



**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 J24007-1**

*Naval Air Station Whidbey Island
Oak Harbor, Washington*

June 2019

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

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TestAmerica Sacramento
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West Sacramento, CA 95605
Tel: (916)373-5600

TestAmerica Job ID: 320-24007-1
Client Project/Site: Whidbey Island

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

Attn: Tiffany Hill



Authorized for release by:
12/14/2016 9:00:28 AM

Laura Turpen, Project Manager I
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LINKS

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www.testamericainc.com

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

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

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

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Definitions/Glossary

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

TestAmerica Job ID: 320-24007-1

Qualifiers

LCMS

Qualifier	Qualifier Description
Q	One or more quality control criteria failed.
U	Undetected at the Limit of Detection.
E	Result exceeded calibration range.

Glossary

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

Case Narrative

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

TestAmerica Job ID: 320-24007-1

Job ID: 320-24007-1

Laboratory: TestAmerica Sacramento

Narrative

CASE NARRATIVE

Client: CH2M Hill Constructors, Inc.

Project: Whidbey Island

Report Number: 320-24007-1

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 12/03/2016; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 3.0 C.

PFOA/PFOS

Samples WI-CV-3RW13-1216 (320-24007-1) and WI-CV-3FB13-1216 (320-24007-2) were analyzed for PFOA/PFOS in accordance with 537. The samples were prepared on 12/05/2016 and analyzed on 12/12/2016.

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-140697.

The following sample has a pH of 9:

Case Narrative

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

TestAmerica Job ID: 320-24007-1

Job ID: 320-24007-1 (Continued)

Laboratory: TestAmerica Sacramento (Continued)

WI-CV-3FB13-1216 (320-24007-2)

13C2 PFDA and 13C2 PFHxA failed the surrogate recovery criteria high for WI-CV-3RW13-1216 (320-24007-1). Re-analysis was performed with concurring results. The original analysis has been reported. There is no impact on the data as the associated analytes are Non-Detect (ND).

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

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Detection Summary

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

TestAmerica Job ID: 320-24007-1

Client Sample ID: WI-CV-3RW13-1216

Lab Sample ID: 320-24007-1

No Detections.

Client Sample ID: WI-CV-3FB13-1216

Lab Sample ID: 320-24007-2

No Detections.

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This Detection Summary does not include radiochemical test results.

TestAmerica Sacramento

Client Sample Results

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

TestAmerica Job ID: 320-24007-1

Client Sample ID: WI-CV-3RW13-1216

Lab Sample ID: 320-24007-1

Date Collected: 12/01/16 09:12

Matrix: Water

Date Received: 12/03/16 09:40

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.046	U	0.057	0.015	ug/L		12/05/16 19:07	12/12/16 08:45	1
Perfluorooctanoic acid (PFOA)	0.023	U	0.029	0.0090	ug/L		12/05/16 19:07	12/12/16 08:45	1
Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.13	0.046	ug/L		12/05/16 19:07	12/12/16 08:45	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	131	Q	70 - 130				12/05/16 19:07	12/12/16 08:45	1
13C2 PFDA	136	Q	70 - 130				12/05/16 19:07	12/12/16 08:45	1

Client Sample ID: WI-CV-3FB13-1216

Lab Sample ID: 320-24007-2

Date Collected: 12/01/16 09:13

Matrix: Water

Date Received: 12/03/16 09:40

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.047	U	0.059	0.015	ug/L		12/05/16 19:07	12/12/16 09:15	1
Perfluorooctanoic acid (PFOA)	0.023	U	0.029	0.0092	ug/L		12/05/16 19:07	12/12/16 09:15	1
Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.14	0.047	ug/L		12/05/16 19:07	12/12/16 09:15	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	118		70 - 130				12/05/16 19:07	12/12/16 09:15	1
13C2 PFDA	117		70 - 130				12/05/16 19:07	12/12/16 09:15	1

Surrogate Summary

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

TestAmerica Job ID: 320-24007-1

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)
320-24007-1	WI-CV-3RW13-1216	131 Q	136 Q
320-24007-2	WI-CV-3FB13-1216	118	117
LCS 320-140697/2-A	Lab Control Sample	125	124
LCSD 320-140697/3-A	Lab Control Sample Dup	117	118
MB 320-140697/1-A	Method Blank	110	114

Surrogate Legend

13C2 PFHxA = 13C2 PFHxA

13C2 PFDA = 13C2 PFDA

QC Sample Results

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

TestAmerica Job ID: 320-24007-1

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

Lab Sample ID: MB 320-140697/1-A
Matrix: Water
Analysis Batch: 141575

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 140697

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		12/05/16 19:07	12/12/16 01:51	1
Perfluorooctanoic acid (PFOA)	0.024	U	0.030	0.0094	ug/L		12/05/16 19:07	12/12/16 01:51	1
Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.14	0.048	ug/L		12/05/16 19:07	12/12/16 01:51	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	110		70 - 130	12/05/16 19:07	12/12/16 01:51	1
13C2 PFDA	114		70 - 130	12/05/16 19:07	12/12/16 01:51	1

Lab Sample ID: LCS 320-140697/2-A
Matrix: Water
Analysis Batch: 141575

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 140697

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Perfluorooctanesulfonic acid (PFOS)	0.300	0.311		ug/L		103	70 - 130
Perfluorooctanoic acid (PFOA)	0.152	0.165	E	ug/L		108	70 - 130
Perfluorobutanesulfonic acid (PFBS)	0.673	0.620		ug/L		92	70 - 130

Surrogate	LCS %Recovery	LCS Qualifier	Limits
13C2 PFHxA	125		70 - 130
13C2 PFDA	124		70 - 130

Lab Sample ID: LCSD 320-140697/3-A
Matrix: Water
Analysis Batch: 141575

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 140697

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	Limits	RPD	RPD Limit
Perfluorooctanesulfonic acid (PFOS)	0.300	0.301		ug/L		100	70 - 130	3	30
Perfluorooctanoic acid (PFOA)	0.152	0.149		ug/L		98	70 - 130	10	30
Perfluorobutanesulfonic acid (PFBS)	0.673	0.603		ug/L		90	70 - 130	3	30

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
13C2 PFHxA	117		70 - 130
13C2 PFDA	118		70 - 130

QC Association Summary

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

TestAmerica Job ID: 320-24007-1

LCMS

Prep Batch: 140697

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-24007-1	WI-CV-3RW13-1216	Total/NA	Water	537	
320-24007-2	WI-CV-3FB13-1216	Total/NA	Water	537	
MB 320-140697/1-A	Method Blank	Total/NA	Water	537	
LCS 320-140697/2-A	Lab Control Sample	Total/NA	Water	537	
LCSD 320-140697/3-A	Lab Control Sample Dup	Total/NA	Water	537	

Analysis Batch: 141575

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 320-140697/1-A	Method Blank	Total/NA	Water	537	140697
LCS 320-140697/2-A	Lab Control Sample	Total/NA	Water	537	140697
LCSD 320-140697/3-A	Lab Control Sample Dup	Total/NA	Water	537	140697

Analysis Batch: 141576

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-24007-1	WI-CV-3RW13-1216	Total/NA	Water	537	140697
320-24007-2	WI-CV-3FB13-1216	Total/NA	Water	537	140697

Lab Chronicle

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

TestAmerica Job ID: 320-24007-1

Client Sample ID: WI-CV-3RW13-1216

Lab Sample ID: 320-24007-1

Date Collected: 12/01/16 09:12

Matrix: Water

Date Received: 12/03/16 09:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			260.9 mL	1.0 mL	140697	12/05/16 19:07	VPM	TAL SAC
Total/NA	Analysis	537		1			141576	12/12/16 08:45	JRB	TAL SAC

Client Sample ID: WI-CV-3FB13-1216

Lab Sample ID: 320-24007-2

Date Collected: 12/01/16 09:13

Matrix: Water

Date Received: 12/03/16 09:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			255.7 mL	1.0 mL	140697	12/05/16 19:07	VPM	TAL SAC
Total/NA	Analysis	537		1			141576	12/12/16 09:15	JRB	TAL SAC

Laboratory References:

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



Certification Summary

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

TestAmerica Job ID: 320-24007-1

Laboratory: TestAmerica Sacramento

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

Authority	Program	EPA Region	Certification ID	Expiration Date
A2LA	DoD ELAP		2928-01	01-31-17
Analysis Method	Prep Method	Matrix	Analyte	

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Method Summary

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

TestAmerica Job ID: 320-24007-1

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

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Sample Summary

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

TestAmerica Job ID: 320-24007-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-24007-1	WI-CV-3RW13-1216	Water	12/01/16 09:12	12/03/16 09:40
320-24007-2	WI-CV-3FB13-1216	Water	12/01/16 09:13	12/03/16 09:40

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Login Sample Receipt Checklist

Client: CH2M Hill Constructors, Inc.

Job Number: 320-24007-1

Login Number: 24007

List Source: TestAmerica Sacramento

List Number: 1

Creator: Edman, Connor M

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

ANALYTICAL REPORT

Job Number: 320-24007-1
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
12/14/2016 9:06 AM

Laura Turpen, Project Manager I
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12/14/2016

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Definitions/Glossary

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

TestAmerica Job ID: 320-24007-1

Qualifiers

LCMS

Qualifier	Qualifier Description
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E	Result exceeded calibration range.

Glossary

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

CASE NARRATIVE

Client: CH2M Hill Constructors, Inc.

Project: Whidbey Island

Report Number: 320-24007-1

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.

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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.

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 12/03/2016; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 3.0 C.

PFOA/PFOS

Samples WI-CV-3RW13-1216 (320-24007-1) and WI-CV-3FB13-1216 (320-24007-2) were analyzed for PFOA/PFOS in accordance with 537. The samples were prepared on 12/05/2016 and analyzed on 12/12/2016.

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-140697.

The following sample has a pH of 9:
WI-CV-3FB13-1216 (320-24007-2)

13C2 PFDA and 13C2 PFHxA failed the surrogate recovery criteria high for WI-CV-3RW13-1216 (320-24007-1). Re-analysis was performed with concurring results. The original analysis has been reported. There is no impact on the data as the associated analytes are Non-Detect (ND).

No additional 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: 320-24007-1

Client Sample ID: WI-CV-3RW13-1216

Lab Sample ID: 320-24007-1

No Detections.

Client Sample ID: WI-CV-3FB13-1216

Lab Sample ID: 320-24007-2

No Detections.

This Detection Summary does not include radiochemical test results.

TestAmerica Sacramento

Client Sample Results

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

TestAmerica Job ID: 320-24007-1

Client Sample ID: WI-CV-3RW13-1216

Lab Sample ID: 320-24007-1

Date Collected: 12/01/16 09:12

Matrix: Water

Date Received: 12/03/16 09:40

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.046	U	0.057	0.015	ug/L		12/05/16 19:07	12/12/16 08:45	1
Perfluorooctanoic acid (PFOA)	0.023	U	0.029	0.0090	ug/L		12/05/16 19:07	12/12/16 08:45	1
Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.13	0.046	ug/L		12/05/16 19:07	12/12/16 08:45	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	131	Q	70 - 130				12/05/16 19:07	12/12/16 08:45	1
13C2 PFDA	136	Q	70 - 130				12/05/16 19:07	12/12/16 08:45	1

Client Sample ID: WI-CV-3FB13-1216

Lab Sample ID: 320-24007-2

Date Collected: 12/01/16 09:13

Matrix: Water

Date Received: 12/03/16 09:40

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.047	U	0.059	0.015	ug/L		12/05/16 19:07	12/12/16 09:15	1
Perfluorooctanoic acid (PFOA)	0.023	U	0.029	0.0092	ug/L		12/05/16 19:07	12/12/16 09:15	1
Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.14	0.047	ug/L		12/05/16 19:07	12/12/16 09:15	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	118		70 - 130				12/05/16 19:07	12/12/16 09:15	1
13C2 PFDA	117		70 - 130				12/05/16 19:07	12/12/16 09:15	1

Default Detection Limits

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

TestAmerica Job ID: 320-24007-1

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: 320-24007-1

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

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)	
		3C2 PFHx (70-130)	3C2 PFDA (70-130)
320-24007-1	WI-CV-3RW13-1216	131 Q	136 Q
320-24007-2	WI-CV-3FB13-1216	118	117
LCS 320-140697/2-A	Lab Control Sample	125	124
LCSD 320-140697/3-A	Lab Control Sample Dup	117	118
MB 320-140697/1-A	Method Blank	110	114

Surrogate Legend

13C2 PFHxA = 13C2 PFHxA

13C2 PFDA = 13C2 PFDA

QC Sample Results

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

TestAmerica Job ID: 320-24007-1

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

Lab Sample ID: MB 320-140697/1-A
Matrix: Water
Analysis Batch: 141575

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 140697

Analyte	MB MB		LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Perfluorooctanesulfonic acid (PFOS)	0.048	U	0.060	0.016	ug/L		12/05/16 19:07	12/12/16 01:51	1
Perfluorooctanoic acid (PFOA)	0.024	U	0.030	0.0094	ug/L		12/05/16 19:07	12/12/16 01:51	1
Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.14	0.048	ug/L		12/05/16 19:07	12/12/16 01:51	1

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
13C2 PFHxA	110		70 - 130	12/05/16 19:07	12/12/16 01:51	1
13C2 PFDA	114		70 - 130	12/05/16 19:07	12/12/16 01:51	1

Lab Sample ID: LCS 320-140697/2-A
Matrix: Water
Analysis Batch: 141575

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 140697

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Perfluorooctanoic acid (PFOA)	0.152	0.165	E	ug/L		108	70 - 130
Perfluorobutanesulfonic acid (PFBS)	0.673	0.620		ug/L		92	70 - 130

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
13C2 PFHxA	125		70 - 130
13C2 PFDA	124		70 - 130

Lab Sample ID: LCSD 320-140697/3-A
Matrix: Water
Analysis Batch: 141575

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 140697

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	Limits	RPD	RPD Limit
Perfluorooctanoic acid (PFOA)	0.152	0.149		ug/L		98	70 - 130	10	30
Perfluorobutanesulfonic acid (PFBS)	0.673	0.603		ug/L		90	70 - 130	3	30

Surrogate	LCSD LCSD		Limits
	%Recovery	Qualifier	
13C2 PFHxA	117		70 - 130
13C2 PFDA	118		70 - 130

QC Association Summary

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

TestAmerica Job ID: 320-24007-1

LCMS

Prep Batch: 140697

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-24007-1	WI-CV-3RW13-1216	Total/NA	Water	537	
320-24007-2	WI-CV-3FB13-1216	Total/NA	Water	537	
MB 320-140697/1-A	Method Blank	Total/NA	Water	537	
LCS 320-140697/2-A	Lab Control Sample	Total/NA	Water	537	
LCSD 320-140697/3-A	Lab Control Sample Dup	Total/NA	Water	537	

Analysis Batch: 141575

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 320-140697/1-A	Method Blank	Total/NA	Water	537	140697
LCS 320-140697/2-A	Lab Control Sample	Total/NA	Water	537	140697
LCSD 320-140697/3-A	Lab Control Sample Dup	Total/NA	Water	537	140697

Analysis Batch: 141576

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-24007-1	WI-CV-3RW13-1216	Total/NA	Water	537	140697
320-24007-2	WI-CV-3FB13-1216	Total/NA	Water	537	140697

Lab Chronicle

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

TestAmerica Job ID: 320-24007-1

Client Sample ID: WI-CV-3RW13-1216

Lab Sample ID: 320-24007-1

Date Collected: 12/01/16 09:12

Matrix: Water

Date Received: 12/03/16 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			140697	12/05/16 19:07	VPM	TAL SAC
Total/NA	Analysis	537		1	141576	12/12/16 08:45	JRB	TAL SAC

Client Sample ID: WI-CV-3FB13-1216

Lab Sample ID: 320-24007-2

Date Collected: 12/01/16 09:13

Matrix: Water

Date Received: 12/03/16 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			140697	12/05/16 19:07	VPM	TAL SAC
Total/NA	Analysis	537		1	141576	12/12/16 09:15	JRB	TAL SAC

Laboratory References:

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

Certification Summary

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

TestAmerica Job ID: 320-24007-1

Laboratory: TestAmerica Sacramento

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

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

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

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

TestAmerica Job ID: 320-24007-1

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: 320-24007-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-24007-1	WI-CV-3RW13-1216	Water	12/01/16 09:12	12/03/16 09:40
320-24007-2	WI-CV-3FB13-1216	Water	12/01/16 09:13	12/03/16 09:40

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24007-1

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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-24007-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration		
					Reagent ID	Volume Added				
LC537-HSP_00010	01/28/17	07/28/16	Methanol, Lot 090285	10000 uL	LC537SPIM_00012	375 uL	Perfluorobutane Sulfonate	3366 ng/mL		
							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	Perfluorobutane Sulfonate	89.76 ug/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	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-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		

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-24007-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorooctanesulfonic acid (PFOS)	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
..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_00025	03/19/17	11/21/16	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
							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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-24007-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration	
					Reagent ID	Volume Added			
							Perfluorooctanesulfonic acid (PFOS)	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 BCM2579V				(Purchased Reagent)	Perfluoroheptanoic acid	0.99 g/g
..LC537-PFHxS_00008	07/28/17	07/28/16	Methanol, Lot 090285	5.5 mL	LC537 PFHxS_00002	0.0061 g	Perfluorohexanesulfonic acid	1008.61 ug/mL	
....LC537 PFHxS_00002	04/01/18		Sigma, Lot BCBL3545V				(Purchased Reagent)	Perfluorohexanesulfonic acid	0.9094 g/g
...LC537-PFNA_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	
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	

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-24007-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration	
					Reagent ID	Volume Added			
							Perfluorooctanesulfonic acid (PFOS)	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-PFHxA 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-PFHxA 00010	07/28/17	07/28/16	Methanol, Lot 090285	7 mL	LC537 PFHxA 00002	0.0072 g	Perfluoroheptanoic acid	1018.29 ug/mL	
....LC537 PFHxA 00002	04/01/18		Aldrich, Lot BCBM2579V				(Purchased Reagent)	Perfluoroheptanoic acid	0.99 g/g
..LC537-PFHxS 00008	07/28/17	07/28/16	Methanol, Lot 090285	5.5 mL	LC537 PFHxS 00002	0.0061 g	Perfluorohexanesulfonic acid	1008.61 ug/mL	
....LC537 PFHxS 00002	04/01/18		Sigma, Lot BCBL3545V				(Purchased Reagent)	Perfluorohexanesulfonic acid	0.9094 g/g
...LC537-PFNA 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	
							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	

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-24007-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							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 BCM2579V		(Purchased Reagent)		Perfluoroheptanoic acid	0.99 g/g
...LC537-PFHxS_00008	07/28/17	07/28/16	Methanol, Lot 090285	5.5 mL	LC537 PFHxS_00002	0.0061 g	Perfluorohexanesulfonic acid	1008.61 ug/mL
...LC537 PFHxS_00002	04/01/18		Sigma, Lot BCBL3545V		(Purchased Reagent)		Perfluorohexanesulfonic acid	0.9094 g/g
...LC537-PFNA_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
..LCM2PFOA_00003	03/19/17		Wellington Laboratories, Lot M2PFOA0312		LCMPFOS_00018	300 uL	13C4 PFOS	1.434 ug/mL
..LCMPFOS_00018	08/03/21		Wellington Laboratories, Lot MPFOS0816		(Purchased Reagent)		13C2-PFOA	50 ug/mL
.LC537-SU_00020	04/07/17	10/07/16	Methanol, Lot 104453	25000 uL	LCMPFDA_00008	100 uL	13C2 PFDA	0.2 ug/mL
..LCMPFDA_00008	08/19/20		Wellington Laboratories, Lot MPFDA0815		LCMPFHxA_00009	100 uL	13C2 PFHxA	0.2 ug/mL
..LCMPFHxA_00009	04/09/20		Wellington Laboratories, Lot MPFHxA0415		(Purchased Reagent)		13C2 PFDA	50 ug/mL
							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
							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

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-24007-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration		
					Reagent ID	Volume Added				
.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 BCM2579V		(Purchased Reagent)		Perfluoroheptanoic acid	0.99 g/g		
...LC537-PFHxS_00008	07/28/17	07/28/16	Methanol, Lot 090285	5.5 mL	LC537_PFHxS_00002	0.0061 g	Perfluorohexanesulfonic acid	1008.61 ug/mL		
....LC537_PFHxS_00002	04/01/18		Sigma, Lot BCBL3545V		(Purchased Reagent)		Perfluorohexanesulfonic acid	0.9094 g/g		
...LC537-PFNA_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-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		

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-24007-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
						250 uL	13C4 PFOS 13C2 PFDA 13C2 PFHxA	28.68 ng/mL 10 ng/mL 10 ng/mL
.LC537-HSP_00010	01/28/17	07/28/16	Methanol, Lot 090285	10000 uL	LC537SPIM_00012	375 uL	Perfluorobutanesulfonic acid (PFBS) Perfluoroheptanoic acid Perfluorohexanesulfonic acid Perfluorononanoic acid Perfluorooctanoic acid (PFOA) Perfluorooctanesulfonic acid (PFOS)	3366 ng/mL 381.857 ng/mL 1134.68 ng/mL 736.695 ng/mL 760.489 ng/mL 1502.49 ng/mL
..LC537SPIM_00012	01/28/17	07/28/16	Methanol, Lot 104453	10 mL	LC537-PFBS_00006 LC537-PFHxA_00010 LC537-PFHxS_00008 LC537-PFNA_00008 LC537-PFOA_00009 LC537-PFOS_00006	0.44 mL 0.1 mL 0.3 mL 0.2 mL 0.098 mL 0.4 mL	Perfluorobutanesulfonic acid (PFBS) Perfluoroheptanoic acid Perfluorohexanesulfonic acid Perfluorononanoic acid Perfluorooctanoic acid (PFOA) Perfluorooctanesulfonic acid (PFOS)	89.76 ug/mL 10.1829 ug/mL 30.2582 ug/mL 19.6452 ug/mL 20.2797 ug/mL 40.0664 ug/mL
...LC537-PFBS_00006	07/28/17	07/28/16	Methanol, Lot 090285	5 mL	LC537_PFBS_00002	0.0102 g	Perfluorobutanesulfonic acid (PFBS)	2040 ug/mL
....LC537_PFBS_00002	04/01/18		Sigma, Lot MKBP8842V				(Purchased Reagent) Perfluorobutanesulfonic acid (PFBS)	1 g/g
...LC537-PFHxA_00010	07/28/17	07/28/16	Methanol, Lot 090285	7 mL	LC537_PFHxA_00002	0.0072 g	Perfluoroheptanoic acid	1018.29 ug/mL
....LC537_PFHxA_00002	04/01/18		Aldrich, Lot BCM2579V				(Purchased Reagent) Perfluoroheptanoic acid	0.99 g/g
...LC537-PFHxS_00008	07/28/17	07/28/16	Methanol, Lot 090285	5.5 mL	LC537_PFHxS_00002	0.0061 g	Perfluorohexanesulfonic acid	1008.61 ug/mL
....LC537_PFHxS_00002	04/01/18		Sigma, Lot BCBL3545V				(Purchased Reagent) Perfluorohexanesulfonic acid	0.9094 g/g
...LC537-PFNA_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 LCMPFOS_00018	100 uL 300 uL	13C2-PFOA 13C4 PFOS	0.5 ug/mL 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 LCMPFHxA_00009	100 uL 100 uL	13C2 PFDA 13C2 PFHxA	0.2 ug/mL 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) Perfluoroheptanoic acid Perfluorohexanesulfonic acid Perfluorononanoic acid Perfluorooctanoic acid (PFOA)	178.398 ng/mL 20.2384 ng/mL 60.1382 ng/mL 39.0448 ng/mL 40.3059 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-24007-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorooctanesulfonic acid (PFOS)	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-PFHxA_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-PFHxA_00010	07/28/17	07/28/16	Methanol, Lot 090285	7 mL	LC537_PFHxA_00002	0.0072 g	Perfluoroheptanoic acid	1018.29 ug/mL
....LC537_PFHxA_00002	04/01/18		Aldrich, Lot BCM2579V		(Purchased Reagent)		Perfluoroheptanoic acid	0.99 g/g
...LC537-PFHxS_00008	07/28/17	07/28/16	Methanol, Lot 090285	5.5 mL	LC537_PFHxS_00002	0.0061 g	Perfluorohexanesulfonic acid	1008.61 ug/mL
....LC537_PFHxS_00002	04/01/18		Sigma, Lot BCBL3545V		(Purchased Reagent)		Perfluorohexanesulfonic acid	0.9094 g/g
...LC537-PFNA_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-SU_00022	05/21/17	11/21/16	Methanol, Lot 104453	20000 uL	LCMPFDA_00008	80 uL	13C2 PFDA	0.2 ug/mL
					LCMPFHxA_00009	80 uL	13C2 PFHxA	0.2 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24007-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LCMPFDA_00008	08/19/20		Wellington Laboratories, Lot MPFDA0815		(Purchased Reagent)		13C2 PFDA	50 ug/mL
.LCMPFHxA_00009	04/09/20		Wellington Laboratories, Lot MPFHxA0415		(Purchased Reagent)		13C2 PFHxA	50 ug/mL

Reagent

LC537_PFB_00002

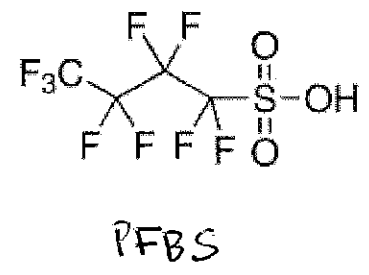
#: 4/1/15 SPV

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

Certificate of Analysis

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

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



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 %

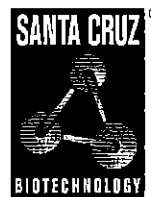
Jamie Gleason

Jamie Gleason, Manager
Quality Control
Milwaukee, Wisconsin US

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

Reagent

LC537_PFB2_00001



The Power to Question

CERTIFICATE OF ANALYSIS

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

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

Test Conditions: Refractive Index: n_{20/D}

Reagent

LC537_PFHpA_00002

R: 4/1/15 4V

Certificate of Analysis

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

PFHpA

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

Dr. Claudia Geitner
Manager Quality Control
Buchs, Switzerland

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

Reagent

LC537_PFHxS_00002

r: 4/1/15 stw

Certificate of Analysis

Product Name: TRIDECAFLUOROHEXANE-1-SULFONIC ACID POTASSIUM SALT
 >= 98.0 % T

Product Number: 50929

Batch Number: BCBL3545V

Brand: Aldrich

CAS Number: 3871-99-6

Formula: C₆F₁₃KO₃S

Formula Weight: 438.20

Quality Release Date: 20 JUN 2013

PFH₁₃S-K

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

Dr. Claudia Geitner
Manager Quality Control
Buchs, Switzerland

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

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

stw 4/1/15

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

Reagent

LC537_PENA_00002

R: 4/1/15 SKV



Certificate of Analysis

Apr 2, 2015 (JST)

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

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

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

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

Customer service:

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

PFNA

Reagent

LC537_PFOA_00002

3/21/15

SIGMA-ALDRICH

CERTIFICATE OF ANALYSIS

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

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

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

Reference Material (RM)

1. General Information

Formula: 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

identity (GC-MS)
Assay (GCMS)
Date of Analysis

complying
99.4 %
13.Nov.2013

3. Advice and Remarks

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

Sigma-Aldrich Laborchemikalien GmbH
Quality Management SA-LC

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GC/MS-Method

Analytical Department

Article: Pentadecafluorooctanoic acid OEKANAL

Article-No.: 33824

Batch: SZBD308XV

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

Injector: Split mode

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

Inj.-temp.: 280°C

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

Split: 1:100

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

Detector: MSD

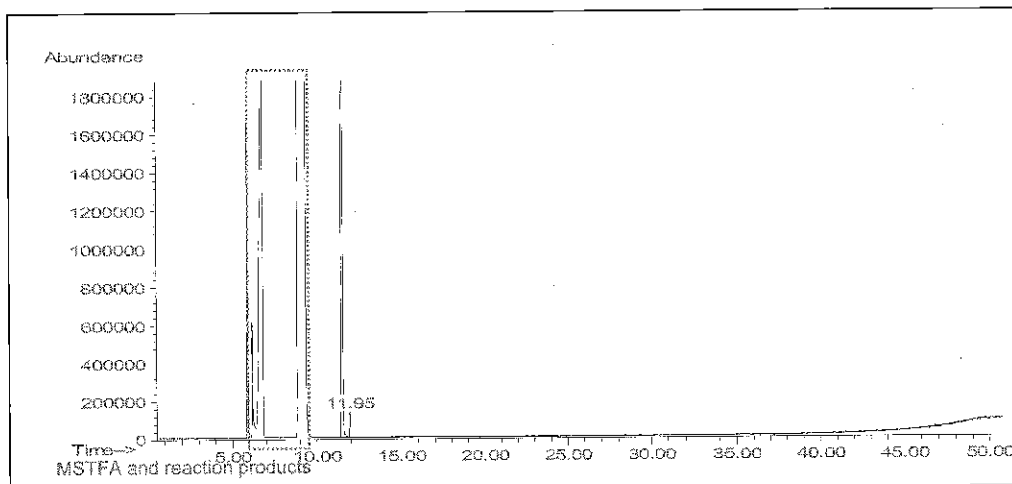
Mass range: 10-600 amu (Scan mode)

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

Identity: Mass spectrum complies

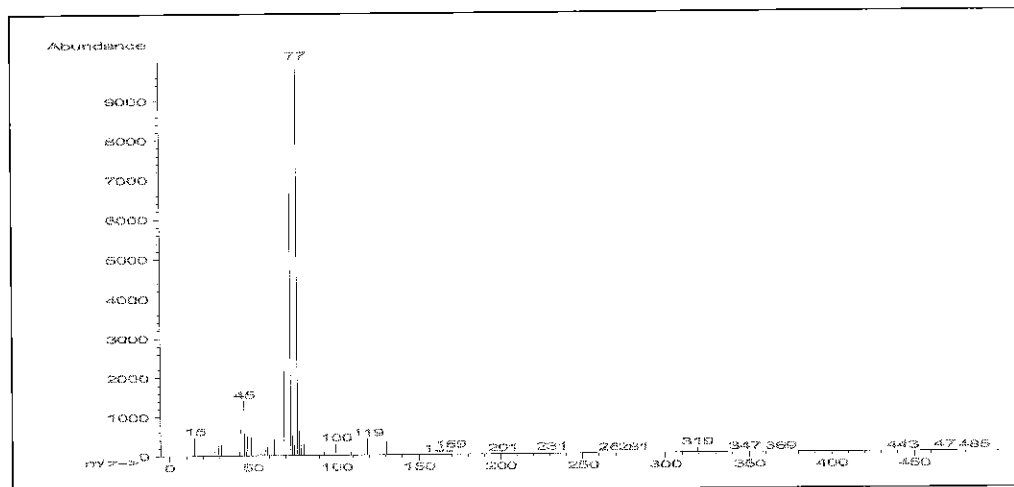
Operator: Ahrens / 2013-11-13

Total Ion Chromatogram:



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

Mass spectrum (rt = 11.54 min):



Reagent

LC537_PFOA2_00001

Certificate of Analysis

Alfa Aesar
A Johnson Matthey Company

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

PFOA

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

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www.alfa.com

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+33 (0)3 8862 6864
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+91 8008 812626
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Fax: +82-2-3140-6002
Email: saleskorea@alfa-asia.com

Reagent

LC537_PFOs_00002

SIGMA-ALDRICH®

CERTIFICATE OF ANALYSIS

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

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

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

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)	98.00 %
Date of Analysis	10.Aug.2012

FW-Correction:

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

Purity = 91.06%

3. Advice and Remarks

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

Sigma-Aldrich Laborchemikalien GmbH
 Quality Management SA-LC

Reagent

LC537_PFOs2_00001

Certificate of Analysis

Inw 820
12LCMS 0579

Product Name: HEPTADEC AFLUORO OCTANESULFONIC ACID TETRAETHYLAMMONIUM SALT
98 %
Product Number: 365289
Product Brand: Aldrich
Molecular Formula: C₁₆H₂₀F₁₇NO₃S
Molecular Mass: 629.37
CAS Number: 56773-42-3

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

QC RELEASE DATE 13/APR/11

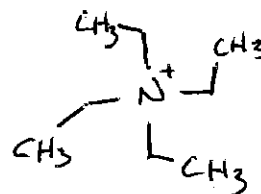
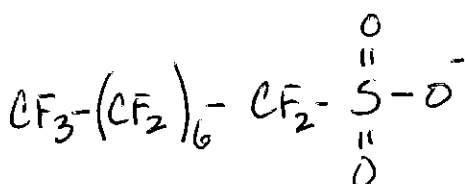
$$\text{Mw correction} = \frac{500.125}{629.37} = 0.7946$$

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

E. Schwarzler

Purity + Mw Correction = 77.87%

Edeltraud Schwarzler, Manager
Quality Control
Buchs, Switzerland



	<u>C₈F₁₇SO₃H</u>	<u>C₈H₂₀N</u>
C = 12.011	96.088	96.088
F = 18.998	322.966	-
S = 32.066	32.066	-
O = 15.999	47.997	-
H = 1.008	1.008	20.160
N = 14.007	-	14.007
	<u>500.125</u>	<u>130.255</u> →

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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, traceability and batch consistency.

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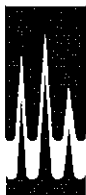
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We are committed to the success of our Customers, Employees and Shareholders through leadership in Life Science, High Technology and Service.

Reagent

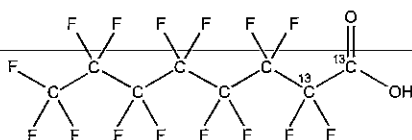
LCM2PFOA_00003



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2PFOA **LOT NUMBER:** M2PFOA0312
COMPOUND: Perfluoro-n-[1,2-¹³C₂]octanoic acid
STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₂¹²C₆HF₁₅O₂ **MOLECULAR WEIGHT:** 416.05
CONCENTRATION: 50 ± 2.5 µg/ml **SOLVENT(S):** Methanol
Water (<1%)
CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99%¹³C
(1,2-¹³C₂)
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, \dots, x_n on which it depends is:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

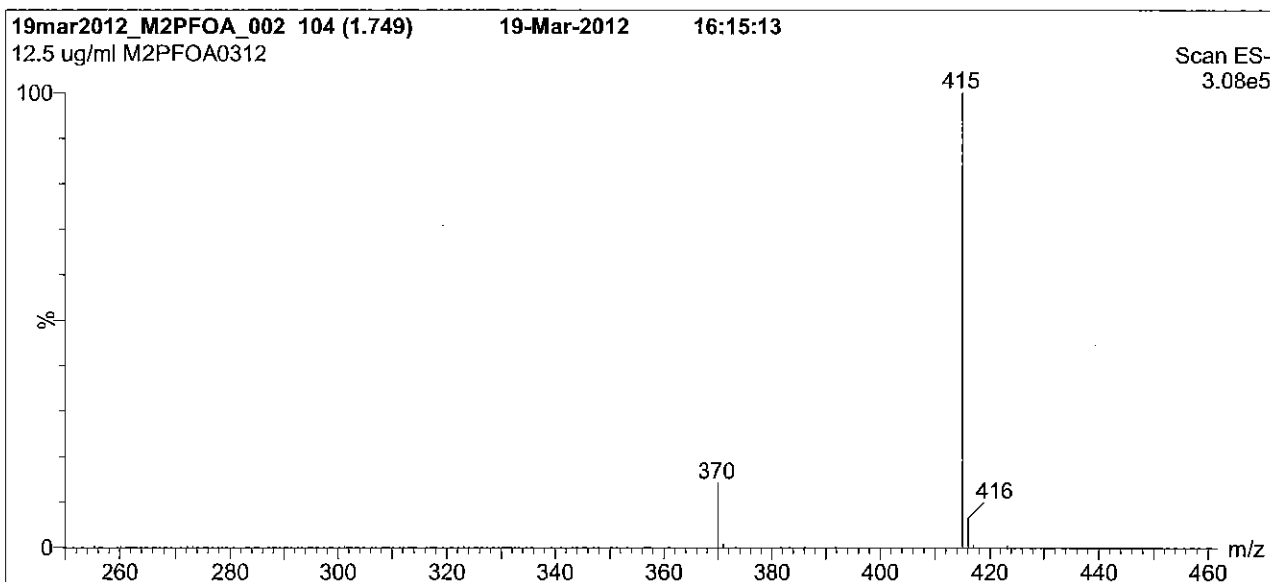
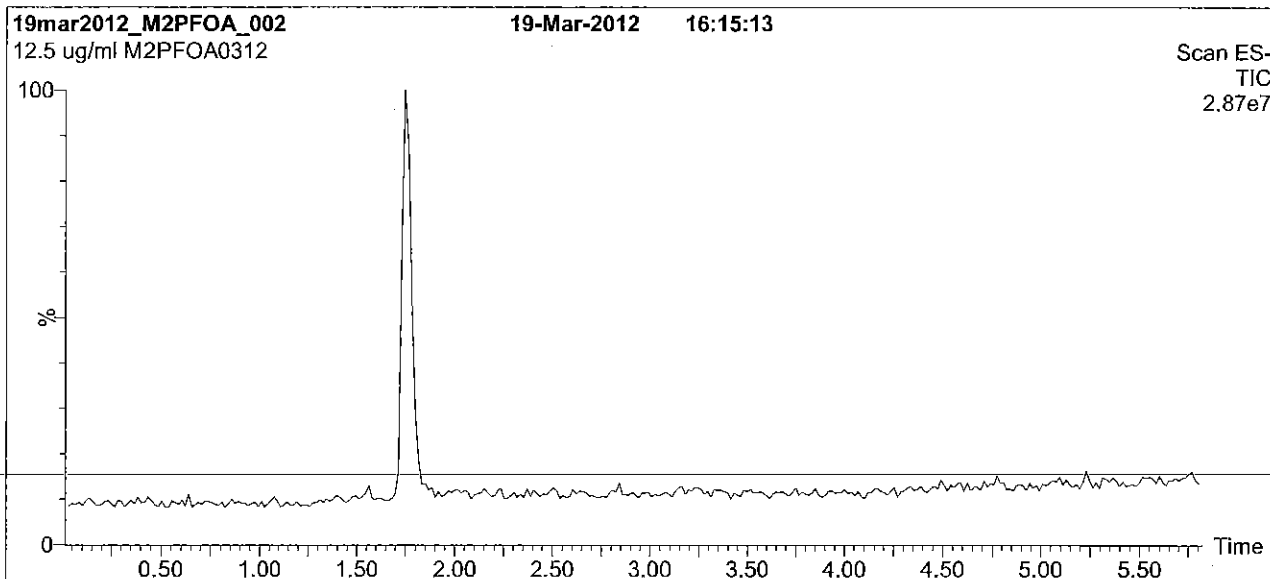
QUALITY MANAGEMENT:

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



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H₂O
(both with 10 mM NH₄OAc 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

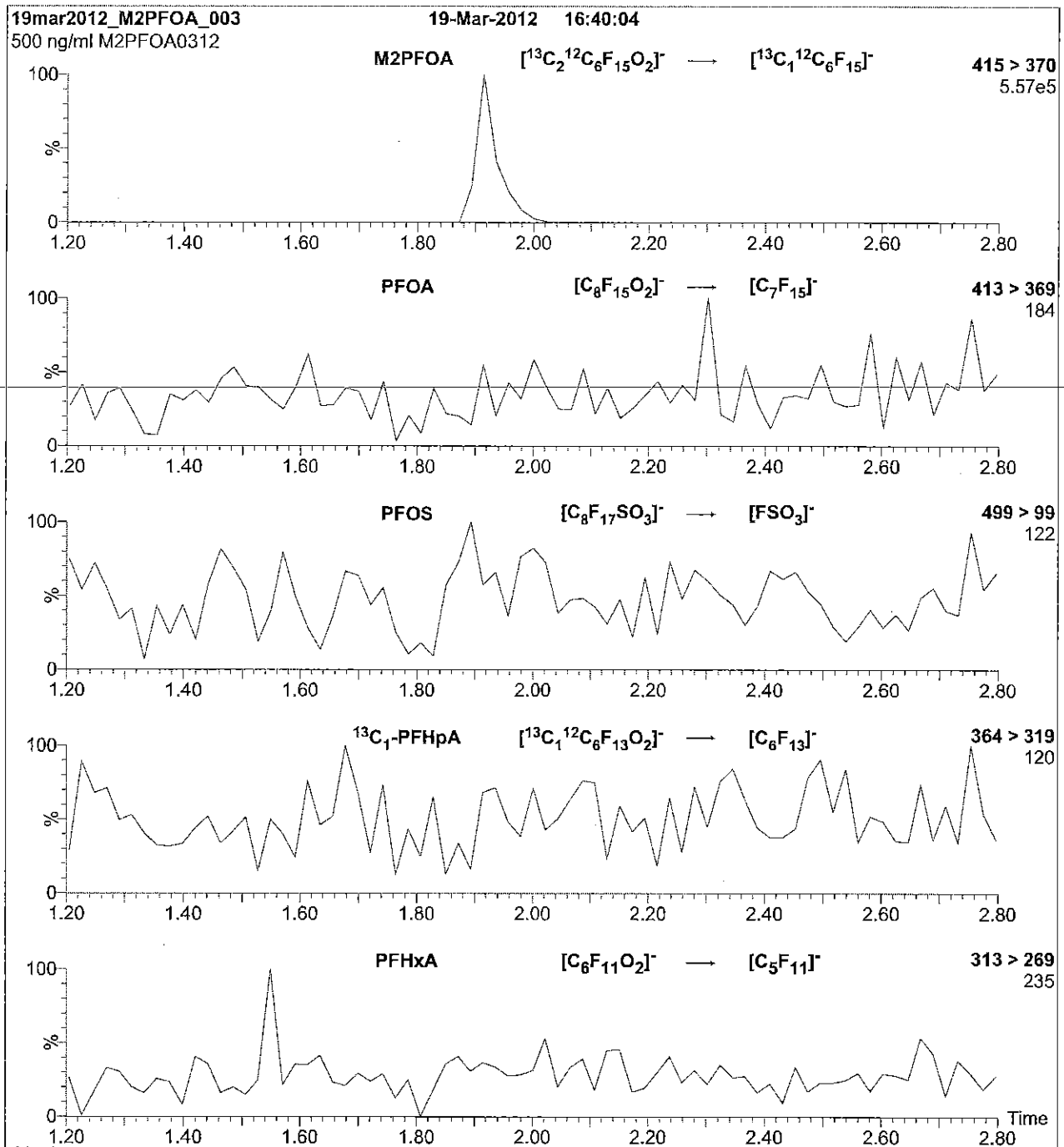
Flow: 300 μ l/min

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)

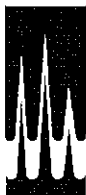
Flow: 300 $\mu\text{l}/\text{min}$

MS Parameters

Collision Gas (mbar) = $3.35\text{e-}3$
Collision Energy (eV) = 11

Reagent

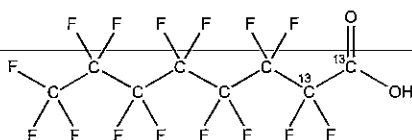
LCM2PFOA_00004



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CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2PFOA **LOT NUMBER:** M2PFOA0312
COMPOUND: Perfluoro-n-[1,2-¹³C₂]octanoic acid
STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₂¹²C₆HF₁₅O₂ **MOLECULAR WEIGHT:** 416.05
CONCENTRATION: 50 ± 2.5 µg/ml **SOLVENT(S):** Methanol
Water (<1%)
CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99%¹³C
(1,2-¹³C₂)
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, \dots, x_n on which it depends is:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

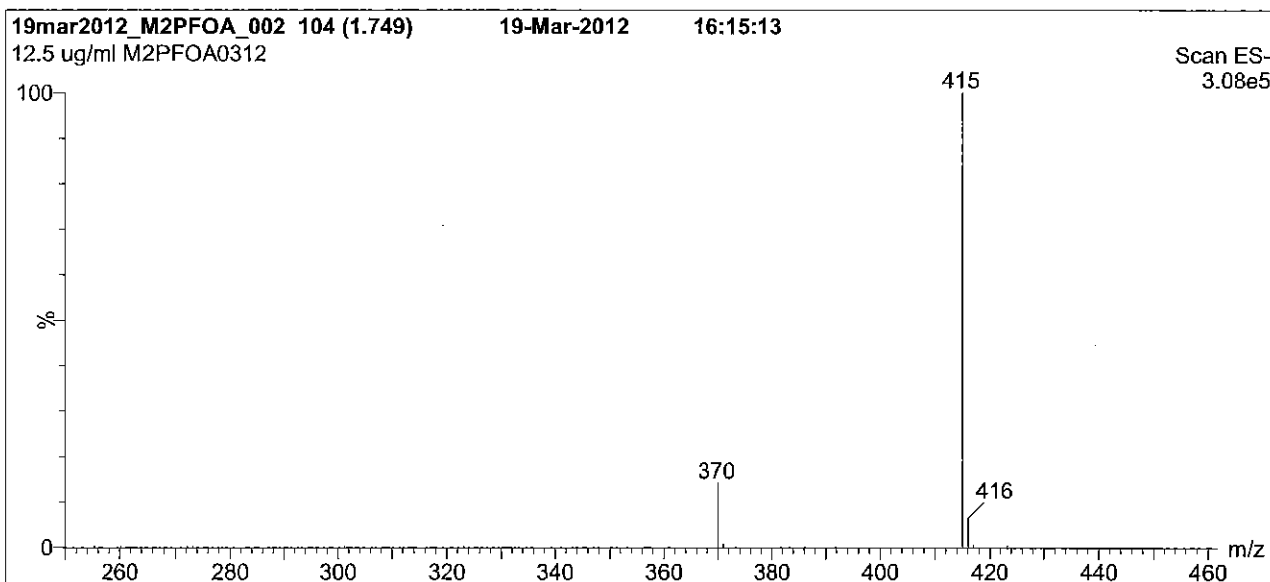
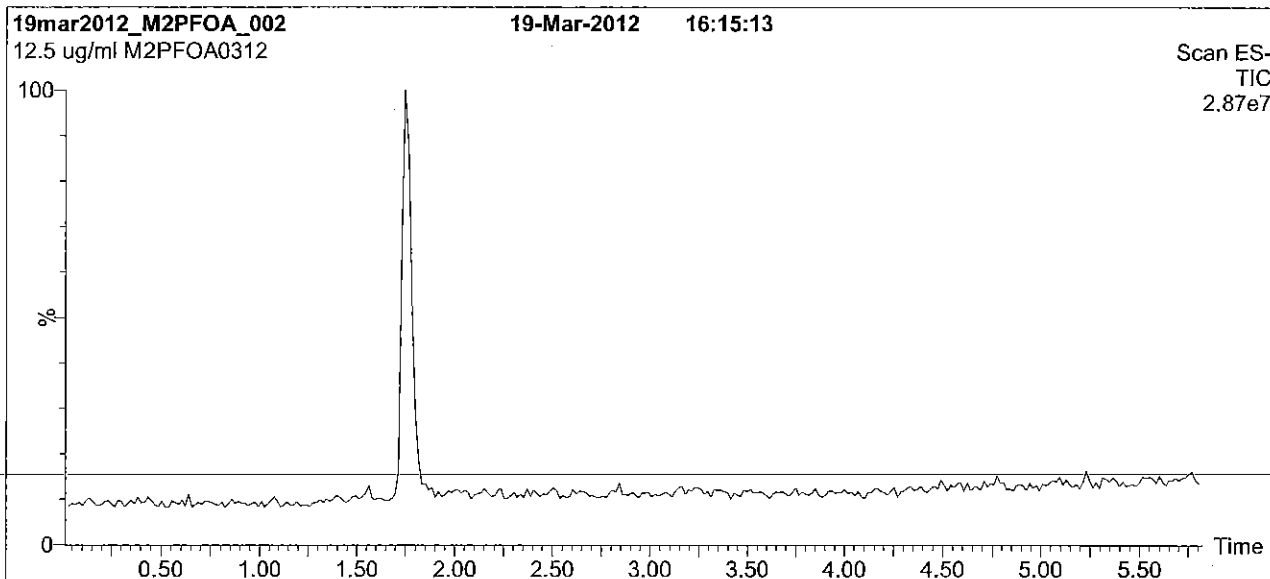
QUALITY MANAGEMENT:

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



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
 Start: 60% (80:20 MeOH:ACN) / 40% H₂O
 (both with 10 mM NH₄OAc 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

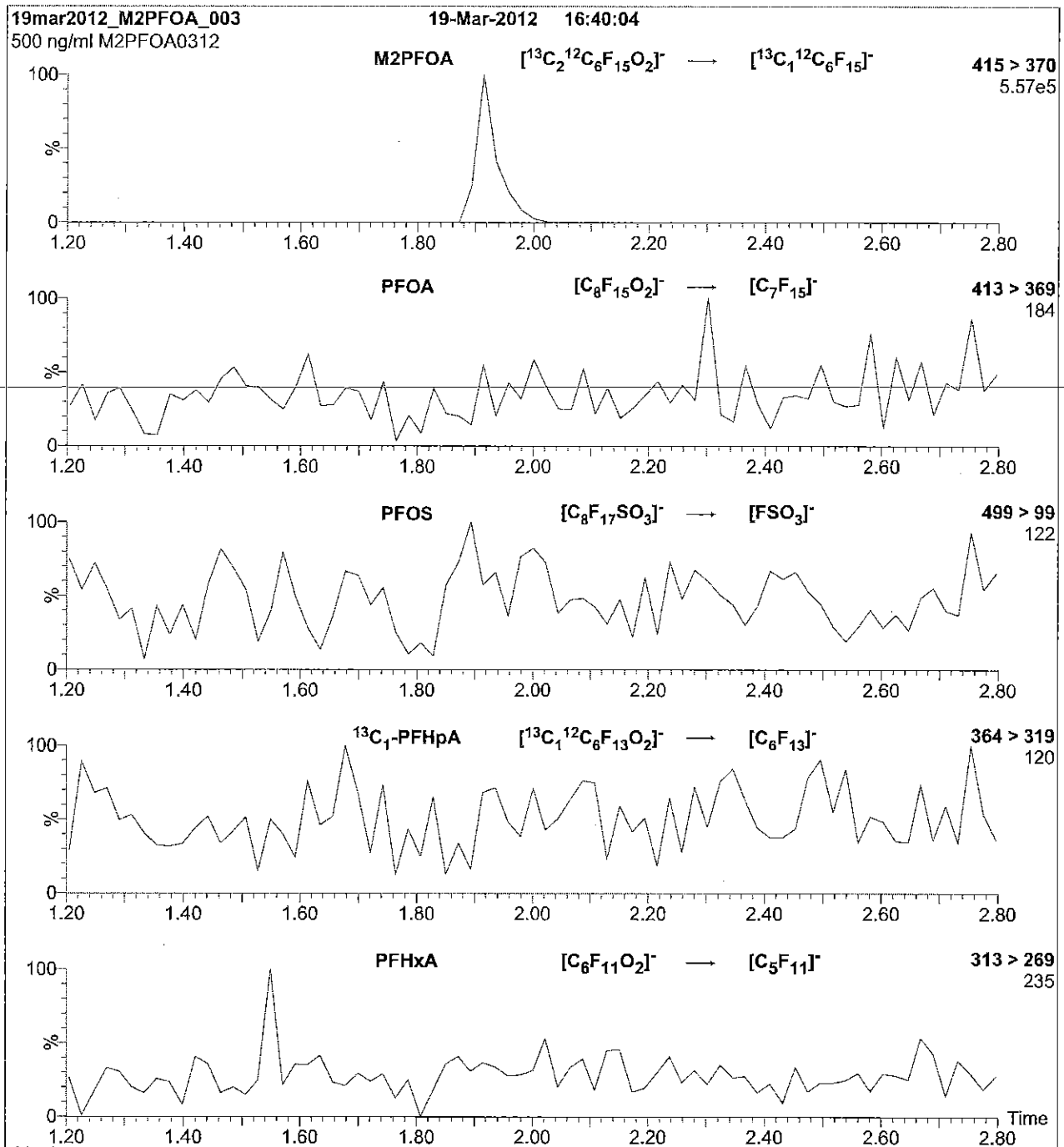
Flow: 300 μ l/min

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

MS Parameters

Collision Gas (mbar) = $3.35\text{e-}3$
Collision Energy (eV) = 11

Reagent

LCMPFDA_00008



605243

ID: LCMPFDA_00008

Exp: 08/19/20 Pptd: CBW

13C2-Perfluorodecanoic acid

Rec. 3/29/16 JEB ✓



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CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:

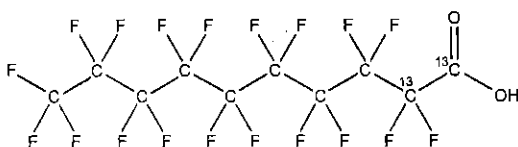
MPFDA

LOT NUMBER:

MPFDA0815

COMPOUND:Perfluoro-n-[1,2-¹³C₂]decanoic acid**STRUCTURE:****CAS #:**

Not available

**MOLECULAR FORMULA:**¹³C₂¹²C₈HF₁₉O₂**MOLECULAR WEIGHT:**

516.07

CONCENTRATION:

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

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

08/19/2015

(1,2-¹³C₂)**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 ¹³C₁-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:

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HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

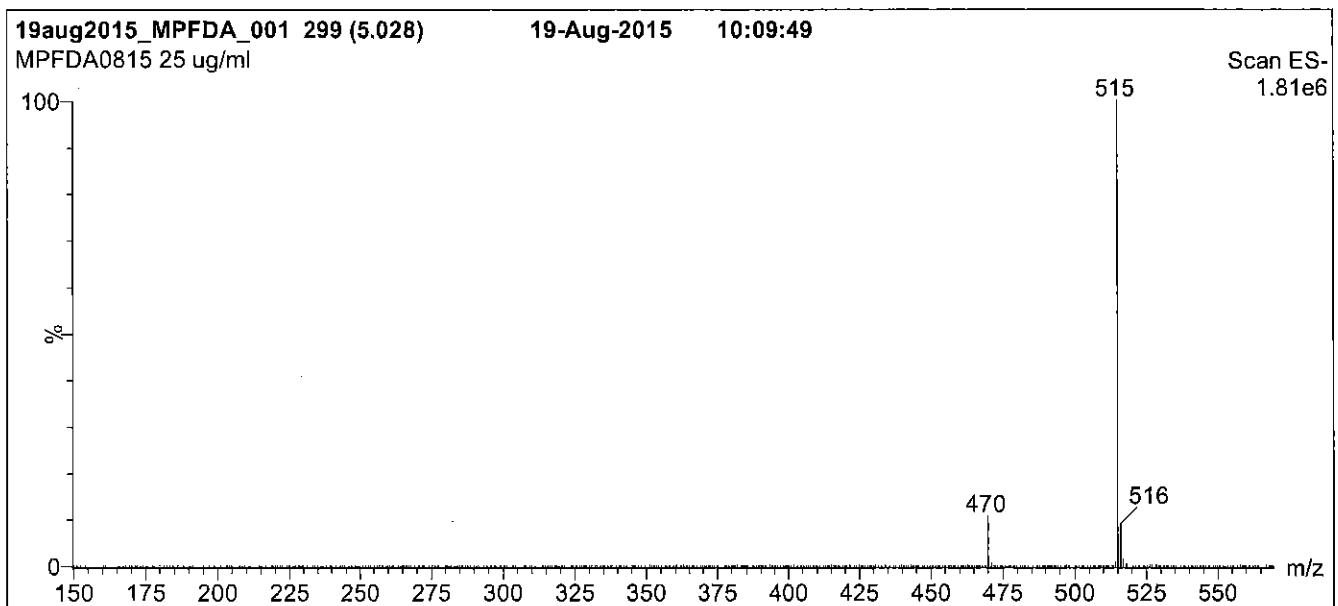
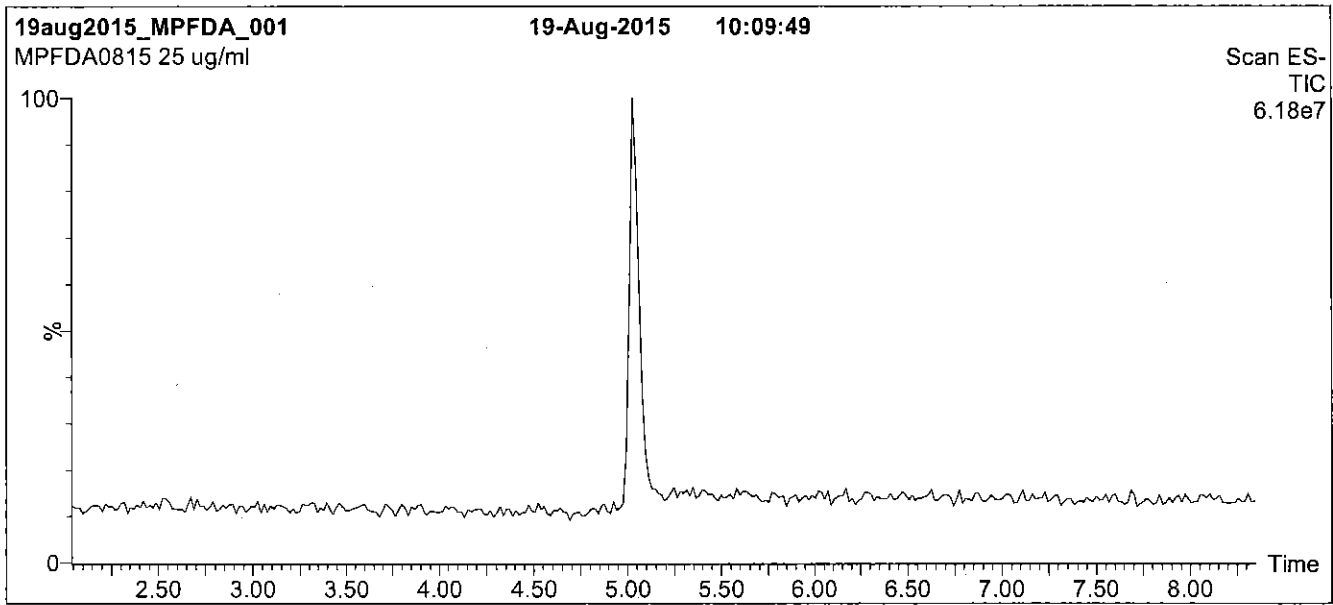
QUALITY MANAGEMENT:

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



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

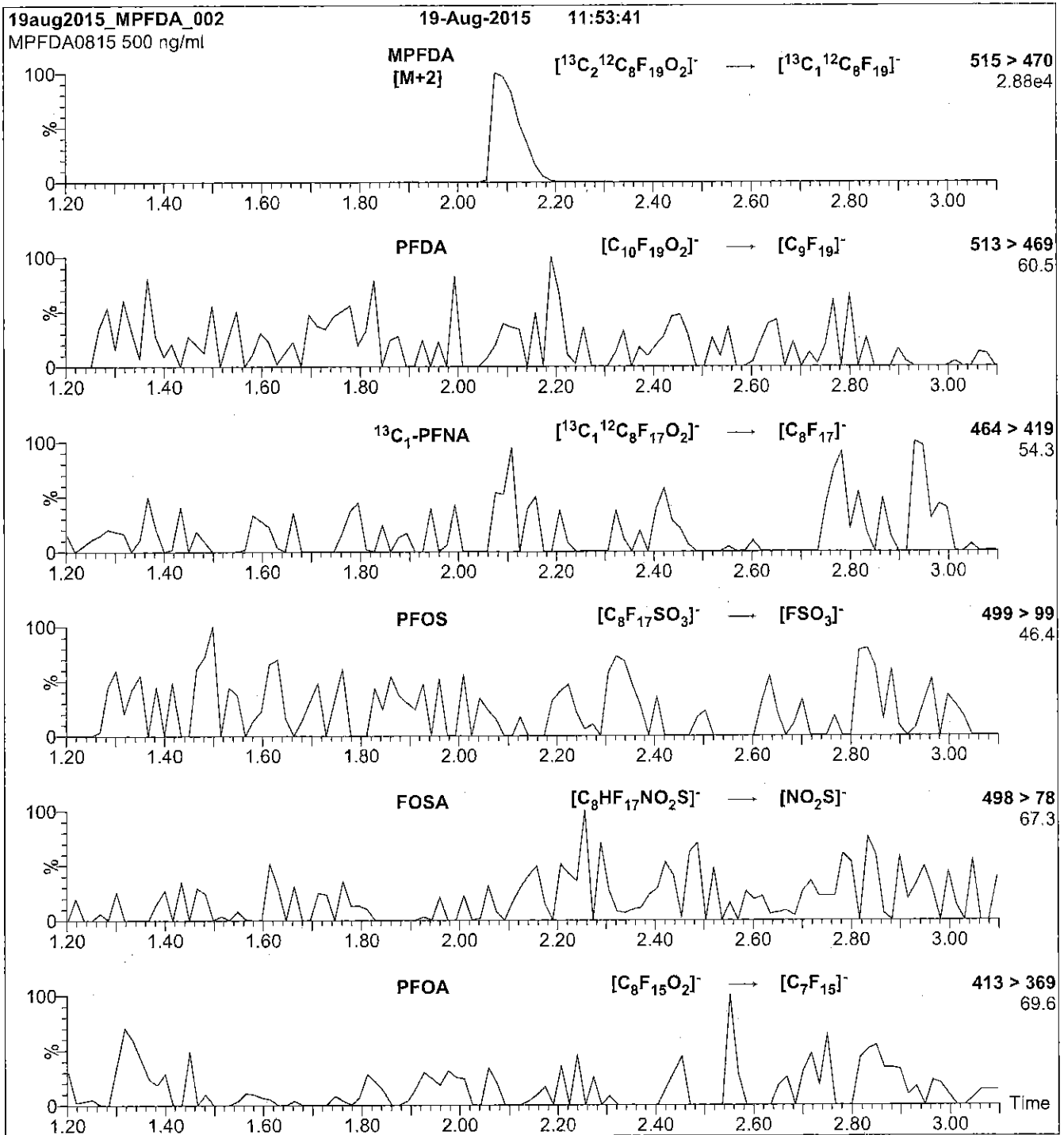
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCMPFHxA_00009



605244
 ID: LCMPFHxA_00009
 Exp: 04/09/20 Prpd: CBW
¹³C₂-Perfluorohexanoic ac

Rec. 3/29/16 JRB ✓



WELLINGTON LABORATORIES

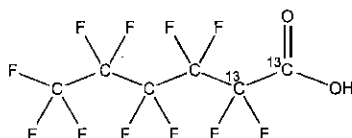
CERTIFICATE OF ANALYSIS DOCUMENTATION

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

LOT NUMBER: MPFHxA0415

STRUCTURE:

CAS #: Not available



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

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

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 04/09/2015

ISOTOPIC PURITY: ≥99%¹³C
 (1,2-¹³C₂)

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:

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HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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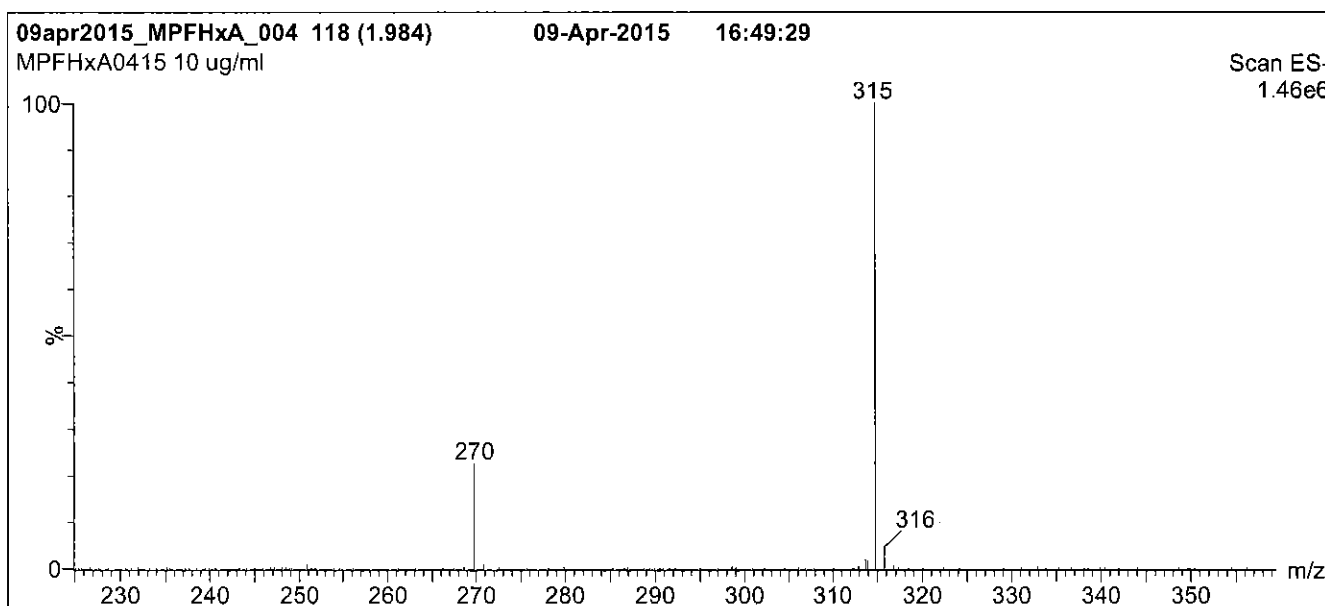
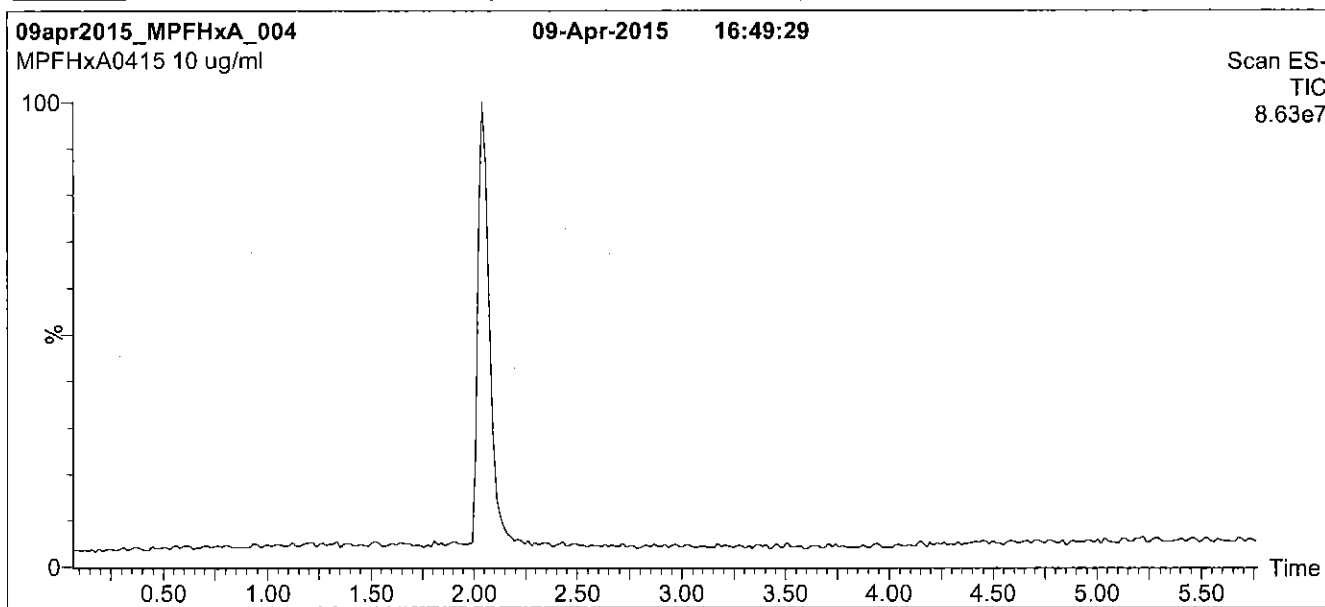
QUALITY MANAGEMENT:

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



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



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions over 0.5 min.
Time: 10 min

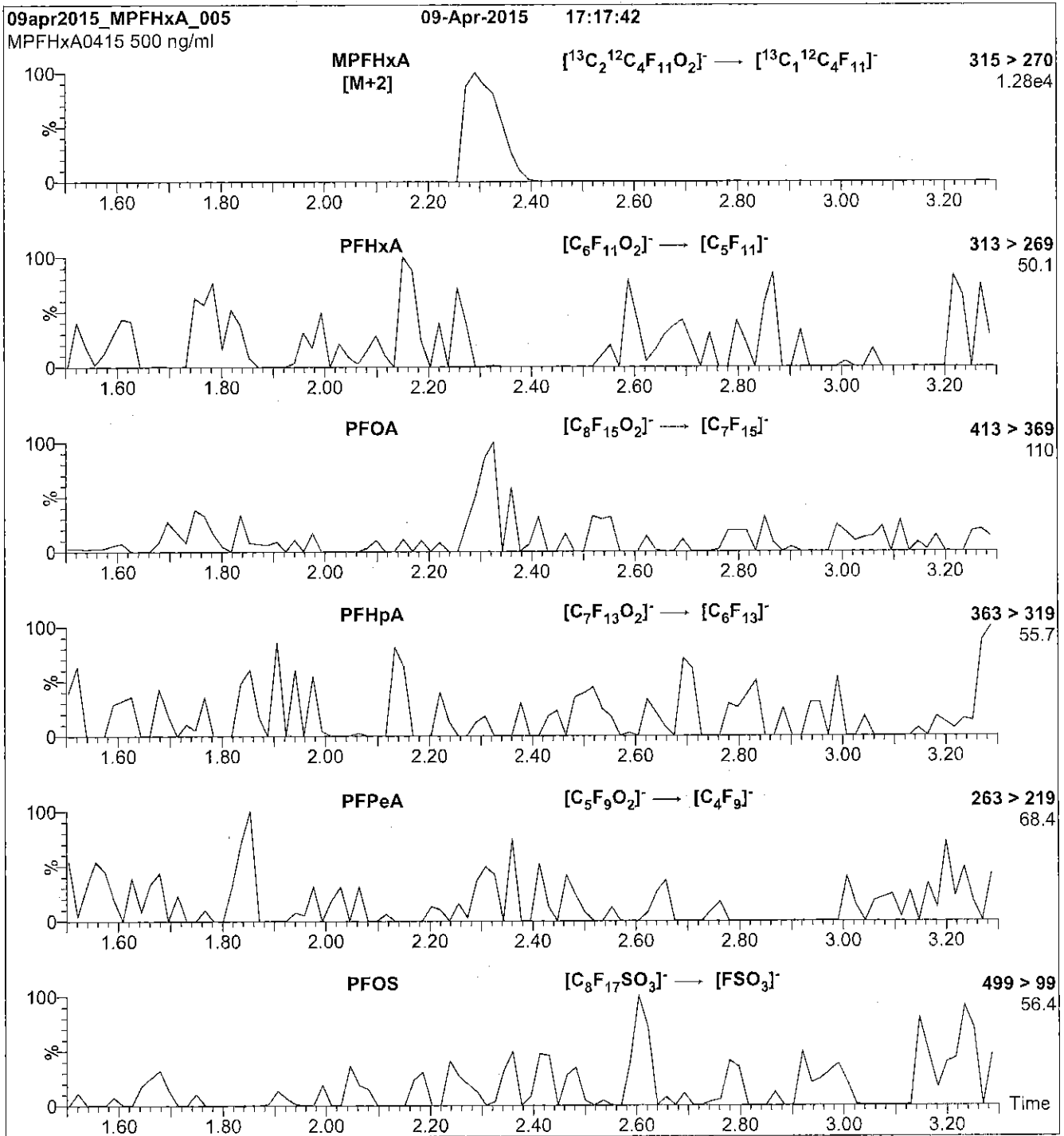
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

Flow: 300 μ l/min

MS Parameters

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

Reagent

LCMPFOS_00013

605227
ID: LCMFOS_00012
Exp: 01/22/21 Prpd: CBW
13C4-Perfluorooctanesulfo

Rec 3/29/16 JRB ✓

606228
ID: LCMFOS_00013
Exp: 01/22/21 Prpd: CBW
13C4-Perfluorooctanesulfo

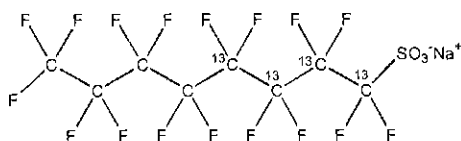


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFOS **LOT NUMBER:** MPFOS0116
COMPOUND: Sodium perfluoro-1-[1,2,3,4-¹³C₄]octanesulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA: ¹³C₄¹²C₄F₁₇SO₃Na **MOLECULAR WEIGHT:** 526.08
CONCENTRATION: 50.0 ± 2.5 µg/ml (Na salt) **SOLVENT(S):** Methanol
47.8 ± 2.4 µg/ml (MPFOS anion)
CHEMICAL PURITY: >98% **ISOTOPIC PURITY:** ≥99% ¹³C
(1,2,3,4-¹³C₄)
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-[1,2,3-¹³C₃]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:

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HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

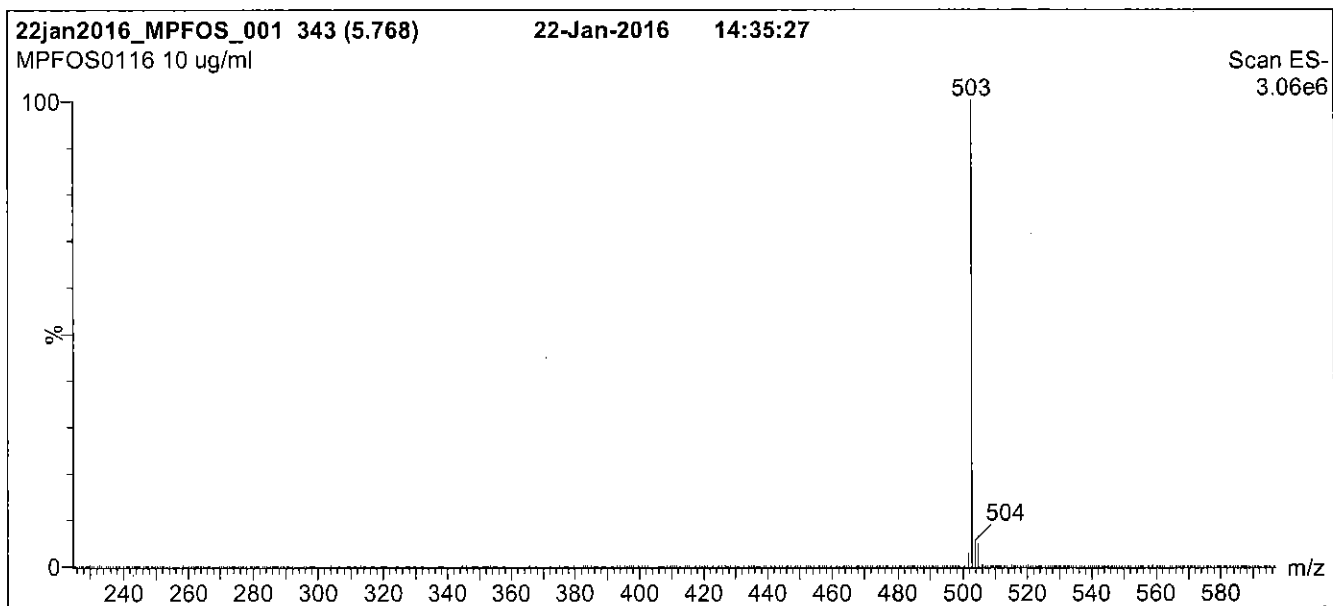
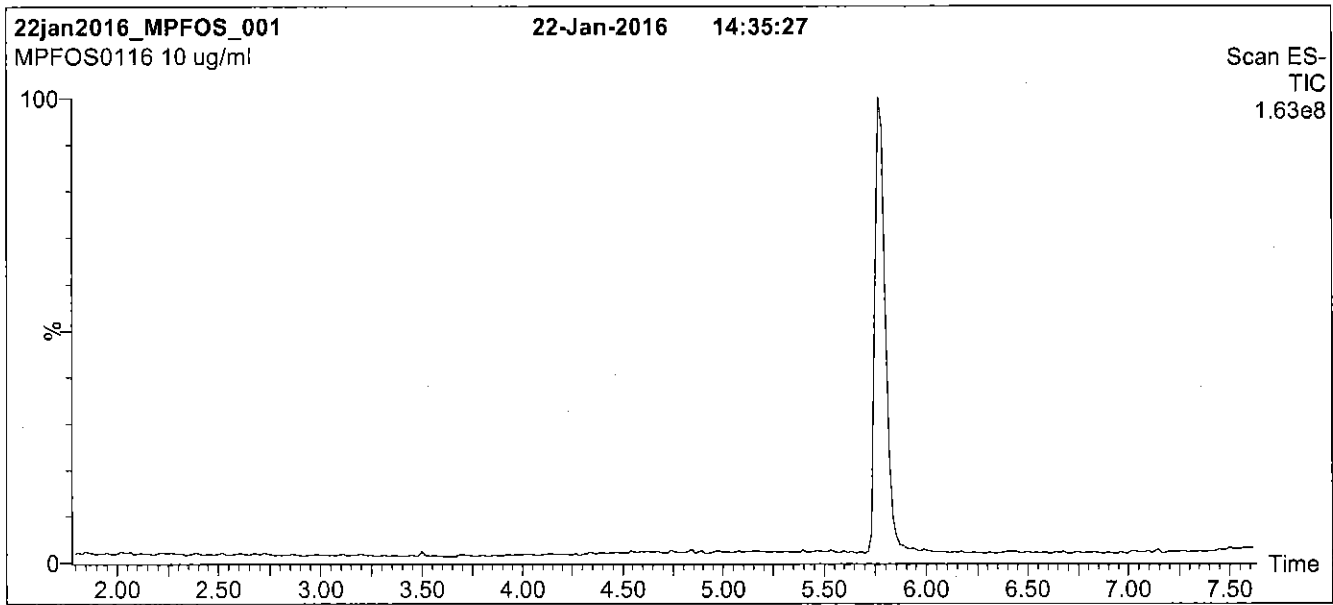
QUALITY MANAGEMENT:

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



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

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



Conditions for Figure 1:

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

Chromatographic Conditions

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

Mobile phase: Gradient
 Start: 55% (80:20 MeOH:ACN) / 45% H₂O
 (both with 10 mM NH₄OAc 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

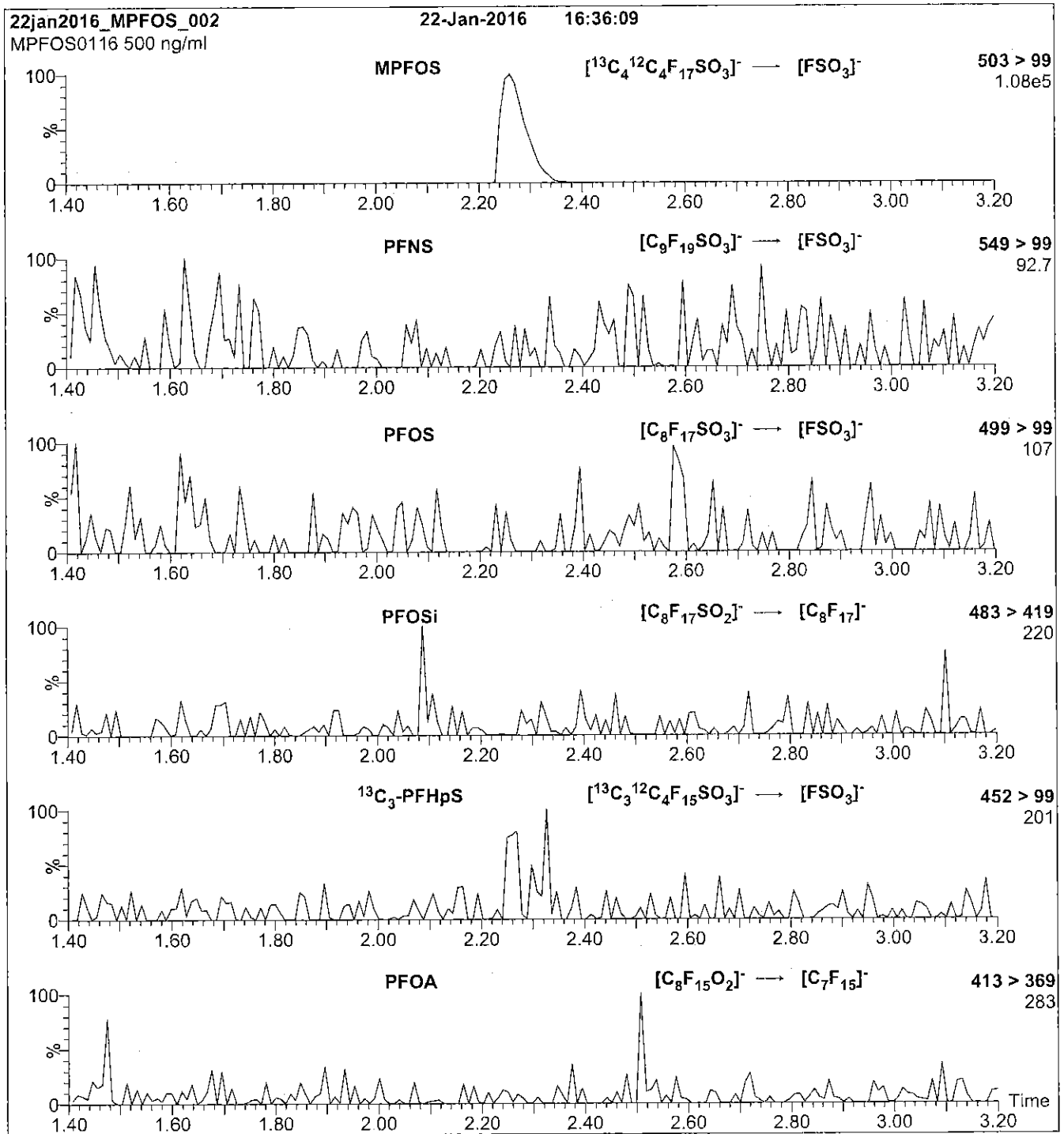
Flow: 300 μ l/min

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

MS Parameters

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

Reagent

LCMPFOS_00018

R: SBC 9/22/16



738686
ID: LCMFOS_00018
Exp: 08/03/21 Papi: SBC
13C4-Perfluorooctanesulfo

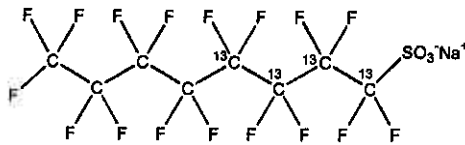


WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

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

STRUCTURE: **CAS #:** Not available



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


DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

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

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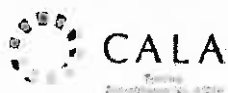
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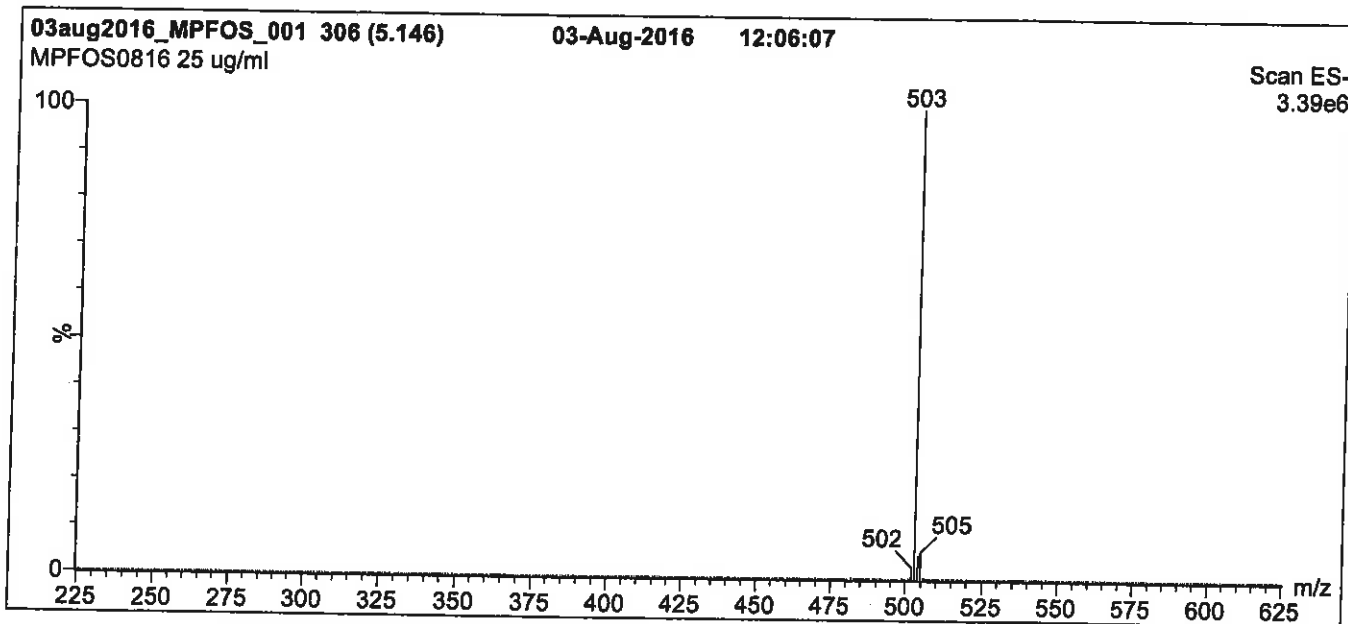
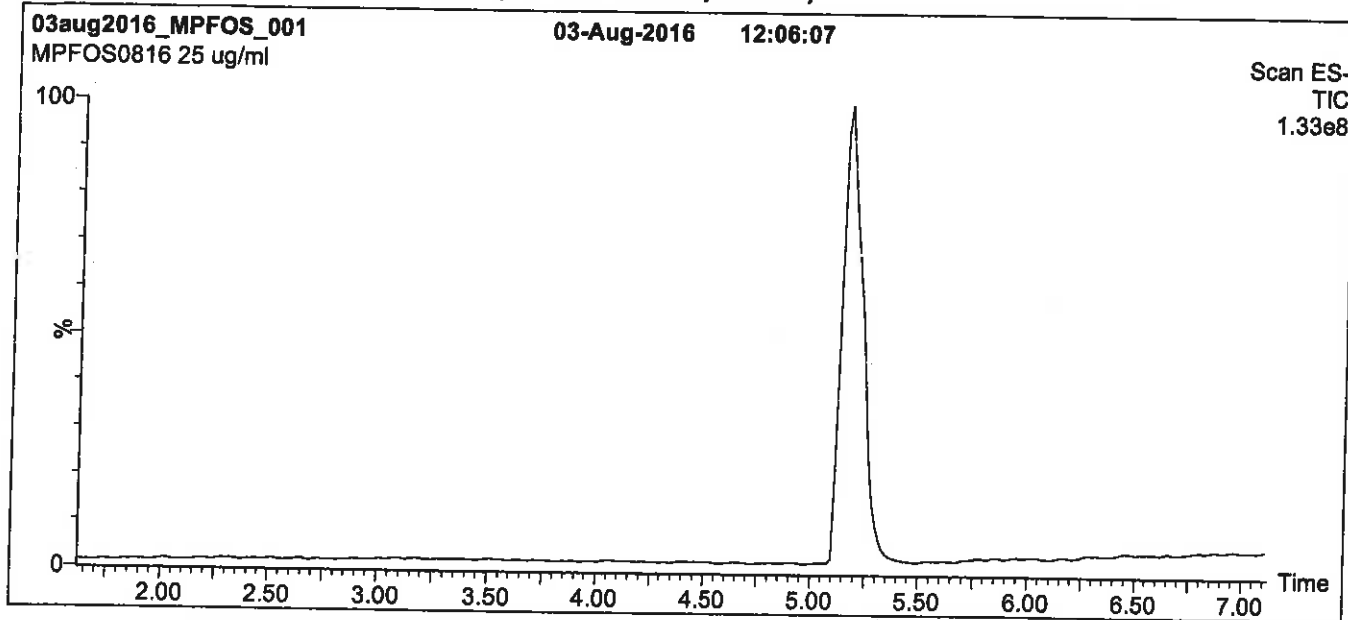
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Figure 1: MPFOS; LC/MS Data (TIC and Mass Spectrum)



Conditions for Figure 1:

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

Chromatographic Conditions

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

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

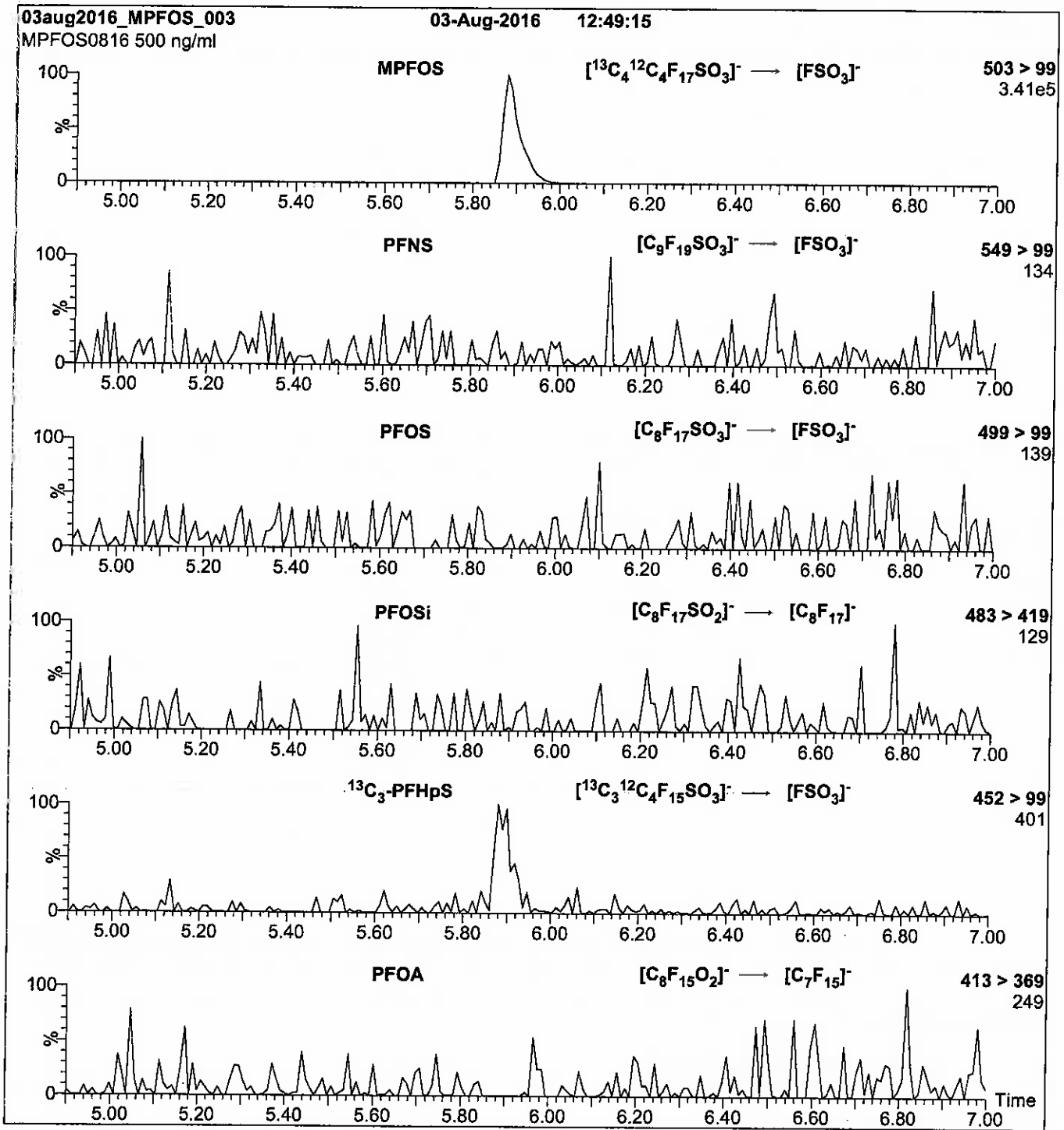
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

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

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



Conditions for Figure 2:

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

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

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

MS Parameters

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

Method 537 DOD

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

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-24007-1

SDG No.: _____

Matrix: Water Level: Low

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

Client Sample ID	Lab Sample ID	PFHxA #	PFDA #
WI-CV-3RW13-1216	320-24007-1	131 Q	136 Q
WI-CV-3FB13-1216	320-24007-2	118	117
	MB 320-140697/1-A	110	114
	LCS 320-140697/2-A	125	124
	LCSD 320-140697/3-A	117	118

PFHxA = 13C2 PFHxA
PFDA = 13C2 PFDA

QC LIMITS
70-130
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.: 320-24007-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 11DEC2016A6A_032.d
 Lab ID: LCS 320-140697/2-A Client ID: _____

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	0.300	0.311	103	70-130	
Perfluorooctanoic acid (PFOA)	0.152	0.165	108	70-130	E
Perfluorobutanesulfonic acid (PFBS)	0.673	0.620	92	70-130	

Column to be used to flag recovery and RPD values

FORM III
LCMS LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-24007-1

SDG No.: _____

Matrix: Water Level: Low Lab File ID: 11DEC2016A6A_033.d

Lab ID: LCSD 320-140697/3-A Client ID: _____

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
Perfluorooctanesulfonic acid (PFOS)	0.300	0.301	100	3	30	70-130	
Perfluorooctanoic acid (PFOA)	0.152	0.149	98	10	30	70-130	
Perfluorobutanesulfonic acid (PFBS)	0.673	0.603	90	3	30	70-130	

Column to be used to flag recovery and RPD values

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24007-1
 SDG No.: _____
 Lab File ID: 11DEC2016A6A_031.d Lab Sample ID: MB 320-140697/1-A
 Matrix: Water Date Extracted: 12/05/2016 19:07
 Instrument ID: A6 Date Analyzed: 12/12/2016 01:51
 Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-140697/2-A	11DEC2016A6 A 032.d	12/12/2016 02:21
	LCSD 320-140697/3-A	11DEC2016A6 A 033.d	12/12/2016 02:50
WI-CV-3RW13-1216	320-24007-1	11DEC2016A6 A 045.d	12/12/2016 08:45
WI-CV-3FB13-1216	320-24007-2	11DEC2016A6 A 046.d	12/12/2016 09:15

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24007-1
 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 320-141573/3 CCVL	802153	20.06	1836390	20.68		
CCV 320-141575/29 CCVIS	886505	20.05	1829934	20.68		
MB 320-140697/1-A	727943	20.06	2041401	20.68		
LCS 320-140697/2-A	666170	20.06	1671691	20.68		
LCSD 320-140697/3-A	726944	20.06	1770414	20.68		
CCV 320-141575/42 CCVIS	773280	20.06	1595954	20.68		
CCV 320-141576/42 CCVIS	773280	20.06	1595954	20.68		
320-24007-1	WI-CV-3RW13-1216	628285	2153268	20.67		
320-24007-2	WI-CV-3FB13-1216	729638	2075236	20.68		
CCV 320-141576/48 CCVIS	1009083	20.06	1927685	20.68		

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

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

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24007-1
 SDG No.: _____
 Sample No.: CCV 320-141575/29 Date Analyzed: 12/12/2016 00:52
 Instrument ID: A6 GC Column: Acquity ID: 2.1 (mm)
 Lab File ID (Standard): 11DEC2016A6A_029.d Heated Purge: (Y/N) N
 Calibration ID: 26888

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	886505	20.05	1829934	20.68		
UPPER LIMIT	1241107	20.55	2561908	21.18		
LOWER LIMIT	620554	19.55	1280954	20.18		
LAB SAMPLE ID	CLIENT SAMPLE ID					
MB 320-140697/1-A		727943	20.06	2041401	20.68	
LCS 320-140697/2-A		666170	20.06	1671691	20.68	
LCSD 320-140697/3-A		726944	20.06	1770414	20.68	

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

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

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24007-1
 SDG No.: _____
 Sample No.: CCV 320-141575/42 Date Analyzed: 12/12/2016 07:17
 Instrument ID: A6 GC Column: Acquity ID: 2.1 (mm)
 Lab File ID (Standard): 11DEC2016A6A_042.d Heated Purge: (Y/N) N
 Calibration ID: 26888

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	773280	20.06	1595954	20.68		
UPPER LIMIT	1082592	20.56	2234336	21.18		
LOWER LIMIT	541296	19.56	1117168	20.18		
LAB SAMPLE ID	CLIENT SAMPLE ID					
MB 320-140697/1-A	727943	20.06	2041401	20.68		
LCS 320-140697/2-A	666170	20.06	1671691	20.68		
LCSD 320-140697/3-A	726944	20.06	1770414	20.68		

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

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

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24007-1
 SDG No.: _____
 Sample No.: CCV 320-141576/42 Date Analyzed: 12/12/2016 07:17
 Instrument ID: A6 GC Column: Acquity ID: 2.1 (mm)
 Lab File ID (Standard): 11DEC2016A6A_042.d Heated Purge: (Y/N) N
 Calibration ID: 26888

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	773280	20.06	1595954	20.68		
UPPER LIMIT	1082592	20.56	2234336	21.18		
LOWER LIMIT	541296	19.56	1117168	20.18		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-24007-1	WI-CV-3RW13-1216	628285	20.05	2153268	20.67	
320-24007-2	WI-CV-3FB13-1216	729638	20.06	2075236	20.68	

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

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

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24007-1
 SDG No.: _____
 Sample No.: CCV 320-141576/48 Date Analyzed: 12/12/2016 10:14
 Instrument ID: A6 GC Column: Acquity ID: 2.1 (mm)
 Lab File ID (Standard): 11DEC2016A6A_048.d Heated Purge: (Y/N) N
 Calibration ID: 26888

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	1009083	20.06	1927685	20.68		
UPPER LIMIT	1412716	20.56	2698759	21.18		
LOWER LIMIT	706358	19.56	1349380	20.18		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-24007-1	WI-CV-3RW13-1216	628285	20.05	2153268	20.67	
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13PFOA = 13C2-PFOA
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FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-24007-1
 SDG No.: _____
 Client Sample ID: WI-CV-3RW13-1216 Lab Sample ID: 320-24007-1
 Matrix: Water Lab File ID: 11DEC2016A6A_045.d
 Analysis Method: 537 Date Collected: 12/01/2016 09:12
 Extraction Method: 537 Date Extracted: 12/05/2016 19:07
 Sample wt/vol: 260.9(mL) Date Analyzed: 12/12/2016 08:45
 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.: 141576 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.046	U	0.057	0.046	0.015
335-67-1	Perfluorooctanoic acid (PFOA)	0.023	U	0.029	0.023	0.0090
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.13	0.11	0.046

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	131	Q	70-130
STL00996	13C2 PFDA	136	Q	70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161211-37708.b\11DEC2016A6A_045.d
 Lims ID: 320-24007-A-1-A
 Client ID: WI-CV-3RW13-1216
 Sample Type: Client
 Inject. Date: 12-Dec-2016 08:45:55 ALS Bottle#: 47 Worklist Smp#: 45
 Injection Vol: 10.0 ul Dil. Factor: 1.0000
 Sample Info: 320-24007-a-1-a
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35°C
 Operator ID: CBW Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20161211-37708.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 12-Dec-2016 16:23:40 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: XAWRK002

First Level Reviewer: barnettj Date: 12-Dec-2016 16:23:06

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
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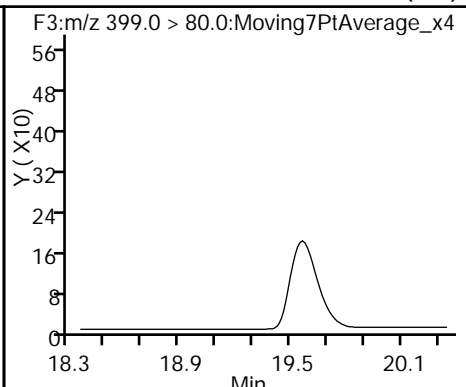
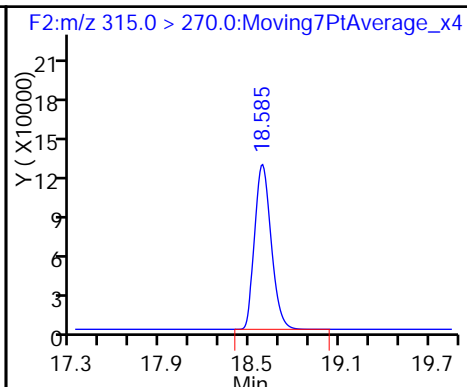
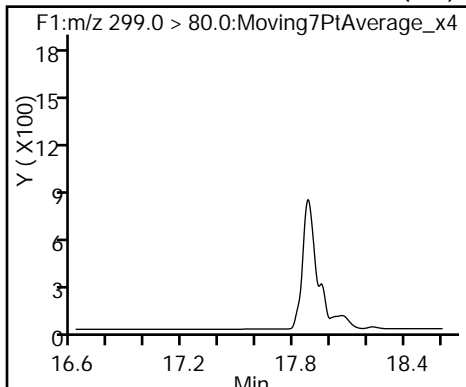
\$ 2 13C2 PFHxA	315.0 > 270.0	18.585	18.594	-0.009	1.000	957311	13.1	30764
* 5 13C2-PFOA	415.0 > 370.0	20.047	20.058	-0.011		628285	10.0	16249
* 8 13C4 PFOS	503.0 > 80.0	20.667	20.679	-0.012		2153268	28.7	32148
\$ 10 13C2 PFDA	515.0 > 470.0	21.471	21.471	0.0	1.000	747254	13.6	23740

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20161211-37708.b\11DEC2016A6A_045.d
Injection Date: 12-Dec-2016 08:45:55 Instrument ID: A6
Lims ID: 320-24007-A-1-A Lab Sample ID: 320-24007-1
Client ID: WI-CV-3RW13-1216
Operator ID: CBW ALS Bottle#: 47 Worklist Smp#: 45
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL

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

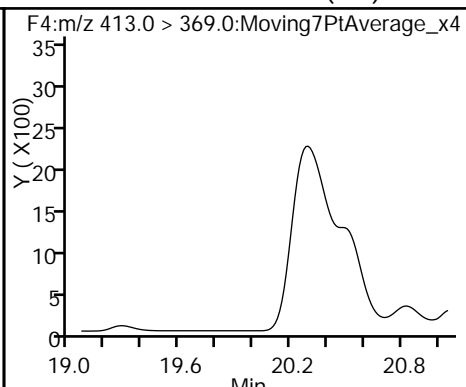
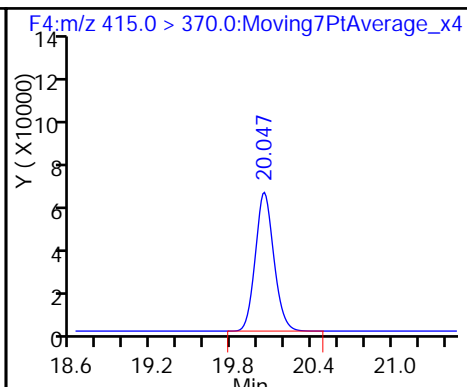
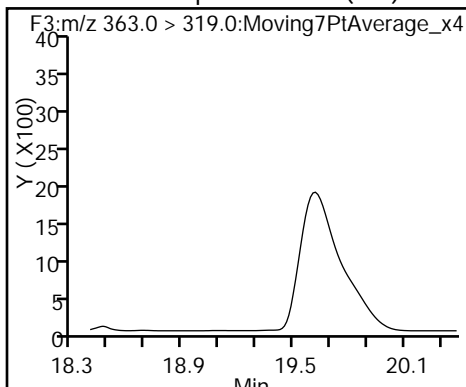
3 Perfluorohexanesulfonic acid (ND)



4 Perfluoroheptanoic acid (ND)

* 5 13C2-PFOA

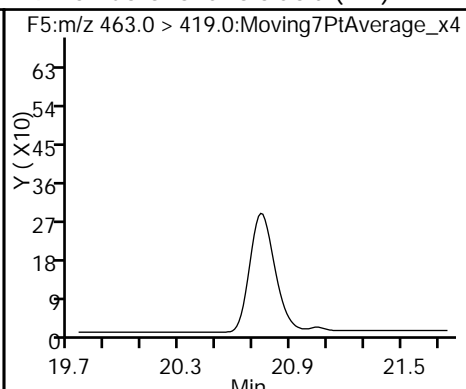
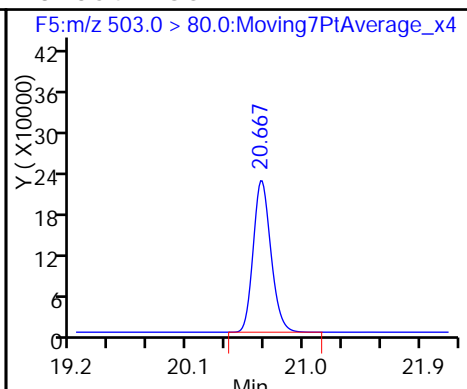
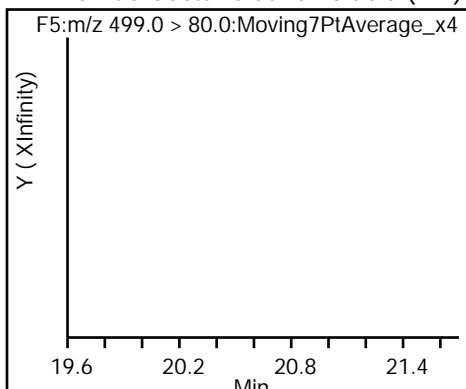
6 Perfluorooctanoic acid (ND)



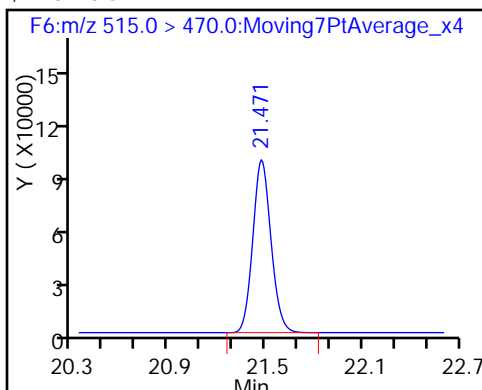
7 Perfluorooctane sulfonic acid (ND)

* 8 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161211-37708.b\11DEC2016A6A_045.d
 Lims ID: 320-24007-A-1-A
 Client ID: WI-CV-3RW13-1216
 Sample Type: Client
 Inject. Date: 12-Dec-2016 08:45:55 ALS Bottle#: 47 Worklist Smp#: 45
 Injection Vol: 10.0 ul Dil. Factor: 1.0000
 Sample Info: 320-24007-a-1-a
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35°C
 Operator ID: CBW Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20161211-37708.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 12-Dec-2016 16:23:40 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: XAWRK002

First Level Reviewer: barnettj Date: 12-Dec-2016 16:23:06

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	13.1	130.62
\$ 10 13C2 PFDA	10.0	13.6	135.73

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-24007-1
 SDG No.: _____
 Client Sample ID: WI-CV-3FB13-1216 Lab Sample ID: 320-24007-2
 Matrix: Water Lab File ID: 11DEC2016A6A_046.d
 Analysis Method: 537 Date Collected: 12/01/2016 09:13
 Extraction Method: 537 Date Extracted: 12/05/2016 19:07
 Sample wt/vol: 255.7(mL) Date Analyzed: 12/12/2016 09:15
 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.: 141576 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.047	U	0.059	0.047	0.015
335-67-1	Perfluorooctanoic acid (PFOA)	0.023	U	0.029	0.023	0.0092
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.14	0.11	0.047

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	118		70-130
STL00996	13C2 PFDA	117		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161211-37708.b\11DEC2016A6A_046.d
 Lims ID: 320-24007-A-2-A
 Client ID: WI-CV-3FB13-1216
 Sample Type: Client
 Inject. Date: 12-Dec-2016 09:15:31 ALS Bottle#: 48 Worklist Smp#: 46
 Injection Vol: 10.0 ul Dil. Factor: 1.0000
 Sample Info: 320-24007-a-2-a
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
 Operator ID: CBW Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20161211-37708.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 12-Dec-2016 16:23:40 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: XAWRK002

First Level Reviewer: barnettj Date: 12-Dec-2016 16:23:40

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
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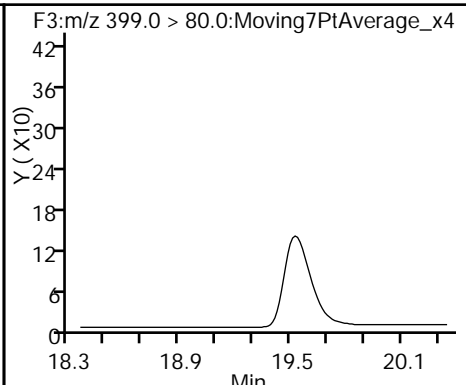
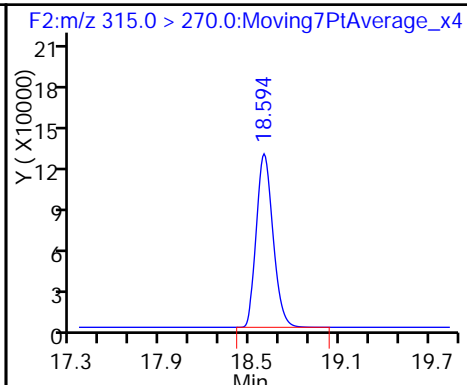
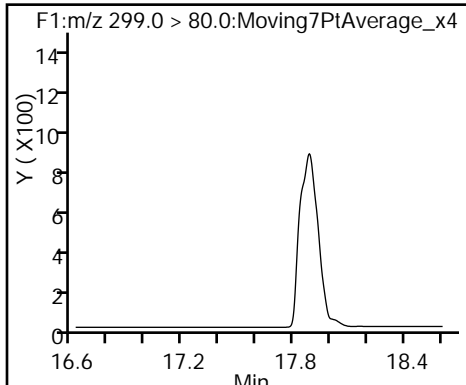
\$ 2 13C2 PFHxA	315.0 > 270.0	18.594	18.594	0.0	1.000	1004432	11.8	32089
* 5 13C2-PFOA	415.0 > 370.0	20.058	20.058	0.0		729638	10.0	19135
* 8 13C4 PFOS	503.0 > 80.0	20.679	20.679	0.0		2075236	28.7	54014
\$ 10 13C2 PFDA	515.0 > 470.0	21.480	21.471	0.009	1.000	747276	11.7	23486

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20161211-37708.b\11DEC2016A6A_046.d
Injection Date: 12-Dec-2016 09:15:31 Instrument ID: A6
Lims ID: 320-24007-A-2-A Lab Sample ID: 320-24007-2
Client ID: WI-CV-3FB13-1216
Operator ID: CBW ALS Bottle#: 48 Worklist Smp#: 46
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL

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

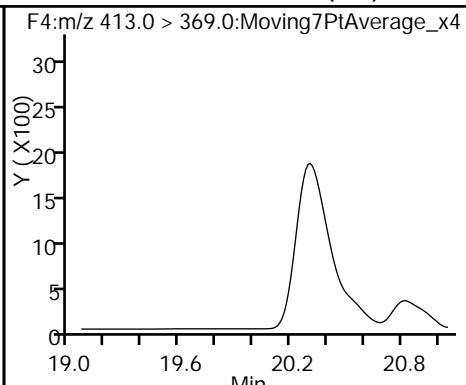
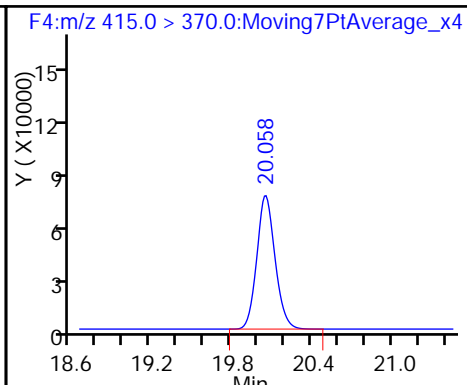
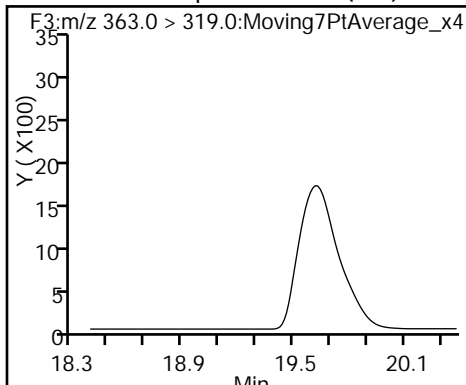
3 Perfluorohexanesulfonic acid (ND)



4 Perfluoroheptanoic acid (ND)

* 5 13C2-PFOA

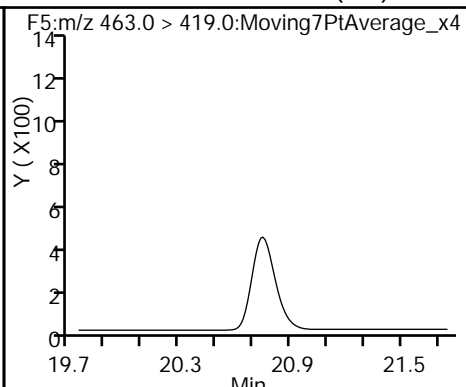
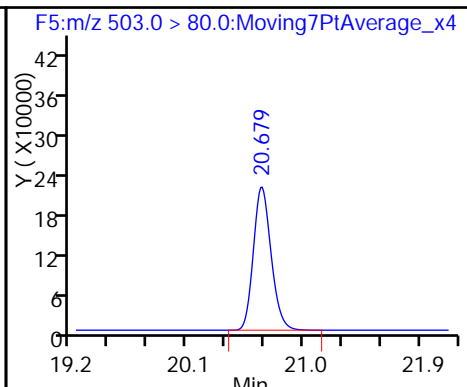
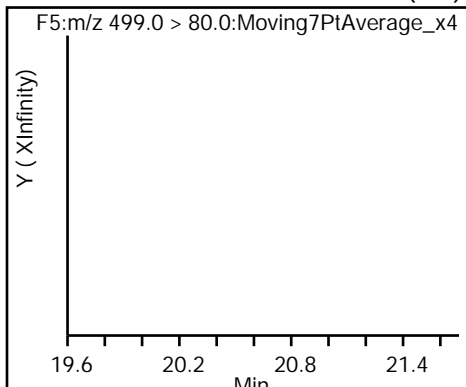
6 Perfluorooctanoic acid (ND)



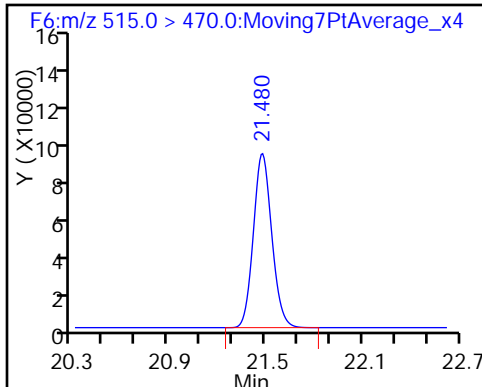
7 Perfluorooctane sulfonic acid (ND)

* 8 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161211-37708.b\11DEC2016A6A_046.d
 Lims ID: 320-24007-A-2-A
 Client ID: WI-CV-3FB13-1216
 Sample Type: Client
 Inject. Date: 12-Dec-2016 09:15:31 ALS Bottle#: 48 Worklist Smp#: 46
 Injection Vol: 10.0 ul Dil. Factor: 1.0000
 Sample Info: 320-24007-a-2-a
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35°C
 Operator ID: CBW Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20161211-37708.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 12-Dec-2016 16:23:40 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: XAWRK002

First Level Reviewer: barnettj Date: 12-Dec-2016 16:23:40

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	11.8	118.01
\$ 10 13C2 PFDA	10.0	11.7	116.88

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

Lab Name: TestAmerica Sacramento Job No.: 320-24007-1 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.: 320-24007-1 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	13PF OA	Ave	126557 2032288	324913	658044	1121930	1727957	0.994 20.2	2.60	5.12	10.3	15.3
Perfluorooctanoic acid (PFOA)	13PF OA	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	13PF OA	Ave	168128 4124664	525061	1245341	2227031	3558831	1.92 39.0	5.01	9.87	19.9	29.5
13C2 PFHxA	13PF OA	Ave	933751 1095977	1106485	1261522	1117585	1240474	10.0 10.0	10.0	10.0	10.0	10.0
13C2 PFDA	13PF OA	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.: 320-24007-1 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:

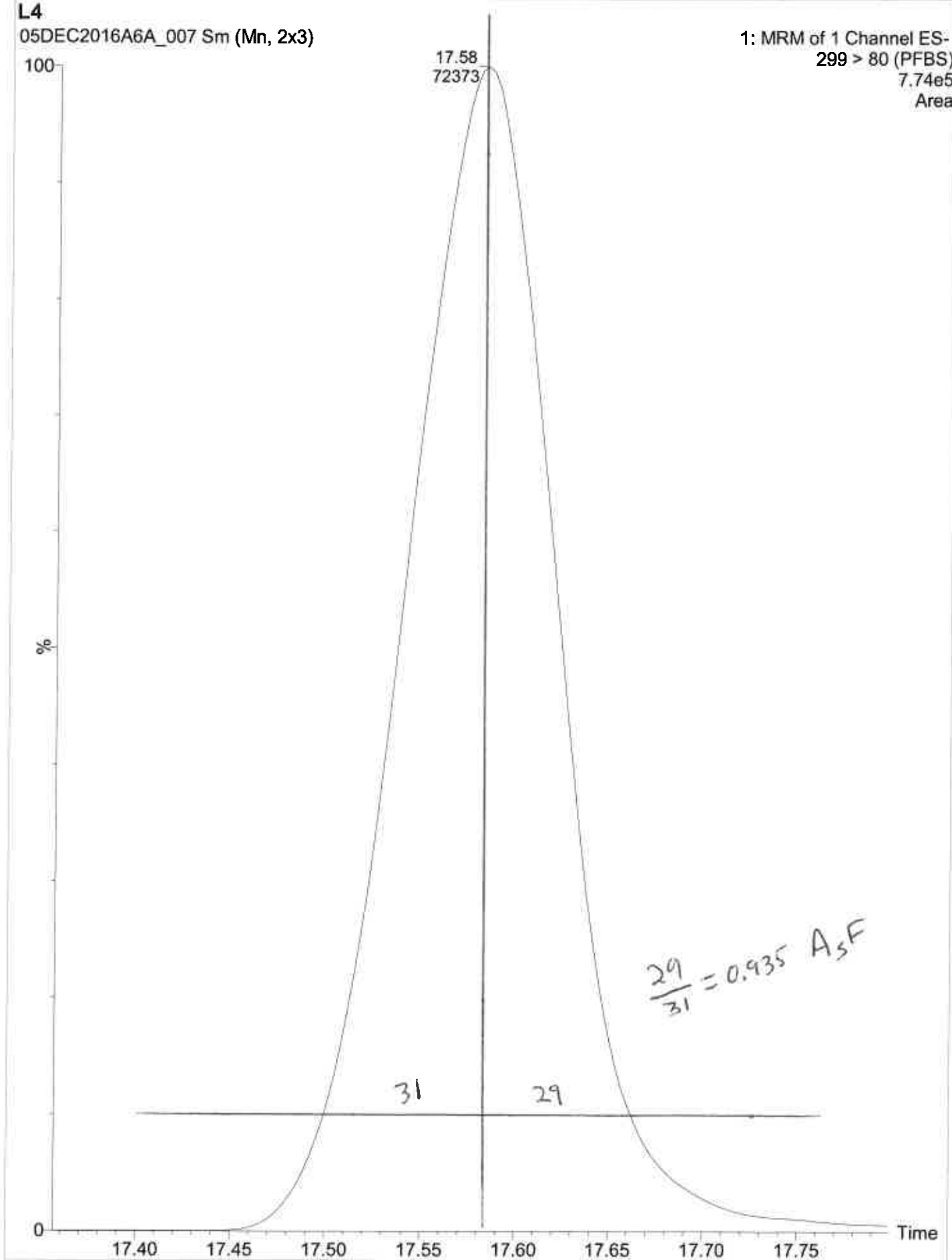
LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-140688/2	05DEC2016A6A_004.d
Level 2	STD 320-140688/3	05DEC2016A6A_005.d
Level 3	STD 320-140688/4	05DEC2016A6A_006.d
Level 4	STD 320-140688/5	05DEC2016A6A_007.d
Level 5	STD 320-140688/6	05DEC2016A6A_008.d
Level 6	STD 320-140688/7	05DEC2016A6A_009.d

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)

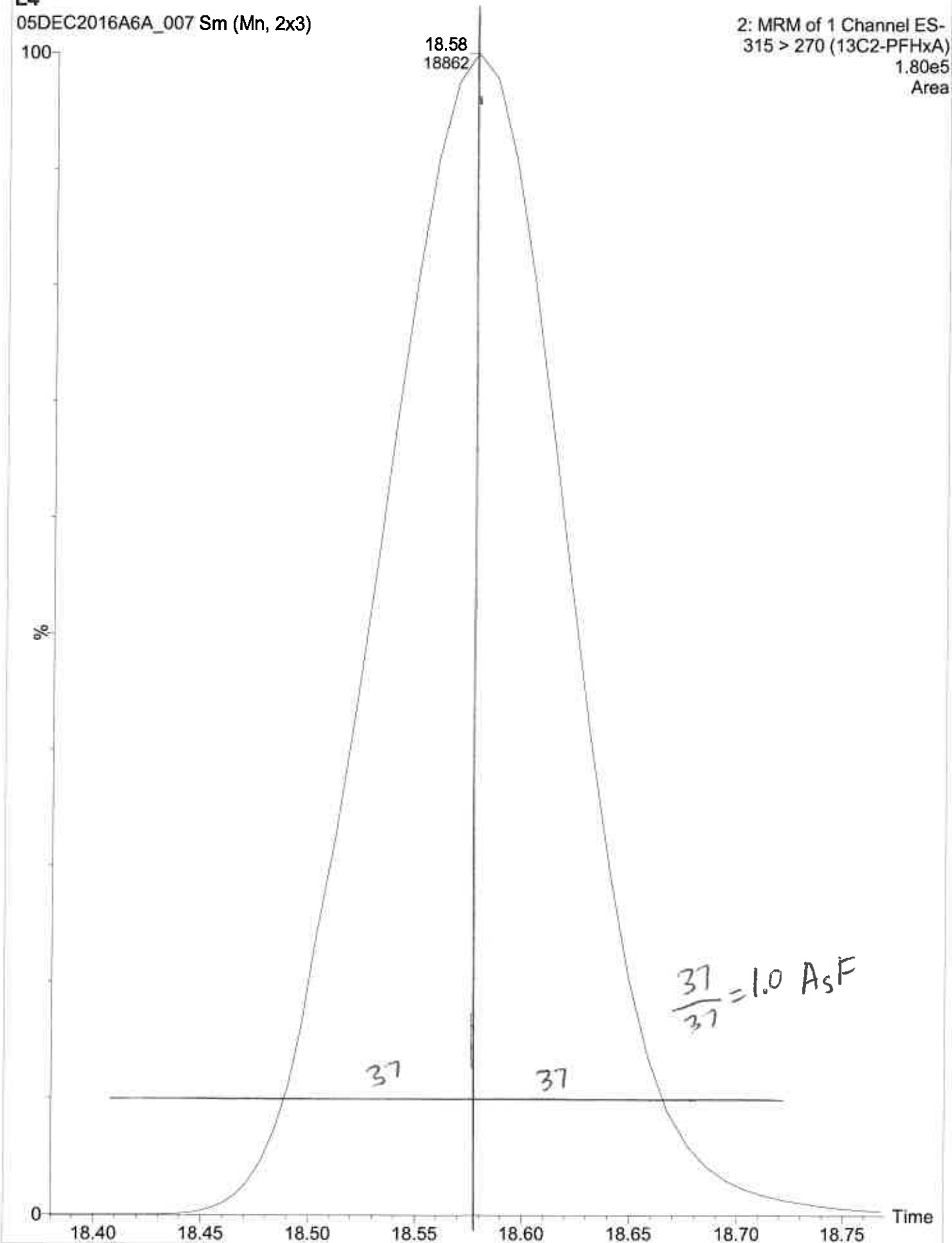
1: MRM of 1 Channel ES-
299 > 80 (PFBS)
7.74e5
Area



L4

05DEC2016A6A_007 Sm (Mn, 2x3)

2: MRM of 1 Channel ES-
315 > 270 (13C2-PFHxA)
1.80e5
Area



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	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	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

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

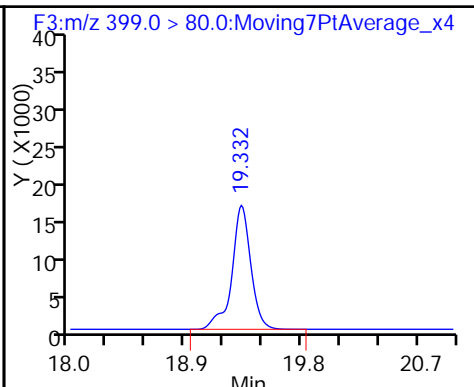
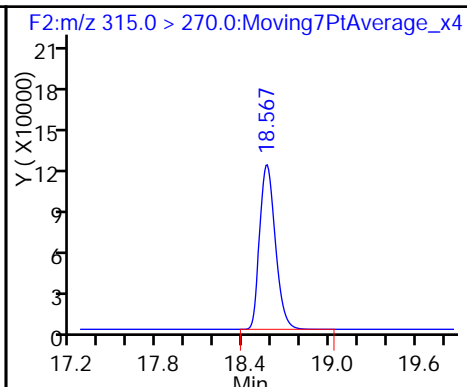
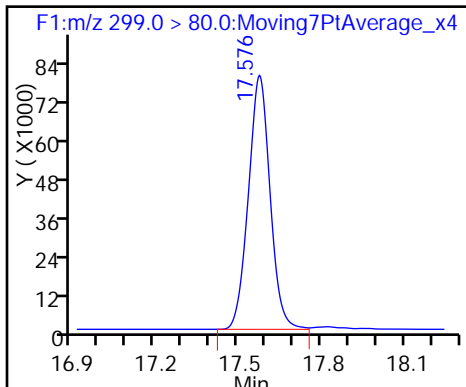
Method: 537_A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

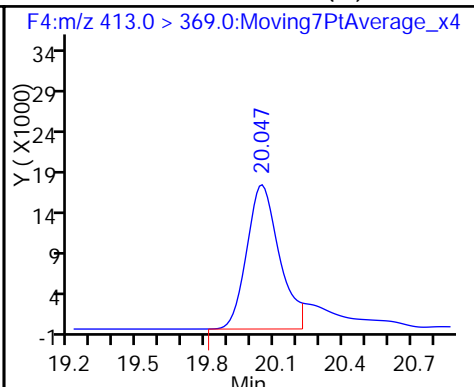
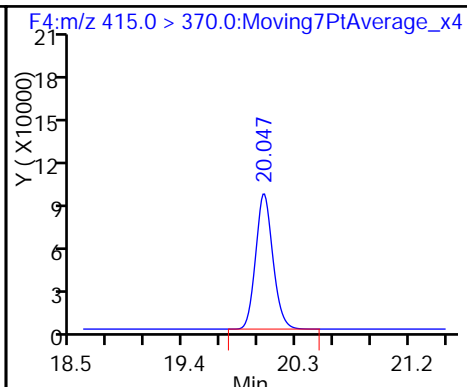
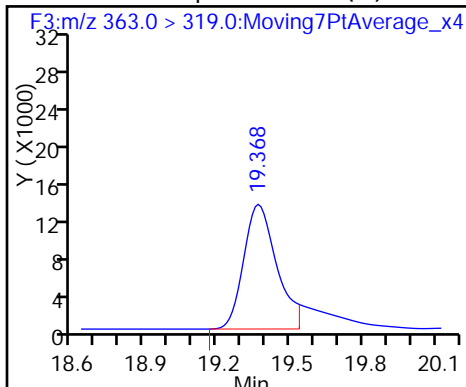
3 Perfluorohexanesulfonic acid



4 Perfluoroheptanoic acid (M)

* 5 13C2-PFOA

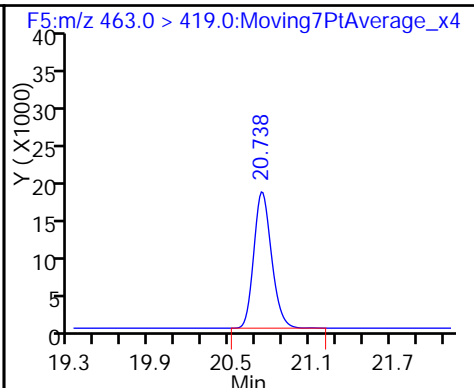
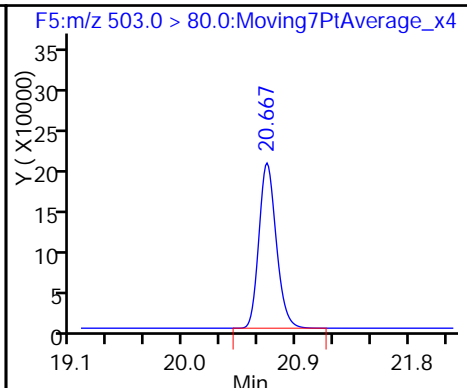
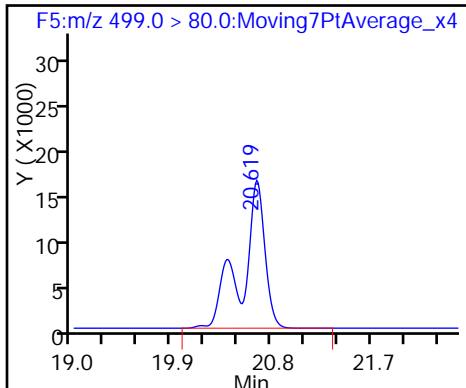
6 Perfluorooctanoic acid (M)



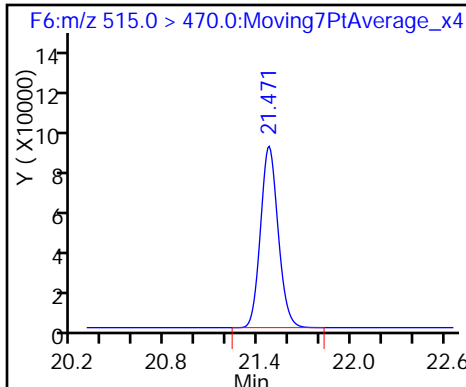
7 Perfluorooctane sulfonic acid

* 8 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

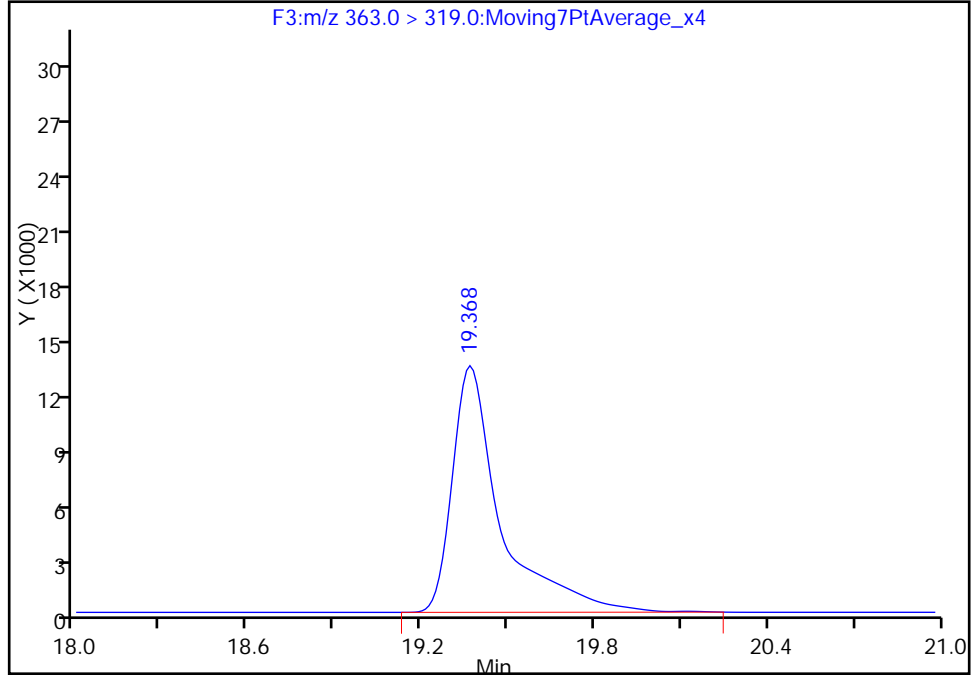
Data File: \\ChromNA\Sacramento\ChromData\A6\20161205-37524.b\05DEC2016A6A_004.d
Injection Date: 05-Dec-2016 17:26:03 Instrument ID: A6
Lims ID: STD L1
Client ID:
Operator ID: CBW ALS Bottle#: 1 Worklist Smp#: 2
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: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

4 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

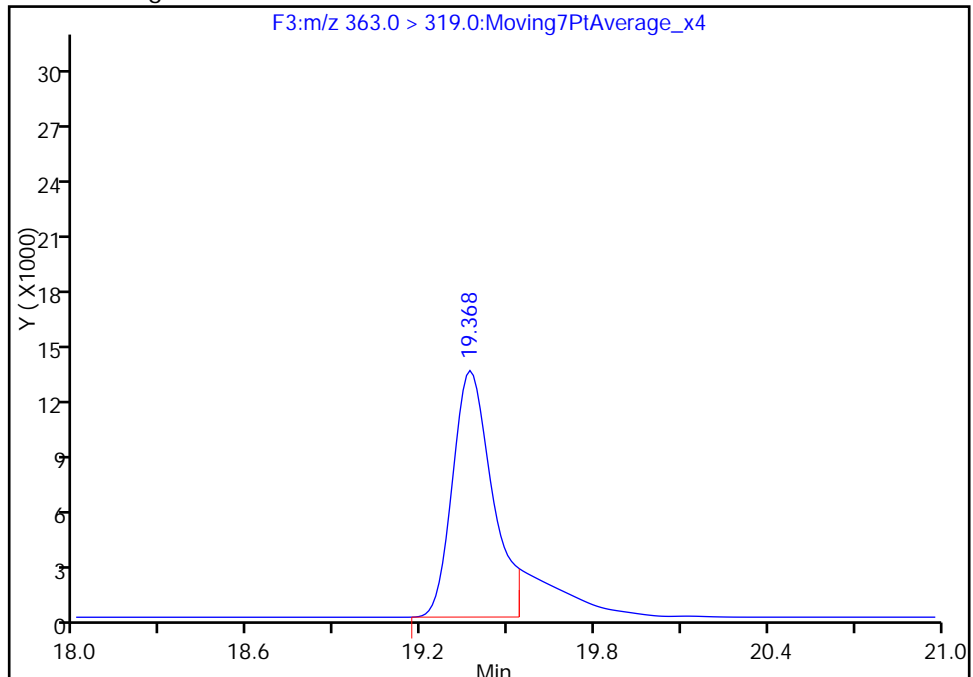
RT: 19.37
Area: 155591
Amount: 1.476072
Amount Units: ng/ml

Processing Integration Results



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

Manual Integration Results



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

Audit Reason: Split Peak

TestAmerica Sacramento

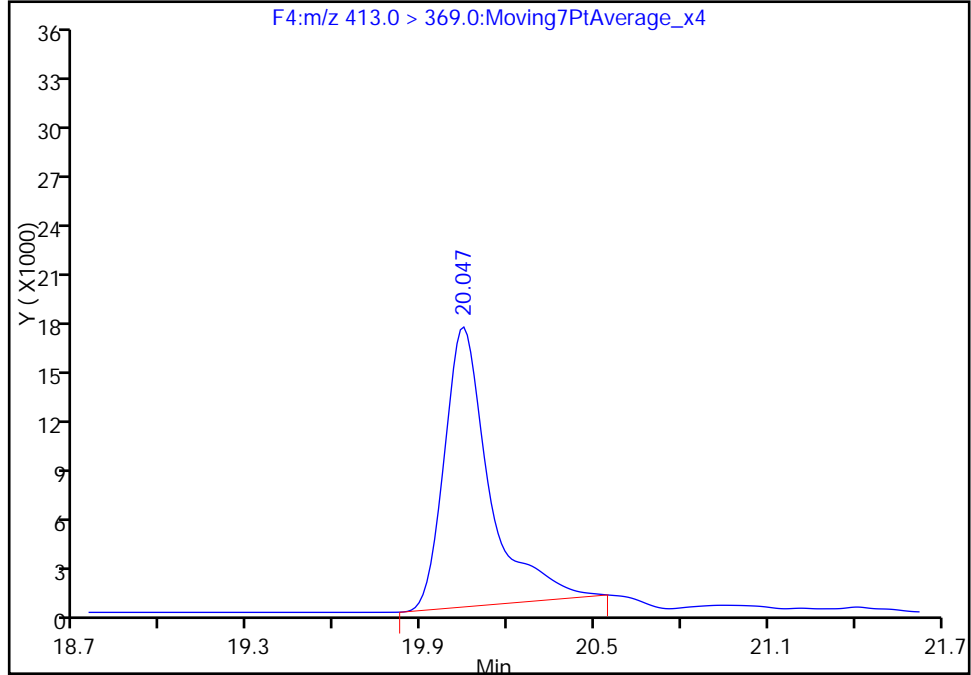
Data File: \\ChromNA\Sacramento\ChromData\A6\20161205-37524.b\05DEC2016A6A_004.d
Injection Date: 05-Dec-2016 17:26:03 Instrument ID: A6
Lims ID: STD L1
Client ID:
Operator ID: CBW ALS Bottle#: 1 Worklist Smp#: 2
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: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

6 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

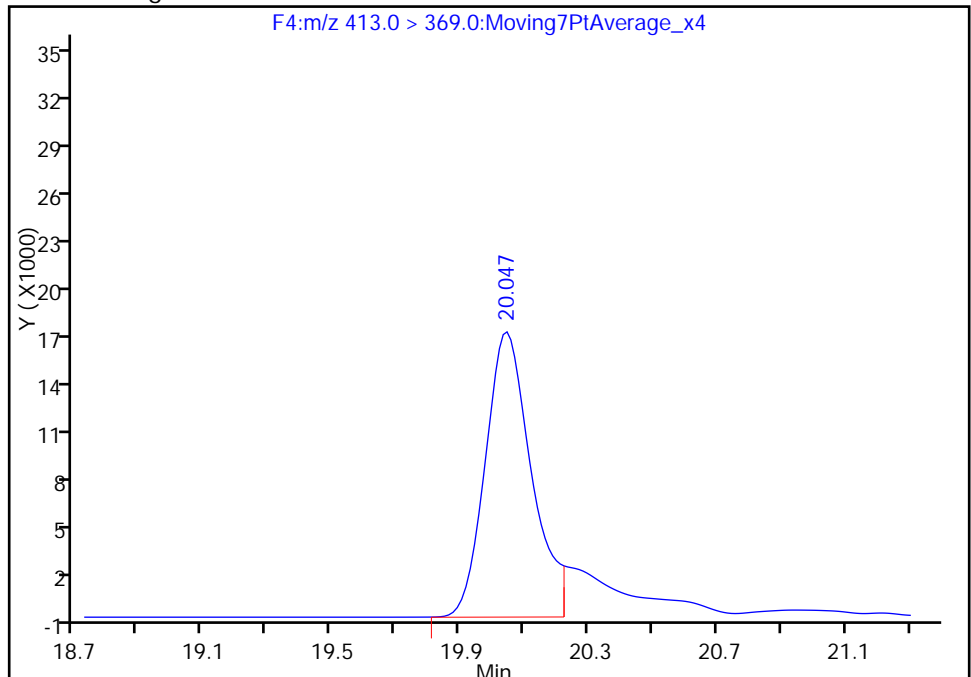
RT: 20.05
Area: 186490
Amount: 1.959453
Amount Units: ng/ml

Processing Integration Results



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

Manual Integration Results



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	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	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

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

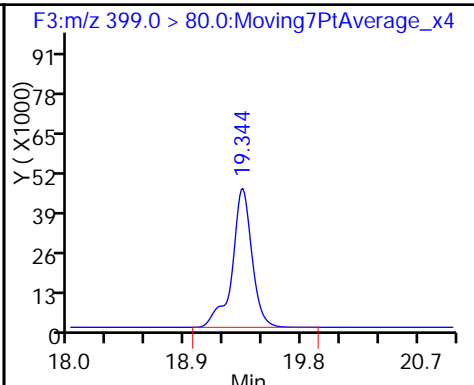
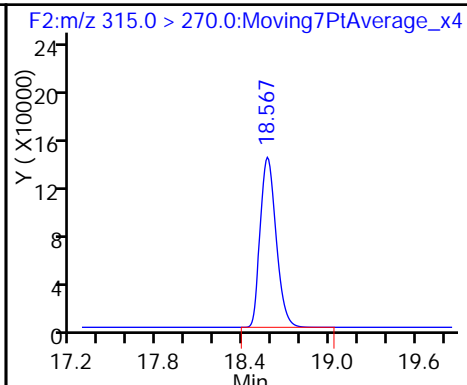
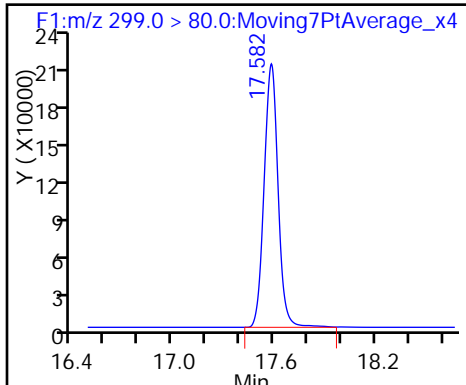
Method: 537_A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

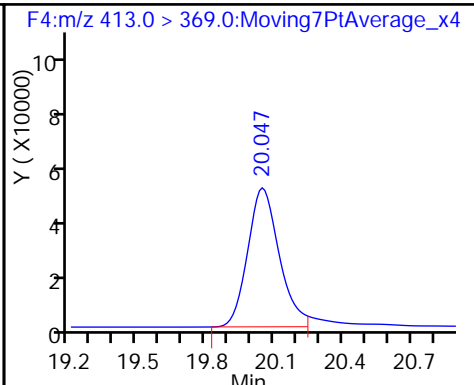
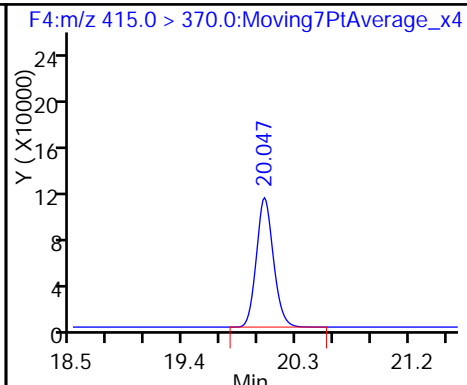
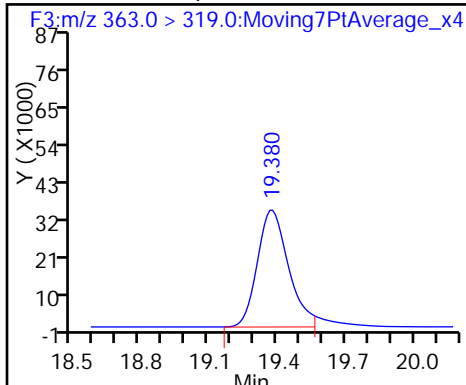
3 Perfluorohexanesulfonic acid



4 Perfluoroheptanoic acid (M)

* 5 13C2-PFOA

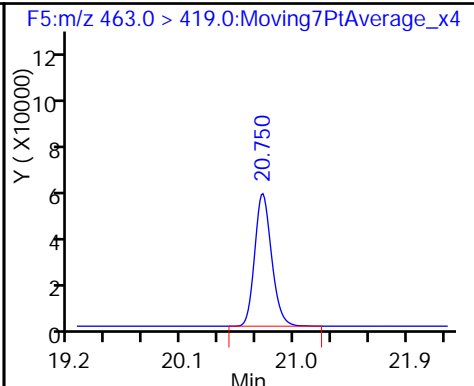
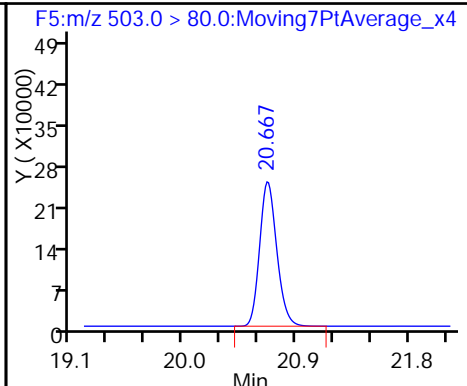
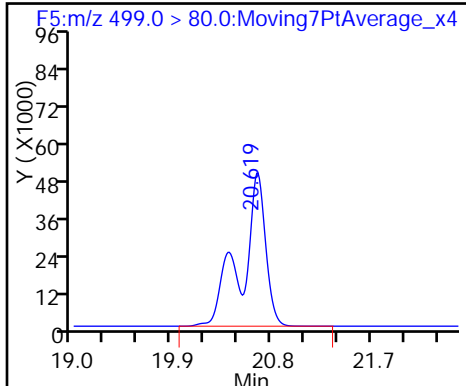
6 Perfluorooctanoic acid (M)



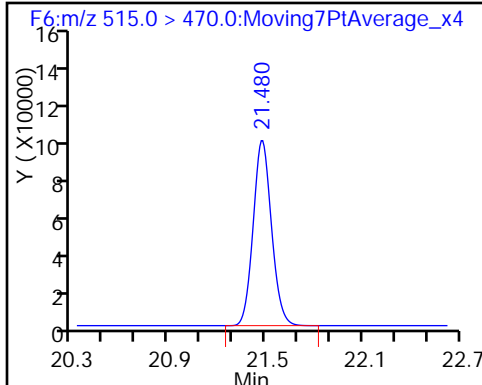
7 Perfluorooctane sulfonic acid

* 8 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

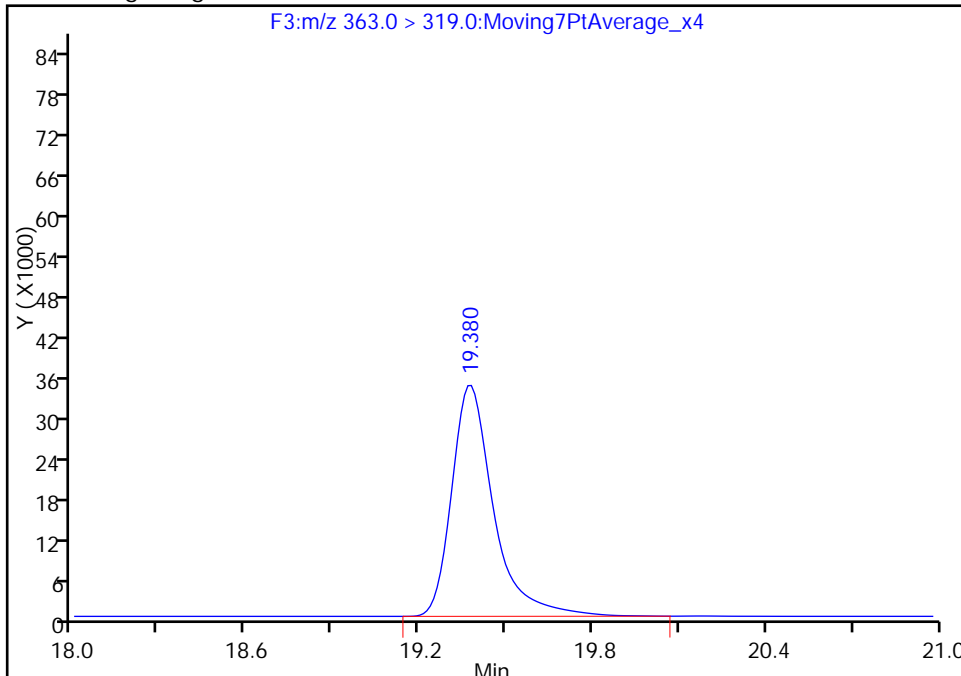
Data File: \\ChromNA\Sacramento\ChromData\A6\20161205-37524.b\05DEC2016A6A_005.d
Injection Date: 05-Dec-2016 17:55:38 Instrument ID: A6
Lims ID: STD L2
Client ID:
Operator ID: CBW ALS Bottle#: 2 Worklist Smp#: 3
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: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

4 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

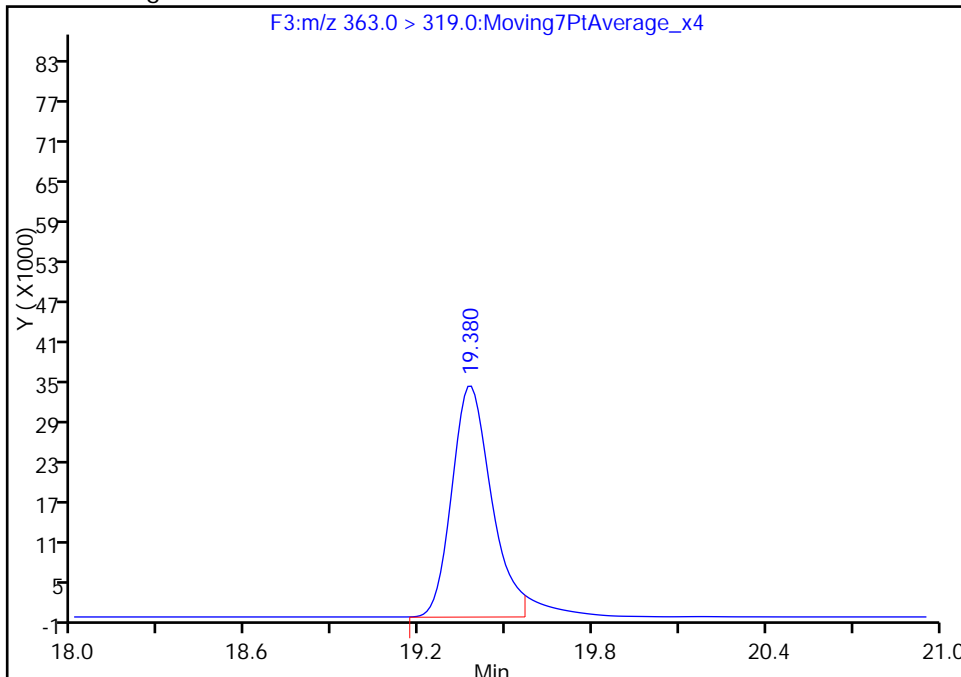
RT: 19.38
Area: 344811
Amount: 2.670013
Amount Units: ng/ml

Processing Integration Results



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

Manual Integration Results



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

Audit Reason: Split Peak

TestAmerica Sacramento

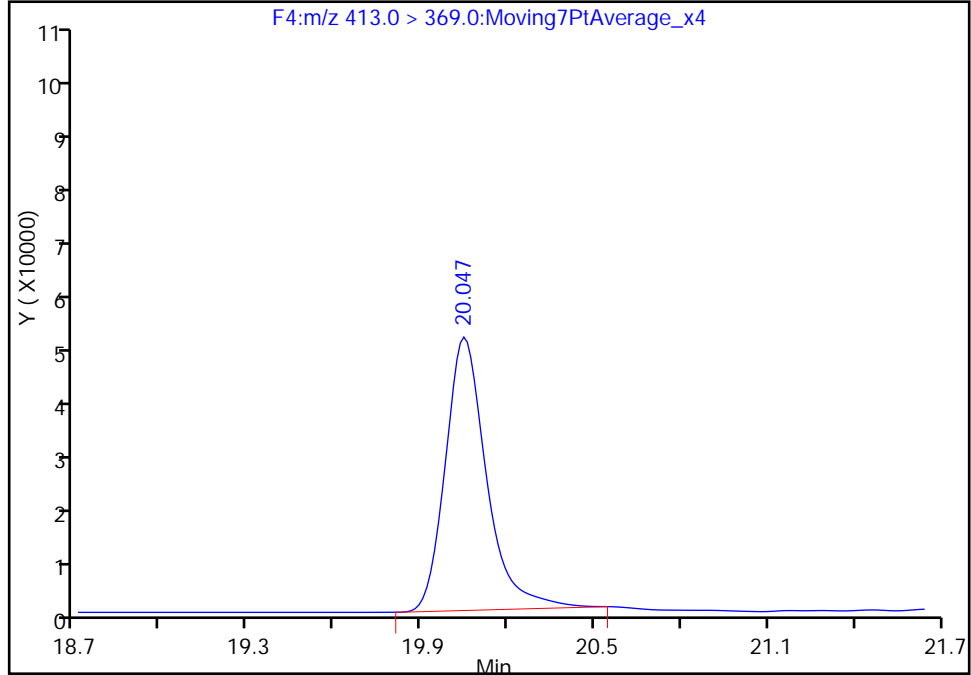
Data File: \\ChromNA\Sacramento\ChromData\A6\20161205-37524.b\05DEC2016A6A_005.d
Injection Date: 05-Dec-2016 17:55:38 Instrument ID: A6
Lims ID: STD L2
Client ID:
Operator ID: CBW ALS Bottle#: 2 Worklist Smp#: 3
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: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

6 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

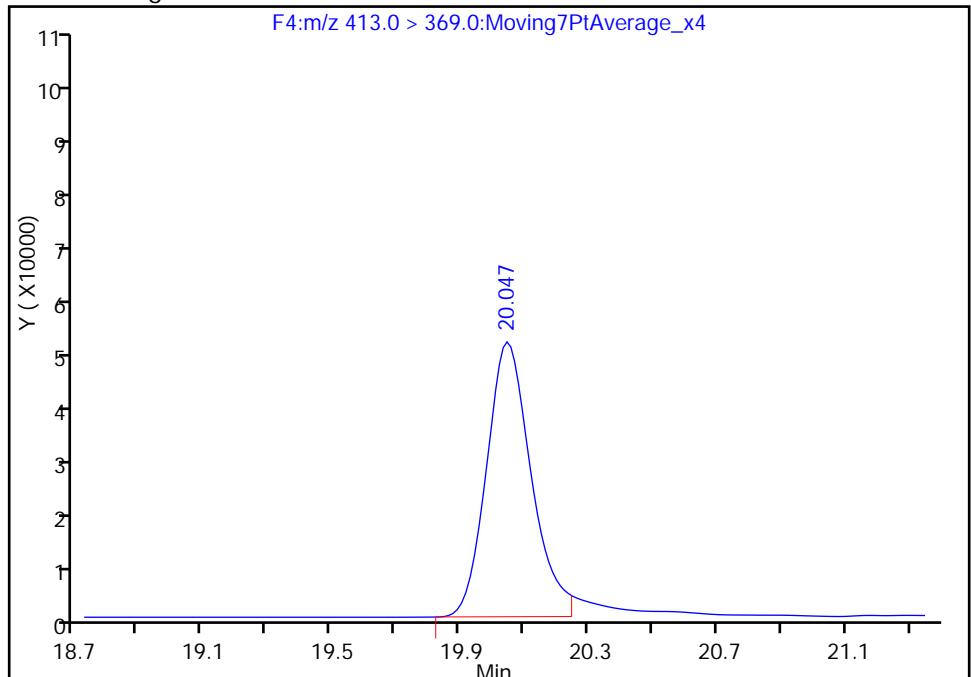
RT: 20.05
Area: 504990
Amount: 4.595586
Amount Units: ng/ml

Processing Integration Results



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

Manual Integration Results



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

TestAmerica Sacramento

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

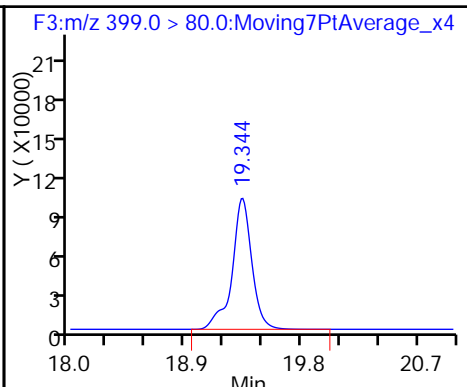
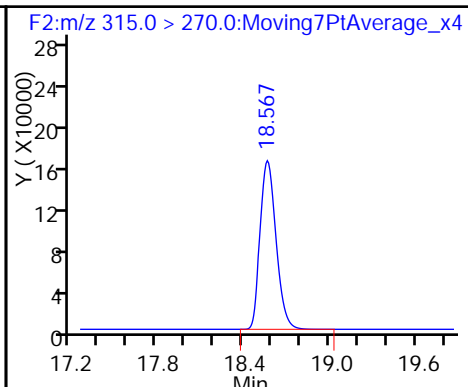
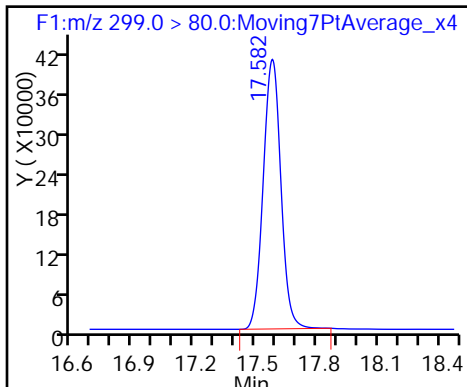
Method: 537_A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

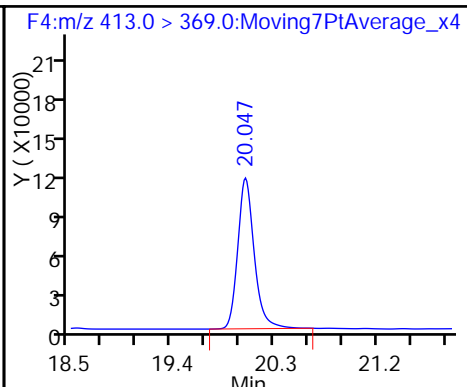
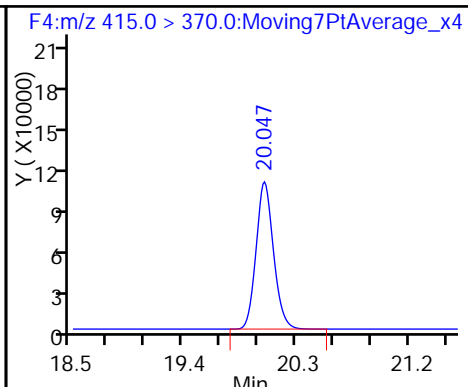
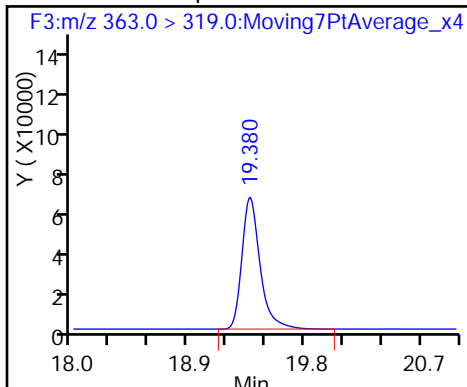
3 Perfluorohexanesulfonic acid



4 Perfluoroheptanoic acid

* 5 13C2-PFOA

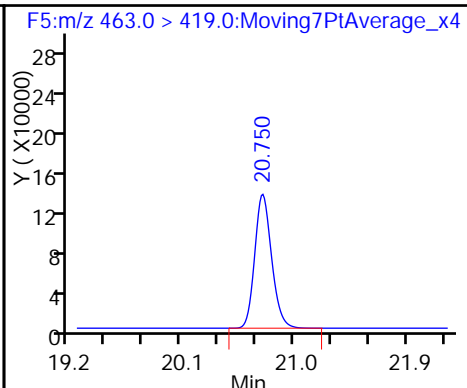
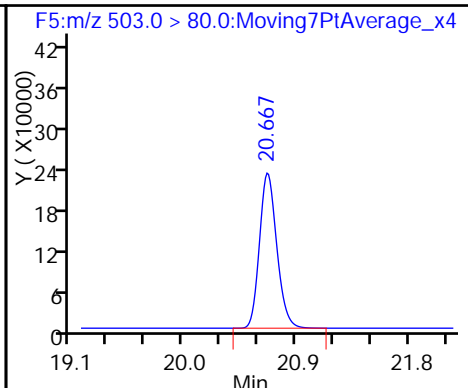
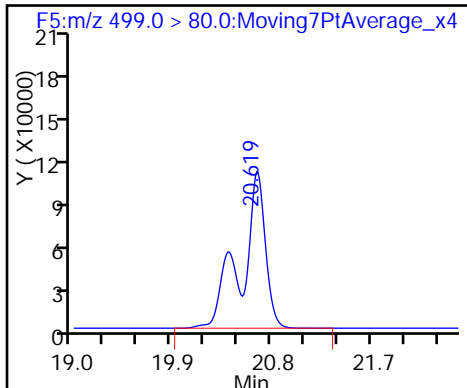
6 Perfluorooctanoic acid



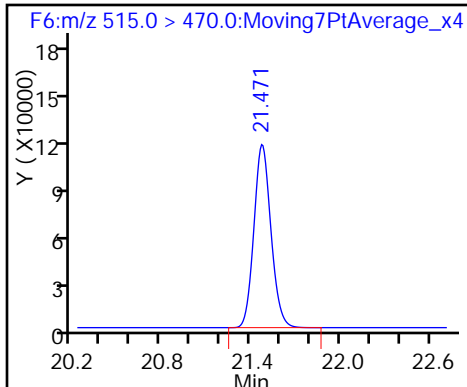
7 Perfluorooctane sulfonic acid

* 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
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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

TestAmerica Sacramento

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

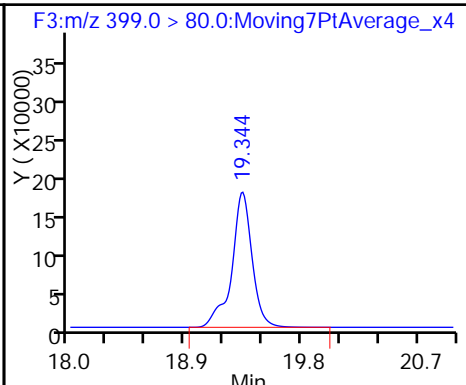
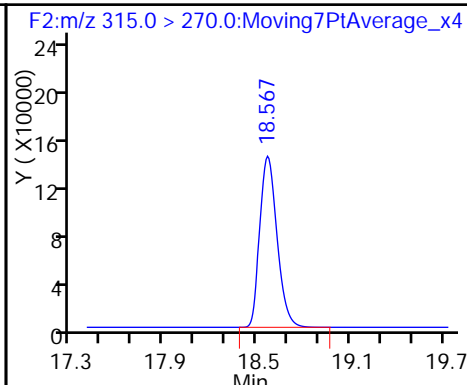
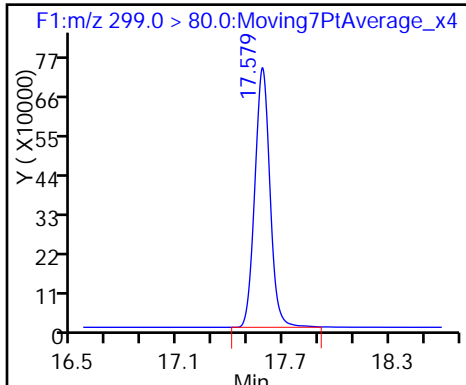
Method: 537_A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

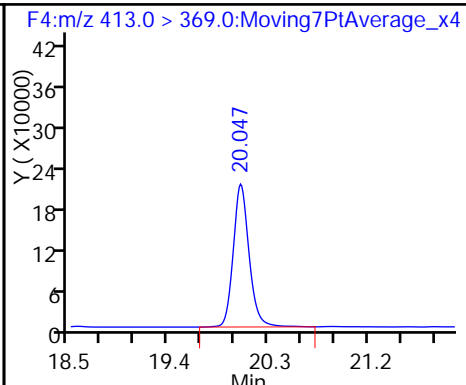
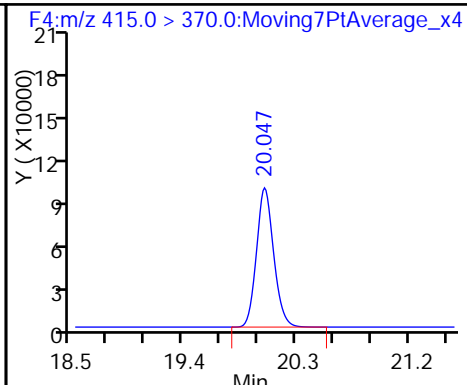
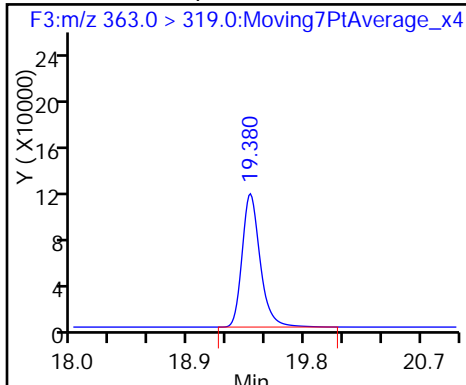
3 Perfluorohexanesulfonic acid



4 Perfluoroheptanoic acid

* 5 13C2-PFOA

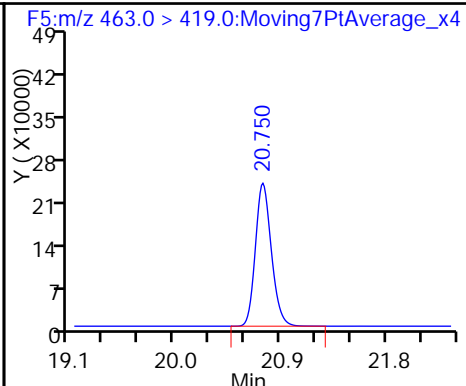
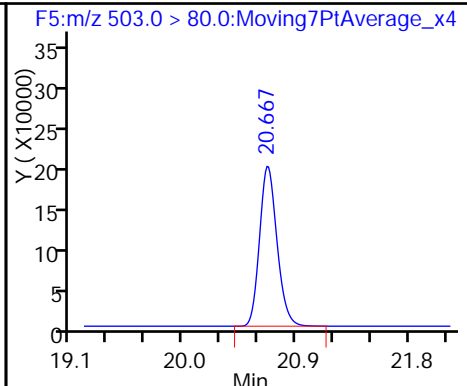
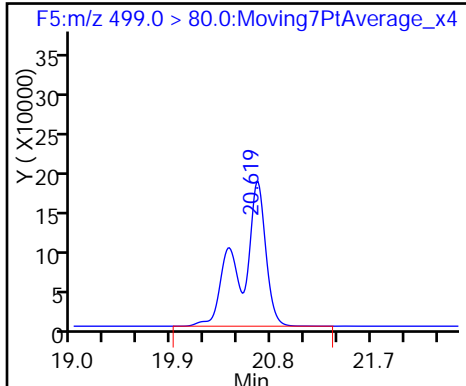
6 Perfluorooctanoic acid



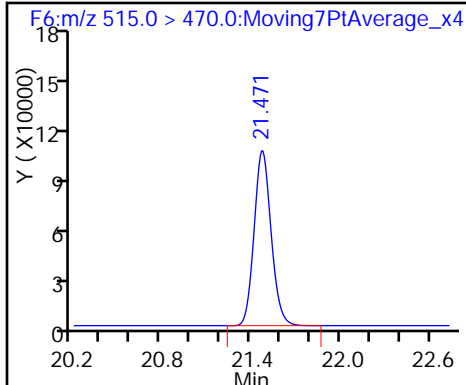
7 Perfluorooctane sulfonic acid

* 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

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

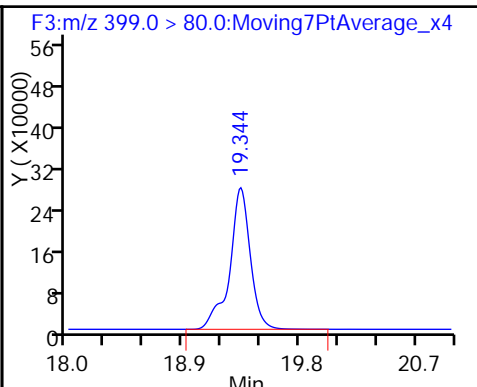
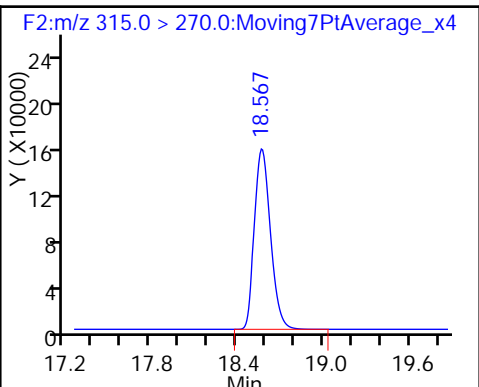
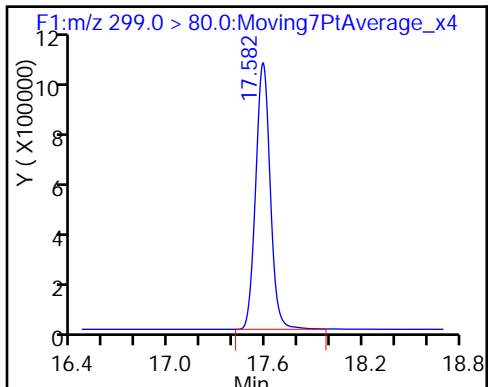
Method: 537_A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

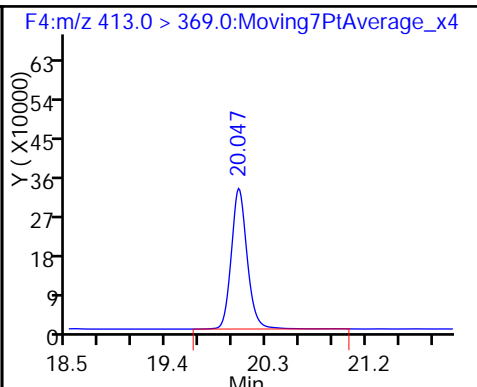
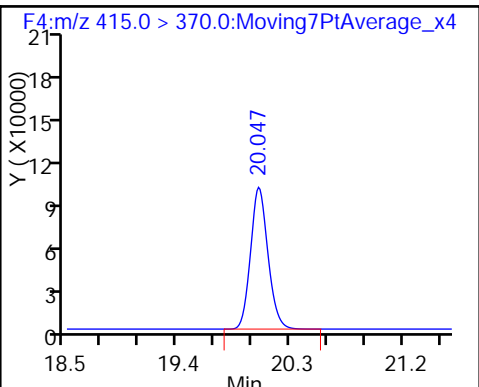
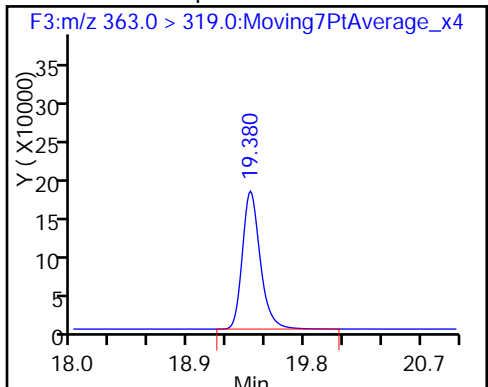
3 Perfluorohexanesulfonic acid



4 Perfluoroheptanoic acid

* 5 13C2-PFOA

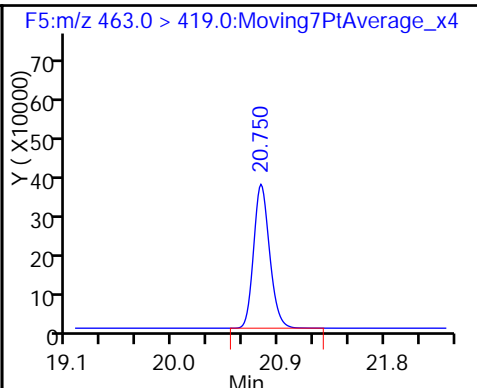
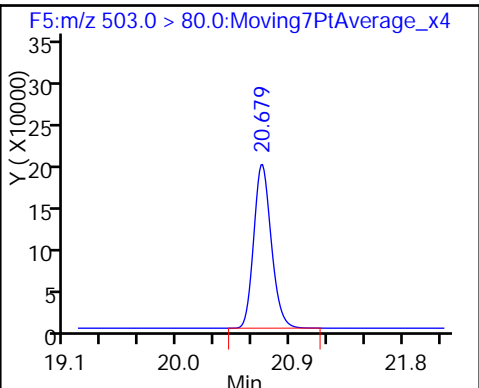
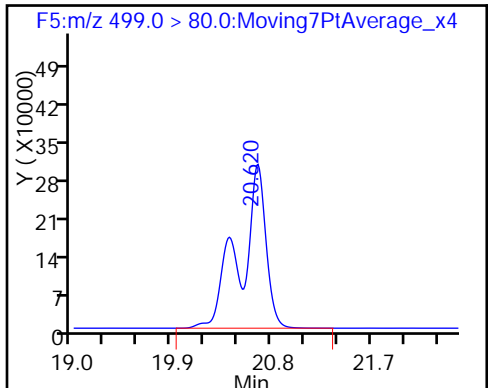
6 Perfluorooctanoic acid



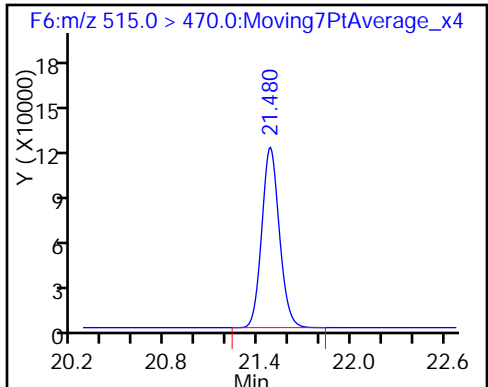
7 Perfluorooctane sulfonic acid

* 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

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

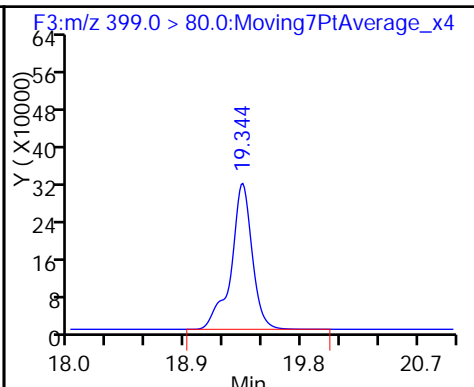
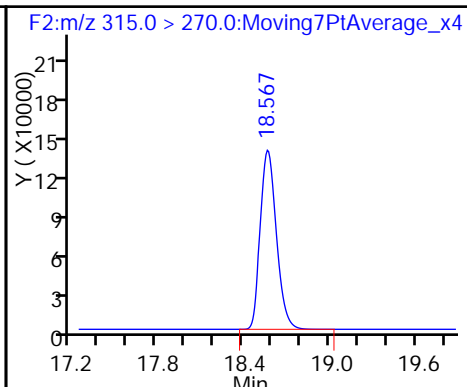
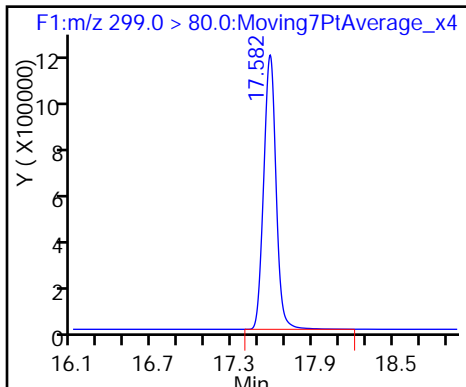
Method: 537_A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

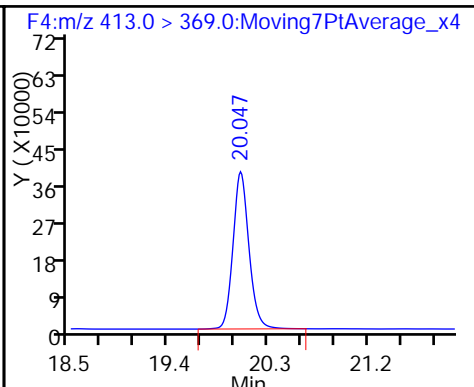
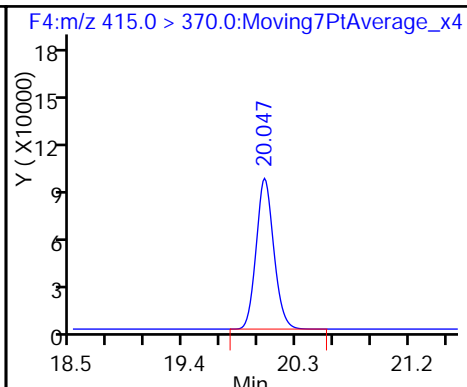
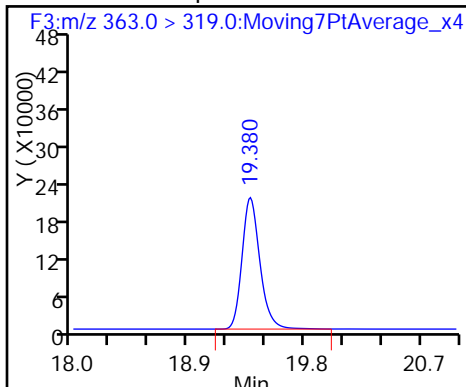
3 Perfluorohexanesulfonic acid



4 Perfluoroheptanoic acid

* 5 13C2-PFOA

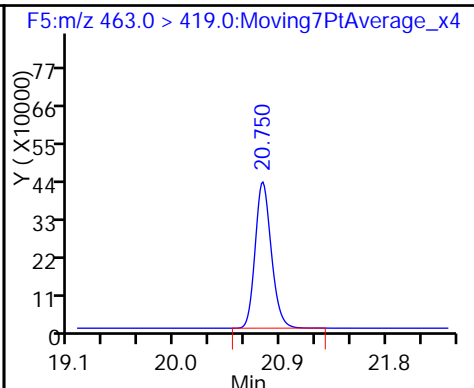
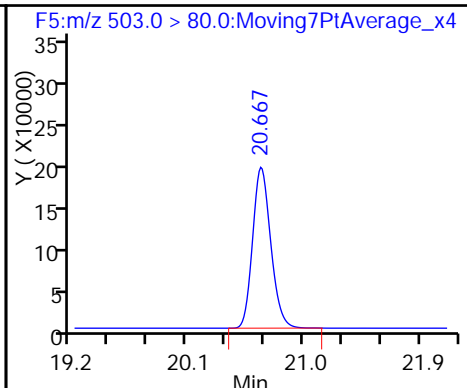
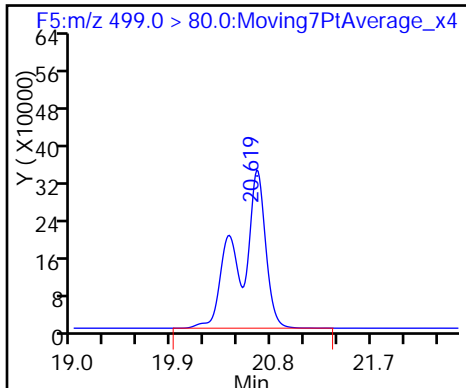
6 Perfluorooctanoic acid



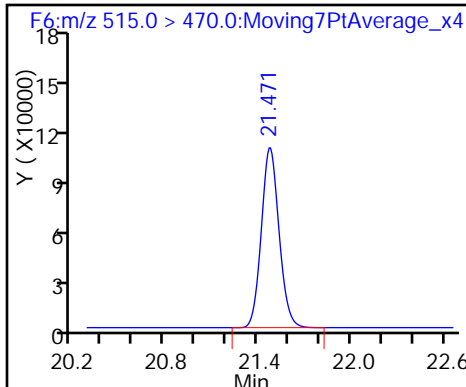
7 Perfluorooctane sulfonic acid

* 8 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24007-1
 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	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	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

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

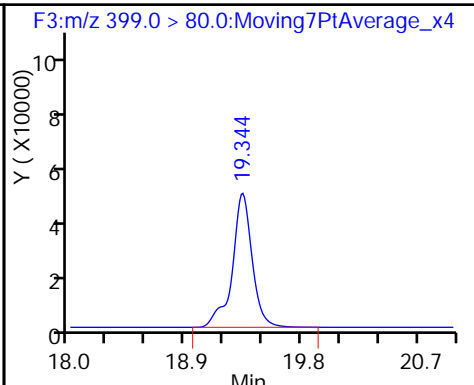
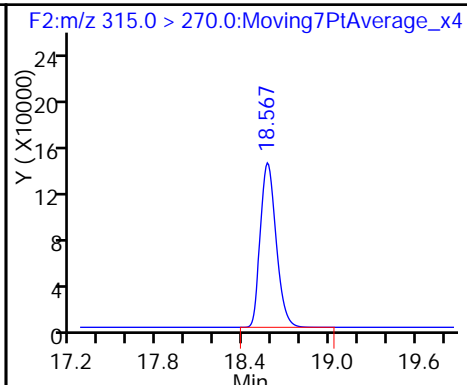
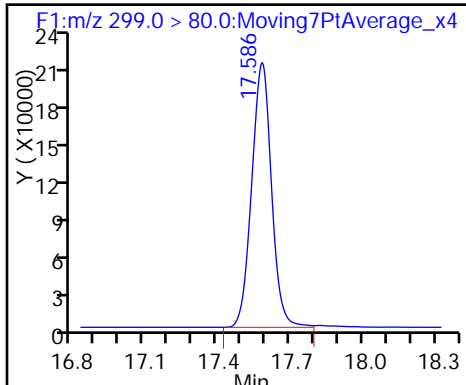
Method: 537__A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

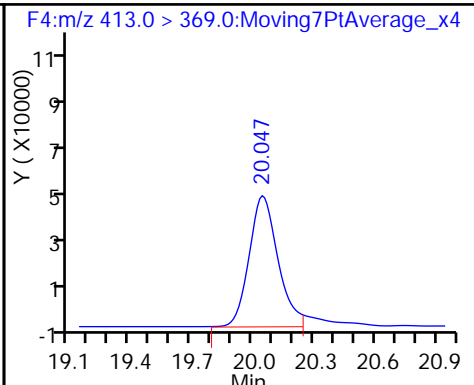
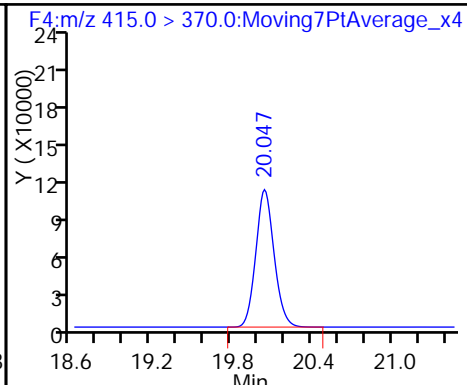
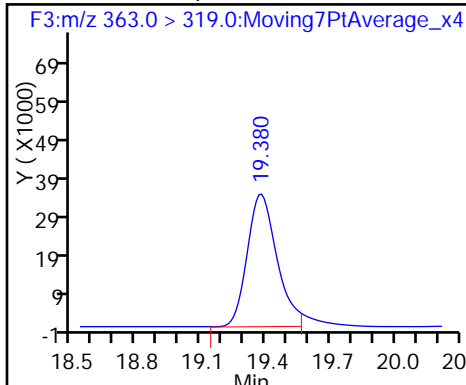
3 Perfluorohexanesulfonic acid



4 Perfluoroheptanoic acid (M)

* 5 13C2-PFOA

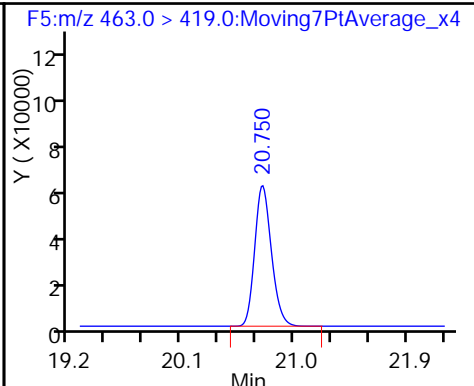
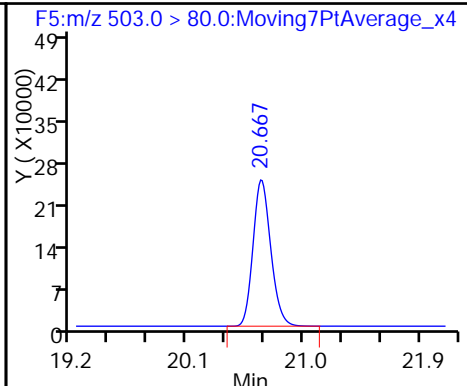
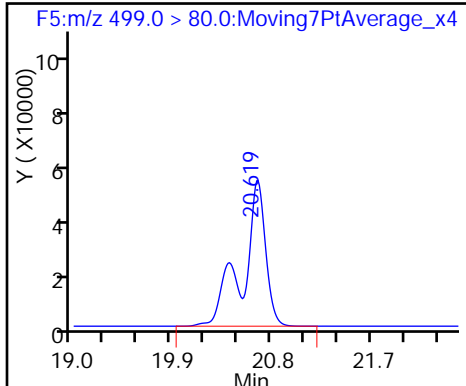
6 Perfluorooctanoic acid (M)



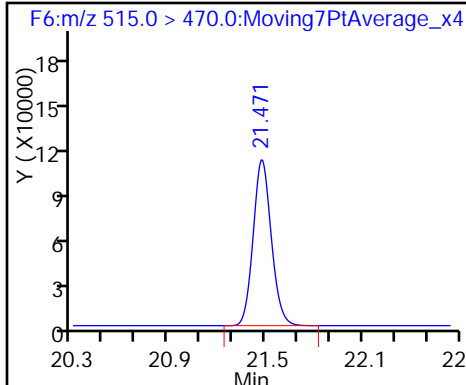
7 Perfluorooctane sulfonic acid

* 8 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

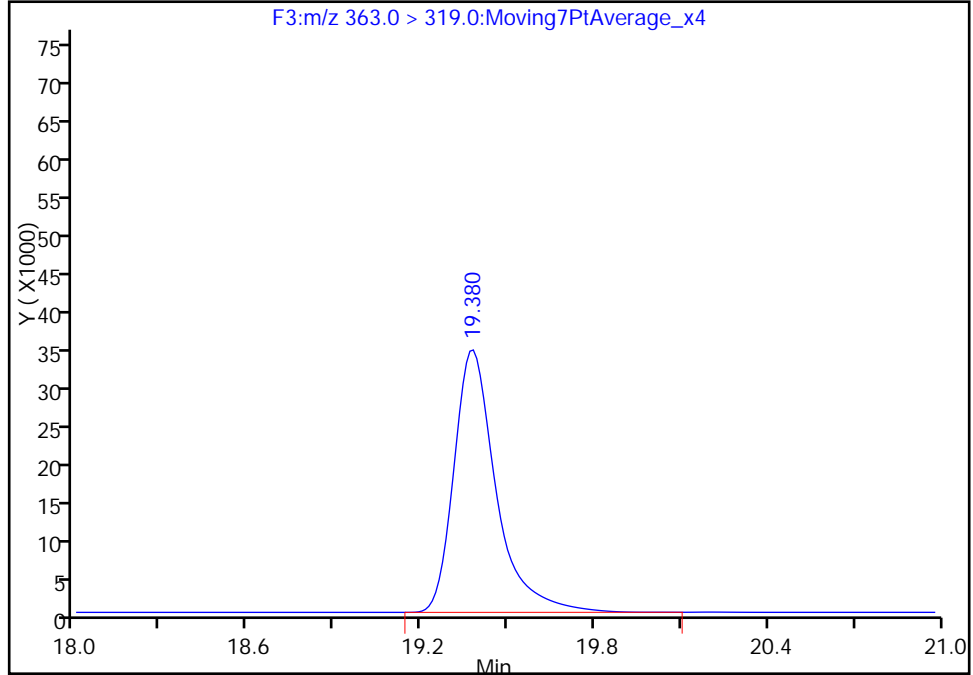
Data File: \\ChromNA\Sacramento\ChromData\A6\20161205-37524.b\05DEC2016A6A_011.d
Injection Date: 05-Dec-2016 20:53:12 Instrument ID: A6
Lims ID: CCV L2
Client ID:
Operator ID: CBW ALS Bottle#: 2 Worklist Smp#: 9
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: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

4 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

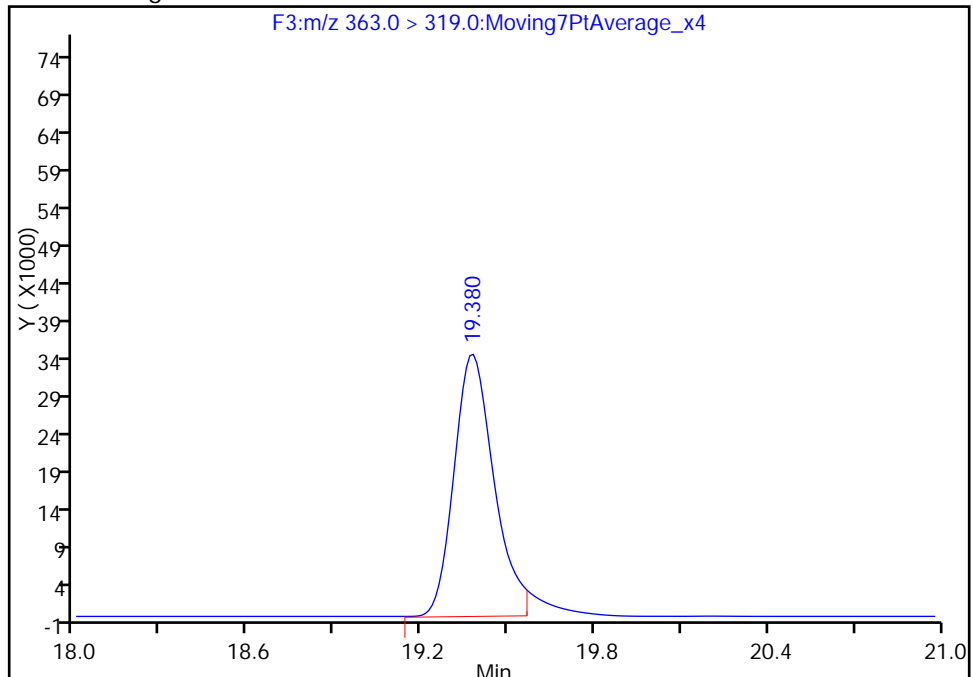
RT: 19.38
Area: 349162
Amount: 2.802857
Amount Units: ng/ml

Processing Integration Results



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

Manual Integration Results



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

Audit Reason: Split Peak

TestAmerica Sacramento

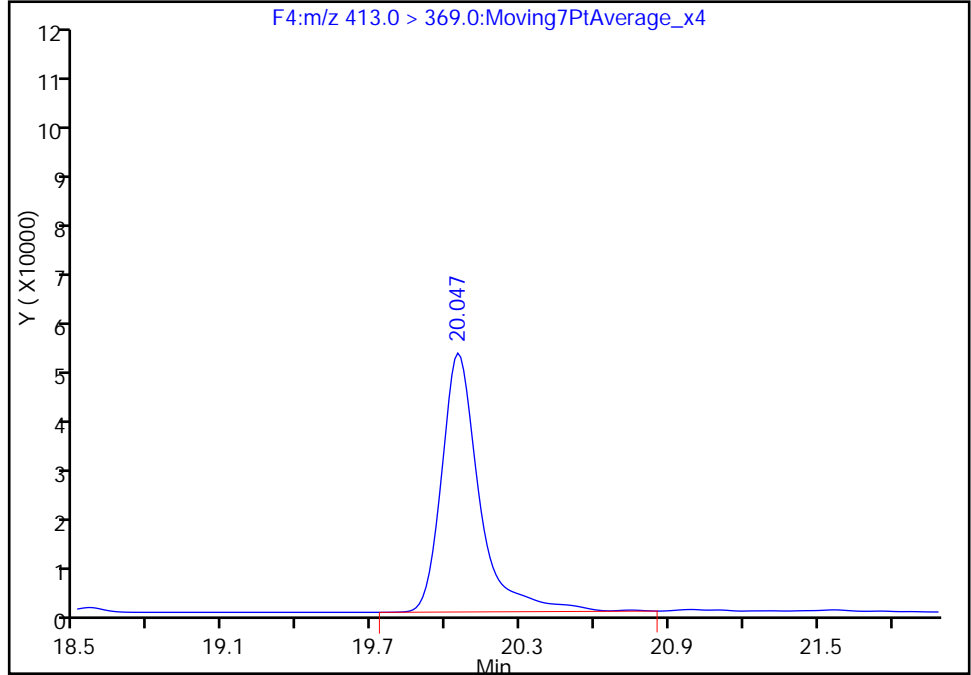
Data File: \\ChromNA\Sacramento\ChromData\A6\20161205-37524.b\05DEC2016A6A_011.d
Injection Date: 05-Dec-2016 20:53:12 Instrument ID: A6
Lims ID: CCV L2
Client ID:
Operator ID: CBW ALS Bottle#: 2 Worklist Smp#: 9
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: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

6 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

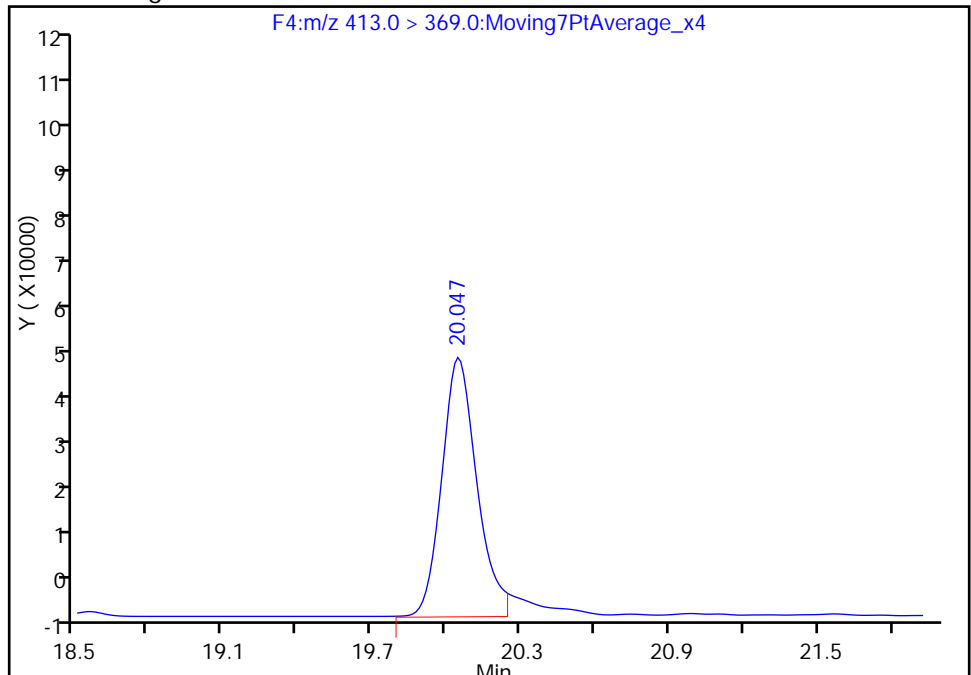
RT: 20.05
Area: 520603
Amount: 4.880820
Amount Units: ng/ml

Processing Integration Results



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

Manual Integration Results



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.: 320-24007-1
 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
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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

TestAmerica Sacramento

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

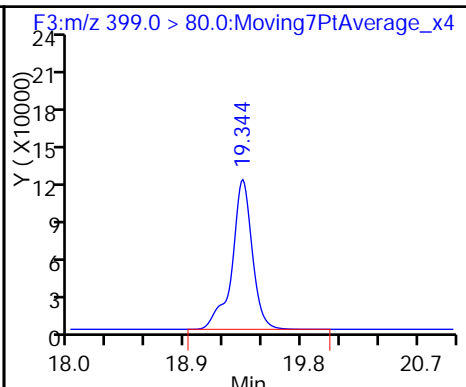
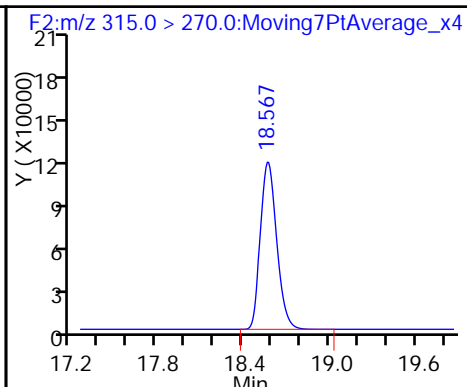
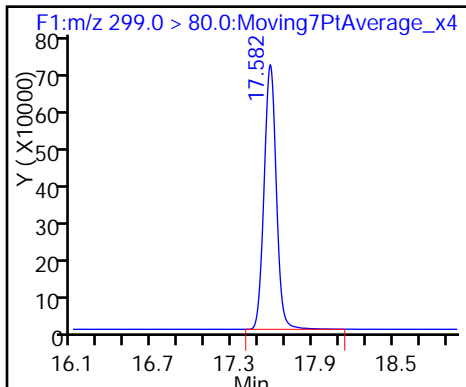
Method: 537_A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

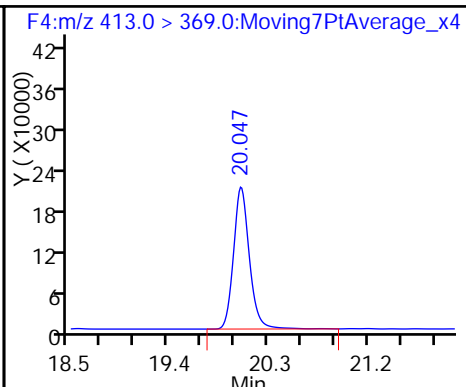
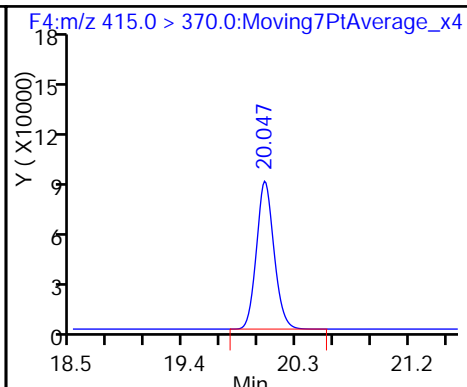
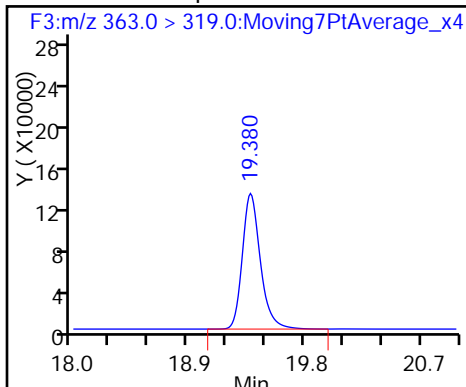
3 Perfluorohexanesulfonic acid



4 Perfluoroheptanoic acid

* 5 13C2-PFOA

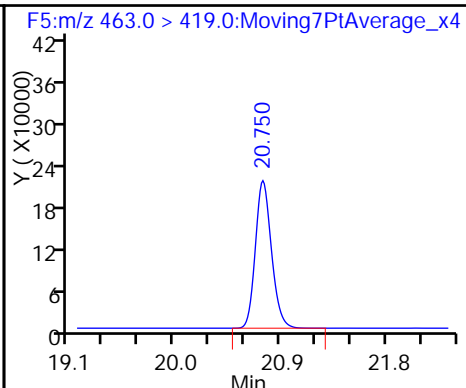
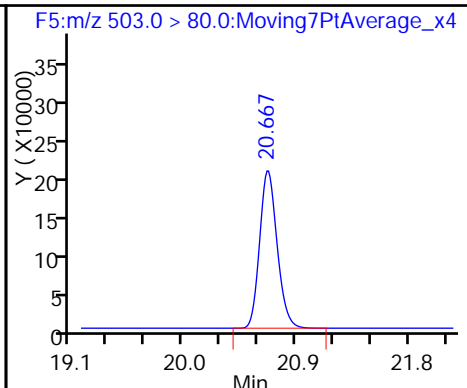
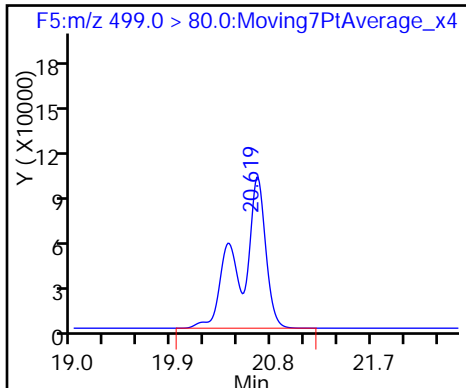
6 Perfluorooctanoic acid



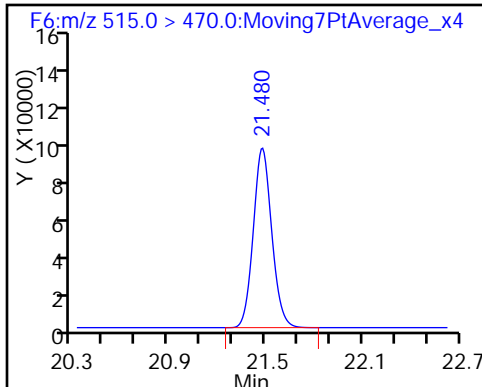
7 Perfluorooctane sulfonic acid

* 8 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24007-1
 SDG No.: _____
 Lab Sample ID: CCV 320-141573/3 Calibration Date: 12/11/2016 12:02
 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: 11DEC2016A6A_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	0.6477		21.1	22.9	-7.7	50.0
Perfluorohexanesulfonic acid	Ave	0.8980	0.7642		6.57	7.72	-14.9	50.0
Perfluoroheptanoic acid	Ave	1.215	1.413		3.02	2.60	16.3	50.0
Perfluorooctanoic acid (PFOA)	Ave	1.040	1.044		5.19	5.17	0.3	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.044	0.8884		8.69	10.2	-14.9	50.0
Perfluorononanoic acid	Ave	1.134	1.098		4.85	5.01	-3.2	50.0
13C2 PFHxA	Ave	1.167	1.108		9.50	10.0	-5.0	30.0
13C2 PFDA	Ave	0.8763	0.7903		9.02	10.0	-9.8	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161211-37708.b\11DEC2016A6A_003.d
 Lims ID: CCV L2
 Client ID:
 Sample Type: CCVL
 Inject. Date: 11-Dec-2016 12:02:56 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\20161211-37708.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 12-Dec-2016 15:39:28 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: XAWRK002

First Level Reviewer: westendorfc Date: 11-Dec-2016 12:36:03

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
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1 Perfluorobutanesulfonic acid	299.0 > 80.0	17.612	17.612	0.0	1.000	949190	21.1	569
\$ 2 13C2 PFHxA	315.0 > 270.0	18.585	18.585	0.0	1.000	889175	9.50	27996
3 Perfluorohexanesulfonic acid	399.0 > 80.0	19.356	19.356	0.0	1.000	377563	6.57	8685
4 Perfluoroheptanoic acid	363.0 > 319.0	19.391	19.391	0.0	1.000	294373	3.02	4026
* 5 13C2-PFOA	415.0 > 370.0	20.058	20.058	0.0		802153	10.0	20748
6 Perfluorooctanoic acid	413.0 > 369.0	20.058	20.058	0.0	1.000	432862	5.19	181
7 Perfluorooctane sulfonic acid	499.0 > 80.0	20.619	20.619	0.0	1.000	581183	8.69	5853
* 8 13C4 PFOS	503.0 > 80.0	20.679	20.679	0.0		1836390	28.7	27361
9 Perfluorononanoic acid	463.0 > 419.0	20.750	20.750	0.0	1.000	441361	4.85	3888
\$ 10 13C2 PFDA	515.0 > 470.0	21.480	21.480	0.0	1.000	633909	9.02	19884

Reagents:

LC537-L2_00014 Amount Added: 1.00 Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20161211-37708.b\11DEC2016A6A_003.d

Injection Date: 11-Dec-2016 12:02:56

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

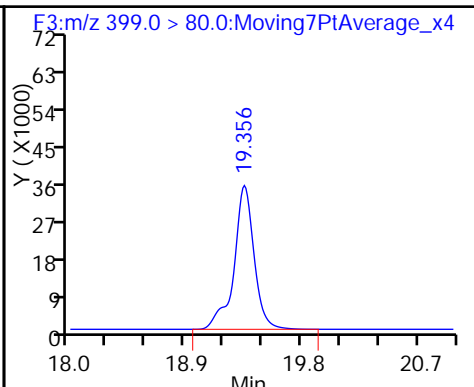
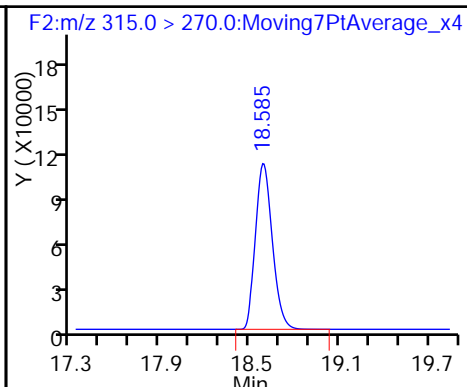
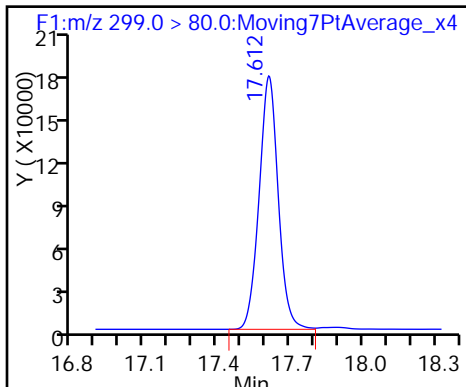
Method: 537_A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

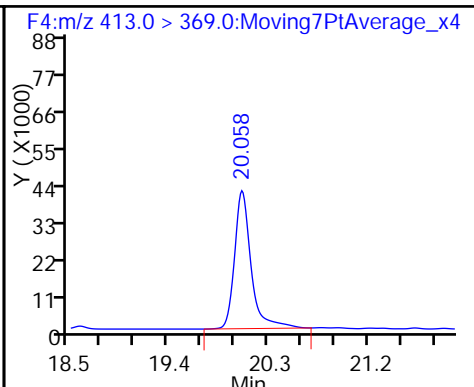
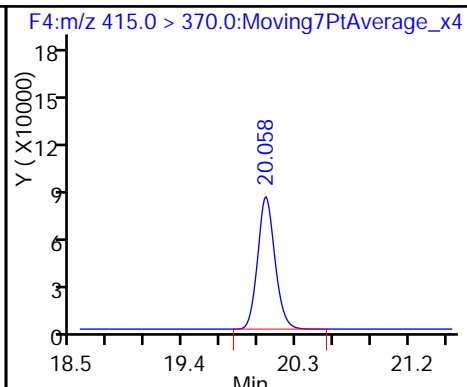
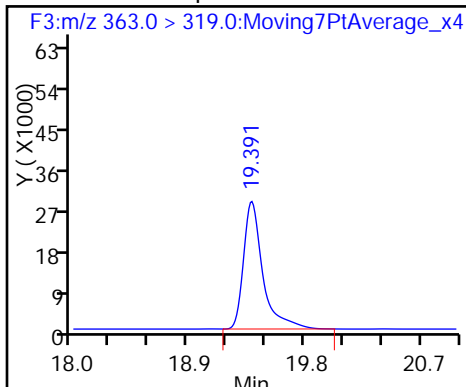
3 Perfluorohexanesulfonic acid



4 Perfluoroheptanoic acid

* 5 13C2-PFOA

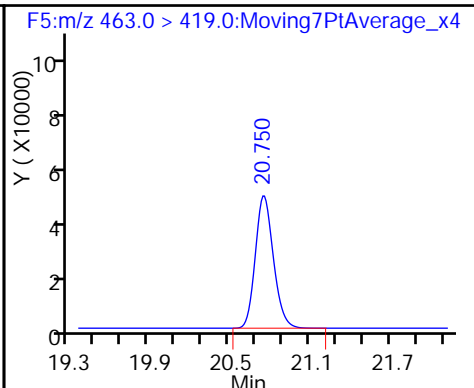
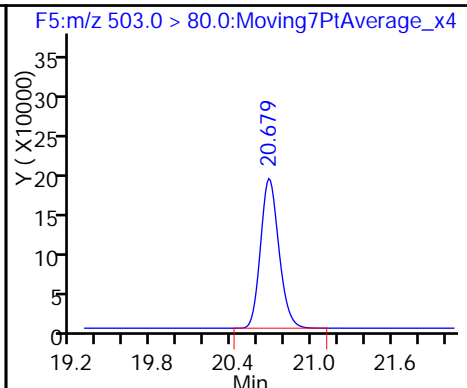
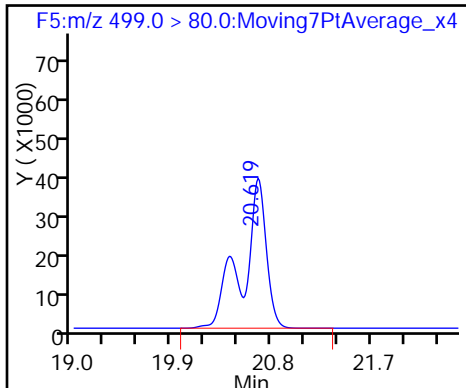
6 Perfluorooctanoic acid



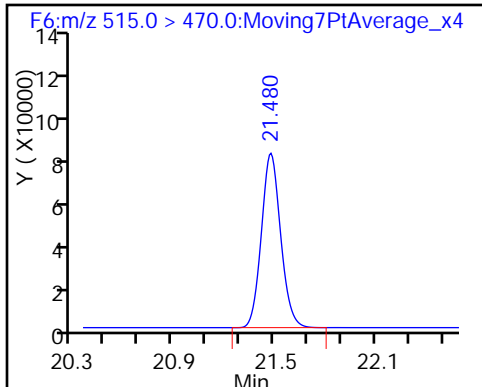
7 Perfluorooctane sulfonic acid

* 8 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24007-1
 SDG No.: _____
 Lab Sample ID: CCV 320-141575/29 Calibration Date: 12/12/2016 00:52
 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: 11DEC2016A6A_029.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	0.7417		142	135	5.7	30.0
Perfluorohexanesulfonic acid	Ave	0.8980	1.056		53.4	45.4	17.6	30.0
Perfluoroheptanoic acid	Ave	1.215	1.187		14.9	15.3	-2.3	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.040	1.100		32.2	30.4	5.7	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.044	1.251		72.0	60.1	19.8	30.0
Perfluorononanoic acid	Ave	1.134	1.223		31.8	29.5	7.8	30.0
13C2 PFHxA	Ave	1.167	1.297		11.1	10.0	11.2	30.0
13C2 PFDA	Ave	0.8763	0.9257		10.6	10.0	5.6	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161211-37708.b\11DEC2016A6A_029.d
 Lims ID: CCV L5
 Client ID:
 Sample Type: CCVIS
 Inject. Date: 12-Dec-2016 00:52:23 ALS Bottle#: 5 Worklist Smp#: 29
 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\20161211-37708.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 12-Dec-2016 16:03:06 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: XAWRK002

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid	299.0 > 80.0	17.612	17.612	0.0	1.000	6371773	142.4	26361
\$ 2 13C2 PFHxA	315.0 > 270.0	18.585	18.585	0.0	1.000	1149765	11.1	37115
3 Perfluorohexanesulfonic acid	399.0 > 80.0	19.344	19.344	0.0	1.000	3058257	53.4	68628
4 Perfluoroheptanoic acid	363.0 > 319.0	19.380	19.380	0.0	1.000	1607457	14.9	23861
* 5 13C2-PFOA	415.0 > 370.0	20.047	20.047	0.0		886505	10.0	22969
6 Perfluorooctanoic acid	413.0 > 369.0	20.047	20.047	0.0	1.000	2965495	32.2	1550
7 Perfluorooctane sulfonic acid	499.0 > 80.0	20.619	20.619	0.0	1.000	4797861	72.0	24477
* 8 13C4 PFOS	503.0 > 80.0	20.679	20.679	0.0		1829934	28.7	37378
9 Perfluorononanoic acid	463.0 > 419.0	20.750	20.750	0.0	1.000	3194560	31.8	47943
\$ 10 13C2 PFDA	515.0 > 470.0	21.471	21.471	0.0	1.000	820622	10.6	25626

Reagents:

LC537-L5_00017 Amount Added: 1.00 Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20161211-37708.b\11DEC2016A6A_029.d

Injection Date: 12-Dec-2016 00:52:23

Instrument ID: A6

Lims ID: CCV L5

Client ID:

Operator ID: CBW

ALS Bottle#: 5

Worklist Smp#: 29

Injection Vol: 10.0 ul

Dil. Factor: 1.0000

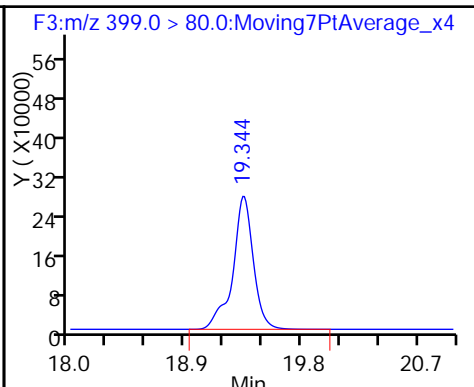
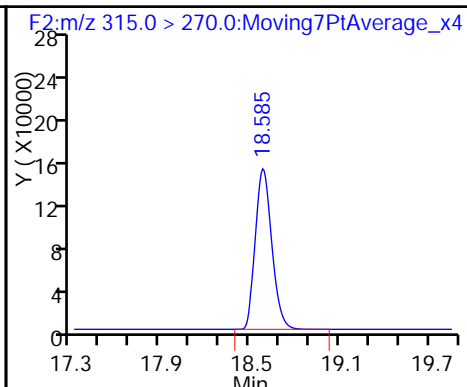
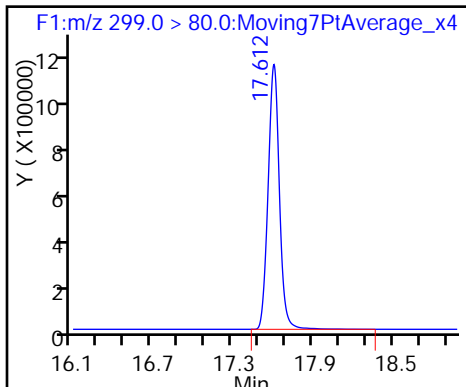
Method: 537_A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

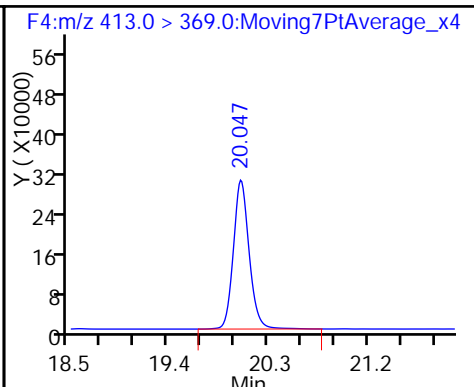
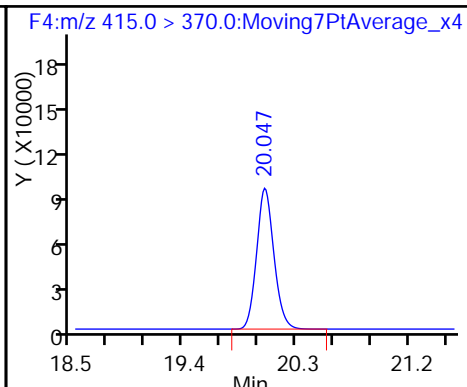
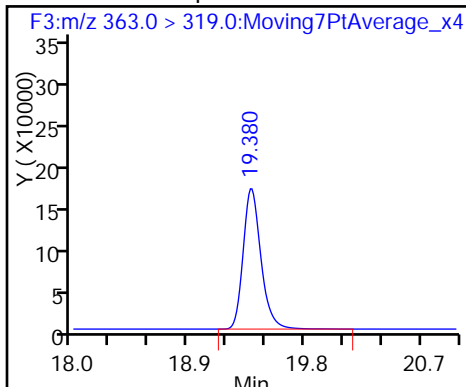
3 Perfluorohexanesulfonic acid



4 Perfluoroheptanoic acid

* 5 13C2-PFOA

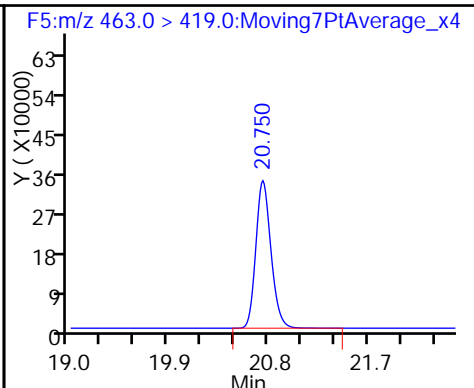
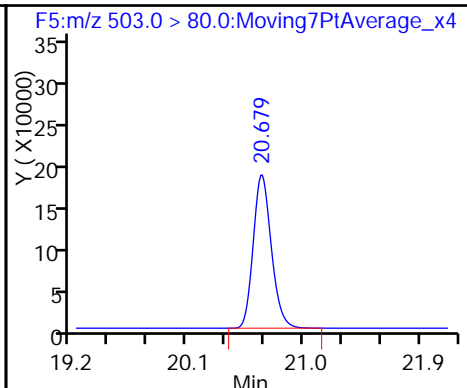
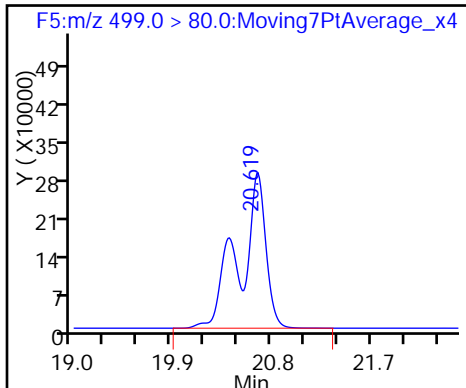
6 Perfluorooctanoic acid



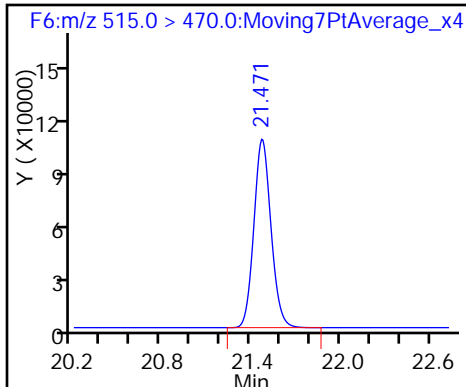
7 Perfluorooctane sulfonic acid

* 8 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24007-1
 SDG No.: _____
 Lab Sample ID: CCV 320-141575/42 Calibration Date: 12/12/2016 07:17
 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: 11DEC2016A6A_042.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	0.7659		49.2	45.1	9.2	30.0
Perfluorohexanesulfonic acid	Ave	0.8980	0.9727		16.5	15.2	8.3	30.0
Perfluoroheptanoic acid	Ave	1.215	1.259		5.30	5.12	3.6	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.040	1.027		10.1	10.2	-1.3	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.044	1.103		21.3	20.1	5.7	30.0
Perfluorononanoic acid	Ave	1.134	1.119		9.74	9.87	-1.4	30.0
13C2 PFHxA	Ave	1.167	1.159		9.94	10.0	-0.6	30.0
13C2 PFDA	Ave	0.8763	0.8676		9.90	10.0	-1.0	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24007-1
 SDG No.: _____
 Lab Sample ID: CCV 320-141576/42 Calibration Date: 12/12/2016 07:17
 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: 11DEC2016A6A_042.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	0.7659		49.2	45.1	9.2	30.0
Perfluorohexanesulfonic acid	Ave	0.8980	0.9727		16.5	15.2	8.3	30.0
Perfluoroheptanoic acid	Ave	1.215	1.259		5.30	5.12	3.6	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.040	1.027		10.1	10.2	-1.3	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.044	1.103		21.3	20.1	5.7	30.0
Perfluorononanoic acid	Ave	1.134	1.119		9.74	9.87	-1.4	30.0
13C2 PFHxA	Ave	1.167	1.159		9.94	10.0	-0.6	30.0
13C2 PFDA	Ave	0.8763	0.8676		9.90	10.0	-1.0	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161211-37708.b\11DEC2016A6A_042.d
 Lims ID: CCV L3
 Client ID:
 Sample Type: CCVIS
 Inject. Date: 12-Dec-2016 07:17:09 ALS Bottle#: 3 Worklist Smp#: 42
 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\20161211-37708.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 12-Dec-2016 16:18:09 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: XAWRK002

First Level Reviewer: barnettj Date: 12-Dec-2016 14:07:56

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid	299.0 > 80.0	17.615	17.615	0.0	1.000	1922306	49.2	1010
\$ 2 13C2 PFHxA	315.0 > 270.0	18.594	18.594	0.0	1.000	896365	9.94	28870
3 Perfluorohexanesulfonic acid	399.0 > 80.0	19.356	19.356	0.0	1.000	822955	16.5	19422
4 Perfluoroheptanoic acid	363.0 > 319.0	19.392	19.392	0.0	1.000	498219	5.30	4262
* 5 13C2-PFOA	415.0 > 370.0	20.058	20.058	0.0		773280	10.0	20239
6 Perfluorooctanoic acid	413.0 > 369.0	20.058	20.058	0.0	1.000	809567	10.1	379
7 Perfluorooctane sulfonic acid	499.0 > 80.0	20.619	20.619	0.0	1.000	1236123	21.3	12778
* 8 13C4 PFOS	503.0 > 80.0	20.679	20.679	0.0		1595954	28.7	41645
9 Perfluorononanoic acid	463.0 > 419.0	20.750	20.750	0.0	1.000	853830	9.74	14980
\$ 10 13C2 PFDA	515.0 > 470.0	21.471	21.471	0.0	1.000	670876	9.90	21278

Reagents:

LC537-L3_00016 Amount Added: 1.00 Units: mL

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161211-37708.b\11DEC2016A6A_042.d
 Lims ID: CCV L3
 Client ID:
 Sample Type: CCVIS
 Inject. Date: 12-Dec-2016 07:17:09 ALS Bottle#: 3 Worklist Smp#: 42
 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\20161211-37708.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 12-Dec-2016 16:18:09 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: XAWRK002

First Level Reviewer: barnettj Date: 12-Dec-2016 14:07:56

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid	299.0 > 80.0	17.615	17.615	0.0	1.000	1922306	49.2	1010
\$ 2 13C2 PFHxA	315.0 > 270.0	18.594	18.594	0.0	1.000	896365	9.94	28870
3 Perfluorohexanesulfonic acid	399.0 > 80.0	19.356	19.356	0.0	1.000	822955	16.5	19422
4 Perfluoroheptanoic acid	363.0 > 319.0	19.392	19.392	0.0	1.000	498219	5.30	4262
* 5 13C2-PFOA	415.0 > 370.0	20.058	20.058	0.0		773280	10.0	20239
6 Perfluorooctanoic acid	413.0 > 369.0	20.058	20.058	0.0	1.000	809567	10.1	379
7 Perfluorooctane sulfonic acid	499.0 > 80.0	20.619	20.619	0.0	1.000	1236123	21.3	12778
* 8 13C4 PFOS	503.0 > 80.0	20.679	20.679	0.0		1595954	28.7	41645
9 Perfluorononanoic acid	463.0 > 419.0	20.750	20.750	0.0	1.000	853830	9.74	14980
\$ 10 13C2 PFDA	515.0 > 470.0	21.471	21.471	0.0	1.000	670876	9.90	21278

Reagents:

LC537-L3_00016 Amount Added: 1.00 Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20161211-37708.b\11DEC2016A6A_042.d

Injection Date: 12-Dec-2016 07:17:09

Instrument ID: A6

Lims ID: CCV L3

Client ID:

Operator ID: CBW

ALS Bottle#: 3

Worklist Smp#: 42

Injection Vol: 10.0 ul

Dil. Factor: 1.0000

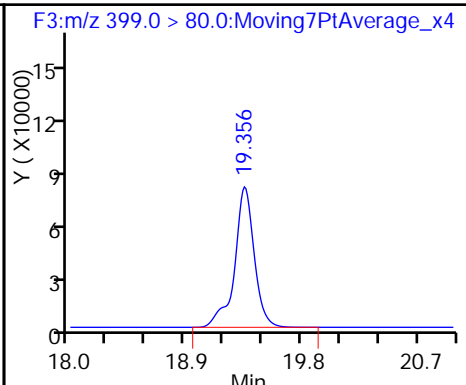
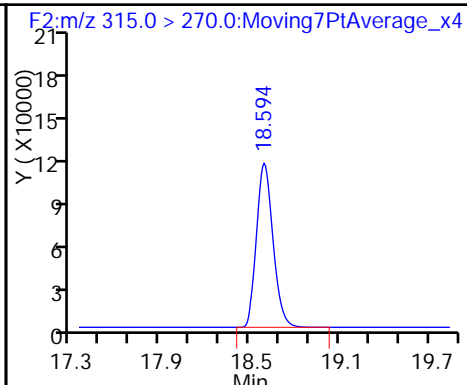
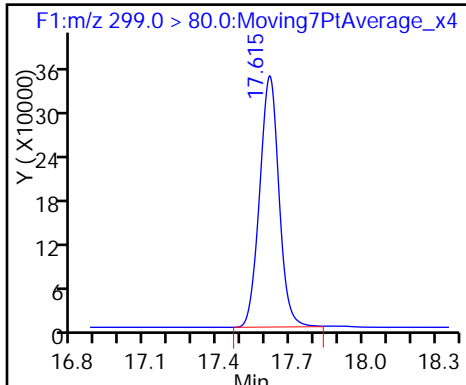
Method: 537_A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

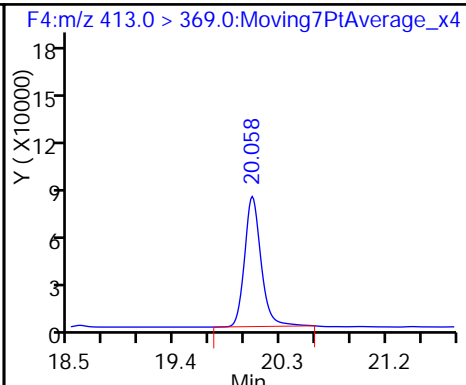
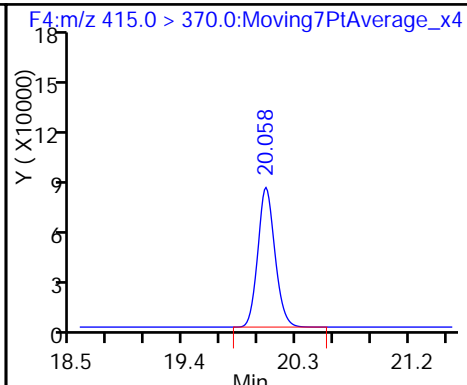
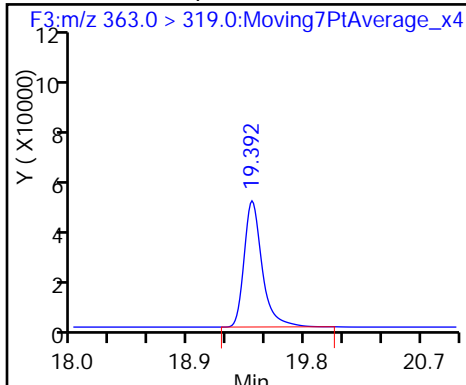
3 Perfluorohexanesulfonic acid



4 Perfluoroheptanoic acid

* 5 13C2-PFOA

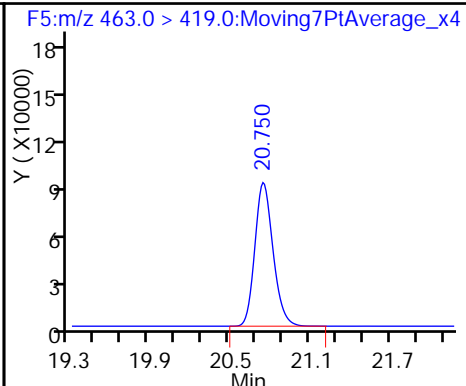
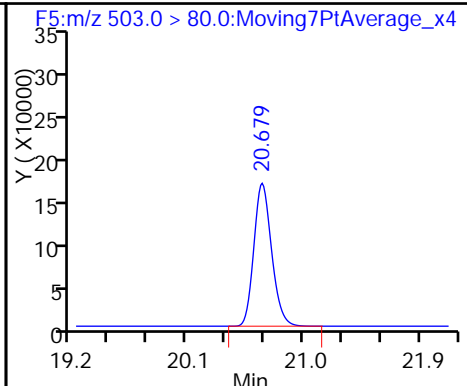
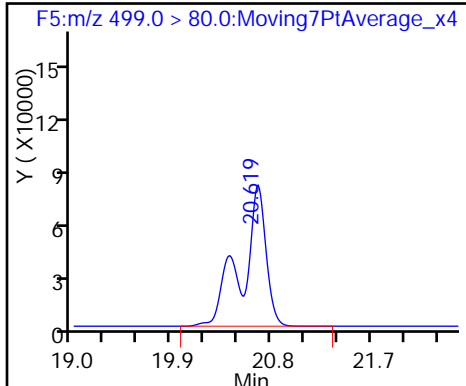
6 Perfluorooctanoic acid



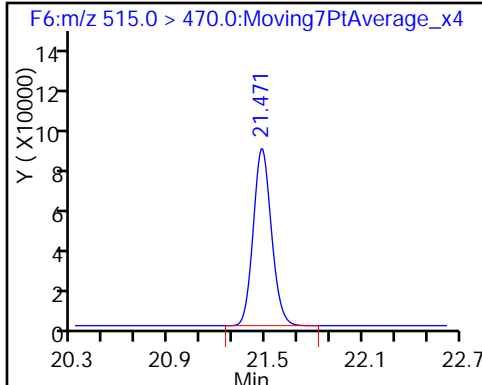
7 Perfluorooctane sulfonic acid

* 8 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20161211-37708.b\11DEC2016A6A_042.d

Injection Date: 12-Dec-2016 07:17:09

Instrument ID: A6

Lims ID: CCV L3

Client ID:

Operator ID: CBW

ALS Bottle#: 3

Worklist Smp#: 42

Injection Vol: 10.0 ul

Dil. Factor: 1.0000

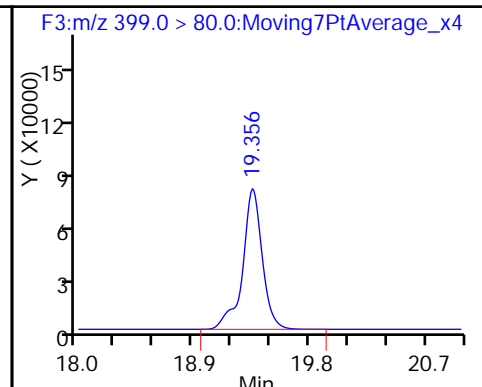
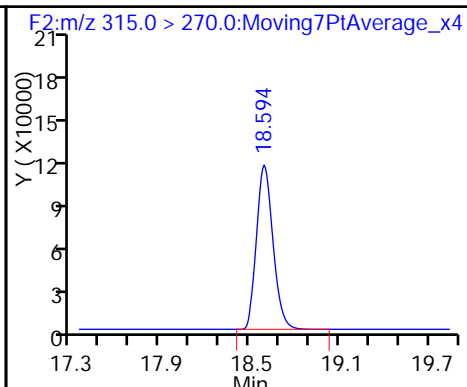
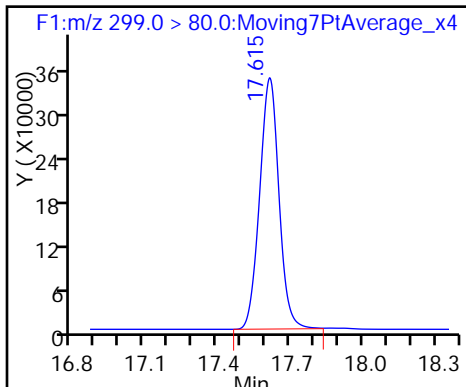
Method: 537_A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

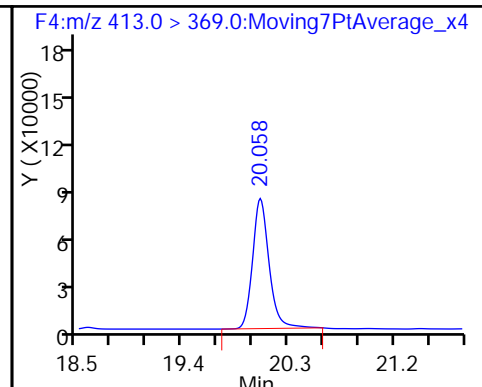
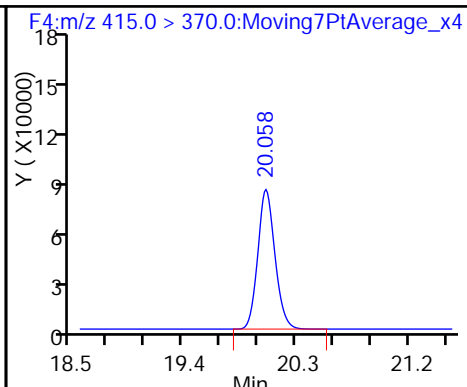
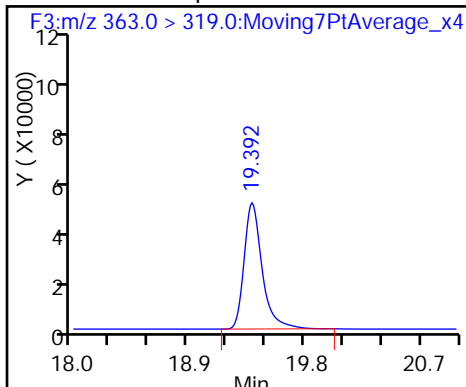
3 Perfluorohexanesulfonic acid



4 Perfluoroheptanoic acid

* 5 13C2-PFOA

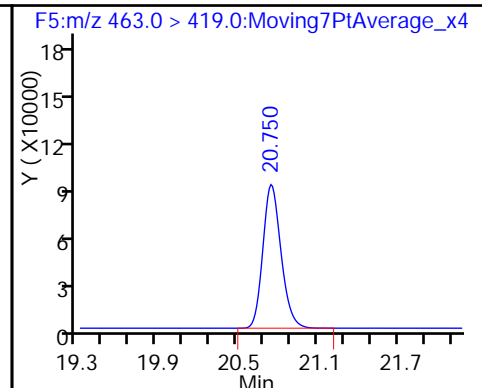
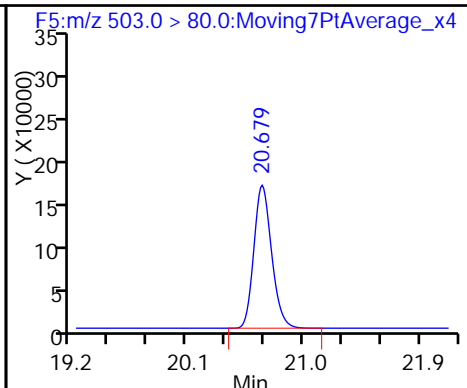
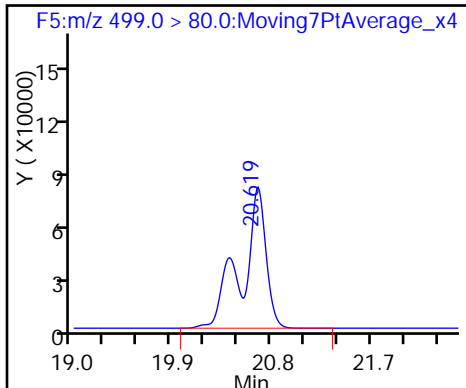
6 Perfluorooctanoic acid



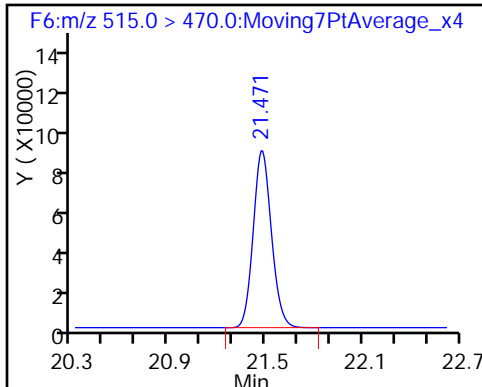
7 Perfluorooctane sulfonic acid

* 8 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24007-1
 SDG No.: _____
 Lab Sample ID: CCV 320-141576/48 Calibration Date: 12/12/2016 10:14
 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: 11DEC2016A6A_048.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.7015	0.7473		143	135	6.5	30.0
Perfluorohexanesulfonic acid	Ave	0.8980	1.069		54.0	45.4	19.1	30.0
Perfluoroheptanoic acid	Ave	1.215	1.136		14.3	15.3	-6.5	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.040	1.072		31.4	30.4	3.1	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.044	1.274		73.3	60.1	22.0	30.0
Perfluorononanoic acid	Ave	1.134	1.149		29.9	29.5	1.3	30.0
13C2 PFHxA	Ave	1.167	1.258		10.8	10.0	7.9	30.0
13C2 PFDA	Ave	0.8763	0.8739		9.97	10.0	-0.3	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161211-37708.b\11DEC2016A6A_048.d
 Lims ID: CCV L5
 Client ID:
 Sample Type: CCVIS
 Inject. Date: 12-Dec-2016 10:14:45 ALS Bottle#: 5 Worklist Smp#: 48
 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\20161211-37708.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 12-Dec-2016 16:23:52 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: XAWRK002

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid	299.0 > 80.0	17.624	17.624	0.0	1.000	6762886	143.4	5155
\$ 2 13C2 PFHxA	315.0 > 270.0	18.594	18.594	0.0	1.000	1269772	10.8	40755
3 Perfluorohexanesulfonic acid	399.0 > 80.0	19.356	19.356	0.0	1.000	3261631	54.0	10320
4 Perfluoroheptanoic acid	363.0 > 319.0	19.392	19.392	0.0	1.000	1750501	14.3	15116
* 5 13C2-PFOA	415.0 > 370.0	20.059	20.059	0.0		1009083	10.0	26278
6 Perfluorooctanoic acid	413.0 > 369.0	20.059	20.059	0.0	1.000	3291820	31.4	838
7 Perfluorooctane sulfonic acid	499.0 > 80.0	20.620	20.620	0.0	1.000	5146174	73.3	6373
* 8 13C4 PFOS	503.0 > 80.0	20.679	20.679	0.0		1927685	28.7	24906
9 Perfluorononanoic acid	463.0 > 419.0	20.750	20.750	0.0	1.000	3417396	29.9	20018
\$ 10 13C2 PFDA	515.0 > 470.0	21.480	21.480	0.0	1.000	881823	9.97	27850

Reagents:

LC537-L5_00017 Amount Added: 1.00 Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20161211-37708.b\11DEC2016A6A_048.d

Injection Date: 12-Dec-2016 10:14:45

Instrument ID: A6

Lims ID: CCV L5

Client ID:

Operator ID: CBW

ALS Bottle#: 5

Worklist Smp#: 48

Injection Vol: 10.0 ul

Dil. Factor: 1.0000

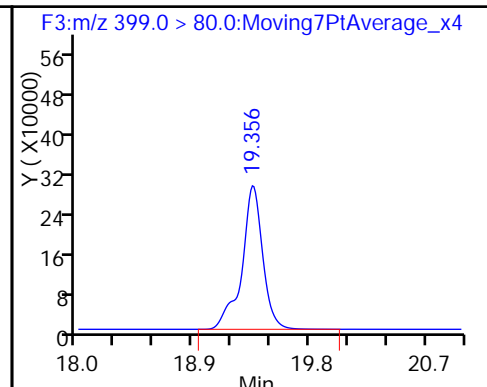
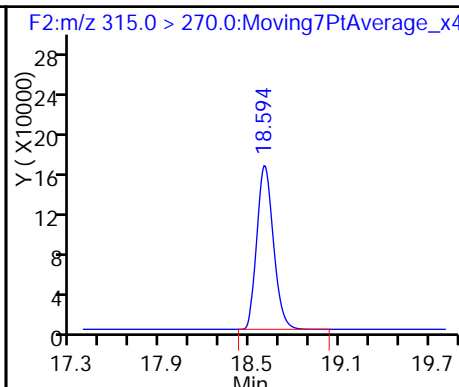
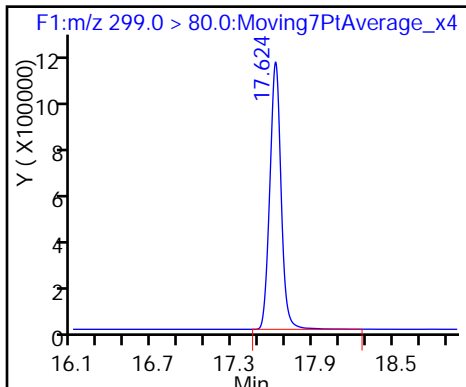
Method: 537_A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

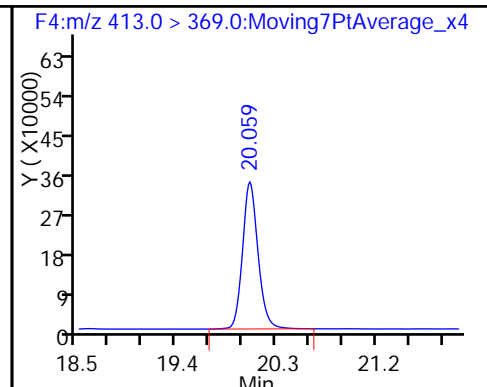
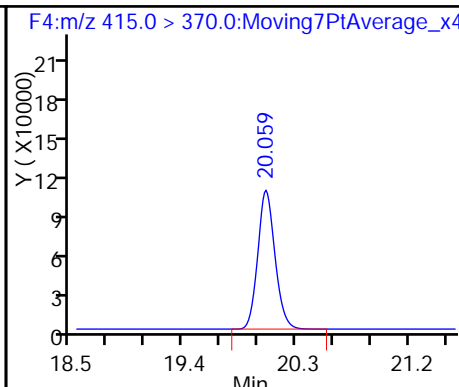
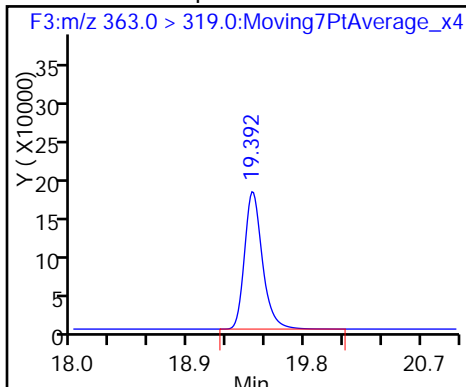
3 Perfluorohexanesulfonic acid



4 Perfluoroheptanoic acid

* 5 13C2-PFOA

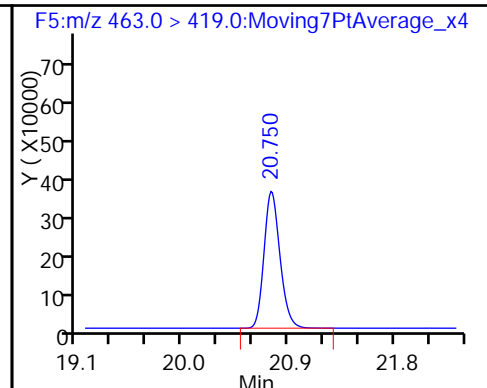
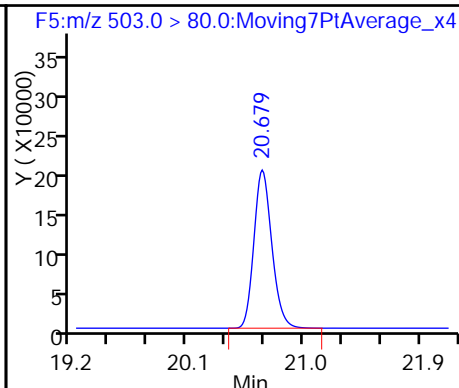
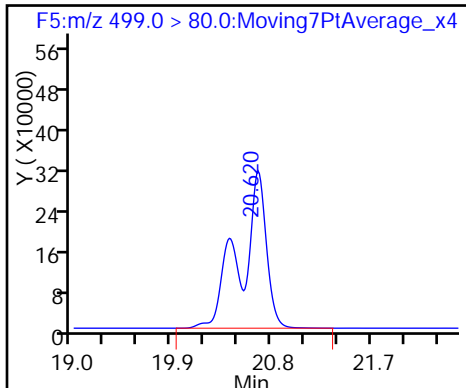
6 Perfluorooctanoic acid



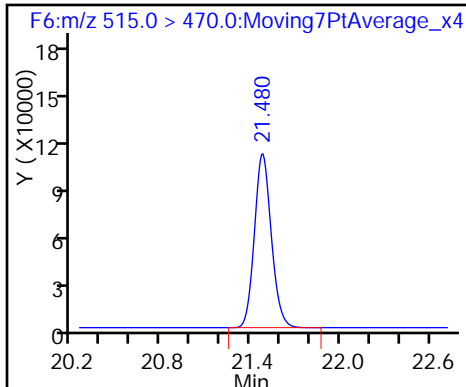
7 Perfluorooctane sulfonic acid

* 8 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-24007-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: MB 320-140697/1-A
 Matrix: Water Lab File ID: 11DEC2016A6A_031.d
 Analysis Method: 537 Date Collected: _____
 Extraction Method: 537 Date Extracted: 12/05/2016 19:07
 Sample wt/vol: 250 (mL) Date Analyzed: 12/12/2016 01:51
 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.: 141575 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	110		70-130
STL00996	13C2 PFDA	114		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161211-37708.b\11DEC2016A6A_031.d
 Lims ID: MB 320-140697/1-A
 Client ID:
 Sample Type: MB
 Inject. Date: 12-Dec-2016 01:51:35 ALS Bottle#: 36 Worklist Smp#: 31
 Injection Vol: 10.0 ul Dil. Factor: 1.0000
 Sample Info: mb 320-140697/1-a BOX 17
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35°C
 Operator ID: CBW Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20161211-37708.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 12-Dec-2016 16:17:15 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: XAWRK002

First Level Reviewer: barnettj Date: 12-Dec-2016 16:02:35

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
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\$ 2 13C2 PFHxA	315.0 > 270.0	18.585	18.585	0.0	1.000	930157	11.0	29883
* 5 13C2-PFOA	415.0 > 370.0	20.058	20.047	0.011		727943	10.0	19074
* 8 13C4 PFOS	503.0 > 80.0	20.679	20.679	0.0		2041401	28.7	53232
\$ 10 13C2 PFDA	515.0 > 470.0	21.471	21.471	0.0	1.000	725549	11.4	22952

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20161211-37708.b\11DEC2016A6A_031.d

Injection Date: 12-Dec-2016 01:51:35

Instrument ID: A6

Lims ID: MB 320-140697/1-A

Client ID:

Operator ID: CBW

ALS Bottle#: 36

Worklist Smp#: 31

Injection Vol: 10.0 ul

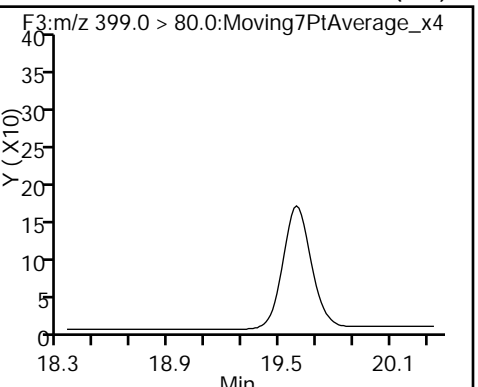
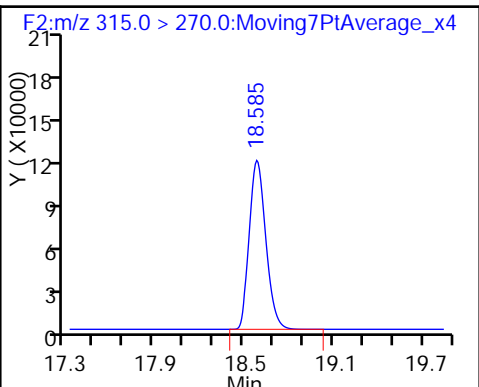
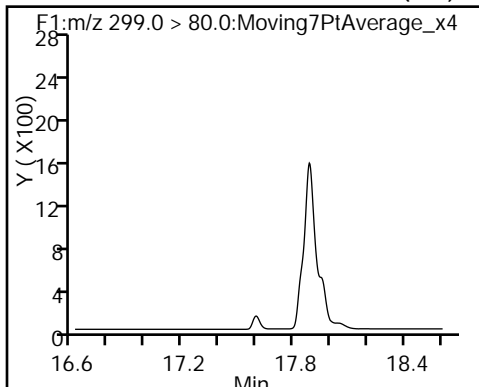
Dil. Factor: 1.0000

Method: 537_A6

Limit Group: LC 537 ICAL

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

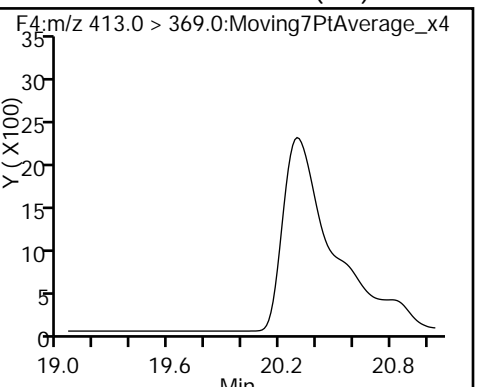
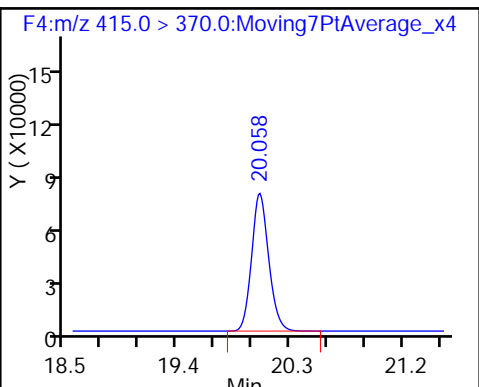
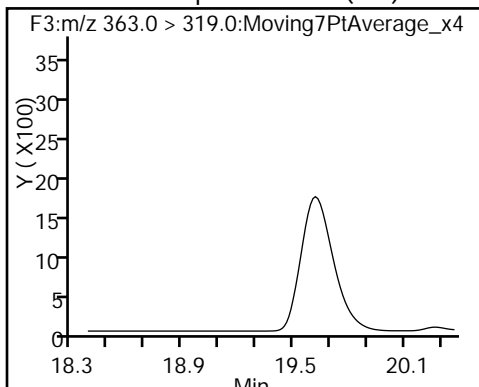
3 Perfluorohexanesulfonic acid (ND)



4 Perfluoroheptanoic acid (ND)

* 5 13C2-PFOA

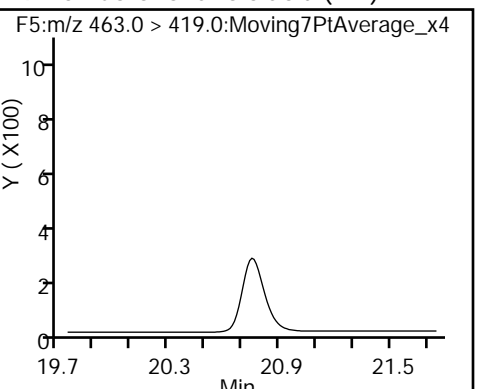
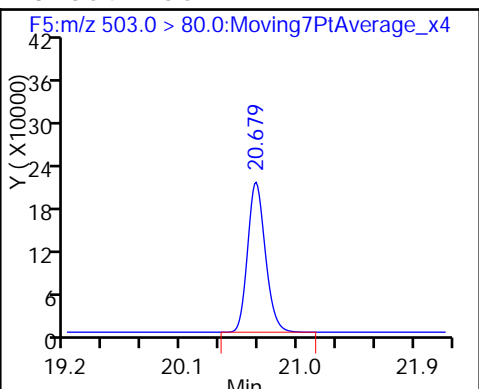
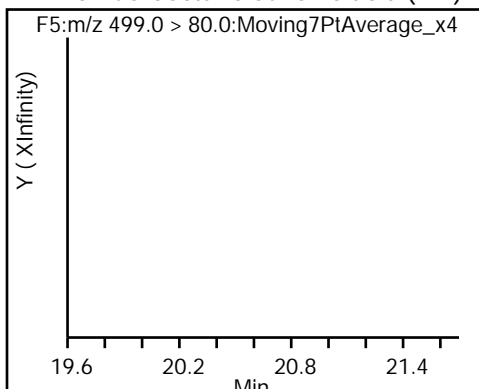
6 Perfluorooctanoic acid (ND)



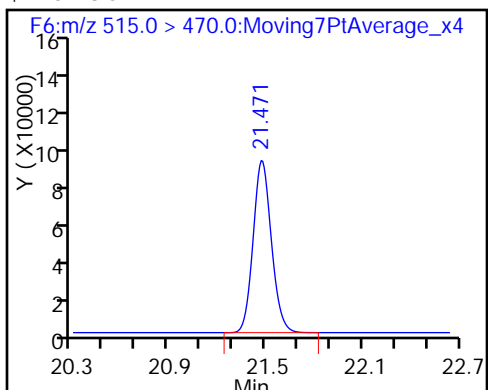
7 Perfluorooctane sulfonic acid (ND)

* 8 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161211-37708.b\11DEC2016A6A_031.d
 Lims ID: MB 320-140697/1-A
 Client ID:
 Sample Type: MB
 Inject. Date: 12-Dec-2016 01:51:35 ALS Bottle#: 36 Worklist Smp#: 31
 Injection Vol: 10.0 ul Dil. Factor: 1.0000
 Sample Info: mb 320-140697/1-a BOX 17
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35°C
 Operator ID: CBW Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20161211-37708.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 12-Dec-2016 16:17:15 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: XAWRK002

First Level Reviewer: barnettj Date: 12-Dec-2016 16:02:35

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	11.0	109.54
\$ 10 13C2 PFDA	10.0	11.4	113.74

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-24007-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: LCS 320-140697/2-A
 Matrix: Water Lab File ID: 11DEC2016A6A_032.d
 Analysis Method: 537 Date Collected: _____
 Extraction Method: 537 Date Extracted: 12/05/2016 19:07
 Sample wt/vol: 250 (mL) Date Analyzed: 12/12/2016 02:21
 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.: 141575 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.311		0.060	0.048	0.016
335-67-1	Perfluorooctanoic acid (PFOA)	0.165	E	0.030	0.024	0.0094
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.620		0.14	0.11	0.048

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	125		70-130
STL00996	13C2 PFDA	124		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161211-37708.b\11DEC2016A6A_032.d
 Lims ID: LCS 320-140697/2-A
 Client ID:
 Sample Type: LCS
 Inject. Date: 12-Dec-2016 02:21:11 ALS Bottle#: 37 Worklist Smp#: 32
 Injection Vol: 10.0 ul Dil. Factor: 1.0000
 Sample Info: lcs 320-140697/2-a
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
 Operator ID: CBW Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20161211-37708.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 12-Dec-2016 16:17:15 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: XAWRK002

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
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1 Perfluorobutanesulfonic acid	299.0 > 80.0	17.611	17.612	-0.001	1.000	6339861	155.1	11742
\$ 2 13C2 PFHxA	315.0 > 270.0	18.594	18.585	0.009	1.000	972997	12.5	31263
3 Perfluorohexanesulfonic acid	399.0 > 80.0	19.356	19.344	0.012	1.000	2990695	57.1	67257
4 Perfluoroheptanoic acid	363.0 > 319.0	19.392	19.380	0.012	1.000	1637743	20.2	42373
* 5 13C2-PFOA	415.0 > 370.0	20.059	20.047	0.012		666170	10.0	17435
6 Perfluorooctanoic acid	413.0 > 369.0	20.059	20.047	0.012	1.000	2855605	41.2	1261 E
7 Perfluorooctane sulfonic acid	499.0 > 80.0	20.620	20.619	0.001	1.000	4728335	77.7	17221
* 8 13C4 PFOS	503.0 > 80.0	20.679	20.679	0.0		1671691	28.7	43003
9 Perfluorononanoic acid	463.0 > 419.0	20.750	20.750	0.0	1.000	3157216	41.8	27718 E
\$ 10 13C2 PFDA	515.0 > 470.0	21.480	21.471	0.009	1.000	721634	12.4	22876

QC Flag Legend

Processing Flags

E - Exceeded Maximum Amount

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20161211-37708.b\11DEC2016A6A_032.d

Injection Date: 12-Dec-2016 02:21:11

Instrument ID: A6

Lims ID: LCS 320-140697/2-A

Client ID:

Operator ID: CBW

ALS Bottle#: 37

Worklist Smp#: 32

Injection Vol: 10.0 ul

Dil. Factor: 1.0000

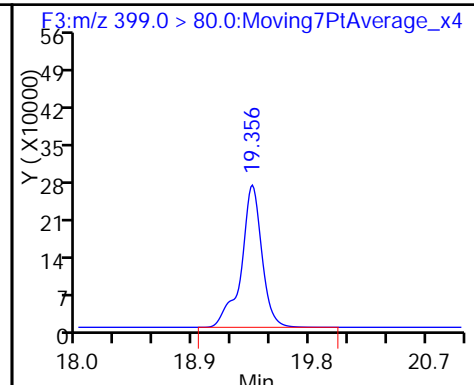
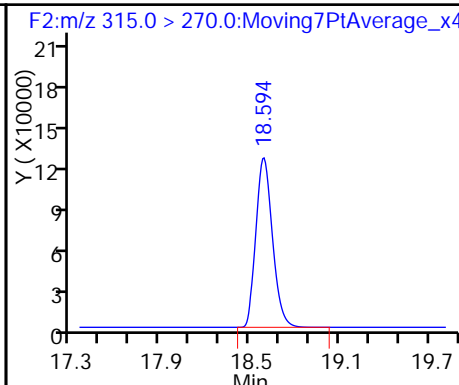
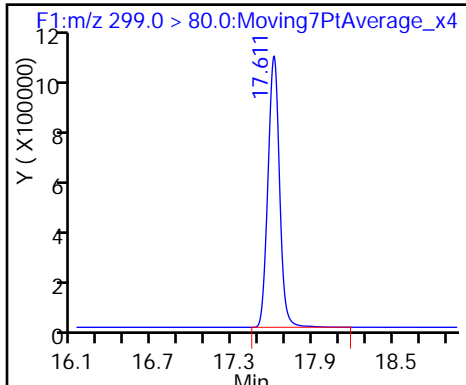
Method: 537_A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

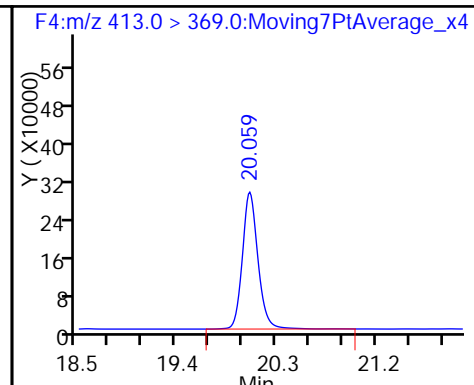
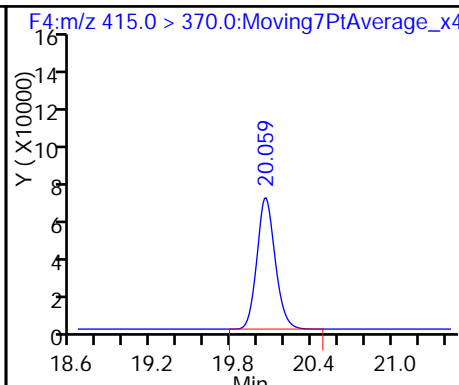
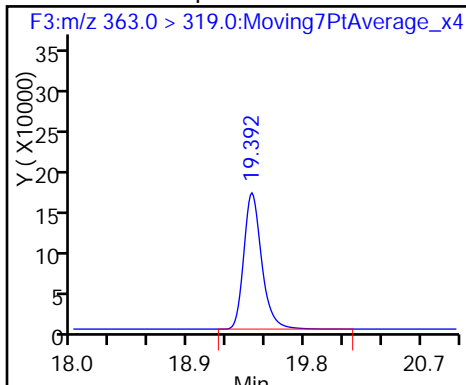
3 Perfluorohexanesulfonic acid



4 Perfluoroheptanoic acid

* 5 13C2-PFOA

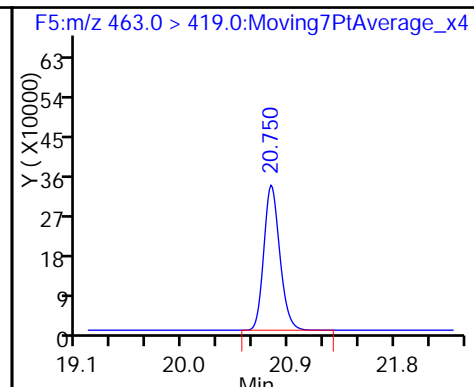
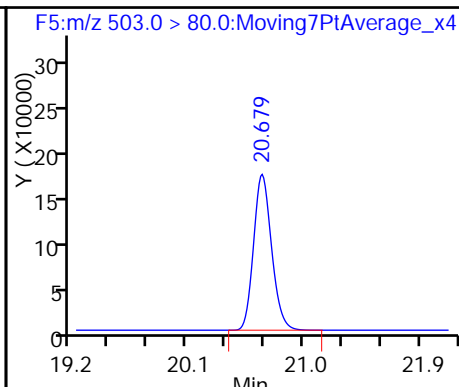
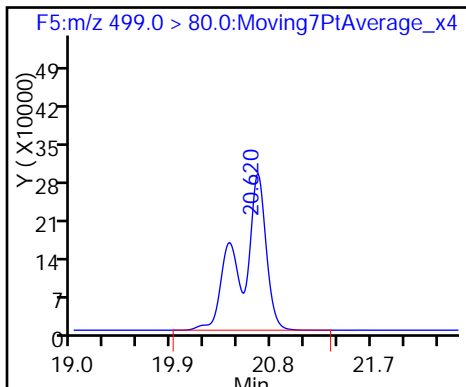
6 Perfluorooctanoic acid



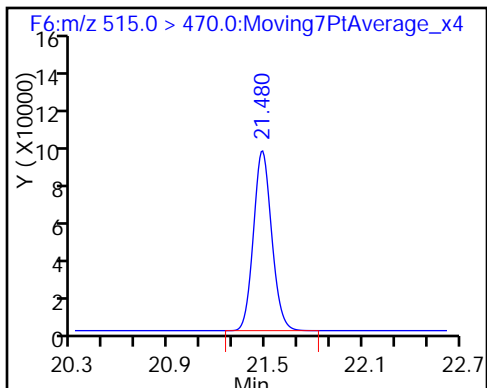
7 Perfluorooctane sulfonic acid

* 8 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161211-37708.b\11DEC2016A6A_032.d
 Lims ID: LCS 320-140697/2-A
 Client ID:
 Sample Type: LCS
 Inject. Date: 12-Dec-2016 02:21:11 ALS Bottle#: 37 Worklist Smp#: 32
 Injection Vol: 10.0 ul Dil. Factor: 1.0000
 Sample Info: lcs 320-140697/2-a
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
 Operator ID: CBW Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20161211-37708.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 12-Dec-2016 16:17:15 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: XAWRK002

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	12.5	125.21
\$ 10 13C2 PFDA	10.0	12.4	123.62

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-24007-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: LCSD 320-140697/3-A
 Matrix: Water Lab File ID: 11DEC2016A6A_033.d
 Analysis Method: 537 Date Collected: _____
 Extraction Method: 537 Date Extracted: 12/05/2016 19:07
 Sample wt/vol: 250 (mL) Date Analyzed: 12/12/2016 02:50
 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.: 141575 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.301		0.060	0.048	0.016
335-67-1	Perfluorooctanoic acid (PFOA)	0.149		0.030	0.024	0.0094
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.603		0.14	0.11	0.048

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	117		70-130
STL00996	13C2 PFDA	118		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161211-37708.b\11DEC2016A6A_033.d
 Lims ID: LCSD 320-140697/3-A
 Client ID:
 Sample Type: LCSD
 Inject. Date: 12-Dec-2016 02:50:47 ALS Bottle#: 38 Worklist Smp#: 33
 Injection Vol: 10.0 ul Dil. Factor: 1.0000
 Sample Info: lcsd 320-140697/3-a
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
 Operator ID: CBW Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20161211-37708.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 12-Dec-2016 16:17:15 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: XAWRK002

First Level Reviewer: barnettj Date: 12-Dec-2016 14:07:00

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

1 Perfluorobutanesulfonic acid	299.0 > 80.0	17.608	17.612	-0.004	1.000	6528601	150.8	54531
\$ 2 13C2 PFHxA	315.0 > 270.0	18.594	18.585	0.009	1.000	992146	11.7	31547
3 Perfluorohexanesulfonic acid	399.0 > 80.0	19.356	19.344	0.012	1.000	3071054	55.4	69140
4 Perfluoroheptanoic acid	363.0 > 319.0	19.391	19.380	0.011	1.000	1702000	19.3	29546
* 5 13C2-PFOA	415.0 > 370.0	20.058	20.047	0.011		726944	10.0	18764
6 Perfluorooctanoic acid	413.0 > 369.0	20.058	20.047	0.011	1.000	2816969	37.2	1090
7 Perfluorooctane sulfonic acid	499.0 > 80.0	20.619	20.619	0.0	1.000	4850814	75.3	17512
* 8 13C4 PFOS	503.0 > 80.0	20.679	20.679	0.0		1770414	28.7	36354
9 Perfluorononanoic acid	463.0 > 419.0	20.750	20.750	0.0	1.000	3256195	39.5	31227 E
\$ 10 13C2 PFDA	515.0 > 470.0	21.471	21.471	0.0	1.000	750922	11.8	23969

QC Flag Legend

Processing Flags

E - Exceeded Maximum Amount

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20161211-37708.b\11DEC2016A6A_033.d

Injection Date: 12-Dec-2016 02:50:47

Instrument ID: A6

Lims ID: LCSD 320-140697/3-A

Client ID:

Operator ID: CBW

ALS Bottle#: 38

Worklist Smp#: 33

Injection Vol: 10.0 ul

Dil. Factor: 1.0000

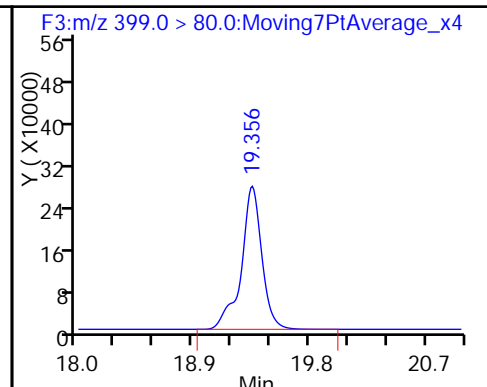
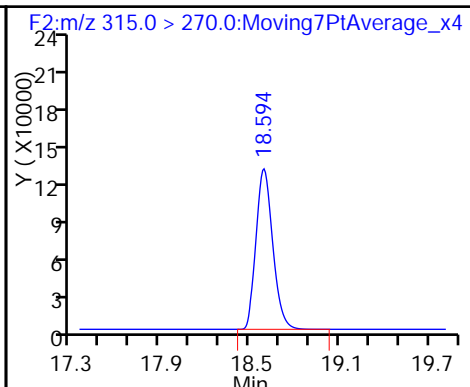
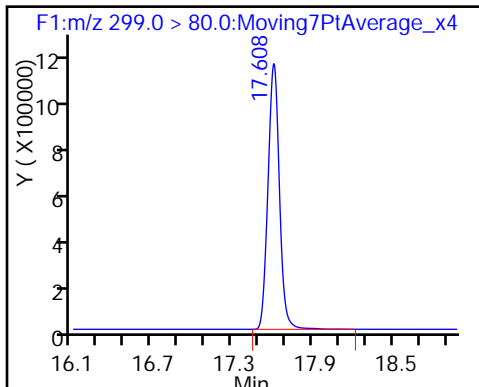
Method: 537_A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

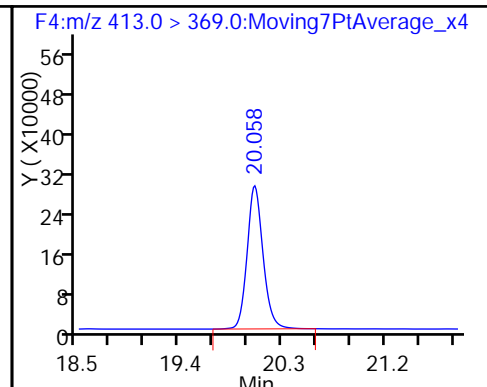
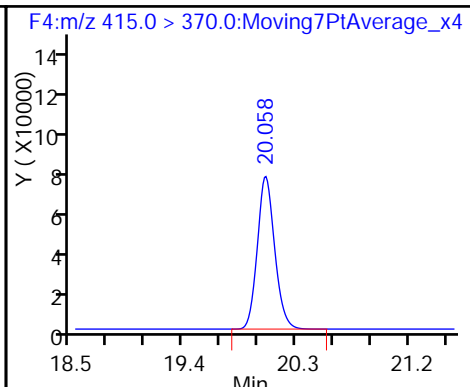
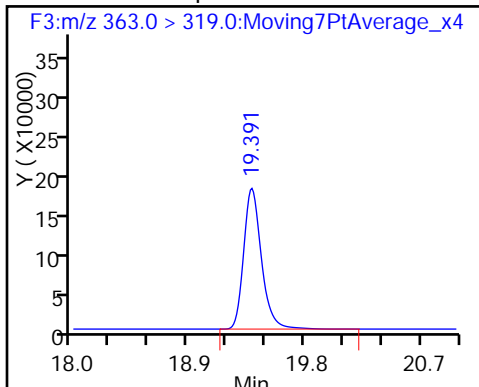
3 Perfluorohexanesulfonic acid



4 Perfluoroheptanoic acid

* 5 13C2-PFOA

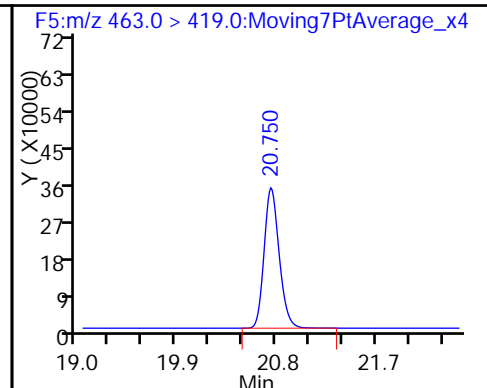
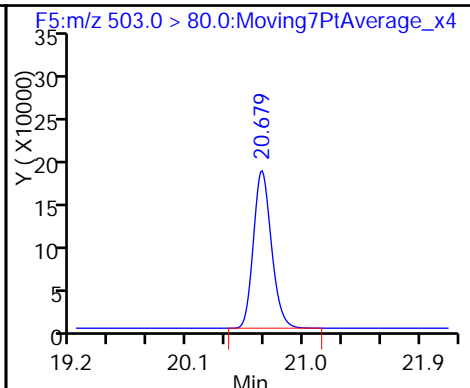
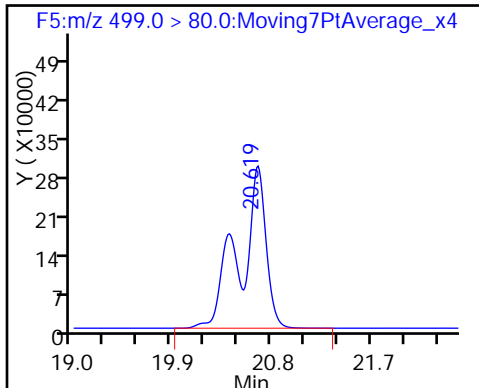
6 Perfluorooctanoic acid



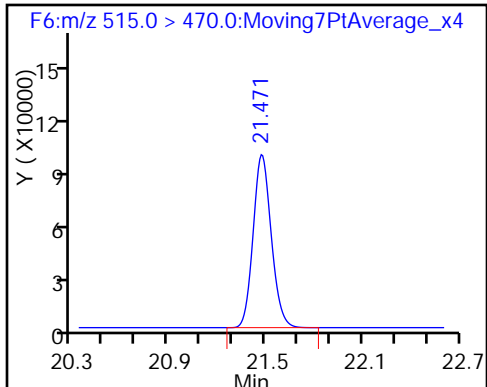
7 Perfluorooctane sulfonic acid

* 8 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161211-37708.b\11DEC2016A6A_033.d
 Lims ID: LCSD 320-140697/3-A
 Client ID:
 Sample Type: LCSD
 Inject. Date: 12-Dec-2016 02:50:47 ALS Bottle#: 38 Worklist Smp#: 33
 Injection Vol: 10.0 ul Dil. Factor: 1.0000
 Sample Info: lcsd 320-140697/3-a
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
 Operator ID: CBW Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20161211-37708.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 12-Dec-2016 16:17:15 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: XAWRK002

First Level Reviewer: barnettj Date: 12-Dec-2016 14:07:00

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	11.7	117.00
\$ 10 13C2 PFDA	10.0	11.8	117.88

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-24007-1

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_00 4.d	Acquity 2.1 (mm)
STD 320-140688/3 IC		12/05/2016 17:55	1	05DEC2016A6A_00 5.d	Acquity 2.1 (mm)
STD 320-140688/4 IC		12/05/2016 18:25	1	05DEC2016A6A_00 6.d	Acquity 2.1 (mm)
STD 320-140688/5 ICISAV		12/05/2016 18:54	1	05DEC2016A6A_00 7.d	Acquity 2.1 (mm)
STD 320-140688/6 IC		12/05/2016 19:24	1	05DEC2016A6A_00 8.d	Acquity 2.1 (mm)
STD 320-140688/7 IC		12/05/2016 19:54	1	05DEC2016A6A_00 9.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_01 1.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_01 3.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.: 320-24007-1

SDG No.: _____

Instrument ID: A6 Start Date: 12/11/2016 12:02

Analysis Batch Number: 141573 End Date: 12/11/2016 18:57

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-141573/3 CCVL		12/11/2016 12:02	1	11DEC2016A6A_00 3.d	Acquity 2.1(mm)
CCV 320-141573/4 CCVIS		12/11/2016 12:32	1		Acquity 2.1(mm)
ZZZZZ		12/11/2016 13:02	1		Acquity 2.1(mm)
ZZZZZ		12/11/2016 13:31	1		Acquity 2.1(mm)
ZZZZZ		12/11/2016 14:01	1		Acquity 2.1(mm)
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ZZZZZ		12/11/2016 15:00	1		Acquity 2.1(mm)
ZZZZZ		12/11/2016 15:30	1		Acquity 2.1(mm)
ZZZZZ		12/11/2016 15:59	1		Acquity 2.1(mm)
ZZZZZ		12/11/2016 16:29	1		Acquity 2.1(mm)
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ZZZZZ		12/11/2016 17:28	1		Acquity 2.1(mm)
ZZZZZ		12/11/2016 17:58	1		Acquity 2.1(mm)
CCV 320-141573/17 CCVIS		12/11/2016 18:57	1		Acquity 2.1(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-24007-1

SDG No.: _____

Instrument ID: A6 Start Date: 12/12/2016 00:52

Analysis Batch Number: 141575 End Date: 12/12/2016 07:17

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-141575/29 CCVIS		12/12/2016 00:52	1	11DEC2016A6A_02 9.d	Acquity 2.1(mm)
ZZZZZ		12/12/2016 01:21	1		Acquity 2.1(mm)
MB 320-140697/1-A		12/12/2016 01:51	1	11DEC2016A6A_03 1.d	Acquity 2.1(mm)
LCS 320-140697/2-A		12/12/2016 02:21	1	11DEC2016A6A_03 2.d	Acquity 2.1(mm)
LCSD 320-140697/3-A		12/12/2016 02:50	1	11DEC2016A6A_03 3.d	Acquity 2.1(mm)
ZZZZZ		12/12/2016 03:20	1		Acquity 2.1(mm)
ZZZZZ		12/12/2016 03:49	1		Acquity 2.1(mm)
ZZZZZ		12/12/2016 04:19	1		Acquity 2.1(mm)
ZZZZZ		12/12/2016 04:49	1		Acquity 2.1(mm)
ZZZZZ		12/12/2016 05:18	1		Acquity 2.1(mm)
ZZZZZ		12/12/2016 05:48	1		Acquity 2.1(mm)
ZZZZZ		12/12/2016 06:17	1		Acquity 2.1(mm)
CCV 320-141575/42 CCVIS		12/12/2016 07:17	1	11DEC2016A6A_04 2.d	Acquity 2.1(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-24007-1

SDG No.: _____

Instrument ID: A6 Start Date: 12/12/2016 07:17

Analysis Batch Number: 141576 End Date: 12/12/2016 10:14

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-141576/42 CCVIS		12/12/2016 07:17	1	11DEC2016A6A_04 2.d	Acquity 2.1(mm)
ZZZZZ		12/12/2016 07:46	1		Acquity 2.1(mm)
ZZZZZ		12/12/2016 08:16	1		Acquity 2.1(mm)
320-24007-1		12/12/2016 08:45	1	11DEC2016A6A_04 5.d	Acquity 2.1(mm)
320-24007-2		12/12/2016 09:15	1	11DEC2016A6A_04 6.d	Acquity 2.1(mm)
CCV 320-141576/48 CCVIS		12/12/2016 10:14	1	11DEC2016A6A_04 8.d	Acquity 2.1(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-24007-1

SDG No.: _____

Batch Number: 140697 Batch Start Date: 12/05/16 19:07 Batch Analyst: Marchenko, Veronika P

Batch Method: 537 Batch End Date: 12/06/16 18:16

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	ReceivedpH	LC537-HSP 00010
MB 320-140697/1		537, 537				250 mL	1.0 mL	7 SU	
LCS 320-140697/2		537, 537				250 mL	1.0 mL	7 SU	50 uL
LCSD 320-140697/3		537, 537				250 mL	1.0 mL	7 SU	50 uL
320-24007-A-1	WI-CV-3RW13-1216	537, 537	T	298.22 g	37.35 g	260.9 mL	1.0 mL	7 SU	
320-24007-A-2	WI-CV-3FB13-1216	537, 537	T	282.40 g	26.75 g	255.7 mL	1.0 mL	9 SU	

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-IS 00025	LC537-SU 00022	AnalysisComment			
MB 320-140697/1		537, 537		20 uL	50 uL	Chlorine ND			
LCS 320-140697/2		537, 537		20 uL	50 uL	Chlorine ND			
LCSD 320-140697/3		537, 537		20 uL	50 uL	Chlorine ND			
320-24007-A-1	WI-CV-3RW13-1216	537, 537	T	20 uL	50 uL	Chlorine ND			
320-24007-A-2	WI-CV-3FB13-1216	537, 537	T	20 uL	50 uL	Chlorine ND			

Batch Notes	
Manifold ID	2,4
Methanol ID	789820
Pipette ID	MD05306/MG0455
Analyst ID - IS Reagent Drop	ERW
Analyst ID - IS Reagent Drop Witness	NSH
Analyst ID - SU Reagent Drop	JER
Analyst ID - SU Reagent Drop Witness	VPM
Analyst ID - TA Reagent Drop	JER
Analyst ID - TA Reagent Drop Witness	VPM
SPE Cartridge ID	6332578-03
Trizma ID	SLBN2122V
Reagent Water ID	11/29/16

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.: 320-24007-1

SDG No.: _____

Batch Number: 140697 Batch Start Date: 12/05/16 19:07 Batch Analyst: Marchenko, Veronika P

Batch Method: 537 Batch End Date: 12/06/16 18:16

Basis	Basis Description
T	Total/NA

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

A6

Job No: 24005, 24007 Instrument ID & Date: 12-12-16 ICAL Batch: 140688
 Extraction Batch: 140697 Worklist #: 37708 TALS Batch: 141575, 141576, 141579

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

1st Level Reviewer / Date: JRB 12-13-16

2nd Level Reviewer / Date: MWay 12/13/16

NCM # and Comments: 72680, 7255, 72756, 72757
JRB 12-13-16

Instrument ID & Date: ^{AL6} 12-5-16 Worklist#: 37524

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

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

1st Level Reviewer / Date: JRB 12-6-16

2nd Level Reviewer / Date: R. [Signature] 12/7/16

NCM # and Comments: _____

TestAmerica Laboratories
Worklist QC Batch Report

Worklist Name: 11DEC2016A_A6 537 Worklist Number: 37708
 Instrument Name: A6 Chrom Method: 537_A6
 Data Directory: \\ChromNA\Sacramento\ChromData\A6\20161211-37708.b
 QC Batching: Enabled Limit Group Batching: Enabled

QC Batch: 1	LC 537 ICAL Raw Batch: 141573
# 1 RB	# 1 RB
# 2 RB	# 2 RB
# 3 CCV L2	# 3 CCV L2
# 4 CCV L5	# 4 CCV L5
# 5 RB	# 5 RB
# 6 MB 320-140632/1-A	# 6 MB 320-140632/1-A
# 7 LCS 320-140632/2-A	# 7 LCS 320-140632/2-A
# 8 LCSD 320-140632/3-A	# 8 LCSD 320-140632/3-A
# 9 320-23971-A-1-A	# 9 320-23971-A-1-A
#10 320-23971-A-2-A	#10 320-23971-A-2-A
#11 320-23971-A-3-A	#11 320-23971-A-3-A
#12 320-23971-A-4-A	#12 320-23971-A-4-A
#13 320-23971-A-5-A	#13 320-23971-A-5-A
#14 320-23971-B-6-A	#14 320-23971-B-6-A
#15 320-23971-A-7-A	#15 320-23971-A-7-A
#16 RB	#16 RB
#17 CCV L3	#17 CCV L3

QC Batch: 2	LC 537 ICAL Raw Batch: 141574
#17 CCV L3	#17 CCV L3
#18 RB	#18 RB
#19 320-23971-A-8-A	#19 320-23971-A-8-A
#20 320-23971-A-9-A	#20 320-23971-A-9-A
#21 320-23971-A-10-A	#21 320-23971-A-10-A
#22 320-23970-A-1-A	#22 320-23970-A-1-A
#23 320-23970-A-2-A	#23 320-23970-A-2-A
#24 320-23970-A-3-A	#24 320-23970-A-3-A
#25 320-23970-A-4-A	#25 320-23970-A-4-A
#26 320-23970-A-5-A	#26 320-23970-A-5-A
#27 320-23970-A-6-A	#27 320-23970-A-6-A
#28 RB	#28 RB
#29 CCV L5	#29 CCV L5

QC Batch: 3	LC 537 ICAL Raw Batch: 141575
#29 CCV L5	#29 CCV L5
#30 RB	#30 RB
#31 MB 320-140697/1-A	#31 MB 320-140697/1-A
#32 LCS 320-140697/2-A	#32 LCS 320-140697/2-A
#33 LCSD 320-140697/3-A	#33 LCSD 320-140697/3-A
#34 320-24005-A-1-A	#34 320-24005-A-1-A
#35 320-24005-A-2-A	#35 320-24005-A-2-A
#36 320-24005-A-3-A	#36 320-24005-A-3-A
#37 320-24005-A-4-A	#37 320-24005-A-4-A
#38 320-24005-A-5-A	#38 320-24005-A-5-A
#39 320-24005-A-6-A	#39 320-24005-A-6-A
#40 320-24005-A-7-A	#40 320-24005-A-7-A
#41 RB	#41 RB
#42 CCV L3	#42 CCV L3

is out confirmed on rerun.
is out. Rerun is good.

QC Batch: 4	LC 537 ICAL Raw Batch: 141576
#42 CCV L3	#42 CCV L3
#43 RB	#43 RB
#44 320-24005-A-8-A	#44 320-24005-A-8-A
#45 320-24007-A-1-A	#45 320-24007-A-1-A
#46 320-24007-A-2-A	#46 320-24007-A-2-A
#47 RB	#47 RB
#48 CCV L5	#48 CCV L5

*I.S. out. Rerun is good
Sur out. Rerun confirms*

QC Batch: 5	LC 537 ICAL Raw Batch: 141577
#48 CCV L5	#48 CCV L5
#49 RB	#49 RB
#50 320-23719-A-4-A	#50 320-23719-A-4-A
#51 320-23719-A-5-A	#51 320-23719-A-5-A
#52 320-23719-A-6-A	#52 320-23719-A-6-A
#53 320-23719-A-7-A	#53 320-23719-A-7-A
#54 320-23719-A-8-A	#54 320-23719-A-8-A
#55 320-23719-A-9-A	#55 320-23719-A-9-A
#56 320-23720-A-1-A	#56 320-23720-A-1-A
#57 320-23720-A-2-A	#57 320-23720-A-2-A
#58 320-23721-A-1-A	#58 320-23721-A-1-A
#59 320-23722-A-1-A	#59 320-23722-A-1-A
#60 RB	#60 RB
#61 CCV L3	#61 CCV L3

QC Batch: 6	LC 537 ICAL Raw Batch: 141758
#61 CCV L3	#61 CCV L3
#79 RB	#79 RB
#62 320-23928-A-15-A	#62 320-23928-A-15-A
#63 320-23928-A-28-A	#63 320-23928-A-28-A
#64 320-23928-A-25-D MS	#64 320-23928-A-25-D MS
#65 320-23928-A-25-D MS	#65 320-23928-A-25-D MS
#66 320-23928-A-27-D MS	#66 320-23928-A-27-D MS
#67 320-23928-A-27-A	#67 320-23928-A-27-A
#68 320-23928-A-27-D MS	#68 320-23928-A-27-D MS
#69 320-23970-A-1-A	#69 320-23970-A-1-A
#70 RB	#70 RB
#71 CCV L5	#71 CCV L5

QC Batch: 7	LC 537 ICAL Raw Batch: 141759
#71 CCV L5	#71 CCV L5
#72 RB	#72 RB
#73 320-24005-A-1-A	#73 320-24005-A-1-A
#74 320-24005-A-3-A	#74 320-24005-A-3-A
#75 320-24005-A-8-A	#75 320-24005-A-8-A
#76 320-24007-A-1-A	#76 320-24007-A-1-A
#77 RB	#77 RB
#78 CCV L3	#78 CCV L3
#80 RB	#80 RB

11 pushes

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-140697

Method Code: 320-537_Prep-320

Analyst: Marchenko, Veronika P

Batch Open: 12/5/2016 7:07:00PM

Batch End: 12/09/16 18:16

Screened A4 12/7/16

No dilutions needed

AC 12/11/16

Extraction of Perfluorinated Alkyl Acids

Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmnt FinAmnt	PHs		Due Date	Analytical TAT	Div Rank	Comments	Output Sample Lab ID
				Rcvd	Adj1					
1 MB-320-140697/1 N/A	N/A		250 mL 1.0 mL	7		N/A	N/A	N/A	Chlorine ND	MB 320-140697/1-A
2 LCS-320-140697/2 N/A	N/A		250 mL 1.0 mL	7		N/A	N/A	N/A	Chlorine ND	LCS 320-140697/2-A
3 LCSD-320-140697/3 N/A	N/A		250 mL 1.0 mL	7		N/A	N/A	N/A	Chlorine ND	LCSD 320-140697/3-A
4 320-24005-A-1 (537_DOD5)	N/A (320-24005-1)	300.83 g 38.38 g	262.5 mL 1.0 mL	7		12/9/16	5_Days	4	Chlorine ND	320-24005-A-1-A
5 320-24005-A-2 (537_DOD5)	N/A (320-24005-1)	281.15 g 26.45 g	254.7 mL 1.0 mL	9		12/9/16	5_Days	4	Chlorine ND	320-24005-A-2-A
6 320-24005-A-3 (537_DOD5)	N/A (320-24005-1)	303.21 g 37.75 g	265.5 mL 1.0 mL	7		12/9/16	5_Days	4	Chlorine ND	320-24005-A-3-A
7 320-24005-A-4 (537_DOD5)	N/A (320-24005-1)	300.88 g 26.91 g	274 mL 1.0 mL	9		12/9/16	5_Days	4	Chlorine ND	320-24005-A-4-A
8 320-24005-A-5 (537_DOD5)	N/A (320-24005-1)	260.19 g 25.92 g	234.3 mL 1.0 mL	7		12/9/16	5_Days	4	Chlorine ND	320-24005-A-5-A
9 320-24005-A-6 (537_DOD5)	N/A (320-24005-1)	278.12 g 26.74 g	251.4 mL 1.0 mL	9		12/9/16	5_Days	4	Chlorine ND	320-24005-A-6-A
10 320-24005-A-7 (537_DOD5)	N/A (320-24005-1)	297.94 g 38.11 g	259.8 mL 1.0 mL	7		12/9/16	5_Days	4	Chlorine ND	320-24005-A-7-A

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

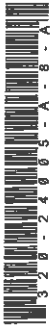


Batch Number: 320-140697

Analyst: Marchenko, Veronika P

Batch Open: 12/5/2016 7:07:00PM

Method Code: 320-537_Prep-320

Batch End:

ID	Sample ID	Weight (g)	Volume (mL)	Days	Date	Chlorine ND	Barcode
11	320-24005-A-8 (537_DOD5)	280.94 g 26.81 g	254.1 mL 1.0 mL	4	12/9/16	Chlorine ND	
12	320-24007-A-1 (537_DOD5)	298.22 g 87.35 g	260.9 mL 1.0 mL	4	12/9/16	Chlorine ND	
13	320-24007-A-2 (537_DOD5)	282.40 g 26.75 g	255.7 mL 1.0 mL	4	12/9/16	Chlorine ND	

Batch Notes

Manifold ID 2,4
 Trizma ID SLBN2122V
 SPE Cartridge ID 6332578-03
 Methanol ID 789820
 Reagent Water ID 11/29/16
 Pipette ID MD05306/MG0455
 Analyst ID - TA Reagent Drop JER
 Analyst ID - TA Reagent Drop Witness VPM
 Analyst ID - SU Reagent Drop JER
 Analyst ID - SU Reagent Drop Witness NSH
 Analyst ID - IS Reagent Drop ERW 12/6/16
 Analyst ID - IS Reagent Drop Witness
 Batch Comment

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Analyst: Marchenko, Veronika P

Batch Number: 320-140697

Method Code: 320-537_Prep-320

Batch Open: 12/5/2016 7:07:00PM

Batch End:

Comments

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Analyst: Marchenko, Veronika P

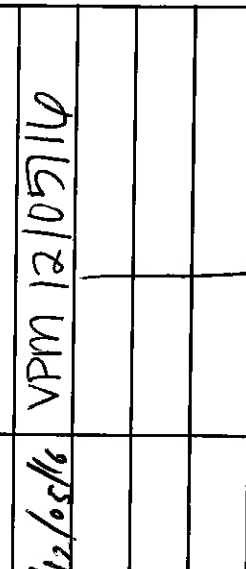
Batch Number: 320-140697

Method Code: 320-537_Prep-320

Batch Open: 12/5/2016 7:07:00PM

Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-140697/1	LC537-SU_00022	50 uL	1.0 mL		VPM 12/05/16
LCS 320-140697/2	LC537-HSP_00010	50 uL	1.0 mL		
LCS 320-140697/2	LC537-SU_00022	50 uL	1.0 mL		
LCSD 320-140697/3	LC537-HSP_00010	50 uL	1.0 mL		
LCSD 320-140697/3	LC537-SU_00022	50 uL	1.0 mL		
320-24005-A-1	LC537-SU_00022	50 uL	1.0 mL		
320-24005-A-2	LC537-SU_00022	50 uL	1.0 mL		
320-24005-A-3	LC537-SU_00022	50 uL	1.0 mL		
320-24005-A-4	LC537-SU_00022	50 uL	1.0 mL		
320-24005-A-5	LC537-SU_00022	50 uL	1.0 mL		
320-24005-A-6	LC537-SU_00022	50 uL	1.0 mL		
320-24005-A-7	LC537-SU_00022	50 uL	1.0 mL		
320-24005-A-8	LC537-SU_00022	50 uL	1.0 mL		
320-24007-A-1	LC537-SU_00022	50 uL	1.0 mL		
320-24007-A-2	LC537-SU_00022	50 uL	1.0 mL		

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Analyst: Marchenko, Veronika P

Batch Number: 320-140697

Method Code: 320-537_Prep-320

Batch Open: 12/5/2016 7:07:00PM

Batch End:

Reagent	Other Reagents: Amount/Units	Lot#:
LC537-IS-00025	20 μ L	
exp. 3/19/17		
0.5-1.434 μ g/ μ L		

Preparation Batch Number(s): 140697 Test: 5370005 (L) PUSH
 Earliest Holding Time: 12/15/16

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

1st Level Reviewer: VPM

Date: 12/16/16

2nd Level Reviewer: ERW

Date: 12/6/16

Comments: _____

Shipping and Receiving Documents

West Sacramento, CA 95605
phone 916.373.5600 fax

TestAmerica Laboratories, Inc.
COC No: 44 of 1 COCs

Regulatory Program: DW NPDES RCRA Other:


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

Site Contact: **Eric Epple**
Lab Contact: **Laura Turpen**

Date: **12/21/2016**
Carrier: **FedEx**

Client Contact
Tiffany Hill
Project Chemist
1100 NE Circle Blvd Ste 300 Corvallis, OR 97330
(541) 768-3109
(541) 908-3794
Project Name: CTO-08
Site: OLF Coupeville
P O #: 100067106050 - 679580.09.F.I.F.S

Analysis Turnaround Time
 CALENDAR DAYS WORKING DAYS
TAT if different from Below 7-Day _____
 2 weeks
 1 week
 2 days
 1 day

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Performance MS/MSD (Y/N)	USEPA Method 537 (PFOA, PFOS, and PFBS)	Sample Specific Notes:	
WI-CV-3RW13-1216	12/1/16	0912	G	DW	2	N	N	X		
WI-CV-3FB13-1216	12/1/16	0913	G	DW	2	N	N	X		
 320-24007 Chain of Custody										
						6				

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

Return to Client Disposal by Lab Archive for _____ Months

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

Special Instructions/QC Requirements & Comments:

Custody Seals Intact: Yes No

Relinquished by: Eric Epple Company: CH2M Date/Time: 12-2-16/1600

Relinquished by: Hi Zeigami Company: TAMS Date/Time: 12/3/16

Relinquished by: _____ Company: _____ Date/Time: _____

Cooler Temp. (°C): Obs'd: 2.0 Therm ID No.: 12

Login Sample Receipt Checklist

Client: CH2M Hill Constructors, Inc.

Job Number: 320-24007-1

Login Number: 24007
List Number: 1
Creator: Edman, Connor M

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	

Case No.	Case Name	Case ID	Case Description	Case Type	Case Status	Case Date	Case Location	Case Agent	Case Manager	Case Owner	Case Assignee	Case Category	Case Sub-Category	Case Priority	Case Urgency	Case Resolution	Case Duration	Case Cost	Case Budget	Case Revenue	Case Profit	Case Margin	Case ROI	Case NPV	Case IRR	Case Payback	Case Break-Even	Case Risk	Case Sensitivity	Case Scenario	Case Assumption	Case Note	Case Comment	Case Attachment	Case Link	Case Email	Case Phone	Case Fax	Case Address	Case City	Case State	Case Zip	Case Country	Case Language	Case Currency	Case Timezone	Case Calendar	Case Holiday	Case Weekend	Case Public	Case Private	Case Archived	Case Deleted	Case Recycled	Case Soft Deleted	Case Hard Deleted	Case Purged	Case Expired	Case Expired Date	Case Expired Reason	Case Expired Action	Case Expired Date	Case Expired Reason	Case Expired Action
1	Case 1	1000000001	Case 1 Description	Case Type 1	Case Status 1	2023-01-01	Case Location 1	Case Agent 1	Case Manager 1	Case Owner 1	Case Assignee 1	Case Category 1	Case Sub-Category 1	Case Priority 1	Case Urgency 1	Case Resolution 1	Case Duration 1	Case Cost 1	Case Budget 1	Case Revenue 1	Case Profit 1	Case Margin 1	Case ROI 1	Case Payback 1	Case Break-Even 1	Case Risk 1	Case Sensitivity 1	Case Scenario 1	Case Assumption 1	Case Note 1	Case Comment 1	Case Attachment 1	Case Link 1	Case Email 1	Case Phone 1	Case Fax 1	Case Address 1	Case City 1	Case State 1	Case Zip 1	Case Country 1	Case Language 1	Case Currency 1	Case Timezone 1	Case Calendar 1	Case Holiday 1	Case Weekend 1	Case Public 1	Case Private 1	Case Archived 1	Case Deleted 1	Case Recycled 1	Case Soft Deleted 1	Case Hard Deleted 1	Case Purged 1	Case Expired 1	Case Expired Date 1	Case Expired Reason 1	Case Expired Action 1	Case Expired Date 1	Case Expired Reason 1	Case Expired Action 1		

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

Client: CH2M HILL, Inc., Corvallis, Oregon
SDG: 320-24007
Laboratory: Test America, Sacramento, California
Site: Whidbey Island, CTO-0008, Washington
Date: December 21, 2016

PFCs			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-CV-3RW13-1216	320-24007-1	Water
2	WI-CV-3FB13-1216	320-24007-2	Water

A full data validation was performed on the analytical data for one water sample and one aqueous field blank sample collected on December 1, 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
PFCs

Method References
USEPA Method 537 Rev 1.1 Modified

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

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

The following data quality indicators were reviewed for this report:

Organics

- Date Completeness, Case Narrative & Custody Documentation
- Holding times
- Gas Chromatography/Mass Spectrometry (GC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination

- Surrogate Spike recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

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

Data Usability Assessment

There were no rejections of data.

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

Perfluorinated Compounds (PFCs)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. 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 percent difference (%D) 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 sample was free of contamination.

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate %R values except for the following.

Sample ID	Surrogate	%R	Qualifier
1	13C2-PFHxA	131%	None - Sample ND
	13C2-PFDA	136%	

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. No action was required.

Field Duplicate Sample Precision

- Field duplicate samples were free of contamination.

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

Signed: Nancy Weaver
Nancy Weaver
Senior Chemist

Dated: 12/21/16

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.: 320-24007-1
 SDG No.: _____
 Client Sample ID: WI-CV-3RW13-1216 Lab Sample ID: 320-24007-1
 Matrix: Water Lab File ID: 11DEC2016A6A_045.d
 Analysis Method: 537 Date Collected: 12/01/2016 09:12
 Extraction Method: 537 Date Extracted: 12/05/2016 19:07
 Sample wt/vol: 260.9(mL) Date Analyzed: 12/12/2016 08:45
 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.: 141576 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.046	U	0.057	0.046	0.015
335-67-1	Perfluorooctanoic acid (PFOA)	0.023	U	0.029	0.023	0.0090
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.13	0.11	0.046

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	131	Q	70-130
STL00996	13C2 PFDA	136	Q	70-130

NWZ/21/14

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

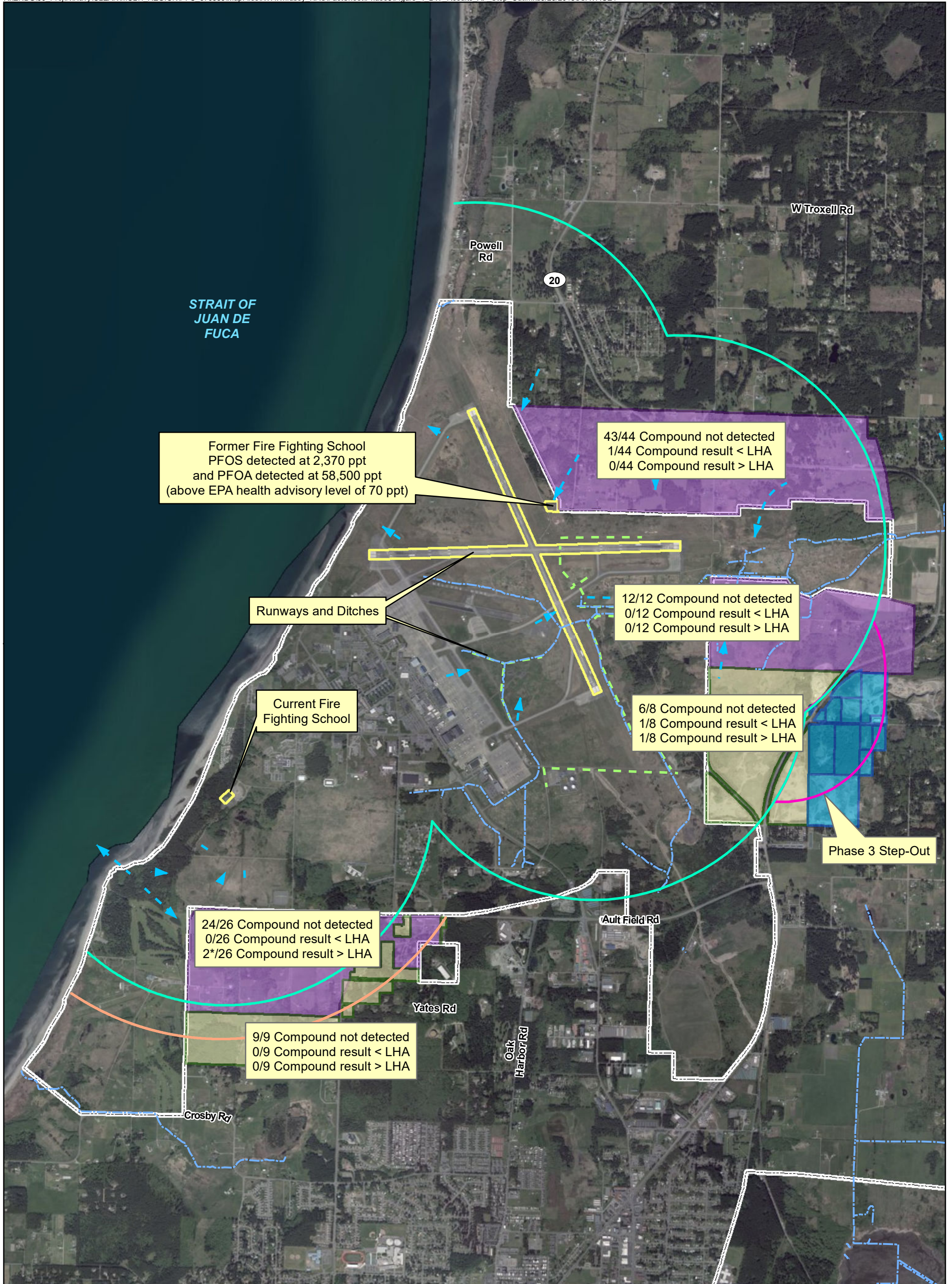
2

Lab Name: <u>TestAmerica Sacramento</u>	Job No.: <u>320-24007-1</u>
SDG No.: _____	
Client Sample ID: <u>WI-CV-3FB13-1216</u>	Lab Sample ID: <u>320-24007-2</u>
Matrix: <u>Water</u>	Lab File ID: <u>11DEC2016A6A_046.d</u>
Analysis Method: <u>537</u>	Date Collected: <u>12/01/2016 09:13</u>
Extraction Method: <u>537</u>	Date Extracted: <u>12/05/2016 19:07</u>
Sample wt/vol: <u>255.7(mL)</u>	Date Analyzed: <u>12/12/2016 09:15</u>
Con. Extract Vol.: <u>1.0(mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>10(uL)</u>	GC Column: <u>Acquity</u> ID: <u>2.1(mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>141576</u>	Units: <u>ug/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.047	U	0.059	0.047	0.015
335-67-1	Perfluorooctanoic acid (PFOA)	0.023	U	0.029	0.023	0.0092
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.14	0.11	0.047

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	118		70-130
STL00996	13C2 PFDA	117		70-130

12/12/16



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

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

Runways and Ditches

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

Current Fire Fighting School

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

Phase 3 Step-Out

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

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

Legend

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

- Base Boundary
- - - Inferred Groundwater Flow Direction

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

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



0 0.225 0.45
 Miles

1 inch = 0.45 mile
 Imagery Source: Esri

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