NAVFAC
Naval Facilities Engineering Command

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 J24441-1

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: 320-24441-1
Client Project/Site: Whidbey Island

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

Attn: Tiffany Hill

Authorized for release by:
12/23/2016 3:19:30 PM

Laura Turpen, Project Manager I
(916)374-4414
laura.turpen@testamericainc.com

Table of Contents

Definitions/Glossary

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

TestAmerica Job ID: 320-24441-1

Qualifiers

LCMS

Qualifier	Qualifier Description
U	Undetected at the Limit of Detection.

Glossary

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

Job ID: 320-24441-1

Laboratory: TestAmerica Sacramento

Narrative

CASE NARRATIVE

Client: CH2M Hill Constructors, Inc.

Project: Whidbey Island

Report Number: 320-24441-1

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 12/16/2016; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 1.5 C.

An extended TAT was requested by the client via an email on December 8. Samples received the week of December 12 were requested to have a due date of December 27, 2016.

PFOA/PFOS

Samples WI-AF-3RW35-1216 (320-24441-1) and WI-AF-3FB35-1216 (320-24441-2) were analyzed for PFOA/PFOS in accordance with 537. The samples were prepared on 12/17/2016 and analyzed on 12/22/2016.

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch

Job ID: 320-24441-1 (Continued)

Laboratory: TestAmerica Sacramento (Continued)

320-142683.

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: 320-24441-1

Client Sample ID: WI-AF-3RW35-1216 — Lab Sample ID: 320-24441-1

No Detections.

Client Sample ID: WI-AF-3FB35-1216 — Lab Sample ID: 320-24441-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample ID: WI-AF-3RW35-1216

Lab Sample ID: 320-24441-1

Date Collected: 12/14/16 14:25

Matrix: Water

Date Received: 12/16/16 10:05

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.045	U	0.056	0.015	ug/L		12/17/16 13:06	12/22/16 12:20	1
Perfluorooctanoic acid (PFOA)	0.023	U	0.028	0.0089	ug/L		12/17/16 13:06	12/22/16 12:20	1
Perfluorobutanesulfonic acid (PFBS)	0.10	U	0.13	0.045	ug/L		12/17/16 13:06	12/22/16 12:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*102*		*70 - 130*	*12/17/16 13:06*	*12/22/16 12:20*	*1*
13C2 PFDA	*103*		*70 - 130*	*12/17/16 13:06*	*12/22/16 12:20*	*1*

Client Sample ID: WI-AF-3FB35-1216

Lab Sample ID: 320-24441-2

Date Collected: 12/14/16 14:26

Matrix: Water

Date Received: 12/16/16 10:05

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	0.015	ug/L		12/17/16 13:06	12/22/16 12:50	1
Perfluorooctanoic acid (PFOA)	0.024	U	0.030	0.0094	ug/L		12/17/16 13:06	12/22/16 12:50	1
Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.14	0.047	ug/L		12/17/16 13:06	12/22/16 12:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*96*		*70 - 130*	*12/17/16 13:06*	*12/22/16 12:50*	*1*
13C2 PFDA	*100*		*70 - 130*	*12/17/16 13:06*	*12/22/16 12:50*	*1*

Surrogate Summary

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

TestAmerica Job ID: 320-24441-1

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

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)									
Lab Sample ID	Client Sample ID	3C2 PFHx (70-130)	3C2 PFDA (70-130)								
320-24441-1	WI-AF-3RW35-1216	102	103								
320-24441-2	WI-AF-3FB35-1216	96	100								
LCS 320-142683/2-A	Lab Control Sample	111	113								
LCSD 320-142683/3-A	Lab Control Sample Dup	114	114								
MB 320-142683/1-A	Method Blank	103	104								

Surrogate Legend

13C2 PFHxA = 13C2 PFHxA

13C2 PFDA = 13C2 PFDA

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

Lab Sample ID: MB 320-142683/1-A
Matrix: Water
Analysis Batch: 143413

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 142683

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		12/17/16 13:06	12/22/16 10:51	1
Perfluorooctanoic acid (PFOA)	0.024	U	0.030	0.0094	ug/L		12/17/16 13:06	12/22/16 10:51	1
Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.14	0.048	ug/L		12/17/16 13:06	12/22/16 10:51	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*103*		*70 - 130*	*12/17/16 13:06*	*12/22/16 10:51*	*1*
13C2 PFDA	*104*		*70 - 130*	*12/17/16 13:06*	*12/22/16 10:51*	*1*

Lab Sample ID: LCS 320-142683/2-A
Matrix: Water
Analysis Batch: 143413

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 142683

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorooctanesulfonic acid (PFOS)	0.160	0.149		ug/L		93	70 - 130
Perfluorooctanoic acid (PFOA)	0.0811	0.0740		ug/L		91	70 - 130
Perfluorobutanesulfonic acid (PFBS)	0.359	0.340		ug/L		95	70 - 130

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C2 PFHxA	*111*		*70 - 130*
13C2 PFDA	*113*		*70 - 130*

Lab Sample ID: LCSD 320-142683/3-A
Matrix: Water
Analysis Batch: 143413

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 142683

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorooctanesulfonic acid (PFOS)	0.160	0.158		ug/L		99	70 - 130	6	30
Perfluorooctanoic acid (PFOA)	0.0811	0.0751		ug/L		93	70 - 130	1	30
Perfluorobutanesulfonic acid (PFBS)	0.359	0.352		ug/L		98	70 - 130	4	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C2 PFHxA	*114*		*70 - 130*
13C2 PFDA	*114*		*70 - 130*

QC Association Summary

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

TestAmerica Job ID: 320-24441-1

LCMS

Prep Batch: 142683

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-24441-1	WI-AF-3RW35-1216	Total/NA	Water	537	
320-24441-2	WI-AF-3FB35-1216	Total/NA	Water	537	
MB 320-142683/1-A	Method Blank	Total/NA	Water	537	
LCS 320-142683/2-A	Lab Control Sample	Total/NA	Water	537	
LCSD 320-142683/3-A	Lab Control Sample Dup	Total/NA	Water	537	

Analysis Batch: 143413

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-24441-1	WI-AF-3RW35-1216	Total/NA	Water	537	142683
320-24441-2	WI-AF-3FB35-1216	Total/NA	Water	537	142683
MB 320-142683/1-A	Method Blank	Total/NA	Water	537	142683
LCS 320-142683/2-A	Lab Control Sample	Total/NA	Water	537	142683
LCSD 320-142683/3-A	Lab Control Sample Dup	Total/NA	Water	537	142683

Lab Chronicle

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

TestAmerica Job ID: 320-24441-1

Client Sample ID: WI-AF-3RW35-1216

Lab Sample ID: 320-24441-1

Date Collected: 12/14/16 14:25

Matrix: Water

Date Received: 12/16/16 10:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			266 mL	1.0 mL	142683	12/17/16 13:06	VPM	TAL SAC
Total/NA	Analysis	537		1			143413	12/22/16 12:20	CBW	TAL SAC

Client Sample ID: WI-AF-3FB35-1216

Lab Sample ID: 320-24441-2

Date Collected: 12/14/16 14:26

Matrix: Water

Date Received: 12/16/16 10:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			251.3 mL	1.0 mL	142683	12/17/16 13:06	VPM	TAL SAC
Total/NA	Analysis	537		1			143413	12/22/16 12:50	CBW	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: 320-24441-1

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

Method Summary

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

TestAmerica Job ID: 320-24441-1

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

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

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

Sample Summary

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

TestAmerica Job ID: 320-24441-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-24441-1	WI-AF-3RW35-1216	Water	12/14/16 14:25	12/16/16 10:05
320-24441-2	WI-AF-3FB35-1216	Water	12/14/16 14:26	12/16/16 10:05

TestAmerica Sacramento
880 Riverside Parkway

West Sacramento, CA 95605
phone 916.373.5600 fax

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

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

Client Contact	Project Manager: Katie Tippin	Site Contact: Eric Epple	Date: 12/15/2016	COC No: 9
Tiffany Hill	Tel/Fax: (757) 671-6258	Lab Contact: Laura Turpen	Carrier: FedEx	1 of 1 COCs
Project Chemist	Analysis Turnaround Time			Sampler:
1100 NE Circle Blvd Ste 300 Corvallis, OR 97330	☑CALENDAR DAYS ☐WORKING DAYS			For Lab Use Only:
(541) 768-3109	TAT if different from Below _____7-Day_____			Walk-in Client:
(541) 908-3794	☐ 2 weeks			Lab Sampling:
Project Name: CTO-08	☐ 1 week			
Site: NAS Whidbey Island	☐ 2 days			Job / SDG No.:
P O #: 100067106050 - 679580.06.FI.FS	☐ 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)	USEPA Method 537 (PFOA, PFOS, and PFBS)	Sample Specific Notes:
WI-AF-3RW35-1216	12/14/16	1425	G	DW	2	N	N	X	
WI-AF-3FB35-1216	12/14/16	1426	G	DW	2	N	N	X	
								6	

320-24441 Chain of Custody

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

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

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

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

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

Special Instructions/QC Requirements & Comments:

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd: 2.4 | Corr'd: 1.5 | Therm ID No.: 12

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Eric Epple	CH2M	12-15-16/1600		TA-SAC	12/16/16 10:05
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Form No. CA-C-WI-002, Rev. 4.3, dated 12/05/2013

Login Sample Receipt Checklist

Client: CH2M Hill Constructors, Inc.

Job Number: 320-24441-1

Login Number: 24441
List Number: 1
Creator: Nelson, Kym D

List Source: TestAmerica Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	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 <6mm (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: 320-24441-1

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
12/23/2016 3:21 PM

Laura Turpen, Project Manager I
880 Riverside Parkway, West Sacramento, CA, 95605
(916)374-4414
laura.turpen@testamericainc.com
12/23/2016

Table of Contents

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Project/Site: Whidbey Island

TestAmerica Job ID: 320-24441-1

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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: 320-24441-1

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.

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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.

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

RECEIPT

The samples were received on 12/16/2016; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 1.5 C.

An extended TAT was requested by the client via an email on December 8. Samples received the week of December 12 were requested to have a due date of December 27, 2016.

PFOA/PFOS

Samples WI-AF-3RW35-1216 (320-24441-1) and WI-AF-3FB35-1216 (320-24441-2) were analyzed for PFOA/PFOS in accordance with 537. The samples were prepared on 12/17/2016 and analyzed on 12/22/2016.

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-142683.

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: 320-24441-1

Client Sample ID: WI-AF-3RW35-1216 — Lab Sample ID: 320-24441-1

No Detections.

Client Sample ID: WI-AF-3FB35-1216 — Lab Sample ID: 320-24441-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample ID: WI-AF-3RW35-1216

Lab Sample ID: 320-24441-1

Date Collected: 12/14/16 14:25

Matrix: Water

Date Received: 12/16/16 10:05

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.045	U	0.056	0.015	ug/L		12/17/16 13:06	12/22/16 12:20	1
Perfluorooctanoic acid (PFOA)	0.023	U	0.028	0.0089	ug/L		12/17/16 13:06	12/22/16 12:20	1
Perfluorobutanesulfonic acid (PFBS)	0.10	U	0.13	0.045	ug/L		12/17/16 13:06	12/22/16 12:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*102*		*70 - 130*	*12/17/16 13:06*	*12/22/16 12:20*	*1*
13C2 PFDA	*103*		*70 - 130*	*12/17/16 13:06*	*12/22/16 12:20*	*1*

Client Sample ID: WI-AF-3FB35-1216

Lab Sample ID: 320-24441-2

Date Collected: 12/14/16 14:26

Matrix: Water

Date Received: 12/16/16 10:05

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	0.015	ug/L		12/17/16 13:06	12/22/16 12:50	1
Perfluorooctanoic acid (PFOA)	0.024	U	0.030	0.0094	ug/L		12/17/16 13:06	12/22/16 12:50	1
Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.14	0.047	ug/L		12/17/16 13:06	12/22/16 12:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*96*		*70 - 130*	*12/17/16 13:06*	*12/22/16 12:50*	*1*
13C2 PFDA	*100*		*70 - 130*	*12/17/16 13:06*	*12/22/16 12:50*	*1*

Default Detection Limits

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

TestAmerica Job ID: 320-24441-1

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: 320-24441-1

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

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)									
		3C2 PFHx	3C2 PFDA								
Lab Sample ID	Client Sample ID	(70-130)	(70-130)								
320-24441-1	WI-AF-3RW35-1216	102	103								
320-24441-2	WI-AF-3FB35-1216	96	100								
LCS 320-142683/2-A	Lab Control Sample	111	113								
LCSD 320-142683/3-A	Lab Control Sample Dup	114	114								
MB 320-142683/1-A	Method Blank	103	104								

Surrogate Legend

13C2 PFHxA = 13C2 PFHxA

13C2 PFDA = 13C2 PFDA

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

Lab Sample ID: MB 320-142683/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 143413 — **Prep Batch: 142683**

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		12/17/16 13:06	12/22/16 10:51	1
Perfluorooctanoic acid (PFOA)	0.024	U	0.030	0.0094	ug/L		12/17/16 13:06	12/22/16 10:51	1
Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.14	0.048	ug/L		12/17/16 13:06	12/22/16 10:51	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*103*		*70 - 130*	*12/17/16 13:06*	*12/22/16 10:51*	*1*
13C2 PFDA	*104*		*70 - 130*	*12/17/16 13:06*	*12/22/16 10:51*	*1*

Lab Sample ID: LCS 320-142683/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 143413 — **Prep Batch: 142683**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorooctanesulfonic acid (PFOS)	0.160	0.149		ug/L		93	70 - 130
Perfluorooctanoic acid (PFOA)	0.0811	0.0740		ug/L		91	70 - 130
Perfluorobutanesulfonic acid (PFBS)	0.359	0.340		ug/L		95	70 - 130

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C2 PFHxA	*111*		*70 - 130*
13C2 PFDA	*113*		*70 - 130*

Lab Sample ID: LCSD 320-142683/3-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 143413 — **Prep Batch: 142683**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorooctanesulfonic acid (PFOS)	0.160	0.158		ug/L		99	70 - 130	6	30
Perfluorooctanoic acid (PFOA)	0.0811	0.0751		ug/L		93	70 - 130	1	30
Perfluorobutanesulfonic acid (PFBS)	0.359	0.352		ug/L		98	70 - 130	4	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C2 PFHxA	*114*		*70 - 130*
13C2 PFDA	*114*		*70 - 130*

LCMS

Prep Batch: 142683

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-24441-1	WI-AF-3RW35-1216	Total/NA	Water	537	
320-24441-2	WI-AF-3FB35-1216	Total/NA	Water	537	
MB 320-142683/1-A	Method Blank	Total/NA	Water	537	
LCS 320-142683/2-A	Lab Control Sample	Total/NA	Water	537	
LCSD 320-142683/3-A	Lab Control Sample Dup	Total/NA	Water	537	

Analysis Batch: 143413

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-24441-1	WI-AF-3RW35-1216	Total/NA	Water	537	142683
320-24441-2	WI-AF-3FB35-1216	Total/NA	Water	537	142683
MB 320-142683/1-A	Method Blank	Total/NA	Water	537	142683
LCS 320-142683/2-A	Lab Control Sample	Total/NA	Water	537	142683
LCSD 320-142683/3-A	Lab Control Sample Dup	Total/NA	Water	537	142683

Lab Chronicle

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

TestAmerica Job ID: 320-24441-1

Client Sample ID: WI-AF-3RW35-1216

Lab Sample ID: 320-24441-1

Date Collected: 12/14/16 14:25

Matrix: Water

Date Received: 12/16/16 10:05

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			142683	12/17/16 13:06	VPM	TAL SAC
Total/NA	Analysis	537		1	143413	12/22/16 12:20	CBW	TAL SAC

Client Sample ID: WI-AF-3FB35-1216

Lab Sample ID: 320-24441-2

Date Collected: 12/14/16 14:26

Matrix: Water

Date Received: 12/16/16 10:05

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			142683	12/17/16 13:06	VPM	TAL SAC
Total/NA	Analysis	537		1	143413	12/22/16 12:50	CBW	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: 320-24441-1

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

Method Summary

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

TestAmerica Job ID: 320-24441-1

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

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

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

Sample Summary

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

TestAmerica Job ID: 320-24441-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-24441-1	WI-AF-3RW35-1216	Water	12/14/16 14:25	12/16/16 10:05
320-24441-2	WI-AF-3FB35-1216	Water	12/14/16 14:26	12/16/16 10:05

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24441-1

SDG No.:

Instrument ID: A6 Analysis Batch Number: 140688

Lab Sample ID: STD 320-140688/2 IC Client Sample ID:

Date Analyzed: 12/05/16 17:26 Lab File ID: 05DEC2016A6A_004.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid	19.37	Split Peak	barnettj	12/06/16 10:00
Perfluorooctanoic acid (PFOA)	20.05	Split Peak	barnettj	12/06/16 10:00

Lab Sample ID: STD 320-140688/3 IC Client Sample ID:

Date Analyzed: 12/05/16 17:55 Lab File ID: 05DEC2016A6A_005.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid	19.38	Split Peak	barnettj	12/06/16 10:03
Perfluorooctanoic acid (PFOA)	20.05	Split Peak	barnettj	12/06/16 10:03

Lab Sample ID: CCV 320-140688/9 CCVL Client Sample ID:

Date Analyzed: 12/05/16 20:53 Lab File ID: 05DEC2016A6A_011.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid	19.38	Split Peak	barnettj	12/06/16 10:08
Perfluorooctanoic acid (PFOA)	20.05	Split Peak	barnettj	12/06/16 10:08

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24441-1

SDG No.:

Instrument ID: A6 Analysis Batch Number: 143413

Lab Sample ID: CCV 320-143413/34 CCVIS Client Sample ID:

Date Analyzed: 12/22/16 15:54 Lab File ID: 19DEC2016A6A_159.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid	19.36	Split Peak	westendorfc	12/22/16 16:50

537

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24441-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
LC537-ICV_00017	01/13/17	08/09/16	MeOH/H2O, Lot 067374	10 mL	LC537-IS_00018	200 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
.LC537-IS_00018	01/13/17	07/13/16	Methanol, Lot 090285	10000 uL	LCM2PFOA_00004	100 uL	13C2-PFOA	0.5 ug/mL
					LCMPFOS_00013	300 uL	13C4 PFOS	1.434 ug/mL
..LCM2PFOA_00004	03/19/17	Wellington Laboratories, Lot M2PFOA0312			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00013	01/22/21	Wellington Laboratories, Lot MPFOS0116			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
LC537-ICV_00017	01/13/17	08/09/16	MeOH/H2O, Lot 067374	10 mL	LC537-SU_00017	500 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
					LC537ICIM_00013	25 uL	Perfluorobutanesulfonic acid (PFBS)	114.77 ng/mL
							Perfluorooctanoic acid (PFOA)	25.0965 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	27.2389 ng/mL
.LC537-SU_00017	01/19/17	07/19/16	Methanol, Lot 104453	25000 uL	LCMPFDA_00008	100 uL	13C2 PFDA	0.2 ug/mL
					LCMPFHxA_00009	100 uL	13C2 PFHxA	0.2 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
.LC537ICIM_00013	02/05/17	08/09/16	Methanol, Lot 090285	25 mL	LC537-PFBS2_00005	0.5 mL	Perfluorobutanesulfonic acid (PFBS)	45.908 ug/mL
					LC537-PFOA2_00007	0.13 mL	Perfluorooctanoic acid (PFOA)	10.0386 ug/mL
					LC537-PFOS2_00005	0.22 mL	Perfluorooctanesulfonic acid (PFOS)	10.8956 ug/mL
..LC537-PFBS2_00005	03/01/17	02/29/16	Methanol, Lot 090285	10 mL	LC537_PFBS2_00001	0.023 g	Perfluorobutanesulfonic acid (PFBS)	2295.4 ug/mL
...LC537_PFBS2_00001	08/09/17	Santa Cruz Biotechnology, Lot H0112			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	0.998 g/g
..LC537-PFOA2_00007	07/25/17	08/05/16	Methanol, Lot 090285	10 mL	LC537_PFOA2_00001	0.0195 g	Perfluorooctanoic acid (PFOA)	1930.5 ug/mL
...LC537_PFOA2_00001	07/25/17	Afla Aesar, Lot D24Y026			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.99 g/g
..LC537-PFOS2_00005	03/01/17	02/29/16	Methanol, Lot 090285	10 mL	LC537_PFOS2_00001	0.0159 g	Perfluorooctanesulfonic acid (PFOS)	1238.13 ug/mL
...LC537_PFOS2_00001	07/26/17	Sigma, Lot BCBF5116V			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.7787 g/g
LC537-IS_00027	03/19/17	12/14/16	Methanol, Lot 090285	10000 uL	LCM2PFOA_00003	100 uL	13C2-PFOA	0.5 ug/mL
					LCMPFOS_00018	300 uL	13C4 PFOS	1.434 ug/mL
.LCM2PFOA_00003	03/19/17	Wellington Laboratories, Lot M2PFOA0312			(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-L1_00015	01/13/17	07/28/16	MeOH/H2O, Lot 090285	5 mL	LC537-IS_00018	100 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-MSP_00012	24.4 uL	Perfluorobutanesulfonic acid (PFBS)	8.76058 ng/mL
							Perfluoroheptanoic acid	0.993847 ng/mL
							Perfluorohexanesulfonic acid	2.9532 ng/mL
							Perfluorononanoic acid	1.91737 ng/mL
							Perfluorooctanoic acid (PFOA)	1.9793 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	3.91048 ng/mL
					LC537-SU_00017	250 uL	13C2 PFDA	10 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24441-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							13C2 PFHxA	10 ng/mL
.LC537-IS_00018	01/13/17	07/13/16	Methanol, Lot 090285	10000 uL	LCM2PFOA_00004	100 uL	13C2-PFOA	0.5 ug/mL
					LCMPFOS_00013	300 uL	13C4 PFOS	1.434 ug/mL
..LCM2PFOA_00004	03/19/17	Wellington Laboratories, Lot M2PFOA0312			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00013	01/22/21	Wellington Laboratories, Lot MPFOS0116			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-MSP_00012	01/28/17	07/28/16	Methanol, Lot 090285	10000 uL	LC537SPIM_00012	200 uL	Perfluorobutanesulfonic acid (PFBS)	1795.2 ng/mL
							Perfluoroheptanoic acid	203.657 ng/mL
							Perfluorohexanesulfonic acid	605.164 ng/mL
							Perfluorononanoic acid	392.904 ng/mL
							Perfluorooctanoic acid (PFOA)	405.594 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	801.328 ng/mL
..LC537SPIM_00012	01/28/17	07/28/16	Methanol, Lot 104453	10 mL	LC537-PFBS_00006	0.44 mL	Perfluorobutanesulfonic acid (PFBS)	89.76 ug/mL
					LC537-PFHpA_00010	0.1 mL	Perfluoroheptanoic acid	10.1829 ug/mL
					LC537-PFHxS_00008	0.3 mL	Perfluorohexanesulfonic acid	30.2582 ug/mL
					LC537-PFNA_00008	0.2 mL	Perfluorononanoic acid	19.6452 ug/mL
					LC537-PFOA_00009	0.098 mL	Perfluorooctanoic acid (PFOA)	20.2797 ug/mL
					LC537-PFOS_00006	0.4 mL	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_00010	07/28/17	07/28/16	Methanol, Lot 090285	7 mL	LC537_PFHpA_00002	0.0072 g	Perfluoroheptanoic acid	1018.29 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_00008	07/28/17	07/28/16	Methanol, Lot 090285	5 mL	LC537_PFNA_00002	0.0051 g	Perfluorononanoic acid	982.26 ug/mL
....LC537_PFNA_00002	04/01/18	TCI America, Lot QN44F			(Purchased Reagent)		Perfluorononanoic acid	0.963 g/g
...LC537-PFOA_00009	07/28/17	07/28/16	Methanol, Lot 090285	7 mL	LC537_PFOA_00002	0.0145 g	Perfluorooctanoic acid (PFOA)	2069.36 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_00017	01/19/17	07/19/16	Methanol, Lot 104453	25000 uL	LCMPFDA_00008	100 uL	13C2 PFDA	0.2 ug/mL
					LCMPFHxA_00009	100 uL	13C2 PFHxA	0.2 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
LC537-L2_00014	01/13/17	07/28/16	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00010	34 uL	Perfluorobutanesulfonic acid (PFBS)	22.8888 ng/mL
							Perfluoroheptanoic acid	2.59663 ng/mL
							Perfluorohexanesulfonic acid	7.71585 ng/mL
							Perfluorononanoic acid	5.00953 ng/mL
							Perfluorooctanoic acid (PFOA)	5.17132 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	10.2169 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24441-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LC537-IS_00018	100 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00017	250 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00010	01/28/17	07/28/16	Methanol, Lot 090285	10000 uL	LC537SPIM_00012	375 uL	Perfluorobutanesulfonic acid (PFBS)	3366 ng/mL
							Perfluoroheptanoic acid	381.857 ng/mL
							Perfluorohexanesulfonic acid	1134.68 ng/mL
							Perfluorononanoic acid	736.695 ng/mL
							Perfluorooctanoic acid (PFOA)	760.489 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	1502.49 ng/mL
..LC537SPIM_00012	01/28/17	07/28/16	Methanol, Lot 104453	10 mL	LC537-PFBS_00006	0.44 mL	Perfluorobutanesulfonic acid (PFBS)	89.76 ug/mL
					LC537-PFHpA_00010	0.1 mL	Perfluoroheptanoic acid	10.1829 ug/mL
					LC537-PFHxS_00008	0.3 mL	Perfluorohexanesulfonic acid	30.2582 ug/mL
					LC537-PFNA_00008	0.2 mL	Perfluorononanoic acid	19.6452 ug/mL
					LC537-PFOA_00009	0.098 mL	Perfluorooctanoic acid (PFOA)	20.2797 ug/mL
					LC537-PFOS_00006	0.4 mL	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_00010	07/28/17	07/28/16	Methanol, Lot 090285	7 mL	LC537_PFHpA_00002	0.0072 g	Perfluoroheptanoic acid	1018.29 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_00008	07/28/17	07/28/16	Methanol, Lot 090285	5 mL	LC537_PFNA_00002	0.0051 g	Perfluorononanoic acid	982.26 ug/mL
....LC537_PFNA_00002	04/01/18		TCI America, Lot QN44F		(Purchased Reagent)		Perfluorononanoic acid	0.963 g/g
...LC537-PFOA_00009	07/28/17	07/28/16	Methanol, Lot 090285	7 mL	LC537_PFOA_00002	0.0145 g	Perfluorooctanoic acid (PFOA)	2069.36 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_00018	01/13/17	07/13/16	Methanol, Lot 090285	10000 uL	LCM2PFOA_00004	100 uL	13C2-PFOA	0.5 ug/mL
					LCMPFOS_00013	300 uL	13C4 PFOS	1.434 ug/mL
..LCM2PFOA_00004	03/19/17		Wellington Laboratories, Lot M2PFOA0312		(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00013	01/22/21		Wellington Laboratories, Lot MPFOS0116		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-SU_00017	01/19/17	07/19/16	Methanol, Lot 104453	25000 uL	LCMPFDA_00008	100 uL	13C2 PFDA	0.2 ug/mL
					LCMPFHxA_00009	100 uL	13C2 PFHxA	0.2 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
LC537-L3_00016	01/28/17	11/07/16	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00010	67 uL	Perfluorobutanesulfonic acid (PFBS)	45.1044 ng/mL
							Perfluoroheptanoic acid	5.11689 ng/mL
							Perfluorohexanesulfonic acid	15.2048 ng/mL
							Perfluorononanoic acid	9.87171 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24441-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorooctanoic acid (PFOA)	10.1905 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	20.1334 ng/mL
					LC537-IS_00024	100 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00020	250 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00010	01/28/17	07/28/16	Methanol, Lot 090285	10000 uL	LC537SPIM_00012	375 uL	Perfluorobutanesulfonic acid (PFBS)	3366 ng/mL
							Perfluoroheptanoic acid	381.857 ng/mL
							Perfluorohexanesulfonic acid	1134.68 ng/mL
							Perfluorononanoic acid	736.695 ng/mL
							Perfluorooctanoic acid (PFOA)	760.489 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	1502.49 ng/mL
..LC537SPIM_00012	01/28/17	07/28/16	Methanol, Lot 104453	10 mL	LC537-PFBS_00006	0.44 mL	Perfluorobutanesulfonic acid (PFBS)	89.76 ug/mL
					LC537-PFHpA_00010	0.1 mL	Perfluoroheptanoic acid	10.1829 ug/mL
					LC537-PFHxS_00008	0.3 mL	Perfluorohexanesulfonic acid	30.2582 ug/mL
					LC537-PFNA_00008	0.2 mL	Perfluorononanoic acid	19.6452 ug/mL
					LC537-PFOA_00009	0.098 mL	Perfluorooctanoic acid (PFOA)	20.2797 ug/mL
					LC537-PFOS_00006	0.4 mL	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_00010	07/28/17	07/28/16	Methanol, Lot 090285	7 mL	LC537_PFHpA_00002	0.0072 g	Perfluoroheptanoic acid	1018.29 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_00008	07/28/17	07/28/16	Methanol, Lot 090285	5 mL	LC537_PFNA_00002	0.0051 g	Perfluorononanoic acid	982.26 ug/mL
....LC537_PFNA_00002	04/01/18		TCI America, Lot QN44F		(Purchased Reagent)		Perfluorononanoic acid	0.963 g/g
...LC537-PFOA_00009	07/28/17	07/28/16	Methanol, Lot 090285	7 mL	LC537_PFOA_00002	0.0145 g	Perfluorooctanoic acid (PFOA)	2069.36 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_00024	03/19/17	11/03/16	Methanol, Lot 090285	10000 uL	LCM2PFOA_00003	100 uL	13C2-PFOA	0.5 ug/mL
					LCMPFOS_00018	300 uL	13C4 PFOS	1.434 ug/mL
..LCM2PFOA_00003	03/19/17		Wellington Laboratories, Lot M2PFOA0312		(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_00020	04/07/17	10/07/16	Methanol, Lot 104453	25000 uL	LCMPFDA_00008	100 uL	13C2 PFDA	0.2 ug/mL
					LCMPFHxA_00009	100 uL	13C2 PFHxA	0.2 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
LC537-L4_00015	01/13/17	07/28/16	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00010	135 uL	Perfluorobutanesulfonic acid (PFBS)	90.882 ng/mL

Lab Name: TestAmerica Sacramento Job No.: 320-24441-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluoroheptanoic acid	10.3101 ng/mL
							Perfluorohexanesulfonic acid	30.6364 ng/mL
							Perfluorononanoic acid	19.8908 ng/mL
							Perfluorooctanoic acid (PFOA)	20.5332 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	40.5672 ng/mL
					LC537-IS_00018	100 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00017	250 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00010	01/28/17	07/28/16	Methanol, Lot 090285	10000 uL	LC537SPIM_00012	375 uL	Perfluorobutanesulfonic acid (PFBS)	3366 ng/mL
							Perfluoroheptanoic acid	381.857 ng/mL
							Perfluorohexanesulfonic acid	1134.68 ng/mL
							Perfluorononanoic acid	736.695 ng/mL
							Perfluorooctanoic acid (PFOA)	760.489 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	1502.49 ng/mL
..LC537SPIM_00012	01/28/17	07/28/16	Methanol, Lot 104453	10 mL	LC537-PFBS_00006	0.44 mL	Perfluorobutanesulfonic acid (PFBS)	89.76 ug/mL
					LC537-PFHpA_00010	0.1 mL	Perfluoroheptanoic acid	10.1829 ug/mL
					LC537-PFHxS_00008	0.3 mL	Perfluorohexanesulfonic acid	30.2582 ug/mL
					LC537-PFNA_00008	0.2 mL	Perfluorononanoic acid	19.6452 ug/mL
					LC537-PFOA_00009	0.098 mL	Perfluorooctanoic acid (PFOA)	20.2797 ug/mL
					LC537-PFOS_00006	0.4 mL	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_00010	07/28/17	07/28/16	Methanol, Lot 090285	7 mL	LC537_PFHpA_00002	0.0072 g	Perfluoroheptanoic acid	1018.29 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_00008	07/28/17	07/28/16	Methanol, Lot 090285	5 mL	LC537_PFNA_00002	0.0051 g	Perfluorononanoic acid	982.26 ug/mL
....LC537_PFNA_00002	04/01/18		TCI America, Lot QN44F		(Purchased Reagent)		Perfluorononanoic acid	0.963 g/g
...LC537-PFOA_00009	07/28/17	07/28/16	Methanol, Lot 090285	7 mL	LC537_PFOA_00002	0.0145 g	Perfluorooctanoic acid (PFOA)	2069.36 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_00018	01/13/17	07/13/16	Methanol, Lot 090285	10000 uL	LCM2PFOA_00004	100 uL	13C2-PFOA	0.5 ug/mL
					LCMPFOS_00013	300 uL	13C4 PFOS	1.434 ug/mL
..LCM2PFOA_00004	03/19/17		Wellington Laboratories, Lot M2PFOA0312		(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00013	01/22/21		Wellington Laboratories, Lot MPFOS0116		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-SU_00017	01/19/17	07/19/16	Methanol, Lot 104453	25000 uL	LCMPFDA_00008	100 uL	13C2 PFDA	0.2 ug/mL
					LCMPFHxA_00009	100 uL	13C2 PFHxA	0.2 ug/mL
..LCMPFDA_00008	08/19/20		Wellington Laboratories, Lot MPFDA0815		(Purchased Reagent)		13C2 PFDA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24441-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCMPFHxA_00009	04/09/20	Wellington Laboratories, Lot MPFHxA0415			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
LC537-L5_00017	01/28/17	11/07/16	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00010	200 uL	Perfluorobutanesulfonic acid (PFBS)	134.64 ng/mL
							Perfluoroheptanoic acid	15.2743 ng/mL
							Perfluorohexanesulfonic acid	45.3873 ng/mL
							Perfluorononanoic acid	29.4678 ng/mL
							Perfluorooctanoic acid (PFOA)	30.4196 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	60.0996 ng/mL
					LC537-IS_00024	100 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00020	250 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00010	01/28/17	07/28/16	Methanol, Lot 090285	10000 uL	LC537SPIM_00012	375 uL	Perfluorobutanesulfonic acid (PFBS)	3366 ng/mL
							Perfluoroheptanoic acid	381.857 ng/mL
							Perfluorohexanesulfonic acid	1134.68 ng/mL
							Perfluorononanoic acid	736.695 ng/mL
							Perfluorooctanoic acid (PFOA)	760.489 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	1502.49 ng/mL
..LC537SPIM_00012	01/28/17	07/28/16	Methanol, Lot 104453	10 mL	LC537-PFBS_00006	0.44 mL	Perfluorobutanesulfonic acid (PFBS)	89.76 ug/mL
					LC537-PFHpA_00010	0.1 mL	Perfluoroheptanoic acid	10.1829 ug/mL
					LC537-PFHxS_00008	0.3 mL	Perfluorohexanesulfonic acid	30.2582 ug/mL
					LC537-PFNA_00008	0.2 mL	Perfluorononanoic acid	19.6452 ug/mL
					LC537-PFOA_00009	0.098 mL	Perfluorooctanoic acid (PFOA)	20.2797 ug/mL
					LC537-PFOS_00006	0.4 mL	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_00010	07/28/17	07/28/16	Methanol, Lot 090285	7 mL	LC537_PFHpA_00002	0.0072 g	Perfluoroheptanoic acid	1018.29 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_00008	07/28/17	07/28/16	Methanol, Lot 090285	5 mL	LC537_PFNA_00002	0.0051 g	Perfluorononanoic acid	982.26 ug/mL
....LC537_PFNA_00002	04/01/18	TCI America, Lot QN44F			(Purchased Reagent)		Perfluorononanoic acid	0.963 g/g
...LC537-PFOA_00009	07/28/17	07/28/16	Methanol, Lot 090285	7 mL	LC537_PFOA_00002	0.0145 g	Perfluorooctanoic acid (PFOA)	2069.36 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_00024	03/19/17	11/03/16	Methanol, Lot 090285	10000 uL	LCM2PFOA_00003	100 uL	13C2-PFOA	0.5 ug/mL
					LCMPFOS_00018	300 uL	13C4 PFOS	1.434 ug/mL
..LCM2PFOA_00003	03/19/17	Wellington Laboratories, Lot M2PFOA0312			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00018	08/03/21	Wellington Laboratories, Lot MPFOS0816			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-24441-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LC537-SU_00020	04/07/17	10/07/16	Methanol, Lot 104453	25000 uL	LCMPFDA_00008	100 uL	13C2 PFDA	0.2 ug/mL
					LCMPFHxA_00009	100 uL	13C2 PFHxA	0.2 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
LC537-L6_00014	01/13/17	07/28/16	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00010	265 uL	Perfluorobutanesulfonic acid (PFBS)	178.398 ng/mL
							Perfluoroheptanoic acid	20.2384 ng/mL
							Perfluorohexanesulfonic acid	60.1382 ng/mL
							Perfluorononanoic acid	39.0448 ng/mL
							Perfluorooctanoic acid (PFOA)	40.3059 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	79.632 ng/mL
					LC537-IS_00018	100 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00017	250 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00010	01/28/17	07/28/16	Methanol, Lot 090285	10000 uL	LC537SPIM_00012	375 uL	Perfluorobutanesulfonic acid (PFBS)	3366 ng/mL
							Perfluoroheptanoic acid	381.857 ng/mL
							Perfluorohexanesulfonic acid	1134.68 ng/mL
							Perfluorononanoic acid	736.695 ng/mL
							Perfluorooctanoic acid (PFOA)	760.489 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	1502.49 ng/mL
..LC537SPIM_00012	01/28/17	07/28/16	Methanol, Lot 104453	10 mL	LC537-PFBS_00006	0.44 mL	Perfluorobutanesulfonic acid (PFBS)	89.76 ug/mL
					LC537-PFHpA_00010	0.1 mL	Perfluoroheptanoic acid	10.1829 ug/mL
					LC537-PFHxS_00008	0.3 mL	Perfluorohexanesulfonic acid	30.2582 ug/mL
					LC537-PFNA_00008	0.2 mL	Perfluorononanoic acid	19.6452 ug/mL
					LC537-PFOA_00009	0.098 mL	Perfluorooctanoic acid (PFOA)	20.2797 ug/mL
					LC537-PFOS_00006	0.4 mL	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_00010	07/28/17	07/28/16	Methanol, Lot 090285	7 mL	LC537_PFHpA_00002	0.0072 g	Perfluoroheptanoic acid	1018.29 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_00008	07/28/17	07/28/16	Methanol, Lot 090285	5 mL	LC537_PFNA_00002	0.0051 g	Perfluorononanoic acid	982.26 ug/mL
....LC537_PFNA_00002	04/01/18	TCI America, Lot QN44F			(Purchased Reagent)		Perfluorononanoic acid	0.963 g/g
...LC537-PFOA_00009	07/28/17	07/28/16	Methanol, Lot 090285	7 mL	LC537_PFOA_00002	0.0145 g	Perfluorooctanoic acid (PFOA)	2069.36 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_00018	01/13/17	07/13/16	Methanol, Lot 090285	10000 uL	LCM2PFOA_00004	100 uL	13C2-PFOA	0.5 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24441-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCMPFOS_00013	300 uL	13C4 PFOS	1.434 ug/mL
..LCM2PFOA_00004	03/19/17	Wellington Laboratories, Lot M2PFOA0312			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00013	01/22/21	Wellington Laboratories, Lot MPFOS0116			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-SU_00017	01/19/17	07/19/16	Methanol, Lot 104453	25000 uL	LCMPFDA_00008	100 uL	13C2 PFDA	0.2 ug/mL
					LCMPFHxA_00009	100 uL	13C2 PFHxA	0.2 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
LC537-MSP_00014	03/14/17	09/14/16	Methanol, Lot 090285	10000 uL	LC537SPIM_00013	200 uL	Perfluorobutane Sulfonate	1795.2 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	1795.2 ng/mL
							Perfluoroheptanoic acid	203.657 ng/mL
							Perfluorohexanesulfonic acid	605.164 ng/mL
							Perfluorononanoic acid	392.904 ng/mL
							Perfluorooctanoic acid (PFOA)	405.594 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	801.328 ng/mL
.LC537SPIM_00013	03/14/17	09/14/16	Methanol, Lot 104453	10000 uL	LC537-PFBS_00006	440 uL	Perfluorobutane Sulfonate	89760 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	89760 ng/mL
					LC537-PFHpA_00010	100 uL	Perfluoroheptanoic acid	10182.9 ng/mL
					LC537-PFHxS_00008	300 uL	Perfluorohexanesulfonic acid	30258.2 ng/mL
					LC537-PFNA_00008	200 uL	Perfluorononanoic acid	19645.2 ng/mL
					LC537-PFOA_00009	98 uL	Perfluorooctanoic acid (PFOA)	20279.7 ng/mL
					LC537-PFOS_00006	400 uL	Perfluorooctanesulfonic acid (PFOS)	40066.4 ng/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_00010	07/28/17	07/28/16	Methanol, Lot 090285	7 mL	LC537_PFHpA_00002	0.0072 g	Perfluoroheptanoic acid	1018.29 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_00008	07/28/17	07/28/16	Methanol, Lot 090285	5 mL	LC537_PFNA_00002	0.0051 g	Perfluorononanoic acid	982.26 ug/mL
...LC537_PFNA_00002	04/01/18	TCI America, Lot QN44F			(Purchased Reagent)		Perfluorononanoic acid	0.963 g/g
..LC537-PFOA_00009	07/28/17	07/28/16	Methanol, Lot 090285	7 mL	LC537_PFOA_00002	0.0145 g	Perfluorooctanoic acid (PFOA)	2069.36 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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24441-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCMPFHxA_00009	04/09/20	Wellington Laboratories, Lot MPFHxA0415			(Purchased Reagent)		13C2 PFHxA	50 ug/mL

Reagent

LC537_PFBS_00002

R: 4/1/15 SRV

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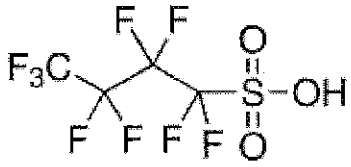
3050 Spruce Street, Saint Louis, MO 63103, USA
Website: www.sigmaaldrich.com
Email USA: techserv@sial.com
Outside USA: eurtechserv@sial.com

Certificate of Analysis

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

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



PFBS

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

Jamie Gleason

Jamie Gleason, Manager
Quality Control
Milwaukee, Wisconsin US

Reagent

LC537_PFBS2_00001

CERTIFICATE OF ANALYSIS

The Power to Question

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: n20/D

Reagent

LC537_PFHpA_00002

R: 4/1/15 SRV

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Certificate of Analysis

PFHpA

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

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

Claudia Geitner

Dr. Claudia Geitner
Manager Quality Control
Buchs, Switzerland

Reagent

LC537_PFHxS_00002

Y: 4/1/15 SKV

SIGMA-ALDRICH®

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

Certificate of Analysis

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

PFH_xS-K

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

Claudia Geitner

Dr. Claudia Geitner
Manager Quality Control
Buchs, Switzerland

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

Purity = 90.94 / w/m.w correction

SKV 4/1/15

Reagent

LC537_PFNA_00002

R: 4/1/15 SKV

Certificate of Analysis

Apr 2, 2015 (JST)

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

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

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

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

Customer service:

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

PFNA

Reagent

LC537_PFOA_00002

P: 3/26/15 RV

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: C8HF15O2
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

identiy (GC-MS)	complying
Assay (GCMS)	99.4 %
Date of Analysis	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 aliqout portions of the substance, the person handling the substance must assure, that the integrity of the substance is maintained and proper records of all its handlings are kept. Special care has to be taken to avoid any contamination or adulteration of the substance.
- We herewith confirm that the delivery is effected according to the technical delivery conditions agreed.
- Particular properties of the products or the suitability for a particular area of application are not assured.
- We guarantee a proper quality within our General Conditions of Sales.

Sigma-Aldrich Laborchemikalien GmbH
Quality Management SA-LC

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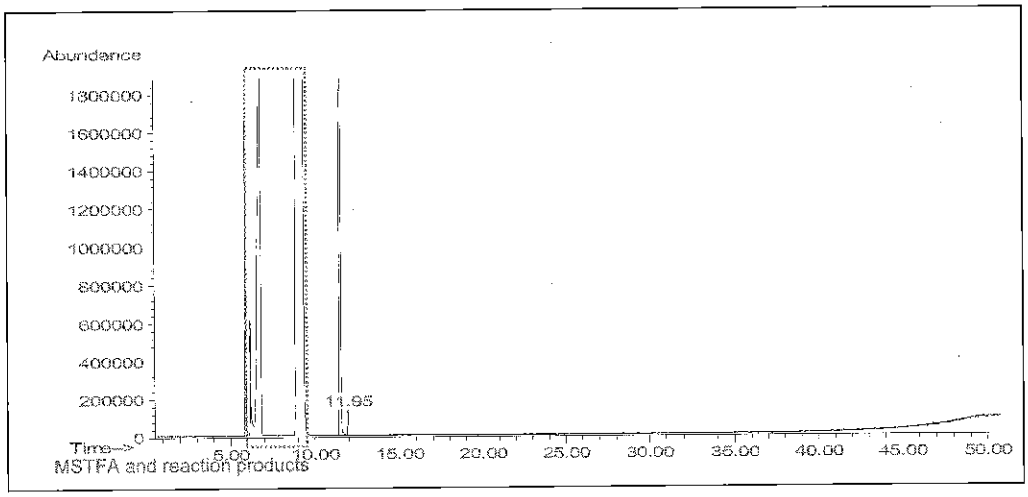
GC/MS-Method

Analytical Department

Article: **Pentadecafluorooctanoic acid OEKANAL**
Article-No.: **33824**
Batch: **SZBD308XV**

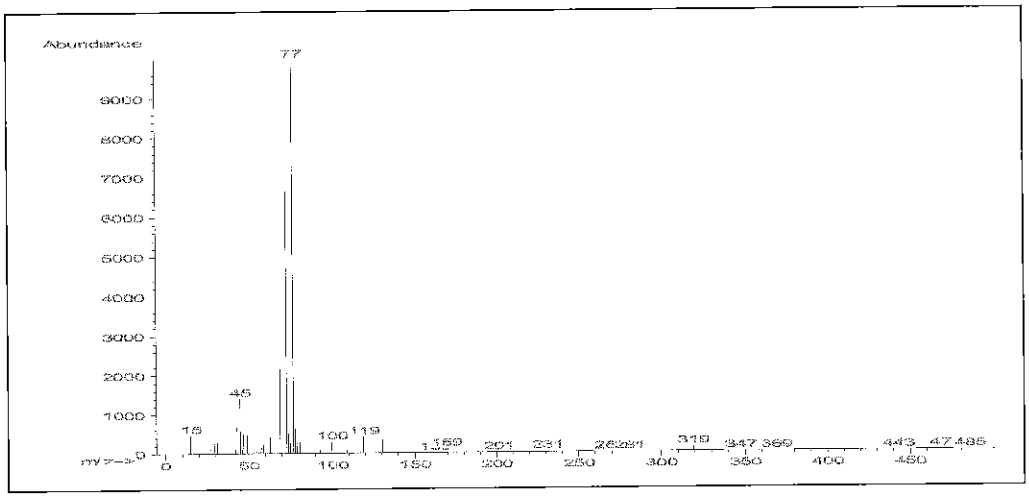
Column:	XTI-5 (Restek); 30 m; fs cap.; I.D.:0.25 mm; 1 µm df
Injector:	Split mode
Injection:	approx. 1 µl of reaction mixture with MSTFA (approx. 10 mg + 200 µl MSTFA)
Inj.-temp.:	280°C
Oven-temp.:	40°C (for 2 min) to 320°C (6°C/min) hold for 2 min
Split:	1:100
Flow:	1 ml He/min (Constant flow mode)
Detector:	MSD
Mass range:	10-600 amu (Scan mode)
Evaluation:	Purity: Total Ion Chromatogram (MSTFA and reaction products blinded out in report) Identity: Mass spectrum complies
Operator:	Ahrens / 2013-11-13

Total Ion Chromatogram:



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

Mass spectrum (rt = 11.54 min):



Reagent

LC537_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

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

Reagent

LC537_PFOS_00002

Γ: 4/1/15 SV

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CERTIFICATE OF ANALYSIS

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

Seelze, 13.08.2012/419060/12/17583

Order-No.:
Customer-No.:

Order-Code:

Quantity:

Production Date: 09.Aug.2012
Expiry Date: 09.Aug.2017 – EXP date

Article/Product: 33829 Batch : SZBC222XV

Heptadecafluorooctanesulfonic acid potassium salt OEKANAL® PFOS-K+

Reference Material (RM)

1. General Information

Formula: C8F17KO3S
CAS-No.: [2795-39-3]
Usage : PFOS

Molar mass: 538.22 g/Mole
Recomm. storage temp.: roomtemp.

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

2. Batch Analysis

Identity	complying
Assay (LC-MS)	98 %
Date of Analysis	10.Aug.2012

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

Purity = 91.66 %

3. Advice and Remarks

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

Sigma-Aldrich Laborchemikalien GmbH
Quality Management SA-LC

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Reagent

LC537_PFOS2_00001

SIGMA-ALDRICH

ALDRICH

Industriestrasse 25, CH-9471 Buchs (SG), Switzerland
Tel: +41 81 755 2511 Fax: +41 81 756 5449

Certificate of Analysis

INV 820
12LCMS 0579

Product Name:	HEPTADECAFLUOROOCTANESULFONIC ACID TETRAETHYLAMMONIUM SALT 98 %
Product Number:	365289
Product Brand:	Aldrich
Molecular Formula:	$C_{16}H_{20}F_{17}NO_3S$
Molecular Mass:	629.37
CAS Number:	56773-42-3

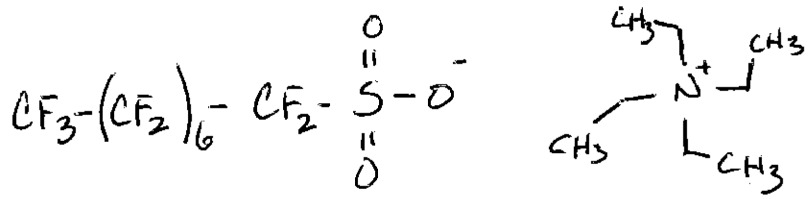
TEST	SPECIFICATION	LOT BCBF5116V RESULTS
APPEARANCE (COLOR)	OFF-WHITE TO WHITE	WHITE
APPEARANCE (FORM)	POWDER, LUMPS OR CHUNKS	POWDER WITH LUMPS
CARBON CONTENT	29.77 % - 31.29 %	30.52
INFRARED SPECTRUM	CONFORMS TO STRUCTURE	CONFORMS

QC RELEASE DATE 13/APR/11

MW correction = $\frac{500.125}{629.37}$ = 0.7946 ~~98% = 79.46%~~ DEH 7-26-12

Purity + MW Correction = 77.87%

Edeltraud Schwärzler, Manager
Quality Control
Buchs, Switzerland



	$C_8F_{17}SO_3+H$	$C_8H_{20}N$
C = 12.011	96088	96.088
F = 18.998	322.966	-
S = 32.066	32.066	-
O = 15.999	47.997	-
H = 1.008	1.008	20.160
N = 14.007	-	14.007
	500.125	130.255 →

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

Certificate of Origin

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

Country of Origin	China

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

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

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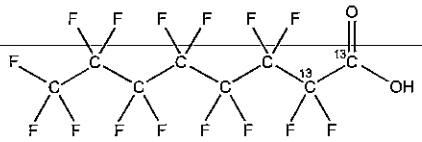
Reagent

LCM2PFOA_00003

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M2PFOA	**LOT NUMBER:**	M2PFOA0312
COMPOUND:	Perfluoro-n-[1,2-$^{13}C_2$]octanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_6HF_{15}O_2$	**MOLECULAR WEIGHT:**	416.05
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	03/19/2012		
EXPIRY DATE: (mm/dd/yyyy)	03/19/2017		
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:** 01/09/2013 (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 $x_1, x_2, \ldots x_n$ on which it depends is:

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

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

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

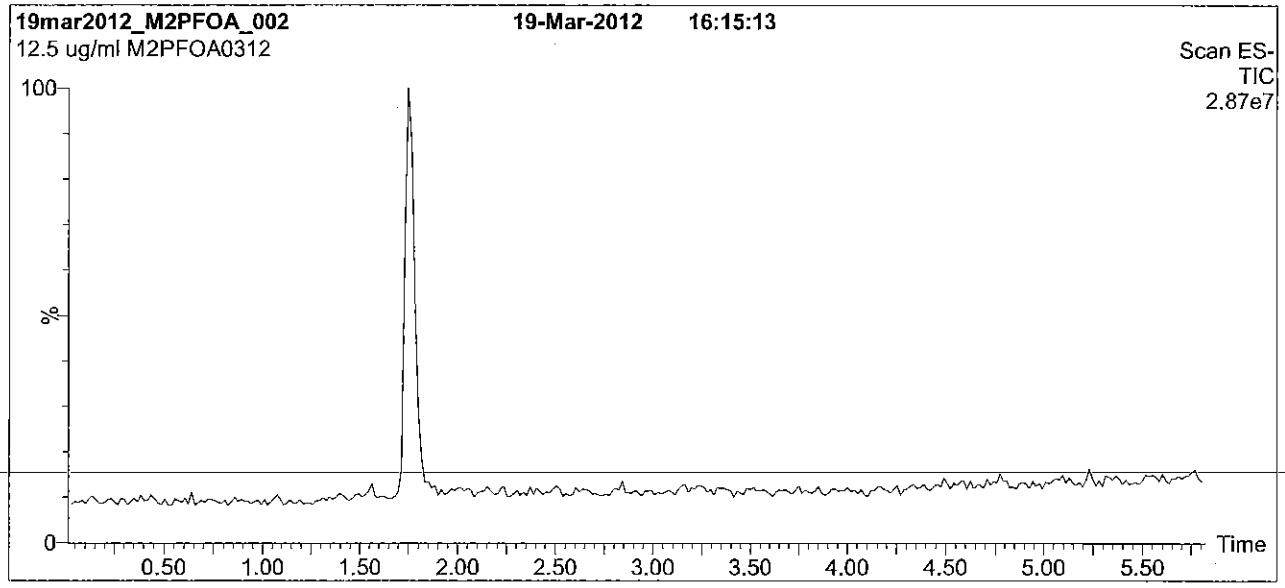
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

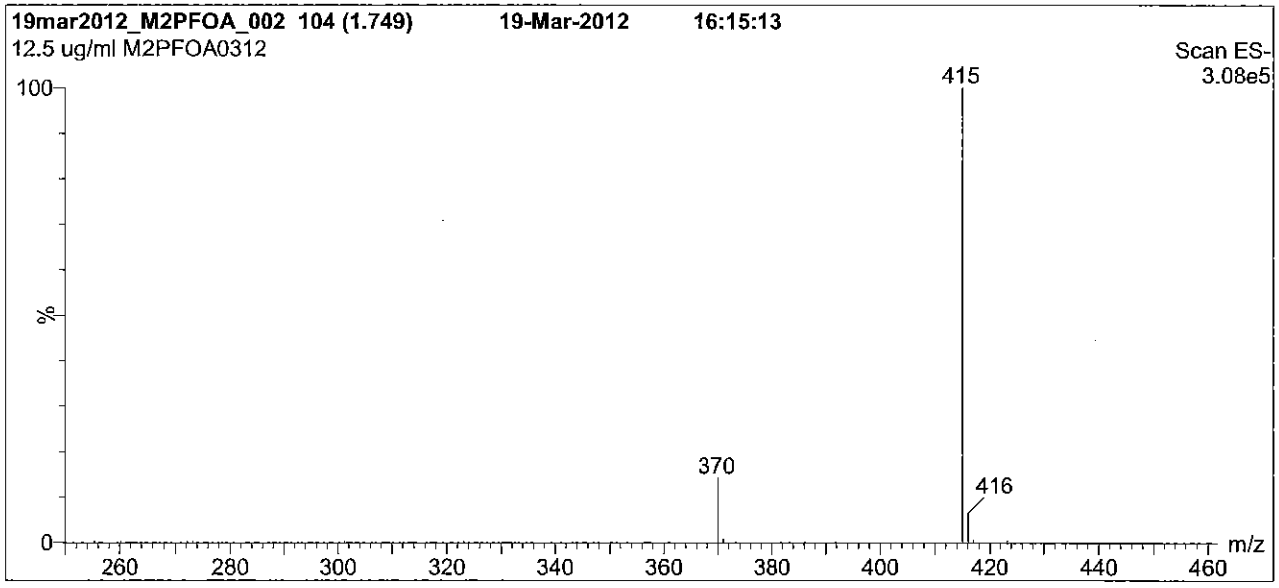
CALA Testing Accreditation No.: A1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 6.5 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

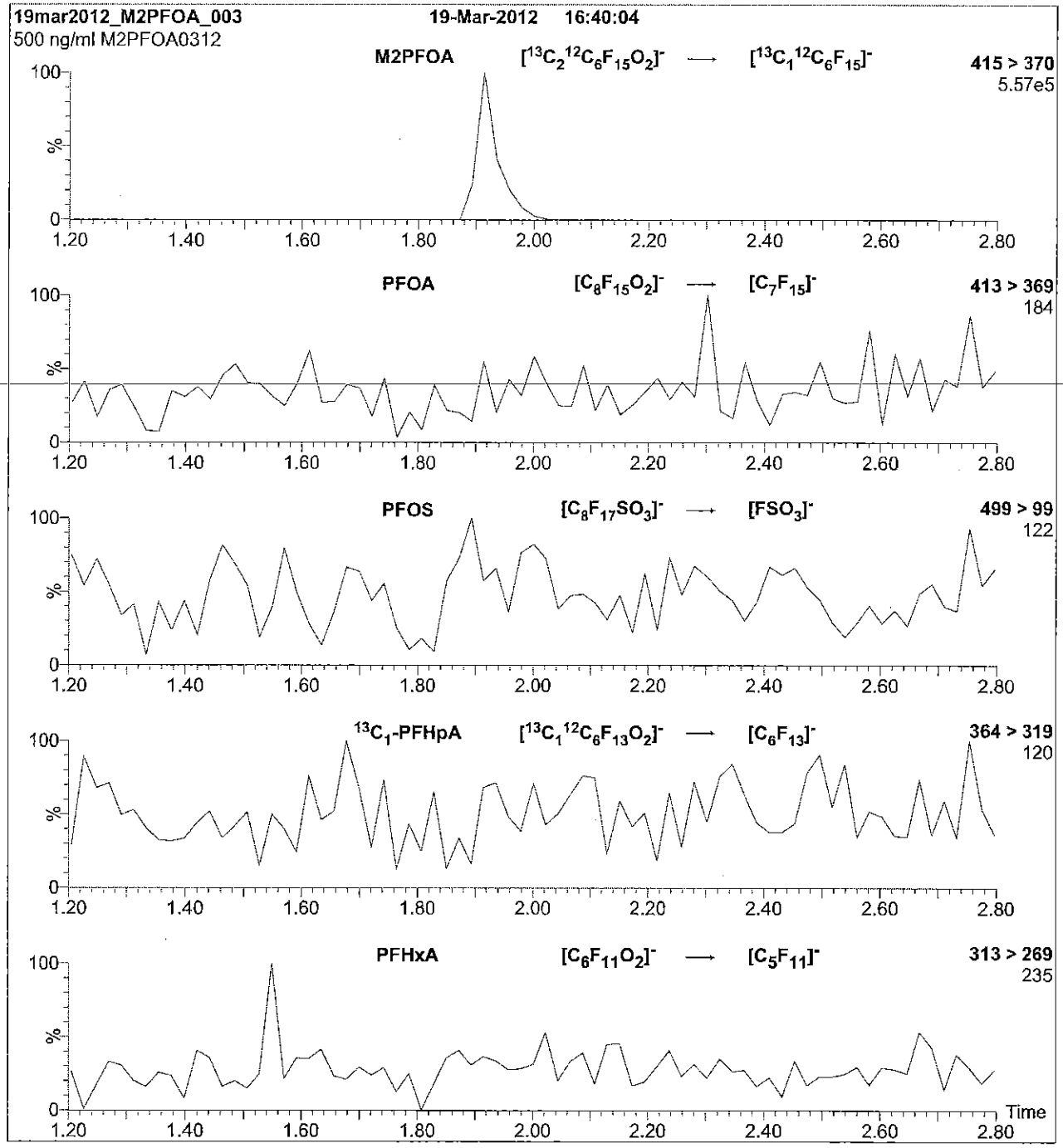
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 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 µl (500 ng/ml M2PFOA)
Mobile phase:	Isocratic 70% (80:20 MeOH:ACN) / 30% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 11

Reagent

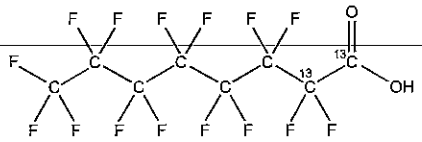
LCM2PFOA_00004

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2PFOA
LOT NUMBER: M2PFOA0312
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]octanoic acid

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_6HF_{15}O_2$
MOLECULAR WEIGHT: 416.05
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)
CHEMICAL PURITY: >98%
ISOTOPIC PURITY: ≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy) 03/19/2012
EXPIRY DATE: (mm/dd/yyyy) 03/19/2017
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:** 01/09/2013 (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 $x_1, x_2, \ldots x_n$ on which it depends is:

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

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

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

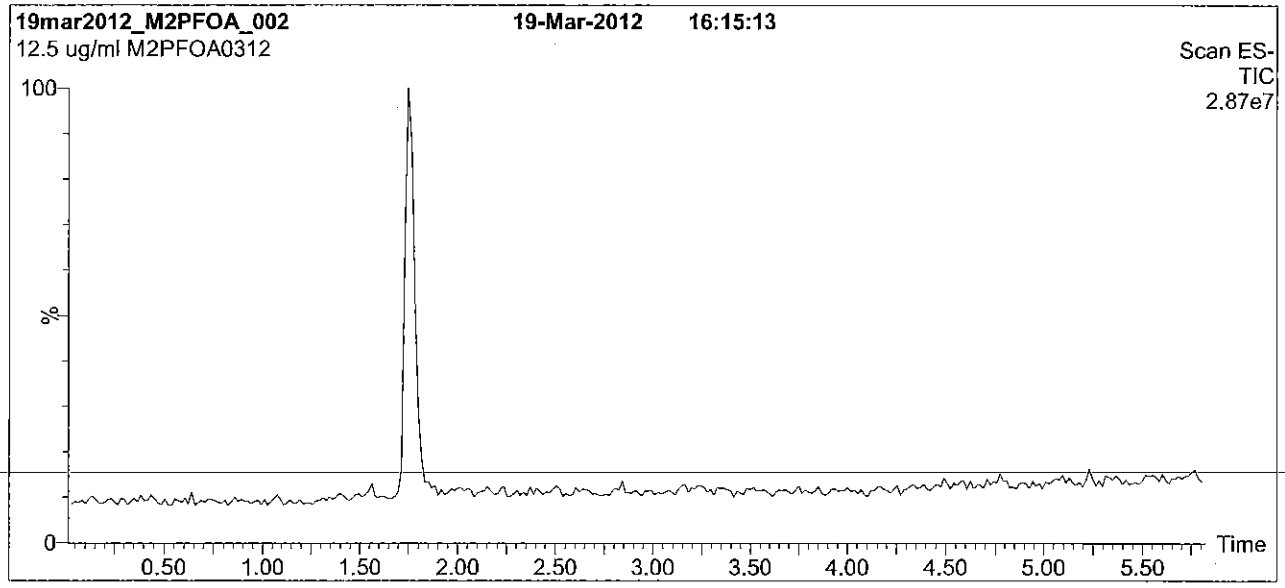
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

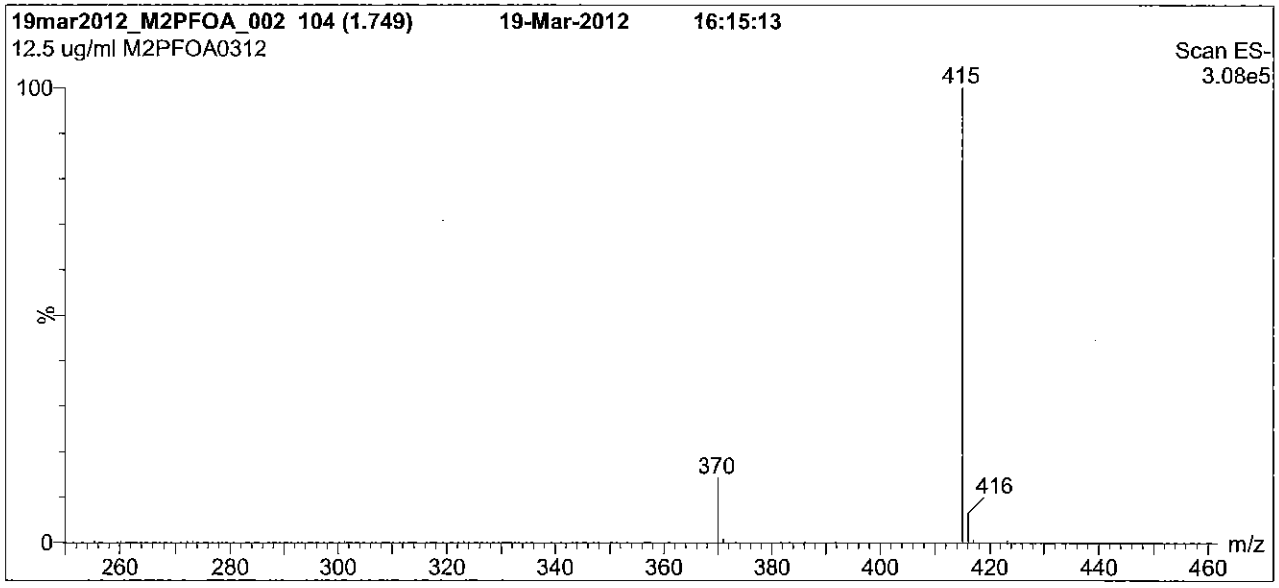
CALA

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 6.5 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

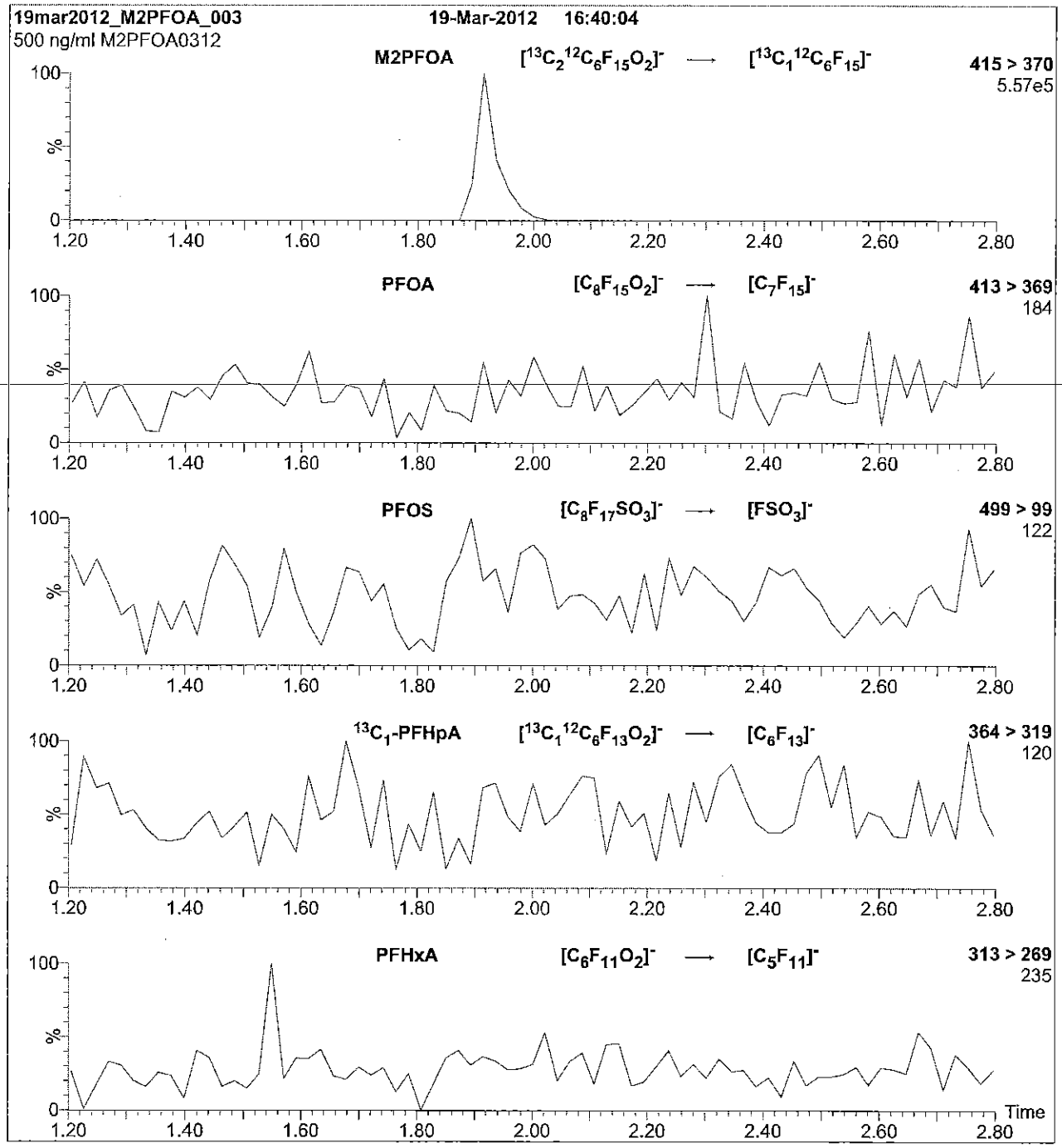
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 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 µl (500 ng/ml M2PFOA)
Mobile phase:	Isocratic 70% (80:20 MeOH:ACN) / 30% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 11

Reagent

LCMPFDA_00008

605243
ID: LCMPFDA_00008
Exp: 08/19/20 Prpd: CBW
13C2-Perfluorodecanoic a

Rec. 3/29/16 JRB ✓

WELLINGTON LABORATORIES

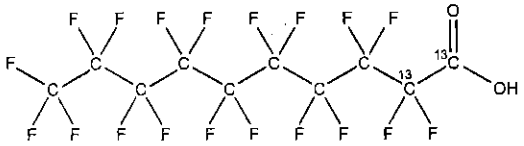
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFDA
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]decanoic acid

LOT NUMBER: MPFDA0815

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_8HF_{19}O_2$	**MOLECULAR WEIGHT:**	516.07
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	08/19/2015		
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 $^{13}C_1$-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.

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

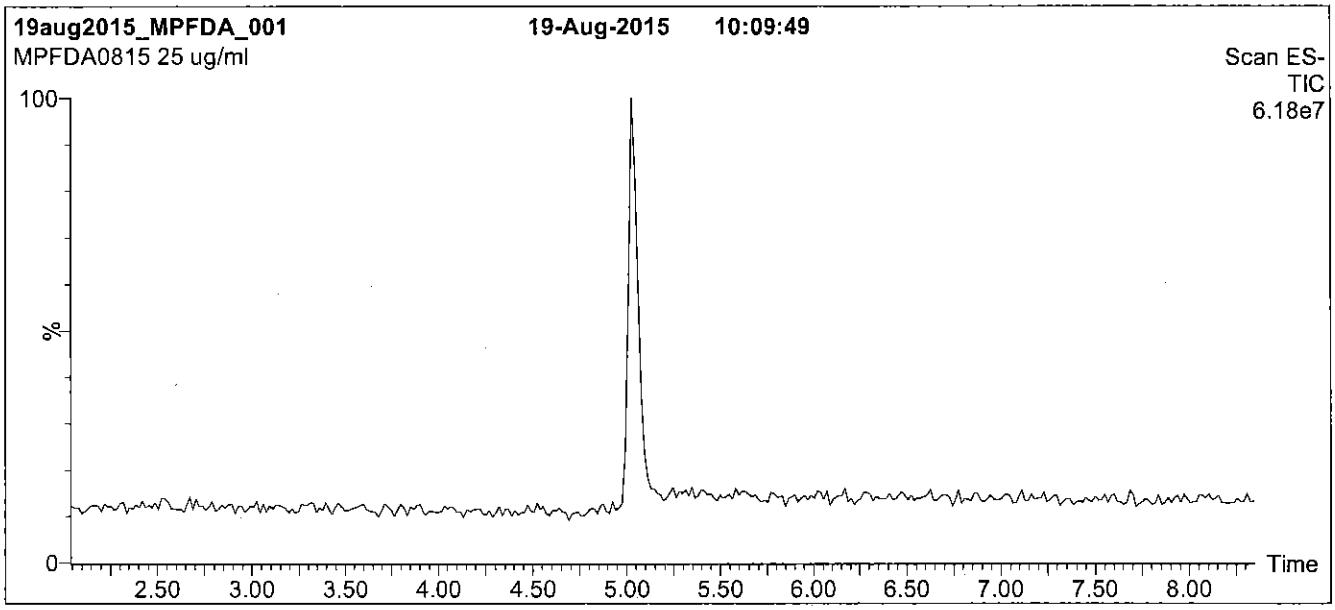
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

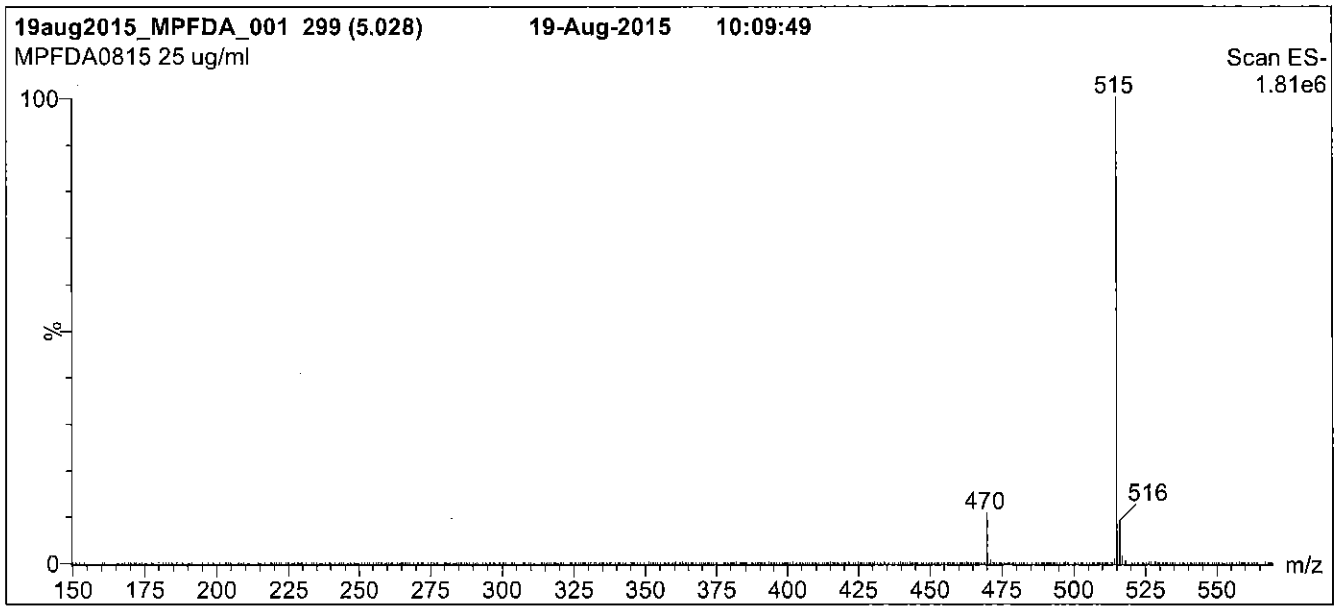
CALA Testing

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

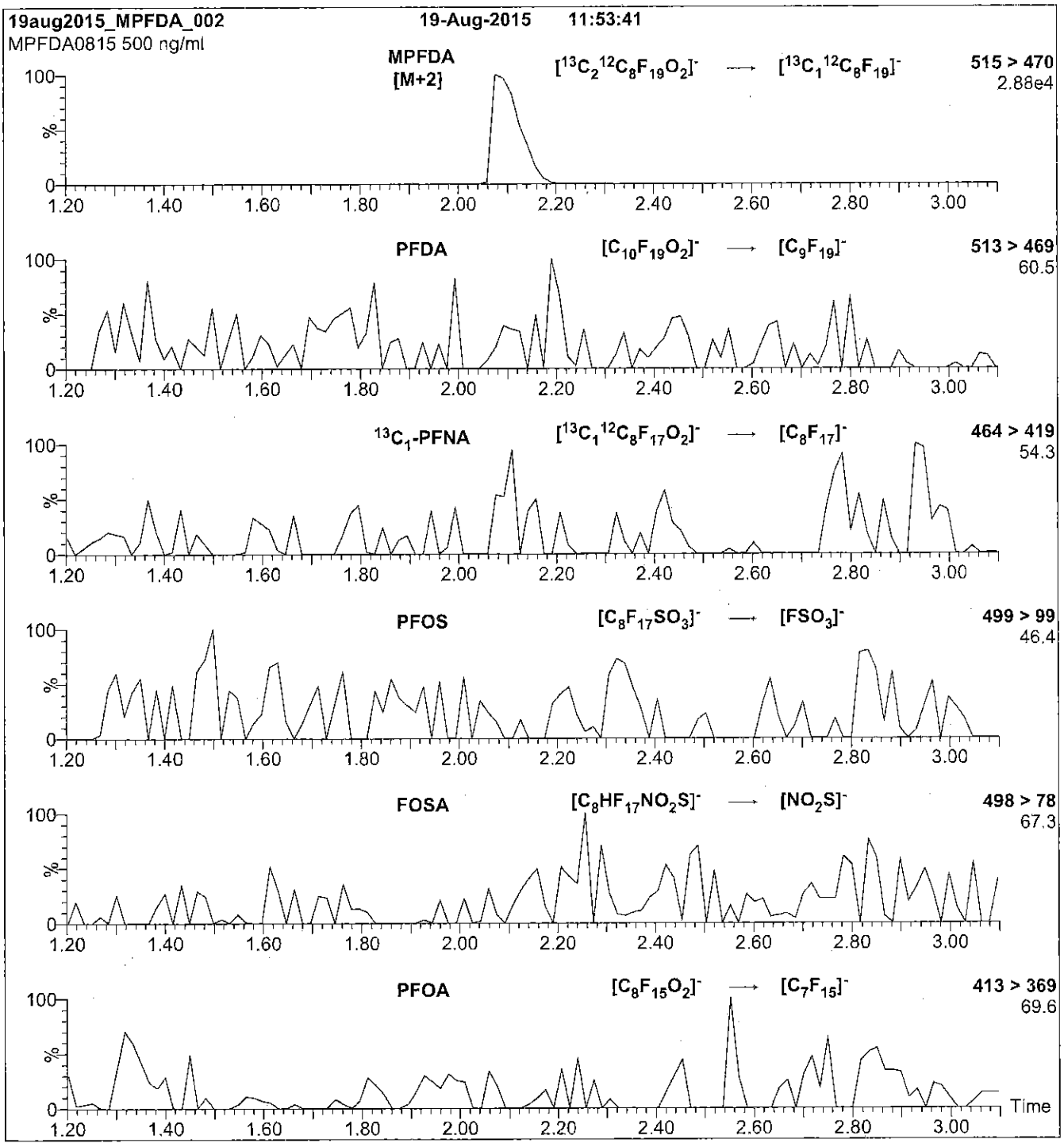
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 13

Reagent

LCMPFHxA_00009

Rec. 3/29/16 JRB ✓

WELLINGTON LABORATORIES

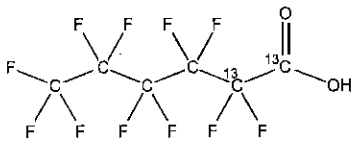
CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

LOT NUMBER: MPFHxA0415

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_4HF_{11}O_2$	**MOLECULAR WEIGHT:**	316.04
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	04/09/2015		
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:

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

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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:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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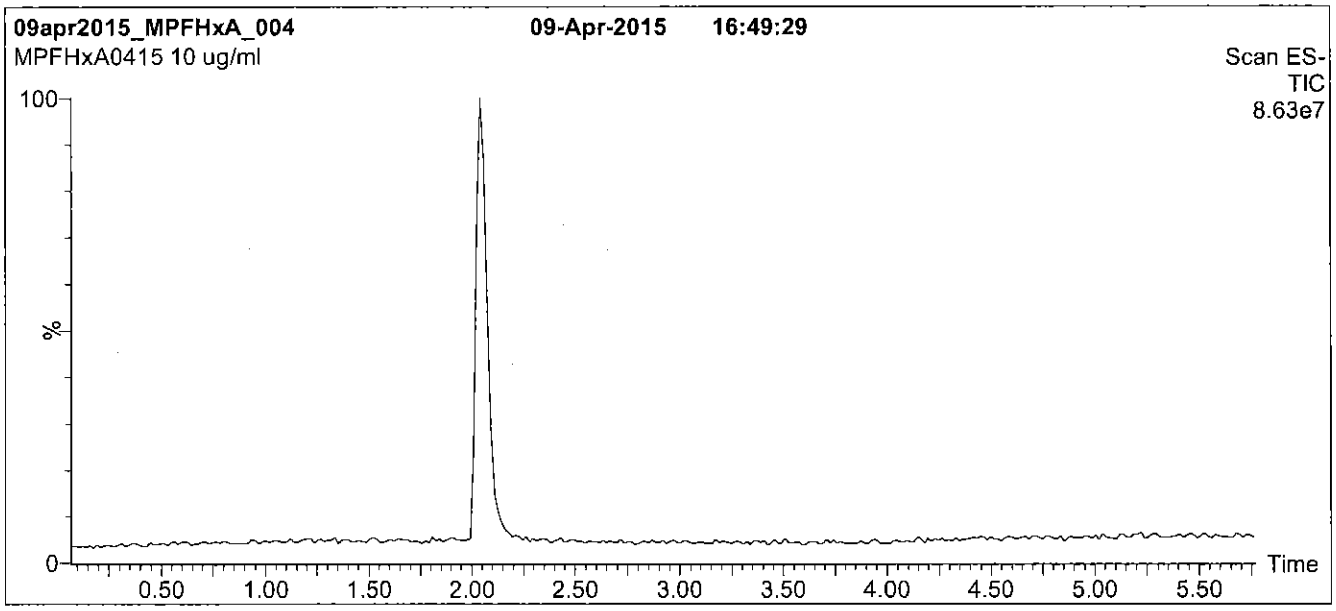
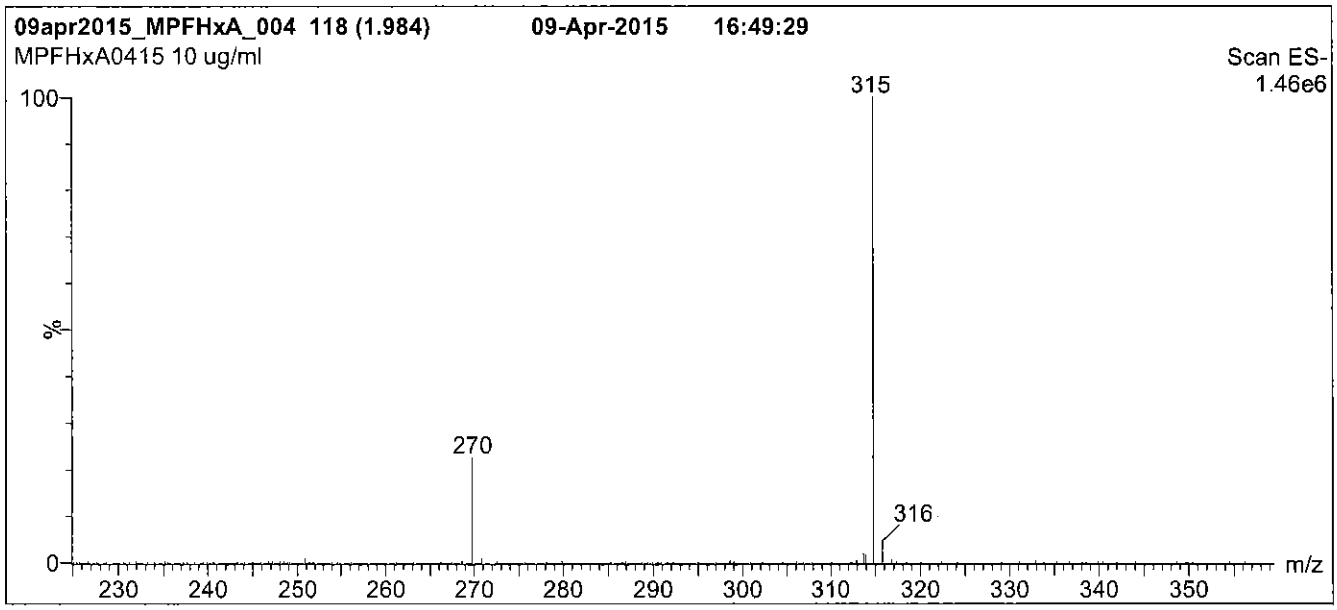
CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions over 0.5 min.
Time: 10 min

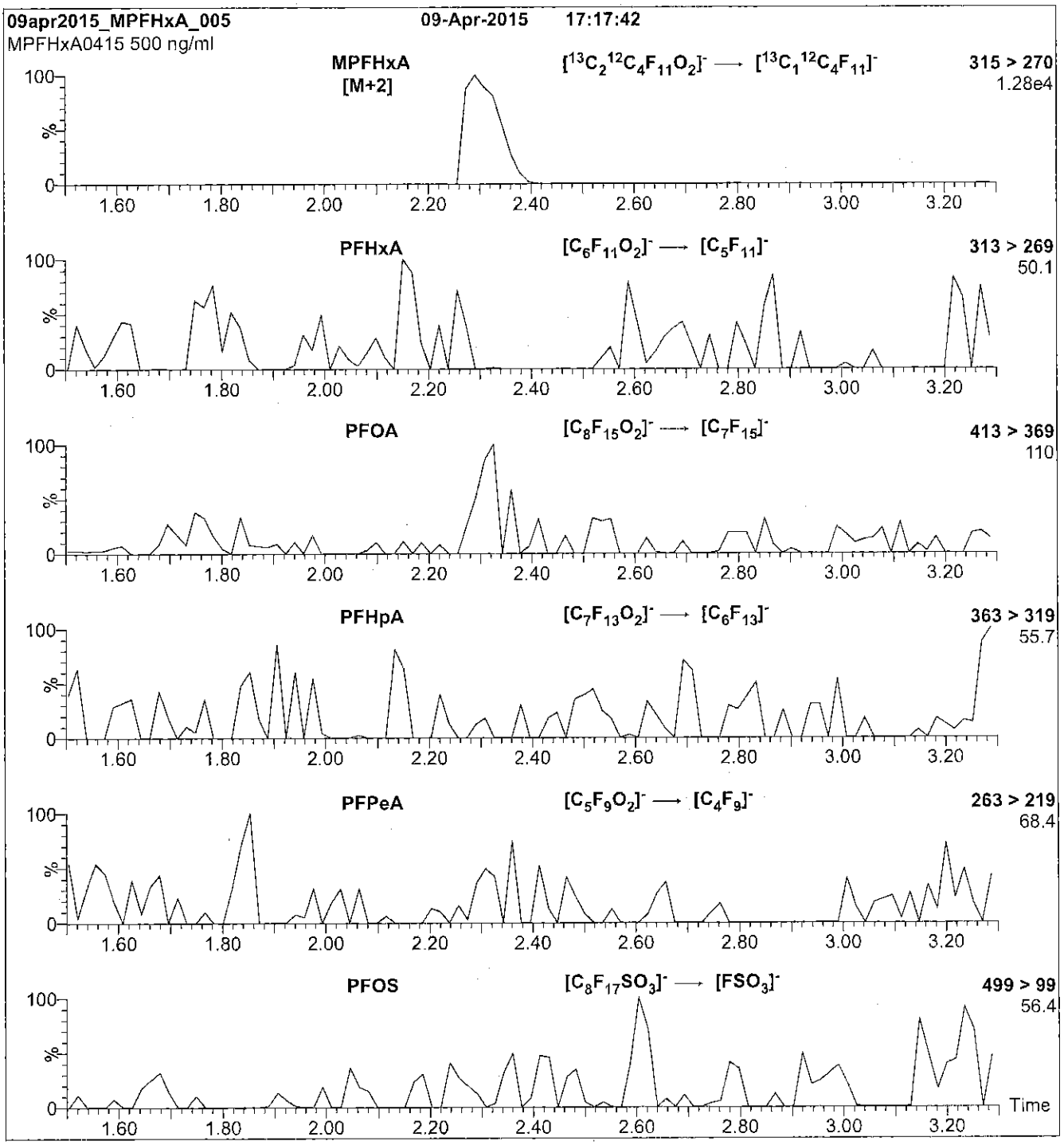
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.20e-3
Collision Energy (eV) = 10

Reagent

LCMPFOS_00013

Rec. 3/29/16 JRB ✓

605227
ID: LCMPFOS_00012
Exp: 01/22/21 Prpd: CBW
13C4-Perfluorooctanesulfo

606228
ID: LCMPFOS_00013
Exp: 01/22/21 Prpd: CBW
13C4-Perfluorooctanesulfo

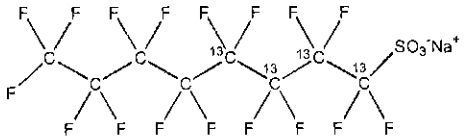
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFOS **LOT NUMBER:** MPFOS0116

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

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$^{13}C_4{}^{12}C_4F_{17}SO_3Na$	**MOLECULAR WEIGHT:**	526.08
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.8 ± 2.4 µg/ml (MPFOS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2,3,4\text{-}^{13}C_4$)
LAST TESTED: (mm/dd/yyyy)	01/22/2016		
EXPIRY DATE: (mm/dd/yyyy)	01/22/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 02/01/2016 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

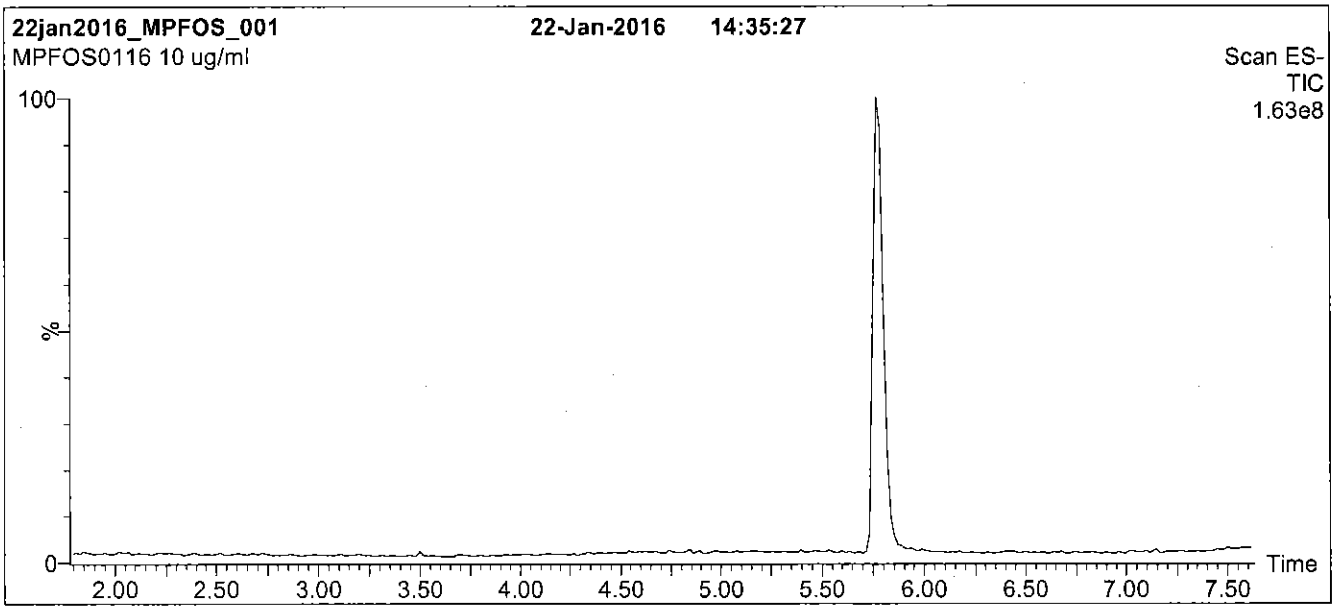
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

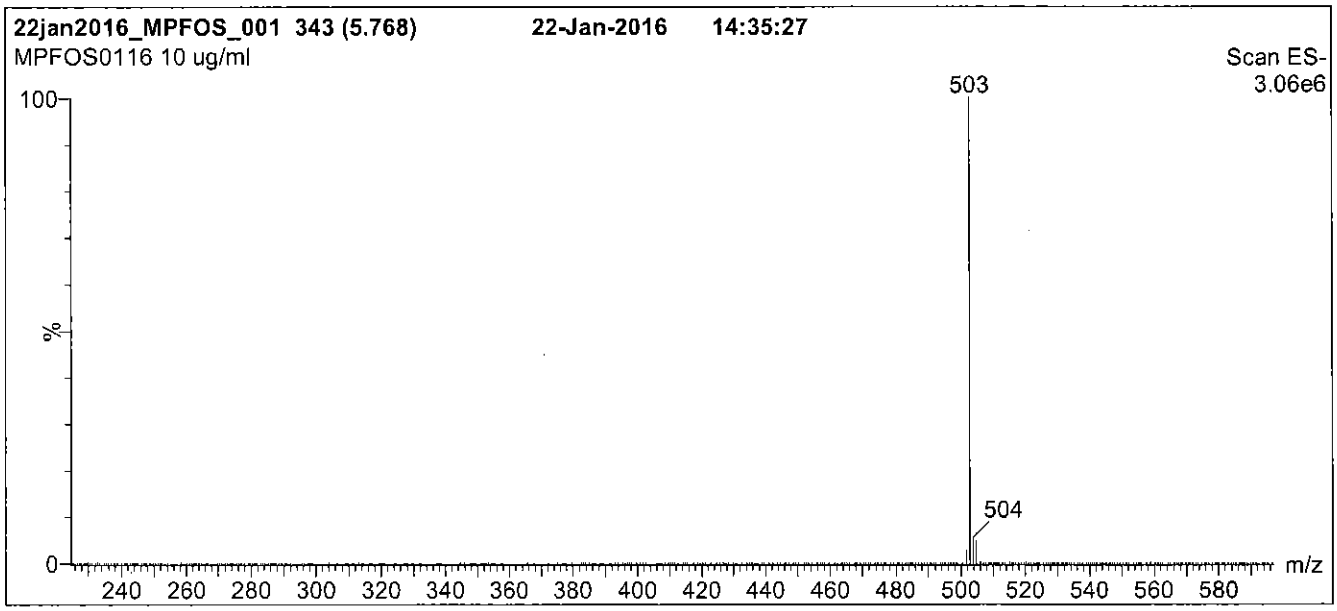
CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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

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





Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

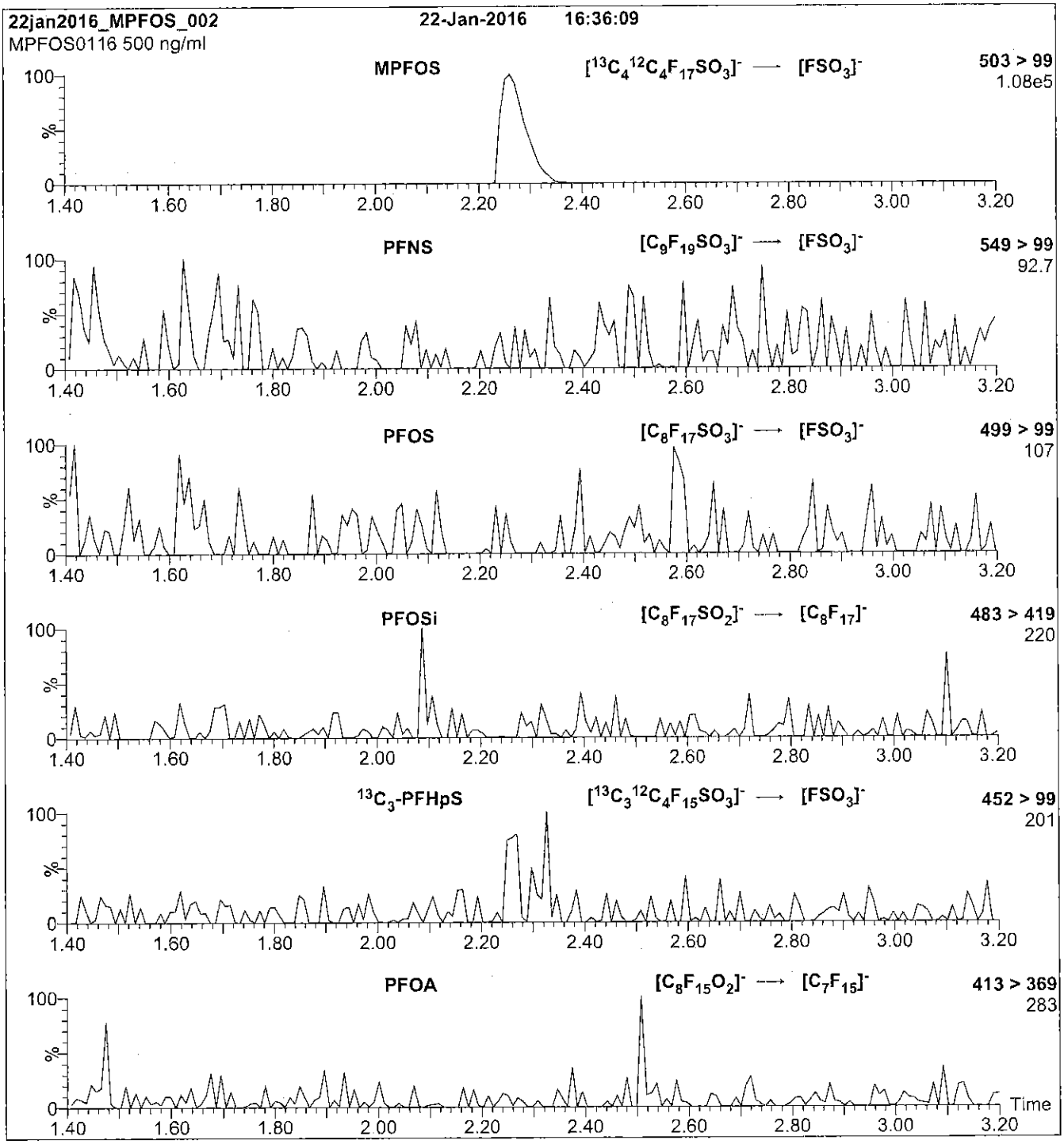
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 60.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

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

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

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.70e-3
Collision Energy (eV) = 40

Reagent

LCMPFOS_00018

R: SBC 9/22/16

738686
ID: LCMPFOS_00018
Exp: 08/03/21 Ppd: SBC
13C4-Perfluorooctanesulfo

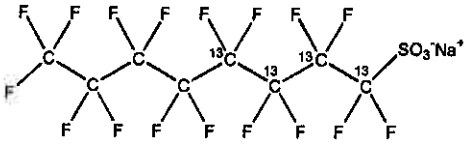
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

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

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

STRUCTURE: **CAS #:** Not available



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

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

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

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CALA

ANAB ACCREDITED

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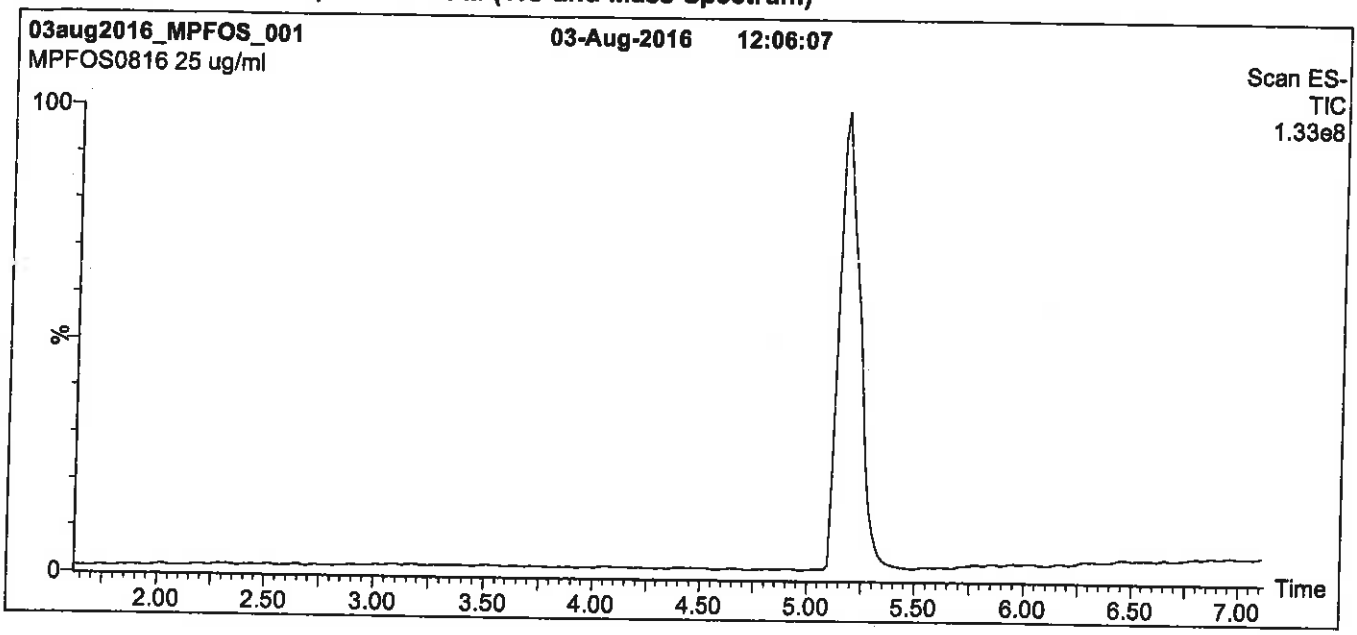

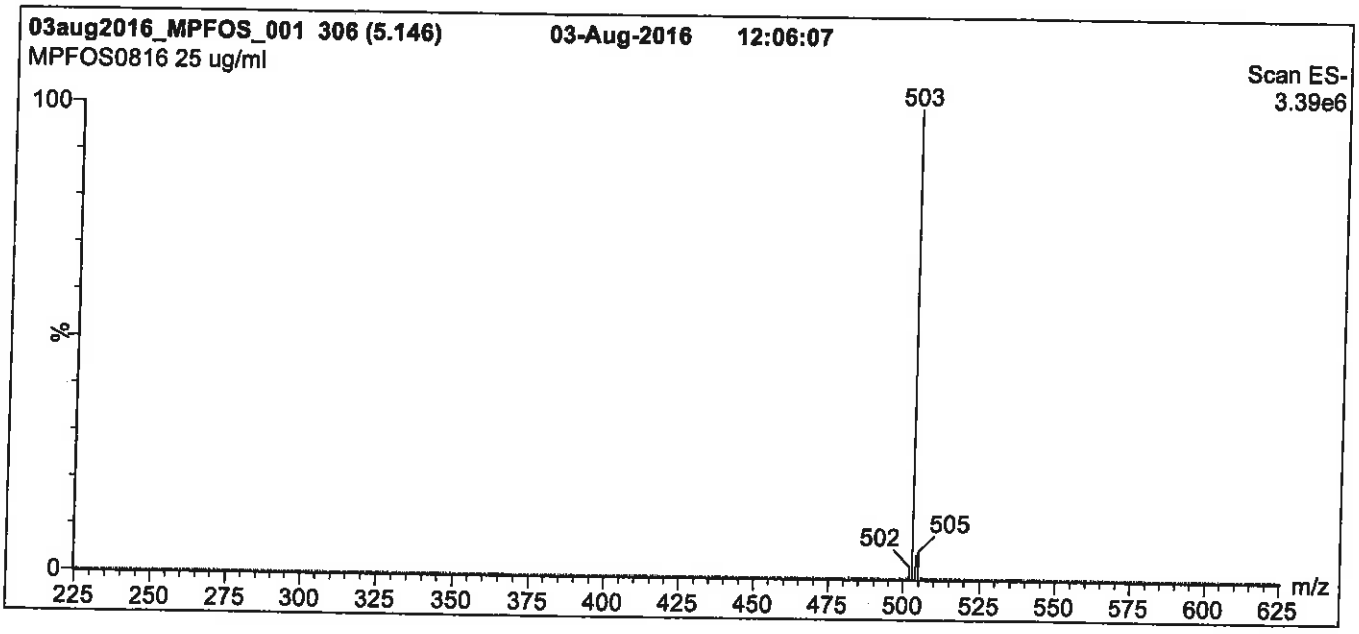

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(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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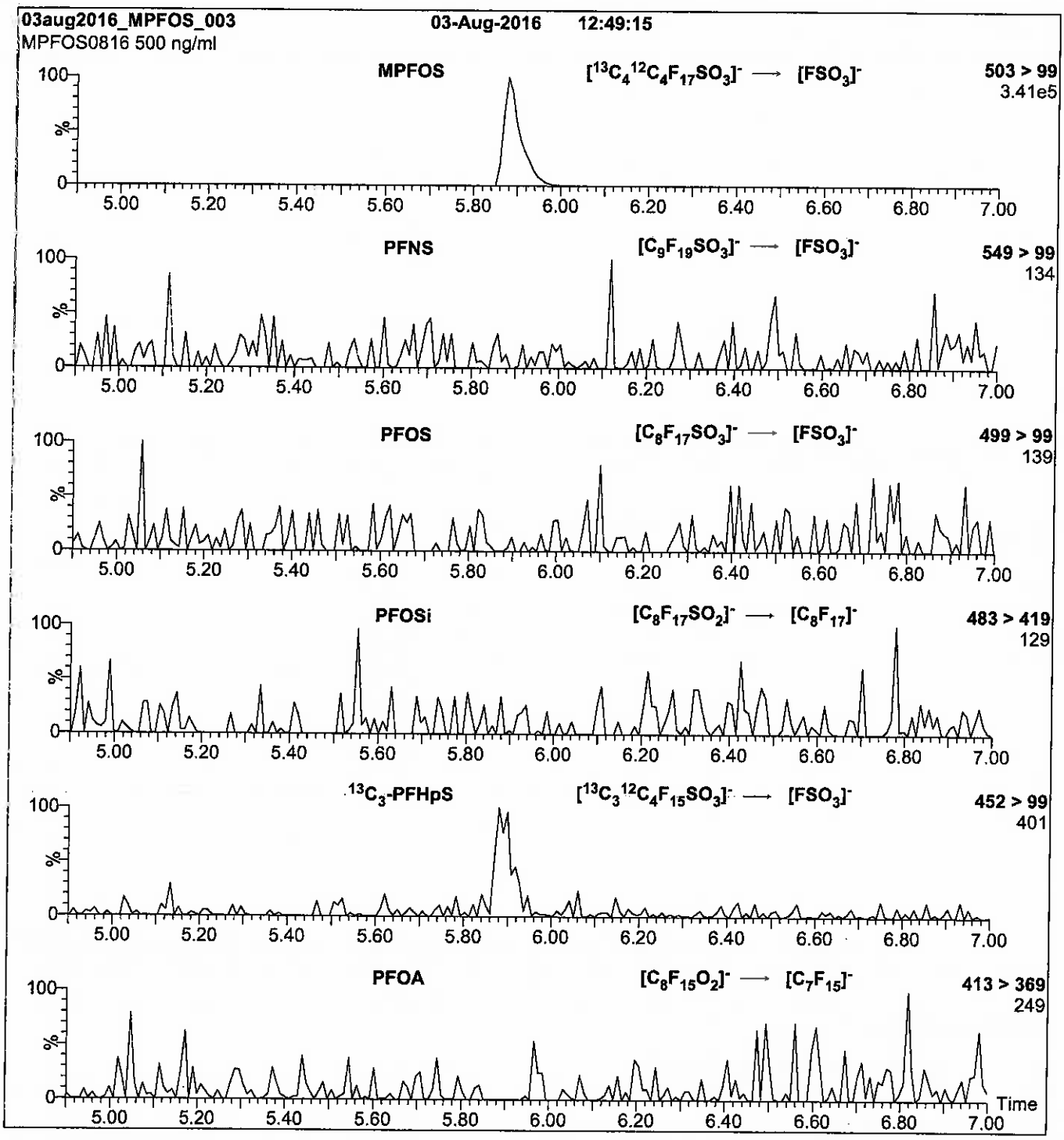

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Injection: Direct loop injection
10 µl (500 ng/ml MPFOS)

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

Flow: 300 µl/min

MS Parameters

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

Method 537 DOD

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

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-24441-1

SDG No.:

Matrix: Water Level: Low

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

Client Sample ID	Lab Sample ID	PFHxA #	PFDA #
WI-AF-3RW35-1216	320-24441-1	102	103
WI-AF-3FB35-1216	320-24441-2	96	100
	MB 320-142683/1-A	103	104
	LCS 320-142683/2-A	111	113
	LCSD 320-142683/3-A	114	114

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

Column to be used to flag recovery values

FORM II 537

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-24441-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 19DEC2016A6A_150.d

Lab ID: LCS 320-142683/2-A Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	0.160	0.149	93	70-130	
Perfluorooctanoic acid (PFOA)	0.0811	0.0740	91	70-130	
Perfluorobutanesulfonic acid (PFBS)	0.359	0.340	95	70-130	

Column to be used to flag recovery and RPD values

FORM III 537

FORM III
LCMS LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-24441-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 19DEC2016A6A_151.d

Lab ID: LCSD 320-142683/3-A Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	0.160	0.158	99	6	30	70-130	
Perfluorooctanoic acid (PFOA)	0.0811	0.0751	93	1	30	70-130	
Perfluorobutanesulfonic acid (PFBS)	0.359	0.352	98	4	30	70-130	

Column to be used to flag recovery and RPD values

FORM III 537

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24441-1

SDG No.:

Lab File ID: 19DEC2016A6A_149.d Lab Sample ID: MB 320-142683/1-A

Matrix: Water Date Extracted: 12/17/2016 13:06

Instrument ID: A6 Date Analyzed: 12/22/2016 10:51

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-142683/2-A	19DEC2016A6A_150.d	12/22/2016 11:21
	LCSD 320-142683/3-A	19DEC2016A6A_151.d	12/22/2016 11:51
WI-AF-3RW35-1216	320-24441-1	19DEC2016A6A_152.d	12/22/2016 12:20
WI-AF-3FB35-1216	320-24441-2	19DEC2016A6A_153.d	12/22/2016 12:50

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24441-1

SDG No.:

Instrument ID: A6 Calibration Start Date: 12/05/2016 17:26

GC Column: Acquity ID: 2.1(mm) Calibration End Date: 12/05/2016 19:54

Calibration ID: 26888

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MEAN AREA AND MEAN RT		965911	20.05	2046916	20.67		
UPPER LIMIT		1448867	20.55	3070374	21.17		
LOWER LIMIT		482956	19.55	1023458	20.17		
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCV 320-140688/9 CCVL		1025187	20.05	2358079	20.67		
ICV 320-140688/11		877210	20.05	2015178	20.67		
CCV 320-143413/22 CCVIS		771348	20.00	1564962	20.61		
MB 320-142683/1-A		695779	20.00	2117564	20.62		
LCS 320-142683/2-A		637524	20.01	1783962	20.62		
LCSD 320-142683/3-A		618882	20.00	1665020	20.61		
320-24441-1	WI-AF-3RW35-1216	622463	20.00	1935617	20.62		
320-24441-2	WI-AF-3FB35-1216	616113	20.00	1880219	20.61		
CCV 320-143413/34 CCVIS		773306	20.00	1768636	20.62		

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

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

Column used to flag values outside QC limits

FORM VIII 537

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24441-1

SDG No.:

Sample No.: CCV 320-143413/22 Date Analyzed: 12/22/2016 09:52

Instrument ID: A6 GC Column: Acquity ID: 2.1(mm)

Lab File ID (Standard): 19DEC2016A6A_147.d Heated Purge: (Y/N) N

Calibration ID: 26888

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		771348	20.00	1564962	20.61		
UPPER LIMIT		1079887	20.50	2190947	21.11		
LOWER LIMIT		539944	19.50	1095473	20.11		
LAB SAMPLE ID	CLIENT SAMPLE ID						
MB 320-142683/1-A		695779	20.00	2117564	20.62		
LCS 320-142683/2-A		637524	20.01	1783962	20.62		
LCSD 320-142683/3-A		618882	20.00	1665020	20.61		
320-24441-1	WI-AF-3RW35-1216	622463	20.00	1935617	20.62		
320-24441-2	WI-AF-3FB35-1216	616113	20.00	1880219	20.61		

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

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

Column used to flag values outside QC limits

FORM VIII 537

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24441-1

SDG No.:

Sample No.: CCV 320-143413/34 Date Analyzed: 12/22/2016 15:54

Instrument ID: A6 GC Column: Acquity ID: 2.1(mm)

Lab File ID (Standard): 19DEC2016A6A_159.d Heated Purge: (Y/N) N

Calibration ID: 26888

		13PFOA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		773306	20.00	1768636	20.62		
UPPER LIMIT		1082628	20.50	2476090	21.12		
LOWER LIMIT		541314	19.50	1238045	20.12		
LAB SAMPLE ID	CLIENT SAMPLE ID						
MB 320-142683/1-A		695779	20.00	2117564	20.62		
LCS 320-142683/2-A		637524	20.01	1783962	20.62		
LCSD 320-142683/3-A		618882	20.00	1665020	20.61		
320-24441-1	WI-AF-3RW35-1216	622463	20.00	1935617	20.62		
320-24441-2	WI-AF-3FB35-1216	616113	20.00	1880219	20.61		

13PFOA = 13C2-PFOA
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Area Limit = 70%-140% of internal standard area
RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII 537

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-24441-1

SDG No.:

Client Sample ID: WI-AF-3RW35-1216 Lab Sample ID: 320-24441-1

Matrix: Water Lab File ID: 19DEC2016A6A_152.d

Analysis Method: 537 Date Collected: 12/14/2016 14:25

Extraction Method: 537 Date Extracted: 12/17/2016 13:06

Sample wt/vol: 266(mL) Date Analyzed: 12/22/2016 12:20

Con. Extract Vol.: 1.0(mL) Dilution Factor: 1

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

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

Analysis Batch No.: 143413 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.045	U	0.056	0.045	0.015
335-67-1	Perfluorooctanoic acid (PFOA)	0.023	U	0.028	0.023	0.0089
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.10	U	0.13	0.10	0.045

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

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161221-38111.b\19DEC2016A6A_152.d
Lims ID: 320-24441-A-1-A
Client ID: WI-AF-3RW35-1216
Sample Type: Client
Inject. Date: 22-Dec-2016 12:20:37 ALS Bottle#: 7 Worklist Smp#: 27
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: 320-24441-a-1-a
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
Operator ID: CBW Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20161221-38111.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 23-Dec-2016 08:23:57 Calib Date: 05-Dec-2016 19:54:00
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161205-37524.b\05DEC2016A6A_009.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK034

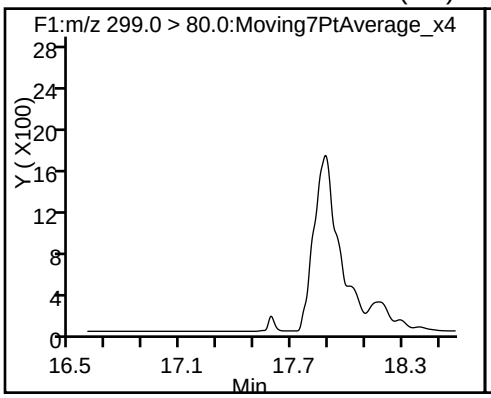
First Level Reviewer: westendorfc Date: 22-Dec-2016 14:49:11

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
$ 2 13C2 PFHxA								
315.0 > 270.0	18.548	18.567	-0.019	1.000	738509	10.2	24264	
* 5 13C2-PFOA								
415.0 > 370.0	19.999	19.999	0.0		622463	10.0	15733	
* 8 13C4 PFOS								
503.0 > 80.0	20.619	20.608	0.011		1935617	28.7	33423	
$ 10 13C2 PFDA								
515.0 > 470.0	21.409	21.409	0.0	1.000	561018	10.3	17797	

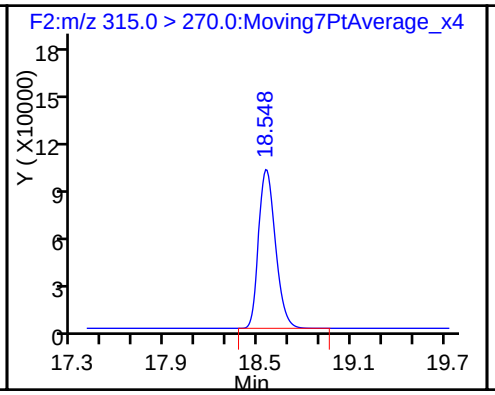
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20161221-38111.b\19DEC2016A6A_152.d
Injection Date: 22-Dec-2016 12:20:37 Instrument ID: A6
Lims ID: 320-24441-A-1-A Lab Sample ID: 320-24441-1
Client ID: WI-AF-3RW35-1216
Operator ID: CBW ALS Bottle#: 7 Worklist Smp#: 27
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL

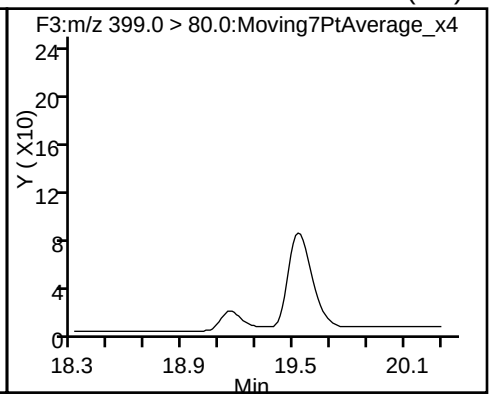
1 Perfluorobutanesulfonic acid (ND)



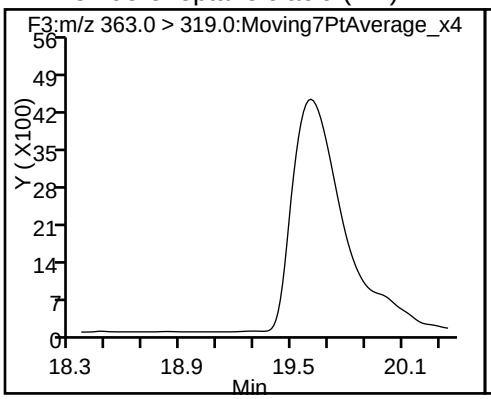
$ 2 13C2 PFHxA



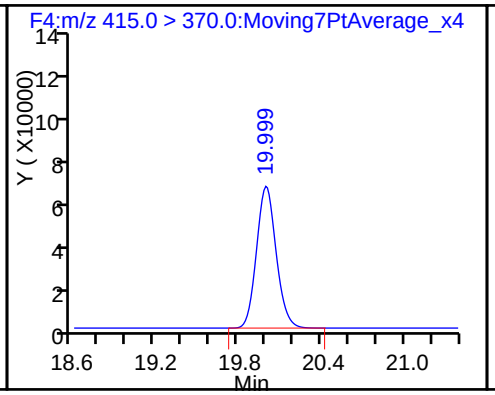
3 Perfluorohexanesulfonic acid (ND)



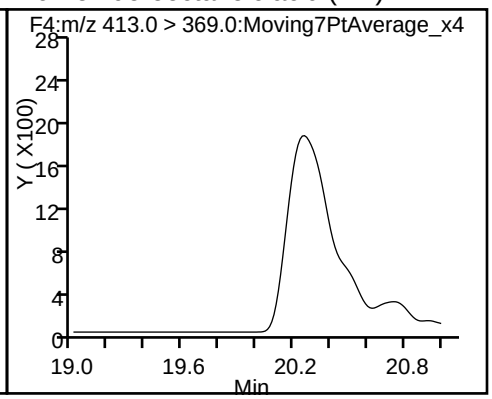
4 Perfluoroheptanoic acid (ND)



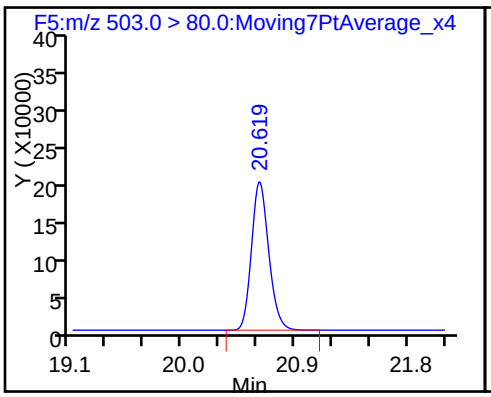
* 5 13C2-PFOA



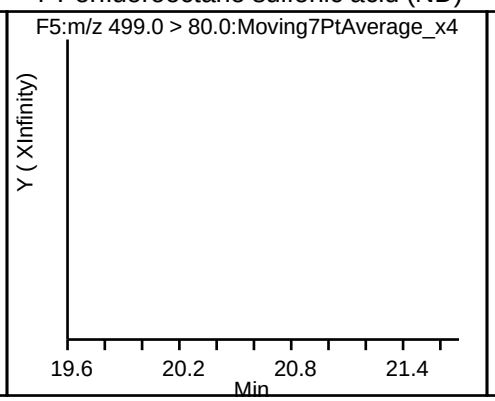
6 Perfluorooctanoic acid (ND)



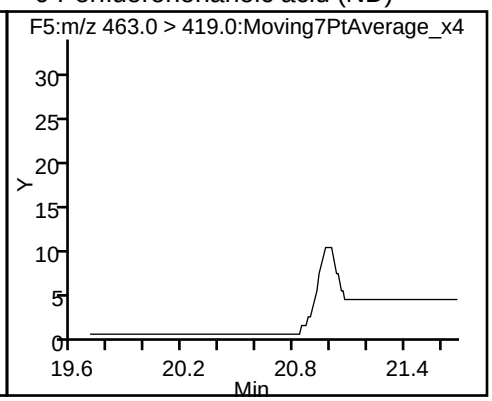
* 8 13C4 PFOS



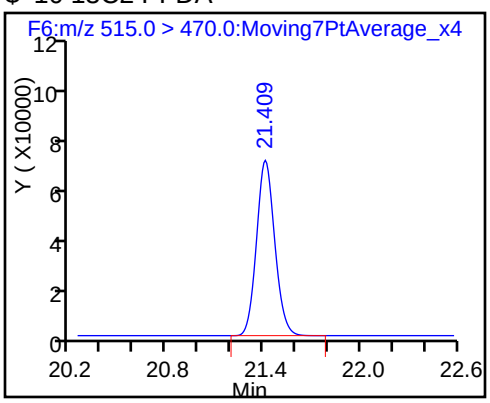
7 Perfluorooctane sulfonic acid (ND)



9 Perfluorononanoic acid (ND)



$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161221-38111.b\19DEC2016A6A_152.d
Lims ID: 320-24441-A-1-A
Client ID: WI-AF-3RW35-1216
Sample Type: Client
Inject. Date: 22-Dec-2016 12:20:37 ALS Bottle#: 7 Worklist Smp#: 27
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: 320-24441-a-1-a
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
Operator ID: CBW Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20161221-38111.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 23-Dec-2016 08:23:57 Calib Date: 05-Dec-2016 19:54:00
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161205-37524.b\05DEC2016A6A_009.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK034

First Level Reviewer: westendorfc Date: 22-Dec-2016 14:49:11

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	10.2	101.71
$ 10 13C2 PFDA	10.0	10.3	102.85

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-24441-1

SDG No.:

Client Sample ID: WI-AF-3FB35-1216 | Lab Sample ID: 320-24441-2

Matrix: Water | Lab File ID: 19DEC2016A6A_153.d

Analysis Method: 537 | Date Collected: 12/14/2016 14:26

Extraction Method: 537 | Date Extracted: 12/17/2016 13:06

Sample wt/vol: 251.3(mL) | Date Analyzed: 12/22/2016 12:50

Con. Extract Vol.: 1.0(mL) | Dilution Factor: 1

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

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

Analysis Batch No.: 143413 | 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	0.015
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	0.047

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	96		70-130
STL00996	13C2 PFDA	100		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161221-38111.b\19DEC2016A6A_153.d
Lims ID: 320-24441-A-2-A
Client ID: WI-AF-3FB35-1216
Sample Type: Client
Inject. Date: 22-Dec-2016 12:50:14 ALS Bottle#: 8 Worklist Smp#: 28
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: 320-24441-a-2-a
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
Operator ID: CBW Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20161221-38111.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 23-Dec-2016 08:23:57 Calib Date: 05-Dec-2016 19:54:00
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161205-37524.b\05DEC2016A6A_009.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK034

First Level Reviewer: westendorfc Date: 22-Dec-2016 14:50:27

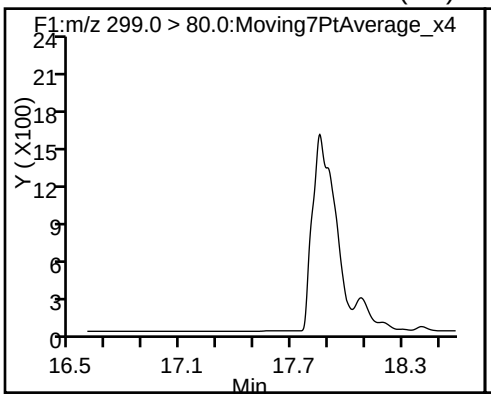
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
$ 2 13C2 PFHxA								
315.0 > 270.0	18.549	18.567	-0.018	1.000	688639	9.58	22798	
* 5 13C2-PFOA								
415.0 > 370.0	19.999	19.999	0.0		616113	10.0	15722	
* 8 13C4 PFOS								
503.0 > 80.0	20.608	20.608	0.0		1880219	28.7	48829	
$ 10 13C2 PFDA								
515.0 > 470.0	21.409	21.409	0.0	1.000	542260	10.0	17241	

TestAmerica Sacramento

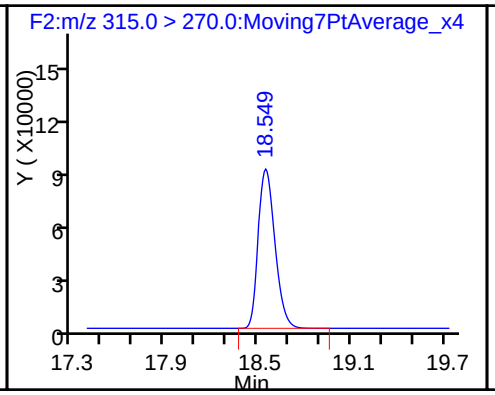
Data File: \\ChromNA\Sacramento\ChromData\A6\20161221-38111.b\19DEC2016A6A_153.d

Injection Date:	22-Dec-2016 12:50:14	Instrument ID:	A6		
Lims ID:	320-24441-A-2-A	Lab Sample ID:	320-24441-2		
Client ID:	WI-AF-3FB35-1216				
Operator ID:	CBW	ALS Bottle#:	8	Worklist Smp#:	28
Injection Vol:	10.0 ul	Dil. Factor:	1.0000		
Method:	537__A6	Limit Group:	LC 537 ICAL		

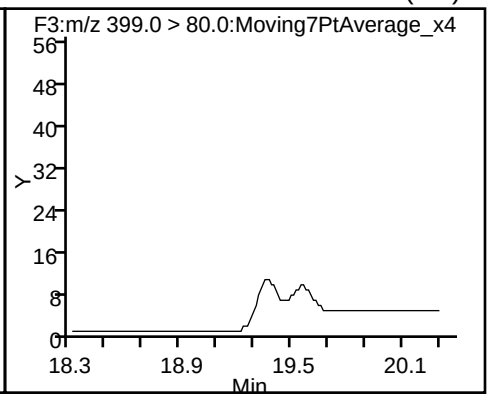
1 Perfluorobutanesulfonic acid (ND)



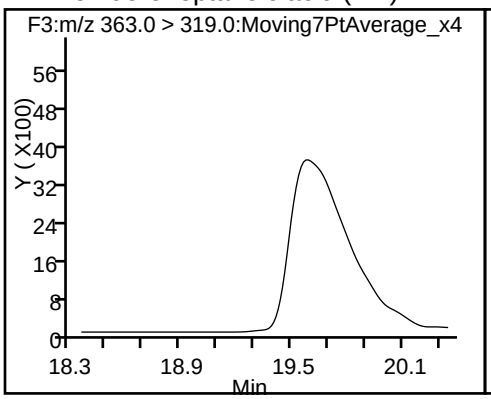
$ 2 13C2 PFHxA



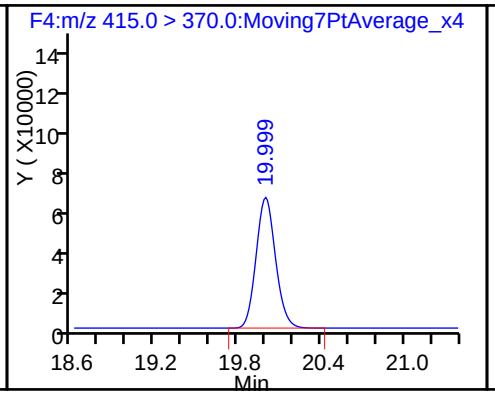
3 Perfluorohexanesulfonic acid (ND)



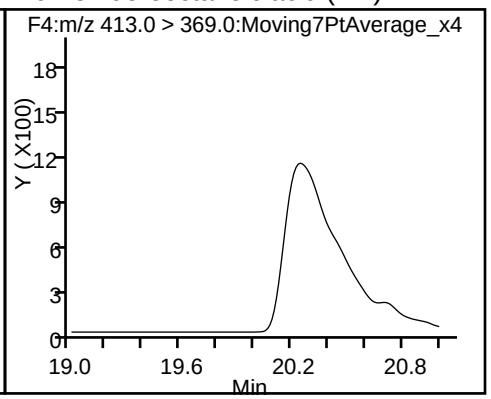
4 Perfluoroheptanoic acid (ND)



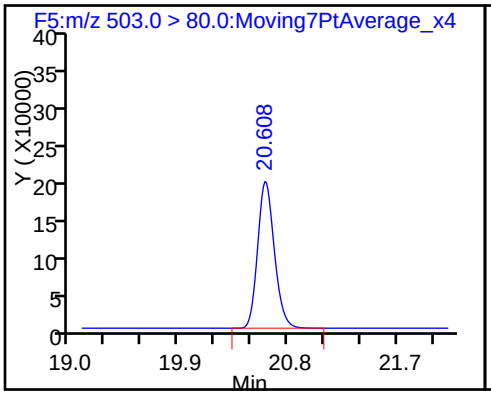
* 5 13C2-PFOA



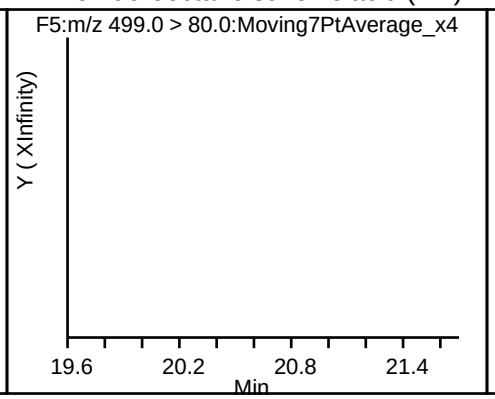
6 Perfluorooctanoic acid (ND)



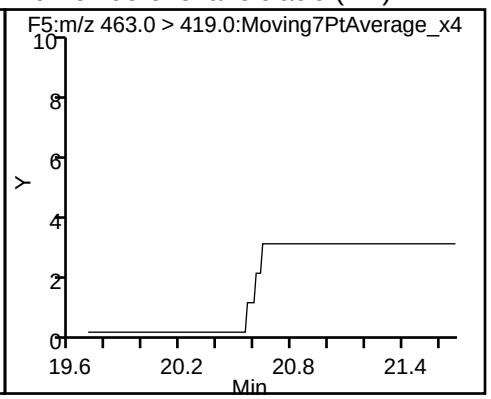
* 8 13C4 PFOS



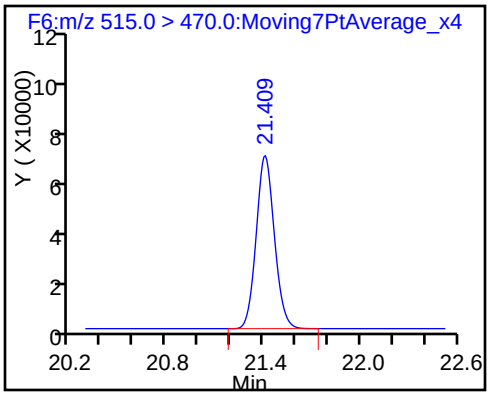
7 Perfluorooctane sulfonic acid (ND)



9 Perfluorononanoic acid (ND)



$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161221-38111.b\19DEC2016A6A_153.d
Lims ID: 320-24441-A-2-A
Client ID: WI-AF-3FB35-1216
Sample Type: Client
Inject. Date: 22-Dec-2016 12:50:14 ALS Bottle#: 8 Worklist Smp#: 28
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: 320-24441-a-2-a
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
Operator ID: CBW Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20161221-38111.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 23-Dec-2016 08:23:57 Calib Date: 05-Dec-2016 19:54:00
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161205-37524.b\05DEC2016A6A_009.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK034

First Level Reviewer: westendorfc Date: 22-Dec-2016 14:50:27

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	9.58	95.82
$ 10 13C2 PFDA	10.0	10.0	100.44

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

Lab Name: TestAmerica Sacramento Job No.: 320-24441-1 Analy Batch No.: 140688

SDG No.:

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

Calibration Start Date: 12/05/2016 17:26 Calibration End Date: 12/05/2016 19:54 Calibration ID: 26888

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-140688/2	05DEC2016A6A_004.d
Level 2	STD 320-140688/3	05DEC2016A6A_005.d
Level 3	STD 320-140688/4	05DEC2016A6A_006.d
Level 4	STD 320-140688/5	05DEC2016A6A_007.d
Level 5	STD 320-140688/6	05DEC2016A6A_008.d
Level 6	STD 320-140688/7	05DEC2016A6A_009.d

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
Perfluorobutanesulfonic acid (PFBS)	0.7247 0.6563	0.6525	0.7178	0.7256	0.7321	Ave		0.7015				5.2		30.0			
Perfluorohexanesulfonic acid	0.8344 0.8930	0.7757	0.9290	0.9478	1.0082	Ave		0.8980				9.3		30.0			
Perfluoroheptanoic acid	1.4137 1.1078	1.1891	1.2161	1.1975	1.1665	Ave		1.2151				8.6		30.0			
Perfluorooctanoic acid (PFOA)	0.9720 1.0610	0.9049	1.0674	1.1235	1.1136	Ave		1.0404				8.2		30.0			
Perfluorooctanesulfonic acid (PFOS)	0.8855 1.0951	0.9020	1.0711	1.0966	1.2136	Ave		1.0440				12.1		30.0			
Perfluorononanoic acid	0.9735 1.1655	0.9961	1.1929	1.2321	1.2453	Ave		1.1342				10.5		30.0			
13C2 PFHxA	1.0366 1.2091	1.0515	1.1929	1.2298	1.2791	Ave		1.1665				8.5		30.0			
13C2 PFDA	0.8084 0.9456	0.7439	0.8674	0.9054	0.9868	Ave		0.8763				10.2		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.: 320-24441-1 Analy Batch No.: 140688

SDG No.:

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

Calibration Start Date: 12/05/2016 17:26 Calibration End Date: 12/05/2016 19:54 Calibration ID: 26888

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-140688/2	05DEC2016A6A_004.d
Level 2	STD 320-140688/3	05DEC2016A6A_005.d
Level 3	STD 320-140688/4	05DEC2016A6A_006.d
Level 4	STD 320-140688/5	05DEC2016A6A_007.d
Level 5	STD 320-140688/6	05DEC2016A6A_008.d
Level 6	STD 320-140688/7	05DEC2016A6A_009.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2	LVL 3	LVL 4	LVL 5
Perfluorobutanesulfonic acid (PFBS)	PFOS	Ave	437563 7753569	1227165	2489398	4401661	6630132	8.76 178	22.9	45.1	90.9	135
Perfluorohexanesulfonic acid	PFOS	Ave	169827 3556638	491809	1086082	1938237	3077974	2.95 60.1	7.72	15.2	30.6	45.4
Perfluoroheptanoic acid	13PFOA	Ave	126557 2032288	324913	658044	1121930	1727957	0.994 20.2	2.60	5.12	10.3	15.3
Perfluorooctanoic acid (PFOA)	13PFOA	Ave	173304 3876381	492431	1150281	2096404	3285195	1.98 40.3	5.17	10.2	20.5	30.4
Perfluorooctanesulfonic acid (PFOS)	PFOS	Ave	238662 5775285	757269	1658139	2969550	4906017	3.91 79.6	10.2	20.1	40.6	60.1
Perfluorononanoic acid	13PFOA	Ave	168128 4124664	525061	1245341	2227031	3558831	1.92 39.0	5.01	9.87	19.9	29.5
13C2 PFHxA	13PFOA	Ave	933751 1095977	1106485	1261522	1117585	1240474	10.0 10.0	10.0	10.0	10.0	10.0
13C2 PFDA	13PFOA	Ave	728204 857144	782778	917302	822787	957025	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.: 320-24441-1 Analy Batch No.: 140688

SDG No.:

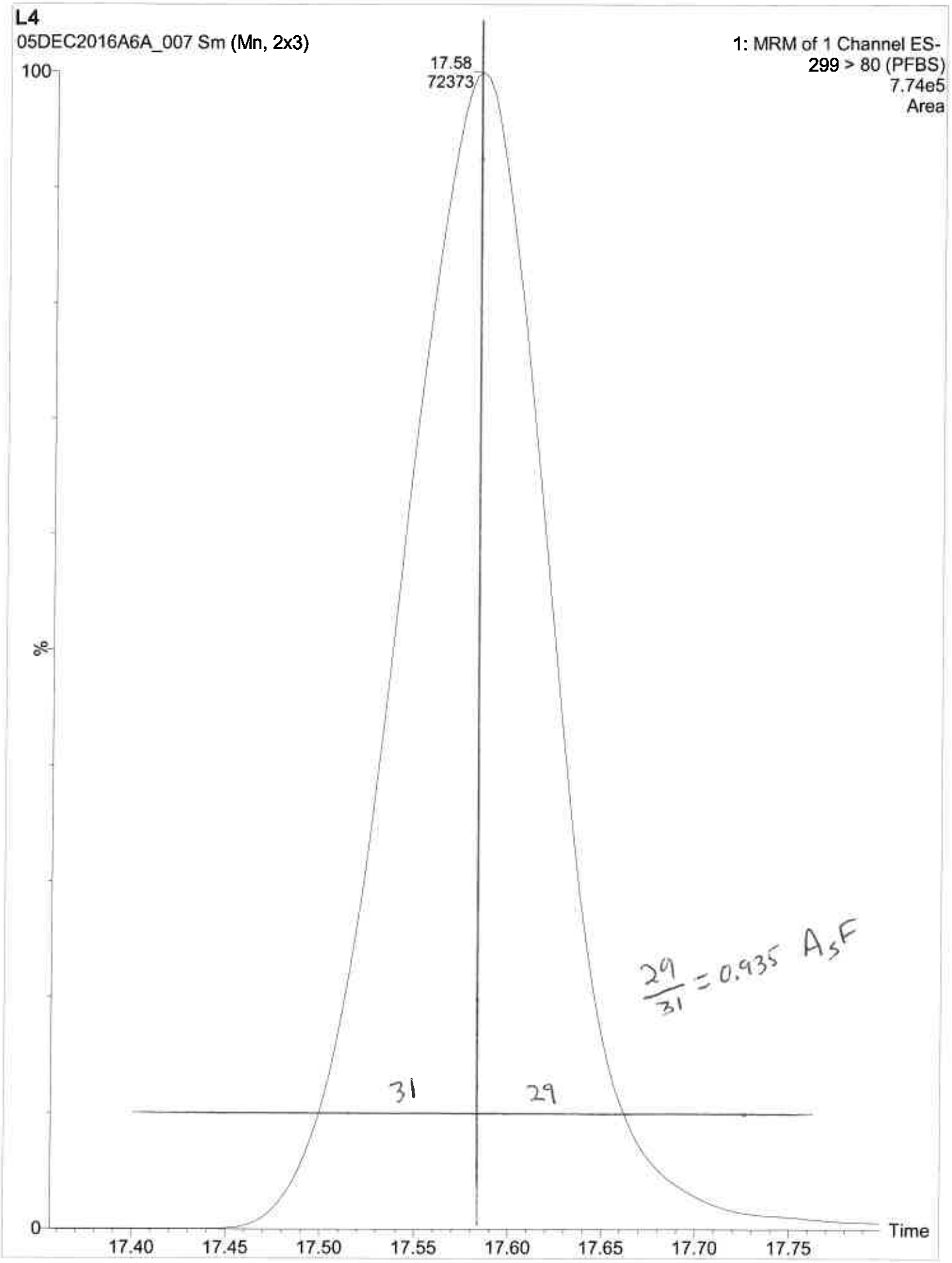
Instrument ID: A6 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

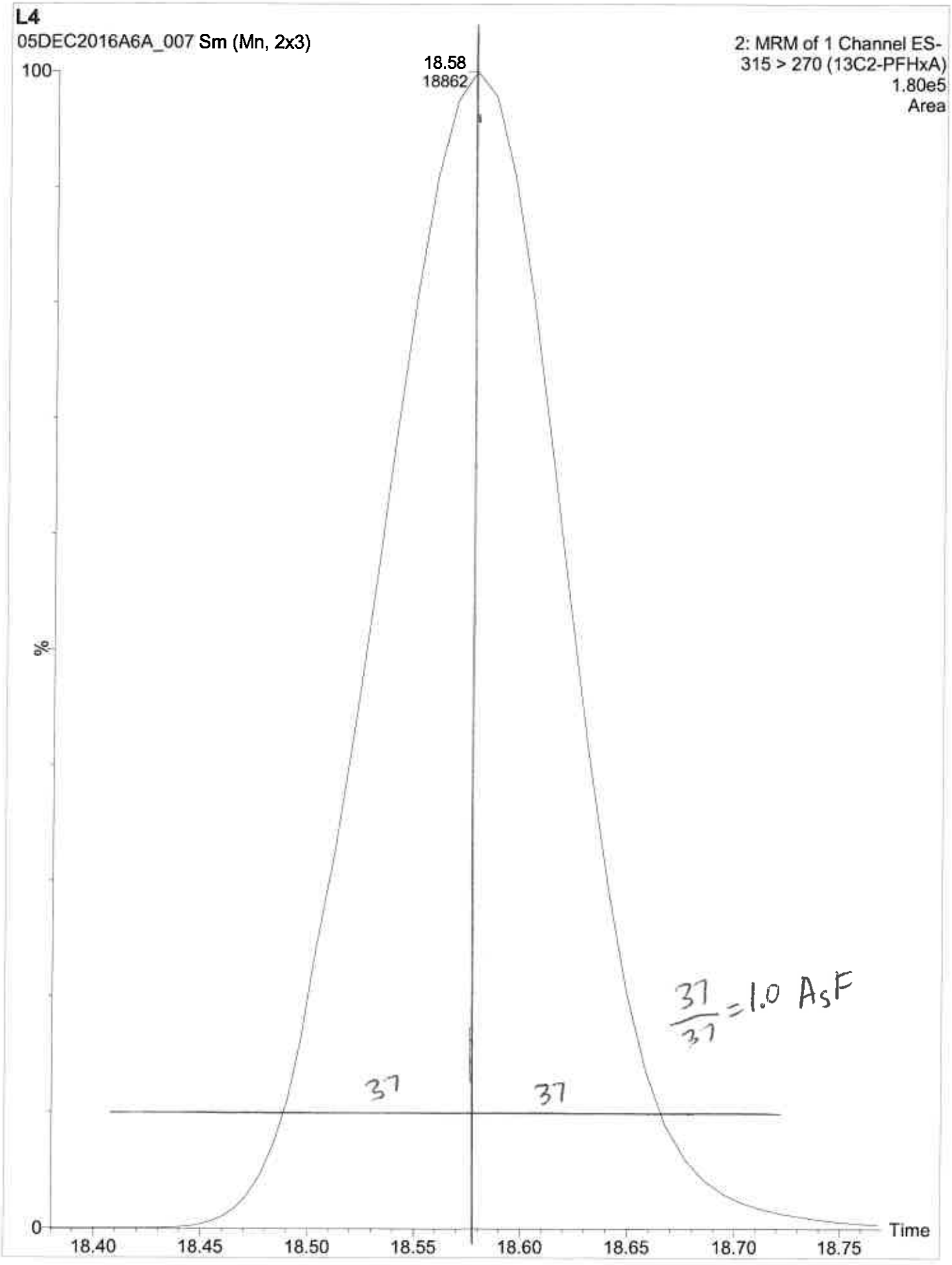
Calibration Start Date: 12/05/2016 17:26 Calibration End Date: 12/05/2016 19:54 Calibration ID: 26888

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-140688/2	05DEC2016A6A_004.d
Level 2	STD 320-140688/3	05DEC2016A6A_005.d
Level 3	STD 320-140688/4	05DEC2016A6A_006.d
Level 4	STD 320-140688/5	05DEC2016A6A_007.d
Level 5	STD 320-140688/6	05DEC2016A6A_008.d
Level 6	STD 320-140688/7	05DEC2016A6A_009.d

ANALYTE	PERCENT ERROR						PERCENT ERROR LIMIT					
	LVL 1 #	LVL 2 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6
Perfluorobutanesulfonic acid (PFBS)	3.3	-7.0	2.3	3.4	4.4	-6.4	50	50	50	50	50	50
Perfluorohexanesulfonic acid	-7.1	-13.6	3.4	5.5	12.3	-0.6	50	50	50	50	50	50
Perfluoroheptanoic acid	16.3	-2.1	0.1	-1.5	-4.0	-8.8	50	50	50	50	50	50
Perfluorooctanoic acid (PFOA)	-6.6	-13.0	2.6	8.0	7.0	2.0	50	50	50	50	50	50
Perfluorooctanesulfonic acid (PFOS)	-15.2	-13.6	2.6	5.0	16.2	4.9	50	50	50	50	50	50
Perfluorononanoic acid	-14.2	-12.2	5.2	8.6	9.8	2.8	50	50	50	50	50	50
13C2 PFHxA	-11.1	-9.9	2.3	5.4	9.7	3.7	30	30	30	30	30	30
13C2 PFDA	-7.7	-15.1	-1.0	3.3	12.6	7.9	30	30	30	30	30	30


L4
05DEC2016A6A_007 Sm (Mn, 2x3)
1: MRM of 1 Channel ES-
299 > 80 (PFBS)
7.74e5
Area
17.58
72373
100
%
0
31
29
$\frac{29}{31} = 0.935$ A$_5$F
17.40
17.45
17.50
17.55
17.60
17.65
17.70
17.75
Time


L4
05DEC2016A6A_007 Sm (Mn, 2x3)
2: MRM of 1 Channel ES-
315 > 270 (13C2-PFHxA)
1.80e5
Area
18.58
18862
100
%
0
37
37
37/37 = 1.0 AsF
18.40
18.45
18.50
18.55
18.60
18.65
18.70
18.75
Time

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161205-37524.b\05DEC2016A6A_004.d
Lims ID: STD L1
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 05-Dec-2016 17:26:03 ALS Bottle#: 1 Worklist Smp#: 2
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\20161205-37524.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 06-Dec-2016 16:35:34 Calib Date: 05-Dec-2016 19:54:00
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161205-37524.b\05DEC2016A6A_009.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK024

First Level Reviewer: barnettj Date: 06-Dec-2016 10:00:02

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								
299.0 > 80.0	17.576	17.581	-0.005	1.000	437563	9.05	466	
$ 2 13C2 PFHxA								
315.0 > 270.0	18.567	18.567	0.0	1.000	933751	8.89	30467	
3 Perfluorohexanesulfonic acid								
399.0 > 80.0	19.332	19.342	-0.010	1.000	169827	2.74	4140	
4 Perfluoroheptanoic acid								M
363.0 > 319.0	19.368	19.378	-0.010	1.000	126557	1.16	45.1	M
* 5 13C2-PFOA								
415.0 > 370.0	20.047	20.047	0.0		900764	10.0	23392	
6 Perfluorooctanoic acid								M
413.0 > 369.0	20.047	20.047	0.0	1.000	173304	1.85	35.0	M
7 Perfluorooctane sulfonic acid								
499.0 > 80.0	20.619	20.619	0.0	1.000	238662	3.32	2941	
* 8 13C4 PFOS								
503.0 > 80.0	20.667	20.669	-0.002		1976615	28.7	40886	
9 Perfluorononanoic acid								
463.0 > 419.0	20.738	20.748	-0.010	1.000	168128	1.65	6043	
$ 10 13C2 PFDA								
515.0 > 470.0	21.471	21.474	-0.003	1.000	728204	9.23	22953	

QC Flag Legend

Review Flags

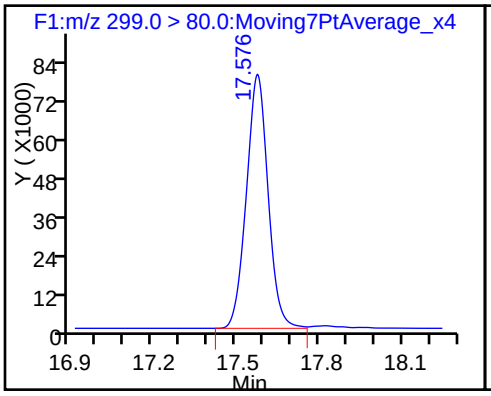
M - Manually Integrated

Reagents:

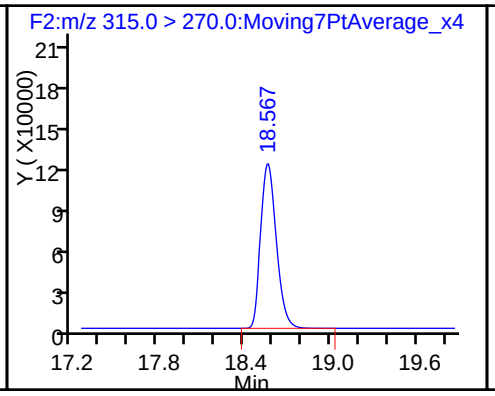
LC537-L1_00015 Amount Added: 1.00 Units: mL

Data File: \\ChromNA\Sacramento\ChromData\A6\20161205-37524.b\05DEC2016A6A_004.d
Injection Date: 05-Dec-2016 17:26:03 Instrument ID: A6
Lims ID: STD L1
Client ID:
Operator ID: CBW ALS Bottle#: 1 Worklist Smp#: 2
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL

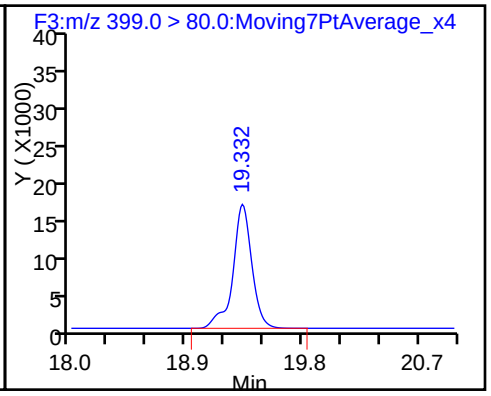
1 Perfluorobutanesulfonic acid



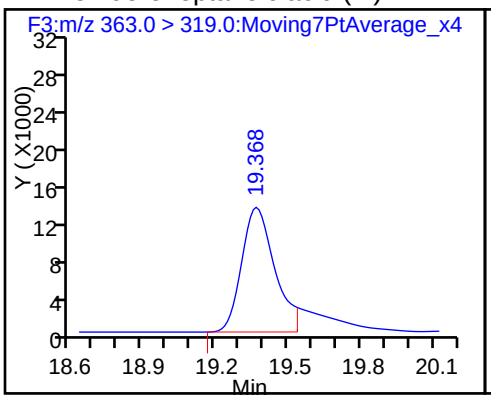
$ 2 13C2 PFHxA



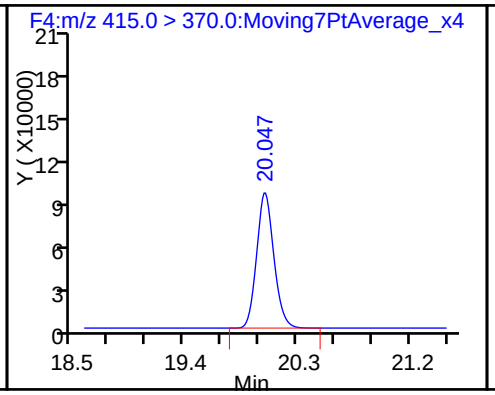
3 Perfluorohexanesulfonic acid



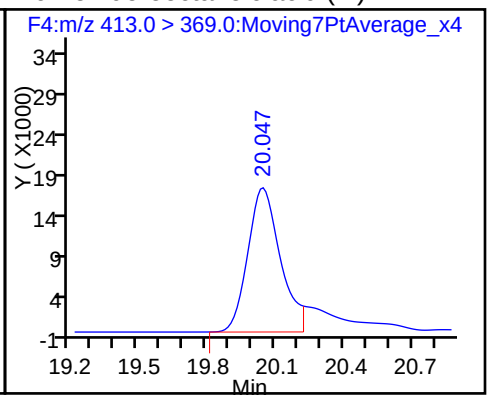
4 Perfluoroheptanoic acid (M)



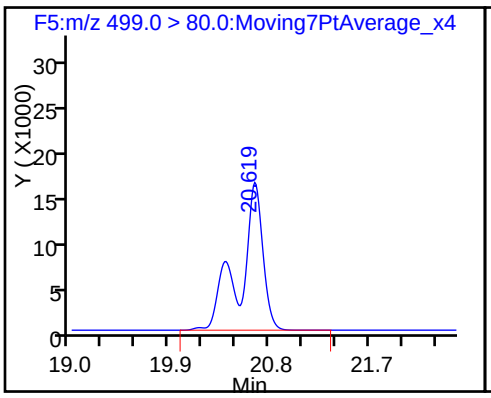
* 5 13C2-PFOA



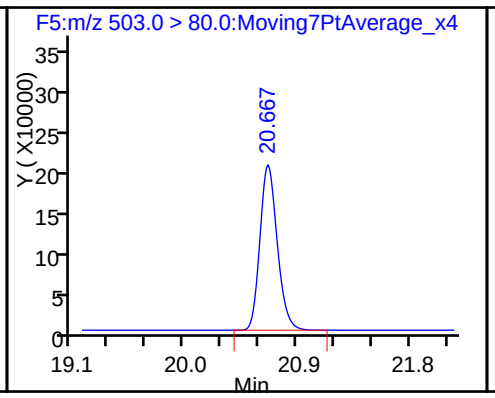
6 Perfluorooctanoic acid (M)



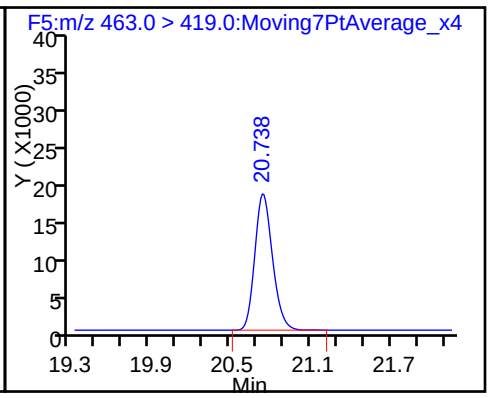
7 Perfluorooctane sulfonic acid



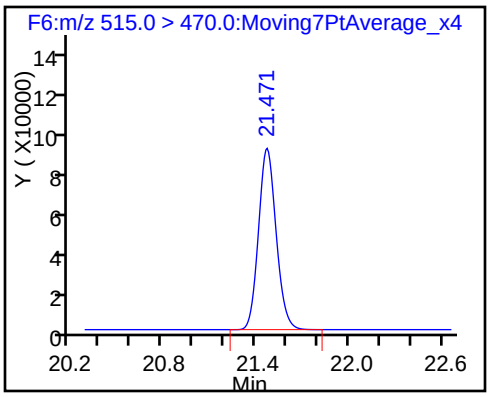
* 8 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

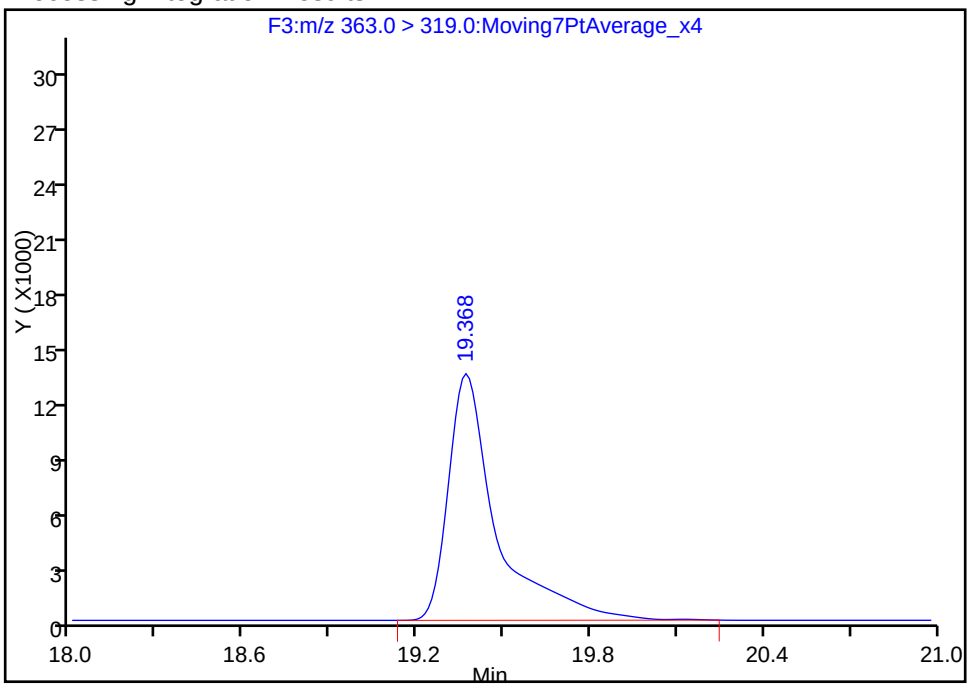
Data File: \\ChromNA\Sacramento\ChromData\A6\20161205-37524.b\05DEC2016A6A_004.d
Injection Date: 05-Dec-2016 17:26:03 Instrument ID: A6
Lims ID: STD L1
Client ID:
Operator ID: CBW ALS Bottle#: 1 Worklist Smp#: 2
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F3:MRM

4 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

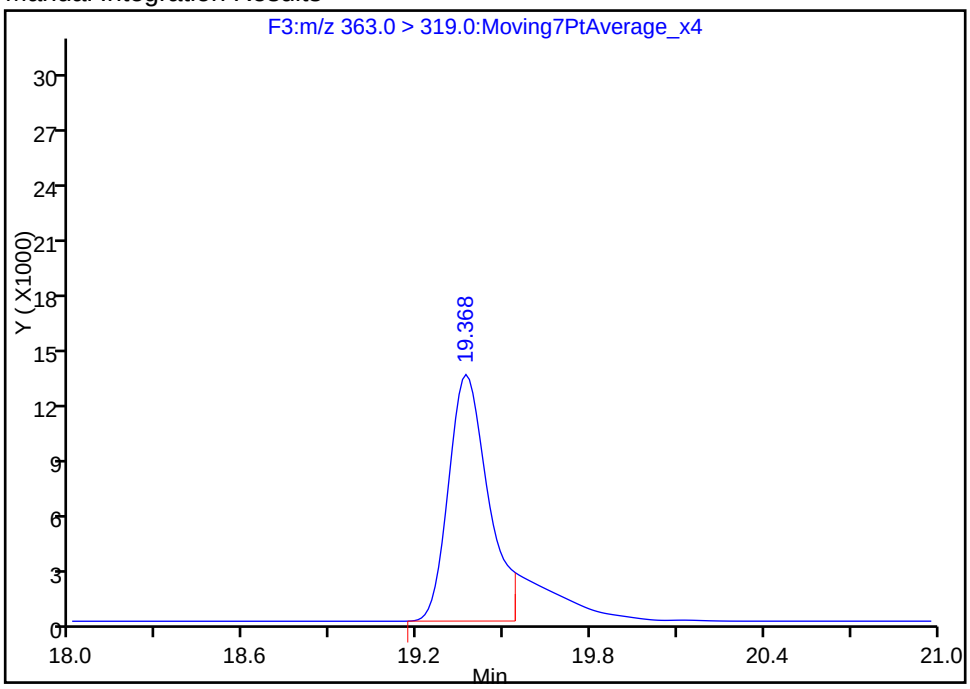
Processing Integration Results

RT: 19.37
Area: 155591
Amount: 1.476072
Amount Units: ng/ml



Manual Integration Results

RT: 19.37
Area: 126557
Amount: 1.156251
Amount Units: ng/ml



Reviewer: barnettj, 06-Dec-2016 10:00:02
Audit Action: Manually Integrated Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

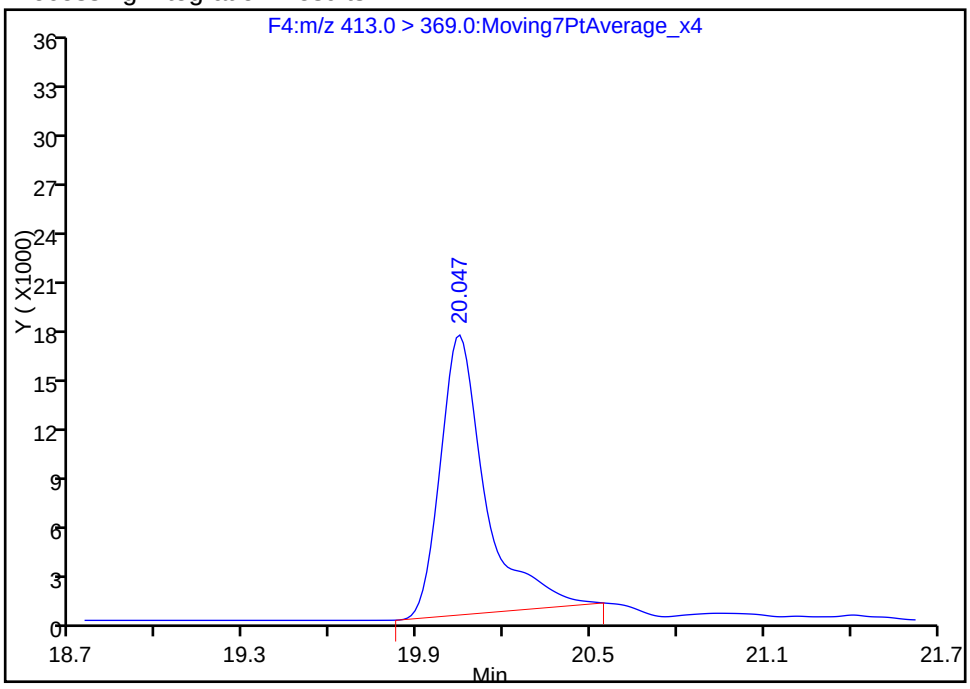
Data File: \\ChromNA\Sacramento\ChromData\A6\20161205-37524.b\05DEC2016A6A_004.d
Injection Date: 05-Dec-2016 17:26:03 Instrument ID: A6
Lims ID: STD L1
Client ID:
Operator ID: CBW ALS Bottle#: 1 Worklist Smp#: 2
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

6 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

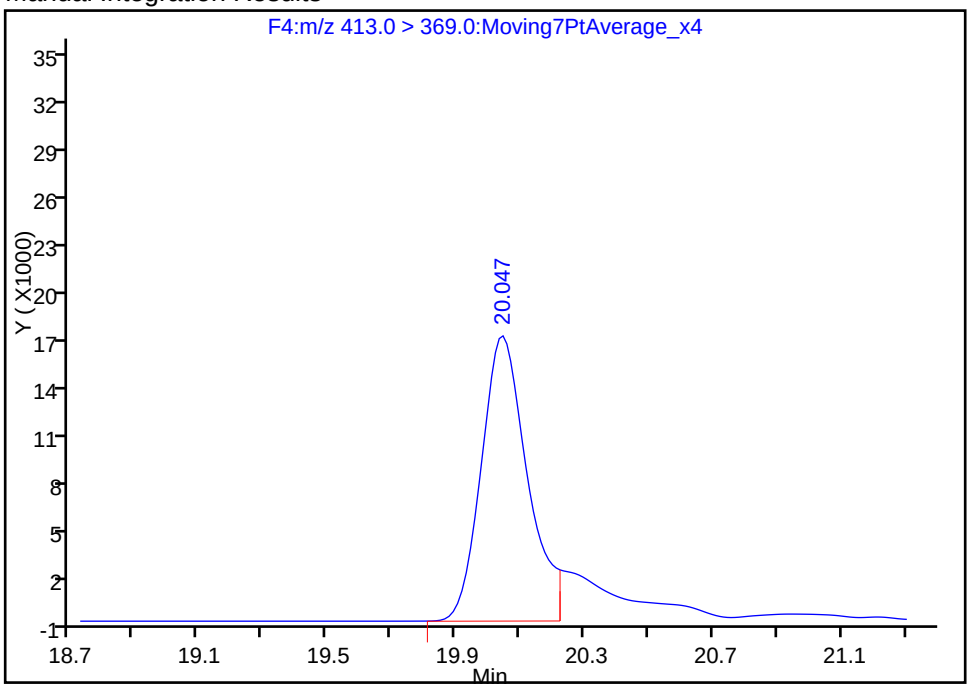
Processing Integration Results

RT: 20.05
Area: 186490
Amount: 1.959453
Amount Units: ng/ml



Manual Integration Results

RT: 20.05
Area: 173304
Amount: 1.849212
Amount Units: ng/ml



Reviewer: barnettj, 06-Dec-2016 10:00:02
Audit Action: Manually Integrated Audit Reason: Split Peak

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161205-37524.b\05DEC2016A6A_005.d
Lims ID: STD L2
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 05-Dec-2016 17:55:38 ALS Bottle#: 2 Worklist Smp#: 3
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\20161205-37524.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 06-Dec-2016 16:35:35 Calib Date: 05-Dec-2016 19:54:00
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161205-37524.b\05DEC2016A6A_009.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK024

First Level Reviewer: barnettj Date: 06-Dec-2016 09:58:24

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								
299.0 > 80.0	17.582	17.581	0.001	1.000	1227165	21.3	5055	
$ 2 13C2 PFHxA								
315.0 > 270.0	18.567	18.567	0.0	1.000	1106485	9.01	35678	
3 Perfluorohexanesulfonic acid								
399.0 > 80.0	19.344	19.342	0.002	1.000	491809	6.67	11495	
4 Perfluoroheptanoic acid								M
363.0 > 319.0	19.380	19.378	0.002	1.000	324913	2.54	155	M
* 5 13C2-PFOA								
415.0 > 370.0	20.047	20.047	0.0		1052273	10.0	27645	
6 Perfluorooctanoic acid								M
413.0 > 369.0	20.047	20.047	0.0	1.000	492431	4.50	100	M
7 Perfluorooctane sulfonic acid								
499.0 > 80.0	20.619	20.619	0.0	1.000	757269	8.83	8449	
* 8 13C4 PFOS								
503.0 > 80.0	20.667	20.669	-0.002		2356620	28.7	30757	
9 Perfluorononanoic acid								
463.0 > 419.0	20.750	20.748	0.002	1.000	525061	4.40	13911	
$ 10 13C2 PFDA								
515.0 > 470.0	21.480	21.474	0.006	1.000	782778	8.49	24678	

QC Flag Legend

Review Flags

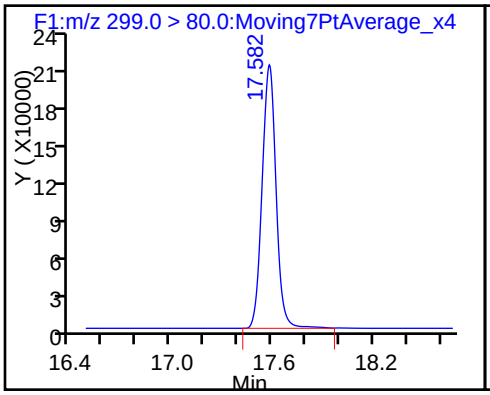
M - Manually Integrated

Reagents:

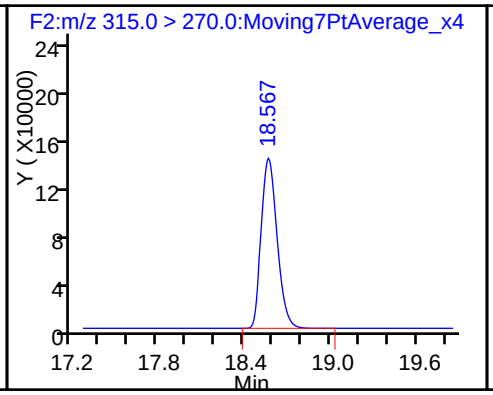
LC537-L2_00014 Amount Added: 1.00 Units: mL

Data File: \\ChromNA\Sacramento\ChromData\A6\20161205-37524.b\05DEC2016A6A_005.d
Injection Date: 05-Dec-2016 17:55:38 Instrument ID: A6
Lims ID: STD L2
Client ID:
Operator ID: CBW ALS Bottle#: 2 Worklist Smp#: 3
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL

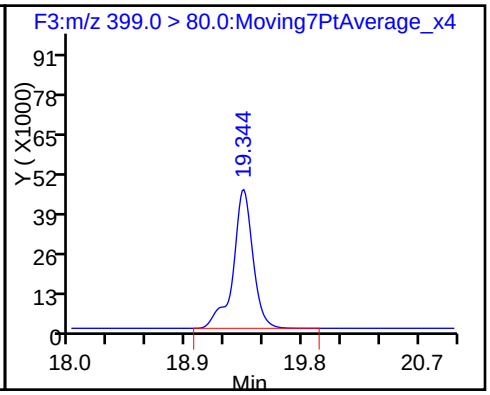
1 Perfluorobutanesulfonic acid



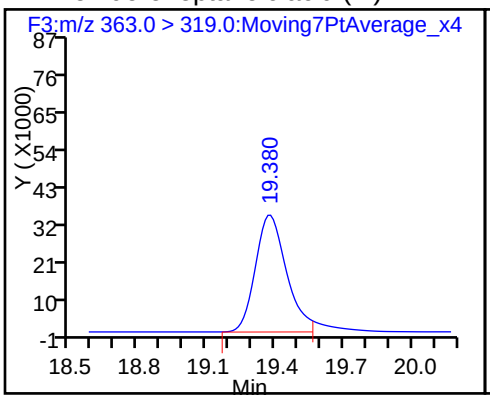
$ 2 13C2 PFHxA



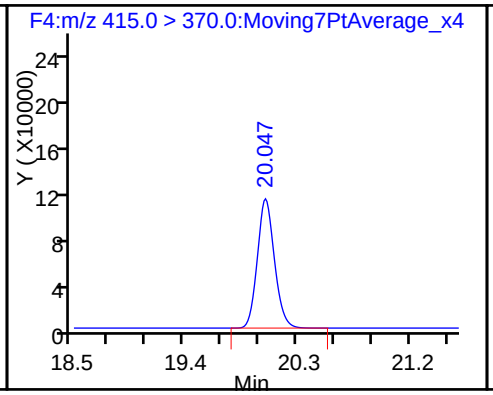
3 Perfluorohexanesulfonic acid



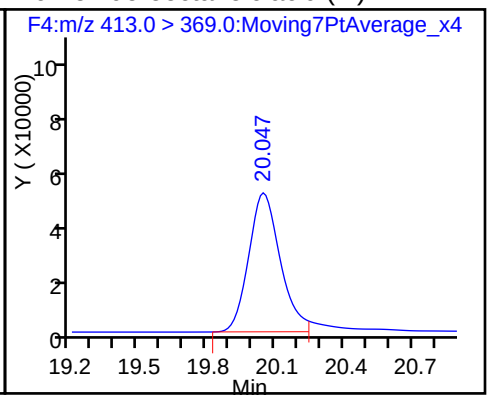
4 Perfluoroheptanoic acid (M)



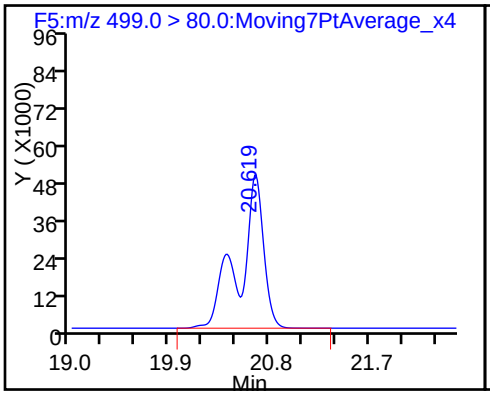
* 5 13C2-PFOA



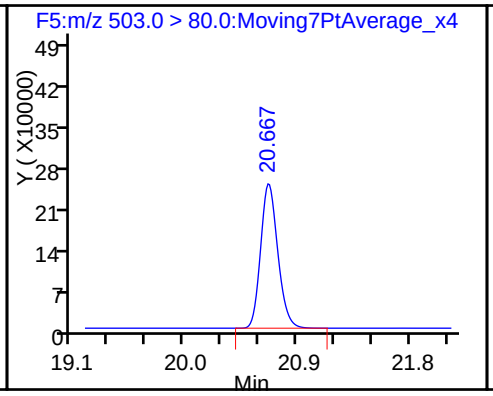
6 Perfluorooctanoic acid (M)



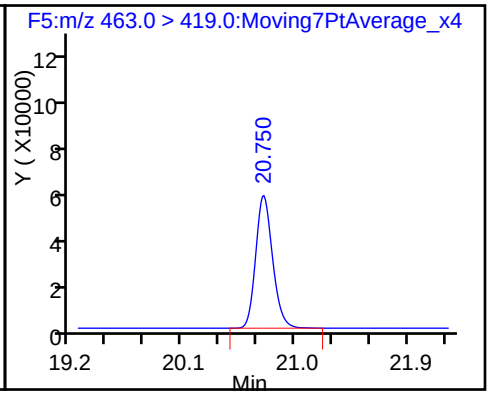
7 Perfluorooctane sulfonic acid



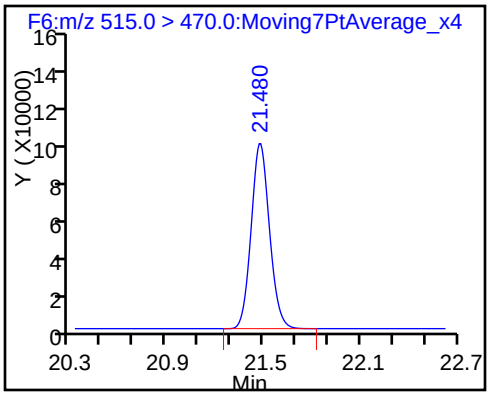
* 8 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

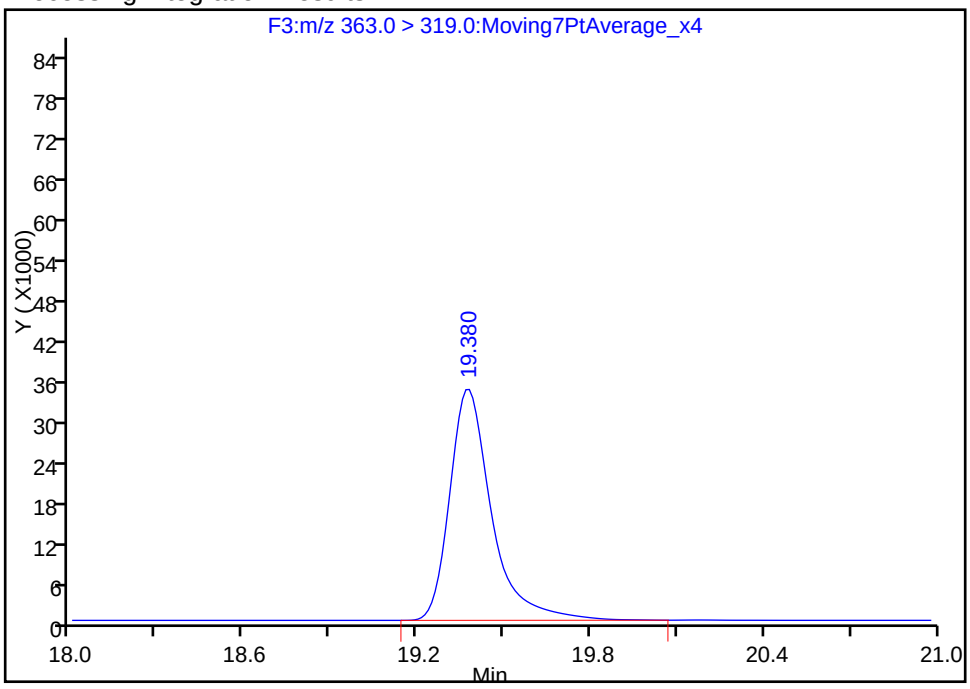
Data File: \\ChromNA\Sacramento\ChromData\A6\20161205-37524.b\05DEC2016A6A_005.d
Injection Date: 05-Dec-2016 17:55:38 Instrument ID: A6
Lims ID: STD L2
Client ID:
Operator ID: CBW ALS Bottle#: 2 Worklist Smp#: 3
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F3:MRM

4 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

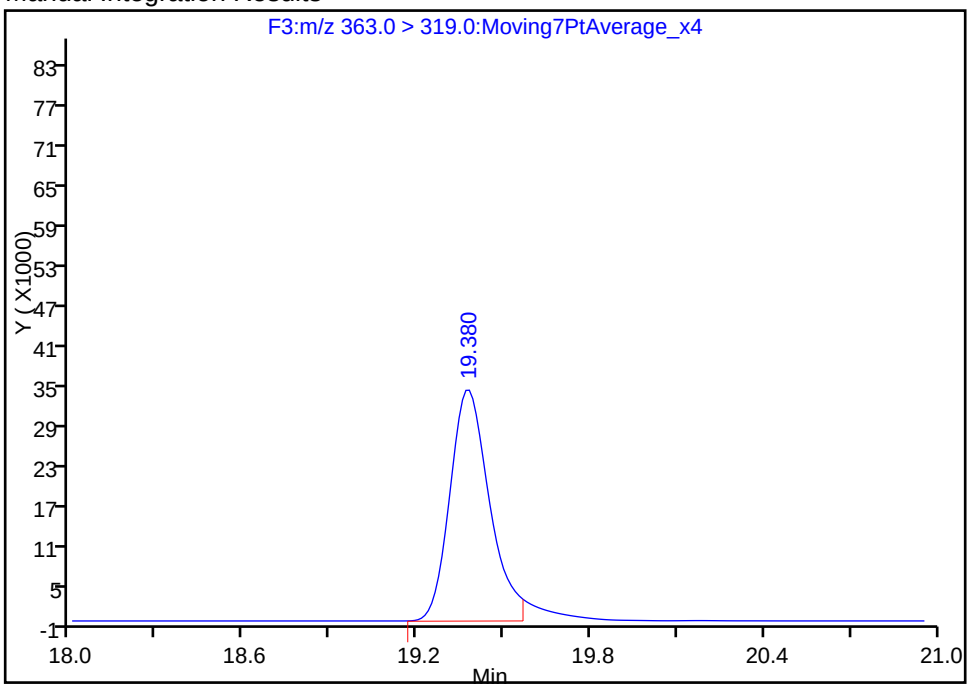
Processing Integration Results

RT: 19.38
Area: 344811
Amount: 2.670013
Amount Units: ng/ml



Manual Integration Results

RT: 19.38
Area: 324913
Amount: 2.541065
Amount Units: ng/ml



Reviewer: barnettj, 06-Dec-2016 10:03:30
Audit Action: Manually Integrated Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

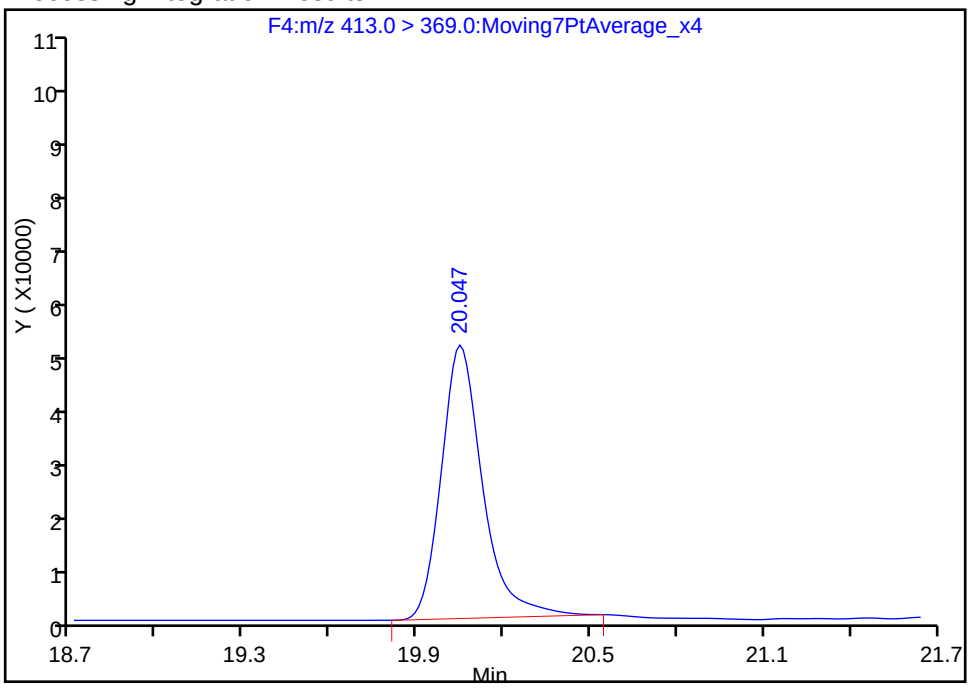
Data File: \\ChromNA\Sacramento\ChromData\A6\20161205-37524.b\05DEC2016A6A_005.d
Injection Date: 05-Dec-2016 17:55:38 Instrument ID: A6
Lims ID: STD L2
Client ID:
Operator ID: CBW ALS Bottle#: 2 Worklist Smp#: 3
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

6 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

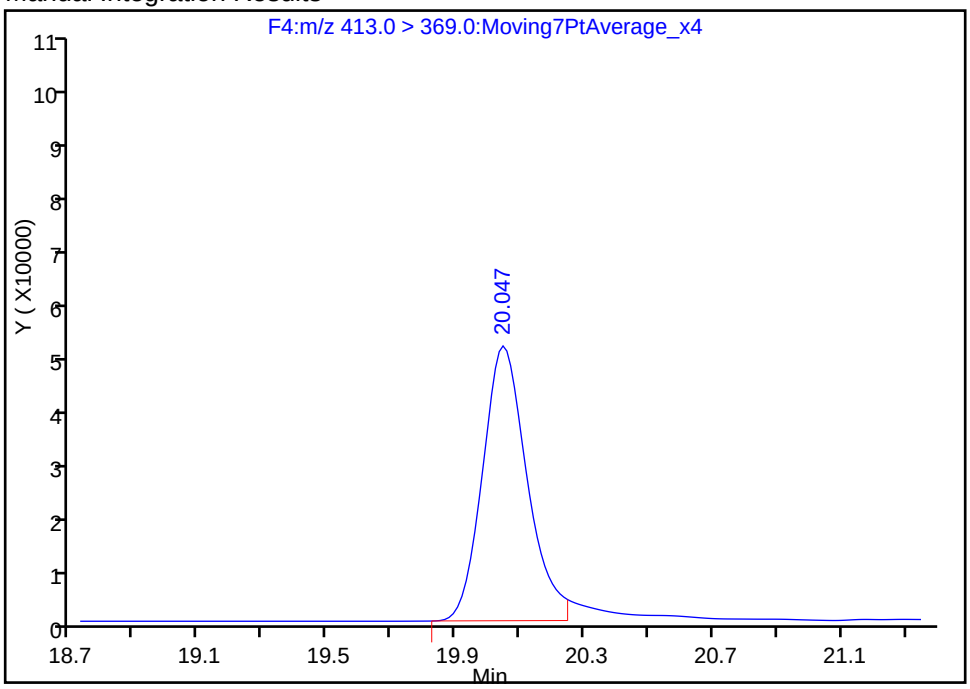
Processing Integration Results

RT: 20.05
Area: 504990
Amount: 4.595586
Amount Units: ng/ml



Manual Integration Results

RT: 20.05
Area: 492431
Amount: 4.497863
Amount Units: ng/ml



Reviewer: barnettj, 06-Dec-2016 10:03:30
Audit Action: Manually Integrated Audit Reason: Split Peak

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161205-37524.b\05DEC2016A6A_006.d
Lims ID: STD L3
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 05-Dec-2016 18:25:13 ALS Bottle#: 3 Worklist Smp#: 4
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\20161205-37524.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 06-Dec-2016 16:35:36 Calib Date: 05-Dec-2016 19:54:00
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161205-37524.b\05DEC2016A6A_009.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK024

First Level Reviewer: barnettj Date: 06-Dec-2016 09:58:05

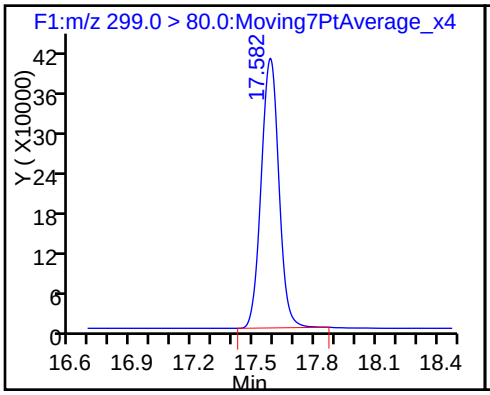
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								
299.0 > 80.0	17.582	17.581	0.001	1.000	2489398	46.2	1804	
$ 2 13C2 PFHxA								
315.0 > 270.0	18.567	18.567	0.0	1.000	1261522	10.2	40506	
3 Perfluorohexanesulfonic acid								
399.0 > 80.0	19.344	19.342	0.002	1.000	1086082	15.7	25400	
4 Perfluoroheptanoic acid								
363.0 > 319.0	19.380	19.378	0.002	1.000	658044	5.12	4774	
* 5 13C2-PFOA								
415.0 > 370.0	20.047	20.047	0.0		1057506	10.0	27287	
6 Perfluorooctanoic acid								
413.0 > 369.0	20.047	20.047	0.0	1.000	1150281	10.5	429	
7 Perfluorooctane sulfonic acid								
499.0 > 80.0	20.619	20.619	0.0	1.000	1658139	20.7	19019	
* 8 13C4 PFOS								
503.0 > 80.0	20.667	20.669	-0.002		2205243	28.7	57142	
9 Perfluorononanoic acid								
463.0 > 419.0	20.750	20.748	0.002	1.000	1245341	10.4	13210	
$ 10 13C2 PFDA								
515.0 > 470.0	21.471	21.474	-0.003	1.000	917302	9.90	28753	

Reagents:

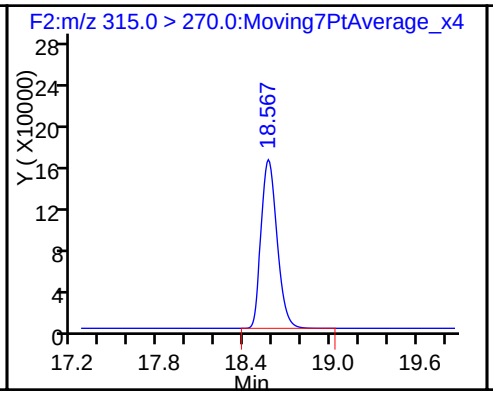
LC537-L3_00016 Amount Added: 1.00 Units: mL

Data File: \\ChromNA\Sacramento\ChromData\A6\20161205-37524.b\05DEC2016A6A_006.d
Injection Date: 05-Dec-2016 18:25:13 Instrument ID: A6
Lims ID: STD L3
Client ID:
Operator ID: CBW ALS Bottle#: 3 Worklist Smp#: 4
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL

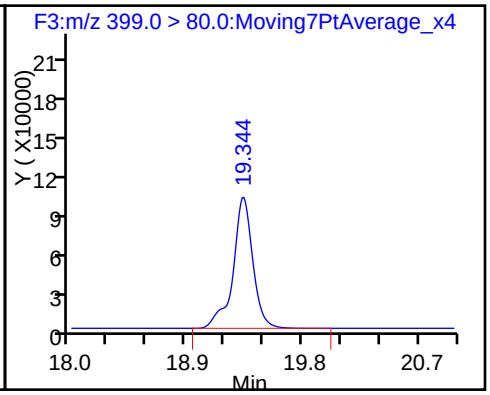
1 Perfluorobutanesulfonic acid



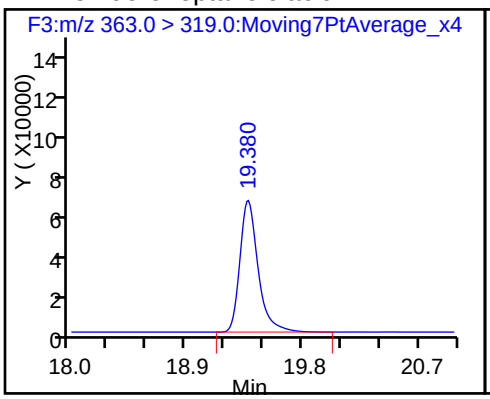
$ 2 13C2 PFHxA



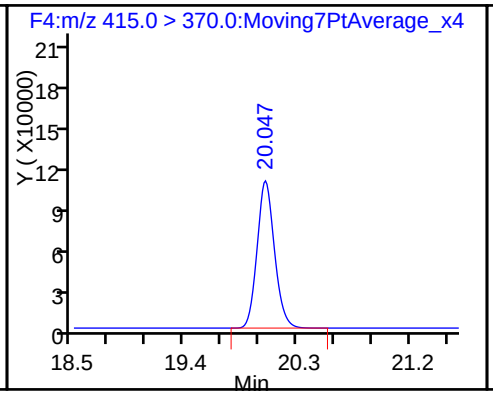
3 Perfluorohexanesulfonic acid



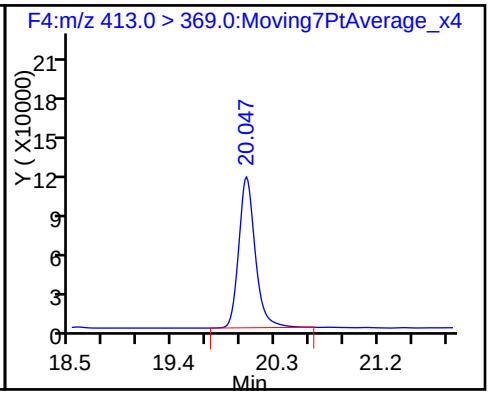
4 Perfluoroheptanoic acid



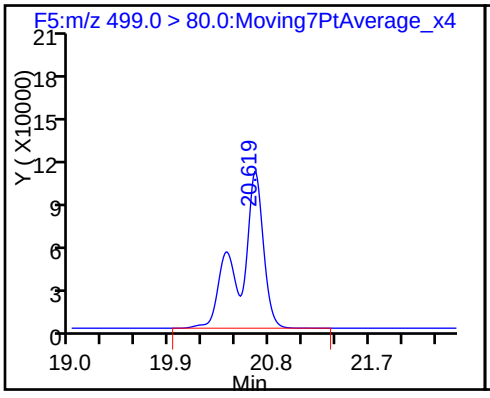
* 5 13C2-PFOA



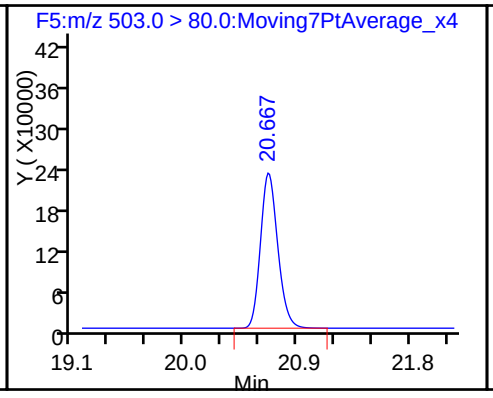
6 Perfluorooctanoic acid



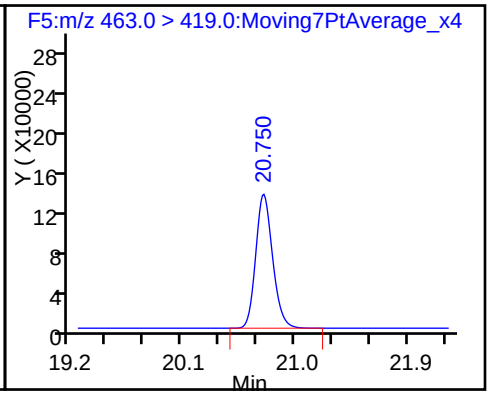
7 Perfluorooctane sulfonic acid



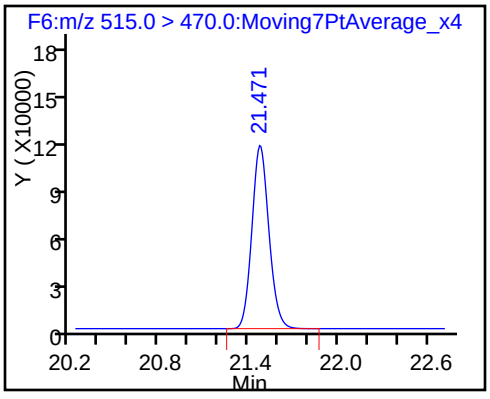
* 8 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161205-37524.b\05DEC2016A6A_007.d
Lims ID: STD L4
Client ID:
Sample Type: ICISAV Calib Level: 4
Inject. Date: 05-Dec-2016 18:54:48 ALS Bottle#: 4 Worklist Smp#: 5
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\20161205-37524.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 06-Dec-2016 16:35:37 Calib Date: 05-Dec-2016 19:54:00
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161205-37524.b\05DEC2016A6A_009.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK024

First Level Reviewer: barnettj Date: 06-Dec-2016 13:43:03

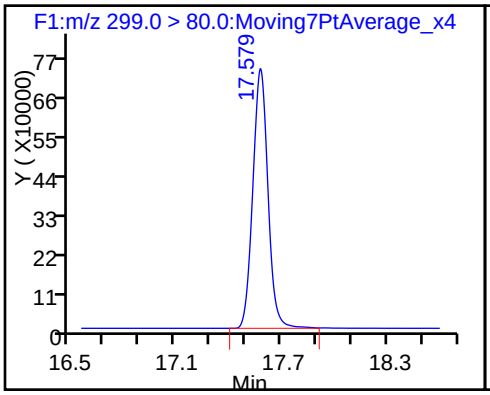
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								
299.0 > 80.0	17.579	17.581	-0.002	1.000	4401661	94.0	2768	
$ 2 13C2 PFHxA								
315.0 > 270.0	18.567	18.567	0.0	1.000	1117585	10.5	28676	
3 Perfluorohexanesulfonic acid								
399.0 > 80.0	19.344	19.342	0.002	1.000	1938237	32.3	25196	
4 Perfluoroheptanoic acid								
363.0 > 319.0	19.380	19.378	0.002	1.000	1121930	10.2	12796	
* 5 13C2-PFOA								
415.0 > 370.0	20.047	20.047	0.0		908727	10.0	23744	
6 Perfluorooctanoic acid								
413.0 > 369.0	20.047	20.047	0.0	1.000	2096404	22.2	516	
7 Perfluorooctane sulfonic acid								
499.0 > 80.0	20.619	20.619	0.0	1.000	2969550	42.6	9704	
* 8 13C4 PFOS								
503.0 > 80.0	20.667	20.669	-0.002		1914415	28.7	28032	
9 Perfluorononanoic acid								
463.0 > 419.0	20.750	20.748	0.002	1.000	2227031	21.6	23494	
$ 10 13C2 PFDA								
515.0 > 470.0	21.471	21.474	-0.003	1.000	822787	10.3	25796	

Reagents:

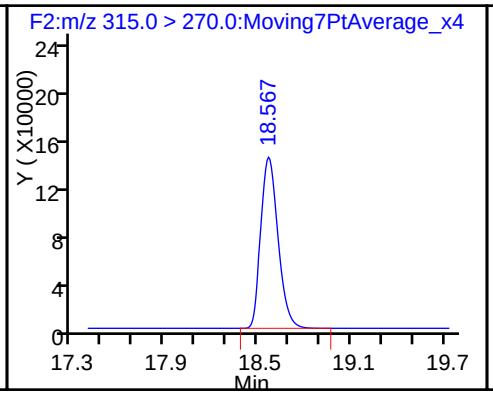
LC537-L4_00015 Amount Added: 1.00 Units: mL

Data File: \\ChromNA\Sacramento\ChromData\A6\20161205-37524.b\05DEC2016A6A_007.d
Injection Date: 05-Dec-2016 18:54:48 Instrument ID: A6
Lims ID: STD L4
Client ID:
Operator ID: CBW ALS Bottle#: 4 Worklist Smp#: 5
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL

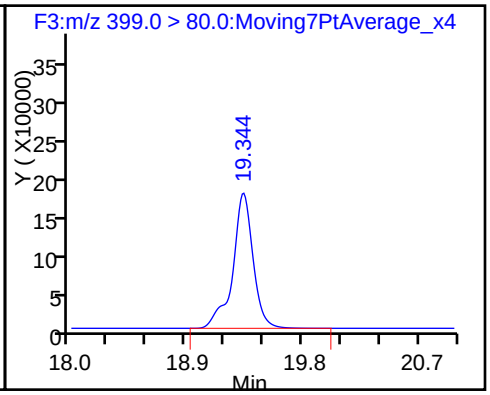
1 Perfluorobutanesulfonic acid



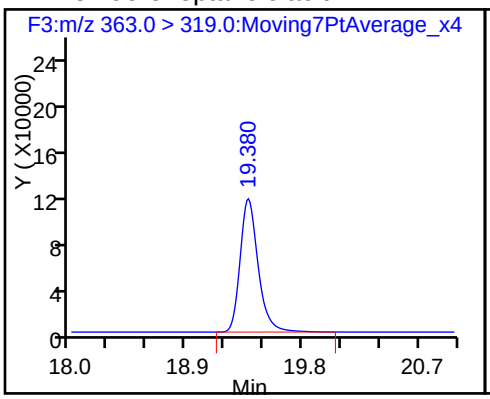
$ 2 13C2 PFHxA



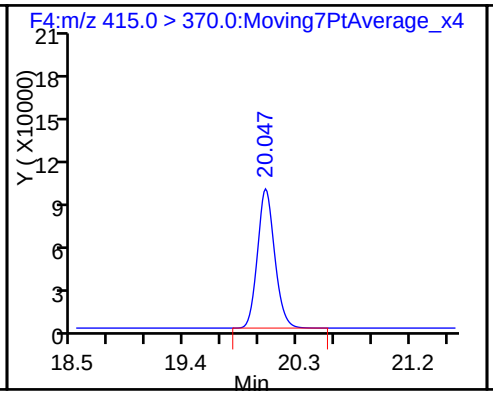
3 Perfluorohexanesulfonic acid



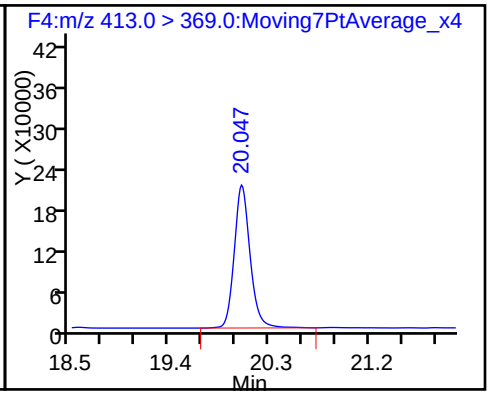
4 Perfluoroheptanoic acid



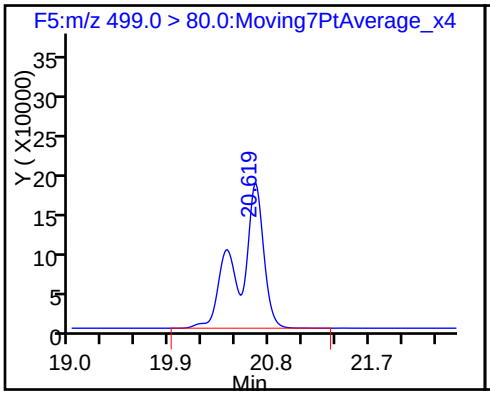
* 5 13C2-PFOA



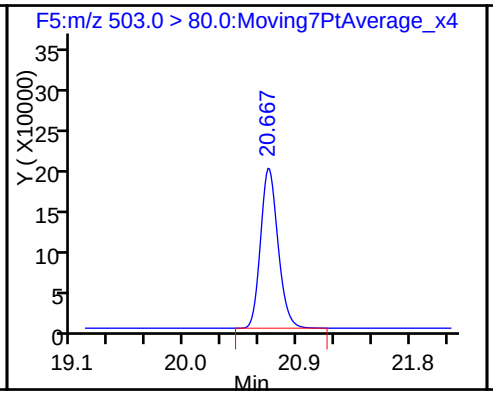
6 Perfluorooctanoic acid



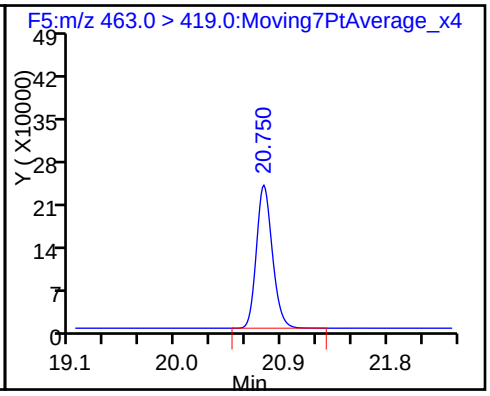
7 Perfluorooctane sulfonic acid



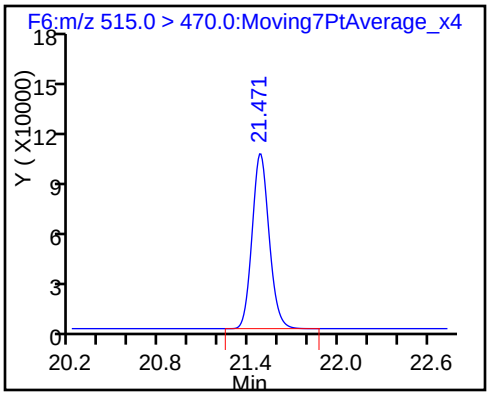
* 8 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161205-37524.b\05DEC2016A6A_008.d
Lims ID: STD L5
Client ID:
Sample Type: IC Calib Level: 5
Inject. Date: 05-Dec-2016 19:24:23 ALS Bottle#: 5 Worklist Smp#: 6
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\20161205-37524.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 06-Dec-2016 16:35:38 Calib Date: 05-Dec-2016 19:54:00
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161205-37524.b\05DEC2016A6A_009.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK024

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								
299.0 > 80.0	17.582	17.581	0.001	1.000	6630132	140.5	3208	
$ 2 13C2 PFHxA								
315.0 > 270.0	18.567	18.567	0.0	1.000	1240474	11.0	39454	
3 Perfluorohexanesulfonic acid								
399.0 > 80.0	19.344	19.342	0.002	1.000	3077974	51.0	14553	
4 Perfluoroheptanoic acid								
363.0 > 319.0	19.380	19.378	0.002	1.000	1727957	14.7	6886	
* 5 13C2-PFOA								
415.0 > 370.0	20.047	20.047	0.0		969779	10.0	24964	
6 Perfluorooctanoic acid								
413.0 > 369.0	20.047	20.047	0.0	1.000	3285195	32.6	1114	
7 Perfluorooctane sulfonic acid								
499.0 > 80.0	20.620	20.619	0.001	1.000	4906017	69.9	10146	
* 8 13C4 PFOS								
503.0 > 80.0	20.679	20.669	0.010		1929192	28.7	32805	
9 Perfluorononanoic acid								
463.0 > 419.0	20.750	20.748	0.002	1.000	3558831	32.4	16307	
$ 10 13C2 PFDA								
515.0 > 470.0	21.480	21.474	0.006	1.000	957025	11.3	30231	

Reagents:

LC537-L5_00017 Amount Added: 1.00 Units: mL

Report Date: 06-Dec-2016 16:35:39 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20161205-37524.b\05DEC2016A6A_008.d

Injection Date: 05-Dec-2016 19:24:23 Instrument ID: A6

Lims ID: STD L5

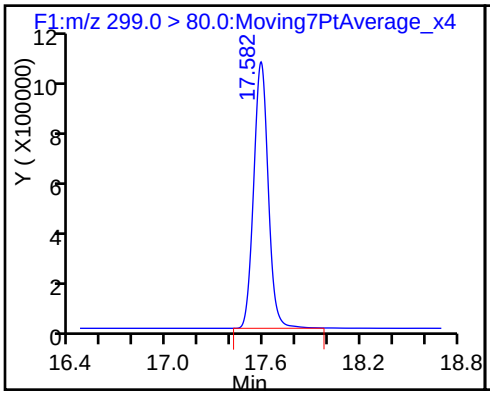
Client ID:

Operator ID: CBW ALS Bottle#: 5 Worklist Smp#: 6

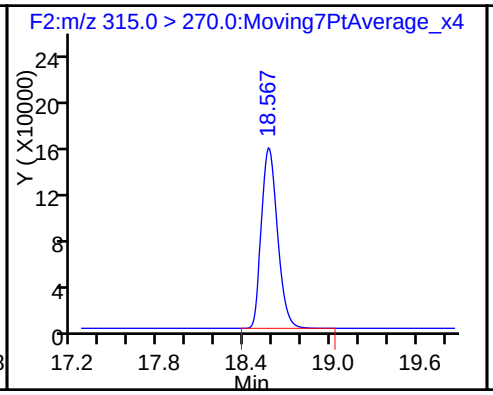
Injection Vol: 10.0 ul Dil. Factor: 1.0000

Method: 537__A6 Limit Group: LC 537 ICAL

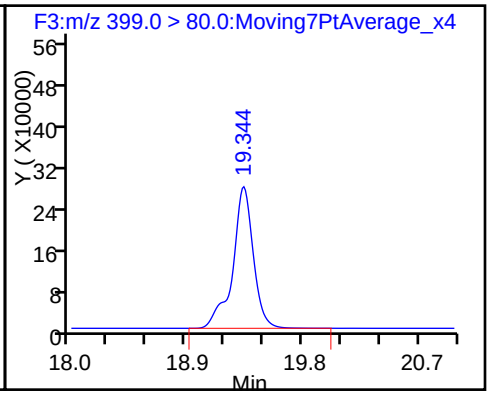
1 Perfluorobutanesulfonic acid



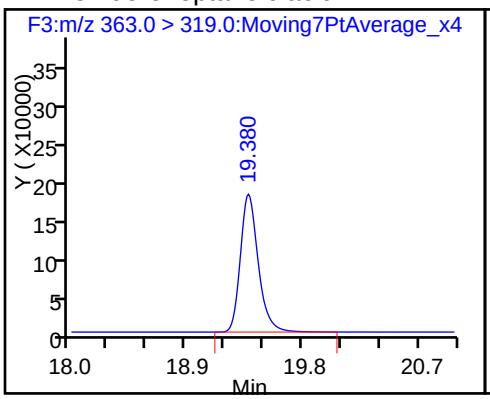
$ 2 13C2 PFHxA



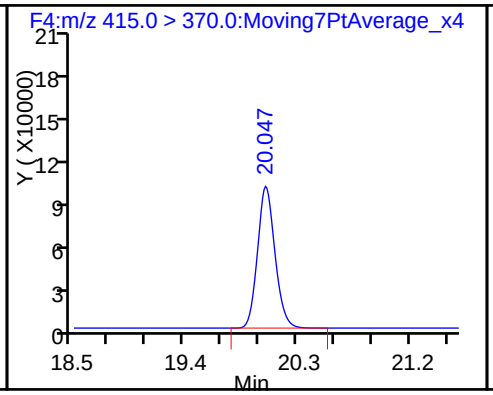
3 Perfluorohexanesulfonic acid



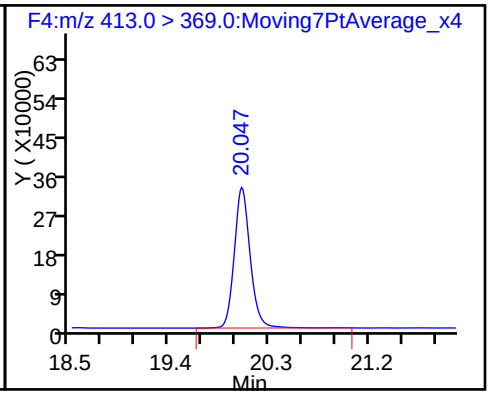
4 Perfluoroheptanoic acid



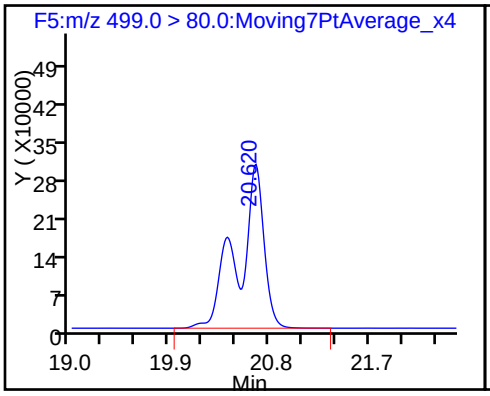
* 5 13C2-PFOA



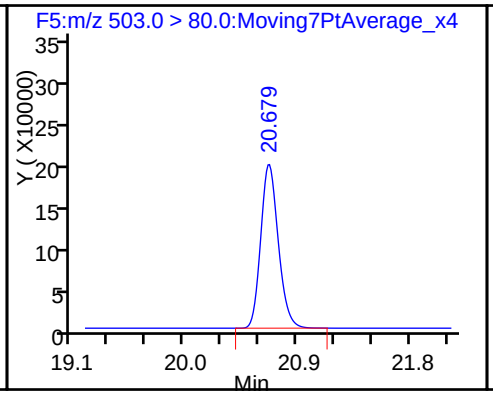
6 Perfluorooctanoic acid



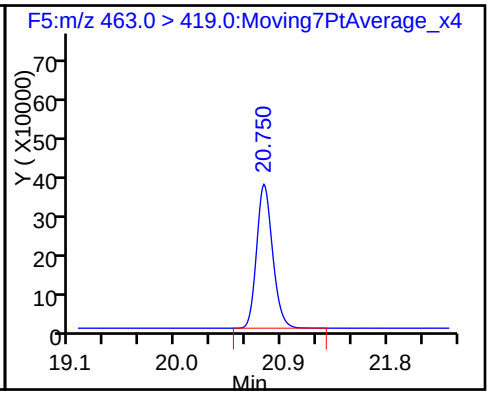
7 Perfluorooctane sulfonic acid



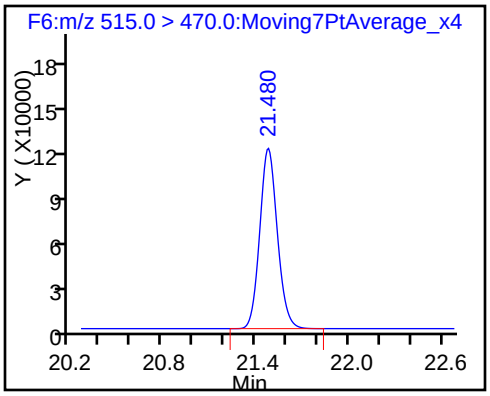
* 8 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161205-37524.b\05DEC2016A6A_009.d
Lims ID: STD L6
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 05-Dec-2016 19:54:00 ALS Bottle#: 6 Worklist Smp#: 7
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\20161205-37524.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 06-Dec-2016 16:35:39 Calib Date: 05-Dec-2016 19:54:00
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161205-37524.b\05DEC2016A6A_009.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK024

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								
299.0 > 80.0	17.582	17.581	0.001	1.000	7753569	166.9	8570	
$ 2 13C2 PFHxA								
315.0 > 270.0	18.567	18.567	0.0	1.000	1095977	10.4	34796	
3 Perfluorohexanesulfonic acid								
399.0 > 80.0	19.344	19.342	0.002	1.000	3556638	59.8	31299	
4 Perfluoroheptanoic acid								
363.0 > 319.0	19.380	19.378	0.002	1.000	2032288	18.5	6367	
* 5 13C2-PFOA								
415.0 > 370.0	20.047	20.047	0.0		906416	10.0	23083	
6 Perfluorooctanoic acid								
413.0 > 369.0	20.047	20.047	0.0	1.000	3876381	41.1	917	
7 Perfluorooctane sulfonic acid								
499.0 > 80.0	20.619	20.619	0.0	1.000	5775285	83.5	12991	
* 8 13C4 PFOS								
503.0 > 80.0	20.667	20.669	-0.002		1899408	28.7	17628	
9 Perfluorononanoic acid								
463.0 > 419.0	20.750	20.748	0.002	1.000	4124664	40.1	17939	
$ 10 13C2 PFDA								
515.0 > 470.0	21.471	21.474	-0.003	1.000	857144	10.8	26862	

Reagents:

LC537-L6_00014 Amount Added: 1.00 Units: mL

Report Date: 06-Dec-2016 16:35:40 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20161205-37524.b\05DEC2016A6A_009.d

Injection Date: 05-Dec-2016 19:54:00 Instrument ID: A6

Lims ID: STD L6

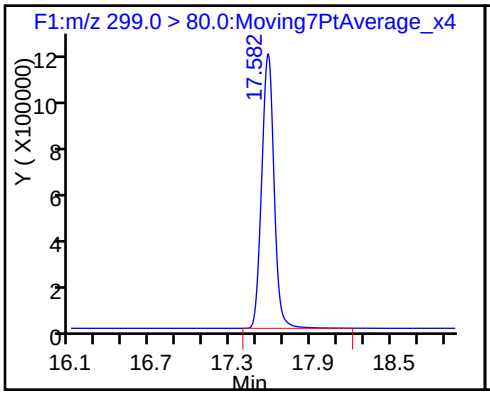
Client ID:

Operator ID: CBW ALS Bottle#: 6 Worklist Smp#: 7

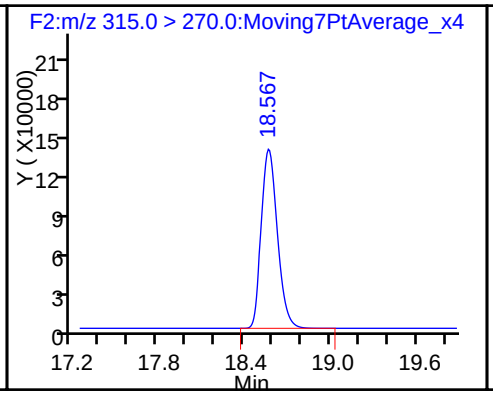
Injection Vol: 10.0 ul Dil. Factor: 1.0000

Method: 537__A6 Limit Group: LC 537 ICAL

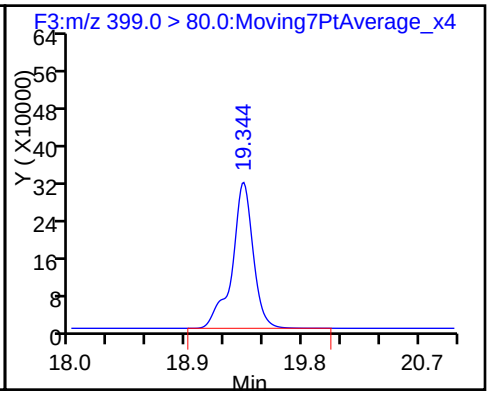
1 Perfluorobutanesulfonic acid



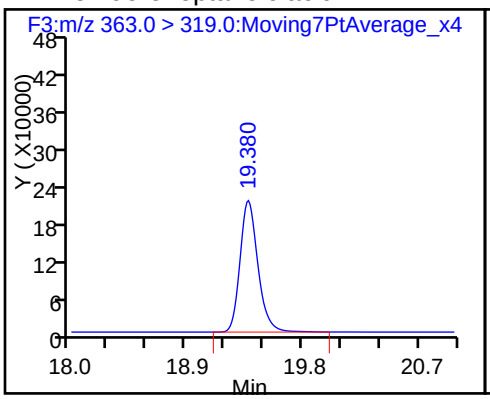
$ 2 13C2 PFHxA



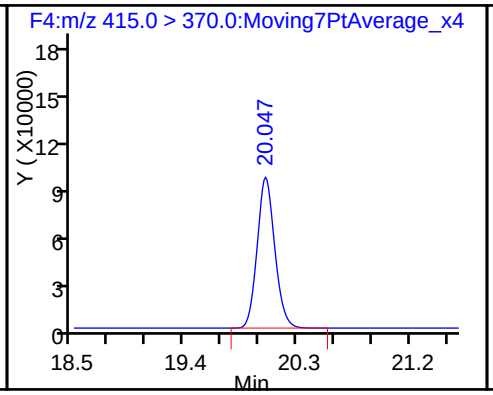
3 Perfluorohexanesulfonic acid



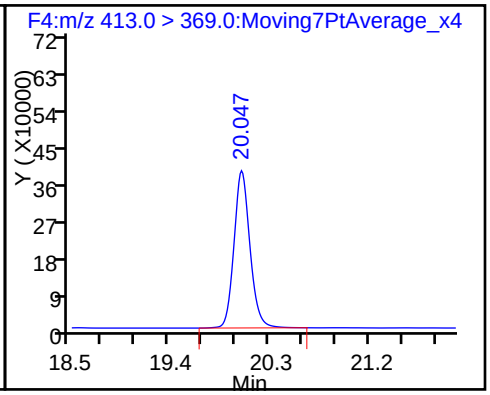
4 Perfluoroheptanoic acid



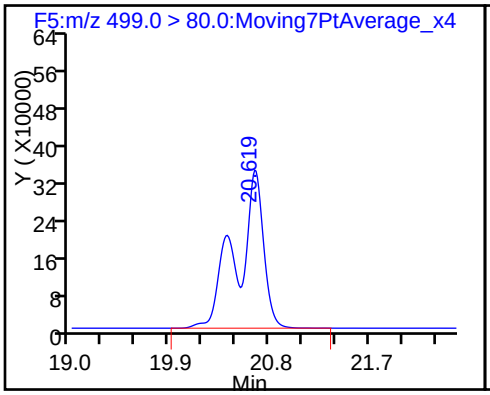
* 5 13C2-PFOA



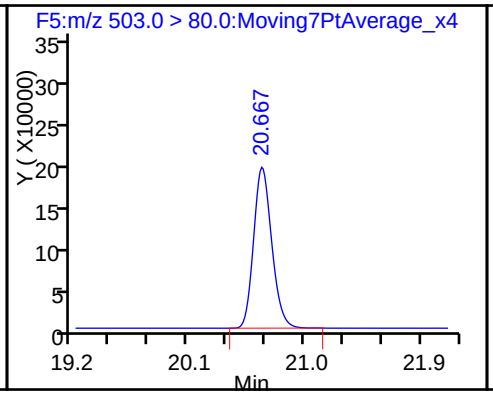
6 Perfluorooctanoic acid



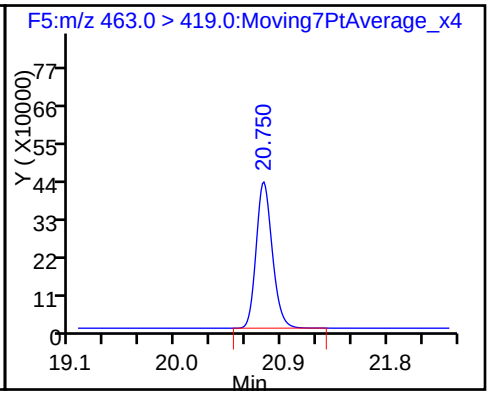
7 Perfluorooctane sulfonic acid



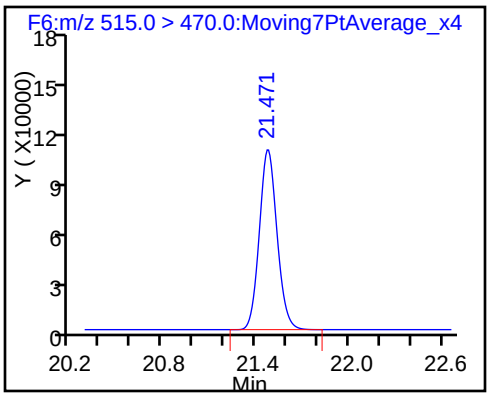
* 8 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24441-1

SDG No.:

Lab Sample ID: CCV 320-140688/9 Calibration Date: 12/05/2016 20:53

Instrument ID: A6 Calib Start Date: 12/05/2016 17:26

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/05/2016 19:54

Lab File ID: 05DEC2016A6A_011.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.7015	0.6306		20.6	22.9	-10.1	50.0
Perfluorohexanesulfonic acid	Ave	0.8980	0.7822		6.72	7.72	-12.9	50.0
Perfluoroheptanoic acid	Ave	1.215	1.239		2.65	2.60	1.9	50.0
Perfluorooctanoic acid (PFOA)	Ave	1.040	0.9133		4.54	5.17	-12.2	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.044	0.8902		8.71	10.2	-14.7	50.0
Perfluorononanoic acid	Ave	1.134	1.093		4.83	5.01	-3.6	50.0
13C2 PFHxA	Ave	1.167	1.081		9.27	10.0	-7.3	30.0
13C2 PFDA	Ave	0.8763	0.8211		9.37	10.0	-6.3	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161205-37524.b\05DEC2016A6A_011.d
Lims ID: CCV L2
Client ID:
Sample Type: CCVL
Inject. Date: 05-Dec-2016 20:53:12 ALS Bottle#: 2 Worklist Smp#: 9
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\20161205-37524.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 06-Dec-2016 16:35:40 Calib Date: 05-Dec-2016 19:54:00
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161205-37524.b\05DEC2016A6A_009.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK024

First Level Reviewer: barnettj Date: 06-Dec-2016 10:08:33

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								
299.0 > 80.0	17.586	17.581	0.005	1.000	1186753	20.6	693	
$ 2 13C2 PFHxA								
315.0 > 270.0	18.567	18.567	0.0	1.000	1108698	9.27	35970	
3 Perfluorohexanesulfonic acid								
399.0 > 80.0	19.344	19.342	0.002	1.000	496197	6.72	11535	
4 Perfluoroheptanoic acid								M
363.0 > 319.0	19.380	19.378	0.002	1.000	329772	2.65	166	M
* 5 13C2-PFOA								
415.0 > 370.0	20.047	20.047	0.0		1025187	10.0	21492	
6 Perfluorooctanoic acid								M
413.0 > 369.0	20.047	20.047	0.0	1.000	484196	4.54	93.2	M
7 Perfluorooctane sulfonic acid								
499.0 > 80.0	20.619	20.619	0.0	1.000	747766	8.71	8549	
* 8 13C4 PFOS								
503.0 > 80.0	20.667	20.669	-0.002		2358079	28.7	20478	
9 Perfluorononanoic acid								
463.0 > 419.0	20.750	20.748	0.002	1.000	561371	4.83	15032	
$ 10 13C2 PFDA								
515.0 > 470.0	21.471	21.474	-0.003	1.000	841818	9.37	26813	

QC Flag Legend

Review Flags

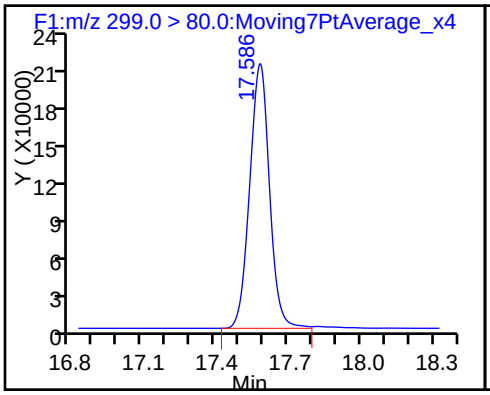
M - Manually Integrated

Reagents:

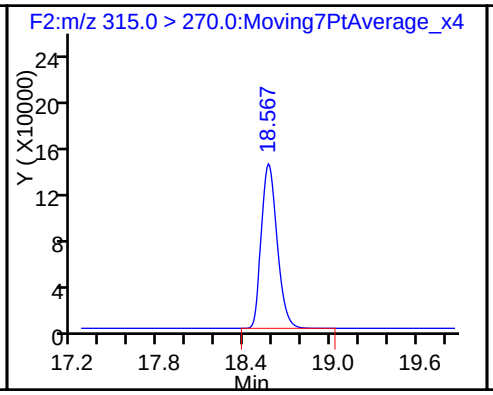
LC537-L2_00014 Amount Added: 1.00 Units: mL

Data File: \\ChromNA\Sacramento\ChromData\A6\20161205-37524.b\05DEC2016A6A_011.d
Injection Date: 05-Dec-2016 20:53:12 Instrument ID: A6
Lims ID: CCV L2
Client ID:
Operator ID: CBW ALS Bottle#: 2 Worklist Smp#: 9
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL

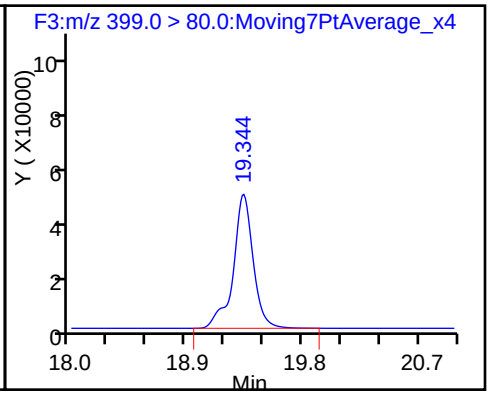
1 Perfluorobutanesulfonic acid



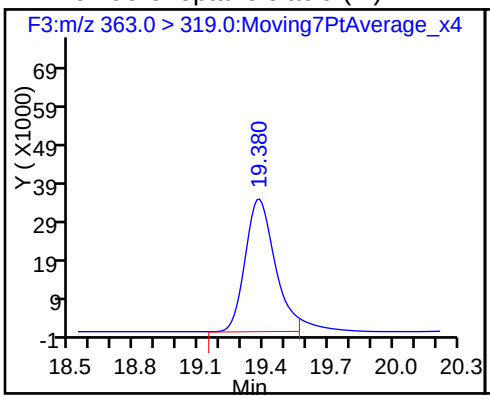
$ 2 13C2 PFHxA



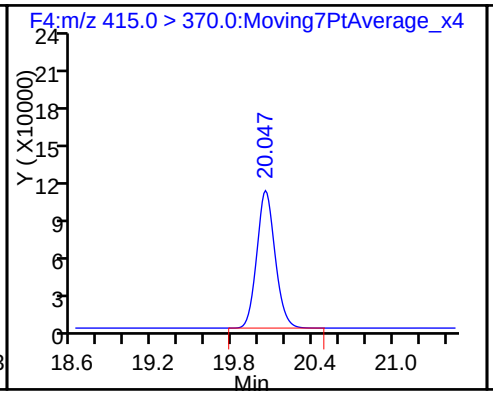
3 Perfluorohexanesulfonic acid



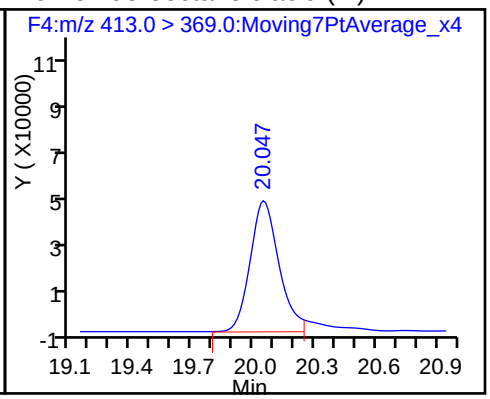
4 Perfluoroheptanoic acid (M)



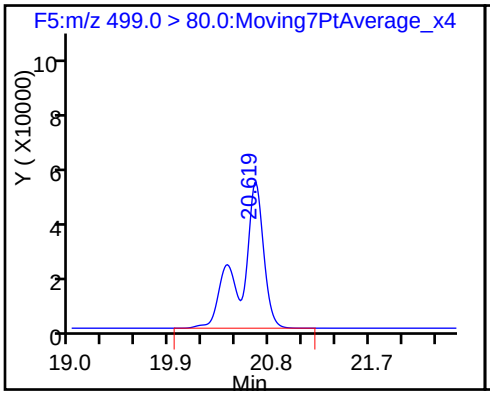
* 5 13C2-PFOA



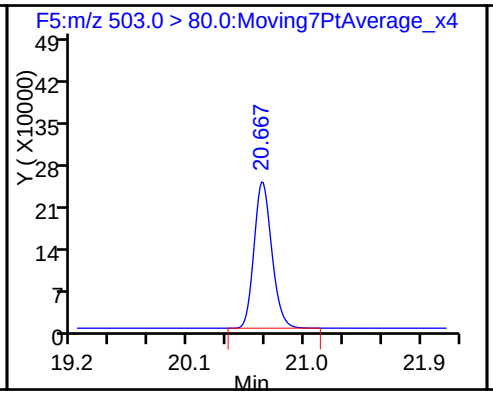
6 Perfluorooctanoic acid (M)



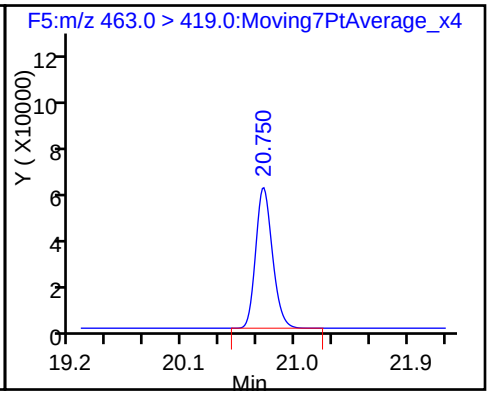
7 Perfluorooctane sulfonic acid



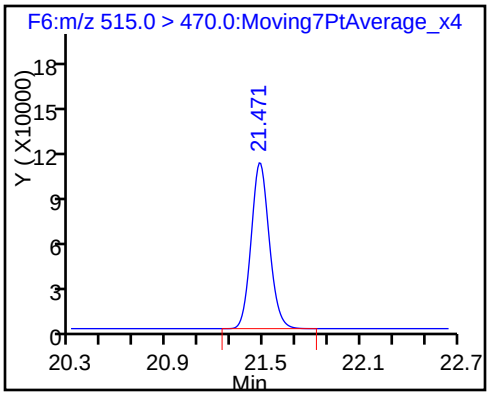
* 8 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

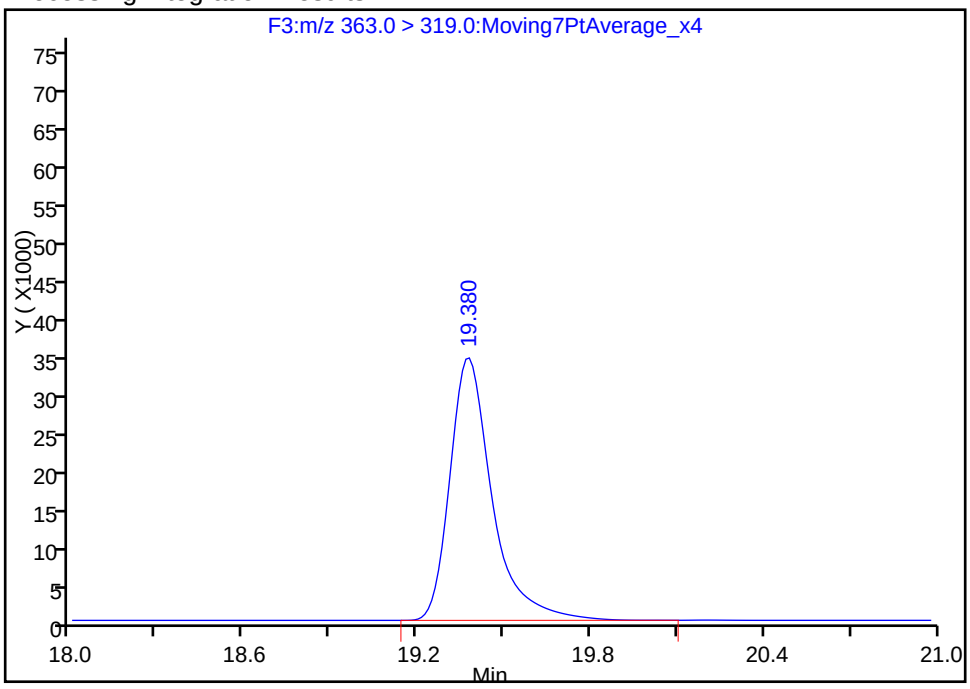
Data File: \\ChromNA\Sacramento\ChromData\A6\20161205-37524.b\05DEC2016A6A_011.d
Injection Date: 05-Dec-2016 20:53:12 Instrument ID: A6
Lims ID: CCV L2
Client ID:
Operator ID: CBW ALS Bottle#: 2 Worklist Smp#: 9
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F3:MRM

4 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

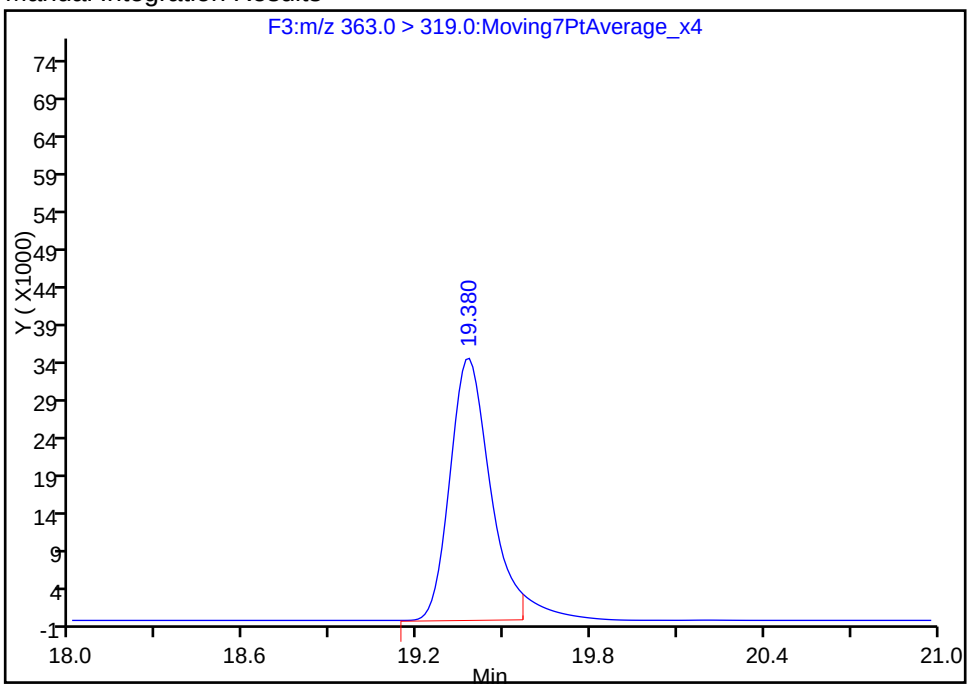
Processing Integration Results

RT: 19.38
Area: 349162
Amount: 2.802857
Amount Units: ng/ml



Manual Integration Results

RT: 19.38
Area: 329772
Amount: 2.647206
Amount Units: ng/ml



Reviewer: barnettj, 06-Dec-2016 10:08:33
Audit Action: Manually Integrated Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

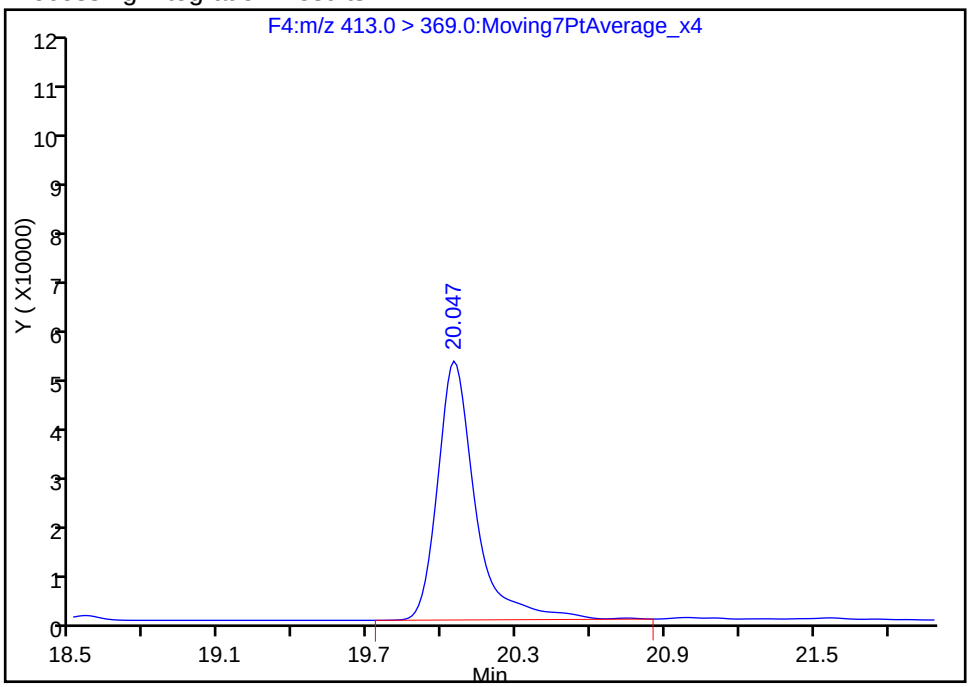
Data File: \\ChromNA\Sacramento\ChromData\A6\20161205-37524.b\05DEC2016A6A_011.d
Injection Date: 05-Dec-2016 20:53:12 Instrument ID: A6
Lims ID: CCV L2
Client ID:
Operator ID: CBW ALS Bottle#: 2 Worklist Smp#: 9
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

6 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

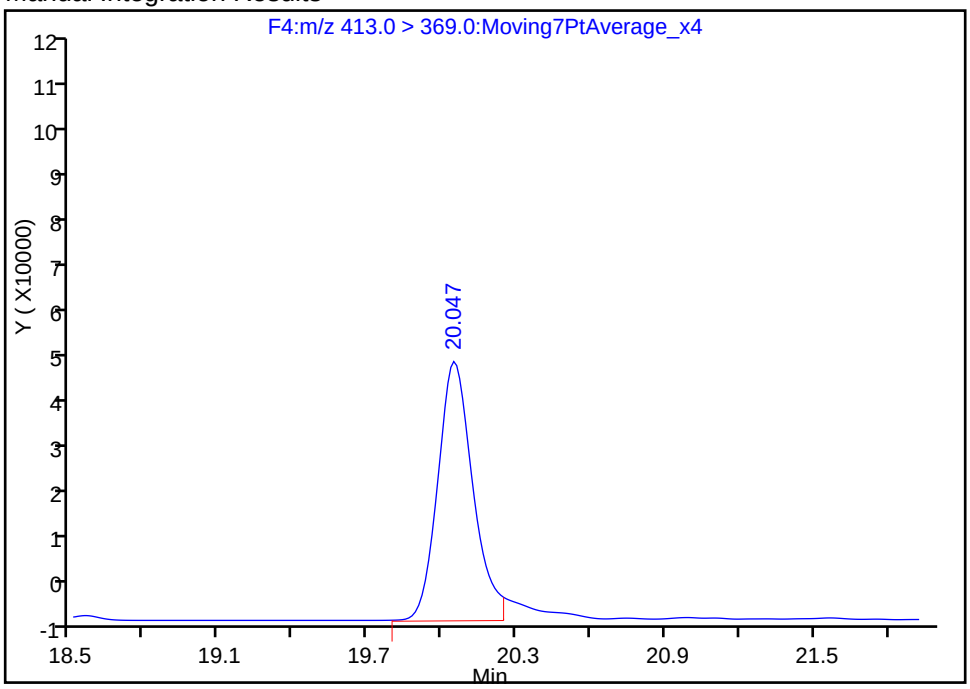
Processing Integration Results

RT: 20.05
Area: 520603
Amount: 4.880820
Amount Units: ng/ml



Manual Integration Results

RT: 20.05
Area: 484196
Amount: 4.539493
Amount Units: ng/ml



Reviewer: barnettj, 06-Dec-2016 10:08:33
Audit Action: Manually Integrated Audit Reason: Split Peak

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24441-1

SDG No.:

Lab Sample ID: ICV 320-140688/11 Calibration Date: 12/05/2016 21:52

Instrument ID: A6 Calib Start Date: 12/05/2016 17:26

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/05/2016 19:54

Lab File ID: 05DEC2016A6A_013.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.7015	0.5756		94.2	115	-18.0	30.0
Perfluorohexanesulfonic acid	Ave	0.8980	0.6976		20.6	26.5	-22.3	30.0
Perfluoroheptanoic acid	Ave	1.215	1.155		11.9	12.5	-4.9	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.040	0.9604		23.2	25.1	-7.7	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.044	0.8424		22.0	27.2	-19.3	30.0
Perfluorononanoic acid	Ave	1.134	0.9316		20.6	25.1	-17.9	30.0
13C2 PFHxA	Ave	1.167	1.079		9.25	10.0	-7.5	30.0
13C2 PFDA	Ave	0.8763	0.8628		9.85	10.0	-1.5	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161205-37524.b\05DEC2016A6A_013.d
Lims ID: ICV
Client ID:
Sample Type: ICV
Inject. Date: 05-Dec-2016 21:52:24 ALS Bottle#: 7 Worklist Smp#: 11
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\20161205-37524.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 06-Dec-2016 16:53:23 Calib Date: 05-Dec-2016 19:54:00
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161205-37524.b\05DEC2016A6A_009.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK024

First Level Reviewer: barnettj Date: 06-Dec-2016 16:34:53

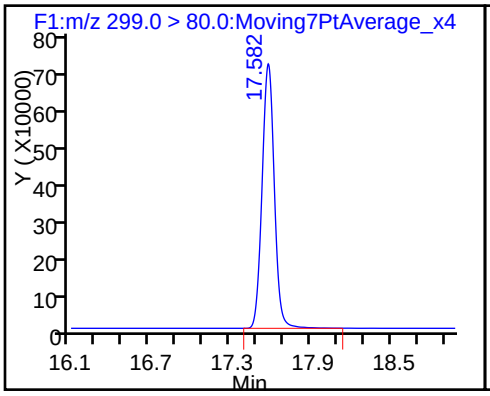
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								
299.0 > 80.0	17.582	17.581	0.001	1.000	4641388	94.2	8629	
$ 2 13C2 PFHxA								
315.0 > 270.0	18.567	18.567	0.0	1.000	946677	9.25	29673	
3 Perfluorohexanesulfonic acid								
399.0 > 80.0	19.344	19.342	0.002	1.000	1298107	20.6	29738	
4 Perfluoroheptanoic acid								
363.0 > 319.0	19.380	19.378	0.002	1.000	1267011	11.9	9991	
* 5 13C2-PFOA								
415.0 > 370.0	20.047	20.047	0.0		877210	10.0	22431	
6 Perfluorooctanoic acid								
413.0 > 369.0	20.047	20.047	0.0	1.000	2114272	23.2	647	
7 Perfluorooctane sulfonic acid								
499.0 > 80.0	20.619	20.619	0.0	1.000	1612191	22.0	13496	
* 8 13C4 PFOS								
503.0 > 80.0	20.667	20.669	-0.002		2015178	28.7	51574	
9 Perfluorononanoic acid								
463.0 > 419.0	20.750	20.748	0.002	1.000	2051048	20.6	7161	
$ 10 13C2 PFDA								
515.0 > 470.0	21.480	21.474	0.006	1.000	756809	9.85	23714	

Reagents:

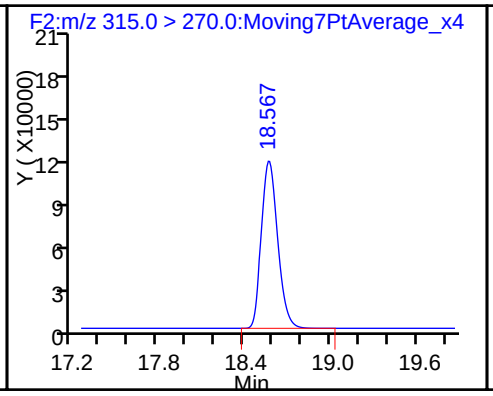
LC537-ICV_00017 Amount Added: 1.00 Units: mL

Data File: \\ChromNA\Sacramento\ChromData\A6\20161205-37524.b\05DEC2016A6A_013.d
Injection Date: 05-Dec-2016 21:52:24 Instrument ID: A6
Lims ID: ICV
Client ID:
Operator ID: CBW ALS Bottle#: 7 Worklist Smp#: 11
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL

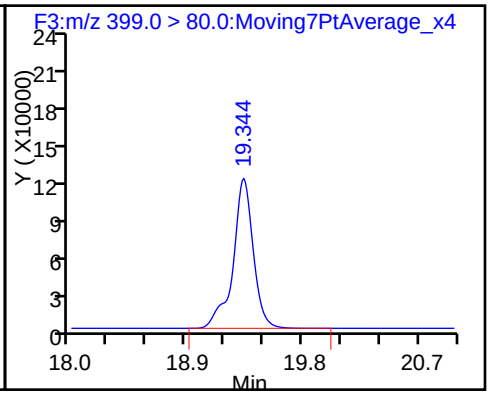
1 Perfluorobutanesulfonic acid



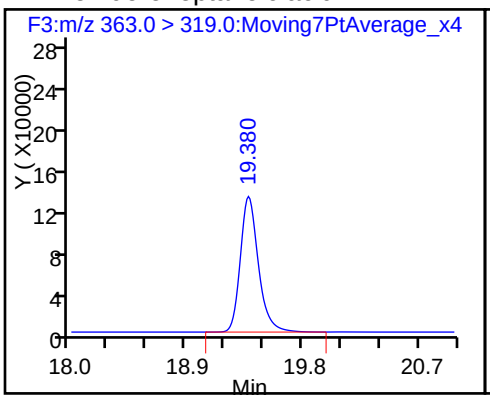
$ 2 13C2 PFHxA



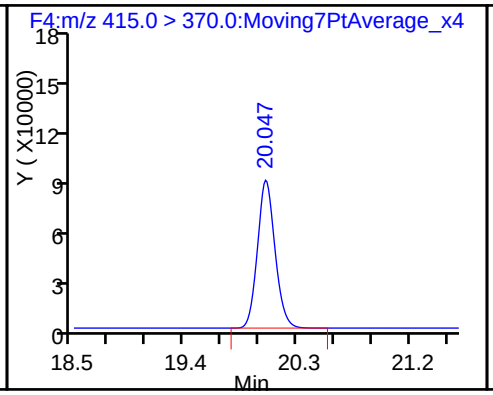
3 Perfluorohexanesulfonic acid



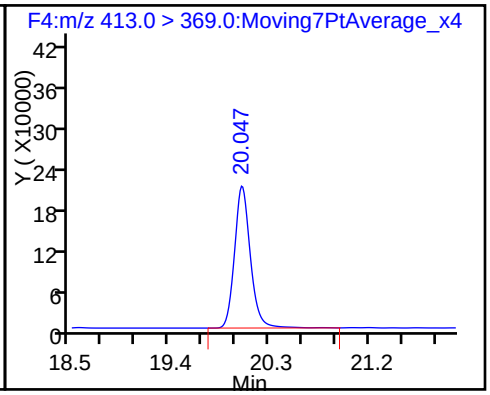
4 Perfluoroheptanoic acid



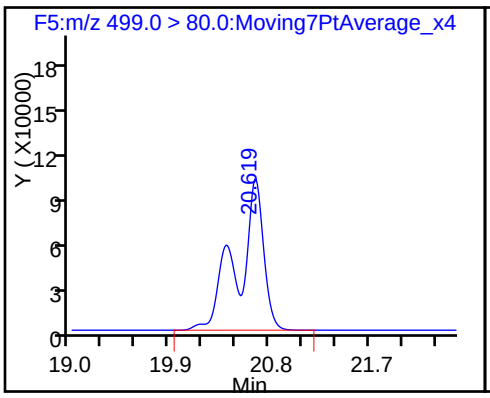
* 5 13C2-PFOA



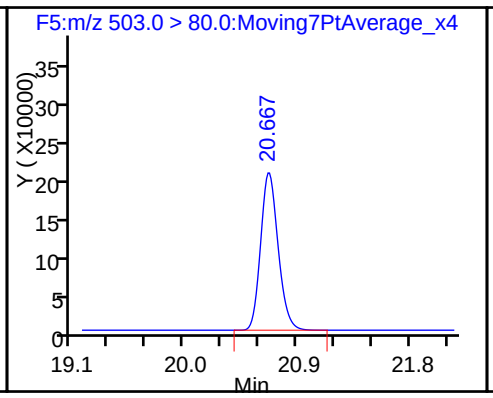
6 Perfluorooctanoic acid



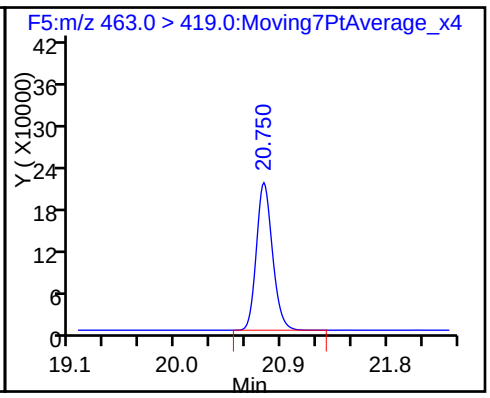
7 Perfluorooctane sulfonic acid



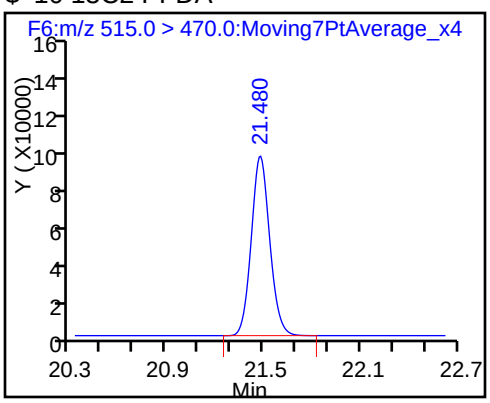
* 8 13C4 PFOS



9 Perfluorononanoic acid



$ 10 13C2 PFDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24441-1

SDG No.:

Lab Sample ID: CCV 320-142884/3 Calibration Date: 12/19/2016 09:45

Instrument ID: A6 Calib Start Date: 12/05/2016 17:26

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/05/2016 19:54

Lab File ID: 19DEC2016A6A_003.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.7015	0.6117		20.0	22.9	-12.8	50.0
Perfluorohexanesulfonic acid	Ave	0.8980	0.6980		6.00	7.72	-22.3	50.0
Perfluoroheptanoic acid	Ave	1.215	1.305		2.79	2.60	7.4	50.0
Perfluorooctanoic acid (PFOA)	Ave	1.040	0.9478		4.71	5.17	-8.9	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.044	0.8410		8.23	10.2	-19.4	50.0
Perfluorononanoic acid	Ave	1.134	1.022		4.51	5.01	-9.9	50.0
13C2 PFHxA	Ave	1.167	1.048		8.99	10.0	-10.1	30.0
13C2 PFDA	Ave	0.8763	0.8176		9.33	10.0	-6.7	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161219-37999.b\19DEC2016A6A_003.d
Lims ID: CCV L2
Client ID:
Sample Type: CCVL
Inject. Date: 19-Dec-2016 09:45:37 ALS Bottle#: 2 Worklist Smp#: 3
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\20161219-37999.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 19-Dec-2016 13:22:17 Calib Date: 05-Dec-2016 19:54:00
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161205-37524.b\05DEC2016A6A_009.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK025

First Level Reviewer: westendorfc Date: 19-Dec-2016 11:23:20

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								
299.0 > 80.0	17.586	17.586	0.0	1.000	701934	20.0	516	
$ 2 13C2 PFHxA								
315.0 > 270.0	18.549	18.549	0.0	1.000	642432	8.99	21202	
3 Perfluorohexanesulfonic acid								
399.0 > 80.0	19.308	19.308	0.0	1.000	269978	6.00	6558	
4 Perfluoroheptanoic acid								
363.0 > 319.0	19.344	19.344	0.0	1.000	207650	2.79	752	
* 5 13C2-PFOA								
415.0 > 370.0	19.999	19.999	0.0		612795	10.0	15691	
6 Perfluorooctanoic acid								
413.0 > 369.0	19.999	19.999	0.0	1.000	300363	4.71	247	
* 8 13C4 PFOS								
503.0 > 80.0	20.619	20.619	0.0		1437810	28.7	37350	
7 Perfluorooctane sulfonic acid								
499.0 > 80.0	20.619	20.619	0.0	1.000	430785	8.23	7306	
9 Perfluorononanoic acid								
463.0 > 419.0	20.691	20.691	0.0	1.000	313809	4.51	8317	
$ 10 13C2 PFDA								
515.0 > 470.0	21.418	21.418	0.0	1.000	501037	9.33	15767	

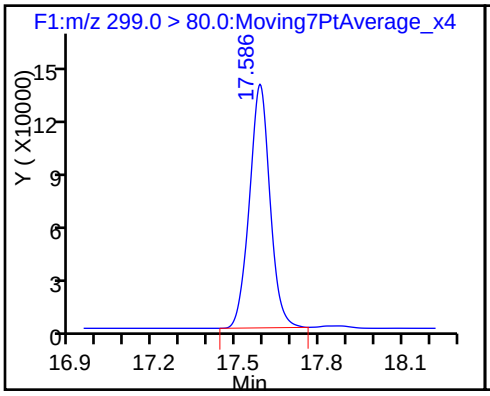
Reagents:

LC537-L2_00014 Amount Added: 1.00 Units: mL

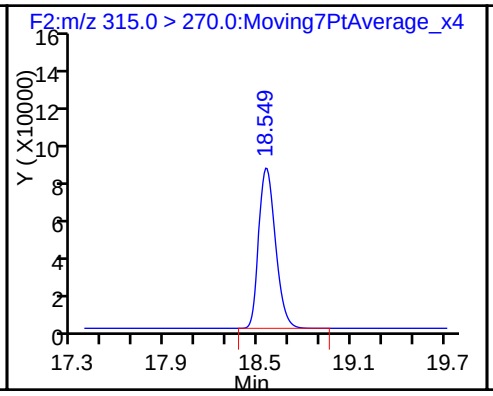
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20161219-37999.b\19DEC2016A6A_003.d
Injection Date: 19-Dec-2016 09:45:37 Instrument ID: A6
Lims ID: CCV L2
Client ID:
Operator ID: CBW ALS Bottle#: 2 Worklist Smp#: 3
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL

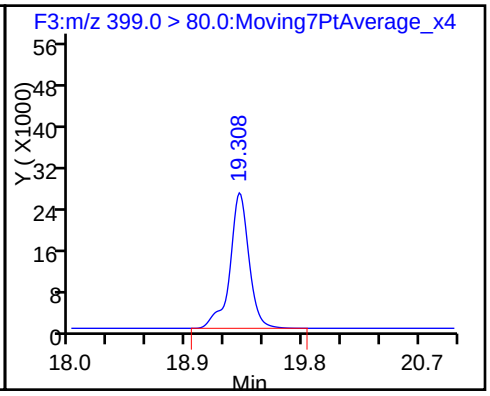
1 Perfluorobutanesulfonic acid



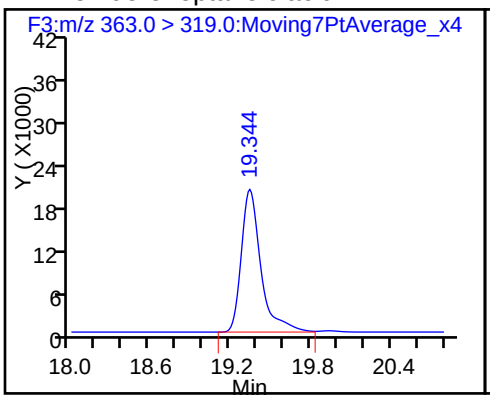
$ 2 13C2 PFHxA



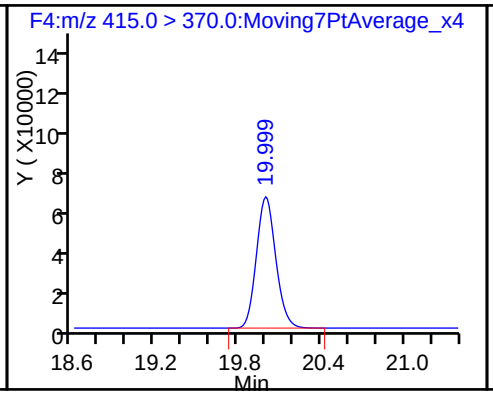
3 Perfluorohexanesulfonic acid



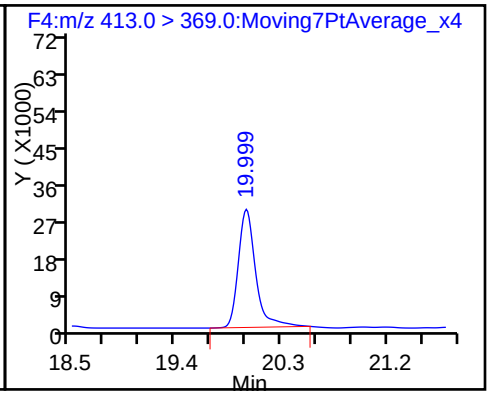
4 Perfluoroheptanoic acid



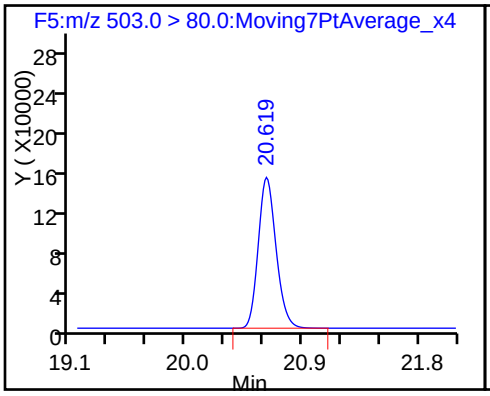
* 5 13C2-PFOA



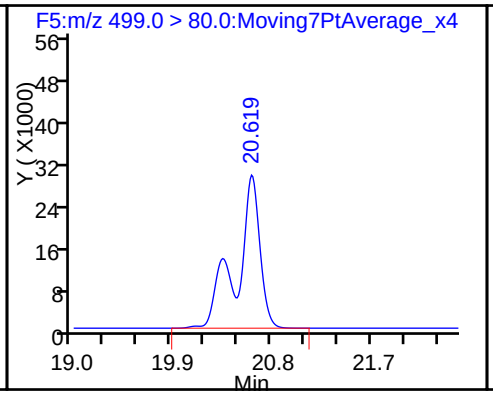
6 Perfluorooctanoic acid



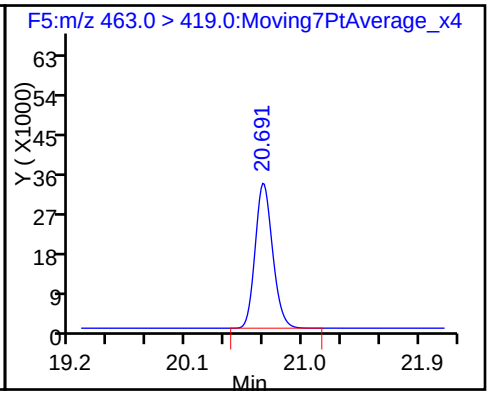
* 8 13C4 PFOS



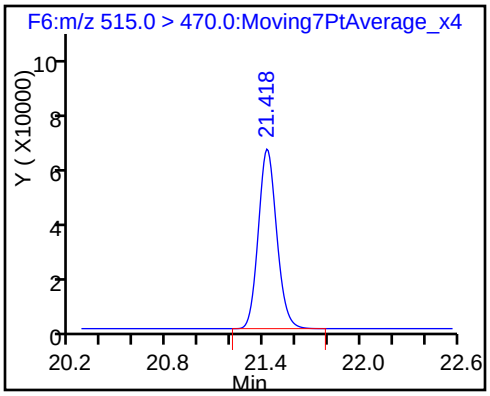
7 Perfluorooctane sulfonic acid



9 Perfluorononanoic acid



$ 10 13C2 PFDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24441-1

SDG No.:

Lab Sample ID: CCV 320-143413/22 Calibration Date: 12/22/2016 09:52

Instrument ID: A6 Calib Start Date: 12/05/2016 17:26

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/05/2016 19:54

Lab File ID: 19DEC2016A6A_147.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.7015	0.7735		148	135	10.3	30.0
Perfluorohexanesulfonic acid	Ave	0.8980	1.083		54.7	45.4	20.6	30.0
Perfluoroheptanoic acid	Ave	1.215	1.273		16.0	15.3	4.7	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.040	1.054		30.8	30.4	1.3	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.044	1.258		72.4	60.1	20.5	30.0
Perfluorononanoic acid	Ave	1.134	1.190		30.9	29.5	5.0	30.0
13C2 PFHxA	Ave	1.167	1.289		11.1	10.0	10.5	30.0
13C2 PFDA	Ave	0.8763	0.9564		10.9	10.0	9.1	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161221-38111.b\19DEC2016A6A_147.d
Lims ID: CCV L5
Client ID:
Sample Type: CCVIS
Inject. Date: 22-Dec-2016 09:52:37 ALS Bottle#: 5 Worklist Smp#: 22
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: CCV L5 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\20161221-38111.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 22-Dec-2016 13:16:24 Calib Date: 05-Dec-2016 19:54:00
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161205-37524.b\05DEC2016A6A_009.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK034

First Level Reviewer: westendorfc Date: 22-Dec-2016 13:15:50

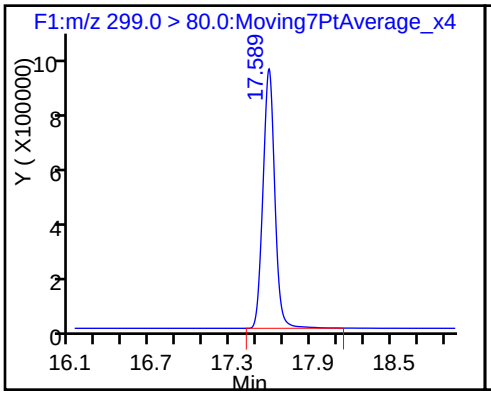
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								
299.0 > 80.0	17.589	17.589	0.0	1.000	5682964	148.5	3372	
$ 2 13C2 PFHxA								
315.0 > 270.0	18.567	18.567	0.0	1.000	994589	11.1	32229	
3 Perfluorohexanesulfonic acid								
399.0 > 80.0	19.308	19.308	0.0	1.000	2682129	54.7	59949	
4 Perfluoroheptanoic acid								
363.0 > 319.0	19.344	19.344	0.0	1.000	1499340	16.0	827	
* 5 13C2-PFOA								
415.0 > 370.0	19.999	19.999	0.0		771348	10.0	19499	
6 Perfluorooctanoic acid								
413.0 > 369.0	19.999	19.999	0.0	1.000	2472785	30.8	1214	
* 8 13C4 PFOS								
503.0 > 80.0	20.608	20.608	0.0		1564962	28.7	22635	
7 Perfluorooctane sulfonic acid								
499.0 > 80.0	20.619	20.619	0.0	1.000	4126885	72.4	25095	
9 Perfluorononanoic acid								
463.0 > 419.0	20.690	20.690	0.0	1.000	2705915	30.9	16656	
$ 10 13C2 PFDA								
515.0 > 470.0	21.409	21.409	0.0	1.000	737689	10.9	23069	

Reagents:

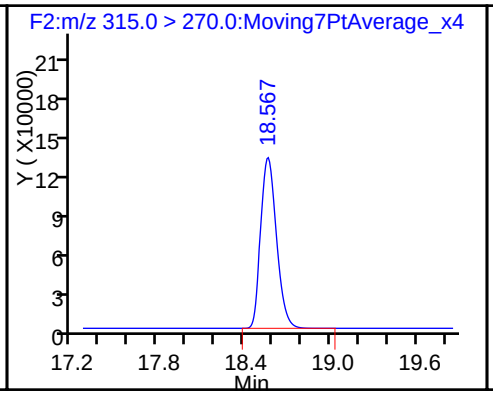
LC537-L5_00017 Amount Added: 1.00 Units: mL

Data File: \\ChromNA\Sacramento\ChromData\A6\20161221-38111.b\19DEC2016A6A_147.d
Injection Date: 22-Dec-2016 09:52:37 Instrument ID: A6
Lims ID: CCV L5
Client ID:
Operator ID: CBW ALS Bottle#: 5 Worklist Smp#: 22
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL

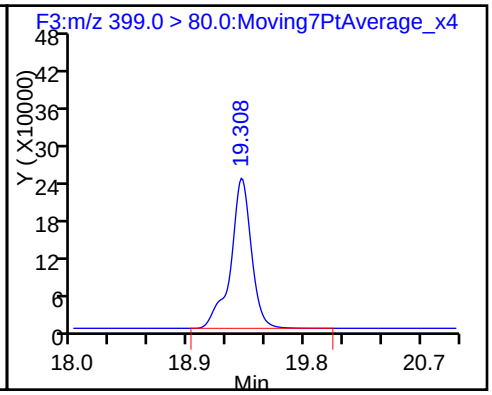
1 Perfluorobutanesulfonic acid



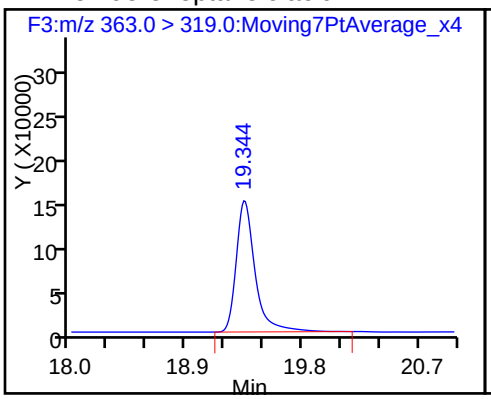
$ 2 13C2 PFHxA



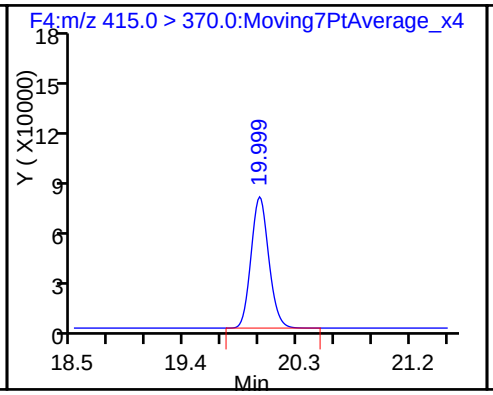
3 Perfluorohexanesulfonic acid



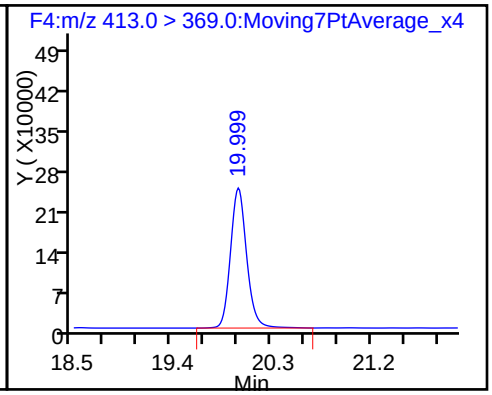
4 Perfluoroheptanoic acid



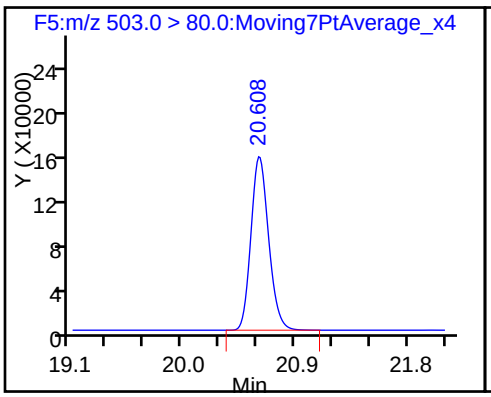
* 5 13C2-PFOA



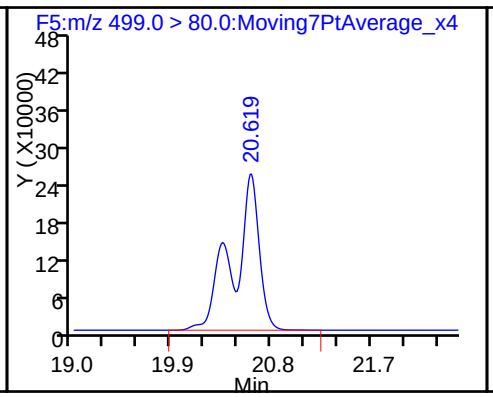
6 Perfluorooctanoic acid



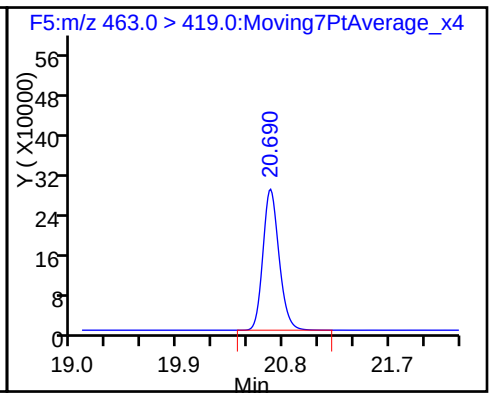
* 8 13C4 PFOS



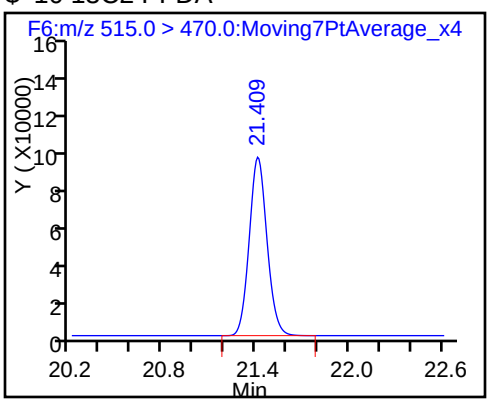
7 Perfluorooctane sulfonic acid



9 Perfluorononanoic acid



$ 10 13C2 PFDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24441-1

SDG No.:

Lab Sample ID: CCV 320-143413/34 Calibration Date: 12/22/2016 15:54

Instrument ID: A6 Calib Start Date: 12/05/2016 17:26

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/05/2016 19:54

Lab File ID: 19DEC2016A6A_159.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.7015	0.7987		51.4	45.1	13.9	30.0
Perfluorohexanesulfonic acid	Ave	0.8980	0.9765		16.5	15.2	8.7	30.0
Perfluoroheptanoic acid	Ave	1.215	1.297		5.46	5.12	6.8	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.040	1.021		10.0	10.2	-1.9	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.044	1.115		21.5	20.1	6.8	30.0
Perfluorononanoic acid	Ave	1.134	1.301		11.3	9.87	14.7	30.0
13C2 PFHxA	Ave	1.167	1.193		10.2	10.0	2.3	30.0
13C2 PFDA	Ave	0.8763	0.9192		10.5	10.0	4.9	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161221-38111.b\19DEC2016A6A_159.d
Lims ID: CCV L3
Client ID:
Sample Type: CCVIS
Inject. Date: 22-Dec-2016 15:54:46 ALS Bottle#: 3 Worklist Smp#: 34
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: CCV L3 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\20161221-38111.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 22-Dec-2016 16:54:06 Calib Date: 05-Dec-2016 19:54:00
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161205-37524.b\05DEC2016A6A_009.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK034

First Level Reviewer: westendorfc Date: 22-Dec-2016 16:50:16

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								
299.0 > 80.0	17.589	17.589	0.0	1.000	2221484	51.4	586	
$ 2 13C2 PFHxA								
315.0 > 270.0	18.557	18.557	0.0	1.000	922504	10.2	29811	
3 Perfluorohexanesulfonic acid								
399.0 > 80.0	19.320	19.320	0.0	1.000	915588	16.5	20825	
4 Perfluoroheptanoic acid								M
363.0 > 319.0	19.356	19.356	0.0	1.000	513370	5.46	72.7	M
* 5 13C2-PFOA								
415.0 > 370.0	19.999	19.999	0.0		773306	10.0	19564	
6 Perfluorooctanoic acid								
413.0 > 369.0	19.999	19.999	0.0	1.000	804619	10.0	401	
* 8 13C4 PFOS								
503.0 > 80.0	20.619	20.619	0.0		1768636	28.7	45579	
7 Perfluorooctane sulfonic acid								
499.0 > 80.0	20.619	20.619	0.0	1.000	1384896	21.5	22451	
9 Perfluorononanoic acid								
463.0 > 419.0	20.690	20.690	0.0	1.000	993517	11.3	9472	
$ 10 13C2 PFDA								
515.0 > 470.0	21.418	21.418	0.0	1.000	710850	10.5	22348	

QC Flag Legend

Review Flags

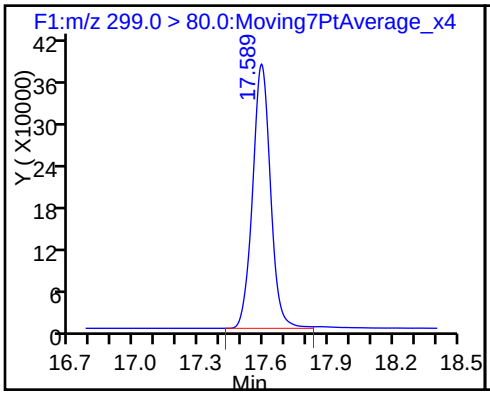
M - Manually Integrated

Reagents:

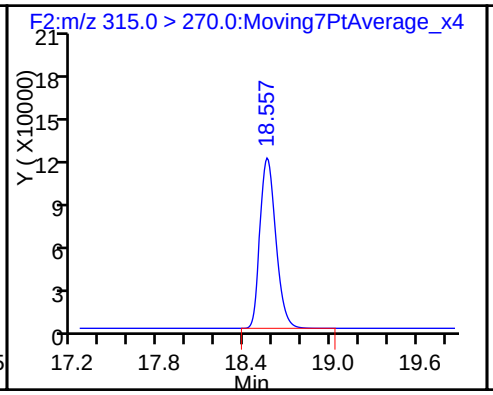
LC537-L3_00016 Amount Added: 1.00 Units: mL

Data File: \\ChromNA\Sacramento\ChromData\A6\20161221-38111.b\19DEC2016A6A_159.d
Injection Date: 22-Dec-2016 15:54:46 Instrument ID: A6
Lims ID: CCV L3
Client ID:
Operator ID: CBW ALS Bottle#: 3 Worklist Smp#: 34
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL

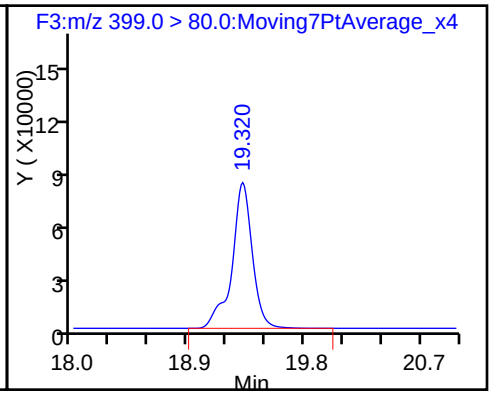
1 Perfluorobutanesulfonic acid



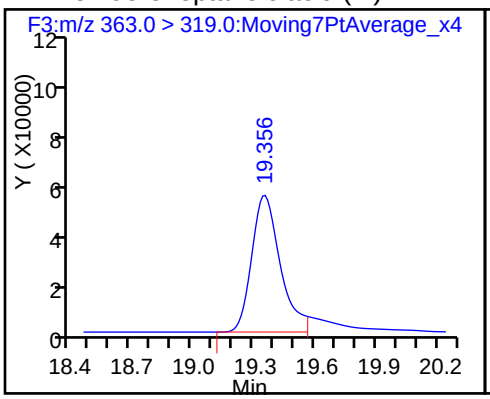
$ 2 13C2 PFHxA



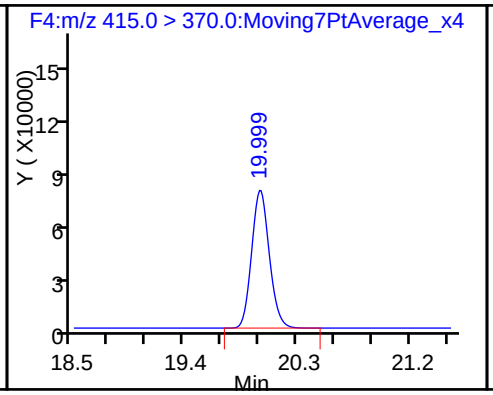
3 Perfluorohexanesulfonic acid



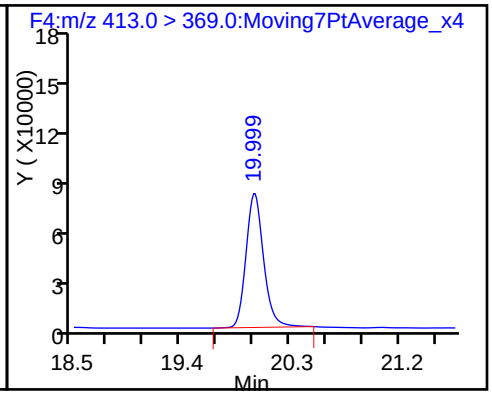
4 Perfluoroheptanoic acid (M)



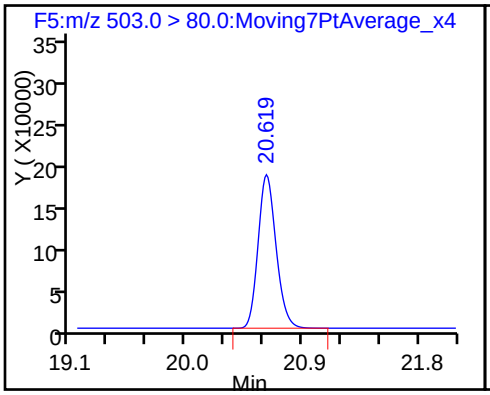
* 5 13C2-PFOA



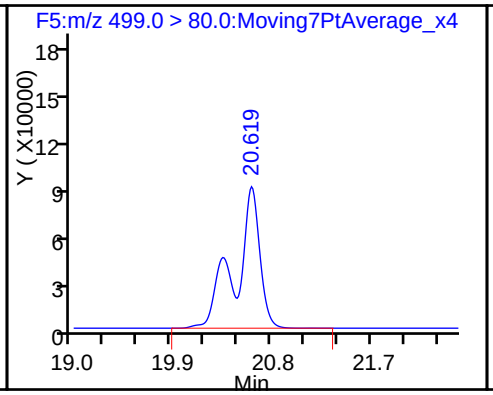
6 Perfluorooctanoic acid



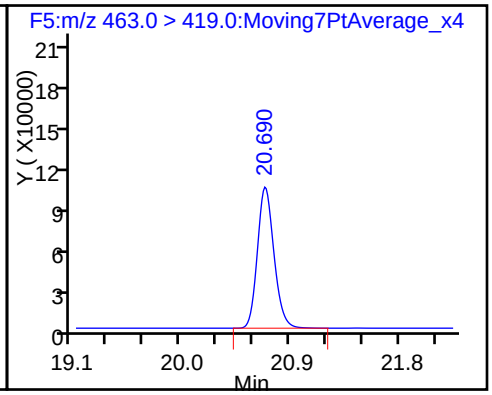
* 8 13C4 PFOS



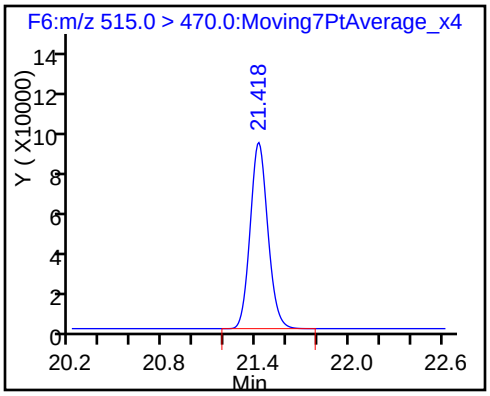
7 Perfluorooctane sulfonic acid



9 Perfluorononanoic acid



$ 10 13C2 PFDA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

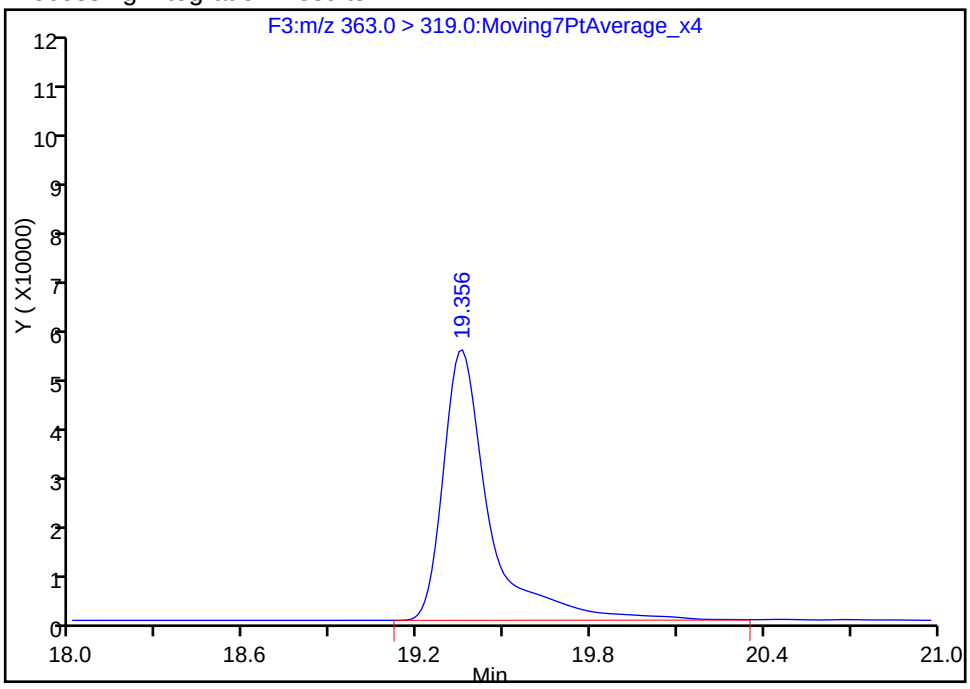
Data File: \\ChromNA\Sacramento\ChromData\A6\20161221-38111.b\19DEC2016A6A_159.d
Injection Date: 22-Dec-2016 15:54:46 Instrument ID: A6
Lims ID: CCV L3
Client ID:
Operator ID: CBW ALS Bottle#: 3 Worklist Smp#: 34
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F3:MRM

4 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

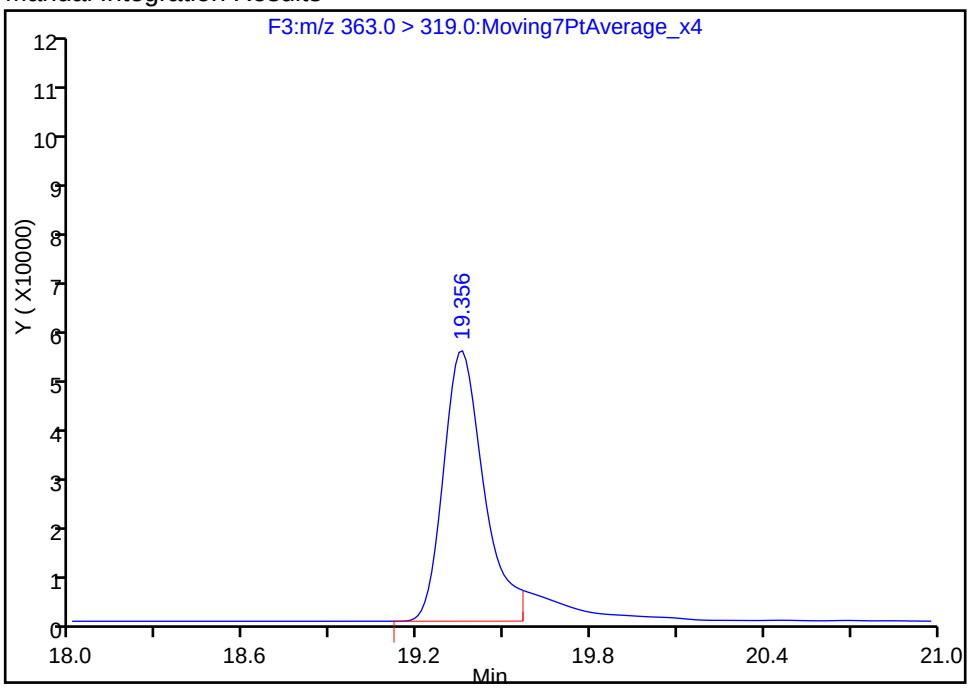
Processing Integration Results

RT: 19.36
Area: 586964
Amount: 6.246507
Amount Units: ng/ml



Manual Integration Results

RT: 19.36
Area: 513370
Amount: 5.463315
Amount Units: ng/ml



Reviewer: westendorfc, 22-Dec-2016 16:50:16
Audit Action: Manually Integrated Audit Reason: Split Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-24441-1

SDG No.:

Client Sample ID: Lab Sample ID: MB 320-142683/1-A

Matrix: Water Lab File ID: 19DEC2016A6A_149.d

Analysis Method: 537 Date Collected:

Extraction Method: 537 Date Extracted: 12/17/2016 13:06

Sample wt/vol: 250(mL) Date Analyzed: 12/22/2016 10:51

Con. Extract Vol.: 1.0(mL) Dilution Factor: 1

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

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

Analysis Batch No.: 143413 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	103		70-130
STL00996	13C2 PFDA	104		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161221-38111.b\19DEC2016A6A_149.d
Lims ID: MB 320-142683/1-A
Client ID:
Sample Type: MB
Inject. Date: 22-Dec-2016 10:51:49 ALS Bottle#: 4 Worklist Smp#: 24
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: mb 320-142683/1-a
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
Operator ID: CBW Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20161221-38111.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 23-Dec-2016 08:23:57 Calib Date: 05-Dec-2016 19:54:00
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161205-37524.b\05DEC2016A6A_009.d

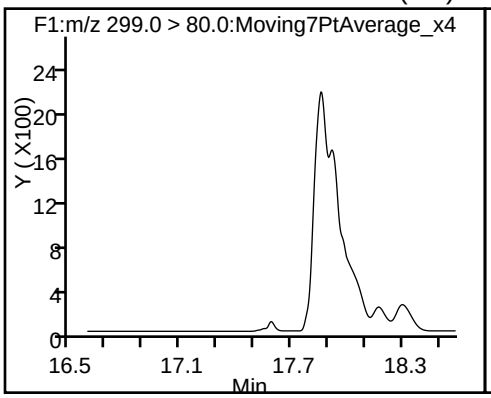
Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK034

First Level Reviewer: westendorfc Date: 22-Dec-2016 13:16:00

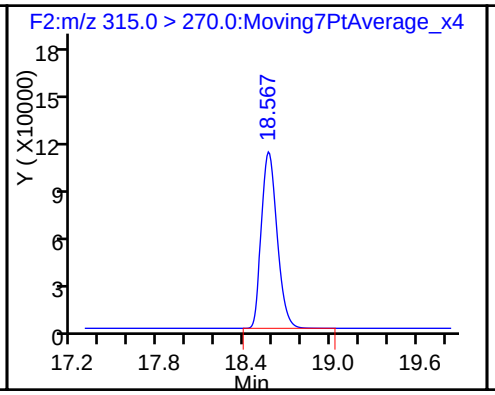
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
$ 2 13C2 PFHxA								
315.0 > 270.0	18.567	18.567	0.0	1.000	838511	10.3	27307	
* 5 13C2-PFOA								
415.0 > 370.0	19.999	19.999	0.0		695779	10.0	17609	
6 Perfluorooctanoic acid								
413.0 > 369.0	20.236	19.999	0.237	1.000	20557	0.2840	8.8	
* 8 13C4 PFOS								
503.0 > 80.0	20.619	20.608	0.011		2117564	28.7	21958	
$ 10 13C2 PFDA								
515.0 > 470.0	21.418	21.409	0.009	1.000	632698	10.4	20038	

Data File: \\ChromNA\Sacramento\ChromData\A6\20161221-38111.b\19DEC2016A6A_149.d
Injection Date: 22-Dec-2016 10:51:49 Instrument ID: A6
Lims ID: MB 320-142683/1-A
Client ID:
Operator ID: CBW ALS Bottle#: 4 Worklist Smp#: 24
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL

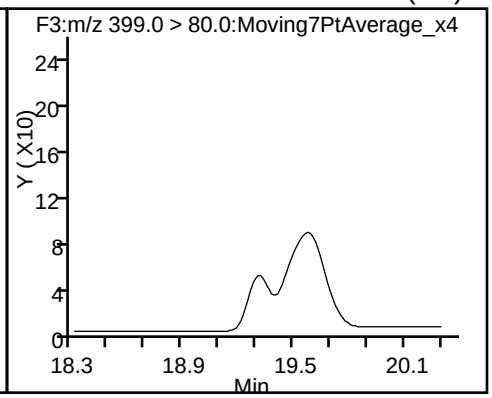
1 Perfluorobutanesulfonic acid (ND)



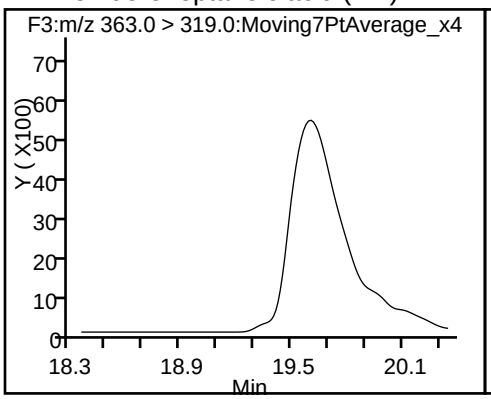
$ 2 13C2 PFHxA



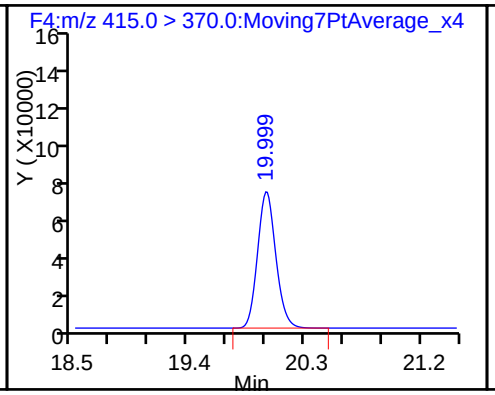
3 Perfluorohexanesulfonic acid (ND)



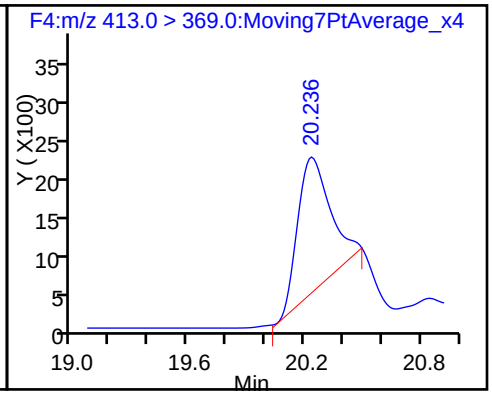
4 Perfluoroheptanoic acid (ND)



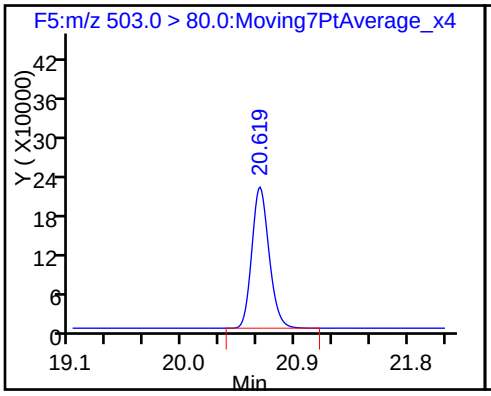
* 5 13C2-PFOA



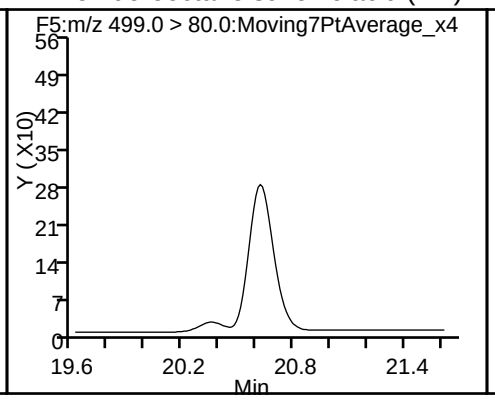
6 Perfluorooctanoic acid



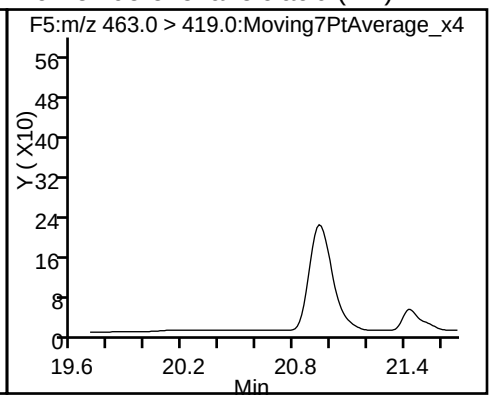
* 8 13C4 PFOS



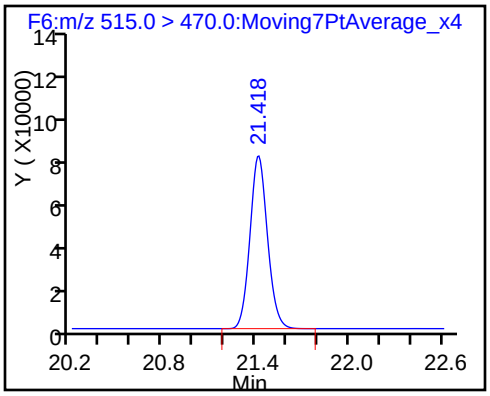
7 Perfluorooctane sulfonic acid (ND)



9 Perfluorononanoic acid (ND)



$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161221-38111.b\19DEC2016A6A_149.d
Lims ID: MB 320-142683/1-A
Client ID:
Sample Type: MB
Inject. Date: 22-Dec-2016 10:51:49 ALS Bottle#: 4 Worklist Smp#: 24
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: mb 320-142683/1-a
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
Operator ID: CBW Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20161221-38111.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 23-Dec-2016 08:23:57 Calib Date: 05-Dec-2016 19:54:00
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161205-37524.b\05DEC2016A6A_009.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK034

First Level Reviewer: westendorfc Date: 22-Dec-2016 13:16:00

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	10.3	103.31
$ 10 13C2 PFDA	10.0	10.4	103.77

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-24441-1

SDG No.:

Client Sample ID: | Lab Sample ID: LCS 320-142683/2-A

Matrix: Water | Lab File ID: 19DEC2016A6A_150.d

Analysis Method: 537 | Date Collected:

Extraction Method: 537 | Date Extracted: 12/17/2016 13:06

Sample wt/vol: 250(mL) | Date Analyzed: 12/22/2016 11:21

Con. Extract Vol.: 1.0(mL) | Dilution Factor: 1

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

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

Analysis Batch No.: 143413 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.149		0.060	0.048	0.016
335-67-1	Perfluorooctanoic acid (PFOA)	0.0740		0.030	0.024	0.0094
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.340		0.14	0.11	0.048

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	111		70-130
STL00996	13C2 PFDA	113		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161221-38111.b\19DEC2016A6A_150.d
Lims ID: LCS 320-142683/2-A
Client ID:
Sample Type: LCS
Inject. Date: 22-Dec-2016 11:21:24 ALS Bottle#: 5 Worklist Smp#: 25
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: lcs 320-142683/2-a
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
Operator ID: CBW Instrument ID: A6

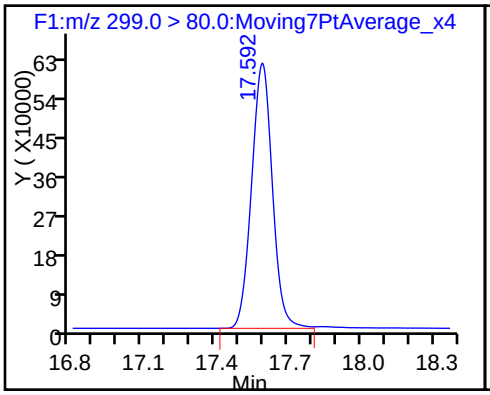
Method: \\ChromNA\Sacramento\ChromData\A6\20161221-38111.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 23-Dec-2016 08:23:57 Calib Date: 05-Dec-2016 19:54:00
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161205-37524.b\05DEC2016A6A_009.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK034

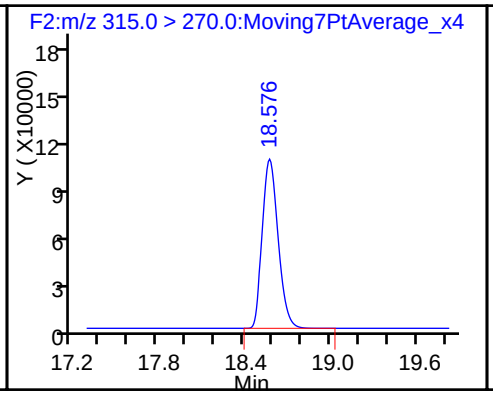
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								
299.0 > 80.0	17.592	17.589	0.003	1.000	3709912	85.0	625	
$ 2 13C2 PFHxA								
315.0 > 270.0	18.576	18.567	0.009	1.000	828770	11.1	26800	
3 Perfluorohexanesulfonic acid								
399.0 > 80.0	19.320	19.308	0.012	1.000	1596105	28.6	36096	
4 Perfluoroheptanoic acid								
363.0 > 319.0	19.356	19.356	0.0	1.000	861383	11.1	1067	
* 5 13C2-PFOA								
415.0 > 370.0	20.011	19.999	0.012		637524	10.0	2213	
6 Perfluorooctanoic acid								
413.0 > 369.0	20.011	19.999	0.012	1.000	1227656	18.5	715	
* 8 13C4 PFOS								
503.0 > 80.0	20.619	20.608	0.011		1783962	28.7	45586	
7 Perfluorooctane sulfonic acid								
499.0 > 80.0	20.619	20.619	0.0	1.000	2425614	37.4	30963	
9 Perfluorononanoic acid								
463.0 > 419.0	20.690	20.690	0.0	1.000	1424844	19.7	14998	
$ 10 13C2 PFDA								
515.0 > 470.0	21.409	21.409	0.0	1.000	629545	11.3	19810	

Data File: \\ChromNA\Sacramento\ChromData\A6\20161221-38111.b\19DEC2016A6A_150.d
Injection Date: 22-Dec-2016 11:21:24 Instrument ID: A6
Lims ID: LCS 320-142683/2-A
Client ID:
Operator ID: CBW ALS Bottle#: 5 Worklist Smp#: 25
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL

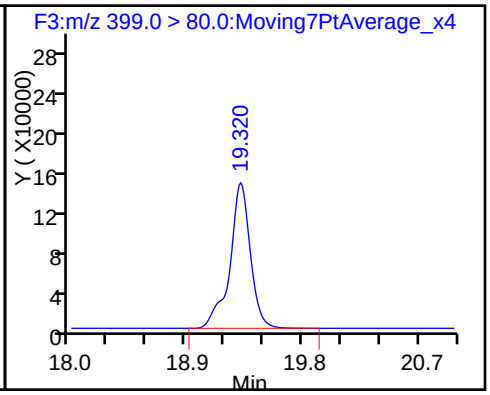
1 Perfluorobutanesulfonic acid



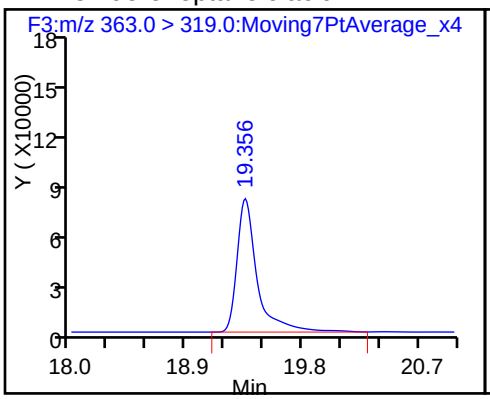
$ 2 13C2 PFHxA



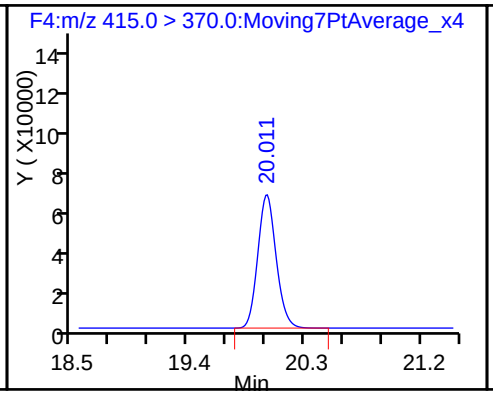
3 Perfluorohexanesulfonic acid



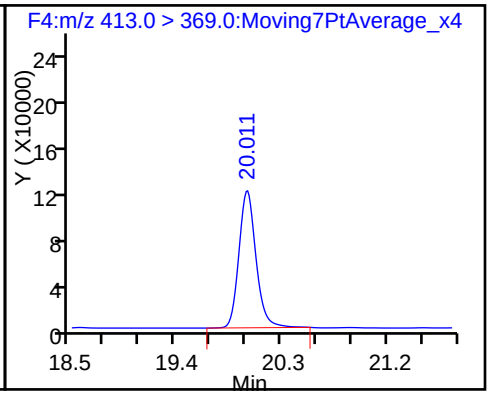
4 Perfluoroheptanoic acid



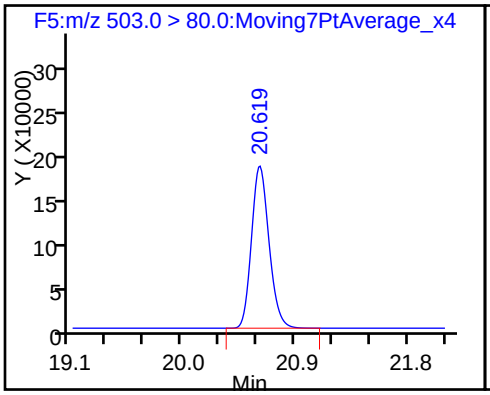
* 5 13C2-PFOA



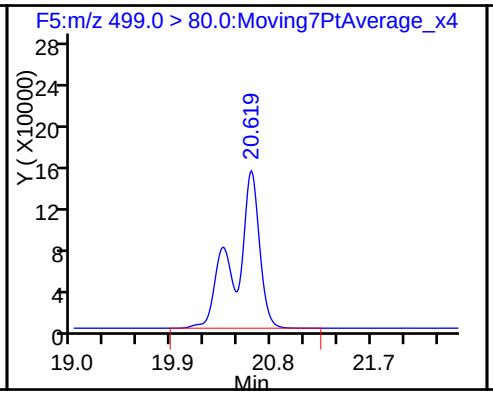
6 Perfluorooctanoic acid



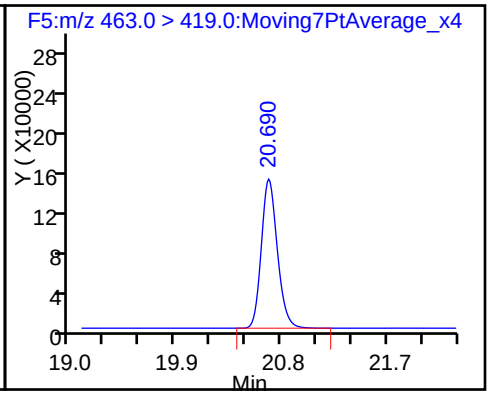
* 8 13C4 PFOS



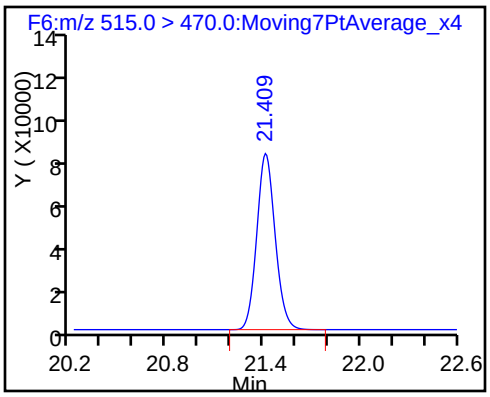
7 Perfluorooctane sulfonic acid



9 Perfluorononanoic acid



$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161221-38111.b\19DEC2016A6A_150.d
Lims ID: LCS 320-142683/2-A
Client ID:
Sample Type: LCS
Inject. Date: 22-Dec-2016 11:21:24 ALS Bottle#: 5 Worklist Smp#: 25
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: lcs 320-142683/2-a
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
Operator ID: CBW Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20161221-38111.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 23-Dec-2016 08:23:57 Calib Date: 05-Dec-2016 19:54:00
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161205-37524.b\05DEC2016A6A_009.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK034

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	11.1	111.44
$ 10 13C2 PFDA	10.0	11.3	112.69

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-24441-1

SDG No.:

Client Sample ID: Lab Sample ID: LCSD 320-142683/3-A

Matrix: Water Lab File ID: 19DEC2016A6A_151.d

Analysis Method: 537 Date Collected:

Extraction Method: 537 Date Extracted: 12/17/2016 13:06

Sample wt/vol: 250(mL) Date Analyzed: 12/22/2016 11:51

Con. Extract Vol.: 1.0(mL) Dilution Factor: 1

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

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

Analysis Batch No.: 143413 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.158		0.060	0.048	0.016
335-67-1	Perfluorooctanoic acid (PFOA)	0.0751		0.030	0.024	0.0094
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.352		0.14	0.11	0.048

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	114		70-130
STL00996	13C2 PFDA	114		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161221-38111.b\19DEC2016A6A_151.d
Lims ID: LCSD 320-142683/3-A
Client ID:
Sample Type: LCSD
Inject. Date: 22-Dec-2016 11:51:01 ALS Bottle#: 6 Worklist Smp#: 26
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: lcsd 320-142683/3-a
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
Operator ID: CBW Instrument ID: A6

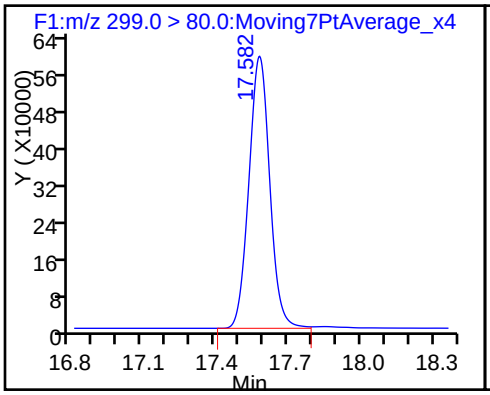
Method: \\ChromNA\Sacramento\ChromData\A6\20161221-38111.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 23-Dec-2016 08:23:57 Calib Date: 05-Dec-2016 19:54:00
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161205-37524.b\05DEC2016A6A_009.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK034

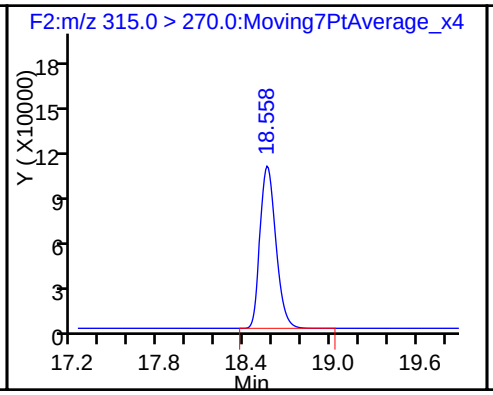
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid								
299.0 > 80.0	17.582	17.589	-0.007	1.000	3587874	88.1	583	
$ 2 13C2 PFHxA								
315.0 > 270.0	18.558	18.567	-0.009	1.000	824912	11.4	26660	
3 Perfluorohexanesulfonic acid								
399.0 > 80.0	19.308	19.308	0.0	1.000	1580930	30.3	36487	
4 Perfluoroheptanoic acid								
363.0 > 319.0	19.344	19.356	-0.012	1.000	818112	10.9	698	
* 5 13C2-PFOA								
415.0 > 370.0	19.999	19.999	0.0		618882	10.0	15661	
6 Perfluorooctanoic acid								
413.0 > 369.0	19.999	19.999	0.0	1.000	1208477	18.8	659	
* 8 13C4 PFOS								
503.0 > 80.0	20.608	20.608	0.0		1665020	28.7	42852	
7 Perfluorooctane sulfonic acid								
499.0 > 80.0	20.608	20.619	-0.011	1.000	2392877	39.5	38037	
9 Perfluorononanoic acid								
463.0 > 419.0	20.690	20.690	0.0	1.000	1424407	20.3	13513	
$ 10 13C2 PFDA								
515.0 > 470.0	21.409	21.409	0.0	1.000	620648	11.4	19788	

Data File: \\ChromNA\Sacramento\ChromData\A6\20161221-38111.b\19DEC2016A6A_151.d
Injection Date: 22-Dec-2016 11:51:01 Instrument ID: A6
Lims ID: LCSD 320-142683/3-A
Client ID:
Operator ID: CBW ALS Bottle#: 6 Worklist Smp#: 26
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL

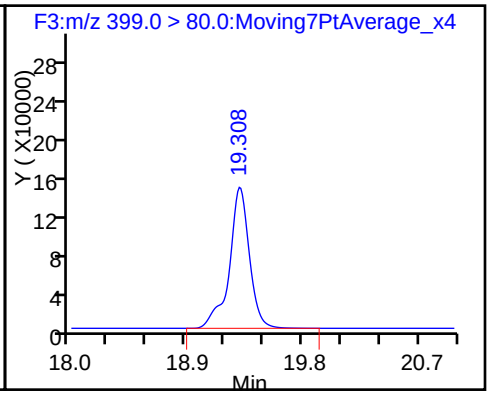
1 Perfluorobutanesulfonic acid



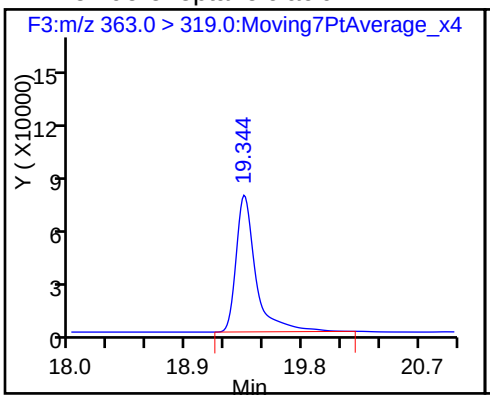
$ 2 13C2 PFHxA



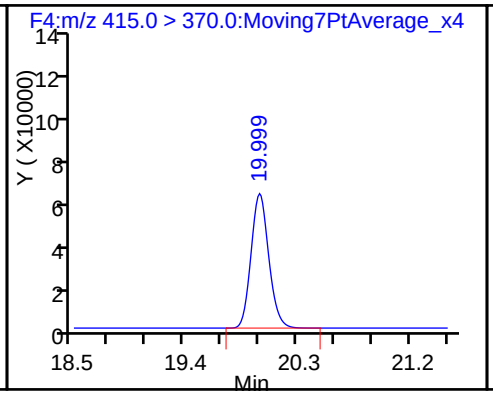
3 Perfluorohexanesulfonic acid



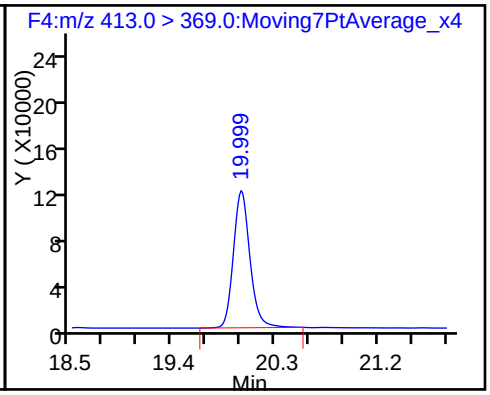
4 Perfluoroheptanoic acid



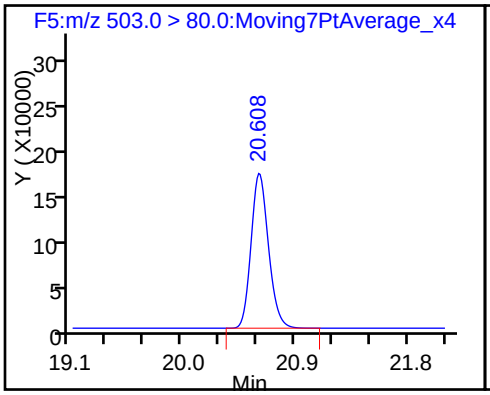
* 5 13C2-PFOA



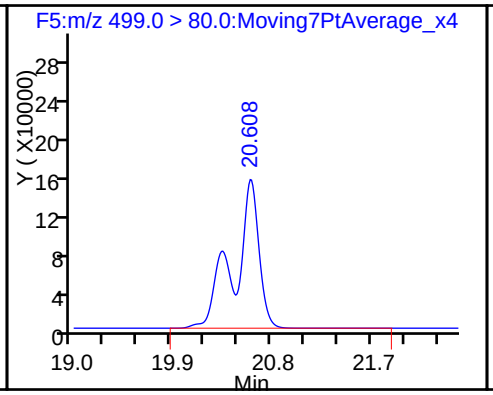
6 Perfluorooctanoic acid



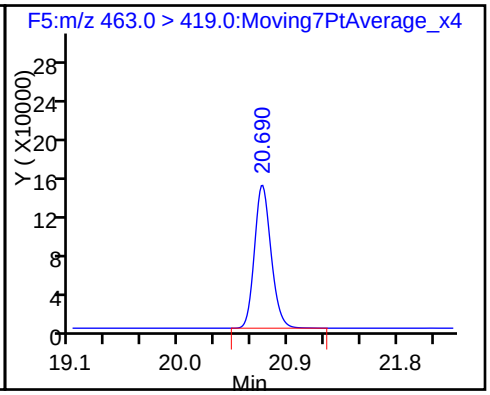
* 8 13C4 PFOS



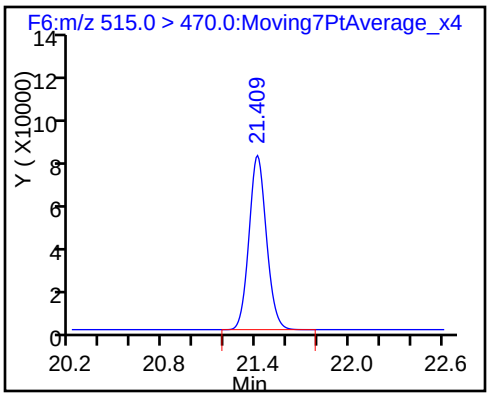
7 Perfluorooctane sulfonic acid



9 Perfluorononanoic acid



$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161221-38111.b\19DEC2016A6A_151.d
Lims ID: LCSD 320-142683/3-A
Client ID:
Sample Type: LCSD
Inject. Date: 22-Dec-2016 11:51:01 ALS Bottle#: 6 Worklist Smp#: 26
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Sample Info: lcsd 320-142683/3-a
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
Operator ID: CBW Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20161221-38111.b\537__A6.m
Limit Group: LC 537 ICAL
Last Update: 23-Dec-2016 08:23:57 Calib Date: 05-Dec-2016 19:54:00
Integrator: Picker
Quant Method: Internal Standard Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161205-37524.b\05DEC2016A6A_009.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK034

Compound	Amount Added	Amount Recovered	% Rec.
$ 2 13C2 PFHxA	10.0	11.4	114.26
$ 10 13C2 PFDA	10.0	11.4	114.44

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-24441-1

SDG No.:

Instrument ID: A6 Start Date: 12/05/2016 17:26

Analysis Batch Number: 140688 End Date: 12/06/2016 02:48

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
STD 320-140688/2 IC		12/05/2016 17:26	1	05DEC2016A6A_004.d	Acquity 2.1(mm)
STD 320-140688/3 IC		12/05/2016 17:55	1	05DEC2016A6A_005.d	Acquity 2.1(mm)
STD 320-140688/4 IC		12/05/2016 18:25	1	05DEC2016A6A_006.d	Acquity 2.1(mm)
STD 320-140688/5 ICISAV		12/05/2016 18:54	1	05DEC2016A6A_007.d	Acquity 2.1(mm)
STD 320-140688/6 IC		12/05/2016 19:24	1	05DEC2016A6A_008.d	Acquity 2.1(mm)
STD 320-140688/7 IC		12/05/2016 19:54	1	05DEC2016A6A_009.d	Acquity 2.1(mm)
ZZZZZ		12/05/2016 20:23	1		Acquity 2.1(mm)
CCV 320-140688/9 CCVL		12/05/2016 20:53	1	05DEC2016A6A_011.d	Acquity 2.1(mm)
ZZZZZ		12/05/2016 21:22	1		Acquity 2.1(mm)
ICV 320-140688/11		12/05/2016 21:52	1	05DEC2016A6A_013.d	Acquity 2.1(mm)
ZZZZZ		12/05/2016 22:22	1		Acquity 2.1(mm)
ZZZZZ		12/05/2016 22:51	1		Acquity 2.1(mm)
ZZZZZ		12/05/2016 23:21	1		Acquity 2.1(mm)
ZZZZZ		12/05/2016 23:50	1		Acquity 2.1(mm)
ZZZZZ		12/06/2016 00:20	1		Acquity 2.1(mm)
ZZZZZ		12/06/2016 00:49	1		Acquity 2.1(mm)
ZZZZZ		12/06/2016 01:19	1		Acquity 2.1(mm)
ZZZZZ		12/06/2016 01:49	1		Acquity 2.1(mm)
ZZZZZ		12/06/2016 02:18	1		Acquity 2.1(mm)
CCV 320-140688/21 CCVIS		12/06/2016 02:48	1		Acquity 2.1(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-24441-1

SDG No.:

Instrument ID: A6 Start Date: 12/19/2016 09:45

Analysis Batch Number: 142884 End Date: 12/19/2016 11:51

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-142884/3 CCVL		12/19/2016 09:45	1	19DEC2016A6A_003.d	Acquity 2.1(mm)
CCV 320-142884/4 CCVIS		12/19/2016 10:15	1		Acquity 2.1(mm)
ZZZZZ		12/19/2016 10:44	1		Acquity 2.1(mm)
CCV 320-142884/7 CCVIS		12/19/2016 11:51	1		Acquity 2.1(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-24441-1

SDG No.:

Instrument ID: A6 Start Date: 12/22/2016 09:52

Analysis Batch Number: 143413 End Date: 12/22/2016 15:54

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-143413/22 CCVIS		12/22/2016 09:52	1	19DEC2016A6A_147.d	Acquity 2.1(mm)
ZZZZZ		12/22/2016 10:22	1		Acquity 2.1(mm)
MB 320-142683/1-A		12/22/2016 10:51	1	19DEC2016A6A_149.d	Acquity 2.1(mm)
LCS 320-142683/2-A		12/22/2016 11:21	1	19DEC2016A6A_150.d	Acquity 2.1(mm)
LCSD 320-142683/3-A		12/22/2016 11:51	1	19DEC2016A6A_151.d	Acquity 2.1(mm)
320-24441-1		12/22/2016 12:20	1	19DEC2016A6A_152.d	Acquity 2.1(mm)
320-24441-2		12/22/2016 12:50	1	19DEC2016A6A_153.d	Acquity 2.1(mm)
ZZZZZ		12/22/2016 13:19	1		Acquity 2.1(mm)
ZZZZZ		12/22/2016 13:49	1		Acquity 2.1(mm)
ZZZZZ		12/22/2016 14:19	1		Acquity 2.1(mm)
CCV 320-143413/34 CCVIS		12/22/2016 15:54	1	19DEC2016A6A_159.d	Acquity 2.1(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-24441-1

SDG No.:

Batch Number: 142683 Batch Start Date: 12/17/16 13:06 Batch Analyst: Marchenko, Veronika P

Batch Method: 537 Batch End Date: 12/19/16 13:25

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	ReceivedpH	LC537-IS 00027
MB 320-142683/1		537, 537				250 mL	1.0 mL	7 SU	20 uL
LCS 320-142683/2		537, 537				250 mL	1.0 mL	7 SU	20 uL
LCSD 320-142683/3		537, 537				250 mL	1.0 mL	7 SU	20 uL
320-24441-A-1	WI-AF-3RW35-1216	537, 537	T	292.14 g	26.16 g	266 mL	1.0 mL	7 SU	20 uL
320-24441-A-2	WI-AF-3FB35-1216	537, 537	T	278.10 g	26.81 g	251.3 mL	1.0 mL	7 SU	20 uL

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-MSP 00014	LC537-SU 00026	AnalysisComment			
MB 320-142683/1		537, 537			50 uL	Chlorine ND			
LCS 320-142683/2		537, 537		50 uL	50 uL	Chlorine ND			
LCSD 320-142683/3		537, 537		50 uL	50 uL	Chlorine ND			
320-24441-A-1	WI-AF-3RW35-1216	537, 537	T		50 uL	Chlorine ND			
320-24441-A-2	WI-AF-3FB35-1216	537, 537	T		50 uL	Chlorine ND			

Batch Notes	
Manifold ID	5
Methanol ID	807188
Pipette ID	MD05306
Analyst ID - IS Reagent Drop	VPM
Analyst ID - IS Reagent Drop Witness	CCB
Analyst ID - SU Reagent Drop	VPM
Analyst ID - SU Reagent Drop Witness	ERW
Analyst ID - TA Reagent Drop	VPM
Analyst ID - TA Reagent Drop Witness	ERW
SPE Cartridge ID	6341059-01
Trizma ID	SLBR4303V
Reagent Water ID	12/15/16

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.: 320-24441-1

SDG No.:

Batch Number: 142683 Batch Start Date: 12/17/16 13:06 Batch Analyst: Marchenko, Veronika P

Batch Method: 537 Batch End Date: 12/19/16 13:25

Basis	Basis Description
T	Total/NA

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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sacramento

Method 537 CCV/Data Review Checklist

Job No: 24441, 24442 Instrument ID & Date: A6 12/22/16 ICAL Batch: 140688
Extraction Batch: 142683 Worklist #: 38111 TALS Batch: 143413, 143415

Review Items	Level 1 Yes	Level 1 No	Level 1 N/A	Level 2
Initial Calibration				
1. Is ICAL verified and locked in Chrom & TALS?	✓			✓
2. Is ICV properly linked in TALS?	✓			✓
Continuing Calibration				
1. Low-range CCV injected at start of analytical run? CCV injected after every 10 samples and at the end of the analytical run and alternated between Low-range, Mid-range and High-range?	✓			✓
2. If sequence was not after an ICAL was a low and mid range CCV injected at the start of the analytical run?	✓			✓
3. Native compounds and surrogates in control? Low-range within ±50% of true value Mid and High-range within ±30% of true value	✓			✓
4. Internal Standard areas in control? Areas ≥ 50% of average area of the ICal and 70-140% of the most recent CCV.	✓			✓
Client Samples & QC Sample Results				
1. Were preparation and analysis done within holding times?	✓			✓
2. Are Chromatograms reviewed and spectra verified?	✓			✓
3. Are positive results within calibration range?	✓			✓
4. Dilutions due to target cpds? 0 Dilutions due to non-targets? 0	✓			✓
5. All target compounds in MB < 1/3 RL ? (Requires NCM if "no.")	✓			✓
6. Are target constituents in LCS/LCSD within method control limits?	✓			✓
7. Internal Standard areas in control for all samples and QC reported? ±50% from the average area of the ICAL and 70-140% of the most recent CCV	✓			✓
8. Do results (e.g., dilutions/trip blanks) make sense?	✓			✓
9. Are MS/MSD recoveries and RPDs within method control limits?			✓	
10. Are all QC samples properly linked in TALS?	✓			✓
11. All manual integrations appropriate and completely documented?	✓			✓
12. Are nonconformances documented as NCMs?	✓			✓
13. Are all Chrom graphics uploaded?	✓			✓

1st Level Reviewer / Date: [signature] 12/23/16 2nd Level Reviewer / Date: [signature] 12/23/2016

NCM # and Comments: _____

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sacramento

Method 537 ICAL Checklist

Instrument ID & Date: A6 12-5-16 Worklist#: 37524

ICAL Batch: 140688, 140689 Calibration ID number: 26888, 26889

Review Items	-- Level 1 -- Yes	No	N/A	Level 2
Initial Calibration				
1. Mass calibration, as needed, verified by full scan of PFC stock standard. All PFC ions used for quantitation are within 0.3 m/z of true mass?	✓			✓
2. Responses increase with increasing concentration?	✓			✓
3. Fit used (circle): (Average) Linear (1/x²)Linear Quadratic (6 points minimum)				
4. Meets fit criteria? Intercept ≤ ½ RL RSD ≤ 30% for Average $R^2 \geq 0.990$ for Linear $R^2 \geq 0.990$ for Quadratic NOTE: "Force through Zero" must be used and weighted if needed	✓			✓
5. If quadratic fit used the curve does not "bend over".			✓	
6. Feed calibration points into the calculated curve. Are points ≤MRL within ±50% of true value? Are points >MRL within ±30% of true value?	✓			✓
7. Any carryover from the high calibration point must be ≤ 1/3 RL	✓			✓
8. Asymmetry check meets criteria for the first two eluting peaks?.(0.8 - 1.5).	✓			✓
9. Is the asymmetry check scanned and linked in TALS to the calibration point?	✓			✓
10. Is ICV (2nd source) ± 30% of true value?	✓			✓
11. Is ICV (2nd source) internal standards ±50% of average area of the ICAL?	✓			✓
12. ICal locked in Chrom and uploaded to TALS?	✓			✓
13. ICal locked in TALS and scanned?				✓

1st Level Reviewer / Date: JRB 12-6-16 2nd Level Reviewer / Date: [signature] 12/7/16

NCM # and Comments: _____

TestAmerica Laboratories
Worklist QC Batch Report

Worklist Name: 21DEC2016A_A6 537 Worklist Number: 38111
Instrument Name: A6 Chrom Method: 537_A6
Data Directory: \\ChromNA\Sacramento\ChromData\A6\20161221-38111.b
QC Batching: Enabled Limit Group Batching: Enabled

QC Batch: 1	LC 537 ICAL Raw Batch: 143409	LC 537 CS ICAL Raw Batch: 143410
# 1 CCV L5	# 1 CCV L5	
# 2 RB	# 2 RB	
# 3 320-24313-A-1-A	# 3 320-24313-A-1-A	
# 4 320-24313-A-2-A	# 4 320-24313-A-2-A	
# 5 320-24313-A-3-A	# 5 320-24313-A-3-A	
# 6 320-24313-A-4-A	# 6 320-24313-A-4-A	
# 7 320-24313-A-5-A	# 7 320-24313-A-5-A	
# 8 MB 320-137363/1-A	# 8 MB 320-137363/1-A	
# 9 320-20510-A-7-B	# 9 320-20510-A-7-B	
#10 320-20510-A-8-B	#10 320-20510-A-8-B	
#11 CCV L3	#11 CCV L3	#11 CCV L3

QC Batch: 2	LC 537 ICAL Raw Batch: 143411	LC 537 CS ICAL Raw Batch: 143412
#11 CCV L3	#11 CCV L3	#11 CCV L3
#12 RB		#12 RB
#13 320-24143-A-1-A		#13 320-24143-A-1-A
#14 320-24143-A-2-A		#14 320-24143-A-2-A
#15 320-24143-A-3-A		#15 320-24143-A-3-A
#16 320-24156-A-4-A		#16 320-24156-A-4-A
#17 320-24156-A-5-A		#17 320-24156-A-5-A
#18 320-24156-A-6-A		#18 320-24156-A-6-A
#19 320-24156-A-7-A		#19 320-24156-A-7-A
#20 320-24156-A-8-A		#20 320-24156-A-8-A
#21 320-24156-A-9-A		#21 320-24156-A-9-A
#22 CCV L5	#22 CCV L5	#22 CCV L5

QC Batch: 3	LC 537 ICAL Raw Batch: 143413	LC 537 CS ICAL Raw Batch: 143414
#22 CCV L5	#22 CCV L5	#22 CCV L5
#23 RB	#23 RB	
#24 MB 320-142683/1-A	#24 MB 320-142683/1-A	
#25 LCS 320-142683/2-A	#25 LCS 320-142683/2-A	
#26 LCSD 320-142683/3-A	#26 LCSD 320-142683/3-A	
#27 320-24441-A-1-A	#27 320-24441-A-1-A	
#28 320-24441-A-2-A	#28 320-24441-A-2-A	
#29 320-24442-A-1-A	#29 320-24442-A-1-A	
#30 320-24442-A-2-A	#30 320-24442-A-2-A	
#31 320-24442-A-3-A	#31 320-24442-A-3-A	
#41 320-24156-A-2-B DU		#41 320-24156-A-2-B DU
#40 320-24156-A-14-A		#40 320-24156-A-14-A
#34 CCV L3	#34 CCV L3	#34 CCV L3

QC Batch: 4	LC 537 ICAL Raw Batch: 143415	LC 537 CS ICAL Raw Batch: 143611
#34 CCV L3	#34 CCV L3	#34 CCV L3
#35 RB	#35 RB	
#42 537 MSP QC	#42 537 MSP QC	
#43 537 HSP QC	#43 537 HSP QC	
#32 320-24442-A-4-A	#32 320-24442-A-4-A	

QC Batch: 4	LC 537 ICAL Raw Batch: 143415	LC 537 CS ICAL Raw Batch: 143611
#33 320-24442-A-5-A	#33 320-24442-A-5-A	
#36 320-24442-A-6-A	#36 320-24442-A-6-A	
#44 MB 320-142406/1-A	#44 MB 320-142406/1-A	
#45 LLCS 320-142406/2-A	#45 LLCS 320-142406/2-A	
#46 LLCSD 320-142406/3-A	#46 LLCSD 320-142406/3-A	
#47 320-24371-A-1-A	#47 320-24371-A-1-A	
#48 320-24371-A-2-A	#48 320-24371-A-2-A	
#49 320-24371-A-3-A	#49 320-24371-A-3-A	
#50 320-24371-A-4-A	#50 320-24371-A-4-A	
#37 CCV L5	#37 CCV L5	

QC Batch: 5	LC 537 ICAL Raw Batch: 143649
#37 CCV L5	#37 CCV L5
#38 RB	#38 RB
#51 320-24371-A-5-A	#51 320-24371-A-5-A
#52 320-24371-A-6-A	#52 320-24371-A-6-A
#53 320-24371-A-7-A	#53 320-24371-A-7-A
#54 320-24371-A-8-A	#54 320-24371-A-8-A
#55 320-24371-A-9-A	#55 320-24371-A-9-A
#56 320-24371-A-10-A	#56 320-24371-A-10-A
#57 320-24371-A-11-A	#57 320-24371-A-11-A
#58 320-24371-A-12-A	#58 320-24371-A-12-A
#59 320-24371-A-13-A	#59 320-24371-A-13-A
#78 CCV L5	#78 CCV L5

QC Batch: 6	LC 537 ICAL Raw Batch: 143650	LC 537 CS ICAL Raw Batch: 143651
#78 CCV L5	#78 CCV L5	
#79 RB	#79 RB	
#60 MB 320-142564/1-A	#60 MB 320-142564/1-A	
#61 LCS 320-142564/2-A	#61 LCS 320-142564/2-A	
#62 LCSD 320-142564/3-A	#62 LCSD 320-142564/3-A	
#63 320-24375-A-1-A	#63 320-24375-A-1-A	
#64 320-24375-A-2-A	#64 320-24375-A-2-A	
#65 320-24375-A-3-A	#65 320-24375-A-3-A	
#66 320-24375-A-4-A	#66 320-24375-A-4-A	
#67 320-24375-A-5-A	#67 320-24375-A-5-A	
#68 320-24375-A-6-A	#68 320-24375-A-6-A	
#69 320-24375-A-7-A	#69 320-24375-A-7-A	
#80 CCV L3	#80 CCV L3	#80 CCV L3

QC Batch: 7	LC 537 ICAL Raw Batch: 143652	LC 537 CS ICAL Raw Batch: 143653
#80 CCV L3	#80 CCV L3	#80 CCV L3
#81 RB	#81 RB	
#70 320-24375-A-8-A	#70 320-24375-A-8-A	
#71 320-24375-A-9-A	#71 320-24375-A-9-A	
#72 320-24375-A-10-A	#72 320-24375-A-10-A	
#73 320-24375-A-11-A	#73 320-24375-A-11-A	
#74 320-24375-A-12-A	#74 320-24375-A-12-A	
#75 320-24375-A-13-A	#75 320-24375-A-13-A	
#76 320-24375-B-14-A	#76 320-24375-B-14-A	
#77 320-24375-A-15-A	#77 320-24375-A-15-A	
#82 CCV L5	#82 CCV L5	

32 Rush

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-142683

Method Code: 320-537_Prep-320

Analyst: Marchenko, Veronika P

Batch Open: 12/17/2016 1:06:00PM

Batch End: 12/19/2016 1:25:00PM

Screened A4 12/20/16, No DL needed

Extraction of Perfluorinated Alkyl Acids

Due 12/27

	Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmnt FinAmnt	PHs Rcvd	PHs Adj1	PHs Adj2	Due Date	Analytical TAT	Dlv Rank	Comments	Output Sample Lab ID
1	MB-320-142683/1 N/A	N/A		250 mL	7			N/A	N/A	N/A	Chlorine ND	MB 320-142683/1-A
				1.0 mL								
2	LCS-320-142683/2 N/A	N/A		250 mL	7			N/A	N/A	N/A	Chlorine ND	LCS 320-142683/2-A
				1.0 mL								
3	LCSD-320-142683/3 N/A	N/A		250 mL	7			N/A	N/A	N/A	Chlorine ND	LCSD 320-142683/3-A
				1.0 mL								
4	320-24441-A-1 (537_DOD5)	N/A (320-24441-1)	292.14 g	266 mL	7			12/21/16	8_Day_Rush	4	Chlorine ND	320-24441-A-1-A
			26.16 g	1.0 mL								
5	320-24441-A-2 (537_DOD5)	N/A (320-24441-1)	278.10 g	251.3 mL	7			12/21/16	8_Day_Rush	4	Chlorine ND	320-24441-A-2-A
			26.81 g	1.0 mL								
6	320-24442-A-1 (537_DOD5)	N/A (320-24442-1)	282.34 g	254.9 mL	7			12/21/16	8_Day_Rush	4	Chlorine ND	320-24442-A-1-A
			27.45 g	1.0 mL								
7	320-24442-A-2 (537_DOD5)	N/A (320-24442-1)	287.67 g	260.8 mL	7			12/21/16	8_Day_Rush	4	Chlorine ND	320-24442-A-2-A
			26.89 g	1.0 mL								
8	320-24442-A-3 (537_DOD5)	N/A (320-24442-1)	277.16 g	249.2 mL	7			12/21/16	8_Day_Rush	4	Chlorine ND	320-24442-A-3-A
			27.95 g	1.0 mL								
9	320-24442-A-4 (537_DOD5)	N/A (320-24442-1)	305.50 g	278.9 mL	7			12/21/16	8_Day_Rush	4	Chlorine ND	320-24442-A-4-A
			26.65 g	1.0 mL								
10	320-24442-A-5 (537_DOD5)	N/A (320-24442-1)	282.69 g	255.7 mL	7			12/21/16	8_Day_Rush	4	Chlorine ND	320-24442-A-5-A
			26.96 g	1.0 mL								

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-142683

Analyst: Marchenko, Veronika P

Batch Open: 12/17/2016 1:06:00PM

Method Code: 320-537_Prep-320

Batch End: 12/19/2016 1:25:00PM

11	320-24442-A-6 (537_DOD5)	N/A (320-24442-1)	285.68 g 26.25 g	259.4 mL 1.0 mL	7			12/21/16	8_Day_Rush	4	Chlorine ND	

Batch Notes

Manifold ID	5
Trizma ID	SLBR4303V
SPE Cartridge ID	6341059-01
Methanol ID	807188
Reagent Water ID	12/15/16
Pipette ID	MD05306
Analyst ID - TA Reagent Drop	VPM
Analyst ID - TA Reagent Drop Witness	ERW
Analyst ID - SU Reagent Drop	VPM
Analyst ID - SU Reagent Drop Witness	ERW
Analyst ID - IS Reagent Drop	VPM
Analyst ID - IS Reagent Drop Witness	CCB
Batch Comment	

Comments

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-142683
Method Code: 320-537_Prep-320

Analyst: Marchenko, Veronika P

Batch Open: 12/17/2016 1:06:00PM
Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-142683/1	LC537-SU_00026	50 uL	1.0 mL	VPM 12/17/16	ERW 12/17/16
LCS 320-142683/2	LC537-MSP_00014	50 uL	1.0 mL		
LCS 320-142683/2	LC537-SU_00026	50 uL	1.0 mL		
LCSD 320-142683/3	LC537-MSP_00014	50 uL	1.0 mL		
LCSD 320-142683/3	LC537-SU_00026	50 uL	1.0 mL		
320-24441-A-1	LC537-SU_00026	50 uL	1.0 mL		
320-24441-A-2	LC537-SU_00026	50 uL	1.0 mL		
320-24442-A-1	LC537-SU_00026	50 uL	1.0 mL		
320-24442-A-2	LC537-SU_00026	50 uL	1.0 mL		
320-24442-A-3	LC537-SU_00026	50 uL	1.0 mL		
320-24442-A-4	LC537-SU_00026	50 uL	1.0 mL		
320-24442-A-5	LC537-SU_00026	50 uL	1.0 mL		
320-24442-A-6	LC537-SU_00026	50 uL	1.0 mL		

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-142683

Method Code: 320-537_Prep-320

Analyst: Marchenko, Veronika P

Batch Open: 12/17/2016 1:06:00PM

Batch End:

Other Reagents:

Reagent	Amount/Units	Lot#:

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sacramento
Preparation Data Review Checklist

Preparation Batch Number(s): 142683 Test: 537-0005 Rush

Earliest Holding Time: 12/27/16

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

1st Level Reviewer: NSH Date: 12-19-16

2nd Level Reviewer: VPM Date: 12/19/16

Comments: _____

Shipping and Receiving Documents

TestAmerica Sacramento
880 Riverside Parkway

West Sacramento, CA 95605
phone 916.373.5600 fax

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

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

Client Contact	Project Manager: Katie Tippin	Site Contact: Eric Epple	Date: 12/15/2016	COC No: 1
Tiffany Hill	Tel/Fax: (757) 671-6258	Lab Contact: Laura Turpen	Carrier: FedEx	1 of 1 COCs
Project Chemist	Analysis Turnaround Time			Sampler:
1100 NE Circle Blvd Ste 300 Corvallis, OR 97330	☑ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
(541) 768-3109	TAT if different from Below 7-Day			Walk-in Client:
(541) 908-3794	☐ 2 weeks			Lab Sampling:
Project Name: CTO-08	☐ 1 week			Job / SDG No.:
Site: NAS Whidbey Island	☐ 2 days			
P O #: 100067106050 - 679580.06.FI.FS	☐ 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)	USEPA Method 537 (PFOA, PFOS, and PFBS)	Sample Specific Notes:
WI-AF-3RW35-1216	12/14/16	1425	G	DW	2	N	N	X	
WI-AF-3FB35-1216	12/14/16	1426	G	DW	2	N	N	X	
								6	

320-24441 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _Trizma__

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

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

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

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

Special Instructions/QC Requirements & Comments:

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd: 2.4 Corr'd: 1.5 Therm ID No.: 12

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Eric Epple	CH2M	12-15-16 / 1800		TA-SAC	12/16/16 10:05
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Form No. CA-C-WI-002, Rev. 4.3, dated 12/05/2013

Login Sample Receipt Checklist

Client: CH2M Hill Constructors, Inc.

Job Number: 320-24441-1

Login Number: 24441
List Number: 1
Creator: Nelson, Kym D

List Source: TestAmerica Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	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 <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Contract_ID	QCC_CTO_Number	Phase	Investigation_ID	Sample_Name	Archive_Code	Analysis_Group	Analytical_Method	RAC_Code	Lab_Code	Lab_Name	Leachate_Method	Sample_Basis	Extraction_Method	Result_Type	Lab_QC_Type	Sample_Medium	QC_Level	Date/Time_Collected	Date_Received	Leachate_Date	Leachate_Time	Extraction_Date	Extraction_Time	Analysis_Date	Analysis_Time	Lab_Sample_ID	Dilution	Run_Number	Percent_Moisture	Percent_Lipid	Chem_Name	Analyte_ID	Analyte_Value	Original_Analyte_Value	Result_Units	Lab_Qualifier	Validator_Qualifier	QC_Column_Type	Analysis_Result_Type	Result_Normalizer	QC_Control_Limit_Code	QC_Accuracy_Upper	QC_Accuracy_Lower	Tissue_Lipid_Data	QC_Narrative	MDL	Detection_Limit	JQAM_Version	SDL	LOQ	SDA	Analysis_Batch	Validator_Name	Val_Date
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 12:00	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-1	H	1			Perfluorooctanesulfonic acid (PFOS)	763-23-1	0.0485		UG/L			PE	TRG				0.0485	0.0485	0.0485	320-24363-1		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 12:00	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-1	H	1			Perfluorooctanoic acid (PFOA)	335-67-1	0.11		UG/L			PE	TRG				0.11	0.11	0.14	320-24363-1		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 12:00	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-1	H	1			Perfluorobutanesulfonic acid (PFBS)	375-73-5			UG/L	U		PE	TRG				0.3	0.047	0.11	0.14	320-24363-1		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 12:00	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-1	H	1			1H,1H,2H,2H-Perfluorooctanesulfonic acid	27619-97-2	0.18	0.18	UG/L			PE	TRG	BLNK	150	70	0.3	0.18	0.18	0.14	320-24363-1		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 12:00	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-1	H	1			1H,1H,2H,2H-Perfluorodecanesulfonic acid	39108-34-4	0.14	0.14	UG/L			PE	TRG	BLNK	150	70	0.3	0.14	0.14	0.14	320-24363-1		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 12:00	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-1	H	1			Perfluorooctanesulfonamide (FOSA)	754-91-6	0.0485		UG/L	U		PE	TRG				0.3	0.0485	0.0485	0.14	320-24363-1		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 12:00	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-1	H	1			N-Methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	2355-31-9	0.0485		UG/L	U		PE	TRG				0.3	0.0485	0.0485	0.14	320-24363-1		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 12:00	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-1	H	1			N-Ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	2991-50-6	0.0485		UG/L	U		PE	TRG				0.3	0.0485	0.0485	0.14	320-24363-1		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 14:30	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-2	H	1			Perfluorooctanesulfonic acid (PFOS)	763-23-1	0.0485		UG/L	U		PE	TRG				0.3	0.014	0.0485	0.098	320-24363-2		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 14:30	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-2	H	1			Perfluorooctanoic acid (PFOA)	335-67-1	0.0485		UG/L	U		PE	TRG				0.3	0.0485	0.0485	0.14	320-24363-2		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 14:30	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-2	H	1			Perfluorobutanesulfonic acid (PFBS)	375-73-5	0.132	0.132	UG/L			PE	TRG				0.3	0.047	0.11	0.14	320-24363-2		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 14:30	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-2	H	1			1H,1H,2H,2H-Perfluorooctanesulfonic acid	27619-97-2	0.14	0.14	UG/L			PE	TRG	BLNK	150	70	0.3	0.14	0.14	0.14	320-24363-2		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 14:30	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-2	H	1			Perfluorooctanesulfonamide (FOSA)	754-91-6	0.0485		UG/L	U		PE	TRG				0.3	0.0485	0.0485	0.14	320-24363-2		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 14:30	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-2	H	1			N-Methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	2355-31-9	0.0485		UG/L	U		PE	TRG				0.3	0.0485	0.0485	0.14	320-24363-2		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 14:30	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-2	H	1			N-Ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	2991-50-6	0.0485		UG/L	U		PE	TRG				0.3	0.0485	0.0485	0.14	320-24363-2		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 14:31	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-3	H	1			Perfluorooctanesulfonic acid (PFOS)	763-23-1	0.0485		UG/L	U		PE	TRG				0.3	0.014	0.0485	0.098	320-24363-3		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 14:31	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-3	H	1			Perfluorooctanoic acid (PFOA)	335-67-1	0.0485		UG/L	U		PE	TRG				0.3	0.0485	0.0485	0.14	320-24363-3		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 14:31	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-3	H	1			Perfluorobutanesulfonic acid (PFBS)	375-73-5	0.0485		UG/L	U		PE	TRG				0.3	0.047	0.11	0.14	320-24363-3		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 14:31	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-3	H	1			1H,1H,2H,2H-Perfluorooctanesulfonic acid	27619-97-2	0.14	0.14	UG/L			PE	TRG	BLNK	150	70	0.3	0.14	0.14	0.14	320-24363-3		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 14:31	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-3	H	1			Perfluorooctanesulfonamide (FOSA)	754-91-6	0.0485		UG/L	U		PE	TRG				0.3	0.0485	0.0485	0.14	320-24363-3		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 14:31	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-3	H	1			N-Methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	2355-31-9	0.0485		UG/L	U		PE	TRG				0.3	0.0485	0.0485	0.14	320-24363-3		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 14:31	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-3	H	1			N-Ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	2991-50-6	0.0485		UG/L	U		PE	TRG				0.3	0.0485	0.0485	0.14	320-24363-3		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 15:00	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-4	H	1			Perfluorooctanesulfonic acid (PFOS)	763-23-1	0.0485		UG/L	U		PE	TRG				0.3	0.014	0.0485	0.098	320-24363-4		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 15:00	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-4	H	1			Perfluorooctanoic acid (PFOA)	335-67-1	0.0485		UG/L	U		PE	TRG				0.3	0.0485	0.0485	0.14	320-24363-4		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 15:00	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-4	H	1			Perfluorobutanesulfonic acid (PFBS)	375-73-5	0.0485		UG/L	U		PE	TRG				0.3	0.047	0.11	0.14	320-24363-4		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 15:00	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-4	H	1			1H,1H,2H,2H-Perfluorooctanesulfonic acid	27619-97-2	0.14	0.14	UG/L			PE	TRG	BLNK	150	70	0.3	0.14	0.14	0.14	320-24363-4		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 15:00	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-4	H	1			Perfluorooctanesulfonamide (FOSA)	754-91-6	0.0485		UG/L	U		PE	TRG				0.3	0.0485	0.0485	0.14	320-24363-4		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 15:00	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-4	H	1			N-Methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	2355-31-9	0.0485		UG/L	U		PE	TRG				0.3	0.0485	0.0485	0.14	320-24363-4		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 15:00	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-4	H	1			N-Ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	2991-50-6	0.0485		UG/L	U		PE	TRG				0.3	0.0485	0.0485	0.14	320-24363-4		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 15:15	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-5	H	1			Perfluorooctanesulfonic acid (PFOS)	763-23-1	0.0485		UG/L	U		PE	TRG				0.3	0.014	0.0485	0.098	320-24363-5		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 15:15	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-5	H	1			Perfluorooctanoic acid (PFOA)	335-67-1	0.0485		UG/L	U		PE	TRG				0.3	0.0485	0.0485	0.14	320-24363-5		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 15:15	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-5	H	1			Perfluorobutanesulfonic acid (PFBS)	375-73-5	0.0485		UG/L	U		PE	TRG				0.3	0.047	0.11	0.14	320-24363-5		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 15:15	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-5	H	1			1H,1H,2H,2H-Perfluorooctanesulfonic acid	27619-97-2	0.14	0.14	UG/L			PE	TRG	BLNK	150	70	0.3	0.14	0.14	0.14	320-24363-5		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 15:15	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-5	H	1			Perfluorooctanesulfonamide (FOSA)	754-91-6	0.0485		UG/L	U		PE	TRG				0.3	0.0485	0.0485	0.14	320-24363-5		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 15:15	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-5	H	1			N-Methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	2355-31-9	0.0485		UG/L	U		PE	TRG				0.3	0.0485	0.0485	0.14	320-24363-5		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 15:15	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-5	H	1			N-Ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	2991-50-6	0.0485		UG/L	U		PE	TRG				0.3	0.0485	0.0485	0.14	320-24363-5		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 15:30	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-6	H	1			Perfluorooctanesulfonic acid (PFOS)	763-23-1	0.0485		UG/L	U		PE	TRG				0.3	0.014	0.0485	0.098	320-24363-6		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 15:30	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-6	H	1			Perfluorooctanoic acid (PFOA)	335-67-1	0.0485		UG/L	U		PE	TRG				0.3	0.0485	0.0485	0.14	320-24363-6		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 15:30	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-6	H	1			Perfluorobutanesulfonic acid (PFBS)	375-73-5	0.0485		UG/L	U		PE	TRG				0.3	0.047	0.11	0.14	320-24363-6		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 15:30	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-6	H	1			1H,1H,2H,2H-Perfluorooctanesulfonic acid	27619-97-2	0.14	0.14	UG/L			PE	TRG	BLNK	150	70	0.3	0.14	0.14	0.14	320-24363-6		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 15:30	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-6	H	1			Perfluorooctanesulfonamide (FOSA)	754-91-6	0.0485		UG/L	U		PE	TRG				0.3	0.0485	0.0485	0.14	320-24363-6		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 15:30	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-6	H	1			N-Methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	2355-31-9	0.0485		UG/L	U		PE	TRG				0.3	0.0485	0.0485	0.14	320-24363-6		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 15:30	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-6	H	1			N-Ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	2991-50-6	0.0485		UG/L	U		PE	TRG				0.3	0.0485	0.0485	0.14	320-24363-6		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 15:45	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-7	H	1			Perfluorooctanesulfonic acid (PFOS)	763-23-1	0.0485		UG/L	U		PE	TRG				0.3	0.014	0.0485	0.098	320-24363-7		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 15:45	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-7	H	1			Perfluorooctanoic acid (PFOA)	335-67-1	0.0485		UG/L	U		PE	TRG				0.3	0.0485	0.0485	0.14	320-24363-7		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 15:45	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-7	H	1			Perfluorobutanesulfonic acid (PFBS)	375-73-5	0.0485		UG/L	U		PE	TRG				0.3	0.047	0.11	0.14	320-24363-7		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 15:45	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-7	H	1			1H,1H,2H,2H-Perfluorooctanesulfonic acid	27619-97-2	0.14	0.14	UG/L			PE	TRG	BLNK	150	70	0.3	0.14	0.14	0.14	320-24363-7		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 15:45	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-7	H	1			Perfluorooctanesulfonamide (FOSA)	754-91-6	0.0485		UG/L	U		PE	TRG				0.3	0.0485	0.0485	0.14	320-24363-7		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 15:45	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-7	H	1			N-Methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	2355-31-9	0.0485		UG/L	U		PE	TRG				0.3	0.0485	0.0485	0.14	320-24363-7		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 15:45	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-7	H	1			N-Ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	2991-50-6	0.0485		UG/L	U		PE	TRG				0.3	0.0485	0.0485	0.14	320-24363-7		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 16:00	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-8	H	1			Perfluorooctanesulfonic acid (PFOS)	763-23-1	0.0485		UG/L	U		PE	TRG				0.3	0.014	0.0485	0.098	320-24363-8		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 16:00	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-8	H	1			Perfluorooctanoic acid (PFOA)	335-67-1	0.0485		UG/L	U		PE	TRG				0.3	0.0485	0.0485	0.14	320-24363-8		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 16:00	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-8	H	1			Perfluorobutanesulfonic acid (PFBS)	375-73-5	0.0485		UG/L	U		PE	TRG				0.3	0.047	0.11	0.14	320-24363-8		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TAMER	Test America	NONE	NA	METHOD	550	REG	50	#	12/02/2016 16:00	12/06/2016			20161209	10:09:00	20161214	10:10:00	320-24363-8	H	1			1H,1H,2H,2H-Perfluorooctanesulfonic acid	27619-97-2	0.14	0.14	UG/L			PE	TRG	BLNK	150	70	0.3	0.14	0.14	0.14	320-24363-8		
WQAR-16QA0000	0308		SHHOBEY_ISLAND_NAS	SHHOBEY_ISLAND_NAS-WQAR-2016-16-1216	NONE		SVT	KRG	TA

ENVIRONMENTAL
Data Services, Inc.

DATA VALIDATION SUMMARY REPORT
WHIDBEY ISLAND, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon
SDG: 320-24441-1
Laboratory: Test America, Sacramento, California
Site: Whidbey Island, CTO-0008, Washington
Date: January 5, 2017

PFCs			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-AF-3RW35-1216	320-24441-1	Water
2	WI-AF-3FB35-1216	320-24441-2	Water

A full data validation was performed on the analytical data for one water sample and one aqueous field blank sample collected on December 14, 2016 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	*Method References*
PFCs	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. All criteria were met.

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

- A MS/MSD sample was not collected.

Laboratory Control Samples/Laboratory Control Sample Duplicates

- The LCS/LCSD samples exhibited acceptable percent recoveries (%R) and RPD 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 Dated: 1/6/17

Nancy Weaver
Senior Chemist

Data Qualifier	Definition
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: TestAmerica Sacramento Job No.: 320-24441-1

SDG No.:

Client Sample ID: WI-AF-3RW35-1216 Lab Sample ID: 320-24441-1

Matrix: Water Lab File ID: 19DEC2016A6A_152.d

Analysis Method: 537 Date Collected: 12/14/2016 14:25

Extraction Method: 537 Date Extracted: 12/17/2016 13:06

Sample wt/vol: 266(mL) Date Analyzed: 12/22/2016 12:20

Con. Extract Vol.: 1.0(mL) Dilution Factor: 1

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

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

Analysis Batch No.: 143413 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.045	U	0.056	0.045	0.015
335-67-1	Perfluorooctanoic acid (PFOA)	0.023	U	0.028	0.023	0.0089
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.10	U	0.13	0.10	0.045

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

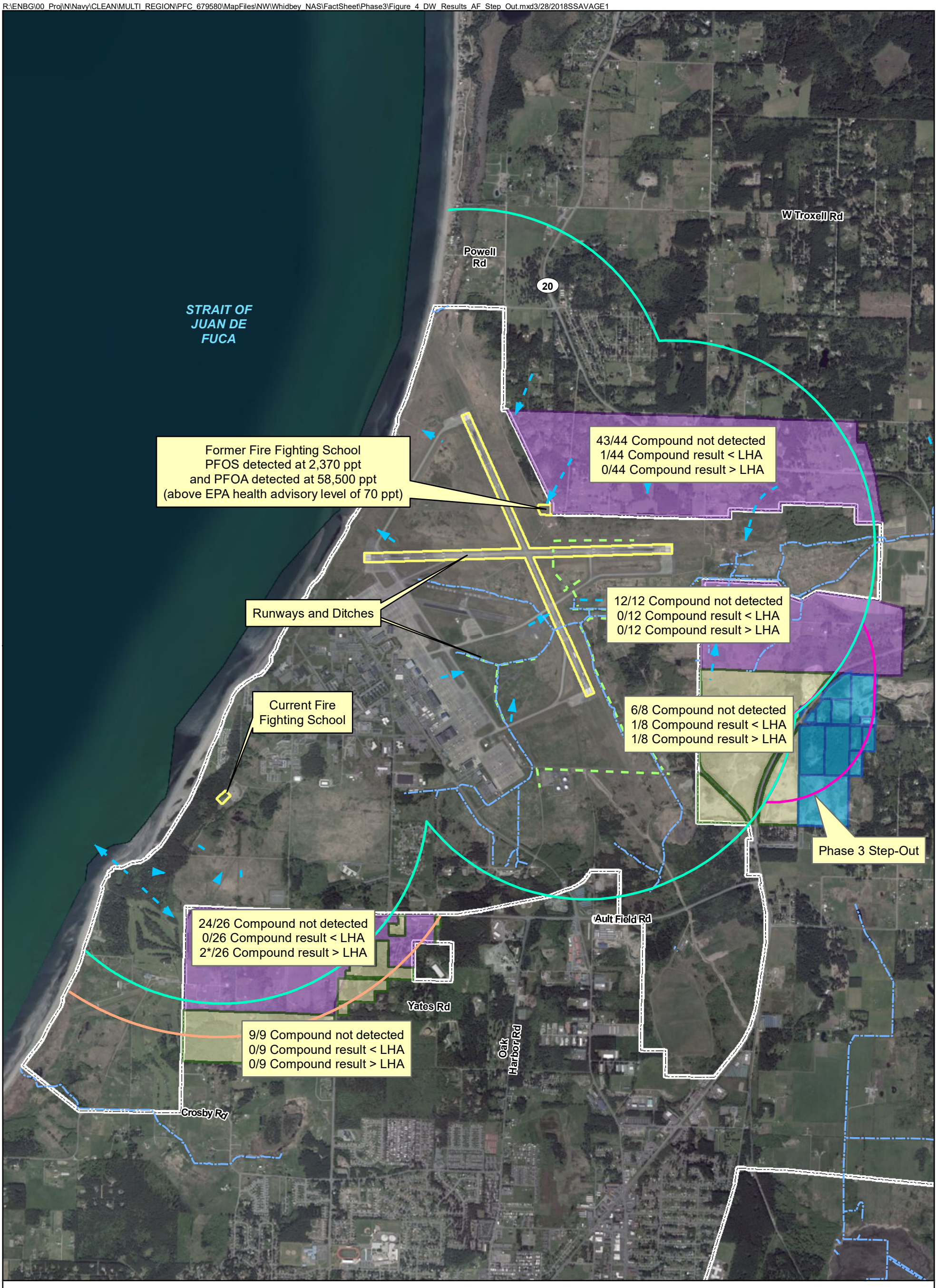
FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-24441-1
SDG No.:
Client Sample ID: WI-AF-3FB35-1216 Lab Sample ID: 320-24441-2
Matrix: Water Lab File ID: 19DEC2016A6A_153.d
Analysis Method: 537 Date Collected: 12/14/2016 14:26
Extraction Method: 537 Date Extracted: 12/17/2016 13:06
Sample wt/vol: 251.3(mL) Date Analyzed: 12/22/2016 12:50
Con. Extract Vol.: 1.0(mL) Dilution Factor: 1
Injection Volume: 10(uL) GC Column: Acquity ID: 2.1(mm)
% Moisture: GPC Cleanup:(Y/N) N
Analysis Batch No.: 143413 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	0.015
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	0.047

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	96		70-130
STL00996	13C2 PFDA	100		70-130

R:\ENBG\00_Proj\N\Navy\CLEAN\MULTI_REGION\PFC_679580\MapFiles\NW\Whidbey_NAS\FactSheet\Phase3\Figure_4_DW_Results_AF_Step_Out.mxd3/28/2018SSAVAGE1



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.

N

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