



**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 320-24311**

*Outlying Landing Field Coupeville
Naval Air Station Whidbey Island
Coupeville, Washington*

February 2019

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

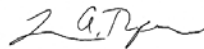
ANALYTICAL REPORT

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TestAmerica Sacramento
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TestAmerica Job ID: 320-24311-1
Client Project/Site: Whidbey Island

For:
CH2M Hill Constructors, Inc.
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Attn: Tiffany Hill



Authorized for release by:
12/29/2016 10:09:18 AM

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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: 320-24311-1

Qualifiers

LCMS

Qualifier	Qualifier Description
U	Undetected at the Limit of Detection.
M	Manual integrated compound.
D	The reported value is from a dilution.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
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: 320-24311-1

Job ID: 320-24311-1

Laboratory: TestAmerica Sacramento

Narrative

CASE NARRATIVE

Client: CH2M Hill Constructors, Inc.

Project: Whidbey Island

Report Number: 320-24311-1

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 12/13/2016; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 1.5 C.

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

Receipt Exceptions

The container labels for the following samples did not match the information listed on the Chain-of-Custody (COC): WI-CV-1RW32-1216 (320-24311-1) and WI-CV-1FB32-1216 (320-24311-2). The labels for sample WI-CV-1RW32-1216 list the time as 14:15, while the COC lists the time as 12:49. The labels for sample WI-CV-1FB32-1216 list the time as 14:16, while the COC lists the time as 12:51. The client requested that the sample times be logged in according to the times on the sample labels.

Case Narrative

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

TestAmerica Job ID: 320-24311-1

Job ID: 320-24311-1 (Continued)

Laboratory: TestAmerica Sacramento (Continued)

PFOA/PFOS

Samples WI-CV-1RW32-1216 (320-24311-1), WI-CV-1FB32-1216 (320-24311-2), WI-CV-1RW33-1216 (320-24311-3), WI-CV-1FB33-1216 (320-24311-4), WI-CV-1RW34-1216 (320-24311-5) and WI-CV-1FB34-1216 (320-24311-6) were analyzed for PFOA/PFOS in accordance with 537. The samples were prepared on 12/14/2016 and analyzed on 12/28/2016.

Sample WI-CV-1RW34-1216 (320-24311-5)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

The following sample was centrifuged prior to spiking/extraction: WI-CV-1RW32-1216 (320-24311-1)

The aqueous portion of the following sample was decanted prior to spiking/extraction, due to containing excess sediment on the bottom of the original bottle: WI-CV-1RW33-1216 (320-24311-3)

The concentration of Perfluorooctanoic acid (PFOA) in the Laboratory Control Sample (LCS) was greater than the upper calibration range. This is due to the LCS being spike at the high level, as per the method guidelines. (LCS 320-142201/2-A)

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-142201.

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



Detection Summary

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

TestAmerica Job ID: 320-24311-1

Client Sample ID: WI-CV-1RW32-1216

Lab Sample ID: 320-24311-1

No Detections.

Client Sample ID: WI-CV-1FB32-1216

Lab Sample ID: 320-24311-2

No Detections.

Client Sample ID: WI-CV-1RW33-1216

Lab Sample ID: 320-24311-3

No Detections.

Client Sample ID: WI-CV-1FB33-1216

Lab Sample ID: 320-24311-4

No Detections.

Client Sample ID: WI-CV-1RW34-1216

Lab Sample ID: 320-24311-5

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanesulfonic acid (PFBS)	0.061	J	0.14	0.048	ug/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA) - DL	0.66	D	0.30	0.095	ug/L	10		537	Total/NA

Client Sample ID: WI-CV-1FB34-1216

Lab Sample ID: 320-24311-6

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: 320-24311-1

Client Sample ID: WI-CV-1RW32-1216

Date Collected: 12/09/16 14:15

Date Received: 12/13/16 10:05

Lab Sample ID: 320-24311-1

Matrix: Water

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.049	U	0.061	0.016	ug/L		12/14/16 15:24	12/28/16 02:24	1
Perfluorooctanoic acid (PFOA)	0.024	U	0.030	0.0095	ug/L		12/14/16 15:24	12/28/16 02:24	1
Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.14	0.048	ug/L		12/14/16 15:24	12/28/16 02:24	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	113		70 - 130				12/14/16 15:24	12/28/16 02:24	1
13C2 PFDA	105		70 - 130				12/14/16 15:24	12/28/16 02:24	1

Client Sample ID: WI-CV-1FB32-1216

Date Collected: 12/09/16 14:16

Date Received: 12/13/16 10:05

Lab Sample ID: 320-24311-2

Matrix: Water

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.048	U	0.060	0.016	ug/L		12/14/16 15:24	12/28/16 02:53	1
Perfluorooctanoic acid (PFOA)	0.024	U M	0.030	0.0094	ug/L		12/14/16 15:24	12/28/16 02:53	1
Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.14	0.048	ug/L		12/14/16 15:24	12/28/16 02:53	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	115		70 - 130				12/14/16 15:24	12/28/16 02:53	1
13C2 PFDA	113		70 - 130				12/14/16 15:24	12/28/16 02:53	1

Client Sample ID: WI-CV-1RW33-1216

Date Collected: 12/10/16 09:14

Date Received: 12/13/16 10:05

Lab Sample ID: 320-24311-3

Matrix: Water

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.047	U	0.058	0.015	ug/L		12/14/16 15:24	12/28/16 03:23	1
Perfluorooctanoic acid (PFOA)	0.023	U	0.029	0.0091	ug/L		12/14/16 15:24	12/28/16 03:23	1
Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.14	0.046	ug/L		12/14/16 15:24	12/28/16 03:23	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	101		70 - 130				12/14/16 15:24	12/28/16 03:23	1
13C2 PFDA	110		70 - 130				12/14/16 15:24	12/28/16 03:23	1

Client Sample ID: WI-CV-1FB33-1216

Date Collected: 12/10/16 09:15

Date Received: 12/13/16 10:05

Lab Sample ID: 320-24311-4

Matrix: Water

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.049	U	0.061	0.016	ug/L		12/14/16 15:24	12/28/16 03:53	1
Perfluorooctanoic acid (PFOA)	0.024	U	0.030	0.0096	ug/L		12/14/16 15:24	12/28/16 03:53	1
Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.14	0.048	ug/L		12/14/16 15:24	12/28/16 03:53	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	114		70 - 130				12/14/16 15:24	12/28/16 03:53	1
13C2 PFDA	109		70 - 130				12/14/16 15:24	12/28/16 03:53	1

TestAmerica Sacramento

Client Sample Results

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

TestAmerica Job ID: 320-24311-1

Client Sample ID: WI-CV-1RW34-1216

Lab Sample ID: 320-24311-5

Date Collected: 12/10/16 09:40

Matrix: Water

Date Received: 12/13/16 10:05

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.048	U M	0.060	0.016	ug/L	-	12/14/16 15:24	12/28/16 05:21	1
Perfluorobutanesulfonic acid (PFBS)	0.061	J	0.14	0.048	ug/L	-	12/14/16 15:24	12/28/16 05:21	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	109		70 - 130				12/14/16 15:24	12/28/16 05:21	1
13C2 PFDA	125		70 - 130				12/14/16 15:24	12/28/16 05:21	1

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.66	D	0.30	0.095	ug/L	-	12/14/16 15:24	12/28/16 04:22	10
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	99		70 - 130				12/14/16 15:24	12/28/16 04:22	10
13C2 PFDA	113		70 - 130				12/14/16 15:24	12/28/16 04:22	10

Client Sample ID: WI-CV-1FB34-1216

Lab Sample ID: 320-24311-6

Date Collected: 12/10/16 09:41

Matrix: Water

Date Received: 12/13/16 10:05

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.048	U	0.060	0.015	ug/L	-	12/14/16 15:24	12/28/16 04:52	1
Perfluorooctanoic acid (PFOA)	0.024	U M	0.030	0.0094	ug/L	-	12/14/16 15:24	12/28/16 04:52	1
Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.14	0.047	ug/L	-	12/14/16 15:24	12/28/16 04:52	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	102		70 - 130				12/14/16 15:24	12/28/16 04:52	1
13C2 PFDA	97		70 - 130				12/14/16 15:24	12/28/16 04:52	1

Surrogate Summary

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

TestAmerica Job ID: 320-24311-1

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

Matrix: Water

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)	
		3C2 PFHx (70-130)	3C2 PFDA (70-130)
320-24311-1	WI-CV-1RW32-1216	113	105
320-24311-2	WI-CV-1FB32-1216	115	113
320-24311-3	WI-CV-1RW33-1216	101	110
320-24311-4	WI-CV-1FB33-1216	114	109
320-24311-5 - DL	WI-CV-1RW34-1216	99	113
320-24311-5	WI-CV-1RW34-1216	109	125
320-24311-6	WI-CV-1FB34-1216	102	97
LCS 320-142201/2-A	Lab Control Sample	121	119
LCSD 320-142201/3-A	Lab Control Sample Dup	118	114
MB 320-142201/1-A	Method Blank	110	104

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: 320-24311-1

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

Lab Sample ID: MB 320-142201/1-A
Matrix: Water
Analysis Batch: 144052

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 142201

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		12/14/16 15:24	12/28/16 00:55	1
Perfluorooctanoic acid (PFOA)	0.024	U	0.030	0.0094	ug/L		12/14/16 15:24	12/28/16 00:55	1
Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.14	0.048	ug/L		12/14/16 15:24	12/28/16 00:55	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	110		70 - 130	12/14/16 15:24	12/28/16 00:55	1
13C2 PFDA	104		70 - 130	12/14/16 15:24	12/28/16 00:55	1

Lab Sample ID: LCS 320-142201/2-A
Matrix: Water
Analysis Batch: 144052

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 142201

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Perfluorooctanesulfonic acid (PFOS)	0.300	0.273		ug/L		91	70 - 130
Perfluorooctanoic acid (PFOA)	0.146	0.158	E	ug/L		108	70 - 130
Perfluorobutanesulfonic acid (PFBS)	0.673	0.550		ug/L		82	70 - 130

Surrogate	LCS %Recovery	LCS Qualifier	Limits
13C2 PFHxA	121		70 - 130
13C2 PFDA	119		70 - 130

Lab Sample ID: LCSD 320-142201/3-A
Matrix: Water
Analysis Batch: 144052

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 142201

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	Limits	RPD	RPD Limit
Perfluorooctanesulfonic acid (PFOS)	0.300	0.277		ug/L		92	70 - 130	2	30
Perfluorooctanoic acid (PFOA)	0.146	0.151		ug/L		103	70 - 130	5	30
Perfluorobutanesulfonic acid (PFBS)	0.673	0.555		ug/L		82	70 - 130	1	30

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
13C2 PFHxA	118		70 - 130
13C2 PFDA	114		70 - 130

QC Association Summary

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

TestAmerica Job ID: 320-24311-1

LCMS

Prep Batch: 142201

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-24311-1	WI-CV-1RW32-1216	Total/NA	Water	537	
320-24311-2	WI-CV-1FB32-1216	Total/NA	Water	537	
320-24311-3	WI-CV-1RW33-1216	Total/NA	Water	537	
320-24311-4	WI-CV-1FB33-1216	Total/NA	Water	537	
320-24311-5 - DL	WI-CV-1RW34-1216	Total/NA	Water	537	
320-24311-5	WI-CV-1RW34-1216	Total/NA	Water	537	
320-24311-6	WI-CV-1FB34-1216	Total/NA	Water	537	
MB 320-142201/1-A	Method Blank	Total/NA	Water	537	
LCS 320-142201/2-A	Lab Control Sample	Total/NA	Water	537	
LCSD 320-142201/3-A	Lab Control Sample Dup	Total/NA	Water	537	

Analysis Batch: 144052

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-24311-1	WI-CV-1RW32-1216	Total/NA	Water	537	142201
320-24311-2	WI-CV-1FB32-1216	Total/NA	Water	537	142201
320-24311-3	WI-CV-1RW33-1216	Total/NA	Water	537	142201
320-24311-4	WI-CV-1FB33-1216	Total/NA	Water	537	142201
320-24311-5 - DL	WI-CV-1RW34-1216	Total/NA	Water	537	142201
320-24311-5	WI-CV-1RW34-1216	Total/NA	Water	537	142201
320-24311-6	WI-CV-1FB34-1216	Total/NA	Water	537	142201
MB 320-142201/1-A	Method Blank	Total/NA	Water	537	142201
LCS 320-142201/2-A	Lab Control Sample	Total/NA	Water	537	142201
LCSD 320-142201/3-A	Lab Control Sample Dup	Total/NA	Water	537	142201

Lab Chronicle

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

TestAmerica Job ID: 320-24311-1

Client Sample ID: WI-CV-1RW32-1216

Lab Sample ID: 320-24311-1

Date Collected: 12/09/16 14:15

Matrix: Water

Date Received: 12/13/16 10:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			247.4 mL	1 mL	142201	12/14/16 15:24	KMK	TAL SAC
Total/NA	Analysis	537		1			144052	12/28/16 02:24	JRB	TAL SAC

Client Sample ID: WI-CV-1FB32-1216

Lab Sample ID: 320-24311-2

Date Collected: 12/09/16 14:16

Matrix: Water

Date Received: 12/13/16 10:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			249.9 mL	1 mL	142201	12/14/16 15:24	KMK	TAL SAC
Total/NA	Analysis	537		1			144052	12/28/16 02:53	JRB	TAL SAC

Client Sample ID: WI-CV-1RW33-1216

Lab Sample ID: 320-24311-3

Date Collected: 12/10/16 09:14

Matrix: Water

Date Received: 12/13/16 10:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			257.7 mL	1 mL	142201	12/14/16 15:24	KMK	TAL SAC
Total/NA	Analysis	537		1			144052	12/28/16 03:23	JRB	TAL SAC

Client Sample ID: WI-CV-1FB33-1216

Lab Sample ID: 320-24311-4

Date Collected: 12/10/16 09:15

Matrix: Water

Date Received: 12/13/16 10:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			246.1 mL	1 mL	142201	12/14/16 15:24	KMK	TAL SAC
Total/NA	Analysis	537		1			144052	12/28/16 03:53	JRB	TAL SAC

Client Sample ID: WI-CV-1RW34-1216

Lab Sample ID: 320-24311-5

Date Collected: 12/10/16 09:40

Matrix: Water

Date Received: 12/13/16 10:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537	DL		248.5 mL	1 mL	142201	12/14/16 15:24	KMK	TAL SAC
Total/NA	Analysis	537	DL	10			144052	12/28/16 04:22	JRB	TAL SAC
Total/NA	Prep	537			248.5 mL	1 mL	142201	12/14/16 15:24	KMK	TAL SAC
Total/NA	Analysis	537		1			144052	12/28/16 05:21	JRB	TAL SAC

Lab Chronicle

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

TestAmerica Job ID: 320-24311-1

Client Sample ID: WI-CV-1FB34-1216

Lab Sample ID: 320-24311-6

Date Collected: 12/10/16 09:41

Matrix: Water

Date Received: 12/13/16 10:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			251.4 mL	1 mL	142201	12/14/16 15:24	KMK	TAL SAC
Total/NA	Analysis	537		1			144052	12/28/16 04:52	JRB	TAL SAC

Laboratory References:

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

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Certification Summary

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

TestAmerica Job ID: 320-24311-1

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: 320-24311-1

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: 320-24311-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-24311-1	WI-CV-1RW32-1216	Water	12/09/16 14:15	12/13/16 10:05
320-24311-2	WI-CV-1FB32-1216	Water	12/09/16 14:16	12/13/16 10:05
320-24311-3	WI-CV-1RW33-1216	Water	12/10/16 09:14	12/13/16 10:05
320-24311-4	WI-CV-1FB33-1216	Water	12/10/16 09:15	12/13/16 10:05
320-24311-5	WI-CV-1RW34-1216	Water	12/10/16 09:40	12/13/16 10:05
320-24311-6	WI-CV-1FB34-1216	Water	12/10/16 09:41	12/13/16 10:05

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Regulatory Program: DW NPDES RCRA Other:

Client Contact		Project Manager: Katie Tippin			Site Contact: Eric Epple			Date: 12/12/2016			COC No: 8			
Tiffany Hill		Tel/Fax: (757) 671-6258			Lab Contact: Laura Turpen			Carrier: FedEx			1 of 1 COCs			
Project Chemist		Analysis Turnaround Time												
1100 NE Circle Blvd Ste 300 Corvallis, OR 97330		<input checked="" type="checkbox"/> CALENDAR DAYS		<input type="checkbox"/> WORKING DAYS		Filtered Sample (Y/N) Perform MS / MSD (Y/N) USEPA Method 537 (PFOA, PFOS, and PFBS)						Sampler:		
(541) 768-3109		TAT if different from Below <u>7</u> -Day _____										For Lab Use Only:		
(541) 908-3794		<input type="checkbox"/> 2 weeks		<input type="checkbox"/> 1 week								Walk-in Client:		
Project Name: CTO-08		<input type="checkbox"/> 2 days		<input type="checkbox"/> 1 day								Lab Sampling:		
Site: OLF Coupeville												Job / SDG No.:		
P O #: 100067106050 - 679580.09.FI.FS														

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	USEPA Method 537 (PFOA, PFOS, and PFBS)	Sample Specific Notes:
WI-CV-1RW32-1216	12/9/16	1249	G	DW	2	N	N	X	
WI-CV-1FB32-1216	12/9/16	1251	G	DW	2	N	N	X	
WI-CV-1RW33-1216	12/10/16	0914	G	DW	2	N	N	X	
WI-CV-1FB33-1216	12/10/16	0915	G	DW	2	N	N	X	
WI-CV-1RW34-1216	12/10/16	0940	G	DW	2	N	N	X	
WI-CV-1FB34-1216	12/10/16	0941	G	DW	2	N	N	X	

320-24311 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____	
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.	
<input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown	
Special Instructions/QC Requirements & Comments: <i>* Containers labeled for HPLC 12/13/16 CM2 12/13/16 * Containers labeled for 1416 CM2 12/13/16</i>	
Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab <input type="checkbox"/> Archive for _____ Months	

Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Cooler Temp. (°C): Obs'd: <u>2.4</u> Corr'd: <u>1.3</u>		Therm ID No.: <u>02</u> <u>rce</u>	
Relinquished by: <i>Eric Epple</i>		Company: CH2M		Date/Time: 12-12-16/1600		Received by: <i>Laura Turpen</i>	
Relinquished by:		Company:		Date/Time:		Received by: <i>JAS</i>	
Relinquished by:		Company:		Date/Time:		Received in Laboratory by:	
						Date/Time: 12/13/16 10:05	

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12/29/2016

Login Sample Receipt Checklist

Client: CH2M Hill Constructors, Inc.

Job Number: 320-24311-1

Login Number: 24311
List Number: 1
Creator: Nelson, Kym D

List Source: TestAmerica Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	False	Refer to Job Narrative for details.
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: 320-24311-1
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
12/29/2016 10:10 AM

Laura Turpen, Project Manager I
880 Riverside Parkway, West Sacramento, CA, 95605
(916)374-4414
laura.turpen@testamericainc.com
12/29/2016

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Definitions/Glossary

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

TestAmerica Job ID: 320-24311-1

Qualifiers

LCMS

Qualifier	Qualifier Description
U	Undetected at the Limit of Detection.
M	Manual integrated compound.
D	The reported value is from a dilution.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
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: Whidbey Island

Report Number: 320-24311-1

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 12/13/2016; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 1.5 C.

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

Receipt Exceptions

The container labels for the following samples did not match the information listed on the Chain-of-Custody (COC): WI-CV-1RW32-1216 (320-24311-1) and WI-CV-1FB32-1216 (320-24311-2). The labels for sample WI-CV-1RW32-1216 list the time as 14:15, while the COC lists the time as 12:49. The labels for sample WI-CV-1FB32-1216 list the time as 14:16, while the COC lists the time as 12:51. The client requested that the sample times be logged in according to the times on the sample labels.

PFOA/PFOS

Samples WI-CV-1RW32-1216 (320-24311-1), WI-CV-1FB32-1216 (320-24311-2), WI-CV-1RW33-1216 (320-24311-3), WI-CV-1FB33-1216 (320-24311-4), WI-CV-1RW34-1216 (320-24311-5) and WI-CV-1FB34-1216 (320-24311-6) were analyzed for PFOA/PFOS in accordance with 537. The samples were prepared on 12/14/2016 and analyzed on 12/28/2016.

Sample WI-CV-1RW34-1216 (320-24311-5)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

The following sample was centrifuged prior to spiking/extraction: WI-CV-1RW32-1216 (320-24311-1)

The aqueous portion of the following sample was decanted prior to spiking/extraction, due to containing excess sediment on the bottom of the original bottle: WI-CV-1RW33-1216 (320-24311-3)

The concentration of Perfluorooctanoic acid (PFOA) in the Laboratory Control Sample (LCS) was greater than the upper calibration range.

This is due to the LCS being spike at the high level, as per the method guidelines.
(LCS 320-142201/2-A)

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-142201.

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

Detection Summary

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

TestAmerica Job ID: 320-24311-1

Client Sample ID: WI-CV-1RW32-1216

Lab Sample ID: 320-24311-1

No Detections.

Client Sample ID: WI-CV-1FB32-1216

Lab Sample ID: 320-24311-2

No Detections.

Client Sample ID: WI-CV-1RW33-1216

Lab Sample ID: 320-24311-3

No Detections.

Client Sample ID: WI-CV-1FB33-1216

Lab Sample ID: 320-24311-4

No Detections.

Client Sample ID: WI-CV-1RW34-1216

Lab Sample ID: 320-24311-5

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanesulfonic acid (PFBS)	0.061	J	0.14	0.048	ug/L	1		537	Total/NA
Perfluorooctanoic acid (PFOA) - DL	0.66	D	0.30	0.095	ug/L	10		537	Total/NA

Client Sample ID: WI-CV-1FB34-1216

Lab Sample ID: 320-24311-6

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: 320-24311-1

Client Sample ID: WI-CV-1RW32-1216

Date Collected: 12/09/16 14:15

Date Received: 12/13/16 10:05

Lab Sample ID: 320-24311-1

Matrix: Water

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.049	U	0.061	0.016	ug/L		12/14/16 15:24	12/28/16 02:24	1
Perfluorooctanoic acid (PFOA)	0.024	U	0.030	0.0095	ug/L		12/14/16 15:24	12/28/16 02:24	1
Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.14	0.048	ug/L		12/14/16 15:24	12/28/16 02:24	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	113		70 - 130				12/14/16 15:24	12/28/16 02:24	1
13C2 PFDA	105		70 - 130				12/14/16 15:24	12/28/16 02:24	1

Client Sample ID: WI-CV-1FB32-1216

Date Collected: 12/09/16 14:16

Date Received: 12/13/16 10:05

Lab Sample ID: 320-24311-2

Matrix: Water

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.048	U	0.060	0.016	ug/L		12/14/16 15:24	12/28/16 02:53	1
Perfluorooctanoic acid (PFOA)	0.024	U M	0.030	0.0094	ug/L		12/14/16 15:24	12/28/16 02:53	1
Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.14	0.048	ug/L		12/14/16 15:24	12/28/16 02:53	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	115		70 - 130				12/14/16 15:24	12/28/16 02:53	1
13C2 PFDA	113		70 - 130				12/14/16 15:24	12/28/16 02:53	1

Client Sample ID: WI-CV-1RW33-1216

Date Collected: 12/10/16 09:14

Date Received: 12/13/16 10:05

Lab Sample ID: 320-24311-3

Matrix: Water

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.047	U	0.058	0.015	ug/L		12/14/16 15:24	12/28/16 03:23	1
Perfluorooctanoic acid (PFOA)	0.023	U	0.029	0.0091	ug/L		12/14/16 15:24	12/28/16 03:23	1
Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.14	0.046	ug/L		12/14/16 15:24	12/28/16 03:23	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	101		70 - 130				12/14/16 15:24	12/28/16 03:23	1
13C2 PFDA	110		70 - 130				12/14/16 15:24	12/28/16 03:23	1

Client Sample ID: WI-CV-1FB33-1216

Date Collected: 12/10/16 09:15

Date Received: 12/13/16 10:05

Lab Sample ID: 320-24311-4

Matrix: Water

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.049	U	0.061	0.016	ug/L		12/14/16 15:24	12/28/16 03:53	1
Perfluorooctanoic acid (PFOA)	0.024	U	0.030	0.0096	ug/L		12/14/16 15:24	12/28/16 03:53	1
Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.14	0.048	ug/L		12/14/16 15:24	12/28/16 03:53	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	114		70 - 130				12/14/16 15:24	12/28/16 03:53	1
13C2 PFDA	109		70 - 130				12/14/16 15:24	12/28/16 03:53	1

Client Sample Results

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

TestAmerica Job ID: 320-24311-1

Client Sample ID: WI-CV-1RW34-1216

Lab Sample ID: 320-24311-5

Date Collected: 12/10/16 09:40

Matrix: Water

Date Received: 12/13/16 10:05

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.048	U M	0.060	0.016	ug/L		12/14/16 15:24	12/28/16 05:21	1
Perfluorobutanesulfonic acid (PFBS)	0.061	J	0.14	0.048	ug/L		12/14/16 15:24	12/28/16 05:21	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	109		70 - 130				12/14/16 15:24	12/28/16 05:21	1
13C2 PFDA	125		70 - 130				12/14/16 15:24	12/28/16 05:21	1

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.66	D	0.30	0.095	ug/L		12/14/16 15:24	12/28/16 04:22	10
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	99		70 - 130				12/14/16 15:24	12/28/16 04:22	10
13C2 PFDA	113		70 - 130				12/14/16 15:24	12/28/16 04:22	10

Client Sample ID: WI-CV-1FB34-1216

Lab Sample ID: 320-24311-6

Date Collected: 12/10/16 09:41

Matrix: Water

Date Received: 12/13/16 10:05

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

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.048	U	0.060	0.015	ug/L		12/14/16 15:24	12/28/16 04:52	1
Perfluorooctanoic acid (PFOA)	0.024	U M	0.030	0.0094	ug/L		12/14/16 15:24	12/28/16 04:52	1
Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.14	0.047	ug/L		12/14/16 15:24	12/28/16 04:52	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	102		70 - 130				12/14/16 15:24	12/28/16 04:52	1
13C2 PFDA	97		70 - 130				12/14/16 15:24	12/28/16 04:52	1

Default Detection Limits

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

TestAmerica Job ID: 320-24311-1

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: 320-24311-1

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)
320-24311-1	WI-CV-1RW32-1216	113	105
320-24311-2	WI-CV-1FB32-1216	115	113
320-24311-3	WI-CV-1RW33-1216	101	110
320-24311-4	WI-CV-1FB33-1216	114	109
320-24311-5 - DL	WI-CV-1RW34-1216	99	113
320-24311-5	WI-CV-1RW34-1216	109	125
320-24311-6	WI-CV-1FB34-1216	102	97
LCS 320-142201/2-A	Lab Control Sample	121	119
LCSD 320-142201/3-A	Lab Control Sample Dup	118	114
MB 320-142201/1-A	Method Blank	110	104

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: 320-24311-1

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

Lab Sample ID: MB 320-142201/1-A
Matrix: Water
Analysis Batch: 144052

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 142201

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		12/14/16 15:24	12/28/16 00:55	1
Perfluorooctanoic acid (PFOA)	0.024	U	0.030	0.0094	ug/L		12/14/16 15:24	12/28/16 00:55	1
Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.14	0.048	ug/L		12/14/16 15:24	12/28/16 00:55	1

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
13C2 PFHxA	110		70 - 130	12/14/16 15:24	12/28/16 00:55	1
13C2 PFDA	104		70 - 130	12/14/16 15:24	12/28/16 00:55	1

Lab Sample ID: LCS 320-142201/2-A
Matrix: Water
Analysis Batch: 144052

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 142201

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Perfluorooctanoic acid (PFOA)	0.146	0.158	E	ug/L		108	70 - 130
Perfluorobutanesulfonic acid (PFBS)	0.673	0.550		ug/L		82	70 - 130

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
13C2 PFHxA	121		70 - 130
13C2 PFDA	119		70 - 130

Lab Sample ID: LCSD 320-142201/3-A
Matrix: Water
Analysis Batch: 144052

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 142201

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	Limits	RPD	RPD Limit
Perfluorooctanoic acid (PFOA)	0.146	0.151		ug/L		103	70 - 130	5	30
Perfluorobutanesulfonic acid (PFBS)	0.673	0.555		ug/L		82	70 - 130	1	30

Surrogate	LCSD LCSD		Limits
	%Recovery	Qualifier	
13C2 PFHxA	118		70 - 130
13C2 PFDA	114		70 - 130

QC Association Summary

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

TestAmerica Job ID: 320-24311-1

LCMS

Prep Batch: 142201

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-24311-1	WI-CV-1RW32-1216	Total/NA	Water	537	
320-24311-2	WI-CV-1FB32-1216	Total/NA	Water	537	
320-24311-3	WI-CV-1RW33-1216	Total/NA	Water	537	
320-24311-4	WI-CV-1FB33-1216	Total/NA	Water	537	
320-24311-5	WI-CV-1RW34-1216	Total/NA	Water	537	
320-24311-5 - DL	WI-CV-1RW34-1216	Total/NA	Water	537	
320-24311-6	WI-CV-1FB34-1216	Total/NA	Water	537	
MB 320-142201/1-A	Method Blank	Total/NA	Water	537	
LCS 320-142201/2-A	Lab Control Sample	Total/NA	Water	537	
LCSD 320-142201/3-A	Lab Control Sample Dup	Total/NA	Water	537	

Analysis Batch: 144052

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-24311-1	WI-CV-1RW32-1216	Total/NA	Water	537	142201
320-24311-2	WI-CV-1FB32-1216	Total/NA	Water	537	142201
320-24311-3	WI-CV-1RW33-1216	Total/NA	Water	537	142201
320-24311-4	WI-CV-1FB33-1216	Total/NA	Water	537	142201
320-24311-5 - DL	WI-CV-1RW34-1216	Total/NA	Water	537	142201
320-24311-5	WI-CV-1RW34-1216	Total/NA	Water	537	142201
320-24311-6	WI-CV-1FB34-1216	Total/NA	Water	537	142201
MB 320-142201/1-A	Method Blank	Total/NA	Water	537	142201
LCS 320-142201/2-A	Lab Control Sample	Total/NA	Water	537	142201
LCSD 320-142201/3-A	Lab Control Sample Dup	Total/NA	Water	537	142201

Lab Chronicle

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

TestAmerica Job ID: 320-24311-1

Client Sample ID: WI-CV-1RW32-1216

Date Collected: 12/09/16 14:15

Date Received: 12/13/16 10:05

Lab Sample ID: 320-24311-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			142201	12/14/16 15:24	KMK	TAL SAC
Total/NA	Analysis	537		1	144052	12/28/16 02:24	JRB	TAL SAC

Client Sample ID: WI-CV-1FB32-1216

Date Collected: 12/09/16 14:16

Date Received: 12/13/16 10:05

Lab Sample ID: 320-24311-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			142201	12/14/16 15:24	KMK	TAL SAC
Total/NA	Analysis	537		1	144052	12/28/16 02:53	JRB	TAL SAC

Client Sample ID: WI-CV-1RW33-1216

Date Collected: 12/10/16 09:14

Date Received: 12/13/16 10:05

Lab Sample ID: 320-24311-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			142201	12/14/16 15:24	KMK	TAL SAC
Total/NA	Analysis	537		1	144052	12/28/16 03:23	JRB	TAL SAC

Client Sample ID: WI-CV-1FB33-1216

Date Collected: 12/10/16 09:15

Date Received: 12/13/16 10:05

Lab Sample ID: 320-24311-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537			142201	12/14/16 15:24	KMK	TAL SAC
Total/NA	Analysis	537		1	144052	12/28/16 03:53	JRB	TAL SAC

Client Sample ID: WI-CV-1RW34-1216

Date Collected: 12/10/16 09:40

Date Received: 12/13/16 10:05

Lab Sample ID: 320-24311-5

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537	DL		142201	12/14/16 15:24	KMK	TAL SAC
Total/NA	Analysis	537	DL	10	144052	12/28/16 04:22	JRB	TAL SAC
Total/NA	Prep	537			142201	12/14/16 15:24	KMK	TAL SAC
Total/NA	Analysis	537		1	144052	12/28/16 05:21	JRB	TAL SAC

Lab Chronicle

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

TestAmerica Job ID: 320-24311-1

Client Sample ID: WI-CV-1FB34-1216

Lab Sample ID: 320-24311-6

Date Collected: 12/10/16 09:41

Matrix: Water

Date Received: 12/13/16 10:05

<u>Prep Type</u>	<u>Batch Type</u>	<u>Batch Method</u>	<u>Run</u>	<u>Dilution Factor</u>	<u>Batch Number</u>	<u>Prepared or Analyzed</u>	<u>Analyst</u>	<u>Lab</u>
Total/NA	Prep	537			142201	12/14/16 15:24	KMK	TAL SAC
Total/NA	Analysis	537		1	144052	12/28/16 04:52	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: 320-24311-1

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: 320-24311-1

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: 320-24311-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-24311-1	WI-CV-1RW32-1216	Water	12/09/16 14:15	12/13/16 10:05
320-24311-2	WI-CV-1FB32-1216	Water	12/09/16 14:16	12/13/16 10:05
320-24311-3	WI-CV-1RW33-1216	Water	12/10/16 09:14	12/13/16 10:05
320-24311-4	WI-CV-1FB33-1216	Water	12/10/16 09:15	12/13/16 10:05
320-24311-5	WI-CV-1RW34-1216	Water	12/10/16 09:40	12/13/16 10:05
320-24311-6	WI-CV-1FB34-1216	Water	12/10/16 09:41	12/13/16 10:05

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24311-1

SDG No.: _____

Instrument ID: A6 Analysis Batch Number: 143828

Lab Sample ID: STD 320-143828/4 IC Client Sample ID: _____

Date Analyzed: 12/24/16 04:26 Lab File ID: 24DEC2016A6A_004.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid	19.34	Baseline	phomsopha t	12/24/16 11:57
Perfluorooctanoic acid (PFOA)	20.00	Baseline	phomsopha t	12/24/16 11:57

Lab Sample ID: STD 320-143828/5 IC Client Sample ID: _____

Date Analyzed: 12/24/16 04:55 Lab File ID: 24DEC2016A6A_005.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	20.00	Baseline	phomsopha t	12/24/16 11:59

Lab Sample ID: STD 320-143828/6 IC Client Sample ID: _____

Date Analyzed: 12/24/16 05:25 Lab File ID: 24DEC2016A6A_006.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid	19.34	Baseline	phomsopha t	12/24/16 12:04
Perfluorooctanoic acid (PFOA)	20.00	Baseline	phomsopha t	12/24/16 12:09

Lab Sample ID: STD 320-143828/7 ICISAV Client Sample ID: _____

Date Analyzed: 12/24/16 05:54 Lab File ID: 24DEC2016A6A_007.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid	19.36	Baseline	phomsopha t	12/24/16 12:07

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24311-1

SDG No.: _____

Instrument ID: A6 Analysis Batch Number: 143828

Lab Sample ID: STD 320-143828/8 IC Client Sample ID: _____

Date Analyzed: 12/24/16 06:24 Lab File ID: 24DEC2016A6A_008.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid	19.36	Baseline	phomsopha t	12/24/16 12:10

Lab Sample ID: STD 320-143828/9 IC Client Sample ID: _____

Date Analyzed: 12/24/16 06:54 Lab File ID: 24DEC2016A6A_009.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid	19.36	Baseline	phomsopha t	12/24/16 12:11

Lab Sample ID: CCV 320-143828/11 CCVL Client Sample ID: _____

Date Analyzed: 12/24/16 07:53 Lab File ID: 24DEC2016A6A_011.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid	19.36	Baseline	phomsopha t	12/24/16 12:19
Perfluorooctanoic acid (PFOA)	20.01	Baseline	phomsopha t	12/24/16 12:19

Lab Sample ID: ICV 320-143828/13 Client Sample ID: _____

Date Analyzed: 12/24/16 08:52 Lab File ID: 24DEC2016A6A_013.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid	19.36	Baseline	phomsopha t	12/24/16 12:21

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24311-1

SDG No.: _____

Instrument ID: A6 Analysis Batch Number: 144052

Lab Sample ID: 320-24311-2 Client Sample ID: WI-CV-1FB32-1216

Date Analyzed: 12/28/16 02:53 Lab File ID: 27DEC2016A6A_021.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	19.99	Split Peak	barnettj	12/28/16 14:04

Lab Sample ID: 320-24311-6 Client Sample ID: WI-CV-1FB34-1216

Date Analyzed: 12/28/16 04:52 Lab File ID: 27DEC2016A6A_025.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	19.97	Missed Peak	barnettj	12/28/16 14:06

Lab Sample ID: 320-24311-5 Client Sample ID: WI-CV-1RW34-1216

Date Analyzed: 12/28/16 05:21 Lab File ID: 27DEC2016A6A_026.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	20.34	Missed Peak	barnettj	12/28/16 14:09

Lab Sample ID: CCV 320-144052/27 CCVIS Client Sample ID: _____

Date Analyzed: 12/28/16 05:51 Lab File ID: 27DEC2016A6A_027.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluoroheptanoic acid	19.33	Split Peak	barnettj	12/28/16 13:57

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-24311-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration		
					Reagent ID	Volume Added				
LC537-HSP_00013	05/21/17	11/21/16	Methanol, Lot 090285	10000 uL	LC537SPIM_00017	375 uL	Perfluorobutane Sulfonate	3366 ng/mL		
							Perfluorobutanesulfonic acid (PFBS)	3366 ng/mL		
							Perfluoroheptanoic acid	385.529 ng/mL		
							Perfluorohexanesulfonic acid	1134.68 ng/mL		
							Perfluorononanoic acid	777.808 ng/mL		
							Perfluorooctanoic acid (PFOA)	731.96 ng/mL		
Perfluorooctanesulfonic acid (PFOS)	1502.49 ng/mL									
.LC537SPIM_00017	05/21/17	11/21/16	Methanol, Lot 104453	10000 uL	LC537-PFBS_00006	440 uL	Perfluorobutane Sulfonate	89.76 ug/mL		
							Perfluorobutanesulfonic acid (PFBS)	89.76 ug/mL		
							LC537-PFHpa_00012	100 uL	Perfluoroheptanoic acid	10.2808 ug/mL
							LC537-PFHxS_00008	300 uL	Perfluorohexanesulfonic acid	30.2582 ug/mL
							LC537-PFNA_00011	200 uL	Perfluorononanoic acid	20.7415 ug/mL
							LC537-PFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	19.5189 ug/mL
LC537-PFOS_00006	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0664 ug/mL							
..LC537-PFBS_00006	07/28/17	07/28/16	Methanol, Lot 090285	5 mL	LC537_PFBS_00002	0.0102 g	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_00012	11/04/17	11/18/16	Methanol, Lot 090285	13 mL	LC537_PFHpa_00002	0.0135 g		Perfluoroheptanoic acid	1028.08 ug/mL	
...LC537_PFHpa_00002	04/01/18		Aldrich, Lot BCBM2579V				(Purchased Reagent)	Perfluoroheptanoic acid	0.99 g/g	
..LC537-PFHxS_00008	07/28/17	07/28/16	Methanol, Lot 090285	5.5 mL	LC537_PFHxS_00002	0.0061 g		Perfluorohexanesulfonic acid	1008.61 ug/mL	
..LC537_PFHxS_00002	04/01/18		Sigma, Lot BCBL3545V				(Purchased Reagent)	Perfluorohexanesulfonic acid	0.9094 g/g	
..LC537-PFNA_00011	11/21/17	11/21/16	Methanol, Lot 090285	6.5 mL	LC537_PFNA_00002	0.007 g		Perfluorononanoic acid	1037.08 ug/mL	
..LC537_PFNA_00002	04/01/18		TCI America, Lot QN44F				(Purchased Reagent)	Perfluorononanoic acid	0.963 g/g	
..LC537-PFOA_00011	11/21/17	11/21/16	Methanol, Lot 090285	6.5 mL	LC537_PFOA_00002	0.0127 g		Perfluorooctanoic acid (PFOA)	1951.89 ug/mL	
..LC537_PFOA_00002	11/04/18		Fluka, Lot SZBD308XV				(Purchased Reagent)	Perfluorooctanoic acid (PFOA)	0.999 g/g	
..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_00019	03/01/17	12/20/16	MeOH/H2O, Lot 067374	10 mL	LC537-IS_00028	200 uL	13C2-PFOA	10 ng/mL		
							13C4 PFOS	28.68 ng/mL		
.LC537-IS_00028	06/19/17	12/19/16	Methanol, Lot 090285	10000 uL	LCM2PFOA_00005	100 uL	13C2-PFOA	0.5 ug/mL		
							LCMPFOS_00018	300 uL	13C4 PFOS	1.434 ug/mL
..LCM2PFOA_00005	06/19/18		Wellington Laboratories, Lot M2PFOA0613				(Purchased Reagent)	13C2-PFOA	50 ug/mL	
..LCMPFOS_00018	08/03/21		Wellington Laboratories, Lot MPFOS0816				(Purchased Reagent)	13C4 PFOS	47.8 ug/mL	
LC537-ICV_00019	03/01/17	12/20/16	MeOH/H2O, Lot 067374	10 mL	LC537-SU_00027	500 uL	13C2 PFDA	10 ng/mL		
							13C2 PFHxA	10 ng/mL		
							LC537ICIM_00014	25 uL	Perfluorobutanesulfonic acid (PFBS)	114.77 ng/mL
								Perfluorooctanoic acid (PFOA)	25.0232 ng/mL	

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-24311-1

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_00027	06/19/17	12/19/16	Methanol, Lot 104453	20000 uL	LCMPFDA 00008	80 uL	13C2 PFDA	0.2 ug/mL
..LCMPFDA 00008	08/19/20	Wellington Laboratories, Lot MPFDA0815			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFHxA 00009	04/09/20	Wellington Laboratories, Lot MPFHxA0415			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
.LC537ICIM_00014	03/01/17	12/20/16	Methanol, Lot 090285	25 mL	LC537-PFBS2_00005	0.5 mL	Perfluorobutanesulfonic acid (PFBS)	45.908 ug/mL
					LC537-PFOA2_00008	0.142 mL	Perfluorooctanoic acid (PFOA)	10.0093 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_00008	07/25/17	12/20/16	Methanol, Lot 090285	10 mL	LC537 PFOA2 00001	0.0178 g	Perfluorooctanoic acid (PFOA)	1762.2 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_00026	03/19/17	12/05/16	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_00017	06/14/17	12/23/16	MeOH/H2O, Lot 090285	5 mL	LC537-IS_00028	100 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-MSP_00017	25 uL	Perfluorobutanesulfonic acid (PFBS)	8.976 ng/mL
							Perfluoroheptanoic acid	0.99 ng/mL
							Perfluorohexanesulfonic acid	3.02582 ng/mL
							Perfluorononanoic acid	2.07415 ng/mL
							Perfluorooctanoic acid (PFOA)	1.95189 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	4.00664 ng/mL
					LC537-SU_00026	250 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-IS_00028	06/19/17	12/19/16	Methanol, Lot 090285	10000 uL	LCM2PFOA 00005	100 uL	13C2-PFOA	0.5 ug/mL
					LCMPFOS 00018	300 uL	13C4 PFOS	1.434 ug/mL
..LCM2PFOA 00005	06/19/18	Wellington Laboratories, Lot M2PFOA0613			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS 00018	08/03/21	Wellington Laboratories, Lot MPFOS0816			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-MSP_00017	06/22/17	12/22/16	Methanol, Lot 090285	10000 uL	LC537SPIM_00018	200 uL	Perfluorobutanesulfonic acid (PFBS)	1795.2 ng/mL
							Perfluoroheptanoic acid	198 ng/mL
							Perfluorohexanesulfonic acid	605.164 ng/mL
							Perfluorononanoic acid	414.831 ng/mL
							Perfluorooctanoic acid (PFOA)	390.378 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-24311-1

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_00018	06/22/17	12/22/16	Methanol, Lot 104453	10000 uL	LC537-PFBS_00006	440 uL	Perfluorobutanesulfonic acid (PFBS)	89.76 ug/mL	
					LC537-PFHpA_00013	100 uL	Perfluoroheptanoic acid	9.9 ug/mL	
					LC537-PFHxS_00008	300 uL	Perfluorohexanesulfonic acid	30.2582 ug/mL	
					LC537-PFNA_00011	200 uL	Perfluorononanoic acid	20.7415 ug/mL	
					LC537-PFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	19.5189 ug/mL	
					LC537-PFOS_00006	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0664 ug/mL	
...LC537-PFBS_00006	07/28/17	07/28/16	Methanol, Lot 090285	5 mL	LC537_PFBS_00002	0.0102 g	Perfluorobutanesulfonic acid (PFBS)	2040 ug/mL	
....LC537_PFBS_00002	04/01/18		Sigma, Lot MKBP8842V				(Purchased Reagent)	Perfluorobutanesulfonic acid (PFBS)	1 g/g
...LC537-PFHpA_00013	06/22/17	12/22/16	Methanol, Lot 090285	56.8 mL	LC537 PFHpA_00002	0.0568 g	Perfluoroheptanoic acid	990 ug/mL	
....LC537 PFHpA_00002	04/01/18		Aldrich, Lot BCBM2579V				(Purchased Reagent)	Perfluoroheptanoic acid	0.99 g/g
..LC537-PFHxS_00008	07/28/17	07/28/16	Methanol, Lot 090285	5.5 mL	LC537 PFHxS_00002	0.0061 g	Perfluorohexanesulfonic acid	1008.61 ug/mL	
....LC537 PFHxS_00002	04/01/18		Sigma, Lot BCBL3545V				(Purchased Reagent)	Perfluorohexanesulfonic acid	0.9094 g/g
...LC537-PFNA_00011	11/21/17	11/21/16	Methanol, Lot 090285	6.5 mL	LC537 PFNA_00002	0.007 g	Perfluorononanoic acid	1037.08 ug/mL	
....LC537 PFNA_00002	04/01/18		TCI America, Lot QN44F				(Purchased Reagent)	Perfluorononanoic acid	0.963 g/g
..LC537-PFOA_00011	11/21/17	11/21/16	Methanol, Lot 090285	6.5 mL	LC537 PFOA_00002	0.0127 g	Perfluorooctanoic acid (PFOA)	1951.89 ug/mL	
....LC537 PFOA_00002	11/04/18		Fluka, Lot SZBD308XV				(Purchased Reagent)	Perfluorooctanoic acid (PFOA)	0.999 g/g
...LC537-PFOS_00006	07/28/17	07/28/16	Methanol, Lot 090285	6 mL	LC537_PFOS_00002	0.0066 g	Perfluorooctanesulfonic acid (PFOS)	1001.66 ug/mL	
....LC537_PFOS_00002	08/09/17		Fluka, Lot SZBC222XV				(Purchased Reagent)	Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-SU_00026	06/14/17	12/16/16	Methanol, Lot 104453	20000 uL	LC537-SU_00025	10000 uL	13C2 PFDA	0.2 ug/mL	
..LC537-SU_00025	06/14/17	12/14/16	Methanol, Lot 104453	10000 uL	LCMPFDA_00008	80 uL	13C2 PFHxA	0.2 ug/mL	
					LCMPFHxA_00009	80 uL	13C2 PFHxA	0.4 ug/mL	
...LCMPFDA_00008	08/19/20		Wellington Laboratories, Lot MPFDA0815				(Purchased Reagent)	13C2 PFDA	50 ug/mL
...LCMPFHxA_00009	04/09/20		Wellington Laboratories, Lot MPFHxA0415				(Purchased Reagent)	13C2 PFHxA	50 ug/mL
LC537-L2_00016	06/14/17	12/23/16	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00014	34 uL	Perfluorobutanesulfonic acid (PFBS)	22.8888 ng/mL	
							Perfluoroheptanoic acid	2.5245 ng/mL	
							Perfluorohexanesulfonic acid	7.71585 ng/mL	
							Perfluorononanoic acid	5.28909 ng/mL	
							Perfluorooctanoic acid (PFOA)	4.97733 ng/mL	
							Perfluorooctanesulfonic acid (PFOS)	10.2169 ng/mL	
LC537-IS_00028	100 uL	13C2-PFOA	10 ng/mL						
LC537-SU_00026	250 uL	13C4 PFOS	28.68 ng/mL						
.LC537-HSP_00014	06/22/17	12/22/16	Methanol, Lot 090285	10000 uL	LC537SPIM_00018	375 uL	Perfluorobutanesulfonic acid (PFBS)	3366 ng/mL	
							Perfluoroheptanoic acid	371.25 ng/mL	
							Perfluorohexanesulfonic acid	1134.68 ng/mL	
							Perfluorononanoic acid	777.808 ng/mL	

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-24311-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorooctanoic acid (PFOA)	731.96 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	1502.49 ng/mL
..LC537SPIM_00018	06/22/17	12/22/16	Methanol, Lot 104453	10000 uL	LC537-PFBS_00006	440 uL	Perfluorobutanesulfonic acid (PFBS)	89.76 ug/mL
					LC537-PFHpA_00013	100 uL	Perfluoroheptanoic acid	9.9 ug/mL
					LC537-PFHxS_00008	300 uL	Perfluorohexanesulfonic acid	30.2582 ug/mL
					LC537-PFNA_00011	200 uL	Perfluorononanoic acid	20.7415 ug/mL
					LC537-PFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	19.5189 ug/mL
					LC537-PFOS_00006	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0664 ug/mL
...LC537-PFBS_00006	07/28/17	07/28/16	Methanol, Lot 090285	5 mL	LC537_PFBS_00002	0.0102 g	Perfluorobutanesulfonic acid (PFBS)	2040 ug/mL
....LC537_PFBS_00002	04/01/18		Sigma, Lot MKBP8842V		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1 g/g
...LC537-PFHpA_00013	06/22/17	12/22/16	Methanol, Lot 090285	56.8 mL	LC537 PFHpA_00002	0.0568 g	Perfluoroheptanoic acid	990 ug/mL
...LC537 PFHpA_00002	04/01/18		Aldrich, Lot BCBM2579V		(Purchased Reagent)		Perfluoroheptanoic acid	0.99 g/g
...LC537-PFHxS_00008	07/28/17	07/28/16	Methanol, Lot 090285	5.5 mL	LC537 PFHxS_00002	0.0061 g	Perfluorohexanesulfonic acid	1008.61 ug/mL
...LC537 PFHxS_00002	04/01/18		Sigma, Lot BCBL3545V		(Purchased Reagent)		Perfluorohexanesulfonic acid	0.9094 g/g
...LC537-PFNA_00011	11/21/17	11/21/16	Methanol, Lot 090285	6.5 mL	LC537 PFNA_00002	0.007 g	Perfluorononanoic acid	1037.08 ug/mL
...LC537 PFNA_00002	04/01/18		TCI America, Lot QN44F		(Purchased Reagent)		Perfluorononanoic acid	0.963 g/g
...LC537-PFOA_00011	11/21/17	11/21/16	Methanol, Lot 090285	6.5 mL	LC537 PFOA_00002	0.0127 g	Perfluorooctanoic acid (PFOA)	1951.89 ug/mL
...LC537 PFOA_00002	11/04/18		Fluka, Lot SZBD308XV		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
...LC537-PFOS_00006	07/28/17	07/28/16	Methanol, Lot 090285	6 mL	LC537_PFOS_00002	0.0066 g	Perfluorooctanesulfonic acid (PFOS)	1001.66 ug/mL
....LC537_PFOS_00002	08/09/17		Fluka, Lot SZBC222XV		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-IS_00028	06/19/17	12/19/16	Methanol, Lot 090285	10000 uL	LCM2PFOA_00005	100 uL	13C2-PFOA	0.5 ug/mL
					LCMPFOS_00018	300 uL	13C4 PFOS	1.434 ug/mL
..LCM2PFOA_00005	06/19/18		Wellington Laboratories, Lot M2PFOA0613		(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00018	08/03/21		Wellington Laboratories, Lot MPFOS0816		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-SU_00026	06/14/17	12/16/16	Methanol, Lot 104453	20000 uL	LC537-SU_00025	10000 uL	13C2 PFDA	0.2 ug/mL
							13C2 PFHxA	0.2 ug/mL
..LC537-SU_00025	06/14/17	12/14/16	Methanol, Lot 104453	10000 uL	LCMPFDA_00008	80 uL	13C2 PFDA	0.4 ug/mL
					LCMPFHxA_00009	80 uL	13C2 PFHxA	0.4 ug/mL
...LCMPFDA_00008	08/19/20		Wellington Laboratories, Lot MPFDA0815		(Purchased Reagent)		13C2 PFDA	50 ug/mL
...LCMPFHxA_00009	04/09/20		Wellington Laboratories, Lot MPFHxA0415		(Purchased Reagent)		13C2 PFHxA	50 ug/mL
LC537-L3_00018	06/14/17	12/23/16	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00014	67 uL	Perfluorobutanesulfonic acid (PFBS)	45.1044 ng/mL
							Perfluoroheptanoic acid	4.97475 ng/mL
							Perfluorohexanesulfonic acid	15.2048 ng/mL
							Perfluorononanoic acid	10.4226 ng/mL
							Perfluorooctanoic acid (PFOA)	9.80826 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	20.1334 ng/mL
					LC537-IS_00028	100 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00026	250 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-24311-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration		
					Reagent ID	Volume Added				
.LC537-HSP_00014	06/22/17	12/22/16	Methanol, Lot 090285	10000 uL	LC537SPIM_00018	375 uL	Perfluorobutanesulfonic acid (PFBS)	3366 ng/mL		
							Perfluoroheptanoic acid	371.25 ng/mL		
							Perfluorohexanesulfonic acid	1134.68 ng/mL		
							Perfluorononanoic acid	777.808 ng/mL		
							Perfluorooctanoic acid (PFOA)	731.96 ng/mL		
Perfluorooctanesulfonic acid (PFOS)	1502.49 ng/mL									
..LC537SPIM_00018	06/22/17	12/22/16	Methanol, Lot 104453	10000 uL	LC537-PFBS_00006	440 uL	Perfluorobutanesulfonic acid (PFBS)	89.76 ug/mL		
							LC537-PFHpA_00013	100 uL	Perfluoroheptanoic acid	9.9 ug/mL
							LC537-PFHxS_00008	300 uL	Perfluorohexanesulfonic acid	30.2582 ug/mL
							LC537-PFNA_00011	200 uL	Perfluorononanoic acid	20.7415 ug/mL
							LC537-PFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	19.5189 ug/mL
							LC537-PFOS_00006	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0664 ug/mL
...LC537-PFBS_00006	07/28/17	07/28/16	Methanol, Lot 090285	5 mL	LC537_PFBS_00002	0.0102 g	Perfluorobutanesulfonic acid (PFBS)	2040 ug/mL		
....LC537_PFBS_00002	04/01/18		Sigma, Lot MKBP8842V		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1 g/g		
...LC537-PFHpA_00013	06/22/17	12/22/16	Methanol, Lot 090285	56.8 mL	LC537 PFHpA_00002	0.0568 g	Perfluoroheptanoic acid	990 ug/mL		
....LC537 PFHpA_00002	04/01/18		Aldrich, Lot BCM2579V		(Purchased Reagent)		Perfluoroheptanoic acid	0.99 g/g		
...LC537-PFHxS_00008	07/28/17	07/28/16	Methanol, Lot 090285	5.5 mL	LC537 PFHxS_00002	0.0061 g	Perfluorohexanesulfonic acid	1008.61 ug/mL		
....LC537 PFHxS_00002	04/01/18		Sigma, Lot BCBL3545V		(Purchased Reagent)		Perfluorohexanesulfonic acid	0.9094 g/g		
...LC537-PFNA_00011	11/21/17	11/21/16	Methanol, Lot 090285	6.5 mL	LC537 PFNA_00002	0.007 g	Perfluorononanoic acid	1037.08 ug/mL		
....LC537 PFNA_00002	04/01/18		TCI America, Lot QN44F		(Purchased Reagent)		Perfluorononanoic acid	0.963 g/g		
...LC537-PFOA_00011	11/21/17	11/21/16	Methanol, Lot 090285	6.5 mL	LC537 PFOA_00002	0.0127 g	Perfluorooctanoic acid (PFOA)	1951.89 ug/mL		
....LC537 PFOA_00002	11/04/18		Fluka, Lot SZBD308XV		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g		
...LC537-PFOS_00006	07/28/17	07/28/16	Methanol, Lot 090285	6 mL	LC537_PFOS_00002	0.0066 g	Perfluorooctanesulfonic acid (PFOS)	1001.66 ug/mL		
....LC537_PFOS_00002	08/09/17		Fluka, Lot SZBC222XV		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g		
.LC537-IS_00028	06/19/17	12/19/16	Methanol, Lot 090285	10000 uL	LCM2PFOA_00005	100 uL	13C2-PFOA	0.5 ug/mL		
					LCMPFOS_00018	300 uL	13C4 PFOS	1.434 ug/mL		
..LCM2PFOA_00005	06/19/18		Wellington Laboratories, Lot M2PFOA0613		(Purchased Reagent)		13C2-PFOA	50 ug/mL		
..LCMPFOS_00018	08/03/21		Wellington Laboratories, Lot MPFOS0816		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL		
.LC537-SU_00026	06/14/17	12/16/16	Methanol, Lot 104453	20000 uL	LC537-SU_00025	10000 uL	13C2 PFDA	0.2 ug/mL		
							13C2 PFHxA	0.2 ug/mL		
..LC537-SU_00025	06/14/17	12/14/16	Methanol, Lot 104453	10000 uL	LCMPFDA_00008	80 uL	13C2 PFDA	0.4 ug/mL		
					LCMPFHxA_00009	80 uL	13C2 PFHxA	0.4 ug/mL		
...LCMPFDA_00008	08/19/20		Wellington Laboratories, Lot MPFDA0815		(Purchased Reagent)		13C2 PFDA	50 ug/mL		
..LCMPFHxA_00009	04/09/20		Wellington Laboratories, Lot MPFHxA0415		(Purchased Reagent)		13C2 PFHxA	50 ug/mL		
LC537-L4_00017	06/14/17	12/23/16	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00014	135 uL	Perfluorobutanesulfonic acid (PFBS)	90.882 ng/mL		
							Perfluoroheptanoic acid	10.0238 ng/mL		
							Perfluorohexanesulfonic acid	30.6364 ng/mL		
							Perfluorononanoic acid	21.0008 ng/mL		
							Perfluorooctanoic acid (PFOA)	19.7629 ng/mL		

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-24311-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorooctanesulfonic acid (PFOS)	40.5672 ng/mL
					LC537-IS_00028	100 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00026	250 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00014	06/22/17	12/22/16	Methanol, Lot 090285	10000 uL	LC537SPIM_00018	375 uL	Perfluorobutanesulfonic acid (PFBS)	3366 ng/mL
							Perfluoroheptanoic acid	371.25 ng/mL
							Perfluorohexanesulfonic acid	1134.68 ng/mL
							Perfluorononanoic acid	777.808 ng/mL
							Perfluorooctanoic acid (PFOA)	731.96 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	1502.49 ng/mL
.LC537SPIM_00018	06/22/17	12/22/16	Methanol, Lot 104453	10000 uL	LC537-PFBS_00006	440 uL	Perfluorobutanesulfonic acid (PFBS)	89.76 ug/mL
					LC537-PFHxA_00013	100 uL	Perfluoroheptanoic acid	9.9 ug/mL
					LC537-PFHxS_00008	300 uL	Perfluorohexanesulfonic acid	30.2582 ug/mL
					LC537-PFNA_00011	200 uL	Perfluorononanoic acid	20.7415 ug/mL
					LC537-PFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	19.5189 ug/mL
					LC537-PFOS_00006	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0664 ug/mL
.LC537-PFBS_00006	07/28/17	07/28/16	Methanol, Lot 090285	5 mL	LC537_PFBS_00002	0.0102 g	Perfluorobutanesulfonic acid (PFBS)	2040 ug/mL
.LC537_PFBS_00002	04/01/18		Sigma, Lot MKBP8842V		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1 g/g
.LC537-PFHxA_00013	06/22/17	12/22/16	Methanol, Lot 090285	56.8 mL	LC537_PFHxA_00002	0.0568 g	Perfluoroheptanoic acid	990 ug/mL
.LC537_PFHxA_00002	04/01/18		Aldrich, Lot BCBM2579V		(Purchased Reagent)		Perfluoroheptanoic acid	0.99 g/g
.LC537-PFHxS_00008	07/28/17	07/28/16	Methanol, Lot 090285	5.5 mL	LC537_PFHxS_00002	0.0061 g	Perfluorohexanesulfonic acid	1008.61 ug/mL
.LC537_PFHxS_00002	04/01/18		Sigma, Lot BCBL3545V		(Purchased Reagent)		Perfluorohexanesulfonic acid	0.9094 g/g
.LC537-PFNA_00011	11/21/17	11/21/16	Methanol, Lot 090285	6.5 mL	LC537_PFNA_00002	0.007 g	Perfluorononanoic acid	1037.08 ug/mL
.LC537_PFNA_00002	04/01/18		TCI America, Lot QN44F		(Purchased Reagent)		Perfluorononanoic acid	0.963 g/g
.LC537-PFOA_00011	11/21/17	11/21/16	Methanol, Lot 090285	6.5 mL	LC537_PFOA_00002	0.0127 g	Perfluorooctanoic acid (PFOA)	1951.89 ug/mL
.LC537_PFOA_00002	11/04/18		Fluka, Lot SZBD308XV		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
.LC537-PFOS_00006	07/28/17	07/28/16	Methanol, Lot 090285	6 mL	LC537_PFOS_00002	0.0066 g	Perfluorooctanesulfonic acid (PFOS)	1001.66 ug/mL
.LC537_PFOS_00002	08/09/17		Fluka, Lot SZBC222XV		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g
.LC537-IS_00028	06/19/17	12/19/16	Methanol, Lot 090285	10000 uL	LCM2PFOA_00005	100 uL	13C2-PFOA	0.5 ug/mL
					LCMPFOS_00018	300 uL	13C4 PFOS	1.434 ug/mL
.LCM2PFOA_00005	06/19/18		Wellington Laboratories, Lot M2PFOA0613		(Purchased Reagent)		13C2-PFOA	50 ug/mL
.LCMPFOS_00018	08/03/21		Wellington Laboratories, Lot MPFOS0816		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-SU_00026	06/14/17	12/16/16	Methanol, Lot 104453	20000 uL	LC537-SU_00025	10000 uL	13C2 PFDA	0.2 ug/mL
							13C2 PFHxA	0.2 ug/mL
.LC537-SU_00025	06/14/17	12/14/16	Methanol, Lot 104453	10000 uL	LCMPFDA_00008	80 uL	13C2 PFDA	0.4 ug/mL
					LCMPFHxA_00009	80 uL	13C2 PFHxA	0.4 ug/mL
.LCMPFDA_00008	08/19/20		Wellington Laboratories, Lot MPFDA0815		(Purchased Reagent)		13C2 PFDA	50 ug/mL
.LCMPFHxA_00009	04/09/20		Wellington Laboratories, Lot MPFHxA0415		(Purchased Reagent)		13C2 PFHxA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-24311-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration		
					Reagent ID	Volume Added				
LC537-L5_00019	06/14/17	12/23/16	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00014	200 uL	Perfluorobutanesulfonic acid (PFBS)	134.64 ng/mL		
							Perfluoroheptanoic acid	14.85 ng/mL		
							Perfluorohexanesulfonic acid	45.3873 ng/mL		
							Perfluorononanoic acid	31.1123 ng/mL		
							Perfluorooctanoic acid (PFOA)	29.2784 ng/mL		
					Perfluorooctanesulfonic acid (PFOS)	60.0996 ng/mL				
					LC537-IS_00028	100 uL	13C2-PFOA	10 ng/mL		
							13C4 PFOS	28.68 ng/mL		
					LC537-SU_00026	250 uL	13C2 PFDA	10 ng/mL		
							13C2 PFHxA	10 ng/mL		
.LC537-HSP_00014	06/22/17	12/22/16	Methanol, Lot 090285	10000 uL	LC537SPIM_00018	375 uL	Perfluorobutanesulfonic acid (PFBS)	3366 ng/mL		
							Perfluoroheptanoic acid	371.25 ng/mL		
							Perfluorohexanesulfonic acid	1134.68 ng/mL		
							Perfluorononanoic acid	777.808 ng/mL		
							Perfluorooctanoic acid (PFOA)	731.96 ng/mL		
Perfluorooctanesulfonic acid (PFOS)	1502.49 ng/mL									
..LC537SPIM_00018	06/22/17	12/22/16	Methanol, Lot 104453	10000 uL	LC537-PFBS_00006	440 uL	Perfluorobutanesulfonic acid (PFBS)	89.76 ug/mL		
							LC537-PFHpA_00013	100 uL	Perfluoroheptanoic acid	9.9 ug/mL
							LC537-PFHxS_00008	300 uL	Perfluorohexanesulfonic acid	30.2582 ug/mL
							LC537-PFNA_00011	200 uL	Perfluorononanoic acid	20.7415 ug/mL
							LC537-PFOA_00011	100 uL	Perfluorooctanoic acid (PFOA)	19.5189 ug/mL
LC537-PFOS_00006	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0664 ug/mL							
...LC537-PFBS_00006	07/28/17	07/28/16	Methanol, Lot 090285	5 mL	LC537_PFBS_00002	0.0102 g	Perfluorobutanesulfonic acid (PFBS)	2040 ug/mL		
....LC537_PFBS_00002	04/01/18		Sigma, Lot MKBP8842V		(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1 g/g		
...LC537-PFHpA_00013	06/22/17	12/22/16	Methanol, Lot 090285	56.8 mL	LC537 PFHpA_00002	0.0568 g	Perfluoroheptanoic acid	990 ug/mL		
...LC537 PFHpA_00002	04/01/18		Aldrich, Lot BCM2579V		(Purchased Reagent)		Perfluoroheptanoic acid	0.99 g/g		
...LC537-PFHxS_00008	07/28/17	07/28/16	Methanol, Lot 090285	5.5 mL	LC537 PFHxS_00002	0.0061 g	Perfluorohexanesulfonic acid	1008.61 ug/mL		
...LC537 PFHxS_00002	04/01/18		Sigma, Lot BCBL3545V		(Purchased Reagent)		Perfluorohexanesulfonic acid	0.9094 g/g		
...LC537-PFNA_00011	11/21/17	11/21/16	Methanol, Lot 090285	6.5 mL	LC537 PFNA_00002	0.007 g	Perfluorononanoic acid	1037.08 ug/mL		
...LC537 PFNA_00002	04/01/18		TCI America, Lot QN44F		(Purchased Reagent)		Perfluorononanoic acid	0.963 g/g		
...LC537-PFOA_00011	11/21/17	11/21/16	Methanol, Lot 090285	6.5 mL	LC537 PFOA_00002	0.0127 g	Perfluorooctanoic acid (PFOA)	1951.89 ug/mL		
...LC537 PFOA_00002	11/04/18		Fluka, Lot SZBD308XV		(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g		
...LC537-PFOS_00006	07/28/17	07/28/16	Methanol, Lot 090285	6 mL	LC537_PFOS_00002	0.0066 g	Perfluorooctanesulfonic acid (PFOS)	1001.66 ug/mL		
....LC537_PFOS_00002	08/09/17		Fluka, Lot SZBC222XV		(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g		
.LC537-IS_00028	06/19/17	12/19/16	Methanol, Lot 090285	10000 uL	LCM2PFOA_00005	100 uL	13C2-PFOA	0.5 ug/mL		
					LCMPFOS_00018	300 uL	13C4 PFOS	1.434 ug/mL		
..LCM2PFOA_00005	06/19/18		Wellington Laboratories, Lot M2PFOA0613		(Purchased Reagent)		13C2-PFOA	50 ug/mL		
..LCMPFOS_00018	08/03/21		Wellington Laboratories, Lot MPFOS0816		(Purchased Reagent)		13C4 PFOS	47.8 ug/mL		
.LC537-SU_00026	06/14/17	12/16/16	Methanol, Lot 104453	20000 uL	LC537-SU_00025	10000 uL	13C2 PFDA	0.2 ug/mL		

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-24311-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LC537-SU_00025	06/14/17	12/14/16	Methanol, Lot 104453	10000 uL	LCMPFDA 00008	80 uL	13C2 PFHxA	0.2 ug/mL
					LCMPFHxA 00009	80 uL	13C2 PFDA	0.4 ug/mL
...LCMPFDA 00008	08/19/20	Wellington Laboratories, Lot MPFDA0815			(Purchased Reagent)		13C2 PFHxA	0.4 ug/mL
...LCMPFHxA 00009	04/09/20	Wellington Laboratories, Lot MPFHxA0415			(Purchased Reagent)		13C2 PFDA	50 ug/mL
					(Purchased Reagent)		13C2 PFHxA	50 ug/mL
LC537-L6_00016	06/14/17	12/23/16	MeOH/H2O, Lot 090285	5 mL	LC537-HSP_00014	265 uL	Perfluorobutanesulfonic acid (PFBS)	178.398 ng/mL
							Perfluoroheptanoic acid	19.6763 ng/mL
							Perfluorohexanesulfonic acid	60.1382 ng/mL
							Perfluorononanoic acid	41.2238 ng/mL
							Perfluorooctanoic acid (PFOA)	38.7939 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	79.632 ng/mL
					LC537-IS_00028	100 uL	13C2-PFOA	10 ng/mL
							13C4 PFOS	28.68 ng/mL
					LC537-SU_00026	250 uL	13C2 PFDA	10 ng/mL
							13C2 PFHxA	10 ng/mL
.LC537-HSP_00014	06/22/17	12/22/16	Methanol, Lot 090285	10000 uL	LC537SPIM_00018	375 uL	Perfluorobutanesulfonic acid (PFBS)	3366 ng/mL
							Perfluoroheptanoic acid	371.25 ng/mL
							Perfluorohexanesulfonic acid	1134.68 ng/mL
							Perfluorononanoic acid	777.808 ng/mL
							Perfluorooctanoic acid (PFOA)	731.96 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	1502.49 ng/mL
..LC537SPIM_00018	06/22/17	12/22/16	Methanol, Lot 104453	10000 uL	LC537-PFBS_00006	440 uL	Perfluorobutanesulfonic acid (PFBS)	89.76 ug/mL
					LC537-PFHpA 00013	100 uL	Perfluoroheptanoic acid	9.9 ug/mL
					LC537-PFHxS 00008	300 uL	Perfluorohexanesulfonic acid	30.2582 ug/mL
					LC537-PFNA 00011	200 uL	Perfluorononanoic acid	20.7415 ug/mL
					LC537-PFOA 00011	100 uL	Perfluorooctanoic acid (PFOA)	19.5189 ug/mL
					LC537-PFOS_00006	400 uL	Perfluorooctanesulfonic acid (PFOS)	40.0664 ug/mL
...LC537-PFBS_00006	07/28/17	07/28/16	Methanol, Lot 090285	5 mL	LC537_PFBS_00002	0.0102 g	Perfluorobutanesulfonic acid (PFBS)	2040 ug/mL
....LC537_PFBS_00002	04/01/18	Sigma, Lot MKBP8842V			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1 g/g
...LC537-PFHpA 00013	06/22/17	12/22/16	Methanol, Lot 090285	56.8 mL	LC537 PFHpA 00002	0.0568 g	Perfluoroheptanoic acid	990 ug/mL
...LC537 PFHpA 00002	04/01/18	Aldrich, Lot BCM2579V			(Purchased Reagent)		Perfluoroheptanoic acid	0.99 g/g
...LC537-PFHxS 00008	07/28/17	07/28/16	Methanol, Lot 090285	5.5 mL	LC537 PFHxS 00002	0.0061 g	Perfluorohexanesulfonic acid	1008.61 ug/mL
...LC537 PFHxS 00002	04/01/18	Sigma, Lot BCBL3545V			(Purchased Reagent)		Perfluorohexanesulfonic acid	0.9094 g/g
...LC537-PFNA 00011	11/21/17	11/21/16	Methanol, Lot 090285	6.5 mL	LC537 PFNA 00002	0.007 g	Perfluorononanoic acid	1037.08 ug/mL
...LC537 PFNA 00002	04/01/18	TCI America, Lot QN44F			(Purchased Reagent)		Perfluorononanoic acid	0.963 g/g
...LC537-PFOA 00011	11/21/17	11/21/16	Methanol, Lot 090285	6.5 mL	LC537 PFOA 00002	0.0127 g	Perfluorooctanoic acid (PFOA)	1951.89 ug/mL
...LC537 PFOA 00002	11/04/18	Fluka, Lot SZBD308XV			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	0.999 g/g
...LC537-PFOS_00006	07/28/17	07/28/16	Methanol, Lot 090285	6 mL	LC537_PFOS_00002	0.0066 g	Perfluorooctanesulfonic acid (PFOS)	1001.66 ug/mL
....LC537_PFOS_00002	08/09/17	Fluka, Lot SZBC222XV			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	0.9106 g/g

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24311-1

SDG No.: _____

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LC537-IS_00028	06/19/17	12/19/16	Methanol, Lot 090285	10000 uL	LCM2PFOA_00005	100 uL	13C2-PFOA	0.5 ug/mL
					LCMPFOS_00018	300 uL	13C4 PFOS	1.434 ug/mL
..LCM2PFOA_00005	06/19/18	Wellington Laboratories, Lot M2PFOA0613			(Purchased Reagent)		13C2-PFOA	50 ug/mL
..LCMPFOS_00018	08/03/21	Wellington Laboratories, Lot MPFOS0816			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LC537-SU_00026	06/14/17	12/16/16	Methanol, Lot 104453	20000 uL	LC537-SU_00025	10000 uL	13C2 PFDA	0.2 ug/mL
							13C2 PFHxA	0.2 ug/mL
..LC537-SU_00025	06/14/17	12/14/16	Methanol, Lot 104453	10000 uL	LCMPFDA_00008	80 uL	13C2 PFDA	0.4 ug/mL
					LCMPFHxA_00009	80 uL	13C2 PFHxA	0.4 ug/mL
...LCMPFDA_00008	08/19/20	Wellington Laboratories, Lot MPFDA0815			(Purchased Reagent)		13C2 PFDA	50 ug/mL
...LCMPFHxA_00009	04/09/20	Wellington Laboratories, Lot MPFHxA0415			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
LC537-SU_00024	06/05/17	12/05/16	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
.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

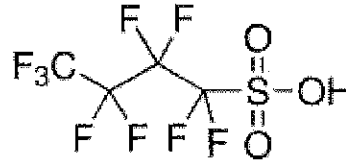
Outside USA: eurtechserv@sial.com

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



PFBS

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

Jamie Gleason, Manager
 Quality Control
 Milwaukee, Wisconsin US

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

Reagent

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 sv

Certificate of Analysis

Product Name: PERFLUOROHEPTANOIC ACID
99 %

Product Number: 342041

Batch Number: BCBM2579V

Brand: Aldrich

CAS Number: 375-85-9

Formula: $CF_3(CF_2)_5CO_2H$

Formula Weight: 364.06

Quality Release Date: 06 DEC 2013

Recommended Retest Date: OCT 2018

PFHPA

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

Dr. Claudia Geitner
Manager Quality Control
Buchs, Switzerland

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 SW

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

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

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

SW 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

11/3/2015 21

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

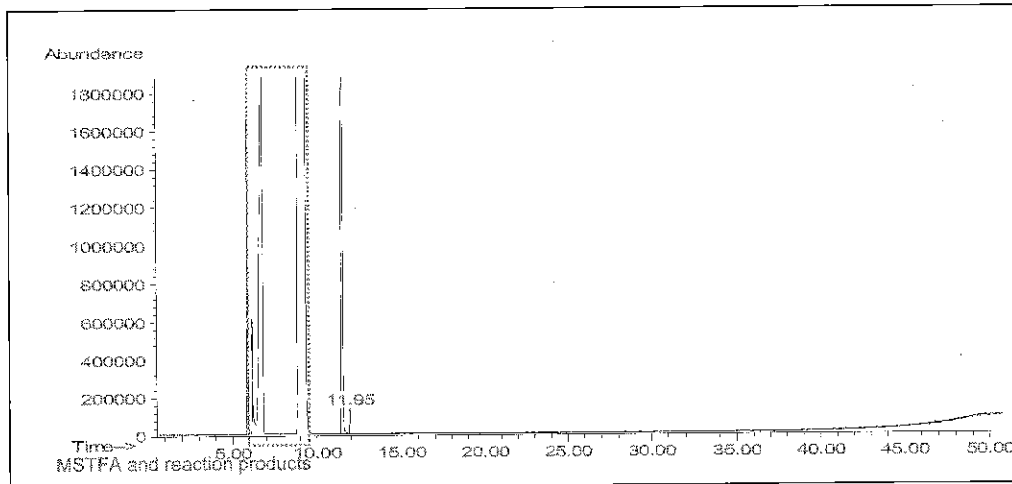
Mass range: 10-600 amu (Scan mode)

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

Identity: Mass spectrum complies

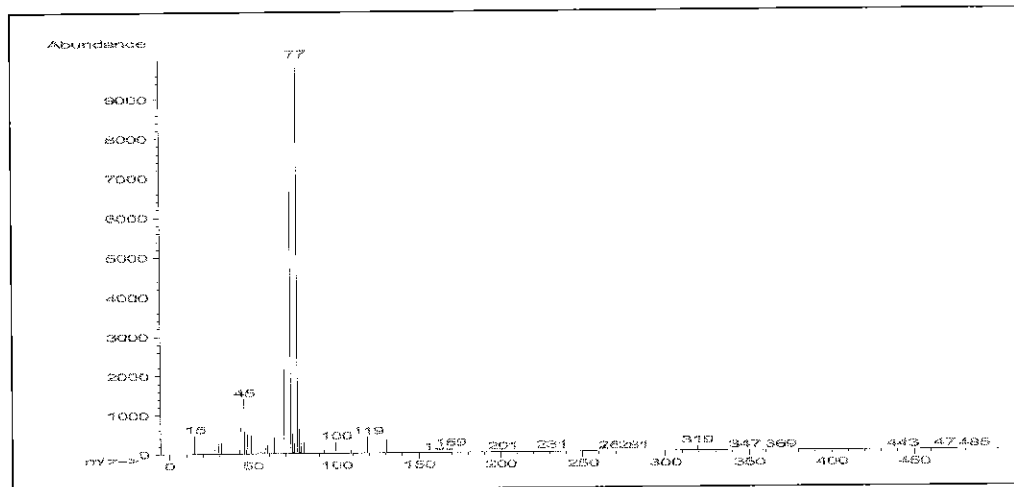
Operator: Ahrens / 2013-11-13

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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Tel: +82-2-3140-6000
Fax: +82-2-3140-6002
Email: saleskorea@alfa-asia.com

Reagent

LC537_PFOs_00002

F: 4/115 SV

SIGMA-ALDRICH®

CERTIFICATE OF ANALYSIS

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

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

Inv 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

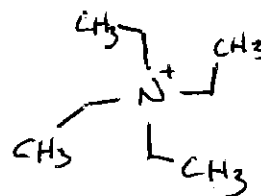
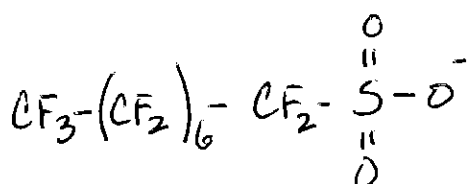
$$\text{MW correction} = \frac{500.125}{629.37} = 0.7946$$

~~79.46%~~ Oct 7-26-12

E. Schwarz

Purity + MW Correction = 77.87%

Edeltraud Schwärzler, 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: C₁₆H₂₀F₁₇NO₃S
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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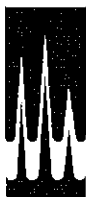
Sigma-Aldrich shall not be held liable for any damage resulting from handling or from processing the above product(s). This document does not make any warranty, express or implied, of fitness for any particular use of the product(s). Purchaser must determine the suitability of the product(s) for its use under the applicable law and regulations.

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

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

Reagent

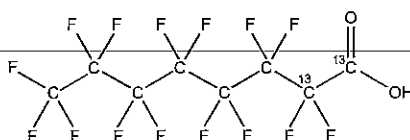
LCM2PFOA_00003



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.

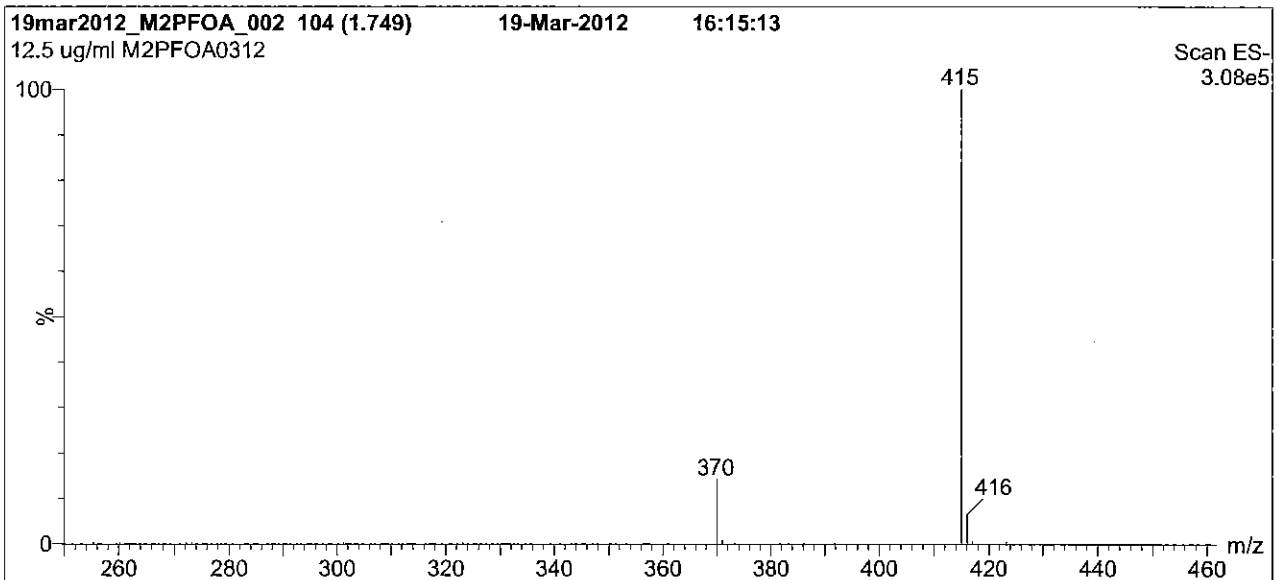
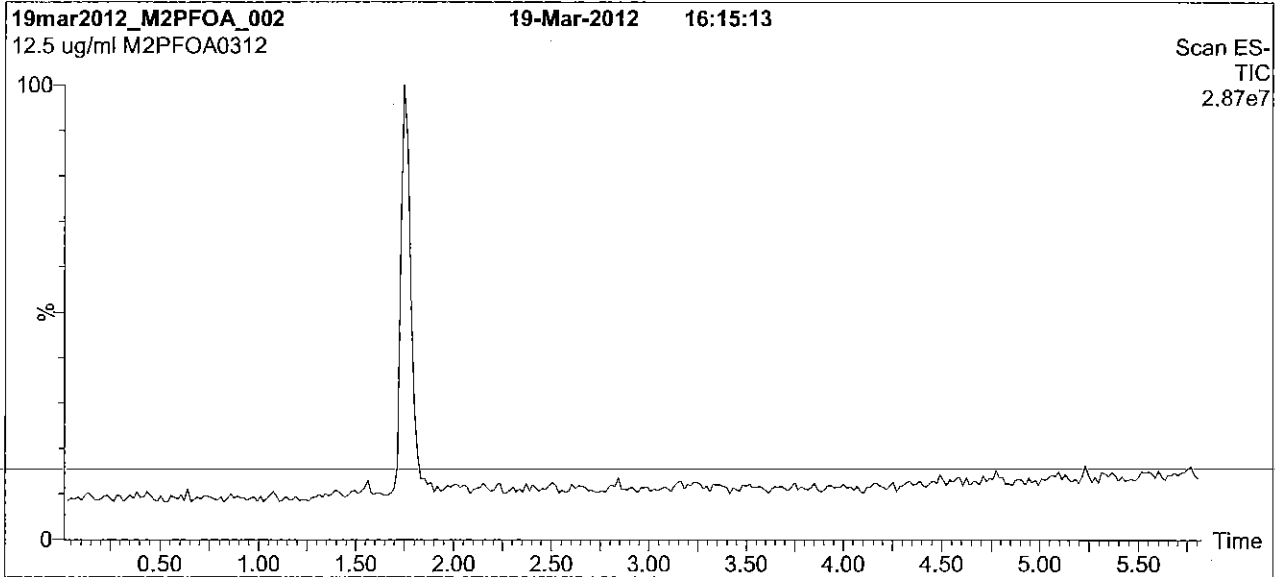
QUALITY MANAGEMENT:

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).



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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

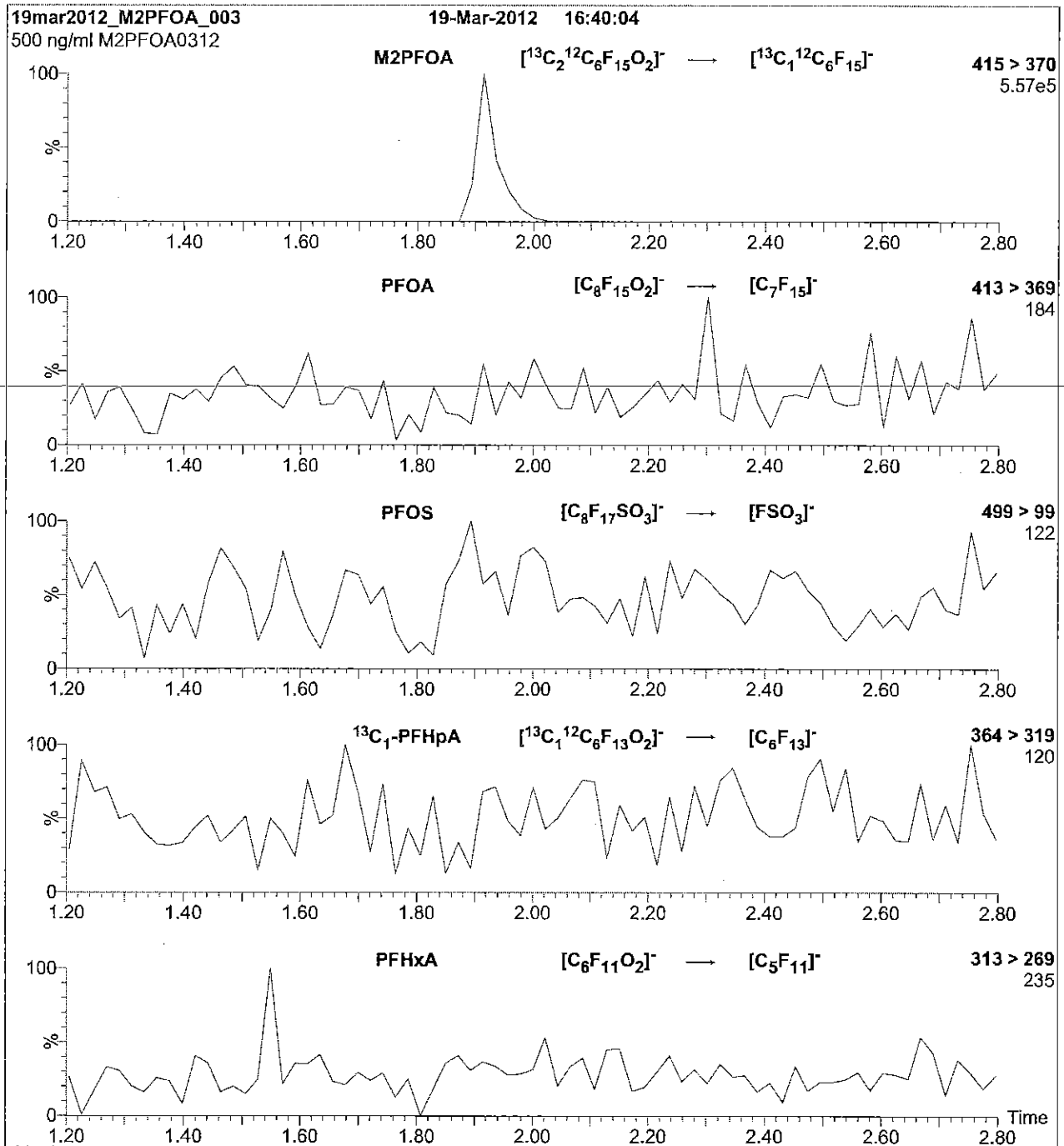
Flow: 300 μ l/min

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

Reagent

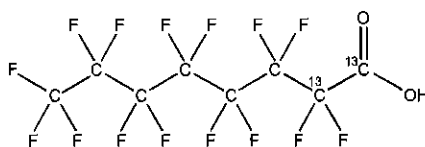
LCM2PFOA_00005



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2PFOA **LOT NUMBER:** M2PFOA0613
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) 06/19/2013
EXPIRY DATE: (mm/dd/yyyy) 06/19/2018
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____


B.G. Chittim

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

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

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

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

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

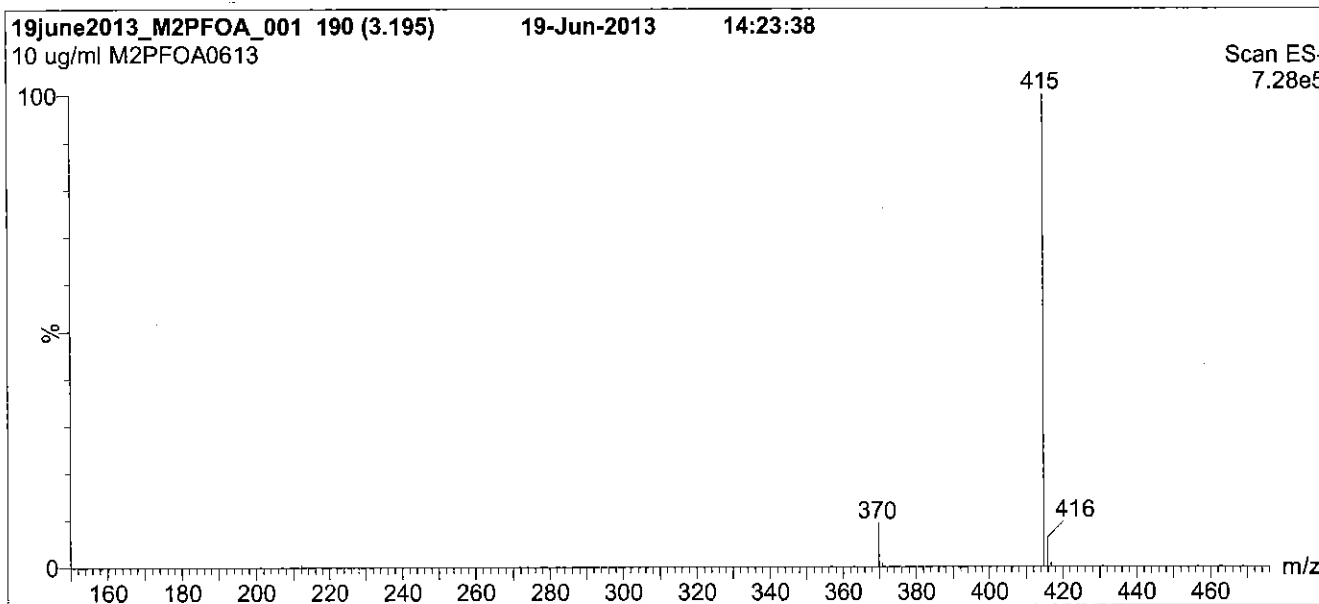
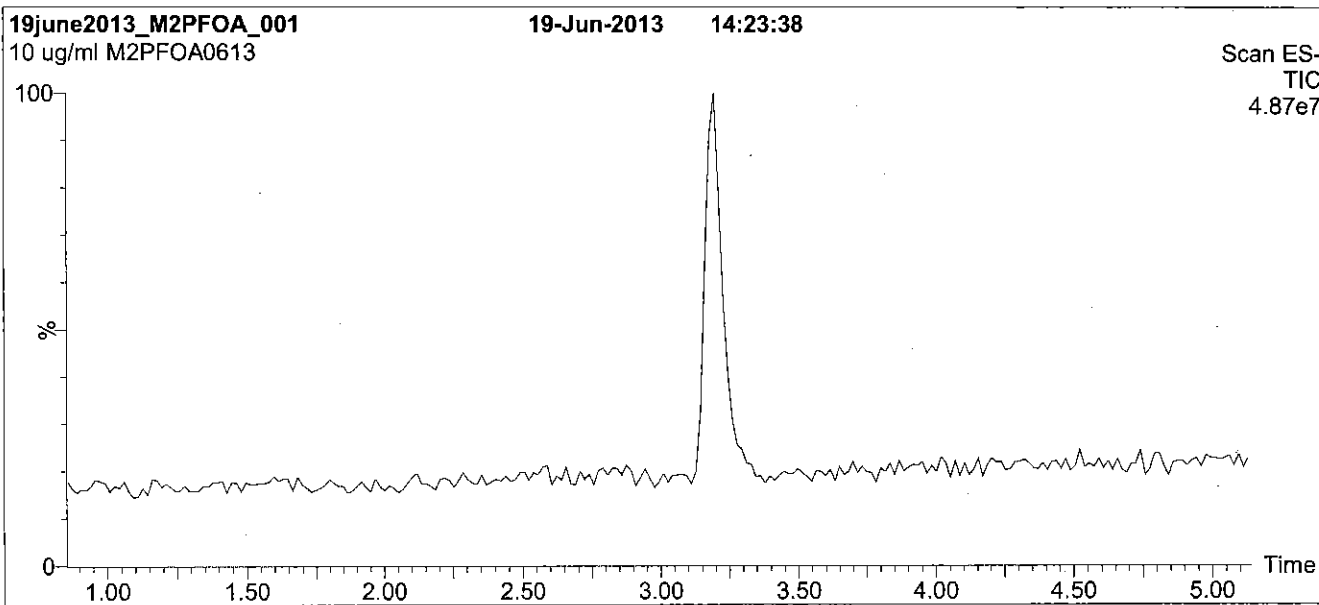
QUALITY MANAGEMENT:

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: 50% (80:20 MeOH:ACN) / 50% H₂O
 (both with 10 mM NH₄OAc buffer)
 Ramp to 90% organic over 7 min and hold for 1.5 min
 before returning to initial conditions in 0.5 min.
 Time: 10 min

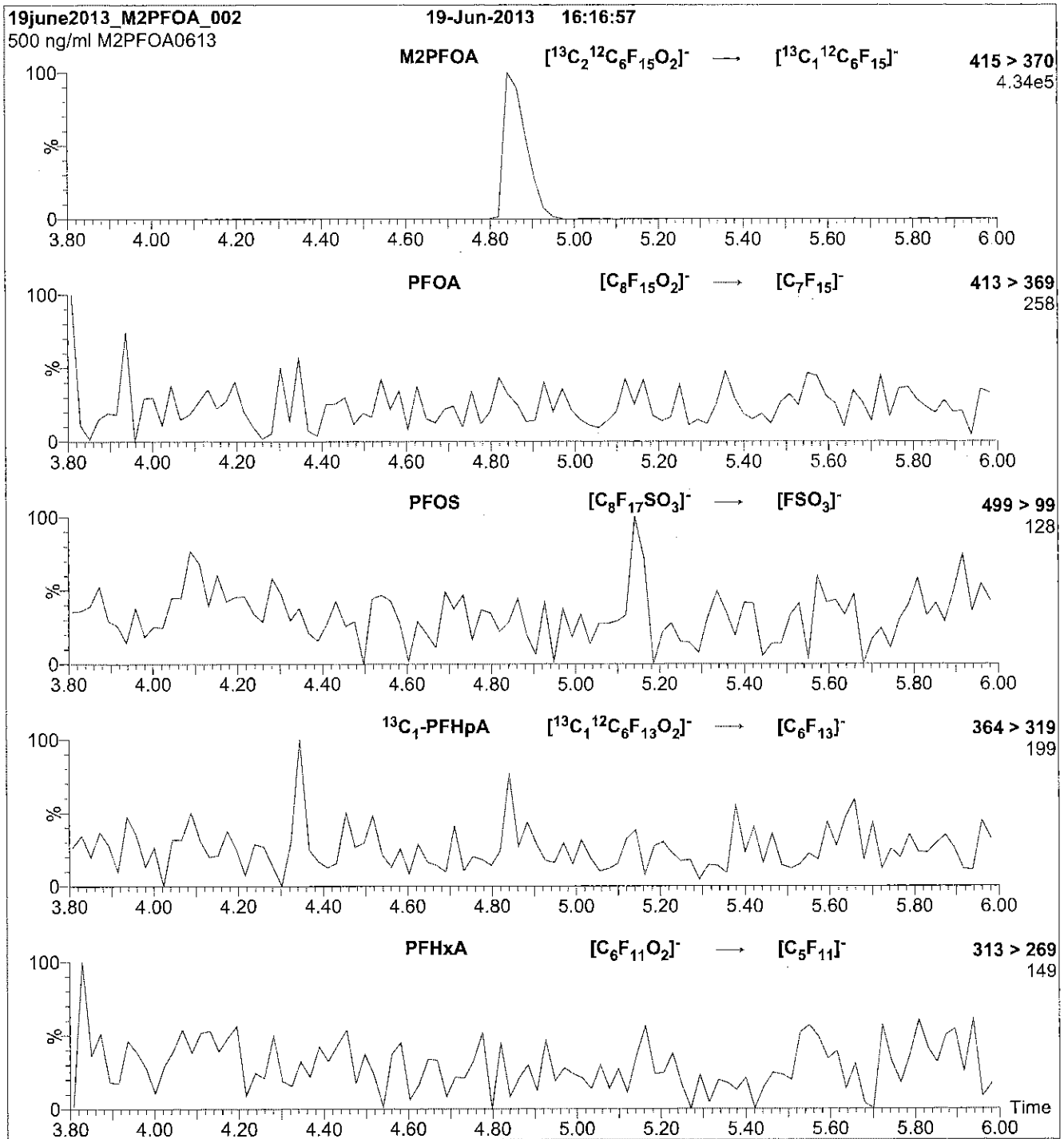
Flow: 300 μ l/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

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

Figure 2: M2PFOA; LC/MS/MS Data (Selected MRM Transitions)



Conditions for Figure 2:

Injection: Direct loop injection
10 μl (500 ng/ml M2PFOA)

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

Reagent

LCMPFDA_00008



605243

ID: LCMPFDA_00008

Exp: 08/19/20 Prep: CBW

13C2-Perfluorodecanoic acid

Rec. 3/29/16 JEB ✓



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

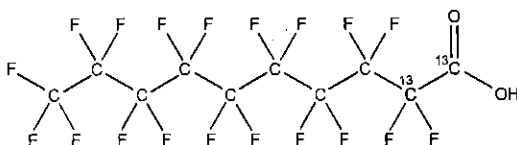
MPFDA

LOT NUMBER:

MPFDA0815

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

Not available

**MOLECULAR FORMULA:** $^{13}\text{C}_2\ ^{12}\text{C}_8\text{HF}_{19}\text{O}_2$ **MOLECULAR WEIGHT:**

516.07

CONCENTRATION: $50 \pm 2.5 \mu\text{g/ml}$ **SOLVENT(S):**

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY: $\geq 99\%$ 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.

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

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TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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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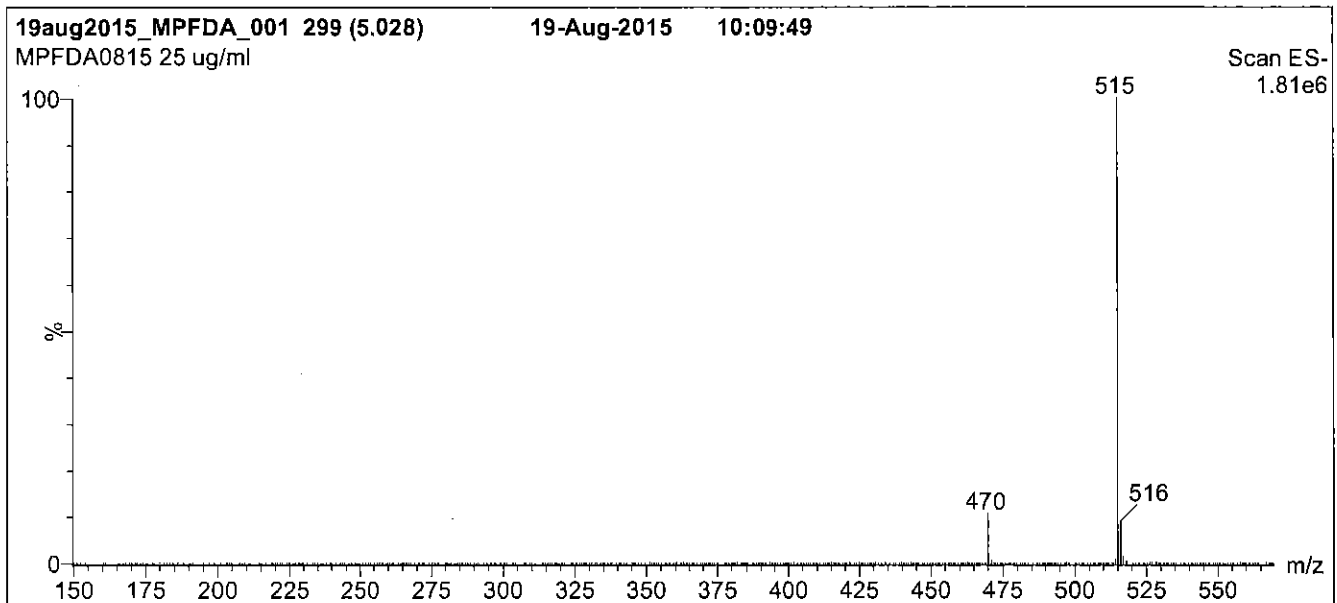
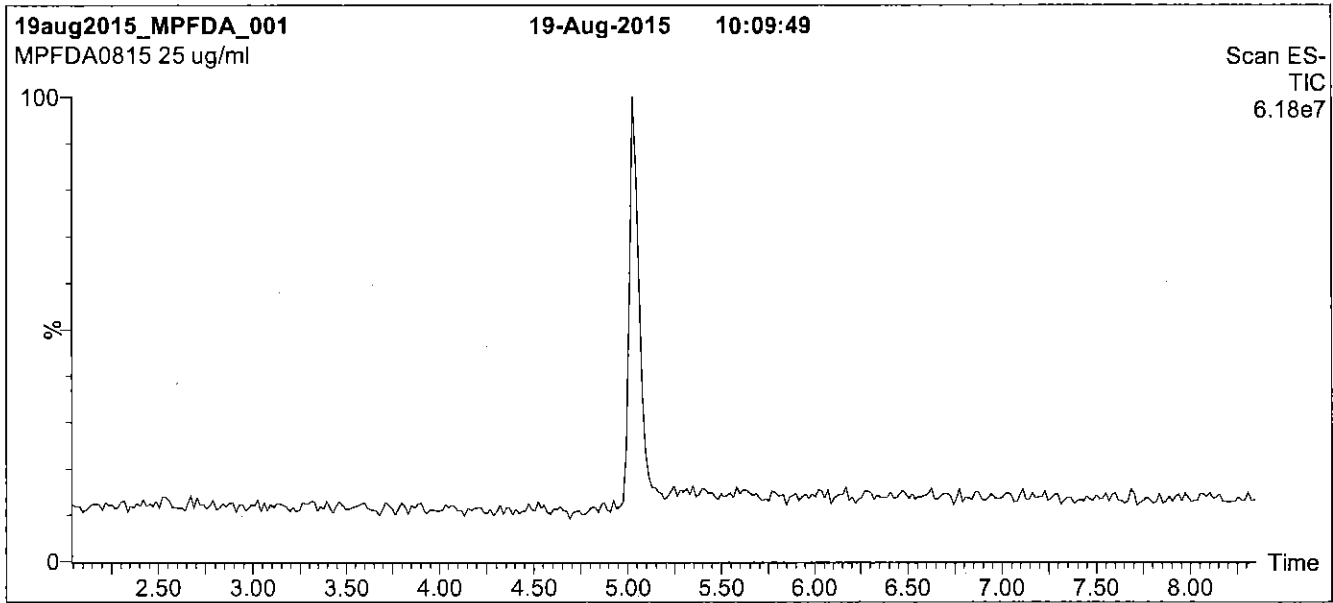
QUALITY MANAGEMENT:

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: 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

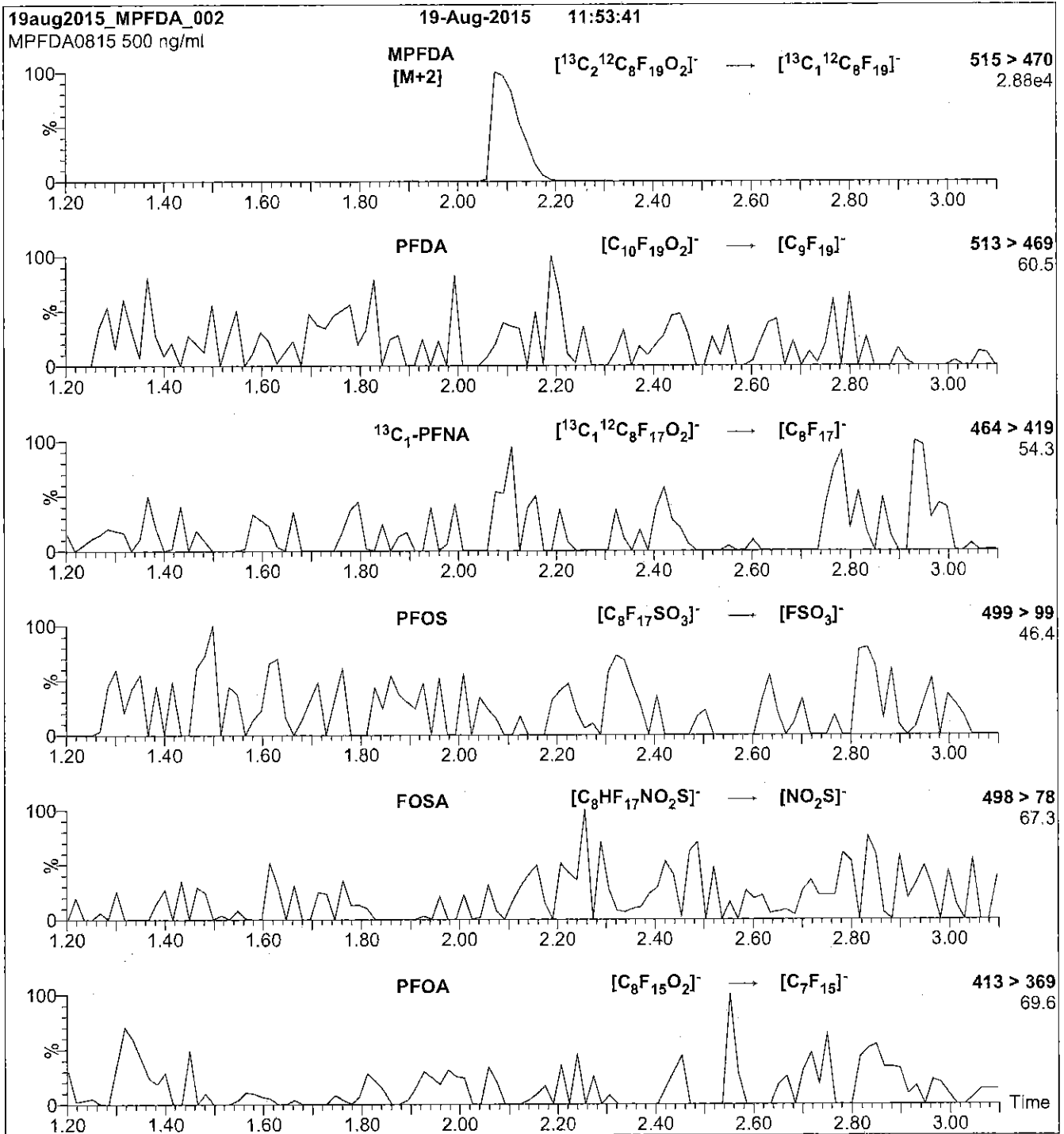
Column: Acquity UPLC BEH Shield RP₁₈
1.7 μ m, 2.1 x 100 mm
Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H₂O
(both with 10 mM NH₄OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

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

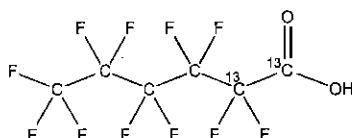
CERTIFICATE OF ANALYSIS DOCUMENTATION

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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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.

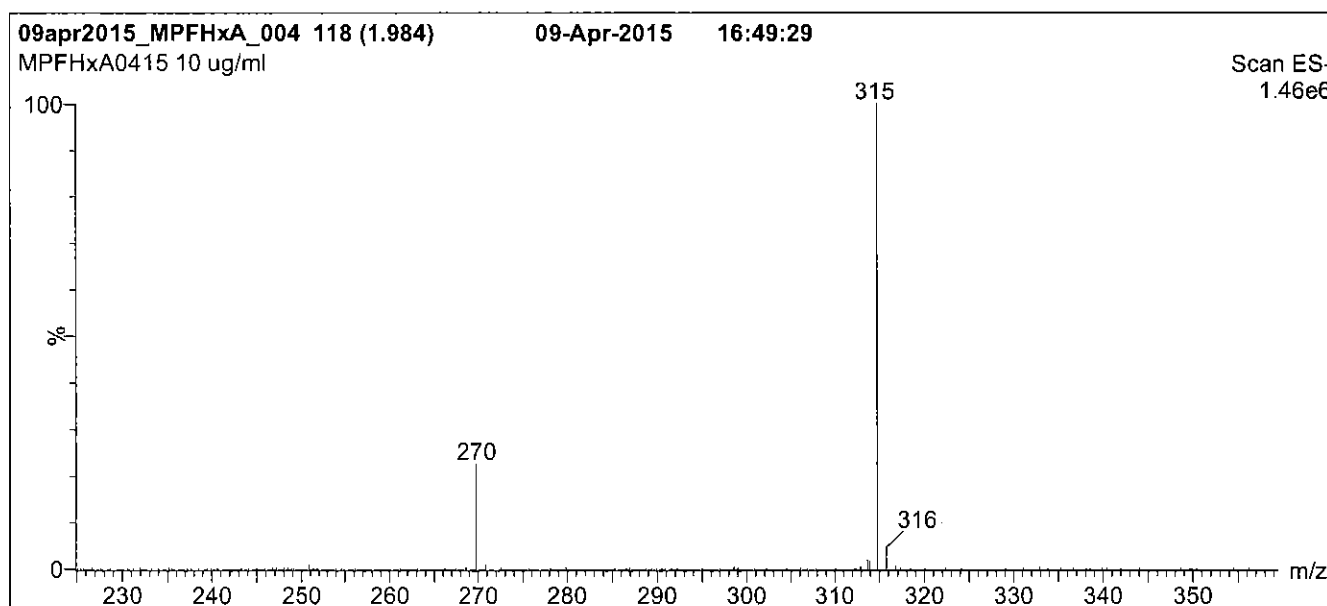
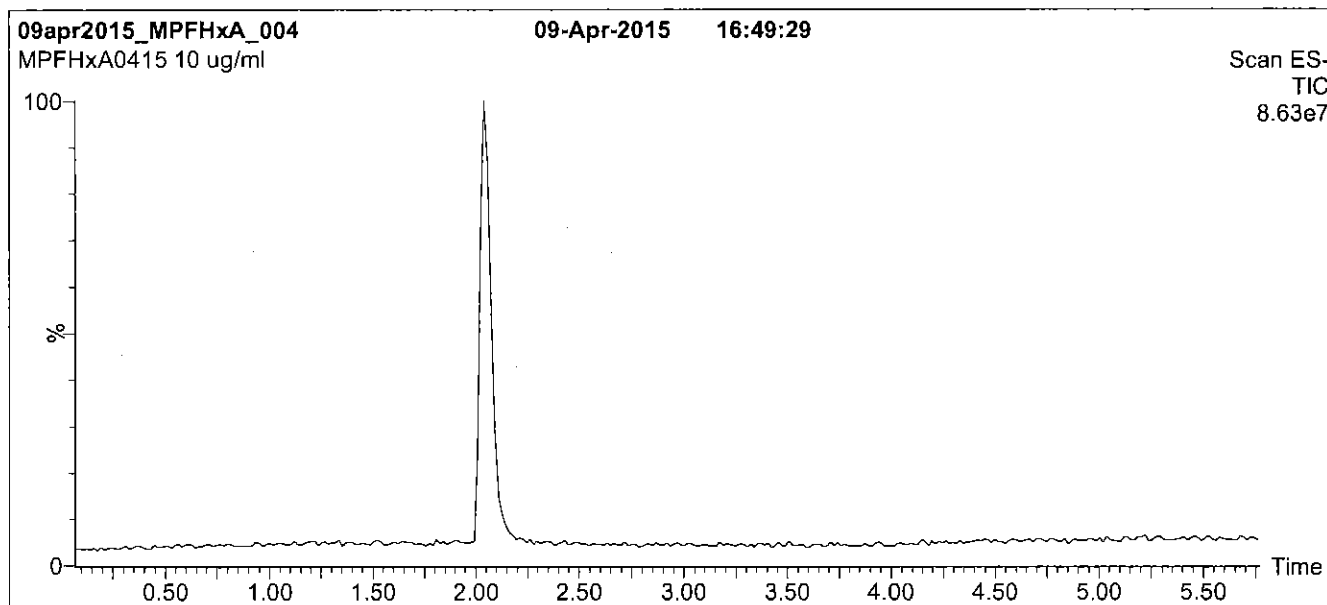
QUALITY MANAGEMENT:

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: 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

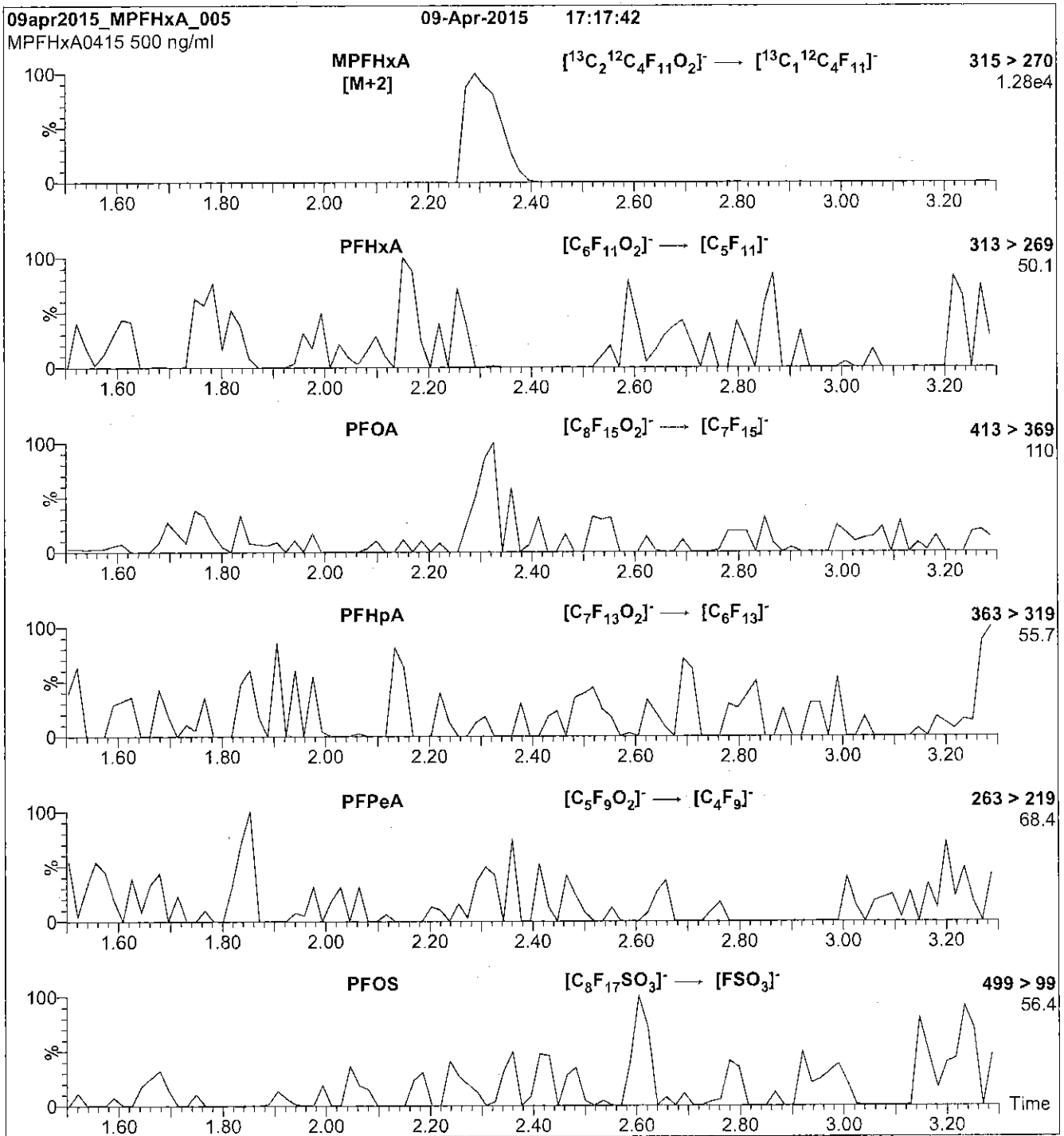
Flow: 300 μ l/min

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_00018

R: SBC 9/22/16



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

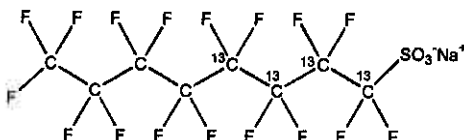


WELLINGTON LABORATORIES

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 (1,2,3,4-¹³C)
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.

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.

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EXPIRY DATE / PERIOD OF VALIDITY:

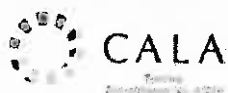
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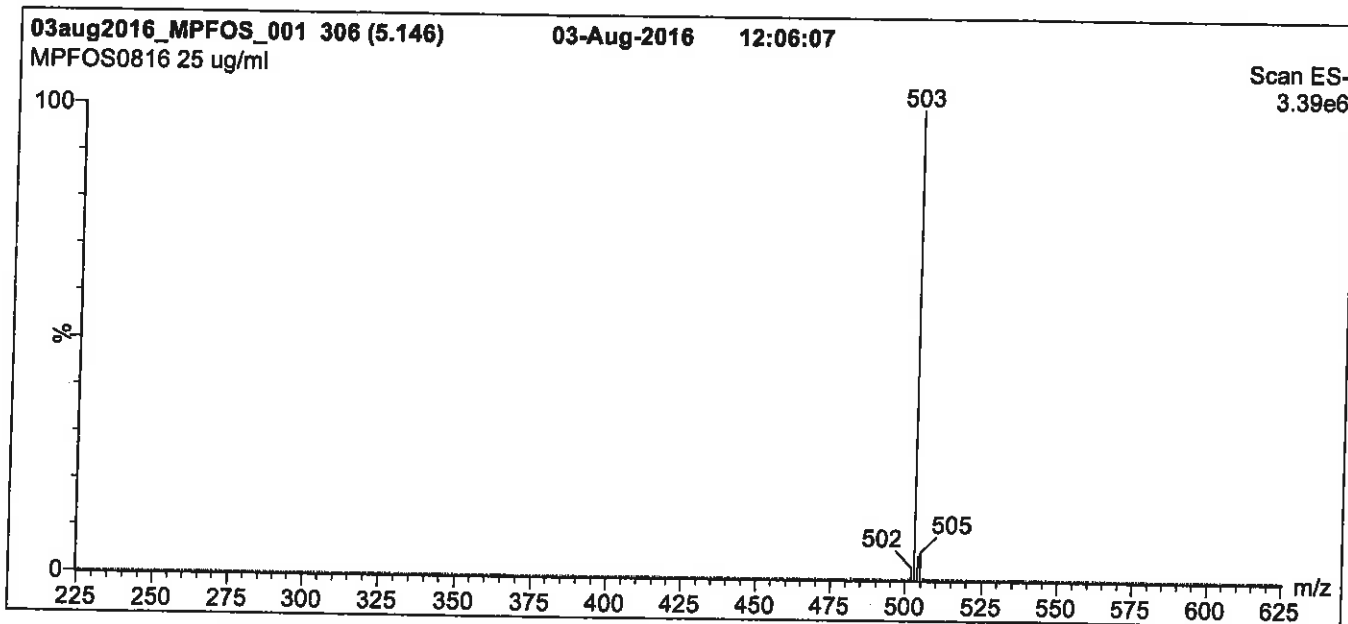
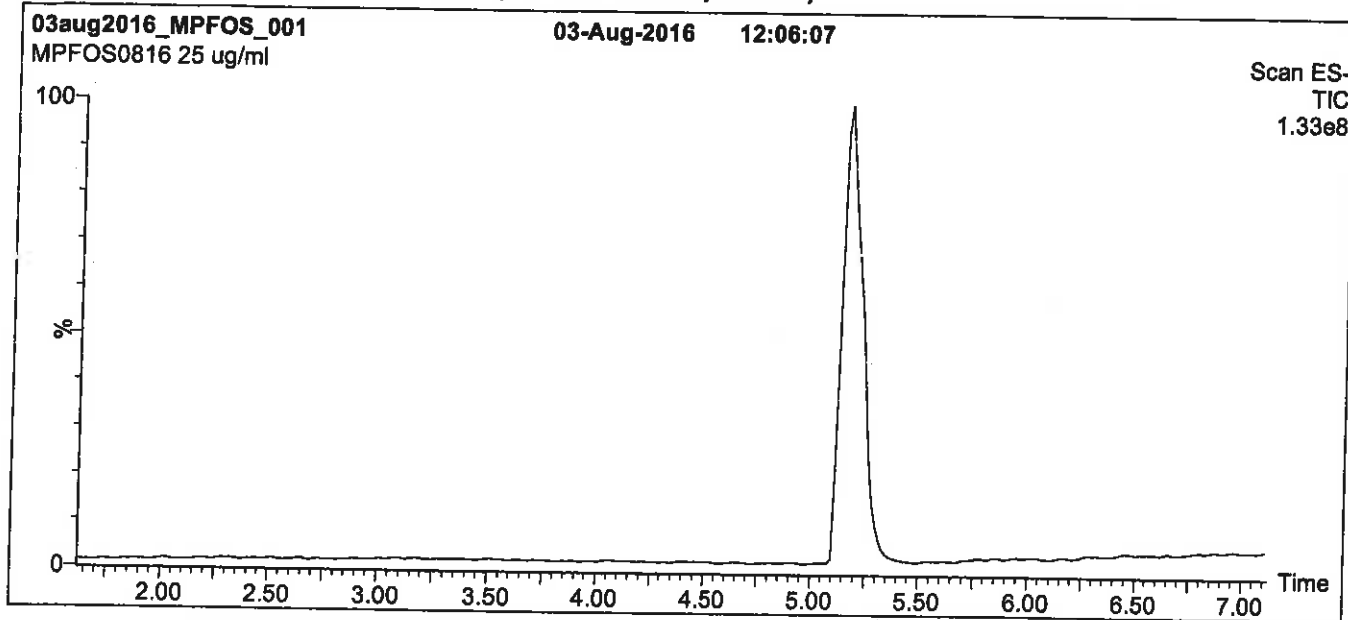
QUALITY MANAGEMENT:

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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: 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

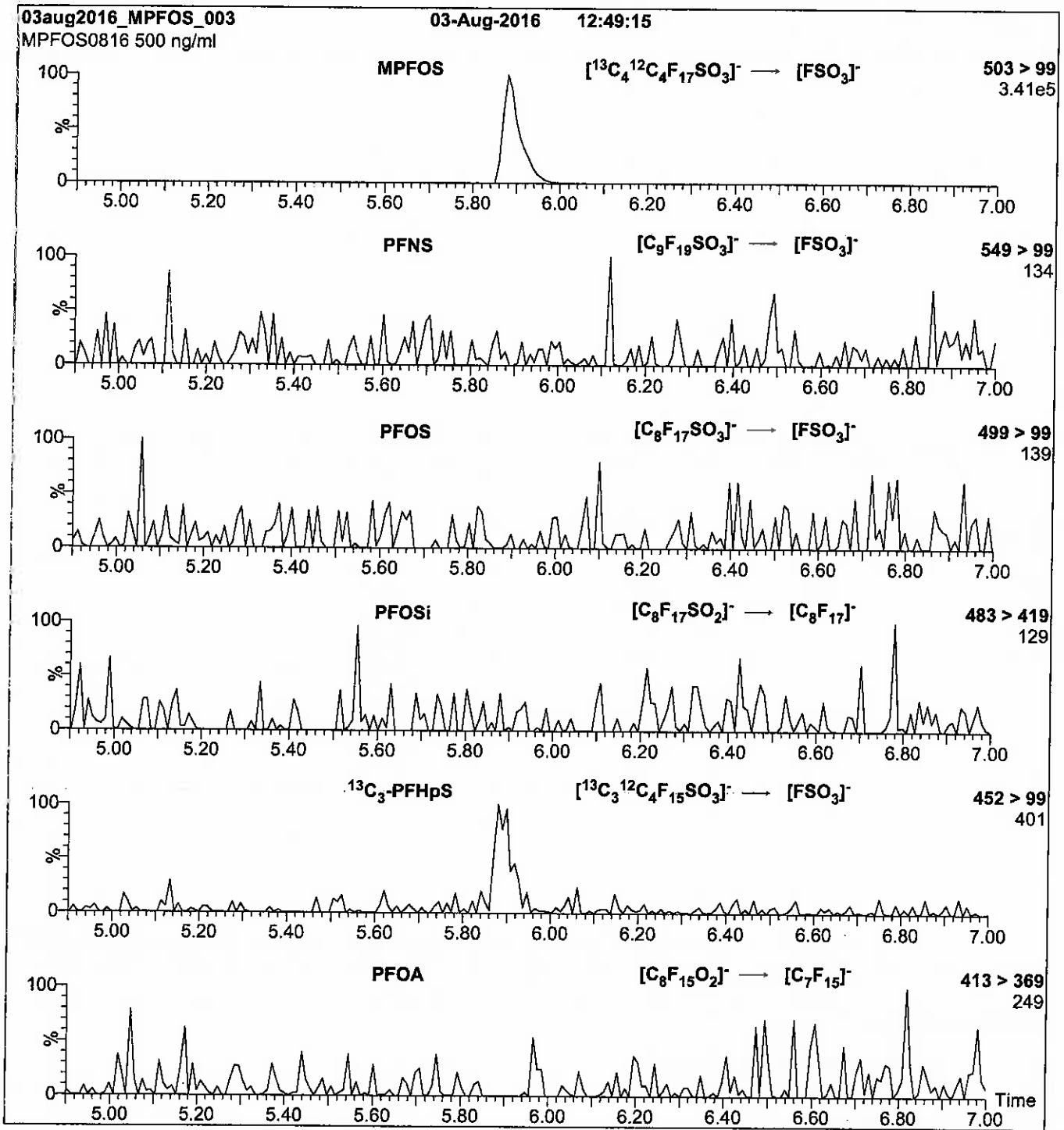
Flow: 300 μ l/min

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.: 320-24311-1

SDG No.: _____

Matrix: Water Level: Low

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

Client Sample ID	Lab Sample ID	PFHxA #	PFDA #
WI-CV-1RW32-1216	320-24311-1	113	105
WI-CV-1FB32-1216	320-24311-2	115	113
WI-CV-1RW33-1216	320-24311-3	101	110
WI-CV-1FB33-1216	320-24311-4	114	109
WI-CV-1RW34-1216	320-24311-5	109	125
WI-CV-1RW34-1216 DL	320-24311-5 DL	99	113
WI-CV-1FB34-1216	320-24311-6	102	97
	MB 320-142201/1-A	110	104
	LCS 320-142201/2-A	121	119
	LCSD 320-142201/3-A	118	114

PFHxA = 13C2 PFHxA
PFDA = 13C2 PFDA

QC LIMITS
70-130
70-130

Column to be used to flag recovery values

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-24311-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: 27DEC2016A6A_018.d
 Lab ID: LCS 320-142201/2-A Client ID: _____

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	0.300	0.273	91	70-130	
Perfluorooctanoic acid (PFOA)	0.146	0.158	108	70-130	E
Perfluorobutanesulfonic acid (PFBS)	0.673	0.550	82	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.: 320-24311-1

SDG No.: _____

Matrix: Water Level: Low Lab File ID: 27DEC2016A6A_019.d

Lab ID: LCSD 320-142201/3-A Client ID: _____

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
Perfluorooctanesulfonic acid (PFOS)	0.300	0.277	92	2	30	70-130	
Perfluorooctanoic acid (PFOA)	0.146	0.151	103	5	30	70-130	
Perfluorobutanesulfonic acid (PFBS)	0.673	0.555	82	1	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.: 320-24311-1
 SDG No.: _____
 Lab File ID: 27DEC2016A6A_017.d Lab Sample ID: MB 320-142201/1-A
 Matrix: Water Date Extracted: 12/14/2016 15:24
 Instrument ID: A6 Date Analyzed: 12/28/2016 00:55
 Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-142201/2-A	27DEC2016A6 A 018.d	12/28/2016 01:25
	LCSD 320-142201/3-A	27DEC2016A6 A 019.d	12/28/2016 01:54
WI-CV-1RW32-1216	320-24311-1	27DEC2016A6 A 020.d	12/28/2016 02:24
WI-CV-1FB32-1216	320-24311-2	27DEC2016A6 A 021.d	12/28/2016 02:53
WI-CV-1RW33-1216	320-24311-3	27DEC2016A6 A 022.d	12/28/2016 03:23
WI-CV-1FB33-1216	320-24311-4	27DEC2016A6 A 023.d	12/28/2016 03:53
WI-CV-1RW34-1216 DL	320-24311-5 DL	27DEC2016A6 A 024.d	12/28/2016 04:22
WI-CV-1FB34-1216	320-24311-6	27DEC2016A6 A 025.d	12/28/2016 04:52
WI-CV-1RW34-1216	320-24311-5	27DEC2016A6 A 026.d	12/28/2016 05:21

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24311-1
 SDG No.: _____
 Instrument ID: A6 Calibration Start Date: 12/24/2016 04:26
 GC Column: Acquity ID: 2.1(mm) Calibration End Date: 12/24/2016 06:54
 Calibration ID: 27291

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
INITIAL CALIBRATION MEAN AREA AND MEAN RT	587721	20.01	1475089	20.62		
UPPER LIMIT	881582	20.51	2212634	21.12		
LOWER LIMIT	293861	19.51	737545	20.12		
LAB SAMPLE ID	CLIENT SAMPLE ID					
CCV 320-143828/11 CCVL		652887	20.01	1599599	20.62	
ICV 320-143828/13		590506	20.01	1587807	20.62	
CCV 320-144052/15 CCVIS		621113	20.00	1589494	20.62	
MB 320-142201/1-A		630164	20.00	1833172	20.61	
LCS 320-142201/2-A		547841	20.00	1499197	20.61	
LCSD 320-142201/3-A		586019	20.00	1522334	20.61	
320-24311-1	WI-CV-1RW32-1216	659005	20.00	2028167	20.61	
320-24311-2	WI-CV-1FB32-1216	635775	19.99	1959709	20.61	
320-24311-3	WI-CV-1RW33-1216	632380	20.00	1938231	20.61	
320-24311-4	WI-CV-1FB33-1216	668209	20.00	2079790	20.61	
320-24311-5 DL	WI-CV-1RW34-1216 DL	55423Q	20.00	196952Q	20.62	
320-24311-6	WI-CV-1FB34-1216	657355	20.00	1842654	20.61	
320-24311-5	WI-CV-1RW34-1216	480558	19.99	1785601	20.61	
CCV 320-144052/27 CCVIS		650671	19.99	1655589	20.61	

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.: 320-24311-1
 SDG No.: _____
 Sample No.: CCV 320-144052/15 Date Analyzed: 12/27/2016 23:56
 Instrument ID: A6 GC Column: Acquity ID: 2.1 (mm)
 Lab File ID (Standard): 27DEC2016A6A_015.d Heated Purge: (Y/N) N
 Calibration ID: 27291

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	621113	20.00	1589494	20.62		
UPPER LIMIT	869558	20.50	2225292	21.12		
LOWER LIMIT	434779	19.50	1112646	20.12		
LAB SAMPLE ID	CLIENT SAMPLE ID					
MB 320-142201/1-A		630164	20.00	1833172	20.61	
LCS 320-142201/2-A		547841	20.00	1499197	20.61	
LCSD 320-142201/3-A		586019	20.00	1522334	20.61	
320-24311-1	WI-CV-1RW32-1216	659005	20.00	2028167	20.61	
320-24311-2	WI-CV-1FB32-1216	635775	19.99	1959709	20.61	
320-24311-3	WI-CV-1RW33-1216	632380	20.00	1938231	20.61	
320-24311-4	WI-CV-1FB33-1216	668209	20.00	2079790	20.61	
320-24311-5 DL	WI-CV-1RW34-1216 DL	55423Q	20.00	196952Q	20.62	
320-24311-6	WI-CV-1FB34-1216	657355	20.00	1842654	20.61	
320-24311-5	WI-CV-1RW34-1216	480558	19.99	1785601	20.61	

13PFOA = 13C2-PFOA

PFOS = 13C4 PFOS

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

Column used to flag values outside QC limits

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-24311-1
 SDG No.: _____
 Sample No.: CCV 320-144052/27 Date Analyzed: 12/28/2016 05:51
 Instrument ID: A6 GC Column: Acquity ID: 2.1 (mm)
 Lab File ID (Standard): 27DEC2016A6A_027.d Heated Purge: (Y/N) N
 Calibration ID: 27291

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	650671	19.99	1655589	20.61		
UPPER LIMIT	910939	20.49	2317825	21.11		
LOWER LIMIT	455470	19.49	1158912	20.11		
LAB SAMPLE ID	CLIENT SAMPLE ID					
MB 320-142201/1-A		630164	20.00	1833172	20.61	
LCS 320-142201/2-A		547841	20.00	1499197	20.61	
LCSD 320-142201/3-A		586019	20.00	1522334	20.61	
320-24311-1	WI-CV-1RW32-1216	659005	20.00	2028167	20.61	
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13PFOA = 13C2-PFOA
 PFOS = 13C4 PFOS

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Column used to flag values outside QC limits

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-24311-1
 SDG No.: _____
 Client Sample ID: WI-CV-1RW32-1216 Lab Sample ID: 320-24311-1
 Matrix: Water Lab File ID: 27DEC2016A6A_020.d
 Analysis Method: 537 Date Collected: 12/09/2016 14:15
 Extraction Method: 537 Date Extracted: 12/14/2016 15:24
 Sample wt/vol: 247.4(mL) Date Analyzed: 12/28/2016 02:24
 Con. Extract Vol.: 1(mL) Dilution Factor: 1
 Injection Volume: 10(uL) GC Column: Acquity ID: 2.1(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 144052 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.049	U	0.061	0.049	0.016
335-67-1	Perfluorooctanoic acid (PFOA)	0.024	U	0.030	0.024	0.0095
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.14	0.11	0.048

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	113		70-130
STL00996	13C2 PFDA	105		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\27DEC2016A6A_020.d
 Lims ID: 320-24311-A-1-A
 Client ID: WI-CV-1RW32-1216
 Sample Type: Client
 Inject. Date: 28-Dec-2016 02:24:22 ALS Bottle#: 25 Worklist Smp#: 20
 Injection Vol: 10.0 ul Dil. Factor: 1.0000
 Sample Info: 320-24311-a-1-a
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
 Operator ID: CBW Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 28-Dec-2016 14:23:17 Calib Date: 24-Dec-2016 06:54:10
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK012

First Level Reviewer: barnettj Date: 28-Dec-2016 14:03:18

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

\$ 2 13C2 PFHxA	315.0 > 270.0	18.539	18.548	-0.009	1.000	886480	11.3	29658
* 5 13C2-PFOA	415.0 > 370.0	19.999	19.999	0.0		659005	10.0	16745
* 8 13C4 PFOS	503.0 > 80.0	20.608	20.619	-0.011		2028167	28.7	53162
9 Perfluorononanoic acid								M
	463.0 > 419.0	20.679	20.702	-0.023	1.000	1784	0.0236	53.8 M
\$ 10 13C2 PFDA	515.0 > 470.0	21.400	21.418	-0.018	1.000	695570	10.5	21789

QC Flag Legend

Review Flags

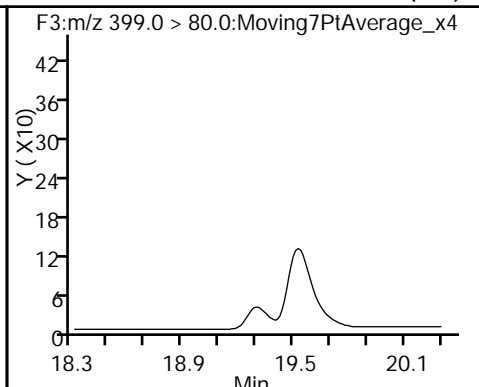
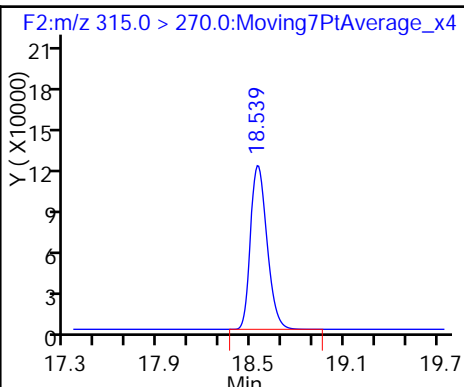
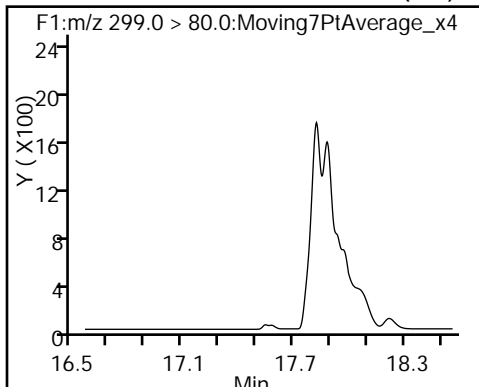
M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\27DEC2016A6A_020.d
Injection Date: 28-Dec-2016 02:24:22 Instrument ID: A6
Lims ID: 320-24311-A-1-A Lab Sample ID: 320-24311-1
Client ID: WI-CV-1RW32-1216
Operator ID: CBW ALS Bottle#: 25 Worklist Smp#: 20
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL

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

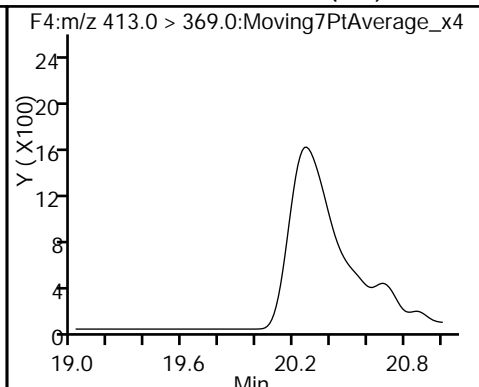
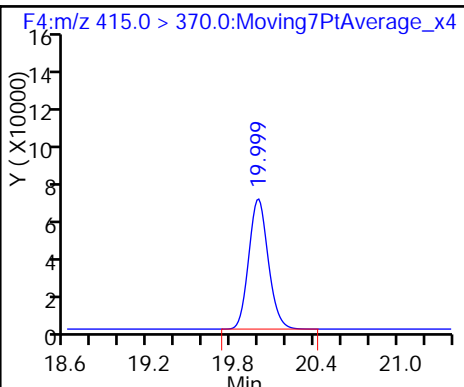
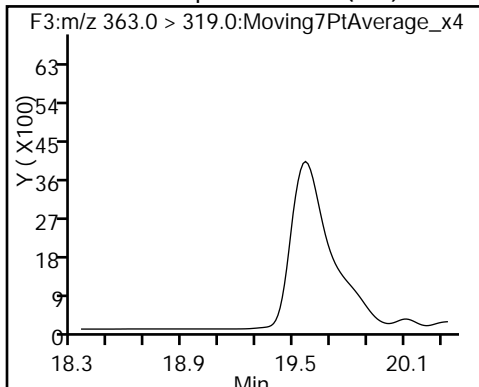
3 Perfluorohexanesulfonic acid (ND)



4 Perfluoroheptanoic acid (ND)

* 5 13C2-PFOA

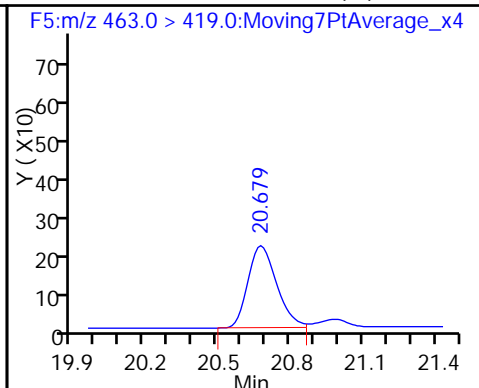
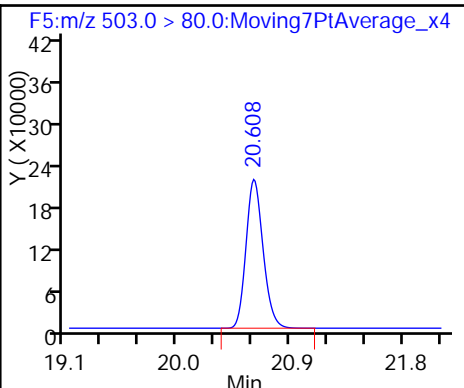
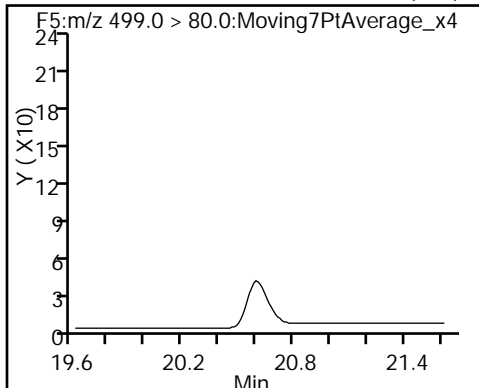
6 Perfluorooctanoic acid (ND)



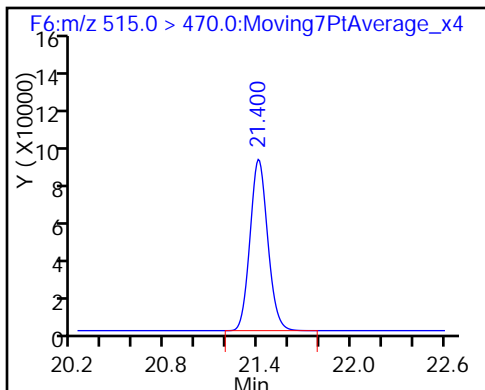
7 Perfluorooctane sulfonic acid (ND)

* 8 13C4 PFOS

9 Perfluorononanoic acid (M)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\27DEC2016A6A_020.d
 Lims ID: 320-24311-A-1-A
 Client ID: WI-CV-1RW32-1216
 Sample Type: Client
 Inject. Date: 28-Dec-2016 02:24:22 ALS Bottle#: 25 Worklist Smp#: 20
 Injection Vol: 10.0 ul Dil. Factor: 1.0000
 Sample Info: 320-24311-a-1-a
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35°C
 Operator ID: CBW Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 28-Dec-2016 14:23:17 Calib Date: 24-Dec-2016 06:54:10
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK012

First Level Reviewer: barnettj Date: 28-Dec-2016 14:03:18

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	11.3	112.74
\$ 10 13C2 PFDA	10.0	10.5	104.68

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-24311-1
 SDG No.: _____
 Client Sample ID: WI-CV-1FB32-1216 Lab Sample ID: 320-24311-2
 Matrix: Water Lab File ID: 27DEC2016A6A_021.d
 Analysis Method: 537 Date Collected: 12/09/2016 14:16
 Extraction Method: 537 Date Extracted: 12/14/2016 15:24
 Sample wt/vol: 249.9(mL) Date Analyzed: 12/28/2016 02:53
 Con. Extract Vol.: 1(mL) Dilution Factor: 1
 Injection Volume: 10(uL) GC Column: Acquity ID: 2.1(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 144052 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 M	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	115		70-130
STL00996	13C2 PFDA	113		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\27DEC2016A6A_021.d
 Lims ID: 320-24311-A-2-A
 Client ID: WI-CV-1FB32-1216
 Sample Type: Client
 Inject. Date: 28-Dec-2016 02:53:56 ALS Bottle#: 26 Worklist Smp#: 21
 Injection Vol: 10.0 ul Dil. Factor: 1.0000
 Sample Info: 320-24311-a-2-a
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
 Operator ID: CBW Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 28-Dec-2016 14:23:17 Calib Date: 24-Dec-2016 06:54:10
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK012

First Level Reviewer: barnettj Date: 28-Dec-2016 14:04:03

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	18.539	18.548	-0.009	1.000	868705	11.5	28873
* 5 13C2-PFOA	415.0 > 370.0	19.986	19.999	-0.013		635775	10.0	16074
6 Perfluorooctanoic acid								M
413.0 > 369.0	19.986	20.011	-0.025	1.000	842	0.0132	0.4	M
* 8 13C4 PFOS	503.0 > 80.0	20.608	20.619	-0.011		1959709	28.7	40785
9 Perfluorononanoic acid								M
463.0 > 419.0	20.679	20.702	-0.023	1.000	384	0.005258	5.8	M
\$ 10 13C2 PFDA	515.0 > 470.0	21.400	21.418	-0.018	1.000	726690	11.3	23087

QC Flag Legend

Review Flags

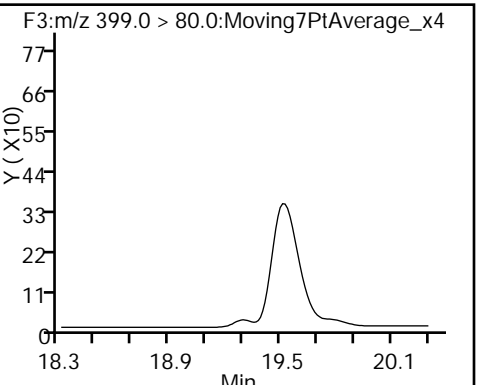
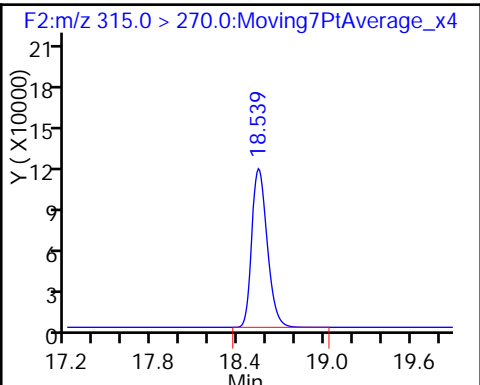
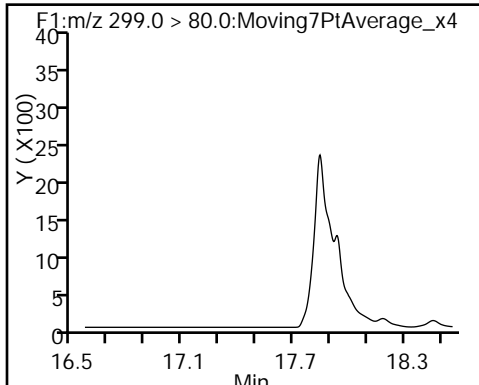
M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\27DEC2016A6A_021.d
Injection Date: 28-Dec-2016 02:53:56 Instrument ID: A6
Lims ID: 320-24311-A-2-A Lab Sample ID: 320-24311-2
Client ID: WI-CV-1FB32-1216
Operator ID: CBW ALS Bottle#: 26 Worklist Smp#: 21
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL

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

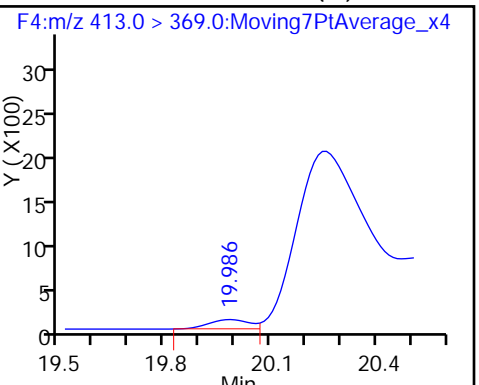
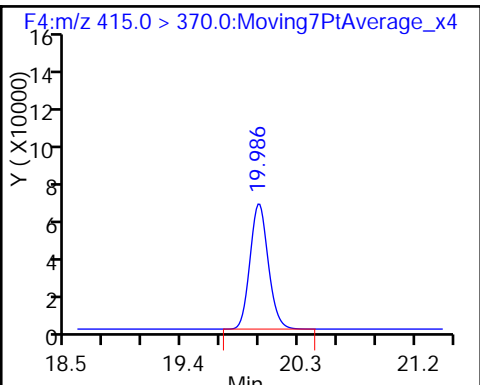
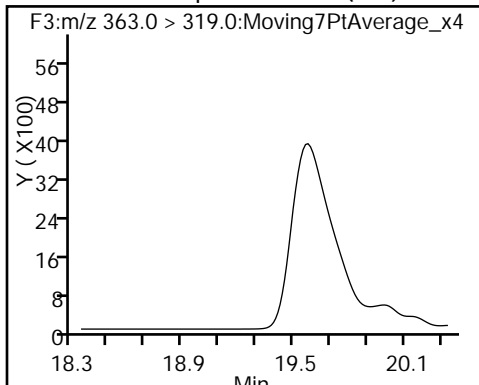
3 Perfluorohexanesulfonic acid (ND)



4 Perfluoroheptanoic acid (ND)

* 5 13C2-PFOA

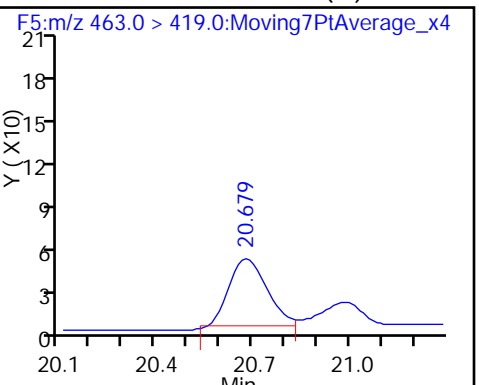
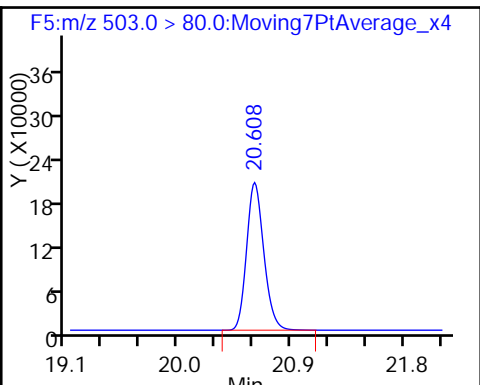
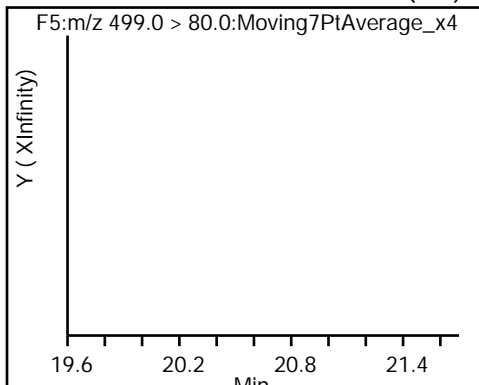
6 Perfluorooctanoic acid (M)



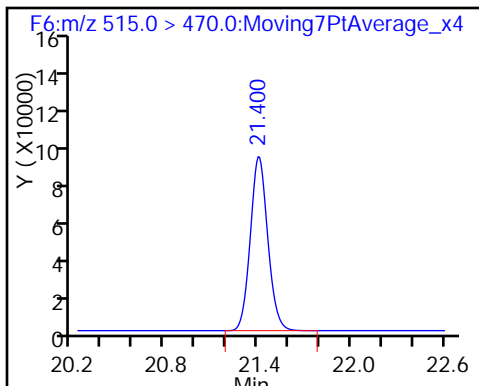
7 Perfluorooctane sulfonic acid (ND)

* 8 13C4 PFOS

9 Perfluorononanoic acid (M)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\27DEC2016A6A_021.d
 Lims ID: 320-24311-A-2-A
 Client ID: WI-CV-1FB32-1216
 Sample Type: Client
 Inject. Date: 28-Dec-2016 02:53:56 ALS Bottle#: 26 Worklist Smp#: 21
 Injection Vol: 10.0 ul Dil. Factor: 1.0000
 Sample Info: 320-24311-a-2-a
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35°C
 Operator ID: CBW Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 28-Dec-2016 14:23:17 Calib Date: 24-Dec-2016 06:54:10
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK012

First Level Reviewer: barnettj Date: 28-Dec-2016 14:04:03

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	11.5	114.52
\$ 10 13C2 PFDA	10.0	11.3	113.36

TestAmerica Sacramento

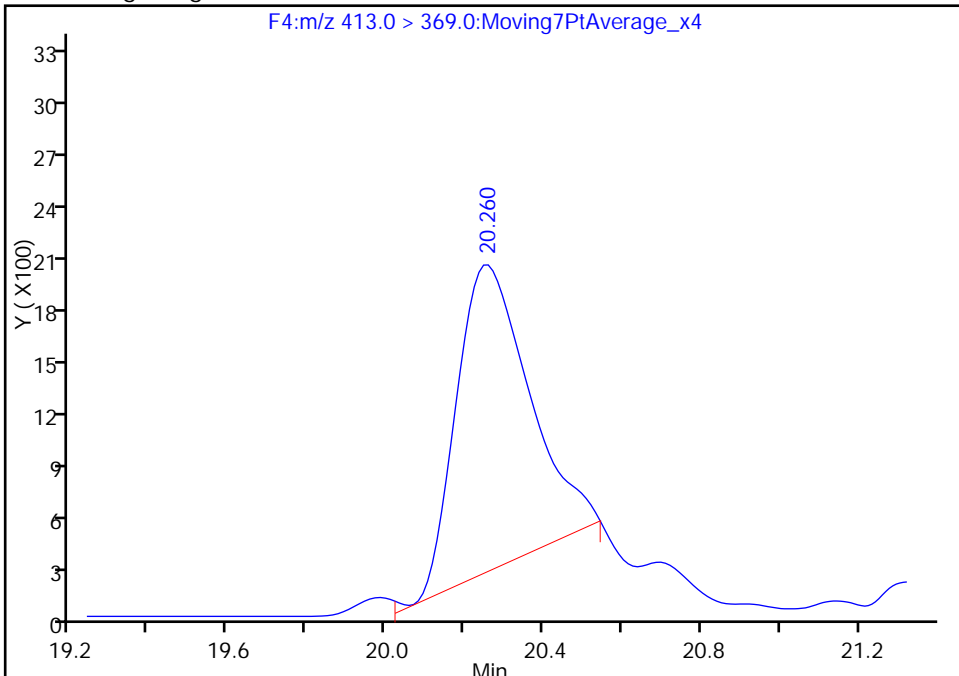
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Injection Date: 28-Dec-2016 02:53:56 Instrument ID: A6
Lims ID: 320-24311-A-2-A Lab Sample ID: 320-24311-2
Client ID: WI-CV-1FB32-1216
Operator ID: CBW ALS Bottle#: 26 Worklist Smp#: 21
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F4:M/RM

6 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

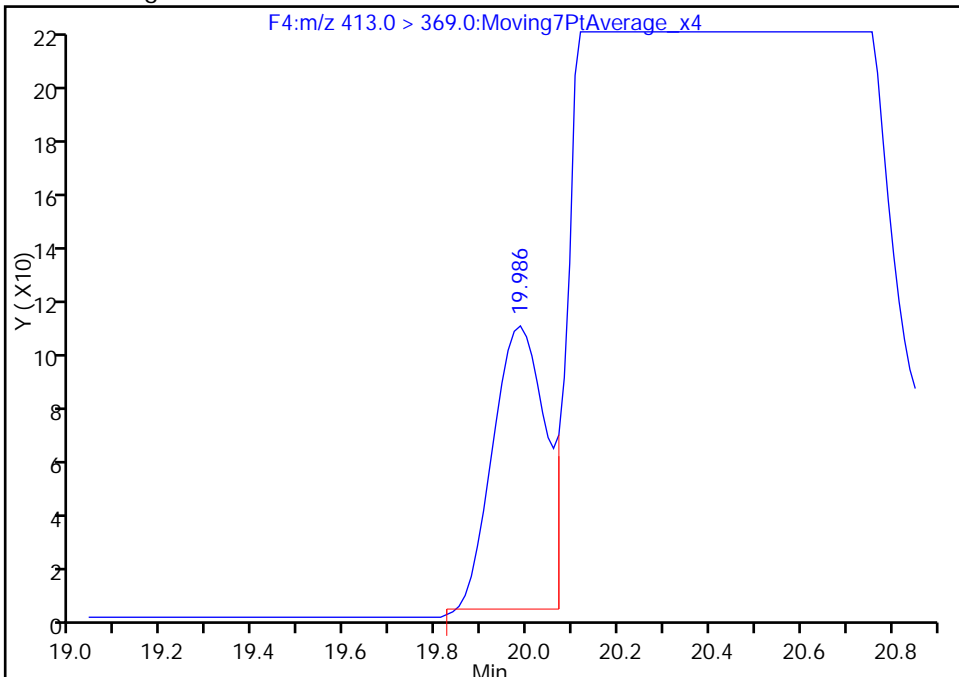
RT: 20.26
Area: 22443
Amount: 0.350959
Amount Units: ng/ml

Processing Integration Results



RT: 19.99
Area: 842
Amount: 0.013167
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 28-Dec-2016 14:04:03
Audit Action: Manually Integrated

Audit Reason: Split Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-24311-1
 SDG No.: _____
 Client Sample ID: WI-CV-1RW33-1216 Lab Sample ID: 320-24311-3
 Matrix: Water Lab File ID: 27DEC2016A6A_022.d
 Analysis Method: 537 Date Collected: 12/10/2016 09:14
 Extraction Method: 537 Date Extracted: 12/14/2016 15:24
 Sample wt/vol: 257.7(mL) Date Analyzed: 12/28/2016 03:23
 Con. Extract Vol.: 1(mL) Dilution Factor: 1
 Injection Volume: 10(uL) GC Column: Acquity ID: 2.1(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 144052 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.047	U	0.058	0.047	0.015
335-67-1	Perfluorooctanoic acid (PFOA)	0.023	U	0.029	0.023	0.0091
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.14	0.11	0.046

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	101		70-130
STL00996	13C2 PFDA	110		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\27DEC2016A6A_022.d
 Lims ID: 320-24311-A-3-A
 Client ID: WI-CV-1RW33-1216
 Sample Type: Client
 Inject. Date: 28-Dec-2016 03:23:32 ALS Bottle#: 27 Worklist Smp#: 22
 Injection Vol: 10.0 ul Dil. Factor: 1.0000
 Sample Info: 320-24311-a-3-a
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
 Operator ID: CBW Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 28-Dec-2016 14:23:17 Calib Date: 24-Dec-2016 06:54:10
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK012

First Level Reviewer: barnettj Date: 28-Dec-2016 14:04:48

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	18.549	18.548	0.001	1.000	762178	10.1	24836
* 5 13C2-PFOA	415.0 > 370.0	19.999	19.999	0.0		632380	10.0	16194
* 8 13C4 PFOS	503.0 > 80.0	20.608	20.619	-0.011		1938231	28.7	33753
9 Perfluorononanoic acid								M
463.0 > 419.0	20.679	20.702	-0.023	1.000	1787	0.0246	22.0	M
\$ 10 13C2 PFDA	515.0 > 470.0	21.409	21.418	-0.009	1.000	702092	11.0	22141

QC Flag Legend

Review Flags

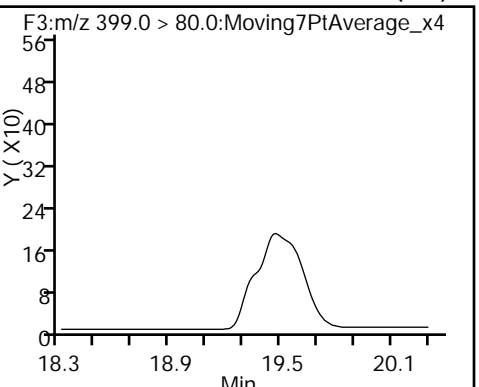
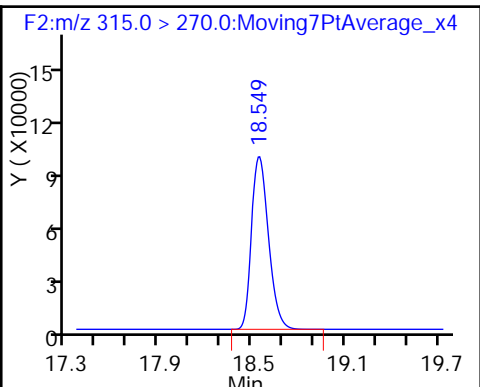
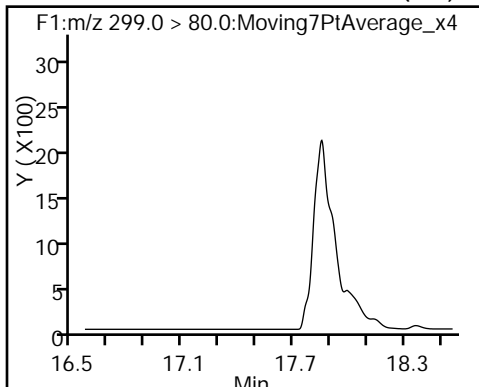
M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\27DEC2016A6A_022.d
Injection Date: 28-Dec-2016 03:23:32 Instrument ID: A6
Lims ID: 320-24311-A-3-A Lab Sample ID: 320-24311-3
Client ID: WI-CV-1RW33-1216
Operator ID: CBW ALS Bottle#: 27 Worklist Smp#: 22
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537_A6 Limit Group: LC 537 ICAL

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

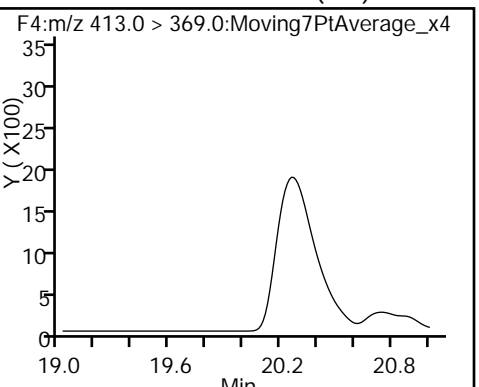
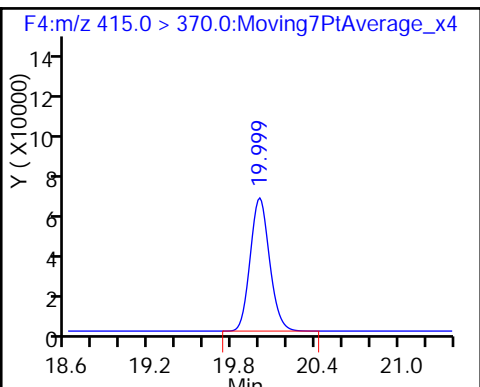
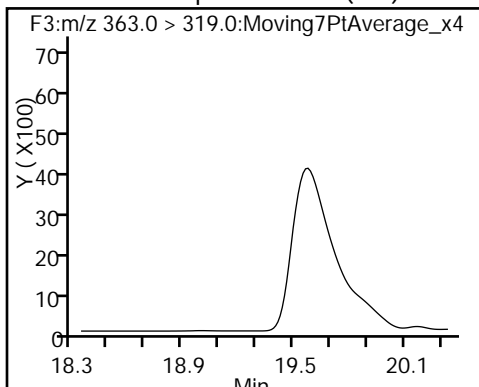
3 Perfluorohexanesulfonic acid (ND)



4 Perfluoroheptanoic acid (ND)

* 5 13C2-PFOA

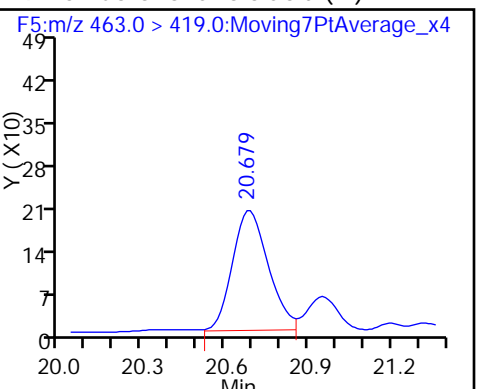
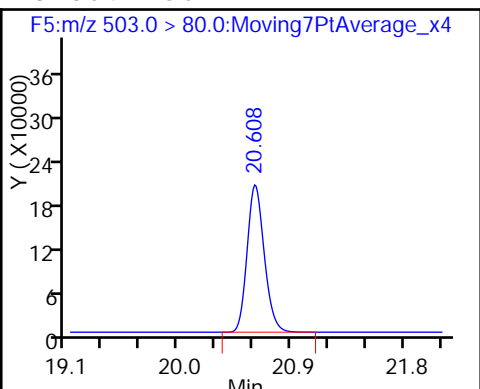
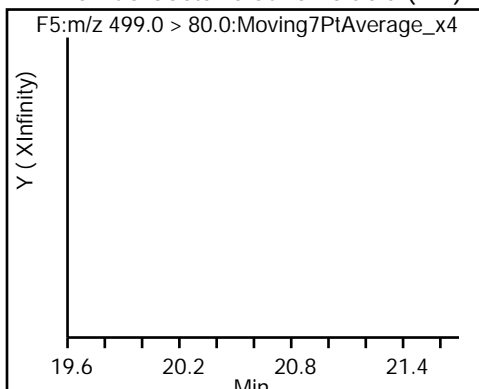
6 Perfluorooctanoic acid (ND)



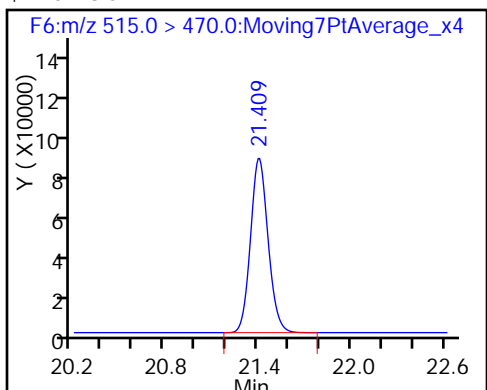
7 Perfluorooctane sulfonic acid (ND)

* 8 13C4 PFOS

9 Perfluorononanoic acid (M)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\27DEC2016A6A_022.d
 Lims ID: 320-24311-A-3-A
 Client ID: WI-CV-1RW33-1216
 Sample Type: Client
 Inject. Date: 28-Dec-2016 03:23:32 ALS Bottle#: 27 Worklist Smp#: 22
 Injection Vol: 10.0 ul Dil. Factor: 1.0000
 Sample Info: 320-24311-a-3-a
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35°C
 Operator ID: CBW Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 28-Dec-2016 14:23:17 Calib Date: 24-Dec-2016 06:54:10
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK012

First Level Reviewer: barnettj Date: 28-Dec-2016 14:04:48

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	10.1	101.02
\$ 10 13C2 PFDA	10.0	11.0	110.11

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-24311-1
 SDG No.: _____
 Client Sample ID: WI-CV-1FB33-1216 Lab Sample ID: 320-24311-4
 Matrix: Water Lab File ID: 27DEC2016A6A_023.d
 Analysis Method: 537 Date Collected: 12/10/2016 09:15
 Extraction Method: 537 Date Extracted: 12/14/2016 15:24
 Sample wt/vol: 246.1(mL) Date Analyzed: 12/28/2016 03:53
 Con. Extract Vol.: 1(mL) Dilution Factor: 1
 Injection Volume: 10(uL) GC Column: Acquity ID: 2.1(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 144052 Units: ug/L

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

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	114		70-130
STL00996	13C2 PFDA	109		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\27DEC2016A6A_023.d
 Lims ID: 320-24311-A-4-A
 Client ID: WI-CV-1FB33-1216
 Sample Type: Client
 Inject. Date: 28-Dec-2016 03:53:07 ALS Bottle#: 28 Worklist Smp#: 23
 Injection Vol: 10.0 ul Dil. Factor: 1.0000
 Sample Info: 320-24311-a-4-a
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
 Operator ID: CBW Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 28-Dec-2016 14:23:17 Calib Date: 24-Dec-2016 06:54:10
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK012

First Level Reviewer: barnettj Date: 28-Dec-2016 14:05:09

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
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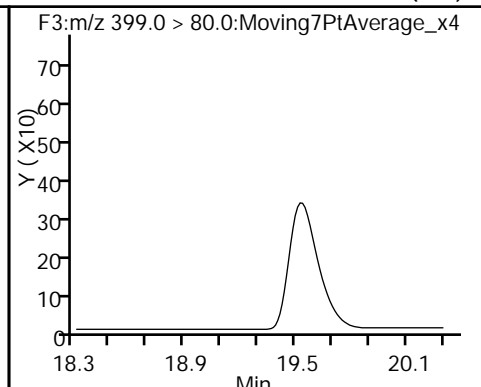
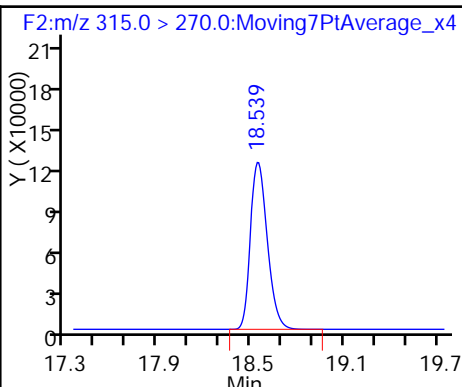
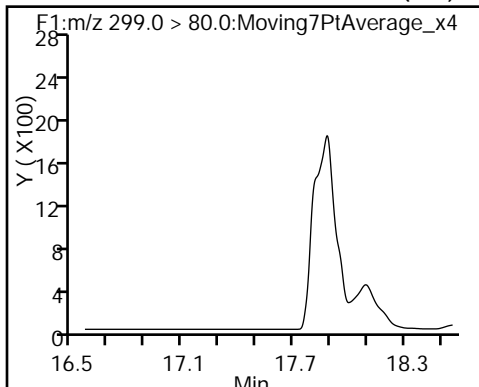
\$ 2 13C2 PFHxA	315.0 > 270.0	18.539	18.548	-0.009	1.000	910689	11.4	29864
* 5 13C2-PFOA	415.0 > 370.0	19.999	19.999	0.0		668209	10.0	17008
* 8 13C4 PFOS	503.0 > 80.0	20.608	20.619	-0.011		2079790	28.7	54064
\$ 10 13C2 PFDA	515.0 > 470.0	21.409	21.418	-0.009	1.000	731298	10.9	22780

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\27DEC2016A6A_023.d
Injection Date: 28-Dec-2016 03:53:07 Instrument ID: A6
Lims ID: 320-24311-A-4-A Lab Sample ID: 320-24311-4
Client ID: WI-CV-1FB33-1216
Operator ID: CBW ALS Bottle#: 28 Worklist Smp#: 23
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537_A6 Limit Group: LC 537 ICAL

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

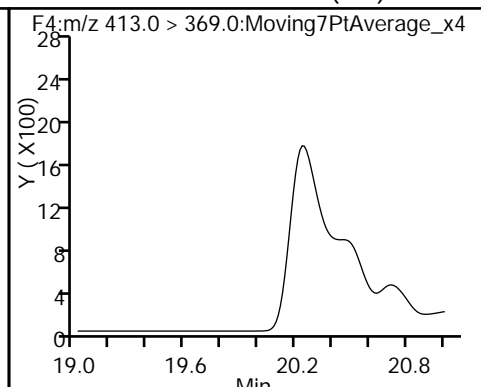
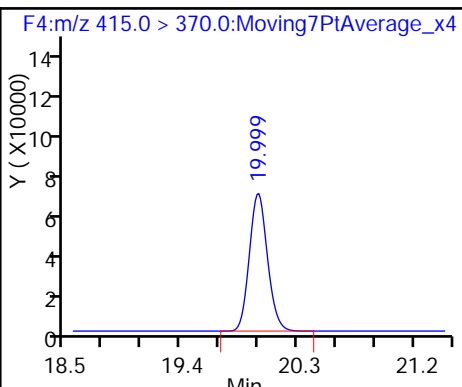
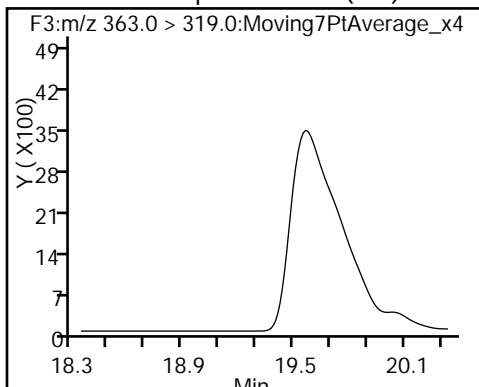
3 Perfluorohexanesulfonic acid (ND)



4 Perfluoroheptanoic acid (ND)

* 5 13C2-PFOA

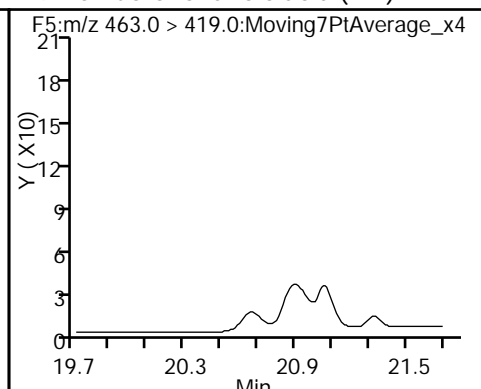
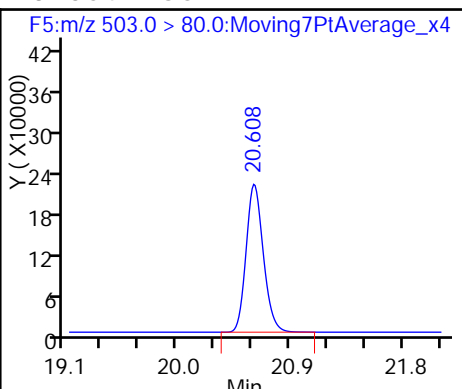
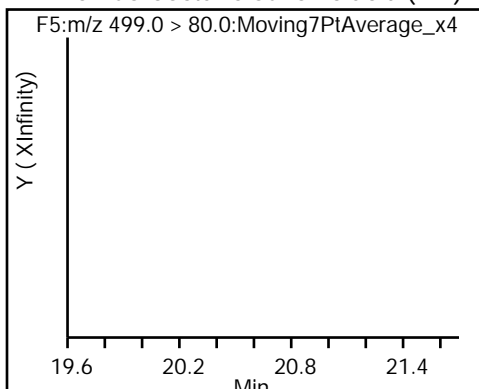
6 Perfluorooctanoic acid (ND)



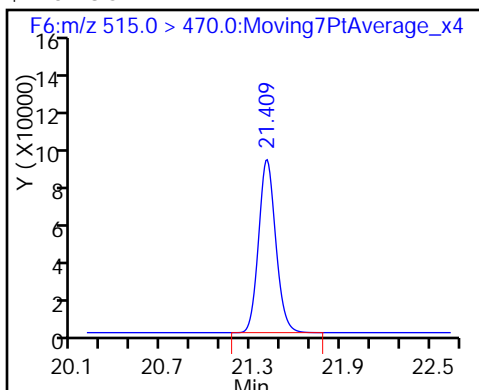
7 Perfluorooctane sulfonic acid (ND)

* 8 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\27DEC2016A6A_023.d
 Lims ID: 320-24311-A-4-A
 Client ID: WI-CV-1FB33-1216
 Sample Type: Client
 Inject. Date: 28-Dec-2016 03:53:07 ALS Bottle#: 28 Worklist Smp#: 23
 Injection Vol: 10.0 ul Dil. Factor: 1.0000
 Sample Info: 320-24311-a-4-a
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35°C
 Operator ID: CBW Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 28-Dec-2016 14:23:17 Calib Date: 24-Dec-2016 06:54:10
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK012

First Level Reviewer: barnettj Date: 28-Dec-2016 14:05:09

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	11.4	114.23
\$ 10 13C2 PFDA	10.0	10.9	108.54

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-24311-1
 SDG No.: _____
 Client Sample ID: WI-CV-1RW34-1216 Lab Sample ID: 320-24311-5
 Matrix: Water Lab File ID: 27DEC2016A6A_026.d
 Analysis Method: 537 Date Collected: 12/10/2016 09:40
 Extraction Method: 537 Date Extracted: 12/14/2016 15:24
 Sample wt/vol: 248.5 (mL) Date Analyzed: 12/28/2016 05:21
 Con. Extract Vol.: 1 (mL) Dilution Factor: 1
 Injection Volume: 10 (uL) GC Column: Acquity ID: 2.1 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 144052 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.048	U M	0.060	0.048	0.016
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.061	J	0.14	0.11	0.048

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	109		70-130
STL00996	13C2 PFDA	125		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\27DEC2016A6A_026.d
 Lims ID: 320-24311-A-5-A
 Client ID: WI-CV-1RW34-1216
 Sample Type: Client
 Inject. Date: 28-Dec-2016 05:21:55 ALS Bottle#: 31 Worklist Smp#: 26
 Injection Vol: 10.0 ul Dil. Factor: 1.0000
 Sample Info: 320-24311-a-5-a
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
 Operator ID: CBW Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 28-Dec-2016 14:23:17 Calib Date: 24-Dec-2016 06:54:10
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK012

First Level Reviewer: barnettj Date: 28-Dec-2016 14:09:19

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	17.560	17.566	-0.006	1.000	715202	15.1	225	
\$ 2 13C2 PFHxA	315.0 > 270.0	18.539	18.548	-0.009	1.000	626153	10.9	20459	
3 Perfluorohexanesulfonic acid	399.0 > 80.0	19.297	19.308	-0.011	1.000	1344707	23.0	27925	
4 Perfluoroheptanoic acid	363.0 > 319.0	19.332	19.344	-0.012	1.000	763693	13.0	118	M
* 5 13C2-PFOA	415.0 > 370.0	19.986	19.999	-0.013		480558	10.0	12022	
6 Perfluorooctanoic acid	413.0 > 369.0	19.986	20.011	-0.025	1.000	7089075	146.7	2299	E
7 Perfluorooctane sulfonic acid	499.0 > 80.0	20.335	20.619	-0.284	1.000	3773	0.0551	117	M
* 8 13C4 PFOS	503.0 > 80.0	20.608	20.619	-0.011		1785601	28.7	46388	
9 Perfluorononanoic acid	463.0 > 419.0	20.667	20.702	-0.035	1.000	691	0.0125	3.8	M
\$ 10 13C2 PFDA	515.0 > 470.0	21.400	21.418	-0.018	1.000	604477	12.5	19031	

QC Flag Legend

Processing Flags

E - Exceeded Maximum Amount

Review Flags

M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\27DEC2016A6A_026.d

Injection Date: 28-Dec-2016 05:21:55

Instrument ID: A6

Lims ID: 320-24311-A-5-A

Lab Sample ID:

Client ID: WI-CV-1RW34-1216

Operator ID: CBW

ALS Bottle#: 31

Worklist Smp#: 26

Injection Vol: 10.0 ul

Dil. Factor: 1.0000

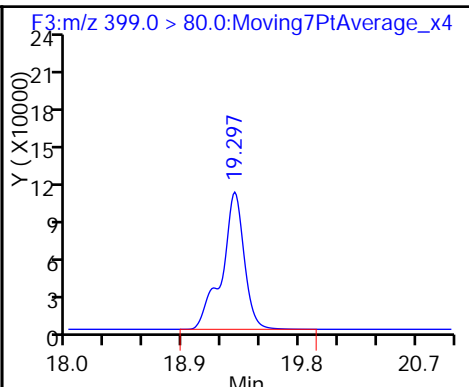
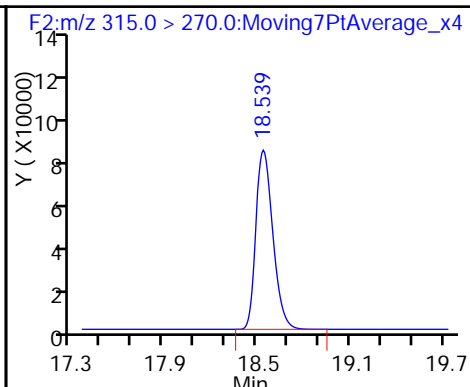
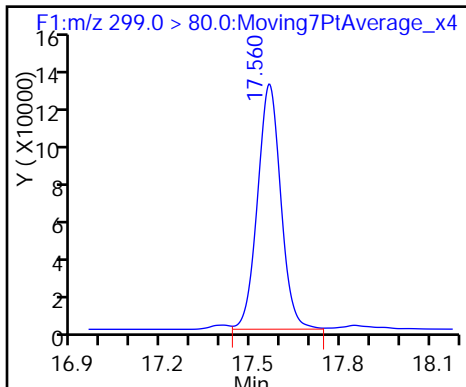
Method: 537_A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

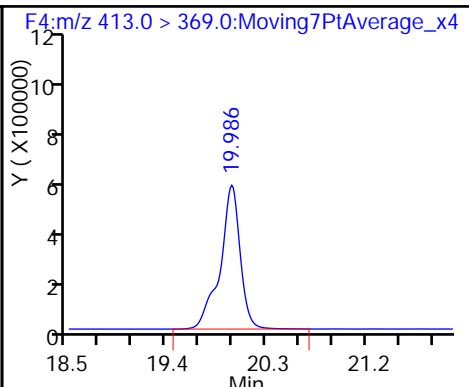
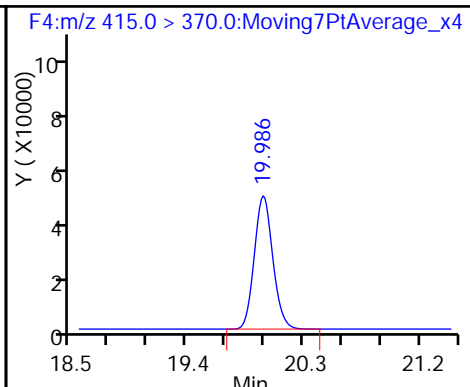
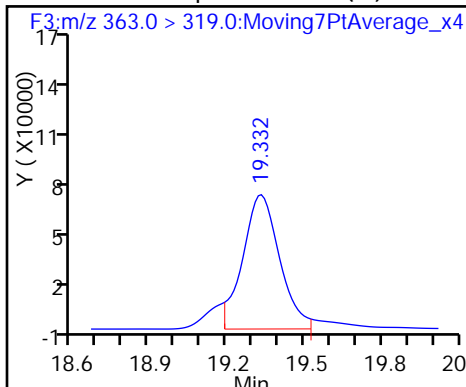
3 Perfluorohexanesulfonic acid



4 Perfluoroheptanoic acid (M)

* 5 13C2-PFOA

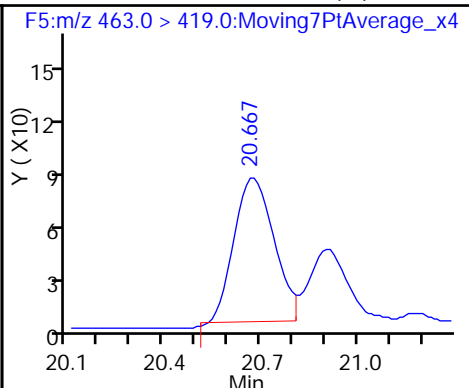
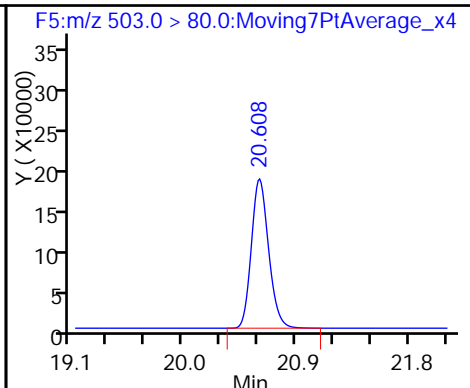
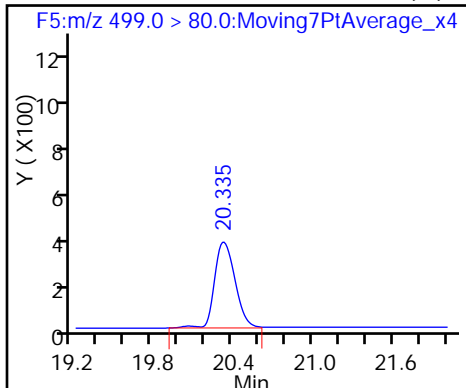
6 Perfluorooctanoic acid



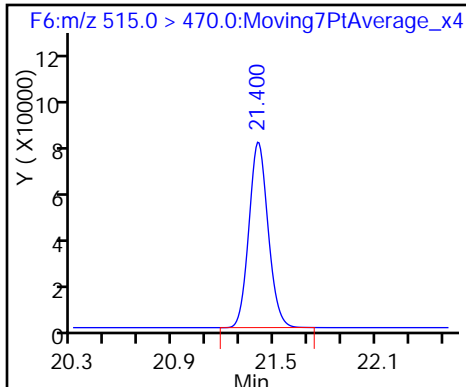
7 Perfluorooctane sulfonic acid (M)

* 8 13C4 PFOS

9 Perfluorononanoic acid (M)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\27DEC2016A6A_026.d
 Lims ID: 320-24311-A-5-A
 Client ID: WI-CV-1RW34-1216
 Sample Type: Client
 Inject. Date: 28-Dec-2016 05:21:55 ALS Bottle#: 31 Worklist Smp#: 26
 Injection Vol: 10.0 ul Dil. Factor: 1.0000
 Sample Info: 320-24311-a-5-a
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35°C
 Operator ID: CBW Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 28-Dec-2016 14:23:17 Calib Date: 24-Dec-2016 06:54:10
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK012

First Level Reviewer: barnettj Date: 28-Dec-2016 14:09:19

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	10.9	109.21
\$ 10 13C2 PFDA	10.0	12.5	124.75

TestAmerica Sacramento

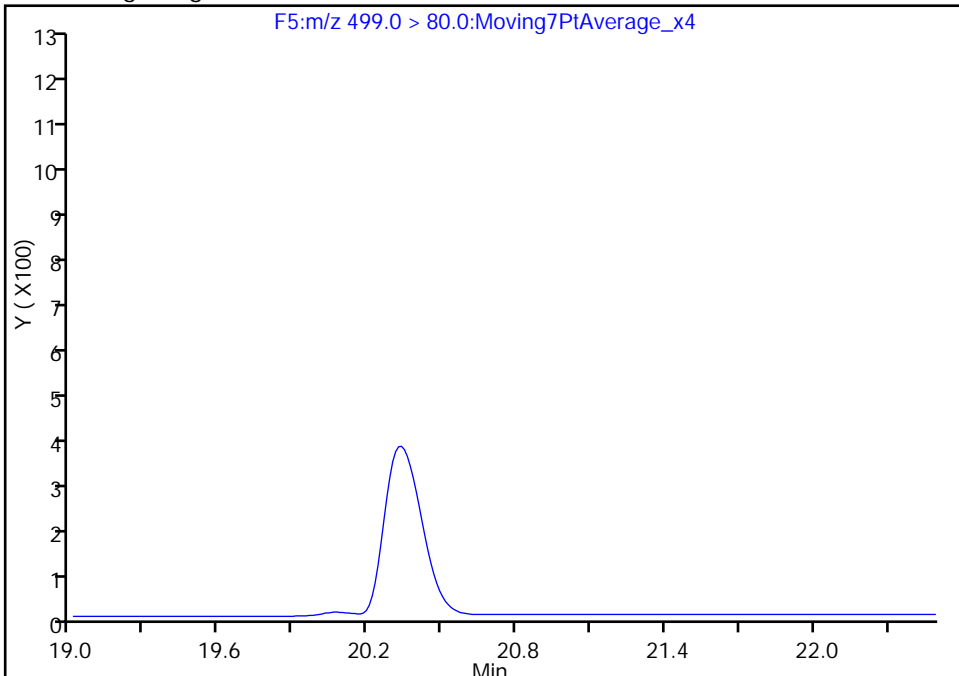
Data File: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\27DEC2016A6A_026.d
Injection Date: 28-Dec-2016 05:21:55 Instrument ID: A6
Lims ID: 320-24311-A-5-A Lab Sample ID:
Client ID: WI-CV-1RW34-1216
Operator ID: CBW ALS Bottle#: 31 Worklist Smp#: 26
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F5:MRM

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

Signal: 1

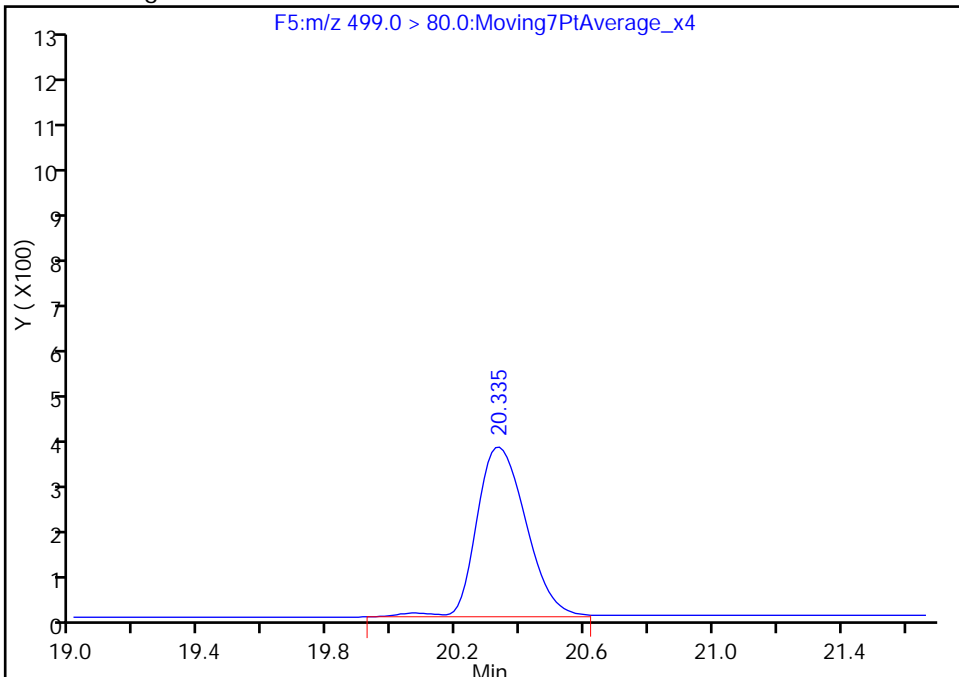
Not Detected
Expected RT: 20.62

Processing Integration Results



Manual Integration Results

RT: 20.34
Area: 3773
Amount: 0.055112
Amount Units: ng/ml



Reviewer: barnettj, 28-Dec-2016 14:09:19
Audit Action: Manually Integrated

Audit Reason: Missed Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-24311-1
 SDG No.: _____
 Client Sample ID: WI-CV-1RW34-1216 DL Lab Sample ID: 320-24311-5 DL
 Matrix: Water Lab File ID: 27DEC2016A6A_024.d
 Analysis Method: 537 Date Collected: 12/10/2016 09:40
 Extraction Method: 537 Date Extracted: 12/14/2016 15:24
 Sample wt/vol: 248.5 (mL) Date Analyzed: 12/28/2016 04:22
 Con. Extract Vol.: 1 (mL) Dilution Factor: 10
 Injection Volume: 10 (uL) GC Column: Acquity ID: 2.1 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 144052 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.66	D	0.30	0.24	0.095

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	99		70-130
STL00996	13C2 PFDA	113		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\27DEC2016A6A_024.d
 Lims ID: 320-24311-A-5-A
 Client ID: WI-CV-1RW34-1216
 Sample Type: Client
 Inject. Date: 28-Dec-2016 04:22:43 ALS Bottle#: 29 Worklist Smp#: 24
 Injection Vol: 10.0 ul Dil. Factor: 10.0000
 Sample Info: 320-24311-a-5-a 10X
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35°C
 Operator ID: CBW Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 28-Dec-2016 14:23:17 Calib Date: 24-Dec-2016 06:54:10
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK012

First Level Reviewer: barnettj Date: 28-Dec-2016 14:06:04

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	17.560	17.566	-0.006	1.000	67642	1.30	32.4	
\$ 2 13C2 PFHxA	315.0 > 270.0	18.548	18.548	0.0	1.000	65511	0.99	2151	
3 Perfluorohexanesulfonic acid	399.0 > 80.0	19.308	19.308	0.0	1.000	116574	1.81	2362	
4 Perfluoroheptanoic acid	363.0 > 319.0	19.332	19.344	-0.012	1.000	83223	1.23	13.1	M
* 5 13C2-PFOA	415.0 > 370.0	19.999	19.999	0.0		55423	1.00	1414	
6 Perfluorooctanoic acid	413.0 > 369.0	19.999	20.011	-0.012	1.000	910246	16.3	586	
* 8 13C4 PFOS	503.0 > 80.0	20.619	20.619	0.0		196952	2.87	5207	
\$ 10 13C2 PFDA	515.0 > 470.0	21.409	21.418	-0.009	1.000	63003	1.13	2005	

QC Flag Legend

Review Flags

M - Manually Integrated

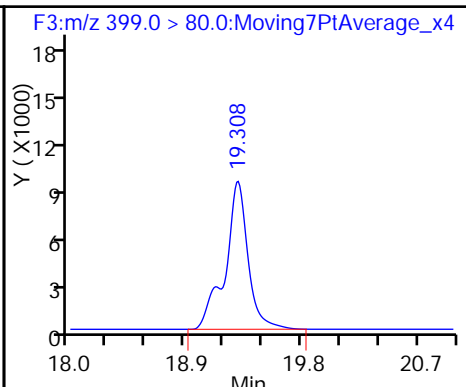
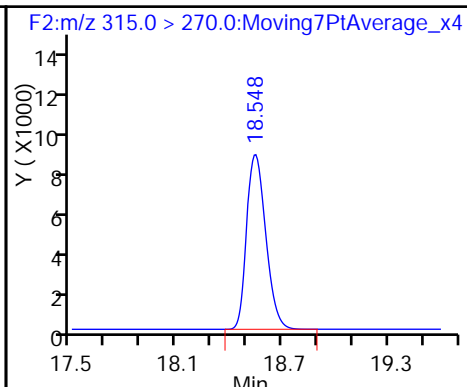
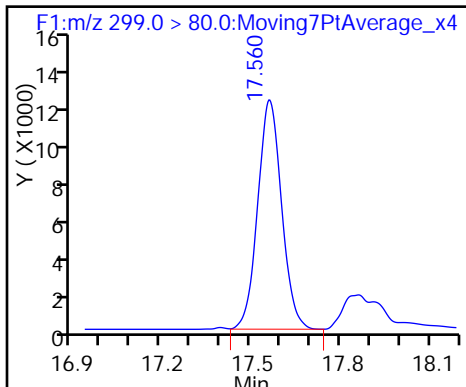
TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\27DEC2016A6A_024.d
Injection Date: 28-Dec-2016 04:22:43 Instrument ID: A6
Lims ID: 320-24311-A-5-A Lab Sample ID: 320-24311-5
Client ID: WI-CV-1RW34-1216
Operator ID: CBW ALS Bottle#: 29 Worklist Smp#: 24
Injection Vol: 10.0 ul Dil. Factor: 10.0000
Method: 537_A6 Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

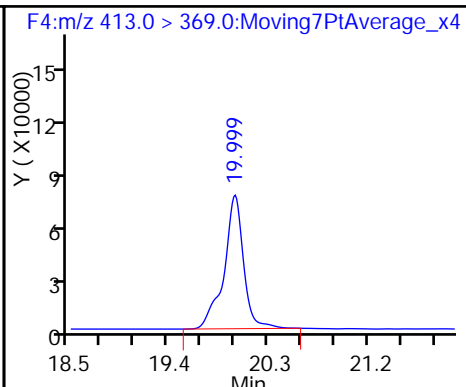
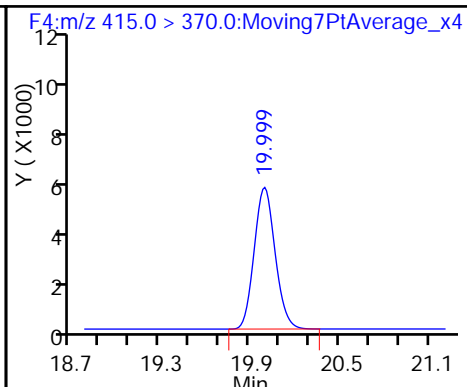
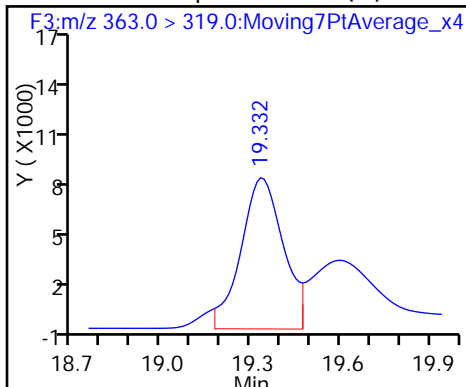
3 Perfluorohexanesulfonic acid



4 Perfluoroheptanoic acid (M)

* 5 13C2-PFOA

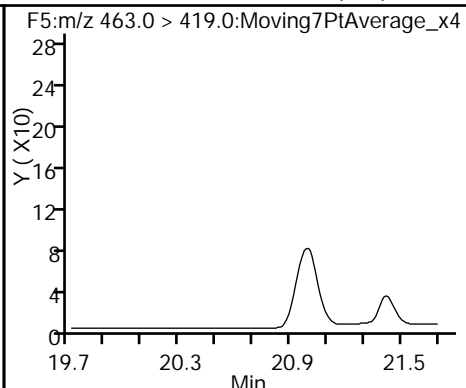
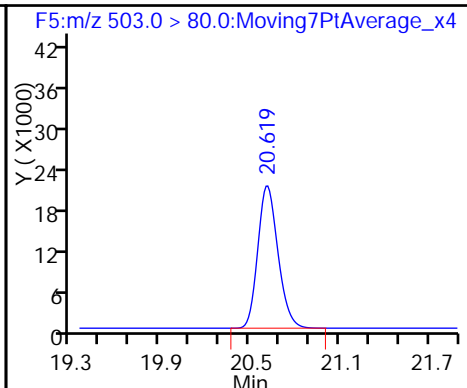
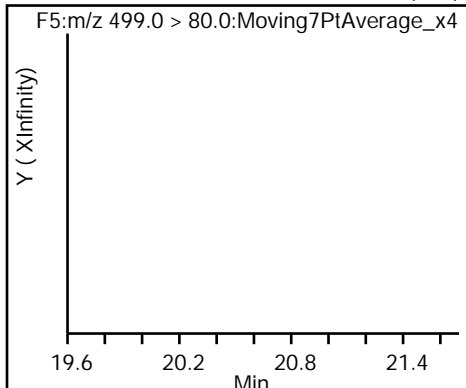
6 Perfluorooctanoic acid



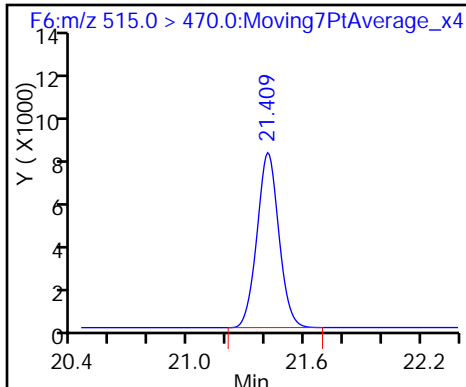
7 Perfluorooctane sulfonic acid (ND)

* 8 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\27DEC2016A6A_024.d
 Lims ID: 320-24311-A-5-A
 Client ID: WI-CV-1RW34-1216
 Sample Type: Client
 Inject. Date: 28-Dec-2016 04:22:43 ALS Bottle#: 29 Worklist Smp#: 24
 Injection Vol: 10.0 ul Dil. Factor: 10.0000
 Sample Info: 320-24311-a-5-a 10X
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35°C
 Operator ID: CBW Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 28-Dec-2016 14:23:17 Calib Date: 24-Dec-2016 06:54:10
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK012

First Level Reviewer: barnettj Date: 28-Dec-2016 14:06:04

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	0.99	99.07
\$ 10 13C2 PFDA	10.0	1.13	112.74

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-24311-1
 SDG No.: _____
 Client Sample ID: WI-CV-1FB34-1216 Lab Sample ID: 320-24311-6
 Matrix: Water Lab File ID: 27DEC2016A6A_025.d
 Analysis Method: 537 Date Collected: 12/10/2016 09:41
 Extraction Method: 537 Date Extracted: 12/14/2016 15:24
 Sample wt/vol: 251.4(mL) Date Analyzed: 12/28/2016 04:52
 Con. Extract Vol.: 1(mL) Dilution Factor: 1
 Injection Volume: 10(uL) GC Column: Acquity ID: 2.1(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 144052 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.048	U	0.060	0.048	0.015
335-67-1	Perfluorooctanoic acid (PFOA)	0.024	U M	0.030	0.024	0.0094
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.14	0.11	0.047

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	102		70-130
STL00996	13C2 PFDA	97		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\27DEC2016A6A_025.d
 Lims ID: 320-24311-A-6-A
 Client ID: WI-CV-1FB34-1216
 Sample Type: Client
 Inject. Date: 28-Dec-2016 04:52:19 ALS Bottle#: 30 Worklist Smp#: 25
 Injection Vol: 10.0 ul Dil. Factor: 1.0000
 Sample Info: 320-24311-a-6-a
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
 Operator ID: CBW Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 28-Dec-2016 14:23:17 Calib Date: 24-Dec-2016 06:54:10
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK012

First Level Reviewer: barnettj Date: 28-Dec-2016 14:06:51

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

\$ 2 13C2 PFHxA	315.0 > 270.0	18.549	18.548	0.001	1.000	796254	10.2	26165
* 5 13C2-PFOA	415.0 > 370.0	19.999	19.999	0.0		657355	10.0	16729
6 Perfluorooctanoic acid	413.0 > 369.0	19.972	20.011	-0.039	1.000	519	0.007850	0.2 M
* 8 13C4 PFOS	503.0 > 80.0	20.608	20.619	-0.011		1842654	28.7	31815
\$ 10 13C2 PFDA	515.0 > 470.0	21.409	21.418	-0.009	1.000	643443	9.71	20098

QC Flag Legend

Review Flags

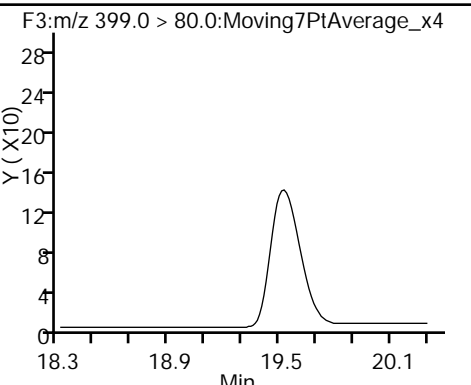
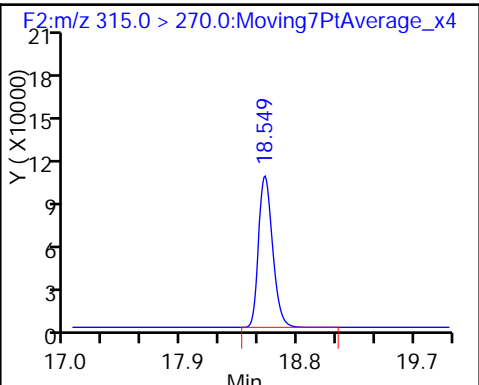
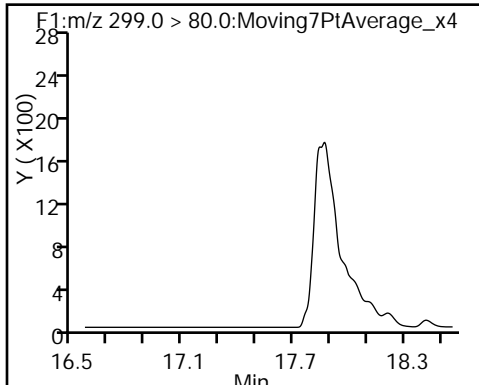
M - Manually Integrated

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\27DEC2016A6A_025.d
Injection Date: 28-Dec-2016 04:52:19 Instrument ID: A6
Lims ID: 320-24311-A-6-A Lab Sample ID: 320-24311-6
Client ID: WI-CV-1FB34-1216
Operator ID: CBW ALS Bottle#: 30 Worklist Smp#: 25
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537_A6 Limit Group: LC 537 ICAL

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

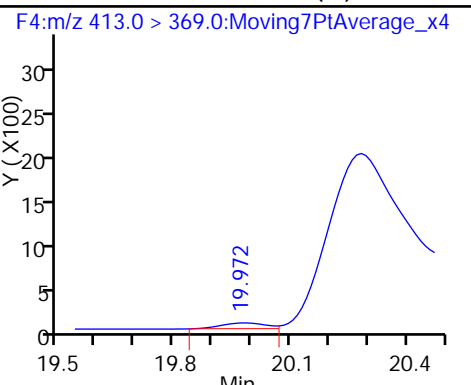
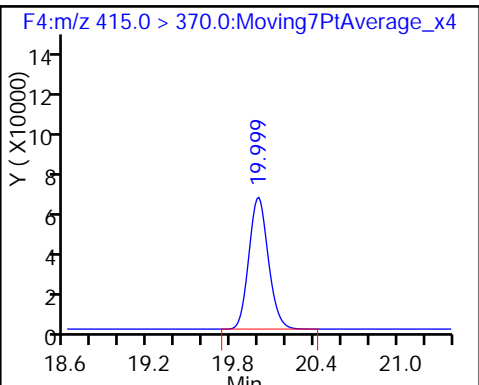
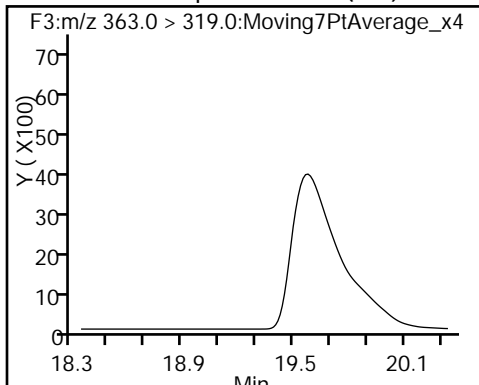
3 Perfluorohexanesulfonic acid (ND)



4 Perfluoroheptanoic acid (ND)

* 5 13C2-PFOA

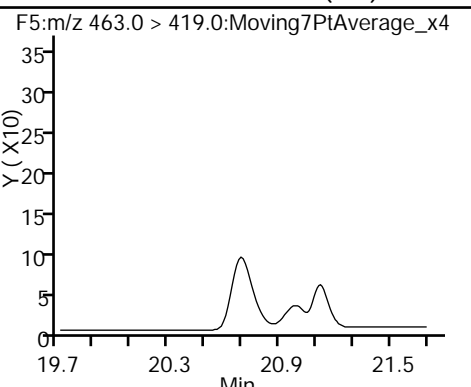
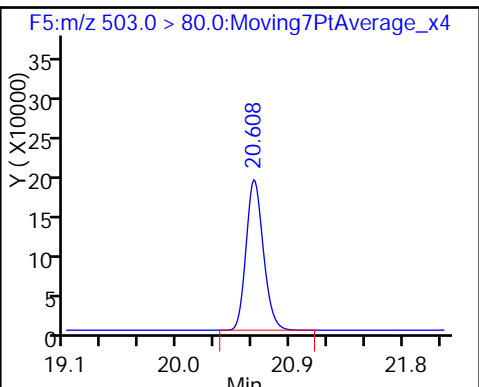
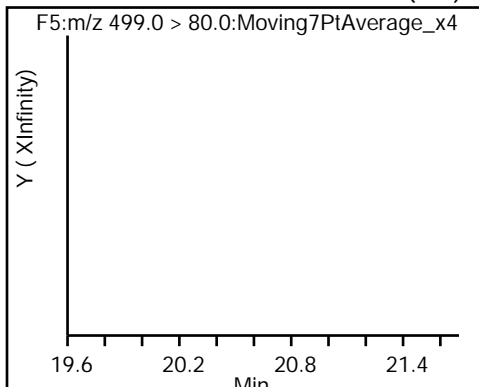
6 Perfluorooctanoic acid (M)



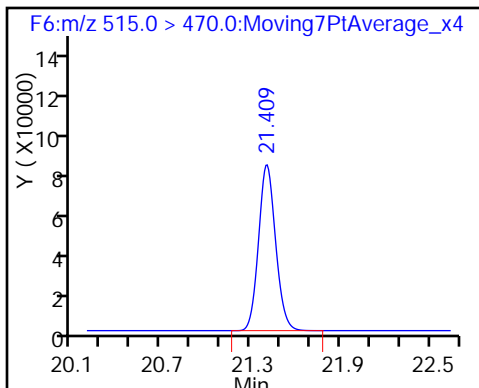
7 Perfluorooctane sulfonic acid (ND)

* 8 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\27DEC2016A6A_025.d
 Lims ID: 320-24311-A-6-A
 Client ID: WI-CV-1FB34-1216
 Sample Type: Client
 Inject. Date: 28-Dec-2016 04:52:19 ALS Bottle#: 30 Worklist Smp#: 25
 Injection Vol: 10.0 ul Dil. Factor: 1.0000
 Sample Info: 320-24311-a-6-a
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35°C
 Operator ID: CBW Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 28-Dec-2016 14:23:17 Calib Date: 24-Dec-2016 06:54:10
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK012

First Level Reviewer: barnettj Date: 28-Dec-2016 14:06:51

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	10.2	101.52
\$ 10 13C2 PFDA	10.0	9.71	97.08

TestAmerica Sacramento

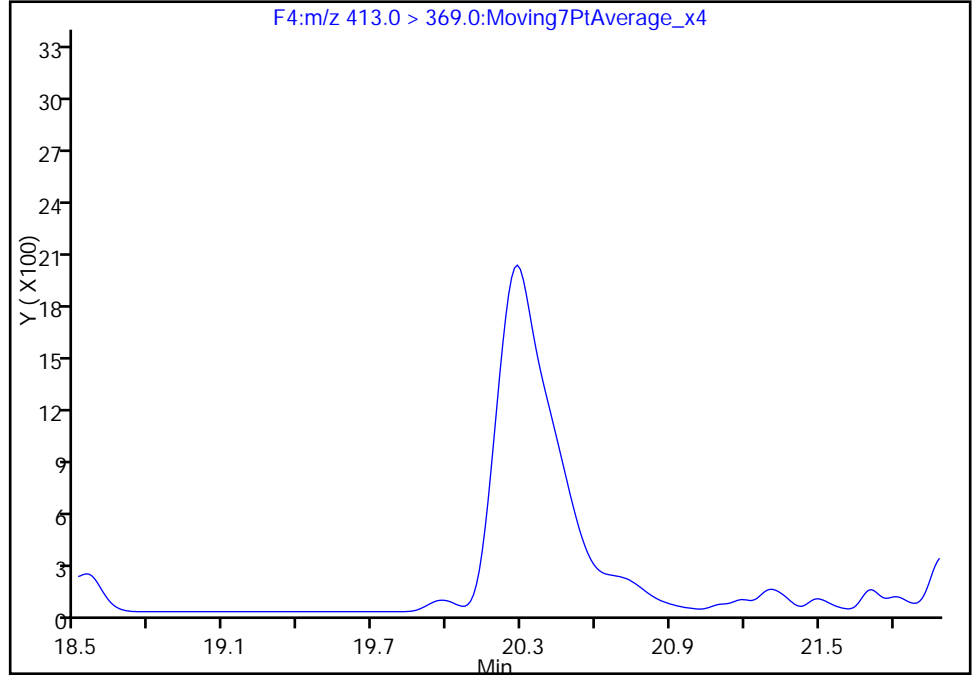
Data File: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\27DEC2016A6A_025.d
Injection Date: 28-Dec-2016 04:52:19 Instrument ID: A6
Lims ID: 320-24311-A-6-A Lab Sample ID: 320-24311-6
Client ID: WI-CV-1FB34-1216
Operator ID: CBW ALS Bottle#: 30 Worklist Smp#: 25
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F4:M/RM

6 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

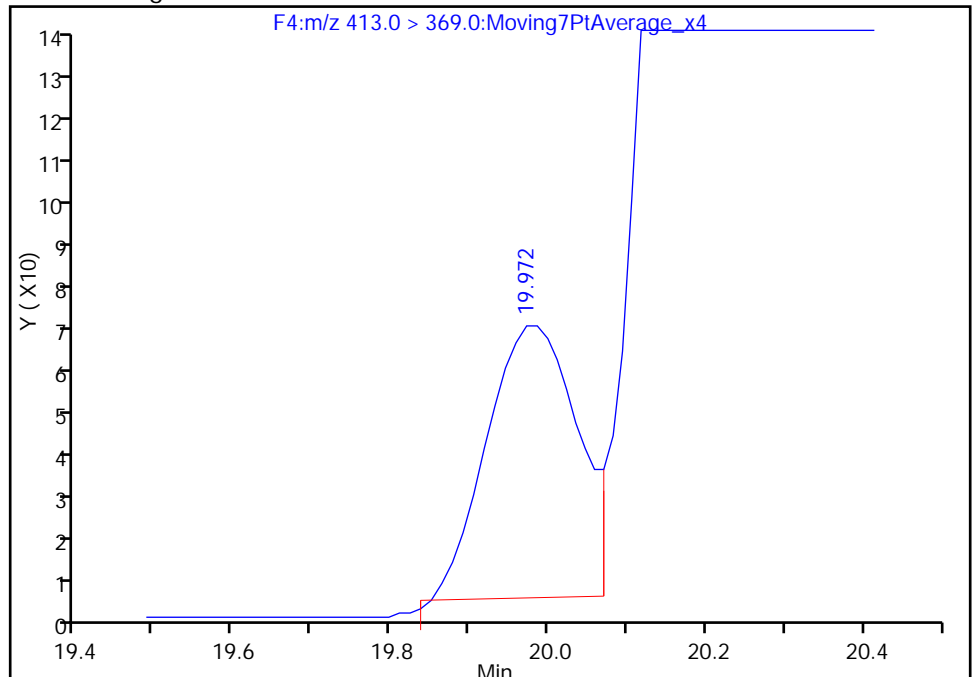
Not Detected
Expected RT: 20.01

Processing Integration Results



RT: 19.97
Area: 519
Amount: 0.007850
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 28-Dec-2016 14:06:51
Audit Action: Manually Integrated

Audit Reason: Missed Peak

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

Lab Name: TestAmerica Sacramento Job No.: 320-24311-1 Analy Batch No.: 143828

SDG No.: _____

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

Calibration Start Date: 12/24/2016 04:26 Calibration End Date: 12/24/2016 06:54 Calibration ID: 27291

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-143828/4	24DEC2016A6A_004.d
Level 2	STD 320-143828/5	24DEC2016A6A_005.d
Level 3	STD 320-143828/6	24DEC2016A6A_006.d
Level 4	STD 320-143828/7	24DEC2016A6A_007.d
Level 5	STD 320-143828/8	24DEC2016A6A_008.d
Level 6	STD 320-143828/9	24DEC2016A6A_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)	0.7489 0.7091	0.7895	0.8086	0.7461	0.7483	Ave		0.7584			4.7		30.0				
Perfluorohexanesulfonic acid	0.7980 0.9951	0.9269	0.9870	0.9674	0.9683	Ave		0.9405			7.8		30.0				
Perfluoroheptanoic acid	1.0776 1.1996	1.3095	1.3597	1.2735	1.1115	Ave		1.2219			9.2		30.0				
Perfluorooctanoic acid (PFOA)	0.8779 1.1195	0.9865	1.0039	1.0531	0.9939	Ave		1.0058			8.0		30.0				
Perfluorooctanesulfonic acid (PFOS)	0.9077 1.1731	1.0347	1.1414	1.1293	1.2114	Ave		1.0996			10.1		30.0				
Perfluorononanoic acid	1.1003 1.2343	1.1975	1.1855	1.1319	1.0424	Ave		1.1487			6.2		30.0				
13C2 PFHxA	1.1206 1.3938	1.0547	1.1626	1.2662	1.1609	Ave		1.1931			10.1		30.0				
13C2 PFDA	0.9167 1.1683	0.9437	0.9678	1.0543	0.9989	Ave		1.0083			9.1		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.: 320-24311-1 Analy Batch No.: 143828

SDG No.: _____

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

Calibration Start Date: 12/24/2016 04:26 Calibration End Date: 12/24/2016 06:54 Calibration ID: 27291

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-143828/4	24DEC2016A6A_004.d
Level 2	STD 320-143828/5	24DEC2016A6A_005.d
Level 3	STD 320-143828/6	24DEC2016A6A_006.d
Level 4	STD 320-143828/7	24DEC2016A6A_007.d
Level 5	STD 320-143828/8	24DEC2016A6A_008.d
Level 6	STD 320-143828/9	24DEC2016A6A_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	384512 5939448	999960	1880513	3444375	4710266	8.98 178	22.9	45.1	90.9	135
Perfluorohexanesulfonic acid	PFOS	Ave	138107 2809913	395737	773860	1505450	2054618	3.03 60.1	7.72	15.2	30.6	45.4
Perfluoroheptanoic acid	13PF OA	Ave	65406 1230238	205998	407699	733295	976632	0.990 19.7	2.52	4.97	10.0	14.9
Perfluorooctanoic acid (PFOA)	13PF OA	Ave	105059 2263615	305974	593502	1195609	1721874	1.95 38.8	4.98	9.81	19.8	29.3
Perfluorooctanesulfonic acid (PFOS)	PFOS	Ave	208018 4386351	584936	1184968	2327023	3403779	4.01 79.6	10.2	20.1	40.6	60.1
Perfluorononanoic acid	13PF OA	Ave	139923 2652055	394672	744764	1365537	1918933	2.07 41.2	5.29	10.4	21.0	31.1
13C2 PFHxA	13PF OA	Ave	687019 726485	657231	700737	727339	686886	10.0 10.0	10.0	10.0	10.0	10.0
13C2 PFDA	13PF OA	Ave	561986 608935	588071	583365	605628	591036	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.: 320-24311-1 Analy Batch No.: 143828

SDG No.: _____

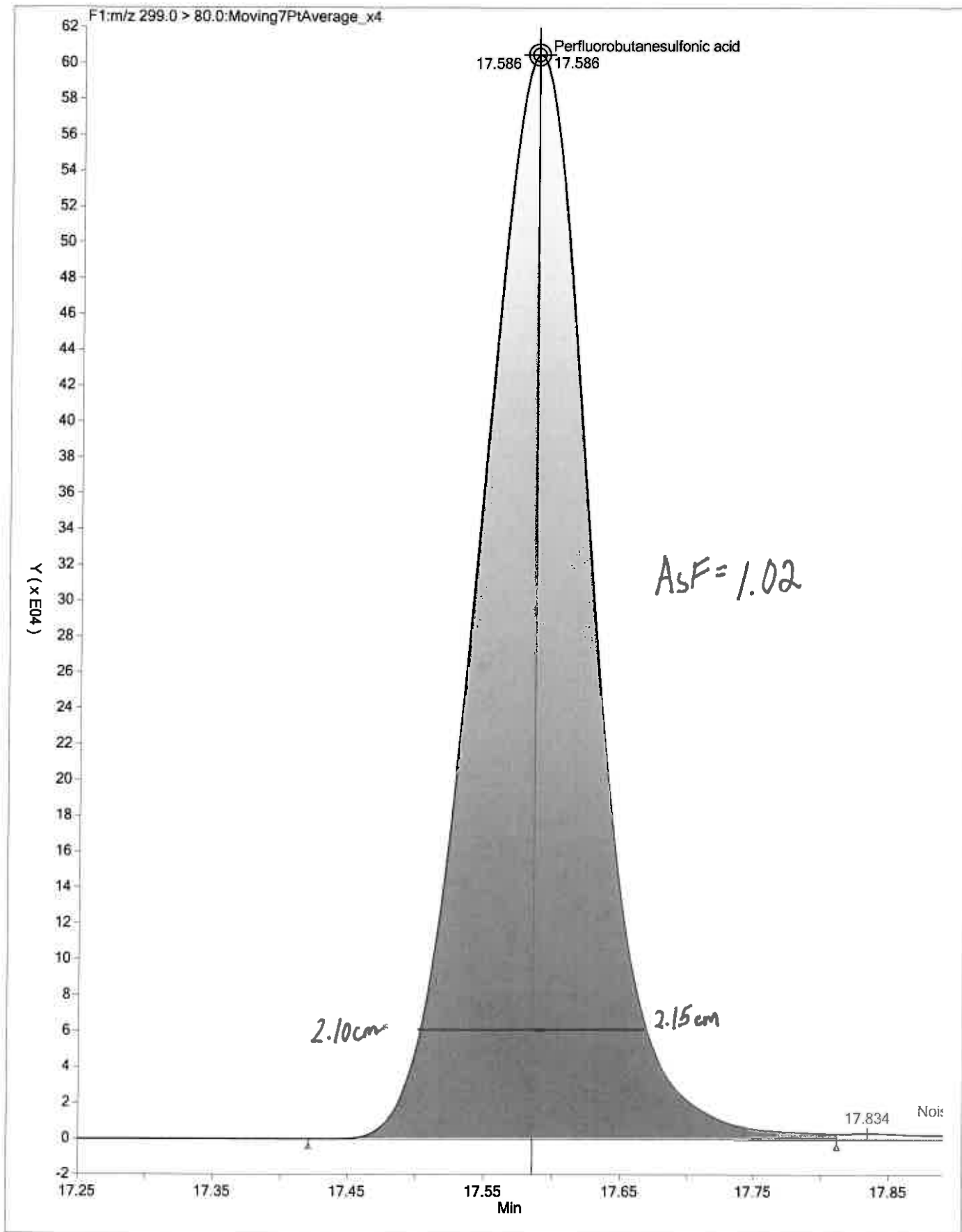
Instrument ID: A6 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

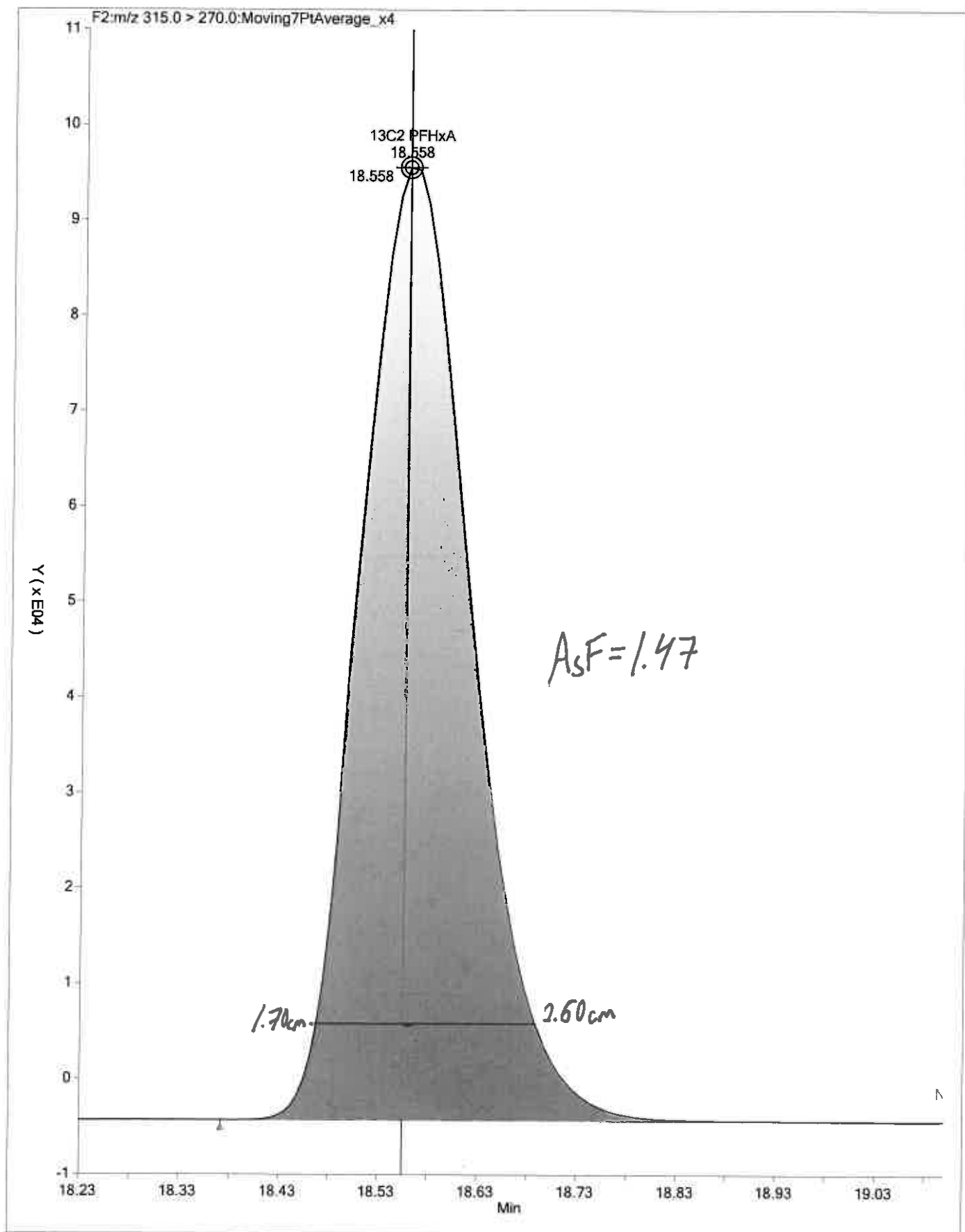
Calibration Start Date: 12/24/2016 04:26 Calibration End Date: 12/24/2016 06:54 Calibration ID: 27291

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-143828/4	24DEC2016A6A_004.d
Level 2	STD 320-143828/5	24DEC2016A6A_005.d
Level 3	STD 320-143828/6	24DEC2016A6A_006.d
Level 4	STD 320-143828/7	24DEC2016A6A_007.d
Level 5	STD 320-143828/8	24DEC2016A6A_008.d
Level 6	STD 320-143828/9	24DEC2016A6A_009.d

ANALYTE	PERCENT ERROR						PERCENT ERROR LIMIT					
	LVL 1 #	LVL 2 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6
Perfluorobutanesulfonic acid (PFBS)	-1.3	4.1	6.6	-1.6	-1.3	-6.5	50	50	50	50	50	50
Perfluorohexanesulfonic acid	-15.2	-1.4	5.0	2.9	3.0	5.8	50	50	50	50	50	50
Perfluoroheptanoic acid	-11.8	7.2	11.3	4.2	-9.0	-1.8	50	50	50	50	50	50
Perfluorooctanoic acid (PFOA)	-12.7	-1.9	-0.2	4.7	-1.2	11.3	50	50	50	50	50	50
Perfluorooctanesulfonic acid (PFOS)	-17.5	-5.9	3.8	2.7	10.2	6.7	50	50	50	50	50	50
Perfluorononanoic acid	-4.2	4.3	3.2	-1.5	-9.3	7.5	50	50	50	50	50	50
13C2 PFHxA	-6.1	-11.6	-2.6	6.1	-2.7	16.8	30	30	30	30	30	30
13C2 PFDA	-9.1	-6.4	-4.0	4.6	-0.9	15.9	30	30	30	30	30	30





TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_004.d
 Lims ID: STD L1
 Client ID:
 Sample Type: IC Calib Level: 1
 Inject. Date: 24-Dec-2016 04:26:10 ALS Bottle#: 1 Worklist Smp#: 4
 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\20161224-38202.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 27-Dec-2016 10:54:51 Calib Date: 24-Dec-2016 06:54:10
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK031

First Level Reviewer: phomsophat Date: 24-Dec-2016 11:54:09

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid	299.0 > 80.0	17.589	17.586	0.003	1.000	384512	8.86	135
\$ 2 13C2 PFHxA	315.0 > 270.0	18.558	18.558	0.0	1.000	687019	9.39	22481
3 Perfluorohexanesulfonic acid	399.0 > 80.0	19.320	19.318	0.002	1.000	138107	2.57	2684
4 Perfluoroheptanoic acid	363.0 > 319.0	19.344	19.350	-0.006	1.000	65406	0.8731	6.0 M
* 5 13C2-PFOA	415.0 > 370.0	19.999	20.005	-0.006		613085	10.0	15656
6 Perfluorooctanoic acid	413.0 > 369.0	19.999	20.004	-0.005	1.000	105059	1.70	29.0 M
7 Perfluorooctane sulfonic acid	499.0 > 80.0	20.620	20.619	0.001	1.000	208018	3.31	3500
* 8 13C4 PFOS	503.0 > 80.0	20.620	20.619	0.001		1640498	28.7	42687
9 Perfluorononanoic acid	463.0 > 419.0	20.691	20.697	-0.006	1.000	139923	1.99	3701
\$ 10 13C2 PFDA	515.0 > 470.0	21.418	21.416	0.002	1.000	561986	9.09	17453

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L1_00017

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_004.d

Injection Date: 24-Dec-2016 04:26:10

Instrument ID: A6

Lims ID: STD L1

Client ID:

Operator ID: CBW

ALS Bottle#: 1

Worklist Smp#: 4

Injection Vol: 10.0 ul

Dil. Factor: 1.0000

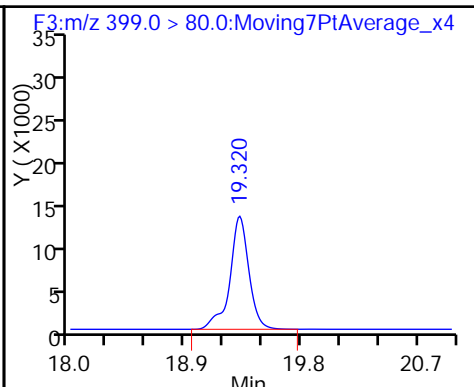
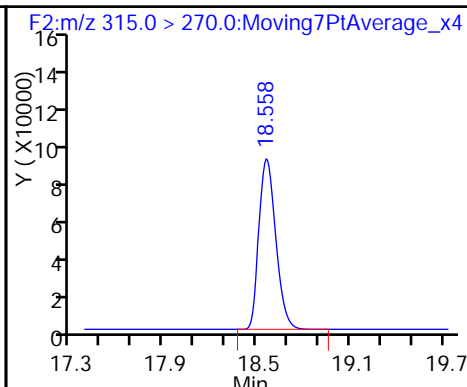
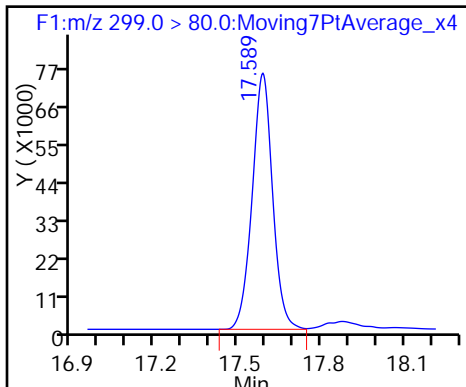
Method: 537_A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

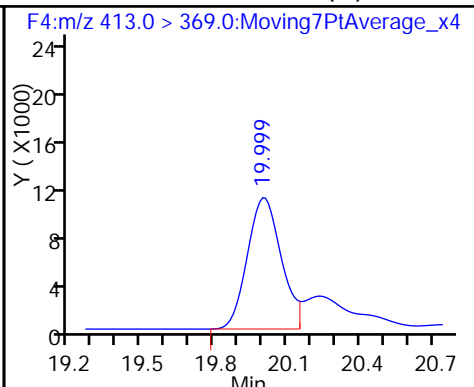
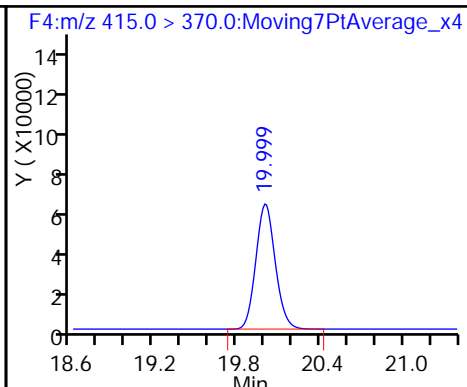
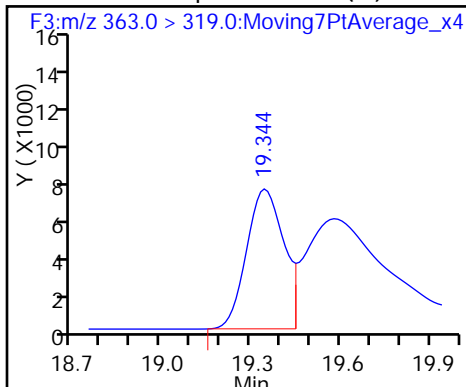
3 Perfluorohexanesulfonic acid



4 Perfluoroheptanoic acid (M)

* 5 13C2-PFOA

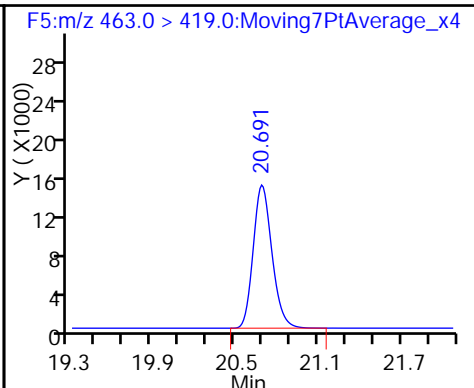
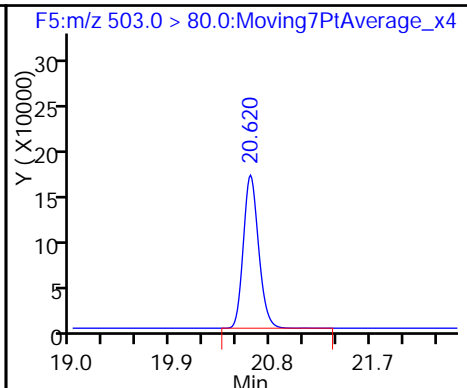
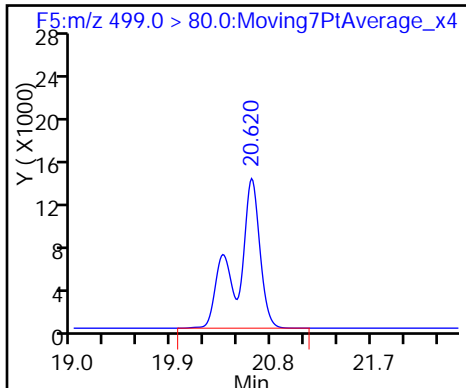
6 Perfluorooctanoic acid (M)



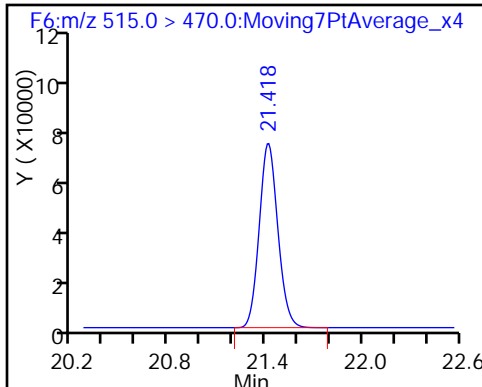
7 Perfluorooctane sulfonic acid

* 8 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

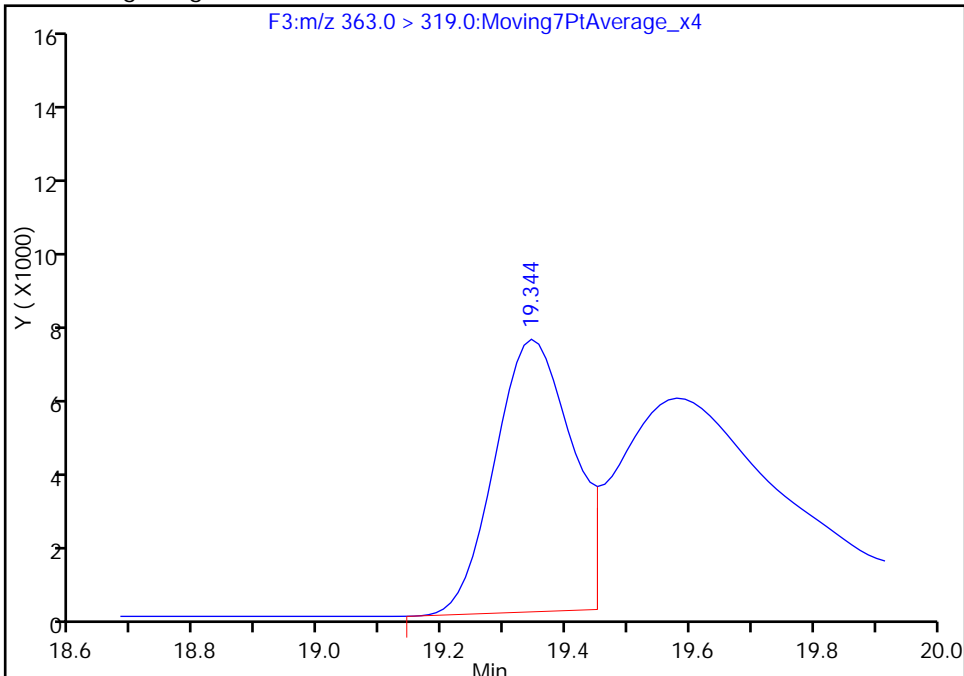
Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_004.d
Injection Date: 24-Dec-2016 04:26:10 Instrument ID: A6
Lims ID: STD L1
Client ID:
Operator ID: CBW ALS Bottle#: 1 Worklist Smp#: 4
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F3:MRM

4 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

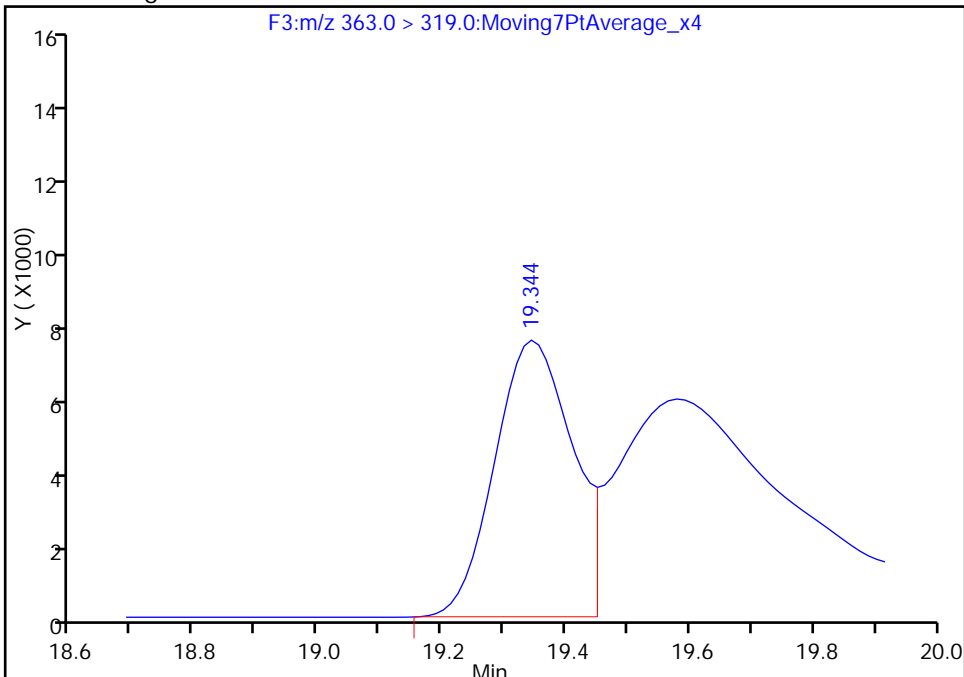
RT: 19.34
Area: 63912
Amount: 0.784751
Amount Units: ng/ml

Processing Integration Results



RT: 19.34
Area: 65406
Amount: 0.873101
Amount Units: ng/ml

Manual Integration Results



Reviewer: phomsophat, 24-Dec-2016 11:57:48
Audit Action: Manually Integrated

Audit Reason: Baseline

TestAmerica Sacramento

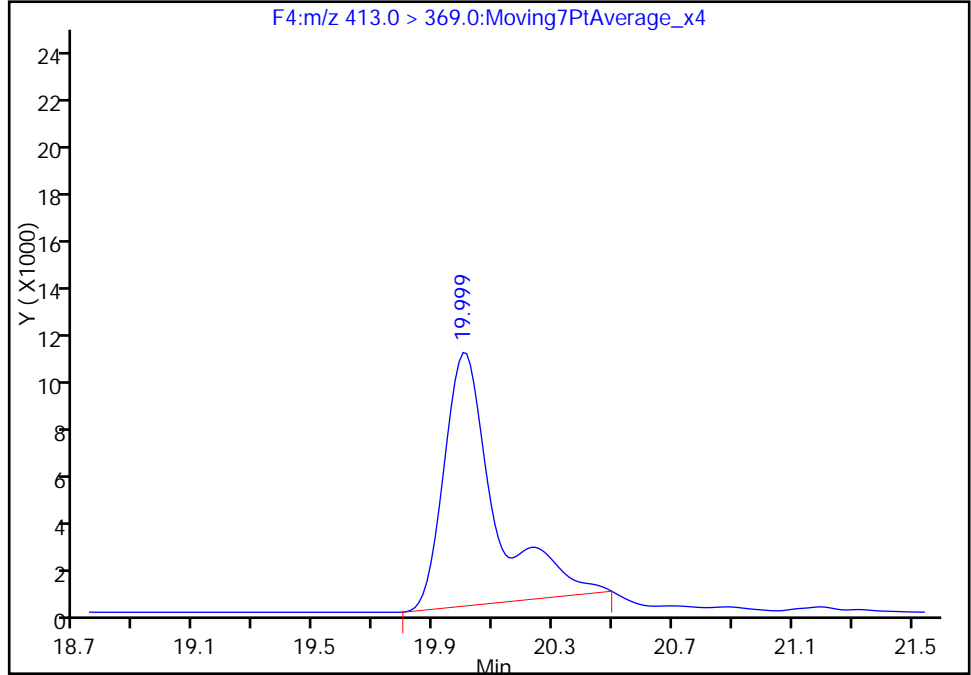
Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_004.d
Injection Date: 24-Dec-2016 04:26:10 Instrument ID: A6
Lims ID: STD L1
Client ID:
Operator ID: CBW ALS Bottle#: 1 Worklist Smp#: 4
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

6 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

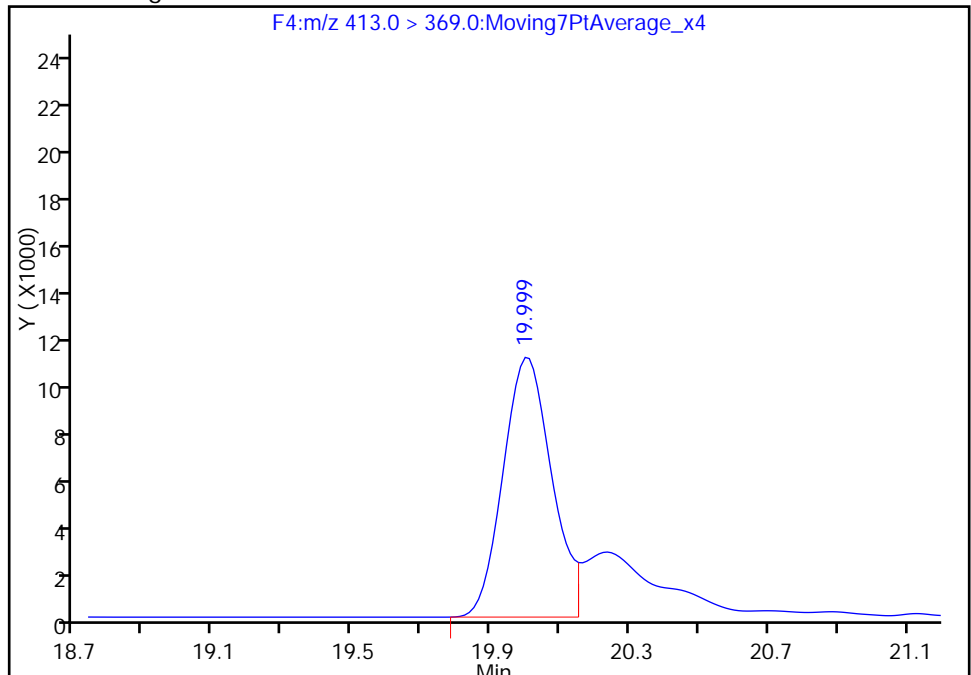
RT: 20.00
Area: 124416
Amount: 1.917532
Amount Units: ng/ml

Processing Integration Results



RT: 20.00
Area: 105059
Amount: 1.703696
Amount Units: ng/ml

Manual Integration Results



Reviewer: phomsophat, 24-Dec-2016 11:57:48
Audit Action: Manually Integrated

Audit Reason: Baseline

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_005.d
 Lims ID: STD L2
 Client ID:
 Sample Type: IC Calib Level: 2
 Inject. Date: 24-Dec-2016 04:55:44 ALS Bottle#: 2 Worklist Smp#: 5
 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\20161224-38202.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 27-Dec-2016 10:54:56 Calib Date: 24-Dec-2016 06:54:10
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK031

First Level Reviewer: phomsophat Date: 24-Dec-2016 11:59:47

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid	299.0 > 80.0	17.586	17.586	0.0	1.000	999960	23.8	332
\$ 2 13C2 PFHxA	315.0 > 270.0	18.558	18.558	0.0	1.000	657231	8.84	21447
3 Perfluorohexanesulfonic acid	399.0 > 80.0	19.309	19.318	-0.009	1.000	395737	7.60	9507
4 Perfluoroheptanoic acid	363.0 > 319.0	19.344	19.350	-0.006	1.000	205998	2.71	17.1
* 5 13C2-PFOA	415.0 > 370.0	19.999	20.005	-0.006		623136	10.0	15732
6 Perfluorooctanoic acid	413.0 > 369.0	19.999	20.005	-0.006	1.000	305974	4.88	76.0 M
7 Perfluorooctane sulfonic acid	499.0 > 80.0	20.620	20.619	0.001	1.000	584936	9.61	9904
* 8 13C4 PFOS	503.0 > 80.0	20.620	20.619	0.001		1586953	28.7	41115
9 Perfluorononanoic acid	463.0 > 419.0	20.691	20.697	-0.006	1.000	394672	5.51	8417
\$ 10 13C2 PFDA	515.0 > 470.0	21.409	21.416	-0.007	1.000	588071	9.36	18601

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L2_00016

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_005.d

Injection Date: 24-Dec-2016 04:55:44

Instrument ID: A6

Lims ID: STD L2

Client ID:

Operator ID: CBW

ALS Bottle#: 2

Worklist Smp#: 5

Injection Vol: 10.0 ul

Dil. Factor: 1.0000

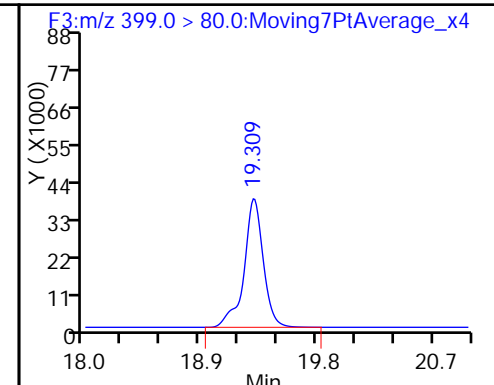
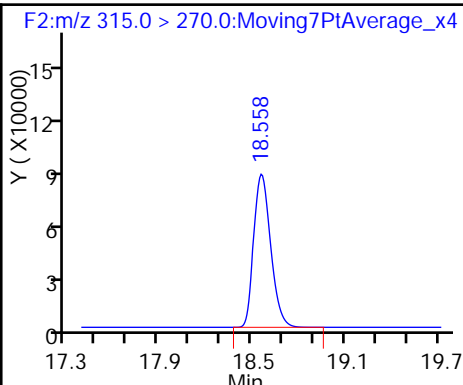
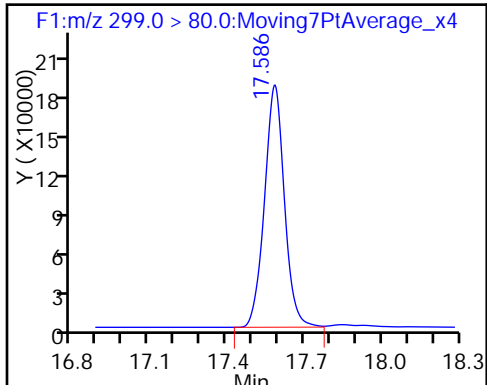
Method: 537_A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

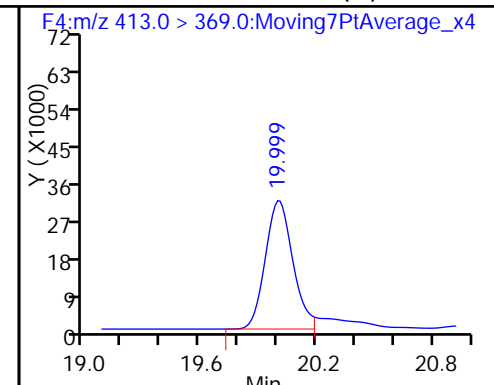
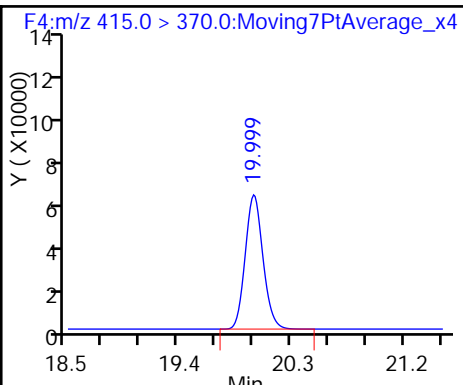
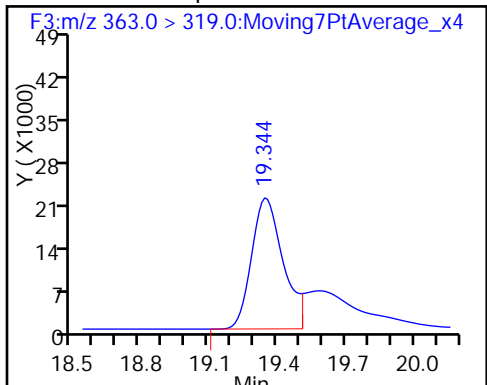
3 Perfluorohexanesulfonic acid



4 Perfluoroheptanoic acid

* 5 13C2-PFOA

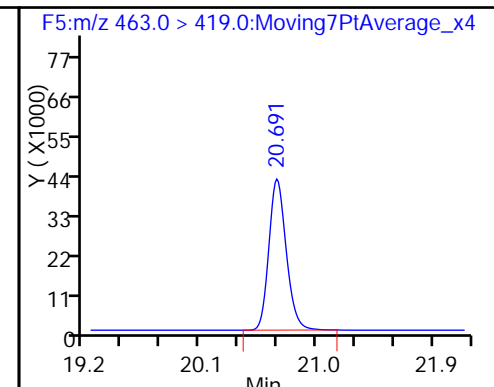
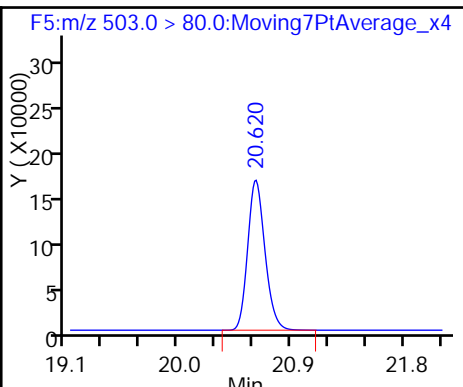
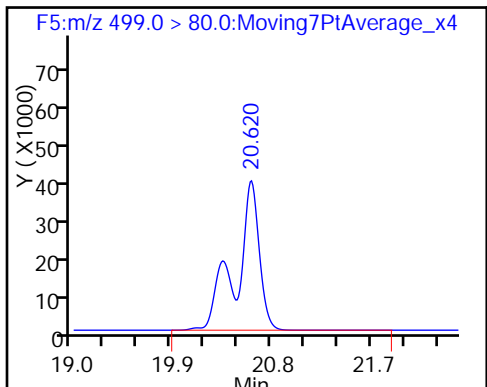
6 Perfluorooctanoic acid (M)



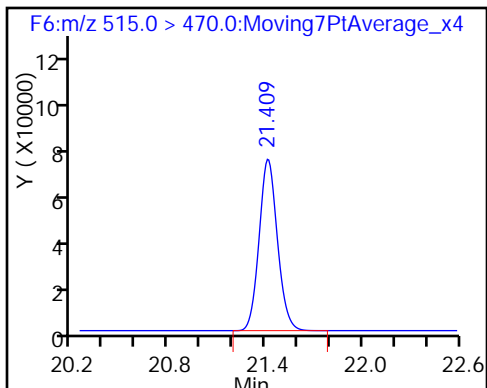
7 Perfluorooctane sulfonic acid

* 8 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

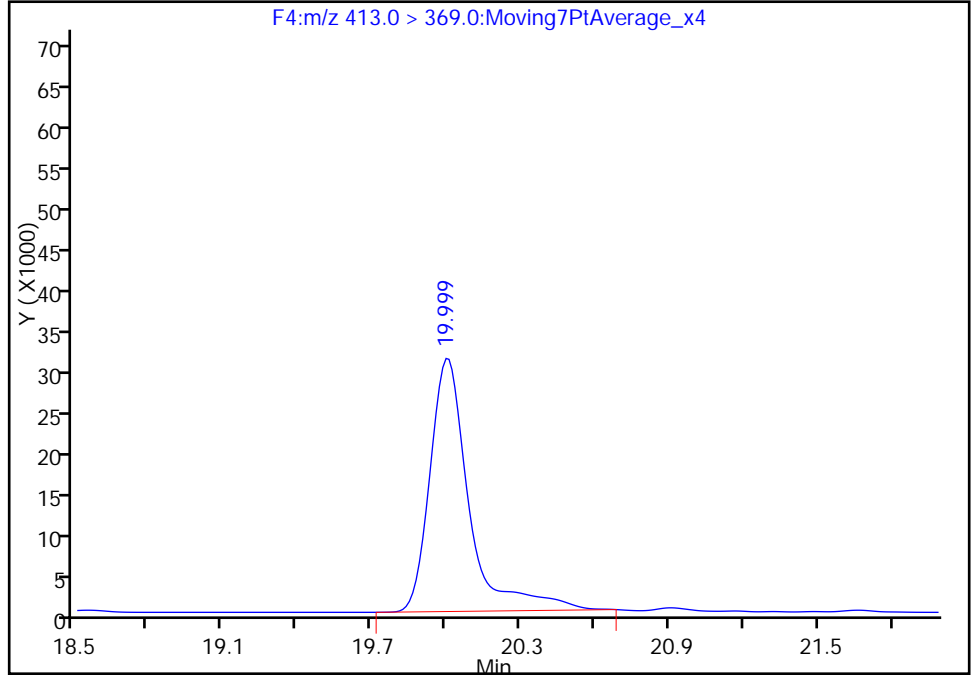
Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_005.d
Injection Date: 24-Dec-2016 04:55:44 Instrument ID: A6
Lims ID: STD L2
Client ID:
Operator ID: CBW ALS Bottle#: 2 Worklist Smp#: 5
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

6 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

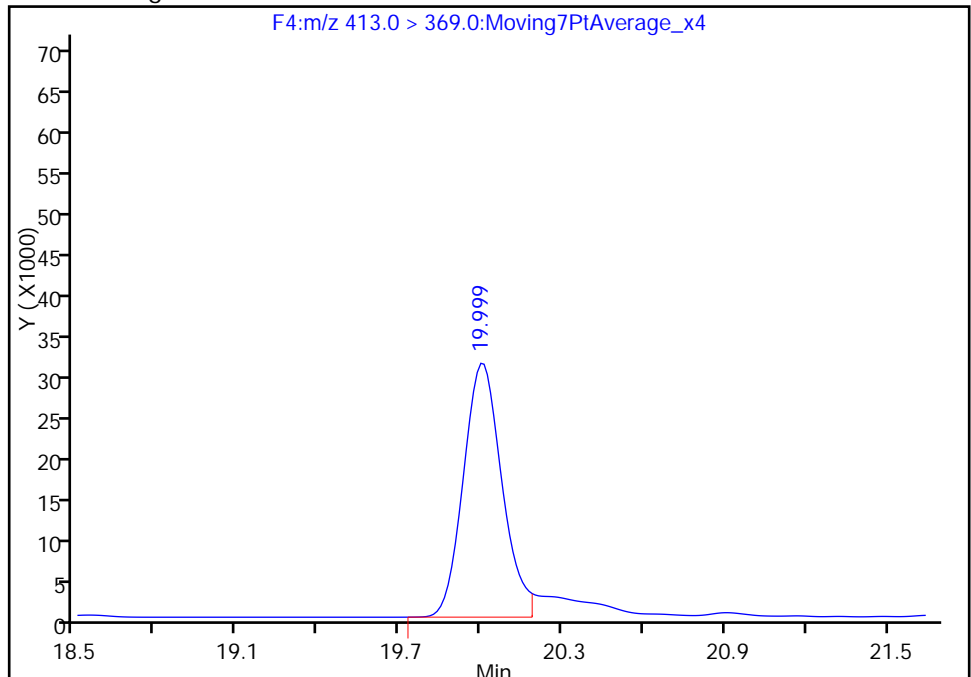
RT: 20.00
Area: 340214
Amount: 5.293744
Amount Units: ng/ml

Processing Integration Results



RT: 20.00
Area: 305974
Amount: 4.881813
Amount Units: ng/ml

Manual Integration Results



Reviewer: phomsophat, 24-Dec-2016 11:59:47
Audit Action: Manually Integrated

Audit Reason: Baseline

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_006.d
 Lims ID: STD L3
 Client ID:
 Sample Type: IC Calib Level: 3
 Inject. Date: 24-Dec-2016 05:25:20 ALS Bottle#: 3 Worklist Smp#: 6
 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\20161224-38202.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 27-Dec-2016 10:55:03 Calib Date: 24-Dec-2016 06:54:10
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK031

First Level Reviewer: phomsophat Date: 24-Dec-2016 12:04:18

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid	299.0 > 80.0	17.586	17.586	0.0	1.000	1880513	48.1	564
\$ 2 13C2 PFHxA	315.0 > 270.0	18.558	18.558	0.0	1.000	700737	9.74	22761
3 Perfluorohexanesulfonic acid	399.0 > 80.0	19.320	19.318	0.002	1.000	773860	16.0	18225
4 Perfluoroheptanoic acid	363.0 > 319.0	19.344	19.350	-0.006	1.000	407699	5.54	39.5 M
* 5 13C2-PFOA	415.0 > 370.0	19.999	20.005	-0.006		602755	10.0	15228
6 Perfluorooctanoic acid	413.0 > 369.0	19.999	20.005	-0.006	1.000	593502	9.79	208 M
7 Perfluorooctane sulfonic acid	499.0 > 80.0	20.619	20.619	0.0	1.000	1184968	20.9	19371
* 8 13C4 PFOS	503.0 > 80.0	20.619	20.619	0.0		1478857	28.7	38359
9 Perfluorononanoic acid	463.0 > 419.0	20.691	20.697	-0.006	1.000	744764	10.8	19653
\$ 10 13C2 PFDA	515.0 > 470.0	21.418	21.416	0.002	1.000	583365	9.60	18358

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L3_00018

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_006.d

Injection Date: 24-Dec-2016 05:25:20

Instrument ID: A6

Lims ID: STD L3

Client ID:

Operator ID: CBW

ALS Bottle#: 3

Worklist Smp#: 6

Injection Vol: 10.0 ul

Dil. Factor: 1.0000

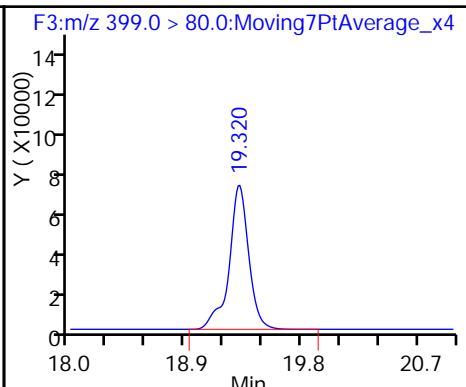
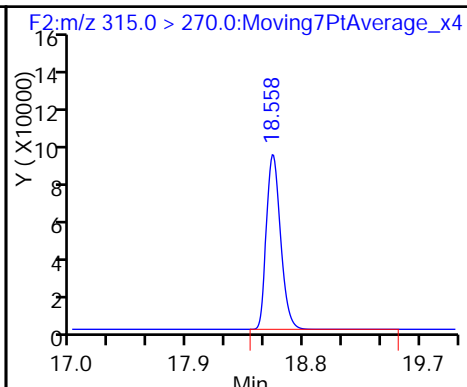
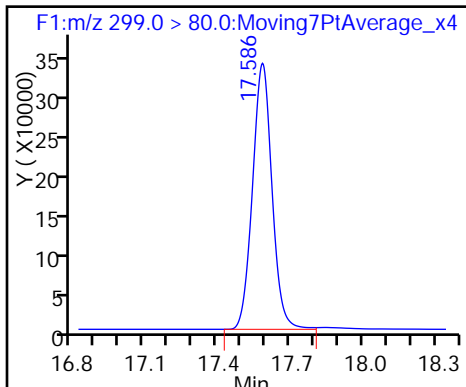
Method: 537_A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

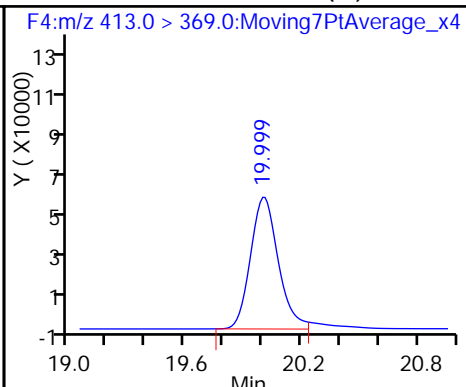
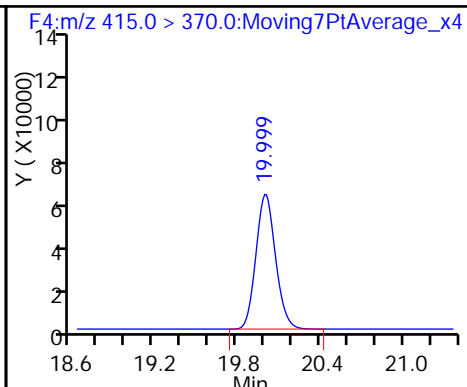
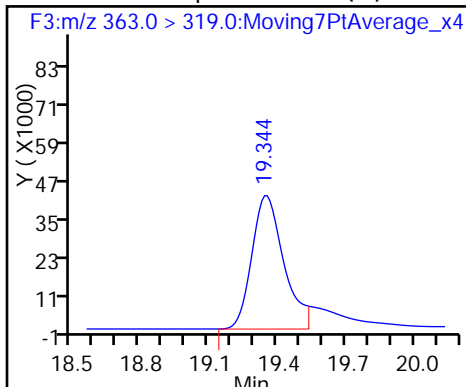
3 Perfluorohexanesulfonic acid



4 Perfluoroheptanoic acid (M)

* 5 13C2-PFOA

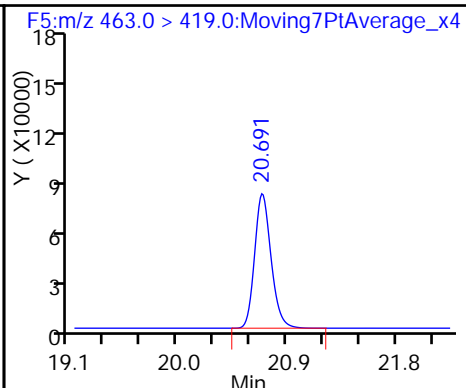
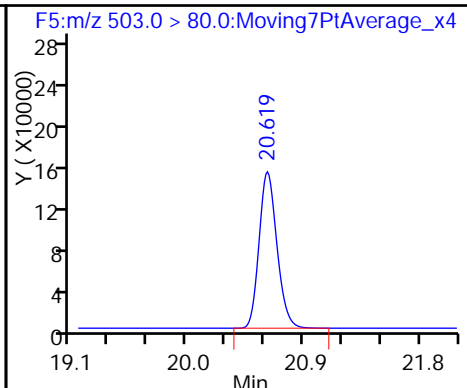
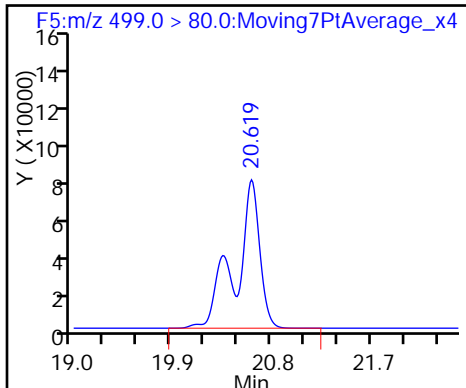
6 Perfluorooctanoic acid (M)



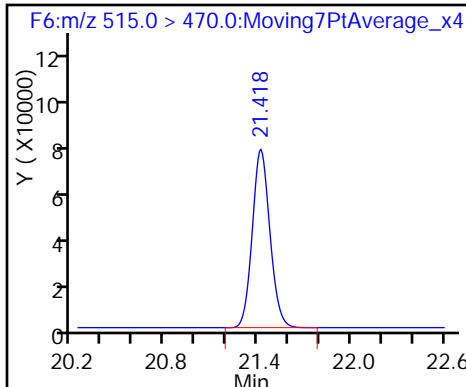
7 Perfluorooctane sulfonic acid

* 8 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

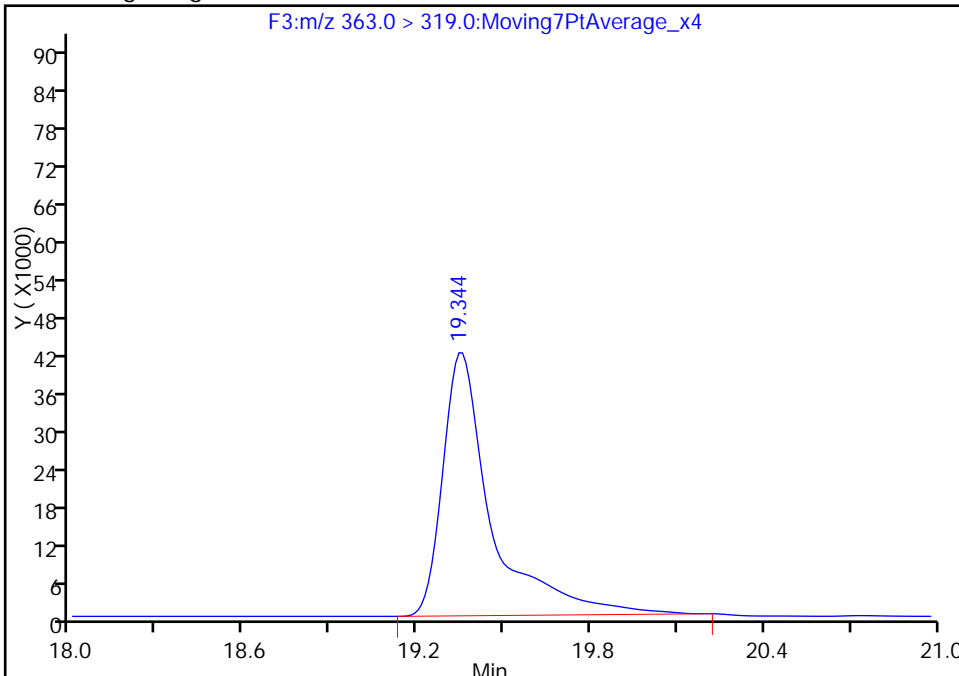
Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_006.d
Injection Date: 24-Dec-2016 05:25:20 Instrument ID: A6
Lims ID: STD L3
Client ID:
Operator ID: CBW ALS Bottle#: 3 Worklist Smp#: 6
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F3:M/RM

4 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

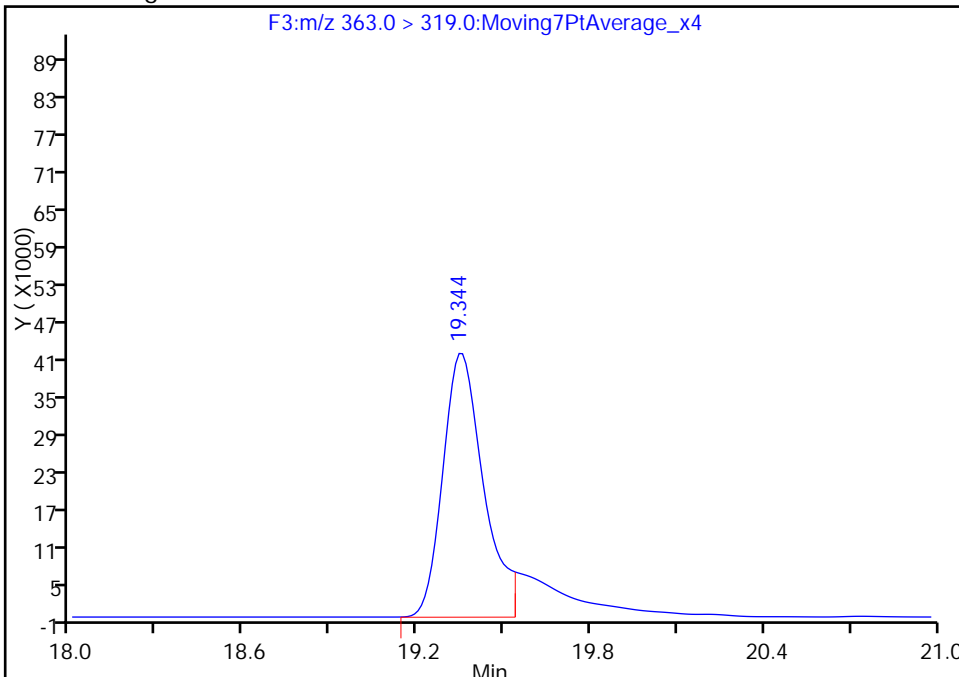
RT: 19.34
Area: 491634
Amount: 6.121135
Amount Units: ng/ml

Processing Integration Results



RT: 19.34
Area: 407699
Amount: 5.535622
Amount Units: ng/ml

Manual Integration Results



Reviewer: phomsophat, 24-Dec-2016 12:04:18
Audit Action: Manually Integrated

Audit Reason: Baseline

TestAmerica Sacramento

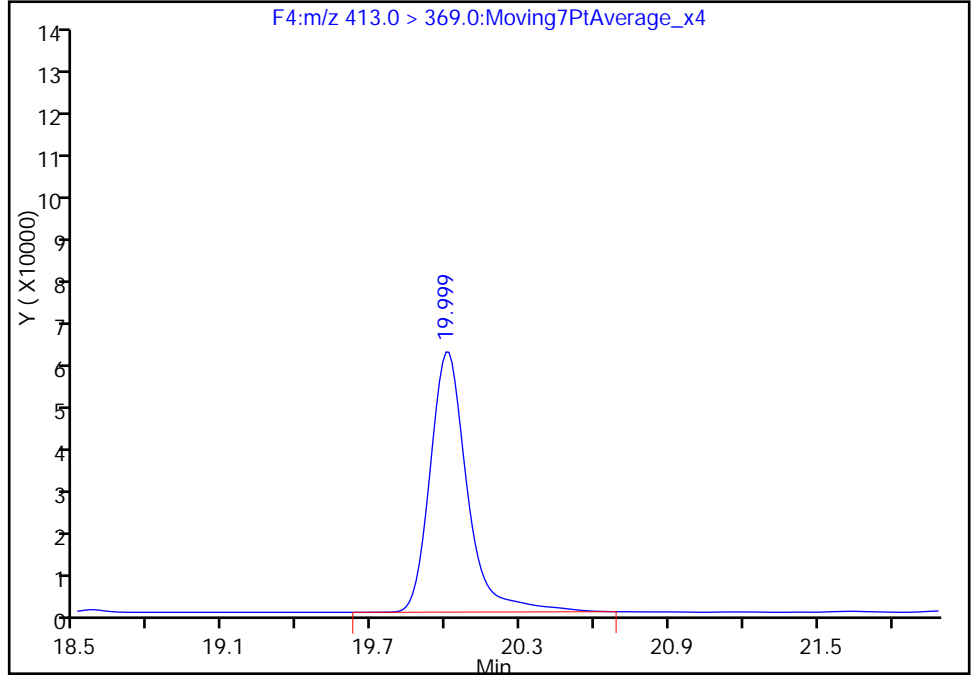
Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_006.d
Injection Date: 24-Dec-2016 05:25:20 Instrument ID: A6
Lims ID: STD L3
Client ID:
Operator ID: CBW ALS Bottle#: 3 Worklist Smp#: 6
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

6 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

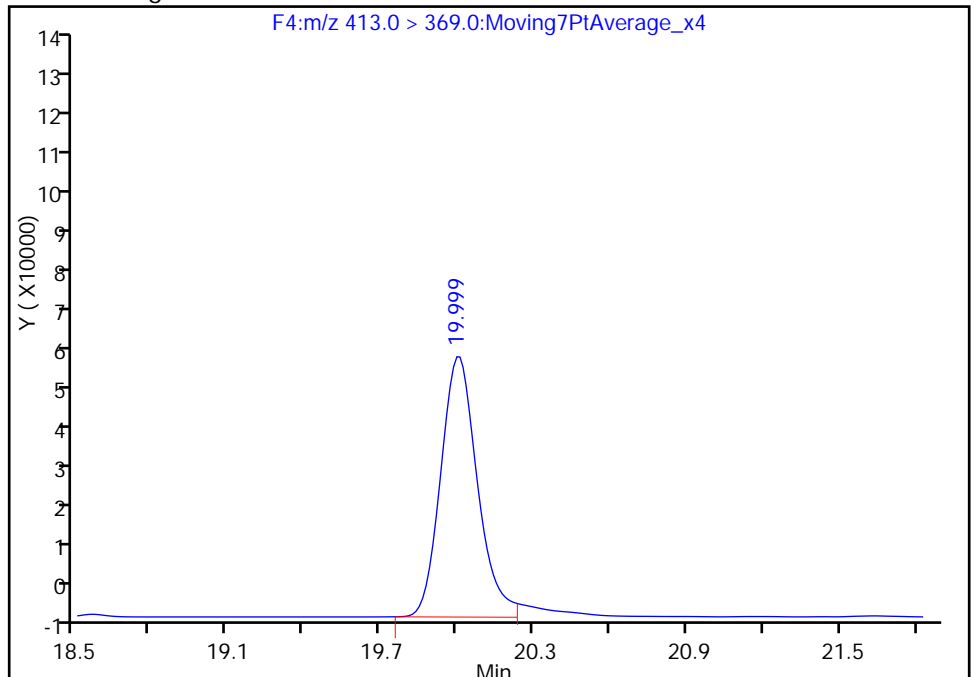
RT: 20.00
Area: 618796
Amount: 10.134867
Amount Units: ng/ml

Processing Integration Results



RT: 20.00
Area: 593502
Amount: 9.789506
Amount Units: ng/ml

Manual Integration Results



Reviewer: phomsophat, 24-Dec-2016 12:09:12
Audit Action: Manually Integrated

Audit Reason: Baseline

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_007.d
 Lims ID: STD L4
 Client ID:
 Sample Type: ICISAV Calib Level: 4
 Inject. Date: 24-Dec-2016 05:54:58 ALS Bottle#: 4 Worklist Smp#: 7
 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\20161224-38202.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 27-Dec-2016 10:55:08 Calib Date: 24-Dec-2016 06:54:10
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK031

First Level Reviewer: phomsophat Date: 24-Dec-2016 11:52:02

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid	299.0 > 80.0	17.586	17.586	0.0	1.000	3444375	89.4	760
\$ 2 13C2 PFHxA	315.0 > 270.0	18.558	18.558	0.0	1.000	727339	10.6	23818
3 Perfluorohexanesulfonic acid	399.0 > 80.0	19.320	19.318	0.002	1.000	1505450	31.5	34932
4 Perfluoroheptanoic acid	363.0 > 319.0	19.356	19.350	0.006	1.000	733295	10.4	79.4 M
* 5 13C2-PFOA	415.0 > 370.0	20.011	20.005	0.006		574449	10.0	14462
6 Perfluorooctanoic acid	413.0 > 369.0	20.011	20.005	0.006	1.000	1195609	20.7	546
7 Perfluorooctane sulfonic acid	499.0 > 80.0	20.619	20.619	0.0	1.000	2327023	41.7	37125
* 8 13C4 PFOS	503.0 > 80.0	20.619	20.619	0.0		1456779	28.7	37378
9 Perfluorononanoic acid	463.0 > 419.0	20.702	20.697	0.005	1.000	1365537	20.7	20501
\$ 10 13C2 PFDA	515.0 > 470.0	21.418	21.416	0.002	1.000	605628	10.5	19163

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L4_00017

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_007.d

Injection Date: 24-Dec-2016 05:54:58

Instrument ID: A6

Lims ID: STD L4

Client ID:

Operator ID: CBW

ALS Bottle#: 4

Worklist Smp#: 7

Injection Vol: 10.0 ul

Dil. Factor: 1.0000

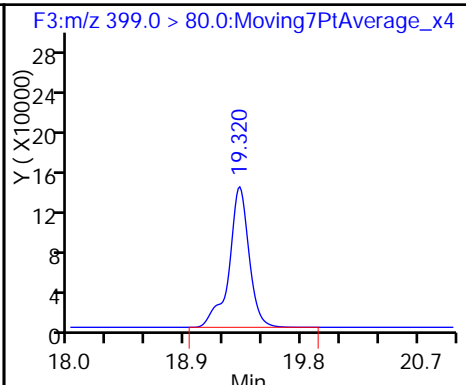
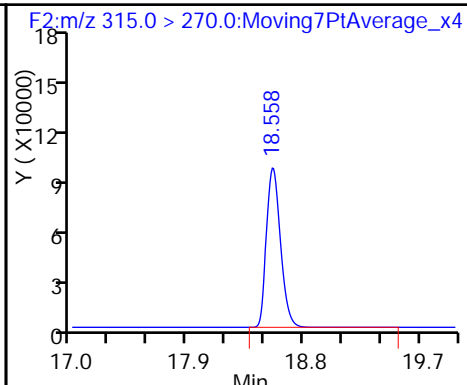
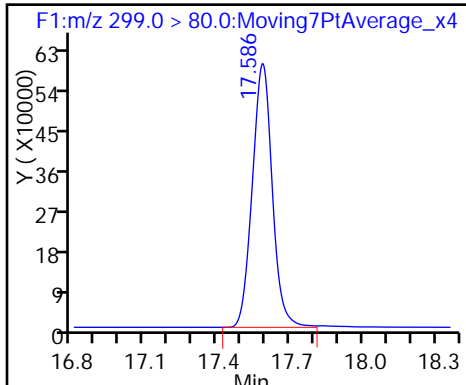
Method: 537_A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

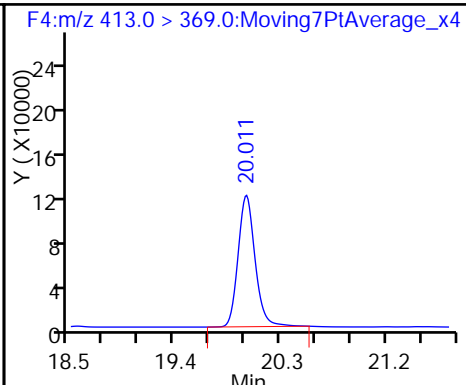
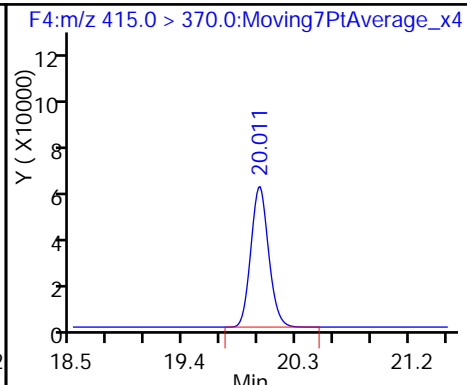
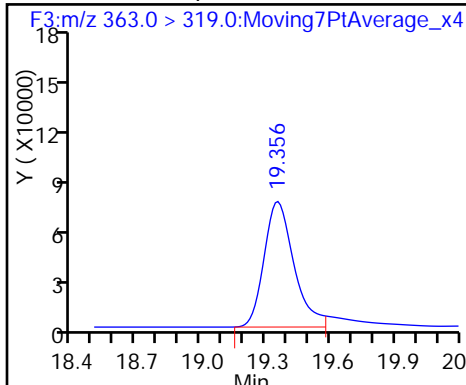
3 Perfluorohexanesulfonic acid



4 Perfluoroheptanoic acid (M)

* 5 13C2-PFOA

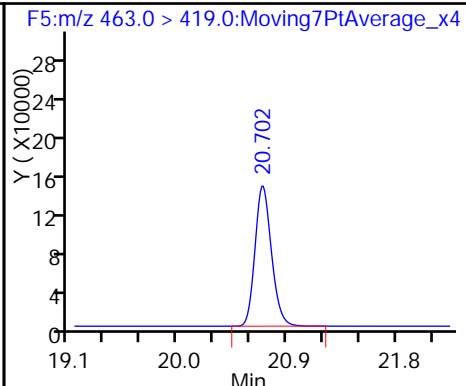
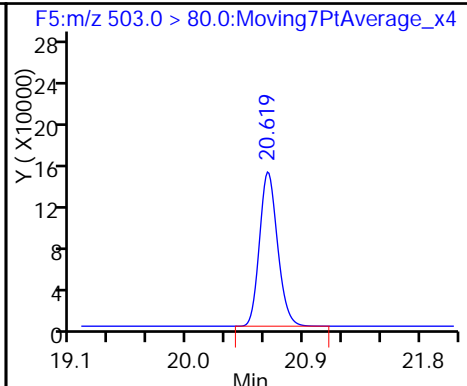
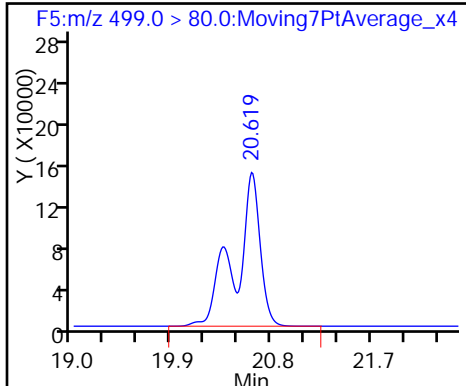
6 Perfluorooctanoic acid



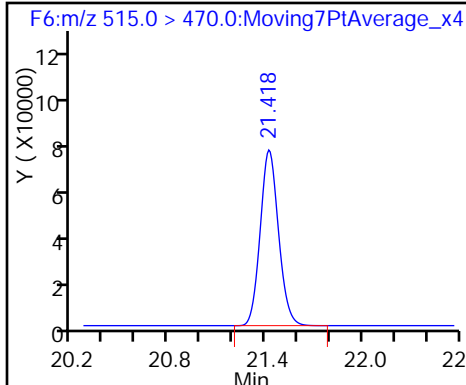
7 Perfluorooctane sulfonic acid

* 8 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

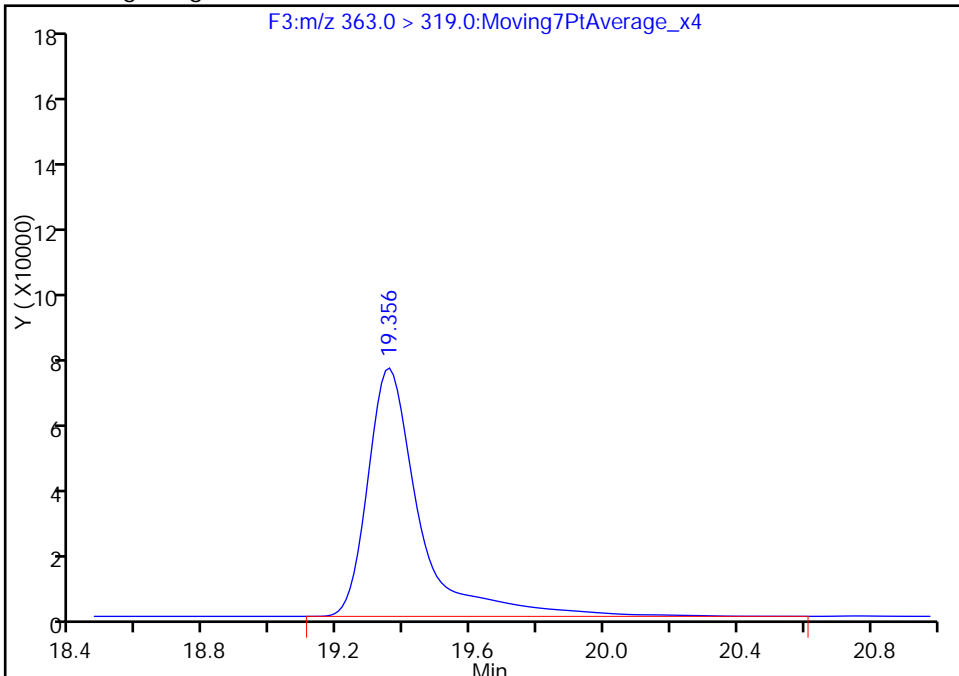
Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_007.d
Injection Date: 24-Dec-2016 05:54:58 Instrument ID: A6
Lims ID: STD L4
Client ID:
Operator ID: CBW ALS Bottle#: 4 Worklist Smp#: 7
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F3:MRM

4 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

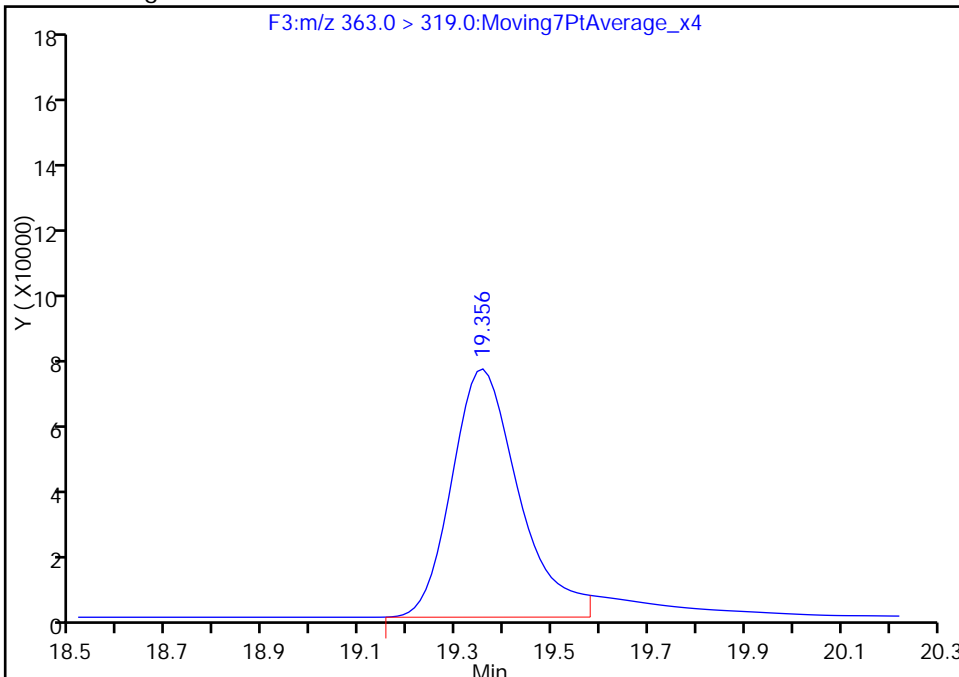
RT: 19.36
Area: 824224
Amount: 11.158414
Amount Units: ng/ml

Processing Integration Results



RT: 19.36
Area: 733295
Amount: 10.447079
Amount Units: ng/ml

Manual Integration Results



Reviewer: phomsophat, 24-Dec-2016 12:07:04

Audit Action: Manually Integrated

Audit Reason: Baseline

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_008.d
 Lims ID: STD L5
 Client ID:
 Sample Type: IC Calib Level: 5
 Inject. Date: 24-Dec-2016 06:24:33 ALS Bottle#: 5 Worklist Smp#: 8
 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\20161224-38202.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 27-Dec-2016 10:55:14 Calib Date: 24-Dec-2016 06:54:10
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK031

First Level Reviewer: phomsophat Date: 24-Dec-2016 12:10:47

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid	299.0 > 80.0	17.582	17.586	-0.004	1.000	4710266	132.8	8284
\$ 2 13C2 PFHxA	315.0 > 270.0	18.558	18.558	0.0	1.000	686886	9.73	22056
3 Perfluorohexanesulfonic acid	399.0 > 80.0	19.320	19.318	0.002	1.000	2054618	46.7	46922
4 Perfluoroheptanoic acid	363.0 > 319.0	19.356	19.350	0.006	1.000	976632	13.5	82.2 M
* 5 13C2-PFOA	415.0 > 370.0	20.011	20.005	0.006		591689	10.0	15022
6 Perfluorooctanoic acid	413.0 > 369.0	20.011	20.005	0.006	1.000	1721874	28.9	1197
7 Perfluorooctane sulfonic acid	499.0 > 80.0	20.619	20.619	0.0	1.000	3403779	66.2	19341
* 8 13C4 PFOS	503.0 > 80.0	20.619	20.619	0.0		1340813	28.7	22935
9 Perfluorononanoic acid	463.0 > 419.0	20.702	20.697	0.005	1.000	1918933	28.2	14288
\$ 10 13C2 PFDA	515.0 > 470.0	21.418	21.416	0.002	1.000	591036	9.91	18532

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L5_00019

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_008.d

Injection Date: 24-Dec-2016 06:24:33

Instrument ID: A6

Lims ID: STD L5

Client ID:

Operator ID: CBW

ALS Bottle#: 5

Worklist Smp#: 8

Injection Vol: 10.0 ul

Dil. Factor: 1.0000

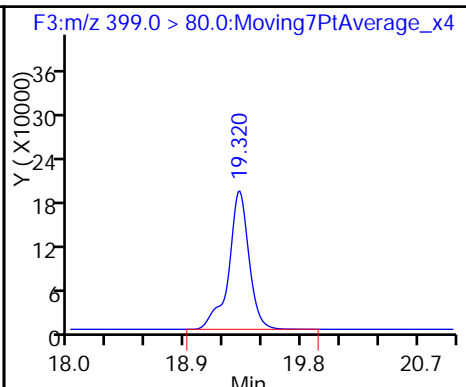
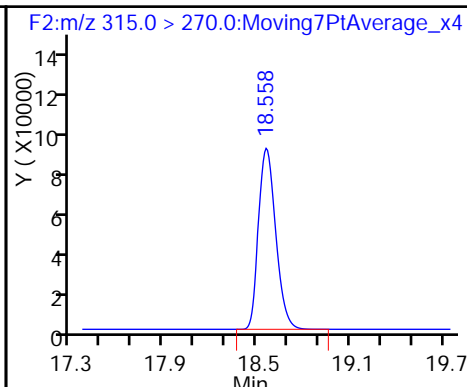
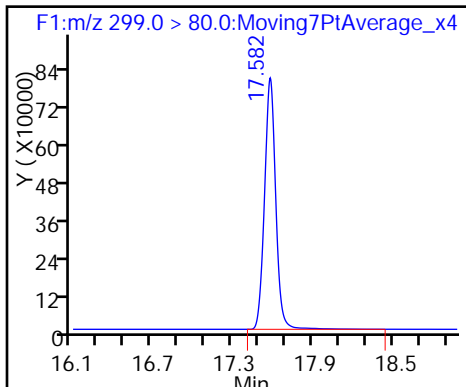
Method: 537_A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

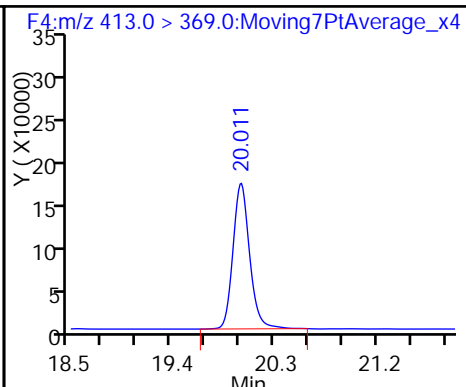
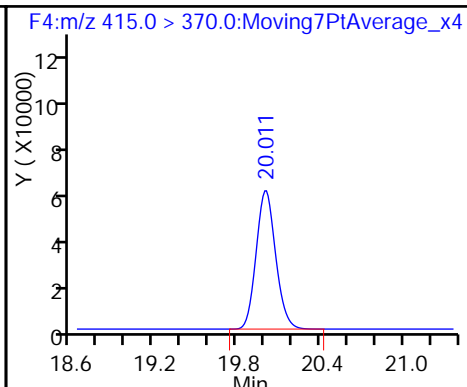
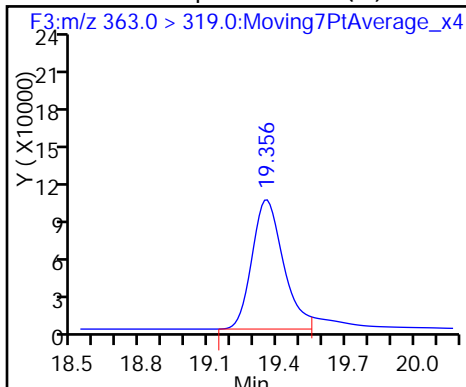
3 Perfluorohexanesulfonic acid



4 Perfluoroheptanoic acid (M)

* 5 13C2-PFOA

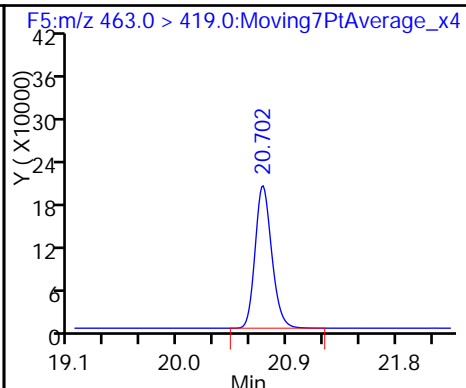
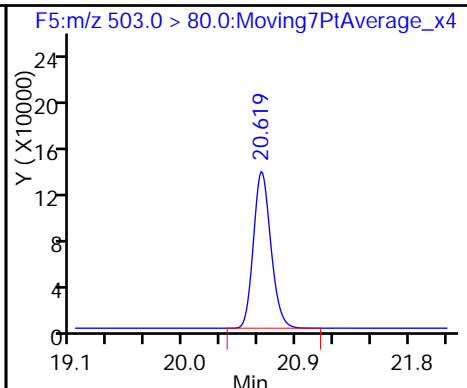
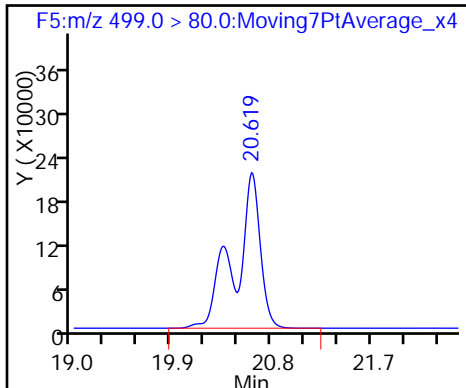
6 Perfluorooctanoic acid



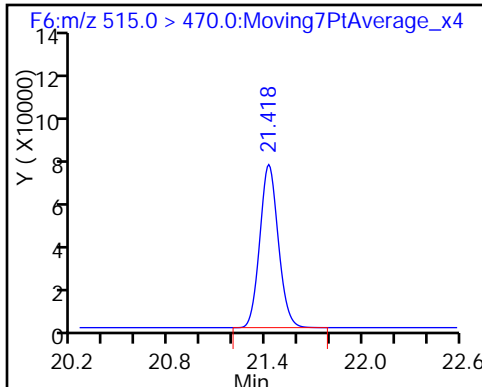
7 Perfluorooctane sulfonic acid

* 8 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

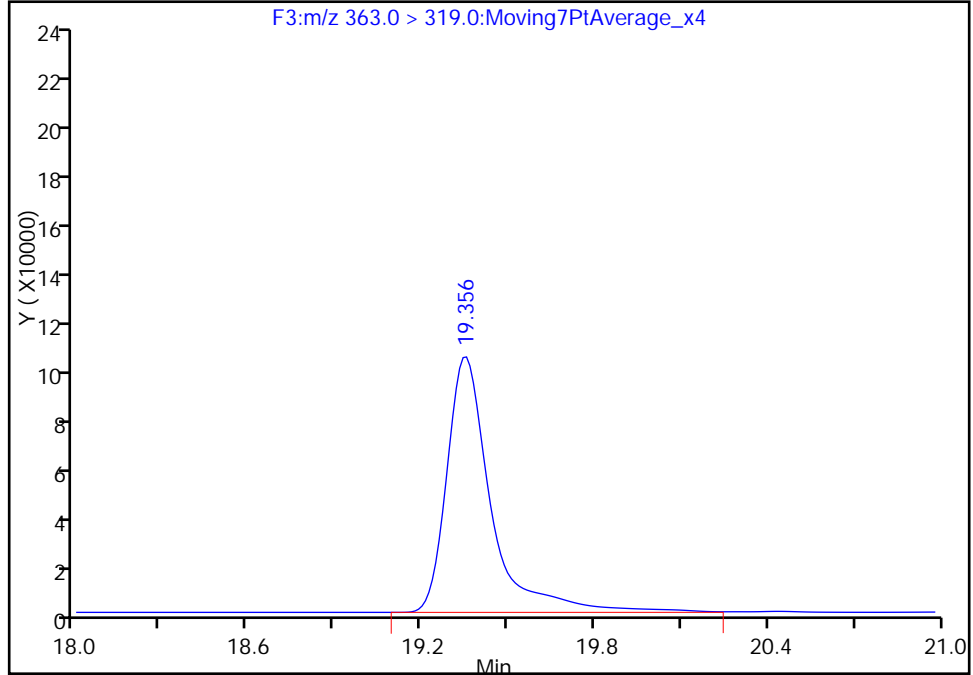
Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_008.d
Injection Date: 24-Dec-2016 06:24:33 Instrument ID: A6
Lims ID: STD L5
Client ID:
Operator ID: CBW ALS Bottle#: 5 Worklist Smp#: 8
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F3:M/RM

4 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

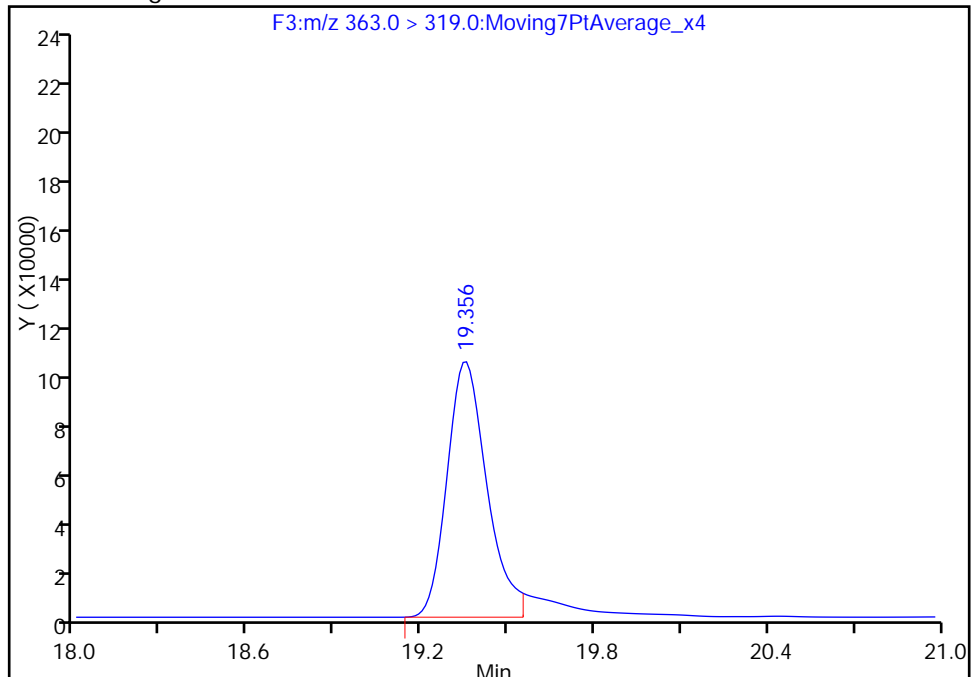
RT: 19.36
Area: 1090608
Amount: 14.634076
Amount Units: ng/ml

Processing Integration Results



RT: 19.36
Area: 976632
Amount: 13.508437
Amount Units: ng/ml

Manual Integration Results



Reviewer: phomsophat, 24-Dec-2016 12:10:47

Audit Action: Manually Integrated

Audit Reason: Baseline

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d
 Lims ID: STD L6
 Client ID:
 Sample Type: IC Calib Level: 6
 Inject. Date: 24-Dec-2016 06:54:10 ALS Bottle#: 6 Worklist Smp#: 9
 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\20161224-38202.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 27-Dec-2016 10:55:20 Calib Date: 24-Dec-2016 06:54:10
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK031

First Level Reviewer: phomsophat Date: 24-Dec-2016 12:11:59

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid	299.0 > 80.0	17.586	17.586	0.0	1.000	5939448	166.8	2454
\$ 2 13C2 PFHxA	315.0 > 270.0	18.567	18.558	0.009	1.000	726485	11.7	23627
3 Perfluorohexanesulfonic acid	399.0 > 80.0	19.320	19.318	0.002	1.000	2809913	63.6	63277
4 Perfluoroheptanoic acid	363.0 > 319.0	19.356	19.350	0.006	1.000	1230238	19.3	129 M
* 5 13C2-PFOA	415.0 > 370.0	20.011	20.005	0.006		521213	10.0	13076
6 Perfluorooctanoic acid	413.0 > 369.0	20.011	20.005	0.006	1.000	2263615	43.2	940
7 Perfluorooctane sulfonic acid	499.0 > 80.0	20.619	20.619	0.0	1.000	4386351	85.0	67299
* 8 13C4 PFOS	503.0 > 80.0	20.619	20.619	0.0		1346636	28.7	34338
9 Perfluorononanoic acid	463.0 > 419.0	20.702	20.697	0.005	1.000	2652055	44.3	14613
\$ 10 13C2 PFDA	515.0 > 470.0	21.418	21.416	0.002	1.000	608935	11.6	19393

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L6_00016

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d

Injection Date: 24-Dec-2016 06:54:10

Instrument ID: A6

Lims ID: STD L6

Client ID:

Operator ID: CBW

ALS Bottle#: 6

Worklist Smp#: 9

Injection Vol: 10.0 ul

Dil. Factor: 1.0000

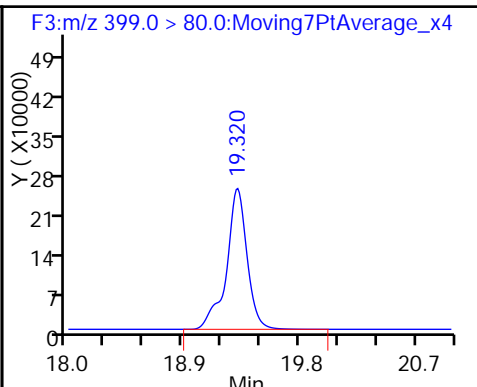
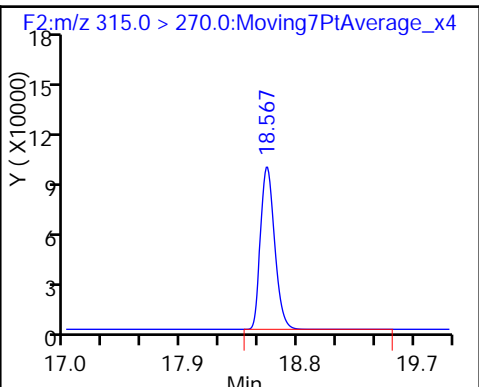
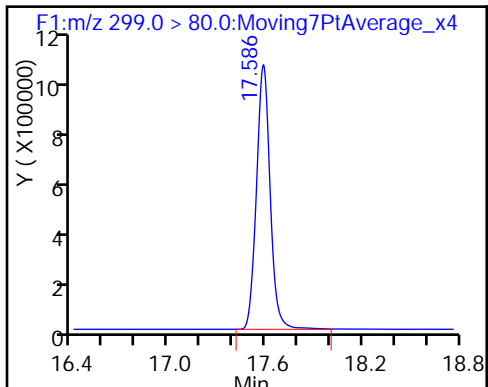
Method: 537_A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

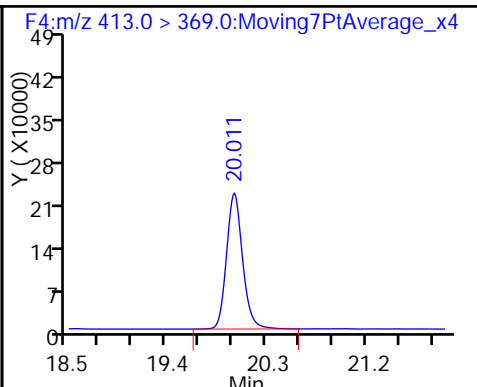
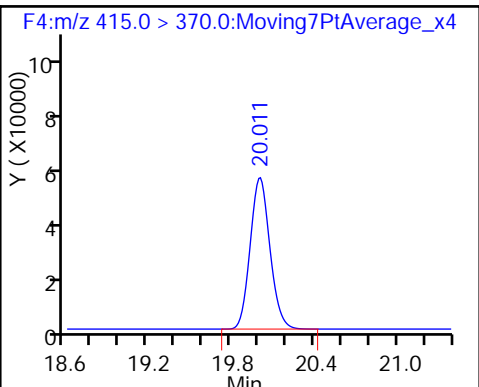
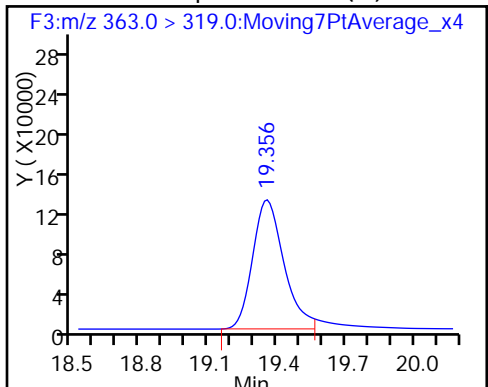
3 Perfluorohexanesulfonic acid



4 Perfluoroheptanoic acid (M)

* 5 13C2-PFOA

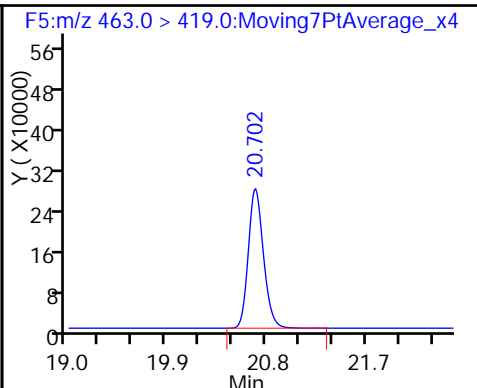
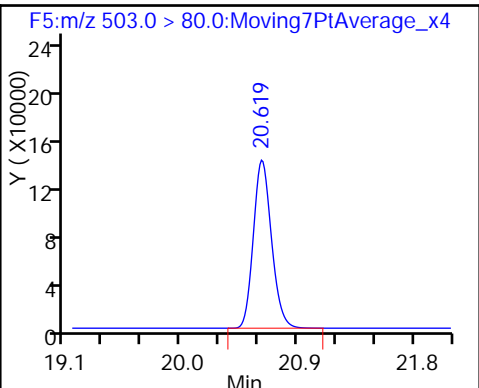
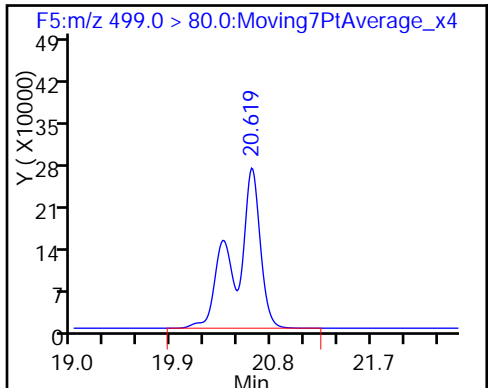
6 Perfluorooctanoic acid



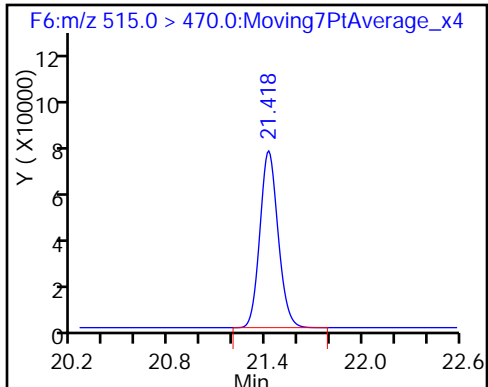
7 Perfluorooctane sulfonic acid

* 8 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

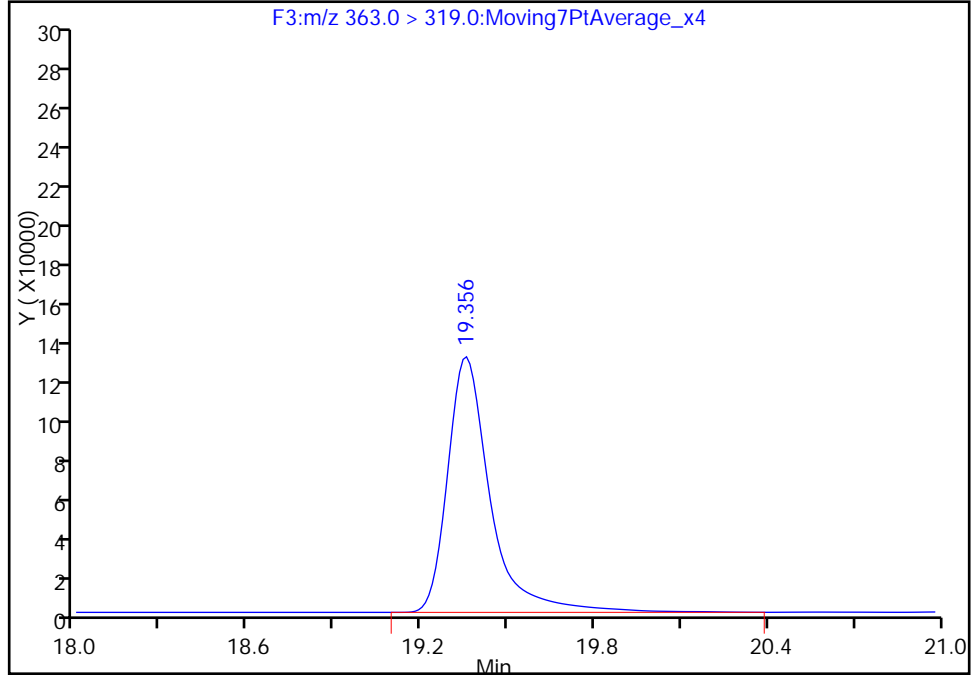
Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d
Injection Date: 24-Dec-2016 06:54:10 Instrument ID: A6
Lims ID: STD L6
Client ID:
Operator ID: CBW ALS Bottle#: 6 Worklist Smp#: 9
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F3:M/RM

4 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

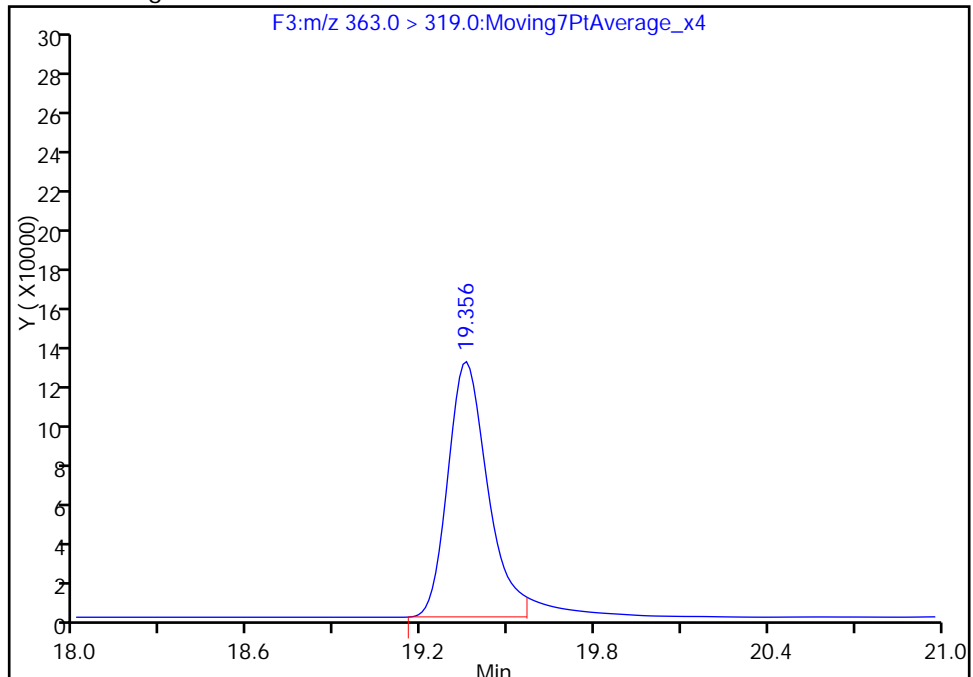
RT: 19.36
Area: 1328838
Amount: 20.595205
Amount Units: ng/ml

Processing Integration Results



RT: 19.36
Area: 1230238
Amount: 19.317083
Amount Units: ng/ml

Manual Integration Results



Reviewer: phomsophat, 24-Dec-2016 12:11:59

Audit Action: Manually Integrated

Audit Reason: Baseline

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24311-1
 SDG No.: _____
 Lab Sample ID: CCV 320-143828/11 Calibration Date: 12/24/2016 07:53
 Instrument ID: A6 Calib Start Date: 12/24/2016 04:26
 GC Column: Acquity ID: 2.10 (mm) Calib End Date: 12/24/2016 06:54
 Lab File ID: 24DEC2016A6A_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	0.7584	0.8007		24.2	22.9	5.6	50.0
Perfluorohexanesulfonic acid	Ave	0.9405	0.9098		7.46	7.72	-3.3	50.0
Perfluoroheptanoic acid	Ave	1.222	1.308		2.70	2.52	7.0	50.0
Perfluorooctanoic acid (PFOA)	Ave	1.006	1.037		5.13	4.98	3.1	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.100	1.106		10.3	10.2	0.5	50.0
Perfluorononanoic acid	Ave	1.149	1.267		5.83	5.29	10.3	50.0
13C2 PFHxA	Ave	1.193	1.160		9.72	10.0	-2.8	30.0
13C2 PFDA	Ave	1.008	0.9498		9.42	10.0	-5.8	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_011.d
 Lims ID: CCV L2
 Client ID:
 Sample Type: CCVL
 Inject. Date: 24-Dec-2016 07:53:20 ALS Bottle#: 2 Worklist Smp#: 11
 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\20161224-38202.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 27-Dec-2016 10:56:28 Calib Date: 24-Dec-2016 06:54:10
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK031

First Level Reviewer: phomsophat Date: 24-Dec-2016 12:19:01

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid	299.0 > 80.0	17.586	17.586	0.0	1.000	1022169	24.2	348
\$ 2 13C2 PFHxA	315.0 > 270.0	18.558	18.559	-0.001	1.000	757155	9.72	24717
3 Perfluorohexanesulfonic acid	399.0 > 80.0	19.320	19.318	0.002	1.000	391515	7.46	9073
4 Perfluoroheptanoic acid	363.0 > 319.0	19.356	19.350	0.006	1.000	215552	2.70	18.7 M
* 5 13C2-PFOA	415.0 > 370.0	20.011	20.005	0.006		652887	10.0	16566
6 Perfluorooctanoic acid	413.0 > 369.0	20.011	20.005	0.006	1.000	336982	5.13	120 M
7 Perfluorooctane sulfonic acid	499.0 > 80.0	20.620	20.619	0.001	1.000	629983	10.3	10166
* 8 13C4 PFOS	503.0 > 80.0	20.620	20.619	0.001		1599599	28.7	41464
9 Perfluorononanoic acid	463.0 > 419.0	20.691	20.697	-0.006	1.000	437409	5.83	9269
\$ 10 13C2 PFDA	515.0 > 470.0	21.418	21.416	0.002	1.000	620121	9.42	19537

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L2_00016

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_011.d

Injection Date: 24-Dec-2016 07:53:20

Instrument ID: A6

Lims ID: CCV L2

Client ID:

Operator ID: CBW

ALS Bottle#: 2

Worklist Smp#: 11

Injection Vol: 10.0 ul

Dil. Factor: 1.0000

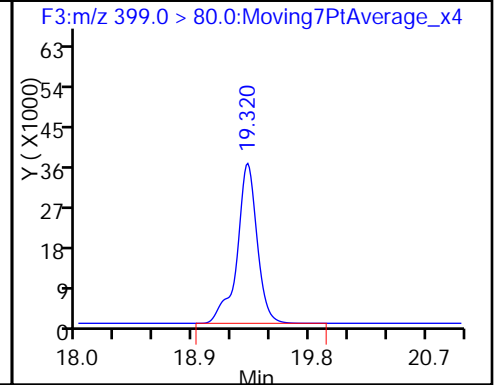
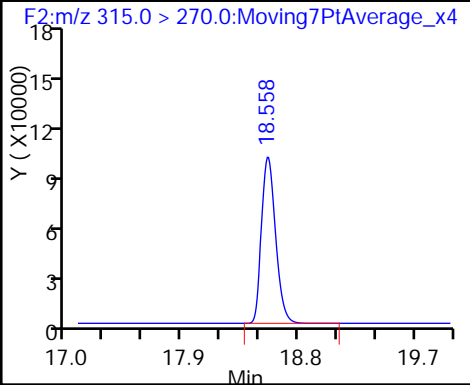
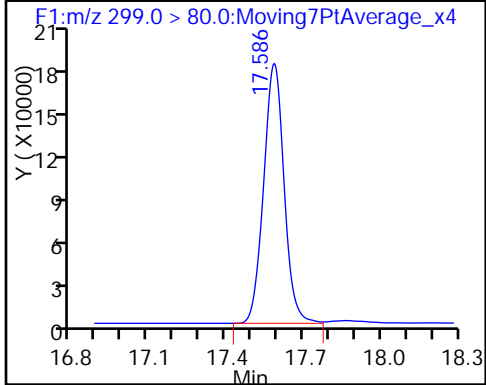
Method: 537_A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

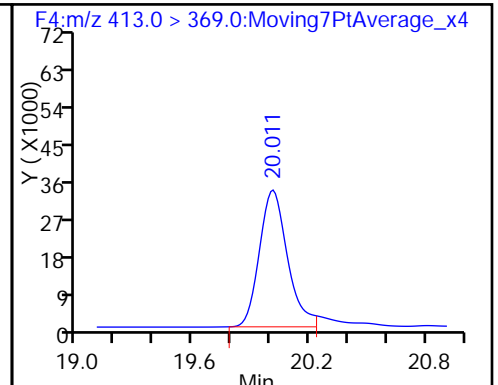
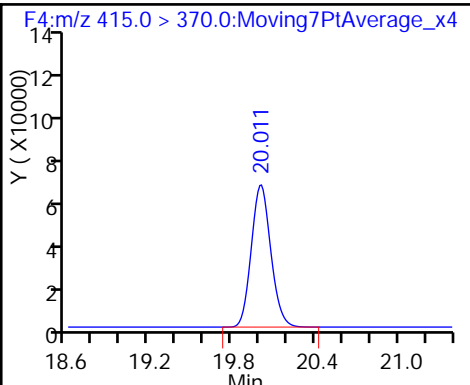
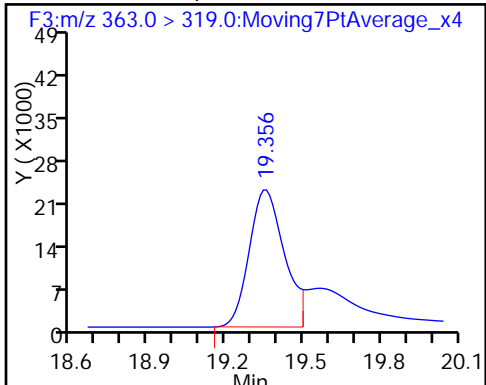
3 Perfluorohexanesulfonic acid



4 Perfluoroheptanoic acid (M)

* 5 13C2-PFOA

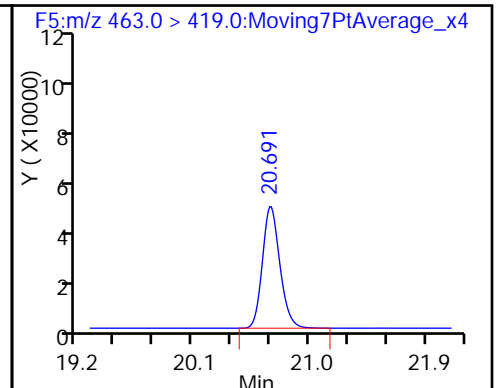
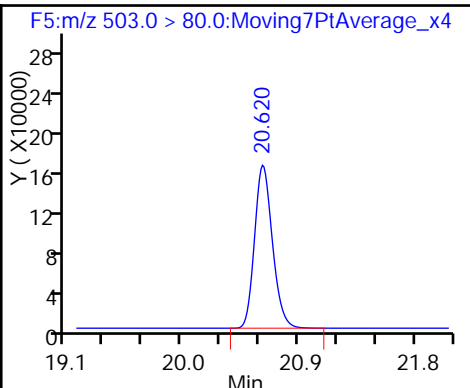
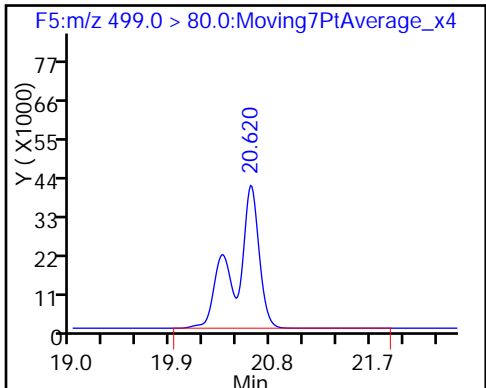
6 Perfluorooctanoic acid (M)



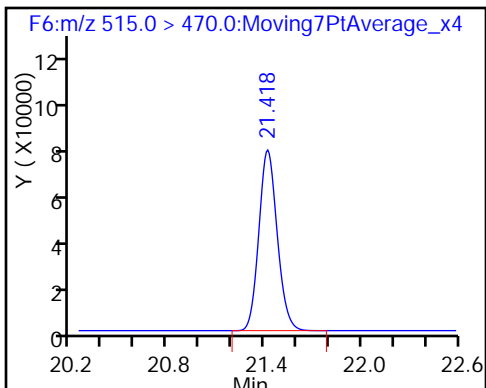
7 Perfluorooctane sulfonic acid

* 8 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

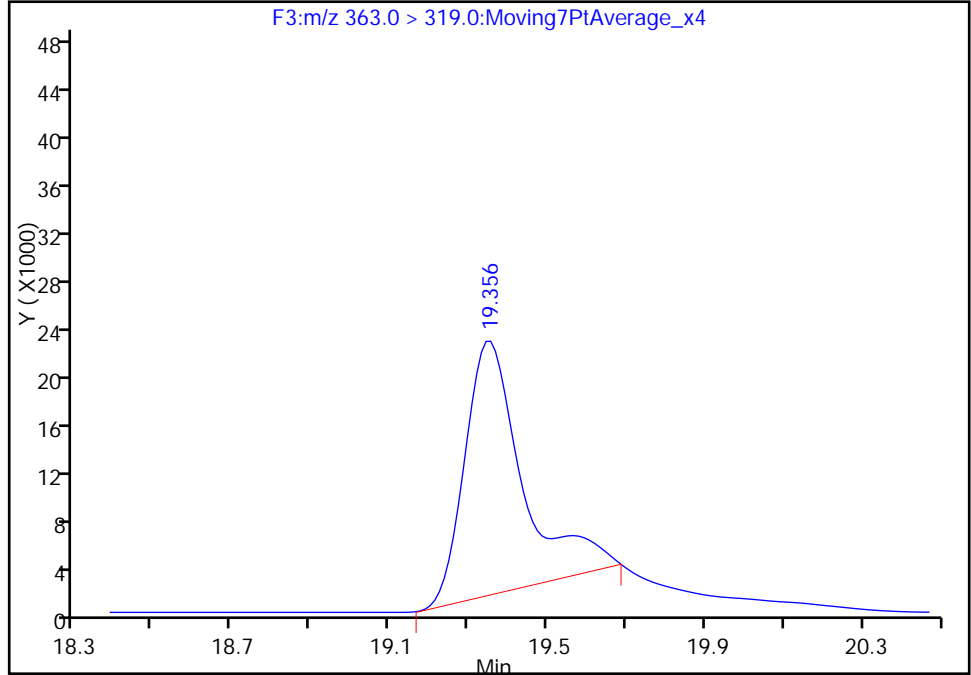
Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_011.d
Injection Date: 24-Dec-2016 07:53:20 Instrument ID: A6
Lims ID: CCV L2
Client ID:
Operator ID: CBW ALS Bottle#: 2 Worklist Smp#: 11
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F3:MRM

4 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

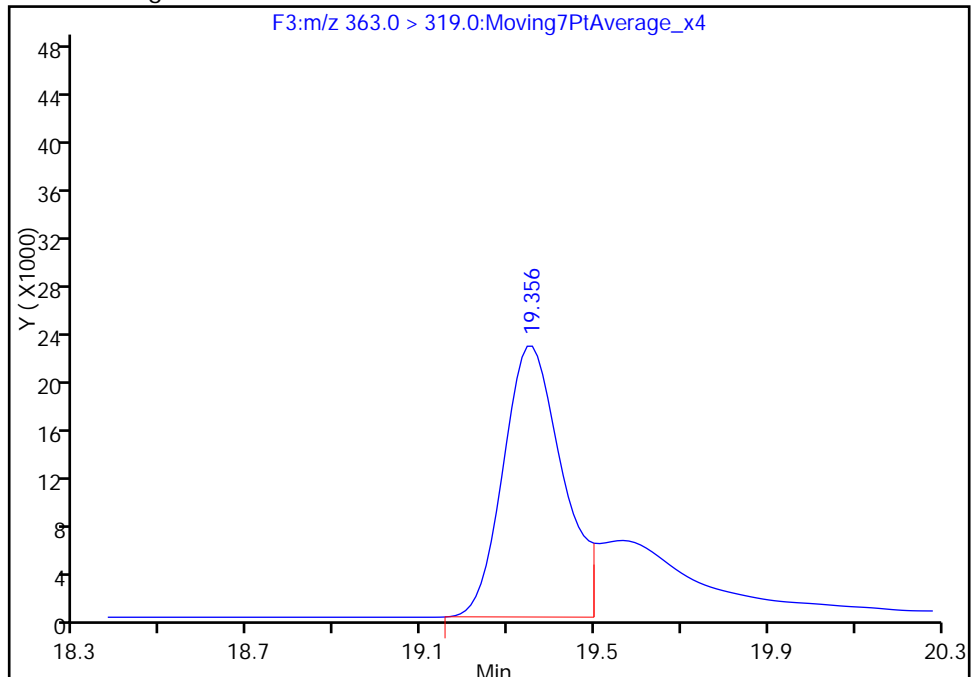
RT: 19.36
Area: 218316
Amount: 2.736624
Amount Units: ng/ml

Processing Integration Results



RT: 19.36
Area: 215552
Amount: 2.701977
Amount Units: ng/ml

Manual Integration Results



Reviewer: phomsophat, 24-Dec-2016 12:19:01
Audit Action: Manually Integrated

Audit Reason: Baseline

TestAmerica Sacramento

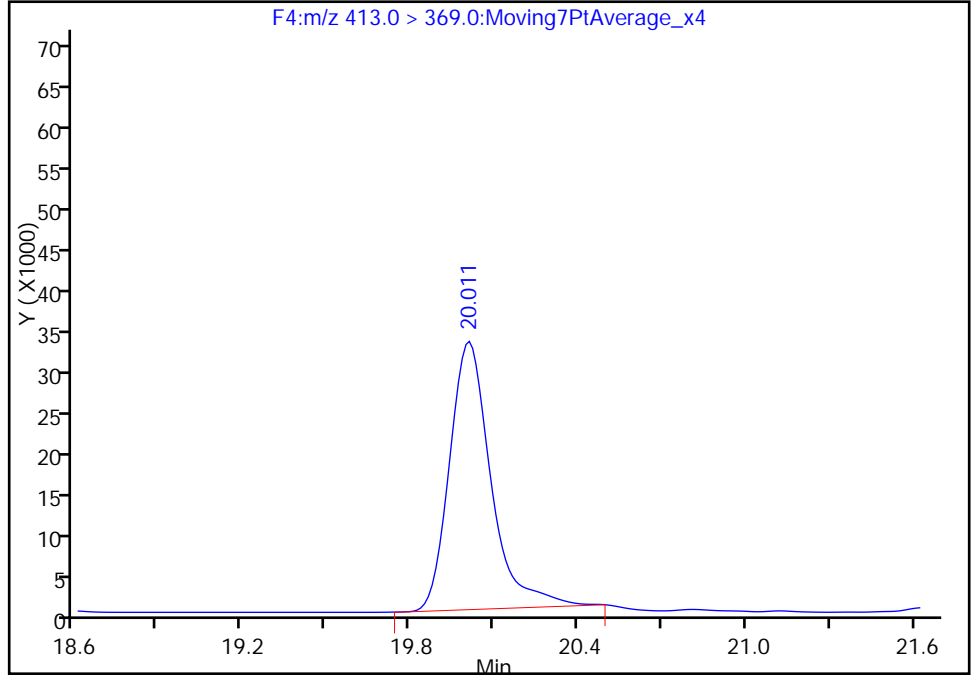
Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_011.d
Injection Date: 24-Dec-2016 07:53:20 Instrument ID: A6
Lims ID: CCV L2
Client ID:
Operator ID: CBW ALS Bottle#: 2 Worklist Smp#: 11
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F4:M/RM

6 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

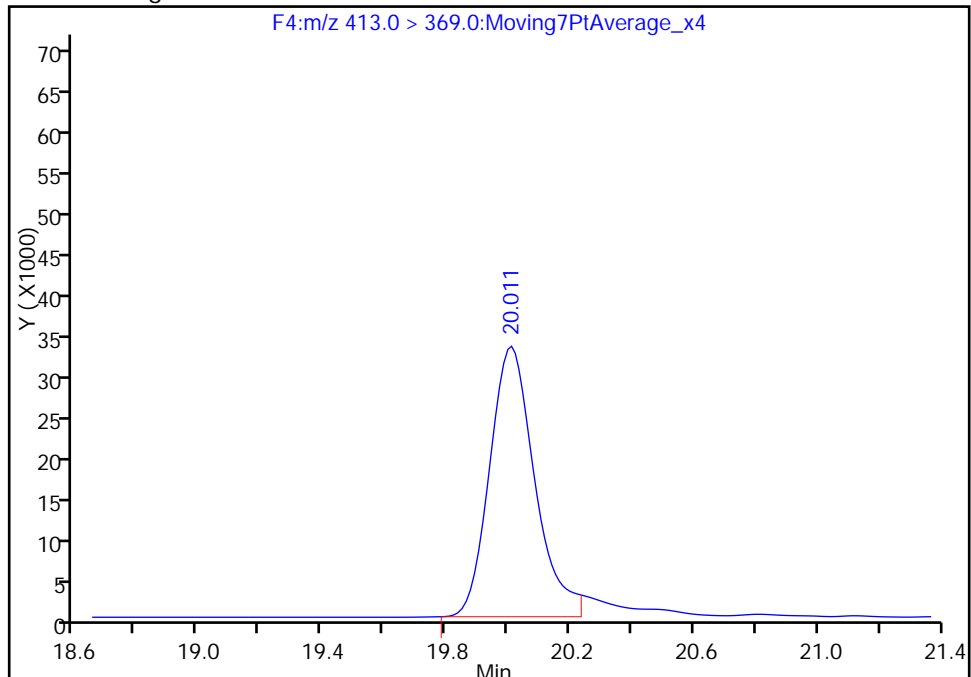
RT: 20.01
Area: 341171
Amount: 5.195334
Amount Units: ng/ml

Processing Integration Results



RT: 20.01
Area: 336982
Amount: 5.131545
Amount Units: ng/ml

Manual Integration Results



Reviewer: phomsophat, 24-Dec-2016 12:19:01
Audit Action: Manually Integrated

Audit Reason: Baseline

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24311-1
 SDG No.: _____
 Lab Sample ID: ICV 320-143828/13 Calibration Date: 12/24/2016 08:52
 Instrument ID: A6 Calib Start Date: 12/24/2016 04:26
 GC Column: Acquity ID: 2.10 (mm) Calib End Date: 12/24/2016 06:54
 Lab File ID: 24DEC2016A6A_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	0.7584	0.5696		86.2	115	-24.9	30.0
Perfluorohexanesulfonic acid	Ave	0.9405	0.6887		19.4	26.5	-26.8	30.0
Perfluoroheptanoic acid	Ave	1.222	1.215		12.5	12.6	-0.5	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.006	1.023		25.5	25.0	1.7	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.100	0.8190		20.3	27.2	-25.5	30.0
Perfluorononanoic acid	Ave	1.149	1.056		23.0	25.0	-8.1	30.0
13C2 PFHxA	Ave	1.193	1.179		9.88	10.0	-1.2	30.0
13C2 PFDA	Ave	1.008	0.9390		9.31	10.0	-6.9	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_013.d
 Lims ID: ICV
 Client ID:
 Sample Type: ICV
 Inject. Date: 24-Dec-2016 08:52:30 ALS Bottle#: 7 Worklist Smp#: 13
 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\20161224-38202.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 27-Dec-2016 10:56:38 Calib Date: 24-Dec-2016 06:54:10
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK031

First Level Reviewer: phomsophat Date: 24-Dec-2016 12:21:33

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid	299.0 > 80.0	17.589	17.586	0.003	1.000	3619397	86.2	870
\$ 2 13C2 PFHxA	315.0 > 270.0	18.567	18.559	0.008	1.000	695964	9.88	22590
3 Perfluorohexanesulfonic acid	399.0 > 80.0	19.320	19.318	0.002	1.000	1009629	19.4	23583
4 Perfluoroheptanoic acid	363.0 > 319.0	19.356	19.350	0.006	1.000	904351	12.5	87.5 M
* 5 13C2-PFOA	415.0 > 370.0	20.011	20.005	0.006		590506	10.0	14954
6 Perfluorooctanoic acid	413.0 > 369.0	20.011	20.005	0.006	1.000	1511917	25.5	1505
7 Perfluorooctane sulfonic acid	499.0 > 80.0	20.631	20.619	0.012	1.000	1235004	20.3	19443
* 8 13C4 PFOS	503.0 > 80.0	20.620	20.619	0.001		1587807	28.7	41047
9 Perfluorononanoic acid	463.0 > 419.0	20.703	20.697	0.006	1.000	1559739	23.0	32800
\$ 10 13C2 PFDA	515.0 > 470.0	21.418	21.416	0.002	1.000	554498	9.31	17342

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-ICV_00019

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_013.d

Injection Date: 24-Dec-2016 08:52:30

Instrument ID: A6

Lims ID: ICV

Client ID:

Operator ID: CBW

ALS Bottle#: 7

Worklist Smp#: 13

Injection Vol: 10.0 ul

Dil. Factor: 1.0000

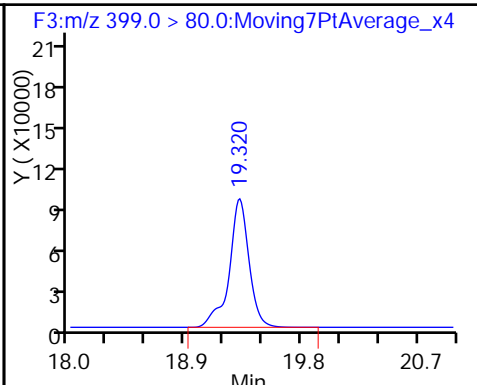
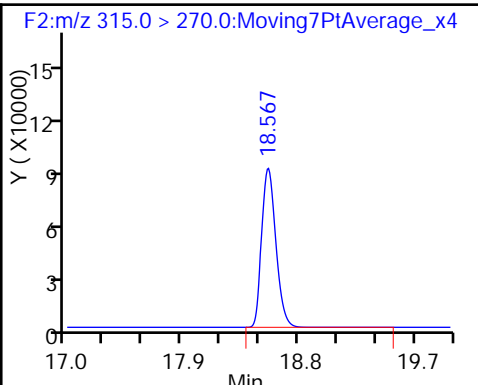
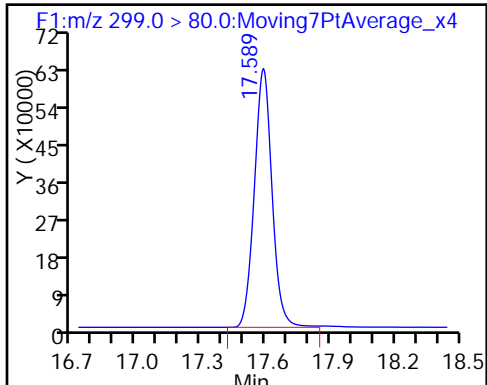
Method: 537_A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

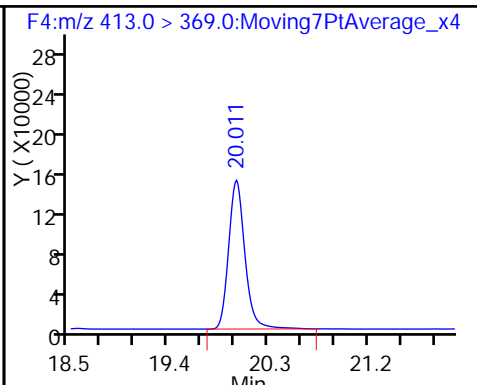
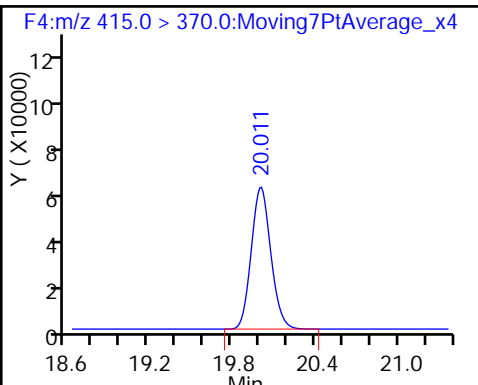
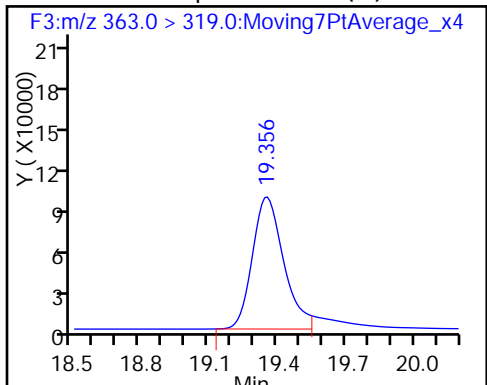
3 Perfluorohexanesulfonic acid



4 Perfluoroheptanoic acid (M)

* 5 13C2-PFOA

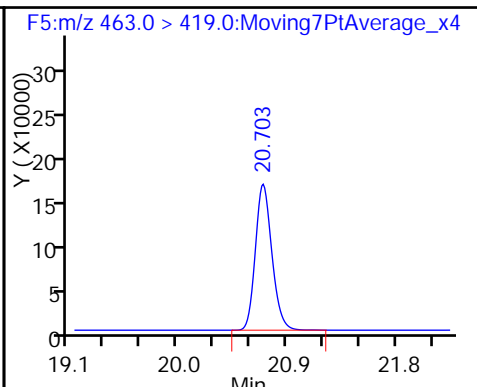
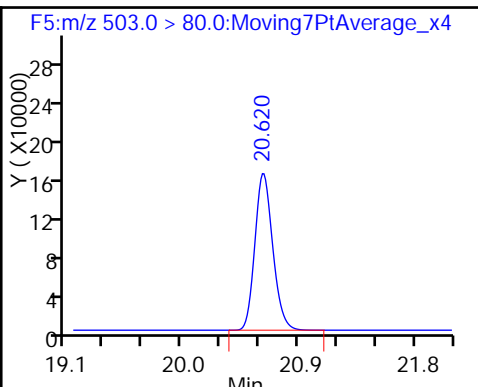
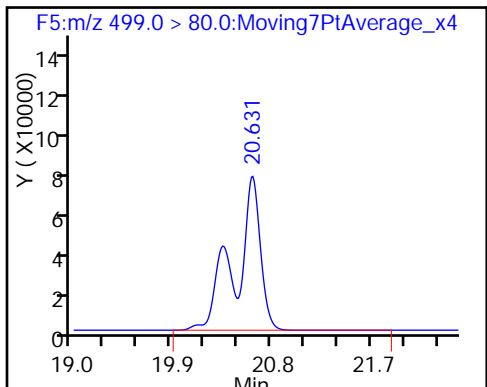
6 Perfluorooctanoic acid



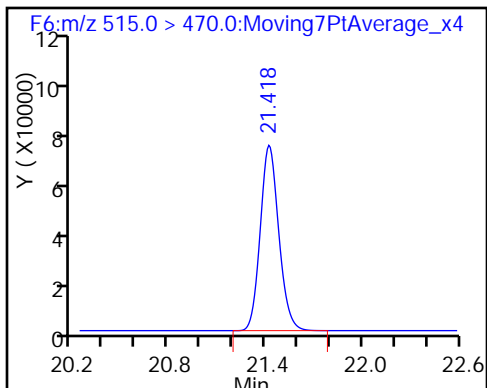
7 Perfluorooctane sulfonic acid

* 8 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

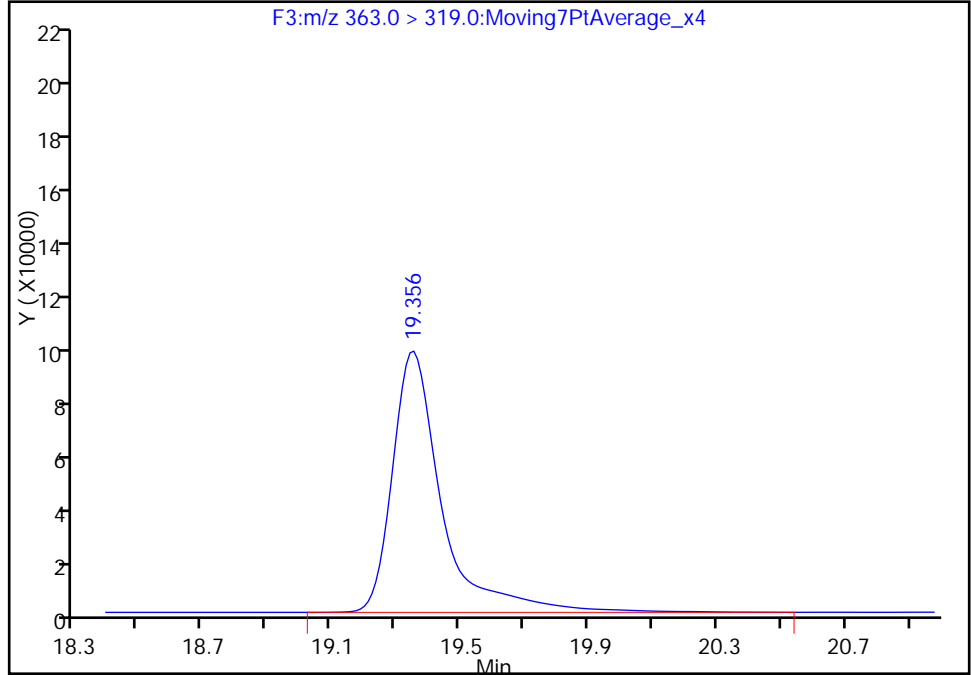
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Injection Date: 24-Dec-2016 08:52:30 Instrument ID: A6
Lims ID: ICV
Client ID:
Operator ID: CBW ALS Bottle#: 7 Worklist Smp#: 13
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F3:MRM

4 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

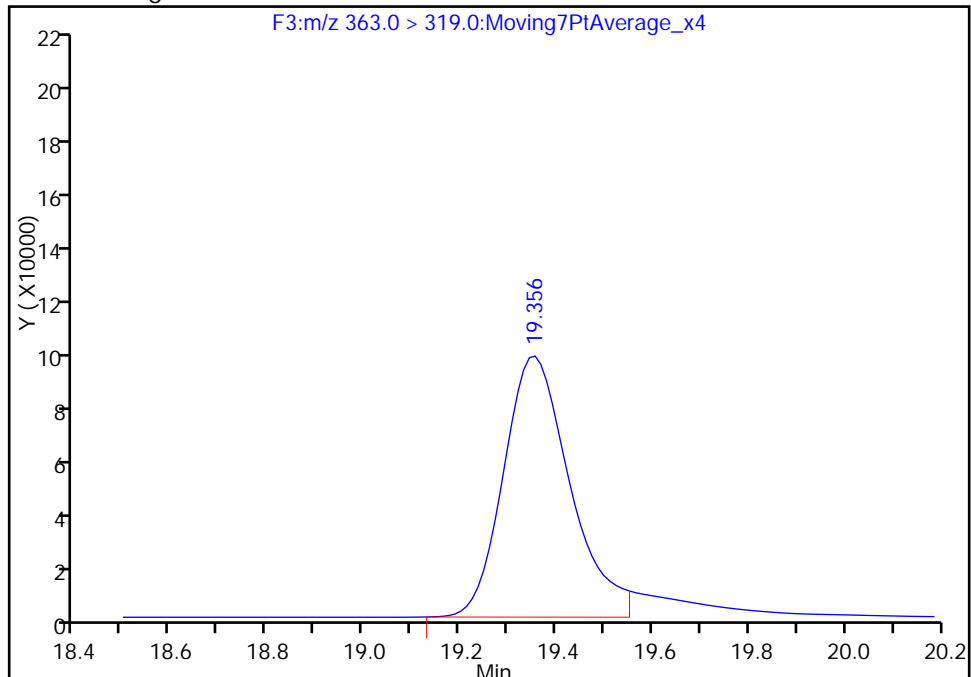
RT: 19.36
Area: 1014586
Amount: 14.061517
Amount Units: ng/ml

Processing Integration Results



RT: 19.36
Area: 904351
Amount: 12.533730
Amount Units: ng/ml

Manual Integration Results



Reviewer: phomsophat, 24-Dec-2016 12:21:33

Audit Action: Manually Integrated

Audit Reason: Baseline

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24311-1
 SDG No.: _____
 Lab Sample ID: CCV 320-144052/15 Calibration Date: 12/27/2016 23:56
 Instrument ID: A6 Calib Start Date: 12/24/2016 04:26
 GC Column: Acquity ID: 2.10 (mm) Calib End Date: 12/24/2016 06:54
 Lab File ID: 27DEC2016A6A_015.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.7584	0.7335		130	135	-3.3	30.0
Perfluorohexanesulfonic acid	Ave	0.9405	0.9514		45.9	45.4	1.2	30.0
Perfluoroheptanoic acid	Ave	1.222	1.243		15.1	14.9	1.8	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.006	1.102		32.1	29.3	9.5	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.100	1.139		62.2	60.1	3.6	30.0
Perfluorononanoic acid	Ave	1.149	1.204		32.6	31.1	4.8	30.0
13C2 PFHxA	Ave	1.193	1.306		10.9	10.0	9.5	30.0
13C2 PFDA	Ave	1.008	1.024		10.2	10.0	1.6	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\27DEC2016A6A_015.d
 Lims ID: CCV L5
 Client ID:
 Sample Type: CCVIS
 Inject. Date: 27-Dec-2016 23:56:22 ALS Bottle#: 5 Worklist Smp#: 15
 Injection Vol: 10.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L5
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
 Operator ID: CBW Instrument ID: A6
 Sublist: chrom-537__A6*sub3
 Method: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 28-Dec-2016 14:25:50 Calib Date: 24-Dec-2016 06:54:10
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK012

First Level Reviewer: barnettj Date: 28-Dec-2016 13:55:53

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	17.566	17.566	0.0	1.000	5472958	130.2	4334
\$ 2 13C2 PFHxA	315.0 > 270.0	18.548	18.548	0.0	1.000	811325	10.9	26813
3 Perfluorohexanesulfonic acid	399.0 > 80.0	19.308	19.308	0.0	1.000	2393217	45.9	16530
4 Perfluoroheptanoic acid	363.0 > 319.0	19.344	19.344	0.0	1.000	1146756	15.1	2907
* 5 13C2-PFOA	415.0 > 370.0	19.999	19.999	0.0		621113	10.0	15554
6 Perfluorooctanoic acid	413.0 > 369.0	20.011	20.011	0.0	1.000	2003162	32.1	936
7 Perfluorooctane sulfonic acid	499.0 > 80.0	20.619	20.619	0.0	1.000	3792904	62.2	17418
* 8 13C4 PFOS	503.0 > 80.0	20.619	20.619	0.0		1589494	28.7	40730
9 Perfluorononanoic acid	463.0 > 419.0	20.702	20.702	0.0	1.000	2326676	32.6	12148
\$ 10 13C2 PFDA	515.0 > 470.0	21.418	21.418	0.0	1.000	636240	10.2	19912

Reagents:

LC537-L5_00019 Amount Added: 1.00 Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\27DEC2016A6A_015.d

Injection Date: 27-Dec-2016 23:56:22

Instrument ID: A6

Lims ID: CCV L5

Client ID:

Operator ID: CBW

ALS Bottle#: 5

Worklist Smp#: 15

Injection Vol: 10.0 ul

Dil. Factor: 1.0000

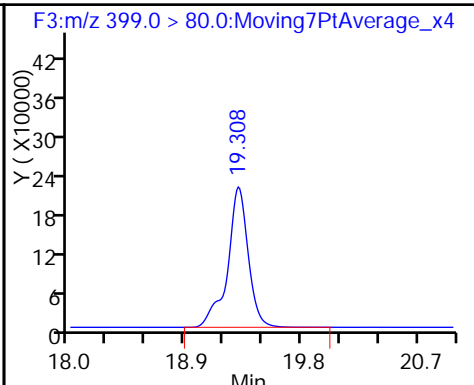
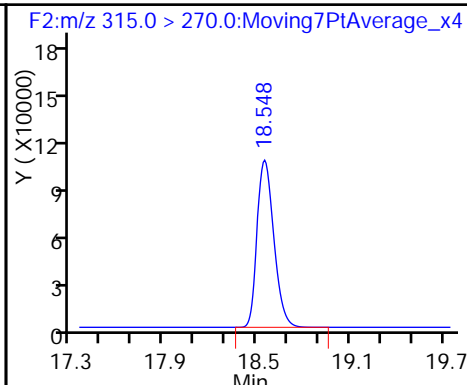
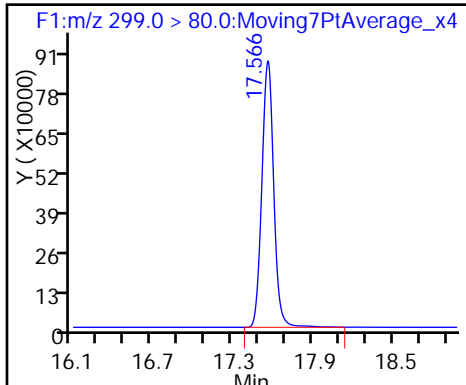
Method: 537_A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

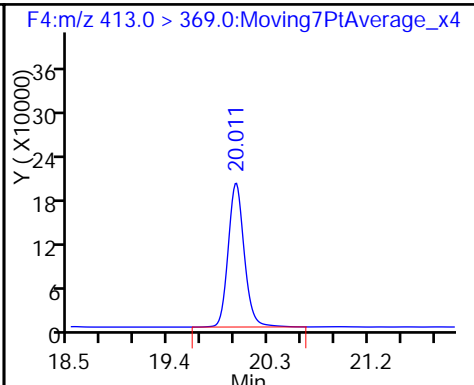
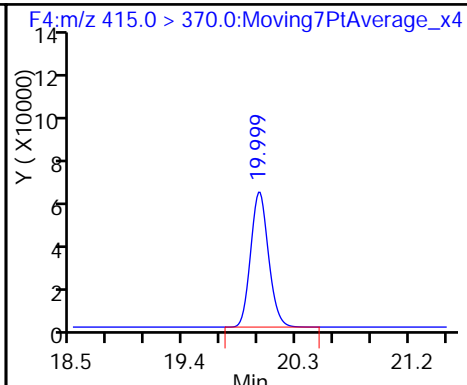
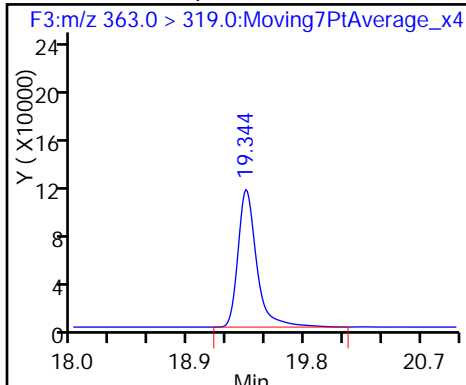
3 Perfluorohexanesulfonic acid



4 Perfluoroheptanoic acid

* 5 13C2-PFOA

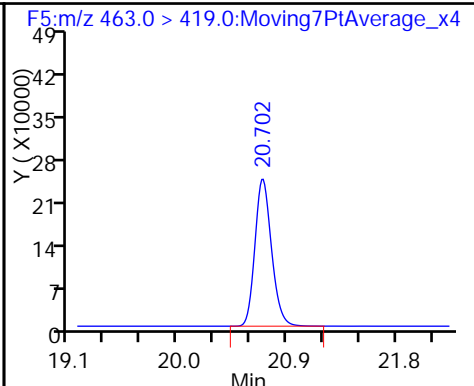
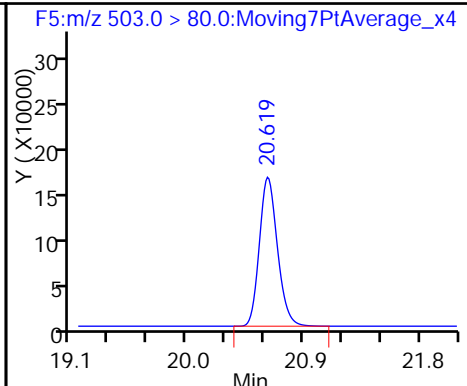
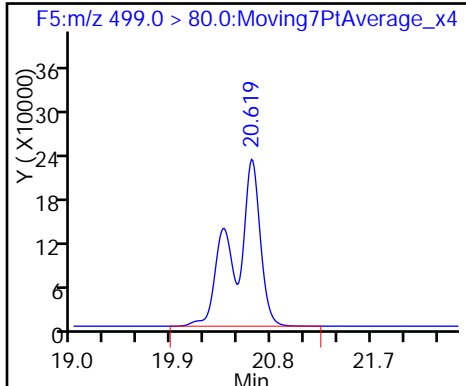
6 Perfluorooctanoic acid



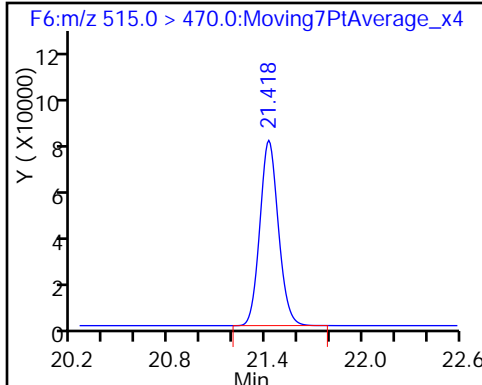
7 Perfluorooctane sulfonic acid

* 8 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-24311-1
 SDG No.: _____
 Lab Sample ID: CCV 320-144052/27 Calibration Date: 12/28/2016 05:51
 Instrument ID: A6 Calib Start Date: 12/24/2016 04:26
 GC Column: Acquity ID: 2.10 (mm) Calib End Date: 12/24/2016 06:54
 Lab File ID: 27DEC2016A6A_027.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	0.7584	0.7718		45.9	45.1	1.8	30.0
Perfluorohexanesulfonic acid	Ave	0.9405	0.9604		15.5	15.2	2.1	30.0
Perfluoroheptanoic acid	Ave	1.222	1.185		4.82	4.97	-3.1	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.006	1.063		10.4	9.81	5.7	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.100	1.111		20.3	20.1	1.1	30.0
Perfluorononanoic acid	Ave	1.149	1.187		10.8	10.4	3.4	30.0
13C2 PFHxA	Ave	1.193	1.156		9.69	10.0	-3.1	30.0
13C2 PFDA	Ave	1.008	0.9797		9.72	10.0	-2.8	30.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\27DEC2016A6A_027.d
 Lims ID: CCV L3
 Client ID:
 Sample Type: CCVIS
 Inject. Date: 28-Dec-2016 05:51:32 ALS Bottle#: 3 Worklist Smp#: 27
 Injection Vol: 10.0 ul Dil. Factor: 1.0000
 Sample Info: CCV L3
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
 Operator ID: CBW Instrument ID: A6
 Sublist: chrom-537__A6*sub3
 Method: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 28-Dec-2016 14:23:31 Calib Date: 24-Dec-2016 06:54:10
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK012

First Level Reviewer: barnettj Date: 28-Dec-2016 13:57:23

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid	299.0 > 80.0	17.570	17.570	0.0	1.000	2009628	45.9	498
\$ 2 13C2 PFHxA	315.0 > 270.0	18.539	18.539	0.0	1.000	752384	9.69	24677
3 Perfluorohexanesulfonic acid	399.0 > 80.0	19.297	19.297	0.0	1.000	842967	15.5	19518
4 Perfluoroheptanoic acid	363.0 > 319.0	19.332	19.332	0.0	1.000	383421	4.82	65.1 M
* 5 13C2-PFOA	415.0 > 370.0	19.986	19.986	0.0		650671	10.0	16250
6 Perfluorooctanoic acid	413.0 > 369.0	19.986	19.986	0.0	1.000	678217	10.4	611
7 Perfluorooctane sulfonic acid	499.0 > 80.0	20.608	20.608	0.0	1.000	1291613	20.3	21415
* 8 13C4 PFOS	503.0 > 80.0	20.608	20.608	0.0		1655589	28.7	24582
9 Perfluorononanoic acid	463.0 > 419.0	20.679	20.679	0.0	1.000	805173	10.8	3153
\$ 10 13C2 PFDA	515.0 > 470.0	21.400	21.400	0.0	1.000	637460	9.72	19916

QC Flag Legend

Review Flags

M - Manually Integrated

Reagents:

LC537-L3_00018

Amount Added: 1.00

Units: mL

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\27DEC2016A6A_027.d

Injection Date: 28-Dec-2016 05:51:32

Instrument ID: A6

Lims ID: CCV L3

Client ID:

Operator ID: CBW

ALS Bottle#: 3

Worklist Smp#: 27

Injection Vol: 10.0 ul

Dil. Factor: 1.0000

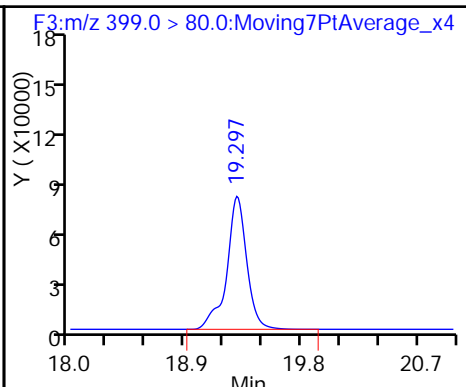
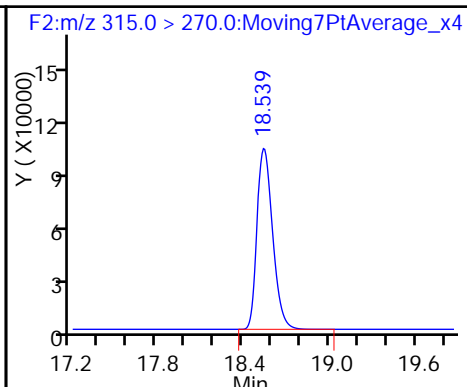
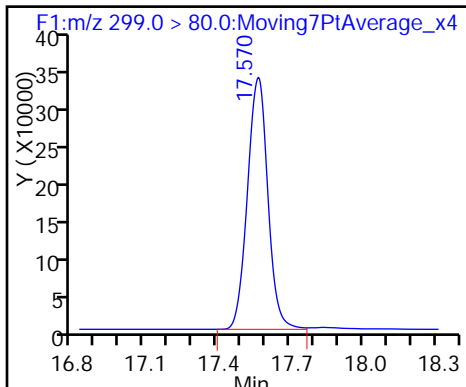
Method: 537_A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

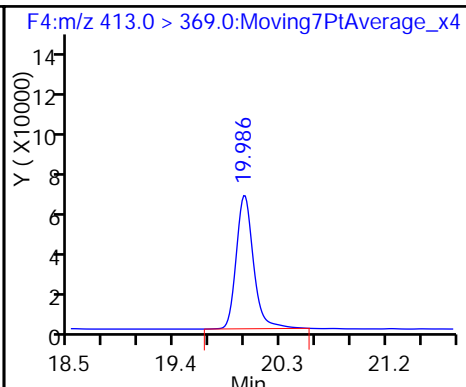
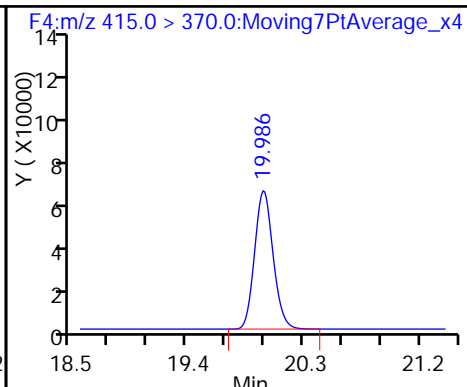
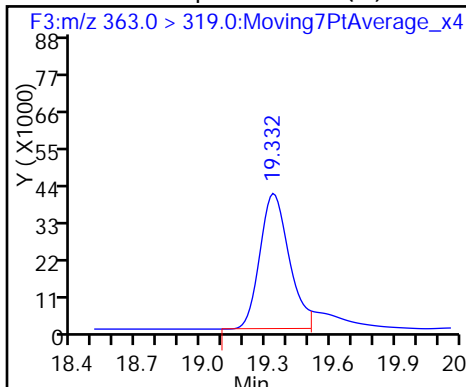
3 Perfluorohexanesulfonic acid



4 Perfluoroheptanoic acid (M)

* 5 13C2-PFOA

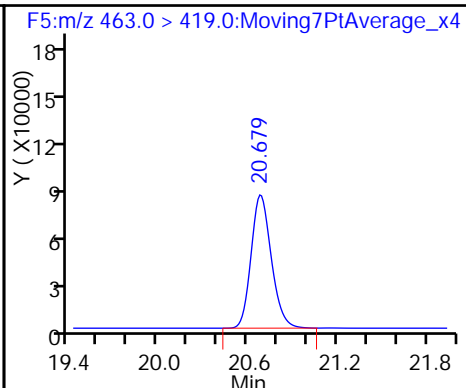
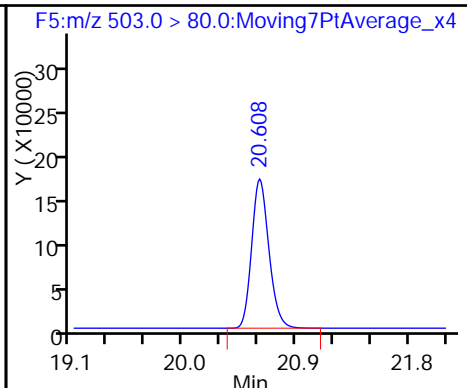
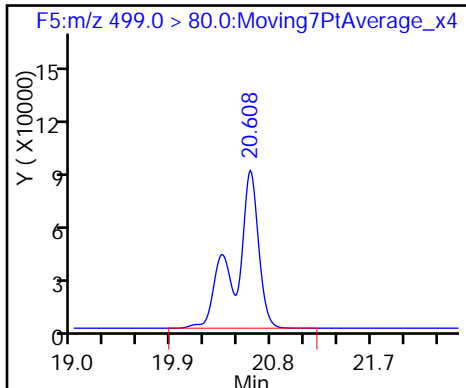
6 Perfluorooctanoic acid



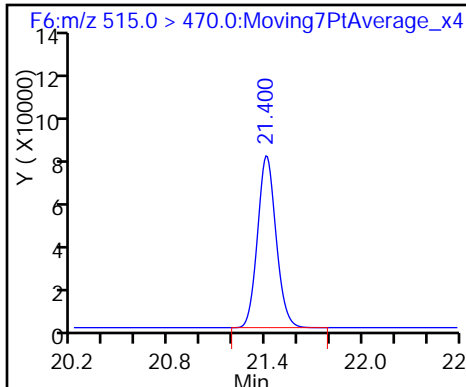
7 Perfluorooctane sulfonic acid

* 8 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento

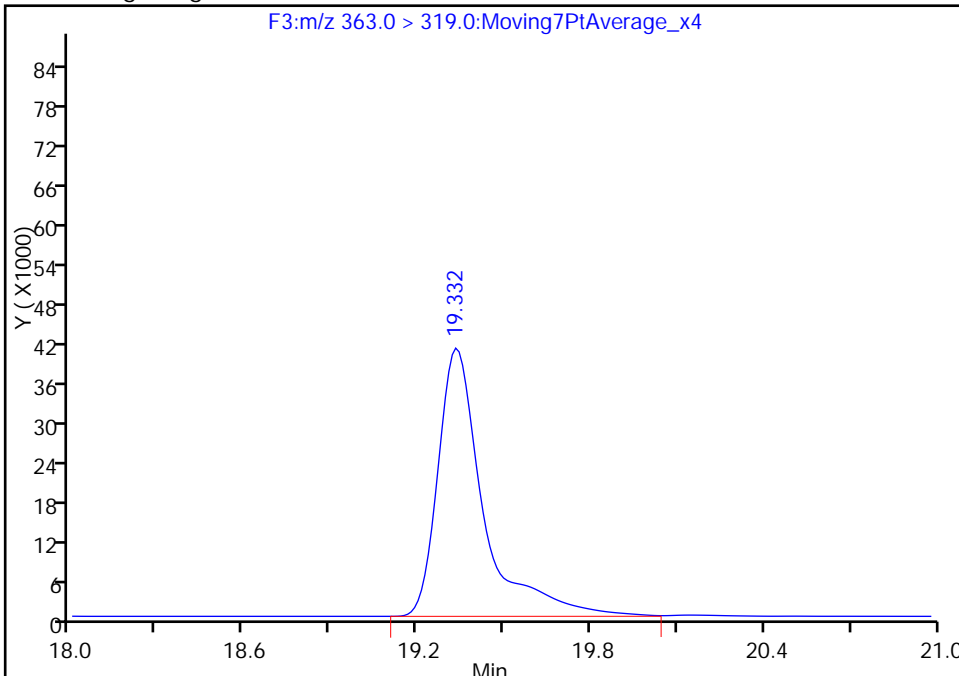
Data File: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\27DEC2016A6A_027.d
Injection Date: 28-Dec-2016 05:51:32 Instrument ID: A6
Lims ID: CCV L3
Client ID:
Operator ID: CBW ALS Bottle#: 3 Worklist Smp#: 27
Injection Vol: 10.0 ul Dil. Factor: 1.0000
Method: 537__A6 Limit Group: LC 537 ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F3:MRM

4 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

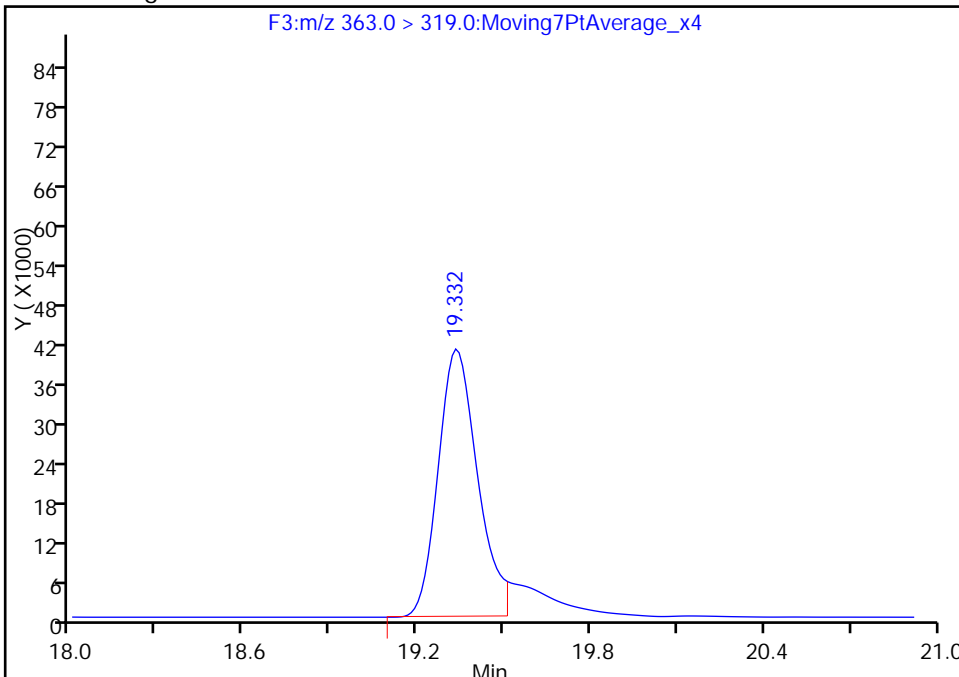
RT: 19.33
Area: 448003
Amount: 5.634912
Amount Units: ng/ml

Processing Integration Results



RT: 19.33
Area: 383421
Amount: 4.822609
Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 28-Dec-2016 13:57:23
Audit Action: Manually Integrated

Audit Reason: Split Peak

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-24311-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: MB 320-142201/1-A
 Matrix: Water Lab File ID: 27DEC2016A6A_017.d
 Analysis Method: 537 Date Collected: _____
 Extraction Method: 537 Date Extracted: 12/14/2016 15:24
 Sample wt/vol: 250(mL) Date Analyzed: 12/28/2016 00:55
 Con. Extract Vol.: 1(mL) Dilution Factor: 1
 Injection Volume: 10(uL) GC Column: Acquity ID: 2.1(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 144052 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	104		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\27DEC2016A6A_017.d
 Lims ID: MB 320-142201/1-A
 Client ID:
 Sample Type: MB
 Inject. Date: 28-Dec-2016 00:55:33 ALS Bottle#: 22 Worklist Smp#: 17
 Injection Vol: 10.0 ul Dil. Factor: 1.0000
 Sample Info: mb 320-142201/1-a BOX 27
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35°C
 Operator ID: CBW Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 28-Dec-2016 14:23:17 Calib Date: 24-Dec-2016 06:54:10
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK012

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
\$ 2 13C2 PFHxA	315.0 > 270.0	18.539	18.548	-0.009	1.000	827774	11.0	27380
* 5 13C2-PFOA	415.0 > 370.0	19.999	19.999	0.0		630164	10.0	64143
* 8 13C4 PFOS	503.0 > 80.0	20.608	20.619	-0.011		1833172	28.7	47726
\$ 10 13C2 PFDA	515.0 > 470.0	21.409	21.418	-0.009	1.000	663500	10.4	20502

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\27DEC2016A6A_017.d

Injection Date: 28-Dec-2016 00:55:33

Instrument ID: A6

Lims ID: MB 320-142201/1-A

Client ID:

Operator ID: CBW

ALS Bottle#: 22

Worklist Smp#: 17

Injection Vol: 10.0 ul

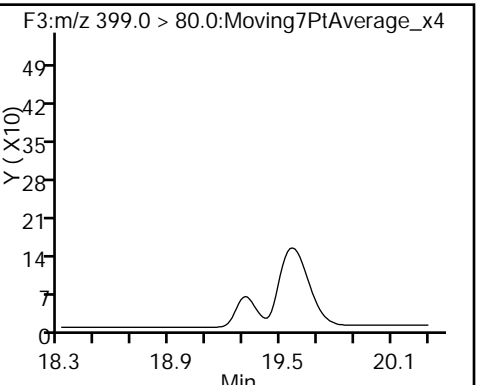
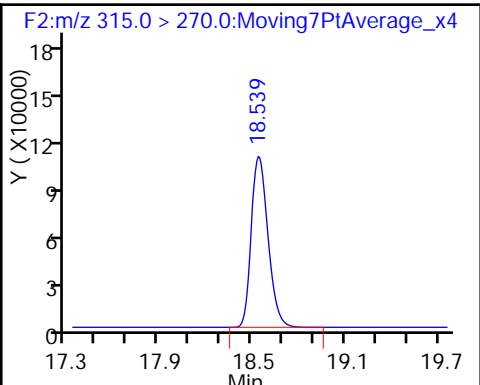
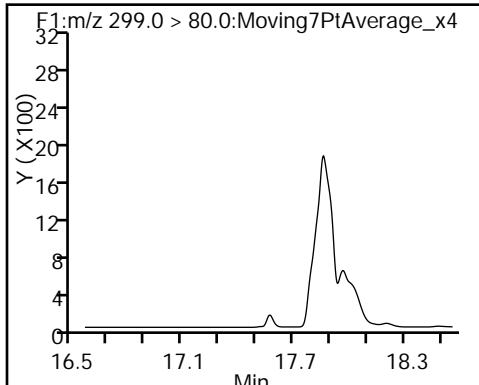
Dil. Factor: 1.0000

Method: 537__A6

Limit Group: LC 537 ICAL

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

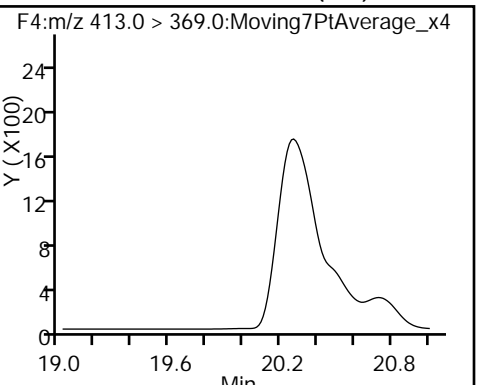
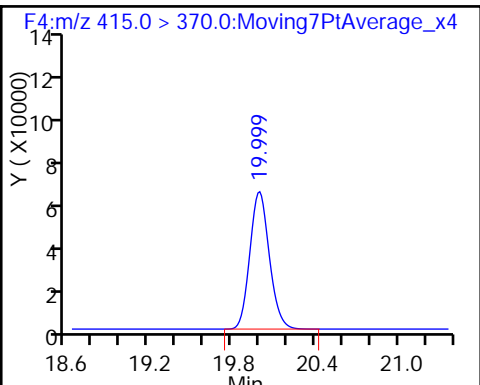
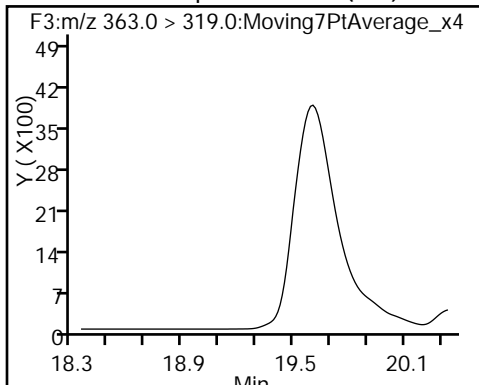
3 Perfluorohexanesulfonic acid (ND)



4 Perfluoroheptanoic acid (ND)

* 5 13C2-PFOA

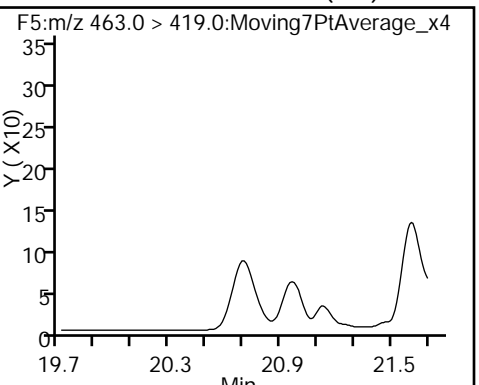
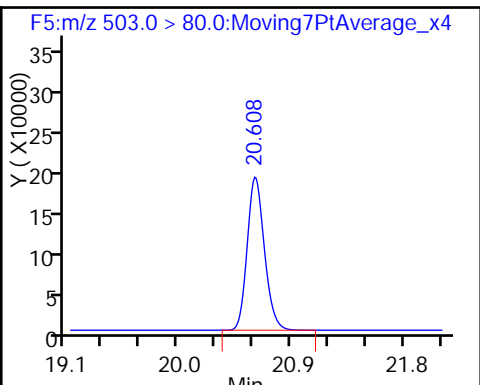
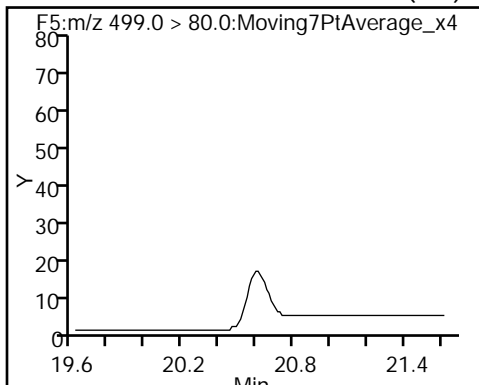
6 Perfluorooctanoic acid (ND)



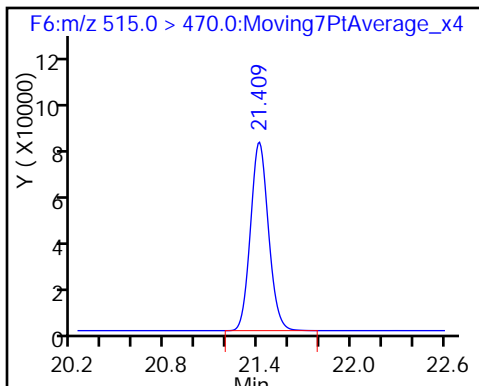
7 Perfluorooctane sulfonic acid (ND)

* 8 13C4 PFOS

9 Perfluorononanoic acid (ND)



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\27DEC2016A6A_017.d
 Lims ID: MB 320-142201/1-A
 Client ID:
 Sample Type: MB
 Inject. Date: 28-Dec-2016 00:55:33 ALS Bottle#: 22 Worklist Smp#: 17
 Injection Vol: 10.0 ul Dil. Factor: 1.0000
 Sample Info: mb 320-142201/1-a BOX 27
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35°C
 Operator ID: CBW Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 28-Dec-2016 14:23:17 Calib Date: 24-Dec-2016 06:54:10
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK012

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	11.0	110.10
\$ 10 13C2 PFDA	10.0	10.4	104.43

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-24311-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: LCS 320-142201/2-A
 Matrix: Water Lab File ID: 27DEC2016A6A_018.d
 Analysis Method: 537 Date Collected: _____
 Extraction Method: 537 Date Extracted: 12/14/2016 15:24
 Sample wt/vol: 250 (mL) Date Analyzed: 12/28/2016 01:25
 Con. Extract Vol.: 1 (mL) Dilution Factor: 1
 Injection Volume: 10 (uL) GC Column: Acquity ID: 2.1 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 144052 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.273		0.060	0.048	0.016
335-67-1	Perfluorooctanoic acid (PFOA)	0.158	E	0.030	0.024	0.0094
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.550		0.14	0.11	0.048

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	121		70-130
STL00996	13C2 PFDA	119		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\27DEC2016A6A_018.d
 Lims ID: LCS 320-142201/2-A
 Client ID:
 Sample Type: LCS
 Inject. Date: 28-Dec-2016 01:25:08 ALS Bottle#: 23 Worklist Smp#: 18
 Injection Vol: 10.0 ul Dil. Factor: 1.0000
 Sample Info: lcs 320-142201/2-a
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
 Operator ID: CBW Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 28-Dec-2016 14:23:17 Calib Date: 24-Dec-2016 06:54:10
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK012

First Level Reviewer: barnettj Date: 28-Dec-2016 14:02:20

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid	299.0 > 80.0	17.563	17.566	-0.003	1.000	5446830	137.4	1308
\$ 2 13C2 PFHxA	315.0 > 270.0	18.549	18.548	0.001	1.000	788677	12.1	25599
3 Perfluorohexanesulfonic acid	399.0 > 80.0	19.309	19.308	0.001	1.000	2440167	49.6	54406
4 Perfluoroheptanoic acid	363.0 > 319.0	19.344	19.344	0.0	1.000	1884167	28.1	17471 E
* 5 13C2-PFOA	415.0 > 370.0	19.999	19.999	0.0		547841	10.0	13880
6 Perfluorooctanoic acid	413.0 > 369.0	19.999	20.011	-0.012	1.000	2179792	39.6	1860 E
7 Perfluorooctane sulfonic acid	499.0 > 80.0	20.608	20.619	-0.011	1.000	3916494	68.1	34370
* 8 13C4 PFOS	503.0 > 80.0	20.608	20.619	-0.011		1499197	28.7	30922
9 Perfluorononanoic acid	463.0 > 419.0	20.691	20.702	-0.011	1.000	2527004	40.2	15543
\$ 10 13C2 PFDA	515.0 > 470.0	21.400	21.418	-0.018	1.000	655318	11.9	20845

QC Flag Legend

Processing Flags

E - Exceeded Maximum Amount

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\27DEC2016A6A_018.d

Injection Date: 28-Dec-2016 01:25:08

Instrument ID: A6

Lims ID: LCS 320-142201/2-A

Client ID:

Operator ID: CBW

ALS Bottle#: 23

Worklist Smp#: 18

Injection Vol: 10.0 ul

Dil. Factor: 1.0000

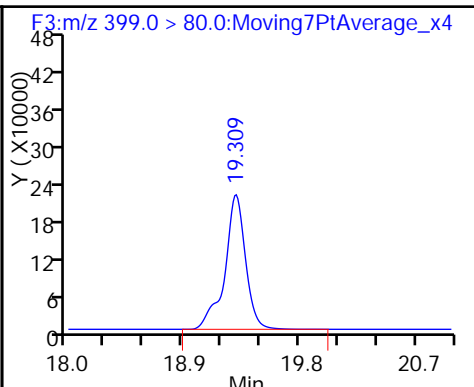
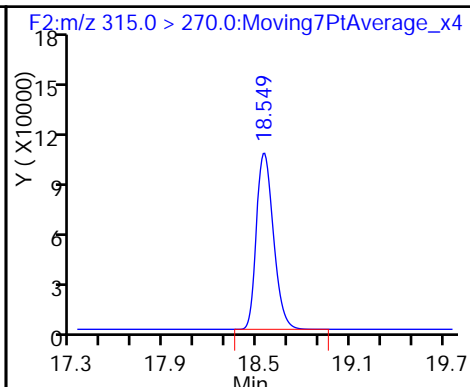
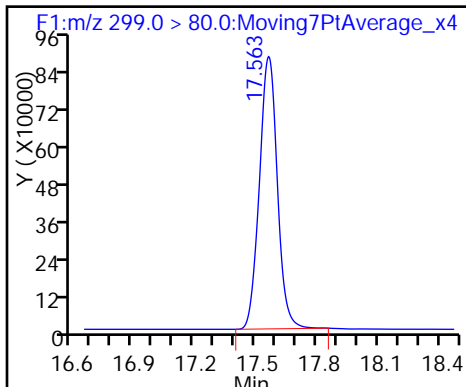
Method: 537_A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

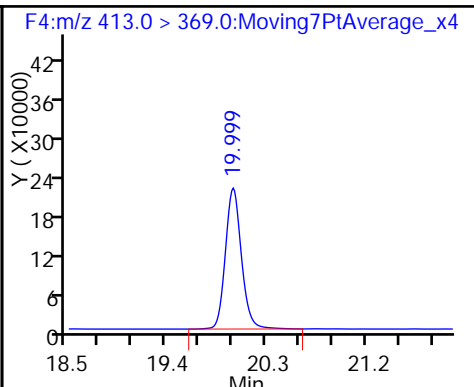
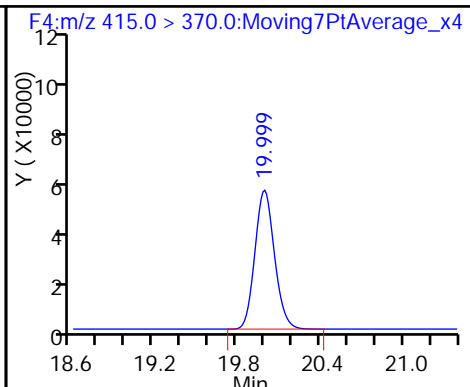
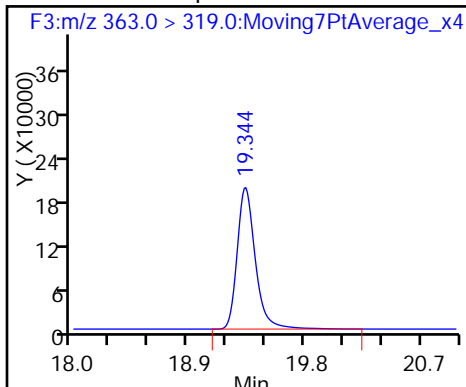
3 Perfluorohexanesulfonic acid



4 Perfluoroheptanoic acid

* 5 13C2-PFOA

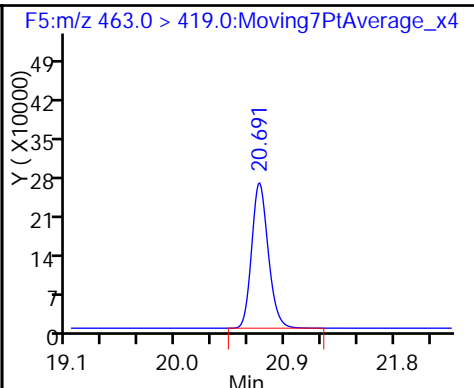
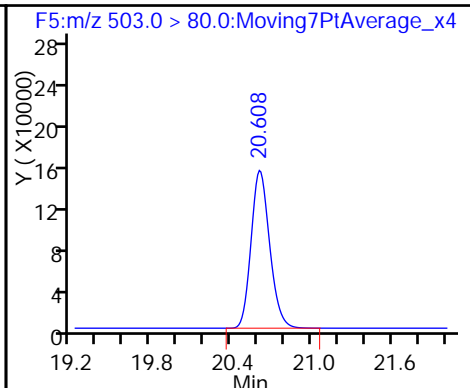
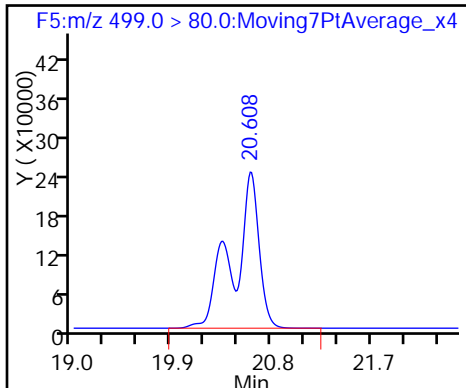
6 Perfluorooctanoic acid



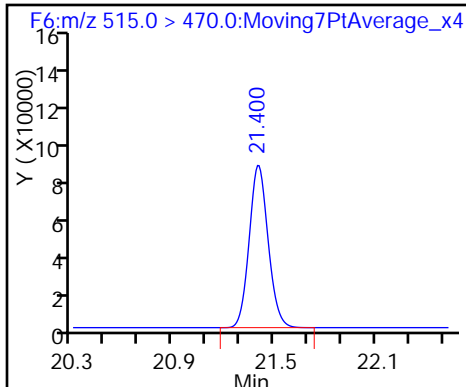
7 Perfluorooctane sulfonic acid

* 8 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\27DEC2016A6A_018.d
 Lims ID: LCS 320-142201/2-A
 Client ID:
 Sample Type: LCS
 Inject. Date: 28-Dec-2016 01:25:08 ALS Bottle#: 23 Worklist Smp#: 18
 Injection Vol: 10.0 ul Dil. Factor: 1.0000
 Sample Info: lcs 320-142201/2-a
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
 Operator ID: CBW Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 28-Dec-2016 14:23:17 Calib Date: 24-Dec-2016 06:54:10
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK012

First Level Reviewer: barnettj Date: 28-Dec-2016 14:02:20

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	12.1	120.66
\$ 10 13C2 PFDA	10.0	11.9	118.64

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-24311-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: LCSD 320-142201/3-A
 Matrix: Water Lab File ID: 27DEC2016A6A_019.d
 Analysis Method: 537 Date Collected: _____
 Extraction Method: 537 Date Extracted: 12/14/2016 15:24
 Sample wt/vol: 250 (mL) Date Analyzed: 12/28/2016 01:54
 Con. Extract Vol.: 1 (mL) Dilution Factor: 1
 Injection Volume: 10 (uL) GC Column: Acquity ID: 2.1 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 144052 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.277		0.060	0.048	0.016
335-67-1	Perfluorooctanoic acid (PFOA)	0.151		0.030	0.024	0.0094
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.555		0.14	0.11	0.048

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	118		70-130
STL00996	13C2 PFDA	114		70-130

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\27DEC2016A6A_019.d
 Lims ID: LCSD 320-142201/3-A
 Client ID:
 Sample Type: LCSD
 Inject. Date: 28-Dec-2016 01:54:45 ALS Bottle#: 24 Worklist Smp#: 19
 Injection Vol: 10.0 ul Dil. Factor: 1.0000
 Sample Info: lcsd 320-142201/3-a
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35*C
 Operator ID: CBW Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 28-Dec-2016 14:23:17 Calib Date: 24-Dec-2016 06:54:10
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK012

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	S/N	Flags
1 Perfluorobutanesulfonic acid	299.0 > 80.0	17.566	17.566	0.0	1.000	5585172	138.7	1059
\$ 2 13C2 PFHxA	315.0 > 270.0	18.548	18.548	0.0	1.000	825860	11.8	27045
3 Perfluorohexanesulfonic acid	399.0 > 80.0	19.308	19.308	0.0	1.000	2583565	51.8	57772
4 Perfluoroheptanoic acid	363.0 > 319.0	19.344	19.344	0.0	1.000	1895158	26.5	5195 E
* 5 13C2-PFOA	415.0 > 370.0	19.999	19.999	0.0		586019	10.0	14842
6 Perfluorooctanoic acid	413.0 > 369.0	19.999	20.011	-0.012	1.000	2225968	37.8	1722
7 Perfluorooctane sulfonic acid	499.0 > 80.0	20.619	20.619	0.0	1.000	4038537	69.2	49821
* 8 13C4 PFOS	503.0 > 80.0	20.608	20.619	-0.011		1522334	28.7	30970
9 Perfluorononanoic acid	463.0 > 419.0	20.690	20.702	-0.012	1.000	2636535	39.2	27742
\$ 10 13C2 PFDA	515.0 > 470.0	21.409	21.418	-0.009	1.000	672874	11.4	21264

QC Flag Legend

Processing Flags

E - Exceeded Maximum Amount

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\27DEC2016A6A_019.d

Injection Date: 28-Dec-2016 01:54:45

Instrument ID: A6

Lims ID: LCSD 320-142201/3-A

Client ID:

Operator ID: CBW

ALS Bottle#: 24

Worklist Smp#: 19

Injection Vol: 10.0 ul

Dil. Factor: 1.0000

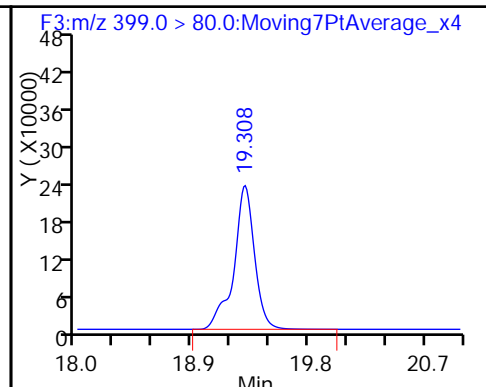
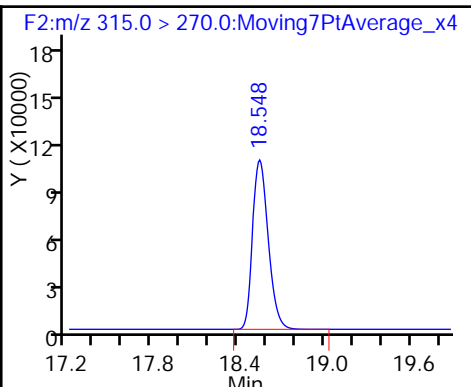
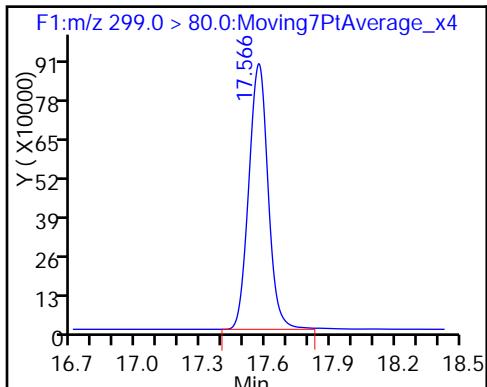
Method: 537__A6

Limit Group: LC 537 ICAL

1 Perfluorobutanesulfonic acid

\$ 2 13C2 PFHxA

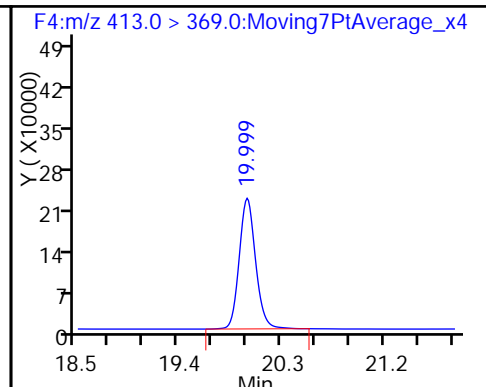
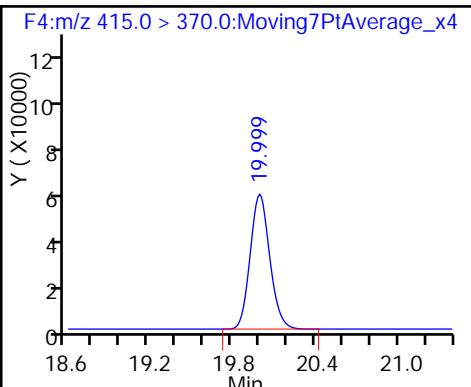
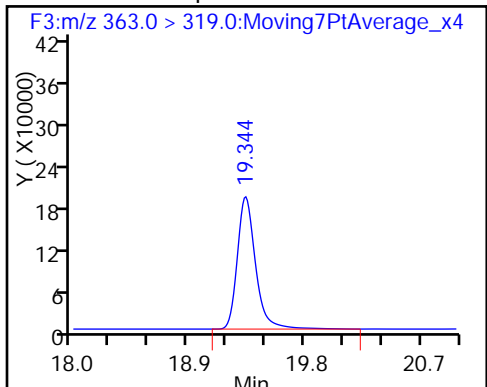
3 Perfluorohexanesulfonic acid



4 Perfluoroheptanoic acid

* 5 13C2-PFOA

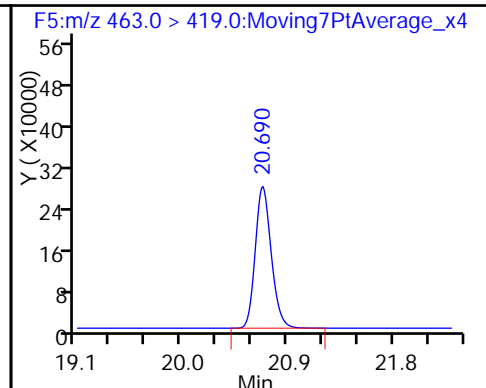
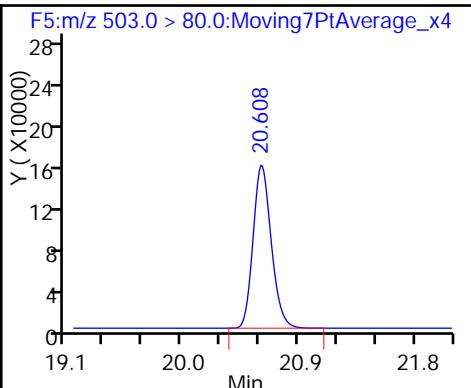
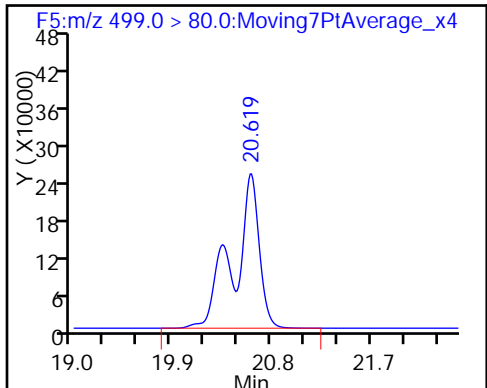
6 Perfluorooctanoic acid



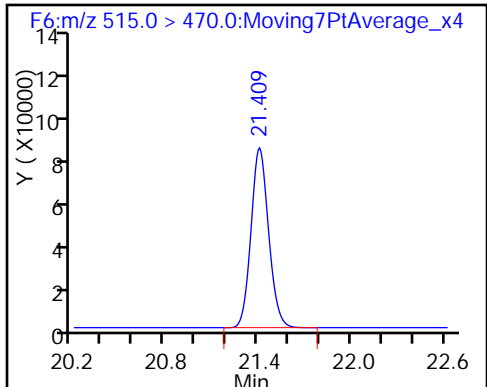
7 Perfluorooctane sulfonic acid

* 8 13C4 PFOS

9 Perfluorononanoic acid



\$ 10 13C2 PFDA



TestAmerica Sacramento
Recovery Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\27DEC2016A6A_019.d
 Lims ID: LCSD 320-142201/3-A
 Client ID:
 Sample Type: LCSD
 Inject. Date: 28-Dec-2016 01:54:45 ALS Bottle#: 24 Worklist Smp#: 19
 Injection Vol: 10.0 ul Dil. Factor: 1.0000
 Sample Info: lcsd 320-142201/3-a
 Misc. Info.: Acquity BEH 1.7um, 3X150mm T=35°C
 Operator ID: CBW Instrument ID: A6
 Method: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b\537__A6.m
 Limit Group: LC 537 ICAL
 Last Update: 28-Dec-2016 14:23:17 Calib Date: 24-Dec-2016 06:54:10
 Integrator: Picker
 Quant Method: Internal Standard Quant By: Initial Calibration
 Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20161224-38202.b\24DEC2016A6A_009.d
 Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
 Process Host: XAWRK012

Compound	Amount Added	Amount Recovered	% Rec.
\$ 2 13C2 PFHxA	10.0	11.8	118.12
\$ 10 13C2 PFDA	10.0	11.4	113.88

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-24311-1

SDG No.: _____

Instrument ID: A6 Start Date: 12/24/2016 03:26

Analysis Batch Number: 143828 End Date: 12/24/2016 15:56

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
ZZZZZ		12/24/2016 03:26	1		Acquity 2.1 (mm)
ZZZZZ		12/24/2016 03:56	1		Acquity 2.1 (mm)
STD 320-143828/4 IC		12/24/2016 04:26	1	24DEC2016A6A_00 4.d	Acquity 2.1 (mm)
STD 320-143828/5 IC		12/24/2016 04:55	1	24DEC2016A6A_00 5.d	Acquity 2.1 (mm)
STD 320-143828/6 IC		12/24/2016 05:25	1	24DEC2016A6A_00 6.d	Acquity 2.1 (mm)
STD 320-143828/7 ICISAV		12/24/2016 05:54	1	24DEC2016A6A_00 7.d	Acquity 2.1 (mm)
STD 320-143828/8 IC		12/24/2016 06:24	1	24DEC2016A6A_00 8.d	Acquity 2.1 (mm)
STD 320-143828/9 IC		12/24/2016 06:54	1	24DEC2016A6A_00 9.d	Acquity 2.1 (mm)
ZZZZZ		12/24/2016 07:23	1		Acquity 2.1 (mm)
CCV 320-143828/11 CCVL		12/24/2016 07:53	1	24DEC2016A6A_01 1.d	Acquity 2.1 (mm)
ZZZZZ		12/24/2016 08:22	1		Acquity 2.1 (mm)
ICV 320-143828/13		12/24/2016 08:52	1	24DEC2016A6A_01 3.d	Acquity 2.1 (mm)
ZZZZZ		12/24/2016 09:22	1		Acquity 2.1 (mm)
ZZZZZ		12/24/2016 11:00	1		Acquity 2.1 (mm)
ZZZZZ		12/24/2016 11:29	1		Acquity 2.1 (mm)
ZZZZZ		12/24/2016 11:59	1		Acquity 2.1 (mm)
ZZZZZ		12/24/2016 12:29	1		Acquity 2.1 (mm)
ZZZZZ		12/24/2016 12:58	1		Acquity 2.1 (mm)
ZZZZZ		12/24/2016 13:28	1		Acquity 2.1 (mm)
ZZZZZ		12/24/2016 13:57	1		Acquity 2.1 (mm)
ZZZZZ		12/24/2016 14:27	1		Acquity 2.1 (mm)
ZZZZZ		12/24/2016 14:57	1		Acquity 2.1 (mm)
ZZZZZ		12/24/2016 15:26	1		Acquity 2.1 (mm)
CCV 320-143828/26 CCVIS		12/24/2016 15:56	1		Acquity 2.1 (mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-24311-1

SDG No.: _____

Instrument ID: A6 Start Date: 12/27/2016 23:56

Analysis Batch Number: 144052 End Date: 12/28/2016 05:51

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-144052/15 CCVIS		12/27/2016 23:56	1	27DEC2016A6A_01 5.d	Acquity 2.1 (mm)
ZZZZZ		12/28/2016 00:25	1		Acquity 2.1 (mm)
MB 320-142201/1-A		12/28/2016 00:55	1	27DEC2016A6A_01 7.d	Acquity 2.1 (mm)
LCS 320-142201/2-A		12/28/2016 01:25	1	27DEC2016A6A_01 8.d	Acquity 2.1 (mm)
LCSD 320-142201/3-A		12/28/2016 01:54	1	27DEC2016A6A_01 9.d	Acquity 2.1 (mm)
320-24311-1		12/28/2016 02:24	1	27DEC2016A6A_02 0.d	Acquity 2.1 (mm)
320-24311-2		12/28/2016 02:53	1	27DEC2016A6A_02 1.d	Acquity 2.1 (mm)
320-24311-3		12/28/2016 03:23	1	27DEC2016A6A_02 2.d	Acquity 2.1 (mm)
320-24311-4		12/28/2016 03:53	1	27DEC2016A6A_02 3.d	Acquity 2.1 (mm)
320-24311-5 DL		12/28/2016 04:22	10	27DEC2016A6A_02 4.d	Acquity 2.1 (mm)
320-24311-6		12/28/2016 04:52	1	27DEC2016A6A_02 5.d	Acquity 2.1 (mm)
320-24311-5		12/28/2016 05:21	1	27DEC2016A6A_02 6.d	Acquity 2.1 (mm)
CCV 320-144052/27 CCVIS		12/28/2016 05:51	1	27DEC2016A6A_02 7.d	Acquity 2.1 (mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-24311-1

SDG No.: _____

Batch Number: 142201 Batch Start Date: 12/14/16 15:23 Batch Analyst: Kolstad, Kate M

Batch Method: 537 Batch End Date: 12/15/16 11:04

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	ReceivedpH	LC537-HSP 00013
MB 320-142201/1		537, 537				250 mL	1 mL	7 SU	
LCS 320-142201/2		537, 537				250 mL	1 mL	7 SU	50 uL
LCSD 320-142201/3		537, 537				250 mL	1 mL	7 SU	50 uL
320-24311-A-1	WI-CV-1RW32-1216	537, 537	T	275.35 g	27.95 g	247.4 mL	1 mL	7 SU	
320-24311-A-2	WI-CV-1FB32-1216	537, 537	T	276.41 g	26.49 g	249.9 mL	1 mL	7 SU	
320-24311-A-3	WI-CV-1RW33-1216	537, 537	T	283.86 g	26.18 g	257.7 mL	1 mL	7 SU	
320-24311-A-4	WI-CV-1FB33-1216	537, 537	T	272.95 g	26.85 g	246.1 mL	1 mL	7 SU	
320-24311-A-5	WI-CV-1RW34-1216	537, 537	T	275.19 g	26.71 g	248.5 mL	1 mL	7 SU	
320-24311-A-6	WI-CV-1FB34-1216	537, 537	T	278.03 g	26.62 g	251.4 mL	1 mL	7 SU	

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-IS 00026	LC537-SU 00024	AnalysisComment			
MB 320-142201/1		537, 537		20 uL	50 uL	chlorine=ND			
LCS 320-142201/2		537, 537		20 uL	50 uL	chlorine=ND			
LCSD 320-142201/3		537, 537		20 uL	50 uL	chlorine=ND			
320-24311-A-1	WI-CV-1RW32-1216	537, 537	T	20 uL	50 uL	chlorine=ND			
320-24311-A-2	WI-CV-1FB32-1216	537, 537	T	20 uL	50 uL	chlorine=ND			
320-24311-A-3	WI-CV-1RW33-1216	537, 537	T	20 uL	50 uL	chlorine=ND			
320-24311-A-4	WI-CV-1FB33-1216	537, 537	T	20 uL	50 uL	chlorine=ND			
320-24311-A-5	WI-CV-1RW34-1216	537, 537	T	20 uL	50 uL	chlorine=ND			
320-24311-A-6	WI-CV-1FB34-1216	537, 537	T	20 uL	50 uL	chlorine=ND			

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

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-24311-1

SDG No.: _____

Batch Number: 142201 Batch Start Date: 12/14/16 15:23 Batch Analyst: Kolstad, Kate M

Batch Method: 537 Batch End Date: 12/15/16 11:04

Batch Notes	
Manifold ID	5, 6
Methanol ID	807187
Pipette ID	MD05306
Analyst ID - IS Reagent Drop	ERW
Analyst ID - IS Reagent Drop Witness	CCB
Analyst ID - SU Reagent Drop	JER
Analyst ID - SU Reagent Drop Witness	KMK
Analyst ID - TA Reagent Drop	JER
Analyst ID - TA Reagent Drop Witness	KMK
SPE Cartridge ID	6332578-03
Trizma ID	SLBR4303V
Reagent Water ID	12/14/16

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: 24311, 24315 Instrument ID & Date: 12-28-16 ICAL Batch: 143828
 Extraction Batch: 142201 Worklist #: 38244 TALS Batch: 144052, 144053

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? <u>1</u> Dilutions due to non-targets? _____	✓			✓
5. All target compounds in MB < 1/3 RL? (Requires NCM if "no.")	✓			✓
6. Are target constituents in LCS/LCSD within method control limits?	✓			✓
7. Internal Standard areas in control for all samples and QC reported? ±50% from the average area of the ICAL and 70-140% of the most recent CCV	✓			✓
8. Do results (e.g., dilutions/trip blanks) make sense?	✓			✓
9. Are MS/MSD recoveries and RPDs within method control limits?			✓	
10. Are all QC samples properly linked in TALS?	✓			✓
11. All manual integrations appropriate and completely documented?	✓			✓
12. Are nonconformances documented as NCMs?	✓			✓
13. Are all Chrom graphics uploaded?	✓			✓

1st Level Reviewer / Date: JRB 12-28-16 2nd Level Reviewer / Date: MWJ 12/29/2016

NCM # and Comments: 74028

Instrument ID & Date: AL6 12/24/16 Worklist#: 39202

ICAL Batch: 143828, 143829 Calibration ID number: 27291, 27292

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 ≤ 1/2 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: CBW 12/27/16

2nd Level Reviewer / Date: Murphy 12/27/2016

NCM # and Comments: _____

TestAmerica Laboratories
Worklist QC Batch Report

Worklist Name: 27DEC2016A_A6 537 Worklist Number: 38244
 Instrument Name: A6 Chrom Method: 537_A6
 Data Directory: \\ChromNA\Sacramento\ChromData\A6\20161228-38244.b
 QC Batching: Enabled Limit Group Batching: Enabled

QC Batch: 1	LC 537 ICAL Raw Batch: 144050	LC 537 CS ICAL Raw Batch: 144051
# 1 RB	# 1 RB	
# 2 CCV L2	# 2 CCV L2	# 2 CCV L2
# 3 CCV L3	# 3 CCV L3	
# 4 RB	# 4 RB	
# 5 MB 320-141791/1-A		# 5 MB 320-141791/1-A
# 6 LLCS 320-141791/2-A		# 6 LLCS 320-141791/2-A
# 7 280-91747-A-1-A		# 7 280-91747-A-1-A
# 8 280-91747-A-1-B DU		# 8 280-91747-A-1-B DU
# 9 280-91747-A-1-C MS		# 9 280-91747-A-1-C MS
#10 280-91747-A-2-A		#10 280-91747-A-2-A
#11 280-91747-A-3-A		#11 280-91747-A-3-A
#12 280-91747-A-4-A		#12 280-91747-A-4-A
#13 280-91747-A-5-A		#13 280-91747-A-5-A
#14 280-91747-A-6-A		#14 280-91747-A-6-A
#15 CCV L5	#15 CCV L5	#15 CCV L5

QC Batch: 2	LC 537 ICAL Raw Batch: 144052	LC 537 CS ICAL Raw Batch: 144173
#15 CCV L5	#15 CCV L5	#15 CCV L5
#16 RB	#16 RB	
#17 MB 320-142201/1-A	#17 MB 320-142201/1-A	
#18 LCS 320-142201/2-A	#18 LCS 320-142201/2-A	
#19 LCSD 320-142201/3-A	#19 LCSD 320-142201/3-A	
#20 320-24311-A-1-A	#20 320-24311-A-1-A	
#21 320-24311-A-2-A	#21 320-24311-A-2-A	
#22 320-24311-A-3-A	#22 320-24311-A-3-A	
#23 320-24311-A-4-A	#23 320-24311-A-4-A	
#24 320-24311-A-5-A	#24 320-24311-A-5-A	
#25 320-24311-A-6-A	#25 320-24311-A-6-A	
#26 320-24311-A-5-A	#26 320-24311-A-5-A	
#27 CCV L3	#27 CCV L3	

QC Batch: 3	LC 537 ICAL Raw Batch: 144053
#27 CCV L3	#27 CCV L3
#28 RB	#28 RB
#29 320-24315-A-1-A	#29 320-24315-A-1-A
#30 320-24315-A-2-A	#30 320-24315-A-2-A
#31 320-24315-A-3-A	#31 320-24315-A-3-A
#32 320-24315-A-4-A	#32 320-24315-A-4-A
#33 320-24315-A-5-A	#33 320-24315-A-5-A
#34 320-24315-A-6-A	#34 320-24315-A-6-A
#35 320-24315-A-7-A	#35 320-24315-A-7-A
#36 320-24315-A-8-A	#36 320-24315-A-8-A
#37 MB 320-143388/1-A	#37 MB 320-143388/1-A
#38 LLCS 320-143388/2-A	#38 LLCS 320-143388/2-A
#39 CCV L5	#39 CCV L5

QC Batch: 4	LC 537 ICAL Raw Batch: 144054
#39 CCV L5	#39 CCV L5
#40 RB	#40 RB
#41 LLCSD 320-143388/3-A	#41 LLCSD 320-143388/3-A
#42 320-24536-A-1-A	#42 320-24536-A-1-A
#43 320-24536-A-2-A	#43 320-24536-A-2-A
#44 320-24536-A-3-A	#44 320-24536-A-3-A
#45 320-24536-A-4-A	#45 320-24536-A-4-A
#46 320-24536-A-5-A	#46 320-24536-A-5-A
#47 320-24536-A-6-A	#47 320-24536-A-6-A
#48 320-24536-A-7-A	#48 320-24536-A-7-A
#49 320-24536-A-8-A	#49 320-24536-A-8-A
#50 320-24536-A-9-A	#50 320-24536-A-9-A
#51 CCV L3	#51 CCV L3

QC Batch: 5	LC 537 ICAL Raw Batch: 144055
#51 CCV L3	#51 CCV L3
#52 RB	#52 RB
#53 320-24536-B-10-A	#53 320-24536-B-10-A
#54 320-24536-A-11-A	#54 320-24536-A-11-A
#55 320-24536-B-12-A	#55 320-24536-B-12-A
#56 320-24536-B-13-A	#56 320-24536-B-13-A
#57 CCV L5	#57 CCV L5

27 Rush

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-142201

Analyst: Kolstad, Kate M

Batch Open: 12/14/2016 3:23:00PM

Method Code: 320-537_Prep-320

Batch End: 12/15/16 11:04

Extraction of Perfluorinated Alkyl Acids

Screened Au 12/16/16, see DL
 AG 12/27/16
 Done 12/27

Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmnt FinAmnt	Rcvd	PHs Adj1	Adj2	Due Date	Analytical TAT	Div Rank	Comments	Output Sample Lab ID
1 MB~320-142201/1 N/A	N/A		250 mL	7			N/A	N/A	N/A	chlorine=ND	
			1 mL								
2 LCS~320-142201/2 N/A	N/A		250 mL	7			N/A	N/A	N/A	chlorine=ND	
			1 mL								
3 LCSD~320-142201/3 N/A	N/A		250 mL	7			N/A	N/A	N/A	chlorine=ND	
			1 mL								
320-24311-A-1 (537_DOD5)	N/A (320-24311-1)	275.35 g	247.4 mL	7			12/18/16	11_Day_Rush	4	chlorine=ND	
		27.95 g	1 mL								
320-24311-A-2 (537_DOD5)	N/A (320-24311-1)	276.41 g	249.9 mL	7			12/18/16	11_Day_Rush	4	chlorine=ND	
		26.49 g	1 mL								
320-24311-A-3 (537_DOD5)	N/A (320-24311-1)	283.86 g	257.7 mL	7			12/18/16	11_Day_Rush	4	chlorine=ND	
		26.18 g	1 mL								
320-24311-A-4 (537_DOD5)	N/A (320-24311-1)	272.95 g	246.1 mL	7			12/18/16	11_Day_Rush	4	chlorine=ND	
		26.85 g	1 mL								
320-24311-A-5 (537_DOD5)	N/A (320-24311-1)	275.19 g	248.5 mL	7			12/18/16	11_Day_Rush	4	chlorine=ND 10X DL	
		26.71 g	1 mL								
320-24311-A-6 (537_DOD5)	N/A (320-24311-1)	278.03 g	251.4 mL	7			12/18/16	11_Day_Rush	4	chlorine=ND	
		26.62 g	1 mL								
320-24315-A-1 (537_DOD5)	N/A (320-24315-1)	283.26 g	256.2 mL	7			12/18/16	11_Day_Rush	4	chlorine=ND	
		27.07 g	1 mL								

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 12/29/2016

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-142201








Analyst: Kolstad, Kate M

Batch Open: 12/14/2016 3:23:00PM

Method Code: 320-537_Prep-320

Batch End:

11
12
13
14
15
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11	320-24315-A-2 (537_DOD5)	N/A (320-24315-1)	279.14 g	252.9 mL	7		12/18/16	11_Day_Rush	4	chlorine=ND	
			26.20 g	1 mL							
12	320-24315-A-3 (537_DOD5)	N/A (320-24315-1)	275.99 g	249.2 mL	7		12/18/16	11_Day_Rush	4	chlorine=ND	
			26.77 g	1 mL							
13	320-24315-A-4 (537_DOD5)	N/A (320-24315-1)	277.46 g	250.6 mL	7		12/18/16	11_Day_Rush	4	chlorine=ND	
			26.84 g	1 mL							
14	320-24315-A-5 (537_DOD5)	N/A (320-24315-1)	277.71 g	250.8 mL	7		12/18/16	11_Day_Rush	4	chlorine=ND	
			26.91 g	1 mL							
15	320-24315-A-6 (537_DOD5)	N/A (320-24315-1)	280.18 g	253.7 mL	7		12/18/16	11_Day_Rush	4	chlorine=ND	
			26.50 g	1 mL							
	320-24315-A-7 (537_DOD5)	N/A (320-24315-1)	270.88 g	242.8 mL	7		12/18/16	11_Day_Rush	4	chlorine=ND	
			28.05 g	1 mL							
	320-24315-A-8 (537_DOD5)	N/A (320-24315-1)	276.28 g	250.5 mL	7		12/18/16	11_Day_Rush	4	chlorine=ND	
			25.76 g	1 mL							

12/29/2016

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-142201

Analyst: Kolstad, Kate M

Batch Open: 12/14/2016 3:23:00PM

Method Code: 320-537_Prep-320

Batch End:

Batch Notes

Manifold ID 5, 6

Trizma ID SLBR4303V

SPE Cartridge ID 6332578-03

Methanol ID 807187

Reagent Water ID 12/14/16

Pipette ID MD05306

Analyst ID - TA Reagent Drop JER

Analyst ID - TA Reagent Drop KMK

Witness

Analyst ID - SU Reagent Drop JER

Analyst ID - SU Reagent Drop KMK

Witness

Analyst ID - IS Reagent Drop

ERU 12/15/16

Analyst ID - IS Reagent Drop

Witness

CAB 12/15/16 799828

Batch Comment

Comments

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12/29/2016

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-142201

Analyst: Kolstad, Kate M

Batch Open: 12/14/2016 3:23:00PM

Method Code: 320-537_Prep-320

Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-142201/1	LC537-SU_00024	50 uL	1 mL	<i>MSD 12/14/16</i>	<i>KMK 12-14-16</i>
LCS 320-142201/2	LC537-HSP_00013	50 uL	1 mL		
LCS 320-142201/2	LC537-SU_00024	50 uL	1 mL		
LCSD 320-142201/3	LC537-HSP_00013	50 uL	1 mL		
LCSD 320-142201/3	LC537-SU_00024	50 uL	1 mL		
320-24311-A-1	LC537-SU_00024	50 uL	1 mL		
320-24311-A-2	LC537-SU_00024	50 uL	1 mL		
320-24311-A-3	LC537-SU_00024	50 uL	1 mL		
320-24311-A-4	LC537-SU_00024	50 uL	1 mL		
320-24311-A-5	LC537-SU_00024	50 uL	1 mL		
320-24311-A-6	LC537-SU_00024	50 uL	1 mL		
320-24315-A-1	LC537-SU_00024	50 uL	1 mL		
320-24315-A-2	LC537-SU_00024	50 uL	1 mL		
320-24315-A-3	LC537-SU_00024	50 uL	1 mL		
320-24315-A-4	LC537-SU_00024	50 uL	1 mL		
320-24315-A-5	LC537-SU_00024	50 uL	1 mL		
320-24315-A-6	LC537-SU_00024	50 uL	1 mL		
320-24315-A-7	LC537-SU_00024	50 uL	1 mL		

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Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-142201

Analyst: Kolstad, Kate M

Batch Open: 12/14/2016 3:23:00PM

Method Code: 320-537_Prep-320

Batch End:

320-24315-A-8	LC537-SU_00024	50 uL	1 mL	<i>[Signature]</i> 12/14/16	KMK 12-14-16
---------------	----------------	-------	------	-----------------------------	--------------

Other Reagents:

Reagent	Amount/Units	Lot#:

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12/29/2016

Preparation Batch Number(s): 142201 Test: 537-DoD5 PUSH
 Earliest Holding Time: 12-23-16

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: _____

Date: _____

2nd Level Reviewer: vpm

Date: 12/15/16

Comments: _____

Shipping and Receiving Documents

Regulatory Program: DW NPDES RCRA Other:

Client Contact Tiffany Hill	Project Manager: Katie Tippin Tel/Fax: (757) 671-6258	Site Contact: Eric Epple Lab Contact: Laura Turpen	Date: 12/12/2016 Carrier: FedEx
Project Chemist 1100 NE Circle Blvd Ste 300 Corvallis, OR 97330 (541) 768-3109 (541) 908-3794	Analysis Turnaround Time <input checked="" type="checkbox"/> CALENDAR DAYS <input type="checkbox"/> WORKING DAYS TAT if different from Below <u>7</u> -Day <input type="checkbox"/> 2 weeks <input type="checkbox"/> 1 week <input type="checkbox"/> 2 days <input type="checkbox"/> 1 day		COC No: 8 of 1 COCs
Project Name: CTO-08 Site: OLF Coupeville P O #: 100067106050 - 679580.09.FI.FS			Sampler: For Lab Use Only: Walk-in Client: Lab Sampling: Job / SDG No.:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS/MSD (Y/N)	USEPA Method 537 (PFOA, PFOS, and PFBS)	Sample Specific Notes:
WI-CV-1RW32-1216	12/9/16	1249	G	DW	2	N	N	X	
WI-CV-1FB32-1216	12/9/16	1251	G	DW	2	N	N	X	
WI-CV-1RW33-1216	12/10/16	0914	G	DW	2	N	N	X	
WI-CV-1FB33-1216	12/10/16	0915	G	DW	2	N	N	X	
WI-CV-1RW34-1216	12/10/16	0940	G	DW	2	N	N	X	
WI-CV-1FB34-1216	12/10/16	0941	G	DW	2	N	N	X	



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

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

Non-Hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
 Return to Client Disposal by Lab Archive for _____ Months

Special Instructions/QC Requirements & Comments:
* containers labeled for 1415 CM12 12/13/16 ** Containers labeled for 1416 CM12 12/13/16

Custody Seals Intact: Yes No Custody Seal No.: _____ Cooler Temp. (°C): Obs'd: 24 Corr'd: 1.3 Therm ID No.: 12 1005

Relinquished by: <u>Eric Epple</u>	Company: CH2M	Date/Time: 12-12-16/1600	Received by: <u>Laura Turpen</u>	Company: <u>TAS</u>	Date/Time: 12/13/16 1005
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

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Login Sample Receipt Checklist

Client: CH2M Hill Constructors, Inc.

Job Number: 320-24311-1

Login Number: 24311
List Number: 1
Creator: Nelson, Kym D

List Source: TestAmerica Sacramento

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

Contract_ID	DO_CTO_ Number	Phase	Installation_ID	Sample_Name	Chem_Name	Analyte_ID	Analyte_Value	Original_Analyte_ Value	Result_Units	Lab_Qualifier	Validator_Qualifier	GC_Column_Type	Analysis_Result_Type	Result_Narrative	QC_Control_ Limit_Code
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW32-1216	Perfluorooctane Sulfonate (PFOS)	1763-23-1		0.049	UG_L	U			PR	TRG	
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW32-1216	Perfluorooctanoic acid (PFOA)	335-67-1		0.024	UG_L	U			PR	TRG	
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW32-1216	Perfluorobutanesulfonic acid (PFBS)	375-73-5		0.11	UG_L	U			PR	TRG	
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW32-1216	13C2 PFHXA	13C2 PFHXA		113	PCT_REC				PR	SURR	SLSA
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW32-1216	13C2 PFDA	13C2 PFDA		105	PCT_REC				PR	SURR	SLSA
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1FB32-1216	Perfluorooctane Sulfonate (PFOS)	1763-23-1		0.048	UG_L	U			PR	TRG	
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1FB32-1216	Perfluorooctanoic acid (PFOA)	335-67-1		0.024	UG_L	U M			PR	TRG	
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1FB32-1216	Perfluorobutanesulfonic acid (PFBS)	375-73-5		0.11	UG_L	U			PR	TRG	
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1FB32-1216	13C2 PFHXA	13C2 PFHXA		115	PCT_REC				PR	SURR	SLSA
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1FB32-1216	13C2 PFDA	13C2 PFDA		113	PCT_REC				PR	SURR	SLSA
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW33-1216	Perfluorooctane Sulfonate (PFOS)	1763-23-1		0.047	UG_L	U			PR	TRG	
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW33-1216	Perfluorooctanoic acid (PFOA)	335-67-1		0.023	UG_L	U			PR	TRG	
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW33-1216	Perfluorobutanesulfonic acid (PFBS)	375-73-5		0.11	UG_L	U			PR	TRG	
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW33-1216	13C2 PFHXA	13C2 PFHXA		101	PCT_REC				PR	SURR	SLSA
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW33-1216	13C2 PFDA	13C2 PFDA		110	PCT_REC				PR	SURR	SLSA
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1FB33-1216	Perfluorooctane Sulfonate (PFOS)	1763-23-1		0.049	UG_L	U			PR	TRG	
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1FB33-1216	Perfluorooctanoic acid (PFOA)	335-67-1		0.024	UG_L	U			PR	TRG	
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1FB33-1216	Perfluorobutanesulfonic acid (PFBS)	375-73-5		0.11	UG_L	U			PR	TRG	
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1FB33-1216	13C2 PFHXA	13C2 PFHXA		114	PCT_REC				PR	SURR	SLSA
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1FB33-1216	13C2 PFDA	13C2 PFDA		109	PCT_REC				PR	SURR	SLSA
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW34-1216	Perfluorooctanoic acid (PFOA)	335-67-1		0.66	UG_L	D			PR	TRG	
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW34-1216	13C2 PFHXA	13C2 PFHXA		99	PCT_REC				PR	SURR	SLSA
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW34-1216	13C2 PFDA	13C2 PFDA		113	PCT_REC				PR	SURR	SLSA
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW34-1216	Perfluorooctane Sulfonate (PFOS)	1763-23-1		0.048	UG_L	U M			PR	TRG	
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW34-1216	Perfluorobutanesulfonic acid (PFBS)	375-73-5		0.061	UG_L	J			PR	TRG	
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW34-1216	13C2 PFHXA	13C2 PFHXA		109	PCT_REC				PR	SURR	SLSA
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW34-1216	13C2 PFDA	13C2 PFDA		125	PCT_REC				PR	SURR	SLSA
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1FB34-1216	Perfluorooctane Sulfonate (PFOS)	1763-23-1		0.048	UG_L	U			PR	TRG	
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1FB34-1216	Perfluorooctanoic acid (PFOA)	335-67-1		0.024	UG_L	U M			PR	TRG	
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1FB34-1216	Perfluorobutanesulfonic acid (PFBS)	375-73-5		0.11	UG_L	U			PR	TRG	
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1FB34-1216	13C2 PFHXA	13C2 PFHXA		102	PCT_REC				PR	SURR	SLSA
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1FB34-1216	13C2 PFDA	13C2 PFDA		97	PCT_REC				PR	SURR	SLSA
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCS 320-142201/2-A	Perfluorooctane Sulfonate (PFOS)	1763-23-1		91	PCT_REC				PR	TRG	LSA
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCS 320-142201/2-A	Perfluorooctanoic acid (PFOA)	335-67-1		108	PCT_REC	E			PR	TRG	LSA
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCS 320-142201/2-A	Perfluorobutanesulfonic acid (PFBS)	375-73-5		82	PCT_REC				PR	TRG	LSA
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCS 320-142201/2-A	13C2 PFHXA	13C2 PFHXA		121	PCT_REC				PR	SURR	SLSA
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCS 320-142201/2-A	13C2 PFDA	13C2 PFDA		119	PCT_REC				PR	SURR	SLSA
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCSD 320-142201/3-A	Perfluorooctane Sulfonate (PFOS)	1763-23-1		92	PCT_REC				PR	TRG	LSP
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCSD 320-142201/3-A	Perfluorooctanoic acid (PFOA)	335-67-1		103	PCT_REC				PR	TRG	LSP
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCSD 320-142201/3-A	Perfluorobutanesulfonic acid (PFBS)	375-73-5		82	PCT_REC				PR	TRG	LSP
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCSD 320-142201/3-A	13C2 PFHXA	13C2 PFHXA		118	PCT_REC				PR	SURR	SLSA
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCSD 320-142201/3-A	13C2 PFDA	13C2 PFDA		114	PCT_REC				PR	SURR	SLSA
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	MB 320-142201/1-A	Perfluorooctane Sulfonate (PFOS)	1763-23-1		0.048	UG_L	U			PR	TRG	
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	MB 320-142201/1-A	Perfluorooctanoic acid (PFOA)	335-67-1		0.024	UG_L	U			PR	TRG	
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	MB 320-142201/1-A	Perfluorobutanesulfonic acid (PFBS)	375-73-5		0.11	UG_L	U			PR	TRG	
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	MB 320-142201/1-A	13C2 PFHXA	13C2 PFHXA		110	PCT_REC				PR	SURR	SLSA
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	MB 320-142201/1-A	13C2 PFDA	13C2 PFDA		104	PCT_REC				PR	SURR	SLSA

Contract_ID	DO_CTO_ Number	Phase	Installation_ID	Sample_Name	QC_Accuracy_ Upper	QC_Accuracy_ Lower	Control_Limit_Date	QC_Narrative	MDL	Detection_Limit	QSM_Version	DL	LOD	LOQ	SDG	Analysis_Batch	Validator_Name	Val_Date
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW32-1216			00000000				5.0	0.016	0.049	0.061	320-24311-1	320-144052		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW32-1216			00000000				5.0	0.0095	0.024	0.030	320-24311-1	320-144052		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW32-1216			00000000				5.0	0.048	0.11	0.14	320-24311-1	320-144052		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW32-1216	130	70	00000000				5.0				320-24311-1	320-144052		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW32-1216	130	70	00000000				5.0				320-24311-1	320-144052		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1FB32-1216			00000000				5.0	0.016	0.048	0.060	320-24311-1	320-144052		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1FB32-1216			00000000				5.0	0.0094	0.024	0.030	320-24311-1	320-144052		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1FB32-1216	130	70	00000000				5.0	0.048	0.11	0.14	320-24311-1	320-144052		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1FB32-1216	130	70	00000000				5.0				320-24311-1	320-144052		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW33-1216			00000000				5.0	0.015	0.047	0.058	320-24311-1	320-144052		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW33-1216			00000000				5.0	0.0091	0.023	0.029	320-24311-1	320-144052		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW33-1216			00000000				5.0	0.046	0.11	0.14	320-24311-1	320-144052		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW33-1216	130	70	00000000				5.0				320-24311-1	320-144052		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW33-1216	130	70	00000000				5.0				320-24311-1	320-144052		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1FB33-1216			00000000				5.0	0.016	0.049	0.061	320-24311-1	320-144052		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1FB33-1216			00000000				5.0	0.0096	0.024	0.030	320-24311-1	320-144052		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1FB33-1216			00000000				5.0	0.048	0.11	0.14	320-24311-1	320-144052		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1FB33-1216	130	70	00000000				5.0				320-24311-1	320-144052		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1FB33-1216	130	70	00000000				5.0				320-24311-1	320-144052		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW34-1216			00000000				5.0	0.095	0.24	0.30	320-24311-1	320-144052		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW34-1216	130	70	00000000				5.0				320-24311-1	320-144052		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW34-1216	130	70	00000000				5.0				320-24311-1	320-144052		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW34-1216			00000000				5.0	0.016	0.048	0.060	320-24311-1	320-144052		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW34-1216			00000000				5.0	0.048	0.11	0.14	320-24311-1	320-144052		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW34-1216	130	70	00000000				5.0				320-24311-1	320-144052		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1RW34-1216	130	70	00000000				5.0				320-24311-1	320-144052		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1FB34-1216			00000000				5.0	0.015	0.048	0.060	320-24311-1	320-144052		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1FB34-1216			00000000				5.0	0.0094	0.024	0.030	320-24311-1	320-144052		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1FB34-1216			00000000				5.0	0.047	0.11	0.14	320-24311-1	320-144052		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1FB34-1216	130	70	00000000				5.0				320-24311-1	320-144052		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	WI-CV-1FB34-1216	130	70	00000000				5.0				320-24311-1	320-144052		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCS 320-142201/2-A	130	70	00000000				5.0	0.016	0.048	0.060	320-24311-1	320-144052		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCS 320-142201/2-A	130	70	00000000				5.0	0.0094	0.024	0.030	320-24311-1	320-144052		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCS 320-142201/2-A	130	70	00000000				5.0	0.048	0.11	0.14	320-24311-1	320-144052		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCS 320-142201/2-A	130	70	00000000				5.0				320-24311-1	320-144052		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCS 320-142201/2-A	130	70	00000000				5.0				320-24311-1	320-144052		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCS 320-142201/3-A	130	70	00000000				5.0	0.016	0.048	0.060	320-24311-1	320-144052		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCS 320-142201/3-A	130	70	00000000				5.0	0.0094	0.024	0.030	320-24311-1	320-144052		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCS 320-142201/3-A	130	70	00000000				5.0	0.048	0.11	0.14	320-24311-1	320-144052		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCS 320-142201/3-A	130	70	00000000				5.0				320-24311-1	320-144052		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	LCS 320-142201/3-A	130	70	00000000				5.0				320-24311-1	320-144052		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	MB 320-142201/1-A			00000000				5.0	0.016	0.048	0.060	320-24311-1	320-144052		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	MB 320-142201/1-A			00000000				5.0	0.0094	0.024	0.030	320-24311-1	320-144052		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	MB 320-142201/1-A			00000000				5.0	0.048	0.11	0.14	320-24311-1	320-144052		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	MB 320-142201/1-A	130	70	00000000				5.0				320-24311-1	320-144052		
N6247016D9000	0008		WHIDBEY_ISLAND_NAS	MB 320-142201/1-A	130	70	00000000				5.0				320-24311-1	320-144052		

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

Client: CH2M HILL, Inc., Corvallis, Oregon
SDG: 320-24311-1
Laboratory: Test America, Sacramento, California
Site: Whidbey Island, CTO-0008, Washington
Date: January 12, 2017

PFCs			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-CV-1RW32-1216	320-24311-1	Water
2	WI-CV-1FB32-1216	320-24311-2	Water
3	WI-CV-1RW33-1216	320-24311-3	Water
4	WI-CV-1FB33-1216	320-24311-4	Water
5	WI-CV-1RW34-1216	320-24311-5	Water
5DL	WI-CV-1RW34-1216DL	320-24311-5DL	Water
6	WI-CV-1FB34-1216	320-24311-6	Water

A full data validation was performed on the analytical data for three water samples and three aqueous field blank samples collected on December 9-10, 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 as qualified for the data quality indicator criteria as detailed in this report.

Perfluorinated Compounds (PFCs)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

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

GC/MS Tuning

- All criteria were met.

Initial Calibration

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

Continuing Calibration

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

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- The field blank samples were free of contamination.

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate %R values.

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

- A MS/MSD sample was not collected.

Laboratory Control Samples/Laboratory Control Sample Duplicates

- The LCS/LCSD samples exhibited acceptable percent recoveries (%R) and RPD values.

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria except for the following.

Sample ID	Internal Standard	Area Count	Qualifier
5DL	13C2-PFOA	Severely Low	J

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- EDS Sample ID #5 was analyzed at a 10X dilution for PFOA due to a high concentration. The reporting limits were adjusted accordingly. No action was required.

Field Duplicate Sample Precision

- Field duplicate samples were not collected.

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

Signed: Nancy Weaver
Nancy Weaver
Senior Chemist

Dated: 1/17/17

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.: 320-24311-1
 SDG No.: _____
 Client Sample ID: WI-CV-1RW32-1216 Lab Sample ID: 320-24311-1
 Matrix: Water Lab File ID: 27DEC2016A6A_020.d
 Analysis Method: 537 Date Collected: 12/09/2016 14:15
 Extraction Method: 537 Date Extracted: 12/14/2016 15:24
 Sample wt/vol: 247.4(mL) Date Analyzed: 12/28/2016 02:24
 Con. Extract Vol.: 1(mL) Dilution Factor: 1
 Injection Volume: 10(uL) GC Column: Acquity ID: 2.1(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 144052 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.049	U	0.061	0.049	0.016
335-67-1	Perfluorooctanoic acid (PFOA)	0.024	U	0.030	0.024	0.0095
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.14	0.11	0.048

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	113		70-130
STL00996	13C2 PFDA	105		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

2

Lab Name: TestAmerica Sacramento Job No.: 320-24311-1
 SDG No.: _____
 Client Sample ID: WI-CV-1FB32-1216 Lab Sample ID: 320-24311-2
 Matrix: Water Lab File ID: 27DEC2016A6A_021.d
 Analysis Method: 537 Date Collected: 12/09/2016 14:16
 Extraction Method: 537 Date Extracted: 12/14/2016 15:24
 Sample wt/vol: 249.9(mL) Date Analyzed: 12/28/2016 02:53
 Con. Extract Vol.: 1(mL) Dilution Factor: 1
 Injection Volume: 10(uL) GC Column: Acquity ID: 2.1(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 144052 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 N	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	115		70-130
STL00996	13C2 PFDA	113		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

3

Lab Name: TestAmerica Sacramento Job No.: 320-24311-1
 SDG No.: _____
 Client Sample ID: WI-CV-1RW33-1216 Lab Sample ID: 320-24311-3
 Matrix: Water Lab File ID: 27DEC2016A6A_022.d
 Analysis Method: 537 Date Collected: 12/10/2016 09:14
 Extraction Method: 537 Date Extracted: 12/14/2016 15:24
 Sample wt/vol: 257.7(mL) Date Analyzed: 12/28/2016 03:23
 Con. Extract Vol.: 1(mL) Dilution Factor: 1
 Injection Volume: 10(uL) GC Column: Acquity ID: 2.1(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 144052 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.047	U	0.058	0.047	0.015
335-67-1	Perfluorooctanoic acid (PFOA)	0.023	U	0.029	0.023	0.0091
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.14	0.11	0.046

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	101		70-130
STL00996	13C2 PFDA	110		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

4

Lab Name: TestAmerica Sacramento Job No.: 320-24311-1
 SDG No.: _____
 Client Sample ID: WI-CV-1FB33-1216 Lab Sample ID: 320-24311-4
 Matrix: Water Lab File ID: 27DEC2016A6A_023.d
 Analysis Method: 537 Date Collected: 12/10/2016 09:15
 Extraction Method: 537 Date Extracted: 12/14/2016 15:24
 Sample wt/vol: 246.1(mL) Date Analyzed: 12/28/2016 03:53
 Con. Extract Vol.: 1(mL) Dilution Factor: 1
 Injection Volume: 10(uL) GC Column: Acquity ID: 2.1(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 144052 Units: ug/L

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

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	114		70-130
STL00996	13C2 PFDA	109		70-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

5

Lab Name: TestAmerica Sacramento Job No.: 320-24311-1
 SDG No.: _____
 Client Sample ID: WI-CV-1RW34-1216 Lab Sample ID: 320-24311-5
 Matrix: Water Lab File ID: 27DEC2016A6A_026.d
 Analysis Method: 537 Date Collected: 12/10/2016 09:40
 Extraction Method: 537 Date Extracted: 12/14/2016 15:24
 Sample wt/vol: 248.5(mL) Date Analyzed: 12/28/2016 05:21
 Con. Extract Vol.: 1(mL) Dilution Factor: 1
 Injection Volume: 10(uL) GC Column: Acquity ID: 2.1(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 144052 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.048	U M	0.060	0.048	0.016
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.061	J	0.14	0.11	0.048

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	109		70-130
STL00996	13C2 PFDA	125		70-130

NW 11/2/17

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

SDL

Lab Name: TestAmerica Sacramento Job No.: 320-24311-1
 SDG No.: _____
 Client Sample ID: WI-CV-1RW34-1216 DL Lab Sample ID: 320-24311-5 DL
 Matrix: Water Lab File ID: 27DEC2016A6A_024.d
 Analysis Method: 537 Date Collected: 12/10/2016 09:40
 Extraction Method: 537 Date Extracted: 12/14/2016 15:24
 Sample wt/vol: 248.5(mL) Date Analyzed: 12/28/2016 04:22
 Con. Extract Vol.: 1(mL) Dilution Factor: 10
 Injection Volume: 10(uL) GC Column: Acquity ID: 2.1(mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 144052 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.66	D / J	0.30	0.24	0.095

ISL

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	99		70-130
STL00996	13C2 PFDA	113		70-130

Milizli7

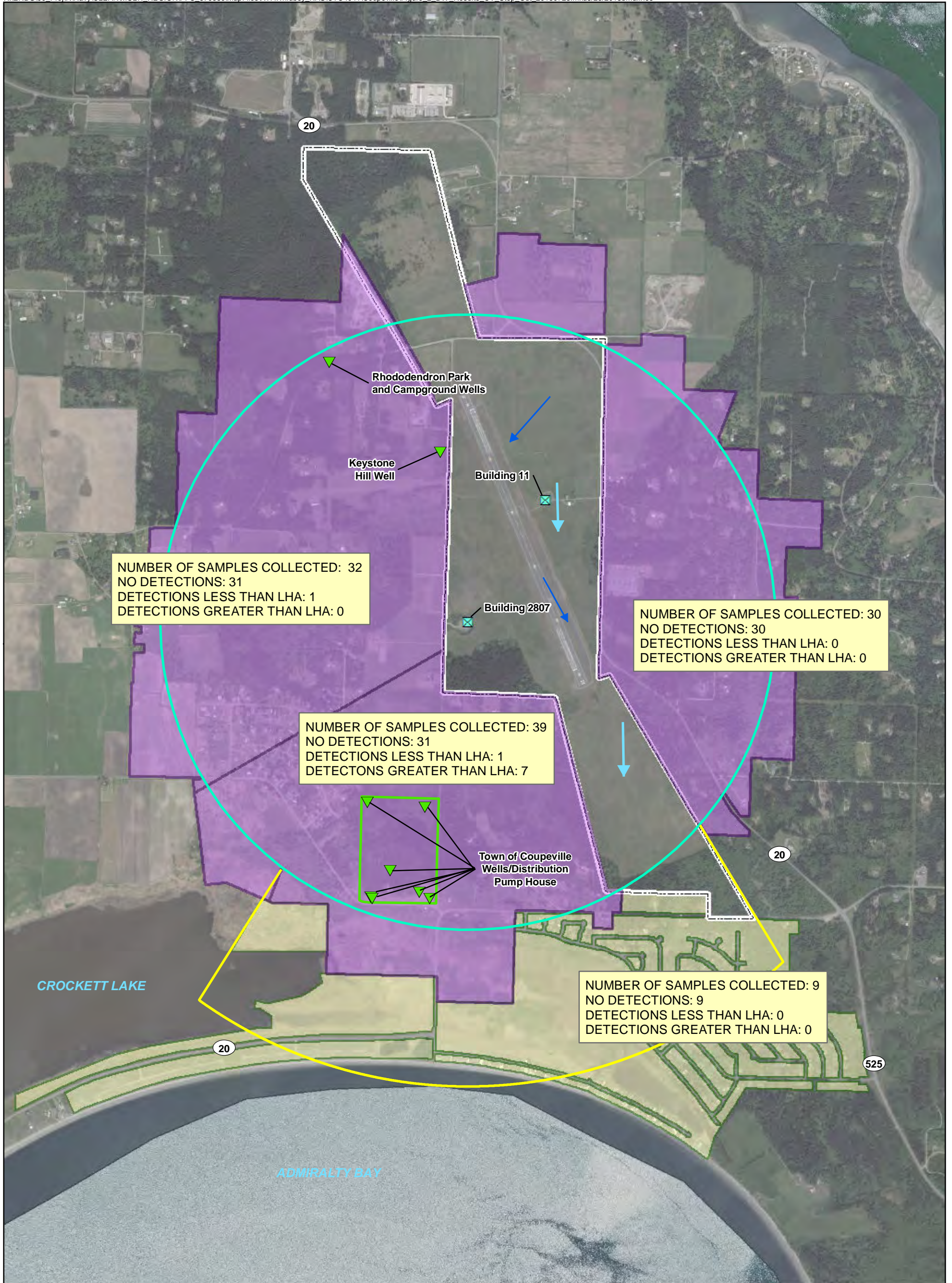
FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

6

Lab Name: TestAmerica Sacramento Job No.: 320-24311-1
 SDG No.: _____
 Client Sample ID: WI-CV-1FB34-1216 Lab Sample ID: 320-24311-6
 Matrix: Water Lab File ID: 27DEC2016A6A_025.d
 Analysis Method: 537 Date Collected: 12/10/2016 09:41
 Extraction Method: 537 Date Extracted: 12/14/2016 15:24
 Sample wt/vol: 251.4 (mL) Date Analyzed: 12/28/2016 04:52
 Con. Extract Vol.: 1 (mL) Dilution Factor: 1
 Injection Volume: 10 (uL) GC Column: Acquity ID: 2.1 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 144052 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.048	U	0.060	0.048	0.015
335-67-1	Perfluorooctanoic acid (PFOA)	0.024	U M	0.030	0.024	0.0094
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.11	U	0.14	0.11	0.047

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	102		70-130
STL00996	13C2 PFDA	97		70-130



NUMBER OF SAMPLES COLLECTED: 32
 NO DETECTIONS: 31
 DETECTIONS LESS THAN LHA: 1
 DETECTIONS GREATER THAN LHA: 0

NUMBER OF SAMPLES COLLECTED: 30
 NO DETECTIONS: 30
 DETECTIONS LESS THAN LHA: 0
 DETECTIONS GREATER THAN LHA: 0

NUMBER OF SAMPLES COLLECTED: 39
 NO DETECTIONS: 31
 DETECTIONS LESS THAN LHA: 1
 DETECTIONS GREATER THAN LHA: 7

NUMBER OF SAMPLES COLLECTED: 9
 NO DETECTIONS: 9
 DETECTIONS LESS THAN LHA: 0
 DETECTIONS GREATER THAN LHA: 0

Legend

- Direction of Middle Zone Groundwater Flow
- Direction of Deep Zone Groundwater Flow
- Municipal Well
- Base Supply Well
- Fort Casey Well Field
- 1-mile zone
- Phase 1 Sampling Area
- Phase 2 Sampling Area
- Half-mile Step-out Downgradient
- Base Boundary

Note:
 One parcel outside the Phase 1 and Phase 2 sampling areas was sampled, and PFOA and PFOS were detected less than the LHA. This sample is not included in the sample counts shown on the figure.

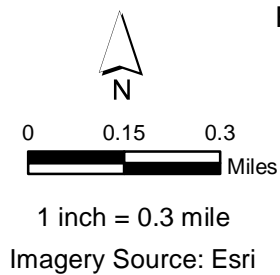


Figure 2
 Results for Drinking Water Well Sampling
 Outlying Landing Field Coupeville
 Coupeville, Washington

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