\_\_

Relinquished by: \_\_\_\_\_  
Date/Time: \_\_\_\_\_  
Company: \_\_\_\_\_

\* logged To IDs on included document per client request GME 1/19/17



# Login Sample Receipt Checklist

Client: CH2M Hill Constructors, Inc.

Job Number: 320-25119-1

**Login Number: 25119**

**List Source: TestAmerica Sacramento**

**List Number: 1**

**Creator: Edman, Connor M**

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.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	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	



## ANALYTICAL REPORT

Job Number: 320-25119-1  
Job Description: Whidbey Island

For:  
CH2M Hill Constructors, Inc.  
1100 NE Circle Blvd  
Corvallis, OR 97330  
Attention: Tiffany Hill



Approved for release.  
Laura Turpen  
Project Manager I  
1/26/2017 8:32 AM

---

Laura Turpen, Project Manager I  
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01/26/2017

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# Definitions/Glossary

Client: CH2M Hill Constructors, Inc.  
Project/Site: Whidbey Island

TestAmerica Job ID: 320-25119-1

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## Qualifiers

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### LCMS

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

---

## Glossary

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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, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

## CASE NARRATIVE

**Client: CH2M Hill Constructors, Inc.**

**Project: Whidbey Island**

**Report Number: 320-25119-1**

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

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

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

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

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

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

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

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

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

### **RECEIPT**

The samples were received on 01/19/2017; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 1.9 C.

### **Receipt Exceptions**

The container labels and the Chain-of-Custody (COC) for the following samples did not match the sample IDs requested by the client: WI-CV-1RW59-0117 (320-25119-1), WI-CV-1FB59-0117 (320-25119-2), WI-CV-1RW60-0117 (320-25119-3) and WI-CV-1FB60-0117 (320-25119-4). Due to a sample ID error on the COC sent, the samples were logged as below:  
WI-CV-1RW48-0117 & WI-CV-1FB48-0117 logged as WI-CV-1RW59-0117 & WI-CV-1FB59-0117  
WI-CV-1RW49-0117 & WI-CV-1FB49-0117 logged as WI-CV-1RW60-0117 & WI-CV-1FB60-0117

### **PFOA/PFOS**

Samples WI-CV-1RW59-0117 (320-25119-1), WI-CV-1FB59-0117 (320-25119-2), WI-CV-1RW60-0117 (320-25119-3) and WI-CV-1FB60-0117 (320-25119-4) were analyzed for PFOA/PFOS in accordance with 537. The samples were prepared on 01/21/2017 and analyzed on 01/25/2017.

The following sample was centrifuged prior to extraction:  
WI-CV-1RW60-0117 (320-25119-3)

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

## Detection Summary

Client: CH2M Hill Constructors, Inc.  
Project/Site: Whidbey Island

TestAmerica Job ID: 320-25119-1

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**Client Sample ID: WI-CV-1RW59-0117**

**Lab Sample ID: 320-25119-1**

No Detections.

---

**Client Sample ID: WI-CV-1FB59-0117**

**Lab Sample ID: 320-25119-2**

No Detections.

---

**Client Sample ID: WI-CV-1RW60-0117**

**Lab Sample ID: 320-25119-3**

No Detections.

---

**Client Sample ID: WI-CV-1FB60-0117**

**Lab Sample ID: 320-25119-4**

No Detections.

This Detection Summary does not include radiochemical test results.

TestAmerica Sacramento

# Client Sample Results

Client: CH2M Hill Constructors, Inc.  
Project/Site: Whidbey Island

TestAmerica Job ID: 320-25119-1

## Client Sample ID: WI-CV-1RW59-0117

Date Collected: 01/17/17 09:14

Date Received: 01/19/17 09:30

## Lab Sample ID: 320-25119-1

Matrix: Water

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.048	U	0.060	0.016	ug/L		01/21/17 11:49	01/25/17 12:18	1
Perfluorooctanoic acid (PFOA)	0.024	U	0.030	0.0095	ug/L		01/21/17 11:49	01/25/17 12:18	1
Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.14	0.048	ug/L		01/21/17 11:49	01/25/17 12:18	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	110		70 - 130				01/21/17 11:49	01/25/17 12:18	1
13C2 PFDA	110		70 - 130				01/21/17 11:49	01/25/17 12:18	1

## Client Sample ID: WI-CV-1FB59-0117

Date Collected: 01/17/17 09:13

Date Received: 01/19/17 09:30

## Lab Sample ID: 320-25119-2

Matrix: Water

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.048	U	0.059	0.015	ug/L		01/21/17 11:49	01/25/17 12:48	1
Perfluorooctanoic acid (PFOA)	0.024	U	0.030	0.0093	ug/L		01/21/17 11:49	01/25/17 12:48	1
Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.14	0.047	ug/L		01/21/17 11:49	01/25/17 12:48	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	105		70 - 130				01/21/17 11:49	01/25/17 12:48	1
13C2 PFDA	104		70 - 130				01/21/17 11:49	01/25/17 12:48	1

## Client Sample ID: WI-CV-1RW60-0117

Date Collected: 01/18/17 09:31

Date Received: 01/19/17 09:30

## Lab Sample ID: 320-25119-3

Matrix: Water

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.049	U	0.061	0.016	ug/L		01/21/17 11:49	01/25/17 13:18	1
Perfluorooctanoic acid (PFOA)	0.024	U	0.030	0.0096	ug/L		01/21/17 11:49	01/25/17 13:18	1
Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.14	0.048	ug/L		01/21/17 11:49	01/25/17 13:18	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	100		70 - 130				01/21/17 11:49	01/25/17 13:18	1
13C2 PFDA	104		70 - 130				01/21/17 11:49	01/25/17 13:18	1

## Client Sample ID: WI-CV-1FB60-0117

Date Collected: 01/18/17 09:30

Date Received: 01/19/17 09:30

## Lab Sample ID: 320-25119-4

Matrix: Water

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.047	U	0.059	0.015	ug/L		01/21/17 11:49	01/25/17 13:47	1
Perfluorooctanoic acid (PFOA)	0.024	U	0.029	0.0092	ug/L		01/21/17 11:49	01/25/17 13:47	1
Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.14	0.047	ug/L		01/21/17 11:49	01/25/17 13:47	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	100		70 - 130				01/21/17 11:49	01/25/17 13:47	1
13C2 PFDA	95		70 - 130				01/21/17 11:49	01/25/17 13:47	1



# Default Detection Limits

Client: CH2M Hill Constructors, Inc.  
Project/Site: Whidbey Island

TestAmerica Job ID: 320-25119-1

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

Prep: 537

Analyte	LOQ	DL	Units	Method
Perfluorobutanesulfonic acid (PFBS)	0.14	0.048	ug/L	537
Perfluorooctanesulfonic acid (PFOS)	0.060	0.016	ug/L	537
Perfluorooctanoic acid (PFOA)	0.030	0.0094	ug/L	537

# Surrogate Summary

Client: CH2M Hill Constructors, Inc.  
Project/Site: Whidbey Island

TestAmerica Job ID: 320-25119-1

**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 PFD/ (70-130)
320-25119-1	WI-CV-1RW59-0117	110	110
320-25119-2	WI-CV-1FB59-0117	105	104
320-25119-3	WI-CV-1RW60-0117	100	104
320-25119-4	WI-CV-1FB60-0117	100	95
LLCS 320-147297/2-A	Lab Control Sample	104	107
MB 320-147297/1-A	Method Blank	98	102

#### Surrogate Legend

13C2 PFHxA = 13C2 PFHxA

13C2 PFDA = 13C2 PFDA

# QC Sample Results

Client: CH2M Hill Constructors, Inc.  
Project/Site: Whidbey Island

TestAmerica Job ID: 320-25119-1

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

**Lab Sample ID: MB 320-147297/1-A**  
**Matrix: Water**  
**Analysis Batch: 147664**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 147297**

Analyte	MB MB		LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Perfluorooctanesulfonic acid (PFOS)	0.048	U	0.060	0.016	ug/L		01/21/17 11:49	01/25/17 09:19	1
Perfluorooctanoic acid (PFOA)	0.024	U	0.030	0.0094	ug/L		01/21/17 11:49	01/25/17 09:19	1
Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.14	0.048	ug/L		01/21/17 11:49	01/25/17 09:19	1

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
13C2 PFHxA	98		70 - 130	01/21/17 11:49	01/25/17 09:19	1
13C2 PFDA	102		70 - 130	01/21/17 11:49	01/25/17 09:19	1

**Lab Sample ID: LLCS 320-147297/2-A**  
**Matrix: Water**  
**Analysis Batch: 147664**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 147297**  
**%Rec.**

Analyte	Spike Added	LLCS LLCS		Unit	D	%Rec	Limits
		Result	Qualifier				
Perfluorooctanesulfonic acid (PFOS)	0.0401	0.0306	J	ug/L		76	50 - 150
Perfluorooctanoic acid (PFOA)	0.0198	0.0174	J M	ug/L		88	50 - 150
Perfluorobutanesulfonic acid (PFBS)	0.0898	0.0729	J	ug/L		81	50 - 150

Surrogate	LLCS LLCS		Limits
	%Recovery	Qualifier	
13C2 PFHxA	104		70 - 130
13C2 PFDA	107		70 - 130

# QC Association Summary

Client: CH2M Hill Constructors, Inc.  
Project/Site: Whidbey Island

TestAmerica Job ID: 320-25119-1

## LCMS

### Prep Batch: 147297

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-25119-1	WI-CV-1RW59-0117	Total/NA	Water	537	
320-25119-2	WI-CV-1FB59-0117	Total/NA	Water	537	
320-25119-3	WI-CV-1RW60-0117	Total/NA	Water	537	
320-25119-4	WI-CV-1FB60-0117	Total/NA	Water	537	
MB 320-147297/1-A	Method Blank	Total/NA	Water	537	
LLCS 320-147297/2-A	Lab Control Sample	Total/NA	Water	537	

### Analysis Batch: 147664

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-25119-1	WI-CV-1RW59-0117	Total/NA	Water	537	147297
320-25119-2	WI-CV-1FB59-0117	Total/NA	Water	537	147297
320-25119-3	WI-CV-1RW60-0117	Total/NA	Water	537	147297
320-25119-4	WI-CV-1FB60-0117	Total/NA	Water	537	147297
MB 320-147297/1-A	Method Blank	Total/NA	Water	537	147297
LLCS 320-147297/2-A	Lab Control Sample	Total/NA	Water	537	147297

# Lab Chronicle

Client: CH2M Hill Constructors, Inc.  
Project/Site: Whidbey Island

TestAmerica Job ID: 320-25119-1

## Client Sample ID: WI-CV-1RW59-0117

Date Collected: 01/17/17 09:14

Date Received: 01/19/17 09:30

## Lab Sample ID: 320-25119-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			147297	01/21/17 11:49	KMK	TAL SAC
Total/NA	Analysis	537		1	147664	01/25/17 12:18	JRB	TAL SAC

## Client Sample ID: WI-CV-1FB59-0117

Date Collected: 01/17/17 09:13

Date Received: 01/19/17 09:30

## Lab Sample ID: 320-25119-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			147297	01/21/17 11:49	KMK	TAL SAC
Total/NA	Analysis	537		1	147664	01/25/17 12:48	JRB	TAL SAC

## Client Sample ID: WI-CV-1RW60-0117

Date Collected: 01/18/17 09:31

Date Received: 01/19/17 09:30

## Lab Sample ID: 320-25119-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			147297	01/21/17 11:49	KMK	TAL SAC
Total/NA	Analysis	537		1	147664	01/25/17 13:18	JRB	TAL SAC

## Client Sample ID: WI-CV-1FB60-0117

Date Collected: 01/18/17 09:30

Date Received: 01/19/17 09:30

## Lab Sample ID: 320-25119-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			147297	01/21/17 11:49	KMK	TAL SAC
Total/NA	Analysis	537		1	147664	01/25/17 13:47	JRB	TAL SAC

### Laboratory References:

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

# Certification Summary

Client: CH2M Hill Constructors, Inc.  
Project/Site: Whidbey Island

TestAmerica Job ID: 320-25119-1

## Laboratory: TestAmerica Sacramento

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

<u>Authority</u>	<u>Program</u>	<u>EPA Region</u>	<u>Certification ID</u>	<u>Expiration Date</u>
A2LA	DoD ELAP		2928-01	01-31-17

<u>Analysis Method</u>	<u>Prep Method</u>	<u>Matrix</u>	<u>Analyte</u>
------------------------	--------------------	---------------	----------------

# Method Summary

Client: CH2M Hill Constructors, Inc.  
Project/Site: Whidbey Island

TestAmerica Job ID: 320-25119-1

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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: CH2M Hill Constructors, Inc.  
Project/Site: Whidbey Island

TestAmerica Job ID: 320-25119-1

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<b>Lab Sample ID</b>	<b>Client Sample ID</b>	<b>Matrix</b>	<b>Collected</b>	<b>Received</b>
320-25119-1	WI-CV-1RW59-0117	Water	01/17/17 09:14	01/19/17 09:30
320-25119-2	WI-CV-1FB59-0117	Water	01/17/17 09:13	01/19/17 09:30
320-25119-3	WI-CV-1RW60-0117	Water	01/18/17 09:31	01/19/17 09:30
320-25119-4	WI-CV-1FB60-0117	Water	01/18/17 09:30	01/19/17 09:30



LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-25119-1

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

Instrument ID: A6 Analysis Batch Number: 147661

Lab Sample ID: STD 320-147661/3 IC Client Sample ID: \_\_\_\_\_

Date Analyzed: 01/24/17 16:04 Lab File ID: 24JAN2017A6A\_003.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid	19.43	Split Peak	barnettj	01/25/17 09:52
Perfluorooctanoic acid (PFOA)	20.09	Split Peak	barnettj	01/25/17 09:52

Lab Sample ID: STD 320-147661/4 IC Client Sample ID: \_\_\_\_\_

Date Analyzed: 01/24/17 16:33 Lab File ID: 24JAN2017A6A\_004.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid	19.43	Split Peak	barnettj	01/25/17 09:52
Perfluorooctanoic acid (PFOA)	20.09	Split Peak	barnettj	01/25/17 09:52

Lab Sample ID: CCV 320-147661/10 CCVL Client Sample ID: \_\_\_\_\_

Date Analyzed: 01/24/17 19:31 Lab File ID: 24JAN2017A6A\_010.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid	19.44	Split Peak	barnettj	01/25/17 10:08
Perfluorooctanoic acid (PFOA)	20.11	Split Peak	barnettj	01/25/17 10:08

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-25119-1

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

Instrument ID: A6 Analysis Batch Number: 147664

Lab Sample ID: LLCS 320-147297/2-A Client Sample ID: \_\_\_\_\_

Date Analyzed: 01/25/17 09:49 Lab File ID: 24JAN2017A6A\_039.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	20.08	Split Peak	barnettj	01/25/17 13:49

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-25119-1

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

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
<b>LC537-ICV_00019</b>	03/01/17	12/20/16	MeOH/H2O, Lot 067374	10 mL	LC537-IS_00028	200 uL	13C2-PFOA	10 ng/mL
.LC537-IS_00028	06/19/17	12/19/16	Methanol, Lot 090285	10000 uL	LCM2PFOA_00005	100 uL	13C2-PFOA	0.5 ug/mL
..LCM2PFOA_00005	06/19/18	Wellington Laboratories, Lot M2PFOA0613			LCMPFOS_00018	300 uL	13C4 PFOS	1.434 ug/mL
..LCMPFOS_00018	08/03/21	Wellington Laboratories, Lot MPFOS0816			(Purchased Reagent)		13C2-PFOA	50 ug/mL
<b>LC537-ICV_00019</b>	03/01/17	12/20/16	MeOH/H2O, Lot 067374	10 mL	LC537-SU_00027	500 uL	13C2 PFDA	10 ng/mL
					LC537ICIM_00014	25 uL	13C2 PFHxA	10 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	114.77 ng/mL
							Perfluorooctanoic acid (PFOA)	25.0232 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	27.2389 ng/mL
.LC537-SU_00027	06/19/17	12/19/16	Methanol, Lot 104453	20000 uL	LCMPFDA_00008	80 uL	13C2 PFDA	0.2 ug/mL
..LCMPFDA_00008	08/19/20	Wellington Laboratories, Lot MPFDA0815			LCMPFHxA_00009	80 uL	13C2 PFHxA	0.2 ug/mL
..LCMPFHxA_00009	04/09/20	Wellington Laboratories, Lot MPFHxA0415			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LC537ICIM_00014	03/01/17	12/20/16	Methanol, Lot 090285	25 mL	LC537-PFBS2_00005	0.5 mL	13C2 PFHxA	50 ug/mL
					LC537-PFOA2_00008	0.142 mL	Perfluorobutanesulfonic acid (PFBS)	45.908 ug/mL
					LC537-PFOS2_00005	0.22 mL	Perfluorooctanoic acid (PFOA)	10.0093 ug/mL
..LC537-PFBS2_00005	03/01/17	02/29/16	Methanol, Lot 090285	10 mL	LC537_PFBS2_00001	0.023 g	Perfluorooctanesulfonic acid (PFOS)	10.8956 ug/mL
...LC537_PFBS2_00001	08/09/17	Santa Cruz Biotechnology, Lot H0112			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	2295.4 ug/mL
..LC537-PFOA2_00008	07/25/17	12/20/16	Methanol, Lot 090285	10 mL	LC537_PFOA2_00001	0.0178 g	Perfluorobutanesulfonic acid (PFBS)	0.998 g/g
...LC537_PFOA2_00001	07/25/17	Afla Aesar, Lot D24Y026			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	1762.2 ug/mL
..LC537-PFOS2_00005	03/01/17	02/29/16	Methanol, Lot 090285	10 mL	LC537_PFOS2_00001	0.0159 g	Perfluorooctanoic acid (PFOA)	0.99 g/g
...LC537_PFOS2_00001	07/26/17	Sigma, Lot BCBF5116V			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	1238.13 ug/mL
<b>LC537-IS_00030</b>	07/17/17	01/17/17	Methanol, Lot 090285	10000 uL	LCM2PFOA_00005	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.7787 g/g
.LCM2PFOA_00005	06/19/18	Wellington Laboratories, Lot M2PFOA0613			LCMPFOS_00018	300 uL	13C2-PFOA	0.5 ug/mL
..LCMPFOS_00018	08/03/21	Wellington Laboratories, Lot MPFOS0816			(Purchased Reagent)		13C4 PFOS	1.434 ug/mL
<b>LC537-L1_00017</b>	06/14/17	12/23/16	MeOH/H2O, Lot 090285	5 mL	LC537-IS_00028	100 uL	13C2-PFOA	10 ng/mL
					LC537-MSP_00017	25 uL	13C4 PFOS	28.68 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	8.976 ng/mL
							Perfluoroheptanoic acid	0.99 ng/mL
							Perfluorohexanesulfonic acid	3.02582 ng/mL
							Perfluorononanoic acid	2.07415 ng/mL
							Perfluorooctanoic acid (PFOA)	1.95189 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	4.00664 ng/mL
					LC537-SU_00026	250 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-25119-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LC537-IS_00028	06/19/17	12/19/16	Methanol, Lot 090285	10000 uL	LCM2PFOA 00005	100 uL	13C2-PFOA	0.5 ug/mL
					LCMPFOS 00018	300 uL	13C4 PFOS	1.434 ug/mL
..LCM2PFOA 00005	06/19/18	Wellington Laboratories, Lot M2PFOA0613			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS 00018	08/03/21	Wellington Laboratories, Lot MPFOS0816			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-MSP_00017	06/22/17	12/22/16	Methanol, Lot 090285	10000 uL	LC537SPIM_00018	200 uL	Perfluorobutanesulfonic acid (PFBS)	1795.2 ng/mL
							Perfluoroheptanoic acid	198 ng/mL
							Perfluorohexanesulfonic acid	605.164 ng/mL
							Perfluorononanoic acid	414.831 ng/mL
							Perfluorooctanoic acid (PFOA)	390.378 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	801.328 ng/mL
..LC537SPIM_00018	06/22/17	12/22/16	Methanol, Lot 104453	10000 uL	LC537-PFBS_00006	440 uL	Perfluorobutanesulfonic acid (PFBS)	89.76 ug/mL
					LC537-PFHpA 00013	100 uL	Perfluoroheptanoic acid	9.9 ug/mL
					LC537-PFHxS 00008	300 uL	Perfluorohexanesulfonic acid	30.2582 ug/mL
					LC537-PFNA 00011	200 uL	Perfluorononanoic acid	20.7415 ug/mL
					LC537-PFOA 00011	100 uL	Perfluorooctanoic acid (PFOA)	19.5189 ug/mL
					LC537-PFOS_00006	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0664 ug/mL
...LC537-PFBS_00006	07/28/17	07/28/16	Methanol, Lot 090285	5 mL	LC537_PFBS_00002	0.0102 g	Perfluorobutanesulfonic acid (PFBS)	2040 ug/mL
....LC537_PFBS_00002	04/01/18	Sigma, Lot MKBP8842V			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1 g/g
...LC537-PFHpA 00013	06/22/17	12/22/16	Methanol, Lot 090285	56.8 mL	LC537 PFHpA 00002	0.0568 g	Perfluoroheptanoic acid	990 ug/mL
....LC537 PFHpA 00002	04/01/18	Aldrich, Lot BCM2579V			(Purchased Reagent)		Perfluoroheptanoic acid	0.99 g/g
...LC537-PFHxS 00008	07/28/17	07/28/16	Methanol, Lot 090285	5.5 mL	LC537 PFHxS 00002	0.0061 g	Perfluorohexanesulfonic acid	1008.61 ug/mL
....LC537 PFHxS 00002	04/01/18	Sigma, Lot BCBL3545V			(Purchased Reagent)		Perfluorohexanesulfonic acid	0.9094 g/g
...LC537-PFNA 00011	11/21/17	11/21/16	Methanol, Lot 090285	6.5 mL	LC537 PFNA 00002	0.007 g	Perfluorononanoic acid	1037.08 ug/mL
....LC537 PFNA 00002	04/01/18	TCI America, Lot QN44F			(Purchased Reagent)		Perfluorononanoic acid	0.963 g/g
...LC537-PFOA 00011	11/21/17	11/21/16	Methanol, Lot 090285	6.5 mL	LC537 PFOA 00002	0.0127 g	Perfluorooctanoic acid (PFOA)	1951.89 ug/mL
....LC537 PFOA 00002	11/04/18	Fluka, Lot SZBD308XV			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
...LC537-PFOS_00006	07/28/17	07/28/16	Methanol, Lot 090285	6 mL	LC537_PFOS_00002	0.0066 g	Perfluorooctanesulfonic acid (PFOS)	1001.66 ug/mL
....LC537_PFOS_00002	08/09/17	Fluka, Lot SZBC222XV			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-SU_00026	06/14/17	12/16/16	Methanol, Lot 104453	20000 uL	LC537-SU_00025	10000 uL	13C2 PFDA	0.2 ug/mL
							13C2 PFHxA	0.2 ug/mL
..LC537-SU_00025	06/14/17	12/14/16	Methanol, Lot 104453	10000 uL	LCMPFDA 00008	80 uL	13C2 PFDA	0.4 ug/mL
					LCMPFHxA 00009	80 uL	13C2 PFHxA	0.4 ug/mL
...LCMPFDA 00008	08/19/20	Wellington Laboratories, Lot MPFDA0815			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFHxA 00009	04/09/20	Wellington Laboratories, Lot MPFHxA0415			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
<b>LC537-L2_00016</b>	06/14/17	12/23/16	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00014	34 uL	Perfluorobutanesulfonic acid (PFBS)	22.8888 ng/mL
							Perfluoroheptanoic acid	2.5245 ng/mL
							Perfluorohexanesulfonic acid	7.71585 ng/mL
							Perfluorononanoic acid	5.28909 ng/mL
							Perfluorooctanoic acid (PFOA)	4.97733 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-25119-1

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

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorooctanesulfonic acid (PFOS)	10.2169 ng/mL
					LC537-IS_00028	100 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00026	250 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00014	06/22/17	12/22/16	Methanol, Lot 090285	10000 uL	LC537SPIM_00018	375 uL	Perfluorobutanesulfonic acid (PFBS)	3366 ng/mL
							Perfluoroheptanoic acid	371.25 ng/mL
							Perfluorohexanesulfonic acid	1134.68 ng/mL
							Perfluorononanoic acid	777.808 ng/mL
							Perfluorooctanoic acid (PFOA)	731.96 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	1502.49 ng/mL
.LC537SPIM_00018	06/22/17	12/22/16	Methanol, Lot 104453	10000 uL	LC537-PFBS_00006	440 uL	Perfluorobutanesulfonic acid (PFBS)	89.76 ug/mL
					LC537-PFHxA_00013	100 uL	Perfluoroheptanoic acid	9.9 ug/mL
					LC537-PFHxS_00008	300 uL	Perfluorohexanesulfonic acid	30.2582 ug/mL
					LC537-PFNA_00011	200 uL	Perfluorononanoic acid	20.7415 ug/mL
					LC537-PFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	19.5189 ug/mL
					LC537-PFOS_00006	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0664 ug/mL
.LC537-PFBS_00006	07/28/17	07/28/16	Methanol, Lot 090285	5 mL	LC537_PFBS_00002	0.0102 g	Perfluorobutanesulfonic acid (PFBS)	2040 ug/mL
.LC537_PFBS_00002	04/01/18		Sigma, Lot MKBP8842V		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1 g/g
.LC537-PFHxA_00013	06/22/17	12/22/16	Methanol, Lot 090285	56.8 mL	LC537_PFHxA_00002	0.0568 g	Perfluoroheptanoic acid	990 ug/mL
.LC537_PFHxA_00002	04/01/18		Aldrich, Lot BCBM2579V		(Purchased Reagent)		Perfluoroheptanoic acid	0.99 g/g
.LC537-PFHxS_00008	07/28/17	07/28/16	Methanol, Lot 090285	5.5 mL	LC537_PFHxS_00002	0.0061 g	Perfluorohexanesulfonic acid	1008.61 ug/mL
.LC537_PFHxS_00002	04/01/18		Sigma, Lot BCBL3545V		(Purchased Reagent)		Perfluorohexanesulfonic acid	0.9094 g/g
.LC537-PFNA_00011	11/21/17	11/21/16	Methanol, Lot 090285	6.5 mL	LC537_PFNA_00002	0.007 g	Perfluorononanoic acid	1037.08 ug/mL
.LC537_PFNA_00002	04/01/18		TCI America, Lot QN44F		(Purchased Reagent)		Perfluorononanoic acid	0.963 g/g
.LC537-PFOA_00011	11/21/17	11/21/16	Methanol, Lot 090285	6.5 mL	LC537_PFOA_00002	0.0127 g	Perfluorooctanoic acid (PFOA)	1951.89 ug/mL
.LC537_PFOA_00002	11/04/18		Fluka, Lot SZBD308XV		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
.LC537-PFOS_00006	07/28/17	07/28/16	Methanol, Lot 090285	6 mL	LC537_PFOS_00002	0.0066 g	Perfluorooctanesulfonic acid (PFOS)	1001.66 ug/mL
.LC537_PFOS_00002	08/09/17		Fluka, Lot SZBC222XV		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-IS_00028	06/19/17	12/19/16	Methanol, Lot 090285	10000 uL	LCM2PFOA_00005	100 uL	13C2-PFOA	0.5 ug/mL
					LCMPFOS_00018	300 uL	13C4 PFOS	1.434 ug/mL
.LCM2PFOA_00005	06/19/18		Wellington Laboratories, Lot M2PFOA0613		(Purchased Reagent)		13C2-PFOA	50 ug/mL
.LCMPFOS_00018	08/03/21		Wellington Laboratories, Lot MPFOS0816		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-SU_00026	06/14/17	12/16/16	Methanol, Lot 104453	20000 uL	LC537-SU_00025	10000 uL	13C2 PFDA	0.2 ug/mL
							13C2 PFHxA	0.2 ug/mL
.LC537-SU_00025	06/14/17	12/14/16	Methanol, Lot 104453	10000 uL	LCMPFDA_00008	80 uL	13C2 PFDA	0.4 ug/mL
					LCMPFHxA_00009	80 uL	13C2 PFHxA	0.4 ug/mL
.LCMPFDA_00008	08/19/20		Wellington Laboratories, Lot MPFDA0815		(Purchased Reagent)		13C2 PFDA	50 ug/mL
.LCMPFHxA_00009	04/09/20		Wellington Laboratories, Lot MPFHxA0415		(Purchased Reagent)		13C2 PFHxA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-25119-1

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

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration		
					Reagent ID	Volume Added				
LC537-L3_00019	06/14/17	01/20/17	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00014	67 uL	Perfluorobutanesulfonic acid (PFBS)	45.1044 ng/mL		
							Perfluoroheptanoic acid	4.97475 ng/mL		
							Perfluorohexanesulfonic acid	15.2048 ng/mL		
							Perfluorononanoic acid	10.4226 ng/mL		
							Perfluorooctanoic acid (PFOA)	9.80826 ng/mL		
					Perfluorooctanesulfonic acid (PFOS)	20.1334 ng/mL				
					LC537-IS_00030	100 uL	13C2-PFOA	10 ng/mL		
							13C4 PFOS	28.68 ng/mL		
					LC537-SU_00029	250 uL	13C2 PFDA	10 ng/mL		
							13C2 PFHxA	10 ng/mL		
.LC537-HSP_00014	06/22/17	12/22/16	Methanol, Lot 090285	10000 uL	LC537SPIM_00018	375 uL	Perfluorobutanesulfonic acid (PFBS)	3366 ng/mL		
							Perfluoroheptanoic acid	371.25 ng/mL		
							Perfluorohexanesulfonic acid	1134.68 ng/mL		
							Perfluorononanoic acid	777.808 ng/mL		
							Perfluorooctanoic acid (PFOA)	731.96 ng/mL		
Perfluorooctanesulfonic acid (PFOS)	1502.49 ng/mL									
..LC537SPIM_00018	06/22/17	12/22/16	Methanol, Lot 104453	10000 uL	LC537-PFBS_00006	440 uL	Perfluorobutanesulfonic acid (PFBS)	89.76 ug/mL		
							LC537-PFHpA_00013	100 uL	Perfluoroheptanoic acid	9.9 ug/mL
							LC537-PFHxS_00008	300 uL	Perfluorohexanesulfonic acid	30.2582 ug/mL
							LC537-PFNA_00011	200 uL	Perfluorononanoic acid	20.7415 ug/mL
							LC537-PFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	19.5189 ug/mL
LC537-PFOS_00006	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0664 ug/mL							
...LC537-PFBS_00006	07/28/17	07/28/16	Methanol, Lot 090285	5 mL	LC537_PFBS_00002	0.0102 g	Perfluorobutanesulfonic acid (PFBS)	2040 ug/mL		
....LC537_PFBS_00002	04/01/18		Sigma, Lot MKBP8842V		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1 g/g		
...LC537-PFHpA_00013	06/22/17	12/22/16	Methanol, Lot 090285	56.8 mL	LC537 PFHpA_00002	0.0568 g	Perfluoroheptanoic acid	990 ug/mL		
...LC537 PFHpA_00002	04/01/18		Aldrich, Lot BCM2579V		(Purchased Reagent)		Perfluoroheptanoic acid	0.99 g/g		
...LC537-PFHxS_00008	07/28/17	07/28/16	Methanol, Lot 090285	5.5 mL	LC537 PFHxS_00002	0.0061 g	Perfluorohexanesulfonic acid	1008.61 ug/mL		
...LC537 PFHxS_00002	04/01/18		Sigma, Lot BCBL3545V		(Purchased Reagent)		Perfluorohexanesulfonic acid	0.9094 g/g		
...LC537-PFNA_00011	11/21/17	11/21/16	Methanol, Lot 090285	6.5 mL	LC537 PFNA_00002	0.007 g	Perfluorononanoic acid	1037.08 ug/mL		
...LC537 PFNA_00002	04/01/18		TCI America, Lot QN44F		(Purchased Reagent)		Perfluorononanoic acid	0.963 g/g		
...LC537-PFOA_00011	11/21/17	11/21/16	Methanol, Lot 090285	6.5 mL	LC537 PFOA_00002	0.0127 g	Perfluorooctanoic acid (PFOA)	1951.89 ug/mL		
...LC537 PFOA_00002	11/04/18		Fluka, Lot SZBD308XV		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g		
...LC537-PFOS_00006	07/28/17	07/28/16	Methanol, Lot 090285	6 mL	LC537_PFOS_00002	0.0066 g	Perfluorooctanesulfonic acid (PFOS)	1001.66 ug/mL		
....LC537_PFOS_00002	08/09/17		Fluka, Lot SZBC222XV		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g		
.LC537-IS_00030	07/17/17	01/17/17	Methanol, Lot 090285	10000 uL	LCM2PFOA_00005	100 uL	13C2-PFOA	0.5 ug/mL		
					LCMPFOS_00018	300 uL	13C4 PFOS	1.434 ug/mL		
..LCM2PFOA_00005	06/19/18		Wellington Laboratories, Lot M2PFOA0613		(Purchased Reagent)		13C2-PFOA	50 ug/mL		
..LCMPFOS_00018	08/03/21		Wellington Laboratories, Lot MPFOS0816		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL		
.LC537-SU_00029	07/17/17	01/17/17	Methanol, Lot 104453	20000 uL	LCMPFDA_00012	80 uL	13C2 PFDA	0.2 ug/mL		

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-25119-1

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

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCMPFDA 00012	09/30/21		Wellington Laboratories, Lot MPFDA0916		LCMPFHxA 00013	80 uL	13C2 PFHxA	0.2 ug/mL
..LCMPFHxA 00013	04/08/21		Wellington Laboratories, Lot MPFHxA0416		(Purchased Reagent)		13C2 PFDA	50 ug/mL
<b>LC537-L4_00017</b>	06/14/17	12/23/16	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00014	135 uL	Perfluorobutanesulfonic acid (PFBS)	90.882 ng/mL
							Perfluoroheptanoic acid	10.0238 ng/mL
							Perfluorohexanesulfonic acid	30.6364 ng/mL
							Perfluorononanoic acid	21.0008 ng/mL
							Perfluorooctanoic acid (PFOA)	19.7629 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	40.5672 ng/mL
					LC537-IS_00028	100 uL	13C2-PFOA	10 ng/mL
					LC537-SU_00026	250 uL	13C4 PFOS	28.68 ng/mL
							13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00014	06/22/17	12/22/16	Methanol, Lot 090285	10000 uL	LC537SPIM_00018	375 uL	Perfluorobutanesulfonic acid (PFBS)	3366 ng/mL
							Perfluoroheptanoic acid	371.25 ng/mL
							Perfluorohexanesulfonic acid	1134.68 ng/mL
							Perfluorononanoic acid	777.808 ng/mL
							Perfluorooctanoic acid (PFOA)	731.96 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	1502.49 ng/mL
..LC537SPIM_00018	06/22/17	12/22/16	Methanol, Lot 104453	10000 uL	LC537-PFBS_00006	440 uL	Perfluorobutanesulfonic acid (PFBS)	89.76 ug/mL
					LC537-PFHpA 00013	100 uL	Perfluoroheptanoic acid	9.9 ug/mL
					LC537-PFHxS 00008	300 uL	Perfluorohexanesulfonic acid	30.2582 ug/mL
					LC537-PFNA 00011	200 uL	Perfluorononanoic acid	20.7415 ug/mL
					LC537-PFOA 00011	100 uL	Perfluorooctanoic acid (PFOA)	19.5189 ug/mL
					LC537-PFOS_00006	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0664 ug/mL
...LC537-PFBS_00006	07/28/17	07/28/16	Methanol, Lot 090285	5 mL	LC537_PFBS_00002	0.0102 g	Perfluorobutanesulfonic acid (PFBS)	2040 ug/mL
....LC537_PFBS_00002	04/01/18		Sigma, Lot MKBP8842V		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1 g/g
...LC537-PFHpA 00013	06/22/17	12/22/16	Methanol, Lot 090285	56.8 mL	LC537 PFHpA 00002	0.0568 g	Perfluoroheptanoic acid	990 ug/mL
...LC537 PFHpA 00002	04/01/18		Aldrich, Lot BCM2579V		(Purchased Reagent)		Perfluoroheptanoic acid	0.99 g/g
...LC537-PFHxS 00008	07/28/17	07/28/16	Methanol, Lot 090285	5.5 mL	LC537 PFHxS 00002	0.0061 g	Perfluorohexanesulfonic acid	1008.61 ug/mL
...LC537 PFHxS 00002	04/01/18		Sigma, Lot BCBL3545V		(Purchased Reagent)		Perfluorohexanesulfonic acid	0.9094 g/g
...LC537-PFNA 00011	11/21/17	11/21/16	Methanol, Lot 090285	6.5 mL	LC537 PFNA 00002	0.007 g	Perfluorononanoic acid	1037.08 ug/mL
...LC537 PFNA 00002	04/01/18		TCI America, Lot QN44F		(Purchased Reagent)		Perfluorononanoic acid	0.963 g/g
...LC537-PFOA 00011	11/21/17	11/21/16	Methanol, Lot 090285	6.5 mL	LC537 PFOA 00002	0.0127 g	Perfluorooctanoic acid (PFOA)	1951.89 ug/mL
...LC537 PFOA 00002	11/04/18		Fluka, Lot SZBD308XV		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
...LC537-PFOS_00006	07/28/17	07/28/16	Methanol, Lot 090285	6 mL	LC537_PFOS_00002	0.0066 g	Perfluorooctanesulfonic acid (PFOS)	1001.66 ug/mL
....LC537_PFOS_00002	08/09/17		Fluka, Lot SZBC222XV		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-IS_00028	06/19/17	12/19/16	Methanol, Lot 090285	10000 uL	LCM2PFOA 00005	100 uL	13C2-PFOA	0.5 ug/mL
					LCMPFOS 00018	300 uL	13C4 PFOS	1.434 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-25119-1

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

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration		
					Reagent ID	Volume Added				
..LCM2PFOA_00005	06/19/18		Wellington Laboratories, Lot M2PFOA0613		(Purchased Reagent)		13C2-PFOA	50 ug/mL		
..LCMPFOS_00018	08/03/21		Wellington Laboratories, Lot MPFOS0816		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL		
.LC537-SU_00026	06/14/17	12/16/16	Methanol, Lot 104453	20000 uL	LC537-SU_00025	10000 uL	13C2 PFDA	0.2 ug/mL		
..LC537-SU_00025	06/14/17	12/14/16	Methanol, Lot 104453	10000 uL	LCMPFDA_00008	80 uL	13C2 PFDA	0.4 ug/mL		
...LCMPFDA_00008	08/19/20		Wellington Laboratories, Lot MPFDA0815		(Purchased Reagent)		13C2 PFDA	50 ug/mL		
...LCMPFHxA_00009	04/09/20		Wellington Laboratories, Lot MPFHxA0415		(Purchased Reagent)		13C2 PFHxA	50 ug/mL		
<b>LC537-L5_00020</b>	06/14/17	01/20/17	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00014	200 uL	Perfluorobutanesulfonic acid (PFBS)	134.64 ng/mL		
							Perfluoroheptanoic acid	14.85 ng/mL		
							Perfluorohexanesulfonic acid	45.3873 ng/mL		
							Perfluorononanoic acid	31.1123 ng/mL		
							Perfluorooctanoic acid (PFOA)	29.2784 ng/mL		
Perfluorooctanesulfonic acid (PFOS)	60.0996 ng/mL									
					LC537-IS_00030	100 uL	13C2-PFOA	10 ng/mL		
					LC537-SU_00029	250 uL	13C2 PFDA	10 ng/mL		
							13C2 PFHxA	10 ng/mL		
.LC537-HSP_00014	06/22/17	12/22/16	Methanol, Lot 090285	10000 uL	LC537SPIM_00018	375 uL	Perfluorobutanesulfonic acid (PFBS)	3366 ng/mL		
							Perfluoroheptanoic acid	371.25 ng/mL		
							Perfluorohexanesulfonic acid	1134.68 ng/mL		
							Perfluorononanoic acid	777.808 ng/mL		
							Perfluorooctanoic acid (PFOA)	731.96 ng/mL		
Perfluorooctanesulfonic acid (PFOS)	1502.49 ng/mL									
..LC537SPIM_00018	06/22/17	12/22/16	Methanol, Lot 104453	10000 uL	LC537-PFBS_00006	440 uL	Perfluorobutanesulfonic acid (PFBS)	89.76 ug/mL		
							LC537-PFHpA_00013	100 uL	Perfluoroheptanoic acid	9.9 ug/mL
							LC537-PFHxS_00008	300 uL	Perfluorohexanesulfonic acid	30.2582 ug/mL
							LC537-PFNA_00011	200 uL	Perfluorononanoic acid	20.7415 ug/mL
							LC537-PFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	19.5189 ug/mL
LC537-PFOS_00006	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0664 ug/mL							
...LC537-PFBS_00006	07/28/17	07/28/16	Methanol, Lot 090285	5 mL	LC537_PFBS_00002	0.0102 g	Perfluorobutanesulfonic acid (PFBS)	2040 ug/mL		
....LC537_PFBS_00002	04/01/18		Sigma, Lot MKBP8842V		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1 g/g		
..LC537-PFHpA_00013	06/22/17	12/22/16	Methanol, Lot 090285	56.8 mL	LC537_PFHpA_00002	0.0568 g	Perfluoroheptanoic acid	990 ug/mL		
....LC537_PFHpA_00002	04/01/18		Aldrich, Lot BCBM2579V		(Purchased Reagent)		Perfluoroheptanoic acid	0.99 g/g		
...LC537-PFHxS_00008	07/28/17	07/28/16	Methanol, Lot 090285	5.5 mL	LC537_PFHxS_00002	0.0061 g	Perfluorohexanesulfonic acid	1008.61 ug/mL		
....LC537_PFHxS_00002	04/01/18		Sigma, Lot BCBL3545V		(Purchased Reagent)		Perfluorohexanesulfonic acid	0.9094 g/g		
...LC537-PFNA_00011	11/21/17	11/21/16	Methanol, Lot 090285	6.5 mL	LC537_PFNA_00002	0.007 g	Perfluorononanoic acid	1037.08 ug/mL		
....LC537_PFNA_00002	04/01/18		TCI America, Lot QN44F		(Purchased Reagent)		Perfluorononanoic acid	0.963 g/g		
...LC537-PFOA_00011	11/21/17	11/21/16	Methanol, Lot 090285	6.5 mL	LC537_PFOA_00002	0.0127 g	Perfluorooctanoic acid (PFOA)	1951.89 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.: 320-25119-1

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

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LC537-PFOS_00006	07/28/17	07/28/16	Methanol, Lot 090285	6 mL	LC537_PFOS_00002	0.0066 g	Perfluorooctanesulfonic acid (PFOS)	1001.66 ug/mL
....LC537_PFOS_00002	08/09/17		Fluka, Lot SZBC222XV		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-IS_00030	07/17/17	01/17/17	Methanol, Lot 090285	10000 uL	LCM2PFOA 00005	100 uL	13C2-PFOA	0.5 ug/mL
					LCMPFOS 00018	300 uL	13C4 PFOS	1.434 ug/mL
..LCM2PFOA 00005	06/19/18		Wellington Laboratories, Lot M2PFOA0613		(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS 00018	08/03/21		Wellington Laboratories, Lot MPFOS0816		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-SU_00029	07/17/17	01/17/17	Methanol, Lot 104453	20000 uL	LCMPFDA 00012	80 uL	13C2 PFDA	0.2 ug/mL
					LCMPFHxA 00013	80 uL	13C2 PFHxA	0.2 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_00016</b>	06/14/17	12/23/16	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00014	265 uL	Perfluorobutanesulfonic acid (PFBS)	178.398 ng/mL
							Perfluoroheptanoic acid	19.6763 ng/mL
							Perfluorohexanesulfonic acid	60.1382 ng/mL
							Perfluorononanoic acid	41.2238 ng/mL
							Perfluorooctanoic acid (PFOA)	38.7939 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	79.632 ng/mL
					LC537-IS_00028	100 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00026	250 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00014	06/22/17	12/22/16	Methanol, Lot 090285	10000 uL	LC537SPIM_00018	375 uL	Perfluorobutanesulfonic acid (PFBS)	3366 ng/mL
							Perfluoroheptanoic acid	371.25 ng/mL
							Perfluorohexanesulfonic acid	1134.68 ng/mL
							Perfluorononanoic acid	777.808 ng/mL
							Perfluorooctanoic acid (PFOA)	731.96 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	1502.49 ng/mL
..LC537SPIM_00018	06/22/17	12/22/16	Methanol, Lot 104453	10000 uL	LC537-PFBS_00006	440 uL	Perfluorobutanesulfonic acid (PFBS)	89.76 ug/mL
					LC537-PFHpA 00013	100 uL	Perfluoroheptanoic acid	9.9 ug/mL
					LC537-PFHxS 00008	300 uL	Perfluorohexanesulfonic acid	30.2582 ug/mL
					LC537-PFNA 00011	200 uL	Perfluorononanoic acid	20.7415 ug/mL
					LC537-PFOA 00011	100 uL	Perfluorooctanoic acid (PFOA)	19.5189 ug/mL
					LC537-PFOS_00006	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0664 ug/mL
...LC537-PFBS_00006	07/28/17	07/28/16	Methanol, Lot 090285	5 mL	LC537_PFBS_00002	0.0102 g	Perfluorobutanesulfonic acid (PFBS)	2040 ug/mL
....LC537_PFBS_00002	04/01/18		Sigma, Lot MKBP8842V		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1 g/g
...LC537-PFHpA 00013	06/22/17	12/22/16	Methanol, Lot 090285	56.8 mL	LC537 PFHpA 00002	0.0568 g	Perfluoroheptanoic acid	990 ug/mL
....LC537 PFHpA 00002	04/01/18		Aldrich, Lot BCM2579V		(Purchased Reagent)		Perfluoroheptanoic acid	0.99 g/g
...LC537-PFHxS 00008	07/28/17	07/28/16	Methanol, Lot 090285	5.5 mL	LC537 PFHxS 00002	0.0061 g	Perfluorohexanesulfonic acid	1008.61 ug/mL
....LC537 PFHxS 00002	04/01/18		Sigma, Lot BCBL3545V		(Purchased Reagent)		Perfluorohexanesulfonic acid	0.9094 g/g
...LC537-PFNA 00011	11/21/17	11/21/16	Methanol, Lot 090285	6.5 mL	LC537_PFNA_00002	0.007 g	Perfluorononanoic acid	1037.08 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-25119-1

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

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
....LC537 PFNA 00002	04/01/18		TCI America, Lot QN44F		(Purchased Reagent)		Perfluorononanoic acid	0.963 g/g
...LC537-PFOA 00011	11/21/17	11/21/16	Methanol, Lot 090285	6.5 mL	LC537_PFOA_00002	0.0127 g	Perfluorooctanoic acid (PFOA)	1951.89 ug/mL
....LC537 PFOA 00002	11/04/18		Fluka, Lot SZBD308XV		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
...LC537-PFOS_00006	07/28/17	07/28/16	Methanol, Lot 090285	6 mL	LC537_PFOS_00002	0.0066 g	Perfluorooctanesulfonic acid (PFOS)	1001.66 ug/mL
....LC537_PFOS_00002	08/09/17		Fluka, Lot SZBC222XV		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-IS_00028	06/19/17	12/19/16	Methanol, Lot 090285	10000 uL	LCM2PFOA_00005	100 uL	13C2-PFOA	0.5 ug/mL
..LCM2PFOA_00005	06/19/18		Wellington Laboratories, Lot M2PFOA0613		LCMPFOS_00018	300 uL	13C4 PFOS	1.434 ug/mL
..LCMPFOS_00018	08/03/21		Wellington Laboratories, Lot MPFOS0816		(Purchased Reagent)		13C2-PFOA	50 ug/mL
.LC537-SU_00026	06/14/17	12/16/16	Methanol, Lot 104453	20000 uL	LC537-SU_00025	10000 uL	13C4 PFOS	47.8 ug/mL
..LC537-SU_00025	06/14/17	12/14/16	Methanol, Lot 104453	10000 uL	LCMPFDA_00008	80 uL	13C2 PFDA	0.2 ug/mL
..LCMPFDA_00008	08/19/20		Wellington Laboratories, Lot MPFDA0815		LCMPFHxA_00009	80 uL	13C2 PFHxA	0.2 ug/mL
..LCMPFHxA_00009	04/09/20		Wellington Laboratories, Lot MPFHxA0415		(Purchased Reagent)		13C2 PFDA	0.4 ug/mL
..LCMPFHxA_00009	04/09/20		Wellington Laboratories, Lot MPFHxA0415		(Purchased Reagent)		13C2 PFHxA	0.4 ug/mL
<b>LC537-LSP_00016</b>	05/04/17	11/04/16	Methanol, Lot 090285	10000 uL	LC537SPIM_00015	50 uL	Perfluorobutane Sulfonate	448.8 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	448.8 ng/mL
							Perfluoroheptanoic acid	53.7429 ng/mL
							Perfluorohexanesulfonic acid	151.291 ng/mL
							Perfluorononanoic acid	101.553 ng/mL
							Perfluorooctanoic acid (PFOA)	99.234 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	200.332 ng/mL
.LC537SPIM_00015	05/04/17	11/04/16	Methanol, Lot 104453	10000 uL	LC537-PFBS_00006	440 uL	Perfluorobutane Sulfonate	89.76 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	89.76 ug/mL
					LC537-PFHpA_00011	100 uL	Perfluoroheptanoic acid	10.7486 ug/mL
					LC537-PFHxS_00008	300 uL	Perfluorohexanesulfonic acid	30.2582 ug/mL
					LC537-PFNA_00009	200 uL	Perfluorononanoic acid	20.3105 ug/mL
					LC537-PFOA_00010	100 uL	Perfluorooctanoic acid (PFOA)	19.8468 ug/mL
					LC537-PFOS_00006	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0664 ug/mL
..LC537-PFBS_00006	07/28/17	07/28/16	Methanol, Lot 090285	5 mL	LC537_PFBS_00002	0.0102 g	Perfluorobutane Sulfonate	2040 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	2040 ug/mL
...LC537_PFBS_00002	04/01/18		Sigma, Lot MKBP8842V		(Purchased Reagent)		Perfluorobutane Sulfonate	1 g/g
							Perfluorobutanesulfonic acid (PFBS)	1 g/g
..LC537-PFHpA_00011	11/04/17	11/04/16	Methanol, Lot 090285	7 mL	LC537_PFHpA_00002	0.0076 g	Perfluoroheptanoic acid	1074.86 ug/mL
..LC537_PFHpA_00002	04/01/18		Aldrich, Lot BCM2579V		(Purchased Reagent)		Perfluoroheptanoic acid	0.99 g/g
..LC537-PFHxS_00008	07/28/17	07/28/16	Methanol, Lot 090285	5.5 mL	LC537_PFHxS_00002	0.0061 g	Perfluorohexanesulfonic acid	1008.61 ug/mL
..LC537_PFHxS_00002	04/01/18		Sigma, Lot BCBL3545V		(Purchased Reagent)		Perfluorohexanesulfonic acid	0.9094 g/g
..LC537-PFNA_00009	11/04/17	11/04/16	Methanol, Lot 090285	5.5 mL	LC537_PFNA_00002	0.0058 g	Perfluorononanoic acid	1015.53 ug/mL
..LC537_PFNA_00002	04/01/18		TCI America, Lot QN44F		(Purchased Reagent)		Perfluorononanoic acid	0.963 g/g
..LC537-PFOA_00010	11/04/17	11/04/16	Methanol, Lot 090285	7.5 mL	LC537_PFOA_00002	0.0149 g	Perfluorooctanoic acid (PFOA)	1984.68 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-25119-1

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

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LC537_PFOA_00002	11/04/18		Fluka, Lot SZBD308XV		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
..LC537-PFOS_00006	07/28/17	07/28/16	Methanol, Lot 090285	6 mL	LC537_PFOS_00002	0.0066 g	Perfluorooctanesulfonic acid (PFOS)	1001.66 ug/mL
...LC537_PFOS_00002	08/09/17		Fluka, Lot SZBC222XV		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
<b>LC537-SU_00029</b>	07/17/17	01/17/17	Methanol, Lot 104453	20000 uL	LCMPFDA_00012	80 uL	13C2 PFDA	0.2 ug/mL
					LCMPFHxA_00013	80 uL	13C2 PFHxA	0.2 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\_00002**

#: 4/1/15 SPV

3050 Spruce Street, Saint Louis, MO 63103, USA

Website: www.sigmaaldrich.com

Email USA: techserv@sial.com

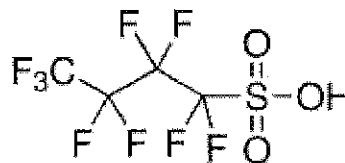
Outside USA: eurtechserv@sial.com

## 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/D</sub>

Reagent

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**LC537\_PFHpA\_00002**



R: 4/1/15 4V

**Certificate of Analysis**

**Product Name:** PERFLUOROHEPTANOIC ACID  
**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

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\_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

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

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

stw 4/1/15

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

Reagent

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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\_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

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# GC/MS-Method

Analytical Department

Article: Pentadecafluorooctanoic acid OEKANAL

Article-No.: 33824

Batch: SZBD308XV

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

Injector: Split mode

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

Inj.-temp.: 280°C

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

Split: 1:100

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

Detector: MSD

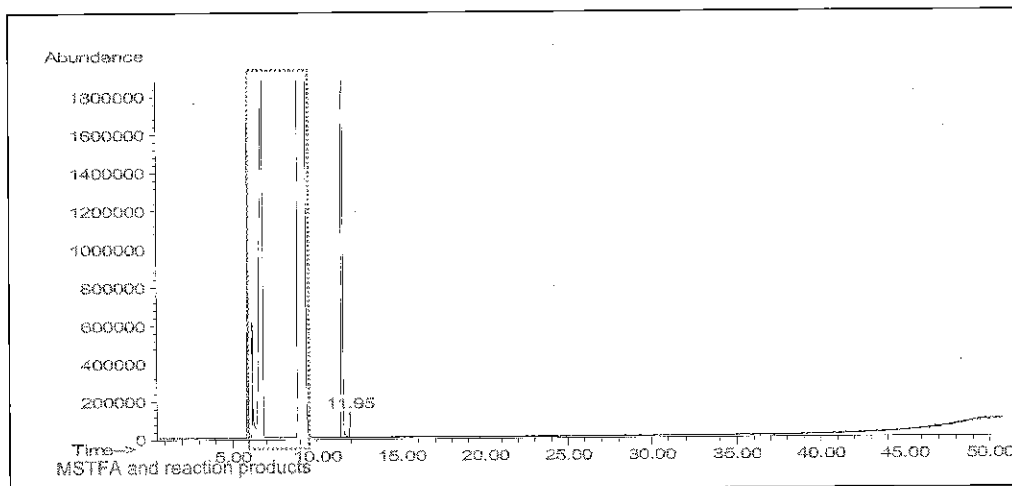
Mass range: 10-600 amu (Scan mode)

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

Identity: Mass spectrum complies

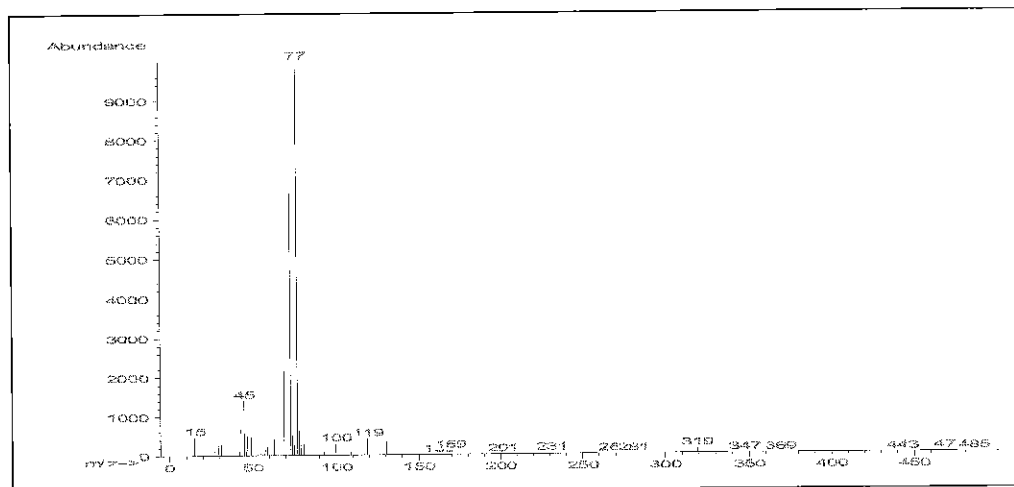
Operator: Ahrens / 2013-11-13

## Total Ion Chromatogram:



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

## Mass spectrum (rt = 11.54 min):





Reagent

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**LC537\_PFOA2\_00001**

# Certificate of Analysis

**Alfa Aesar**  
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

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

**NORTH AMERICA**  
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+1-978-521-6300  
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+49 721 84007 300  
Email: [Eurosales@alfa.com](mailto:Eurosales@alfa.com)

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Reagent

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**LC537\_PFOs\_00002**

**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 - <i>err date</i>

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 = 91.06%*

**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\_PFO2\_00001**

Certificate of Analysis

Inv 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

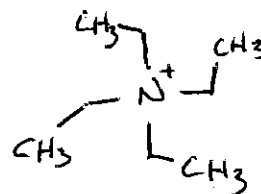
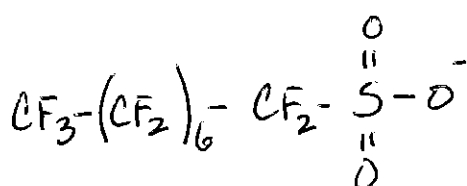
$$\text{Mw correction} = \frac{500.125}{629.37} = 0.7946$$

~~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<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  
**Date of Issue:** 30-MAR-11

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**Country of Origin** China

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

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

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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**



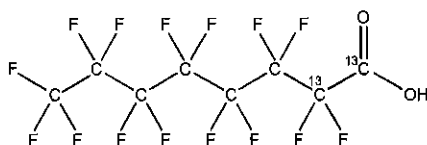


# WELLINGTON LABORATORIES

## 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.

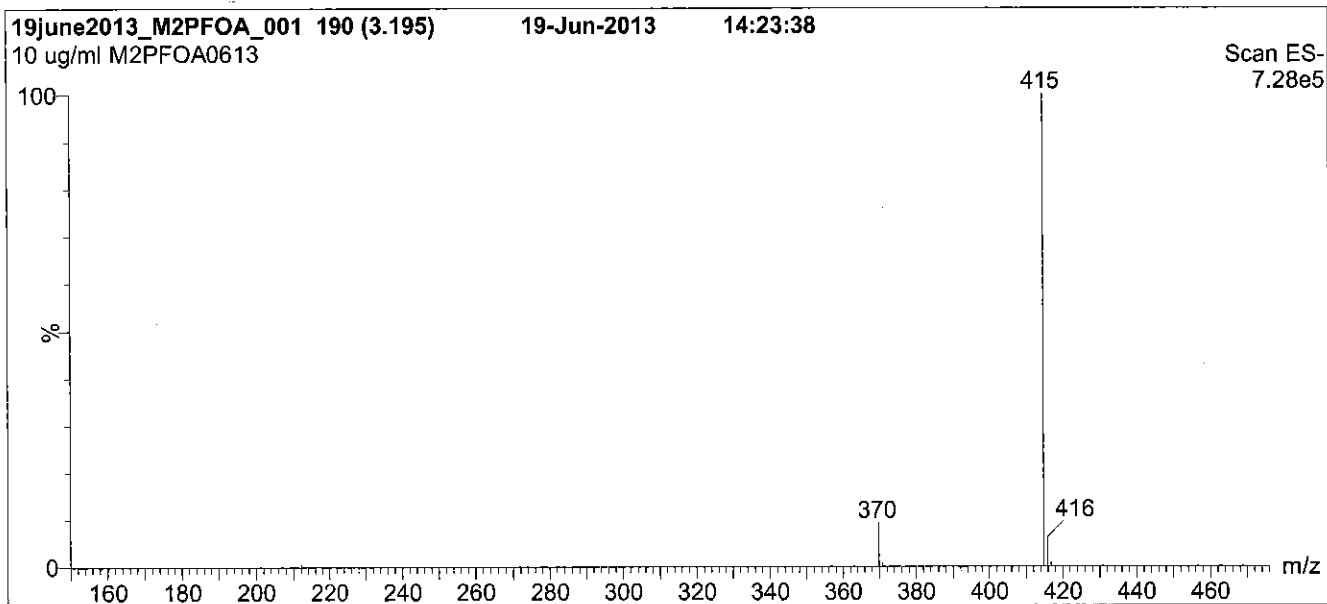
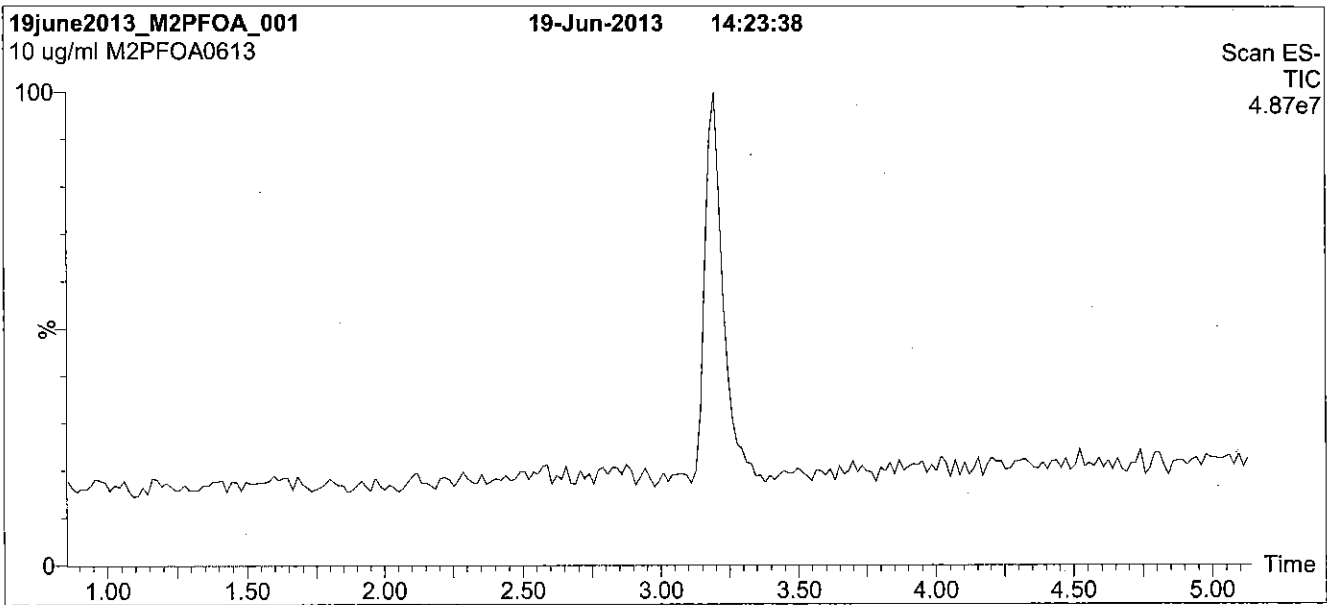
### **QUALITY MANAGEMENT:**

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  $\mu$ 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

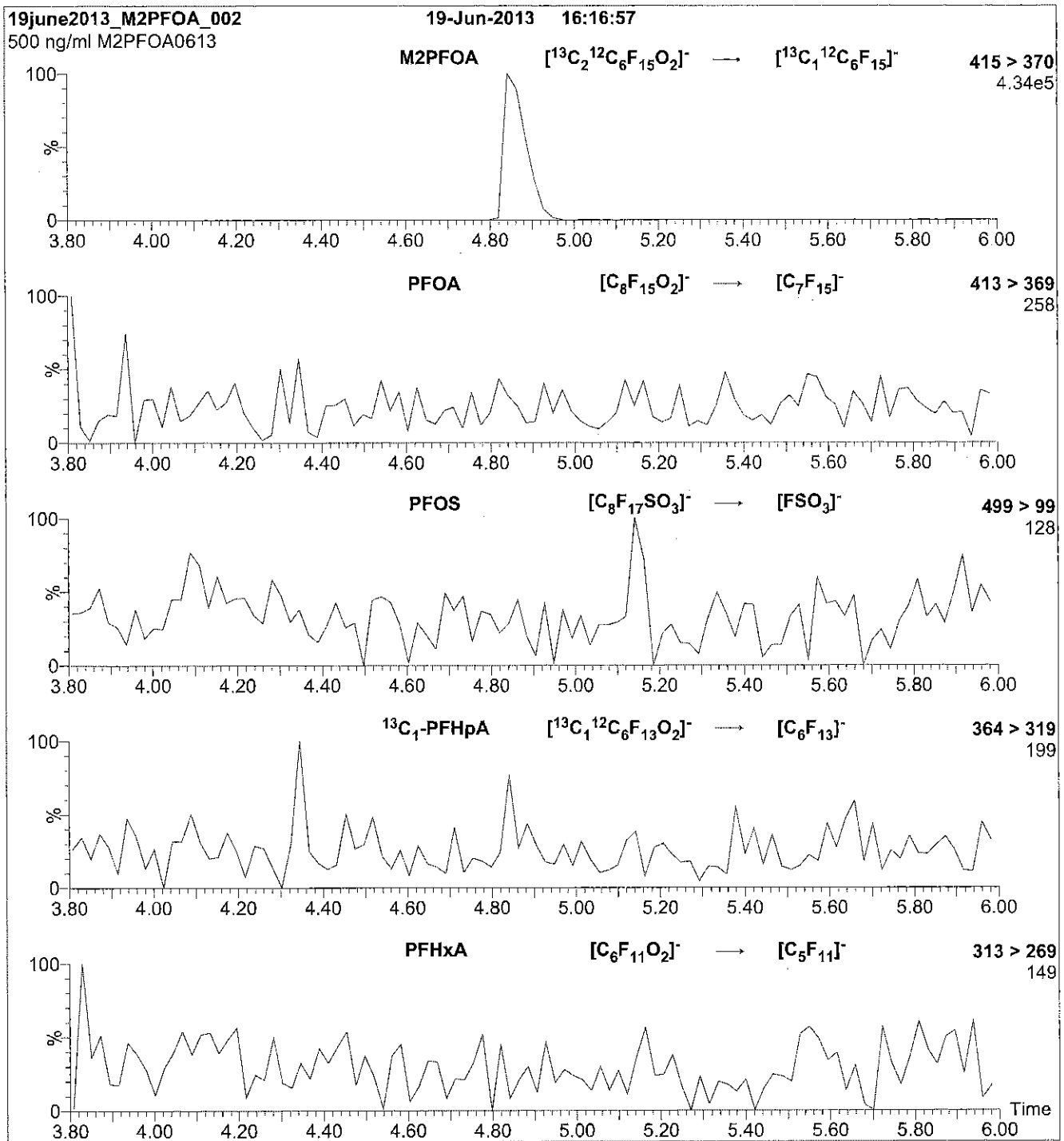
Flow: 300  $\mu$ l/min

**MS Parameters**

Experiment: Full Scan (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\_00008**



605243

ID: LCMPFDA\_00008

Exp: 08/19/20 Pptd: CBW

13C2-Perfluorodecanoic acid

Rec. 3/29/16 JEB ✓



**WELLINGTON**  
LABORATORIES

**CERTIFICATE OF ANALYSIS**  
DOCUMENTATION

**PRODUCT CODE:**

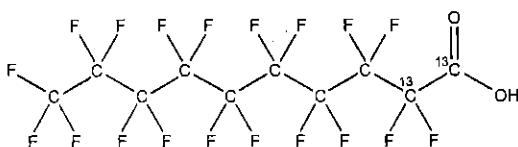
MPFDA

**LOT NUMBER:**

MPFDA0815

**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>**MOLECULAR WEIGHT:**

516.07

**CONCENTRATION:**

50 ± 2.5 µg/ml

**SOLVENT(S):**

Methanol

Water (&lt;1%)

**CHEMICAL PURITY:**

&gt;98%

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

08/19/2015

(1,2-<sup>13</sup>C<sub>2</sub>)**EXPIRY DATE:** (mm/dd/yyyy)

08/19/2020

**RECOMMENDED STORAGE:**

Store ampoule in a cool, dark place

**DOCUMENTATION/ DATA ATTACHED:**

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

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

**ADDITIONAL INFORMATION:**

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains < 0.1% of <sup>13</sup>C<sub>1</sub>-PFNA.

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

Certified By:

B.G. Chittim

Date:

08/21/2015

(mm/dd/yyyy)

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

### **INTENDED USE:**

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

### **HAZARDS:**

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

### **SYNTHESIS / CHARACTERIZATION:**

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

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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.

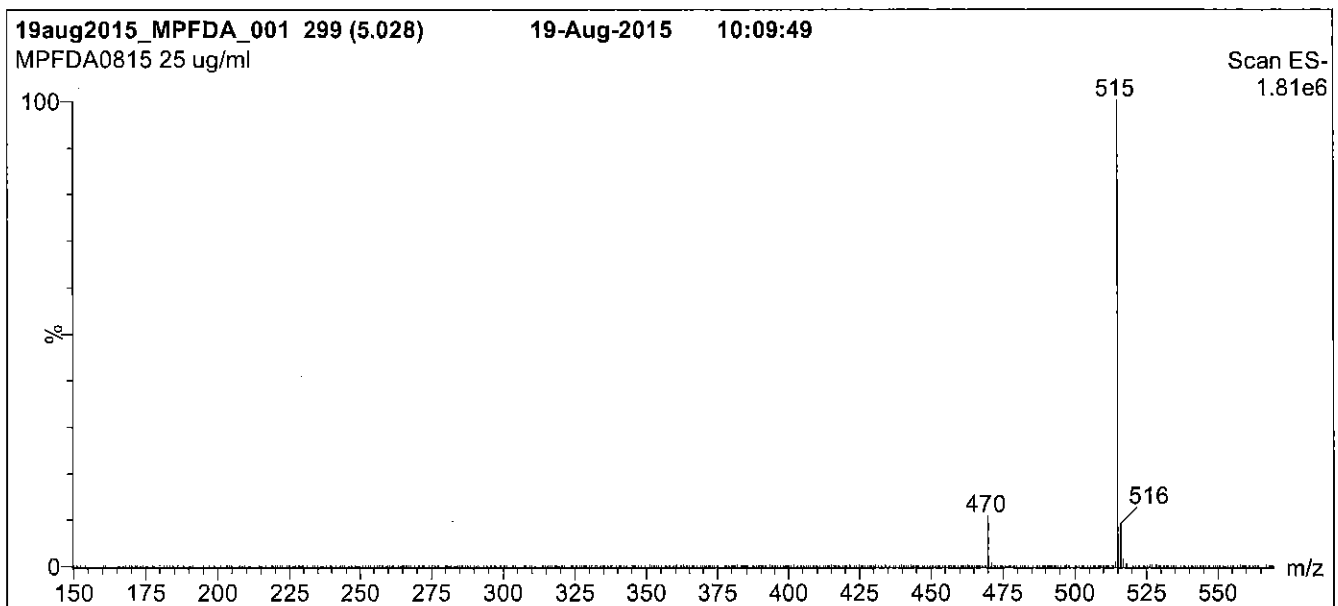
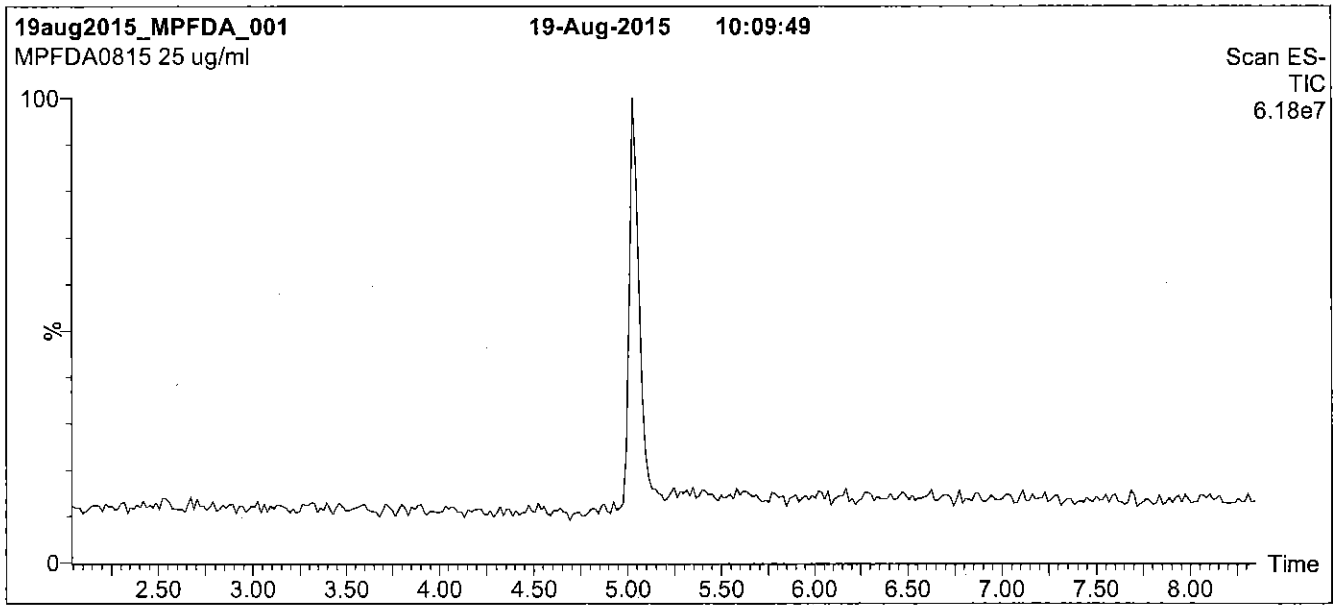
### **QUALITY MANAGEMENT:**

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

Flow: 300  $\mu$ l/min

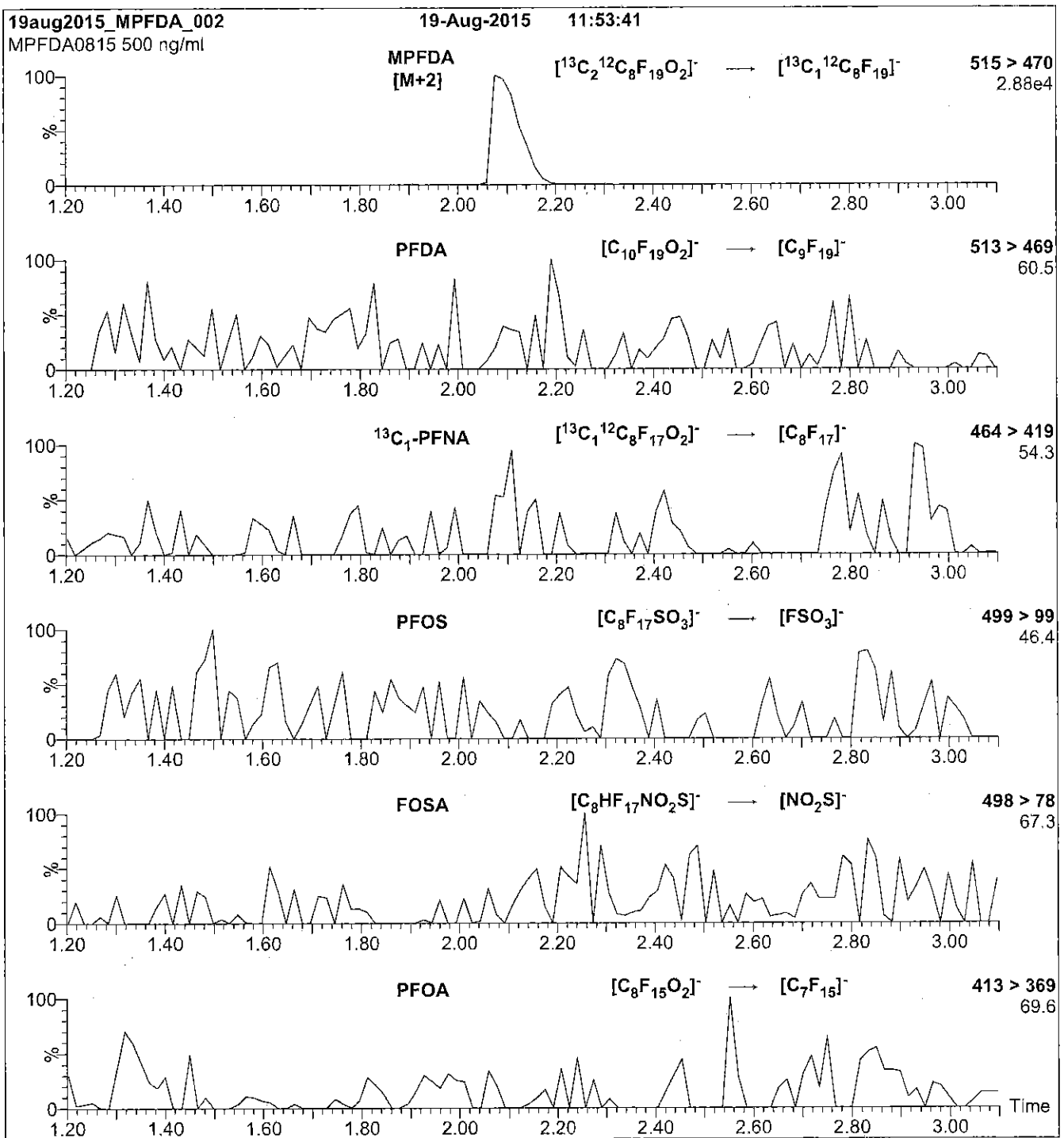
**MS Parameters**

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)  
Capillary Voltage (kV) = 2.00  
Cone Voltage (V) = 15.00  
Cone Gas Flow (l/hr) = 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) = 3.35e-3  
 Collision Energy (eV) = 13

Reagent

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**LCMPFHxA\_00009**



605244  
 ID: LCMPFHxA\_00009  
 Exp: 04/09/20 Prep: CBW  
<sup>13</sup>C<sub>2</sub>-Perfluorohexanoic ac

Rec. 3/29/16 JRB ✓



# WELLINGTON LABORATORIES

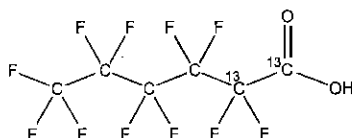
## CERTIFICATE OF ANALYSIS DOCUMENTATION

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

**LOT NUMBER:** MPFHxA0415

**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%  
**LAST TESTED:** (mm/dd/yyyy) 04/09/2015

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

**EXPIRY DATE:** (mm/dd/yyyy) 04/09/2020

**RECOMMENDED STORAGE:** Store ampoule in a cool, dark place

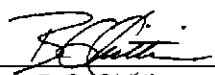
**DOCUMENTATION/ DATA ATTACHED:**

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

**ADDITIONAL INFORMATION:**

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains < 0.1% of perfluoro-n-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: 04/14/2015  
 (mm/dd/yyyy)

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

**INTENDED USE:**

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

**HAZARDS:**

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

**SYNTHESIS / CHARACTERIZATION:**

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

**HOMOGENEITY:**

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

**UNCERTAINTY:**

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

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

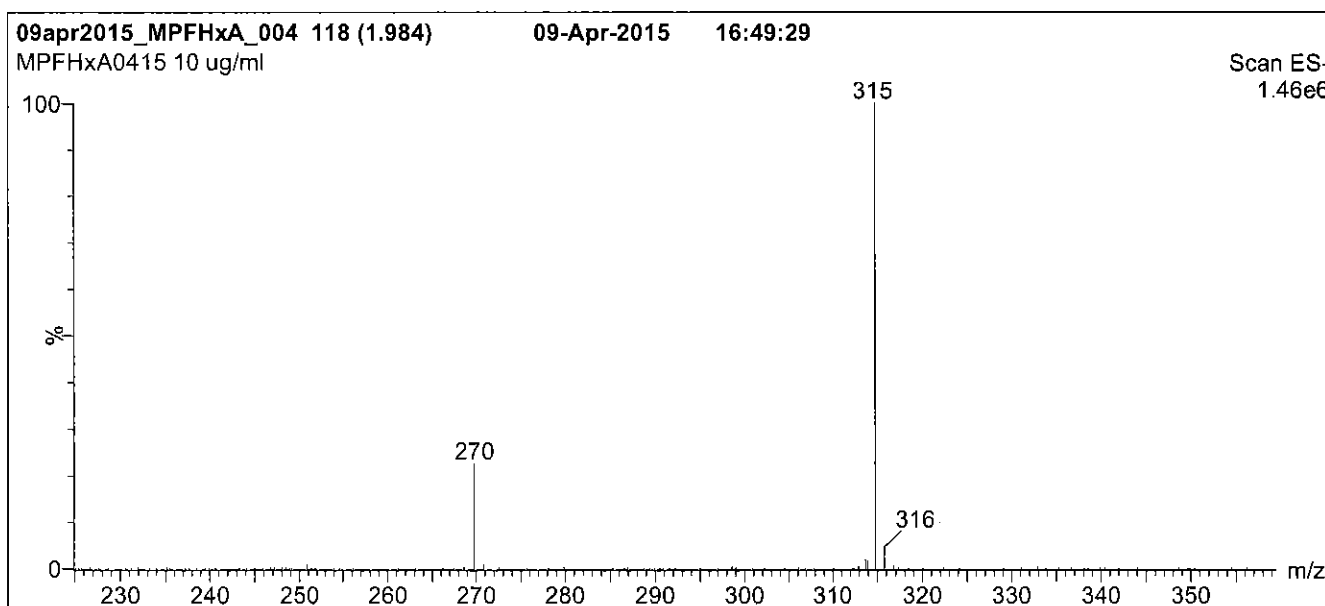
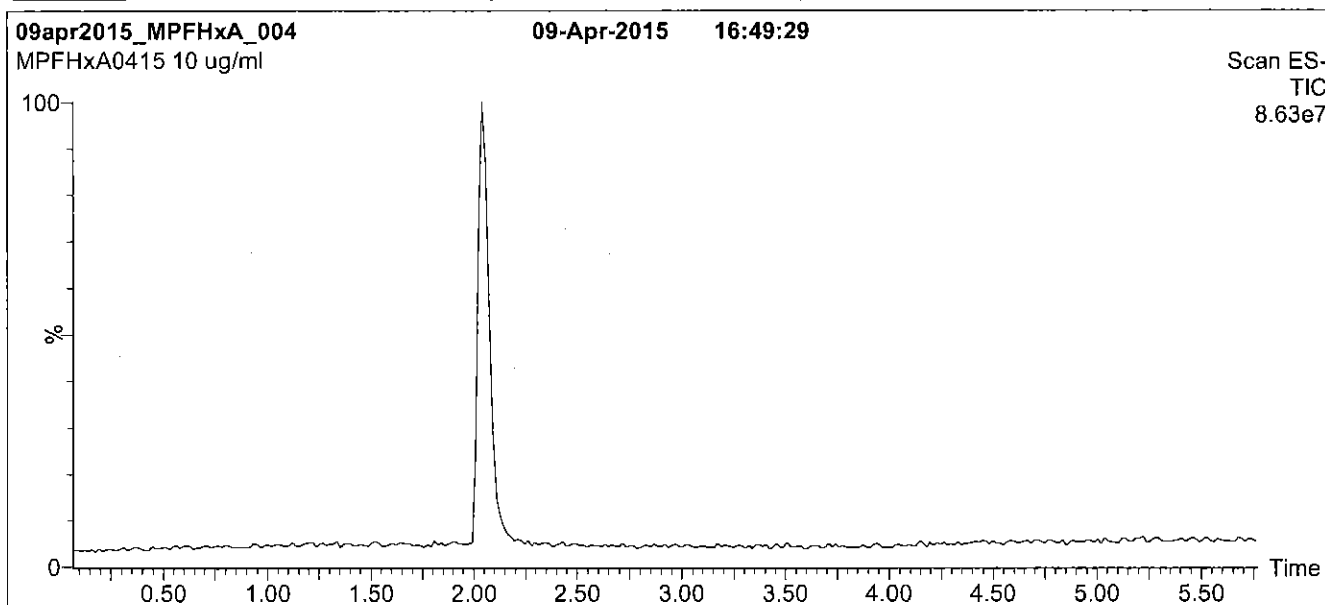
**QUALITY MANAGEMENT:**

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 min and hold for 2 min  
before returning to initial conditions over 0.5 min.  
Time: 10 min

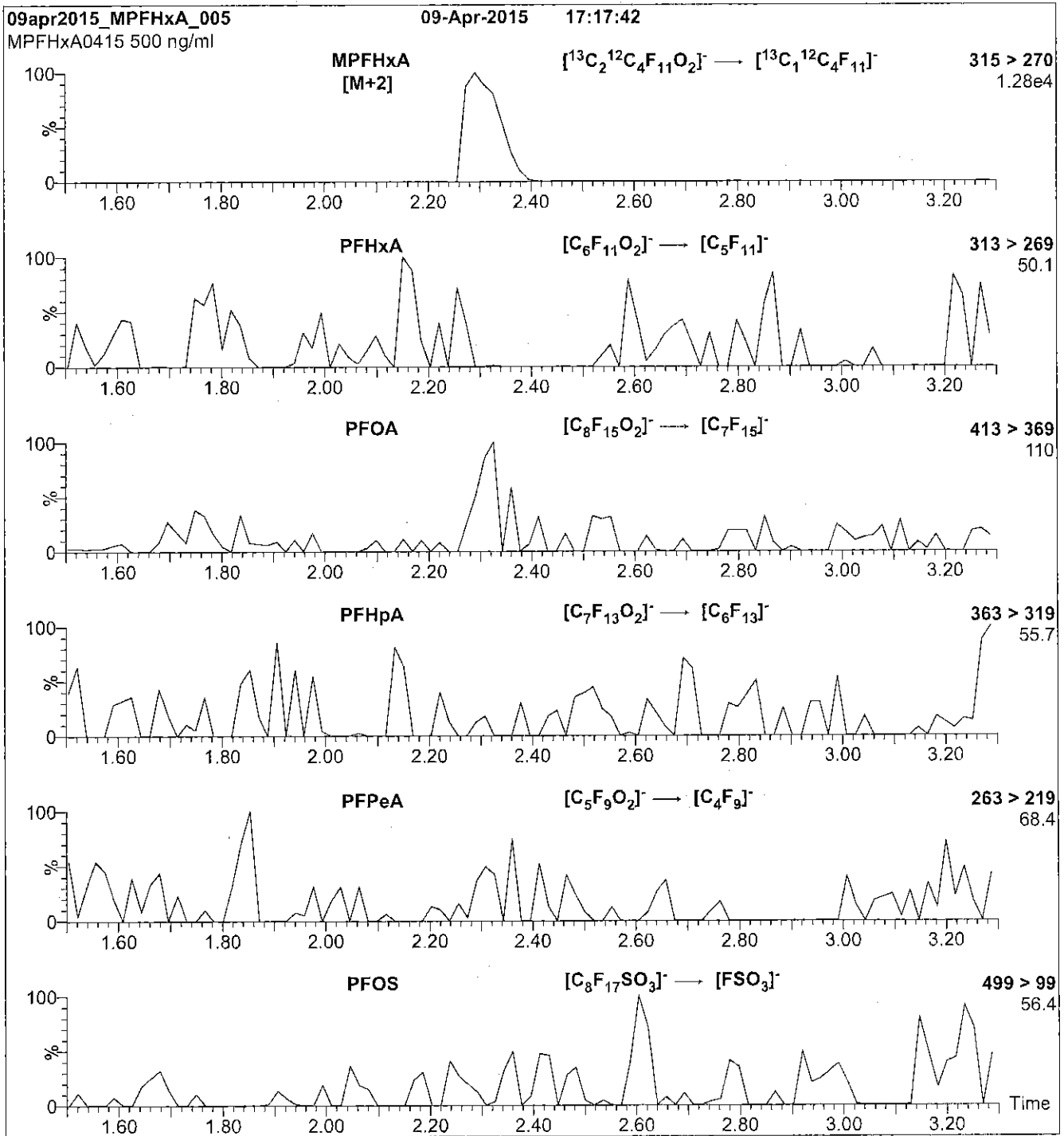
Flow: 300  $\mu$ l/min

**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) = 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) = 3.20e-3  
Collision Energy (eV) = 10

Reagent

---

**LCMPFOS\_00018**

R: SBC 9/22/16



738686  
ID: LCMFOS\_00018  
Exp: 08/03/21 Papi: SBC  
13C4-Perfluorooctanesulfo

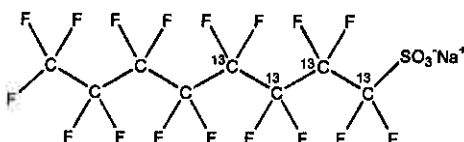


# WELLINGTON LABORATORIES

## 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)	<b>SOLVENT(S):</b>	Methanol
	47.8 ± 2.4 µg/ml (MPFOS anion)	<b>ISOTOPIC PURITY:</b>	≥99% <sup>13</sup> C (1,2,3,4- <sup>13</sup> C <sub>4</sub> )
<b>CHEMICAL PURITY:</b>	>98%		
<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



### **INTENDED USE:**

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### **SYNTHESIS / CHARACTERIZATION:**

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

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

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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.

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

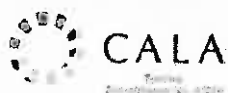
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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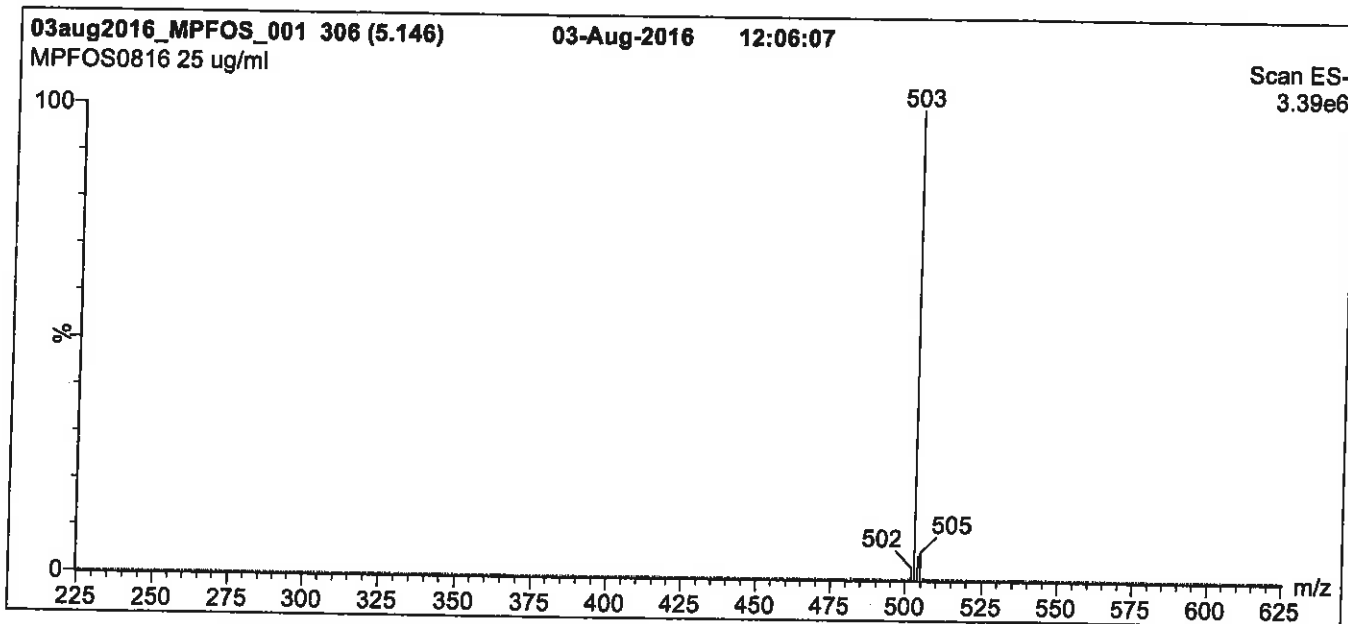
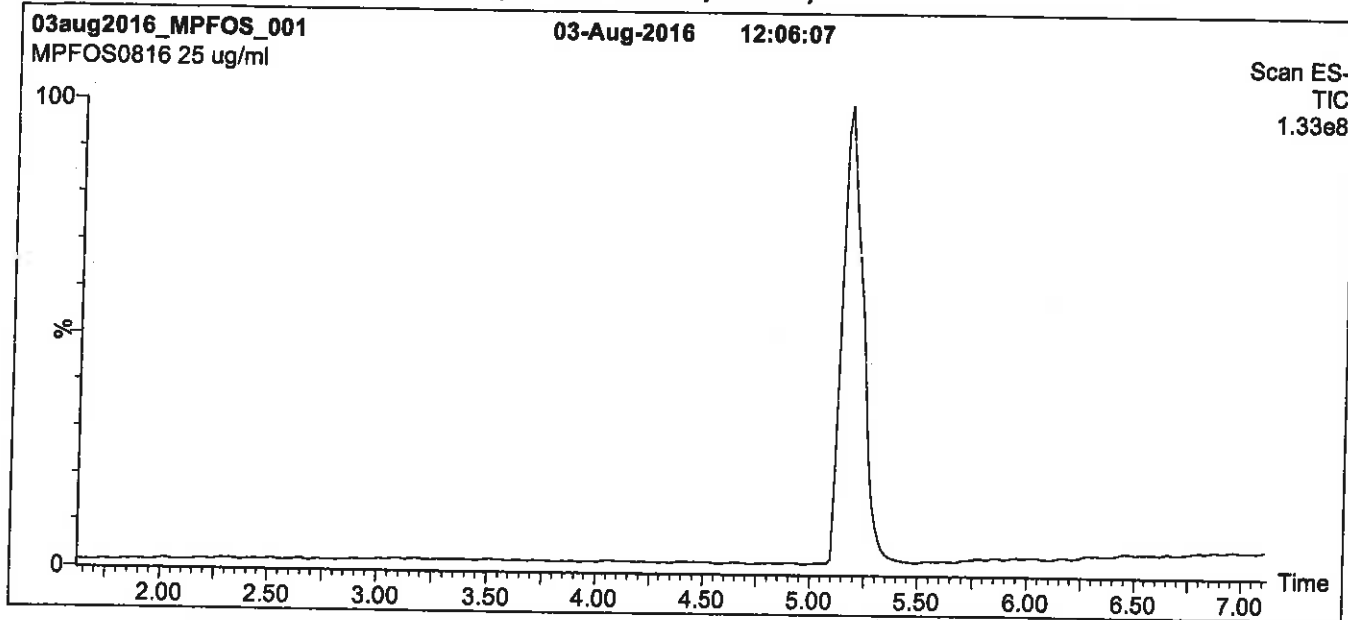
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**Figure 1: MPFOS; LC/MS Data (TIC and Mass Spectrum)**



**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

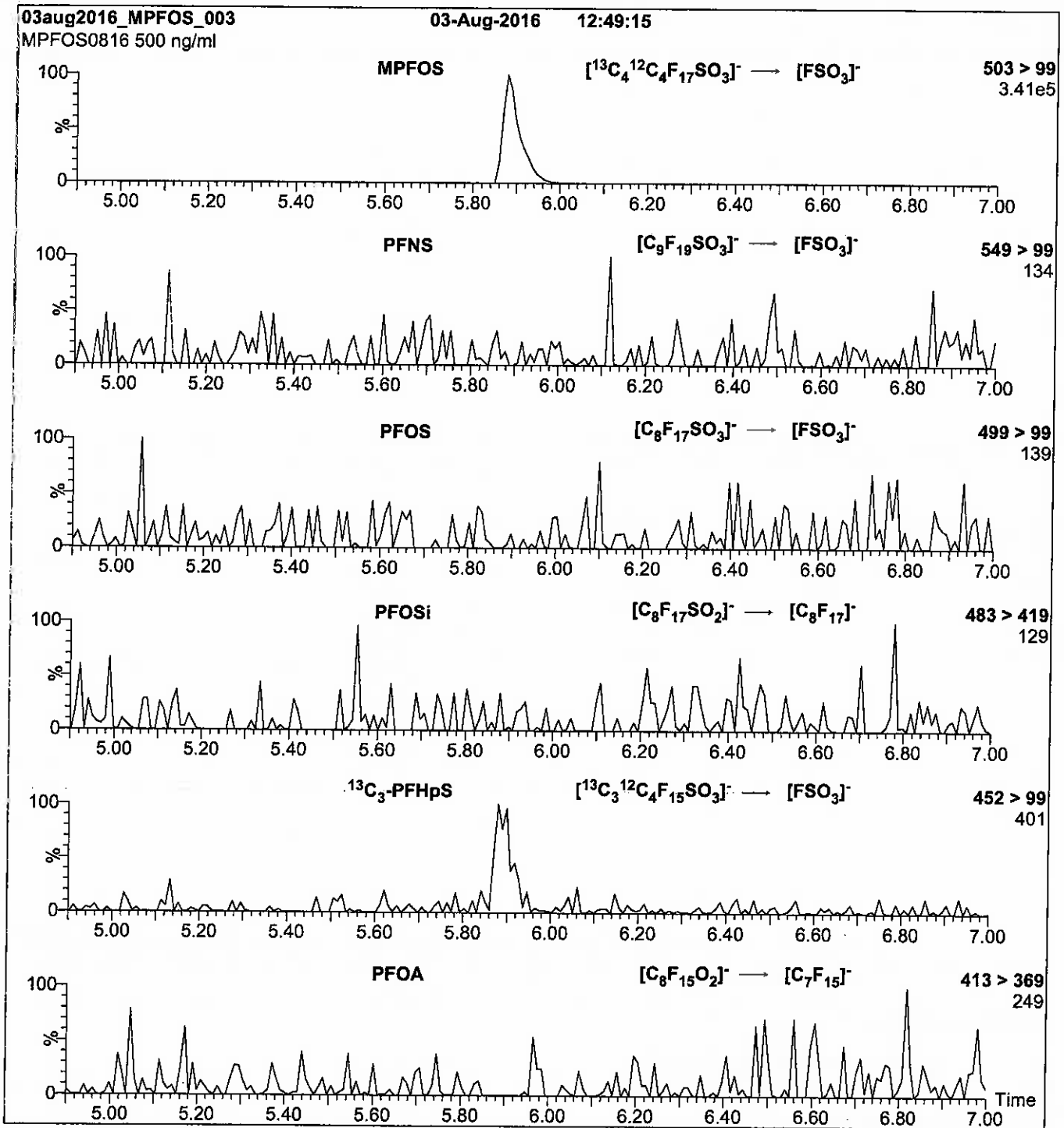
**Flow:** 300  $\mu$ l/min

**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

---

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

FORM II  
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-25119-1

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

Matrix: Water Level: Low

GC Column (1): Acquity ID: 2.1 (mm)

Client Sample ID	Lab Sample ID	PFHxA #	PFDA #
WI-CV-1RW59-0117	320-25119-1	110	110
WI-CV-1FB59-0117	320-25119-2	105	104
WI-CV-1RW60-0117	320-25119-3	100	104
WI-CV-1FB60-0117	320-25119-4	100	95
	MB 320-147297/1-A	98	102
	LLCS 320-147297/2-A	104	107

PFHxA = 13C2 PFHxA  
PFDA = 13C2 PFDA

QC LIMITS  
70-130  
70-130

# Column to be used to flag recovery values

FORM III  
LCMS LOW LEVEL CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-25119-1

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

Matrix: Water Level: Low Lab File ID: 24JAN2017A6A\_039.d

Lab ID: LLCS 320-147297/2-A Client ID: \_\_\_\_\_

COMPOUND	SPIKE ADDED (ug/L)	LLCS CONCENTRATION (ug/L)	LLCS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	0.0401	0.0306 J	76	50-150	
Perfluorooctanoic acid (PFOA)	0.0198	0.0174 J	88	50-150	M
Perfluorobutanesulfonic acid (PFBS)	0.0898	0.0729 J	81	50-150	

# Column to be used to flag recovery and RPD values

FORM IV  
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-25119-1  
 SDG No.: \_\_\_\_\_  
 Lab File ID: 24JAN2017A6A\_038.d Lab Sample ID: MB 320-147297/1-A  
 Matrix: Water Date Extracted: 01/21/2017 11:49  
 Instrument ID: A6 Date Analyzed: 01/25/2017 09:19  
 Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LLCS 320-147297/2-A	24JAN2017A6 A 039.d	01/25/2017 09:49
WI-CV-1RW59-0117	320-25119-1	24JAN2017A6 A 044.d	01/25/2017 12:18
WI-CV-1FB59-0117	320-25119-2	24JAN2017A6 A 045.d	01/25/2017 12:48
WI-CV-1RW60-0117	320-25119-3	24JAN2017A6 A 046.d	01/25/2017 13:18
WI-CV-1FB60-0117	320-25119-4	24JAN2017A6 A 047.d	01/25/2017 13:47

FORM VIII  
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-25119-1  
 SDG No.: \_\_\_\_\_  
 Instrument ID: A6 Calibration Start Date: 01/24/2017 16:04  
 GC Column: Acquity ID: 2.1(mm) Calibration End Date: 01/24/2017 18:32  
 Calibration ID: 27898

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
INITIAL CALIBRATION MEAN AREA AND MEAN RT	653829	20.10	1228760	20.73		
UPPER LIMIT	980744	20.60	1843140	21.23		
LOWER LIMIT	326915	19.60	614380	20.23		
LAB SAMPLE ID	CLIENT SAMPLE ID					
CCV 320-147661/10 CCVL		685988	20.11	1294038	20.75	
ICV 320-147661/12		604008	20.11	1139050	20.74	
CCV 320-147664/36 CCVIS		625069	20.08	1085864	20.71	
MB 320-147297/1-A		630968	20.08	1282606	20.71	
LLCS 320-147297/2-A		627354	20.08	1321123	20.71	
320-25119-1	WI-CV-1RW59-0117	590944	20.08	1404781	20.71	
320-25119-2	WI-CV-1FB59-0117	670783	20.08	1414734	20.71	
320-25119-3	WI-CV-1RW60-0117	624151	20.08	1383463	20.71	
320-25119-4	WI-CV-1FB60-0117	685974	20.08	1431212	20.71	
CCV 320-147664/48 CCVIS		710003	20.08	1331891	20.71	

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.: 320-25119-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-147664/36 Date Analyzed: 01/25/2017 08:20  
 Instrument ID: A6 GC Column: Acquity ID: 2.1 (mm)  
 Lab File ID (Standard): 24JAN2017A6A\_036.d Heated Purge: (Y/N) N  
 Calibration ID: 27898

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	625069	20.08	1085864	20.71		
UPPER LIMIT	875097	20.58	1520210	21.21		
LOWER LIMIT	437548	19.58	760105	20.21		
LAB SAMPLE ID	CLIENT SAMPLE ID					
MB 320-147297/1-A		630968	20.08	1282606	20.71	
LLCS 320-147297/2-A		627354	20.08	1321123	20.71	
320-25119-1	WI-CV-1RW59-0117	590944	20.08	1404781	20.71	
320-25119-2	WI-CV-1FB59-0117	670783	20.08	1414734	20.71	
320-25119-3	WI-CV-1RW60-0117	624151	20.08	1383463	20.71	
320-25119-4	WI-CV-1FB60-0117	685974	20.08	1431212	20.71	

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.: 320-25119-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-147664/48 Date Analyzed: 01/25/2017 14:17  
 Instrument ID: A6 GC Column: Acquity ID: 2.1 (mm)  
 Lab File ID (Standard): 24JAN2017A6A\_048.d Heated Purge: (Y/N) N  
 Calibration ID: 27898

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	710003	20.08	1331891	20.71		
UPPER LIMIT	994004	20.58	1864647	21.21		
LOWER LIMIT	497002	19.58	932324	20.21		
LAB SAMPLE ID	CLIENT SAMPLE ID					
MB 320-147297/1-A		630968	20.08	1282606	20.71	
LLCS 320-147297/2-A		627354	20.08	1321123	20.71	
320-25119-1	WI-CV-1RW59-0117	590944	20.08	1404781	20.71	
320-25119-2	WI-CV-1FB59-0117	670783	20.08	1414734	20.71	
320-25119-3	WI-CV-1RW60-0117	624151	20.08	1383463	20.71	
320-25119-4	WI-CV-1FB60-0117	685974	20.08	1431212	20.71	

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.: 320-25119-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WI-CV-1RW59-0117 Lab Sample ID: 320-25119-1  
 Matrix: Water Lab File ID: 24JAN2017A6A\_044.d  
 Analysis Method: 537 Date Collected: 01/17/2017 09:14  
 Extraction Method: 537 Date Extracted: 01/21/2017 11:49  
 Sample wt/vol: 249.2 (mL) Date Analyzed: 01/25/2017 12:18  
 Con. Extract Vol.: 1 (mL) Dilution Factor: 1  
 Injection Volume: 10 (uL) GC Column: Acquity ID: 2.1 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 147664 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.048	U	0.060	0.048	0.016
335-67-1	Perfluorooctanoic acid (PFOA)	0.024	U	0.030	0.024	0.0095
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.14	0.11	0.048

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	110		70-130
STL00996	13C2 PFDA	110		70-130

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_044.d  
 Lims ID: 320-25119-A-1-A  
 Client ID: WI-CV-1RW59-0117  
 Sample Type: Client  
 Inject. Date: 25-Jan-2017 12:18:48 ALS Bottle#: 23 Worklist Smp#: 44  
 Injection Vol: 10.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-25119-a-1-a  
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35\*C  
 Operator ID: CBW Instrument ID: A6  
 Method: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\537\_\_A6.m  
 Limit Group: LC 537 ICAL  
 Last Update: 25-Jan-2017 14:24:26 Calib Date: 24-Jan-2017 18:32:06  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_008.d  
 Column 1 : Acquity BEH C18 ( 2.10 mm) Det: F1:MRM  
 Process Host: XAWRK015

First Level Reviewer: barnettj Date: 25-Jan-2017 13:53:14

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
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\$ 2 13C2 PFHxA	315.0 > 270.0	18.649	18.658	-0.009	1.000	826790	11.0	27580
* 5 13C2-PFOA	415.0 > 370.0	20.082	20.096	-0.014		590944	10.0	16096
* 8 13C4 PFOS	503.0 > 80.0	20.714	20.730	-0.016		1404781	28.7	38472
\$ 10 13C2 PFDA	515.0 > 470.0	21.524	21.541	-0.017	1.000	704456	11.0	23829

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_044.d

Injection Date: 25-Jan-2017 12:18:48

Instrument ID: A6

Lims ID: 320-25119-A-1-A

Lab Sample ID: 320-25119-1

Client ID: WI-CV-1RW59-0117

Operator ID: CBW

ALS Bottle#: 23

Worklist Smp#: 44

Injection Vol: 10.0 ul

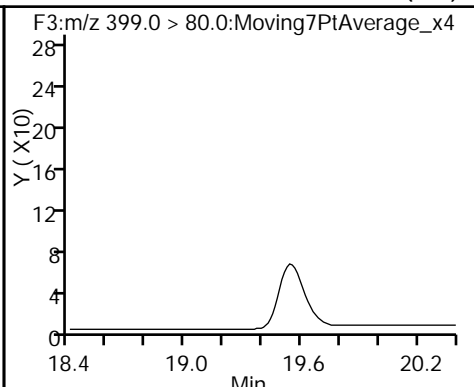
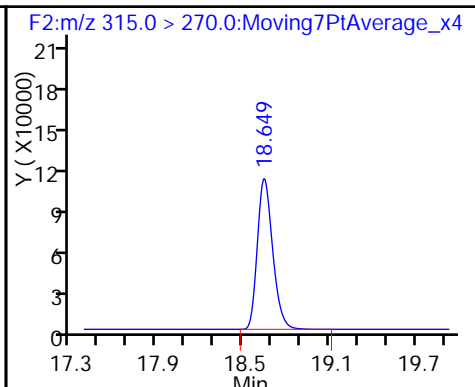
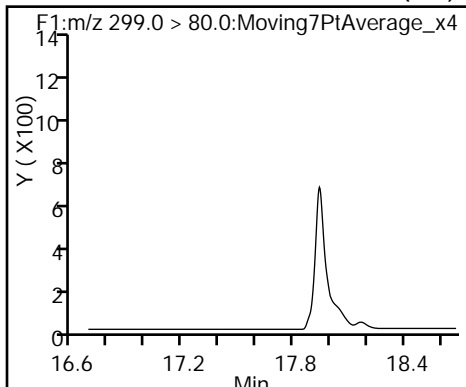
Dil. Factor: 1.0000

Method: 537\_A6

Limit Group: LC 537 ICAL

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

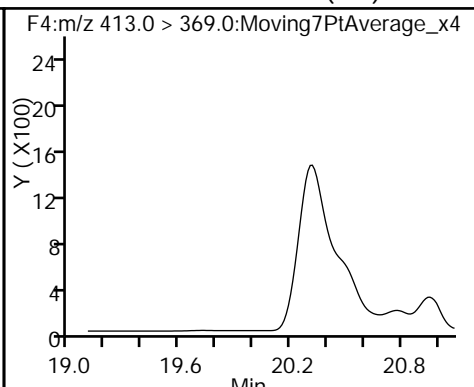
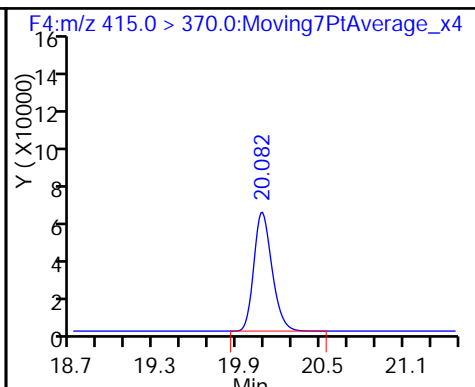
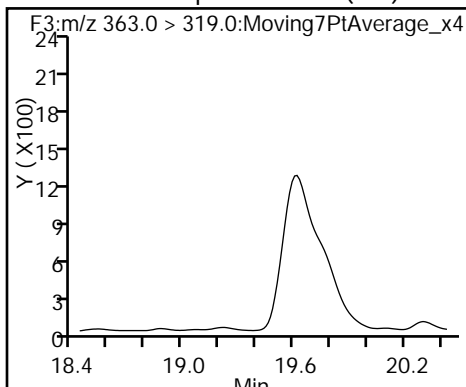
3 Perfluorohexanesulfonic acid (ND)



4 Perfluoroheptanoic acid (ND)

\* 5 13C2-PFOA

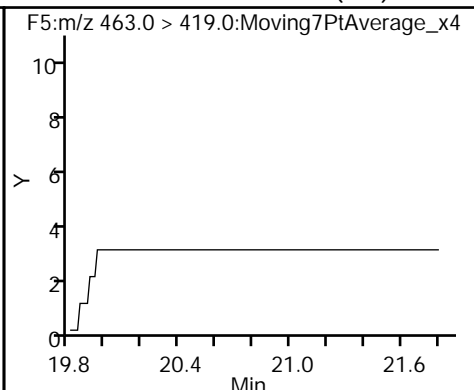
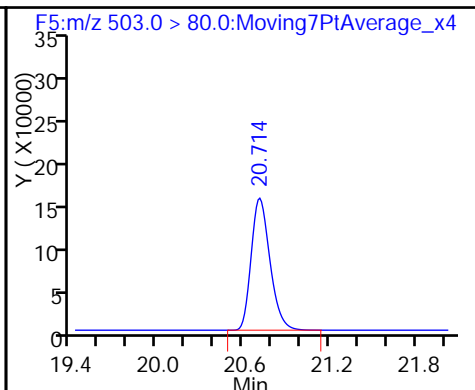
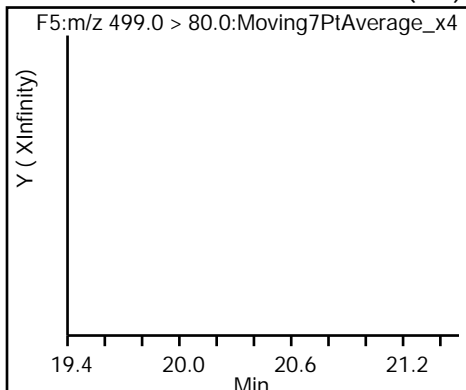
6 Perfluorooctanoic acid (ND)



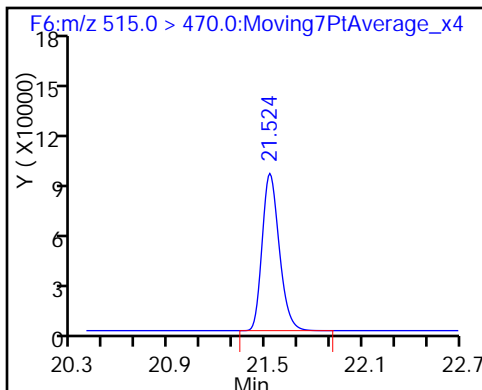
7 Perfluorooctane sulfonic acid (ND)

\* 8 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_044.d  
 Lims ID: 320-25119-A-1-A  
 Client ID: WI-CV-1RW59-0117  
 Sample Type: Client  
 Inject. Date: 25-Jan-2017 12:18:48 ALS Bottle#: 23 Worklist Smp#: 44  
 Injection Vol: 10.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-25119-a-1-a  
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35°C  
 Operator ID: CBW Instrument ID: A6  
 Method: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\537\_\_A6.m  
 Limit Group: LC 537 ICAL  
 Last Update: 25-Jan-2017 14:24:26 Calib Date: 24-Jan-2017 18:32:06  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_008.d  
 Column 1 : Acquity BEH C18 ( 2.10 mm) Det: F1:MRM  
 Process Host: XAWRK015

First Level Reviewer: barnettj Date: 25-Jan-2017 13:53:14

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	11.0	110.11
\$ 10 13C2 PFDA	10.0	11.0	109.93

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-25119-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WI-CV-1FB59-0117 Lab Sample ID: 320-25119-2  
 Matrix: Water Lab File ID: 24JAN2017A6A\_045.d  
 Analysis Method: 537 Date Collected: 01/17/2017 09:13  
 Extraction Method: 537 Date Extracted: 01/21/2017 11:49  
 Sample wt/vol: 252.5 (mL) Date Analyzed: 01/25/2017 12:48  
 Con. Extract Vol.: 1 (mL) Dilution Factor: 1  
 Injection Volume: 10 (uL) GC Column: Acquity ID: 2.1 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 147664 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.048	U	0.059	0.048	0.015
335-67-1	Perfluorooctanoic acid (PFOA)	0.024	U	0.030	0.024	0.0093
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.14	0.11	0.047

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	105		70-130
STL00996	13C2 PFDA	104		70-130

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_045.d  
 Lims ID: 320-25119-A-2-A  
 Client ID: WI-CV-1FB59-0117  
 Sample Type: Client  
 Inject. Date: 25-Jan-2017 12:48:25 ALS Bottle#: 24 Worklist Smp#: 45  
 Injection Vol: 10.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-25119-a-2-a  
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35\*C  
 Operator ID: CBW Instrument ID: A6  
 Method: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\537\_\_A6.m  
 Limit Group: LC 537 ICAL  
 Last Update: 25-Jan-2017 14:24:26 Calib Date: 24-Jan-2017 18:32:06  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_008.d  
 Column 1 : Acquity BEH C18 ( 2.10 mm) Det: F1:MRM  
 Process Host: XAWRK015

First Level Reviewer: barnettj Date: 25-Jan-2017 13:53:37

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
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\$ 2 13C2 PFHxA	315.0 > 270.0	18.640	18.658	-0.018	1.000	891791	10.5	29728
* 5 13C2-PFOA	415.0 > 370.0	20.082	20.096	-0.014		670783	10.0	18493
* 8 13C4 PFOS	503.0 > 80.0	20.714	20.730	-0.016		1414734	28.7	38544
\$ 10 13C2 PFDA	515.0 > 470.0	21.516	21.541	-0.025	1.000	753172	10.4	25391



TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_045.d

Injection Date: 25-Jan-2017 12:48:25

Instrument ID: A6

Lims ID: 320-25119-A-2-A

Lab Sample ID: 320-25119-2

Client ID: WI-CV-1FB59-0117

Operator ID: CBW

ALS Bottle#: 24

Worklist Smp#: 45

Injection Vol: 10.0 ul

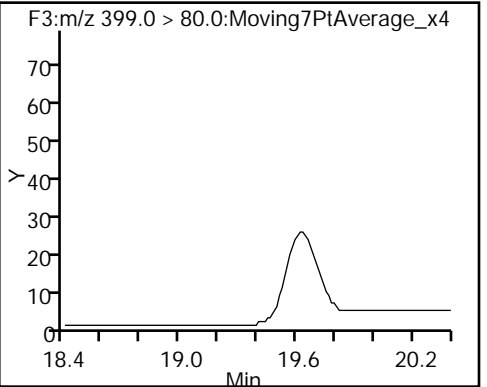
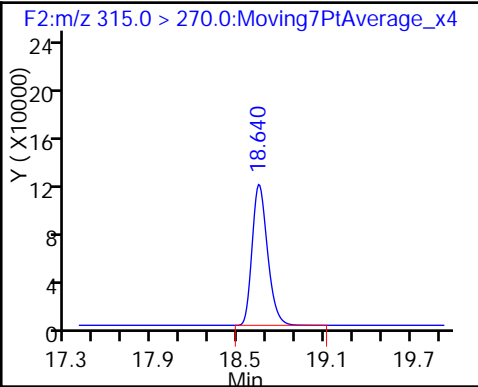
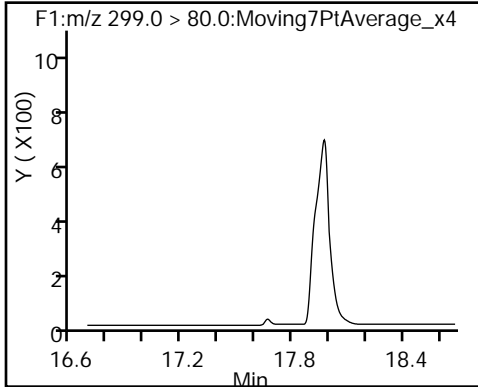
Dil. Factor: 1.0000

Method: 537\_A6

Limit Group: LC 537 ICAL

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

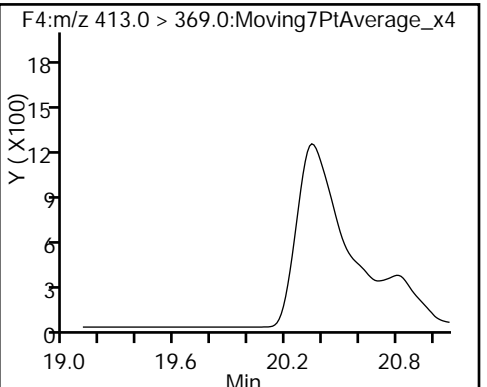
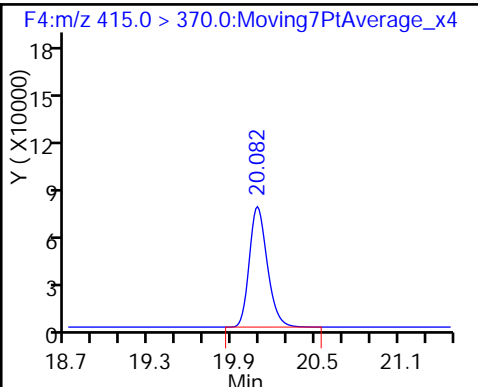
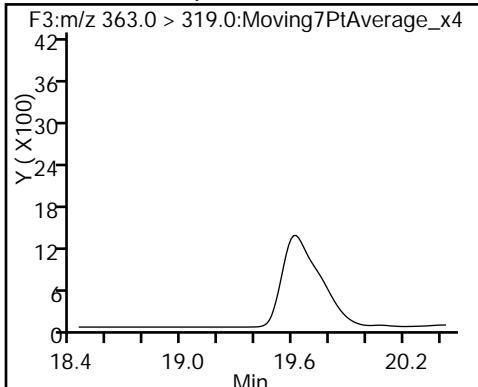
3 Perfluorohexanesulfonic acid (ND)



4 Perfluoroheptanoic acid (ND)

\* 5 13C2-PFOA

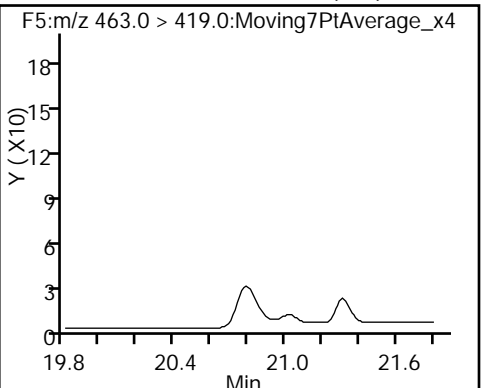
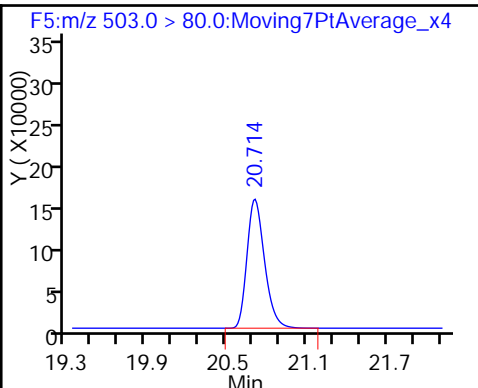
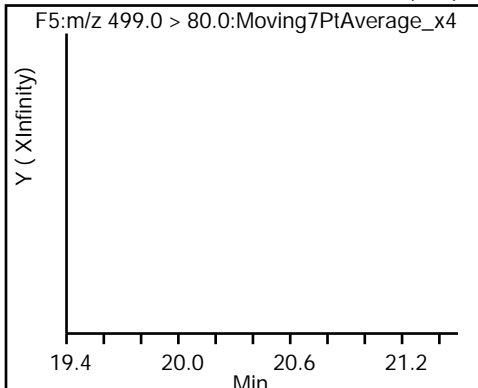
6 Perfluorooctanoic acid (ND)



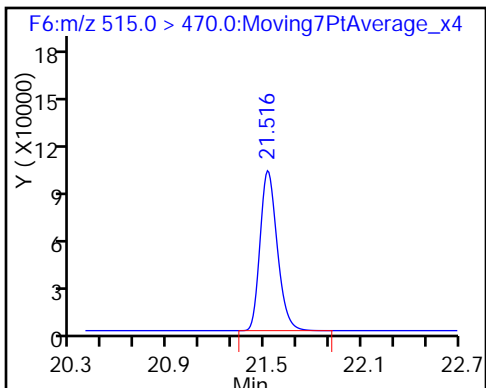
7 Perfluorooctane sulfonic acid (ND)

\* 8 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_045.d  
 Lims ID: 320-25119-A-2-A  
 Client ID: WI-CV-1FB59-0117  
 Sample Type: Client  
 Inject. Date: 25-Jan-2017 12:48:25 ALS Bottle#: 24 Worklist Smp#: 45  
 Injection Vol: 10.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-25119-a-2-a  
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35°C  
 Operator ID: CBW Instrument ID: A6  
 Method: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\537\_\_A6.m  
 Limit Group: LC 537 ICAL  
 Last Update: 25-Jan-2017 14:24:26 Calib Date: 24-Jan-2017 18:32:06  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_008.d  
 Column 1 : Acquity BEH C18 ( 2.10 mm) Det: F1:MRM  
 Process Host: XAWRK015

First Level Reviewer: barnettj Date: 25-Jan-2017 13:53:37

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	10.5	104.63
\$ 10 13C2 PFDA	10.0	10.4	103.54

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-25119-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WI-CV-1RW60-0117 Lab Sample ID: 320-25119-3  
 Matrix: Water Lab File ID: 24JAN2017A6A\_046.d  
 Analysis Method: 537 Date Collected: 01/18/2017 09:31  
 Extraction Method: 537 Date Extracted: 01/21/2017 11:49  
 Sample wt/vol: 246.4(mL) Date Analyzed: 01/25/2017 13:18  
 Con. Extract Vol.: 1(mL) Dilution Factor: 1  
 Injection Volume: 10(uL) GC Column: Acquity ID: 2.1(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 147664 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.049	U	0.061	0.049	0.016
335-67-1	Perfluorooctanoic acid (PFOA)	0.024	U	0.030	0.024	0.0096
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.14	0.11	0.048

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	100		70-130
STL00996	13C2 PFDA	104		70-130

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_046.d  
 Lims ID: 320-25119-A-3-A  
 Client ID: WI-CV-1RW60-0117  
 Sample Type: Client  
 Inject. Date: 25-Jan-2017 13:18:02 ALS Bottle#: 25 Worklist Smp#: 46  
 Injection Vol: 10.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-25119-a-3-a  
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35\*C  
 Operator ID: CBW Instrument ID: A6  
 Method: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\537\_\_A6.m  
 Limit Group: LC 537 ICAL  
 Last Update: 25-Jan-2017 14:24:26 Calib Date: 24-Jan-2017 18:32:06  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_008.d  
 Column 1 : Acquity BEH C18 ( 2.10 mm) Det: F1:MRM  
 Process Host: XAWRK015

First Level Reviewer: barnettj Date: 25-Jan-2017 14:03:31

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
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\$ 2 13C2 PFHxA	315.0 > 270.0	18.640	18.658	-0.018	1.000	789135	9.95	26460
* 5 13C2-PFOA	415.0 > 370.0	20.082	20.096	-0.014		624151	10.0	17188
* 8 13C4 PFOS	503.0 > 80.0	20.714	20.730	-0.016		1383463	28.7	37900
9 Perfluorononanoic acid								M
463.0 > 419.0	20.785	20.803	-0.018	1.000	491	0.006377	11.4	M
\$ 10 13C2 PFDA	515.0 > 470.0	21.524	21.541	-0.017	1.000	703316	10.4	23887

QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_046.d

Injection Date: 25-Jan-2017 13:18:02

Instrument ID: A6

Lims ID: 320-25119-A-3-A

Lab Sample ID: 320-25119-3

Client ID: WI-CV-1RW60-0117

Operator ID: CBW

ALS Bottle#: 25

Worklist Smp#: 46

Injection Vol: 10.0 ul

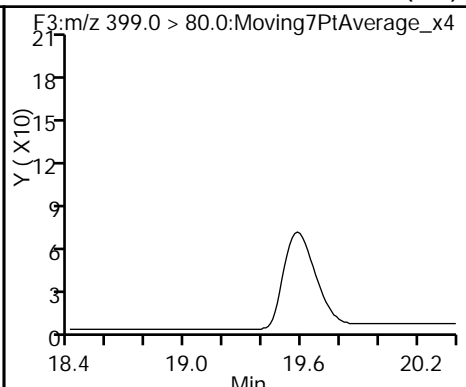
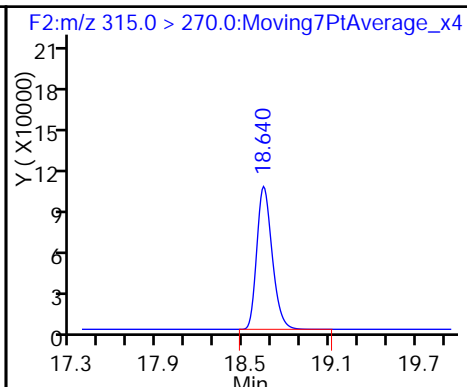
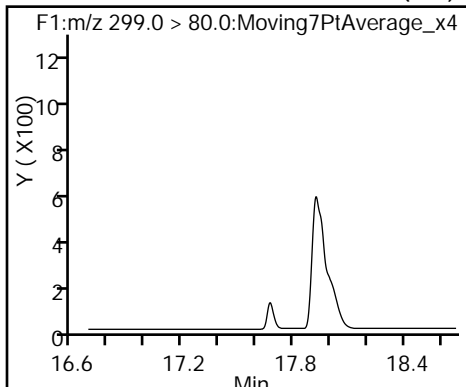
Dil. Factor: 1.0000

Method: 537\_A6

Limit Group: LC 537 ICAL

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

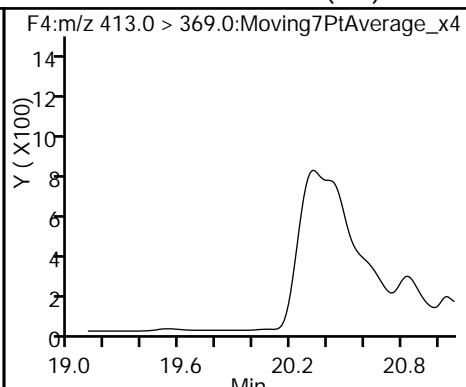
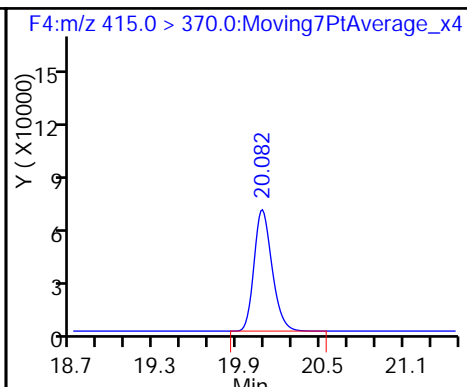
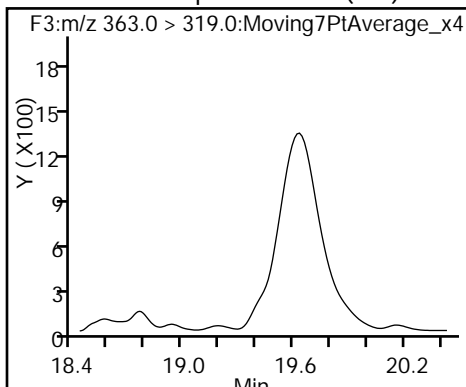
3 Perfluorohexanesulfonic acid (ND)



4 Perfluoroheptanoic acid (ND)

\* 5 13C2-PFOA

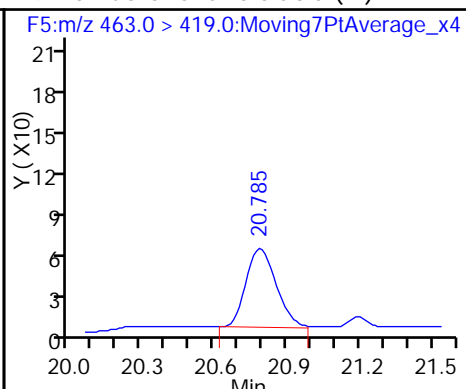
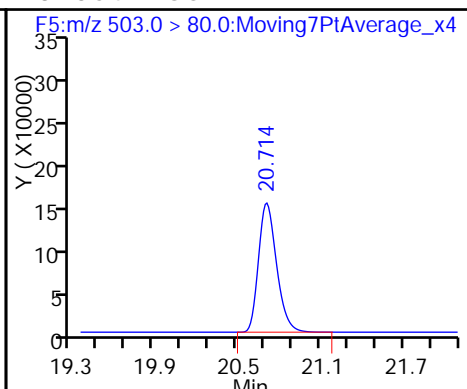
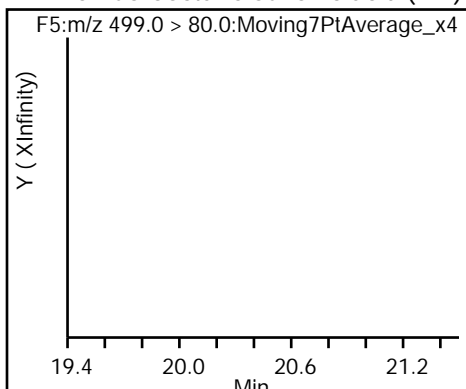
6 Perfluorooctanoic acid (ND)



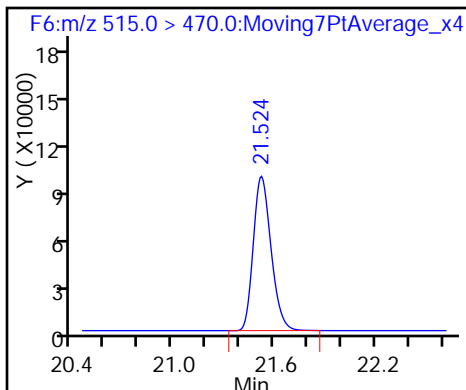
7 Perfluorooctane sulfonic acid (ND)

\* 8 13C4 PFOS

9 Perfluorononanoic acid (M)



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_046.d  
 Lims ID: 320-25119-A-3-A  
 Client ID: WI-CV-1RW60-0117  
 Sample Type: Client  
 Inject. Date: 25-Jan-2017 13:18:02 ALS Bottle#: 25 Worklist Smp#: 46  
 Injection Vol: 10.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-25119-a-3-a  
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35\*C  
 Operator ID: CBW Instrument ID: A6  
 Method: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\537\_\_A6.m  
 Limit Group: LC 537 ICAL  
 Last Update: 25-Jan-2017 14:24:26 Calib Date: 24-Jan-2017 18:32:06  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_008.d  
 Column 1 : Acquity BEH C18 ( 2.10 mm) Det: F1:MRM  
 Process Host: XAWRK015

First Level Reviewer: barnettj Date: 25-Jan-2017 14:03:31

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.95	99.50
\$ 10 13C2 PFDA	10.0	10.4	103.91

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-25119-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WI-CV-1FB60-0117 Lab Sample ID: 320-25119-4  
 Matrix: Water Lab File ID: 24JAN2017A6A\_047.d  
 Analysis Method: 537 Date Collected: 01/18/2017 09:30  
 Extraction Method: 537 Date Extracted: 01/21/2017 11:49  
 Sample wt/vol: 254.7(mL) Date Analyzed: 01/25/2017 13:47  
 Con. Extract Vol.: 1(mL) Dilution Factor: 1  
 Injection Volume: 10(uL) GC Column: Acquity ID: 2.1(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 147664 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.047	U	0.059	0.047	0.015
335-67-1	Perfluorooctanoic acid (PFOA)	0.024	U	0.029	0.024	0.0092
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.14	0.11	0.047

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	100		70-130
STL00996	13C2 PFDA	95		70-130

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_047.d  
 Lims ID: 320-25119-A-4-A  
 Client ID: WI-CV-1FB60-0117  
 Sample Type: Client  
 Inject. Date: 25-Jan-2017 13:47:37 ALS Bottle#: 26 Worklist Smp#: 47  
 Injection Vol: 10.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-25119-a-4-a  
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35\*C  
 Operator ID: CBW Instrument ID: A6  
 Method: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\537\_\_A6.m  
 Limit Group: LC 537 ICAL  
 Last Update: 25-Jan-2017 14:24:26 Calib Date: 24-Jan-2017 18:32:06  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_008.d  
 Column 1 : Acquity BEH C18 ( 2.10 mm) Det: F1:MRM  
 Process Host: XAWRK015

First Level Reviewer: barnettj Date: 25-Jan-2017 14:24:26

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
--------	----	--------	--------	--------	----------	--------------	-----	-------

\$ 2 13C2 PFHxA	315.0 > 270.0	18.640	18.658	-0.018	1.000	875897	10.0	29071
* 5 13C2-PFOA	415.0 > 370.0	20.082	20.096	-0.014		685974	10.0	18865
* 8 13C4 PFOS	503.0 > 80.0	20.714	20.730	-0.016		1431212	28.7	39040
\$ 10 13C2 PFDA	515.0 > 470.0	21.524	21.541	-0.017	1.000	705681	9.49	23642



TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_047.d

Injection Date: 25-Jan-2017 13:47:37

Instrument ID: A6

Lims ID: 320-25119-A-4-A

Lab Sample ID: 320-25119-4

Client ID: WI-CV-1FB60-0117

Operator ID: CBW

ALS Bottle#: 26

Worklist Smp#: 47

Injection Vol: 10.0 ul

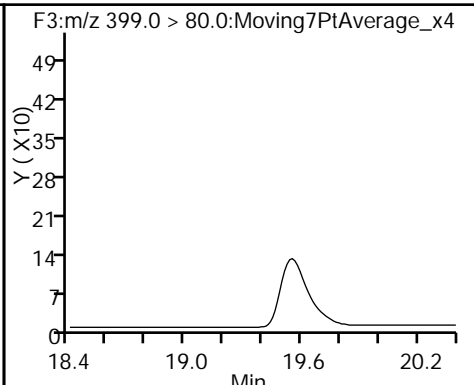
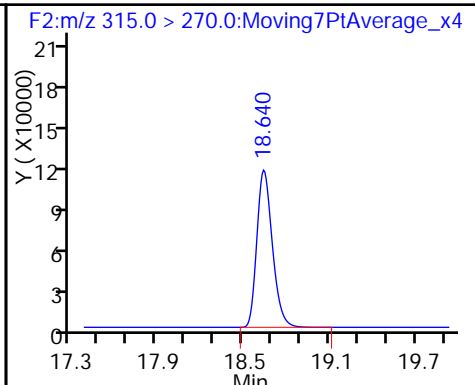
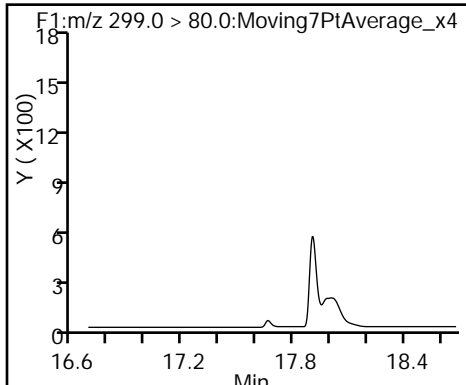
Dil. Factor: 1.0000

Method: 537\_\_A6

Limit Group: LC 537 ICAL

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

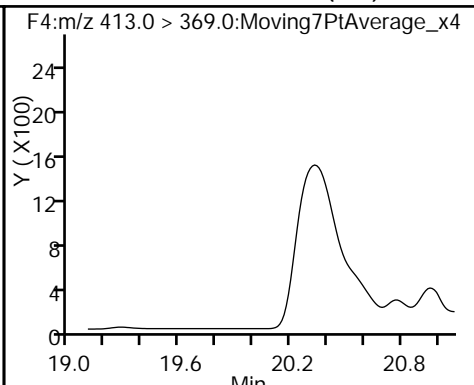
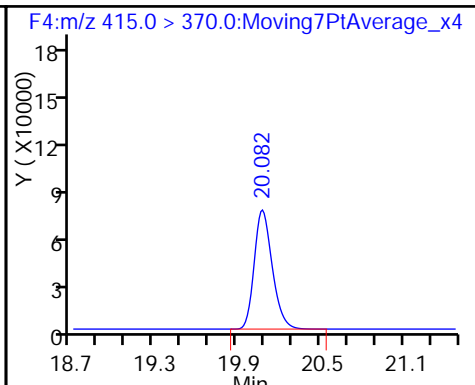
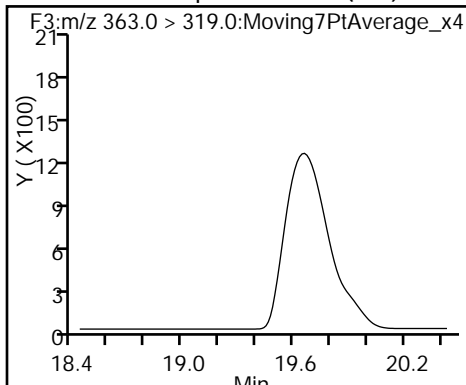
3 Perfluorohexanesulfonic acid (ND)



4 Perfluoroheptanoic acid (ND)

\* 5 13C2-PFOA

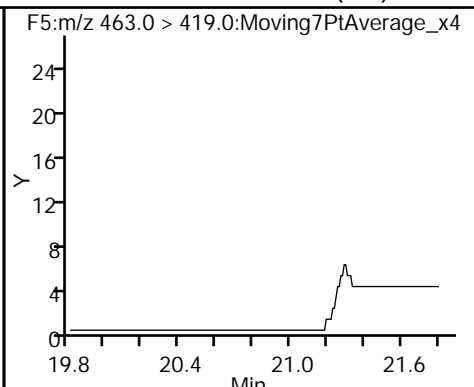
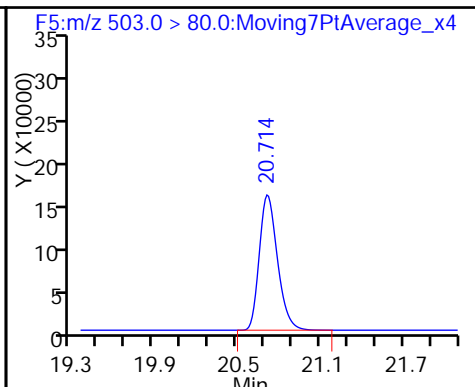
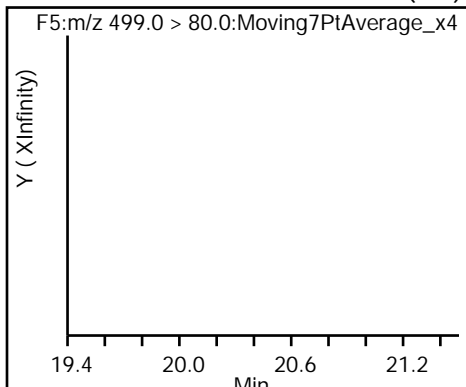
6 Perfluorooctanoic acid (ND)



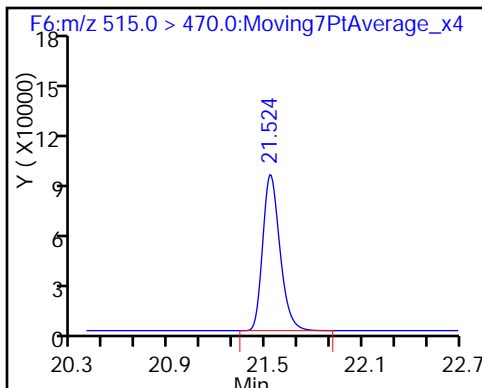
7 Perfluorooctane sulfonic acid (ND)

\* 8 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_047.d  
 Lims ID: 320-25119-A-4-A  
 Client ID: WI-CV-1FB60-0117  
 Sample Type: Client  
 Inject. Date: 25-Jan-2017 13:47:37 ALS Bottle#: 26 Worklist Smp#: 47  
 Injection Vol: 10.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-25119-a-4-a  
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35°C  
 Operator ID: CBW Instrument ID: A6  
 Method: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\537\_\_A6.m  
 Limit Group: LC 537 ICAL  
 Last Update: 25-Jan-2017 14:24:26 Calib Date: 24-Jan-2017 18:32:06  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_008.d  
 Column 1 : Acquity BEH C18 ( 2.10 mm) Det: F1:MRM  
 Process Host: XAWRK015

First Level Reviewer: barnettj Date: 25-Jan-2017 14:24:26

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	10.0	100.49
\$ 10 13C2 PFDA	10.0	9.49	94.87

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

Lab Name: TestAmerica Sacramento Job No.: 320-25119-1 Analy Batch No.: 147661

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

Instrument ID: A6 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/24/2017 16:04 Calibration End Date: 01/24/2017 18:32 Calibration ID: 27898

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-147661/3	24JAN2017A6A_003.d
Level 2	STD 320-147661/4	24JAN2017A6A_004.d
Level 3	STD 320-147661/5	24JAN2017A6A_005.d
Level 4	STD 320-147661/6	24JAN2017A6A_006.d
Level 5	STD 320-147661/7	24JAN2017A6A_007.d
Level 6	STD 320-147661/8	24JAN2017A6A_008.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 (PFBS)	0.7240 0.6936	0.7843	0.7732	0.7241	0.6625	Ave		0.7270			6.4		30.0				
Perfluorohexanesulfonic acid	0.8475 0.9755	0.9230	0.9507	0.9667	0.9035	Ave		0.9278			5.1		30.0				
Perfluoroheptanoic acid	1.2619 1.0890	1.2736	1.1788	1.2241	1.0619	Ave		1.1816			7.5		30.0				
Perfluorooctanoic acid (PFOA)	1.0507 1.1089	1.1693	0.9554	1.1498	0.9852	Ave		1.0699			8.2		30.0				
Perfluorooctanesulfonic acid (PFOS)	0.9568 1.1822	1.0466	1.0874	1.1607	1.0912	Ave		1.0875			7.5		30.0				
Perfluorononanoic acid	1.3391 1.1974	1.2929	1.2031	1.3206	1.0485	Ave		1.2336			8.8		30.0				
13C2 PFHxA	1.2029 1.3245	1.1943	1.2160	1.3847	1.3016	Ave		1.2707			6.1		30.0				
13C2 PFDA	1.0118 1.1311	1.0452	1.0462	1.1378	1.1344	Ave		1.0844			5.2		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.: 320-25119-1 Analy Batch No.: 147661

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

Instrument ID: A6 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/24/2017 16:04 Calibration End Date: 01/24/2017 18:32 Calibration ID: 27898

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-147661/3	24JAN2017A6A_003.d
Level 2	STD 320-147661/4	24JAN2017A6A_004.d
Level 3	STD 320-147661/5	24JAN2017A6A_005.d
Level 4	STD 320-147661/6	24JAN2017A6A_006.d
Level 5	STD 320-147661/7	24JAN2017A6A_007.d
Level 6	STD 320-147661/8	24JAN2017A6A_008.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	294327 4661120	836915	1619491	2616556	3682649	8.98 178	22.9	45.1	90.9	135
Perfluorohexanesulfonic acid	PFOS	Ave	116135 2209984	331991	671200	1177606	1693136	3.03 60.1	7.72	15.2	30.6	45.4
Perfluoroheptanoic acid	13PF OA	Ave	80877 1336981	216684	422942	741749	1028185	0.990 19.7	2.52	4.97	10.0	14.9
Perfluorooctanoic acid (PFOA)	13PF OA	Ave	132774 2684196	392200	675822	1373612	1880740	1.95 38.8	4.98	9.81	19.8	29.3
Perfluorooctanesulfonic acid (PFOS)	PFOS	Ave	173628 3546373	498504	1016551	1872091	2707686	4.01 79.6	10.2	20.1	40.6	60.1
Perfluorononanoic acid	13PF OA	Ave	179817 3079855	460843	904369	1676501	2126918	2.07 41.2	5.29	10.4	21.0	31.1
13C2 PFHxA	13PF OA	Ave	778758 826398	804846	877015	837038	848632	10.0 10.0	10.0	10.0	10.0	10.0
13C2 PFDA	13PF OA	Ave	655015 705744	704379	754518	687782	739638	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.: 320-25119-1 Analy Batch No.: 147661

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

Instrument ID: A6 GC Column: Acquity ID: 2.1 (mm) Heated Purge: (Y/N) N

Calibration Start Date: 01/24/2017 16:04 Calibration End Date: 01/24/2017 18:32 Calibration ID: 27898

Calibration Files:

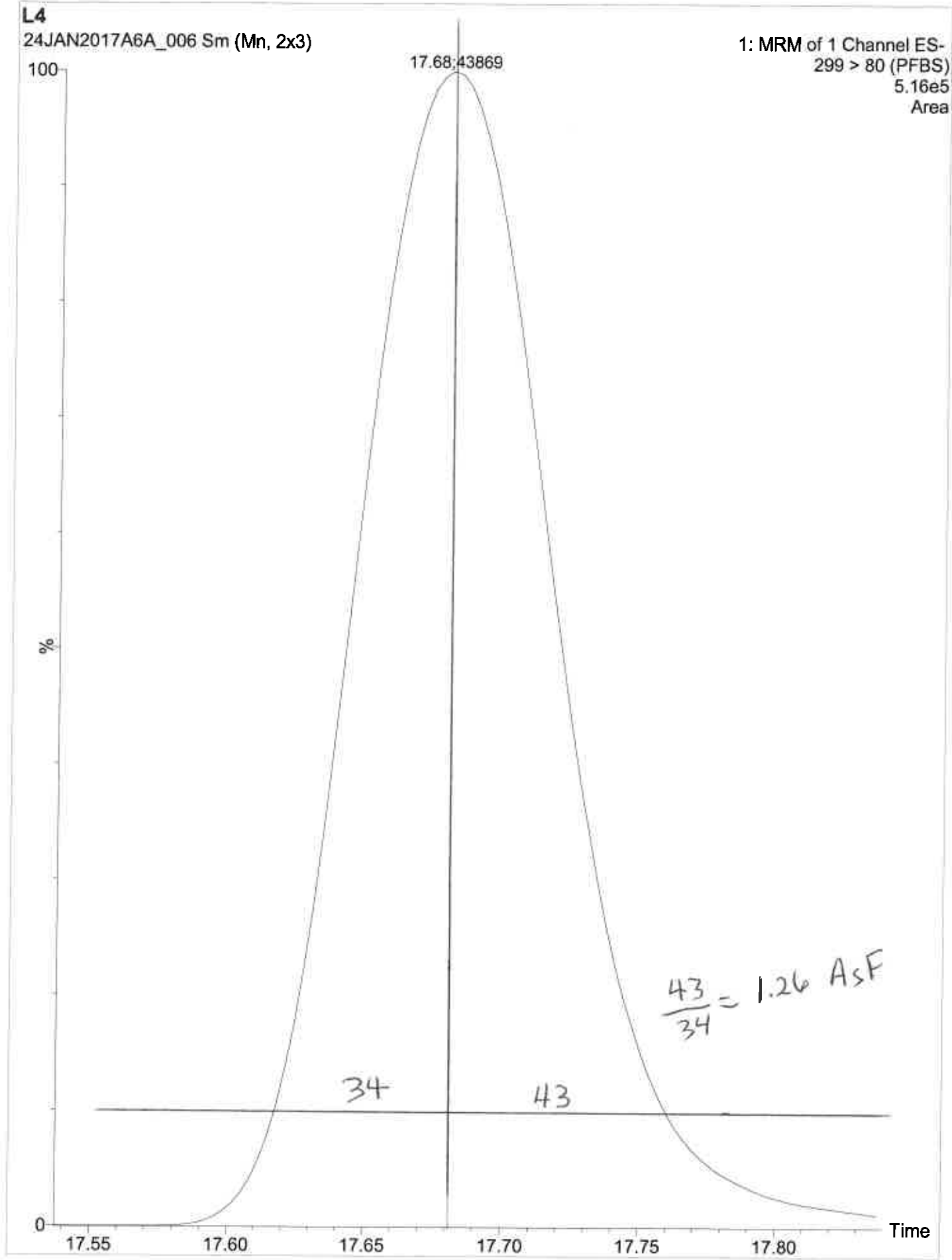
LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-147661/3	24JAN2017A6A_003.d
Level 2	STD 320-147661/4	24JAN2017A6A_004.d
Level 3	STD 320-147661/5	24JAN2017A6A_005.d
Level 4	STD 320-147661/6	24JAN2017A6A_006.d
Level 5	STD 320-147661/7	24JAN2017A6A_007.d
Level 6	STD 320-147661/8	24JAN2017A6A_008.d

ANALYTE	PERCENT ERROR						PERCENT ERROR LIMIT					
	LVL 1 #	LVL 2 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6
Perfluorobutanesulfonic acid (PFBS)	-0.4	7.9	6.4	-0.4	-8.9	-4.6	50	50	50	50	50	50
Perfluorohexanesulfonic acid	-8.7	-0.5	2.5	4.2	-2.6	5.1	50	50	50	50	50	50
Perfluoroheptanoic acid	6.8	7.8	-0.2	3.6	-10.1	-7.8	50	50	50	50	50	50
Perfluorooctanoic acid (PFOA)	-1.8	9.3	-10.7	7.5	-7.9	3.6	50	50	50	50	50	50
Perfluorooctanesulfonic acid (PFOS)	-12.0	-3.8	0.0	6.7	0.3	8.7	50	50	50	50	50	50
Perfluorononanoic acid	8.6	4.8	-2.5	7.1	-15.0	-2.9	50	50	50	50	50	50
13C2 PFHxA	-5.3	-6.0	-4.3	9.0	2.4	4.2	30	30	30	30	30	30
13C2 PFDA	-6.7	-3.6	-3.5	4.9	4.6	4.3	30	30	30	30	30	30

L4

24JAN2017A6A\_006 Sm (Mn, 2x3)

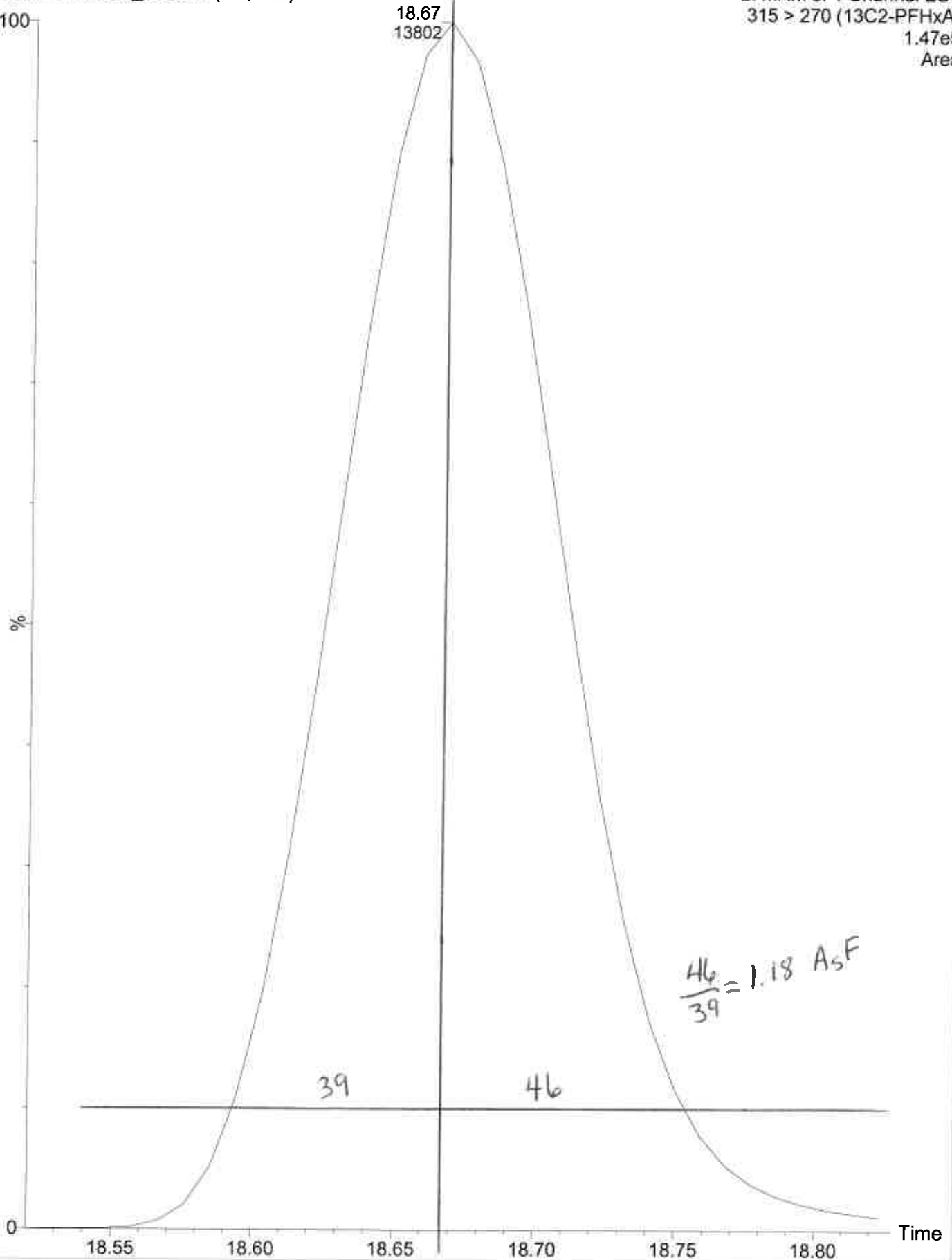
1: MRM of 1 Channel ES-  
299 > 80 (PFBS)  
5.16e5  
Area



L4

24JAN2017A6A\_006 Sm (Mn, 2x3)

2: MRM of 1 Channel ES-  
315 > 270 (13C2-PFHxA)  
1.47e5  
Area



TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_003.d  
 Lims ID: STD L1  
 Client ID:  
 Sample Type: IC Calib Level: 1  
 Inject. Date: 24-Jan-2017 16:04:08 ALS Bottle#: 1 Worklist Smp#: 3  
 Injection Vol: 10.0 ul Dil. Factor: 1.0000  
 Sample Info: STD L1 L1  
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35\*C  
 Operator ID: CBW Instrument ID: A6  
 Sublist: chrom-537\_\_A6\*sub3  
 Method: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\537\_\_A6.m  
 Limit Group: LC 537 ICAL  
 Last Update: 25-Jan-2017 10:24:31 Calib Date: 24-Jan-2017 18:32:06  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_008.d  
 Column 1 : Acquity BEH C18 ( 2.10 mm) Det: F1:MRM  
 Process Host: XAWRK015

First Level Reviewer: barnettj Date: 25-Jan-2017 09:52:59

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid	299.0 > 80.0	17.696	17.685	0.011	1.000	294327	8.94	406
\$ 2 13C2 PFHxA	315.0 > 270.0	18.658	18.658	0.0	1.000	778758	9.47	26147
3 Perfluorohexanesulfonic acid	399.0 > 80.0	19.391	19.403	-0.012	1.000	116135	2.76	2918
4 Perfluoroheptanoic acid	363.0 > 319.0	19.427	19.437	-0.010	1.000	80877	1.06	45.3 M
* 5 13C2-PFOA	415.0 > 370.0	20.094	20.096	-0.002		647399	10.0	17760
6 Perfluorooctanoic acid	413.0 > 369.0	20.094	20.096	-0.002	1.000	132774	1.92	70.3 M
7 Perfluorooctane sulfonic acid	499.0 > 80.0	20.466	20.468	-0.002	1.000	173628	3.53	1325
* 8 13C4 PFOS	503.0 > 80.0	20.726	20.730	-0.004		1298918	28.7	35348
9 Perfluorononanoic acid	463.0 > 419.0	20.797	20.803	-0.006	1.000	179817	2.25	3952
\$ 10 13C2 PFDA	515.0 > 470.0	21.542	21.541	0.001	1.000	655015	9.33	21944



**QC Flag Legend**

Review Flags

M - Manually Integrated

**Reagents:**

LC537-L1\_00017

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_003.d

Injection Date: 24-Jan-2017 16:04:08

Instrument ID: A6

Lims ID: STD L1

Client ID:

Operator ID: CBW

ALS Bottle#: 1

Worklist Smp#: 3

Injection Vol: 10.0 ul

Dil. Factor: 1.0000

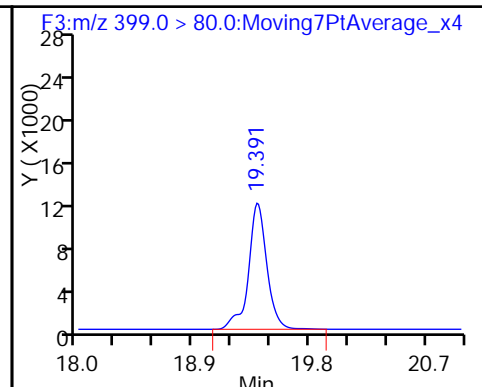
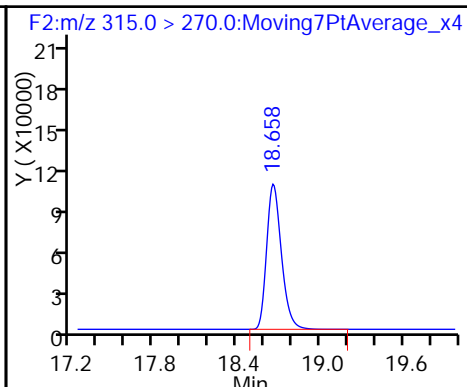
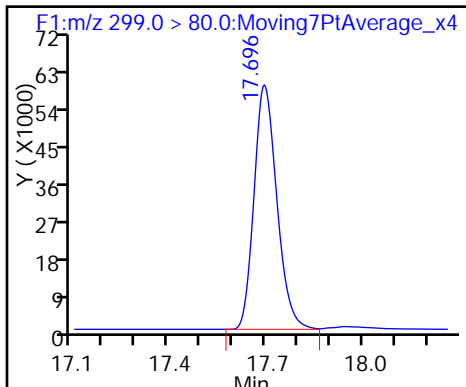
Method: 537\_A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

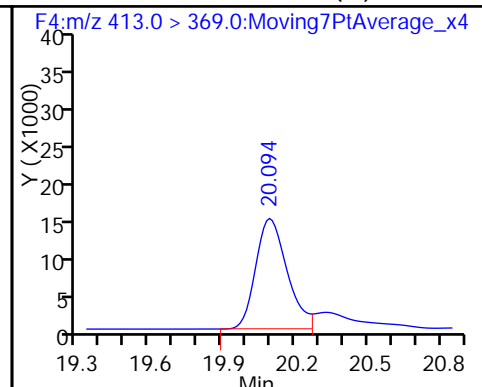
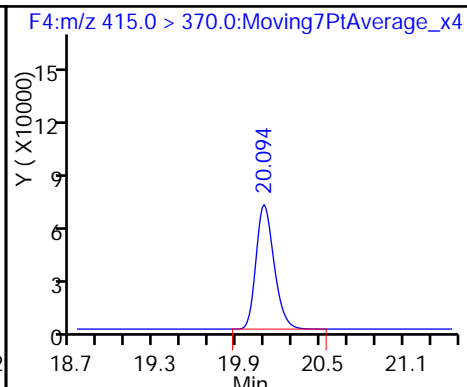
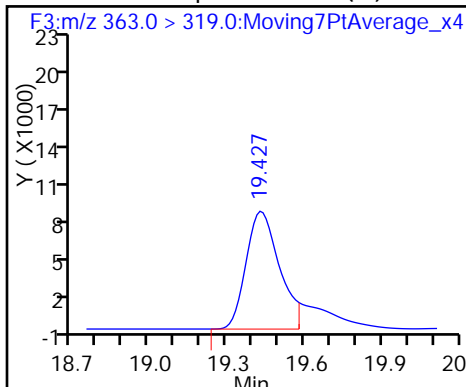
3 Perfluorohexanesulfonic acid



4 Perfluoroheptanoic acid (M)

\* 5 13C2-PFOA

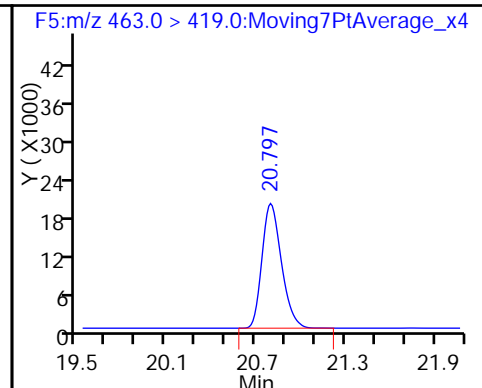
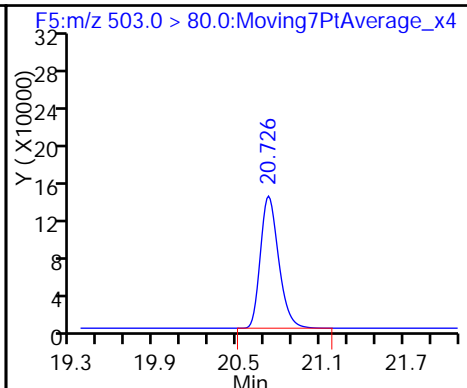
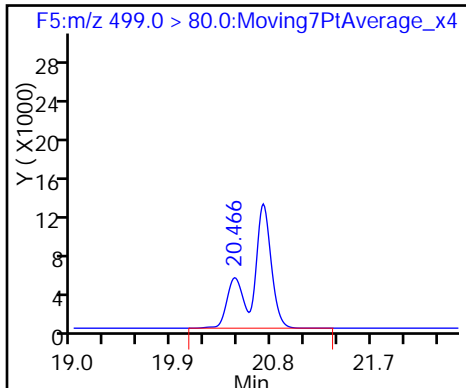
6 Perfluorooctanoic acid (M)



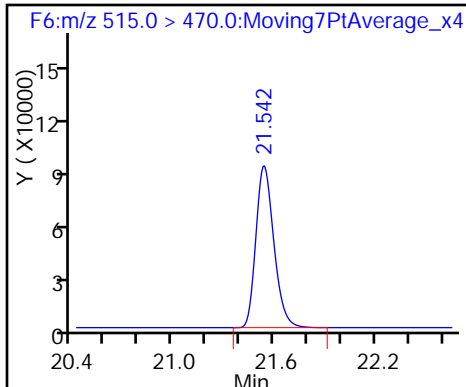
7 Perfluorooctane sulfonic acid

\* 8 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

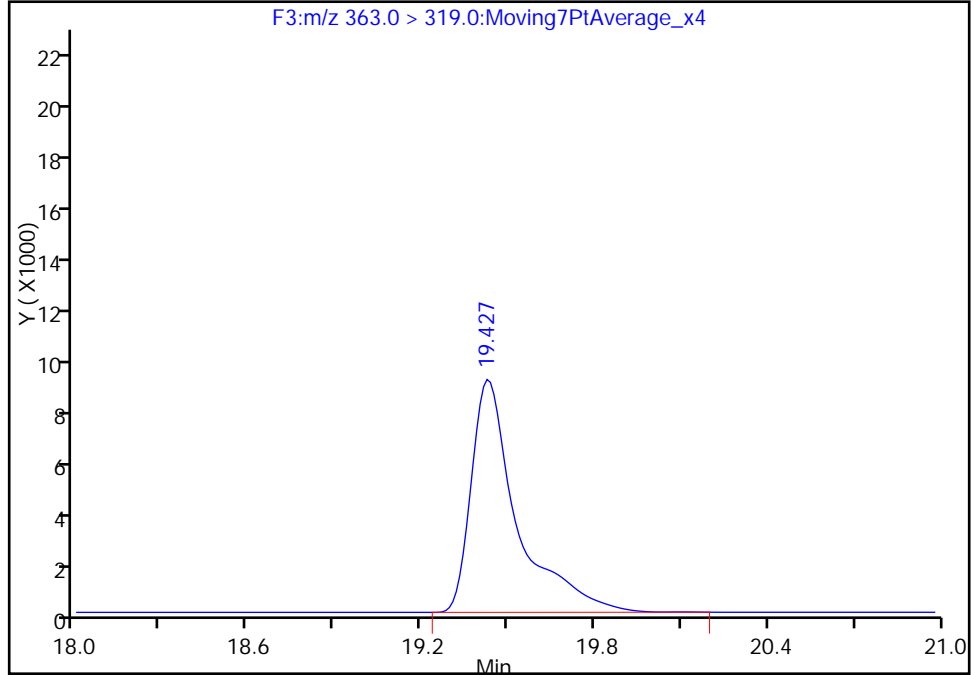
Data File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_003.d  
Injection Date: 24-Jan-2017 16:04:08 Instrument ID: A6  
Lims ID: STD L1  
Client ID:  
Operator ID: CBW ALS Bottle#: 1 Worklist Smp#: 3  
Injection Vol: 10.0 ul Dil. Factor: 1.0000  
Method: 537\_\_A6 Limit Group: LC 537 ICAL  
Column: Acquity BEH C18 ( 2.10 mm) Detector F3:M/RM

4 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

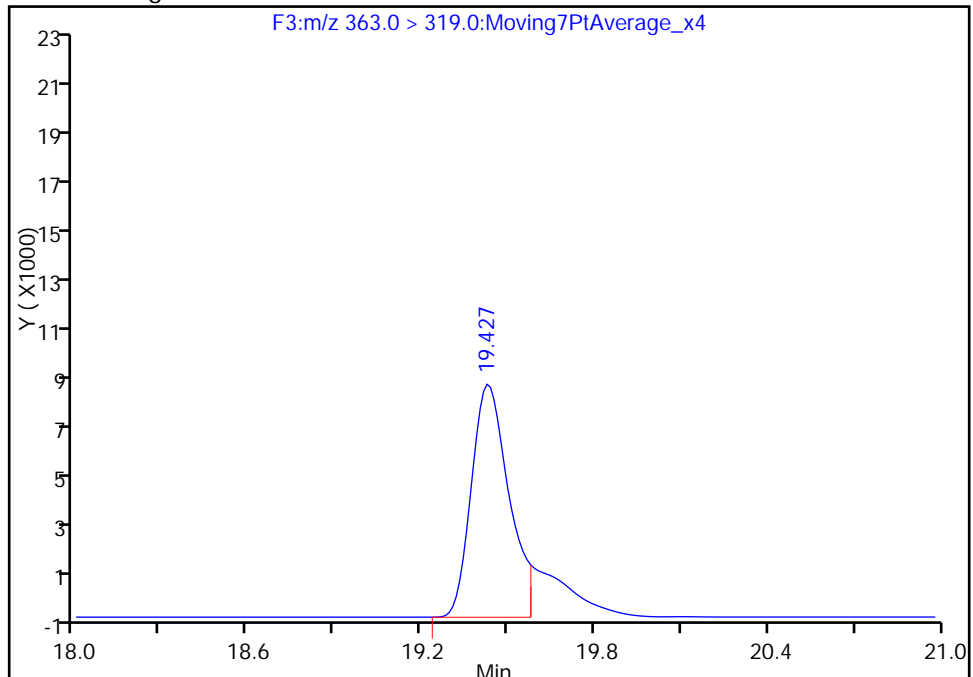
RT: 19.43  
Area: 99579  
Amount: 1.250312  
Amount Units: ng/ml

Processing Integration Results



RT: 19.43  
Area: 80877  
Amount: 1.057287  
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 25-Jan-2017 09:52:59  
Audit Action: Manually Integrated

Audit Reason: Split Peak

TestAmerica Sacramento

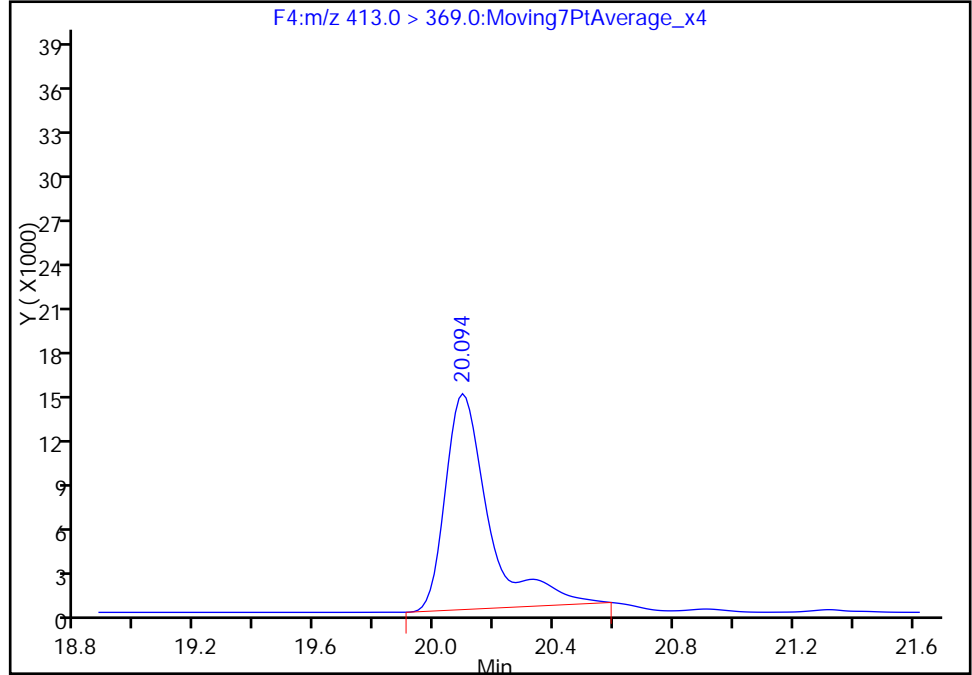
Data File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_003.d  
Injection Date: 24-Jan-2017 16:04:08 Instrument ID: A6  
Lims ID: STD L1  
Client ID:  
Operator ID: CBW ALS Bottle#: 1 Worklist Smp#: 3  
Injection Vol: 10.0 ul Dil. Factor: 1.0000  
Method: 537\_\_A6 Limit Group: LC 537 ICAL  
Column: Acquity BEH C18 ( 2.10 mm) Detector F4:M/RM

6 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

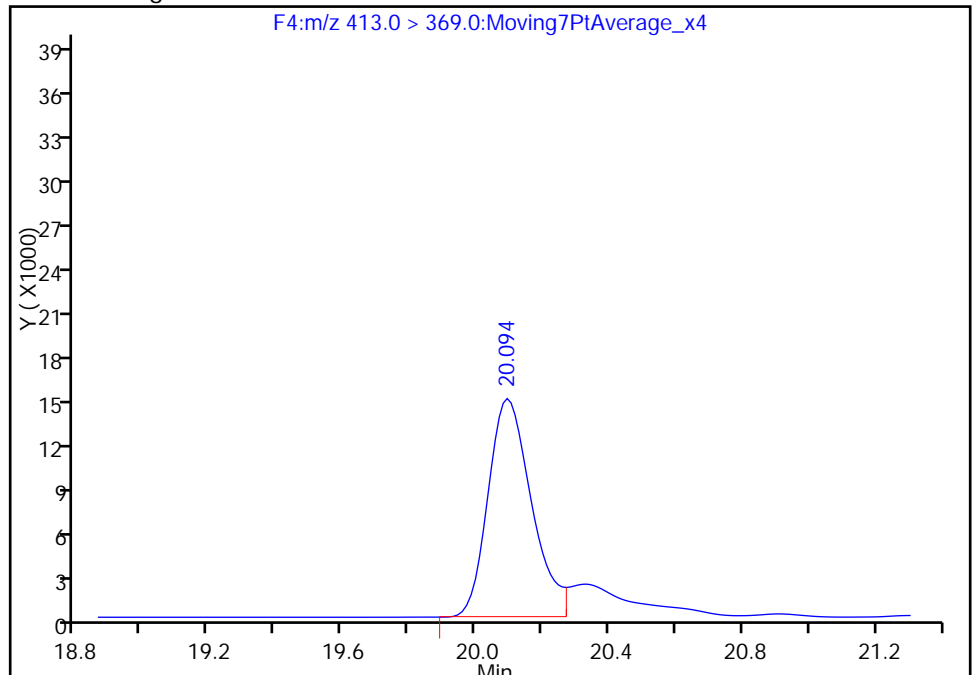
RT: 20.09  
Area: 147106  
Amount: 2.086973  
Amount Units: ng/ml

Processing Integration Results



RT: 20.09  
Area: 132774  
Amount: 1.916927  
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 25-Jan-2017 09:52:59  
Audit Action: Manually Integrated

Audit Reason: Split Peak

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_004.d  
 Lims ID: STD L2  
 Client ID:  
 Sample Type: IC Calib Level: 2  
 Inject. Date: 24-Jan-2017 16:33:43 ALS Bottle#: 2 Worklist Smp#: 4  
 Injection Vol: 10.0 ul Dil. Factor: 1.0000  
 Sample Info: STD L2 L2  
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35\*C  
 Operator ID: CBW Instrument ID: A6  
 Sublist: chrom-537\_\_A6\*sub3  
 Method: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\537\_\_A6.m  
 Limit Group: LC 537 ICAL  
 Last Update: 25-Jan-2017 10:24:32 Calib Date: 24-Jan-2017 18:32:06  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_008.d  
 Column 1 : Acquity BEH C18 ( 2.10 mm) Det: F1:MRM  
 Process Host: XAWRK015

First Level Reviewer: barnettj Date: 25-Jan-2017 09:52:22

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid	299.0 > 80.0	17.692	17.685	0.007	1.000	836915	24.7	644
\$ 2 13C2 PFHxA	315.0 > 270.0	18.658	18.658	0.0	1.000	804846	9.40	26897
3 Perfluorohexanesulfonic acid	399.0 > 80.0	19.403	19.403	0.0	1.000	331991	7.68	7924
4 Perfluoroheptanoic acid	363.0 > 319.0	19.427	19.437	-0.010	1.000	216684	2.72	151 M
6 Perfluorooctanoic acid	413.0 > 369.0	20.094	20.096	-0.002	1.000	392200	5.44	206 M
* 5 13C2-PFOA	415.0 > 370.0	20.094	20.096	-0.002		673912	10.0	18520
7 Perfluorooctane sulfonic acid	499.0 > 80.0	20.466	20.468	-0.002	1.000	498504	9.83	4010
* 8 13C4 PFOS	503.0 > 80.0	20.726	20.730	-0.004		1337002	28.7	36400
9 Perfluorononanoic acid	463.0 > 419.0	20.797	20.803	-0.006	1.000	460843	5.54	12656
\$ 10 13C2 PFDA	515.0 > 470.0	21.542	21.541	0.001	1.000	704379	9.64	23893

### QC Flag Legend

Review Flags

M - Manually Integrated

### Reagents:

LC537-L2\_00016

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_004.d

Injection Date: 24-Jan-2017 16:33:43

Instrument ID: A6

Lims ID: STD L2

Client ID:

Operator ID: CBW

ALS Bottle#: 2

Worklist Smp#: 4

Injection Vol: 10.0 ul

Dil. Factor: 1.0000

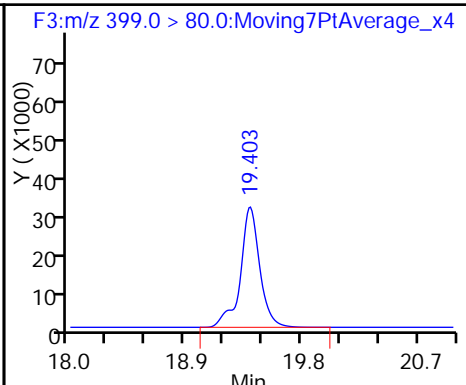
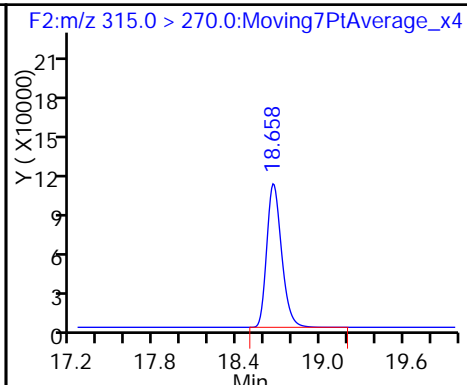
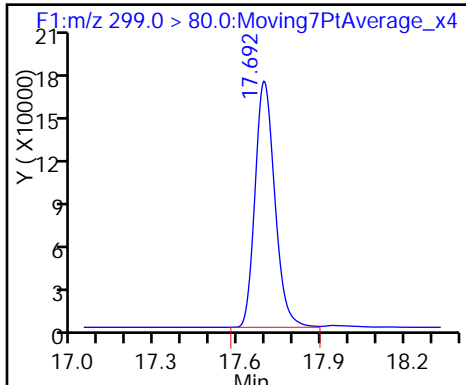
Method: 537\_A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

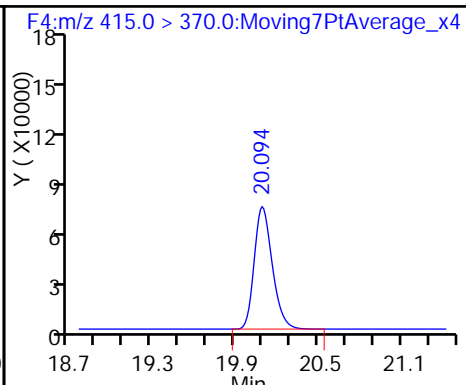
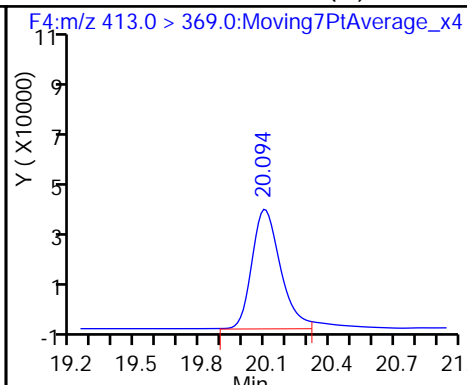
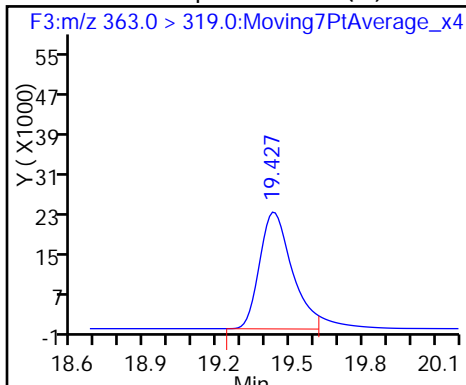
3 Perfluorohexanesulfonic acid



4 Perfluoroheptanoic acid (M)

6 Perfluorooctanoic acid (M)

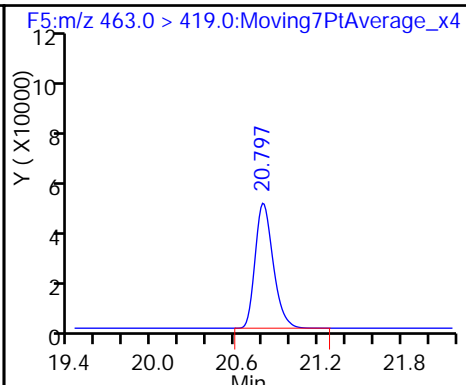
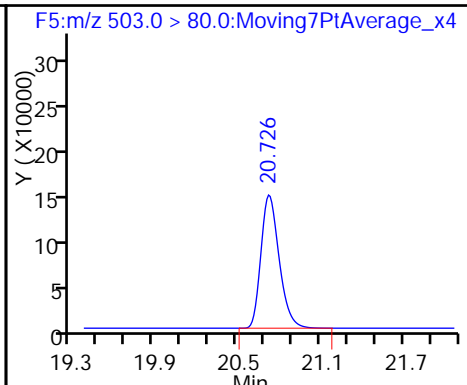
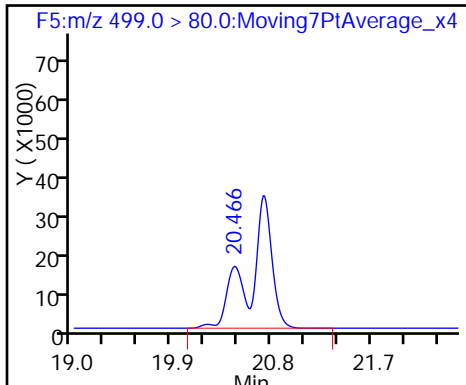
\* 5 13C2-PFOA



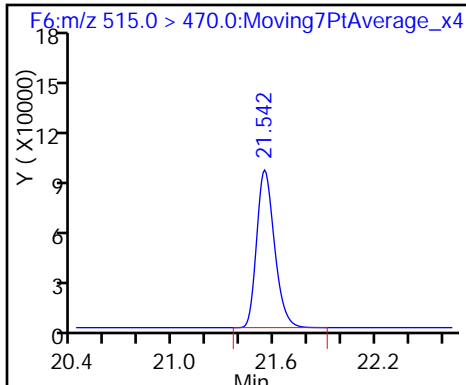
7 Perfluorooctane sulfonic acid

\* 8 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

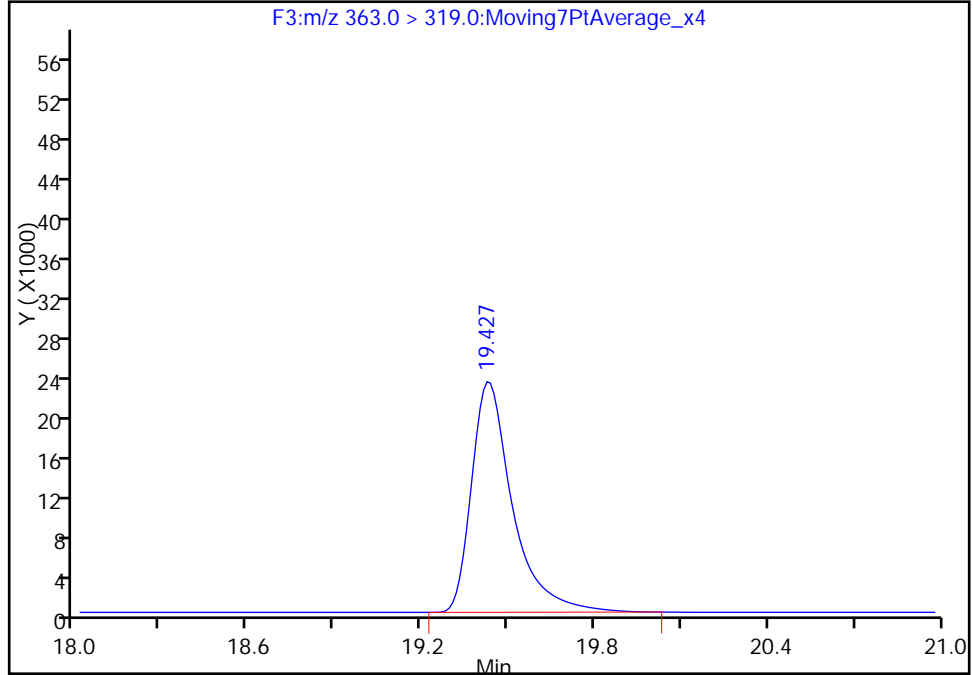
Data File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_004.d  
Injection Date: 24-Jan-2017 16:33:43 Instrument ID: A6  
Lims ID: STD L2  
Client ID:  
Operator ID: CBW ALS Bottle#: 2 Worklist Smp#: 4  
Injection Vol: 10.0 ul Dil. Factor: 1.0000  
Method: 537\_\_A6 Limit Group: LC 537 ICAL  
Column: Acquity BEH C18 ( 2.10 mm) Detector F3:M/RM

4 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

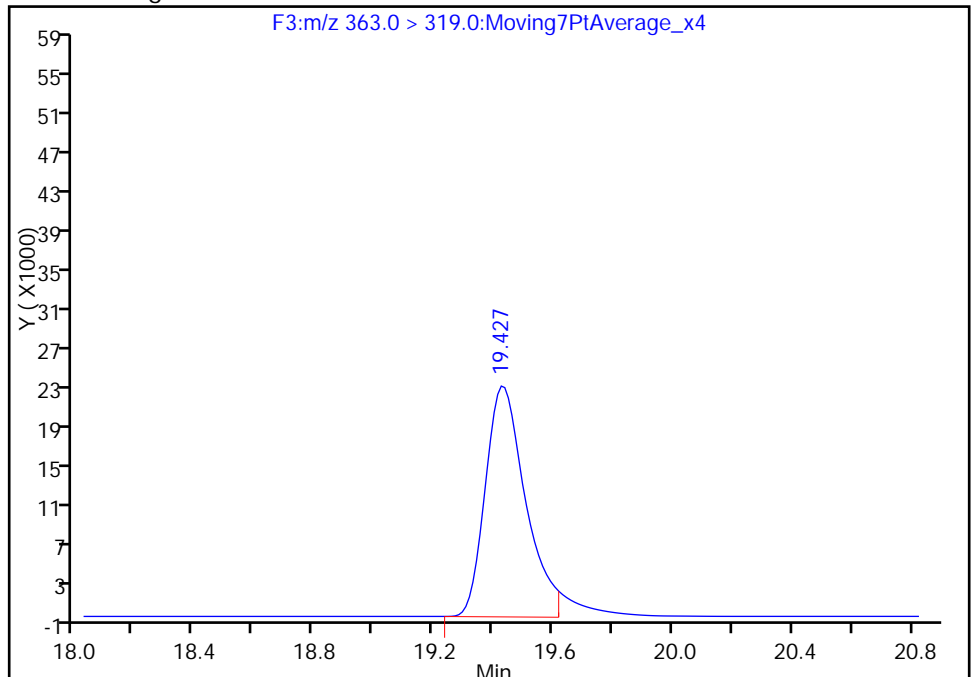
RT: 19.43  
Area: 229238  
Amount: 2.993407  
Amount Units: ng/ml

Processing Integration Results



RT: 19.43  
Area: 216684  
Amount: 2.721220  
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 25-Jan-2017 09:52:22  
Audit Action: Manually Integrated

Audit Reason: Split Peak



TestAmerica Sacramento

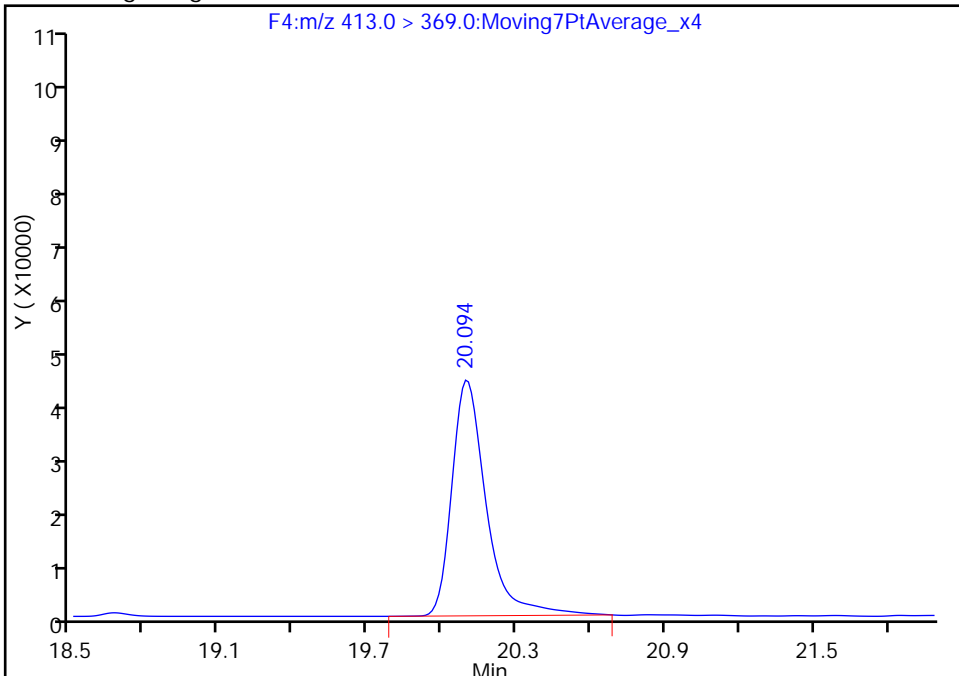
Data File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_004.d  
Injection Date: 24-Jan-2017 16:33:43 Instrument ID: A6  
Lims ID: STD L2  
Client ID:  
Operator ID: CBW ALS Bottle#: 2 Worklist Smp#: 4  
Injection Vol: 10.0 ul Dil. Factor: 1.0000  
Method: 537\_\_A6 Limit Group: LC 537 ICAL  
Column: Acquity BEH C18 ( 2.10 mm) Detector F4:MRM

6 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

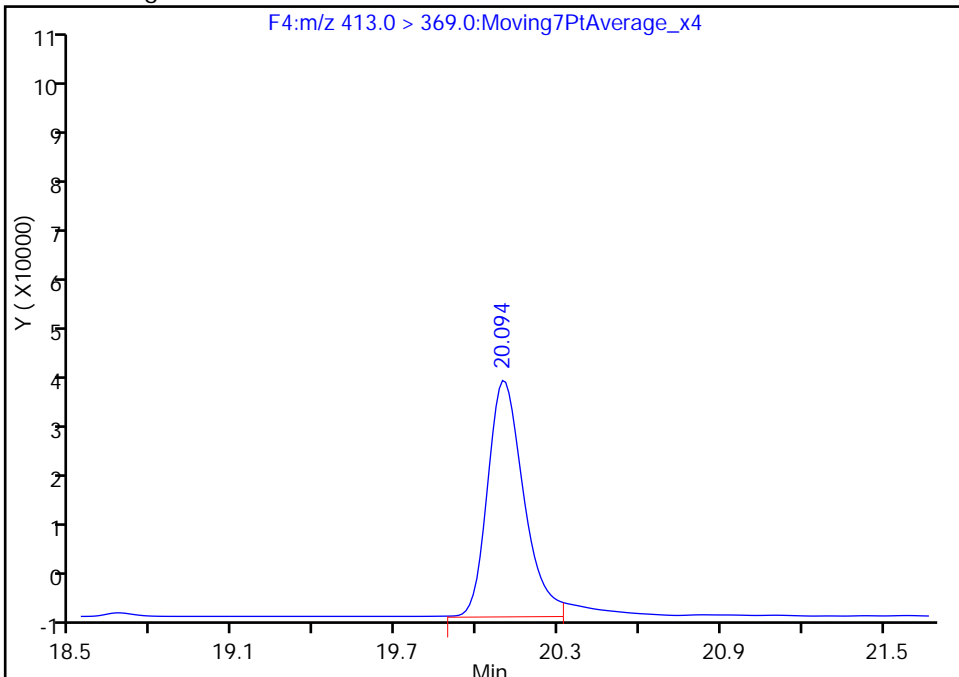
RT: 20.09  
Area: 406644  
Amount: 5.505747  
Amount Units: ng/ml

Processing Integration Results



RT: 20.09  
Area: 392200  
Amount: 5.439626  
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 25-Jan-2017 09:52:22  
Audit Action: Manually Integrated

Audit Reason: Split Peak

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_005.d  
 Lims ID: STD L3  
 Client ID:  
 Sample Type: IC Calib Level: 3  
 Inject. Date: 24-Jan-2017 17:03:19 ALS Bottle#: 3 Worklist Smp#: 5  
 Injection Vol: 10.0 ul Dil. Factor: 1.0000  
 Sample Info: STD L3 L3  
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35\*C  
 Operator ID: CBW Instrument ID: A6  
 Sublist: chrom-537\_\_A6\*sub3

Method: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\537\_\_A6.m  
 Limit Group: LC 537 ICAL  
 Last Update: 25-Jan-2017 10:24:33 Calib Date: 24-Jan-2017 18:32:06  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_008.d

Column 1 : Acquity BEH C18 ( 2.10 mm) Det: F1:MRM  
 Process Host: XAWRK015

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid	299.0 > 80.0	17.686	17.685	0.001	1.000	1619491	48.0	31029
\$ 2 13C2 PFHxA	315.0 > 270.0	18.658	18.658	0.0	1.000	877015	9.57	29230
3 Perfluorohexanesulfonic acid	399.0 > 80.0	19.403	19.403	0.0	1.000	671200	15.6	12708
4 Perfluoroheptanoic acid	363.0 > 319.0	19.439	19.437	0.002	1.000	422942	4.96	8716
* 5 13C2-PFOA	415.0 > 370.0	20.094	20.096	-0.002		721212	10.0	19834
6 Perfluorooctanoic acid	413.0 > 369.0	20.094	20.096	-0.002	1.000	675822	8.76	554
7 Perfluorooctane sulfonic acid	499.0 > 80.0	20.465	20.468	-0.003	1.000	1016551	20.1	8469
* 8 13C4 PFOS	503.0 > 80.0	20.726	20.730	-0.004		1331746	28.7	36078
9 Perfluorononanoic acid	463.0 > 419.0	20.809	20.803	0.006	1.000	904369	10.2	14125
\$ 10 13C2 PFDA	515.0 > 470.0	21.542	21.541	0.001	1.000	754518	9.65	25470

Reagents:

LC537-L3\_00019 Amount Added: 1.00 Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_005.d

Injection Date: 24-Jan-2017 17:03:19

Instrument ID: A6

Lims ID: STD L3

Client ID:

Operator ID: CBW

ALS Bottle#: 3

Worklist Smp#: 5

Injection Vol: 10.0 ul

Dil. Factor: 1.0000

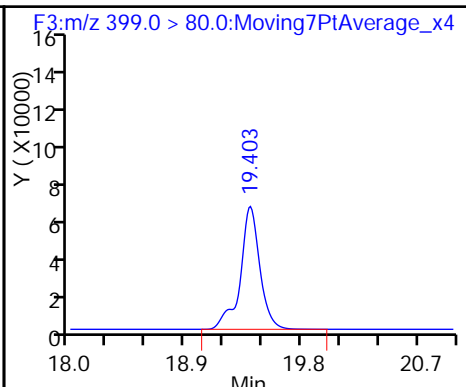
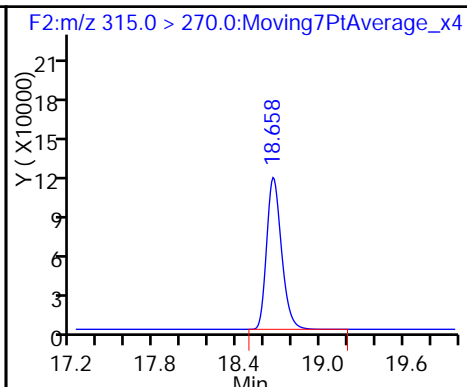
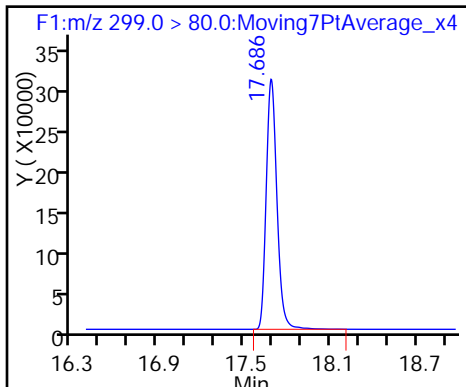
Method: 537\_A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

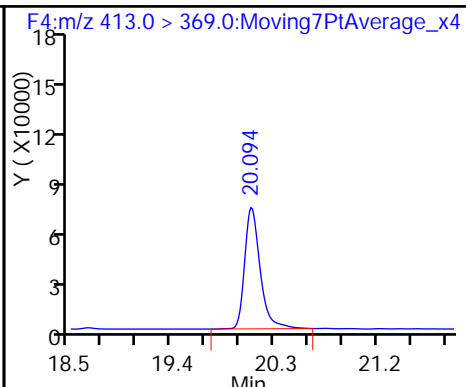
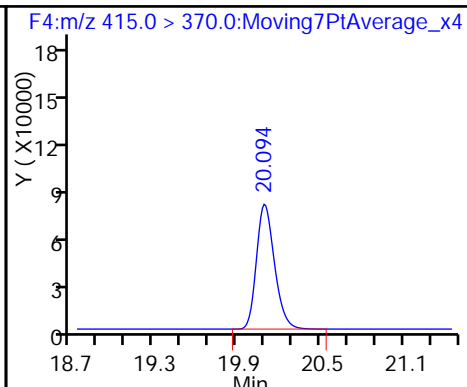
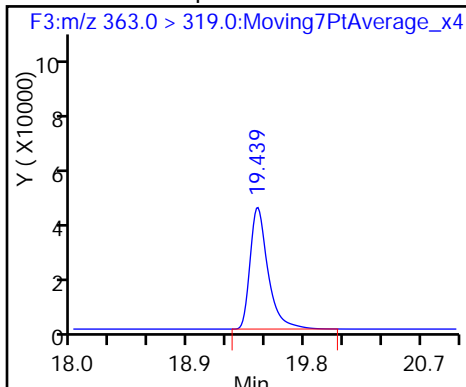
3 Perfluorohexanesulfonic acid



4 Perfluoroheptanoic acid

\* 5 13C2-PFOA

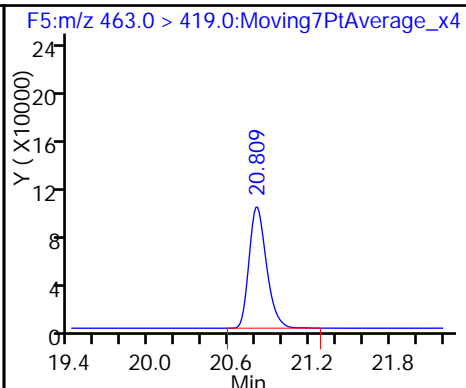
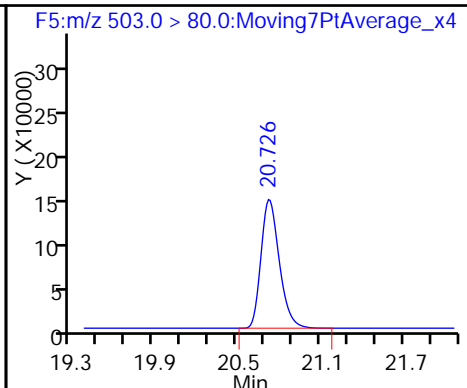
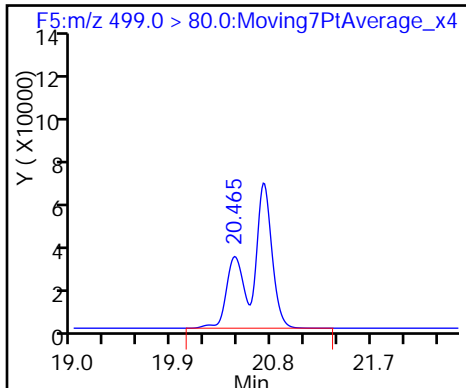
6 Perfluorooctanoic acid



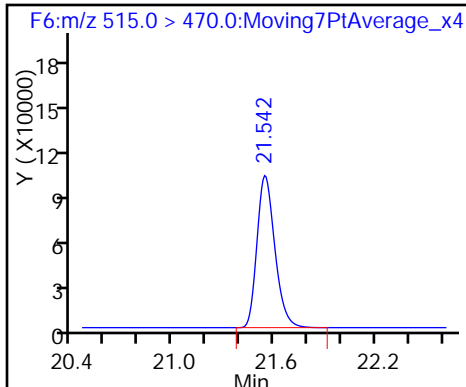
7 Perfluorooctane sulfonic acid

\* 8 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_006.d  
 Lims ID: STD L4  
 Client ID:  
 Sample Type: ICISAV Calib Level: 4  
 Inject. Date: 24-Jan-2017 17:32:54 ALS Bottle#: 4 Worklist Smp#: 6  
 Injection Vol: 10.0 ul Dil. Factor: 1.0000  
 Sample Info: STD L4 L4  
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35\*C  
 Operator ID: CBW Instrument ID: A6  
 Sublist: chrom-537\_\_A6\*sub3

Method: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\537\_\_A6.m  
 Limit Group: LC 537 ICAL  
 Last Update: 25-Jan-2017 10:24:34 Calib Date: 24-Jan-2017 18:32:06  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_008.d

Column 1 : Acquity BEH C18 ( 2.10 mm) Det: F1:MRM  
 Process Host: XAWRK015

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid	299.0 > 80.0	17.679	17.685	-0.006	1.000	2616556	90.5	1742
\$ 2 13C2 PFHxA	315.0 > 270.0	18.658	18.658	0.0	1.000	837038	10.9	28026
3 Perfluorohexanesulfonic acid	399.0 > 80.0	19.403	19.403	0.0	1.000	1177606	31.9	27855
4 Perfluoroheptanoic acid	363.0 > 319.0	19.439	19.437	0.002	1.000	741749	10.4	15638
6 Perfluorooctanoic acid	413.0 > 369.0	20.094	20.096	-0.002	1.000	1373612	21.2	1064
* 5 13C2-PFOA	415.0 > 370.0	20.094	20.096	-0.002		604498	10.0	16375
7 Perfluorooctane sulfonic acid	499.0 > 80.0	20.466	20.468	-0.002	1.000	1872091	43.3	15402
* 8 13C4 PFOS	503.0 > 80.0	20.738	20.730	0.008		1140325	28.7	20547
9 Perfluorononanoic acid	463.0 > 419.0	20.809	20.803	0.006	1.000	1676501	22.5	10761
\$ 10 13C2 PFDA	515.0 > 470.0	21.542	21.541	0.001	1.000	687782	10.5	23064

Reagents:

LC537-L4\_00017 Amount Added: 1.00 Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_006.d

Injection Date: 24-Jan-2017 17:32:54

Instrument ID: A6

Lims ID: STD L4

Client ID:

Operator ID: CBW

ALS Bottle#: 4

Worklist Smp#: 6

Injection Vol: 10.0 ul

Dil. Factor: 1.0000

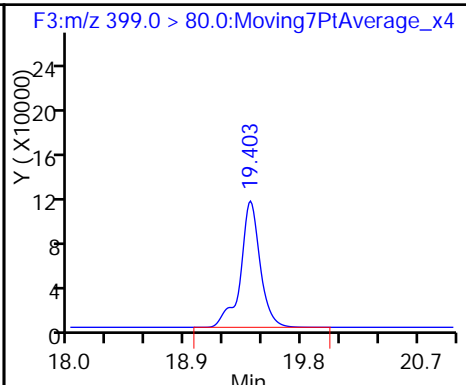
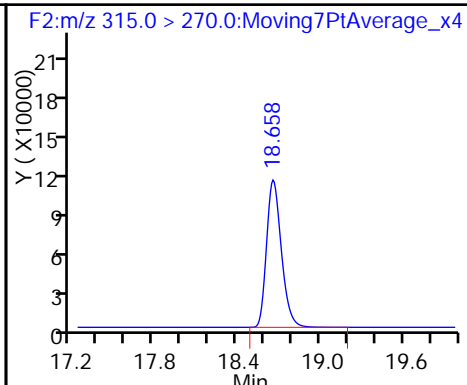
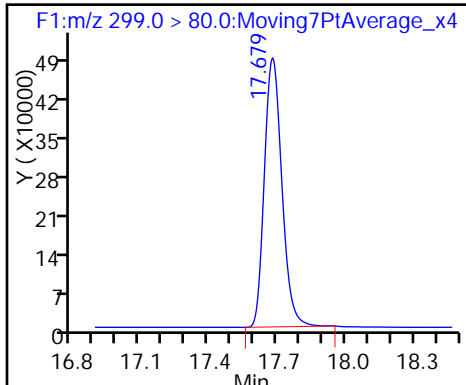
Method: 537\_A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

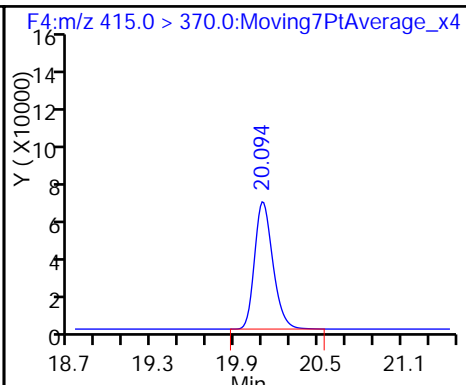
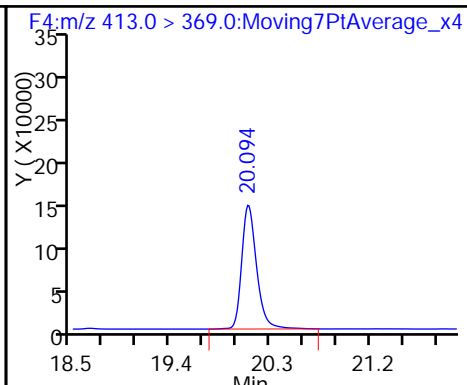
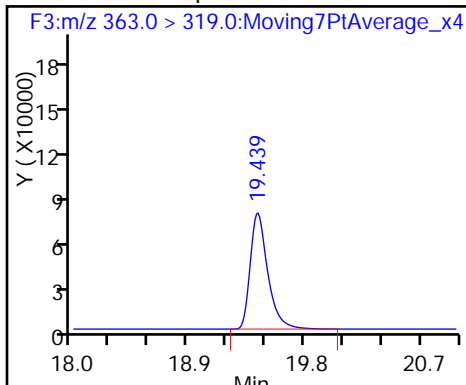
3 Perfluorohexanesulfonic acid



4 Perfluoroheptanoic acid

6 Perfluorooctanoic acid

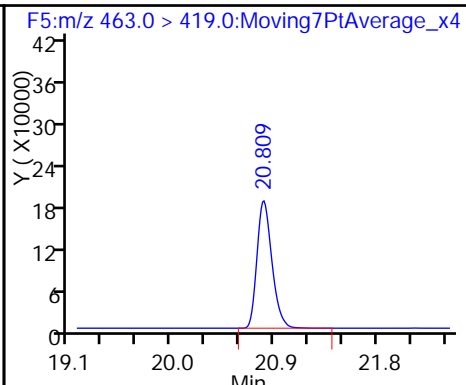
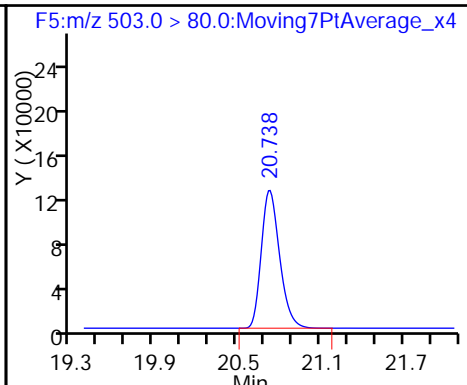
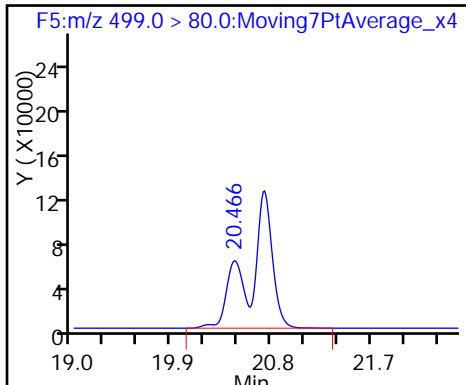
\* 5 13C2-PFOA



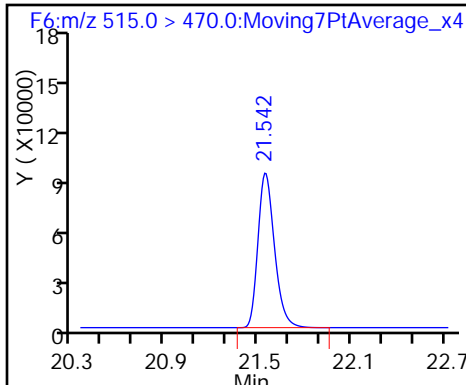
7 Perfluorooctane sulfonic acid

\* 8 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_007.d  
 Lims ID: STD L5  
 Client ID:  
 Sample Type: IC Calib Level: 5  
 Inject. Date: 24-Jan-2017 18:02:30 ALS Bottle#: 5 Worklist Smp#: 7  
 Injection Vol: 10.0 ul Dil. Factor: 1.0000  
 Sample Info: STD L5 L5  
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35\*C  
 Operator ID: CBW Instrument ID: A6  
 Sublist: chrom-537\_\_A6\*sub3  
 Method: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\537\_\_A6.m  
 Limit Group: LC 537 ICAL  
 Last Update: 25-Jan-2017 10:24:35 Calib Date: 24-Jan-2017 18:32:06  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_008.d  
 Column 1 : Acquity BEH C18 ( 2.10 mm) Det: F1:MRM  
 Process Host: XAWRK015

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid	299.0 > 80.0	17.679	17.685	-0.006	1.000	3682649	122.7	33770
\$ 2 13C2 PFHxA	315.0 > 270.0	18.658	18.658	0.0	1.000	848632	10.2	28266
3 Perfluorohexanesulfonic acid	399.0 > 80.0	19.403	19.403	0.0	1.000	1693136	44.2	39384
4 Perfluoroheptanoic acid	363.0 > 319.0	19.439	19.437	0.002	1.000	1028185	13.3	15459
* 5 13C2-PFOA	415.0 > 370.0	20.094	20.096	-0.002		651996	10.0	17896
6 Perfluorooctanoic acid	413.0 > 369.0	20.094	20.096	-0.002	1.000	1880740	27.0	2528
7 Perfluorooctane sulfonic acid	499.0 > 80.0	20.466	20.468	-0.002	1.000	2707686	60.3	23903
* 8 13C4 PFOS	503.0 > 80.0	20.726	20.730	-0.004		1184136	28.7	31885
9 Perfluorononanoic acid	463.0 > 419.0	20.797	20.803	-0.006	1.000	2126918	26.4	25583
\$ 10 13C2 PFDA	515.0 > 470.0	21.533	21.541	-0.008	1.000	739638	10.5	33062

Reagents:

LC537-L5\_00020 Amount Added: 1.00 Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_007.d

Injection Date: 24-Jan-2017 18:02:30

Instrument ID: A6

Lims ID: STD L5

Client ID:

Operator ID: CBW

ALS Bottle#: 5

Worklist Smp#: 7

Injection Vol: 10.0 ul

Dil. Factor: 1.0000

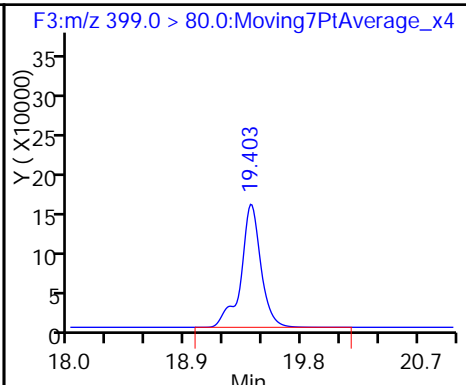
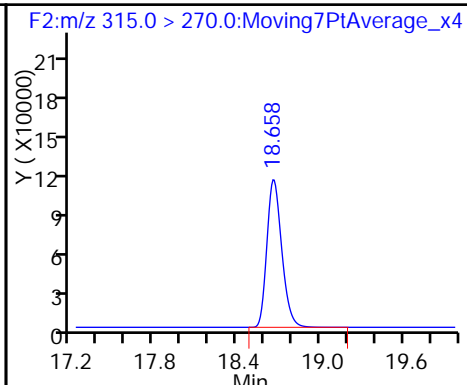
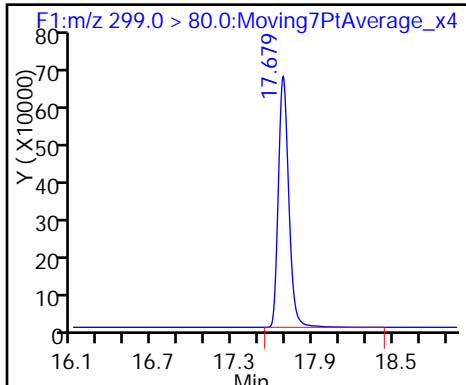
Method: 537\_A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

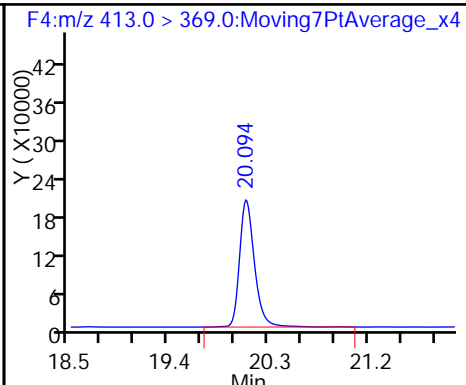
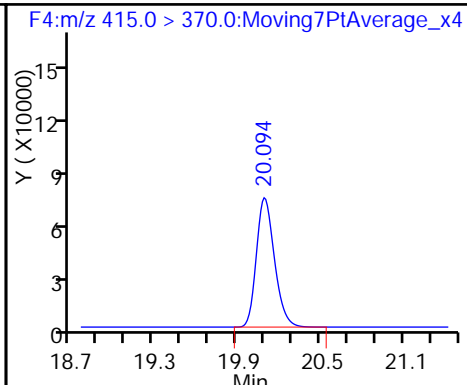
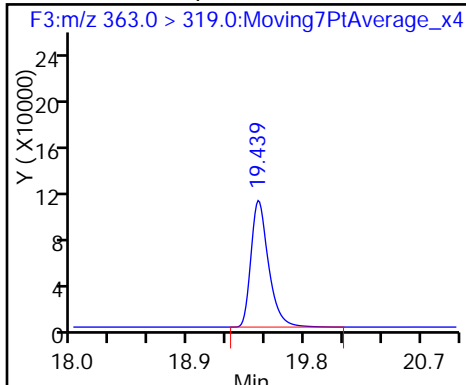
3 Perfluorohexanesulfonic acid



4 Perfluoroheptanoic acid

\* 5 13C2-PFOA

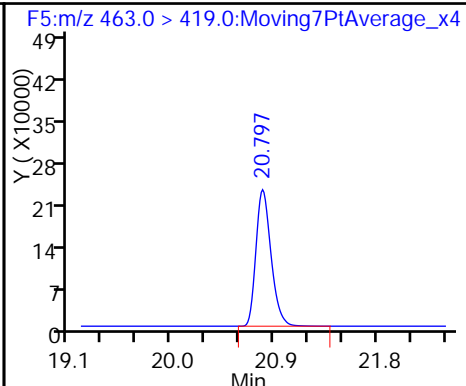
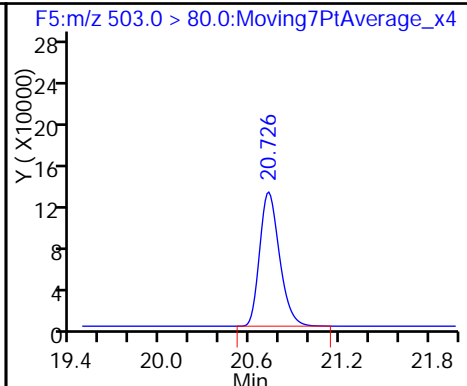
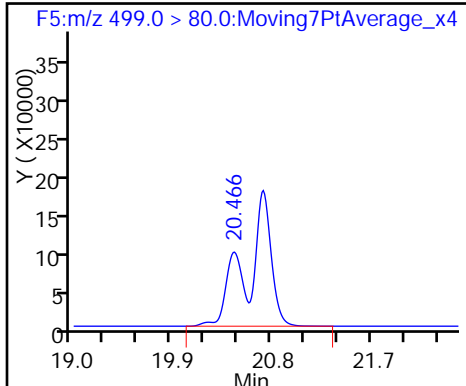
6 Perfluorooctanoic acid



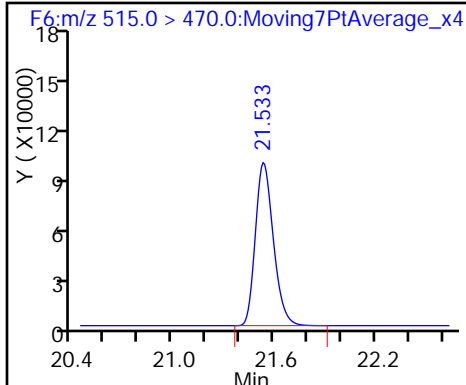
7 Perfluorooctane sulfonic acid

\* 8 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_008.d  
 Lims ID: STD L6  
 Client ID:  
 Sample Type: IC Calib Level: 6  
 Inject. Date: 24-Jan-2017 18:32:06 ALS Bottle#: 6 Worklist Smp#: 8  
 Injection Vol: 10.0 ul Dil. Factor: 1.0000  
 Sample Info: STD L6 L6  
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35\*C  
 Operator ID: CBW Instrument ID: A6  
 Sublist: chrom-537\_\_A6\*sub3  
 Method: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\537\_\_A6.m  
 Limit Group: LC 537 ICAL  
 Last Update: 25-Jan-2017 10:24:36 Calib Date: 24-Jan-2017 18:32:06  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_008.d  
 Column 1 : Acquity BEH C18 ( 2.10 mm) Det: F1:MRM  
 Process Host: XAWRK015

First Level Reviewer: barnettj Date: 25-Jan-2017 10:22:02

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid	299.0 > 80.0	17.676	17.685	-0.009	1.000	4661120	170.2	22002
\$ 2 13C2 PFHxA	315.0 > 270.0	18.658	18.658	0.0	1.000	826398	10.4	27617
3 Perfluorohexanesulfonic acid	399.0 > 80.0	19.415	19.403	0.012	1.000	2209984	63.2	25355
4 Perfluoroheptanoic acid	363.0 > 319.0	19.451	19.437	0.014	1.000	1336981	18.1	27944
6 Perfluorooctanoic acid	413.0 > 369.0	20.106	20.096	0.010	1.000	2684196	40.2	1997
* 5 13C2-PFOA	415.0 > 370.0	20.106	20.096	0.010		623954	10.0	17050
7 Perfluorooctane sulfonic acid	499.0 > 80.0	20.477	20.468	0.009	1.000	3546373	86.6	15457
* 8 13C4 PFOS	503.0 > 80.0	20.738	20.730	0.008		1080434	28.7	29097
9 Perfluorononanoic acid	463.0 > 419.0	20.809	20.803	0.006	1.000	3079855	40.0	25508
\$ 10 13C2 PFDA	515.0 > 470.0	21.542	21.541	0.001	1.000	705744	10.4	23928

Reagents:

LC537-L6\_00016 Amount Added: 1.00 Units: mL



TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_008.d

Injection Date: 24-Jan-2017 18:32:06

Instrument ID: A6

Lims ID: STD L6

Client ID:

Operator ID: CBW

ALS Bottle#: 6

Worklist Smp#: 8

Injection Vol: 10.0 ul

Dil. Factor: 1.0000

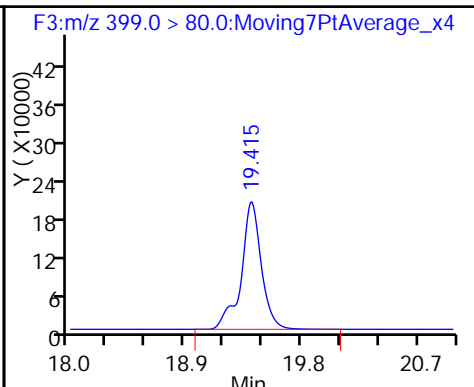
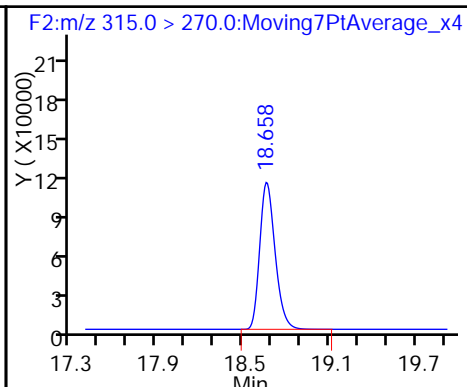
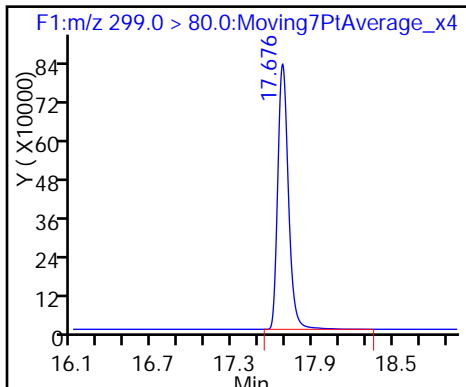
Method: 537\_A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

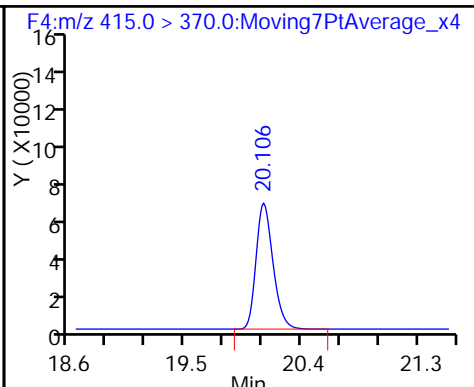
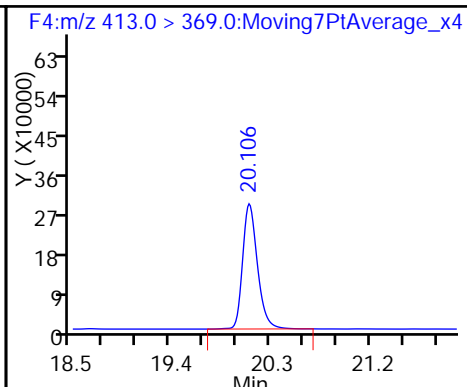
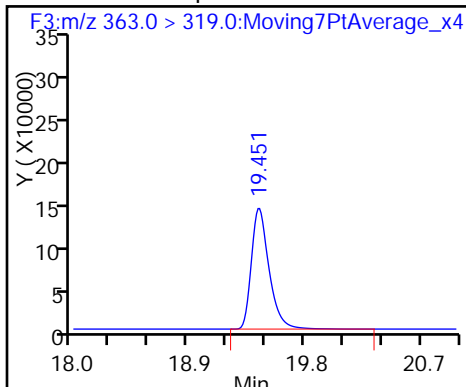
3 Perfluorohexanesulfonic acid



4 Perfluoroheptanoic acid

6 Perfluorooctanoic acid

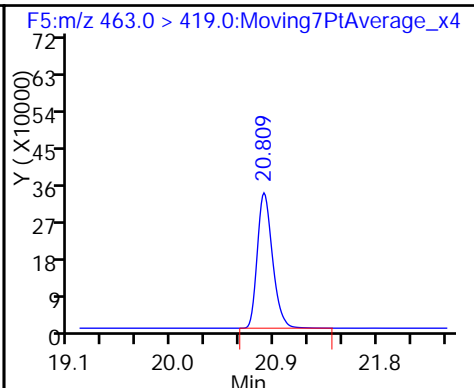
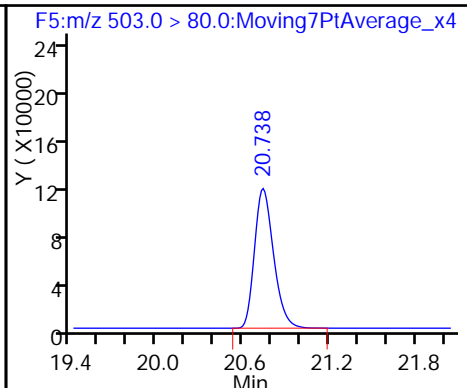
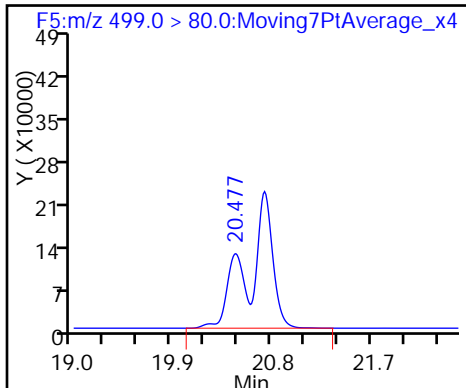
\* 5 13C2-PFOA



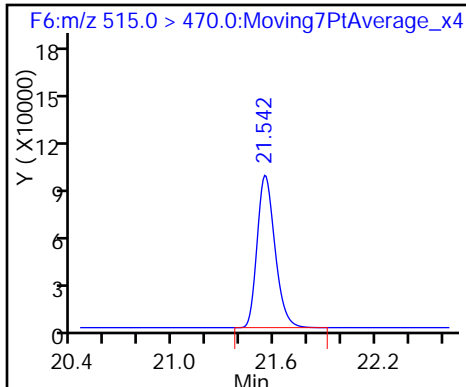
7 Perfluorooctane sulfonic acid

\* 8 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-25119-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-147661/10 Calibration Date: 01/24/2017 19:31  
 Instrument ID: A6 Calib Start Date: 01/24/2017 16:04  
 GC Column: Acquity ID: 2.10 (mm) Calib End Date: 01/24/2017 18:32  
 Lab File ID: 24JAN2017A6A\_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.7270	0.7782		24.5	22.9	7.1	50.0
Perfluorohexanesulfonic acid	Ave	0.9278	0.9185		7.64	7.72	-1.0	50.0
Perfluoroheptanoic acid	Ave	1.182	1.187		2.54	2.52	0.5	50.0
Perfluorooctanoic acid (PFOA)	Ave	1.070	1.096		5.10	4.98	2.5	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.087	1.062		9.97	10.2	-2.4	50.0
Perfluorononanoic acid	Ave	1.234	1.285		5.51	5.29	4.2	50.0
13C2 PFHxA	Ave	1.271	1.203		9.47	10.0	-5.3	30.0
13C2 PFDA	Ave	1.084	1.044		9.63	10.0	-3.7	30.0

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_010.d  
 Lims ID: CCV L2  
 Client ID:  
 Sample Type: CCVL  
 Inject. Date: 24-Jan-2017 19:31:17 ALS Bottle#: 2 Worklist Smp#: 10  
 Injection Vol: 10.0 ul Dil. Factor: 1.0000  
 Sample Info: CCV L2 CCV L2  
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35\*C  
 Operator ID: CBW Instrument ID: A6  
 Sublist: chrom-537\_\_A6\*sub3  
 Method: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\537\_\_A6.m  
 Limit Group: LC 537 ICAL  
 Last Update: 25-Jan-2017 10:22:12 Calib Date: 24-Jan-2017 18:32:06  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_008.d  
 Column 1 : Acquity BEH C18 ( 2.10 mm) Det: F1:MRM  
 Process Host: XAWRK015

First Level Reviewer: barnettj Date: 25-Jan-2017 10:08:05

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid	299.0 > 80.0	17.666	17.685	-0.019	1.000	803696	24.5	952
\$ 2 13C2 PFHxA	315.0 > 270.0	18.649	18.658	-0.009	1.000	825193	9.47	15677
3 Perfluorohexanesulfonic acid	399.0 > 80.0	19.415	19.403	0.012	1.000	319747	7.64	7726
4 Perfluoroheptanoic acid	363.0 > 319.0	19.439	19.437	0.002	1.000	205628	2.54	117 M
6 Perfluorooctanoic acid	413.0 > 369.0	20.106	20.096	0.010	1.000	374382	5.10	207 M
* 5 13C2-PFOA	415.0 > 370.0	20.106	20.096	0.010		685988	10.0	18843
7 Perfluorooctane sulfonic acid	499.0 > 80.0	20.750	20.468	0.282	1.000	489360	9.97	8610
* 8 13C4 PFOS	503.0 > 80.0	20.750	20.730	0.020		1294038	28.7	35177
9 Perfluorononanoic acid	463.0 > 419.0	20.821	20.803	0.018	1.000	466253	5.51	12868
\$ 10 13C2 PFDA	515.0 > 470.0	21.551	21.541	0.010	1.000	716048	9.63	24184

### QC Flag Legend

Review Flags

M - Manually Integrated

### Reagents:

LC537-L2\_00016

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_010.d

Injection Date: 24-Jan-2017 19:31:17

Instrument ID: A6

Lims ID: CCV L2

Client ID:

Operator ID: CBW

ALS Bottle#: 2

Worklist Smp#: 10

Injection Vol: 10.0 ul

Dil. Factor: 1.0000

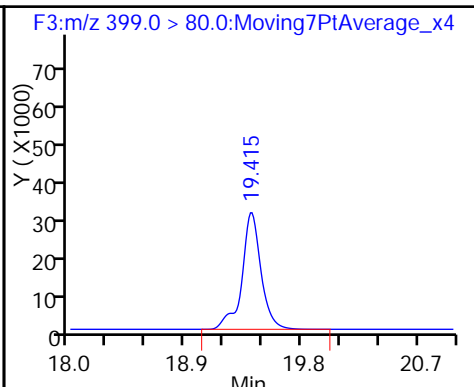
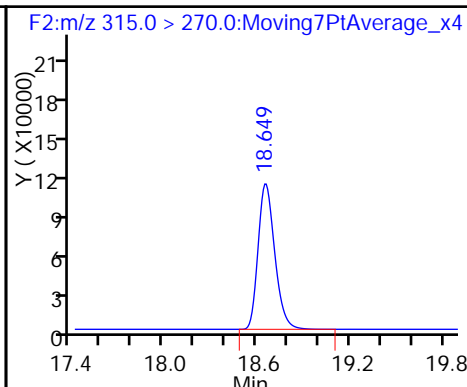
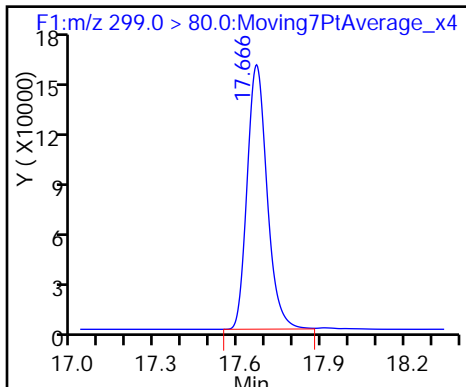
Method: 537\_A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

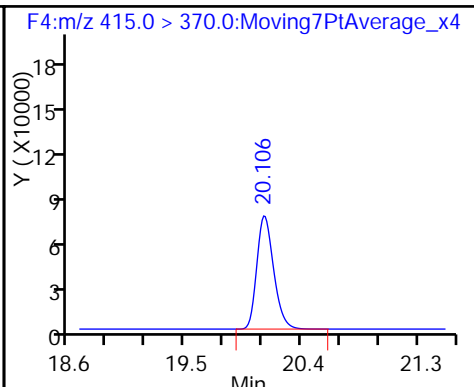
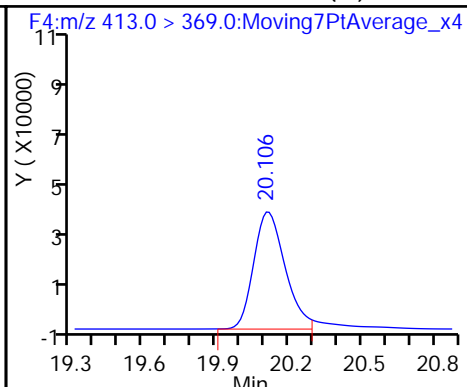
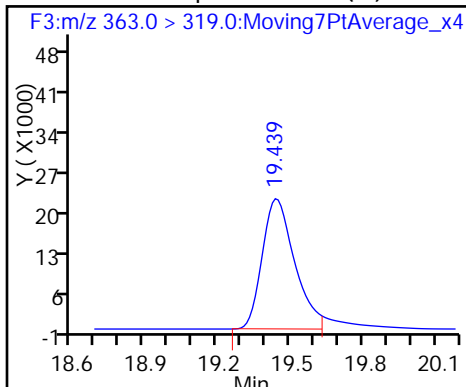
3 Perfluorohexanesulfonic acid



4 Perfluoroheptanoic acid (M)

6 Perfluorooctanoic acid (M)

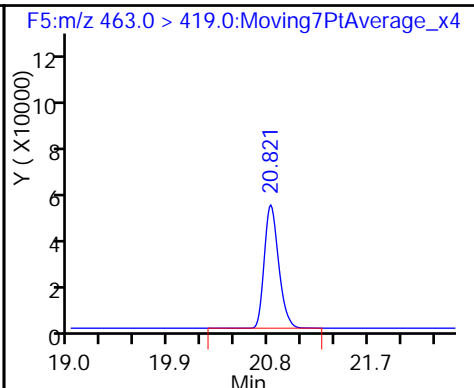
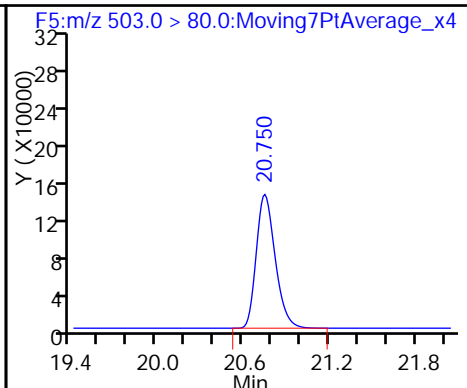
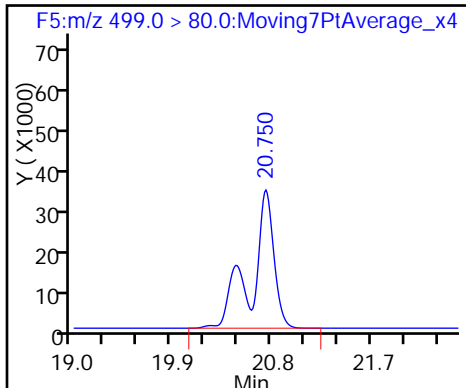
\* 5 13C2-PFOA



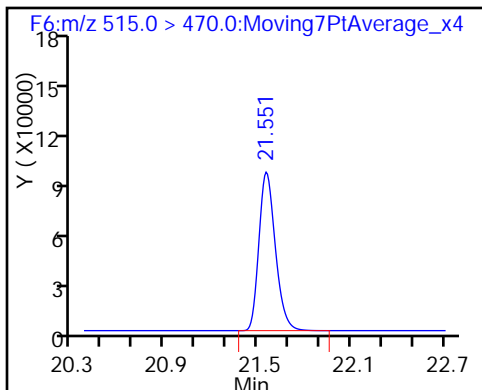
7 Perfluorooctane sulfonic acid

\* 8 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

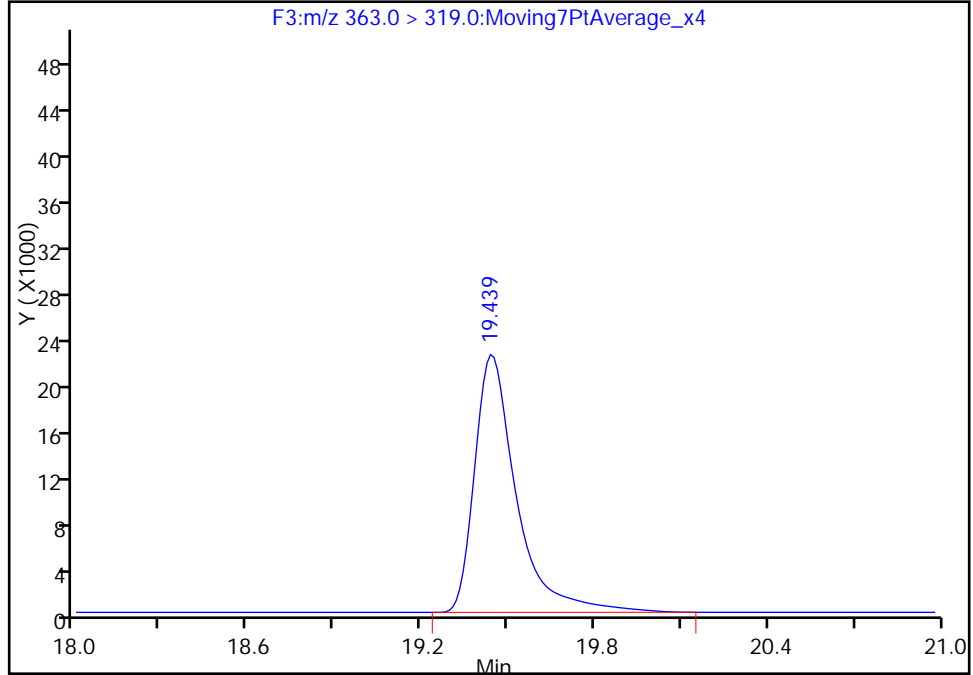
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Injection Date: 24-Jan-2017 19:31:17 Instrument ID: A6  
Lims ID: CCV L2  
Client ID:  
Operator ID: CBW ALS Bottle#: 2 Worklist Smp#: 10  
Injection Vol: 10.0 ul Dil. Factor: 1.0000  
Method: 537\_\_A6 Limit Group: LC 537 ICAL  
Column: Acquity BEH C18 ( 2.10 mm) Detector F3:M/RM

4 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

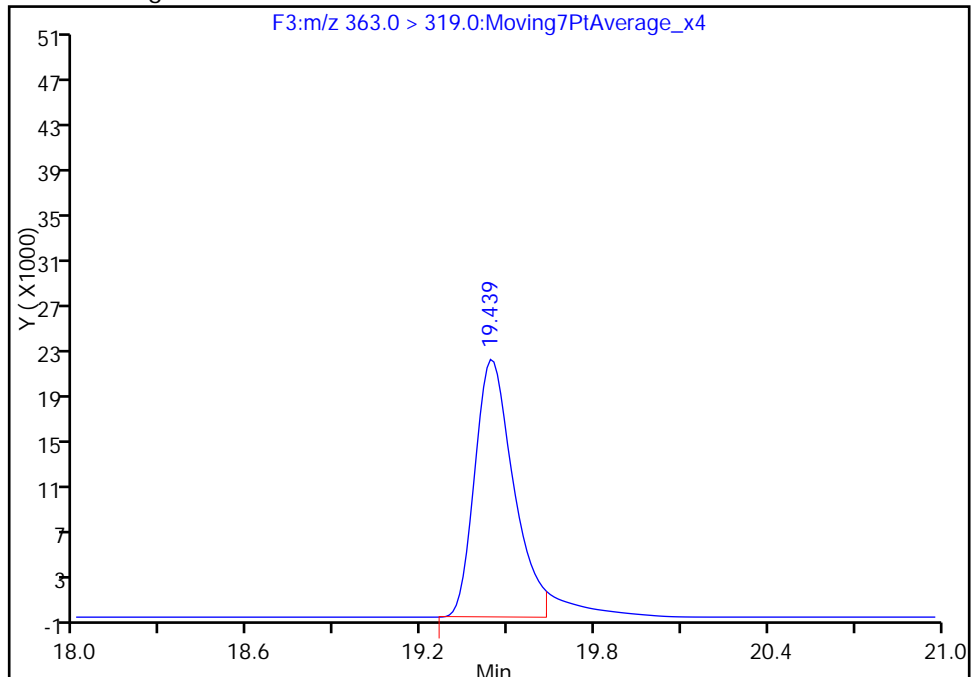
RT: 19.44  
Area: 223578  
Amount: 2.758370  
Amount Units: ng/ml

Processing Integration Results



RT: 19.44  
Area: 205628  
Amount: 2.536914  
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 25-Jan-2017 10:08:05  
Audit Action: Manually Integrated

Audit Reason: Split Peak

TestAmerica Sacramento

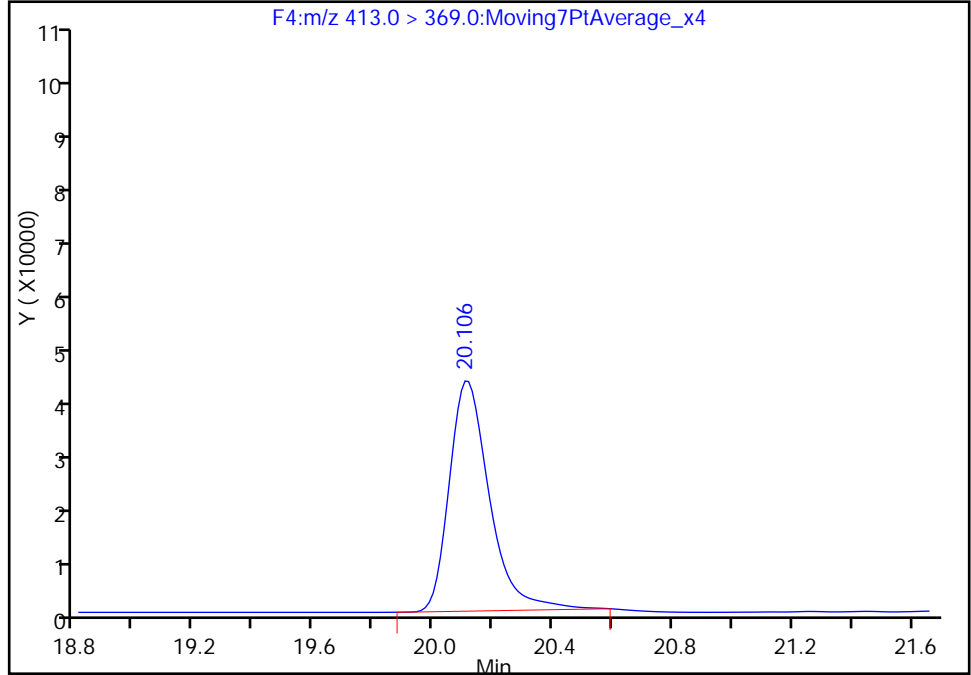
Data File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_010.d  
Injection Date: 24-Jan-2017 19:31:17 Instrument ID: A6  
Lims ID: CCV L2  
Client ID:  
Operator ID: CBW ALS Bottle#: 2 Worklist Smp#: 10  
Injection Vol: 10.0 ul Dil. Factor: 1.0000  
Method: 537\_\_A6 Limit Group: LC 537 ICAL  
Column: Acquity BEH C18 ( 2.10 mm) Detector F4:MRM

6 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

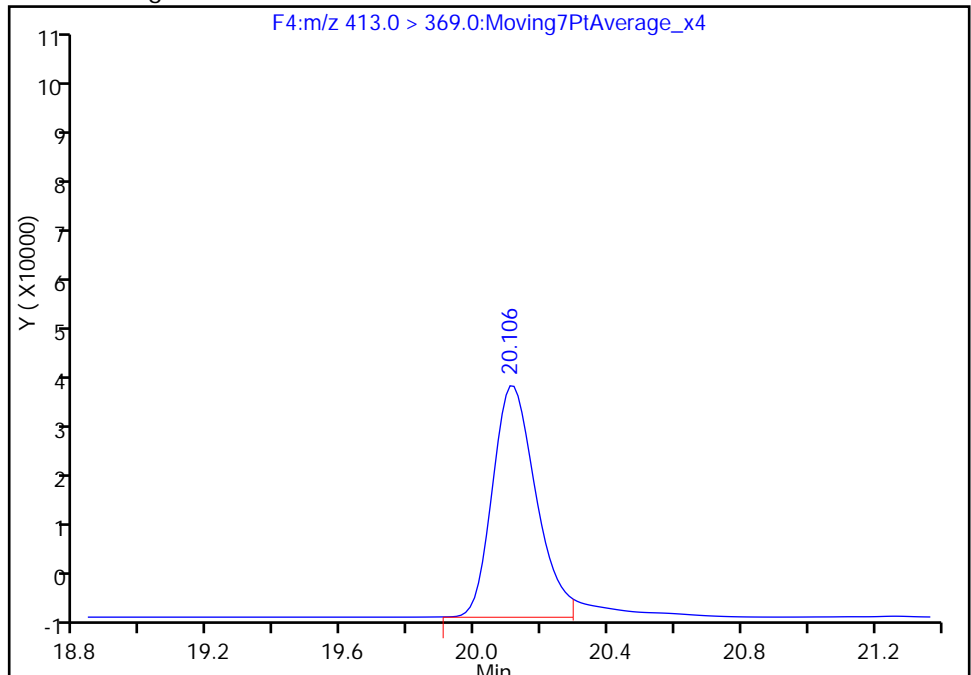
RT: 20.11  
Area: 385048  
Amount: 5.246419  
Amount Units: ng/ml

Processing Integration Results



RT: 20.11  
Area: 374382  
Amount: 5.101091  
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 25-Jan-2017 10:08:05  
Audit Action: Manually Integrated

Audit Reason: Split Peak

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-25119-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: ICV 320-147661/12 Calibration Date: 01/24/2017 20:30  
 Instrument ID: A6 Calib Start Date: 01/24/2017 16:04  
 GC Column: Acquity ID: 2.10 (mm) Calib End Date: 01/24/2017 18:32  
 Lab File ID: 24JAN2017A6A\_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.7270	0.5866		92.6	115	-19.3	30.0
Perfluorohexanesulfonic acid	Ave	0.9278	0.7684		21.9	26.5	-17.2	30.0
Perfluoroheptanoic acid	Ave	1.182	1.133		12.1	12.6	-4.1	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.070	0.8954		20.9	25.0	-16.3	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.087	0.8813		22.1	27.2	-19.0	30.0
Perfluorononanoic acid	Ave	1.234	1.039		21.1	25.0	-15.8	30.0
13C2 PFHxA	Ave	1.271	1.458		11.5	10.0	14.7	30.0
13C2 PFDA	Ave	1.084	1.110		10.2	10.0	2.4	30.0



TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_012.d  
 Lims ID: ICV  
 Client ID:  
 Sample Type: ICV  
 Inject. Date: 24-Jan-2017 20:30:30 ALS Bottle#: 7 Worklist Smp#: 12  
 Injection Vol: 10.0 ul Dil. Factor: 1.0000  
 Sample Info: ICV ICV  
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35\*C  
 Operator ID: CBW Instrument ID: A6  
 Sublist:

Method: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\537\_\_A6.m  
 Limit Group: LC 537 ICAL  
 Last Update: 25-Jan-2017 10:22:15 Calib Date: 24-Jan-2017 18:32:06  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_008.d

Column 1 : Acquity BEH C18 ( 2.10 mm) Det: F1:MRM  
 Process Host: XAWRK015

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid	299.0 > 80.0	17.657	17.685	-0.028	1.000	2673771	92.6	2930
\$ 2 13C2 PFHxA	315.0 > 270.0	18.658	18.658	0.0	1.000	880359	11.5	29110
3 Perfluorohexanesulfonic acid	399.0 > 80.0	19.415	19.403	0.012	1.000	808128	21.9	19175
4 Perfluoroheptanoic acid	363.0 > 319.0	19.451	19.437	0.014	1.000	862609	12.1	17968
6 Perfluorooctanoic acid	413.0 > 369.0	20.106	20.096	0.010	1.000	1353374	20.9	1260
* 5 13C2-PFOA	415.0 > 370.0	20.106	20.096	0.010		604008	10.0	16643
7 Perfluorooctane sulfonic acid	499.0 > 80.0	20.477	20.468	0.009	1.000	953425	22.1	8036
* 8 13C4 PFOS	503.0 > 80.0	20.738	20.730	0.008		1139050	28.7	30933
9 Perfluorononanoic acid	463.0 > 419.0	20.809	20.803	0.006	1.000	1569480	21.1	21356
\$ 10 13C2 PFDA	515.0 > 470.0	21.542	21.541	0.001	1.000	670720	10.2	22653

Reagents:

LC537-ICV\_00019 Amount Added: 1.00 Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_012.d

Injection Date: 24-Jan-2017 20:30:30

Instrument ID: A6

Lims ID: ICV

Client ID:

Operator ID: CBW

ALS Bottle#: 7

Worklist Smp#: 12

Injection Vol: 10.0 ul

Dil. Factor: 1.0000

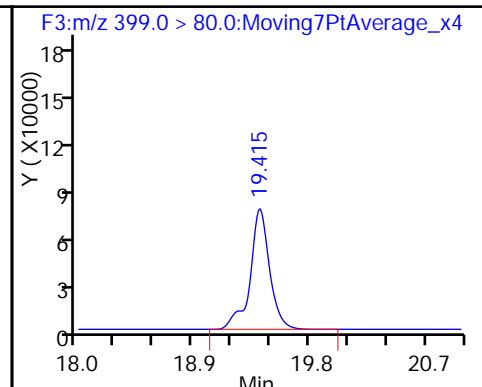
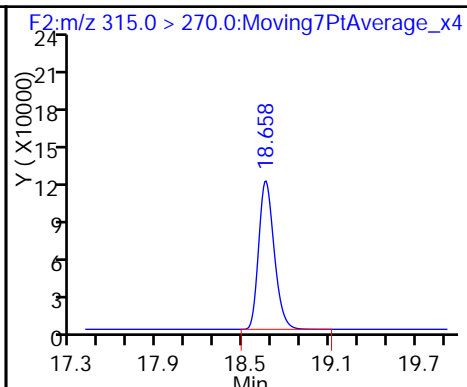
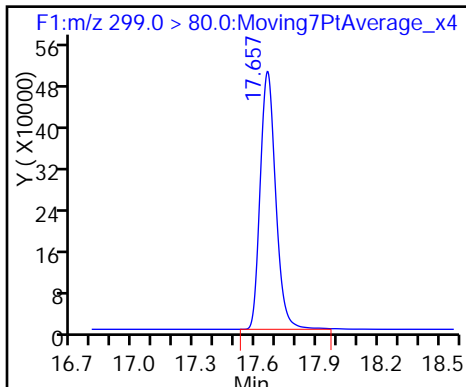
Method: 537\_A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

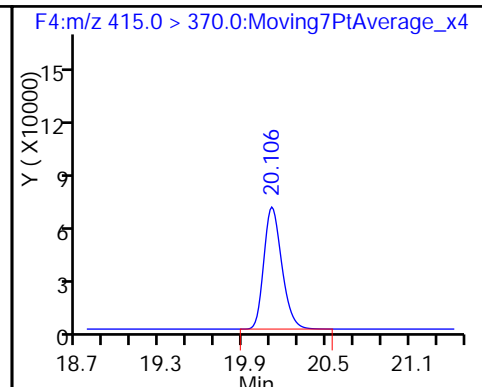
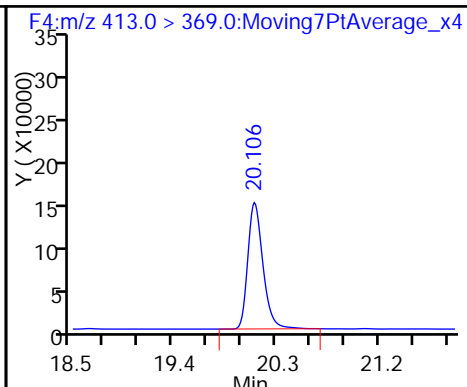
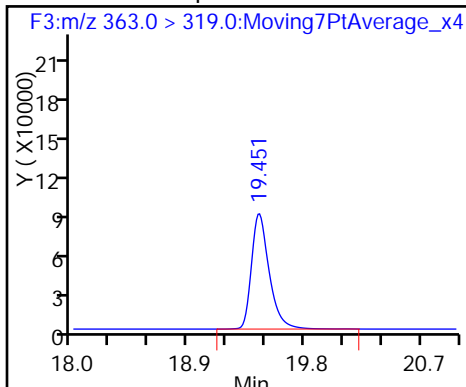
3 Perfluorohexanesulfonic acid



4 Perfluoroheptanoic acid

6 Perfluorooctanoic acid

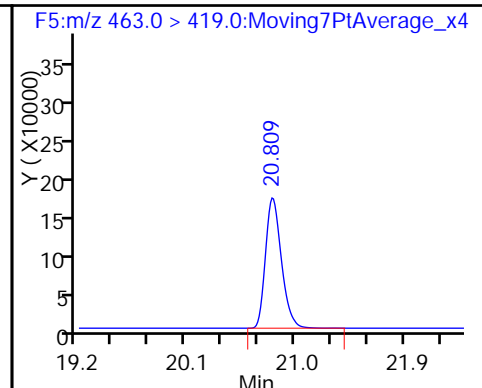
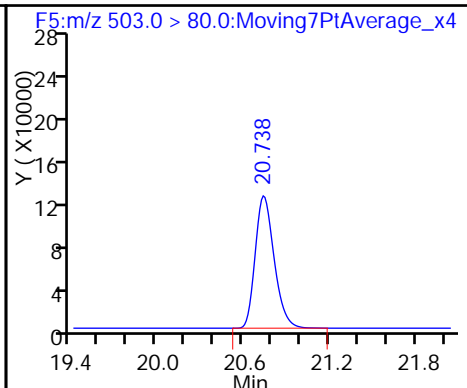
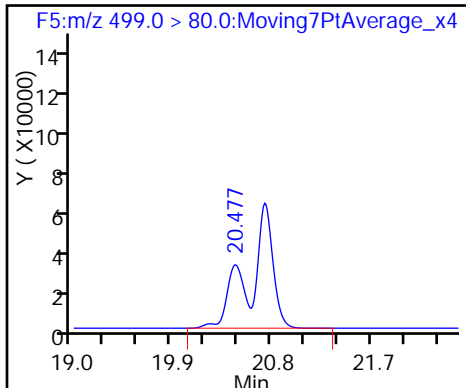
\* 5 13C2-PFOA



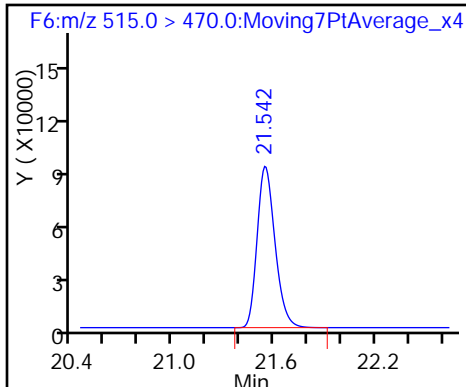
7 Perfluorooctane sulfonic acid

\* 8 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-25119-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-147664/36 Calibration Date: 01/25/2017 08:20  
 Instrument ID: A6 Calib Start Date: 01/24/2017 16:04  
 GC Column: Acquity ID: 2.10 (mm) Calib End Date: 01/24/2017 18:32  
 Lab File ID: 24JAN2017A6A\_036.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.7270	0.6676		124	135	-8.2	30.0
Perfluorohexanesulfonic acid	Ave	0.9278	0.9169		44.9	45.4	-1.2	30.0
Perfluoroheptanoic acid	Ave	1.182	1.059		13.3	14.9	-10.4	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.070	0.9720		26.6	29.3	-9.1	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.087	1.131		62.5	60.1	4.0	30.0
Perfluorononanoic acid	Ave	1.234	1.083		27.3	31.1	-12.2	30.0
13C2 PFHxA	Ave	1.271	1.283		10.1	10.0	1.0	30.0
13C2 PFDA	Ave	1.084	1.101		10.2	10.0	1.5	30.0

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_036.d  
 Lims ID: CCV L5  
 Client ID:  
 Sample Type: CCVIS  
 Inject. Date: 25-Jan-2017 08:20:42 ALS Bottle#: 5 Worklist Smp#: 36  
 Injection Vol: 10.0 ul Dil. Factor: 1.0000  
 Sample Info: CCV L5  
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35\*C  
 Operator ID: CBW Instrument ID: A6  
 Sublist: chrom-537\_\_A6\*sub3  
 Method: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\537\_\_A6.m  
 Limit Group: LC 537 ICAL  
 Last Update: 25-Jan-2017 13:32:27 Calib Date: 24-Jan-2017 18:32:06  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_008.d  
 Column 1 : Acquity BEH C18 ( 2.10 mm) Det: F1:MRM  
 Process Host: XAWRK015

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid	299.0 > 80.0	17.666	17.685	-0.019	1.000	3403251	123.6	30015
\$ 2 13C2 PFHxA	315.0 > 270.0	18.649	18.658	-0.009	1.000	801996	10.1	26950
3 Perfluorohexanesulfonic acid	399.0 > 80.0	19.392	19.403	-0.011	1.000	1575615	44.9	24754
4 Perfluoroheptanoic acid	363.0 > 319.0	19.427	19.437	-0.010	1.000	982536	13.3	7993
* 5 13C2-PFOA	415.0 > 370.0	20.082	20.096	-0.014		625069	10.0	16949
6 Perfluorooctanoic acid	413.0 > 369.0	20.082	20.096	-0.014	1.000	1778853	26.6	1612
7 Perfluorooctane sulfonic acid	499.0 > 80.0	20.454	20.468	-0.014	1.000	2574579	62.5	22417
* 8 13C4 PFOS	503.0 > 80.0	20.714	20.730	-0.016		1085864	28.7	23330
9 Perfluorononanoic acid	463.0 > 419.0	20.785	20.803	-0.018	1.000	2105246	27.3	17647
\$ 10 13C2 PFDA	515.0 > 470.0	21.524	21.541	-0.017	1.000	688196	10.2	23560

Reagents:

LC537-L5\_00020 Amount Added: 1.00 Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_036.d

Injection Date: 25-Jan-2017 08:20:42

Instrument ID: A6

Lims ID: CCV L5

Client ID:

Operator ID: CBW

ALS Bottle#: 5

Worklist Smp#: 36

Injection Vol: 10.0 ul

Dil. Factor: 1.0000

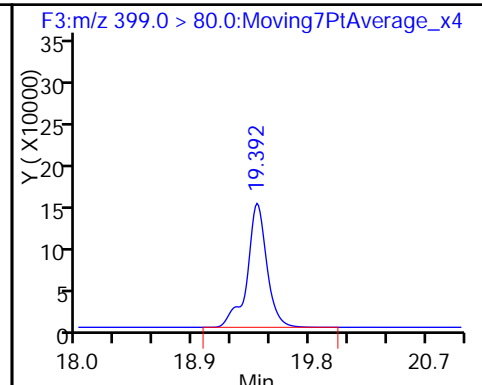
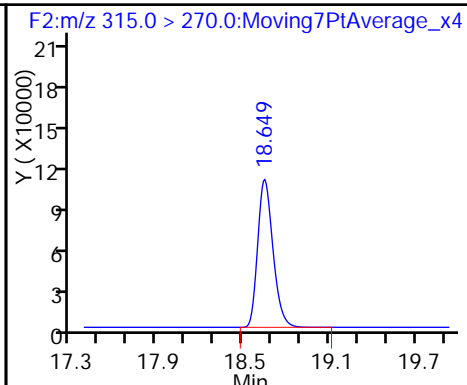
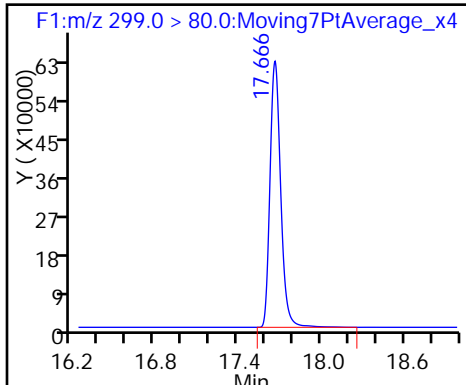
Method: 537\_A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

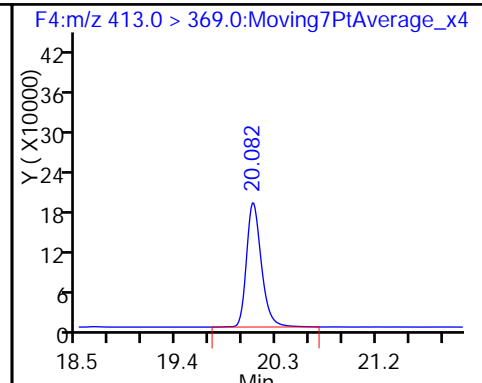
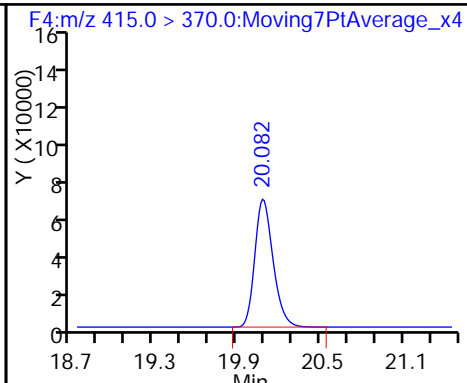
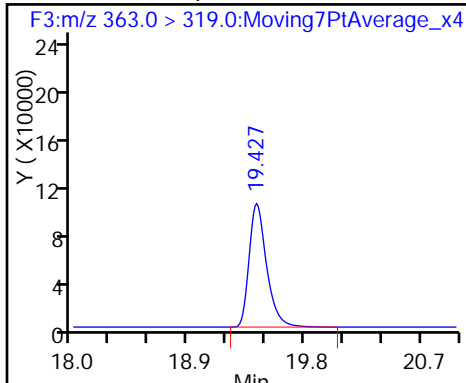
3 Perfluorohexanesulfonic acid



4 Perfluoroheptanoic acid

\* 5 13C2-PFOA

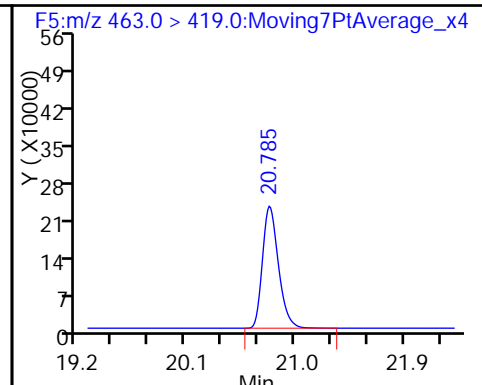
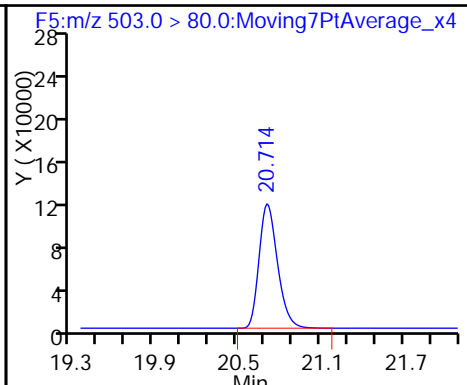
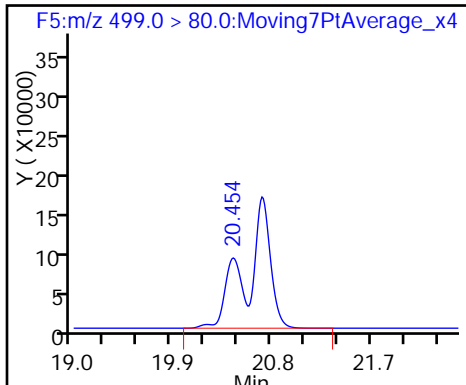
6 Perfluorooctanoic acid



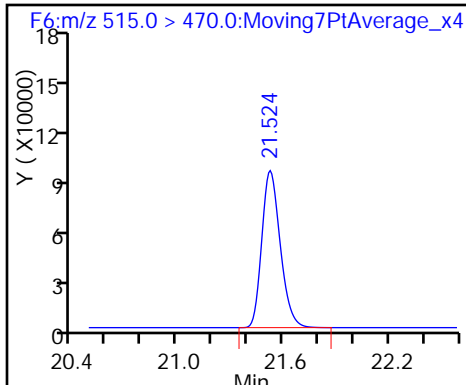
7 Perfluorooctane sulfonic acid

\* 8 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-25119-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-147664/48 Calibration Date: 01/25/2017 14:17  
 Instrument ID: A6 Calib Start Date: 01/24/2017 16:04  
 GC Column: Acquity ID: 2.10 (mm) Calib End Date: 01/24/2017 18:32  
 Lab File ID: 24JAN2017A6A\_048.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.7270	0.7377		45.8	45.1	1.5	30.0
Perfluorohexanesulfonic acid	Ave	0.9278	0.9068		14.9	15.2	-2.3	30.0
Perfluoroheptanoic acid	Ave	1.182	1.218		5.13	4.97	3.1	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.070	0.997		9.14	9.81	-6.8	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.087	1.079		20.0	20.1	-0.7	30.0
Perfluorononanoic acid	Ave	1.234	1.169		9.88	10.4	-5.2	30.0
13C2 PFHxA	Ave	1.271	1.239		9.75	10.0	-2.5	30.0
13C2 PFDA	Ave	1.084	1.053		9.71	10.0	-2.9	30.0

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_048.d  
 Lims ID: CCV L3  
 Client ID:  
 Sample Type: CCVIS  
 Inject. Date: 25-Jan-2017 14:17:11 ALS Bottle#: 3 Worklist Smp#: 48  
 Injection Vol: 10.0 ul Dil. Factor: 1.0000  
 Sample Info: CCV L3  
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35\*C  
 Operator ID: CBW Instrument ID: A6  
 Sublist: chrom-537\_\_A6\*sub3  
 Method: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\537\_\_A6.m  
 Limit Group: LC 537 ICAL  
 Last Update: 25-Jan-2017 14:48:13 Calib Date: 24-Jan-2017 18:32:06  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_008.d  
 Column 1 : Acquity BEH C18 ( 2.10 mm) Det: F1:MRM  
 Process Host: XAWRK015

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid	299.0 > 80.0	17.673	17.685	-0.012	1.000	1545129	45.8	833
\$ 2 13C2 PFHxA	315.0 > 270.0	18.640	18.658	-0.018	1.000	879395	9.75	23287
3 Perfluorohexanesulfonic acid	399.0 > 80.0	19.380	19.403	-0.023	1.000	640292	14.9	15508
4 Perfluoroheptanoic acid	363.0 > 319.0	19.415	19.437	-0.022	1.000	430094	5.13	4478
* 5 13C2-PFOA	415.0 > 370.0	20.082	20.096	-0.014		710003	10.0	15455
6 Perfluorooctanoic acid	413.0 > 369.0	20.082	20.096	-0.014	1.000	694642	9.14	650
7 Perfluorooctane sulfonic acid	499.0 > 80.0	20.454	20.468	-0.014	1.000	1009259	20.0	8225
* 8 13C4 PFOS	503.0 > 80.0	20.714	20.730	-0.016		1331891	28.7	36012
9 Perfluorononanoic acid	463.0 > 419.0	20.785	20.803	-0.018	1.000	865281	9.88	18981
\$ 10 13C2 PFDA	515.0 > 470.0	21.524	21.541	-0.017	1.000	747560	9.71	25154

Reagents:

LC537-L3\_00019 Amount Added: 1.00 Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_048.d

Injection Date: 25-Jan-2017 14:17:11

Instrument ID: A6

Lims ID: CCV L3

Client ID:

Operator ID: CBW

ALS Bottle#: 3

Worklist Smp#: 48

Injection Vol: 10.0 ul

Dil. Factor: 1.0000

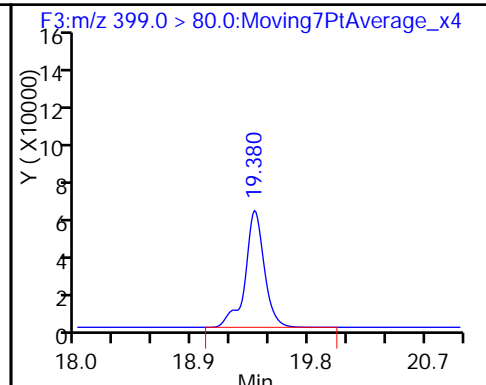
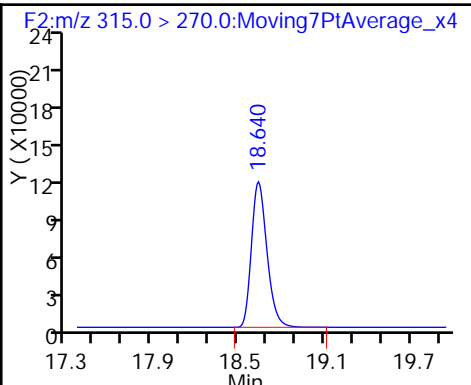
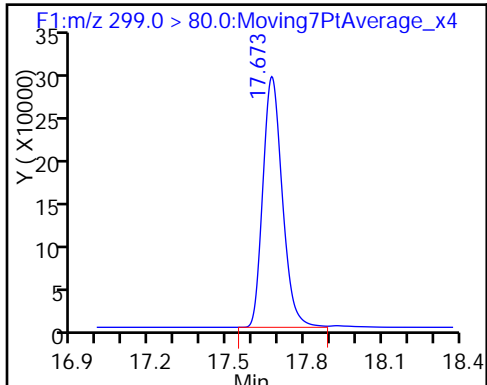
Method: 537\_A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

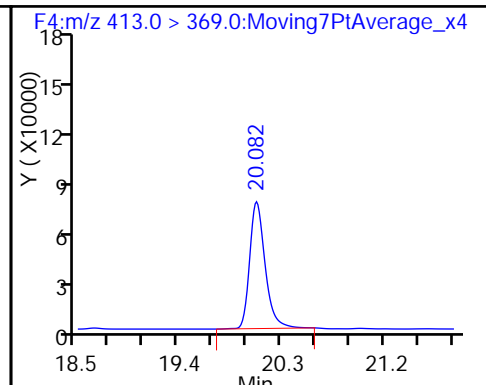
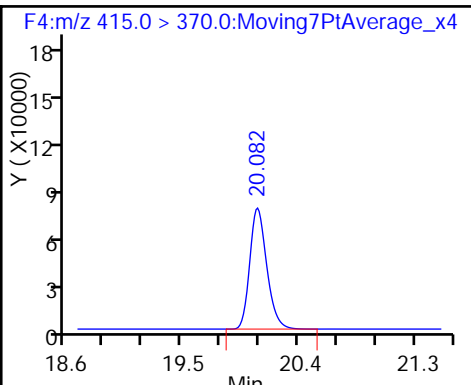
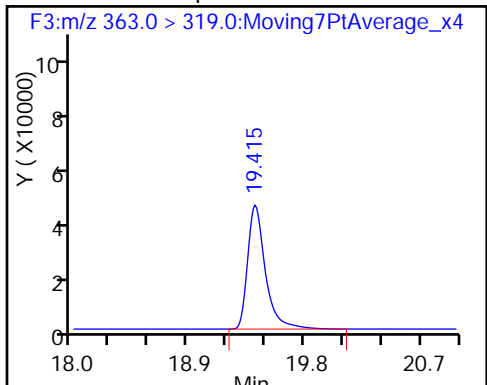
3 Perfluorohexanesulfonic acid



4 Perfluoroheptanoic acid

\* 5 13C2-PFOA

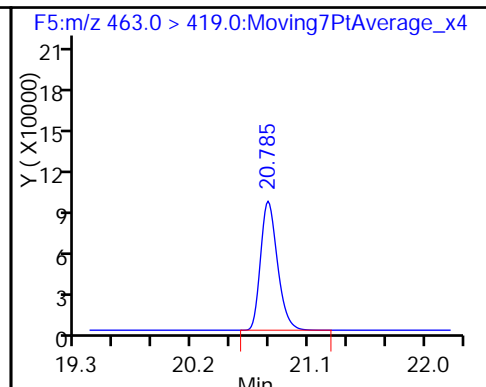
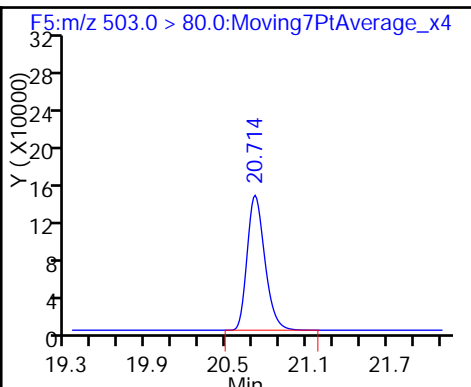
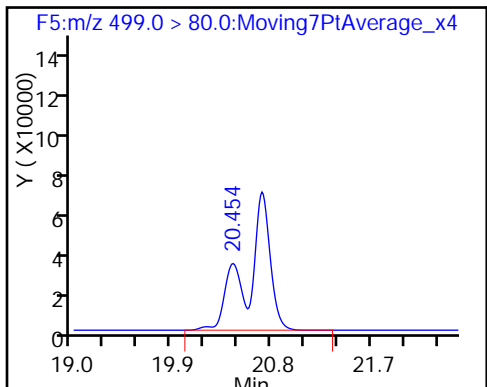
6 Perfluorooctanoic acid



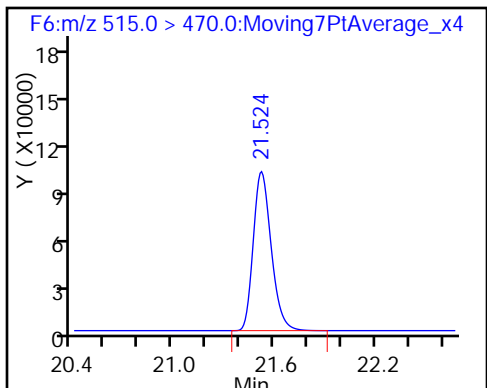
7 Perfluorooctane sulfonic acid

\* 8 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA





FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-25119-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: \_\_\_\_\_ Lab Sample ID: MB 320-147297/1-A  
 Matrix: Water Lab File ID: 24JAN2017A6A\_038.d  
 Analysis Method: 537 Date Collected: \_\_\_\_\_  
 Extraction Method: 537 Date Extracted: 01/21/2017 11:49  
 Sample wt/vol: 250 (mL) Date Analyzed: 01/25/2017 09:19  
 Con. Extract Vol.: 1 (mL) Dilution Factor: 1  
 Injection Volume: 10 (uL) GC Column: Acquity ID: 2.1 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 147664 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.048	U	0.060	0.048	0.016
335-67-1	Perfluorooctanoic acid (PFOA)	0.024	U	0.030	0.024	0.0094
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.14	0.11	0.048

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

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_038.d  
 Lims ID: MB 320-147297/1-A  
 Client ID:  
 Sample Type: MB  
 Inject. Date: 25-Jan-2017 09:19:54 ALS Bottle#: 17 Worklist Smp#: 38  
 Injection Vol: 10.0 ul Dil. Factor: 1.0000  
 Sample Info: mb 320-147297/1-a BOX 53  
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35°C  
 Operator ID: CBW Instrument ID: A6  
 Method: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\537\_\_A6.m  
 Limit Group: LC 537 ICAL  
 Last Update: 25-Jan-2017 14:24:26 Calib Date: 24-Jan-2017 18:32:06  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_008.d  
 Column 1 : Acquity BEH C18 ( 2.10 mm) Det: F1:MRM  
 Process Host: XAWRK015

First Level Reviewer: barnettj Date: 25-Jan-2017 13:48:45

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
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\$ 2 13C2 PFHxA	315.0 > 270.0	18.640	18.658	-0.018	1.000	789419	9.85	25838
* 5 13C2-PFOA	415.0 > 370.0	20.082	20.096	-0.014		630968	10.0	17422
* 8 13C4 PFOS	503.0 > 80.0	20.714	20.730	-0.016		1282606	28.7	23417
\$ 10 13C2 PFDA	515.0 > 470.0	21.516	21.541	-0.025	1.000	698987	10.2	23691

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_038.d

Injection Date: 25-Jan-2017 09:19:54

Instrument ID: A6

Lims ID: MB 320-147297/1-A

Client ID:

Operator ID: CBW

ALS Bottle#: 17

Worklist Smp#: 38

Injection Vol: 10.0 ul

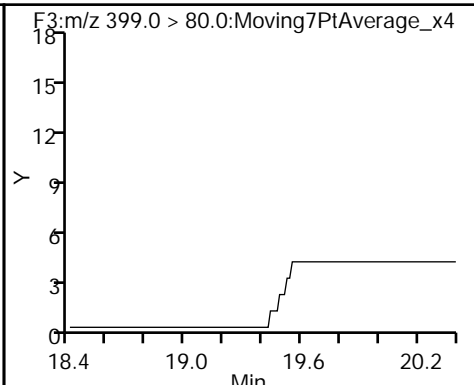
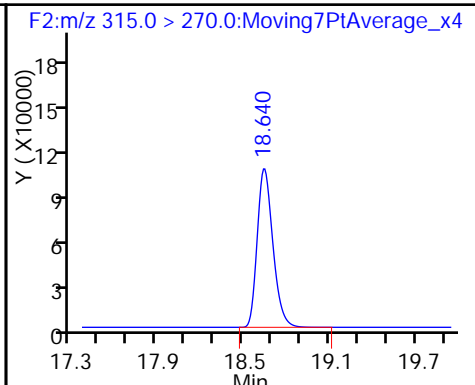
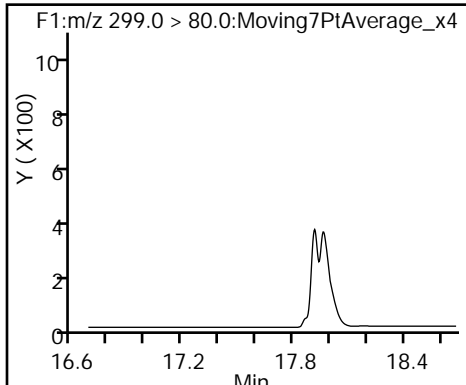
Dil. Factor: 1.0000

Method: 537\_A6

Limit Group: LC 537 ICAL

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

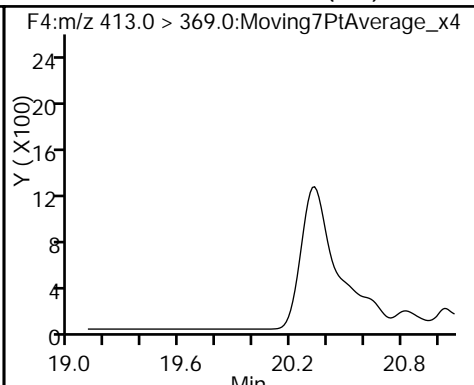
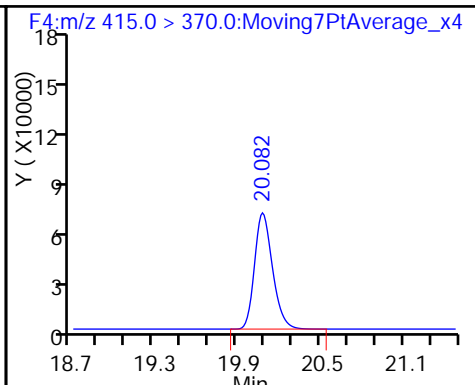
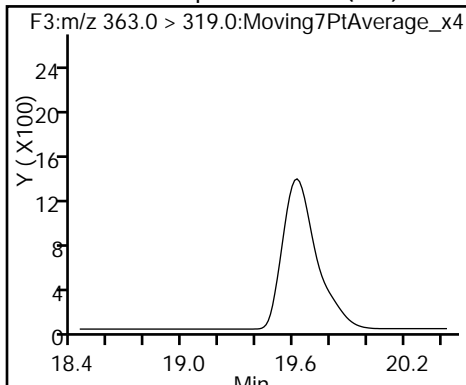
3 Perfluorohexanesulfonic acid (ND)



4 Perfluoroheptanoic acid (ND)

\* 5 13C2-PFOA

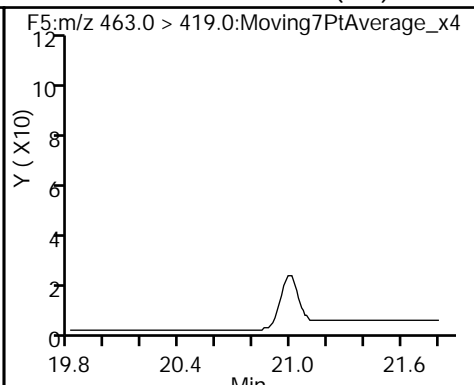
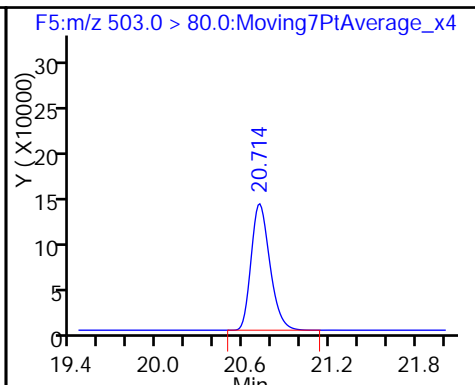
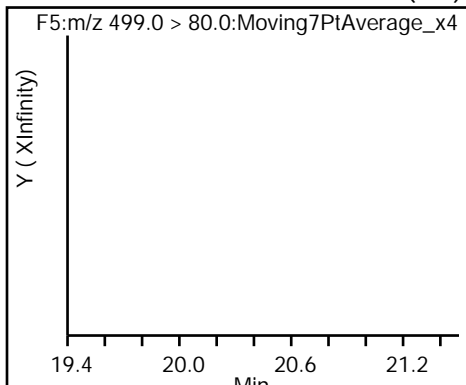
6 Perfluorooctanoic acid (ND)



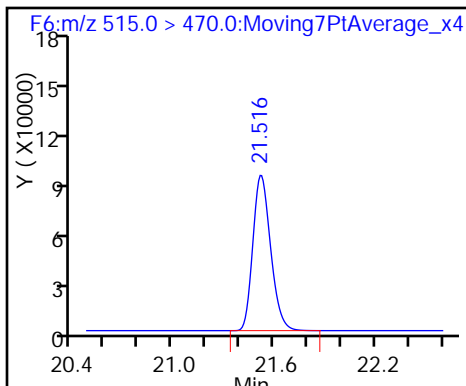
7 Perfluorooctane sulfonic acid (ND)

\* 8 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_038.d  
 Lims ID: MB 320-147297/1-A  
 Client ID:  
 Sample Type: MB  
 Inject. Date: 25-Jan-2017 09:19:54 ALS Bottle#: 17 Worklist Smp#: 38  
 Injection Vol: 10.0 ul Dil. Factor: 1.0000  
 Sample Info: mb 320-147297/1-a BOX 53  
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35°C  
 Operator ID: CBW Instrument ID: A6  
 Method: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\537\_\_A6.m  
 Limit Group: LC 537 ICAL  
 Last Update: 25-Jan-2017 14:24:26 Calib Date: 24-Jan-2017 18:32:06  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_008.d  
 Column 1 : Acquity BEH C18 ( 2.10 mm) Det: F1:MRM  
 Process Host: XAWRK015

First Level Reviewer: barnettj Date: 25-Jan-2017 13:48:45

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	9.85	98.46
\$ 10 13C2 PFDA	10.0	10.2	102.16

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-25119-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: \_\_\_\_\_ Lab Sample ID: LLCS 320-147297/2-A  
 Matrix: Water Lab File ID: 24JAN2017A6A\_039.d  
 Analysis Method: 537 Date Collected: \_\_\_\_\_  
 Extraction Method: 537 Date Extracted: 01/21/2017 11:49  
 Sample wt/vol: 250 (mL) Date Analyzed: 01/25/2017 09:49  
 Con. Extract Vol.: 1 (mL) Dilution Factor: 1  
 Injection Volume: 10 (uL) GC Column: Acquity ID: 2.1 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 147664 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0306	J	0.060	0.048	0.016
335-67-1	Perfluorooctanoic acid (PFOA)	0.0174	J M	0.030	0.024	0.0094
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0729	J	0.14	0.11	0.048

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	104		70-130
STL00996	13C2 PFDA	107		70-130

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_039.d  
 Lims ID: LLCS 320-147297/2-A  
 Client ID:  
 Sample Type: LLCS  
 Inject. Date: 25-Jan-2017 09:49:30 ALS Bottle#: 18 Worklist Smp#: 39  
 Injection Vol: 10.0 ul Dil. Factor: 1.0000  
 Sample Info: llcs 320-147297/2-a  
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35\*C  
 Operator ID: CBW Instrument ID: A6  
 Method: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\537\_\_A6.m  
 Limit Group: LC 537 ICAL  
 Last Update: 25-Jan-2017 14:24:26 Calib Date: 24-Jan-2017 18:32:06  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_008.d  
 Column 1 : Acquity BEH C18 ( 2.10 mm) Det: F1:MRM  
 Process Host: XAWRK015

First Level Reviewer: barnettj Date: 25-Jan-2017 13:49:37

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
--------	----	--------	--------	--------	----------	--------------	-----	-------

1 Perfluorobutanesulfonic acid	299.0 > 80.0	17.670	17.685	-0.015	1.000	610446	18.2	775
\$ 2 13C2 PFHxA	315.0 > 270.0	18.640	18.658	-0.018	1.000	826881	10.4	27492
3 Perfluorohexanesulfonic acid	399.0 > 80.0	19.392	19.403	-0.011	1.000	260806	6.10	6400
4 Perfluoroheptanoic acid	363.0 > 319.0	19.415	19.437	-0.022	1.000	186275	2.51	124 M
* 5 13C2-PFOA	415.0 > 370.0	20.082	20.096	-0.014		627354	10.0	17238
6 Perfluorooctanoic acid	413.0 > 369.0	20.082	20.096	-0.014	1.000	292162	4.35	304 M
7 Perfluorooctane sulfonic acid	499.0 > 80.0	20.454	20.468	-0.014	1.000	383386	7.65	2926
* 8 13C4 PFOS	503.0 > 80.0	20.714	20.730	-0.016		1321123	28.7	36118
9 Perfluorononanoic acid	463.0 > 419.0	20.785	20.803	-0.018	1.000	317102	4.10	1174
\$ 10 13C2 PFDA	515.0 > 470.0	21.515	21.541	-0.026	1.000	726077	10.7	24618

QC Flag Legend

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_039.d

Injection Date: 25-Jan-2017 09:49:30

Instrument ID: A6

Lims ID: LLCS 320-147297/2-A

Client ID:

Operator ID: CBW

ALS Bottle#: 18

Worklist Smp#: 39

Injection Vol: 10.0 ul

Dil. Factor: 1.0000

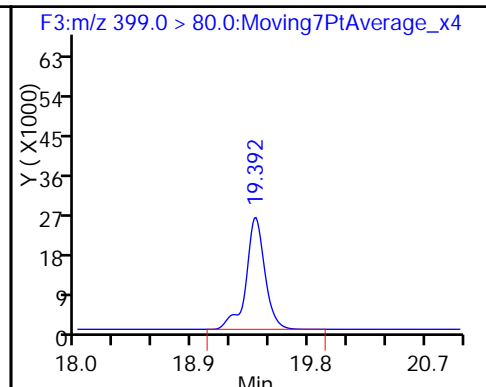
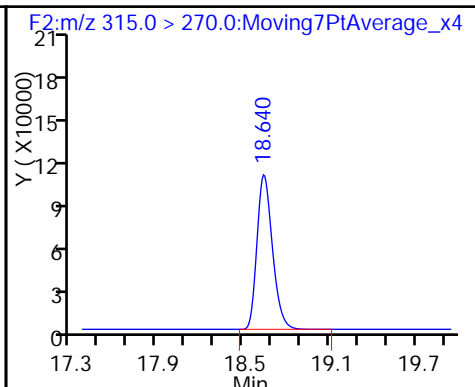
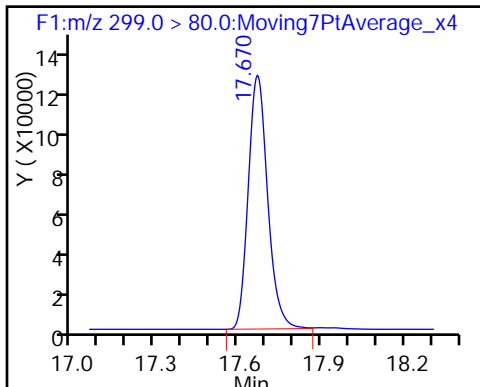
Method: 537\_A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

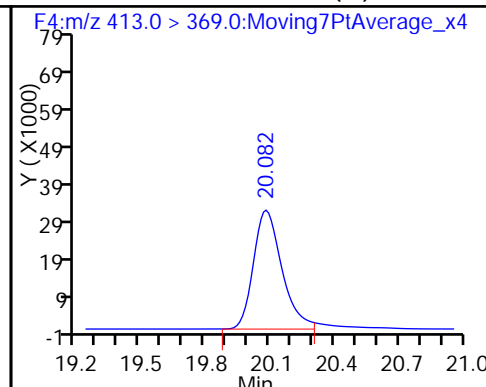
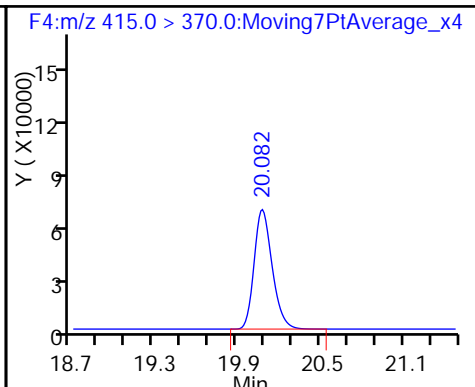
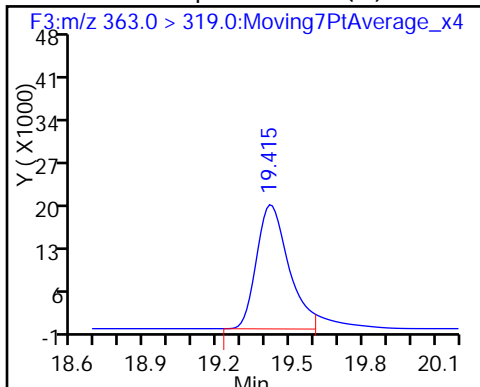
3 Perfluorohexanesulfonic acid



4 Perfluoroheptanoic acid (M)

\* 5 13C2-PFOA

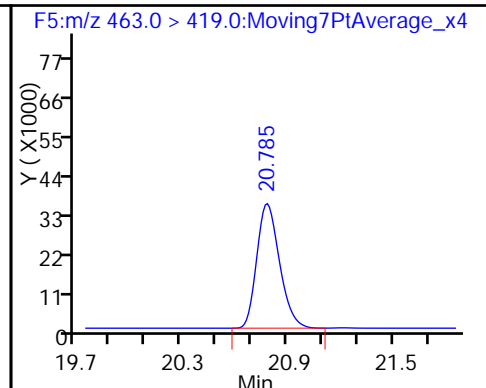
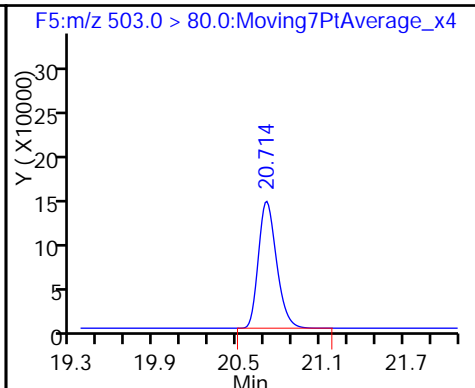
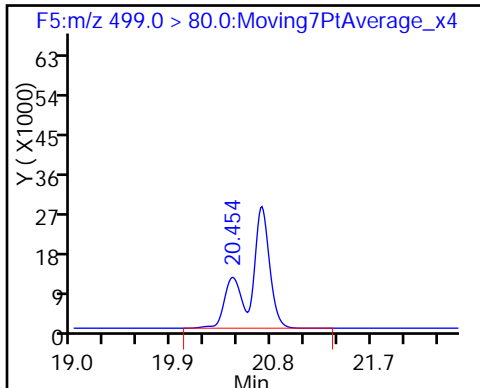
6 Perfluorooctanoic acid (M)



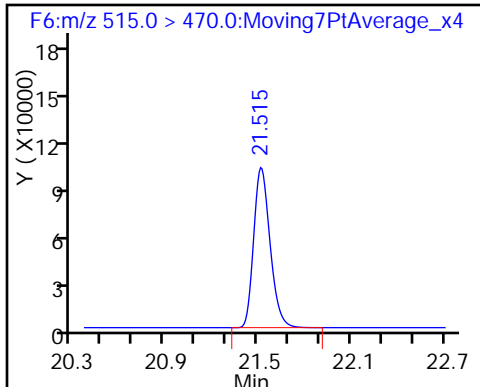
7 Perfluorooctane sulfonic acid

\* 8 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_039.d  
 Lims ID: LLCS 320-147297/2-A  
 Client ID:  
 Sample Type: LLCS  
 Inject. Date: 25-Jan-2017 09:49:30 ALS Bottle#: 18 Worklist Smp#: 39  
 Injection Vol: 10.0 ul Dil. Factor: 1.0000  
 Sample Info: llcs 320-147297/2-a  
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35°C  
 Operator ID: CBW Instrument ID: A6  
 Method: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\537\_\_A6.m  
 Limit Group: LC 537 ICAL  
 Last Update: 25-Jan-2017 14:24:26 Calib Date: 24-Jan-2017 18:32:06  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_008.d  
 Column 1 : Acquity BEH C18 ( 2.10 mm) Det: F1:MRM  
 Process Host: XAWRK015

First Level Reviewer: barnettj Date: 25-Jan-2017 13:49:37

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	10.4	103.73
\$ 10 13C2 PFDA	10.0	10.7	106.73



TestAmerica Sacramento

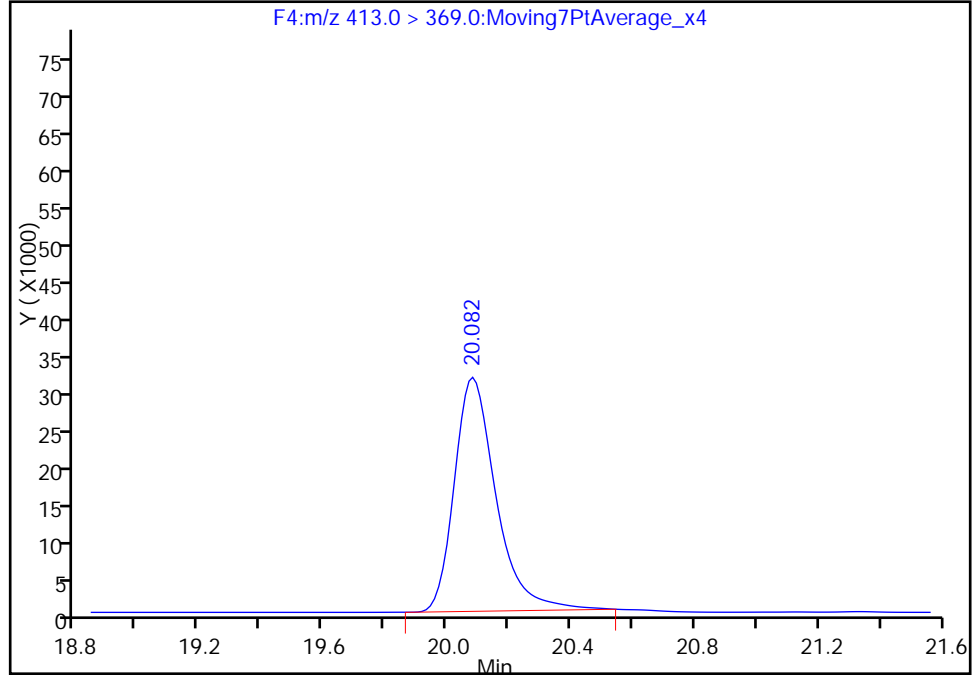
Data File: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b\24JAN2017A6A\_039.d  
Injection Date: 25-Jan-2017 09:49:30 Instrument ID: A6  
Lims ID: LLCS 320-147297/2-A  
Client ID:  
Operator ID: CBW ALS Bottle#: 18 Worklist Smp#: 39  
Injection Vol: 10.0 ul Dil. Factor: 1.0000  
Method: 537\_\_A6 Limit Group: LC 537 ICAL  
Column: Acquity BEH C18 ( 2.10 mm) Detector F4:M/RM

6 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

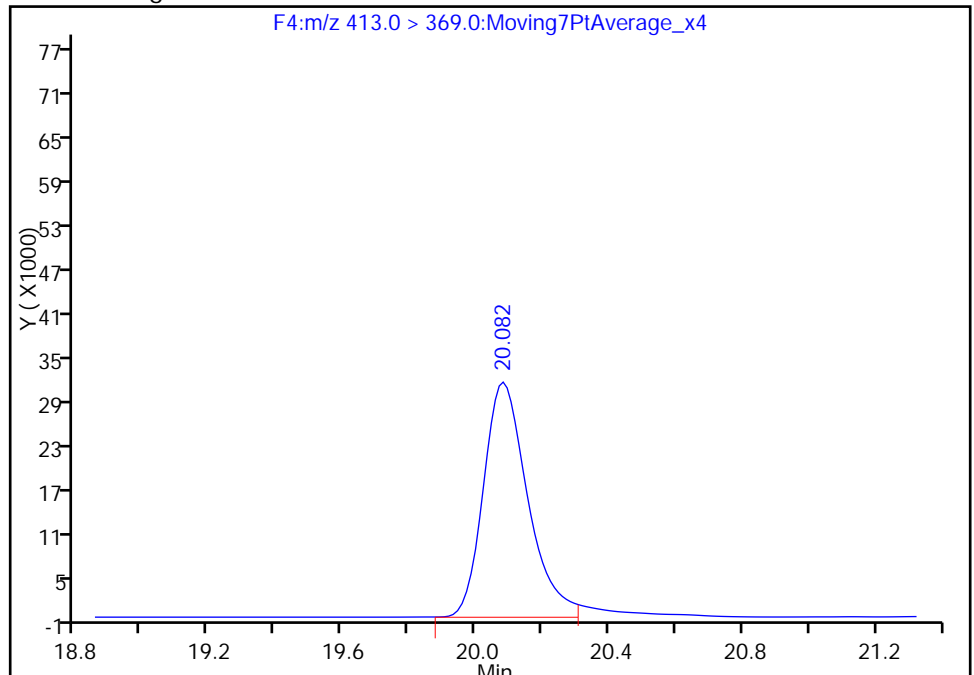
RT: 20.08  
Area: 295352  
Amount: 4.400397  
Amount Units: ng/ml

Processing Integration Results



RT: 20.08  
Area: 292162  
Amount: 4.352870  
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 25-Jan-2017 13:49:37  
Audit Action: Manually Integrated

Audit Reason: Split Peak

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-25119-1

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

Instrument ID: A6 Start Date: 01/24/2017 16:04

Analysis Batch Number: 147661 End Date: 01/25/2017 02:25

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
STD 320-147661/3 IC		01/24/2017 16:04	1	24JAN2017A6A_00 3.d	Acquity 2.1 (mm)
STD 320-147661/4 IC		01/24/2017 16:33	1	24JAN2017A6A_00 4.d	Acquity 2.1 (mm)
STD 320-147661/5 IC		01/24/2017 17:03	1	24JAN2017A6A_00 5.d	Acquity 2.1 (mm)
STD 320-147661/6 ICISAV		01/24/2017 17:32	1	24JAN2017A6A_00 6.d	Acquity 2.1 (mm)
STD 320-147661/7 IC		01/24/2017 18:02	1	24JAN2017A6A_00 7.d	Acquity 2.1 (mm)
STD 320-147661/8 IC		01/24/2017 18:32	1	24JAN2017A6A_00 8.d	Acquity 2.1 (mm)
ZZZZZ		01/24/2017 19:01	1		Acquity 2.1 (mm)
CCV 320-147661/10 CCVL		01/24/2017 19:31	1	24JAN2017A6A_01 0.d	Acquity 2.1 (mm)
ZZZZZ		01/24/2017 20:00	1		Acquity 2.1 (mm)
ICV 320-147661/12		01/24/2017 20:30	1	24JAN2017A6A_01 2.d	Acquity 2.1 (mm)
ZZZZZ		01/24/2017 21:00	1		Acquity 2.1 (mm)
ZZZZZ		01/24/2017 21:29	1		Acquity 2.1 (mm)
ZZZZZ		01/24/2017 21:59	1		Acquity 2.1 (mm)
ZZZZZ		01/24/2017 22:28	1		Acquity 2.1 (mm)
ZZZZZ		01/24/2017 22:58	1		Acquity 2.1 (mm)
ZZZZZ		01/24/2017 23:28	1		Acquity 2.1 (mm)
ZZZZZ		01/24/2017 23:57	1		Acquity 2.1 (mm)
ZZZZZ		01/25/2017 00:27	1		Acquity 2.1 (mm)
ZZZZZ		01/25/2017 00:56	1		Acquity 2.1 (mm)
ZZZZZ		01/25/2017 01:26	1		Acquity 2.1 (mm)
ZZZZZ		01/25/2017 01:56	1		Acquity 2.1 (mm)
CCV 320-147661/24 CCVIS		01/25/2017 02:25	1		Acquity 2.1 (mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-25119-1

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

Instrument ID: A6 Start Date: 01/25/2017 08:20

Analysis Batch Number: 147664 End Date: 01/25/2017 14:17

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-147664/36 CCVIS		01/25/2017 08:20	1	24JAN2017A6A_03 6.d	Acquity 2.1 (mm)
ZZZZZ		01/25/2017 08:50	1		Acquity 2.1 (mm)
MB 320-147297/1-A		01/25/2017 09:19	1	24JAN2017A6A_03 8.d	Acquity 2.1 (mm)
LLCS 320-147297/2-A		01/25/2017 09:49	1	24JAN2017A6A_03 9.d	Acquity 2.1 (mm)
ZZZZZ		01/25/2017 10:19	1		Acquity 2.1 (mm)
ZZZZZ		01/25/2017 10:48	1		Acquity 2.1 (mm)
ZZZZZ		01/25/2017 11:19	1		Acquity 2.1 (mm)
ZZZZZ		01/25/2017 11:49	1		Acquity 2.1 (mm)
320-25119-1		01/25/2017 12:18	1	24JAN2017A6A_04 4.d	Acquity 2.1 (mm)
320-25119-2		01/25/2017 12:48	1	24JAN2017A6A_04 5.d	Acquity 2.1 (mm)
320-25119-3		01/25/2017 13:18	1	24JAN2017A6A_04 6.d	Acquity 2.1 (mm)
320-25119-4		01/25/2017 13:47	1	24JAN2017A6A_04 7.d	Acquity 2.1 (mm)
CCV 320-147664/48 CCVIS		01/25/2017 14:17	1	24JAN2017A6A_04 8.d	Acquity 2.1 (mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-25119-1

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

Batch Number: 147297 Batch Start Date: 01/21/17 11:48 Batch Analyst: Kolstad, Kate M

Batch Method: 537 Batch End Date: 01/23/17 13:50

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	ReceivedpH	LC537-IS 00030
MB 320-147297/1		537, 537				250 mL	1 mL	7 SU	20 uL
LLCS 320-147297/2		537, 537				250 mL	1 mL	7 SU	20 uL
320-25119-A-1	WI-CV-1RW59-0117	537, 537	T	276.77 g	27.57 g	249.2 mL	1 mL	7 SU	20 uL
320-25119-A-2	WI-CV-1FB59-0117	537, 537	T	278.49 g	26.03 g	252.5 mL	1 mL	7 SU	20 uL
320-25119-A-3	WI-CV-1RW60-0117	537, 537	T	274.84 g	28.42 g	246.4 mL	1 mL	7 SU	20 uL
320-25119-A-4	WI-CV-1FB60-0117	537, 537	T	281.46 g	26.76 g	254.7 mL	1 mL	7 SU	20 uL

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-LSP 00016	LC537-SU 00029	AnalysisComment			
MB 320-147297/1		537, 537			50 uL	chlorine=ND			
LLCS 320-147297/2		537, 537		50 uL	50 uL	chlorine=ND			
320-25119-A-1	WI-CV-1RW59-0117	537, 537	T		50 uL	chlorine=ND			
320-25119-A-2	WI-CV-1FB59-0117	537, 537	T		50 uL	chlorine=ND			
320-25119-A-3	WI-CV-1RW60-0117	537, 537	T		50 uL	chlorine=ND			
320-25119-A-4	WI-CV-1FB60-0117	537, 537	T		50 uL	chlorine=ND			

Batch Notes	
Manifold ID	3
Methanol ID	827185
Pipette ID	MD05306
Analyst ID - IS Reagent Drop	NSH
Analyst ID - IS Reagent Drop Witness	CCB
Analyst ID - SU Reagent Drop	VPM
Analyst ID - SU Reagent Drop Witness	KMK
Analyst ID - TA Reagent Drop	VPM
Analyst ID - TA Reagent Drop Witness	KMK
SPE Cartridge ID	6341059-03
Trizma ID	SLBR4303V
Reagent Water ID	SIZ 1-13-17

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.: 320-25119-1

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

Batch Number: 147297 Batch Start Date: 01/21/17 11:48 Batch Analyst: Kolstad, Kate M

Batch Method: 537 Batch End Date: 01/23/17 13:50

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.

A6

Job No: 25130 25119 Instrument ID & Date: 1-25-17 ICAL Batch: 147661  
 Extraction Batch: 147297 Worklist #: 39144 TALS Batch: 147664

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?	✓			✓

1<sup>st</sup> Level Reviewer / Date: JRB 1-25-17

2<sup>nd</sup> Level Reviewer / Date: Murphy 1/25/2017

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

A6

Instrument ID & Date: 1-24-17 Worklist#: 39144

ICAL Batch: 147661, 147662 Calibration ID number: 27898, 27899

Review Items	-- Level 1 --			Level 2
	Yes	No	N/A	
Initial Calibration				
1. Mass calibration, as needed, verified by full scan of PFC stock standard. All PFC ions used for quantitation are within 0.3 m/z of true mass?	✓			✓
2. Responses increase with increasing concentration?	✓			✓
3. Fit used (circle): <u>Average</u> Linear (1/x <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 1-25-17

2<sup>nd</sup> Level Reviewer / Date: Murray 1/25/2017

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

TestAmerica Laboratories  
Worklist QC Batch Report

Worklist Name: 24JAN2017A\_A6 537      Worklist Number: 39144  
 Instrument Name: A6      Chrom Method: 537\_A6  
 Data Directory: \\ChromNA\Sacramento\ChromData\A6\20170124-39144.b  
 QC Batching: Enabled      Limit Group Batching: Enabled

QC Batch: 1	LC 537 ICAL Raw Batch: 147661	LC 537 CS ICAL Raw Batch: 147662
# 1 RB	# 1 RB	
# 2 RB	# 2 RB	
# 3 STD L1	# 3 STD L1	# 3 STD L1
# 4 STD L2	# 4 STD L2	# 4 STD L2
# 5 STD L3	# 5 STD L3	# 5 STD L3
# 6 STD L4	# 6 STD L4	# 6 STD L4
# 7 STD L5	# 7 STD L5	# 7 STD L5
# 8 STD L6	# 8 STD L6	# 8 STD L6
# 9 RB	# 9 RB	# 9 RB
#10 CCV L2	#10 CCV L2	#10 CCV L2
#11 RB	#11 RB	#11 RB
#12 ICV	#12 ICV	#12 ICV
#13 RB	#13 RB	
#14 MB 320-147289/1-A	#14 MB 320-147289/1-A	
#15 LCSD 320-147289/3-A	#15 LCSD 320-147289/3-A	
#16 320-25114-A-9-A	#16 320-25114-A-9-A	
#17 MB 320-147285/1-A	#17 MB 320-147285/1-A	
#18 320-25070-A-1-A	#18 320-25070-A-1-A	
#19 MB 320-147301/1-A	#19 MB 320-147301/1-A	
#20 LCS 320-147301/2-A	#20 LCS 320-147301/2-A	
#21 320-25158-A-1-A	#21 320-25158-A-1-A	
#22 320-25158-A-2-A	#22 320-25158-A-2-A	
#23 320-25158-A-3-A	#23 320-25158-A-3-A	
#24 CCV L3	#24 CCV L3	

QC Batch: 2	LC 537 ICAL Raw Batch: 147663
#24 CCV L3	#24 CCV L3
#25 RB	#25 RB
#26 320-25158-A-4-A	#26 320-25158-A-4-A
#27 320-25158-A-5-A	#27 320-25158-A-5-A
#28 320-25158-A-5-B MS	#28 320-25158-A-5-B MS
#29 320-25158-A-5-C MSD	#29 320-25158-A-5-C MSD
#30 320-25158-A-6-A	#30 320-25158-A-6-A
#31 320-25158-A-7-A	#31 320-25158-A-7-A
#32 320-25158-A-8-A	#32 320-25158-A-8-A
#33 320-25158-A-9-A	#33 320-25158-A-9-A
#34 320-25158-A-10-A	#34 320-25158-A-10-A
#35 320-25158-A-11-A	#35 320-25158-A-11-A
#36 CCV L5	#36 CCV L5

QC Batch: 3	LC 537 ICAL Raw Batch: 147664
#36 CCV L5	#36 CCV L5
#37 RB	#37 RB
#38 MB 320-147297/1-A	#38 MB 320-147297/1-A
#39 LLCS 320-147297/2-A	#39 LLCS 320-147297/2-A
#40 320-25130-A-1-A	#40 320-25130-A-1-A
#41 320-25130-A-1-B MS	#41 320-25130-A-1-B MS
#42 320-25130-A-1-C MSD	#42 320-25130-A-1-C MSD
#43 320-25130-A-2-A	#43 320-25130-A-2-A
#44 320-25119-A-1-A	#44 320-25119-A-1-A



QC Batch: 3	LC 537 ICAL Raw Batch: 147664
#45 320-25119-A-2-A	#45 320-25119-A-2-A
#46 320-25119-A-3-A	#46 320-25119-A-3-A
#47 320-25119-A-4-A	#47 320-25119-A-4-A
#48 CCV L3	#48 CCV L3
#49 RB	#49 RB

53

Screen A @ 1/23/17

# Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-147297

Analyst: Kolstad, Kate M

Batch Open: 1/21/2017 11:48:00AM

Method Code: 320-537\_Prep-320

Batch End: 1/21/17 13:50

## Extraction of Perfluorinated Alkyl Acids

NO-DPL  
Due 1/26

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-320-147297/1 N/A	N/A		250 mL 1 mL	7		N/A	N/A	N/A	chlorine=ND	MB-320-147297/1-A
2 LLCS-320-147297/2 N/A	N/A		250 mL 1 mL	7		N/A	N/A	N/A	chlorine=ND	LLCS-320-147297/2-A
3 320-25130-A-1 (537_DOD5)	N/A (320-25130-1)	279.90 g 27.20 g	252.7 mL 1 mL	7		1/23/17	5_Days	4	chlorine=ND	320-25130-A-1-A
4 320-25130-A-1-MS (537_DOD5)	N/A (320-25130-1)	276.97 g 26.90 g	250.1 mL 1 mL	7		1/23/17	5_Days	4	chlorine=ND	320-25130-A-1-B MS
5 320-25130-A-1-MSD (537_DOD5)	N/A (320-25130-1)	279.50 g 27.09 g	252.4 mL 1 mL	7		1/23/17	5_Days	4	chlorine=ND	320-25130-A-1-C MSB
6 320-25130-A-2 (537_DOD5)	N/A (320-25130-1)	279.26 g 26.35 g	252.9 mL 1 mL	7		1/23/17	5_Days	4	chlorine=ND	320-25130-A-2-A
7 320-25119-A-1 (537_DOD5)	N/A (320-25119-1)	276.77 g 27.57 g	249.2 mL 1 mL	7		1/23/17	5_Days	4	chlorine=ND	320-25119-A-1-A
8 320-25119-A-2 (537_DOD5)	N/A (320-25119-1)	278.49 g 26.03 g	252.5 mL 1 mL	7		1/23/17	5_Days	4	chlorine=ND	320-25119-A-2-A
9 320-25119-A-3 (537_DOD5)	N/A (320-25119-1)	274.84 g 28.42 g	246.4 mL 1 mL	7		1/23/17	5_Days	4	chlorine=ND	320-25119-A-3-A
10 320-25119-A-4 (537_DOD5)	N/A (320-25119-1)	281.46 g 26.76 g	254.7 mL 1 mL	7		1/23/17	5_Days	4	chlorine=ND	320-25119-A-4-A

# Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Analyst: Kolstad, Kate M

Batch Open: 1/21/2017 11:48:00AM

Batch End:

Batch Number: 320-147297

Method Code: 320-537\_Prep-320

## Batch Notes

Manifold ID 3  
Trizma ID SLBR4303V  
SPE Cartridge ID 6341059-03  
Methanol ID 827185  
Reagent Water ID SIZ 1-13-17  
Pipette ID MD05306  
Analyst ID - TA Reagent Drop VPM  
Analyst ID - TA Reagent Drop Witness KMK  
Analyst ID - SU Reagent Drop VPM  
Analyst ID - SU Reagent Drop Witness KMK  
Analyst ID - IS Reagent Drop NSH 827698  
Analyst ID - IS Reagent Drop Witness CCB  
Batch Comment

## Comments

Login Comments for Job 25119: Per client request:  
WLCV-1RW48-0117 & WLCV-1FB48-0117 logged as WLCV-1RW59-0117 & WLCV-1FB59-0117  
WLCV-1RW49-0117 & WLCV-1FB49-0117 logged as WLCV-1RW60-0117 & WLCV-1FB60-0117

# Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Analyst: Kolstad, Kate M

Batch Number: 320-147297

Method Code: 320-537\_Prep-320

Batch Open: 1/21/2017 11:48:00AM

Batch End:

## Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-147297/1	LC537-SU_00029	50 uL	1 mL	↑	KMK 1-21-17
LLCS 320-147297/2	LC537-LSP_00016	50 uL	1 mL	VPM 1/21/17	
LLCS 320-147297/2	LC537-SU_00029	50 uL	1 mL		
320-25130-A-1	LC537-SU_00029	50 uL	1 mL		
320-25130-A-1 MS	LC537-MSP_00017	50 uL	1 mL		
320-25130-A-1 MS	LC537-SU_00029	50 uL	1 mL		
320-25130-A-1 MSD	LC537-MSP_00017	50 uL	1 mL		
320-25130-A-1 MSD	LC537-SU_00029	50 uL	1 mL		
320-25130-A-2	LC537-SU_00029	50 uL	1 mL		
320-25119-A-1	LC537-SU_00029	50 uL	1 mL		
320-25119-A-2	LC537-SU_00029	50 uL	1 mL		
320-25119-A-3	LC537-SU_00029	50 uL	1 mL		
320-25119-A-4	LC537-SU_00029	50 uL	1 mL		

# Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Analyst: Kolstad, Kate M

Batch Number: 320-147297

Method Code: 320-537\_Prep-320

Batch Open: 1/21/2017 11:48:00AM

Batch End:

Reagent	Other Reagents:	Amount/Units	Lot#:

Preparation Batch Number(s): 147297 Test: 537-Prep  
 Earliest Holding Time: 1-31-17

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

Date: 1/23/17

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

Date: 1-23/17

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

# Shipping and Receiving Documents





# Login Sample Receipt Checklist

Client: CH2M Hill Constructors, Inc.

Job Number: 320-25119-1

**Login Number: 25119**  
**List Number: 1**  
**Creator: Edman, Connor M**

**List Source: TestAmerica Sacramento**

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



**DATA VALIDATION SUMMARY REPORT  
WHIDBEY ISLAND, WASHINGTON**

Client: CH2M HILL, Inc., Corvallis, Oregon  
SDG: 320-25119-1  
Laboratory: Test America, Sacramento, California  
Site: Whidbey Island, CTO-0008, Washington  
Date: February 1, 2017

PFCs			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-CV-1RW59-0117	320-25119-1	Water
2	WI-CV-1FB59-0117	320-25119-2	Water
3	WI-CV-1RW60-0117	320-25119-3	Water
4	WI-CV-1FB60-0117	320-25119-4	Water

A full data validation was performed on the analytical data for two water samples and two aqueous field blank samples collected on January 17-18, 2017 by CH2M HILL at the Whidbey Island site in Washington. The samples were analyzed under the EPA Method "Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)".

Specific method references are as follows:

Analysis  
PFCs

Method References  
USEPA Method 537 Rev 1.1 Modified

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method, and the U.S. Department of Defense (DoD) Quality Systems Manual (QSM), Version 5.0 (DoD 2013) and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Superfund Organic Methods Data Review," August 2014;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

***Organics***

- Date Completeness, Case Narrative & Custody Documentation
- Holding times
- Gas Chromatography/Mass Spectrometry (GC/MS) Tuning

- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

### **Data Usability Assessment**

There were no rejections of data.

Overall the data is acceptable for the intended purposes. There were no qualifications.

### **Perfluorinated Compounds (PFCs)**

### **Data Completeness, Case Narrative & Custody Documentation**

- The case narrative and chain-of-custody documentation were included in the data package as required. The samples were incorrectly identified on the chain-of-custody. The laboratory revised the IDs per the client's request to reflect the correct IDs on the Form Is.

### **Holding Times**

- All samples were extracted within 14 days for water samples and analyzed within 28 days.

### **GC/MS Tuning**

- All criteria were met.

### **Initial Calibration**

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

### Continuing Calibration

- All percent difference (%D) and RRF criteria were met.

### Method Blank

- The method blanks were free of contamination.

### Field QC Blank

- The field blank samples were free of contamination.

### Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate %R values.

### Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD sample exhibited acceptable %R and RPD values.

### Laboratory Control Samples

- The LCS samples exhibited acceptable percent recovery (%R) values.

### Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

### Target Compound Identification

- All mass spectra and quantitation criteria were met.

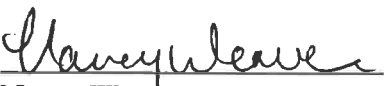
### Compound Quantitation

- All criteria were met.

### Field Duplicate Sample Precision

- Field duplicate samples were not collected.

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed:   
Nancy Weaver  
Senior Chemist

Dated: 2/2/17

<b>Data Qualifier</b>	<b>Definition</b>
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.





FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-25119-1</u>
SDG No.: _____	
Client Sample ID: <u>WI-CV-1RW59-0117</u>	Lab Sample ID: <u>320-25119-1</u>
Matrix: <u>Water</u>	Lab File ID: <u>24JAN2017A6A_044.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>01/17/2017 09:14</u>
Extraction Method: <u>537</u>	Date Extracted: <u>01/21/2017 11:49</u>
Sample wt/vol: <u>249.2(mL)</u>	Date Analyzed: <u>01/25/2017 12:18</u>
Con. Extract Vol.: <u>1(mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>10(uL)</u>	GC Column: <u>Acquity</u> ID: <u>2.1(mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>147664</u>	Units: <u>ug/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.048	U	0.060	0.048	0.016
335-67-1	Perfluorooctanoic acid (PFOA)	0.024	U	0.030	0.024	0.0095
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.14	0.11	0.048

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	110		70-130
STL00996	13C2 PFDA	110		70-130

NW 2/1/17

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

2

Lab Name: TestAmerica Sacramento Job No.: 320-25119-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WI-CV-1FB59-0117 Lab Sample ID: 320-25119-2  
 Matrix: Water Lab File ID: 24JAN2017A6A\_045.d  
 Analysis Method: 537 Date Collected: 01/17/2017 09:13  
 Extraction Method: 537 Date Extracted: 01/21/2017 11:49  
 Sample wt/vol: 252.5(mL) Date Analyzed: 01/25/2017 12:48  
 Con. Extract Vol.: 1(mL) Dilution Factor: 1  
 Injection Volume: 10(uL) GC Column: Acquity ID: 2.1(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 147664 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.048	U	0.059	0.048	0.015
335-67-1	Perfluorooctanoic acid (PFOA)	0.024	U	0.030	0.024	0.0093
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.14	0.11	0.047

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	105		70-130
STL00996	13C2 PFDA	104		70-130

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

3

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-25119-1</u>
SDG No.: _____	
Client Sample ID: <u>WI-CV-1RW60-0117</u>	Lab Sample ID: <u>320-25119-3</u>
Matrix: <u>Water</u>	Lab File ID: <u>24JAN2017A6A_046.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>01/18/2017 09:31</u>
Extraction Method: <u>537</u>	Date Extracted: <u>01/21/2017 11:49</u>
Sample wt/vol: <u>246.4(mL)</u>	Date Analyzed: <u>01/25/2017 13:18</u>
Con. Extract Vol.: <u>1(mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>10(uL)</u>	GC Column: <u>Acquity</u> ID: <u>2.1(mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>147664</u>	Units: <u>ug/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.049	U	0.061	0.049	0.016
335-67-1	Perfluorooctanoic acid (PFOA)	0.024	U	0.030	0.024	0.0096
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.14	0.11	0.048

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	100		70-130
STL00996	13C2 PFDA	104		70-130

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

4

Lab Name: TestAmerica Sacramento Job No.: 320-25119-1

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

Client Sample ID: WI-CV-1FB60-0117 Lab Sample ID: 320-25119-4

Matrix: Water Lab File ID: 24JAN2017A6A\_047.d

Analysis Method: 537 Date Collected: 01/18/2017 09:30

Extraction Method: 537 Date Extracted: 01/21/2017 11:49

Sample wt/vol: 254.7(mL) Date Analyzed: 01/25/2017 13:47

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

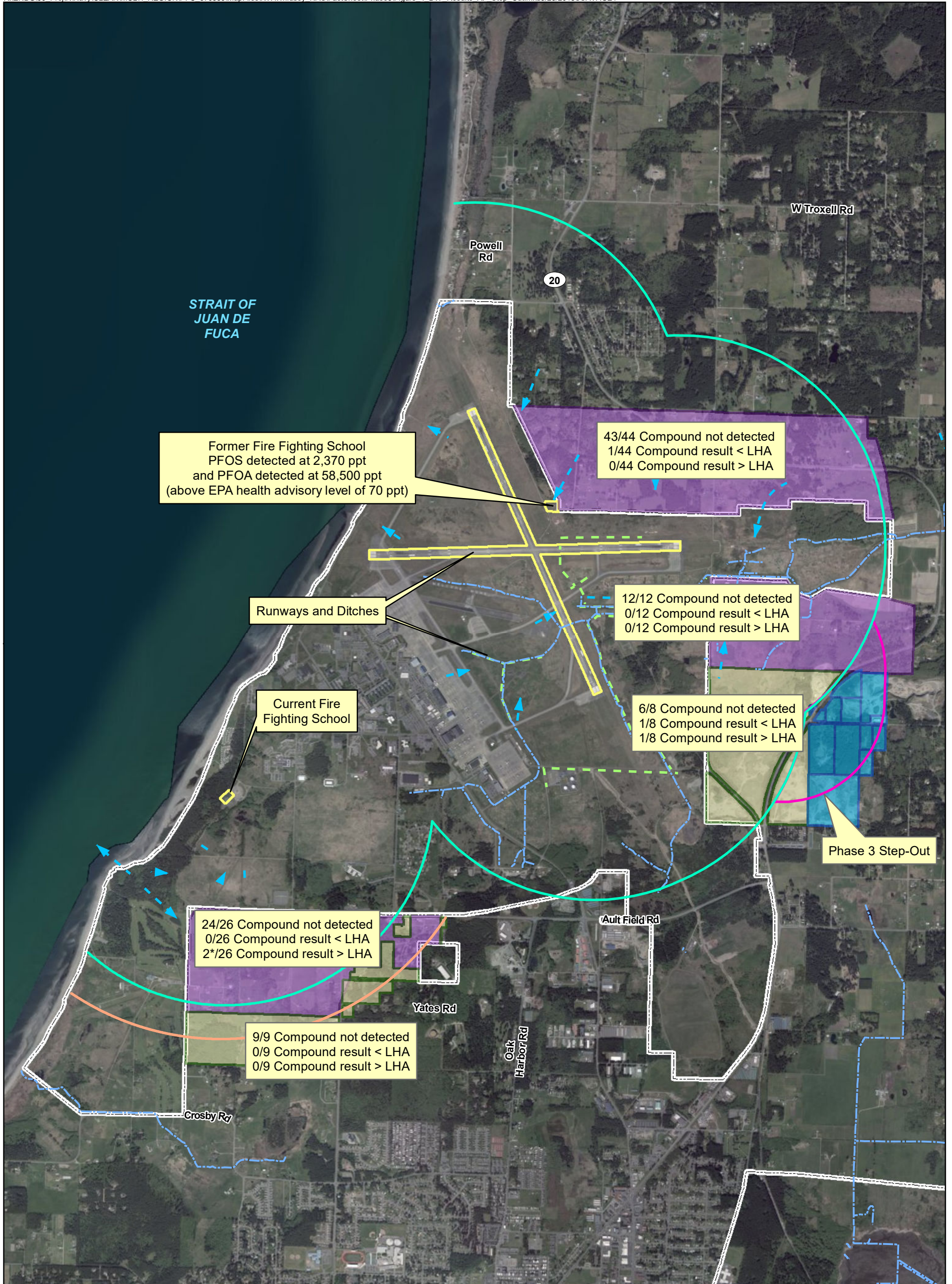
Injection Volume: 10(uL) GC Column: Acquity ID: 2.1(mm)

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

Analysis Batch No.: 147664 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.047	U	0.059	0.047	0.015
335-67-1	Perfluorooctanoic acid (PFOA)	0.024	U	0.029	0.024	0.0092
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.14	0.11	0.047

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	100		70-130
STL00996	13C2 PFDA	95		70-130



Former Fire Fighting School  
 PFOS detected at 2,370 ppt  
 and PFOA detected at 58,500 ppt  
 (above EPA health advisory level of 70 ppt)

43/44 Compound not detected  
 1/44 Compound result < LHA  
 0/44 Compound result > LHA

Runways and Ditches

12/12 Compound not detected  
 0/12 Compound result < LHA  
 0/12 Compound result > LHA

Current Fire Fighting School

6/8 Compound not detected  
 1/8 Compound result < LHA  
 1/8 Compound result > LHA

Phase 3 Step-Out

24/26 Compound not detected  
 0/26 Compound result < LHA  
 2\*/26 Compound result > LHA

9/9 Compound not detected  
 0/9 Compound result < LHA  
 0/9 Compound result > LHA

**Legend**

- 1 Mile Zone
- Half-mile Step-out Downgradient
- - - Surface Water
- - - Drainage Ditch
- Half-mile Step-out Downgradient
- Suspected Source Area
- Parcels in Phase 1 Sampling Area
- Parcels Identified in Phase 2 Sampling Area
- Parcels Identified in Phase 3 Sampling Area

- Base Boundary
- - - Inferred Groundwater Flow Direction

\* Second result above the EPA health advisory is from a duplicate sample collected from the well with the first exceedance near Ault Field.

Note:  
 PFOA and PFOS results reflected on figure,  
 PFBS results discussed in Table 2 and text.



0 0.225 0.45  
 Miles

1 inch = 0.45 mile  
 Imagery Source: Esri

Figure 2  
 Results for Drinking Water Well Sampling  
 Ault Field  
 Naval Air Station Whidbey Island  
 Oak Harbor, Washington